

GE

# LOGIQ P9/P7

## Service Manual

BASIC SERVICE DOCUMENTATION.  
COPYRIGHT GENERAL ELECTRIC COMPANY.  
ADVANCED SERVICE DOCUMENTATION.  
COPYRIGHT GENERAL ELECTRIC COMPANY.  
GE CONFIDENTIAL. UNLICENSED USE BY NON-GE PARTIES IS  
STRICTLY PROHIBITED.  
PROPRIETARY TO GE.  
GE RESTRICTED. DISCLOSURE TO NON-GE PARTIES  
PROHIBITED.  
© 2008, 2010 - 2011 and 2015 - 2017 General Electric Company.  
All Rights Reserved.

Document Number: **5604324**

Revision: **11**







# Important Precautions

---

## TRANSLATION POLICY

### WARNING (EN)

THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.

- IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.
- DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.
- FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.

### AVERTISSEMENT (FR)

CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.

- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.

### WARNUNG (DE)

DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.

- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

**AVISO**  
(ES)

ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.

- SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEHC SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.
- NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.

**ATENÇÃO**  
(PT-Br)

ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.

- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A' CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

**AVISO**  
(PT-pt)

ESTE MANUAL DE ASSISTÊNCIA ESTÁ DISPONÍVEL APENAS EM INGLÊS.

- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENTE EFECTUAR REPARAÇÕES NO EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO PREVIAMENTE ESTE MANUAL.
- A INOBSERVÂNCIA DESTE AVISO PODE RESULTAR EM FERIMENTOS NO TÉCNICO DE ASSISTÊNCIA, OPERADOR OU PACIENTE EM CONSEQUÊNCIA DE CHOQUE ELÉCTRICO, PERIGOS DE ORIGEM MECÂNICA, BEM COMO DE OUTROS TIPOS.

**AVVERTENZA**  
(IT)

IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.

- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEHC RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.
- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.

**HOIATUS  
(ET)**

KÄESOLEV TEENINDUSJUHEK ON SAADAVAL AINULT INGLISE KEELES.

- KUI KLIENDITEENINDUSE OSUTAJA NÕUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TÕLKETEENUSE OSUTAMISE EEST.
- ÄRGE ÜRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KÄESOLEVA TEENINDUSJUHEKIGA TUTVUMIST JA SELLEST ARU SAAMIST.
- KÄESOLEVA HOIATUSE EIRAMINE VÕIB PÕHJUSTADA TEENUSEOSUTAJA, OPERAATORI VÕI PATSIENDI VIGASTAMIST ELEKTRILÖÖGI, MEHAANILISE VÕI MUU OHU TAGAJÄRJEL.

**VAROITUS  
(FI)**

TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.

- JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITTAVAN KÄÄNNÖKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.
- ÄLÄ YRITÄ KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMÄRTÄNYT TÄMÄN HUOLTO-OHJEEN.
- MIKÄLI TÄTÄ VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KÄYTTÄJÄN TAI POTILAAN VAHINGOITTUMINEN SÄHKÖISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.

**ΠΡΟΕΙΔΟΠΟΙΗΣΗ  
(EL)**

ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.

- ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.
- ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.
- ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.

**FIGYELMEZTETÉS  
(HU)**

EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.

- HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.
- NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.
- EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÚTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.

VIÐVÖRUN  
(IS)

ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.

- EF ÞJÓNUSTUADILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.
- REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFI SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.
- EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.

VÝSTRAHA  
(CS)

TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.

- V PŘÍPADĚ, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKladU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.
- NEPROVÁDĚJTE ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.
- V PŘÍPADĚ NEDODRŽOVÁNÍ TĚTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VlivEM ELEKTRICKÉHO PROUDU, RESPEKTIVE VlivEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.

ADVARSEL  
(DA)

DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.

- HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.
- FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.
- MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.

WAARSCHUWING  
(NL)

DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.

- ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.
- PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.
- INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.

**BRĪDINĀJUMS  
(LV)**

**ŠĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGLŪ VALODĀ.**

- JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGLŪ, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.
- NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.
- ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.

**ĮSPĖJIMAS  
(LT)**

**ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA.**

- JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS.
- NEMĖGINKITE ATLIKTI ĮRANGOS TECHININĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE
- NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.

**ADVARSEL  
(NO)**

**DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.**

- HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE.
- IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT.
- MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.

**OSTRZEŻENIE  
(PL)**

**NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNNIE W JĘZYKU ANGIELSKIM.**

- JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TŁUMACZENIA SPOCZYWA NA KLIENCIE.
- NIE PRÓBOWAĆ SERWISOWAĆ NINIEJSZEGO SPRZĘTU BEZ UPRZEDNIEGO ZAPOZNANIA SIĘ Z PODRĘCZNIKIEM SERWISOWYM.
- NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOŻE GROZIĆ OBRAŻENIAMI CIAŁA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEŃ.

**ATENȚIE  
(RO)**

**ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.**

- **DACĂ UN FURNIZOR DE SERVICII PENTRU CLIEȚI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.**
- **NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ȘI ÎNȚELEGERII ACESTUI MANUAL DE SERVICE.**
- **IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.**

**ОСТОРОЖНО!  
(RU)**

**ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДОСТАВЛЯЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.**

- **ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.**
- **ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.**
- **НЕСОБЛЮЖДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЗЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.**

**ПРЕДУПРЕЖДЕНИЕ  
(BG)**

**ТОВА СЕРВИЗНО РЪКОВОДСТВО Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК.**

- **АКО ДОСТАВЧИКЪТ НА СЕРВИЗНИ УСЛУГИ НА КЛИЕНТ СЕ НУЖДАЕ ОТ ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, ЗАДЪЛЖЕНИЕ НА КЛИЕНТА Е ДА ПРЕДОСТАВИ ПРЕВОДАЧЕСКА УСЛУГА.**
- **НЕ СЕ ОПИТВАЙТЕ ДА ИЗВЪРШВАТЕ СЕРВИЗНО ОБСЛУЖВАНЕ НА ТОВА ОБОРУДВАНЕ, ОСВЕН ВСЛУЧАЙ, ЧЕ СЕРВИЗНОТО РЪКОВОДСТВО Е ПРОЧЕТЕНО И СЕ РАЗБИРА.**
- **НЕСПАЗВАНЕТО НА ТОВА ПРЕДУПРЕЖДЕНИЕ МОЖЕ ДА ДОВЕДЕ ДО НАРАНЯВАНЕ НА ДОСТАВЧИКА НА СЕРВИЗНИ УСЛУГИ, НА ОПЕРАТОРА ИЛИ ПАЦИЕНТА ВСЛЕДСТВИЕНА ТОКОВ УДАР, МЕХАНИЧНИ ИЛИ ДРУГИ РИСКОВЕ.**

**UPOZORENJE  
(SR)**

**OVAJ PRIRUČNIK ZA SERVISIRANJE DOSTUPAN JE SAMO NA ENGLISKOM JEZIKU.**

- **AKO KLIJENTOV SERVISER ZAHTEVA JEZIK KOJI NIJE ENGLISKI, ODGOVORNOST JE NA KLIJENTU DA PRUŽI USLUGE PREVOĐENJA.**
- **NEMOJTE POKUŠAVATI DA SERVISIRATE OPREMU AKO NISTE PROČITALI I RAZUMELI PRIRUČNIK ZA SERVISIRANJE.**
- **AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO POVREĐIVANJA SERVISERA, OPERATERA ILI PACIJENTA UZROKOVANOG ELEKTRIČNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.**

**OPOZORILO  
(SL)**

TA SERVISNI PRIROČNIK JE NA VOLJO SAMO V ANGLEŠČINI.

- ČE PONUDNIK SERVISNIH STORITEV ZA STRANKO POTREBUJE NAVODILA V DRUGEM JEZIKU, JE ZA PREVOD ODGOVORNA STRANKA SAMA.
- NE POSKUŠAJTE SERVISIRATI OPREME, NE DA BI PREJ PREBRALI IN RAZUMELI SERVISNI PRIROČNIK.
- ČE TEGA OPOZORILA NE UPOŠTEVATE, OBSTAJA NEVARNOST ELEKTRIČNEGA UDARA, MEHANSKIH ALI DRUGIH NEVARNOSTI IN POSLEDIČNIH POŠKODB PONUDNIKA SERVISNIH STORITEV, UPORABNIKA OPREME ALI PACIENTA.

**UPOZORENJE  
(HR)**

OVAJ SERVISNI PRIRUČNIK DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- AKO KLIJENTOV SERVISER ZAHTIJEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST KLIJENTA JE PRUŽITI USLUGE PREVOĐENJA.
- NEMOJTE POKUŠAVATI SERVISIRATI OPREMU AKO NISTE PROČITALI I RAZUMJELI SERVISNI PRIRUČNIK.
- AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO OZLJEDE SERVISERA, OPERATERA ILI PACIJENTA PROUZROČENE STRUJNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.

**UPOZORNENIE  
(SK)**

TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.

- AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.
- NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.
- ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, PRÍPADNE DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.

**VARNING  
(SV)**

DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.

- OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.
- FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.
- OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.



DİKKAT  
(TR)

**BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.**

- **EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.**
- **SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.**
- **BU UYARININ GÖZ ARDI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDE KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.**

警告  
(JA)

このサービスマニュアルには英語版しかありません。

GEHC 以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。

このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。

この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

**本服務手冊僅提供英文版。**

- **如顧客之服務提供者需要英文版以外之語言，顧客需自行負擔其翻譯服務之責任。**
- **在查閱並了解本服務手冊之內容前，請勿試圖維修本設備。**
- **未確實遵守本警告，可能導致服務提供者、操作者或病患遭受電擊、機械危險或其他傷害。**

警告  
(繁體中文)  
Traditional  
Chinese



**注意:**  
(ZH-CN)

本维修手册仅存有英文本。  
非 GEHC 公司的维修员要求非英文本的维修手册时，  
客户需自行负责翻译。  
未详细阅读和完全了解本手册之前，不得进行维修。  
忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

**경고**  
(KO)

- 본 서비스 지침서는 영어로만 이용하실 수 있습니다.
- 고객의 서비스 제공자가 영어이외 언어를 요구할 경우, 번역 서비스 지침서를 제공하는 것은 고객의 책임입니다.
- 본 서비스 지침서를 지참했고 이해하지 않는 한은 해당 장비를 수리를 시도하지 마십시오.
- 이 경우에 유해하지 않은 전기쇼크, 기계상의 혹은 다른 위험으로부터 서비스 제공자, 운영자 혹은 환자에게 위험을 가할 수 있습니다.

## DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent write "Damage In Shipment" on ALL copies of the freight or express bill BEFORE delivery is accepted or "signed for" by a GE representative or hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

## CERTIFIED ELECTRICAL CONTRACTOR STATEMENT - FOR USA ONLY

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

## OMISSIONS & ERRORS

If there are any omissions, errors or suggestions for improving this documentation, please contact the GE Healthcare Global Documentation Group with specific information listing the system type, manual title, part number, revision number, page number and suggestion details.

Mail the information to: Service Documentation, 9900 Innovation Drive (RP-2123), Wauwatosa, WI53226, USA.

GE Healthcare employees should use TrackWise to report service documentation issues. These issues will then be in the internal problem reporting tool and communicated to the writer.

## SERVICE SAFETY CONSIDERATIONS



**DANGER DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**



**WARNING *Use all Personal Protection Equipment (PPE) such as gloves, safety shoes, safety glasses, and kneeling pad, to reduce the risk of injury.***

For a complete review of all safety requirements, see the Chapter 1, Safety Considerations section in the Service Manual.

---

# LEGAL NOTES

---

The contents of this publication may not be copied or duplicated in any form, in whole or in part, without prior written permission of GE Healthcare.

GE Healthcare may revise this publication from time to time without written notice.

## TRADEMARKS

All products and their name brands are trademarks of their respective holders.

## COPYRIGHTS

All Material Copyright© 2018 by General Electric Company Inc. All Rights Reserved.

# Revision History

Revision	Date	Reason for change
1	October 2014	Initial release
2	December 2014	Enhancement feedback
3	May 2015	Enhancement feedback
4	March 2016	Initial release for R2
5	August 2016	Correction
6	November 2016	Initial release for R2.5
7	July 2017	Enhancement feedback
8	June 2018	Enhancement feedback
9	August 2018	Enhancement feedback
10	October 2018	Enhancement feedback
11	January 2019	Enhancement feedback

# List of Effected Pages (LOEP)

Pages	Revision	Pages	Revision	Pages	Revision
Title Page	11	3-1 to 3-78	11	8-1 to 8-206	11
Warnings i to ii-xii	11	4-1 to 4-44	11	9-1 to 9-32	11
TOC	11	5-1 to 5-152	11	10-1 to 10-36	11
1-1 to 1-17	11	6-1 to 6-8	11	Back Cover	N/A
2-1 to 2-10	11	7-1 to 7-36	11		

# Table of Contents

## CHAPTER 1 Introduction

Overview .....	1 - 1
Purpose of Chapter 1 .....	1 - 1
Purpose of Service Manual .....	1 - 1
Typical Users of the Basic Service Manual .....	1 - 2
Models Covered by this Manual .....	1 - 2
Purpose of Operator Manual(s) .....	1 - 3
Important Conventions .....	1 - 3
Conventions Used in this Manual .....	1 - 3
Standard Hazard Icons .....	1 - 4
Product Icons .....	1 - 5
Safety Considerations .....	1 - 8
Introduction .....	1 - 8
Human Safety .....	1 - 8
Mechanical Safety .....	1 - 8
Electrical Safety .....	1 - 9
Safe Practices .....	1 - 9
Probes .....	1 - 9
Auxiliary Devices Safety .....	1 - 10
Battery Safety .....	1 - 12
Labels Locations .....	1 - 13
Dangerous Procedure Warnings .....	1 - 15
Lockout/Tagout Requirements (For USA Only) .....	1 - 15
Returning/Shipping System, Probes and Repair Parts .....	1 - 15
Electromagnetic Compatibility (EMC) .....	1 - 16
What is EMC? .....	1 - 16
Compliance .....	1 - 16
Electrostatic Discharge (ESD) Prevention .....	1 - 16
Customer Assistance .....	1 - 17
Contact Information .....	1 - 17
System Manufacturer .....	1 - 17

## CHAPTER 2

### Site Preparation

Overview .....	2 - 1
Purpose of Chapter 2 .....	2 - 1
General Console Requirements .....	2 - 2
Environmental Requirements .....	2 - 2
Cooling .....	2 - 2
Lighting .....	2 - 2
Electrical Requirements .....	2 - 2
LOGIQ P9/P7 Power Requirements .....	2 - 3
Inrush Current .....	2 - 3
Site Circuit Breaker .....	2 - 3
Site Power Outlets .....	2 - 3
Main Power Plug .....	2 - 3
EMI Limitations .....	2 - 4
Probe Environmental Requirements .....	2 - 5
Time and Manpower Requirements .....	2 - 5
System Specifications .....	2 - 6
Physical Dimensions of LOGIQ P9/P7 .....	2 - 6
Acoustic Noise Output .....	2 - 6
Electrical Specifications .....	2 - 6
Facility Needs .....	2 - 7
Purchaser Responsibilities .....	2 - 7
Mandatory Site Requirements .....	2 - 8
Site Recommendations .....	2 - 8
Recommended Ultrasound Room Layout .....	2 - 9
Networking Setup Requirements .....	2 - 10
Stand-alone Unit (without Network Connection) .....	2 - 10
Unit Connected to Hospital's Network .....	2 - 10
Purpose of the DICOM Network Function .....	2 - 10
DICOM Option Pre-installation Requirements .....	2 - 10

## CHAPTER 3

### Setup Instructions

Overview. . . . .	3 - 1
The Purpose of Chapter 3 . . . . .	3 - 1
Set Up Reminders . . . . .	3 - 2
Average Installation Time . . . . .	3 - 2
Installation Warnings . . . . .	3 - 3
Moving/Lifting the System . . . . .	3 - 3
System Acclimation Time . . . . .	3 - 3
OPIO Position . . . . .	3 - 3
Brake Pedal Operation . . . . .	3 - 4
Safety Reminders . . . . .	3 - 4
Receiving and Unpacking the Equipment . . . . .	3 - 5
Packing materials - recycling information . . . . .	3 - 8
Preparing for Set Up. . . . .	3 - 9
Verify Customer Order . . . . .	3 - 9
EMI Protection . . . . .	3 - 10
Connection of Auxiliary Devices . . . . .	3 - 11
Connecting the LCD Monitor . . . . .	3 - 12
Connecting the Black & White Printer . . . . .	3 - 13
Connection Scheme: B&W Printer . . . . .	3 - 14
Connecting the Secondary "Patient" LCD Monitor . . . . .	3 - 15
Connecting the Footswitch . . . . .	3 - 17
Connecting the USB Flash Memory Stick . . . . .	3 - 18
Connecting the external USB Hard disk (Handydrive) . . . . .	3 - 18
General Remarks and Hints when using external USB-Devices . . . . .	3 - 19
External USB-Devices - Connection . . . . .	3 - 19
External USB-Devices - Disconnection . . . . .	3 - 19
Completing the Set Up . . . . .	3 - 20
Connecting the Unit to a Power Source . . . . .	3 - 20
Power On / Boot Up . . . . .	3 - 21
Scanner Power On . . . . .	3 - 21
Back End Processor Boot Up . . . . .	3 - 22
During a normal boot, you may observe . . . . .	3 - 23
Power Off / Shutdown . . . . .	3 - 25
Scanner Shutdown . . . . .	3 - 27
Transducer Connection . . . . .	3 - 30

Connecting the Probe	3 - 30
Connecting the CW Pencil Probe	3 - 31
Cable Handling	3 - 31
Activating the Probe	3 - 31
Deactivating the Probe	3 - 31
Disconnecting the Probe	3 - 31
Printer Installation	3 - 32
Installing Digital Black & White Printer Sony UP-D898	3 - 32
Digital Color Printer Sony UP-D25MD	3 - 33
Installing the Bluetooth Deskjet Printer	3 - 34
Connecting the Bluetooth Dongle into the System	3 - 34
Verifying Bluetooth device driver	3 - 35
Prepare the Printer and connect the Bluetooth Printer Adapter	3 - 36
HP Officejet 100	3 - 36
Bluetooth Pairing	3 - 36
Adding Printer to the system	3 - 37
Adjustment of Printer Settings	3 - 37
UP-D898 - Printer Settings	3 - 38
UP-D25MD - Printer Settings	3 - 39
Setting Printer to Print Reports	3 - 41
Setting up the Printer to Print Reports	3 - 41
System Configuration	3 - 42
System/General Preset Menu	3 - 42
External I/O Connectors	3 - 46
Available Probes	3 - 47
Supported probes	3 - 47
Probe Naming Conventions	3 - 47
Probe Description	3 - 47
Software/Option Configuration	3 - 53
Connectivity Setup	3 - 54
Connectivity Introduction	3 - 54
The Dataflow Concept	3 - 54
Dataflow Examples	3 - 55
Stand-alone LOGIQ P9/P7	3 - 56
LOGIQ? + PC within a "Sneaker Net"	3 - 56
Connection between LOGIQ? and DICOM Server	3 - 56
Wired Ethernet from LOGIQ P9/P7 to a Workstation	3 - 57
Direct Cable Connection from the LOGIQ P9/P7 to a Workstation via a Crossover Cable	3 - 57
Connection via a Peer-to-Peer Network	3 - 57
Connection via Hospital Network	3 - 57



---

You will need one network cable to connect the LOGIQ P9/P7 to a wall outlet on the hospital's network. . . . .	3 - 57
Connection using Wireless Option . . . . .	3 - 57
Configuring Connectivity. . . . .	3 - 58
Overview . . . . .	3 - 58
Structured Reporting . . . . .	3 - 58
Supported parameters . . . . .	3 - 58
Connectivity Functions . . . . .	3 - 59
TCPIP . . . . .	3 - 60
Device . . . . .	3 - 62
Service . . . . .	3 - 63
Adding a service to a destination device . . . . .	3 - 63
Removing a service . . . . .	3 - 63
Changing parameters for a service . . . . .	3 - 64
Agent Configuration (R3 only) . . . . .	3 - 65
Agent Configuration (R3 only) . . . . .	3 - 65
Agent Configuration . . . . .	3 - 65
Verifying Back Office Connection - CSD . . . . .	3 - 67
Verifying Back Office Connection – VOC . . . . .	3 - 68
Connectivity Setup Worksheet . . . . .	3 - 70
Paperwork . . . . .	3 - 72
Product Locator Installation . . . . .	3 - 72
User Manual(s) . . . . .	3 - 72

## CHAPTER 4

### Functional Checks

Overview .....	4 - 1
Purpose of Chapter 4 .....	4 - 1
Required Equipment .....	4 - 1
General Procedure .....	4 - 3
System Exterior Visual Check .....	4 - 4
Physical Abnormalities .....	4 - 4
Appearance Inspection .....	4 - 5
Appearance Inspection (R3) .....	4 - 6
Mechanical Parts Functional Check .....	4 - 7
Main LCD .....	4 - 8
LCD ARM .....	4 - 9
OPIO Swivel Lock .....	4 - 10
Swivel/Brake Lock Caster .....	4 - 11
Swivel/Brake Lock Caster .....	4 - 12
Power On/Off .....	4 - 13
Scanner Power On .....	4 - 13
Sleep Mode Check .....	4 - 15
Complete power down .....	4 - 16
Power Off / Shutdown Check .....	4 - 17
System Information .....	4 - 18
Software Version .....	4 - 18
Service Platform Confirmation (R1, R2, R2.5 only) .....	4 - 19
USB Port Test .....	4 - 20
System Integration Checks .....	4 - 21
OPIO Test .....	4 - 21
DVD Drive Test .....	4 - 22
LAN Port Test .....	4 - 22
Peripheral Checks .....	4 - 23
DVR Test (if equipped) .....	4 - 23
Black and White Printer Test .....	4 - 23
Color Printer Test .....	4 - 23
CD/DVD Read/WriteTest .....	4 - 23
ECG Test .....	4 - 23
Gel Warmer Test .....	4 - 24
Single CWD .....	4 - 24
Mode Transition Checks .....	4 - 24
General Information .....	4 - 24
B-Mode .....	4 - 26
Color Flow-Mode .....	4 - 27
Pulse Doppler Mode .....	4 - 28
B/CF/PW Mode .....	4 - 28

M-Mode .....	4 - 30
B-Flow Mode .....	4 - 30
CW Mode (Optional) .....	4 - 31
WLAN (Optional) .....	4 - 32
4D Mode (Optional) .....	4 - 32
Power Assistant (Optional) .....	4 - 32
OPIO Interface Check (R1, R2, R2.5 only) .....	4 - 33
OPIO Interface Check (R3 only) .....	4 - 36
Touch Panel Calibration (R3 only) .....	4 - 39
Board Diagnostics .....	4 - 42

## CHAPTER 5

### Components and Functions (Theory)

Overview .....	5 - 1
Purpose of Chapter 5 .....	5 - 1
General Information .....	5 - 2
System Exterior .....	5 - 2
Operator Panel .....	5 - 3
System Options .....	5 - 5
System Ports .....	5 - 6
Front USB .....	5 - 7
Rear USB and LAN .....	5 - 7
HDMI .....	5 - 9
S-Video / Composite .....	5 - 10
AC Inlet .....	5 - 11
Power ON Sequence .....	5 - 12
Software Options .....	5 - 13
Options .....	5 - 13
Smart Devices Applications (LOGIQ Apps) .....	5 - 16
Hardware Options .....	5 - 17
Options .....	5 - 17
Regional and Peripheral Options .....	5 - 19
Regional Options .....	5 - 19
Peripheral Options .....	5 - 19
Mechanical Descriptions .....	5 - 20
Physical Dimensions .....	5 - 20
LCD Monitor .....	5 - 20
OPIO Positioning .....	5 - 20
Air Flow Distribution .....	5 - 21
Exiting to Windows Desktop .....	5 - 22
Exiting to Windows Desktop .....	5 - 22
Service Platform .....	5 - 24
Introduction .....	5 - 24
Access / Security .....	5 - 24
Local Access .....	5 - 24
How the Customer enables/disables Disruptive Mode and VCO ...	5 - 25

Common Service Desktop (CSD) (R1, R2, R2.5 only) . . . . .	5 - 26
Internationalization . . . . .	5 - 26
CSD Top Page . . . . .	5 - 27
General Layout . . . . .	5 - 27
Decoding System Temperature and Voltage . . . . .	5 - 28
Error Logs . . . . .	5 - 30
Diagnostics . . . . .	5 - 30
Image Quality . . . . .	5 - 31
Configuration . . . . .	5 - 32
Utilities . . . . .	5 - 33
Disk Defragmenter . . . . .	5 - 33
Replacement . . . . .	5 - 35
PM . . . . .	5 - 35
Common Service Desktop (R3 only) . . . . .	5 - 36
Purpose of this section . . . . .	5 - 36
Disruptive mode . . . . .	5 - 36
Color statuses . . . . .	5 - 37
Licenses . . . . .	5 - 37
Advanced Information - Service Desktop and SSA (Secure Service Access) . . . . .	5 - 41
Home . . . . .	5 - 42
Diags . . . . .	5 - 64
DICOM . . . . .	5 - 69
Utilities . . . . .	5 - 73
Options . . . . .	5 - 99
Agent Configuration . . . . .	5 - 101

CHAPTER 6

Service Adjustments

Overview . . . . .	6 - 1
Purpose of Chapter 6 . . . . .	6 - 1
Regulatory . . . . .	6 - 1
LCD Monitor Adjustment . . . . .	6 - 2
Brightness/Contrast (R1.x.x) . . . . .	6 - 4
Brightness . . . . .	6 - 4
Gamma . . . . .	6 - 4
OSD Control on the Utility mode (R1.x.x) . . . . .	6 - 5
21.5 inch Wide Monitor Adjustment (R2.x.x and later) . . . . .	6 - 6
Scan Screen . . . . .	6 - 8
Room Profile . . . . .	6 - 8
Color Profile . . . . .	6 - 8

## CHAPTER 7

### Diagnostics/Troubleshooting

Overview . . . . .	7 - 1
Purpose of Chapter 7 . . . . .	7 - 1
Overview . . . . .	7 - 1
Collect Vital System Information . . . . .	7 - 2
Collecting System Information . . . . .	7 - 2
Request for Service (RFS) (R1, R2, R2.5 only) . . . . .	7 - 3
Request for Service (RFS) (R3 only) . . . . .	7 - 5
Request for Service . . . . .	7 - 5
Check Points Voltages . . . . .	7 - 7
LED for Power Status . . . . .	7 - 7
Screen Captures and Logs . . . . .	7 - 8
Capturing a screen . . . . .	7 - 8
Export Log's and System Data . . . . .	7 - 8
Export System Data (by pressing the ALT + D key) . . . . .	7 - 8
System Warning/Errors and Logs . . . . .	7 - 9
Temperature warning . . . . .	7 - 9
Cause . . . . .	7 - 9
What to do . . . . .	7 - 9
Temperature exceeded threshold . . . . .	7 - 9
Cause . . . . .	7 - 9
What to do . . . . .	7 - 9
Log message of the high temperature . . . . .	7 - 9
System voltage failure . . . . .	7 - 10
Cause . . . . .	7 - 10
What to Do . . . . .	7 - 10
Log message of the Voltage error . . . . .	7 - 10
Hardware configuration error . . . . .	7 - 11
Cause . . . . .	7 - 11
What to do . . . . .	7 - 11
Log message of the Invalid hardware error . . . . .	7 - 11
System Error . . . . .	7 - 12
Cause . . . . .	7 - 12
What to do . . . . .	7 - 12
Log message of System error 13	
Types . . . . .	7 - 13
Remote Access to Service Platform . . . . .	7 - 15
General . . . . .	7 - 15
How the Customer enables/disables Disruptive Mode and VCO . . . . .	7 - 16

GE Icon and Remote Connection . . . . .

7 - 16

Customer Granting Full Remote Access Permission to

GE Service Technician . . . . .

7 - 17

If GE Service Technician requests Remote Access Permission . . . .

7 - 17

Common Service Desktop (CSD) . . . . .

7 - 18

CSD: Configuration . . . . .

7 - 18

Minimum Configuration to Boot/Scan . . . . .

7 - 19

Troubleshooting Trees, Instructions and Tech Tips . . . . .

7 - 20

System does not boot up . . . . .

7 - 21

Noise disturbs the image . . . . .

7 - 22

Trackball - Impaired Sensitivity . . . . .

7 - 23

Printer Malfunction . . . . .

7 - 24

Monitor Troubleshooting . . . . .

7 - 25

How to import patient data base from older consoles . . . . .

7 - 25

EZbackup will not delete images to open disk space . . . . .

7 - 25

Use ScLogWindow . . . . .

7 - 26

SSA key . . . . .

7 - 29

Log analysis . . . . .

7 - 30



## CHAPTER 8

### Replacement Procedures

Overview . . . . .	8 - 1
Purpose of Chapter 8 . . . . .	8 - 1
Returning/Shipping System, Probes and Repair Parts . . . . .	8 - 4
Warnings and important information . . . . .	8 - 5
Purpose of this section . . . . .	8 - 5
Warnings . . . . .	8 - 5
Returning/Shipping Probes and Repair Parts . . . . .	8 - 6
System Software - Installation/Upgrade Procedure . . . . .	8 - 7
Introduction . . . . .	8 - 7
Manpower . . . . .	8 - 7
Tools . . . . .	8 - 7
Preparations . . . . .	8 - 7
Preparation . . . . .	8 - 7
General Notes on LOGIS P7/P9 Software Loading . . . . .	8 - 7
Preparation for Software Loading . . . . .	8 - 9
Recording important settings and parameters (optional) . . . . .	8 - 9
System Software - Installation Procedure . . . . .	8 - 25
Software Installation from DVD . . . . .	8 - 26
System Software - Installation Procedure (R1.x.x) . . . . .	8 - 26
System Software - Installation Procedure (R2.x.x) . . . . .	8 - 32
System Software - Installation Procedure (R3.x.x) . . . . .	8 - 38
Set the system boot order (BIOS setting) . . . . .	8 - 38
Base and Application Software installation . . . . .	8 - 40
Application Software Load Procedure . . . . .	8 - 42
Application Software Installation Preparation (R1.x.x or R2.x.x) . . . . .	8 - 43
Application Software Installation (R1.x.x or R2.x.x) . . . . .	8 - 44
Software DVD / USB Storage . . . . .	8 - 46
Software Installation from Common Service Desktop (R1.x.x or R2.x.x) . . . . .	8 - 48
Involving Software Reload . . . . .	8 - 48
Software Installation from Common Service Desktop (R3.x.x) . . . . .	8 - 51
System Setup Procedure to display the messages in Japanese/Chinese . . . . .	8 - 52
Software and Functional Checks after Installation Procedure . . . . .	8 - 56
Functional Check . . . . .	8 - 56
Settings - Backup and Restore . . . . .	8 - 57
General Information . . . . .	8 - 58
Supported Media . . . . .	8 - 58
General Notes . . . . .	8 - 58

Backup Procedures . . . . .	8 - 58
Restore Procedures . . . . .	8 - 59
EZBackup and EZMove . . . . .	8 - 59
EZBackup and EZMove . . . . .	8 - 59
To review EZBackup and EZMove . . . . .	8 - 60
Option Keys . . . . .	8 - 61
Replacement of Front Cover . . . . .	8 - 62
Manpower . . . . .	8 - 62
Tools . . . . .	8 - 62
Removal Procedure . . . . .	8 - 62
Installation Procedure . . . . .	8 - 63
Functional Check . . . . .	8 - 63
Replacement of Top Cover . . . . .	8 - 64
Manpower . . . . .	8 - 64
Tools . . . . .	8 - 64
Removal Procedure . . . . .	8 - 64
Installation Procedure . . . . .	8 - 65
Functional Check . . . . .	8 - 65
Replacement of Side Cover . . . . .	8 - 66
Manpower . . . . .	8 - 66
Tools . . . . .	8 - 66
Removal Procedure . . . . .	8 - 66
Removal Procedure - Side Cover (L) . . . . .	8 - 66
Removal Procedure - Side Cover (R) . . . . .	8 - 68
Installation Procedure . . . . .	8 - 69
Functional Check . . . . .	8 - 69
Replacement of Rear Cover . . . . .	8 - 70
Manpower . . . . .	8 - 70
Tools . . . . .	8 - 70
Removal Procedure . . . . .	8 - 70
Installation Procedure . . . . .	8 - 70
Functional Check . . . . .	8 - 70
Replacement of Side Tray & Foot Rest Cover . . . . .	8 - 71
Manpower . . . . .	8 - 71
Tools . . . . .	8 - 71
Removal Procedure . . . . .	8 - 71
Removal Procedure - Side Tray . . . . .	8 - 71
Removal Procedure - Foot Rest Cover . . . . .	8 - 72
Installation Procedure . . . . .	8 - 72

Replacement of Monitor and LCD Arm Plastic Covers. . . . .	8 - 73
Manpower . . . . .	8 - 73
Tools . . . . .	8 - 73
Preparations . . . . .	8 - 73
Monitor Remove Procedure . . . . .	8 - 73
Monitor Installation Procedure . . . . .	8 - 75
LCD Arm Plastic Covers Remove Procedure . . . . .	8 - 76
LCD Arm Plastic Covers Installation Procedure . . . . .	8 - 77
Replacement of Monitor Covers. . . . .	8 - 78
Manpower . . . . .	8 - 78
Tools . . . . .	8 - 78
Pre-Work . . . . .	8 - 78
Removal Procedure . . . . .	8 - 78
Installation Procedure . . . . .	8 - 79
Functional Check . . . . .	8 - 79
Replacement of Fixed Arm Cover and Fixed Arm Holder Grip. . . . .	8 - 80
Manpower . . . . .	8 - 80
Tools . . . . .	8 - 80
Removal Procedure . . . . .	8 - 80
Removal Procedure - Fixed Arm Cover . . . . .	8 - 80
Removal Procedure - Fixed Arm Holder Grip . . . . .	8 - 80
Installation Procedure . . . . .	8 - 81
Functional Check . . . . .	8 - 81
Replacement of OPIO and Related Parts. . . . .	8 - 82
Manpower . . . . .	8 - 82
Tools . . . . .	8 - 82
Removal Procedure . . . . .	8 - 82
Removal Procedure - Trackball Ring . . . . .	8 - 83
Removal Procedure - OP Panel Assy . . . . .	8 - 83
Removal Procedure - AN Keyboard (Option) . . . . .	8 - 86
Removal Procedure - Trackball . . . . .	8 - 87
Removal Procedure - LCD Touch Panel Assy . . . . .	8 - 88
Removal Procedure - Freeze key assy . . . . .	8 - 89
Removal Procedure - OP Panel Main PWA Assy . . . . .	8 - 90
Removal Procedure - Encoder on PWA . . . . .	8 - 93
Removal Procedure - Touch panel . . . . .	8 - 93
Installation Procedure . . . . .	8 - 94
Functional Check . . . . .	8 - 95
Replacement of the Caps for Hardkeys . . . . .	8 - 96

Manpower .....	8 - 96
Tools .....	8 - 96
Removal Procedure .....	8 - 96
Installation Procedure .....	8 - 96
Functional Check .....	8 - 97
Replacement of Key Caps (by special native language keys) .....	8 - 98
Manpower .....	8 - 98
Tools .....	8 - 98
Preparations .....	8 - 98
Removal Procedure .....	8 - 98
Installation Procedure .....	8 - 99
Replacement Checking Procedure .....	8 - 99
Functional Check .....	8 - 100
Replacement around Nest Box .....	8 - 101
Manpower .....	8 - 101
Tools .....	8 - 101
Pre-Work .....	8 - 101
Nest Box Access .....	8 - 101
Removal Procedure - Nest Box .....	8 - 103
Installation Procedure - Nest Box. ....	8 - 104
Removal Procedure - Board Assy in Nest Box .....	8 - 105
Removal Procedure - Separating MPI and MCB .....	8 - 107
Removal Procedure - Separating DCWD Board(Optional) from MPI .....	8 - 108
Separating MDC assy from MCB assy .....	8 - 109
Handling EEPROM on MCB Board .....	8 - 110
Separating MCB assy from Brackets and COM Express .....	8 - 111
Separating DC4D Unit from IO BOX .....	8 - 113
Separating Battery Unit from IO BOX .....	8 - 114
Separating HDD .....	8 - 115
Separating COM Express .....	8 - 116
Installation Procedure - MPI, MCB, MDC, DC4D, HDD, Battery and COM Express .....	8 - 117
Functional Check - MPI, MCB, MDC, IO Box .....	8 - 117
Removal Procedure - MBP assy .....	8 - 117
Installation Procedure - MBP assy .....	8 - 117
Functional Check .....	8 - 117
Replacement of Front fan .....	8 - 118
Manpower .....	8 - 118
Tools .....	8 - 118

Removal Procedure . . . . .	8 - 118
Installation Procedure . . . . .	8 - 118
Functional Check . . . . .	8 - 118
Replacement of Bottom fan . . . . .	8 - 119
Manpower . . . . .	8 - 119
Tools . . . . .	8 - 119
Removal Procedure . . . . .	8 - 119
Installation Procedure . . . . .	8 - 121
Functional Check . . . . .	8 - 121
Replacement of Rear Handle . . . . .	8 - 122
Manpower . . . . .	8 - 122
Tools . . . . .	8 - 122
Removal Procedure . . . . .	8 - 122
Installation Procedure . . . . .	8 - 122
Functional Check . . . . .	8 - 122
Replacement of Link Arm Cable Hook . . . . .	8 - 123
Manpower . . . . .	8 - 123
Tools . . . . .	8 - 123
Removal Procedure . . . . .	8 - 123
Installation Procedure . . . . .	8 - 123
Functional Check . . . . .	8 - 123
Replacement of Caster . . . . .	8 - 124
Manpower . . . . .	8 - 124
Tools . . . . .	8 - 124
Removal Procedure . . . . .	8 - 124
Installation Procedure . . . . .	8 - 126
Functional Check . . . . .	8 - 126
Replacement of the COM Express . . . . .	8 - 127
Manpower . . . . .	8 - 127
Tools . . . . .	8 - 127
Removal Procedure . . . . .	8 - 127
Installation Procedure . . . . .	8 - 129
Note on COM Express Replacement . . . . .	8 - 129
Configuring BIOS . . . . .	8 - 129
Note on EEPROM Replacement . . . . .	8 - 130
Accessing EEPROM . . . . .	8 - 131
Initializing EEPROM . . . . .	8 - 132
Modifying contents of EEPROM (ComExpress VPD) . . . . .	8 - 134

Functional Check . . . . .	8 - 134
Replacement of the HDD/SSD. . . . .	8 - 135
Manpower . . . . .	8 - 135
Tools . . . . .	8 - 135
Removal Procedure . . . . .	8 - 135
Installation Procedure . . . . .	8 - 136
Functional Check . . . . .	8 - 136
Replacement of Battery . . . . .	8 - 137
Manpower . . . . .	8 - 137
Tools . . . . .	8 - 137
Removal Procedure . . . . .	8 - 137
Installation Procedure . . . . .	8 - 138
Functional Check . . . . .	8 - 138
Replacement of 4D . . . . .	8 - 139
Manpower . . . . .	8 - 139
Tools . . . . .	8 - 139
Removal Procedure . . . . .	8 - 139
Installation Procedure . . . . .	8 - 140
Functional Check . . . . .	8 - 140
Replacement of Wireless LAN . . . . .	8 - 141
Manpower . . . . .	8 - 141
Tools . . . . .	8 - 141
Removal Procedure . . . . .	8 - 141
Installation Procedure . . . . .	8 - 141
Functional Check . . . . .	8 - 141
Replacement of the Harness Cable and OPIO Cable Assy. . . . .	8 - 142
Manpower . . . . .	8 - 142
Tools . . . . .	8 - 142
Pre-Work . . . . .	8 - 142
Removal Procedure (Harness Cable Assy) . . . . .	8 - 142
Removal Procedure (OPIO Cable Assy) . . . . .	8 - 144
Installation Procedure . . . . .	8 - 144
Functional Check . . . . .	8 - 145
Replacement of Peripheral Cable Assy . . . . .	8 - 146
DVD Cables . . . . .	8 - 146
Manpower . . . . .	8 - 146
Tools . . . . .	8 - 146

Pre work . . . . .	8 - 146
Removal Procedure . . . . .	8 - 146
Installation Procedure . . . . .	8 - 148
B/W Printer Cables . . . . .	8 - 149
Manpower . . . . .	8 - 149
Tools . . . . .	8 - 149
Pre work . . . . .	8 - 149
Removal Procedure . . . . .	8 - 149
Installation Procedure . . . . .	8 - 152
Functional Check . . . . .	8 - 152
Replacement of the Probe Holder . . . . .	8 - 153
Manpower . . . . .	8 - 153
Tools . . . . .	8 - 153
Removal Procedure . . . . .	8 - 153
Installation Procedure . . . . .	8 - 153
Functional Check . . . . .	8 - 153
Replacement of the Cable Hook . . . . .	8 - 154
Manpower . . . . .	8 - 154
Tools . . . . .	8 - 154
Removal Procedure . . . . .	8 - 154
Installation Procedure . . . . .	8 - 154
Functional Check . . . . .	8 - 154
Replacement of the OPIO Tray . . . . .	8 - 155
Manpower . . . . .	8 - 155
Tools . . . . .	8 - 155
Removal Procedure . . . . .	8 - 155
Installation Procedure . . . . .	8 - 155
Functional Check . . . . .	8 - 155
Replacement of the Paper tray . . . . .	8 - 156
Manpower . . . . .	8 - 156
Tools . . . . .	8 - 156
Removal Procedure . . . . .	8 - 156
Installation Procedure . . . . .	8 - 156
Functional Check . . . . .	8 - 156
Replacement of AC Cable Holder . . . . .	8 - 157
Manpower . . . . .	8 - 157
Tools . . . . .	8 - 157
Removal Procedure . . . . .	8 - 157
Installation Procedure . . . . .	8 - 157

Functional Check . . . . .	8 - 157
Replacement of the BW printer . . . . .	8 - 158
Manpower . . . . .	8 - 158
Tools . . . . .	8 - 158
Pre work . . . . .	8 - 158
Removal Procedure . . . . .	8 - 158
Installation Procedure . . . . .	8 - 159
Functional Check . . . . .	8 - 159
Replacement of the Speaker . . . . .	8 - 160
Manpower . . . . .	8 - 160
Tools . . . . .	8 - 160
Pre work . . . . .	8 - 160
Removal Procedure . . . . .	8 - 160
Installation . . . . .	8 - 163
Functional Check . . . . .	8 - 163
Replacement of the Monitor Arm . . . . .	8 - 164
Manpower . . . . .	8 - 164
Tools . . . . .	8 - 164
Removal Procedure . . . . .	8 - 164
Installation Procedure . . . . .	8 - 164
Functional Check . . . . .	8 - 164
Replacement of Front Fan Filter . . . . .	8 - 165
Manpower . . . . .	8 - 165
Tools . . . . .	8 - 165
Removal Procedure . . . . .	8 - 165
Installation Procedure . . . . .	8 - 165
Functional Check . . . . .	8 - 165
Replacement of Bottom Fan Filter . . . . .	8 - 166
Manpower . . . . .	8 - 166
Tools . . . . .	8 - 166
Removal Procedure . . . . .	8 - 166
Installation Procedure . . . . .	8 - 166
Functional Check . . . . .	8 - 166
Replacement of SW CD set (R1, R2, R2.5 only) and SW USB (R3 only) . . . . .	8 - 167
Manpower . . . . .	8 - 167
Tools . . . . .	8 - 167
Removal Procedure . . . . .	8 - 167



Installation Procedure . . . . .	8 - 167
Functional Check . . . . .	8 - 167
Replacement of Drawer . . . . .	8 - 168
Manpower . . . . .	8 - 168
Tools . . . . .	8 - 168
Removal Procedure . . . . .	8 - 168
Installation Procedure . . . . .	8 - 169
Functional Check . . . . .	8 - 169
Replacement of ECG . . . . .	8 - 170
Manpower . . . . .	8 - 170
Tools . . . . .	8 - 170
Removal Procedure . . . . .	8 - 170
Installation Procedure . . . . .	8 - 171
Functional Check . . . . .	8 - 171
Replacement of DCWD ASSY . . . . .	8 - 172
Manpower . . . . .	8 - 172
Tools . . . . .	8 - 172
Removal Procedure . . . . .	8 - 172
Installation Procedure . . . . .	8 - 173
Functional Check . . . . .	8 - 173
Replacement of MCWD ASSY . . . . .	8 - 174
Manpower . . . . .	8 - 174
Tools . . . . .	8 - 174
Removal Procedure . . . . .	8 - 174
Installation Procedure . . . . .	8 - 174
Functional Check . . . . .	8 - 174
Replacement of battery pack for LP7-P9 R2 ext battery pack . . . . .	8 - 175
Manpower . . . . .	8 - 175
Tools . . . . .	8 - 175
Removal Procedure . . . . .	8 - 175
Installation Procedure . . . . .	8 - 178
Functional Check . . . . .	8 - 178
Replacement of battery pack for LP7-P9 R2 Battery option . . . . .	8 - 180
Manpower . . . . .	8 - 180
Tools . . . . .	8 - 180
Removal Procedure . . . . .	8 - 180
Installation Procedure . . . . .	8 - 182

Functional Check . . . . .	8 - 183
Replacement of MBOB . . . . .	8 - 184
Manpower . . . . .	8 - 184
Tools . . . . .	8 - 184
Removal Procedure . . . . .	8 - 184
Installation Procedure . . . . .	8 - 188
Functional Check . . . . .	8 - 188
Replacement of MIO-B . . . . .	8 - 189
Manpower . . . . .	8 - 189
Tools . . . . .	8 - 189
Removal Procedure . . . . .	8 - 189
Installation Procedure . . . . .	8 - 191
Functional Check . . . . .	8 - 191
Replacement of BBC . . . . .	8 - 192
Manpower . . . . .	8 - 192
Tools . . . . .	8 - 192
Removal Procedure . . . . .	8 - 192
Installation Procedure . . . . .	8 - 197
Functional Check . . . . .	8 - 197
Replacement of LOGIQ P9 ROTATION MODULE KIT . . . . .	8 - 198
Manpower . . . . .	8 - 198
Tools . . . . .	8 - 198
Removal Procedure . . . . .	8 - 198
Installation Procedure . . . . .	8 - 203
Functional Check . . . . .	8 - 203
Replacement of ODD Dummy Cover R3 . . . . .	8 - 204
Manpower . . . . .	8 - 204
Tools . . . . .	8 - 204
Pre work . . . . .	8 - 204
Removal Procedure . . . . .	8 - 204
Installation Procedure . . . . .	8 - 204
Functional Check . . . . .	8 - 204
Replacement of Probe Light assy . . . . .	8 - 205
Manpower . . . . .	8 - 205
Tools . . . . .	8 - 205
Pre work . . . . .	8 - 205
Removal Procedure . . . . .	8 - 205

# CHAPTER 9

## Renewal Parts

Overview. . . . . 9 - 1

    Purpose of Chapter 9 . . . . . 9 - 1

List of Abbreviations . . . . . 9 - 2

LOGIQ P9/P7 Software . . . . . 9 - 3

Parts List Groups . . . . . 9 - 4

Plastics Covers (Front/Sides/Rear) . . . . . 9 - 6

    Plastics Covers (Front/Sides/Rear) (R1 ~ R2.5) . . . . . 9 - 6

    Plastics Covers (Front/Sides/Rear) (R3) . . . . . 9 - 8

LCD Monitor . . . . . 9 - 10

    OPIO . . . . . 9 - 12

Nest Box Parts . . . . . 9 - 17

Mechanical Part . . . . . 9 - 21

    Options . . . . . 9 - 24

Optional Peripherals and Accessories . . . . . 9 - 29

    Printers . . . . . 9 - 29

Probes . . . . . 9 - 30

Power Cord. . . . . 9 - 31

## CHAPTER 10

### Care & Maintenance

Overview .....	10 - 1
Preventive Maintenance Inspections .....	10 - 1
Purpose of Chapter 10 .....	10 - 1
Why do Maintenance .....	10 - 2
Quality Assurance .....	10 - 2
Maintenance Task Schedule .....	10 - 2
How often should care & maintenance tasks be performed? .....	10 - 2
Tools Required .....	10 - 5
Special Tools, Supplies and Equipment .....	10 - 5
Specific Requirements for Care & Maintenance .....	10 - 5
System Maintenance .....	10 - 6
Preliminary Checks .....	10 - 6
Functional Checks .....	10 - 7
System Checks .....	10 - 7
Peripheral/Option Checks .....	10 - 8
Input Power .....	10 - 8
Mains Cable Inspection .....	10 - 8
Cleaning .....	10 - 8
General Cleaning .....	10 - 8
Air filter cleaning .....	10 - 9
Physical Inspection .....	10 - 10
<u>Optional</u> Diagnostic Checks .....	10 - 10
View the logs .....	10 - 10
Probe Maintenance .....	10 - 11
Probe Related Checks .....	10 - 11
Basic Probe Care .....	10 - 11
Basic Probe Cleaning and/or Disinfection .....	10 - 11
System Software Updates(Software Download) (R1, R2, R2.5 only) .....	10 - 12
Software download and installation .....	10 - 13
Using a Phantom .....	10 - 21
Electrical Safety Tests .....	10 - 21
Safety Test Overview .....	10 - 21
GEHC Leakage Current Limits .....	10 - 22
Outlet Test - Wiring Arrangement - USA & Canada .....	10 - 24

Grounding Continuity . . . . .	10 - 25
Meter Procedure . . . . .	10 - 25
Enclosure Leakage Current Test . . . . .	10 - 26
Definition . . . . .	10 - 26
Generic Procedure . . . . .	10 - 26
Data Sheet for Enclosure Leakage Current . . . . .	10 - 27
Earth Leakage Current Test . . . . .	10 - 27
Definition . . . . .	10 - 27
Generic Procedure . . . . .	10 - 28
Type BF Patient Leakage Current Test - Probe . . . . .	10 - 29
Definition . . . . .	10 - 29
Generic Procedure on Leakage Current . . . . .	10 - 29
Type BF Patient Leakage current - Mains to Probe . . . . .	10 - 31
When There's Too Much Leakage Current... . . . .	10 - 32
Earth and/or Enclosure Fails . . . . .	10 - 32
Probe Fails . . . . .	10 - 32
Peripheral Fails . . . . .	10 - 32
Still Fails . . . . .	10 - 32
New Unit . . . . .	10 - 33
Ultrasound INSPECTION CERTIFICATE. . . . .	10 - 35



# Chapter 1

## Introduction

### Section 1-1 Overview

#### 1-1-1 Purpose of Chapter 1

This chapter describes important issues related to safely servicing the **LOGIQ P9/P7** ultrasound system. The service provider must read and understand all the information presented in this manual before installing or servicing a unit.

**Table 1-1** Contents in Chapter 1

Section	Description	Page Number
1-1	Overview	1-1
1-2	Important Conventions	1-3
1-3	Safety Considerations	1-8
1-4	Electromagnetic Compatibility (EMC)	1-16
1-5	Customer Assistance	1-17

#### 1-1-2 Purpose of Service Manual



**NOTICE** This Service Manual is valid for **LOGIQ P9/P7** ultrasound systems.

This Service Manual provides installation and service information for LOGIQ P9/P7 Ultrasound Scanning System and contains the following chapters:

- 1) **Chapter 1 - Introduction**: Contains a content summary and warnings.
- 2) **Chapter 2 - Site Preparation**: Contains pre-installation requirements.
- 3) **Chapter 3 - Setup Instructions**: Contains setup and installation procedures.
- 4) **Chapter 4 - Functional Checks**: Contains functional checks that are recommended as part of the installation, or as required during servicing and care and maintenance.
- 5) **Chapter 5 - Components and Functions (Theory)**: Contains block diagrams and functional explanations of the electronics.
- 6) **Chapter 6 - Service Adjustments**: Contains instructions on how to make available adjustments.
- 7) **Chapter 7 - Diagnostics/Troubleshooting**: Provides procedures for running diagnostic or related routines.
- 8) **Chapter 8 - Replacement Procedures**: Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).
- 9) **Chapter 9 - Renewal Parts**: Contains a complete list of field replaceable parts.
- 10) **Chapter 10 - Care & Maintenance**: Provides care and maintenance procedures.

### 1-1-3 Typical Users of the Basic Service Manual

- GE Service Personnel (installation, maintenance, etc.)
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Pre-Installation)

### 1-1-4 Models Covered by this Manual

**Table 1-2 LOGIQ P9/P7 - Model Designations**

Part Number	Description
5560941	LOGIQ P7 Standard
5560939	LOGIQ P7 Tall
5560938	LOGIQ P9
5641296	LOGIQ P7 with High Cabinet
5641037	LOGIQ P9 with Articulating Monitor Arm
5724885	LOGIQ P7 R2 with High Cabinet
5724886	LOGIQ P9 R2 with Articulating Monitor Arm
5759916	LOGIQ P7 R2.5
5759915	LOGIQ P9 R2.5
5794264	LOGIQ P9 R3
5795196	LOGIQ P7 R3

**NOTE:** For LP9/P7 R3, the color of the system that is shown in this manual could look different from the real system.



## 1-1-5 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the LOGIQ P9/P7 and also kept near the unit for quick reference.

## Section 1-2 Important Conventions

### 1-2-1 Conventions Used in this Manual

#### Model Designations

This manual covers the LOGIQ P9/P7 ultrasound units listed on [page 1-2](#).

#### Icons

Pictures, or icons, are used wherever they reinforce the printed message. The icons, labels and conventions used on the product and in the service information are described in this chapter.

#### Safety Precaution Messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards are labeled in one of following ways:



**DANGER** INDICATES THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.



**WARNING** INDICATES THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.



**CAUTION** Indicates the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored.



**NOTICE** Equipment Damage Possible

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.

*Example:* Disk drive will crash.

**NOTE:** Notes provide important information about an item or a procedure. Information contained in a NOTE can often save you time or effort.

1-2-2      **Standard Hazard Icons**

Important information will always be preceded by the exclamation point contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm. Even if a symbol isn't used in this manual, it is included for your reference.



**Table 1-3      Standard Hazard Icons**

ELECTRICAL	MECHANICAL	RADIATION
LASER	HEAT	PINCH

Other hazard icons make you aware of specific procedures that should be followed.

**Table 1-4      Standard Icons Indicating a Special Procedure be Used**

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
<b>WEAR HAND PROTECTION</b>	<b>WEAR FOOT PROTECTION</b>	<b>EYE PROTECTION</b> <b>or</b>

## 1-2-3 Product Icons

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

**Table 1-5 Product Icons**





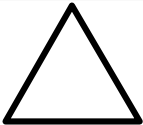











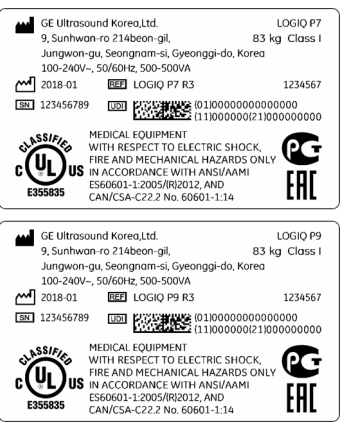





LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Model and serial numbers Electrical ratings	Rear side of the unit on each probe
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear side of the unit
	Council Directive 93/42/EEC concerning medical devices: The CE mark affixed to the equipment testifies compliance to the directive.	Rear side of the unit on the plug of each probe
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX 1) IP Code (IPX 7)	Indicates the degree of protection provided by the enclosure per IEC 60529. IPX 1 - protected against dripping water IPX 7 - protected against the effects of immersion	Footswitch Probes
	Equipment Type BF (man in the box, symbol IEC 60878-5333) indicates B Type equipment having even more electrical isolation than standard Type B equipment because it is intended for intimate patient contact.	Probe connectors Main label on rear of system
	To identify a defibrillation-proof type CF (heart in box with "electrodes", symbol IEC 60878-5336) applied part complying with IEC 60601-1.	Front side of the ECG-preamplifier
"CAUTION This unit weighs... Special care must be used to avoid..." 	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	Used in the Service and User Manual which should be adjacent to equipment at all times for quick reference.
"DANGER - Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Indicated in the Service Manual.
	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	various
	ATTENTION - Consult accompanying documents " is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear side of Power Supply

Table 1-5 Product Icons (Continued)

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	various
	"Mains OFF" Indicates the power off position of the mains power switch.	rear of system at mains switch
	"OFF/Standby" Indicates the power off/standby position of the power switch. <b>CAUTION</b> <b>This Power Switch DOES NOT ISOLATE Mains Supply</b>	Adjacent to On-Off/Standby switch left below the Control panel.
	"Mains ON" Indicates the power on position of the mains power switch.	rear of system at mains switch
	"Protective Earth" Indicates the protective earth (grounding) terminal.	rear of system at mains switch (on primary power supply - RTN)
	"Equipotentiality" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment.	rear of system at mains switch (on primary power supply - RTN)
	Waste Electrical and Electronic Equipment (WEEE) Disposal. This symbol indicates that waste electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rear side of the unit on the plug of each probe
	These symbols indicate that at least one of the six hazardous substances of the China RoHS Labelling Standard is above the RoHS limitation. The number inside the circle is referred to as the Environmental Friendly Use Period (EFUP). It indicates the number of years that the product, under normal use, will remain harmless to health of humans or the environment. EFUP = 10 for Short Use Products EFUP = 20 for Medium Use Products	Rear side of the unit on the plug of each probe
 LAMP CONTAINS MERCURY, DISPOSE ACCORDING TO STATE/LOCAL LAW.	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor and the Touch Panel display, contain mercury.)	Rear side of the unit not visible: - below the cover on read side of Monitor - on rear side of the Touch Panel
	Loading prohibited	at top cover of the system

**Table 1-5      Product Icons (Continued)**

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
 <p>The label contains the following information:  <b>GE Ultrasound Korea Ltd.</b>, LOGIQ P7            9, Sunhwan-ro 214beon-gil, 83 kg Class I            Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea            100-240V~, 50/60Hz, 500-500VA            2018-01  LOGIQ P7 R3 1234567  <b>UDI</b> 123456789  (011000000000000000) (1110000001211000000000)  <b>CLASSIFIED</b> MEDICAL EQUIPMENT WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH ANSI/AAMI ES60601-1:2005/R02012, AND CAN/CSA-C22.2 No. 60601-1:14   <b>E395835</b></p>	Every system has a unique marking for identification, the Unique Device Identification (UDI) Label. The UDI label consists of a series of alpha-numeric characters and barcode, which uniquely identify the LOGIQ P9/P7 system as a medical device manufactured by General Electric. Scan or enter the UDI information into the patient health record as required by country-specific laws.	Rating Plate
 <p>The label contains the following information:  <b>UDI</b> LOGIQ P9 R2 to R2.5 UPG   (011000000000000000) (1110000001211000000000)</p>		Upgraded LOGIQ P9 systems, adjacent to the Rating Plate

## Section 1-3 Safety Considerations

### 1-3-1 Introduction

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.

### 1-3-2 Human Safety

Operating personnel must not remove the system covers, except for removing front cover to clean air filter.

Servicing should be performed by authorized personnel only. Only personnel who have participated in a LOGIQ P9/P7 Training are authorized to service the equipment.

### 1-3-3 Mechanical Safety



**CAUTION** The LOGIQ P9/P7 weighs 60 kg or more, depending on installed peripherals, (133 lbs or more) when ready for use.



Care must be used when moving it or replacing its parts. Failure to follow the precautions listed could result in injury, uncontrolled motion and costly damage.

**ALWAYS:**

- Use the handle to move the system.
- Be sure the pathway is clear.
- Use slow, careful motions.
- Do not let the system strike walls or door frames.

Two people are required when moving on inclines or lifting more than 16 kg (35 lbs).



**WARNING** *USE EXTREME CAUTION WHEN ELEVATING THE UNIT, OR IF IT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE. THE LOGIQ P9/P7 SYSTEM MAY BECOME UNSTABLE WHICH COULD CAUSE A TIP OVER.*



**WARNING** *ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.*



**WARNING** *NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR. EVEN IF IT LOOKS OK, IT MAY BE DAMAGED.*



**CAUTION** Always lower and center the Operator I/O Panel before moving the scanner.



**CAUTION** Before you move or transport the system, make sure to lock the LCD monitor firmly and flip down the monitor to prevent damage to the system.

**NOTE:** Special care should be taken when transporting the unit in a vehicle:

- Eject any DVD/CD from the drive.
- Place the probes in their carrying cases.
- DO NOT use the Control Panel as an anchor point.
- Secure the systems with straps in an upright position and lock the caster wheels (brake).
- Ensure that the LOGIQ P9/P7 system is firmly secured while inside the vehicle.
- Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.

## 1-3-4 Electrical Safety

### 1-3-4-1 Safe Practices

To minimize shock hazard, the equipment chassis must be connected to an electrical ground. The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. If an extension cord is used with the system, make sure that the total current rating of the system does not exceed the extension cord rating.

The power outlet used for this equipment should not be shared with other types of equipment. Both the system power cable and the power connector meet international electrical standards.

This product is classified as Class I and INTERNALLY POWERED ME EQUIPMENT according to the IEC/EN 60601-1.

### 1-3-4-2 Probes


All the probes for the LOGIQ P9/P7 are designed and manufactured to provide trouble-free, reliable service. To ensure this, correct handling of probes is important and the following points should be noted:

- Do not drop a probe or strike it against a hard surface, as this may damage the transducer elements, acoustic lens, or housing.
- Inspect the probe prior to each use for damage or degradation to the Housing, Cable strain relief, Lens and Seal.
- Do not use a cracked or damaged probe. In this event, call your field service representative immediately to obtain a replacement.
- Avoid pulling, pinching or kinking the probe cable, since a damaged cable may compromise the electrical safety of the probe.
- To avoid the risk of a probe accidentally falling, do not allow the probe cables to become entangled, or to be caught in the machine's wheels.
- Never immerse the probe connector or adapter into any liquid.

**NOTE:** *For detailed information on handling probes, refer to the LOGIQ P9/P7 Basic User Manual and the care card supplied with the probe.*

## 1-3-5 Auxiliary Devices Safety

 **WARNING** *Power Supplies for additional equipment **MUST** comply with IEC 60601-1.*

 **WARNING** ***DO NOT attempt to use different peripherals and accessories (brand and model; connected via USB ports) other than approved and provided by GE Healthcare! The ultrasound system is an extremely sensitive and complex medical system. Any unauthorized peripherals may cause system failure or damage!***

The LOGIQ P9/P7 may be used with an isolation transformer to provide the required separation from mains for both, the system and the auxiliary devices.

One AUX main outlet is located at the primary power supply. It is used for connecting the two-fold splitter whose outlets are led to the shelves intend for auxiliary devices (e.g., printers) and the AUX main outlet that is accessible on the back of the control console.

The IEC 60601-1-1 standard provides a guideline for safely interconnecting medical devices in systems. "Equipment connected to the analog or digital interface must comply with the respective IEC/UL standards (e.g. IEC 60950 / UL 60950 for data processing equipment and IEC 60601-1 / ANSI/AAMI ES60601-1 for medical equipment).


Everybody who connects additional equipment to the signal input portion or signal output portion configures a medical system, and is therefore responsible that the system complies with the requirements of the system standard IEC 60601-1-1.

Special care has to be taken, if the device is connected to computer network (e.g., Ethernet), because other devices could be connected without any control. There could be a potential difference between the protective earth and any line of the computer network including the shield.


In this case the only way to operate the system safely is to use an isolated signal link with minimum 4mm creepage distance, 2.5mm air clearance of the isolation device. For computer networks there are media converters available which convert the electrical to optical signals. Please consider that this converter has to comply with IEC xxx standards\* and is battery operated or connected to the isolation mains output of the LOGIQ P9/P7 ultrasound system.

\* IEC xxx stands for standards such as:

- IEC 60601 for medical devices
- IEC 60950 for information technology equipment etc.

 **NOTICE** **The system integrator** (any person connecting the medical device to other devices) **is responsible that the connections are safe.**

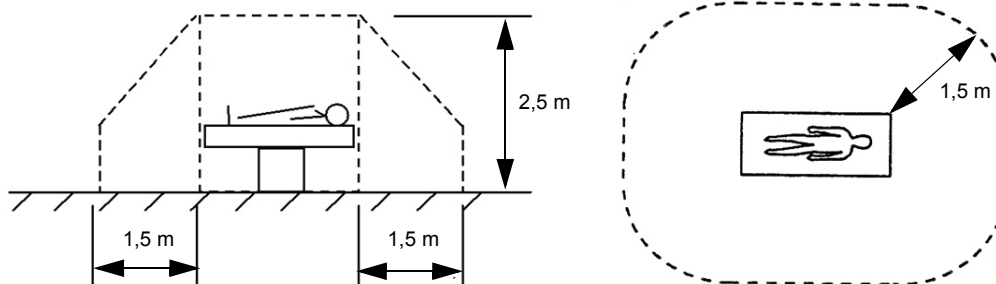
If in doubt, consult the technical service department or your local representative.

 **CAUTION** **The leakage current of the entire system including any / all auxiliary equipment must not exceed the limit values as per IEC 60601-1 / EN 60601-1 respectively other valid national or international standards. All equipment must comply with UL, CSA and IEC requirements.**





**CAUTION** Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are no medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / ANSI/AAMI ES60601-1).



**CAUTION** Auxiliary equipment must only be connected to the main console with the special main outlet provided for the electrical safety of the system.



**CAUTION** Auxiliary equipment with direct main connection requires galvanic separation of the signal and/or control leads.

For hardware installation procedures see: [Chapter 3 - Connection of Auxiliary Devices](#), on page 3-11.



**WARNING** *After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively ANSI/AAMI ES60601-1.*



**NOTICE** All peripherals mounted on the LOGIQ P9/P7 system chassis must be firmly secured in position.

## 1-3-6 Battery Safety

**NOTE:** The LOGIQ P9/P7 ultrasound system is supplied with a lithium ion battery in the power supply module, as option.

The lithium ion technology used in the system's battery is significantly less hazardous to the environment than the lithium metal technology used in some other batteries (such as watch batteries). Used batteries should not be placed with common household waste products. Contact local authorities for the location of a chemical waste collection program nearest you.

**NOTE:** Regulations vary for different countries. Dispose of a used battery in accordance with local regulations.



**CAUTION** USE ONLY BATTERIES APPROVED BY GE HEALTHCARE AS SUITABLE FOR USE WITH THE LOGIQ P9/P7 ULTRASOUND SYSTEM.



**WARNING** **THE LOGIQ P9/P7 BATTERY HAS A SAFETY DEVICE.**  
**DO NOT ATTEMPT TO DIS-ASSEMBLE OR ALTER THE BATTERY!**  
**ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:**

- DO NOT short-circuit the battery by directly connecting the negative terminals with metal objects.
- DO NOT heat the battery or discard it in a fire.
- DO NOT expose the battery to temperatures over 50 °C. Keep the battery away from fire and other heat sources.
- DO NOT charge the battery near a heat source, such as, a fire or heater.
- DO NOT leave the battery in direct sunlight.
- DO NOT pierce the battery with a sharp object, hit it, or step on it.
- DO NOT use a damaged battery.
- DO NOT apply solder to a battery.
- DO NOT connect the battery to an electrical power outlet.



**CAUTION** TO PREVENT THE BATTERY BURSTING, IGNITING, OR FUMES FROM THE BATTERY CAUSING EQUIPMENT DAMAGE, ALWAYS OBSERVE THE FOLLOWING PRECAUTIONS:

- DO NOT immerse the battery in water or allow it to get wet.
- DO NOT place the battery into a microwave oven or pressurized container.
- If the battery leaks or emits an odor, remove it from all possible flammable sources.
- If the battery emits an odor or heat, is deformed or discolored, or in a way appears abnormal during use, recharging or storage, immediately remove it and stop using it.

**NOTE:** If you have any questions about the battery, consult your local GE representative.

- Storage of the battery pack:  
Short-term (less than 1 month): between 0 °C (32 °F) and 50 °C(122 °F)  
Long-term (more than 3 months): between 10 °C (50 °F) and 35 °C (95 °F)

*When charging the battery for the first time after long-term storage, recover the battery pack to original performance through repeating several cycles of full charging and discharging.*

## 1-3-7 Labels Locations

The LOGIQ P9/P7 ultrasound system comes equipped with product labels and icons. These labels and icons represent pertinent information regarding the operation of the unit.

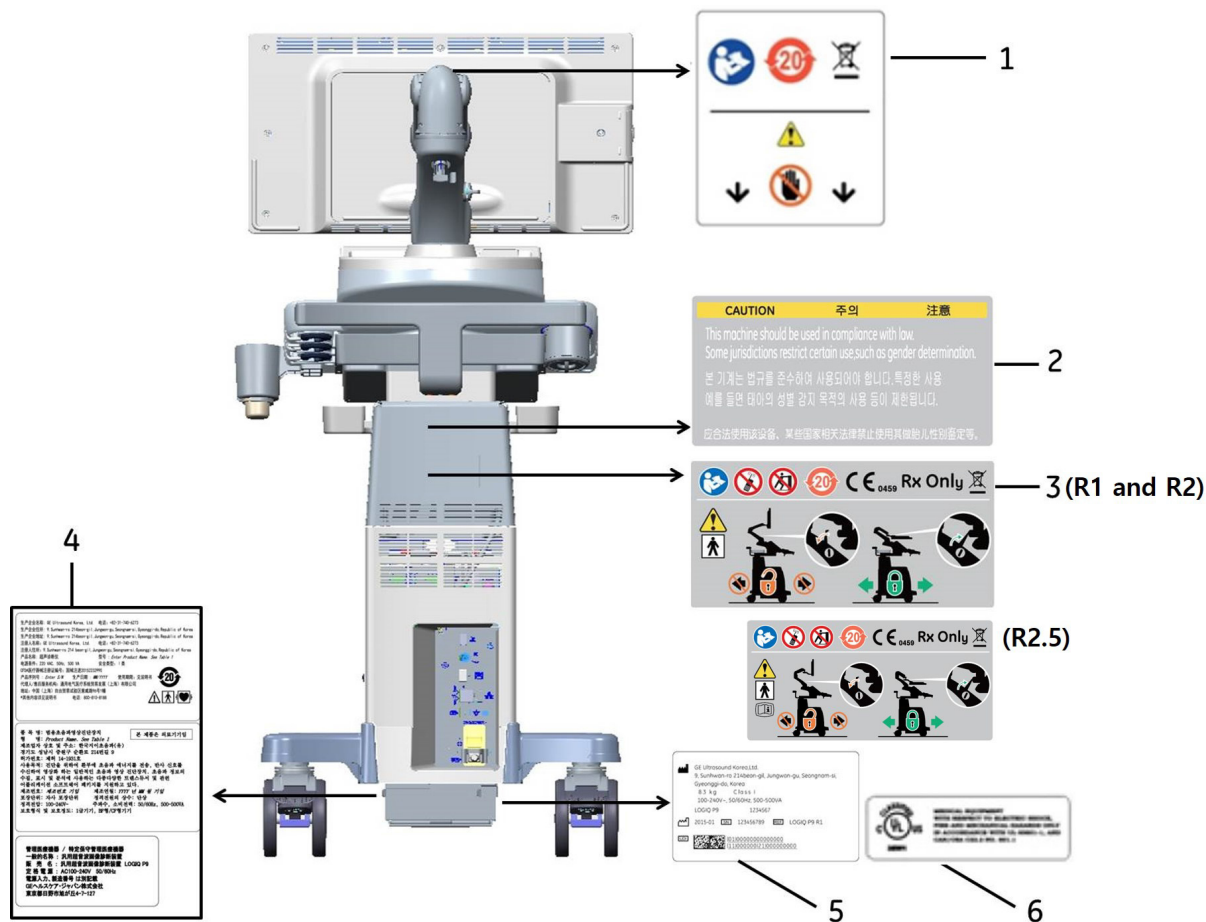


Figure 1-1 Label Location (R1, R2 and R2.5)

\* Required for Asia.

- 1) LCD Caution Label
- 2) Gender Caution Label (Only for India, China, Korea)
- 3) Multi Caution Label
- 4) LOGIQ P9/P7 Rating Label (For China, Korea, Japan)
- 5) LOGIQ P9/P7 Rating Label
- 6) UL Label

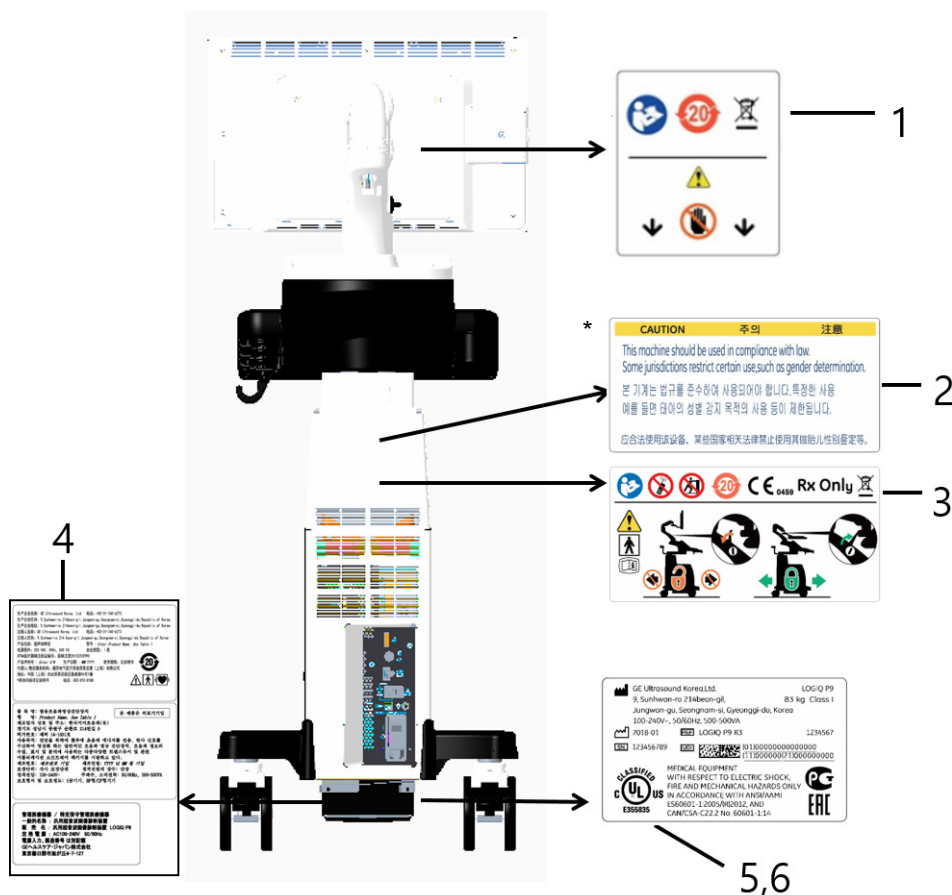


Figure 1-2 Label Location (R3)

\* Required for Asia.

- 1) LCD Caution Label
- 2) Gender Caution Label (Only for India, China, Korea)
- 3) Multi Caution Label
- 4) LOGIQ P9/P7 Rating Label (For China, Korea, Japan)
- 5) LOGIQ P9/P7 Rating Label

### 1-3-8 Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.



**DANGER DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT.**



**USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**



**WARNING EXPLOSION WARNING**

***DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE.  
OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT  
CONSTITUTES A DEFINITE SAFETY HAZARD.***



**WARNING DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT**

***BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT  
INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION  
OF THE EQUIPMENT.***

### 1-3-9 Lockout/Tagout Requirements (For USA Only)

Follow OSHA Lockout/Tagout requirements to protect service personnel from injuries caused by unexpected energizing or start-up of equipment during service, repair, or maintenance.



**NOTICE** Energy Control and Power Lockout for LOGIQ P9/P7.



When servicing parts of the system where there is exposure to voltage greater than 30 Volts:  
Unplug the system.

Maintain control of the system power plug.

There are no test points to verify isolation, you must wait for at least 20 seconds for capacitors to discharge.

Beware that the Power Supply, Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.

### 1-3-10 Returning/Shipping System, Probes and Repair Parts

When returning or shipping the LOGIQ P9/P7 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see Figure on [page 3-8](#))
- the Control Console has to be centered and locked in “unextended” position.

Equipment being returned must be clean and free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

## 1-3-10 Returning/Shipping System, Probes and Repair Parts (cont?)

**NOTE:** *The US Department of Transportation (DOT) has ruled that “items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care” are “regulated medical waste” for transportation purpose and must be transported as a hazardous material.*

## Section 1-4 Electromagnetic Compatibility (EMC)

### 1-4-1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio-frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power or signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

For applicable standards please refer to Chapter 2 in the Basic User Manual of the LOGIQ P9/P7 ultrasound system.

### 1-4-2 Compliance

The LOGIQ P9/P7 unit conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements as mentioned in IEC 60601-1-2.


**NOTE:** *For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.*

### 1-4-3 Electrostatic Discharge (ESD) Prevention

 **WARNING** *DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions:*



- 1.) *When installing boards, ESD may cause damage to a board.  
ALWAYS connect yourself, via an arm-wrist strap, to the advised ESD connection point located on the rear of the system (to the right of the power connector).*
- 2.) *Follow general guidelines for handling of electrostatic sensitive equipment.*

 **WARNING** *Risk of electrical shock: System must be turned off.  
Avoid all contact with electrical contacts, conductors and components.  
Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.*

## Section 1-5 Customer Assistance

### 1-5-1 Contact Information

If this equipment does not work as indicated in this service manual or in the Basic User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

**NOTE:** Prepare vital system information (see: [Section 7-2 on page 7-2](#)) before you call:

- System Type
- System Serial number (also visible on label on back of the system)
- Application Software version
- Backup version
- additional information about installed software

**Table 1-6 Phone Numbers for Customer Assistance**

Location	Phone Number	
USA GE Healthcare Ultrasound Service Engineering 9900 Innovation Drive (RP-2123) Wauwatosa, WI 53226, USA	Service On-site Service: Parts  Applications support	1-800-437-1171 1-800-558-2040  1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Applications support	1-800-321-7937 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH Beethovenstraße 239 Postfach 11 05 60, D-42655 Solingen Germany	OLC - EMEA (Europe, Middle East & Africa) Phone: +49 (0) 212 2802 - 652 (-OLC) +33 1 3083 1300 (English/German all segments incl. training) Fax: +49 (0) 212 2802 - 431	
Online Services Ultrasound Asia Australia China India Japan Korea Singapore	Phone: +(61) 1-800-647-855 +(86) 800-810-8188 +(91) 1-800-11-4567 +(81) 42-648-2924 +(82) 2-6201-3585 +(95) 6277-3444	

### 1-5-2 System Manufacturer

**Table 1-7 System Manufacturer**

Manufacturer	FAX Number
GE Ultrasound Korea, Ltd. 9, Sunhwan-ro 214beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea	+82 (0) 31-740-6436





# Chapter 2

## Site Preparation

---

### Section 2-1 Overview

#### 2-1-1 Purpose of Chapter 2

This chapter provides the information required to plan and prepare for the installation of a LOGIQ P9/P7 ultrasound unit. Included are descriptions of the facility and electrical needs to be met by the purchaser.

**Table 2-1**      **Contents in Chapter 2**

Section	Description	Page Number
<a href="#">2-1</a>	<a href="#">Overview</a>	<a href="#">2-1</a>
<a href="#">2-2</a>	<a href="#">General Console Requirements</a>	<a href="#">2-2</a>
<a href="#">2-3</a>	<a href="#">Facility Needs</a>	<a href="#">2-7</a>

## Section 2-2 General Console Requirements

### 2-2-1 Environmental Requirements

Table 2-2 System Environmental Requirements

	Operational (with probe)	Storage (LOGIQ P9/P7)	Transport (LOGIQ P9/P7)
Temperature	10 - 35 °C (50 - 95 °F) with 2D probe  18- 30 °C (64.4 - 86°F) with 4D probe	-10 - 50 °C (14 - 122 °F)	-10 - 50 °C (14 - 122 °F)
Humidity	10 - 80% (non-condensing)	10 - 90% (non-condensing)	10 - 90% (non-condensing)
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa



**CAUTION** If the system has been in storage or has been transported, please see the acclimation requirements *before* powering ON and/or using the system (see: [Section 3-2-2 "Installation Warnings" on page 3-3](#)).

#### 2-2-1-1 Cooling

The cooling requirement for the LOGIQ P9/P7 is 680 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room.

**NOTE:** *Each person in the room places an additional 300 BTU/hr. demand on the cooling system.*

#### 2-2-1-2 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

### 2-2-2 Electrical Requirements

**NOTE:** *GE Healthcare requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.*

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size Ground wire from the distribution panel to the Ultrasound outlet.

**NOTE:** *Please note that image artifacts can occur, if at any time within the facility, the Ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.*

## 2-2-2-1 LOGIQ P9/P7 Power Requirements

Table 2-3 Electrical Specifications for LOGIQ P9/P7

Voltage	Tolerances	Current	Frequency
100 - 120 VAC	±10%	5.0 ... 4.1 A	50, 60 Hz (±2%)
220 - 240 VAC	±10%	2.2 ... 2.0 A	50, 60 Hz (±2%)

Power Consumption nominal 500 VA including all on-board peripherals.

### 2-2-2-2 Inrush Current

Inrush current is not a factor to consider due to the inrush current limiting properties of the power supplies.

### 2-2-2-3 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.



### CAUTION POWER OUTAGE MAY OCCUR.

The LOGIQ P9/P7 requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you DO NOT have any other equipment operating on the same circuit.

### 2-2-2-4 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other adequate outlets for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

### 2-2-2-5 Main Power Plug

The LOGIQ P9/P7 ultrasound system is supplied with a main power plug, as standard. In the event that the unit arrives without a power plug, or with the wrong plug, contact your GE dealer. When necessary, the installation engineer will supply the appropriate power plug to meet the applicable local regulations.

## 2-2-3 EMI Limitations

Ultrasound systems are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound machines also generate EMI. The LOGIQ P9/P7 complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.



**NOTICE** Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. Sources of EMI include the following:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave oven
- light dimmers
- portable phones
- broadcast stations and mobile broadcasting machines

**Table 2-4 EMI Prevention/Abatement**

EMI Rule	Details
Be aware of RF sources.	Keep the unit at least 5 meters (16.4 feet) away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit.	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace and/or reassemble all screws, RF gaskets, covers and cores.	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets.	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn ON the unit until any loose metallic part is removed and replaced, if required.
Do not place labels where RF gaskets touch metal.	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. In case a label has been found in such a location, move the label to a different, appropriate location.
Use GE- specified harnesses and peripherals.	The interconnect cables are grounded and require ferrite beads and other shielding. Cable length, material, and routing are all important; do not make any changes that do not meet all specifications.
Take care with cellular phones.	Cellular phones may transmit a 5 V/m signal that causes image artifacts.
Properly dress peripheral cables.	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

## 2-2-4 Probe Environmental Requirements

Table 2-5 2D Probe Environmental Requirements

	Operational
Temperature	10 ° - 35 °C for 2D probe  18° - 30°C for 4D probe
Humidity	10 - 80% (non-condensing) for 2D probe  30 - 80% (non-condensing) for 4D probe
Pressure	700 - 1060hPa



**NOTICE** SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF 0 TO + 55 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.

## 2-2-5 Time and Manpower Requirements

Site preparation takes time. Begin Pre-installation checks as soon as possible. If possible, allow six weeks before delivery, for enough time to make necessary changes.



**CAUTION** Have two people available to deliver and unpack the LOGIQ P9/P7 ultrasound system. Attempts to move the unit considerable distances (or on an incline) by one person alone, could result in personal injury and/or damage to the system.



## 2-2-6 System Specifications

### 2-2-6-1 Physical Dimensions of LOGIQ P9/P7

The physical dimensions and weight (without Peripherals) of the LOGIQ P9/P7 unit are summarized in [Table 2-6](#).

**NOTE:** *Physical dimensions (especially height and depth) depend on control console and monitor positioning. For more details refer to [Chapter 5 - OPIO Positioning, on page 5-20](#).*

**Table 2-6 Physical Dimensions and Weight (without Peripherals)**

Height	Width	Depth	Weight
1570 mm (max) 1375 mm (min) *	530 mm (console) 430 mm (Operator Panel)	740 mm	60 kg

\* with low cabinet option

### 2-2-6-2 Acoustic Noise Output

max. 50 dB(A)

### 2-2-6-3 Electrical Specifications

Please refer to [Section 2-2-2-1 "LOGIQ P9/P7 Power Requirements" on page 2-3](#).

## Section 2-3 Facility Needs

### 2-3-1 Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery.

Use the Pre-installation checklist (provided in [Table 2-7](#)) to verify that all needed steps have been taken.

**Table 2-7 LOGIQ P9/P7 Pre-Installation Check List**

Action	Yes	No
Schedule at least 3 hours for installation of the system.		
Notify installation team of the existence of any variances from the basic installation.		
Make sure system and probes have been subject to acclimation period.		
Environmental cooling is sufficient.		
Lighting is adjustable to adapt to varying operational conditions of the scanner.		
Electrical facilities meet system requirements.		
EMI precautions have been taken and all possible sources of interference have been removed.		
Mandatory site requirements have been met.		
If a network is used, IP address has been set for the system and a dedicated network outlet is available.		

Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract.

**NOTE:** *All electrical installations that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.*

The desire to use a non-listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferably prior to the purchase).

The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system reliability.

## 2-3-2 Mandatory Site Requirements

The following are mandatory site requirements. Additional (optional) recommendations, as well as a recommended ultrasound room layout, are provided in [Section 2-3-3 "Site Recommendations"](#).

- A dedicated single branch power outlet of adequate amperage (see [Table 2-3 on page 2-3](#)) that meets all local and national codes and is located less than 2.5 m (8.2 ft) from the unit's proposed location. Refer to: [Section 2-2-2 "Electrical Requirements" on page 2-2](#).
- A door opening of at least 76 cm (2.5 ft) in width.
- The proposed location for the unit is at least 0.2 m (0.67 ft) from the walls, to enable cooling.
- Clean and protected space for storage of probes (either in their case or on a rack).
- Material to safely clean probes (performed using a plastic container, never metal).
- Power outlet and place for any external peripheral are within 2 m (6.5 ft.) of each other with peripheral within 1 m of the unit to connect cables.

**NOTE:** *The LOGIQ P9/P7 has one outlet for on board peripherals.*

In case of network option:

- An active network outlet in the vicinity of the ultrasound unit.
- A network cable of appropriate length (regular Pin-to-Pin network cable).
- An IT administrator who will assist in configuring the unit to work with your local network. A fixed IP address is required. Refer to the form provided in [Figure 3-46 on page 3-71](#) for network details that are required.

**NOTE:** *All relevant preliminary network port installations at the prepared site must be performed by authorized contractors. The purchaser of GE equipment must utilize only qualified personnel to perform servicing of the equipment.*

## 2-3-3 Site Recommendations

The following are (optional) site recommendations. Mandatory site requirements are provided in the [Mandatory Site Requirements](#) section, above.

- Door opening of 90 cm (3 ft) in width.
- Accessible circuit breaker for a dedicated power outlet.
- Sink with hot and cold running water.
- Receptacle for bio-hazardous waste, for example, used probe sheaths.
- Emergency oxygen supply.
- Storage area for linens and equipment.
- Nearby waiting room, lavatory, and dressing room.
- Dual level lighting (bright and dim).
- Lockable cabinet for software and manuals.



### 2-3-3-1 Recommended Ultrasound Room Layout

Figure 2-1 below shows a floor plan illustrating the recommended layout of the Ultrasound Room and depicting the minimal room layout requirements.

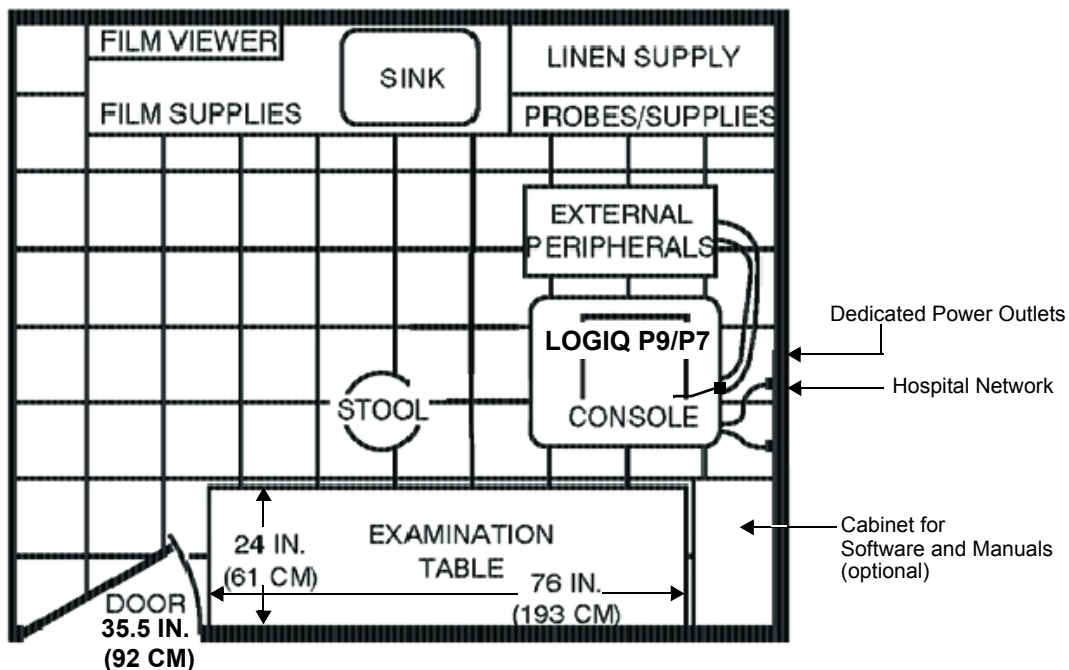


Figure 2-1 Recommended Floor Plan 4.3m x 5.2m (14ft x 17ft)

2-3-4

Networking Setup Requirements

2-3-4-1

Stand-alone Unit (without Network Connection)  
None

2-3-4-2

Unit Connected to Hospital’s Network  
Supported networks:

- Ethernet network connection
- Up to 900 Mbps WLAN (optional)

2-3-4-3

Purpose of the DICOM Network Function  
DICOM (Digital Imaging and Communications in Medicine) services provide the operator with clinically useful features for moving images and patient information over a hospital network. Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues. With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-4-4

DICOM Option Pre-installation Requirements  
To configure the LOGIQ P9/P7 ultrasound unit to work with other network connections, the network administrator must provide some necessary information.  
Use the [Agent Configuration \(R3 only\) on page 3-65](#) to record required information that must include:

- LOGIQ P9/P7 Details:** DICOM network details for the LOGIQ P9/P7 unit, including the host name, local port, IP address, AE title and net mask.
- Routing Information:** IP addresses for default gateway and other routers in use at site.
- DICOM Application Information:** Details of DICOM devices in use at the site, including the DICOM host name, AE title, DICOM port number and IP addresses.

Installation see: [Section 3-13 "Configuring Connectivity" on page 3-58](#).

# Chapter 3

## Setup Instructions

### Section 3-1 Overview

#### 3-1-1 The Purpose of Chapter 3

This chapter contains information needed to setup the LOGIQ P9/P7 ultrasound system. Included are procedures to receive, unpack and configure the equipment.

A worksheet is provided (see: [page 3-65](#) to [page 3-71](#)) to help ensure that all the required information is available, prior to setup the system.

**Table 3-1 Contents in Chapter 3**

Section	Description	Page Number
3-1	Overview	3-1
3-2	Set Up Reminders	3-2
3-3	Receiving and Unpacking the Equipment	3-5
3-4	Packing materials - recycling information	3-8
3-5	Preparing for Set Up	3-9
3-6	Connection of Auxiliary Devices	3-11
3-7	Completing the Set Up	3-20
3-8	Printer Installation	3-32
3-9	System Configuration	3-42
3-10	Available Probes	3-47
3-11	Software/Option Configuration	3-53
3-12	Connectivity Setup	3-54
3-13	Configuring Connectivity	3-58
3-14	Agent Configuration (R3 only)	3-65
3-15	Connectivity Setup Worksheet	3-70
3-16	Paperwork	3-72

Section 3-2

Set Up Reminders

3-2-1

Average Installation Time

Once the site has been prepared, the average installation time required is shown in [Table 3-2](#) below.

Table 3-2     Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	0.5 hours	
Installing the scanner / options / printers	0.5 to 1.5 hours	depends on required configuration
DICOM Option (connectivity)	0.5 - 1.5 hours	depends on configuration amount

## 3-2-2 Installation Warnings

- 1) Since the LOGIQ P9/P7 weighs approximately 90 kg (200 lbs.) without peripherals, two people are required to unpack it.
- 2) There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord.  
**Only** qualified service personnel should carry out servicing and troubleshooting.

### 3-2-2-1 Moving/Lifting the System



When moving or lifting the system, **grasp it only** at the rear handle.



#### WARNING

Do **NOT** pull or lift the system with the front handle of the user interface (operator panel).

Figure 3-1 moving or lifting the system

### 3-2-2-2 System Acclimation Time

After being transported, the LOGIQ P9/P7 system may be very cold or hot. It requires one hour for each 2.5°C increment if it's temperature is below 10°C or above 40°C.



**CAUTION** Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.

Table 3-3 Acclimation Time

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
°F	140	131	122	113	104	96	86	77	68	59	50	41	32	23	14	5	-4	-13	-22	-31	-40
hrs	10	8	6	4	2	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

### 3-2-2-3 OPIO Position

If weight is placed on the OPIO (User Interface) in it's extended position the console could tip over.



**WARNING** The system should **NOT** be moved with the OPIO (User Interface) extended. Move the OPIO to it's centered and locked position.




**WARNING** Monitor mounting mechanism may break if not properly supported (e.g., with packing foam) during transportation.


3-2-2-4 Brake Pedal Operation


 **WARNING** *REMEMBER: If the front wheel brakes are engaged for transportation, release brake pedals (brakes on front wheels under the foot rest) to disengage the lock.*

3-2-3 Safety Reminders

 **DANGER** **WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER’S GROUND SWITCH IS OPEN), DO NOT TOUCH THE UNIT!**


 **CAUTION** Two people should unpack the unit because of its weight.  
Two people are required whenever a part weighing 16kg (35 lb.) or more must be lifted.


 **CAUTION** If the unit is very cold or hot, do NOT turn on its power until it has had sufficient time to acclimate to its operating environment.

 **CAUTION** To prevent electrical shock, connect the unit to a properly grounded power outlet.  
DO NOT use a three to two prong adapter. This defeats safety grounding.

 **CAUTION** DO NOT wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.

 **CAUTION** DO NOT use a 20 Amp to 15 Amp adapter on the 120 Vac unit’s power cord.  
This unit requires a dedicated 16 A circuit.

 **CAUTION** DO NOT operate this unit unless all board covers and frame panels are securely in place, to ensure optimal system performance and cooling.  
(When covers are removed, EMI may be present).

 **CAUTION** **OPERATOR MANUAL(S)**  
The User Manual(s) should be fully read and understood before operating the LOGIQ P9/P7.  
Keep manuals near the unit for reference.


 **CAUTION** **ACOUSTIC OUTPUT HAZARD**  
Although the ultrasound energy transmitted from the LOGIQ P9/P7 ultrasound system is within FDA limitations, avoid unnecessary exposure.  
Ultrasound energy can produce heat and mechanical damage.



Figure 3-2 Environmental Labels

## Section 3-3 Receiving and Unpacking the Equipment

**CAUTION** Please read this section carefully before unpacking the LOGIQ P9/P7 ultrasound system and its (optional) peripherals.

The LOGIQ P9/P7 ultrasound system, together with peripherals, probes and accessories are shipped from the factory in a single durable shipping crate which is mounted on a raised wooden platform base.

**CAUTION** Transport only with forklift or stacker truck.  
During transport pay attention to the point of gravity ("tilt and drop" indicator)!  
Have two people available to unpack the LOGIQ P9/P7.  
Attempts to move the unit considerable distances (or on an incline) by one person alone, could result in personal injury, and/or damage to the system.



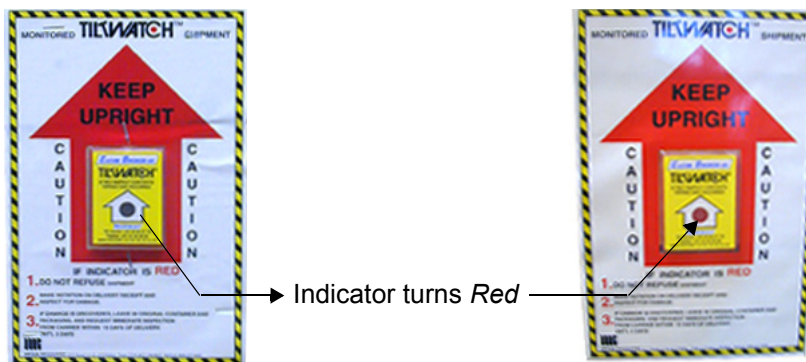
**Table 3-4 Shipping Carton - Dimensions and Weight**

Description	Height	Width	Depth	Weight*
LOGIQ P9/P7 incl. peripherals and accessories	1550 mm / 61 inch	706 mm / 27.7 inch	904 mm / 35.6 inch	120 kg / 267 lbs

\* Weight is approximate and will vary depending upon the supplied peripherals

### Before unpacking the unit:

- Inspect the crate for visible damage.
- Inspect the Drop and Tilt Indicator for evidence of accidental shock or tilting during transit (damage incident, see: [Figure 3-3](#) below).

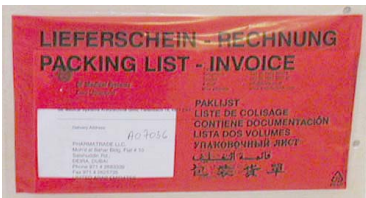


**Figure 3-3 Drop and Tilt Indicator**

**NOTICE** The device must only be transported in the original packaging!  
Each shipping crate is composed of wooden base, cardboard box, re-usable plastic caps and cushions inside. It is recommended to keep and store the shipping crate and all other packing materials (including the support foams, anti-static plastic cover, etc.), in case the unit has to be moved to a different location. Unpack the devices such a way that packaging can be reused.  
For warranty purposes, storage of the above is required for one year from date of purchase.

**NOTICE** If the shipping crate is damaged, please inform the GE sales representative immediately.

Section 3-3     Receiving and Unpacking the Equipment (cont?)



The envelope with delivery address, packing list and invoice is located on the front panel of the crate.

Check whether delivery is complete (according to packing list) and check visual damage!

Figure 3-4 envelope at front panel of the crate

Table 3-5     Unpacking Procedure







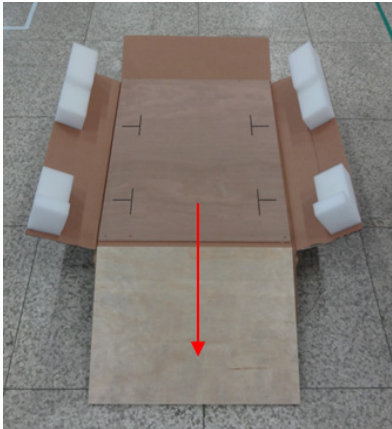

Step	Task
1.	<div>Remove the top cover, then remove the out sleeve.</div> <div></div>
2.	<div>Remove the option box on front of the system.</div> <div></div>



Table 3-5     Unpacking Procedure

Step	Task
3.	<p>Remove the monitor pads from the monitor and remove the 4 pads of the box bottom assy.</p> <div></div>
4.	<p>Carefully remove foam packing material and plastic bag from the ultrasound unit and monitor.</p>
<p><b>Caution: Two people are needed in the next step due to the weight of the equipment.</b></p>	
5.	<p>Unlock the casters and place the 4 caster's direction like the picture below and then using the incline plane of the box bottom assy, slowly move the system from the box.</p> <div></div>
<p><b>Note: Packing crate and material should be stored for future use.</b></p>	

## Section 3-4

### Packing materials - recycling information

The packing materials for LOGIQ P9/P7 are recyclable:

- The Transportation Box is made of cardboard.
- The inner reinforcements are made of Ethafoam (Polyethylene foam).
- The plastic foil is made of LDPE (Low Density Polyethylene).

## Section 3-5 Preparing for Set Up

### 3-5-1 Verify Customer Order

- 1) After unpacking the equipment, it is important to verify that all items ordered by the customer have been received. Compare all items listed on the packing slip (delivery note) with those received.



**NOTICE** It is recommended to keep and store the shipping carton and all other packing materials (including the support foams, anti-static plastic cover, etc.), in case the unit has to be moved to a different location. Unpack the devices such a way that packaging can be reused. For warranty purposes, storage of the above is required for one year from date of purchase.

- 2) Visually inspect the system components using the following checklist.

**Table 3-6 Damage Inspection Checklist - LOGIQ P9/P7 System**

	Step	Item	Recommended Procedure
	1	Main label	Enter <b>Serial Number:</b> _____ (printed on main label, see: <a href="#">Figure 1-1 on page 1-13</a> )
	2	Console	Verify that the system is switched OFF and unplugged. Clean the console and control panel.
	3	Control Console	Physically inspect the control console for missing or damaged items. After switching on the system, verify the proper illumination of all the control panel buttons.
	4	Probes	Check all probes for wear and tear on the lens, cable, and connector. Look for bent or damaged pins on the connector and in the connector socket on the unit. Verify that the EMI fingers around the probe connector socket housing are intact. Check the probe locking mechanism and probe switch.
	5	LCD Display	Clean the LCD display by gently wiping with a dry, soft, lint-free non-abrasive folded cloth. Inspect the monitor for scratches and raster burn.
	6	Fans	Verify that the system's cooling fans and peripheral fans are operating.
	7	Rear Panel	Check the rear panel connectors for bent pins, loose connections and loose or missing hardware. Screw all the cable connectors tightly to the connector sockets on the panel. Verify that the labeling is in good condition.
	8	Covers	Check that all screws are tightly secured in place, that there are no dents or scratches and that no internal parts are exposed.
	9	Peripherals	Check and clean the peripherals in accordance with the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
	10	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation, or any deterioration. Verify continuity. Replace the power cord, as required.

**NOTE:** Report any items that are missing, back-ordered, or damaged, to your GE sales representative. The contact address is shown in [Contact Information on page 1-17](#).

### 3-5-2 EMI Protection

This unit has been designed to minimize the effects of Electro-Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

Ensure that the system is protected from electromagnetic interference (EMI), as follows:

- Operate the system at least 15 feet away from equipment that emits strong electromagnetic radiation.
- Operate the system in an area enclosed by walls, floors and ceilings comprised of wood, plaster or concrete, which help prevent EMI.
- Shield the system when operating it in the vicinity of radio broadcast equipment, if necessary.
- Do not operate mobile phones or other EMI emitting devices in the ultrasound room.
- Verify that all EMI rules listed in the following table are followed:

The LOGIQ P9/P7 ultrasound unit is approved for use in hospitals, clinics and other environmentally qualified facilities, in terms of the prevention of radio wave interference. Operation of the ultrasound unit in an inappropriate environment can cause electronic interference to radios and television sets situated near the medical equipment.

For further details and EMI Prevention/Abatement refer to [Section 2-2-3 "EMI Limitations" on page 2-4](#).

## Section 3-6 Connection of Auxiliary Devices

**NOTE:** Normally auxiliary devices and peripherals come pre-installed with the system.

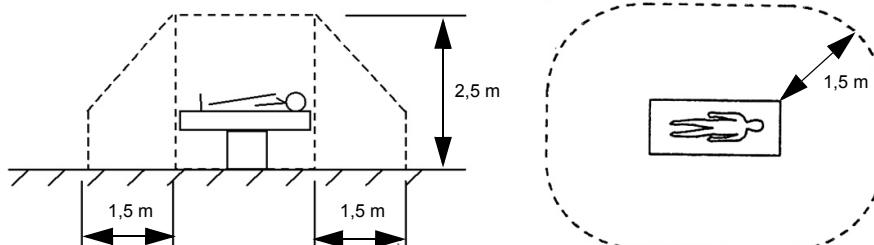
Table 3-7 below outlines hardware installation procedures described in the sub-sections.

**Table 3-7 Connection Procedures**

Sub-section	Description	Page Number
3-6-1	Connecting the LCD Monitor	3-12
3-6-2	Connecting the Black & White Printer	3-13
3-6-3	Connecting the Color Printer	3-14
3-6-3	Connecting the Secondary "Patient" LCD Monitor	3-15
3-6-4	Connecting the Footswitch	3-17
3-6-5	Connecting the USB Flash Memory Stick	3-18
3-6-6	Connecting the external USB Hard disk (Handydrive)	3-18
3-6-7	General Remarks and Hints when using external USB-Devices	3-19

**WARNING** After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively ANSI/AAMI ES60601-1.

**CAUTION** Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are not medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / ANSI/AAMI ES60601-1).



**NOTE:** For more detailed Safety Considerations when connecting auxiliary devices to the LOGIQ P9/P7 system, please review: [Chapter 1 - Auxiliary Devices Safety, on page 1-10](#).

### 3-6-1 Connecting the LCD Monitor

**NOTE:** The LCD monitor comes pre-installed with the system.



Figure 3-5 Connection Scheme - LCD Monitor

## 3-6-2 Connecting the Black & White Printer

- 1) Power OFF/Shutdown the system as described in: [Section 3-7-3 on page 3-25](#).
- 2) Connect the Black & White printer according to correct connection scheme as described in [Figure 3-6 on page 3-14](#).

**NOTE:** *There are three USB ports (stack) on rear panel. The BW printer may be connected to any of the 3x USB stack connector.*

- 3) When all the cables are connected, press the Power ON switch on the Black & White printer.
- 4) Power ON/Boot up the LOGIQ P9/P7 system as described in [Section 3-7-2 on page 3-21](#). All software drivers are pre-installed for the designated Black & White printer only.
- 5) Verify the correct settings in the printer "Properties", see: [Section 3-8-5 "Adjustment of Printer Settings" on page 3-37](#).



**WARNING** *After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively ANSI/AAMI ES60601-1.*

3-6-2-1 Connection Scheme: B&W Printer

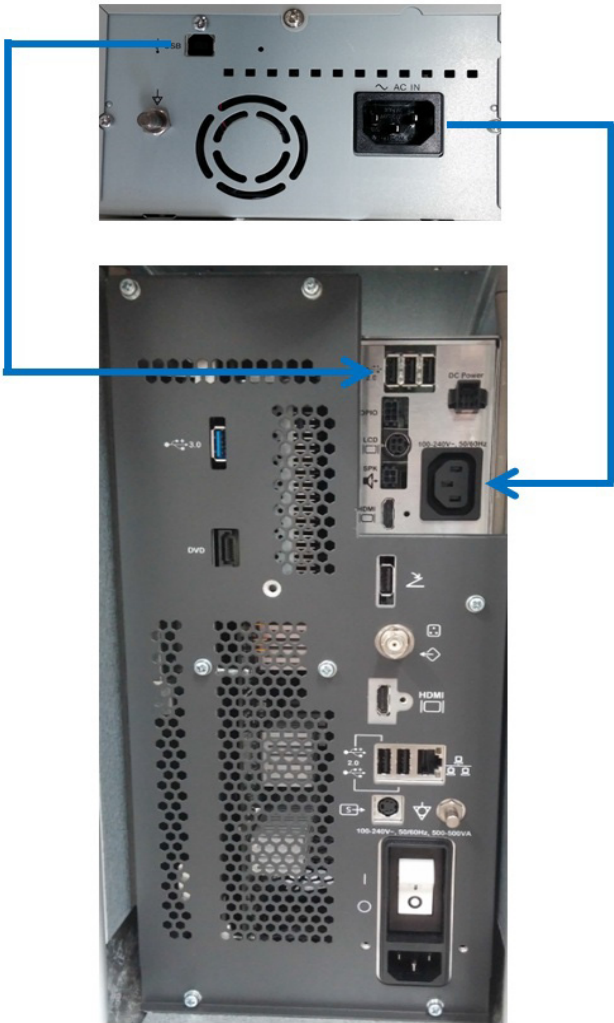


Figure 3-6 B&W Printer connection



### 3-6-3 Connecting the Secondary “Patient” LCD Monitor



**CAUTION** Secondary LCD “Patient” Monitor **MUST NEVER** be connected to the LOGIQ P9/P7 ultrasound systems mains supply directly!  
**Always connect it to the supplied Isolation Transformer!**  
**The Secondary Monitor is the only item to be connected to the Transformer.**



**NOTICE** Secondary Monitor is **NOT intended for diagnostic use**.  
It is an additional device used to allow the patient to watch the proceedings.  
Take your time to think about the best position of the monitor in your facilities.  
Patients should be able to view the monitor easily and without having to bend or turn around.



**NOTICE** Connection to Secondary Monitor is via HDMI cable, but HDMI connector output does NOT carry audio signal.

- 1) Power OFF/Shutdown the system as described in: [Section 3-7-3 on page 3-25](#).
- 2) Connect the Secondary Monitor according to connection scheme (see: [Figure 3-7 on page 3-16](#)).

### 3-6-3 Connecting the Secondary “Patient” LCD Monitor (cont?)

*appropriate  
Transformer*



#### CAUTION

A Secondary “Patient” Monitor **MUST NEVER**  
be connected to the LOGIQ P9/P7 ultrasound systems mains  
supply directly!

Always connect it to an appropriate **Isolation Transformer**

**Figure 3-7 Connection Scheme - Secondary LCD Monitor**

### 3-6-4 Connecting the Footswitch

The footswitch should be directly connected to any accessible USB-port on the LOGIQ P9/P7 (e.g., on rear of the system).

**NOTE:** *Connection of the Footswitch is always the same  
(no differences between PC-Motherboard version of the system).*

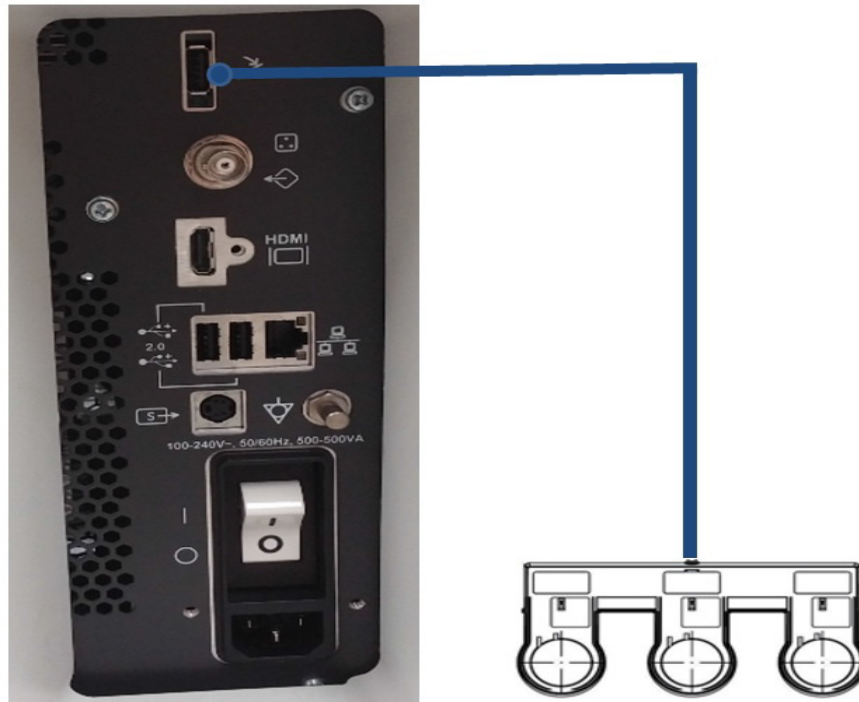



Figure 3-8 Connection Scheme - Footswitch


### 3-6-5 Connecting the USB Flash Memory Stick

 **NOTICE** Before connecting an USB device, please read [General Remarks and Hints when using external USB-Devices](#) on page 3-19.


The USB Flash Memory Stick may be connected to an accessible USB port of the LOGIQ P9/P7 system. Refer to [Section 3-9-2 "External I/O Connectors"](#) .

An external USB Flash Memory Stick can be connected once the system is powered ON, or after shutdown. The LOGIQ P9/P7, Windows detects the device and automatically installs a driver. During this process several dialogs may pop up, starting with the „Found New Hardware“ dialog.

**NOTE:** *Memory drives or sticks may be sensitive to EMC interference.  
This may affect system performance and/or image quality.*

 **NOTICE** Before disconnecting an external USB-device (e.g., USB Stick), the system has to be informed about the removal of the device! For this purpose press the EJECT button on the keyboard.  
For further details refer to: [Section 3-6-7-2 "External USB-Devices - Disconnection"](#) on page 3-19.


### 3-6-6 Connecting the external USB Hard disk (Handydrive)

 **NOTICE** Before connecting an USB device, please read [General Remarks and Hints when using external USB-Devices](#) on page 3-19.


The external “Handydrive” HDD may be connected to an accessible USB port of the LOGIQ P9/P7 system. Refer to [Section 3-9-2 "External I/O Connectors"](#) .

An external USB Hard Disk Drive can be connected once the system is powered ON, or after shutdown. The LOGIQ P9/P7, Windows detects the device and automatically installs a driver. During this process several dialogs may pop up, starting with the „Found New Hardware“ dialog.

**NOTE:** *Memory drives, sticks or HDD drives may be sensitive to EMC interference.  
This may affect system performance and/or image quality.*

 **NOTICE** Before disconnecting an external USB-device (e.g., USB Hard disk), the system has to be informed about the removal of the device! For this purpose press the EJECT button on the keyboard.  
For further details refer to: [Section 3-6-7-2 "External USB-Devices - Disconnection"](#) on page 3-19.


### 3-6-7 General Remarks and Hints when using external USB-Devices

 **WARNING** *Do not connect or disconnect any external USB-devices to or from the system while scanning a patient! The appearing dialogs could distract you from the scan!*

#### 3-6-7-1 External USB-Devices - Connection

When an external USB-storage device (such as a USB-memory stick or an external hard disk) is connected to the LOGIQ P9/P7, Windows detects the device and automatically installs a driver. During this process, several dialogs may pop up, starting with the “Found New Hardware” dialog.

The device is then accessible using the drive letter the system assigned to it.

 **NOTICE** When connecting external USB devices, be sure to execute Safety Directions found in the LOGIQ P9/P7 Basic User Manual.

#### 3-6-7-2 External USB-Devices - Disconnection


 **CAUTION** **Unplugging or ejecting USB devices without first stopping them can often cause the system to crash and possibly result in loss of valuable data.**


To stop the external device, press F3 EJECT button.


## Section 3-7 Completing the Set Up


### 3-7-1 Connecting the Unit to a Power Source

The connection of the LOGIQ P9/P7 ultrasound unit to a power source should be performed by a qualified person who has completed basic LOGIQ P9/P7 System User Training. Use only the power cords, cables and plugs provided by or designated by GE to connect the unit to the power source.

 **CAUTION** Prior to connect the LOGIQ P9/P7 unit to a power source, verify compliance with all electrical and safety requirements. Check the power cord to verify that it is intact and of hospital-grade. Products equipped with a power source (wall outlet) plug should be connected to the fixed power socket that has a protective grounding conductor. Never use an adapter or converter to connect with a power source plug (for example, a three-prong to two-prong converter).

 **WARNING** *The unit's power must be supplied from a separate, properly rated outlet to avoid risk of fire. Refer to [Section 2-2-2-1 "LOGIQ P9/P7 Power Requirements" on page 2-3](#) for rating information. The power cord should not, under any circumstances, be altered to a configuration rated less than that specified for the current.*

 **CAUTION** Whenever disconnecting the LOGIQ P9/P7 system from the electrical outlet, always observe the safety precautions. First unplug the main power cable from the wall outlet socket, then from the unit itself. Remove by pulling on the cable connector - DO NOT pull on the cable.

 **CAUTION** The LOGIQ P9/P7 requires all covers!  
Operate this system only when all board covers and frame panels are securely in place. The covers are required for safe operation, good system performance and cooling purposes.

## 3-7-2 Power On / Boot Up

### 3-7-2-1 Scanner Power On

- 1) Ensure that the wall outlet is of appropriate type, and that the Circuit Breaker is turned off.
- 2) Uncoil the power cable, allowing sufficient slack so that the unit can be moved slightly.
- 3) Verify that the power cable is without any visible scratches or any sign of damage.
- 4) Verify that the on-site mains voltage is within the limits indicated on the rating label on the right side of the rear panel.
- 5) Connect the Main Power Cable to the back of the system. Refer to [Section 8-28](#) for details.
- 6) Connect the Main Power Cable to a hospital grade power outlet with the proper rated voltage. Never use an adapter that would defeat the safety ground.
- 7) Switch ON the Circuit at the rear of the system.

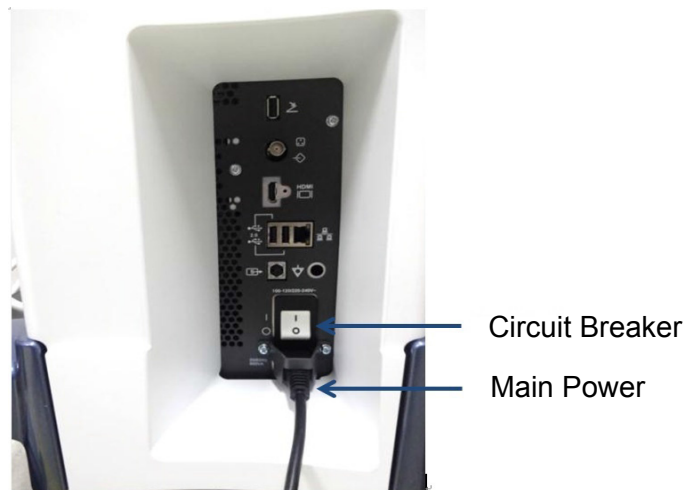


Figure 3-9 Circuit and main power cable at rear of system

### 3-7-2-2 Back End Processor Boot Up



**NOTICE** When AC power is applied to the scanner, the **ON/OFF** button on the control panel illuminates blue, indicating that the System (including the Back-end Processor) is in *Standby* mode.

8) Hold down the **On/Off** button (see: [Figure 3-10](#)) on the control panel for ~3 seconds.

**NOTE:** *The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. The power switch of any attached printer(s) needs to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode (e.g., Color video printer) and must therefore be switched on separately.*

When the **ON/OFF** button on the control panel is pressed, the System (including the Back-end Processor) starts and the operating system is loaded which then leads the application software to activate the scanner.

The system automatically performs an initialization sequence which includes the following:

- Loading the operating system.
- Running a quick diagnostic check of the system.
- Detecting connected probes



**Figure 3-10 On/Off Button on Control Panel**

As soon as the software has been loaded, the system enters 2D-Mode with the probe connected to port nearest to a user.

**NOTE:** *Total time used for start-up is about 2 minutes.*

9) Adjust Height and position of control console.



**3-7-2-3 During a normal boot, you may observe**

- A) Power is distributed to Peripherals, Operator Panel (control panel), Monitor, Front-End and Back-End Processor.
- B) The Back-End Processor and rest of the scanner starts with the sequence listed in following steps:
  - 1) “Boot Screen” is displayed.
  - 2) Back-End Processor is turned ON and starts to load the software.
  - 3) The Start Screen (LOGIQ?) is displayed on the monitor.
  - 4) Start-up progress bars indicating software loading procedures, are displayed on the monitor, as shown in Figure 3-11 below. Start-up progress bars indicating software loading procedures,



**Figure 3-11 GE Healthcare wallpaper with progress bar (R1.x.x)**



**Figure 3-12 GE Healthcare wallpaper with progress bar (R2.x.x and later)**

5) *Startup GE*

**NOTE:** *Startup GE Healthcare wallpaper with progress bar may differ depending on product type and release.*

- 6) The software initiates and sets up the Front-End electronics and the rest of the scanner (incl. the clicking sound of the relays on the PIL board).
- 7) The Keyboard backlight is lit.
- 8) As soon as the software has been loaded, the 2D screen is displayed on the monitor.

### 3-7-3 Power Off / Shutdown

When you power off the unit, the system performs an automatic shutdown sequence

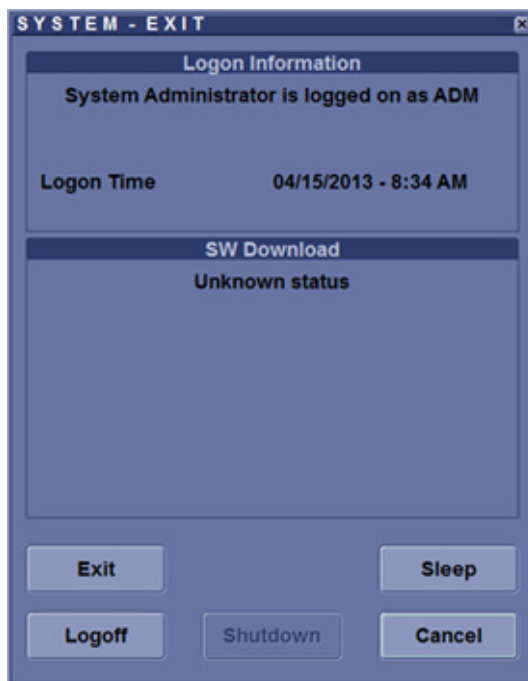


Figure 3-13 System Exit Window (R2 and R2.5)

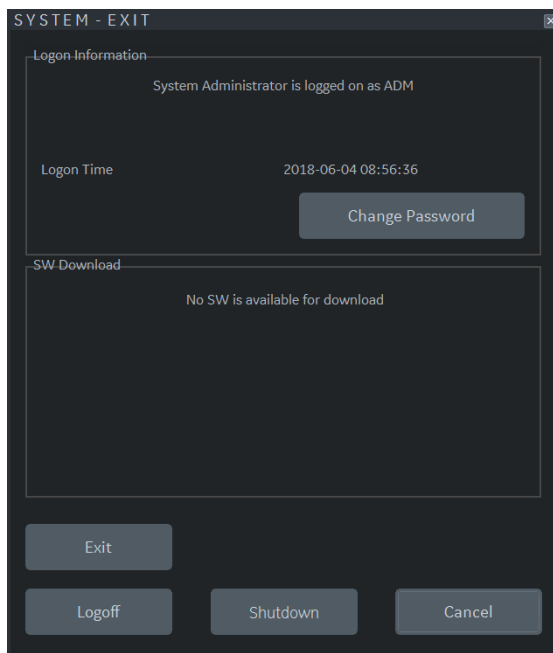


Figure 3-14 System Exit Window (R3)

The SYSTEM - EXIT menu, used when power off the unit, gives you these choices:

- **Logoff**  
Use this button to log off the current user. The system remains ON and ready for a new user to log on. If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.
- **Shutdown**  
Use this button to shut down the system. The entire system will shut down. It is recommended to perform a full shutdown at least once a week.  
  
If the Shutdown button is dimmed, press the power button or Alt F10 to shut down the unit.
- **Cancel**  
Use this button to exit from the System-Exit menu and return to the previous operation.
- **Exit** (Only available when logged in as GE Service with Service Dongle)  
Select this button when you want to exit to the Windows Desktop.
- **Sleep (R2 and R2.5 Only)**  
Use Sleep Mode when you do a portable exam in order to reduce the time to start up the system. When you use Sleep Mode, it takes ~90 seconds to start up the system versus 2-3 minutes.
- **Change Password**  
Use this button to change User Password.  
  
Refer to [Section 4-2-5-4 "Sleep Mode Check" on page 4-14](#).



**NOTICE** After turning off a system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

### 3-7-3-1 Scanner Shutdown

- 1) If not already in read mode, freeze the image.
- 2) Press the **ON/OFF** button (see: [Figure 3-10](#)) on the control panel. Following dialog appears.

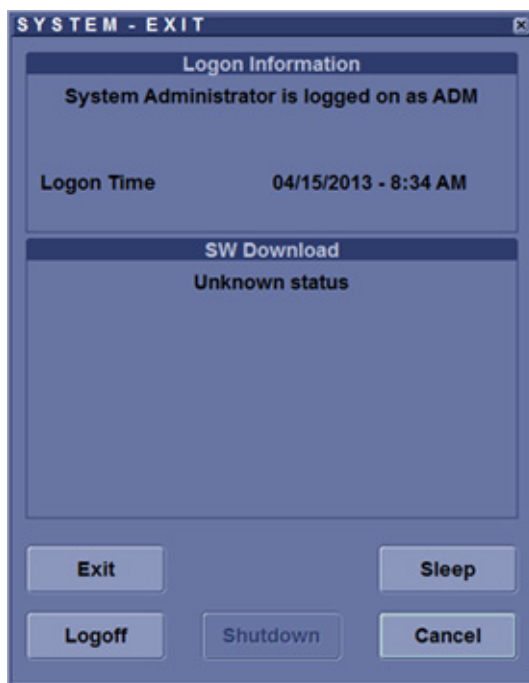


Figure 3-15 System - Exit (R2 and R2.5)

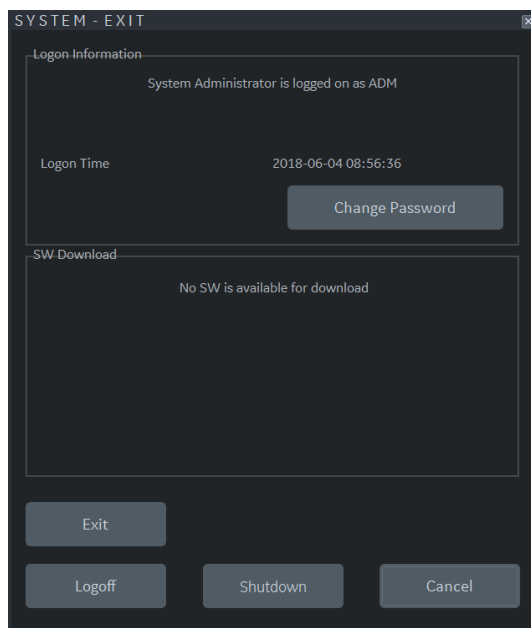


Figure 3-16 System - Exit (R3)

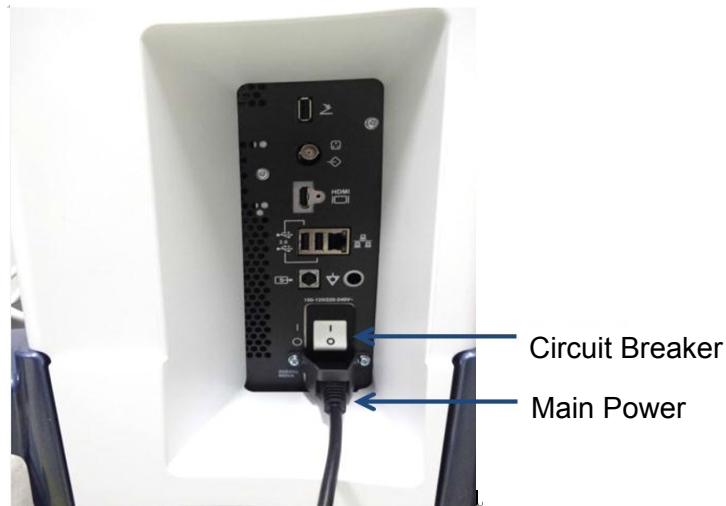
- 3) Select the SHUTDOWN button. The system performs an automatic full shutdown sequence.
- 4) Switch OFF the Circuit at the rear of the system.

**NOTE:** *The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*



**WARNING** ***Disconnection of the Main Power Cable is necessary!***  
***For Example: When repairing the system.***

- 5) After complete power down, disconnect the main power cable from the system or unplug it from the AC wall outlet socket.



**Figure 3-17 Circuit and main power at rear of system**

- 6) Press on the brakes to block the front caster wheels.
- 7) Disconnect probes. (Turn the probe locking handle counterclockwise and then pull the connector straight out of the probe port.)



**CAUTION DO NOT disconnect a probe while running (Live Scan “Write” mode)!  
A software error may occur. In this case switch the unit OFF (perform a reset).**

## 3-7-4 Transducer Connection

### 3-7-4-1 Connecting the Probe

**CAUTION** Inspect the probe before and after each use for damage or degradation to the housing, strain relief, lens, seal, cable and connector. DO NOT use a transducer which appears damaged until functional and safe performance is verified. A thorough inspection should be conducted during the cleaning process.

**CAUTION** Remove any dust or foam rests from the probe pins.

**CAUTION** Fault conditions can result in electric shock hazard. Do not touch the surface of probe connectors which are exposed when the probe is removed. DO NOT touch the patient when connecting or disconnecting a probe.

Probes can be connected at any time, regardless of whether the console is powered on or off. To ensure that the ports are not active, place the system in the image freeze condition.

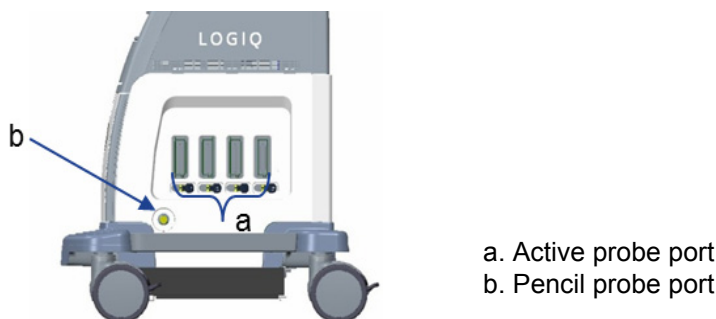
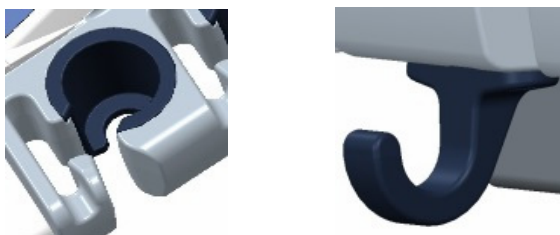


Figure 3-18 Probe port

To connect a probe:

- 1) Place the probe's carrying case on a stable surface and open the case.
- 2) Carefully remove the probe and unwrap the probe cord.
- 3) Put the probe in the probe holder.

**CAUTION** DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.



- 4) Hold the probe connector vertically with the cable pointing upward.
- 5) Turn the connector locking handle to the left.
- 6) Align the connector with the probe port and carefully push into place.
- 7) Turn the connector locking handle to the right to secure the probe connector.
- 8) Carefully position the probe cord so it is free to move and is not resting on the floor.



### 3-7-4-2 Connecting the CW Pencil Probe

Insert the probe connector into the probe port all the way seated in. Carefully position the probe cord so it is free to move and is not resting on the floor.

### 3-7-4-3 Cable Handling

Take the following precautions with probe cables:

- Keep free from wheels
- Do not bend the cable acutely
- Avoid crossing cables between probes.

### 3-7-4-4 Activating the Probe

To activate the probe, select the appropriate probe from the probe indicators on the touch panel.

The probe's default settings for the mode and selected exam are used automatically.



**CAUTION** Make sure that the probe and application names displayed on the screen correspond to the actual probe and application selection.

### 3-7-4-5 Deactivating the Probe

When deactivating the probe, the probe is automatically placed in standby mode.

To deactivate a probe:

- 1) Ensure the LOGIQ™ P9/P7 is in freeze mode. If necessary, press the **Freeze** key.
- 2) Gently wipe the excess gel from the face of the probe.
- 3) Ensure that the probe is placed gently in the probe holder.

### 3-7-4-6 Disconnecting the Probe

Probes can be disconnected at any time. However, the probe should not be active when disconnecting the probe.

- 1) Ensure the probe is deactivated. Deactivate by selecting another probe or pressing Freeze.
- 2) Move the probe locking handle to the left.
- 3) Pull the probe connector straight out of the probe port carefully.



**CAUTION** DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage. Use the integrated cable management hook to wrap the cord.

- 4) Ensure the cable is free.
- 5) Be sure that the probe head is clean before placing the probe in its storage box.

## Section 3-8 Printer Installation

**NOTE:** For Connection schemes refer to [Section 3-6 "Connection of Auxiliary Devices" on page 3-11](#).

For further installation instructions see:

- [Section 3-8-1 "Installing Digital Black & White Printer Sony UP-D898" on page 3-32](#)
- [Section 3-8-2 "Installing Digital Color Printer Sony UP-D25MD" on page 3-27](#)
- [Section 3-8-5 "Adjustment of Printer Settings" on page 3-37](#)

### 3-8-1 Installing Digital Black & White Printer Sony UP-D898

- 1) Power off/Shutdown the system as described in: [Section 3-7-3 on page 3-25](#).
- 2) Physically connect the printer cables as described on [Section 3-6-2 on page 3-13](#).



**NOTICE** After boot up of the system, verify the correct settings in the printer "Properties", see: [Section 3-8-4 "Adding Printer to the system"](#) for assigning the Printer to the remote keys P1, P2, P3, P4, P5 and/or P6, and see: [Section 3-8-5 "Adjustment of Printer Settings"](#) .

### 3-8-2 Digital Color Printer Sony UP-D25MD

- 1) Power off/Shutdown the system as described in: [Section 3-7-3 on page 3-25](#).
- 2) Connect USB cable into the available USB port on the rear of the system. There are three available USB ports on rear of the system. : [Section 3-9-2 "External I/O Connectors"](#)

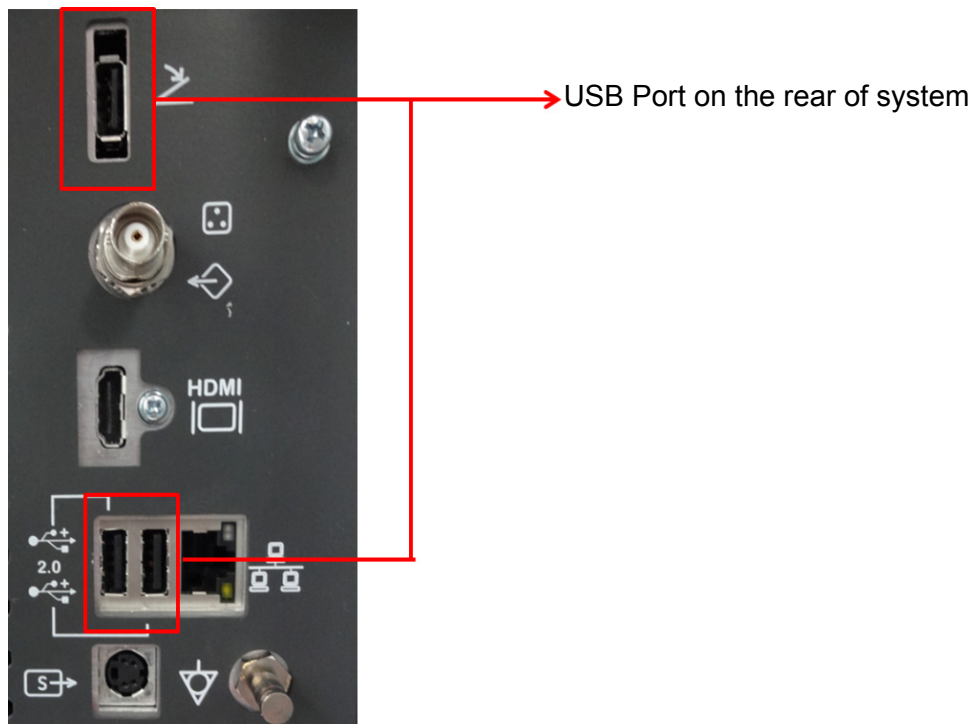


Figure 3-19 External I/O Connectors - on Rear of System



**NOTICE** After boot up of the system, verify the correct settings in the printer "Properties", see: [Section 3-8-4 "Adding Printer to the system"](#) for assigning the Printer to the remote keys P1, P2, P3, P4, P5 and/or P6, and see: [Section 3-8-5 "Adjustment of Printer Settings"](#)

### 3-8-3 Installing the Bluetooth Deskjet Printer

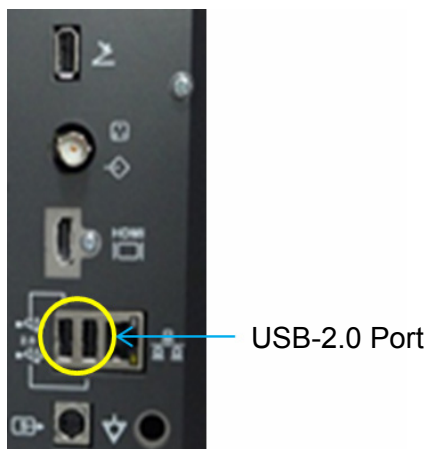
- 1) Power off/Shutdown the system as described in: [Section 3-7-3 on page 3-25](#).
- 2) Physically connect the Bluetooth dongle as described on [Section 3-8-3-1 on page 3-34](#).



**NOTICE** After boot up of the system, verify the correct connection of Bluetooth device driver on the maintenance mode, see: [Section 3-8-3-2 "Verifying Bluetooth device driver"](#) and, see: [Section 3-8-3-3 "Prepare the Printer and connect the Bluetooth Printer Adapter"](#) for Bluetooth pairing between the system and printer.

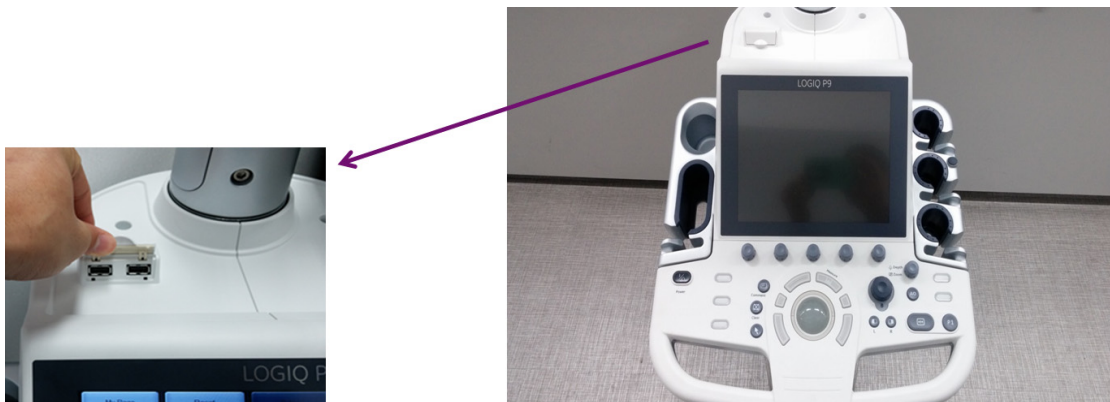
#### 3-8-3-1 Connecting the Bluetooth Dongle into the System

- 1) Connect Bluetooth Dongle into the available USB port. There are three available USB ports on the system. : [Section 3-9-2 "External I/O Connectors"](#) .



**Figure 3-20 External I/O Connectors - on Rear of System**

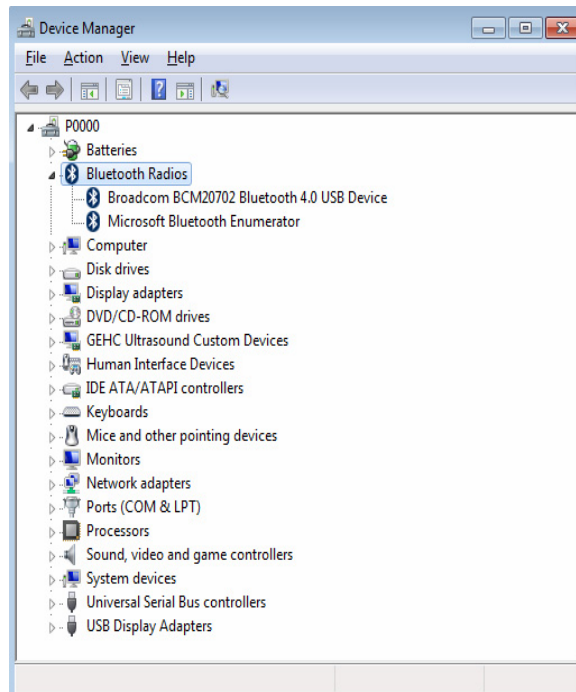
USB 2.0 port: Two hub ports for service and user



**Figure 3-21 External I/O Connector**

### 3-8-3-2 Verifying Bluetooth device driver

- 1) Turn on the system.
- 2) Enter maintenance mode by using service dongle.
- 3) Go to Device Manager by pressing shortcut on the taskbar
- 4) Check that there is “Bluetooth Radios” category.



**Figure 3-22 Bluetooth Radios**

- 5) Check that there are no any “Unknown Device” messages. If there are unknown devices, check again after reboot the system.

### 3-8-3-3 Prepare the Printer and connect the Bluetooth Printer Adapter

#### 3-8-3-3-1 HP Officejet 100

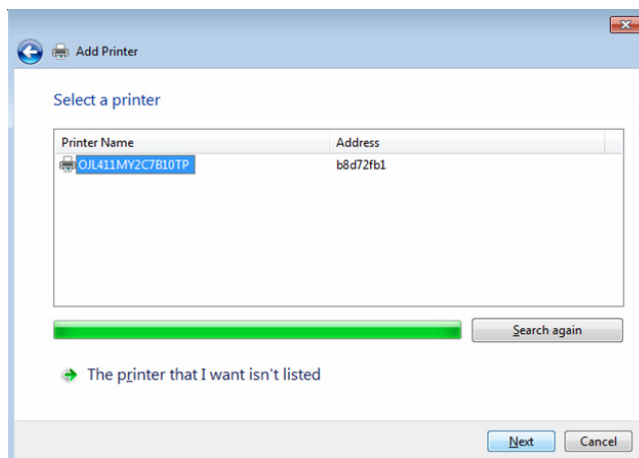
- 1) Connect the power cord to a wall outlet socket.
- 2) Turn on the printer.
- 3) Install ink tanks in the correct order.
- 4) Load paper in the auto sheet feeder.
- 5) Turn on Bluetooth radio.



**Figure 3-23 Connection of Bluetooth Printer Adapter (HP Officejet 100)**

#### 3-8-3-3-2 Bluetooth Pairing

- 1) Press [CTRL + ESC] to open windows start menu.
- 2) Select "Devices and Printers."
- 3) Press "Add a printer" button on the top menu.
- 4) Select "Add a network, wireless or Bluetooth printer."
- 5) Searching for available printers.
- 6) Select a printer.



**Figure 3-24 Selecting a Printer**

- 7) Press "Next" button to install device driver, and then device driver software installed successfully.
- 8) Press "Next" button after confirming the printer name.
- 9) Check "Do not share this printer" option, and press "Next" button.
- 10) Press "Printer a test page" button to check if the printer is working properly.
- 11) Press "Finish" button.
- 12) The printer is listed in the "Device and Faxes" category.
- 13) Bluetooth pairing is completed.

### 3-8-4 Adding Printer to the system

- 1) Select Utility -> Connectivity -> Service.
- 2) Add the Standard Print.
- 3) Highlight Standard Print in the Service list.
- 4) Select the printer from the Printer pull-down Properties menu. For the UP-D898 printer, select "Portrait" as orientation.
- 5) Type the printer name in the Name field. This name is used on the Button screen. After you select the printer from the Printer pull-down Properties menu again, it turns white.
- 6) Press Save.
- 7) Select Button.
- 8) Select the appropriate print key (Print1, Print2...) from the Physical Print Buttons section.
- 9) Select the printer from the MyComputer column and press >> to move it to the Printflow View column.
- 10) Press Save.

### 3-8-5 Adjustment of Printer Settings

- 1) Press Utility ->System ->Peripherals. Select the printer to adjust (UP-D25MD or UP-D898) from the pull-down menu under Standard Printer Properties. Click Properties.
- 2) Select Properties from Printer pull-down menu.
- 3) Click Printing Preferences at the bottom of Properties Window.

To adjust the UP-D898 printer see: [Section 3-8-5-1 "UP-D898 - Printer Settings"](#) .

To adjust the UP-D25MD Printer see: [Section 3-8-5-2 "UP-D25MD - Printer Settings"](#) .



**WARNING** *After each printer installation, the leakage currents have to be measured acc. IEC 60601-1 resp. ANSI/AAMI ES60601-1.*

### 3-8-5-1 UP-D898 - Printer Settings

- 1) Call up the '**Printer Preferences**'; operation see: [Section 3-8-5 "Adjustment of Printer Settings"](#) .
- 2) Select the **MAIN** page (see: [Figure 3-25](#) below) and select:
  - Paper: **1920x1280**
  - Orientation: **Landscape**
  - Interpolation Method: **Bilinear**

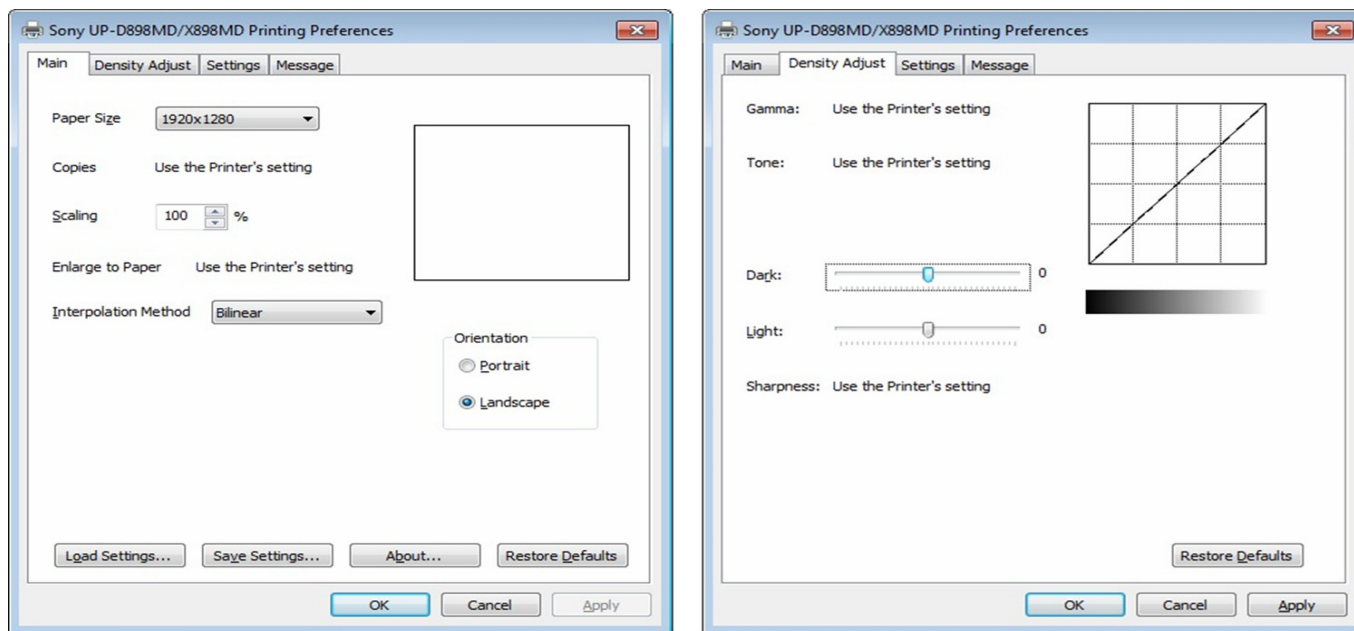


Figure 3-25 Layout + Density Adjust page

- 3) Select the **DENSITY ADJUST** page (see: [Figure 3-25](#) above) and select:
  - Dark = 0; Light = 0
- 4) For saving the adjusted printer settings click **APPLY** and then **OK**.  
Finally close the 'Printers' -window with the close button and exit System Setup with **SAVE&EXIT**.



### 3-8-5-2 UP-D25MD - Printer Settings

1) Call up the '**Printer Preferences**'; operation see: [Section 3-8-5 "Adjustment of Printer Settings"](#) .



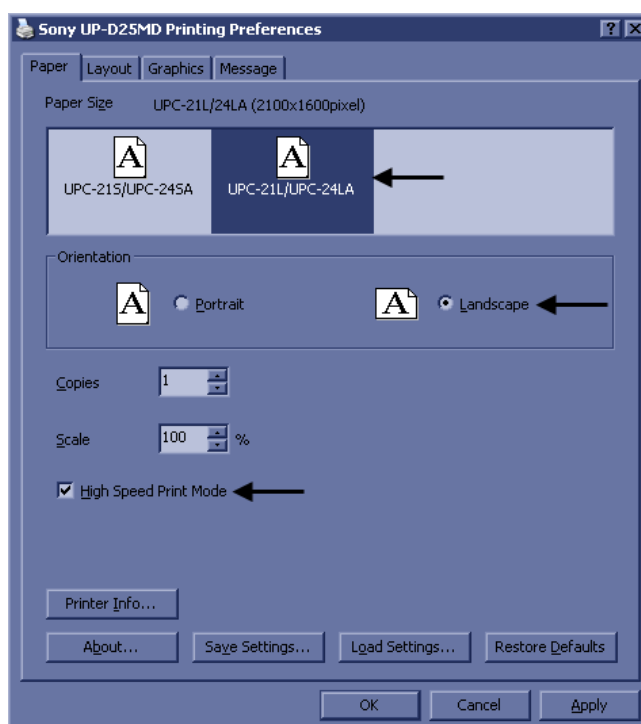
**NOTICE** Settings for Paper Size MUST match with the used Paper (large/small) and also the right color ink cartridge has to be used. Otherwise you will get an error message at printing.

2) Select the PAPER page and select:

- Recommended Paper: **UPC-24LA** (large) / UPC-24SA (small)

*NOTE:* Paper UPC-21L and UPC-21S are also acceptable paper to use.

- Orientation: **Landscape** (recommended when using large paper size)
- **High Speed** (check mark on)



**Figure 3-26 Paper page**

3) Select the GRAPHICS page. From the "Color Adjust" pop-up menu select:

- a) Color Balance: Cyan = 0; Magenta = 0; Yellow = 0

b) Color Correction: set Printer Hardware Color Correction1



Figure 3-27 Graphics page (Color Balance + Color Correction)

- c) Lightness: Sharpness = 7; Dark = 0; Gamma = 14; Light = 0  
d) Lightness: Gamma Curve = Curve 1

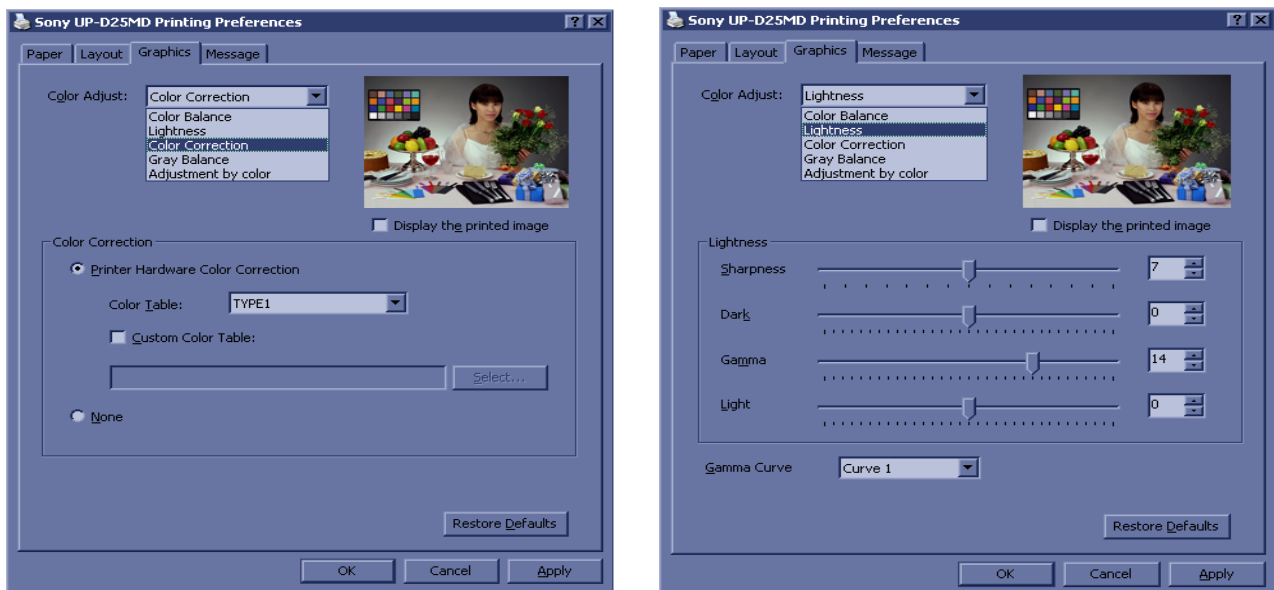


Figure 3-28 Graphics page (Lightness + Gamma Select)

- 4) For saving the adjusted printer settings click APPLY and then OK.  
Finally close the 'Printers'-window with the close button and exit System Setup with SAVE&EXIT.

## 3-8-6 Setting Printer to Print Reports

### 3-8-6-1 Setting up the Printer to Print Reports

To set up the Off-Line Printer to print reports,

- 1) Press Utility -> System -> Peripherals.
- 2) Select the printer from Default Printer pull-down menu.

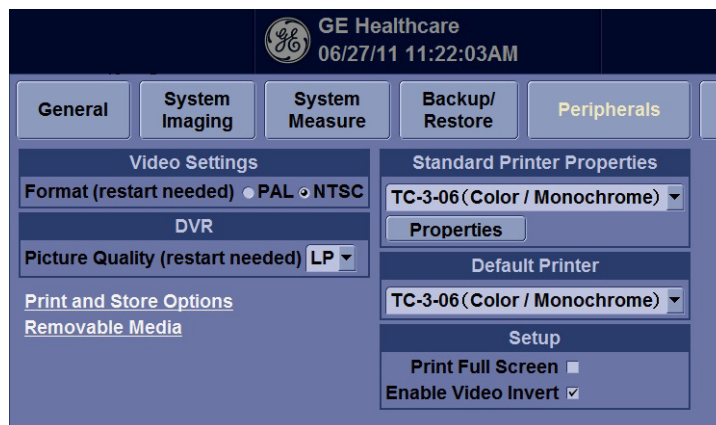


Figure 3-29 Report Printer Setup

- 3) Press Save.
- 4) Press Print on the Report screen to print the report.

Section 3-9  
System Configuration

3-9-1 System/General Preset Menu

The System/General screen allows you to specify hospital name and system date and time.

General	System Imaging	System Measure	Backup/Restore	Peripherals	User Configurable Key	About
<b>Location</b> Hospital GE Healthcare Department Development Preset Region(restart needed) None PoC (restart needed) Language (restart needed) ENG Units Metric MyTrainer ENG				<b>Title Bar</b> Hide Patient Data Never Font Size (restart needed) Default		
<b>Regional Options</b> (restart needed)				<b>Trackball</b> Speed 10 Acceleration 1		
<b>Date/Time</b> Time Format 12-AM/PM Date Format MM/DD/YYYY Default Century 1900				<b>Key Usage</b> Run Fast Key Speed 3x(500ms) Swap Print1/Freeze Key (restart needed) Default Enable Virtual Keyboard Auto Hide Delay Time for Virtual Keyboard (sec) 8 Auto Hide Delay Time for Digital TGC (sec) 8		
<b>Date/Time</b> (restart needed)				<b>Utility</b> Prompt for Save on Exit Utility Font Size Medium		
<b>General User Interface</b> Color Level (restart needed) Bright				<b>Scan Assistant</b> Auto Selection Off Always Use Doppler Cursor		
<b>Monitor</b> Active Room Semi-Dark Dark Semi Dark Light OSD Control						

Figure 3-30 System/General Preset Menu (R1.x.x)

General	System Display	System Imaging	System Measure	Backup/Restore	Peripherals	User Configurable Key	About
<b>Location</b> Hospital GE Healthcare Department Development Machine Description1 Machine Description2 Preset Region(restart needed) None PoC (restart needed) Language (restart needed) ENG Units Metric MyTrainer ENG				<b>Title Bar</b> Hide Patient Data Never Font Size (restart needed) Default			
<b>Regional Options</b> (restart needed)				<b>Trackball</b> Speed 10 Acceleration 1			
<b>Date/Time</b> Time Format 12-AM/PM Date Format MM/DD/YYYY Default Century 2000				<b>Key Usage</b> Run Fast Key Speed 3x(500ms) Swap Print1/Freeze Key (restart needed) Default Enable Virtual Keyboard Auto Hide Delay Time for Virtual Keyboard (sec) 8 Auto Hide Delay Time for Digital TGC (sec) 8			
<b>Date/Time</b> (restart needed)				<b>Utility</b> Prompt for Save on Exit Utility Font Size Medium			
<b>General User Interface</b> Color Level (restart needed) Bright				<b>Scan Assistant</b> Auto Selection Off Always Use Doppler Cursor			
				<b>Power Assistant</b> Allow Offline Scanning (restart needed) Battery Low Warning with Sound			

Figure 3-31 System/General Preset Menu (R2.x.x)

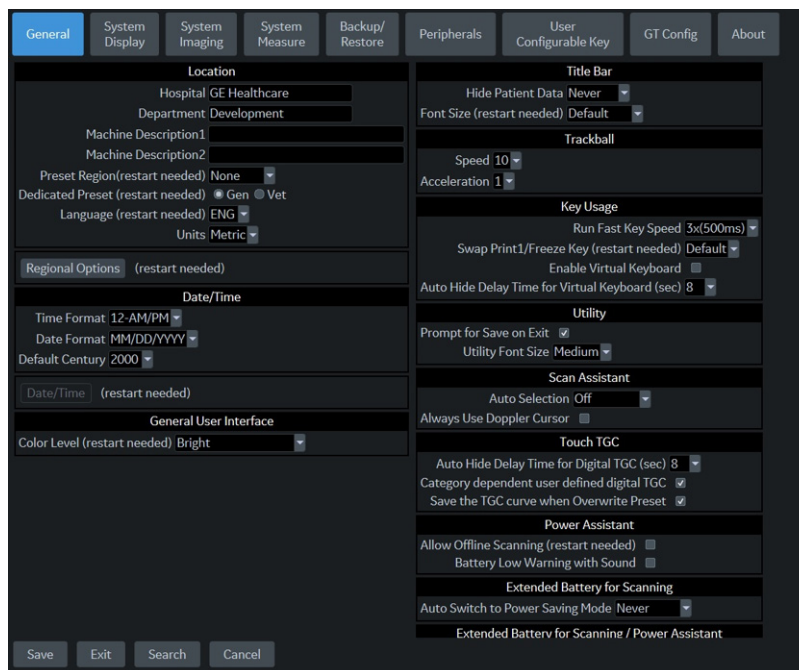


Figure 3-32 System/General Preset Menu (R3.x.x)

Table 3-8 Location

Preset Parameter	Description
Hospital	Type the institution's name.
Department	Type the institution's department name.
Preset Region (restart needed)	Select region (None, Americas, Asia, Europe or Japan).
Language (restart needed)	Select the appropriate language from the drop-down list. Note: If you select Japanese (JPN), only the warning and status messages are displayed in Japanese. You can not type in Japanese.
Units	Select metric or US units of measurement.
Regional Options	Select to set up the keyboard.

Table 3-9 Date and Time

Preset Parameter	Description
Time Format	Select the time format: 12 Hr. AM/PM or 24 Hr.
Date Format	Select the date format: dd/mm/yyyy, mm/dd/yyyy, or yyyy/mm/dd.
Default Century	Select the default century for the system to use.
Date/Time	Select to display the Date/Time Properties window, to specify the system date, time, time zone, and to auto adjust for daylight savings time.

**Table 3-10 General User Interface**

Preset Parameter	Description
Color Level (restart needed)	Select System Color according to the condition of the room.

**Table 3-11 Title Bar**

Preset Parameter	Description
Hide Patient Data	When set to Always, patient information is removed from the scanning screen Title bar and when storing images; or you can set this to remove patient information only when storing the image (On Store); or Never.  Note: Upon recall of images with measurements, Dual image, the DICOM image is recalled. In this case, there is no patient data burned into the DICOM image. If you DO NOT want this to occur, set this to Never.
Font Size (restart needed)	Select to display patient information in the title bar using a small, medium, or large font size. You need to reboot the system for this change to take effect.

**Table 3-12 Trackball**

Preset Parameter	Description
Speed	Set how fast you want the Trackball to move while performing actions such as tracing the anatomy. 0=Slow; 20=Very Fast
Acceleration	Set how fast you want to trackball to move across the display. 0, 1, and 2 with 0 being the slowest acceleration.

**Table 3-13 Key Usage**

Preset Parameter	Description
Run Fast Key speed	Select the maximum value of the key interval when running Fast Key.
Swap Print1/Freeze Key (restart needed)	Swap the control between Print 1 and Freeze key.
Enable Virtual Keyboard	If checked, the Virtual Keyboard appears automatically when cursor is prompted in Patient screen.
Auto Hide Delay Time for Virtual Keyboard(sec)	Select the delay time to Virtual Keyboard auto-hide.
Auto Hide Delay Time for Digital TGC(sec)	Select the delay time to Digital TGC auto-hide.

**Table 3-14 Utility**

Preset Parameter	Description
Prompt for Save on Exit	If selected, the system prompts you to save data when you select exit without saving.
Utility Font Size	Select the font size you want to use to view the Utility menus: Small, Medium, or Large.

**Table 3-15 Scan Assistant**

Preset Parameter	Description
Auto Selection	<p>Off, Category, or Description.</p> <ul style="list-style-type: none"> <li>Off. The Scan Assistant selection on the Patient screen is completely manual. It will say "None" when starting a new patient and you can make a selection manually if desired.</li> <li>Category. Scan Assistant uses the combination of exam category (Abd, OB, etc.) and the currently-selected user to automatically select a Scan Assistant program. It chooses the same program that was used the last time this combination of exam category and user. The user can manually override this auto selection.</li> <li>Description. Scan Assistant uses the combination of the exam description (often auto fills in if the patient was selected from the worklist) and the currently selected user to automatically select a Scan Assistant program. It will choose the same program that was used the last time this combination of exam description and user was selected. The user can manually override this auto selection. If the exam description is blank then it will do the auto selection based on Category as described in the previous paragraph.</li> </ul>
Always Use Doppler Cursor	Use the Doppler Cursor when you activate Scan Assistant.

**Table 3-16 Monitor (R1.x.x)**

Preset Parameter	Description
Dark	Pre-defined monitor settings for Dark Room
Semi Dark	Pre-defined monitor settings for Semi-Dark Room
Light	Pre-defined monitor settings for Light Room
OSD Control	The monitor can also be adjusted in brightness and contrast. For detailed adjustment press the [ OSD controls] buttons on the screen. The OSD menu will appear on the screen. Brightness, Contrast, Backlight and Sharpness can be adjusted in General tab. Monitor colors can be adjusted in RGB tab.

**Table 3-17 Power Assistant (R2.x.x)**

Preset Parameter	Description
Allow offline scanning (restarted needed)	Allow users to scan without AC power if battery option is installed. User need to reboot the system to activate offline scanning.
Battery Low Warning with Sound	Make beep sound when the installed battery is running out.

3-9-2 External I/O Connectors

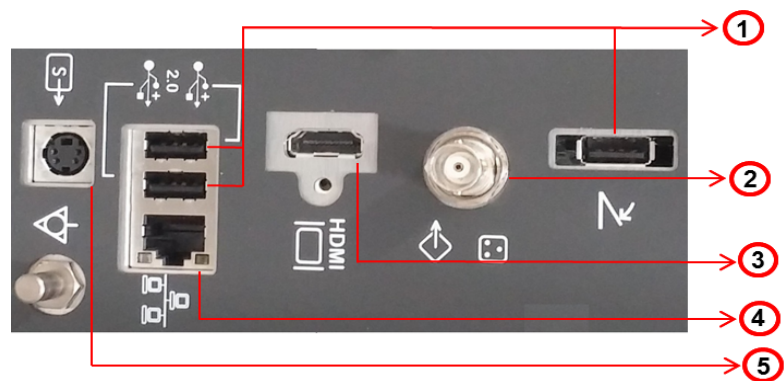


Figure 3-33 External I/O Connectors - on Rear of System

Table 3-18 External I/O Connector - Description

Item	Connector Name	Table Number	Description
1	USB	Table 5-2 Table 5-4	USB port. Refer to <a href="#">Section 5-2-4</a> for details.
2	Composite	Table 5-6	Composite(BNC) Connector for external Monitor. TV-out signal. Resolution :PAL(720x576), NTSC(720x480)
3	HDMI	Table 5-5	Connector for external Monitor. DVI-D Signal. No audio output. Resolution: FHD(1920x1080)
4	NETWORK	Table 5-4	DICOM input/output, twisted pair RJ-45 10/100/1000 megabit/s
5	S-Video	Table 5-6	S-Video Connector for external Monitor. TV-out signal. Resolution: PAL(720x576), NTSC(720x480)

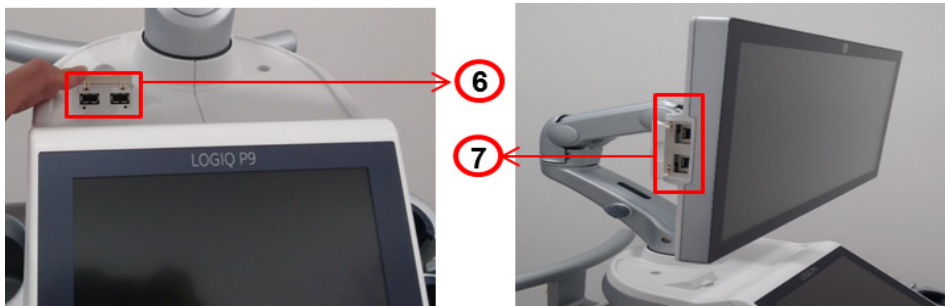


Figure 3-34 External I/O Connector

Table 3-19 External I/O Connector - Description

Item	Connector Name	Table Number	Description
6	USB	Table 5-2	Connected to IO Box via USB HUB. Refer to <a href="#">Section 5-2-4</a> for details.
7	USB	Table 5-2	Connected to MCB via USB HUB. Refer to <a href="#">Section 5-2-4</a> for details.



## Section 3-10 Available Probes

### 3-10-1 Supported probes

The LOGIQ P9/P7 supports the following types of probes:

- Sector Phased Array
- Linear Array
- Convex Array
- Micro convex Array
- Matrix Array
- Split Array
- Volume Probes (4D)
  - Convex Array

**NOTE:** Not all probes described in this document may be available or cleared for sale in all markets.




#### 3-10-1-1 Probe Naming Conventions

**Table 3-20 Probe Naming Convention**

Type	Application	Frequency	Connector Type
C=Convex L=Linear M=Matrix S=Sector R=Real time 4D	AB=Abdominal IC=Intracavitary NA=Neonatal SP=Small Parts	"1-5"	RS



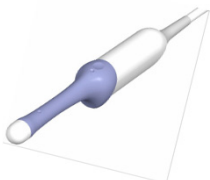




#### 3-10-1-2 Probe Description


**Table 3-21 Probe Description**

Part Name	Illustration	Application	Feature	Part Number	Probe Type	Qty	FR U
C1-5-RS		Abdomen, Vascular, OB/GYN, Urology	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Contrast, Elastography, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, Shear wave	5499608	Convex	1	1
9L-RS		Abdomen, Small Parts, Vascular, Pediatric	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, B Steer+	5499511	Linear	1	1
ML6-15-RS		Small Parts, Vascular, Pediatric, Neonatal, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, B Steer+	5499610	Linear (Matrix)	1	1

Part Name	Illustration	Application	Feature	Part Number	Probe Type	Qty	FR U
L3-12-RS		Abdomen, Vascular (No transcranial), Small Parts, Pediatric, Neonatal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, Biopsy, B Steer+, Shear wave	5785912	Linear	1	1
E8C-RS		OB/GYN, Urology, Transvaginal, Transrectal	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy	5499516	Convex	1	1
4C-RS		Abdomen, OB/GYN, Urology, Vascular	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, B-Flow, B-Flow Color, Shear wave	5488477	Convex	1	1
L8-18i-RS		Small Parts, Vascular, Neonatal, Pediatrics, Intraoperative	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, B Steer+	5499609	Linear	1	1
P8D		Cardiac, Vascular	CW, ASO	5504447	Pencil Probe (CW Split Crystal)	1	1
RAB2-6-RS		Abdomen, OB/GYN, Urology	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, 3D/4D real-time imaging, Biopsy, Advanced 3D	KTZ303982	Volume (Real Time 4D, Convex)	1	1
12L-RS		Small Parts, Vascular, Pediatric, Neonatal, Musculoskeletal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy, B Steer+	5499501	Linear	1	1
3Sc-RS		Cardiac, Abdomen, Transcranial	B, CHI, CF, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, Stress Echo, SRI-HD, Advanced 3D, Biopsy	5433833	Sector	1	1

Part Name	Illustration	Application	Feature	Part Number	Probe Type	Qty	FR U
8C-RS		Pediatrics, Neonatal	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D	5499508	Convex	1	1
L6-12-RS		Abdomen, Vascular (No transcranial), Small Parts, Pediatric, Neonatal	B, CHI, CF, PDI, M, Anatomical M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, Biopsy	5454332	Linear	1	1
6S-RS		Cardiac, Pediatrics, Neonatal	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, SRI-HD, Advanced3D	5499316	Sector	1	1
L4-12t-RS		Small Parts, Vascular, Pediatric, Neonatal, Musculoskeletal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, Biopsy, B Steer+	5435010	Linear	1	1
L10-22-RS (LP9 only)		Small Parts, Musculoskeletal, Neonatal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, B Steer+	5459953	Linear	1	1
12S-RS		Pediatrics, Neonatal	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced3D	5499321	Sector	1	1
E8CS-RS		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, Biopsy	5670375	Convex	1	1

Part Name	Illustration	Application	Feature	Part Number	Probe Type	Qty	FR U
BE9CS-RS		Urology (Transrectal)	B, CHI, CF, PDI, B-Flow, B-Flow Color, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced 3D, Biopsy	5589323	Convex	1	1
IC9-RS		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, Biopsy	5722023	Convex	1	1
RIC5-9A-RS		OB/GYN (Transvaginal), Urology (Transrectal)	B, CHI, CF, PDI, M, Anatomical M, PW, CrossXBeam, LOGIQView, ATO/ASO, SRI-HD, Advanced3D, 3D/4D, Biopsy	KTZ304128	Volume (Real Time 4D, Convex)	1	1
L12n-RS		Small Parts, Vascular, Pediatric, Neonatal, Musculoskeletal	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Elastography, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, Biopsy, B Steer+	5505771	Linear	1	1
P6D		Cardiac, Vascular	CW, ASO	5729437	Pencil Probe (CW Split Crystal)	1	1
P2D		Cardiac, Vascular	CW, ASO	TE100024	Pencil Probe	1	1
L3-9i-RS (LP9 only)		Small Parts, Vascular, Musculoskeletal, Intraoperatives	B, CHI, CF, PDI, M, PW, B-Flow, B-Flow Color, Virtual Convex, CrossXBeam, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D, B Steer+	5721640	Linear	1	1

Part Name	Illustration	Application	Feature	Part Number	Probe Type	Qty	FR U
6Tc-RS		Cardiac (Transesophageal)	B, CHI, CF, PDI, M, MCF, Anatomical M, PW, CW, TVI, TVD, Virtual Convex, LOGIQView, ATO/ASO, Auto TGC, SRI-HD, Advanced 3D  Note: 6Tc-RS probe requires special handling. Refer to the TEE Probe User Manual enclosed with 6Tc-RS probe.	KN100104	TEE	1	1

Probes	LP9 R1 (RS type)	LP7 R1 (RS type)	LP9 R2 (RS type)	LP7 R2 (RS type)	LP9 R2.5 (RS type)	LP7 R2.5 (RS type)	LP9 R3 (RS type)	LP7 R3 (RS type)
<b><u>Matrix</u></b>								
ML6-15-RS	X		X		X		X	
<b><u>4D</u></b>								
RIC5-9A-RS			X	X	X	X	X	X
RAB2-6-RS	X	X	X	X	X	X	X	X
<b><u>Convex</u></b>								
4C-RS		X		X		X		X
E8CS-RS			X	X	X	X	X	X
E8C-RS	X	X	X	X	X	X	X	X
8C-RS	X	X	X	X	X	X	X	X
BE9CS-RS	X	X	X	X	X	X	X	X
C1-5-RS	X		X		X		X	
IC9-RS							X	X
<b><u>Sector</u></b>								
3Sc-RS	X	X	X	X	X	X	X	X
6S-RS	X	X	X	X	X	X	X	X
12S-RS			X	X	X	X	X	X
<b><u>Linear</u></b>								
L6-12-RS	X	X	X	X	X	X	X	X
9L-RS	X		X	X	X	X	X	X
12L-RS	X		X		X		X	
L8-18i-RS	X		X		X		X	
L3-9i-RS			X		X		X	
L4-12t-RS			X	X	X	X	X	X
L10-22-RS			X		X		X	

Probes	LP9 R1 (RS type)	LP7 R1 (RS type)	LP9 R2 (RS type)	LP7 R2 (RS type)	LP9 R2.5 (RS type)	LP7 R2.5 (RS type)	LP9 R3 (RS type)	LP7 R3 (RS type)
L3-12-RS							X	X
<b><u>Pencil</u></b>								
P8D	X	X	X	X	X	X	X	X
P6D					X	X	X	X
P2D							X	X
<b><u>Haystack</u></b>								
L12n-RS					X	X	X	X
<b><u>TEE</u></b>								
6Tc-RS							X	

NOTE: "X" means the probe supports the system.

## Section 3-11 Software/Option Configuration

For description refer to:

- [Section 3-9-1 "System/General Preset Menu" on page 3-42](#)



**NOTICE** More detailed information pertaining System Setup and Measure Setup adjustments is found in the LOGIQ P9/P7 Basic User Manual, which is available in different languages.

## Section 3-12 Connectivity Setup

The LOGIQ™ P9/P7 ultrasound system can be connected to various connectivity devices. The following sections describe how to connect the system to a remote archive/work station or a DICOM service, using a TCP/IP connection.

### 3-12-1 Connectivity Introduction

This section describes communication and connection options between the LOGIQ P9/P7 ultrasound unit and other devices in the hospital information system.

The following scenarios are covered:

- stand-alone LOGIQ P9/P7 scanner; see: [Section 3-12-1-3 on page 3-56](#).
- LOGIQ P9/P7 and one or several PC workstations within a “Sneaker Net” environment. (“Sneaker Net” means that you use a DVD/CD to move data because no network is available); see: [Section 3-12-1-4 on page 3-56](#).
- LOGIQ P9/P7 and DICOM server in a network; see: [Section 3-12-1-5 on page 3-56](#).

#### 3-12-1-1 The Dataflow Concept

Communication between the LOGIQ P9/P7 ultrasound unit and other information providers on the network takes the form of data flows. Each dataflow defines the transfer of patient information from either an input source to the unit, or from the unit to an output source (see examples in [Figure 3-35 on page 3-55](#)).

Patient information can include demographic data and images, as well as reports and Measurement and Analysis (M&A) data.

A dataflow is a set of pre-configured services. Selecting a dataflow will automatically customize the ultrasound unit to work according to the services associated with this dataflow.

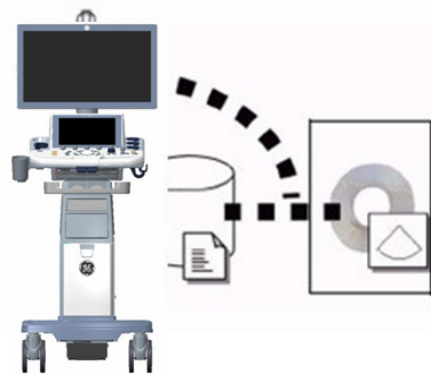
By utilizing data flows, the user can configure the LOGIQ P9/P7 ultrasound unit to optimally meet the needs of the facility, while keeping the user interface unchanged. Once the dataflow is selected, the actual location of the database is entirely transparent.



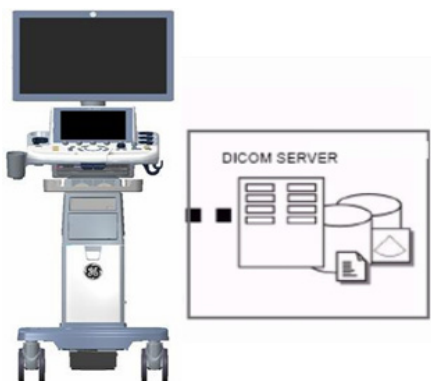
### 3-12-1-2 Dataflow Examples



The local database is used for patient archiving. Images are stored to internal hard drive.



The local database is used for patient archiving. Afterwards images are stored to a DVD/CD or external USB device, etc.



Search in the DICOM Modality Worklist, the patient found is copied into local database. The patient information and the examination results are stored to the local database. Images are stored to a DICOM server and to an image network volume on the local hard drive.

Figure 3-35 Examples of Dataflows

### 3-12-1-3 Stand-alone LOGIQ P9/P7

If digital images or 3D/4D data sets (if available) are stored, they should be saved in the Archive (Image Management System software).

For Image Management functionality refer to the Basic User Manual of the LOGIQ P9/P7.



**NOTICE** To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

### 3-12-1-4 LOGIQ? + PC within a “Sneaker Net”

A PC is used for review and work on studies acquired on one or more LOGIQ P9/P7 scanners without being connected in a network.

The images are first stored on the LOGIQ P9/P7 scanner's hard drive (Archive) and then exported from the scanner's hard drive to a sneaker device (e.g., DVD/CD), and finally imported from the sneaker device to the PC's internal hard drive.

For Image Management functionality refer to the Basic User Manual of the LOGIQ P9/P7.



**NOTICE** To avoid loss of essential data, it is highly recommended to **export/backup patient data** as well as measurements **at least once a month**.

Physical Connection:

No network connection needed.

### 3-12-1-5 Connection between LOGIQ? and DICOM Server

In this configuration, the LOGIQ P9/P7 is configured to work with a DICOM server in a network environment. Usually, this will be the hospital network. Images are first saved on the local image buffer on the scanner. At the end of the examination, the images are sent to the DICOM server via a DICOM spooler. This scenario requires that the scanner is configured to be connected to the DICOM server.

Physical Connection:

You will need one network cable.

- 1) Connect one end of the cable to the Ethernet connector on the LOGIQ P9/P7.
- 2) Connect the other end of the cable to the wall outlet.

**NOTE:** *If a Peer-to-Peer Network is connected to the hospital's network, you may connect the LOGIQ P9/P7 to the Peer-to-Peer Network.*

For more details refer to [Section 3-13 "Configuring Connectivity" on page 3-58](#).

## **3-12-2 Wired Ethernet from LOGIQ P9/P7 to a Workstation**

### **3-12-2-1 Direct Cable Connection from the LOGIQ P9/P7 to a Workstation via a Crossover Cable.**

You will only need a Crossover Cable for network use to connect the two units this way.

- 1) Connect one end of the crossed network cable to the network connector on the LOGIQ P9/P7.
- 2) Connect the other end to the network connector to the Workstation, see the Workstation Service Manual.

### **3-12-2-2 Connection via a Peer-to-Peer Network**

You will need a network switch and one network cable for each unit connected to the switch.

### **3-12-2-3 Connection via Hospital Network**

### **3-12-2-4 You will need one network cable to connect the LOGIQ P9/P7 to a wall outlet on the hospital's network.**

## **3-12-3 Connection using Wireless Option**

Refer to:

- Chapter 5 for theory.
- LOGIQ P9/P7 Basic User Manual: Chapter 16 Configuring Connectivity.

## Section 3-13 Configuring Connectivity

### 3-13-1 Overview

You use Connectivity functionality to set up the connection and communication protocols for the ultrasound system. This page gives an overview of each of the Connectivity functions. Each function is described in detail in the following pages.

### 3-13-2 Structured Reporting

DICOM Structured Reporting provides the results of a procedure as structured data elements (well-defined fields) as opposed to unstructured data (large amounts of text undifferentiated by individual fields). This greatly improves query capability. DICOM Structured Reporting creates coded clinical data that can be used for clinical research, outcomes analysis, and disease management.

DICOM Structured Reporting is a standardized format for medical results. LOGIQ P9/P7 supports the following templates:

- OB-GYN REPORT TEMPLATES
- VASCULAR ULTRASOUND REPORT TEMPLATES
- The system supports selectable vessels with their locations for B-Mode measurements.
- For Vascular studies (Bypass Graft, UEV Map, LEV Map, LEA/UEA, and Carotid), additional measurement locations were added. For instance, for a Bypass Graft, there are now measurements at Inflow, Anast, Thigh, Knee, Calf, Ankle, Graft, RunOff, Pre-Sent, Stent, Post-Stent, and Outflow locations.
- ECHOCARDIOGRAPHY PROCEDURE REPORT TEMPLATES

These templates do not support all M&A results for the LOGIQ P9/P7.

#### 3-13-2-1 Supported parameters

The DICOM supported parameters are listed in the DICOM Conformance Statement at the following web site under DICOM - Ultrasound:

<http://www3.gehealthcare.com/en/Products/Interoperability/DICOM>

### 3-13-3 Connectivity Functions

To set up your institution's connectivity, you must login with administrator privileges.

- 1) **TCPIP:** allows you to configure the Internet Protocol.
- 2) **Device.** allows you to set up devices.
- 3) **Service:** allows you to configure a service (for example, DICOM services such as printers, worklist, and other services such as video print and standard print) from the list of supported services. This means that the user can configure a device with the DICOM service(s) that particular device supports.
- 4) **Dataflow:** allows you to adjust the settings of the selected dataflow and associated services. Selecting a dataflow customizes the ultrasound system to work according to the services associated with the selected dataflow.
- 5) **Button:** allows you to assign a pre-configured output service (or a set of output services) to the Print keys on the control panel.
- 6) **Removable Media:** enables formatting (DICOM, database, or blank formatting) and DICOM verification of removable media.
- 7) **Miscellaneous:** allows you to set up the patient exam menu options, print and store options, and the order of the columns in the examination list on the Patient menu.

Configure these screens from left to right, starting with the Tcpiip tab first.

**NOTE:** *The ultrasound system is pre-configured for many services, with default settings selected. You can change these services and settings as needed.*



**CAUTION** You must restart the LOGIQ P9/P7 (shutdown) after making any changes to connectivity settings in the Utility menus. This includes any changes on the TCPIP or dataflow setup screens.

3-13-4      TCPIP

This configuration category enables users with administrative rights to set the TCPIP for the system and connected remote archive.

- 1) Type the name of the Ultrasound system in the Computer Name field.
- 2) Identify the ultrasound system to the rest of the network by one of the following:
  - DO NOT enable DHCP in the Wired Network Configuration Section..
  - In the Wired Connection Section, Type the IP-Address (acquire unique static IP address from hospital network administrator), Subnet Mask, and Default Gateway (if applicable).

NOTE:      Do not set up the system with DHCP. The IP address MUST BE static for the diagnostic and DICOM to function correctly.

- 3) Select Save settings.
- 4) Re-boot the ultrasound system.

NOTE:      TCPIP settings do not get restored when restoring backups. This is per system design. The LOGIQ P9/P7 IP address MUST BE unique.

TCPIP/Device/Service/Dataflow/Button

Computer NameTPCOM01

Wired Network Configuration

Enable DHCP☒

Network Speed:Auto Detect

Wired Connection

IP-Address3.245.75.175

Subnet Mask255.255.255.0

Default Gateway3.245.75.254

MAC Address00-13-95-15-AE-8B

Speed (Mbps)100

Connected (min)24

StatusOperational

Restart the system to activate any changes saved from this page!

Figure 3-36    Connectivity TCPIP Preset Menu

Table 3-22    Computer Name

Preset Parameter	Description
Computer Name	Type the unique name for the Ultrasound system (no spaces in name).

Table 3-23    Wired Network Configuration

Preset Parameter	Description
Enable DHCP	Select this box to enable dynamic IP Address selection. NOTE: The system shall disable IP-Address, Subnet Mask, and Default Gateway when the user chooses to use DHCP.

**Table 3-23 Wired Network Configuration**

Preset Parameter	Description
IP-Address	Type the IP Address of the Ultrasound system. NOTE: IP stands for Internet Protocol. Every device on the network has a unique IP address.
Subnet Mask	Type the subnet mask address. NOTE: The Subnet Mask is an IP address filter that eliminates communication/messages from network devices of no interest to your system.
Default Gateway	Type the default gateway address.
Network Speed	Select the network speed (Auto Detect, 10Mbps/Half/Full Duplex, or 100 Mbps/Half/Full Duplex/ 1000Mbps/Auto-negotiate)
IPv6 (R3.0 or above)	Select this box if your network system support and you want to use IPv6
IPv6 Address (R3.0 or above)	Type IPv6 Address of the Ultrasound system
IPv6 Prefix Length (R3.0 or above)	Type IPv6 Prefix Length
Default IPv6 Gateway (R3.0 or above)	Type IPv6 Gateway address
Primary DNS Server (R3.0 or above)	Type Primary DNS Server address
Secondary DNS Server (R3.0 or above)	Type Secondary DNS Server address

**Table 3-24 Wired Connection**

Preset Parameter	Description
IP-Address	Displays currently configured IP address
Subnet Mask	Displays currently configured subnet mask address
Default Gateway	Displays currently configured default gateway address
MAC Address	Unique network card address of the system.
Speed (Mbps)	The performance of a network connection.
Connected (min)	The connection time with network.
Status	Current network status.
IPv6 Address (R3.0 or above)	Displays currently configured IPv6 address
IPv6 Prefix Length (R3.0 or above)	Displays currently configured IPv6 Prefix Length
Default IPv6 Gateway (R3.0 or above)	Displays currently configured Gateway address
Primary DNS Server (R3.0 or above)	Displays currently configured Primary DNS Server address
Secondary DNS Server (R3.0 or above)	Displays currently configured Secondary DNS Server address

**NOTE:** Reboot the system to activate any changes saved from this page.

3-13-5      **Device**

To add a new device,

- 1) Press **Add**.
- 2) Type the device name in the Name field.
- 3) Type the device's IP address in the IP Address field.



Figure 3-37    Connectivity Device Preset Menu

Table 3-25    Device

Preset Parameter	Description
Add/Remove	Press Add to add a new device; press Remove to delete a device.
Ping	Press Ping to confirm that a device is connected.
Properties: Name	Type the name of the device.
Properties: IP Address	Type the device's IP address.
Properties: AE Title	AE Title of the LOGIQ P9/P7. NOTE: Only available for MyComputer.
Properties: Port Number	IP Port Number Used for DICOM, set by default to 104. NOTE: Only available for MyComputer.
Properties: MAC Address	Unique network card address. NOTE: Only available for MyComputer.

To ping a device,

- 1) Select the device.
- 2) Press **Ping**. If the smiley face smiles, then the connection has been confirmed. If the smiley face frowns, then the connection has not been made. Check the device name and IP address.



### 3-13-6 Service

For each Device that you added to the system, you need to set up the service(s) that device supports (you must be an administrator to update these screens).

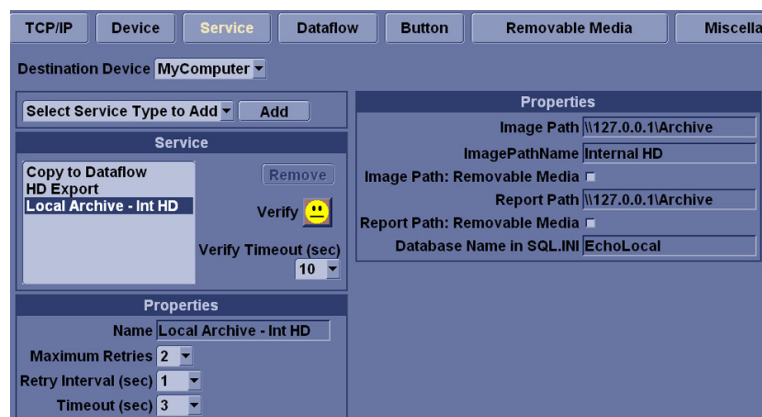


Figure 3-38 Connectivity Services Preset Menu, My Computer

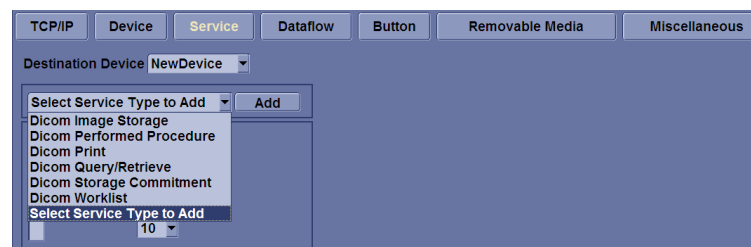


Figure 3-39 Connectivity Services Preset Menu, New Device

The Services screen has the following sections of information:

- 1) Destination Device - lists information about destination devices. You can select from a list of currently existing devices.
- 2) Service Type to Add - lists information about services for the destination device. You can add services, select from a list of currently existing services, and remove services.
- 3) Service Parameters - lists parameters for the service currently selected in the Services section. The name and parameters in this section change, depending on what service is currently selected. In the above figure, this section shows DICOM Print parameters.

#### 3-13-6-1 Adding a service to a destination device

- 1) Select the service from the pull-down menu. Press **Add**.
- 2) Specify the properties for this service. Press **Save**.
- 3) Verify the service.

#### 3-13-6-2 Removing a service

- 1) Select the service. Press **Remove**.
- 2) Press **Save**.

### 3-13-6-3 Changing parameters for a service

There are certain parameters that may need to be set up for each service:

**Table 3-26 Service Parameters: Common Service Parameters**

Preset Parameter	Description
Name	Free text: give a descriptive name to the device.
AE Title	The Application Entity Title for the service.
Port Number	The port number of the service.
Maximum Retries	Max # - the maximum number of times to try establishing a connection to the service.
Retry Interval (sec)	Specify how often (in seconds) the system should try to establish a connection to the service.
Timeout	The amount of time after which the system will stop trying to establish a connection to the service.

Many service parameters are specific to each type of service. The parameters are described on the following pages:

- DICOM Image Storage
- DICOM Performed Procedure
- DICOM Print
- DICOM Query/Retrieve
- DICOM Storage Commitment
- DICOM Worklist
- Standard Print
- Video Capture
- Save As
- Network storage
- USB Quick Save

## Section 3-14 Agent Configuration (R3 only)

### 3-14-1 Agent Configuration (R3 only)

#### Overview

System may be configured to connect to the back office server (FFA Site), which enables GE Service Personnel to connect to the system to monitor health of the system, perform diagnostics, exchange files, or view console desktop.

#### 3-14-1-1 Agent Configuration

- 1) Select [Utility] from touch panel
- 2) Select [Service] to open Common Service Desktop
- 3) Select [Agent Configuration] menu

The screenshot shows the 'Service Browser' window with the 'Service Desktop' tab active. The title bar indicates 'LP9P712345SM8 - GE Healthcare - 12345SM8'. The navigation bar includes 'Home', 'Diags', 'DICOM', 'Utilities', 'Options', and 'Agent Configuration' (highlighted). The 'Agent Configuration' section displays a table of agent status and configuration details. Below this is the 'Advanced Configuration' section with fields for 'Enterprise Server', 'Enterprise Host', and 'Enterprise Port'. At the bottom are 'Proxy Configuration' and 'Credentials' sections, each with checkboxes and input fields. 'Submit Changes' and 'Reset Form' buttons are at the bottom right.

Agent Status	Agent Registered	Agent Quarantine	Agent CRM Verified
Not Running	Not Available	Not Available	Not Available
Agent Model Number: CS_ULS_LOGIQ_E10_R01.6	Serial Number: 123457SM8	CRM No: LP9P7123457SM8	Display Name:

**Advanced Configuration**

Enterprise Server: Production ☒ Enterprise Host: insite.gehealthcare.com Enterprise Port: 443

**Proxy Configuration**

☐ Enable Proxy  
Proxy Server:   
Proxy Port:

**Credentials**

☒ Enable Proxy Credentials  
Username:   
Password:

Submit Changes Reset Form

Figure 3-40 Agent Configuration

Use Agent Configuration to:

- Edit and configure the following:
  - Enterprise server, Select "Production" for install base. Select "Staging" for test purpose
  - Enterprise host name in the agent
  - Enterprise port number in the agent
  - Proxy server, Proxy port in the agent, Consult institutions' IT personnel for Proxy settings
  - CRM number in the agent. The default CRM Number is same as the serial number prefixed with "LP9P7".



**NOTICE** If you want to activate Request for Service (RFS), you need the verified CRM Number. The Serial Number must be registered with only one CRM Number.

-Display name in the agent

- Enter the user name and password for the proxy
- Reset the edited unsaved value
- Update contact details

For more information, see "Agent Configuration" of Common Service Desktop (R3 only) section on Page [3-74](#).

### 3-14-1-2 Verifying Back Office Connection - CSD

- 1) Login to FFA Site from Remote PC using Chrome web browser  
As of 2018, FFA Site address is <https://ffa.am.health.ge.com>
- 2) In System ID field, type the CRM Number of the machine and select [Get Started]

Enter System or Service ID

☒ **System ID**

Devices using RSvP may utilize [Advanced Search](#) for filtering.

**Service Request ID (Optional)**

☐ **Service Request ID**

**Country of System**

Figure 3-41 FFA Site

- 3) At CONNECT mode, Select [Connect] of the “Service Desktop” on Remote Console

Remote Console

Service Desktop	RDP	SSH	Virtual Console
Ready	Ready	Ready	Ready
<input type="button" value="Connect"/>	<input type="button" value="Connect"/>	<input type="button" value="Connect"/>	<input type="button" value="Connect"/>

Figure 3-42 Remote Console

- 4) After selecting [Connect] button, operator may need to wait long time to launch the remote service desktop
- 5) Verify Service Desktop appears on remote PC

### 3-14-1-3 Verifying Back Office Connection – VOC

- 1) On Console, invoke “Disruptive Mode” and “VCO” by left click “GE ICON” and select “Connect Clinical Lifeline

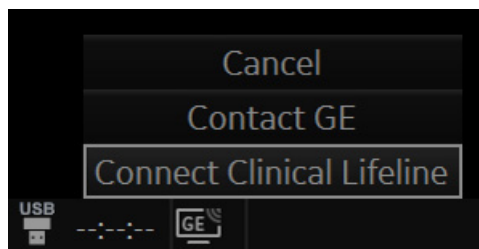


Figure 3-43 Connecting Clinical Lifeline

- 2) Login to FFA Site from Remote PC using Chrome web browser  
As of 2018, FFA Site address is **<https://ffa.am.health.ge.com>**
- 3) In System ID field, type the CRM Number of the machine and select [Get Started]

Enter System or Service ID

☒ **System ID**

Devices using RSvP may utilize [Advanced Search](#) for filtering.

  
**Service Request ID (Optional)**

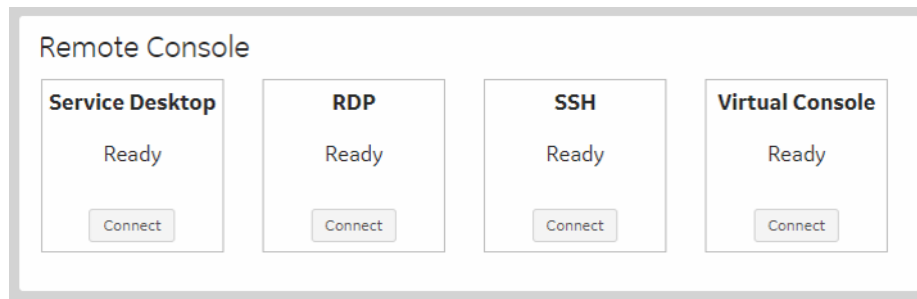
☐ **Service Request ID**

  
**Country of System**

Get Started

Figure 3-44 FFA Site

- 4) At CONNECT mode, Select [Connect] of the “**Virtual Console**” on Remote Console



**Figure 3-45 Remote Console**

- 5) After selecting [Connect] button, operator may need to wait long time to launch the remote service desktop
- 6) Verify console desktop can be viewed from Remote PC

## Section 3-15 Connectivity Setup Worksheet

### Site System Information

Site:	<input type="text"/>	Floor:	<input type="text"/>	Comments: <div style="border: 1px solid black; height: 60px; width: 100%;"></div>
Dept:	<input type="text"/>	Room:	<input type="text"/>	
LOGIQ P9/P7 SN:	<input type="text"/>	Type:	<input type="text"/>	
		REV:	<input type="text"/>	

### CONTACT INFORMATION

Name	Title	Phone	E-Mail Address
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

### TCP/IP Settings

#### System IP Settings

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

### Remote Archive Setup

Name - AE Title:

IP Address:

Subnet Mask:

Default Gateway:

Server Name:

Remote DB User Name:

### Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
11	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>
12	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>	<input type="text"/>



LOGIQ P9/P7					
Host Name	<input style="width: 100%;" type="text"/>	Local Port	<input style="width: 100%;" type="text"/>	IP Address	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>
AE Title	<input style="width: 100%;" type="text"/>			Net Mask	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>
<b>ROUTING INFORMATION</b>					
		<b>Destination IP Addresses</b>			<b>GATEWAY IP Addresses</b>
				Default	
ROUTER1	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>		<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>
ROUTER2	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>		<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>
ROUTER3	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>		<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>
<b>DICOM APPLICATION INFORMATION</b>					
	<b>NAME</b>	<b>MAKE/REVISION</b>	<b>AE TITLE</b>	<b>IP ADDRESSES</b>	<b>PORT</b>
Store 1	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Store 2	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Store 3D_1	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Store 3D_2	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Print	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Worklist	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Structured Reporting	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
Storage Commit	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>
MPPS	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/> . <input style="width: 20%;" type="text"/>	<input style="width: 20%;" type="text"/>


Figure 3-46 Worksheet for DICOM Network Information

Section 3-16  
Paperwork

**NOTE:** During and after installation, the documentation (i.e. User Manual, Installation Manual,...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

3-16-1 Product Locator Installation

**NOTE:** The Product Locator Installation Card shown may not be same as the provided Product Locator card.



Mailing Address  
GE Medical Systems  
Product Locator File  
P.O. Box 414  
Milwaukee, WI 53201-0414

DESCRIPTION	FDA	MODEL	REV	SERIAL
-------------	-----	-------	-----	--------

PREPARE FOR ORDERS THAT DO NOT HAVE A LOCATOR INSTALLATION REPORT

SYSTEM ID NUMBER

INSTALLATION

PRINTED IN USA

OCP	BS	ORD	DATE (MO-DA-YR)
DIST.-COUNTRY	ROOM	EMPLOYEE NO.	
CUSTOMER NO.			
DESTINATION - NAME AND ADDRESS			
ZIP CODE			

Figure 3-47 Product Locator Installation Card

3-16-2 User Manual(s)

Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available. Check with your GE Sales Representative for availability.

# Chapter 4

## Functional Checks

### Section 4-1 Overview

#### 4-1-1 Purpose of Chapter 4

This chapter provides procedures for quickly checking major functions of the LOGIQ P9/P7 scanner diagnostics by using the built-in service software, and power supply adjustments.

**Table 4-1** Contents in Chapter 4

Section	Description	Page Number
4-1	Overview	4-1
4-1-1	Purpose of Chapter 4	4-1
4-2	Required Equipment	4-1
4-3	General Procedure	4-3
4-3-1	System Exterior Visual Check	4-4
4-3-2	Mechanical Parts Functional Check	4-7
4-3-3	Power On/Off	4-13
4-3-4	System Information	4-18
4-3-5	System Integration Checks	4-21
4-3-6	Peripheral Checks	4-23
4-3-7	Mode Transition Checks	4-24
4-3-8	OPIO Interface Check (R1, R2, R2.5 only)	4-33
4-3-9	OPIO Interface Check (R3 only)	4-36
4-3-10	Touch Panel Calibration (R3 only)	4-39
4-4	Board Diagnostics	4-42



**NOTICE** Most of the information pertaining to this Functional Checks chapter is found in the LOGIQ P9/P7 Basic User Manual;

### Section 4-2 Required Equipment

- An empty (blank) CD-R, DVD-R, and/or external USB devices (stick or hard disk drive for data storage/backup. A DVD+RW disc for DVR recording

- At least one transducer. See [Chapter 9 - Probes, on page 9-30](#) for an overview.  
(normally you should check all the transducers used on the system)

## Section 4-3 General Procedure



**CAUTION**

**SYSTEM REQUIRES ALL COVERS**

Operate this unit only when all board covers and frame panels are securely in place.  
The covers are required for safe operation, good system performance and cooling purposes.



**NOTICE**

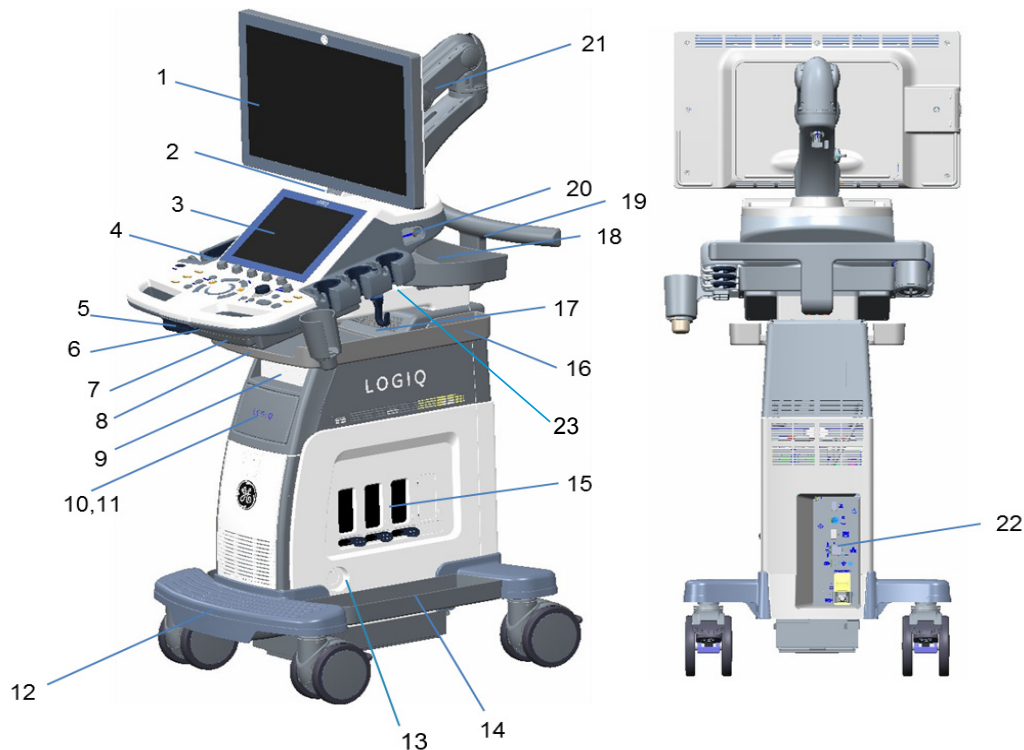
Lockout/Tagout Requirements (For USA only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the Power Cable on the system.



## 4-3-1 System Exterior Visual Check

### 4-3-1-1 Physical Abnormalities



**Figure 4-1 System Exterior**

1. LCD MONITOR	10. BW printer	18. OPIO tray (option)
2. TOUCH PANEL	11. Drawer	19. Rear Handle (option)
3. USB port	12. Foot rest	20. ECG connector (option)
4. Probe Holder	13. CW pencil probe port (option)	21. Articulating arm (option)
5. Control Panel Swivel button	14. SIDE tray (option)	22. External I/O panel
6. Control Panel Up_down button	15. Probe ports - 3 active probe ports 4 active probe ports (option)	
7. A/N keyboard (option)		
8. Multi Purpose Holder (option)	16. Paper tray (option)	
9. DVD Drive	17. Audio speaker	

1) Check for no loose or cracked parts on above locations. (see: [Figure 4-1](#))

## 4-3-1-2 Appearance Inspection

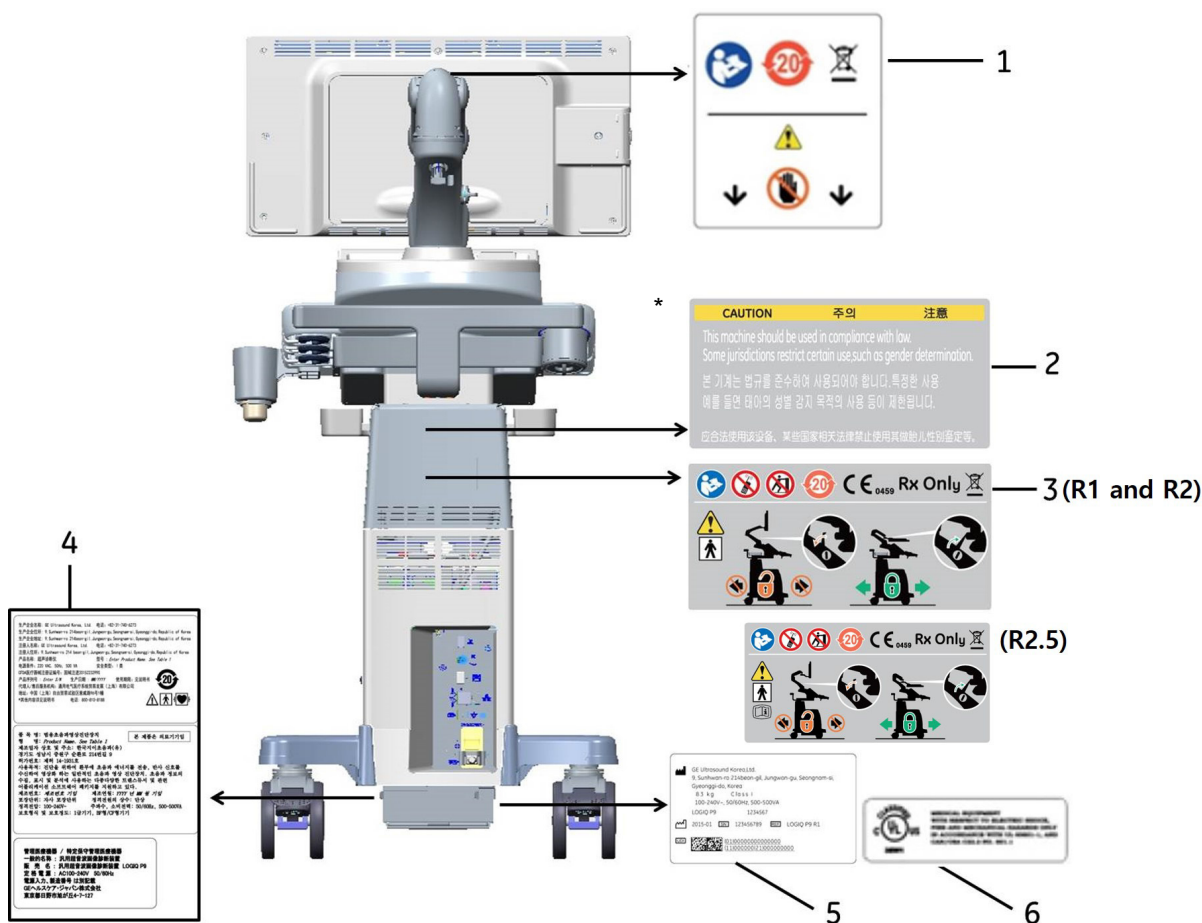


Figure 4-2 Label Location (R1, R2, and R2.5)

\* Required for Asia.

1. LCD CAUTION LABEL
2. GENDER CAUTION LABEL (ONLY FOR INDIA, CHINA, KOREA)
3. MULTI CAUTION LABEL
4. LOGIQ P9/P7 RATING LABEL (FOR CHINA, FOR KOREA, FOR JAPAN)
5. LOGIQ P9/P7 RATING LABEL
6. UL LABEL

- 1) Check presence of LCD Caution Label.
- 2) Check presence of Gender Caution Label.

**NOTE:** Some countries may not have "gender determination" label.

- 3) Check presence of Multi Caution Label.
- 4) Check presence of Rating Plate.

**NOTE:** Rating Plate design slightly differ depending on Console destination. At minimum simply check Console number, manufacturing date and serial Number.

- 5) Check presence of UL Label

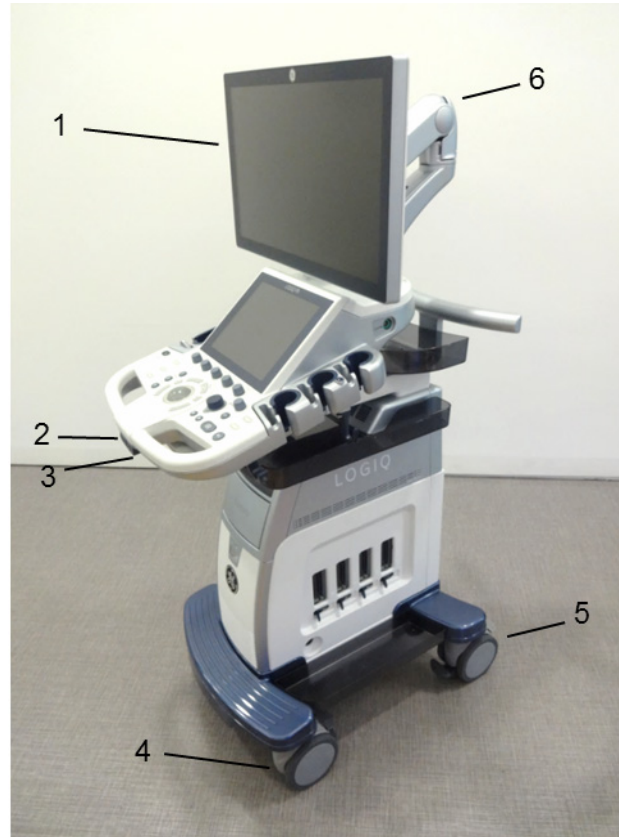




## 4-3-2 Mechanical Parts Functional Check



**CAUTION** Pay attention to moving parts and pinch point when performing mechanical parts functional check.



**Figure 4-4 System Mechanical Checkpoint**

	Location
1	Main LCD
2	OPIO Swivel Lock
3	OPIO UP_DOWN Lock
4	Total Lock Caster
5	Swivel-Lock Caster
6	LCD Arm

**4-3-2-1 Main LCD**

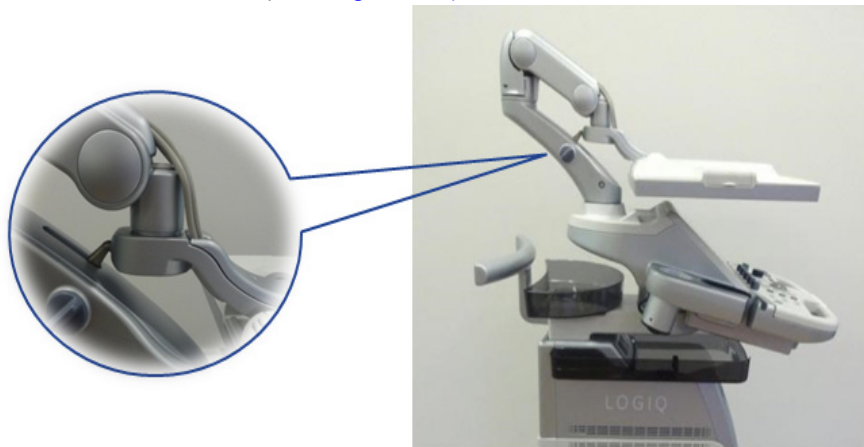
- 1) Tilt LCD Monitor forward
- 2) Verify can be tilted (see: [Figure 4-4](#))



**Figure 4-5 Main LCD**

#### 4-3-2-2 LCD ARM

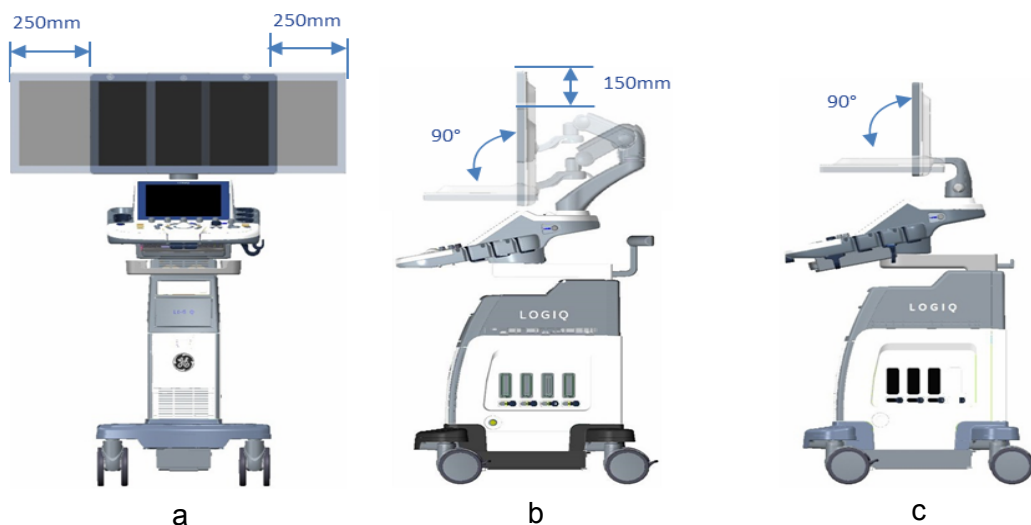
- 1) Loosen LCD Arm LOCK (see: [Figure 4-5](#)).



**Figure 4-6 LCD ARM Lock**

- 2) Verify LCD Monitor can move up/down (vertically) and left/right (horizontally).

**NOTE:** LCD Monitor can move approximately 150mm vertically and 250mm horizontally (see: [Figure 4-6](#)).



**Figure 4-7 LCD Movement**

- a, b : LOGIQ P7/P9 with Flexible Arm
- c : LOGIQ P7/P9 with Fixed Arm

- 3) Engage LCD Arm LOCK.
- 4) Align LCD Arm along center line of the system.
- 5) Verify LCD Panel is locked to position and LCD ARM does not move.

4-3-2-3 OPIO Swivel Lock

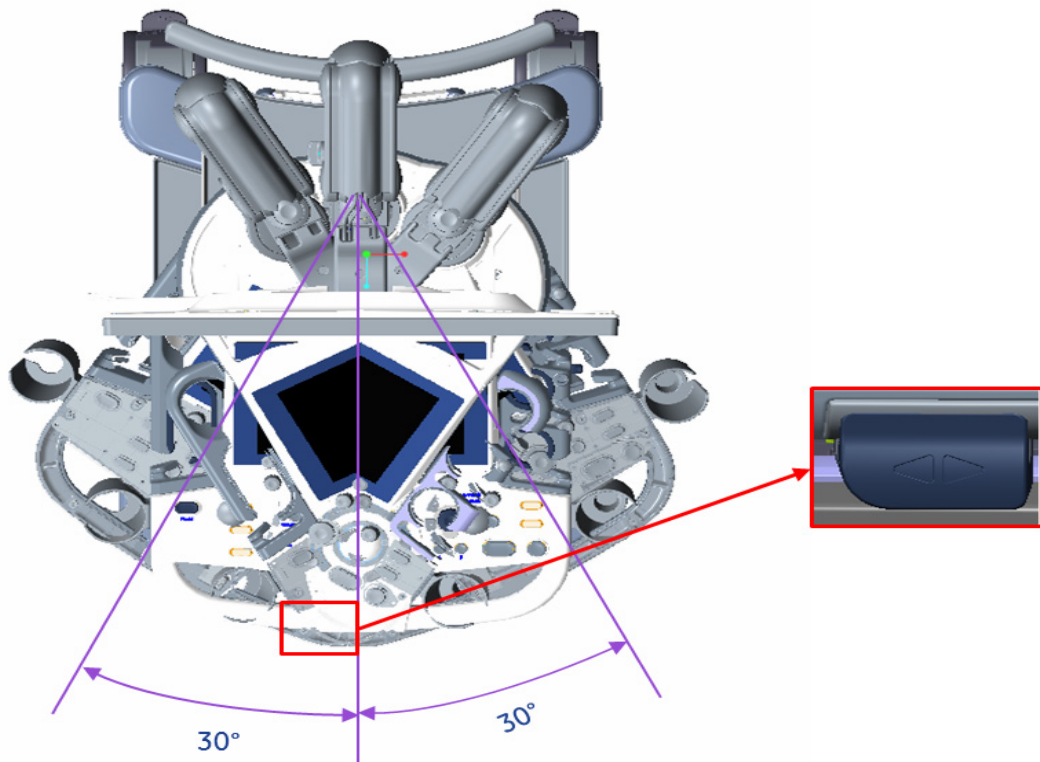


Figure 4-8 OPIO Swivel

- 1) Push the swivel button and hold it. (see: [Figure 4-7](#))
- 2) Rotate OPIO (while holding button).
- 3) Verify OPIO is free to rotate.

**NOTE:** OPIO can rotate approximately 30 degrees to each side.

- 4) Let go of Swivel Lock button (disengage).
- 5) Verify OPIO does not rotate.



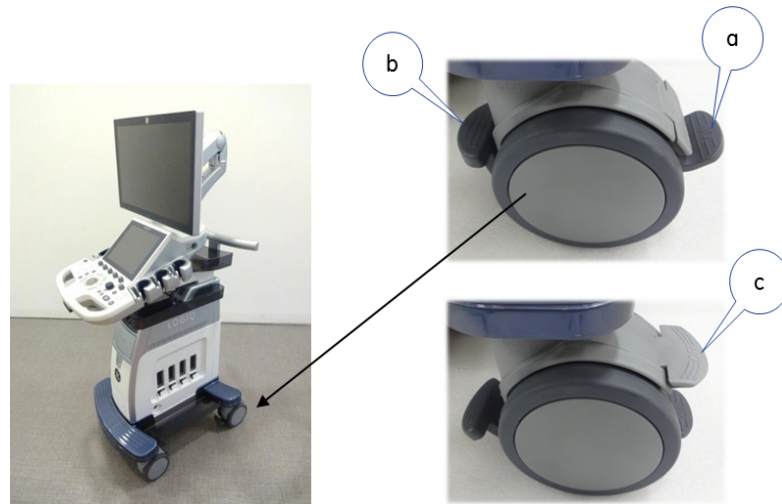
**NOTICE** Do NOT attempt to apply excessive rotating force to OPIO. OPIO Swivel brake is designed to hold OPIO in desired position during normal use, and not meant to completely fix the OPIO position.

#### 4-3-2-4 Swivel/Brake Lock Caster



**CAUTION** System weighs approximately 60kg. Pay attention for system stability when working with the casters

**NOTE:** This procedure applies to *RIGHT REAR* Caster only.



**Figure 4-9 Right Rear Caster**

- 1) Press 'a'. (see: [Figure 4-8](#))
- 2) Rotate wheel until it locks (only one lock position in 360deg turn).
- 3) Verify Swivel Lock engages.
- 4) Press 'b' downward. (see: [Figure 4-8](#))
- 5) Verify Brake is applied to the wheel. (i.e. Wheel does not rotate)
- 6) Press 'b' upward.
- 7) Verify Brake is released.
- 8) Press 'c'. (see: [Figure 4-8](#))
- 9) Verify Swivel is released.

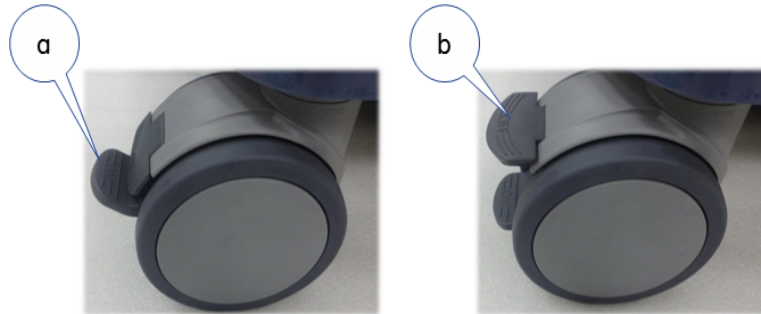
#### 4-3-2-5 Swivel/Brake Lock Caster



**CAUTION**

System weighs approximately 90kg. Pay attention for system stability when working with the casters.

**NOTE:** This procedure applies to casters other than RIGHT REAR Caster.



**Figure 4-10 Total Lock Casters**

- 1) Press 'a'. (see: [Figure 4-9](#))
- 2) Rotate wheel until it locks (several locations where caster engages).
- 3) Verify Swivel Lock engages and Brake is ON.
- 4) Press 'b'. (see: [Figure 4-9](#)).
- 5) Verify wheel is free to move.

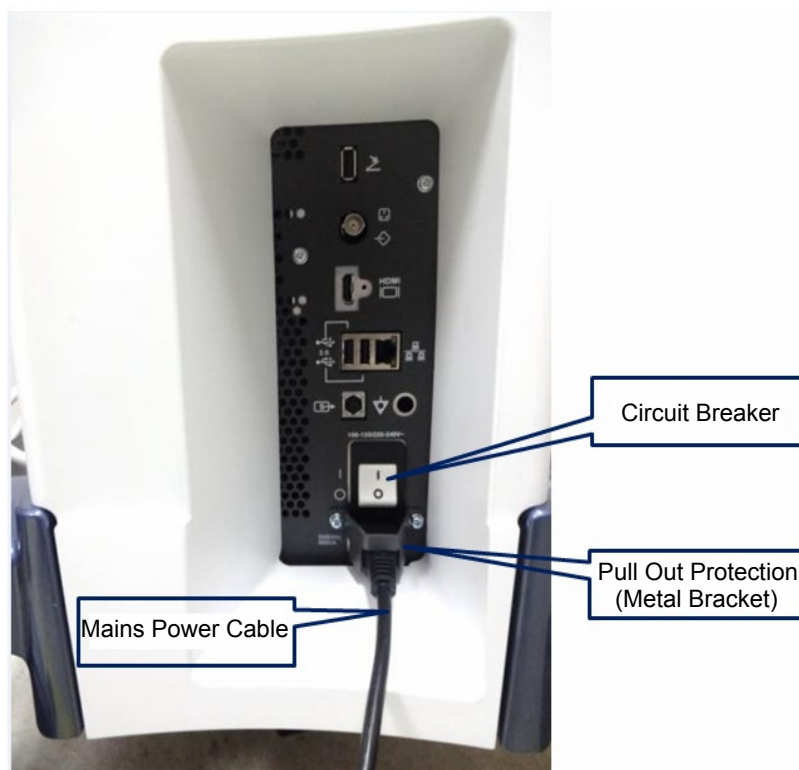
### 4-3-3 Power On/Off



**NOTICE** After turning off a system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

#### 4-3-3-1 Scanner Power On

- 1) Connect the Main Power Cable to the back of the system.
- 2) If not already done, screw on the pull-out protection of the mains power cable with the 2 screws.
- 3) Connect the Main Power Cable to a hospital grade power outlet with the proper rated voltage. Never use an adapter that would defeat the safety ground.
- 4) Switch ON the Circuit Breaker at the rear of the system. (see: [Figure 4-10](#))



**Figure 4-11** Circuit Breaker, pull-out protection and main power cable at rear of system.



**NOTICE** When AC power is applied to the scanner, the **On/Off** button on the control panel illuminates BLUE indicating that the system (including back-end processor) is in Standby Mode.

- 5) Hold down the **On/Off** button (see: [Figure 4-12](#)) on the control panel for ~3 seconds.

**NOTE:** The power for on-board peripheral auxiliary equipments are commonly switched with the **ON/OFF** button. The power switch of any attached printer(s) needs to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode (e.g., Color video printer) and must therefore be switched on separately.

OFF (STAND-BY) (R3 only)    OFF (Stand-by)



ON (R3 only)

ON



**Figure 4-12 On/Off Button on Control Panel and indicator color**

- 6) Verify **On/Off** button color changes to GREEN.
- 7) Verify on-board peripherals power is also turned ON.

As soon as the software is loaded, the system enters 2D-Mode with the probe and application that were used before the system was shut down. Total time used for start-up is about 2 minutes.

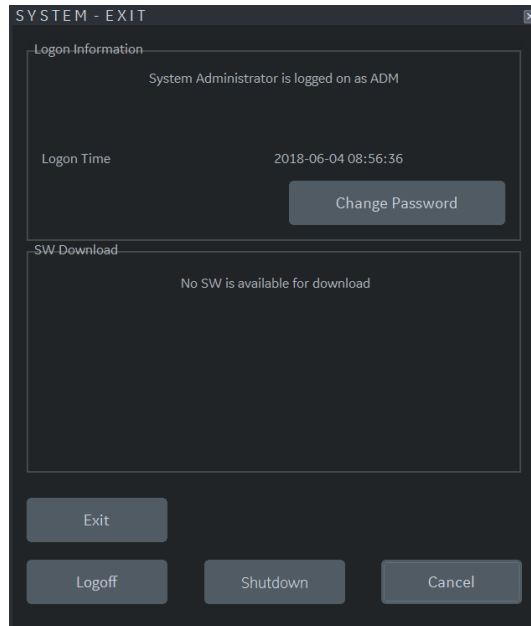
**NOTE:** *The power for on-board peripheral auxiliary equipments are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*



#### 4-3-3-2 Sleep Mode Check

**NOTE:** *This procedure assumes systems is already up and running.*

- 1) To going into the sleep mode, enter the scan screen and lightly press the Power On/Off switch (see: [Figure 4-13](#)) once. The System-Exit window is displayed.



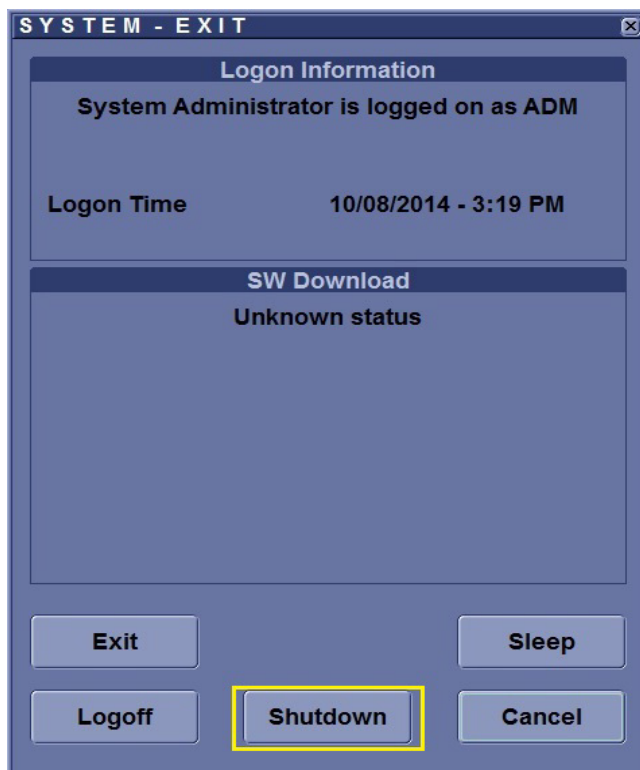
**Figure 4-13 Power OFF User Interface (R3)**

#### 4-3-3-3 Complete power down



**NOTICE** After turning off a system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

- 1) If not already in read mode, freeze the image.
- 2) When you shutdown the system, enter the scan screen and lightly press the Power On/Off switch (see: [Figure 4-14](#)) once. The System-Exit window is displayed.



**Figure 4-14 Power OFF User Interface (R2 and R2.5)**

- 3) Select the SHUTDOWN button. The system performs an automatic full shutdown sequence.
- 4) Switch OFF the Circuit Breaker at the rear of the system.

**NOTE:** *The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the **ON/OFF** button. So the auxiliary equipment need not to be switched ON/OFF separately.*



**WARNING** ***Disconnection of the Main Power Cable is necessary!***  
***For Example: When repairing the system.***

- 5) After complete power down, unscrew the 2 screws and remove the pull-out protection to disconnect the main power cable from the system or unplug it from the AC wall outlet socket.
- 6) Press on the brakes to block the front caster wheels.
- 7) Disconnect probes.



**NOTICE** Be sure to follow probe handling instruction and caution outlined in Basic User Manual.

#### 4-3-3-4 Power Off / Shutdown Check

- 1) When you shut down the system, enter the scan screen and lightly press the Power On/Off switch (see: [Figure 4-14](#)) once. The System-Exit window is displayed.
- 2) The SYSTEM - EXIT menu, used when power off the unit, gives you these choices:
  - **Logoff**  
Use this button to log off the current user. The system remains ON and ready for a new user to log on. If the Logoff button is dimmed, it indicates that no user is logged on to the unit at the moment.
  - **Shutdown**  
Use this button to shut down the system. The entire system will shut down. It is recommended to perform a full shutdown at least once a week.  
  
If the Shutdown button is dimmed, press the power button or Alt F10 to shut down the unit.
  - **Cancel**  
Use this button to exit from the System-Exit menu and return to the previous operation.
  - **Exit** (Only available when logged in as GE Service with Service Dongle)  
Select this button when you want to exit to the Windows Desktop.

## 4-3-4 System Information

### 4-3-4-1 Software Version

- 1) From the touch panel, select Utility -> System -> About.
- 2) Note "Software Version" in Software Group.
- 3) Note "Software Revision" in Software Group.
- 4) Note "Image Part Number" in System Image.

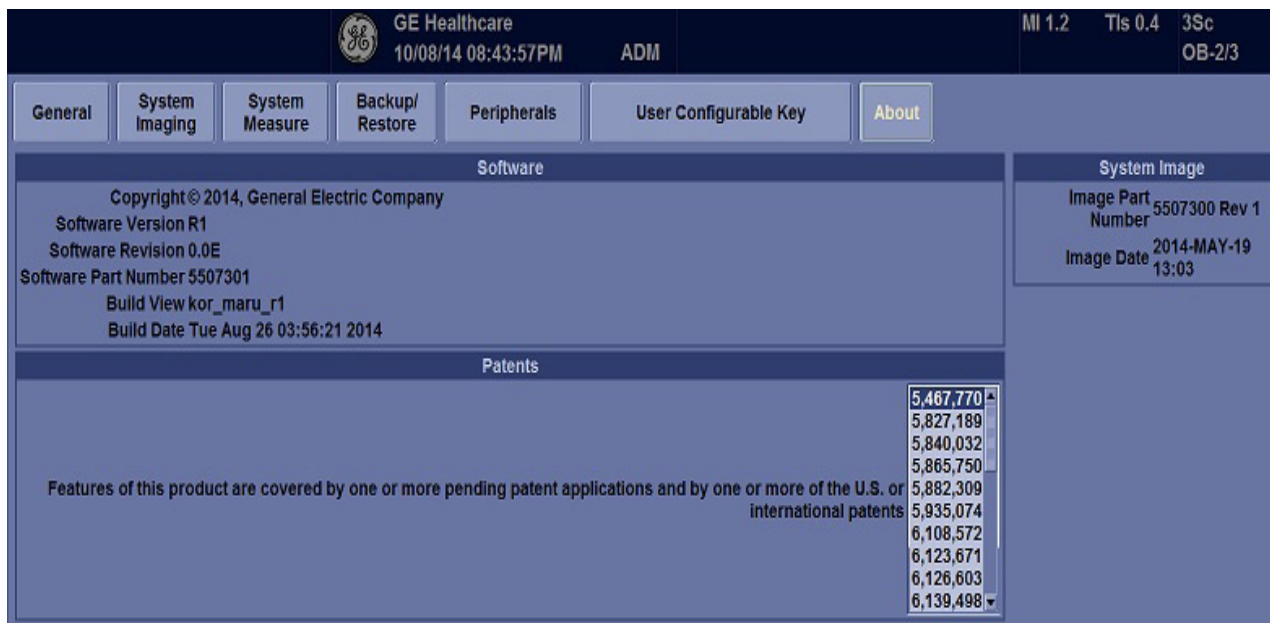


Figure 4-15 Software version (R2 and R2.5)

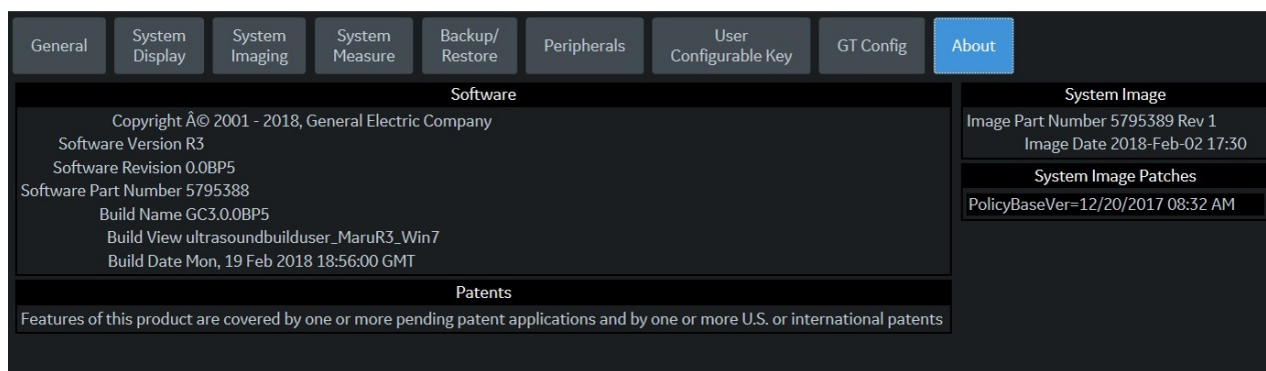


Figure 4-16 Software version (R3)



#### 4-3-4-3 USB Port Test

Required Equipment : Service Dongle

##### External Port Test

- 1) Plug service dongle to the following locations. Refer to [Section 3-9-2](#) for locations.
  - Front USB Port in OPIO
  - USB Port in LCD Monitor
  - Rear USB Access Port
- 2) Verify service dongle LED.

## 4-3-5 System Integration Checks

### 4-3-5-1 OPIO Test

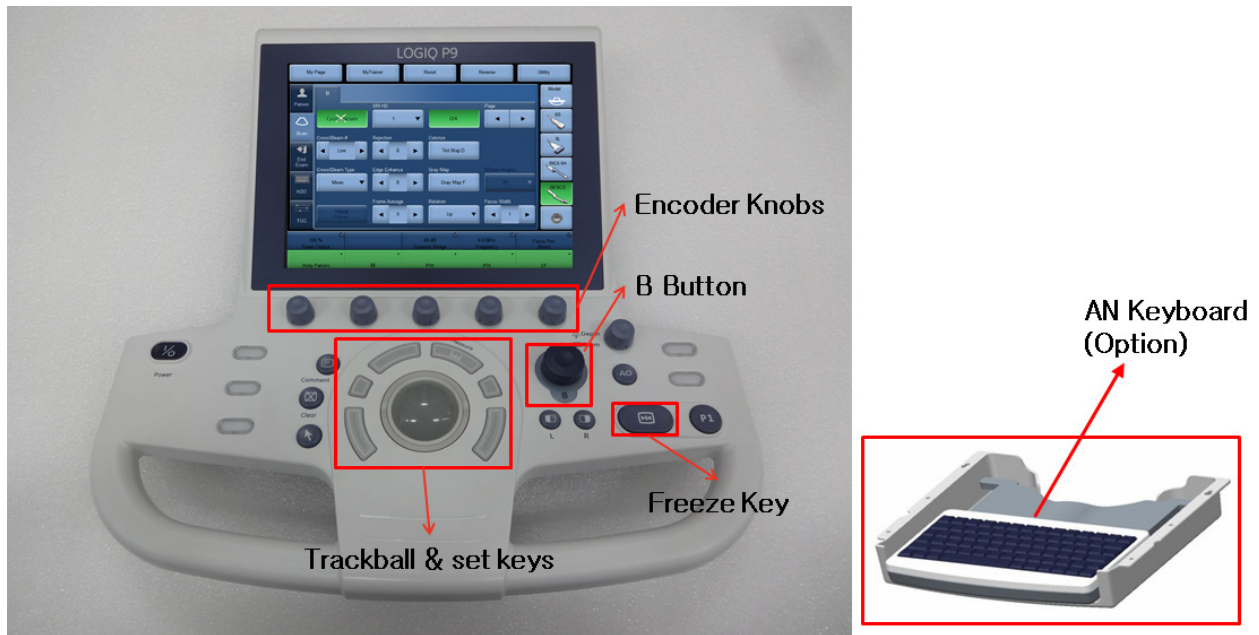


Figure 4-18 OPIO

- 1) Power ON the system.
- 2) Check backlight on AN Keyboard, B Buttons, Freeze Key.
- 3) Select **UTILITY** in touch panel.
- 4) Turn encorder knobs as shown in [Figure 4-18](#).
- 5) Verify backlight luminance (intensity) changes when knobs are turned.



Figure 4-19 Utility

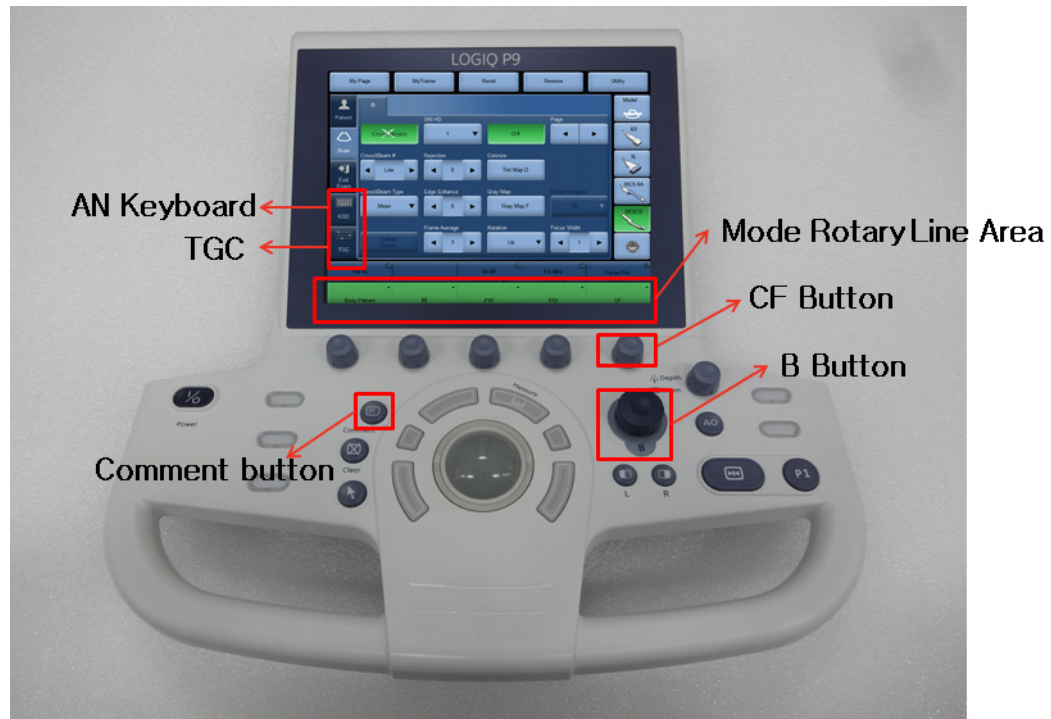


Figure 4-20

- 6) Connect any probe. (if not connected)
- 7) Go to Live CF Mode. (Mode Rotary Line Area in touch panel, Press "CF" Mode button, unfreezes.)
- 8) Turn "GAIN" encoder around CF Mode button and verify ROI gain change.
- 9) Operate TGC sliders(Select TGC in touch panel) and verify B image gain change.
- 10) Press "COMMENT" key.
- 11) Select 'KBD' in touch panel and Type in arbitrary strings. Verify keyboard is functional
- 12) Type in arbitrary strings from A/N Keyboard(If installed). Verify keyboard is functional.

#### 4-3-5-2 DVD Drive Test

- 1) Insert Blank CD-R or DVD-R Media into Optical Drive.
- 2) Select **UTILITY** -> **SYSTEM** -> **Backup Restore**.
- 3) Select "CD/DVD" in "MEDIA" list.
- 4) Select "User Define Configuration checkbox" in Backup and Press "Backup".
- 5) Start backup into Media by pressing "OK" Button.
- 6) Verify "Finished OK" message appears.

#### 4-3-5-3 LAN Port Test

- 1) Plug the Ethernet Cable to connect local area network.
- 2) Verify that Local area network connection is recognized.



## 4-3-6 Peripheral Checks

### 4-3-6-1 DVR Test (if equipped)

Required: Blank [DVD+RW] media.

- 1) Make sure the tab menu of "Video" is found on the right-most touch panel tab. If not found, go to "Utility" -> "Application" -> "Setting" and check "Show video Tab".
- 2) Insert DVD+RW. Go to DVR Touch Panel menu.
- 3) Press "REC-Standby" to go stand-by.
- 4) Start Recording. Perform image scanning including Doppler sound.
- 5) Stop Recording.
- 6) Exit from stand-by.
- 7) Play.
- 8) Verify that Recorded image and sound can be played back.

**NOTE:** LOGIQ P9/P7 support USBHDD file capture. and this menu can select in "Utility" "System" "Peripherals" tab. The recorded data can play on your target PC. The support video format mpeg-2 and h.264 and it depend on codec on your PC of operation system. If you cannot play in window media player, you should be download video codec or recommend use VLC media player(<http://www.videolan.org/>).

### 4-3-6-2 Black and White Printer Test

- 1) Print an image by pressing P button associated with BW Printer. (P key should be configured correctly.)
- 2) Verify that image can be printed.
- 3) Verify that printed image has no distortion as compared the image on screen.

### 4-3-6-3 Color Printer Test

- 1) Print an image by pressing P button associated with Color Printer. (P key should be configured correctly.)
- 2) Verify that image can be printed.
- 3) Verify that printed image has no distortion as compared the image on screen.

### 4-3-6-4 CD/DVD Read/WriteTest

- 1) Insert Blank CD/DVD Media into Optical Drive.
- 2) Go to Utility à System à Backup Restore. Select "CD/DVD" in "Media" list.
- 3) Select "User Define Configuration checkbox" in Backup and Press "Backup".
- 4) Start backup into Media by pressing "OK" Button.
- 5) Verify that "Finished OK" message appears.

### 4-3-6-5 ECG Test

- 1) Connect a any probe. Select cardiac application like "Adult". And start scan.
- 2) Verify that ECG timeline gets displayed on image area.
- 3) Enter CSD.
- 4) Select DIAGNOSTICS - Service Diag - ECG Test.
- 5) Verify diagnostics exhibit "PASS".

#### 4-3-6-6 Gel Warmer Test

- 1) Insert Gel Bottle into Gel Warmer.
- 2) Power ON the warmer.
- 3) Verify Gel gets warm.

*NOTE: Depending on environment, Gel requires 30 minute or more to warm up.*

#### 4-3-6-7 Single CWD

- 1) Connect P8D probe. Select vascular application like "Carotid". And start scan.
- 2) Verify that CW timeline image appears.

### 4-3-7 Mode Transition Checks

#### 4-3-7-1 General Information

- 1) [R1.X.X] Select UTILITY -> SYSTEM -> User Configurable Key.  
[R2.X.X or later] Select UTILITY -> APPLICATION -> Settings.
- 2) [R1.X.X] Select "M" in 2 list of "Mode Rotary Line Key".  
[R2.X.X or later] Select "M" in 2 list of "User Configurable Mode Rotary".
- 3) [R1.X.X] Select "PW" in 3 list of "Mode Rotary Line Key".  
[R2.X.X or later] Select "PW" in 3 list of "User Configurable Mode Rotary".
- 4) [R1.X.X] Select "CF" in 5 list of "Mode Rotary Line Key".  
[R2.X.X or later] Select "CF" in 5 list of "User Configurable Mode Rotary".
- 5) Press "Save".
- 6) Select UTILITY -> SYSTEM -> User Configurable Key.
- 7) Select "B-Flow" in 4 list of "User Defined Hard Key".
- 8) Select "Reset" in 3 list of "User Defined Touch Button".

- 9) Press "Save" and restart the system into Question window by pressing "OK" Button.

The screenshot shows the 'User Configurable Key' page with the following configurations:

- User Defined Hard Key:** 1 Elasto, 2 LOGIQView, 3 3D/4D, 4 B-Flow, 5 Body Pattern.
- User Defined Touch Button (restart needed):** 1 My Page, 2 MyTrainer, 3 Reset, 4 Reverse, 5 Utility.
- Mode Rotary Line Key (restart needed):** 1 Body Pattern, 2 M, 3 PW, 4 PDI, 5 CF.
- MyPage User Defined Function Key:** 1 MyTrainer, 2 Arrow, 3 Word Delete, 4 Eject.
- User defined Trackball SetKey:** BIB-Flow, FOCUS, FREQ, CF/TV/PI, STEER, SCALE, PW/CW/TV/D, BASELINE.

Figure 4-21 User Configurable Key Page (R1.x.x)

The screenshot shows the 'User Configurable Key' page with the following configurations:

- User Defined Hard Key:** 1 Elasto, 2 LOGIQView, 3 3D/4D, 4 B-Flow, 5 Body Pattern.
- User Defined Touch Button (restart needed):** 1 My Page, 2 MyTrainer, 3 Reset, 4 Reverse, 5 Utility.
- MyPage User Defined Function Key:** 1 MyTrainer, 2 Arrow, 3 Word Delete, 4 Eject.
- User defined Trackball SetKey:** BIB-Flow, FOCUS, FREQ, CF/TV/PI, STEER, SCALE, PW/CW/TV/D, BASELINE.

Figure 4-22 User Configurable Key Page (R2.x.x or later)

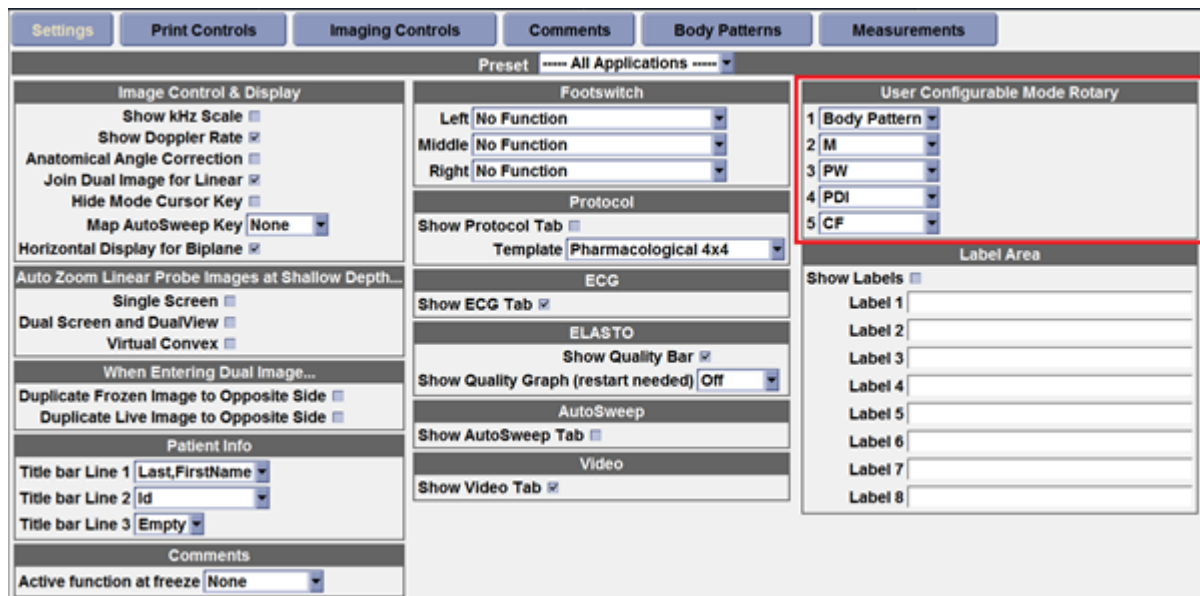


Figure 4-23 User Configurable Key Page (R2.x.x or later)

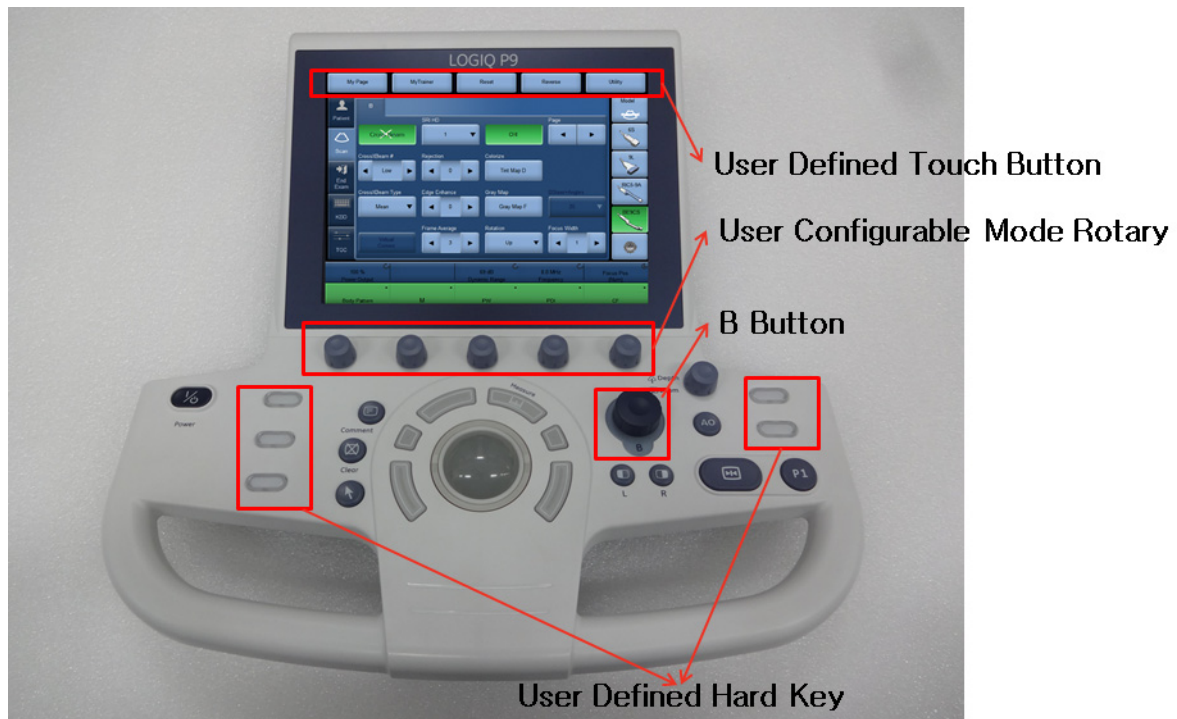


Figure 4-24

#### 4-3-7-2 B-Mode

- 1) Press B Mode button.
- 2) Verify that system scan with the activated probe.
- 3) Verify probe name is displayed on upper right hand corner of main monitor (scan screen).

#### 4-3-7-3 Color Flow-Mode

- 1) Press CF Mode button. (Active CF Mode button on "User Configurable Mode Rotary".)
- 2) Increase CF Gain until noise floor shows up.
- 3) Verify no vertical "streaks" of color that significantly contrasts the surrounding color.

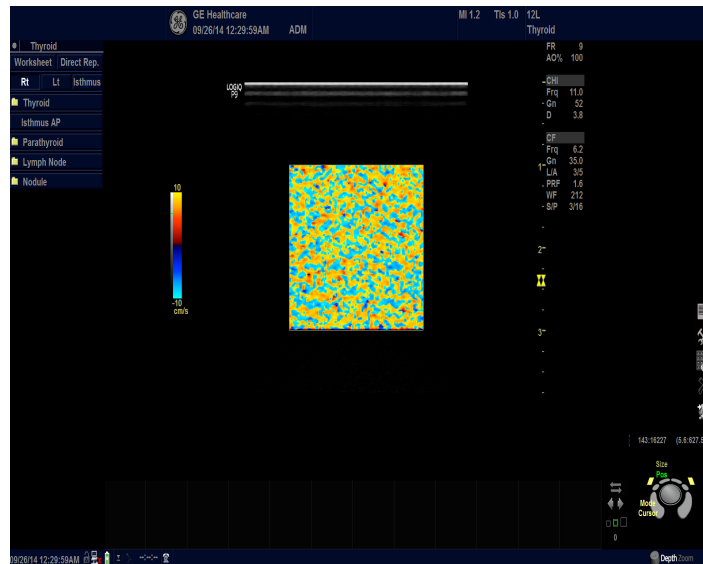


Figure 4-25 Color Flow-Mode

#### 4-3-7-4 Pulse Doppler Mode

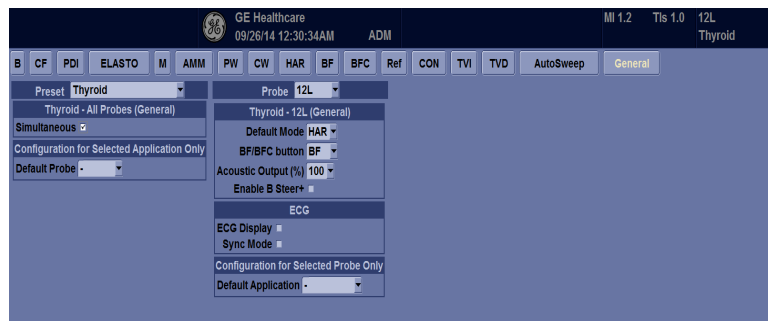


Figure 4-26

- 1) From Utility -> Imaging -> General, verify check on "Simultaneous".
- 2) Press B Mode button.
- 3) Press PW Mode button. (Active PW Mode button on "User Configurable Mode Rotary".)
- 4) Verify that system scan B/PW duplex with the activated probe.
- 5) Revert to original setting in Utility -> Imaging -> General "Simultaneous".

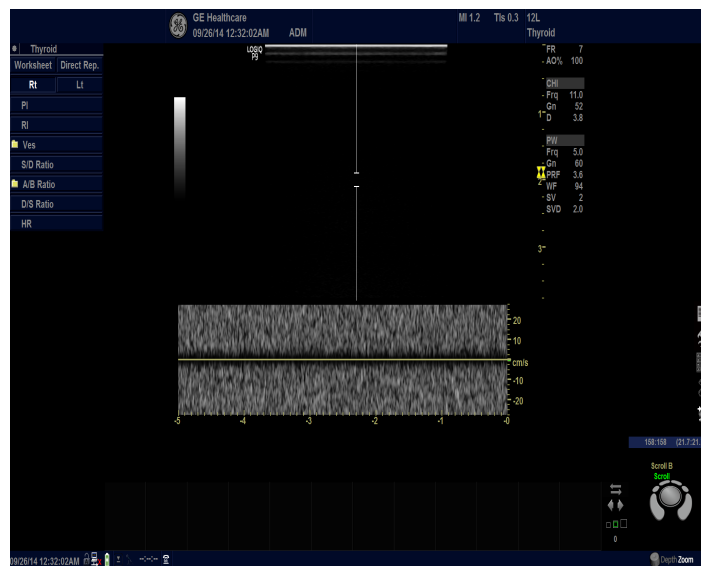


Figure 4-27 Pulse Doppler Mode

#### 4-3-7-5 B/CF/PW Mode

- 1) Press B Mode button.
- 2) Press PW Mode Button.
- 3) Press CF Mode Button.

4) Verify that system scan with B/CFM/PWD Modes.

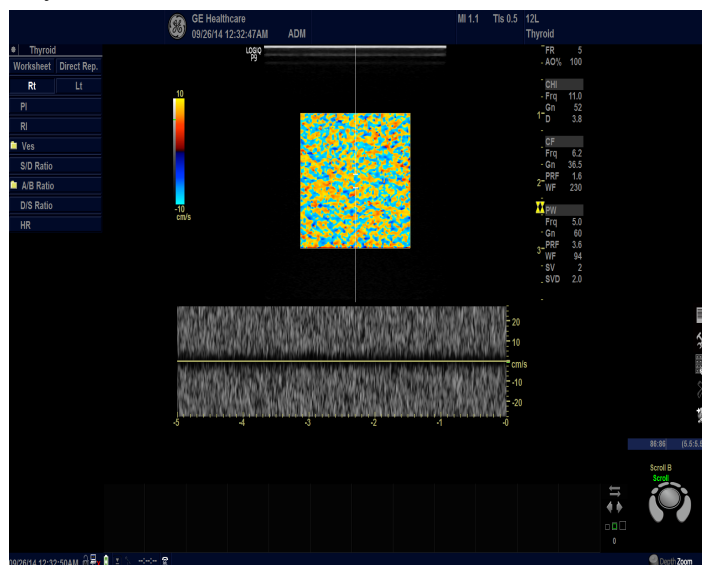


Figure 4-28 B/CF/PW Mode

#### 4-3-7-6 M-Mode

- 1) Press B Mode Button.
- 2) Press M Mode Button. (Active M Mode button on "User Configurable Mode Rotary".)
- 3) Verify that system scan B/M with the activated probe.



Figure 4-29 M-Mode

#### 4-3-7-7 B-Flow Mode

**NOTE:** Make sure to select probe which supports B-flow

- 1) From the touch panel, select Utility -> Imaging -> General.
- 2) Change BF/BFC Button to "BF"

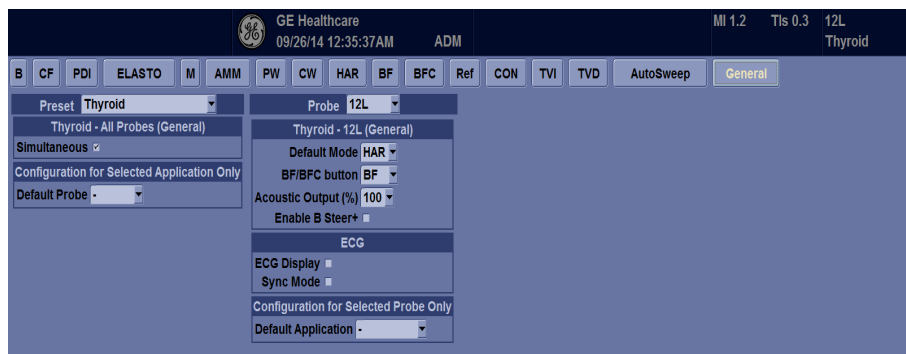


Figure 4-30 BF Setting

- 3) Press B-Flow Button. (Active M Mode button on "User Defined Hard Key".)



4) Verify BF Mode.

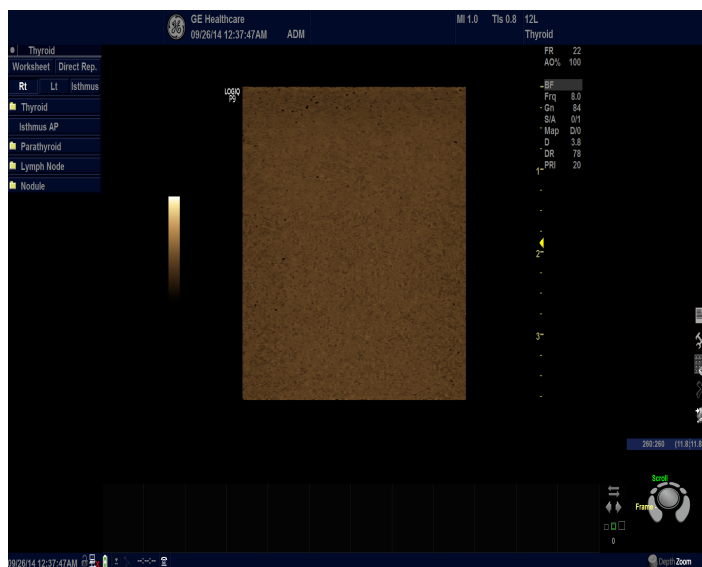


Figure 4-31 B-Flow Mode

5) From the touch panel, select “COLOR”

6) Verify B-Flow Color is shown.

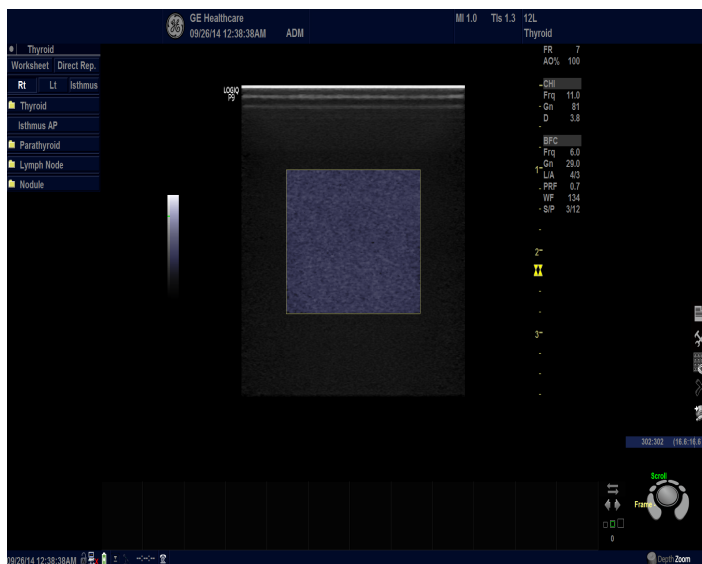


Figure 4-32 B-Flow Color Mode

4-3-7-8 CW Mode (Optional)

**NOTE:** Make sure to select probe which supports CWD

- 1) Press B Mode button.
- 2) Press CW Mode button.
- 3) Verify that system CW scan with the activated probe.

#### 4-3-7-9 WLAN (Optional)

**NOTE:** This test is only applied if the WLAN option has been installed

- 1) Connect a service dongle to USB port and press a power button on console panel.
- 2) Select Exit and enter the user name and password. Choose Maintenance > Exit to Windows. The Windows desktop will appear.
- 3) Click the Device Manager icon on the status bar. A Device Manager window will open.



- 4) Open a sub node of Network adapters.
- 5) Verify that NETGEAR WNDA4100 N900 Wireless Dual Band USB Adapter is listed.

#### 4-3-7-10 4D Mode (Optional)

**NOTE:** This test is only applied if the 4D options (both hardware and software) have been installed.

- 1) Prepare a 4D probe that the version of software has supported.
- 2) Make sure that the probe is connected properly.
- 3) Select the probe on the touch panel.
- 4) Press 3D/4D key.
- 5) [R1.X.X or R2.X.X] Press Static 3D / [R3.X.X] Press 3D tab
- 6) Press Start Set key.
- 7) Verify that Static 3D image is acquired.

#### 4-3-7-11 Power Assistant (Optional)

**NOTE:** This test is only applied if the Battery option has been installed

- 1) Make sure that the Power Assistant option is installed.
- 2) Verify that Battery icon is displayed in status bar and the color is green or yellow, not orange
- 3) Make sure battery icon in status bar is green. If it is yellow, wait for the battery is charged and turned to green.
- 4) Unplug the AC power cable.
- 5) Verify that the system is not turned off.
- 6) Verify that the main display gets dark and the touch panel turn off.
- 7) Plug the AC power cable .
- 8) Verify that Brightness of main display and touch panel be gets normal.

#### 4-3-8 OPIO Interface Check (R1, R2, R2.5 only)

**NOTE:** In above example, key "Alt" is pressed.

**NOTE:** Alternatively, OP Panel Interface test may be executed from Common Service Desktop.

However, performance / response of the diagnostics may be degraded when executed with scanner software still active.

It is located under Diagnostics -> OP Panel Interface in the Diagnostics page.

Before OP Panel Interface test execute from Common Service Desktop, you have to enable the Disruptive Mode in Diagnostics -> Common diagnostics -> Utilities -> Disruptive Mode

To perform OPIO Interface Check using Diagnostics

- 1) Enter Common Service Desktop
- 2) Select Diagnostics -> Common diagnostics -> Utilities -> Disruptive Mode

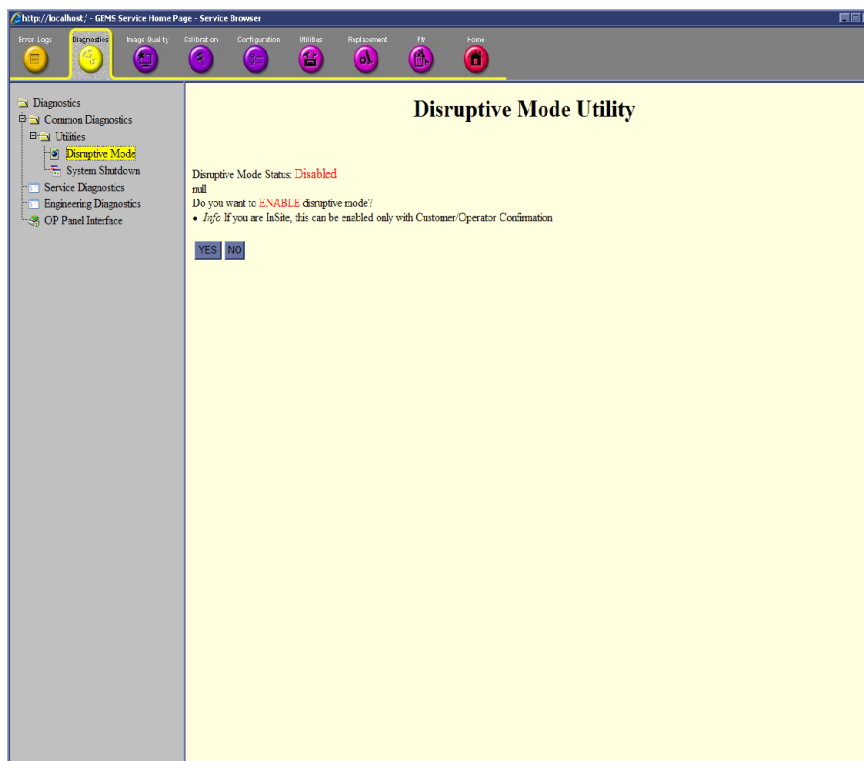


Figure 4-33 Diagnostic Mode page screen

3) Click the "YES" on Diagnostic Mode page

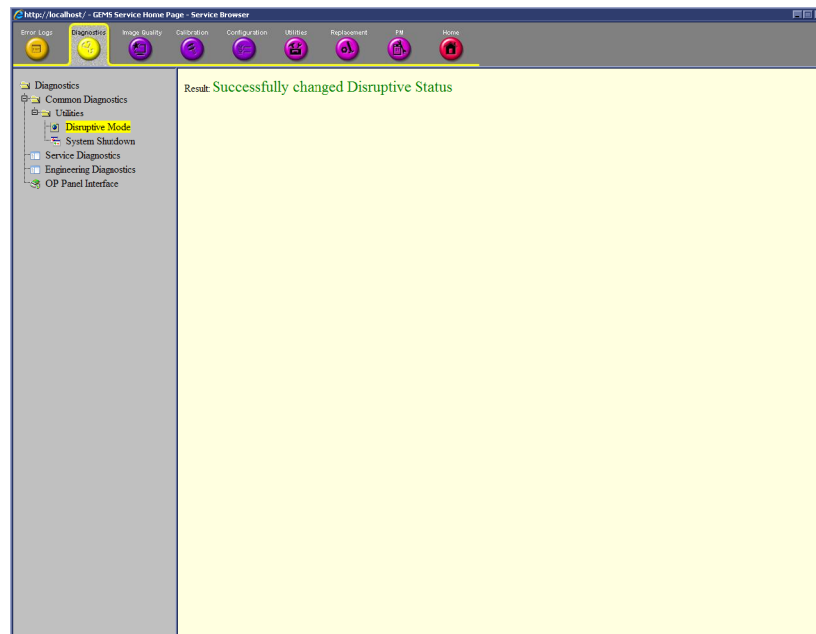


Figure 4-34 Diagnostic Mode page screen after enable the Disruptive mode

4) Select Diagnostics -> OP Panel Interface

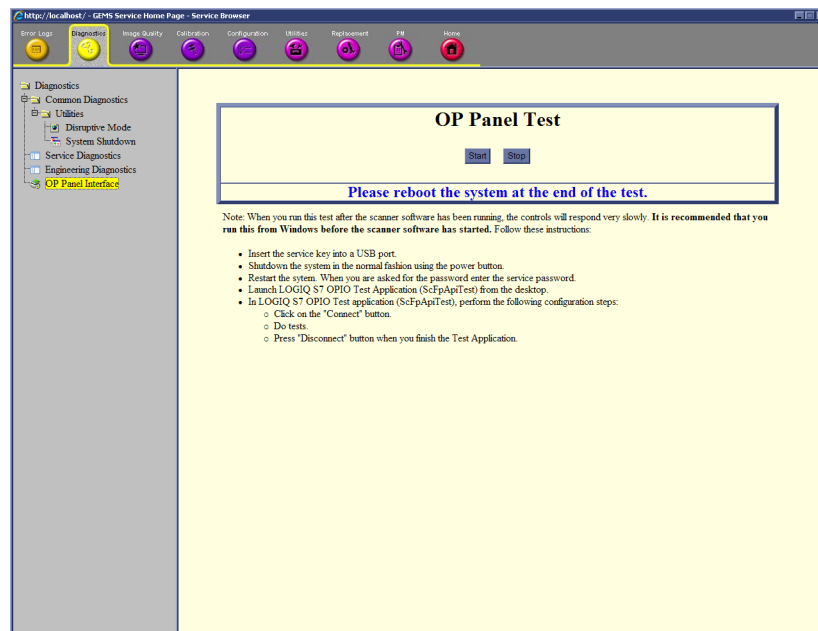


Figure 4-35 OP Panel Interface page screen

- 5) Click the "Start" on OP Panel Interface page

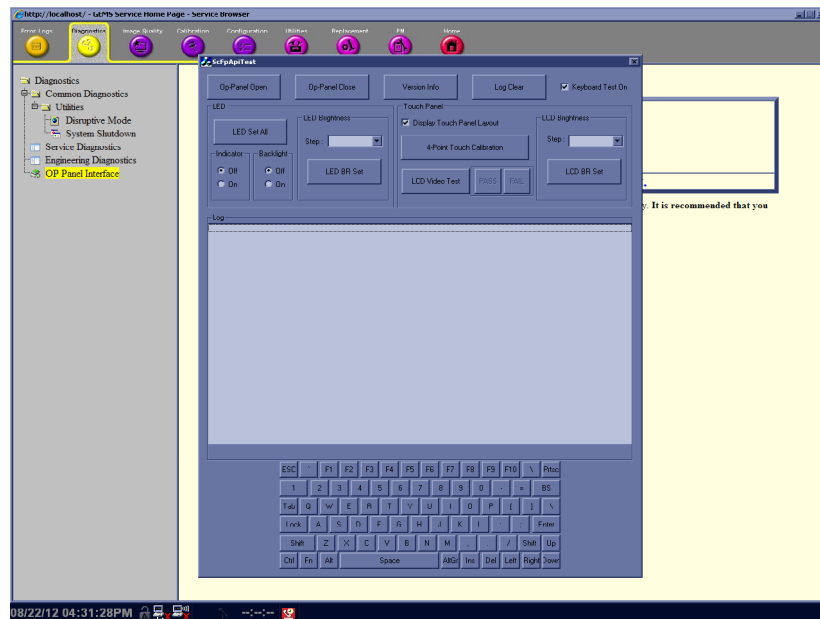


Figure 4-36 OP Panel Interface page screen

- 6) Select "Op-Panel Open"
- 7) Verify OP Panel button operation is reflected on diag window.
- 8) Check the "Display Touch Panel Layout" and Press the four Points in Touch Panel. The four Points is (80, 80), (720, 80), (80, 520) and (720, 520) points.
- 9) Verify that 4 touch points have the almost same position between appeared log points and touch points. The possible error range of touch points is plus or minus 20 points. If this step is failed, Please execute section *section 4-3-10*

**NOTE:** If four touch points are out of possible error range, repeat these 8-9 steps three times.

## 4-3-9 OPIO Interface Check (R3 only)

**NOTE:** Alternatively, OP Panel Interface test may be executed from Common Service Desktop.

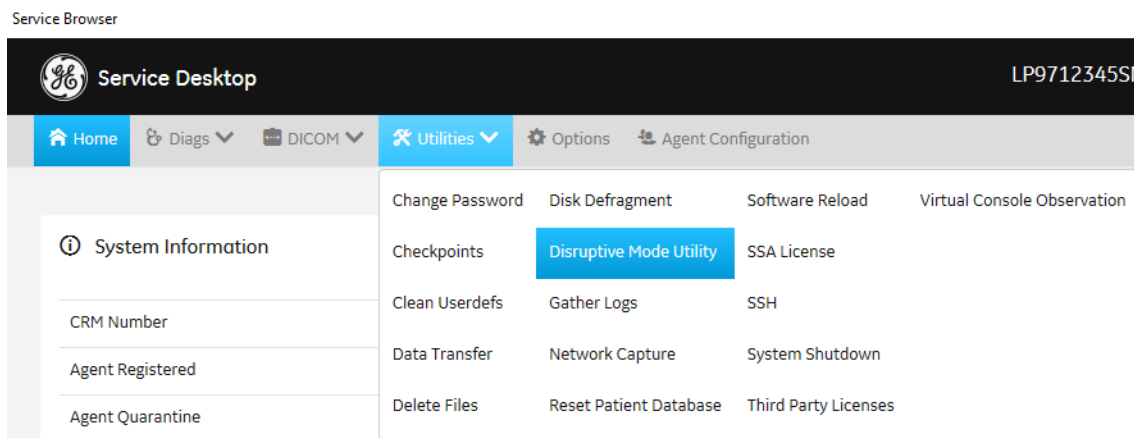
However, performance / response of the diagnostics may be degraded when executed with scanner software still active.

It is located under Diags -> Run Diags -> Service Menu -> OpPanel -> OpPanel Test in the Diagnostics page.

Before OP Panel Interface test execute from Common Service Desktop, you have to enable the Disruptive Mode in Utilities -> Disruptive Mode Utility

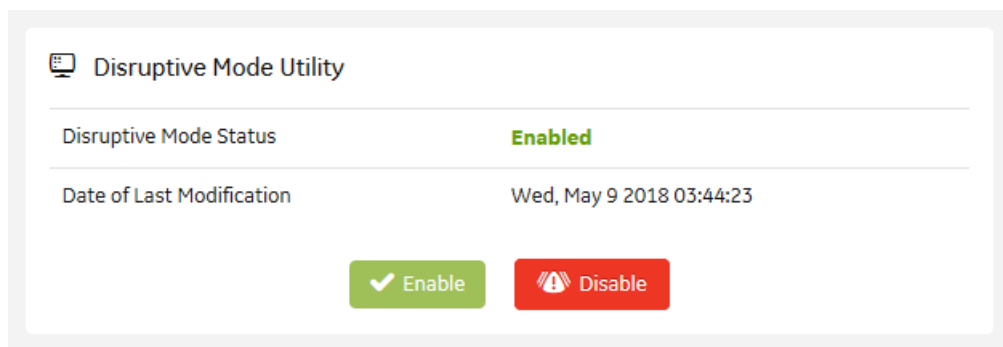
To perform OPIO Interface Check using Diagnostics

- 1) Enter Common Service Desktop
- 2) Select Utilities -> Disruptive Mode Utility



**Figure 4-37 Disruptive Mode Utility**

- 3) Click the "Enable" on Diagnostic Mode Utility page



**Figure 4-38 Diagnostic Mode page screen after enable the Disruptive mode**

- 4) Select Diags -> Run Diags -> Service Menu -> OpPanel -> OpPanel Test

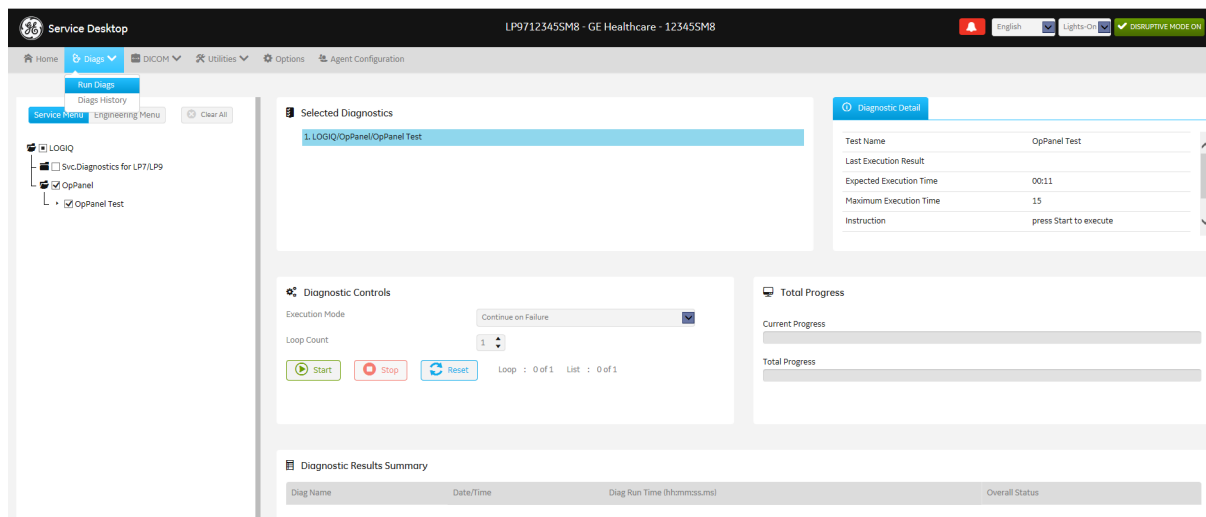


Figure 4-39 OP Panel Interface page screen

- 5) Click the "Start" on OP Panel Interface page

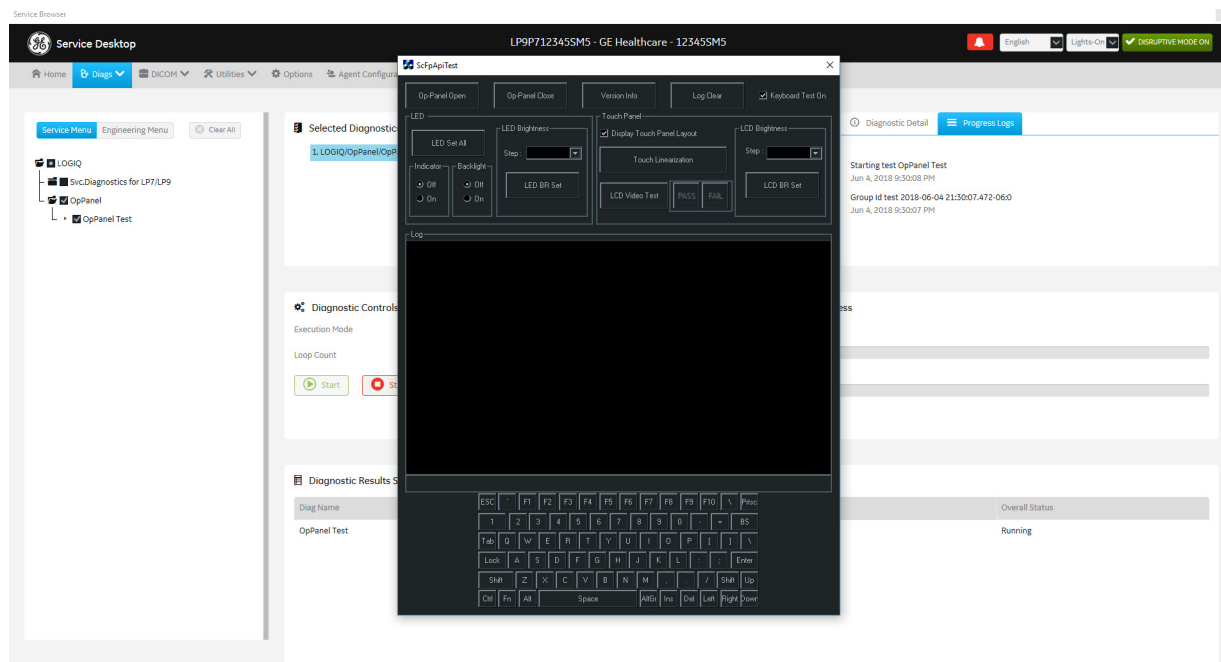


Figure 4-40 OP Panel Interface page screen

- 6) Select "Op-Panel Open"
- 7) Verify OP Panel button operation is reflected on diag window.
- 8) Check the "Display Touch Panel Layout" and Press the four Points in Touch Panel. The four Points is (80, 80), (720, 80), (80, 520) and (720, 520) points.
- 9) Verify that 4 touch points have the almost same position between appeared log points and touch points. The possible error range of touch points is plus or minus 20 points. If this step is failed, Please execute section 4-3-10

---

*NOTE: If four touch points are out of possible error range, repeat these 8-9 steps three times.*



#### 4-3-10 Touch Panel Calibration (R3 only)

- 1) Power ON the scanner, and wait until the main screen comes up.
- 2) Insert the service dong to the front USB port.
- 3) Press Power button on the operator panel once.
- 4) Click [Exit] button on the SYSTEM EXIT dialog.
- 5) On "Maintenance Access" dialog, enter the password
- 6) Click [Exit to Windows] on Maintenance dialog. The system will exit to the Windows desktop.
- 7) Click [Start] button, select "Control Panel", and then select "Tablet PC settings". Tablet PC settings dialog appears.
- 8) Select the "3. Displaylink" in Display tab -> Display options -> Display

- 9) Press the Reset button in Display tab -> Display options -> Details

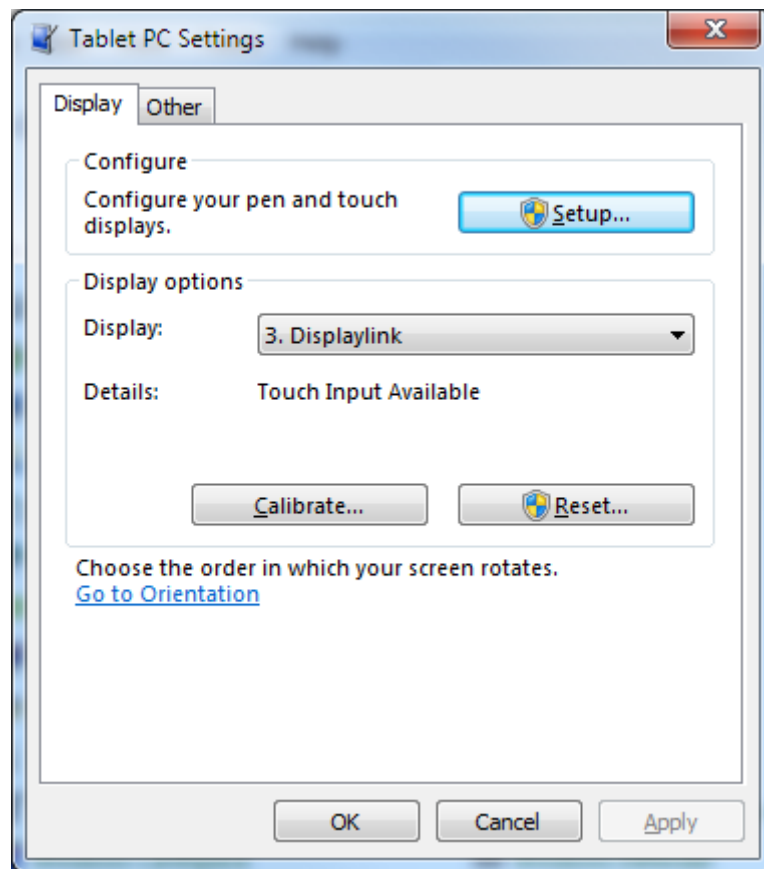


Figure 4-41 Tablet PC Settings dialog

- 10) Press the OK when pop-up the window like section 4-42

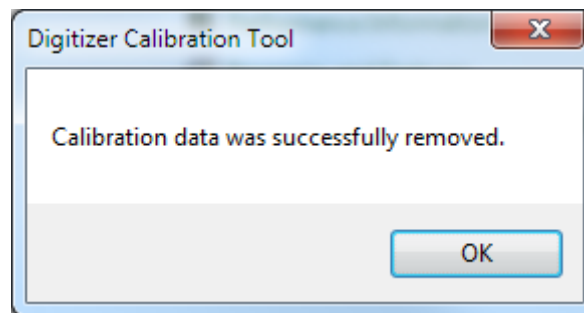


Figure 4-42 Digitizer Calibration Tool

- 11) Press "Calibrate..." in Display tab -> Display options -> Details

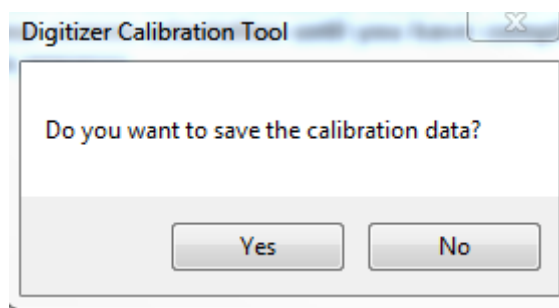
12) Calibrated carefully 16 calibration points in touch panel.



**Figure 4-43 Calibration Layout**

**NOTE:** *Figure 4-35 is intended to be shown upside-down.*

13) Press the Yes when pop-up the window like section 4-44



**Figure 4-44 Digitizer Calibration Tool**

14) Functional Check in section 4-3-8

## Section 4-4 Board Diagnostics



**NOTICE** Please see Section 7-6 for the details.

Category	Item	MCB	MDC	MPI	MIO	Battery Module	ECG	DC4D	Other
<b>MCB</b>	MCB Swept Demodulator Test	X							
	MCB Front End Interface Test	X							
	MCB Analog Test	X							
	MCB Memory Access Test	X							
	MCB Front End Interface FPGA Test	X							
	DSP Master Clock Check	X							
	MCB Temperature Test	X							
	CPU Temperature Test	X							
	MCB Voltage Test	X							
	FPGA Version Test	X							
	HV_STOP Test	X	X						
<b>MDC</b>	MDC Temperature Test		X						
	MDC Voltage Test		X						
<b>Battery</b>	Battery Status Test					X			
	Battery Charge/ Discharge Test					X			
<b>System</b>	Rack Temperature Test	X	X			X			
	Rack Voltage Test	X	X			X			
<b>Memory</b>	Callisto Internal Memory Test	X							
<b>Digital Receive</b>	AFE IF Test	X							
	Complex Mixer Test	X							
	CE Decoder Test	X							
<b>Analog Receive</b>	Noise Floor Test	X							
	BF Analog Rx Gain Test (High Gain)	X							
	BF Analog Rx Gain Test (Med Gain)	X							
	BF Analog Rx Gain Test (Low Gain)	X							
	aCW Pedof	X							
	aCW Beamforming	X							
	aCW IQ Symmetry	X							
<b>ECG</b>	ECG Module Test						X		
<b>DC4D</b>	DC4D Presence Test							X	
	DC4D Version Test							X	
	Static 3D Test							X	
	4D Test							X	

COMEXP	Essential Test								COMEXP
	HD Test Long								HDD
	HD Test Short								HDD
	Memory								COMEXP
	Network Interface								COMEXP/ EthernetPort
	Network Interface Reliability Test				X				COMEXP/ EthernetPort
	RTC Clock				X				COMEXP
	Video cards								COMEXP
	AVI Playback								COMEXP
	CDR								ODD
	CDRW								ODD
	DVD-R								ODD
	DVD-R Double Layer								ODD
	DVD-RW								ODD
	DVD+R								ODD
	DVD+R Double Layer								ODD
	DVD+RW								ODD
	DVD RAM								ODD
	DVD Readonly								ODD
	Keyboard								COMEXP/ AN Keyboard
	Microphone								
	Monitor								COMEXP
	Mouse								COMEXP/ OPIO Trackball
	Sound								COMEXP
	USB Ports								COMEXP/ MIO/ USB Ports



# Chapter 5

## Components and Functions (Theory)

### Section 5-1 Overview

#### 5-1-1 Purpose of Chapter 5

This chapter explains LOGIQ P9/P7's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution scheme and probes.

**Table 5-1 Contents in Chapter 5**

Section	Description	Page Number
5-1	Overview	5-1
5-2	General Information	5-2
5-3	Power ON Sequence	5-12
5-4	Software Options	5-13
5-5	Hardware Options	5-17
5-6	Regional and Peripheral Options	5-19
5-7	Mechanical Descriptions	5-20
5-8	Exiting to Windows Desktop	5-22
5-9	Service Platform	5-24
5-10	Common Service Desktop (CSD) (R1, R2, R2.5 only)	5-26
5-11	Common Service Desktop (R3 only)	5-36

## Section 5-2 General Information

LOGIQ P9/P7 is a digital beamforming curved-, linear- and phased array ultrasound imaging system. The system supports various operating mode such as

- B-Mode, M-Mode, Color Flow (CFM)
- Power Doppler Imaging (PDI), PW Doppler, CW Doppler
- Volume Mode (3D)

Refer to Basic User Manual for full range of operating mode.

### 5-2-1 System Exterior

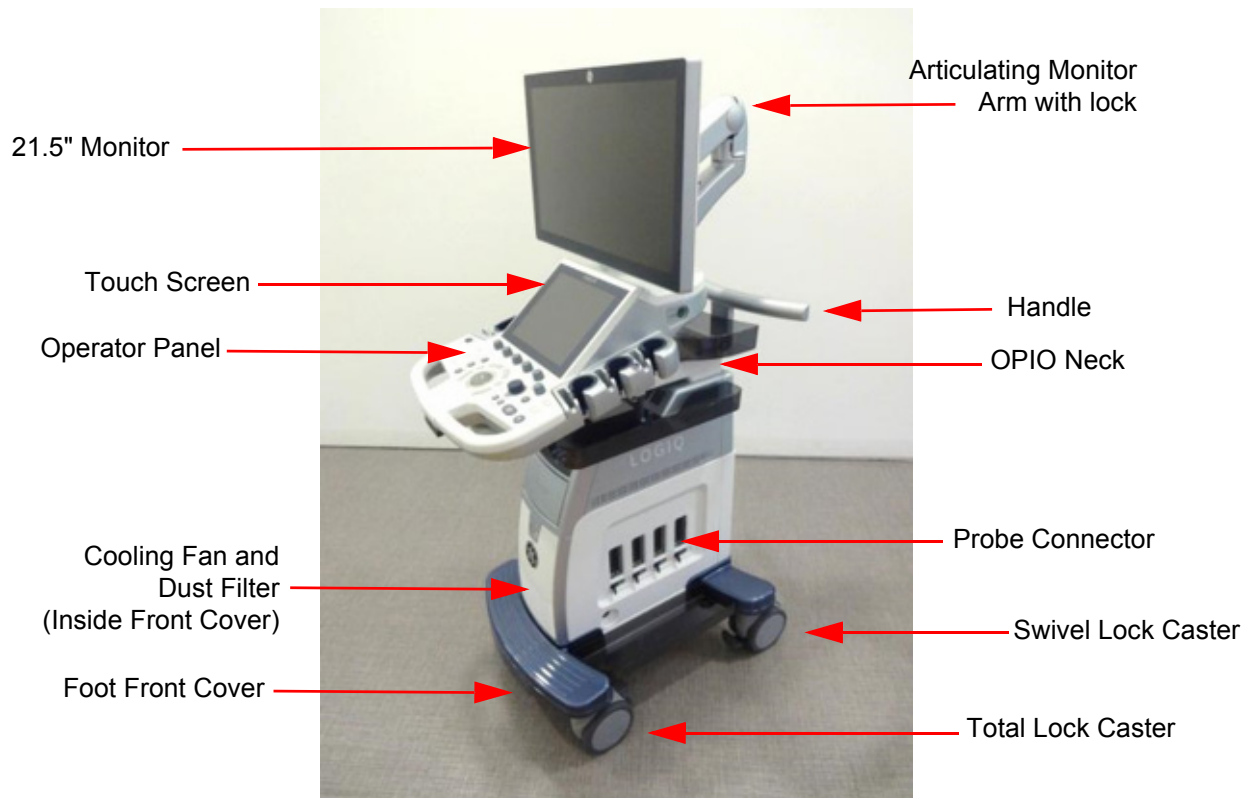


Figure 5-1 System Exterior



5-2-2      Operator Panel

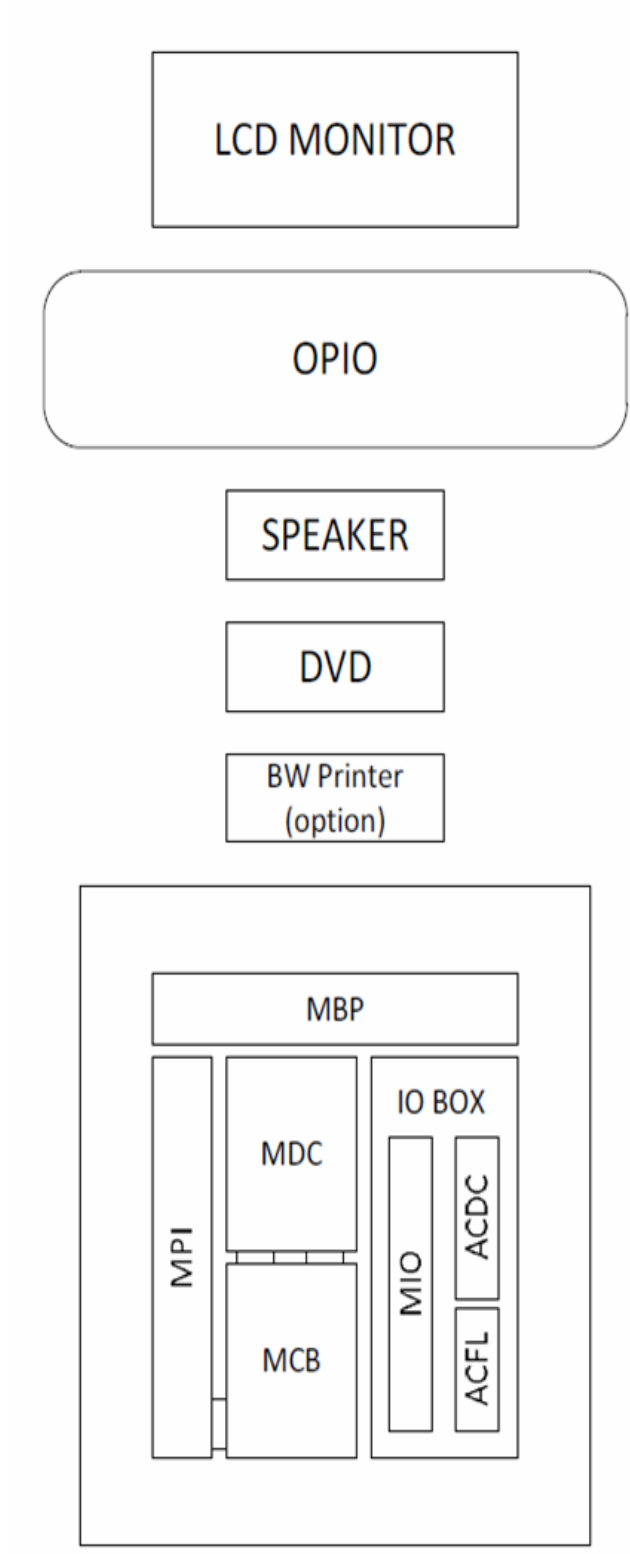


Figure 5-2 Basic Block diagram of LOGIQ P9/P7

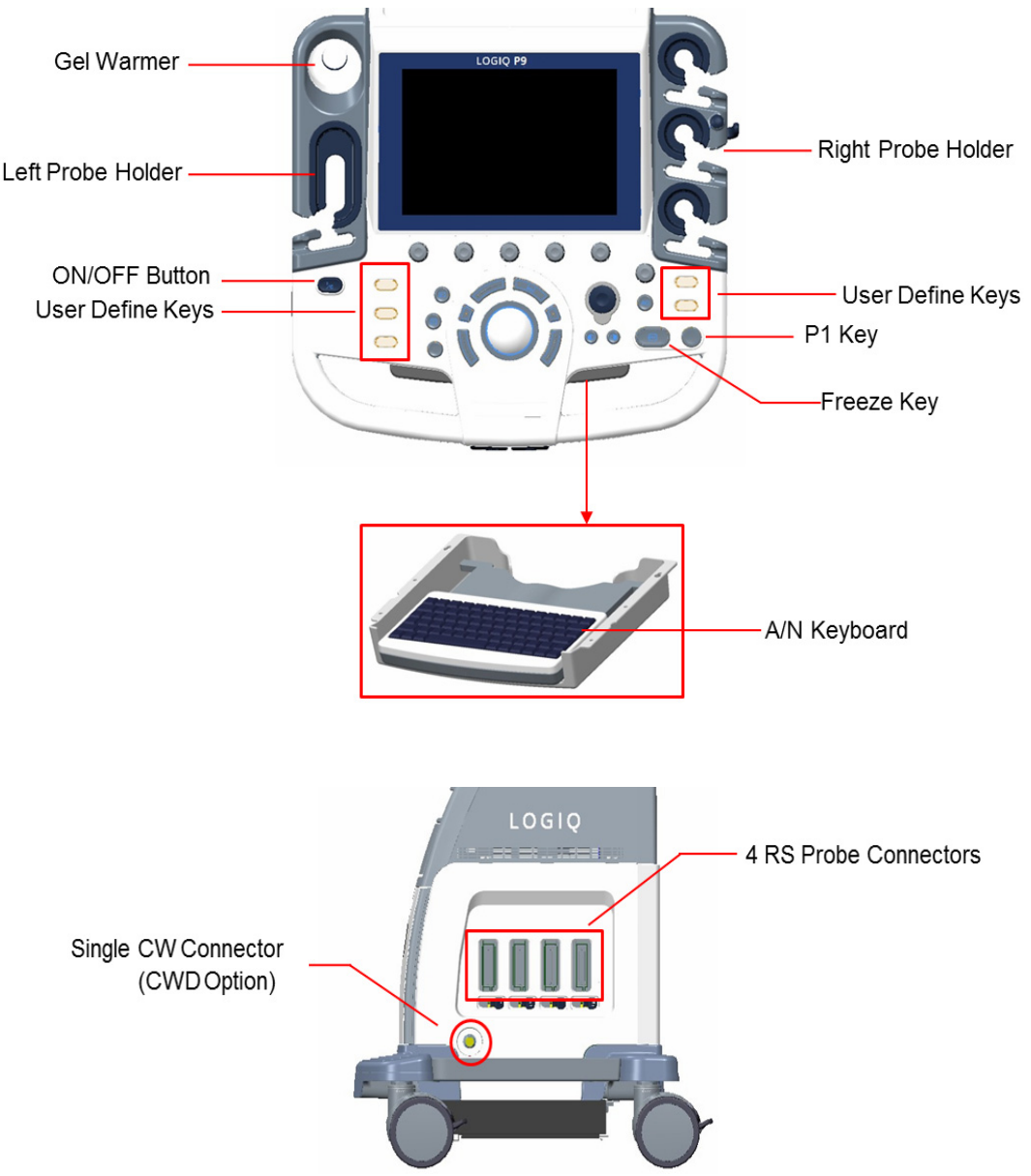


Figure 5-3 Operator Panel and Probe connector

## 5-2-3 System Options

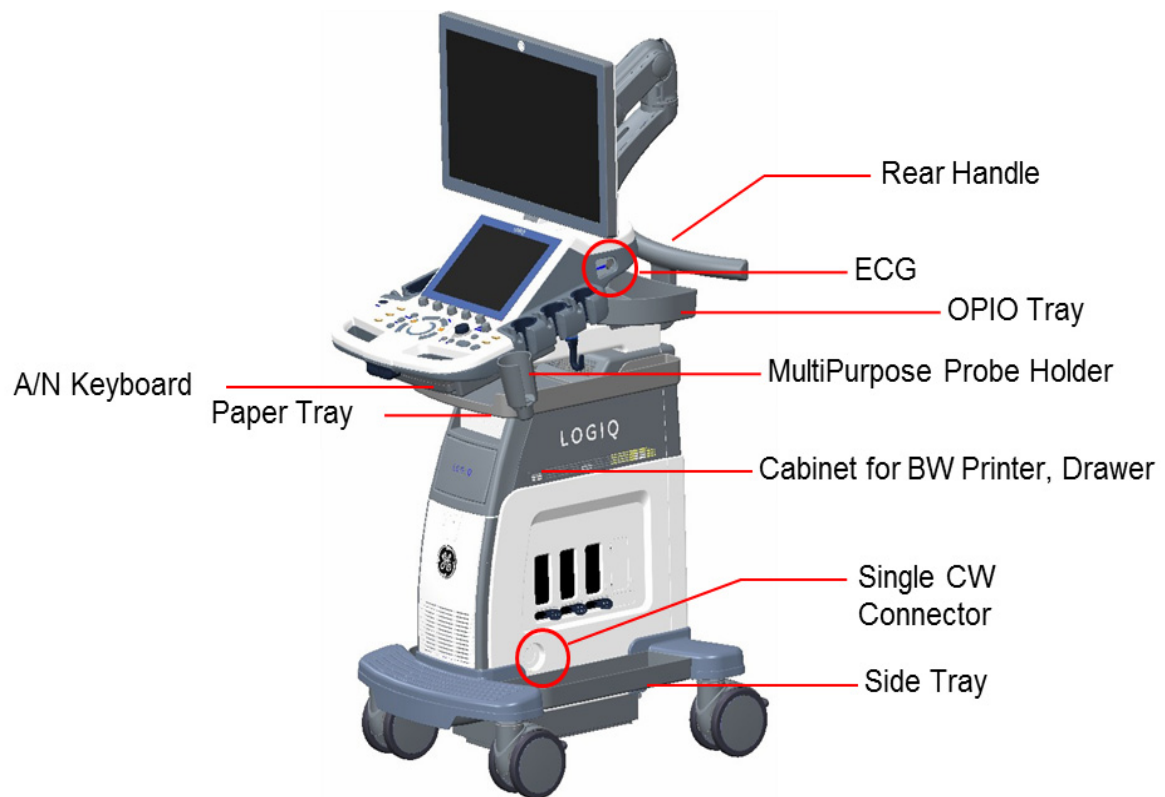


Figure 5-4 System Options

## 5-2-4 System Ports

USB Ports

Rear Panel



**Figure 5-5 System Ports**

System is equipped with 4 USB ports in front. These are customer use and Service port connected to USB controller via USB Hub.

The Rear panel contains following ports.

- 3 USB ports for peripherals such as printers and footswitch
- HDMI for monitor output (without sound)
- S-Video & Composite for monitor output
- RJ45 for LAN connection
- AC Inlet for power

#### 5-2-4-1 Front USB

Customer use and Service port connected to USB controller via USB Hub.

**NOTE:** Front USBs are non-isolated port and not fit to connect external powered USB Devices.

**Table 5-2 USB Connectors(on OPIO for R1 to R2.5)**

Pin No	Output Signal	Description
1	VCC	USB Power Supply
2	- Data	USB Data (-)
3	+ Data	USB Data (+)
4	GND	USB Power Ground

**Table 5-3 USB Connectors(on OPIO for R3)**

Pin No	Output Signal	Description
1	VCC	USB Power Supply
2	- Data	USB Data (-)
3	+ Data	USB Data (+)
4	GND	USB Power Ground
5	USB_SSRX-	Receive signal differential pairs for the Super speed USB data
6	USB_SSRX+	
7	GND	USB signal Ground
8	USB_SSTX-	Transmit signal differential pairs for the Super speed USB data
9	USB_SSTX+	

**Table 5-4 USB Connectors (on LCD monitor)**

Pin No	Output Signal	Description
1	VCC	USB Power Supply
2	- Data	USB Data (-)
3	+ Data	USB Data (+)
4	GND	USB Power Ground
5	USB_SSRX-	Receive signal differential pairs for the Super speed USB data, Not supported
6	USB_SSRX+	
7	GND	USB signal Ground
8	USB_SSTX-	Transmit signal differential pairs for the Super speed USB data, Not supported
9	USB_SSTX+	

#### 5-2-4-2 Rear USB and LAN

2 USB ports and a LAN port are integrated in a connector

LAN : 1000Base-T, 100Base-T, 10Base-T

USB : USB 2.0, 480Mbps, 5V 500mA.

**NOTE:** Rear USBs are non-isolated port and not fit to connect external powered USB Devices.

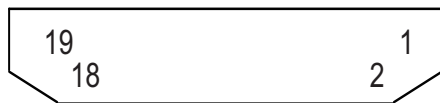
**NOTE:** Maximum allowable current through USB port is 500mA. Devices connected to port should not consume more than rated limit.

**Table 5-5 USB and LAN integrated Connector**

Pin No	Output Signal	Description
A1	VCC	USB Power supply
A2	Data -	USB Data (-)
A3	Data +	USB Data (+)
A4	GND	Ground
B1	VCC	USB Power supply
B2	Data -	USB Data (-)
B3	Data +	USB Data (+)
B4	GND	Ground
1	VCC	Ethernet reference voltage
2	MD0+	Ethernet MDI data 0 (+)
3	MD0-	Ethernet MDI data 0 (-)
4	MD1+	Ethernet MDI data 1 (+)
5	MD1-	Ethernet MDI data 1 (-)
6	MD2+	Ethernet MDI data 2 (+)
7	MD2-	Ethernet MDI data 2 (-)
8	MD3+	Ethernet MDI data 3 (+)
9	MD3-	Ethernet MDI data 3 (-)
10	GND	Ground

### 5-2-4-3 HDMI

**NOTE:** HDMI for external monitor output is DVI-D. However, connector shape is HDMI connector.



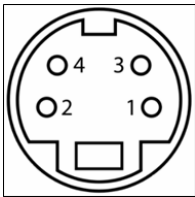
**Table 5-6 Pin Out**

Pin number	Signal name
1	TMDS Data 2+
2	TMDS Data 2 Shield
3	TMDS Data 2-
4	TMDS Data 1+
5	TMDS Data 1 Shield
6	TMDS Data 1-
7	TMDS Data 0+
8	TMDS Data 0 Shield
9	TMDS Data 0-
10	TMDS CLK+
11	TMDS CLK Shield
12	TMDS CLK-
13	NC
14	NC
15	NC
16	NC
17	GND
18	+5V
19	NC

5-2-4-4

S-Video / Composite

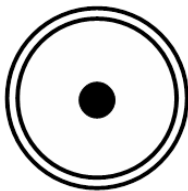
There are S-video / Composite port for external display



<S-Video 4Pin Mini-DIN Female>

Table 5-7 S-Video 4Pin Mini-DIN Female

Pin number	Signal name
1	GND / Ground (Y)
2	GND / Ground (C)
3	Y / Intensity (Luminance)-
4	C / Color (Chrominance)



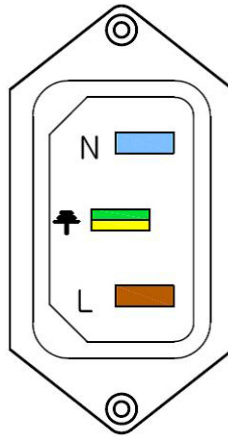
<Composite Connector>

Pin number	Signal name
1	1 plus screen

<Composite Output Port Signal Assignment>



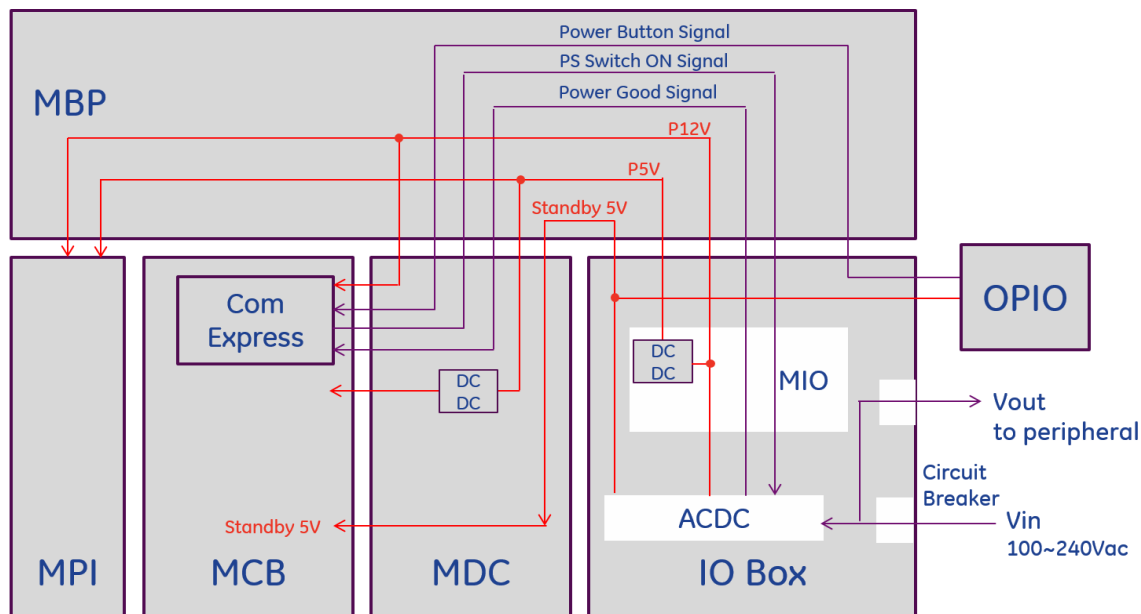
5-2-4-5 AC Inlet



100-120V/220-240V AC

Figure 5-6 AC Inlet

## Section 5-3 Power ON Sequence



### Sequence

- 1) Circuit breaker ON
- 2) AC/DC in IOBOX generates standby 5V
- 3) Standby 5V is supplied to OPIO, COM Express and each board
- 4) OPIO generates Button signal
- 5) COM Express receives the Button signal and generates Power Switch On signal
- 6) ACDC generates P12V after receiving Power Switch On signal from COM Express.
- 7) AC/DC route P12V to each board
  - AC Power is supplied to BW Printer, after generating P12V
  - MIO generates P5V and routes to each board
- 8) MDC generates LV, HV, SHV to MCB and MPI



**NOTICE** Power-ON using Battery is NOT allowed.

## Section 5-4 Software Options

### 5-4-1 Options

Following options are offered for LOGIQ P9/P7.

**Table 5-8 Software Options**

Software Options	Description
Auto IMT	automatically measures the thickness of the Intima Media on the far and near vessel walls. Near Wall IMT is the distance between the trailing edges of the adventitia and intima; the Far Wall IMT is the distance between the leading edges of the adventitia and intima.
B-Flow	intended to provide a more intuitive representation of non-quantitative hemodynamics in vascular structures. All B-Mode measurements are available with B-Flow active: depth, distance along a straight line, % stenosis, volume, trace, circumference, and enclosed area.
Coded Contrast Imaging	LOGIQ P9 only : Provides contrast imaging capability
CW Doppler	Allows examination of blood flow data all along the Doppler Mode cursor rather than from any specific depth. Gather samples along the entire Doppler beam for rapid scanning of the heart. Range gated CW allows information to be gathered at higher velocities.
DICOM	To enable DICOM connection to network device
Elastography	Elastography shows the spatial distribution of tissue elasticity properties in a region of interest by estimating the strain before and after tissue distortion caused by external or internal forces. The strain estimation is filtered and scaled to provide a smooth presentation when displayed.
Elasto QA	Provides QAnalysis function in Elastography
Flow QA	Provides QAnalysis function in Flow
LOGIQView	provides the ability to construct and view a static 2D image which is wider than the field of view of a given transducer. This feature allows viewing and measurements of anatomy that is larger than what would fit in a single image. Examples include scanning of vascular structures and connective tissues in the arms and legs.
Report Writer	Provides output to external printers
Scan Assistant	provides an automated exam script that moves you through an exam step-by-step. This allows you to focus on performing the exam rather than on controlling the system and can help you to increase consistency while reducing keystrokes.
Stress Echo	provides an integrated stress echo package, with the ability to perform image acquisition, review, image optimization, and wall segment scoring and reporting for a complete, efficient stress echo examination.
TVI (Tissue Velocity Imaging)	calculates and color-codes the velocities in tissue. The tissue velocity information is acquired by sampling of tissue Doppler velocity values at discrete points
B Steer+	The user can enhance detectability of biopsy in the tissue without slanting whole B mode image.
VOCALII	You use VOCAL(Virtual Organ Computer-aided Analysis) to visualize and calculate the volume of anatomical structures, such as a tumor lesion, cysts, and the prostate.
VCI Static	VCI (Volume Contrast Enhanced Ultrasound) allows you to sweep smaller slices of data with a higher volume rate.
TUI	Tomographic Ultrasound Imaging (TUI) is a visualization mode which presents data as parallel slices (planes) through the dataset.
4D	4D provides continuous, high volume acquisition of 3D images. 4D adds the dimension of "movement" to a 3D image by providing continuous, real-time displays.

**Table 5-8 Software Options**

Software Options	Description
Auto EF	Automated Ejection Fraction (AutoEF) is a semi-automatic measurement tool used for measurement of the global EF (Ejection fraction).
Measure Assist Breast	Allows automatic contour and measurement of breast lesions.
Measure Assist OB	Allows automatic contour and measurement of BPD, HC, FL and AC.
Breast Productivity	Allows automatic contour and measurement of breast lesions.
Thyroid Productivity	Worksheet summary includes measurements and locations for nodule, parathyroid and lymph node.
Compare Assistant	Allows side-by-side comparison of previous ultrasound and other modality exams during live scanning.
DVR	Software Digital Video Recorder provides cine recording function to DVD or USB storage media.
AFI	Automated Function Imaging (AFI) is a semi-automatic measurement tool used for measurement of the regional functions of the left ventricle. The AFI tool is used as an optional decision support tool. The AFI tool is derived from 2D speckle tracking algorithm, which tracks and calculates the myocardial tissue deformation based on feature tracking on 2D grey scale loops.
Omniview	Displays non-orthogonal view along any drawn plane. Sub-menu on Sectional Visualization of 3D/4D mode.
STIC	Spatio-temporal image correlation (STIC) is a new approach for clinical assessment of the fetal heart. STIC offers an easy to use technique to acquire data from the fetal heart and to aid in visualization with both two dimensional and three-dimensional (3D) cine sequences.
Advanced3D	Designed for rendering B Mode and Color Flow Mode images, e.g., vessel trees.
LP7 MSK Korea (R2 or later)	Support the ML6-15 probe on LP7. (Korea only)
GT (R2.5 or later)	Displays the needle's position in real-time graphics that are overlaid on the image of the scan plane. The trajectory can then be monitored as it progresses toward the target.
Shear Wave Elastography	A type of Elastography using force generated from a high intensity ultrasound pulse to generate a laterally travelling shear wave that is then observed and tracked using ultrasound. The velocity of the shear wave is used to generate an elasticity image.
HRes Contrast Upgrade	LOGIQ P9 only : Provides additional high resolution contrast imaging modes.
Tablet Tools	LOGIQApps are available for Android devices via Bluetooth: Remote Control App and Photo/Barcode Reader App. Bluetooth dongle can be inserted to any of the USB ports in the system.
HDLive	HDlive is an extraordinary rendering method generating amazingly realistic images of the human fetus from sonographic data. Through the use of an advanced illumination model, HDlive supports shadows, a virtual light source and advanced skin rendering techniques.

**NOTE:** *In case the user scans any other barcodes in the manual below apart from “USB Serial” then the barcode reader might be unable to scan the QR Code on the Pinpoint Needle or Patient or worklist. In this case, please re-scan the “USB Serial” barcode.*

### ***USB Serial***

Scan the following code to program the scanner to emulate a regular RS232-based COM Port. If you are using a Microsoft® Windows® PC, you will need to download a driver from the Honeywell website ([www.honeywellaidc.com](http://www.honeywellaidc.com)). The driver will use the next available COM Port number. Apple® Macintosh computers recognize the scanner as a USB CDC class device and automatically use a class driver.



*Note: No extra configuration (e.g., baud rate) is necessary.*

**Figure 5-7 USB Serial**

## 5-4-2 Smart Devices Applications (LOGIQ Apps)

The Smart Devices Applications are available for Android via Bluetooth:

- Remote Control App
- Camera App

To link to the device:

- 1.) Insert Bluetooth dongle into USB slot
- 2.) Connect the device to the LP7/9 via dongle.
- 3.) Scan for devices.
- 4.) Connect to the device.

### Remote Control App

Via the Remote Control App, you will be able to adjust the following controls:

- Depth
- PW Gain
- CF Gain
- B-Mode Gain
- Left/Right
- Measure
- Comment
- Clear
- Trackball
- Freeze
- Store
- Color Flow Scale
- Cursor

### Camera App

You can use the camera to capture images that will go to the patient's exam.

## Section 5-5 Hardware Options

### 5-5-1 Options

Following options are offered for LOGIQ P9/P7.

**Table 5-9 Hardware Options**

Hardware Options	Description
<b>ECG Option</b>	
LP9/P7 ECG Module without ECG cables	Provides interface to ECG cable
ECG Cable - AHA	For US (AHA) color codes
ECG cables - IEC	Right Hand = Red, Left Hand = Yellow, Left Foot=Green
<b>Peripheral Device Cabinet</b>	
High Cabinet for LOGIQ	Provides additional 2 on-board devices
Low Cabinet for LOGIQ	Provides lowest OPIO position
Drawer (for High Cabinet)	Installed on Color printer position
<b>Peripheral Devices &amp; Misc</b>	
Card Reader Mounting Kit	LP9 and LP7 CR Mounting Kit
LP9 and LP7 Articulating Monitor Arm	LP9 and LP7 Articulating Monitor Arm
LP9 and LP7 Pencil Probe CW HW Kit	LP9 and LP7 Pencil CW HW Kit
LP9 and LP7 Side Tray	Maru Side Tray
LP9 and LP7 4D Kit	LP9 and LP7 4D Kit
USB 3 Pedal Foot Switch	USB 3 Pedal Foot Switch
LP9 and LP7 Paper tray	LP9 and LP7 Paper tray
LP9 and LP7 Rear handle	LP9 and LP7 Rear handle
LP9 and LP7 OPIO tray	LP9 and LP7 OPIO tray
LP9 and LP7 Battery Kit	LP9 and LP7 Battery Kit
LP9 and LP7 Battery Pack (=power assiat)	Solo Battery
LP9 and LP7 4 RS Connector MPI	LP9 and LP7 4 RS Connector MPI
LP9 and LP7 Wireless LAN	LP9 and LP7 Wireless LAN
LP9 and LP7 Gel Warmer	LP9 and LP7 Gel Warmer
LP9 and LP7 Universal Video Converter	LP9 and LP7 Universal Video Converter
Isolation Transformer	Isolation Transformer for external patient monitor AC input
MCWD	CW Piggy board for CW option
EMI filter (AC filter)	EMI filter (AC filter)
<b>Optional Probe Holders</b>	
LP9 and LP7 Endocavity vertical probe holder	LP9 and LP7 Vert Endo Prb Holder
LP9 and LP7 Probe holder adapter for small probe	LP9 and LP7 Small Probe Holder

Table 5-9     Hardware Options (Continued)

Hardware Options	Description
LP9 and LP7 Probe Cable Hanger - Front	LP9 and LP7 Front Probe Cable Hanger
LP9 and LP7 Probe Cable Hanger - Rear	LP9 and LP7 Rear Probe Cable Hanger



## Section 5-6 Regional and Peripheral Options

### 5-6-1 Regional Options

Following options are offered for LOGIQ P9/P7.

**Table 5-10 Regional Option**

<b>Optional Power Cables</b>
Destination Set - <i>UK</i>
Destination Set - <i>South Africa</i>
Destination Set - <i>Argentina</i>
Destination Set - <i>Israel</i>
Destination Set - <i>Switzerland</i>
Destination Set - <i>Denmark</i>
Destination Set - <i>US</i>
<i>Destination Set - Japan</i>
Destination Set - <i>Australia/New Zealand</i>
Destination Set - <i>China</i>
Destination Set - <i>India</i>
<i>Destination Set - Italy</i>
Destination Set - <i>Brazil</i>
Power Cord Fix Bracket 220V
<i>Power Cord Fix Bracket 110V</i>
<b>Optional Language Keyboards</b>
LOGIQ P9/P7 Greek Keyboard
LOGIQ P9/P7 Norwegian/Danish Keyboard
LOGIQ™ P9/P7 Russian Keyboard
LOGIQ P9/P7 Swedish Keyboard
LOGIQ™ P9/P7 French Keyboard

### 5-6-2 Peripheral Options

Following options are offered for LOGIQ P9/P7.

**Table 5-11 Peripheral Option**

Printers	Description
LOGIQ P9/P7 Sony UP-D898 Digital B/W Printer Kit	B/W Printer Kit
LOGIQ P9/P7 Sony UP-D25MD Digital Color A6 Printer Kit	Digital Color A6 Printer Kit
LOGIQ P9/P7 Color Inkjet Printer (Off-board)	Inkjet Printer

## Section 5-7 Mechanical Descriptions

### 5-7-1 Physical Dimensions

#### Dimensions and Weight

- Height: 1,375mm (Minimum), 1,570mm (Max.)
- Width: 530mm (Monitor), 430mm (Operator Panel)
- Depth: 740mm
- Weight: 60kg (133 lbs)

### 5-7-2 LCD Monitor

The LOGIQ P9/P7 has a free adjustable LCD monitor in relation to the user interface.

- position up/down: +/- 7.5 cm
- position left/right: +/- 18cm
- rotation up/down: +90°/-15°
- rotation left/right: +/- 90°

### 5-7-3 OPIO Positioning

The control console can be rotated, translated and adjusted in height.

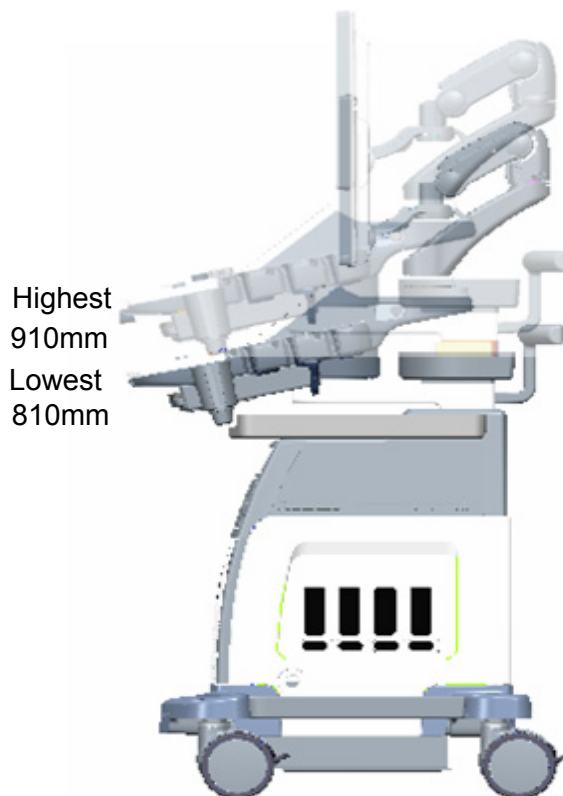


Figure 5-8 adjustable Control Console

## 5-7-4 Air Flow Distribution

**NOTE:** Clean the Air Filter periodically.

Through the filter grid on the front of the system, air flow into the LOGIQ P9/P7 scanner. By means of the 2 FAN, air is blown through the nest-box, and the warm air exits the scanner through holes in the left side panel and rear of the system.

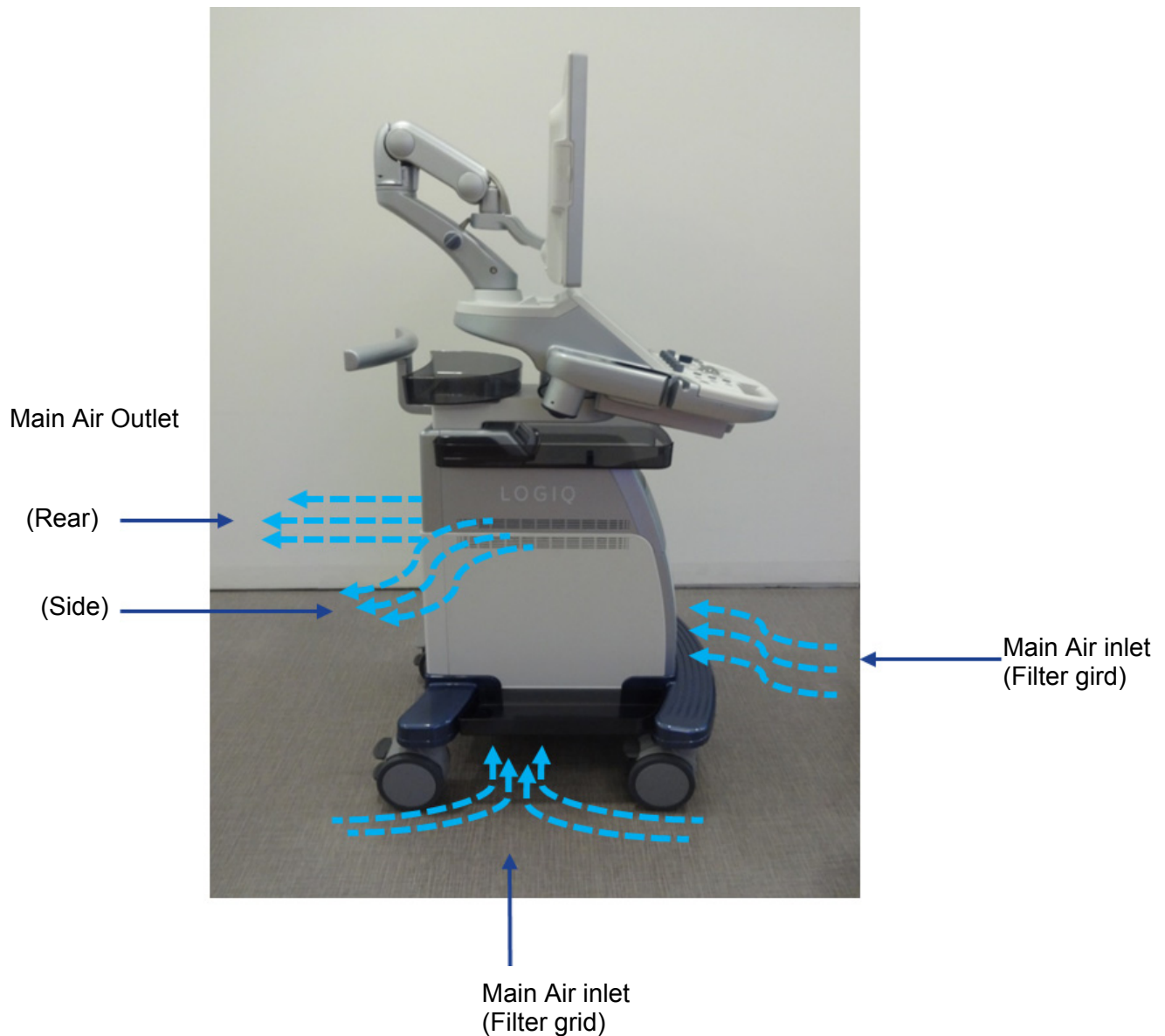


Figure 5-9 Air Inlet/Outlet at LOGIQ P9/P7

## Section 5-8 Exiting to Windows Desktop

LOGIQ P9/P7 backend software operates on embedded version of Windows 7® operating system (R2 and R2.5) or version of Windows 10 Enterprise® operating system (R3). To access some of the functions, service personnel occasionally require to enter Windows desktop to access files, folders or applications.

### 5-8-1 Exiting to Windows Desktop

Tools Required: Service Dongle

- 1) Wait for system to boot.
- 2) Connect Service Dongle to any of the USB ports available.
- 3) Tap power button once.
- 4) If Service Dongle is correctly recognized by the system, U/I popup window provides selection "EXIT".

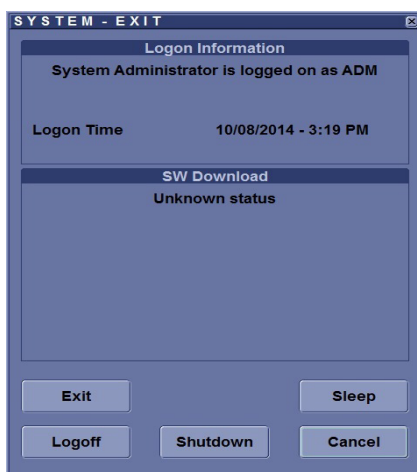


Figure 5-10 SYSTEM - EXIT (R2 and R2.5)

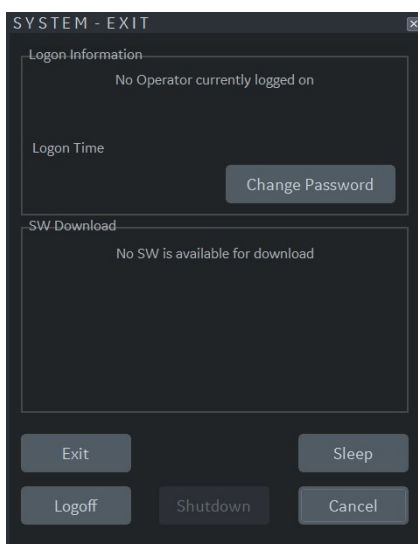


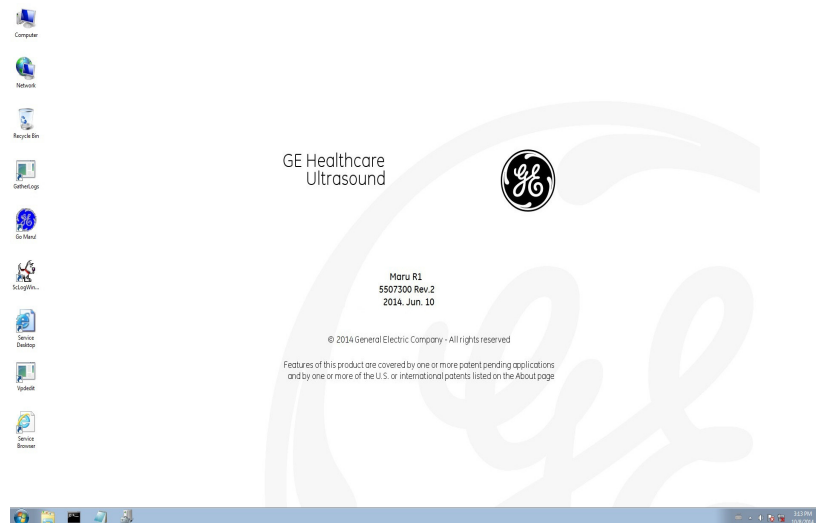
Figure 5-11 SYSTEM - EXIT (R3)

5) On “Maintenance Access” window, type in service password (user name not required).

**NOTE:** *Service Password is rotating password that changes on 6 months period. Only the GE service personnel or GE authorized dealers have access to maintenance password.*

**NOTE:** *Maintenance Password is function of date/time. Therefore, if BIOS settings differ from actual date/time, then the maintenance password may not be recognized.*

6) When entering Windows Desktop, press “Ctrl” and “Esc” at the same time to make windows menu bar to appear.



**Figure 5-12 Windows Desktop (R2 and R2.5)**



**Figure 5-13 Windows Desktop (R3)**

## Section 5-9 Service Platform

### 5-9-1 Introduction

The Service Platform will increase service productivity and reduce training and service costs.

### 5-9-2 Access / Security

The Service Platform has different access and security user levels.  
Each user is only granted access to the tools that are authorized for their use.

- [Local Access](#): via Utility - SERVICE button

#### 5-9-2-1 Local Access

- 1) If not already in read mode, FREEZE the image.
- 2) Press the UTILITIES key on the control panel and touch SERVICE to invoke setup desktop.
- 3) As soon as the GEHC Service Home Page appears, select "Operator" from the pull-down menu, enter the password uls and then click [Okay] (R1, R2, R2.5 only)

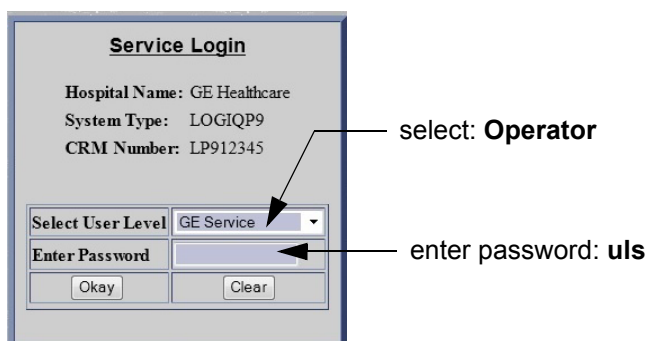


Figure 5-14 Service Login (R1, R2, R2.5 only)

The Common Service Desktop (CSD) is started and the [Home] page - containing basic System Information - appears. The navigation bar at the top of the screen allows to select different tools.

For more detailed information and description refer to [Section Section 5-10 on page 5-26](#) (R1, R2, R2.5 only) or [Section Section 5-11 on page 5-36](#) (R3 only).

### 5-9-2-2 How the Customer enables/disables Disruptive Mode and VCO

- 1) If not already in read mode, FREEZE the image.
- 2) Move the cursor to the GE icon and press the right trackball key (= right-click).
- 3) Select **Connect Clinical Lifeline** (see: [Figure 5-15 on page 5-25](#) (R1, R2, R2.5 only) or [Figure 5-16 on page 5-25](#) (R3 only) below).

This activates “Disruptive Mode” and “VCO” for the application OLC to quickly assist the customer.

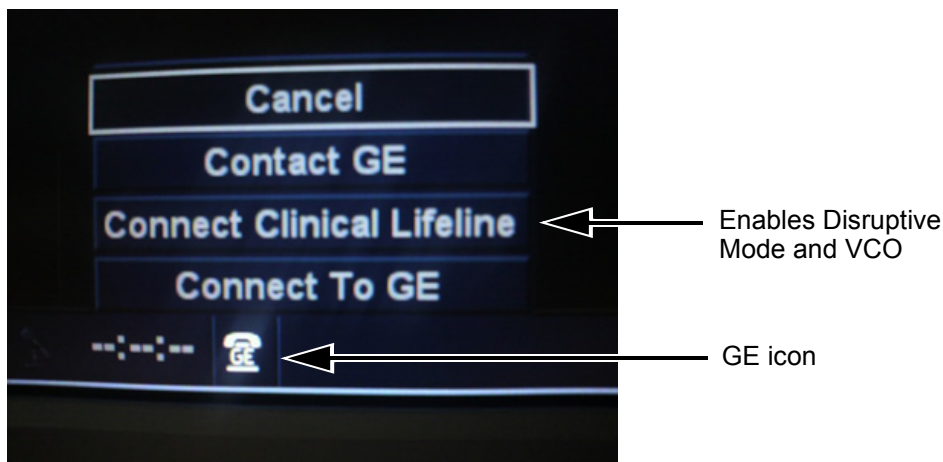


Figure 5-15 Connect Clinical Lifeline (R1, R2, R2.5 only)

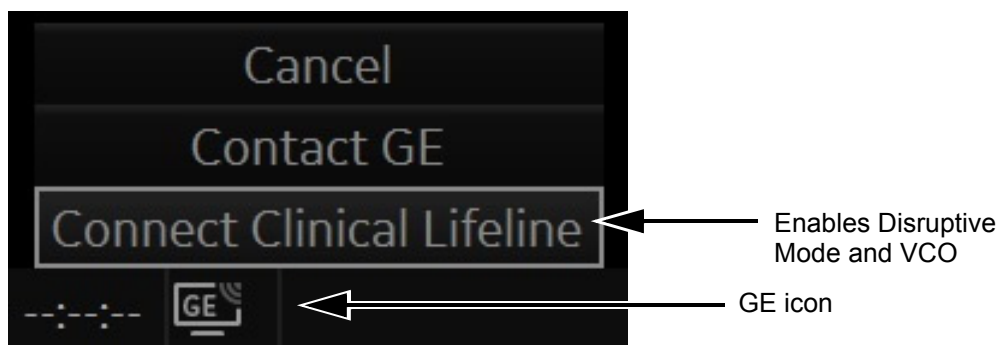


Figure 5-16 Connect Clinical Lifeline (R3 only)

**NOTE:** To disable disruptive mode, select "CANCEL".

Section 5-10  
Common Service Desktop (CSD) (R1, R2, R2.5 only)

5-10-1 Internationalization

The user interface provided by the service platform is designed for GE personnel and as such is in English only. There is no multi-lingual capability built into the Service Interface.

There are different possibilities to access the Common Service Desktop and its available features:

- 1) [Local Access](#) via System Setup - Administration - **SERVICE** page

As soon as the Common Service Desktop (CSD) is started, the Service **[Home]** Page appears.

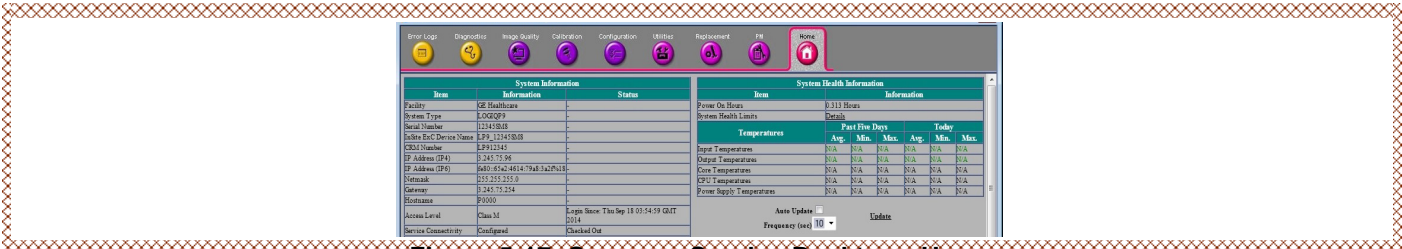


Figure 5-17 Common Service Desktop - Home

The navigation bar at the top of the screen allows to select from following tools:

- [Error Logs](#) on page 5-30
- [Diagnostics](#) on page 5-30
- [Image Quality](#) on page 5-31
- [Configuration](#) on page 5-32
- [Configuration](#) on page 5-32
- [Utilities](#) on page 5-33
- [Replacement](#) on page 5-35
- [PM](#) on page 5-35



## 5-10-2 CSD Top Page

### 5-10-2-1 General Layout

Table 5-12

1	System Information	System ID, Serial, IP Address, InSite StatusAc.etc
2	Connected Probes	Connected and System recognized probe listed
3	Option	Enabled Options and its expiration date
4	Peripheral	Connected and system recognized peripheral listed
5	System Status	System Date, Time...etc
6	Power On Hours	System Power ON hours. Health Limit link should not be referenced.
7	Temperature and Voltage	Details on the following section

The screenshot shows the GEMS Service Home Page in a Windows Internet Explorer browser. The page is titled "GEMS Service Home Page - Windows Internet Explorer" and the address bar shows "http://localhost:5088/modality-csd/servlets/MainServlet". The page has a navigation bar with icons for Error Logs, Diagnostics, Image Quality, Calibration, Configuration, Utilities, Replacement, PM, and Home. The main content area is divided into three sections: System Information, System Health Information, and Options Installed.

**System Information**

Item	Information	Status
Facility	GE Healthcare	-
System Type	LOGIQP9	-
Serial Number	12345678	-
InSite ExC Device Name	LP9_12345678	-
CRM Number	TEST_12	-
IP Address (IP4)	9.245.75.96	-
IP Address (IP6)	660:652:4614:79a8:3a2f%18	-
Netmask	255.255.255.0	-
Gateway	9.245.75.254	-
Hostname	P0000	-
Access Level	Class M	Login Since: Thu Sep 18 04:02:11 GMT 2014
Service Connectivity	Configured	Checked Out
Version: Apache/Tomcat	2.2.17 (Win32) / 6.0.29	-
Version: Java VM	1.6.0_22-604	-
Version: CSD CKM	Platform.Insite2	-
Version: SvcPform	CS_INSITEV3.6.0C	-
Software Installation Date	11:00:09 09/17/2014	-
Server History	No History available	-
Hardware Configuration	<a href="#">Details</a>	-

**System Health Information**

Item	Information																																																	
Power On Hours	0.436 Hours																																																	
System Health Limits	<a href="#">Details</a>																																																	
<b>Temperatures</b>	<table border="1"> <thead> <tr> <th></th> <th colspan="3">Past Five Days</th> <th colspan="3">Today</th> </tr> <tr> <th></th> <th>Avg.</th> <th>Min.</th> <th>Max.</th> <th>Avg.</th> <th>Min.</th> <th>Max.</th> </tr> </thead> <tbody> <tr> <td>Input Temperatures</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Output Temperatures</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Cool Temperatures</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>CPU Temperatures</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Power Supply Temperatures</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>		Past Five Days			Today				Avg.	Min.	Max.	Avg.	Min.	Max.	Input Temperatures	N/A	N/A	N/A	N/A	N/A	N/A	Output Temperatures	N/A	N/A	N/A	N/A	N/A	N/A	Cool Temperatures	N/A	N/A	N/A	N/A	N/A	N/A	CPU Temperatures	N/A	N/A	N/A	N/A	N/A	N/A	Power Supply Temperatures	N/A	N/A	N/A	N/A	N/A	N/A
	Past Five Days			Today																																														
	Avg.	Min.	Max.	Avg.	Min.	Max.																																												
Input Temperatures	N/A	N/A	N/A	N/A	N/A	N/A																																												
Output Temperatures	N/A	N/A	N/A	N/A	N/A	N/A																																												
Cool Temperatures	N/A	N/A	N/A	N/A	N/A	N/A																																												
CPU Temperatures	N/A	N/A	N/A	N/A	N/A	N/A																																												
Power Supply Temperatures	N/A	N/A	N/A	N/A	N/A	N/A																																												

Auto Update ☐  
Frequency (sec) 10 [Update](#)

**Options Installed**

Option Name	Option Status
CodeContrast	Permanent
Diocom	Permanent
Scan Assistant	Permanent
LOGIQView	Permanent
OnBoardReporting	Permanent
TUI	Permanent
VOCAL_II	Permanent
VCI-Static	Permanent
4D	Permanent
Elastography	Permanent
TVI	Permanent
AutoEF	Permanent
AutoDMT	Permanent
BSteer+	Permanent
ElastoQA	Permanent
FlowQA	Permanent
EchoStress	Permanent
BFlow	Permanent
CW_Doppler	Permanent

## 5-10-2-2 Decoding System Temperature and Voltage

**NOTE:** *These are reference only values and therefore, parameters are not constant. Some parameters may be added/deleted depending on the system configuration, type, and variation.*

In general, the first parameter defines data source (board).

"P" in the second parameter denotes "Plus" or "positive" in voltage.

"M" in the second parameter denotes "Minus" or "negative" in voltage.

"V" in the second parameter denotes "decimal point". i.e. 1V5 is 1.5.

Some Example Shown below.

**Table 5-13**

Parameter	Description
BEP_CPU_TEMPERATURE	Temperature at CPU core. This parameter used for system temperature monitoring
GFS_LM83	Additional temperature sensor at LM83 chip on GFS.
GFS_GFE	Additional temperature sensor on GFS.
GFS_SDEM	Additional temperature sensor on GFS.
GFS_BOT	Additional temperature sensor on GFS.
GFS_M5V	GFS Voltage. Minus 5.0Volt (-5V)
GFS_P3V3_VIDEO	GFS Voltage. Positive 3.3Volt (+3.3V) for video signal
GFS_P1V5_PCIE	GFS Voltage. Positive 1.5Volt (+1.5V) for PCI-E
GFS_P2V5	GFS Voltage. +2.5V
GFS_P3V3	GFS Voltage. +3.3V
~	
BF_DVDD_1V8_1	BF Voltage. 1.8V for AFE Analog/Digital Conversion (group 1)
BF_DVDD_1V8_2	BF Voltage. 1.8V for AFE Analog/Digital Conversion (group 2)
BF_DVDD_1V8_3	BF Voltage. 1.8V for AFE Analog/Digital Conversion (group 3)
BF_AVDD_3V3_1	BF Voltage. 3.3V for AFE chip LNA/VCA (group 1)
~	
BF_2V5_CLK	BF Voltage. 2.5V for clock
BF_PHVA	BF Voltage. Positive HVA
BF_MHVA	BF Voltage. Negative HVA
~	
PI_3V3_PRB	Probe Interface, 3.3V powering Probe

System Health Information						
Item	Information					
Power On Hours	0.115 Hours					
System Health Limits	<a href="#">Details</a>					
Temperature and Power	History			Today		
	Avg.	Min.	Max.	Avg.	Min.	Max.
BEP_CPU_TEMPERATURE	40.82	40.00	42.00	40.82	40.00	42.00
GFS_LM83	32.55	32	33	32.55	32	33
GFS_GFE	31.09	31	32	31.09	31	32
GFS_SDEM	41.00	41	41	41.00	41	41
GFS_BOT	39.64	39	41	39.64	39	41
GFS_M5V	-5.21	-5.21	-5.20	-5.21	-5.21	-5.20
GFS_P3V3_VIDEO	3.28	3.28	3.28	3.28	3.28	3.28
GFS_P1V5_PCIE	1.48	1.48	1.48	1.48	1.48	1.48
GFS_P2V5	2.50	2.50	2.50	2.50	2.50	2.50
GFS_P3V3	3.24	3.24	3.24	3.24	3.24	3.24
GFS_P5V	5.10	5.09	5.10	5.10	5.09	5.10
GFS_DSPCORE	1.25	1.25	1.26	1.25	1.25	1.26
BF_DS75	52.36	49	55	52.36	49	55
BF_DVDD_1V8_1	1.91	1.91	1.91	1.91	1.91	1.91
BF_DVDD_1V8_2	1.92	1.92	1.92	1.92	1.92	1.92
BF_DVDD_1V8_3	1.92	1.92	1.92	1.92	1.92	1.92
BF_AVDD_3V3_1	3.58	3.58	3.59	3.58	3.58	3.59
BF_AVDD_3V3_2	3.57	3.57	3.57	3.57	3.57	3.57
BF_AVDD_3V3_3	3.57	3.57	3.57	3.57	3.57	3.57
BF_P2V7VLL	2.79	2.79	2.79	2.79	2.79	2.79
BF_P2V5	2.44	2.44	2.44	2.44	2.44	2.44
BF_1V1_1	1.08	1.07	1.08	1.08	1.07	1.08
BF_1V1_2	1.08	1.08	1.08	1.08	1.08	1.08
BF_1V1_3	1.07	1.06	1.07	1.07	1.06	1.07
BF_1V1_4	1.07	1.06	1.07	1.07	1.06	1.07
BF_1V1_5	1.07	1.06	1.07	1.07	1.06	1.07
BF_1V1_6	1.07	1.06	1.07	1.07	1.06	1.07
BF_2V5_CLK	2.54	2.54	2.54	2.54	2.54	2.54
BF_3V3_CLK	3.41	3.41	3.41	3.41	3.41	3.41
BF_PHVA	1.00	1.00	1.00	1.00	1.00	1.00
BF_MHVA	-0.92	-0.93	-0.90	-0.92	-0.93	-0.90
BF_PHV8	0.15	0.15	0.15	0.15	0.15	0.15
BF_MHVB	-0.09	-0.10	-0.08	-0.09	-0.10	-0.08
BF_PHVMMUX	96.58	96.57	96.59	96.58	96.57	96.59
BF_MHVMUX	97.36	97.36	97.36	97.36	97.36	97.36
PL_5V_P8B	5.03	5.03	5.04	5.03	5.03	5.04
PL_12V	11.75	11.74	11.76	11.75	11.74	11.76
PL_3V3_P8B	3.32	3.32	3.32	3.32	3.32	3.32
PL_1V2	1.22	1.22	1.22	1.22	1.22	1.22
PL_2V5	2.51	2.51	2.51	2.51	2.51	2.51
PL_HVBLEVEL	96.58	96.56	96.61	96.58	96.56	96.61
PL_HVBLEVEL	91.23	91.21	91.26	91.23	91.21	91.26
CPS_HVA	1.09	1.09	1.12	1.09	1.09	1.12
CPS_HVB	0.00	0.00	0.00	0.00	0.00	0.00
CPS_PCWD	0.00	0.00	0.00	0.00	0.00	0.00

### 5-10-3 Error Logs

When the **Error Logs** page is selected, different log viewing options are available. Log Viewer is displayed in a separate window.

### 5-10-4 Diagnostics

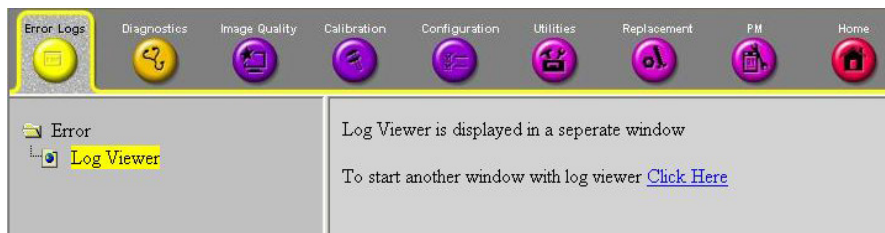


Figure 5-18 Common Service Desktop - Error Logs

The **Diagnostic** page uses a web-controlled user interface to provide access to common service components and perform diagnostics.

The left frame shows the list of diagnostics items. The user can select diagnostics item as necessary and can perform the test with Execute button at the bottom.

The user can extend hierarchy menu and each folder contains several items. The user can select multiple items and execute selected items automatically.

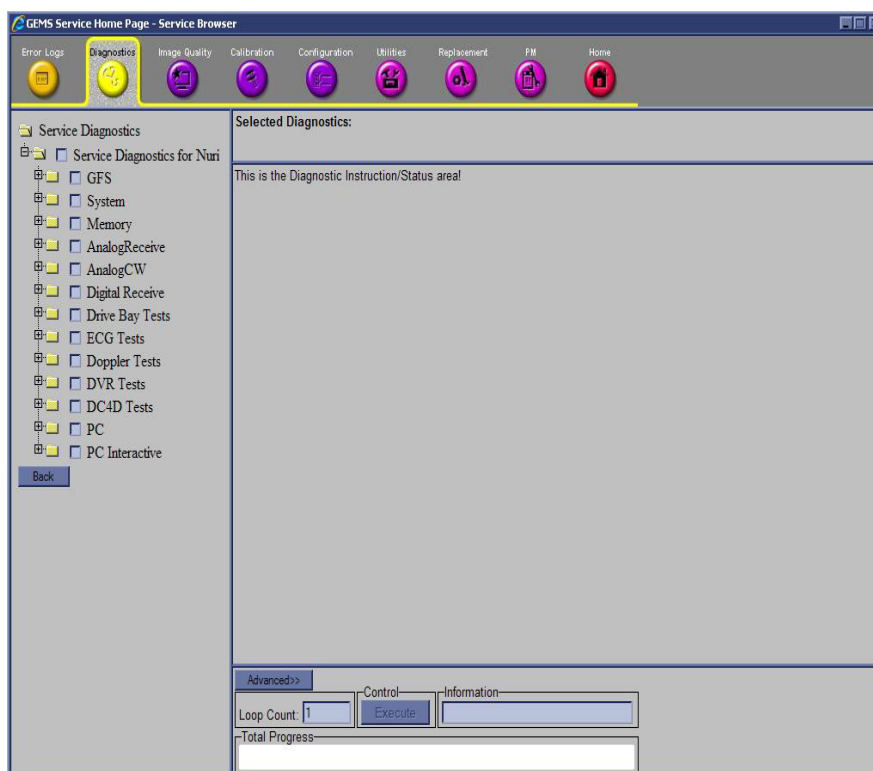


Figure 5-19 Common Service Desktop - Diagnostics

## 5-10-5 Image Quality

In the **Image Quality** page, you can verify image quality.




**Figure 5-20 Common Service Desktop - Image Quality**

NOTE: This **page is not populated** in this version.

5-10-6 Configuration

In the **Configuration** page, you can view and modify different device informations and configurations. in the “InsiteExC Agent Configuration” option field.

Figure 5-21 Common Service Desktop - Configuration

 **NOTICE** Remote access is **ONLY** possible if the service platform is properly configured (either by the user or a GE technician at site). Operation see: [Section 7-5-6 "CSD: Configuration" on page 7-18](#).

## 5-10-7 Utilities

The **Utilities** page contains a variety of Windows utility tools to indicate the status of the system, in addition to various other tools.

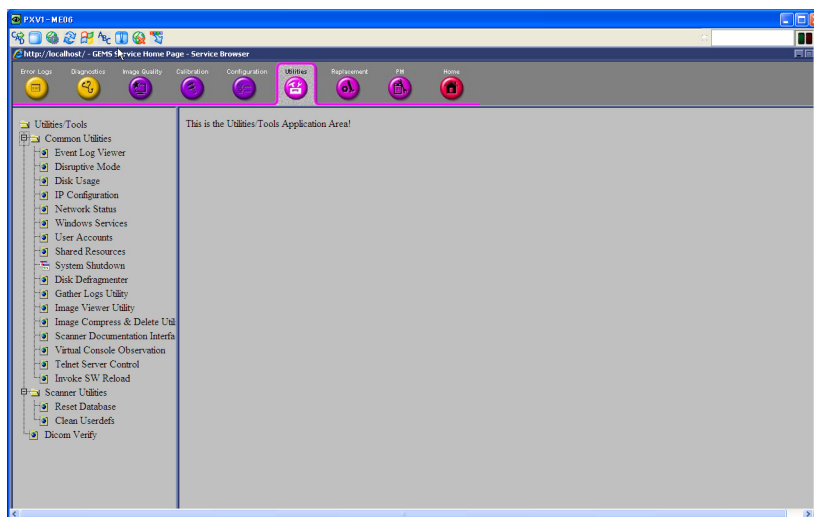


Figure 5-22

Note on Utilities:

One of the menu selections “Disk Defragmenter” invokes Windows® application executed in separate window. Because CSD window is set to be “always on top”, new window is forced to appear on behind CSD, and hence, not viewable.

In order to invoke this functionality, exit to desktop first, and select Windows® application for disk defragmentation.

### 5-10-7-1 Disk Defragmenter

- 1) Exit to Windows
- 2) Select Start -> Programs -> Administrative Tools -> Computer Management

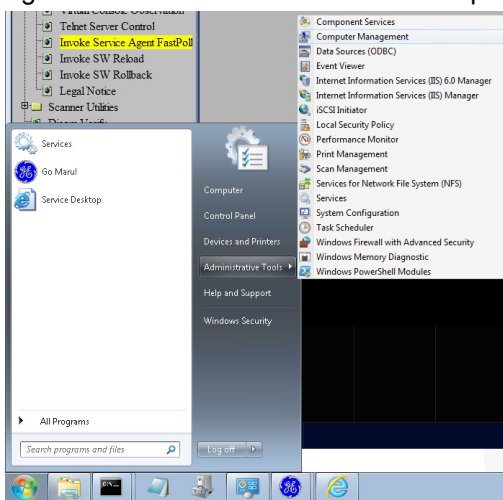


Figure 5-23

- 3) Select “Disk Defragmenter” from left pane

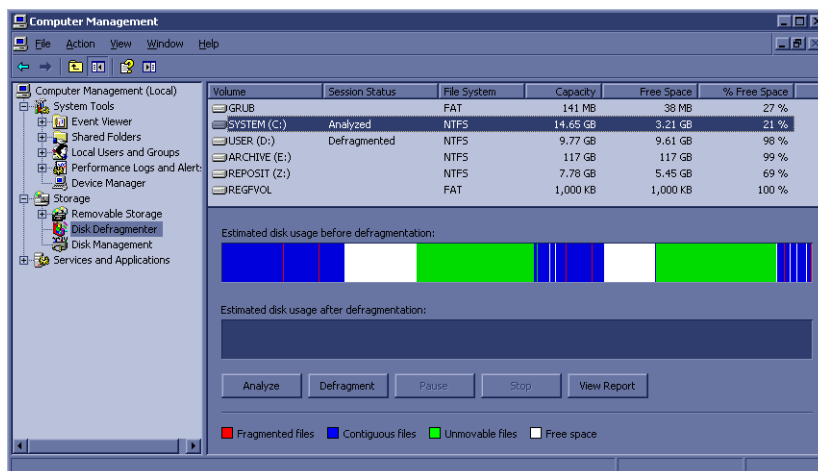


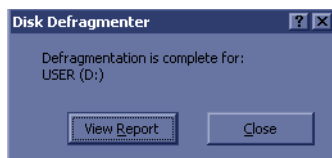
Figure 5-24

- 4) Select Disk Drive to defragment on right (upper) pane  
5) Press “Defragment” to execute defragmentation of the selected disk

**NOTE:** Press “Analyze” button to see current status of the disk

- 6) Wait until process completes and report as such.

**NOTE:** Disk defragmentation - depending on status - may take hours to complete





## 5-10-8 Replacement

There is no accessible parameters in Replacement page.

## 5-10-9 PM

In the **PM** page, information about planned, proactive and preventive maintenance is displayed, as described in [Chapter 10 - Care & Maintenance, on page 10-1](#).



**Figure 5-25 Common Service Desktop - PM**

NOTE: This **page is not populated** in this version.

## Section 5-11 Common Service Desktop (R3 only)

### 5-11-1 Purpose of this section

This section describes the features of the Service desktop. These are the different levels of access to the Service desktop:

- Service Basic access (Class A) – a user locally logged into the machine with Local Service Access privilege. This level provides limited access to Service desktop widgets and utilities.
- Service Advanced access (Class C) Local – Depending on the purchase level, includes an option string to control access.
- GE Service access (Class M) and an SSA key. For users with local Service Access privileges, this level provides unrestricted access to all Service desktop widgets and utilities.
- Remote access – a user remotely accessing the LOGIQ P9/P7. This level provides unrestricted access to all Service desktop widgets and utilities. Disruptive mode is limited to the user access privileges to Remote Service Access.

### 5-11-2 Disruptive mode

Disruptive mode is a way to control interruptions to operation of the LOGIQ P9/P7. Disruptive mode is required whenever service performs a function that may disrupt a normal scan. Activating Disruptive mode results in a red message displayed on the task bar. This message indicates that the LOGIQ P9/P7 needs to be restarted once the service activity is complete. The message remains until the LOGIQ P9/P7 is restarted. This prevents patient scanning while the LOGIQ P9/P7 is not operating at an optimal status.

For example, running a diagnostic may leave the LOGIQ P9/P7 in a state that is not good for imaging.

Specifically, Disruptive mode is required to run diagnostics, clean presets, and reset the patient database, and turn on Virtual Console Observation (VCO).

- When Disruptive mode is On, all service functionality on the Service desktop is allowed but user operation of the LOGIQ P9/P7 may be limited.
- When Disruptive mode is Off, some service functionality on the Service desktop is not available and user operation of the LOGIQ P9/P7 is normal. Additionally, the ability to enable Disruptive mode depends on the logged in user.
- Local user – a user locally logged into the machine will be able to set the LOGIQ P9/P7 to Disruptive mode or allow a Disruptive mode request from a remote user through the Service desktop. The local user must have Authorize Remote Service Access to allow Disruptive mode. If the local user does not have this right, the remote user's request will be automatically denied.
- Remote user – a user remotely accessing the LOGIQ P9/P7 will not be able to automatically switch Disruptive mode to On. The logged in user (user actually logged on to the LOGIQ P9/P7) needs to have the ability to grant remote access. The logged in user will be notified through a dialog box and asked to allow Disruptive mode

**NOTE:** *Change Password and Disk Defragment are not available for the remote user whether Disruptive mode is On or Off.*

*For more information, see [Section 5-11-2 "Disruptive mode" on page 5-36](#)*

### 5-11-3 Color statuses

Throughout the Service desktop, colors indicate the following:

- Green – Status is normal
- Orange – Status is a warning
- Red – Status is an error

### 5-11-4 Licenses

With Service Basic Access (Class A), these are the available options:

- HOME
- Utilities
- Change Password
- Data Transfer
- Delete Files
- Gather Logs
- Network Capture
- SSA License
- Third Party Licenses
- Options
- Agent Configuration

With Service Advanced (Class C), these are the available options:

- HOME
- Diags
  - Run Diags
  - Diags History
- DICOM
  - DICOM Service Status
  - DICOM Spooler
- Utilities
  - Change Password
  - Checkpoints
  - Clean Userdefs
  - Data Transfer
  - Delete Files
  - Disk Defragment
  - Disruptive Mode Utility
  - Gather Logs
  - Network Capture
  - Reset Patient Database
  - Software Reload
  - SSA License
  - Third Party Licenses
- Options
- Agent Configuration

With GE Service access (Class M) and an SSA key, these are the available options:

- HOME
- Diags
  - Run Diags
  - Diags History
- DICOM
  - DICOM Service Status
  - DICOM Spooler
- Utilities
  - Change Password
  - Checkpoints
  - Clean Userdefs
  - Data Transfer
  - Delete Files
  - Disable Remote Connectivity
  - Disk Defragment
  - Disruptive Mode Utility
  - Gather Logs
  - Network Capture
  - Reset Patient Database
  - Software Reload
  - SSA License
  - SSH
  - System Shutdown
  - Third Party Licenses
  - Virtual Console Observation
- Options
- Agent Configuration

With Remote access (Back office server), these are the available options:

- HOME
- Diags
  - Run Diags
  - Diags History
- DICOM
  - DICOM Service Status
  - DICOM Spooler
- Utilities
  - Checkpoints
  - Clean Userdefs
  - Data Transfer
  - Delete Files
  - Disable Remote Connectivity
  - Disruptive Mode Utility
  - Gather Logs
  - Network Capture
  - Reset Patient Database
  - Software Reload
  - SSA License
  - SSH
  - System Shutdown
  - Third Party Licenses
  - Virtual Console Observation
- Options
  - Agent Configuration

## 5-11-5 Advanced Information - Service Desktop and SSA (Secure Service Access)

### SSA Key

The SSA key provides secure access for GE service personnel to advanced tools to service the system

- Access to all service features
- Access to Windows Desktop
- Key must be renewed every 30 days
- Tied to SSO
- Password locked via key pad

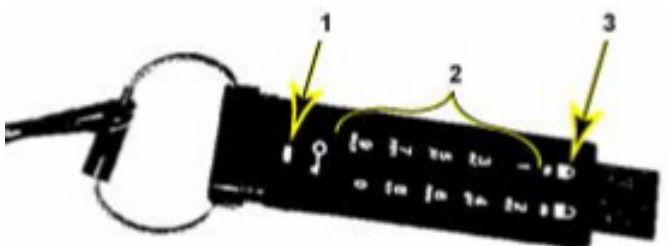


Figure 5-26 SSA Key

Item	Description
1.	Blue LED
2.	Key Pad
3.	Lock Indicators

5-11-6 Home

Home configurations vary depending upon the purchased service level.

Figure 5-27 Home with Class C and Class M Access

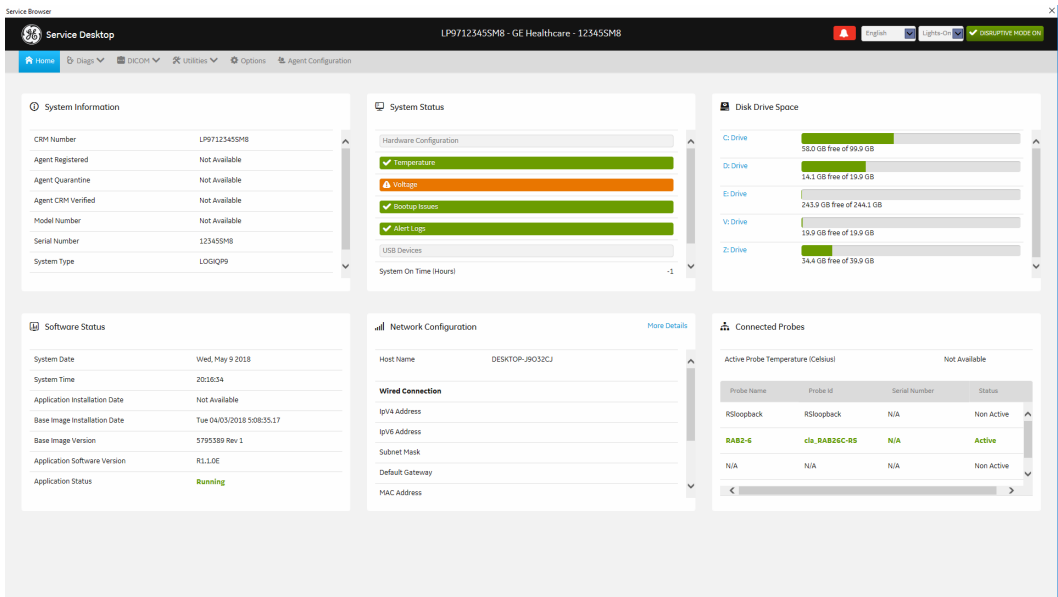
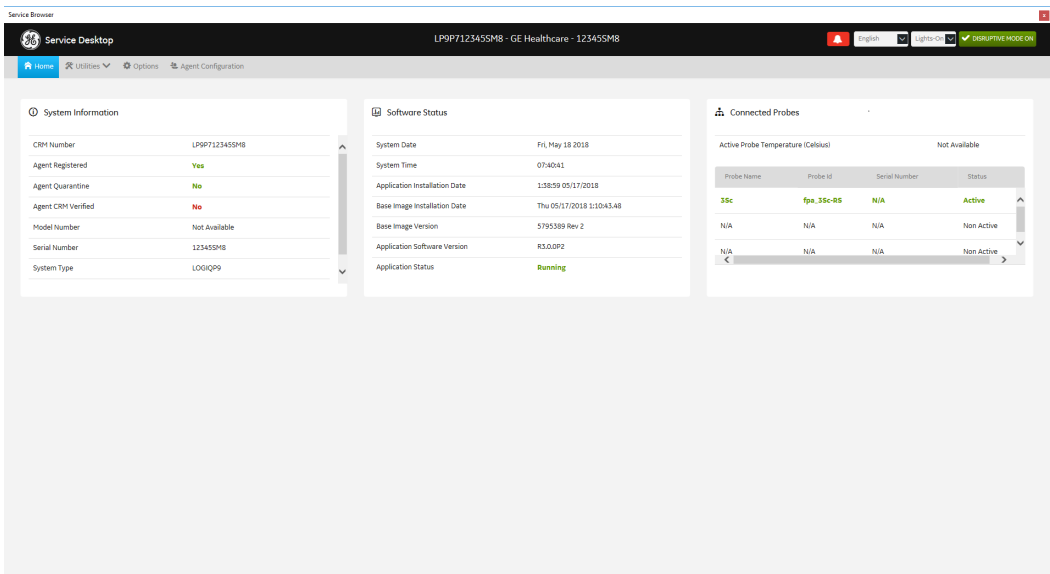


Figure 5-28 Home with Class A Access



For more information, see:

- **System Information** on page 5-43
- **Software Status** on page 5-45
- **System Status** on page 5-46
- **Disk Drive Space** on page 5-58
- **Network Configuration** on page 5-61
- **Connected Probes** on page 5-63



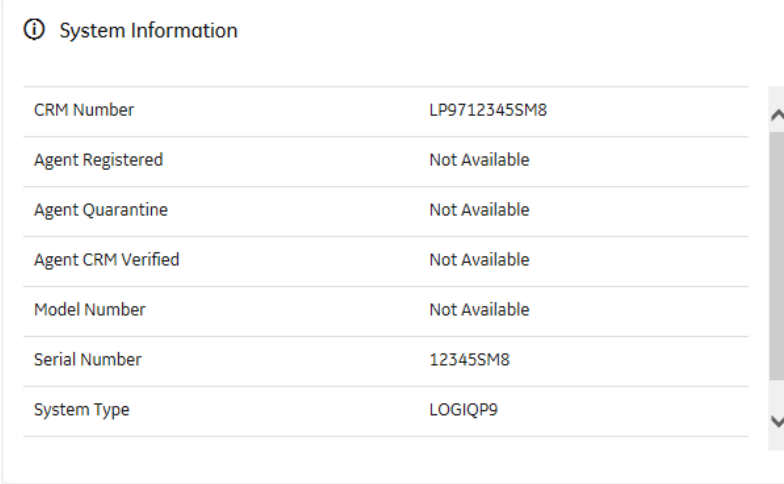
## System Information

**System Information** displays general information about the LOGIQ P9/P7. When the LOGIQ P9/P7 has been successfully configured with the back office, these elements will have the corresponding values:

- **Agent Registered** will be **Yes**
- **Agent Quarantine** will be **No**
- **Agent CRM Verified** will be **Yes**

The information on **System Information** is available to all service class licenses.

To access **System Information**, navigate to **Utility > Service > Home**.



The screenshot shows a web interface titled "System Information" with an information icon. Below the title is a table with system details. The table has two columns: the first column lists system attributes, and the second column shows their current values. A vertical scrollbar is visible on the right side of the table.

CRM Number	LP9712345SM8
Agent Registered	Not Available
Agent Quarantine	Not Available
Agent CRM Verified	Not Available
Model Number	Not Available
Serial Number	12345SM8
System Type	LOGIQP9

Figure 5-29 System Information

This table shows all the elements available on **System Information** with descriptions.

**Table 5-14 System Information**

Element	DESCRIPTION
CRM Number	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region.
Agent Registered	Registered status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent is registered in the back office.</li> <li>• No – The agent is not registered in the back office.</li> <li>• Not Available – The agent is not running or has not been configured.</li> </ul>
Agent Quarantine	Quarantine status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent has more than one device registered with the same CRM Number in the back office.</li> <li>• No – The agent has one device registered with the listed CRM Number in the back office.</li> <li>• Not Available – The agent is not running or has not been configured.</li> </ul>
Agent CRM Verified	CRM verified status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent is verified in the back office.</li> <li>• No – The agent is not verified in the back office.</li> <li>• Not Available – The agent is not running or has not been configured.</li> </ul>
Model Number	GE part number for the LOGIQ P9/P7. The same number as listed on the rating plate.
Serial Number	Serial number of the LOGIQ P9/P7. The same number as listed on the rating plate.
System Type	Product name of the LOGIQ P9/P7.
Facility	Name of the hospital or facility where the LOGIQ P9/P7 is installed.

**For more information, see:**

- [Home on page 5-42](#)

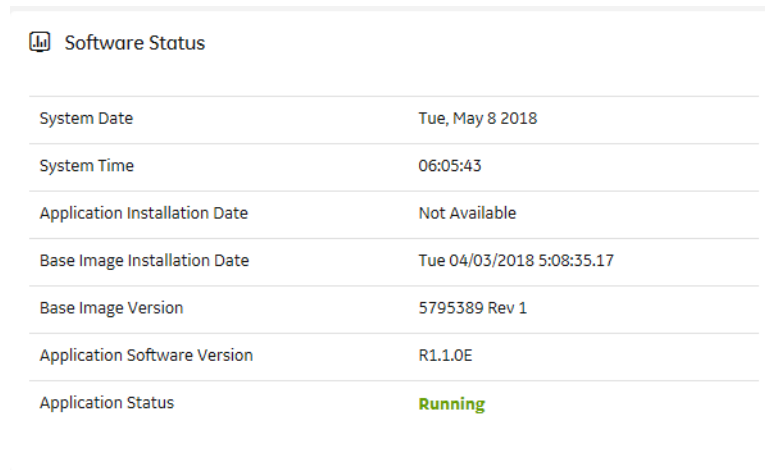
## Software Status

Use **Software Status** to view general information about the software installed on the LOGIQ P9/P7.

The information on **Software Status** is available to all service class licenses.

To access **Software Status**, navigate to **Utility > Service > Home**.

**Figure 5-30 Software Status**



The screenshot shows a web interface titled "Software Status". It contains a table with the following data:

System Date	Tue, May 8 2018
System Time	06:05:43
Application Installation Date	Not Available
Base Image Installation Date	Tue 04/03/2018 5:08:35.17
Base Image Version	5795389 Rev 1
Application Software Version	R1.1.0E
Application Status	Running

This table shows all the elements available on **Software Status** with descriptions.

**Table 5-15 Software Status**

Element	DESCRIPTION
System Date	Current date in the format <day>, <month> <date> <year>.
System Time	Local time based on the last time the system desktop was refreshed in the format <hh:mm:ss>.
Application Installation Date	Date the application software was installed. The application software includes the LOGIQ P9/P7 product-specific software.
Base Image Installation Date	Date the base image software was installed. The base image software includes the Windows operating system and other supporting software.
Base Image Version	Version number of the base image software.
Application Software Version	Version number of the application software.
Application Status	Status of the application. Valid values are: <ul style="list-style-type: none"><li>• Running</li><li>• Stopped</li></ul>

**For more information, see:**

- [Home on page 5-42](#)
- [Software Reload on page 5-81](#)

## System Status

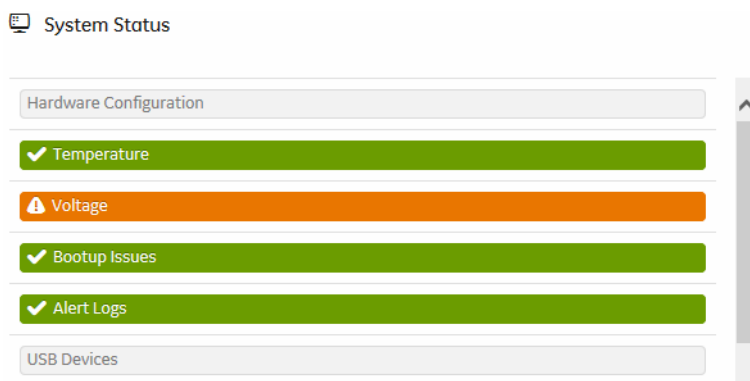
Use **System Status** to view status information on the LOGIQ P9/P7. Specifically, do the following:

- View the hardware configuration file
- View temperatures for FRUs, fans, and a graphical representation of the monitored temperatures
- View voltages for FRUs
- View issues with the boot process
- View alert logs
- View USB devices connected to the LOGIQ P9/P7
- View the amount of time the LOGIQ P9/P7 has been running
- View the amount of time since the LOGIQ P9/P7 has last been rebooted

The information on **System Status** is available to Class C and Class M licenses.

To access **System Status**, navigate to **Utility > Service > Home**.

**Figure 5-31 System Status**



This table shows all the elements available on **System Status** with descriptions.

**Table 5-16 System Status**

Element	DESCRIPTION
Hardware Configuration	Displays the contents of the hardware configuration file.
Temperature	Displays the temperature monitoring of the LOGIQ P9/P7 as normal, warning, or error using the standard colors and icons. Includes temperature out-of-spec events including an overall count of event warnings and errors for the last 30 days or the last status checkpoint whichever is sooner. Temperature displays temperature a graph for the configured monitoring points.
Voltage	Displays the voltage monitoring of the LOGIQ P9/P7 as normal, warning or error using the standard colors and icons. Includes voltage out-of-spec events including an overall count of the event warnings and errors for the last 30 days or last status checkpoint whichever is sooner.
Bootup Issues	Based on the latest occurrence, displays all abnormal boots of the LOGIQ P9/P7 for either the past 30 days or the latest check point.
Alert Logs	Based on the latest occurrence, displays all alerts generated by the LOGIQ P9/P7 for either the past 30 days or the latest check point.
USB Devices	Displays the USB connected devices and their status.
System On Time	Displays the time the LOGIQ P9/P7 was turned on.
Time Since Last Reboot	Displays the time the LOGIQ P9/P7 was last rebooted.

**For more information, see:**

- **Hardware Configuration** on page 5-48
- **Temperature** on page 5-49
- **Voltage** on page 5-52
- **Bootup Issues** on page 5-54
- **Alert Logs** on page 5-56
- **USB Devices** on page 5-57
- **Home** on page 5-42

Hardware Configuration

**Hardware Configuration** displays the contents of the hardware configuration file which includes all the vital product data (VPD).

To access **Hardware Configuration**, navigate to **Utility > Service > Home**, and then under **System Status**, select **Hardware Configuration**.

Figure 5-32 Hardware Configuration

Hardware Configuration			Home Page
Component	Item	Value	
BEP	COMPUTERNAME	DESKTOP-J9032CJ	
BF FPGA	version	0x2023	
COMEXP	VPD revision field	5	
COMEXP	Pole that owns the design	kor	
COMEXP	Functional revision	48	
COMEXP	System Platform	Maru	
COMEXP	Part number (GE format)	6324558-4_FNRV4B	
COMEXP	Bar code serial number	>	
COMEXP	Serial number	N/A	
COMEXP	GE manufacturing location	invalid	
COMEXP	Date of manufacture	14.07.17	
COMEXP	Assembly revision	3	
COMEXP	Prototype flag (1 = prototype board)	0	

This table shows all the elements available on **Hardware Configuration** with descriptions.

Table 5-17 Hardware Configuration

Element	DESCRIPTION
Component	Hardware component.
Item	Parameter with the vital product data (VPD).
Value	Actual value of the Item.

For more information, see:

- [System Status on page 5-46](#)
- [Home on page 5-42](#)

## Temperature

Use **Temperature** to troubleshoot problems with monitored FRUs and the fans. Specifically, use these pages:

- FRU Status
- Graphs

To access **Temperature**, navigate to **Utility > Service > Home**, and then under **System Status**, select **Temperature**.

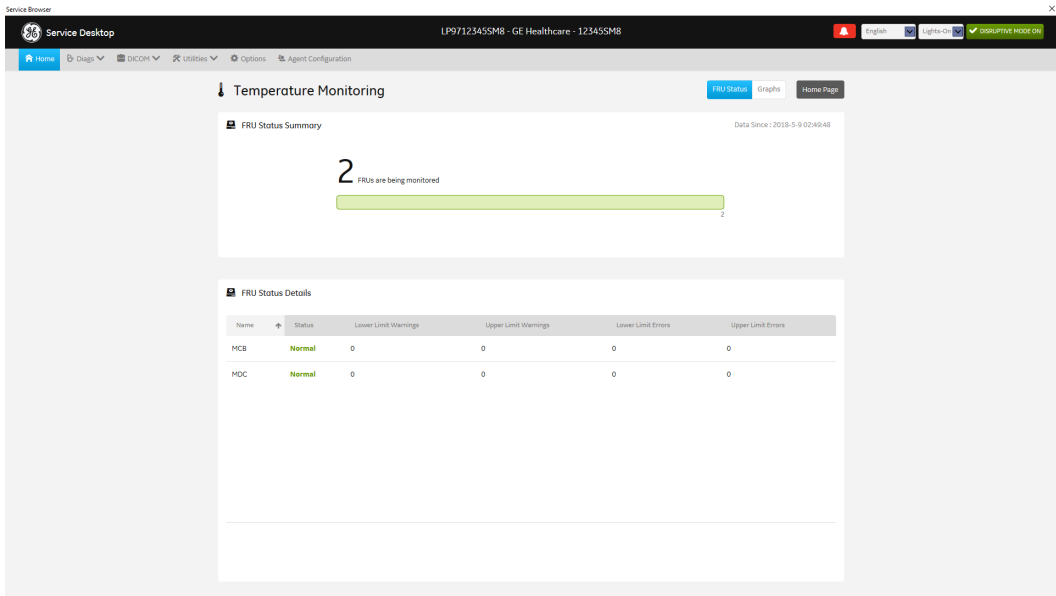
For more information, see:

- **FRU Status** [on page 5-50](#)
- **Graphs** [on page 5-51](#)
- **System Status** [on page 5-46](#)
- [Home on page 5-42](#)

FRU Status

**FRU Status** displays a summary of the FRUs being monitored and the details for each FRU. To access this page, under **System Status**, select **Temperature** and then select **FRU Status**.

Figure 5-33 FRU Status



This table shows all the elements available on **FRU Status** with descriptions.

Table 5-18 FRU Status

Element	DESCRIPTION
FRU Status Summary	Number of the FRUs being monitored.
FRU Status Details	
Name	Name of the FRU. <ul style="list-style-type: none"><li>ETX3 – Represents the ETX 64 transmitter board.</li><li>ETX4 – Represents the ETX 128 transmitter board.</li></ul>
Status	Status of the FRU. Valid values are: <ul style="list-style-type: none"><li>Normal – Indicates that the FRU is operating within the allowable range.</li><li>Warning – Indicates that the FRU is operating close to the limit of the allowable range.</li><li>Error – Indicates that the FRU is operating outside the allowable range.</li></ul>
Low Level Warning	Number of low temperature warnings.
High Level Warning	Number of high temperature warnings.
Low Level Errors	Number of low temperature errors.
High Level Errors	Number of high temperature errors.

For more information, see:

- [Temperature on page 5-49](#)
- [Home on page 5-42](#)

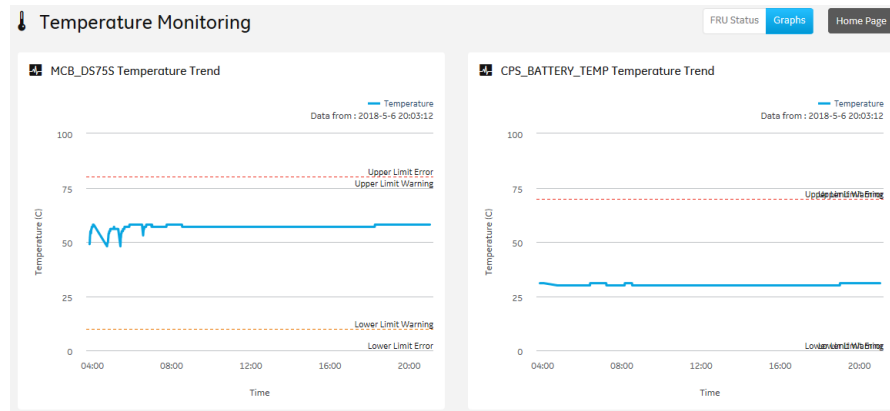


## Graphs

**Graphs** displays trend graphs for selected elements which have been selected as key indicators of overall temperature status inside the card rack.

To access this page, under **System Status**, select **Temperature** and then select **Graphs**.

**Figure 5-34 Graphs**



For more information, see:

- [Temperature on page 5-49](#)
- [Home on page 5-42](#)

Voltage

Use **Voltage** to troubleshoot problems with monitored FRUs of the LOGIQ P9/P7.

Specifically, use these pages:

- FRU Status

To access **Voltage**, navigate to **Utility > Service > Home**, and then under **System Status**, select **Voltage**.

For more information, see:

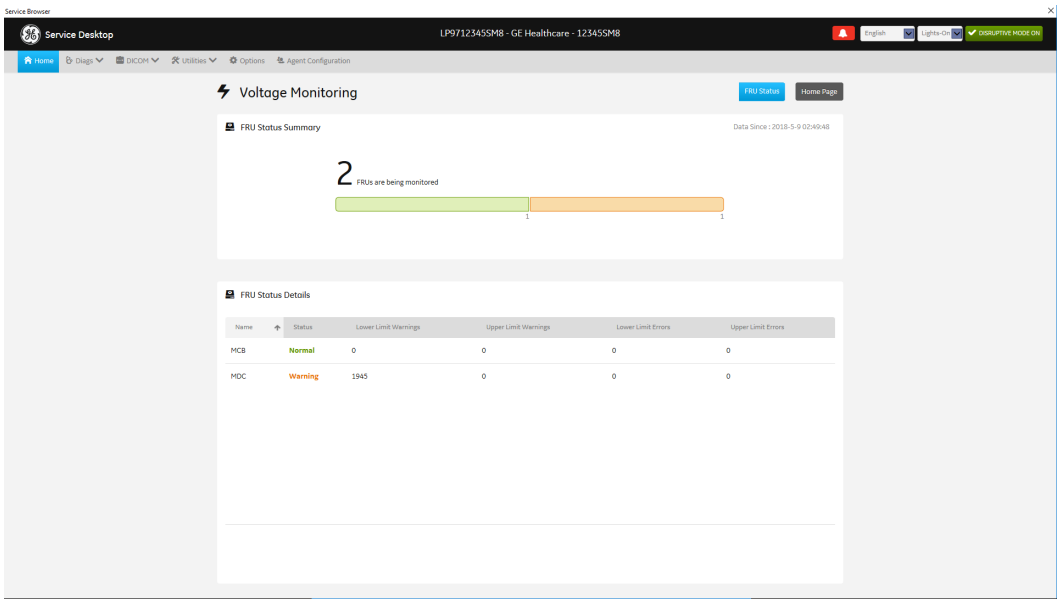
- **FRU Status** on page 5-52
- **System Status** on page 5-46
- **Home** on page 5-42

FRU Status

**FRU Status** displays a summary of the voltages for the FRUs being monitored and the details for each FRU.

To access this page, under **System Status**, select **Voltage** and then select **FRU Status**.

Figure 5-35 FRU Status



This table shows all the elements available on **FRU Status** with descriptions.

**Table 5-19 FRU Status**

Element	DESCRIPTION
Name	Name of the FRU.
Status	Status of the voltage for the FRU. Valid values are: <ul style="list-style-type: none"><li>• Normal – Indicates that the voltage is within the allowable range.</li><li>• Warning – Indicates that the voltage is close to the limit of the allowable range.</li><li>• Error – Indicates that the voltage is outside the allowable range.</li></ul>
Lower Limit Warnings	Number of low limit voltage warnings.
Upper Limit Warnings	Number of high limit voltage warnings.
Lower Limit Errors	Number of low limit voltage errors.
Upper Limit Errors	Number of high limit voltage errors.

**For more information, see:**

- **Voltage** on [page 5-52](#)
- [Home](#) on [page 5-42](#)

Bootup Issues

**Bootup Issues** displays a summary of bootup issues detected by the system that prevented normal scanning, shutdowns, or abnormal statuses.

To access this page, under **System Status**, select **Bootup Issues**.

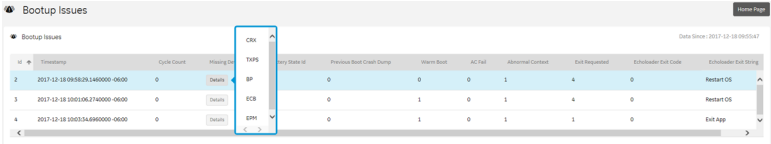
Figure 5-36 Bootup Issues



The screenshot shows the 'Bootup Issues' page with a table of bootup events. The table has columns for ID, Timestamp, Cycle Count, Missing Devices, Battery State, Previous Boot Crash During, Warm Boot, AC Fail, Abnormal Content, Exit Requested, Scheduler Exit Code, and Scheduler Exit String. There are three rows of data.

ID	Timestamp	Cycle Count	Missing Devices	Battery State	Previous Boot Crash During	Warm Boot	AC Fail	Abnormal Content	Exit Requested	Scheduler Exit Code	Scheduler Exit String
2	2017-12-18 09:59:29.1460000 -0600	0	None	PL	0	0	0	1	4	0	Restart OS
3	2017-12-18 10:01:06.2140000 -0600	0	None	PL	0	1	0	1	4	0	Restart OS
4	2017-12-18 10:03:34.6900000 -0600	0	None	PL	0	1	0	1	1	0	Exit App

Figure 5-37 Bootup Issues with Missing Devices



The screenshot shows the 'Bootup Issues' page with a dropdown menu open for the 'Missing Devices' column. The dropdown menu lists 'CRX', 'BP', 'TSPS', 'ECB', and 'EPH'. The table data is the same as in Figure 5-36.

ID	Timestamp	Cycle Count	Missing Devices	Battery State	Previous Boot Crash During	Warm Boot	AC Fail	Abnormal Content	Exit Requested	Scheduler Exit Code	Scheduler Exit String
2	2017-12-18 09:59:29.1460000 -0600	0	None	PL	0	0	0	1	4	0	Restart OS
3	2017-12-18 10:01:06.2140000 -0600	0	None	PL	0	1	0	1	4	0	Restart OS
4	2017-12-18 10:03:34.6900000 -0600	0	None	PL	0	1	0	1	1	0	Exit App

This table shows all the elements available on **Bootup Issues** with descriptions.

**Table 5-20 Bootup Issues**

Element	DESCRIPTION
ID	Identifier for the system software boot. For example, 10 for the tenth boot and so on.
Timestamp	Date and time that the associated issue for the boot occurred.
Cycle Count	Number of times EchoLoader was restarted during the associated boot. <ul style="list-style-type: none"> <li>• 0 - Normal. EchoLoader started without attempting a restart.</li> <li>• 1 or more - Indicates the number of times EchoLoader attempted to restart.</li> </ul>
Missing Devices	Displays the devices that were missing during the boot.
Incompatible Board	Displays whether an incompatible board exists.
Battery State ID	Type of battery detected. For example, <b>EPS</b> or <b>PA</b> . <b>Invalid</b> displays if no battery was detected.
Previous Boot Crash Dump	Displays whether a crash dump has occurred. Valid values are: <ul style="list-style-type: none"> <li>• 1 - Indicates a crash dump has occurred in the previous boot.</li> <li>• 0 - Normal. No crash dump has occurred.</li> </ul>
Warm Boot	Displays whether a warm boot has occurred. Valid values are: <ul style="list-style-type: none"> <li>• 1 - The system was rebooted.</li> <li>• 0 - The system was started after a shutdown.</li> </ul>
AC Fail	Displays whether an AC failure occurred during the boot. Valid values are: <ul style="list-style-type: none"> <li>• 1 - There was an AC failure in the boot.</li> <li>• 0 - Normal. No AC failure has occurred.</li> </ul>
Abnormal Context	Displays whether the software has booted to a stable state (Interface manager successfully initiated). Valid values are: <ul style="list-style-type: none"> <li>• 1 - The system has not booted to a stable state. Only abnormal logs display.</li> <li>• 0 - Normal. The system initialized to a stable state.</li> </ul>
Exit Requested	Displays the type of exit that has been requested. For example, 4 displays the operating system was restarted.
Echoloader Exit Code	Displays the exit code generated by EchoLoader. 0 indicates that Echoloader exited without any issues.
Echoloader Exit String	Displays the type of exit requested by EchoLoader. For example, restart the operating system or exit the application software.

**For more information, see:**

- **System Status** on [page 5-46](#)
- [Home](#) on [page 5-42](#)

## Alert Logs

**Alert Logs** displays the details for each alert. Alerts are status logs typically reported as a result of an error. Alerts are sent to the back office to be managed and reported to service.

To access this page, under **System Status**, select **Alert Logs**.

**Figure 5-38 Alert Logs**

Alert ID	Sub System	Rule	Description	Value	Lower Limit	Upper Limit	Severity	First Alert Time	Last Alert Time	Last Alert Local Time	Last Alert Sent Time	Count
FAN_CTRL_FAULT_Fan_Control	EPH	FAN_CTRL_FAULT	Fan control fault	255	0	231	1	2017-12-20T14:41:04Z	2018-01-05T13:24:40Z	2018-01-05T07:24:40	2018-01-05T13:24:40Z	2

This table shows all the elements available on **Alert Logs** with descriptions.

**Table 5-21 Alert Logs**

Element	DESCRIPTION
Alert ID	Identifier for the alert log that has been sent to the back office.
Sub System	Hardware component.
Rule	Code for the alert. Alerts are filtered in the back office using rule codes.
Description	Description of the alert log.
Value	Current value read for the associated hardware component.
Lower Limit	Value for the lower limit for the associated hardware component.
Upper Limit	Value for the upper limit for the associated hardware component.
Severity	Severity of the alert. These are the valid values: <ul style="list-style-type: none"> <li>• 1 - Error. Out of specification</li> <li>• 2 - Warning</li> <li>• 3 - Normal</li> </ul>
First Alert Time	Time the alert first occurred.
Last Alert Time	Time the alert last occurred.
Last Alert Local Time	Time (local) the alert last occurred.
Last Alert Sent Time	Time the alert was last sent to the back office.
Count	Number of times that the alert has occurred.

**For more information, see:**

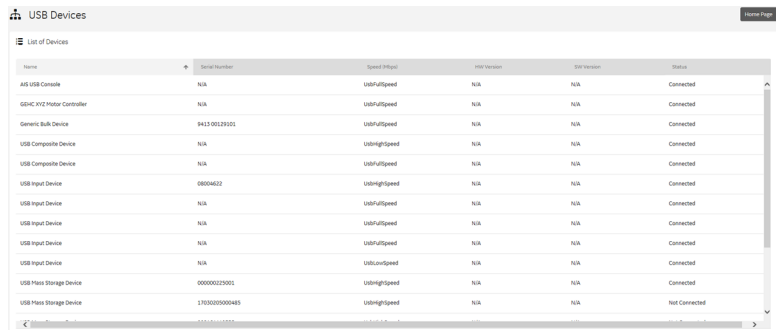
- **System Status** on page 5-46
- [Home](#) on page 5-42

USB Devices

USB Devices displays the details for each USB device.

To access this page, under **System Status**, select **USB Devices**.

Figure 5-39 USB Devices



The screenshot shows a web interface titled 'USB Devices' with a sub-header 'List of Devices'. It contains a table with the following columns: Name, Serial Number, Speed (Type), HW Version, SW Version, and Status. The table lists several devices, including a USB Console, a USB Printer Controller, a Generic Bulk Device, and several USB Composite and Input devices. Most are 'Connected', but one USB Mass Storage Device is 'Not Connected'.

Name	Serial Number	Speed (Type)	HW Version	SW Version	Status
USB USB Console	N/A	UsbFullSpeed	N/A	N/A	Connected
USB4C XYZ Printer Controller	N/A	UsbFullSpeed	N/A	N/A	Connected
Generic Bulk Device	9412301230123	UsbFullSpeed	N/A	N/A	Connected
USB Composite Device	N/A	UsbHighSpeed	N/A	N/A	Connected
USB Composite Device	N/A	UsbFullSpeed	N/A	N/A	Connected
USB Input Device	00000402	UsbHighSpeed	N/A	N/A	Connected
USB Input Device	N/A	UsbFullSpeed	N/A	N/A	Connected
USB Input Device	N/A	UsbFullSpeed	N/A	N/A	Connected
USB Input Device	N/A	UsbFullSpeed	N/A	N/A	Connected
USB Input Device	N/A	UsbLowSpeed	N/A	N/A	Connected
USB Mass Storage Device	000000220001	UsbHighSpeed	N/A	N/A	Connected
USB Mass Storage Device	17000000000405	UsbHighSpeed	N/A	N/A	Not Connected

This table shows all the elements available on **USB Devices** with descriptions.

Table 5-22 USB Devices

Element	DESCRIPTION
Name	Name of the USB device.
Serial Number	Serial number of the USB device.
Speed	Speed of the USB device. For example, USB 3.0.
HW Version	Hardware version of the USB device.
SW Version	Software version of the USB device.
Status	Status of the USB device.

For more information, see:

- **System Status** on page 5-46
- [Home](#) on page 5-42

Disk Drive Space

Use **Disk Drive Space** to view the hard drive partitions including total size and available free space in GB. Includes the overall health of the drive in one of these colors:

- Red – Available free space is less than 10% of the total size.
- Orange – Available free space is more than 10% and less than 20% of the total size.
- Green – Available free space is more than 20% of the total size.

Each partition displays these encryption statuses:

- Conversion status
- Percentage encrypted
- Encryption method
- Protection status
- Lock status

The information on **Disk Drive Space** is available to Class C and Class M licenses.

To access **Disk Drive Space**, navigate to **Utility > Service > Home**.

Figure 5-40 Disk Drive Space

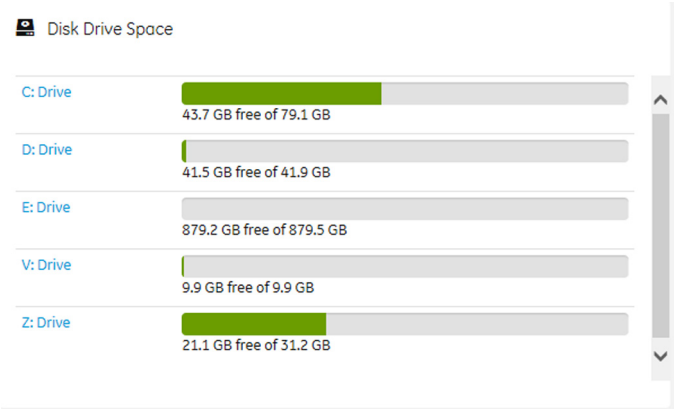
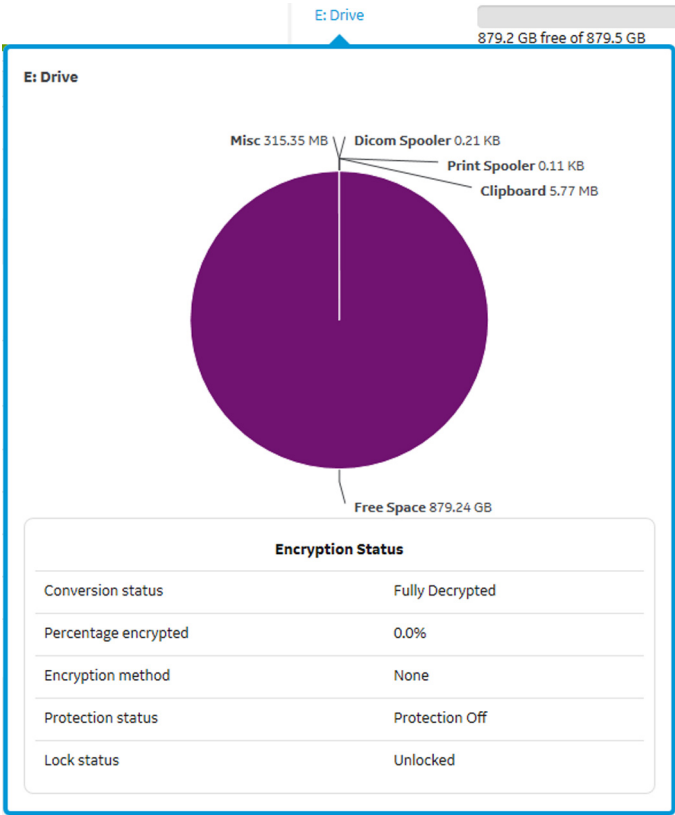




Figure 5-41 E: Drive Details



This table shows all the elements available on **Disk Drive Space** with descriptions.

**Table 5-23 Disk Drive Space**

Element	DESCRIPTION
C: Drive	C: partition shows the graphical representation of the following: <ul style="list-style-type: none"><li>• Used space in GB</li><li>• Available free space in GB</li></ul>
D: Drive	D: partition shows the graphical representation of the following: <ul style="list-style-type: none"><li>• Service</li><li>• Logs</li><li>• Temp</li><li>• Export</li><li>• Service configuration</li><li>• Misc</li><li>• Available free space in GB</li></ul>
E: Drive	E: partition shows the graphical representation of the following: <ul style="list-style-type: none"><li>• Print spooler</li><li>• Clipboard</li><li>• Dicom spooler</li><li>• Misc</li><li>• Available free space in GB</li></ul>
V: Drive	V: partition shows the graphical representation of the following: <ul style="list-style-type: none"><li>• Misc</li><li>• Available free space in GB</li></ul>
Z: Drive	Z: partition shows the graphical representation of the following: <ul style="list-style-type: none"><li>• Package repository</li><li>• Misc</li><li>• Available free space in GB</li></ul>

**For more information, see:**

- [Home on page 5-42](#)

Network Configuration

Use **Network Configuration** to view network (wired and wireless) information (the full ipconfig details) for the network configured with the LOGIQ P9/P7.

The information on **Network Configuration** is available to Class C and Class M licenses.

To access **Network Configuration**, navigate to **Utility > Service > Home**.

Figure 5-42 Network Configuration

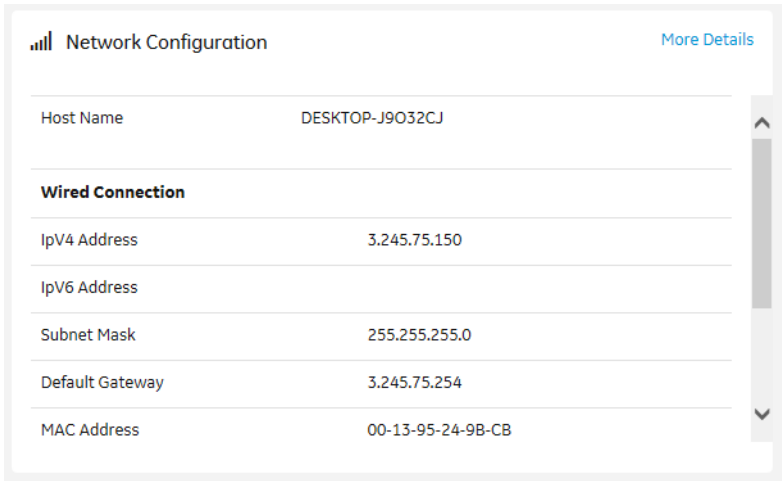
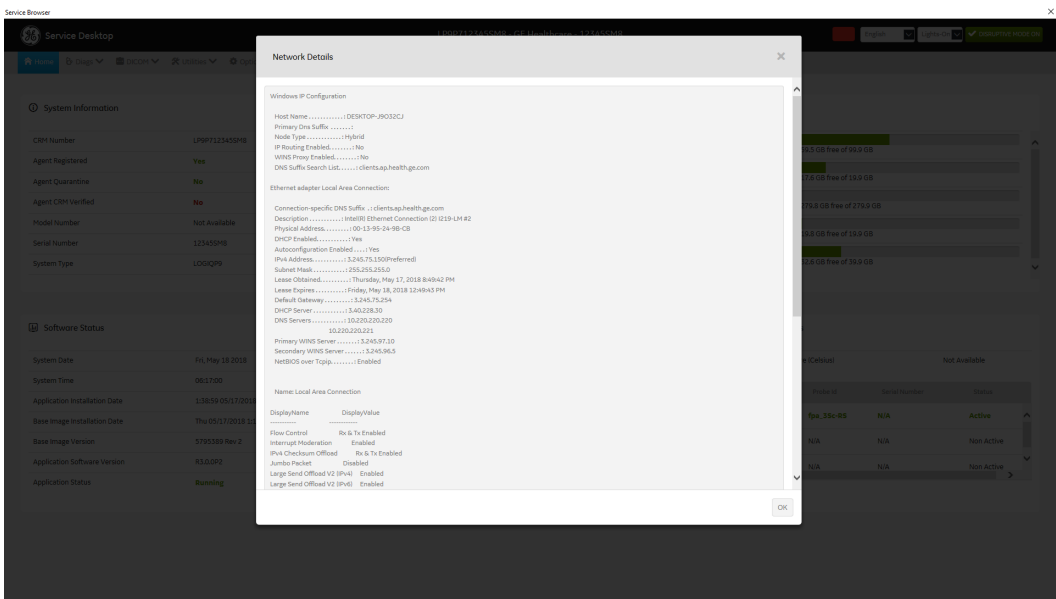


Figure 5-43 Network Configuration with More Details



This table shows all the elements available on **Network Configuration** with descriptions.

**Table 5-24 Network Configuration**

Element	DESCRIPTION
Host Name	Name of the local host for the LOGIQ P9/P7.
More Details	Displays the ipconfig details.
<b>Wired Connection</b>	
IPv4 Address	Local IP address for the wired network connection.
IPv6 Address	Local IP address for the wired network connection.
Subnet Mask	Local subnet mask for the wired network.
Default Gateway	Default gateway for the wired network.
MAC Address	Address for the MAC for the wired network.
Speed (Mbps)	Speed of the wireless connection.
<b>Wireless Connection</b>	
IP Address	IP address for the wireless network connection.
Subnet Mask	Subnet mask for the wireless connection.
Default Gateway	Default gateway for the wireless connection.
MAC Address	Address for the MAC for the wireless connection.
Speed (Mbps)	Speed of the wireless connection.
Status	Current status of the wireless connection.

**For more information, see:**

- [Home on page 5-42](#)


Connected Probes

**Connected Probes** shows probes connected to the LOGIQ P9/P7. The order on the user interface is top down matching the left-to-right order on the LOGIQ P9/P7.

The information on **Connected Probes** is available to all service class licenses.

To access **Connected Probes**, navigate to **Utility > Service > Home**.

Figure 5-44 Connected Probes

 Connected Probes

Active Probe Temperature (Celsius)		Not Available	
Probe Name	Probe Id	Serial Number	Status
N/A	N/A	N/A	Non Active
L8-18i	fla_L818IL-D	855630	Active
N/A	N/A	N/A	Non Active

This table shows all the elements available on **Connected Probes** with descriptions.

Table 5-25 Connected Probes

Element	DESCRIPTION
Active Probe Temperature (Celsius)	When available, temperature of the active probe. Not all probes report temperature. The most common probe to report temperature is the TEE probe.
Probe Name	Name of the probe connected to the LOGIQ P9/P7.
Probe ID	Identifier of the probe connected to the LOGIQ P9/P7.
Serial Number	Serial number of the probe connected to the LOGIQ P9/P7. If the serial number of the probe is not available, then <b>N/A</b> displays.
Status	Statuses of the probe connected to the LOGIQ P9/P7. Valid values are: <ul style="list-style-type: none"><li>Active</li><li>Non Active</li></ul>

For more information, see:

- [Home on page 5-42](#)

5-11-7      Diags

Use **Diags** to troubleshoot functionality with hardware components. With an active Service PRO license, probe diagnostics will be available. Specifically, use these pages:

- **Run Diags** – Run diagnostics on hardware components.
- **Diag History** – View a history of the diagnostics you have run and the results.

*NOTE: Reboot the system after performing any diagnostics before returning the LOGIQ P9/P7 to customer use.*

For more information, see:

- **Run Diags** on page 5-64
- **Diag History** on page 5-67

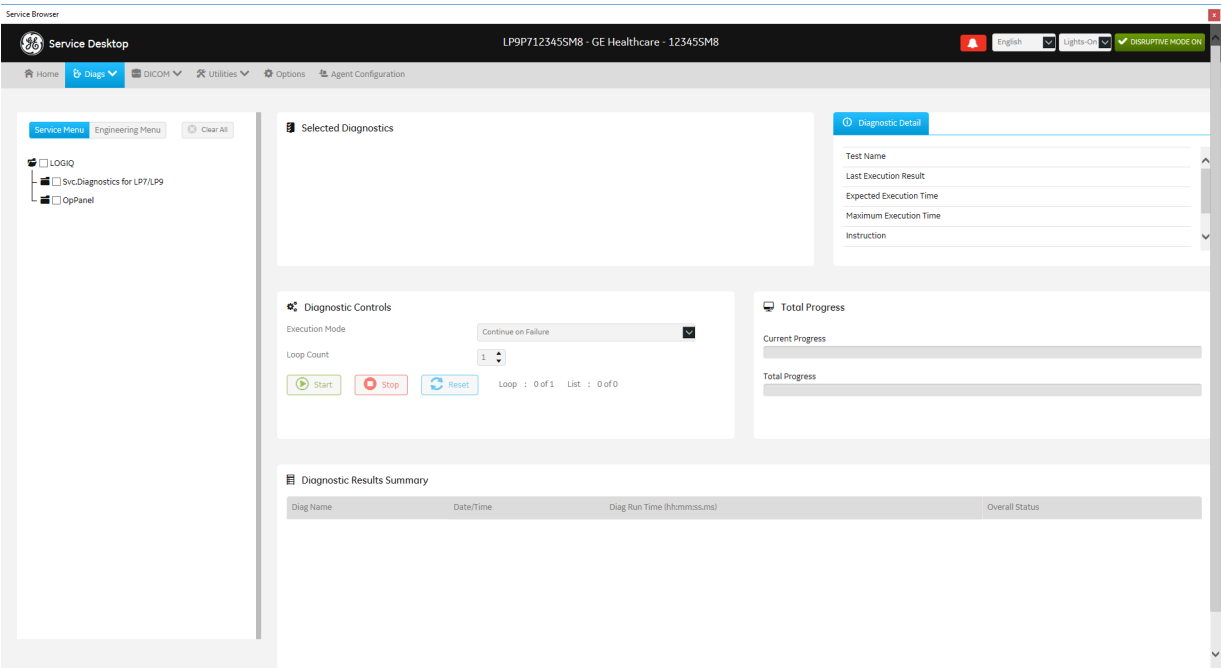
Run Diags

With Disruptive mode set to On, use **Run Diags** to run diagnostics on hardware components with the LOGIQ P9/P7. For information on disruptive mode, see **Disruptive Mode** on page 5-93.

The information on **Run Diags** is available to Class C and Class M licenses.

To access **Run Diags**, navigate to **Utility > Service > Diags > Run Diags**.

Figure 5-45    Run Diags



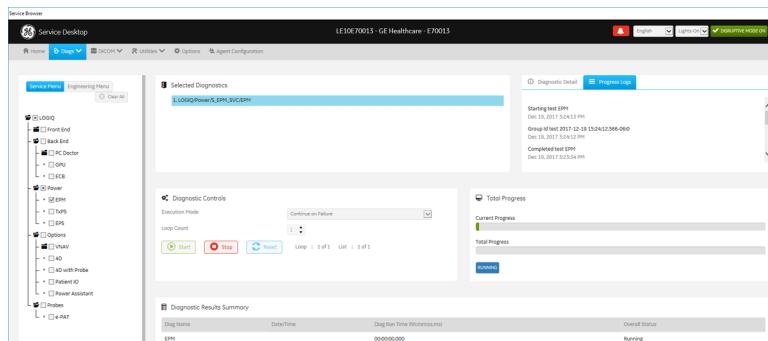
This table shows all the elements available on **Run Diags** with descriptions.

**Table 5-26 Run Diags**

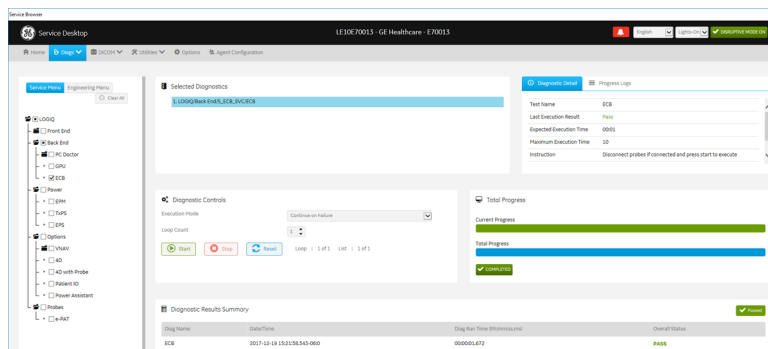
Element	DESCRIPTION
Service Menu	Available service diagnostics in a diagnostics tree.
Engineering Menu	Available engineering diagnostics in a diagnostics tree.
Clear All	Resets the selections within the diagnostics tree.
Selected Diagnostics	Diagnostics that have been selected.
<b>Diagnostic Detail</b>	
Test Name	Name of the diagnostic.
Last Execution Result	Result of the diagnostic run.
Expected Execution Time	Time expected to run the diagnostic.
Maximum Execution Time	Maximum amount of time allowed to run the diagnostic.
Instruction	Special instructions needed in order to perform the diagnostic.
<b>Diagnostic Controls</b>	
Execution Mode	Way the diagnostic behaves when a failure occurs. Valid values are: <ul style="list-style-type: none"> <li>• Continue on Failure</li> <li>• Finish Loop and Stop on Failure</li> <li>• Stop on Failure</li> </ul>
Loop Count	Number of times to run the selected diagnostic.
Start	Starts the selected diagnostic.
Stop	Stops the selected diagnostic.
Reset	Clears the current diagnostic information.
<b>Total Progress</b>	
Current Progress	Progress the current diagnostic.
Total Progress	Progress for all of the selected diagnostics.
<b>Diagnostic Results Summary</b>	
Diag Name	Name of the diagnostic.
Date/Time	Date and time of the diagnostic run.
Diag Run Time	Amount of time taken to run the diagnostic.
Overall Status	Current status of the diagnostic.
Pass/Fail	Whether the selected diagnostic passed or failed. <ul style="list-style-type: none"> <li>• Green - Diagnostic passed</li> <li>• Red - Diagnostic failed</li> </ul>

### To run a diagnostic:

- 1.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 2.) Navigate to **Utility (second page) > Service > Diags > Run Diags**.
- 3.) From the **Service Menu** tab, select the diagnostic (for example, GRLY with Probes). The **Selected Diagnostics** and **Diagnostic Detail** areas populate with information specific to the selected diagnostic.
- 4.) In **Execution Mode**, select the desired mode.
- 5.) In **Loop Count**, select the number of times to run the diagnostic.
- 6.) Click **Start**.



- 7.) View progress in the **Total Progress** area.
- 8.) View the results (Passed or Failed) in the **Diagnostic Results Summary** area.



- 9.) To view details about the diagnostics run, see **Diag History** on page 5-67.

For more information, see:

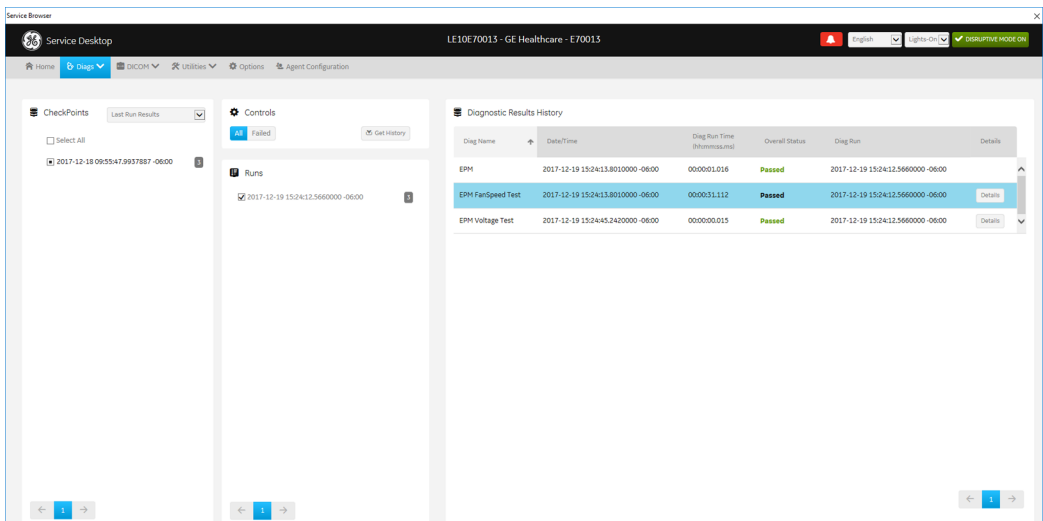
- [Diags on page 5-64](#)
- [Diag History on page 5-67](#)



Diag History

Use **Diag History** to view a history of the diagnostics run on the LOGIQ P9/P7 and the results. The information on **Diag History** is available to Class C and Class M licenses. To access **Diag History**, navigate to **Utility > Service > Diags > Diag History**.

Figure 5-46 Diag History



This table shows all the elements available on **Diag History** with descriptions.

Table 5-27 Diag History

Element	DESCRIPTION
<b>Checkpoints</b>	
Select All	Selects all of the available checkpoints in the list.
<b>Controls</b>	
All	Filters results to show all of the diagnostics.
Failed	Filters results to show failed diagnostics.
Get History	Select to display a history of the run diagnostics.
<b>Runs</b>	
	List of diagnostics run on the LOGIQ P9/P7.
<b>Diagnostic Results History</b>	
	Details about the diagnostics run.

**To view a history of diagnostics:**

- 1.) Navigate to **Utility (second page) > Service > Diags > Diag History**.
- 2.) Select the options that you want to view.
- 3.) Click **Get History**.
- 4.) View the results of your query.
- 5.) To view specific details, click **Details**

Diagnostic Result

✕

Diag Name : EPM FanSpeed Test

Last Start Time : Tuesday, December 19, 2017 15:24:13

End Time : Tuesday, December 19, 2017 15:24:44

Diag Run Time : 31112ms

Overall Status : PASS

✓ EPM Fan Speed Test

Name	Duty Cycle(%)	Measured RPM	Min RPM	Max RPM	Result
FAN 0	0	<=82	0	100	Passed
FAN 1	0	<=82	0	100	Passed
FAN 2	0	<=82	0	100	Passed
FAN 3	0	<=82	0	100	Passed
FAN 0	22	2065	100	2500	Passed
FAN 1	22	2050	100	2500	Passed
FAN 2	22	2249	100	2500	Passed
FAN 3	22	2236	100	2500	Passed
FAN 0	100	2854	2000	4000	Passed
FAN 1	100	2846	2000	4000	Passed
FAN 2	100	3052	2000	4000	Passed
FAN 3	100	3056	2000	4000	Passed

OK

**For more information, see:**

- [Diags on page 5-64](#)
- Run Diags on page 5-64**

5-11-8      **DICOM**

Use **DICOM** to troubleshoot DICOM components and connectivity. Specifically, use these pages:

- DICOM Service Status
- DICOM Spooler

**For more information, see:**

- **DICOM Service Status** on page 5-69
- **DICOM Spooler** on page 5-71

**DICOM Service Status**

**DICOM Service Status** displays information on the DICOM components and connectivity. Use DICOM to test the connectivity of all the available DICOM devices or individual DICOM devices. In addition, you can:

- View DICOM details
- View DICOM connectivity status
- Stop a service
- Ping a single service
- Ping all services

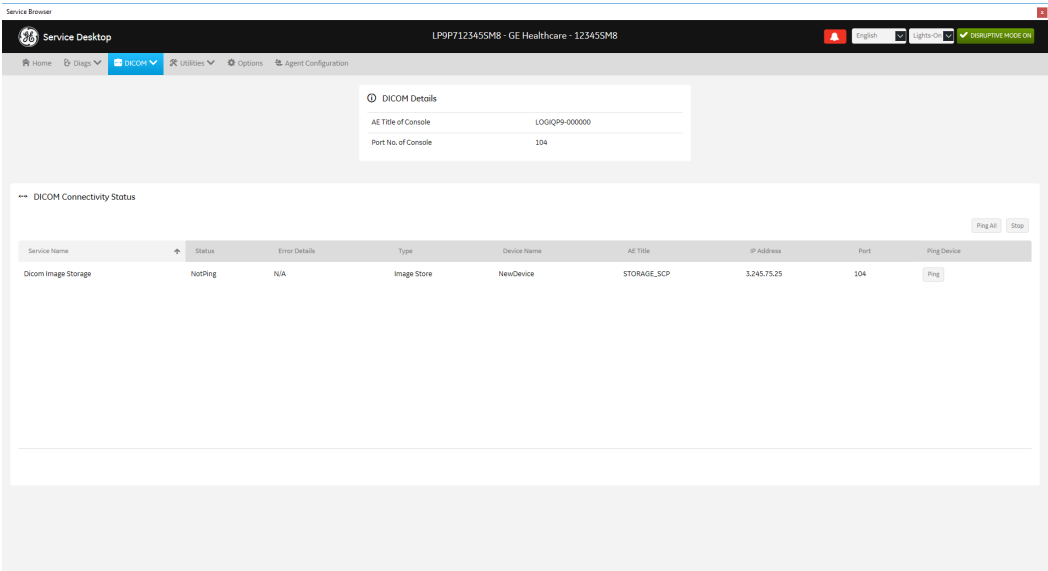
DICOM connectivity status displays as green or red.

- Green means that the DICOM ping passed
- Red means that the DICOM ping failed

The information on **DICOM Service Status** is available to Class C and Class M licenses.

To access **DICOM Service Status**, navigate to **Utility > Service > DICOM > DICOM Service Status**.

**Figure 5-47    DICOM Service Status**



This table shows all the elements available on **DICOM Service Status** with descriptions.

**Table 5-28 DICOM Service Status**

Element	DESCRIPTION
<b>DICOM Details</b>	
AE Title of Console	Application entity title of the LOGIQ P9/P7.
Port No of Console	Port number of the LOGIQ P9/P7.
<b>DICOM Connectivity Status</b>	
Service Name	Name of the DICOM services configured for the LOGIQ P9/P7.
Status	Status of the DICOM service. Valid values are: <ul style="list-style-type: none"> <li>• OK</li> <li>• Not Ok</li> <li>• Not Ping</li> <li>• Ping in progress</li> <li>• Queued</li> </ul>
Error Details	Details for any errors associated DICOM services.
Type	Type of error.
Device Name	Name of the device.
AE Title	Application entity title for the device.
IP Address	IP address for the device.
Port	Port for the device.
Ping Device	Select to confirm that a device is connected or not.

**For more information, see:**

- [DICOM on page 5-69](#)
- [DICOM Spooler on page 5-71](#)

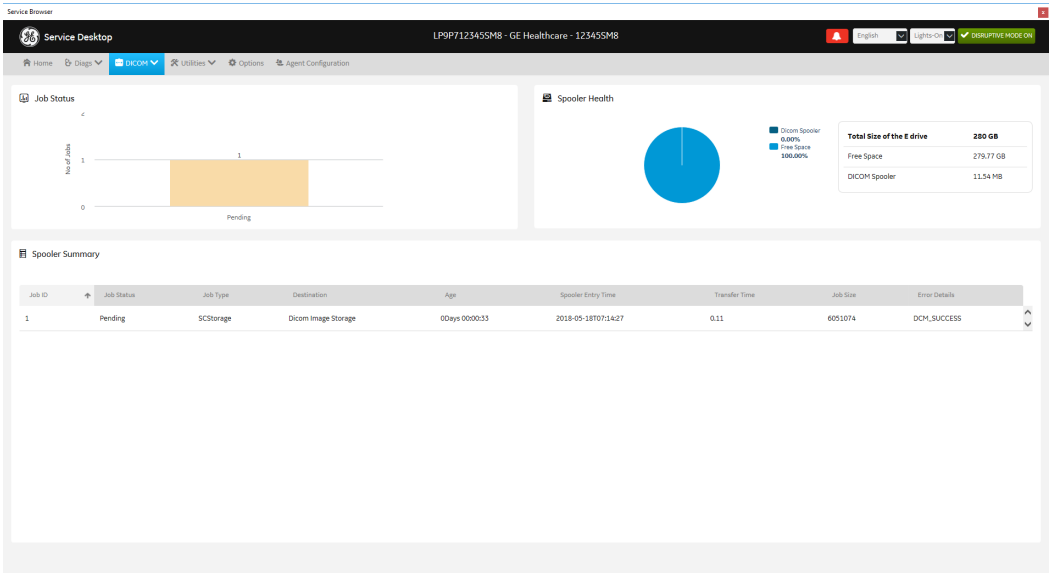
DICOM Spooler

DICOM Spooler provides a summary of the current and recent outgoing jobs.

The information on DICOM Spooler is available to Class C and Class M licenses.

To access DICOM Spooler, navigate to **Utility > Service > DICOM > DICOM Spooler**.

Figure 5-48 DICOM Spooler



This table shows all the elements available on **DICOM Spooler** with descriptions.

**Table 5-29 DICOM Spooler**

Element	DESCRIPTION
Job Status	Displays the number of jobs for each type by status. For example, Pending.
<b>Spooler Health</b>	
DICOM Spooler	Space allotted to DICOM jobs on the E: drive.
Free Space	Available space on the E: drive.
Total Size of the E: Drive	Total space on the E: drive.
<b>Spooler Summary</b>	
Job ID	Number for the job.
Job Status	Current status of the job. These are the valid values: <ul style="list-style-type: none"> <li>• Pending</li> <li>• Active</li> <li>• Hold</li> <li>• Done</li> <li>• Success</li> <li>• Failed</li> </ul>
Job Type	Type of job. These are the valid values: <ul style="list-style-type: none"> <li>• Storage – Images</li> <li>• Structured Reports</li> <li>• Key Image Notes</li> <li>• STC – Storage Commitment</li> <li>• MPPS – Modality Performed Procedure Step</li> </ul>
Destination	Name of service receiving the objects.
Age	Amount of time the job has been in the spooler.
Spooler Entry time	Time the job entered the spooler.
Transfer time	Time the job was transferred from the spooler.
Job Size	Size of the job.
Error details	If applicable, details for the error.

**For more information, see:**

- [DICOM on page 5-69](#)
- **DICOM Service Status on page 5-69**

## 5-11-9 Utilities

**Utilities** configurations vary depending upon the service class.

For more information, see:

- **Change Password** on page 5-79
- **Checkpoints** on page 5-91
- **Clean Userdefs** on page 5-84
- **Data Transfer** on page 5-94
- **Delete Files** on page 5-76
- **Disable Remote Connectivity** on page 5-77
- **Disk Defragment** on page 5-74
- **Disruptive Mode** on page 5-93
- **Gather Logs** on page 5-75
- **Network Capture** on page 5-97
- **Reset Patient Database** on page 5-83
- **SSA License** on page 5-87
- **SSH** on page 5-96
- **Software Reload** on page 5-81
- **System Shutdown** on page 5-89
- **Third Party Software Licenses** on page 5-86
- **Virtual Console Observation** on page 5-78

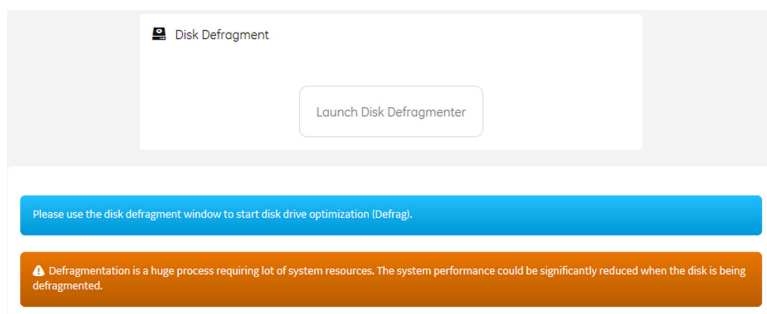
## Disk Defragment

**Disk Defragment** provides a way to launch the Windows Disk Defragmenter tool to use to defragment the disks. Disk fragmentation can reduce the amount of disk space available, and slow computing speed. Use the disk defragmenter to restore optimum disk space and speed performance. If LOGIQ P9/P7 performance would be significantly reduced when the disk is being defragmented, a warning message displays. It is not possible to analyze the SSH drives.

The information on **Disk Defragment** is available to Class C (Service Advanced) and Class M licenses. **Disk Defragment** is not available through a remote connection.

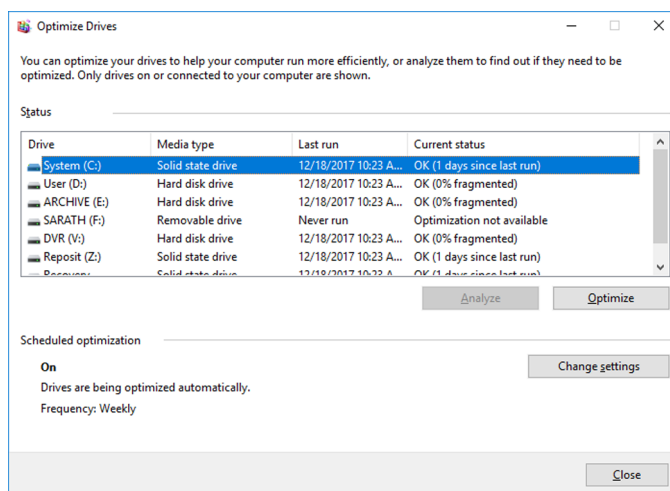
To access **Disk Defragment**, select **Utility (second page) > Service > Utilities > Disk Defragment**.

**Figure 5-49 Disk Defragment**



To analyze, optimize, or schedule optimization for a disk:

- 1.) Navigate to **Utility (second page) > Service > Utilities > Disk Defragment**.
- 2.) Click **Launch Disk Defragmenter**.
- 3.) In the **Optimize Drives** dialog box, select the drive.



- 4.) To analyze the selected drive, click **Analyze**.
- 5.) To optimize the selected drive, click **Optimize**.
- 6.) To set up a schedule, click **Change settings** and select the schedule.

**For more information, see:**

- [Utilities on page 5-73](#)



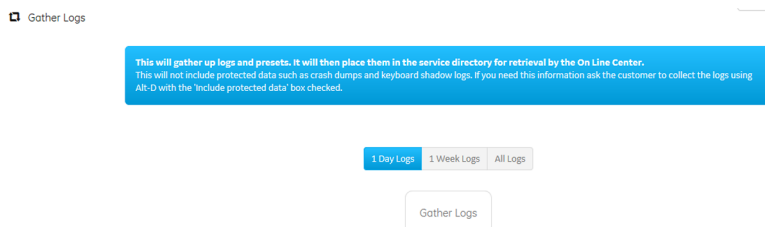
## Gather Logs

**Gather Logs** provides a way to collect system logs and place the log files in the D:\Service directory for retrieval by the online center. These log files do not include protected data such as crash dumps and keyboard shadow logs. The customer can collect logs (including protected data) using Alt+D when Protected Data is checked. Log files are compressed into a .zip file and the file path and name display. If the application software is not running, use the **Gather Logs** shortcut on the Windows desktop.

The information on **Gather Logs** is available to all service class licenses.

To access **Gather Logs**, select **Utility (second page) > Service > Utilities > Gather Logs**.

**Figure 5-50 Gather Logs**



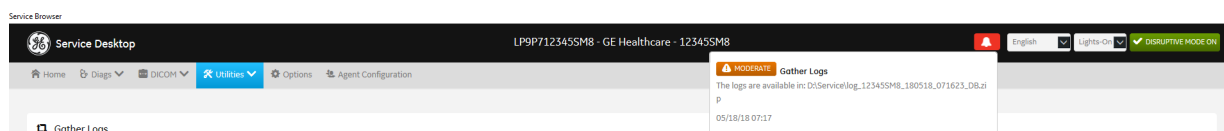
This table shows all the elements available on **Gather Logs** with descriptions.

**Table 5-30 Gather Logs**

Element	DESCRIPTION
1 Day Logs	When selected, gathers log files for one day.
1 Week Logs	When selected, gathers log files for one week.
All Logs	When selected, gathers all available log files.
Gather Logs	Select to gather the log files for the selected time period.

### To gather log files:

- 1.) Navigate to **Utility (second page) > Service > Utilities > Gather Logs**.
- 2.) Select one of the following:
  - 1 Day Logs
  - 1 Week Logs
  - All Logs
- 3.) Click **Gather Logs**. In the resulting dialog box, record the location of the log files and click **OK**.
- 4.) When the gather log operation is complete, click the notification icon in the banner to view the location of the log files.



### For more information, see:

- [Utilities on page 5-73](#)

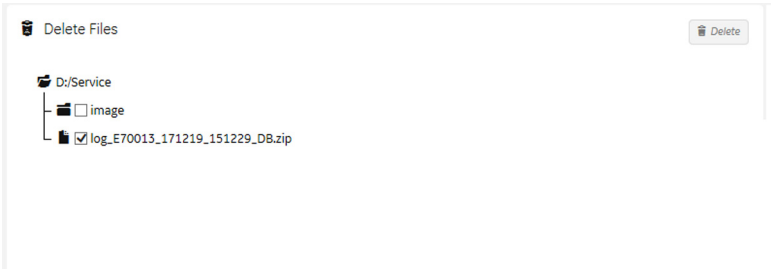
Delete Files

**Delete Files** displays all the files and folders present in the D:\Service folder and allows for their deletion. Deleting unneeded files improves performance and reduces the need to defragment the disk drive.

The information on **Delete Files** is available to all service class licenses.

To access Delete Files, select **Utility (second page) > Service > Utilities > Delete Files**.

Figure 5-51 Delete Files



This table shows all the elements available on **Delete Files** with descriptions.

Table 5-31 Delete Files

Element	DESCRIPTION
Delete Files	Displays the files that are available for deletion.
Delete	Deletes the selected files.

To delete files:

- 1.) Navigate to select **Utility (second page) > Service > Utilities > Delete Files**.
- 2.) Under **Delete Files**, select the available folders and files that you want to delete.
- 3.) Click **Delete**.
- 4.) In the resulting dialog box, click **Delete** and then click **OK**.

For more information, see:

- [Utilities on page 5-73](#)

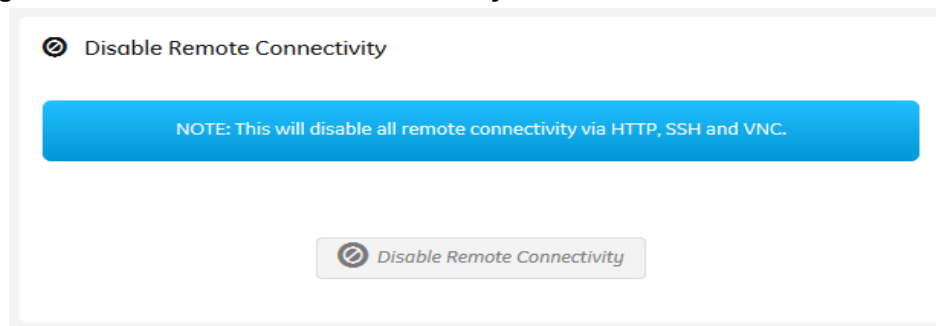
### Disable Remote Connectivity

This utility will uninstall remote connectivity items like Agent Configuration, SSH and Virtual Console Observation (VCO) from Service Desktop. If remote connectivity is disabled, then the Submit Changes button on Agent Configuration and the Start/Stop buttons for SSH and VCO will all be disabled. In addition, some scripts will execute to make the LOGIQ E10 more secure.

**NOTE:** *If you have disabled remote connectivity and then performed a software reload, you will have to disable remote connectivity again.*

To access Disable Remote Connectivity, navigate to Utility (second page) > Service > Utilities, and then select Disable Remote Connectivity.

**Figure 5-52 Disable Remote Connectivity**



To disable remote connectivity:

- 1.) Navigate to Utility (second page) > Service > Utilities, and then select Disable Remote Connectivity.
- 2.) Select Disable Remote Connectivity.
- 3.) To disable connectivity to the LOGIQ E10 through Agent Configuration, SSH, and Virtual Console Observation, click OK.
- 4.) Once connectivity has been disabled, select OK again.

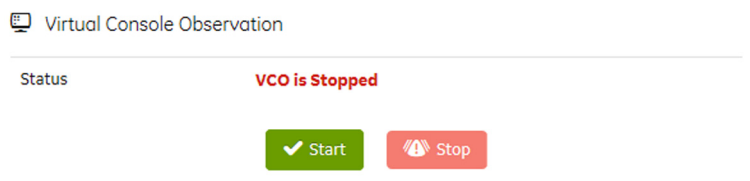
## Virtual Console Observation

**Virtual Console Observation** displays the status of the VNC server. Virtual console observation (VCO) is normally used to remotely access and modify settings and programs.

The information on **Virtual Console Observation** is available to Class M licenses. **Virtual Console Observation** is not available through a remote connection.

To access **Virtual Console Observation**, select **Utility (second page) > Service > Utilities > Virtual Console Observation**.

**Figure 5-53 Virtual Console Observation**



This table shows all the elements available on **Virtual Console Observation** with descriptions.

**Table 5-32 Virtual Console Observation**

Element	DESCRIPTION
Status	When Disruptive mode is on, displays the status of the VNC server. Valid values are: <ul style="list-style-type: none"> <li>VCO is stopped</li> <li>VCO is running</li> </ul>
Start	When Disruptive mode is ON, starts the VNC server.
Stop	When Disruptive mode is ON and the VNC server is running, stops the VNC server.

### To start virtual console observation:

- 1.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 2.) Navigate to **Utility (second page) > Service > Utilities > Virtual Console Observation**.
- 3.) Select **Start**. When VCO starts, the Windows task bar and Windows desktop display.
- 4.) Modify settings and programs as needed.
- 5.) To stop virtual console observation, click **Stop**. When VCO is stopped, the Windows desktop is hidden.
- 6.) Restart the LOGIQ P9/P7.

### For more information, see:

- [Utilities on page 5-73](#)

## Change Password

**Change Password** allows you to change the password for a specified user type.



**CAUTION** ***RISK OF LOSING DATA.***

***IF THE PASSWORD IS LOST, GE WILL NOT BE ABLE TO RECOVER OR RESET IT. LOSS OF A PASSWORD MAY RESULT IN THE LOSS OF PATIENT DATA.***

The information on **Change Password** is available to all service class licenses. **Change Password** is not available through a remote connection.

To access **Change Password**, select **Utility (second page) > Service > Utilities > Change Password**.

**Figure 5-54 Change Password**

This table shows all the elements available on **Change Password** with descriptions.

**Table 5-33 Change Password**

Element	DESCRIPTION
User Type	Type of user for the password reset.
New Password	Password
Confirm Password	Password
Update Password	Select to update the password.
Reset	Select to reset the information.

**To change the password:**

- 1.) Navigate to **Utility (second page) > Service > Utilities > Change Password**.
- 2.) Under **User Type**, select the user.

**NOTE:** Before changing the GEService password (the default is SvcForward123\$), make sure the LOGIQ P9/P7 is connected to the network and the agent is configured. The GEService password is used to perform portions of remote service. If the password is changed and the system information is not updated, it may slow down remote service. Both file transfer and SSH depend on the GEService password.

- 3.) In **New Password** and **Confirm Password**, enter the new password.



**CAUTION RISK OF LOSING DATA.**

**GE WILL NOT BE ABLE TO RECOVER OR RESET CHANGED PASSWORDS.  
SECURELY RECORD THE NEW PASSWORD.**

- 4.) Click **Update Password**.
- 5.) When a SVCService user password has been changed, reboot the LOGIQ P9/P7 to reflect the password change.

**For more information, see:**

- [Utilities on page 5-73](#)

## Software Reload

**Software Reload** displays versions of the base image, application software, base patch, service platform, and documentation packages currently installed on the LOGIQ P9/P7. **Software Reload** reimages the C:\ drive and installs the base image.

- If the drives are encrypted, **Software Reload** will have a catastrophic effect if the customer does not have the recovery key. All patient data will be lost.
- If the drives are not encrypted, software can be reloaded without a recovery key.

With Disruptive mode set to On, reload these software versions from repository partition on the hard drive. The software reload is automatic without any loss of presets, patient data, or connectivity settings.

The information on **Software Reload** is available to Class C (Service Advanced) and Class M licenses.

To access **Software Reload**, select **Utility > Service (second page) > Utilities > Software Reload**.

**Figure 5-55 Software Reload**

This table shows all the elements available on **Software Reload** with descriptions.

**Table 5-34 Software Reload**

Element	DESCRIPTION
Base Image Version	Displays the version number of the base image software.
Base Patch Version	Displays the version number of the base patch.
Application Software Version	Displays the version number of the application software.
Service Platform Version	Displays the version number of the service platform.
Documentation Version	Displays the version number for the documentation.
Software Reload	Reloads the versions listed.

**To reload software:**

- 1.) If the drives are encrypted, obtain the recovery key.
- 2.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 3.) Navigate to **Utility (second page) > Service > Utilities > Software Reload**.
- 4.) View the current version numbers.
- 5.) Click **Software Reload**.



**CAUTION** ***RELOADING SOFTWARE WITHOUT A RECOVERY KEY WILL RESULT IN THE LOSS OF PATIENT DATA.***

- 6.) If you have a recovery key, select **I have a recovery key** and then click **Continue**.

Software Reload

☐ I do not have a recovery key, I do not wish to Reload the Software.

☒ I have a recovery key, I wish to continue Software Reload.

Continue

- 7.) If you have a recovery key, select **I Agree** and then click **Continue Reload**.

Software Reload

Do you really want to reload the Software? Be aware, If you do not have the recovery key, you will lose all the Patient Data. If you want to continue, then select 'I Agree' and click 'Continue Reload'

☒ I Agree

Continue Reload Cancel Reload

**For more information, see:**

- [Utilities on page 5-73](#)



## Reset Patient Database

**Reset Patient Database** resets the LOGIQ P9/P7 patient database. This operation automatically shuts down the application before cleaning the patient database. Once the operation is complete, the LOGIQ P9/P7 reboots with an empty database. Disruptive mode must be On to reset the patient database. If Disruptive mode is Off, a warning message displays asking to turn on Disruptive mode.

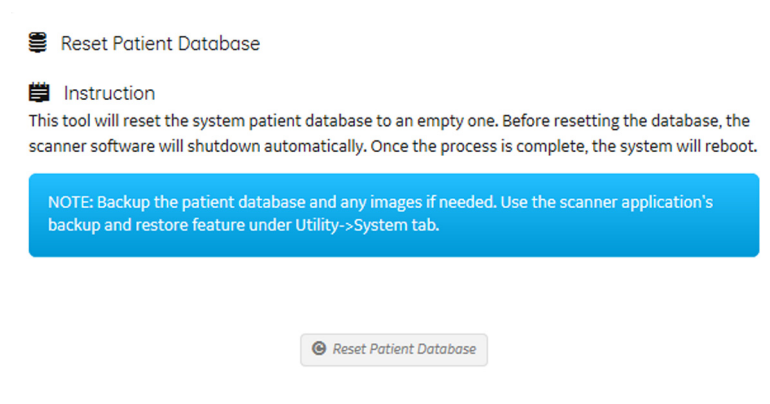
**Reset Patient Database** deletes the contents of the following folders:

- E:\Scanner\GEMS\_IMG
- E:\Scanner\GEMS\_REP

The information on **Reset Patient Database** is available to Class C (Service Advanced) and Class M licenses.

To access **Reset Patient Database**, select **Utility (second page) > Service > Utilities > Reset Patient Database**.

**Figure 5-56 Reset Patient Database**



This table shows all the elements available on **Reset Patient Database** with descriptions.

**Table 5-35 Reset Patient Database**

Element	DESCRIPTION
Instruction	Information about the database reset.
Reset Patient Database	When Disruptive mode is ON, resets the LOGIQ P9/P7 patient database.

### To reset the patient database:

- 1.) Back up the patient database.
- 2.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 3.) Navigate to **Utility (second page) > Service > Utilities > Reset Patient Database**.
- 4.) Click **Reset Patient Database**.
- 5.) Confirm the patient database has been emptied.

**For more information, see:**

- [Utilities on page 5-73](#)

Clean Userdefs

**Clean Userdefs** provides a way to delete user-defined data when user presets may be inhibiting proper operation. User-defined data returns to the user-defined settings to the factory default values. **Clean Userdefs** provides information to backup the current settings if you want to use them later. Disruptive mode must be On to clean user-defined data. If Disruptive mode is Off, a warning message displays asking to turn on Disruptive mode.

Before cleaning user-defined data, the LOGIQ P9/P7 application software automatically shuts down. Once the operation is complete, the system reboots.

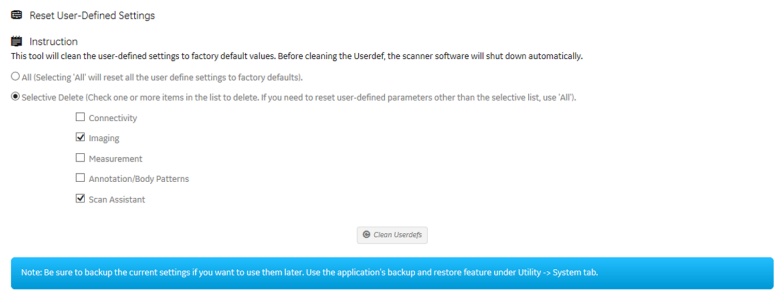
**Clean Userdefs** provides a way to selectively delete the following user-defined data:

- Connectivity – Deletes this file: %TEST\_ROOT%\resources\userdefs\connectivity.res
- Imaging – Deletes this folder: %TEST\_ROOT%\resources\userdefs\ImagingPresets\
- Measurement – Delete this folder: %TEST\_ROOT%\resources\userdefs\EchoMeasure\
- Annotation/Bodymark – Deletes the folder: %TEST\_ROOT%\resources\userdefs\EchoAnnotation\
- Scan Assistant – Deletes the folder: %TEST\_ROOT%\resources\userdefs\EchoExamProtocol

The information on **Clean Userdefs** is available to Class C (Service Advanced) and Class M licenses.

To access **Clean Userdefs**, select **Utility (second page) > Service > Utilities > Clean Userdefs**.

Figure 5-57 Clean Userdefs



This table shows all the elements available on **Clean Userdefs** with descriptions.

Table 5-36 Clean Userdefs

Element	DESCRIPTION
All	When Disruptive mode is ON, deletes all of the user-defined data and returns the LOGIQ P9/P7 to factory default settings.
Selective Delete	When Disruptive mode is ON, deletes the selected user-defined data.
Connectivity	When <b>Selective Delete</b> is selected, deletes this file: %TEST_ROOT%\resources\userdefs\connectivity.res
Imaging	When <b>Selective Delete</b> is selected, deletes this folder: %TEST_ROOT%\resources\userdefs\ImagingPresets\
Measurement	When <b>Selective Delete</b> is selected, delete this folder: %TEST_ROOT%\resources\userdefs\EchoMeasure\
Annotation/Body Patterns	When <b>Selective Delete</b> is selected, deletes this folder: %TEST_ROOT%\resources\userdefs\EchoAnnotation\
Scan Assistant	When <b>Selective Delete</b> is selected, deletes this folder: %TEST_ROOT%\resources\userdefs\EchoExamProtocol
Clean Userdefs	Restarts the application software with a fresh database.

**To clean user-defined data:**

- 1.) If you want to use the current settings later, back them up now.
- 2.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 3.) Navigate to **Utility (second page) > Service > Utilities > Clean Userdefs.**
- 4.) Select the data you want to set to the default settings.
- 5.) Click **Clean Userdefs.**

**For more information, see:**

- [Utilities on page 5-73](#)

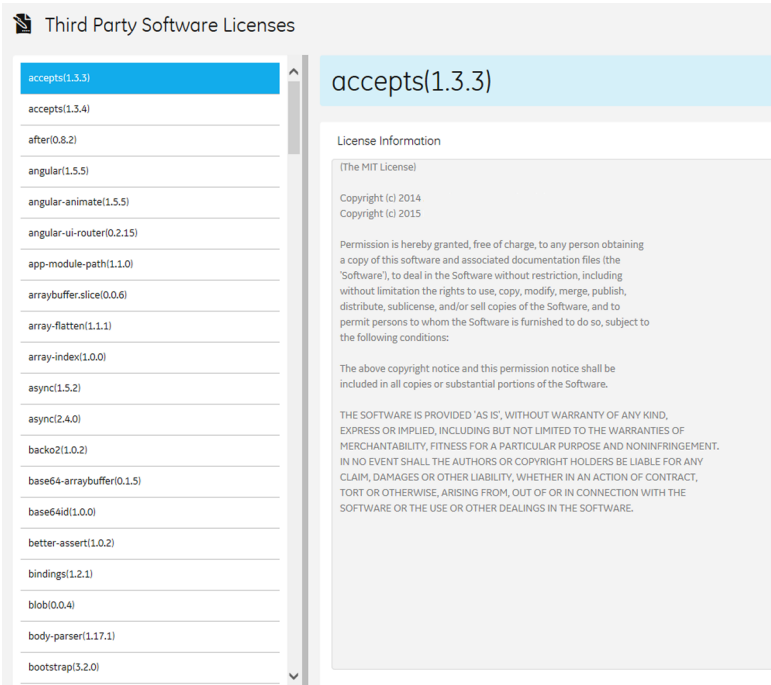
Third Party Software Licenses

Third Party Software Licenses displays the third-party software licenses used as part of the service platform.

The information on Third Party Software Licenses is available to all service class licenses.

To access Third Party Software Licenses, select Utility (second page) > Service > Utilities > Third Party Software Licenses.

Figure 5-58 Third Party Software Licenses



For more information, see:

- [Utilities on page 5-73](#)

## SSA License

**SSA License** provides a way to do the following:

- When inserted, view the details of an SSA key.
- View the status of the service class options.
- Restore an SSA license when the SSA key is not validating or when a remote log in shows as a Class A user.

The information on **SSA License** is available to all service class licenses.

To access **SSA License**, select **Utility (second page) > Service > Utilities > SSA License**.

**Figure 5-59 SSA License**

**Class M key Details**

Name	Value
Class M key Status	Not Plugged In
Drive Letter	Not Available
Expire Date	Not Available
SSO ID	Not Available
Key Counter Value	Not Available
Max Key Counter Value	Not Available

**Service Option Keys**

Name	Status
Service Basic	true
Service Advanced	false
Service Class M	true

**Restore SSA**

This table shows all the elements available on **SSA License** with descriptions.

**Table 5-37 SSA License**

Element	DESCRIPTION
<b>Class M Key Details</b>	
Class M Key Status	Status of the SSA key. Valid values are: <ul style="list-style-type: none"> <li>• Not Plugged In</li> <li>• Plugged In</li> </ul>
Drive Letter	Drive where the SSA key is plugged into the LOGIQ P9/P7.
Expire Date	Date the SSA key is set to expire.
SSO ID	Identifier for the user assigned to the SSA key.
Key Counter Value	Number of times the SSA key has been used.
Max Key Counter Value	Number of remaining times the SSA key can be used.
<b>Service Option Keys</b>	
Name	Name of the service class option.
Status	Status of the access to the associated service class option. Valid values are: <ul style="list-style-type: none"> <li>• True</li> <li>• False</li> </ul>
Restore SSA	Restores the SSA license to the SSA key.

**To view the Class M license information:**

- 1.) Insert the SSA key.
- 2.) Navigate to **Utility (second page) > Service > Utilities > SSA License**.
- 3.) Under **Class M key Details**, view the values. For example, the **SSO ID** for the user assigned to the SSA key.

If **Not Available** displays for all of these values, the SSA key is not validating.

**To restore an SSA key that is not validating:**

- 1.) Remove the SSA key from the LOGIQ P9/P7.
- 2.) If open, close the Service desktop.
- 3.) Restart the LOGIQ P9/P7.
- 4.) Once the LOGIQ P9/P7 has restarted, plug in the SSA key.
- 5.) Navigate to **Utility (second page) > Service > Utilities > SSA License**.
- 6.) Click **Restore SSA**.
- 7.) Check to see if the SSA key validates.

**For more information, see:**

- [Utilities on page 5-73](#)
- [SSA key on page 7-94](#)

## System Shutdown

With remote access, **System Shutdown** provides a way to shut down or restart the LOGIQ P9/P7. Disruptive mode must be On to shut down or restart the LOGIQ P9/P7. If Disruptive mode is Off, a warning message displays.

The information on **System Shutdown** is available to Class M licenses.

To access **System Shutdown**, select **Utility (second page) > Service > Utilities > System Shutdown**.

**Figure 5-60 System Shutdown**

This table shows all the elements available on **System Shutdown** with descriptions.

**Table 5-38 System Shutdown**

Element	DESCRIPTION
<b>Select Operation</b>	
Shutdown System	When Disruptive mode is On, shuts down the LOGIQ P9/P7 when <b>Submit Request</b> is pressed.
Restart System	When Disruptive mode is On, restarts the LOGIQ P9/P7 when <b>Submit Request</b> is pressed.
Shutdown Application	When Disruptive mode is On, shuts down the application software when <b>Submit Request</b> is pressed.
<b>Disruptive Mode</b>	
Retain Disruptive Mode	Determines whether Disruptive mode is retained after an operation has been performed. Generally used by the remote engineer to regain access to disruptive functions after a reboot without having to request Disruptive mode be enabled again.
Submit Request	Performs the operation selected under <b>Select Operation</b> .

---

To remotely start, restart, or shut down the LOGIQ P9/P7:

- 1.) Navigate to **Utility (second page) > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 2.) Navigate to **Utility (second page) > Service > Utilities > System Shutdown** and then select an operation:
  - To shut down the LOGIQ P9/P7, select **Shutdown System**.
  - To restart the LOGIQ P9/P7, select **Restart System**.
  - To shut down the application software, select **Shutdown Application**.
- 3.) To retain the current setting for Disruptive mode, select **Retain Disruptive Mode**.
- 4.) Click **Submit Request**.

**For more information, see:**

- [Utilities on page 5-73](#)



## Checkpoints

**Checkpoints** allows for the creation of checkpoints and displays the history of those checkpoints. Checkpoints are used to indicate when the LOGIQ P9/P7 has been serviced, status has been reset, and information related to the service performed has been added.

The information on **Checkpoints** is available to Class C (Service Advanced) and Class M licenses.

To access **Checkpoints**, select **Utility (second page) > Service > Utilities > Checkpoints**.

**Figure 5-61 Checkpoints**



This table shows all the elements available on **Checkpoints** with descriptions.

**Table 5-39 Checkpoints**

Element	DESCRIPTION
<b>Checkpoints History</b>	
Checkpoint	Displays the name of the checkpoint.
Service Personnel	Displays the ID for the logged in user.
Action	Displays the service action.
Comment	Displays comment text entered when the checkpoint was created.
Service Checkpoint	Displays whether the checkpoint is a service checkpoint or not.
<b>Create Checkpoint</b>	
Action	Selects the service action. Value values are <ul style="list-style-type: none"> <li>Scheduled Maintenance</li> <li>Unscheduled Maintenance</li> <li>Upgrade</li> <li>FMI</li> </ul>
Service Personnel	ID for the logged in user. Value values are: <ul style="list-style-type: none"> <li>SSO ID: When a Class M key is plugged in, the SSO ID for the logged in user.</li> <li>Remote user ID: If there is a remote connection, the remote user ID.</li> <li>User ID: If the SSO ID and remote user ID are not available, the user ID for the logged in user.</li> <li>Unknown: The logged in user ID is not available.</li> </ul>
Comment	Enter comments for creating a checkpoint.
Service Checkpoint	Select whether to mark a service checkpoint or not.
Save	Saves the information.

**To create a check point:**

- 1.) Navigate to **Utility (second page) > Service > Utilities > Checkpoints**.
- 2.) Under **Create Checkpoints**, from **Action**, select the action.
- 3.) In **Comment**, enter notes for the checkpoint.
- 4.) If this is a checkpoint for service, select **Service Checkpoint**.
- 5.) Click **Save**.

**For more information:**

- [Utilities on page 5-73](#)

## Disruptive Mode

**Disruptive Mode** provides a way to enable and disable Disruptive mode. When enabled, Disruptive mode allows a remote user to access the LOGIQ P9/P7 which can disrupt normal operation of the LOGIQ P9/P7. Disruptive mode can be remotely turned on when the logged-in user has Authorize Remote Service Access privilege. If the logged-in user does not have remote service privilege, displays this error message: "You do not have the required permission to perform this operation."

When initiating Disruptive mode from a remote location, a message displays on the LOGIQ P9/P7 asking whether the user will allow Disruptive mode and notifying them that normal operation might be disturbed.

- If **Yes** is selected, then Disruptive mode is turned on.
- If **No** is selected, then Disruptive mode is not turned on and an error message displays saying that permission to change the mode was denied.

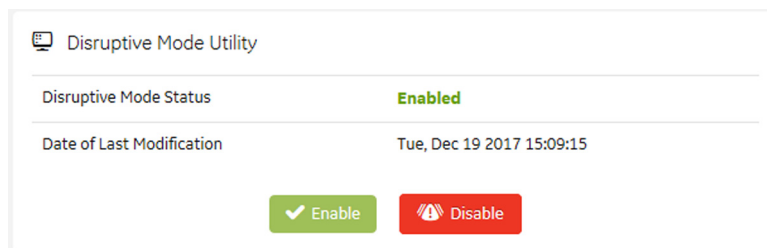
When Disruptive mode is On, the GE icon in the status bar changes to red and displays this message: "Due to Service testing restart needed."

When Disruptive mode is changed to Off, the GE icon turns white and displays this message: "Due to Service testing restart needed." In addition, VCO and SSH stop if running.

The information on **Disruptive Mode** is available to Class C (Service Advanced) and Class M licenses.

To access **Disruptive Mode**, select **Utility (second page) > Service > Utilities > Disruptive Mode Utility**.

**Figure 5-62 Disruptive Mode**



**For more information:**

- [Utilities on page 5-73](#)

## Data Transfer


**Data Transfer** provides a way to do the following:

- View information about past transfers of (APM) information.
- Set up automatic/scheduled transfer of allowed data files from the LOGIQ P9/P7 to the server.
- Manually transfer data files allowed data files from the LOGIQ P9/P7 to the server.

The information on **Data Transfer** is available to all service class licenses.

To access **Data Transfer**, select **Utility (second page) > Service > Utilities > Data Transfer**.


**Figure 5-63 Data Transfer**

 Data Transfer

Type of Upload	Upload Permission	Last Upload Status	Last Upload Attempt	Last Successful Attempt
Never identifiable images	No	NA		
Monitoring Logs	Yes	Success	Dec 19, 2017 11:17:41 AM	Dec 19, 2017 11:17:41 AM
System Logs	Yes	Success	Dec 19, 2017 11:17:44 AM	Dec 19, 2017 11:17:44 AM
User Information	No	NA		
System Configurations	Yes	Success	Dec 19, 2017 11:17:45 AM	Dec 19, 2017 11:17:45 AM
User Configurations	Yes	Success	Dec 19, 2017 11:17:46 AM	Dec 19, 2017 11:17:46 AM
Other logs	Yes	Success	Dec 19, 2017 11:17:54 AM	Dec 19, 2017 11:17:54 AM
Windows logs	Yes	Success	Dec 19, 2017 11:18:30 AM	Dec 19, 2017 11:18:30 AM

☒ Scheduler

☒ All Days ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun

 Send All

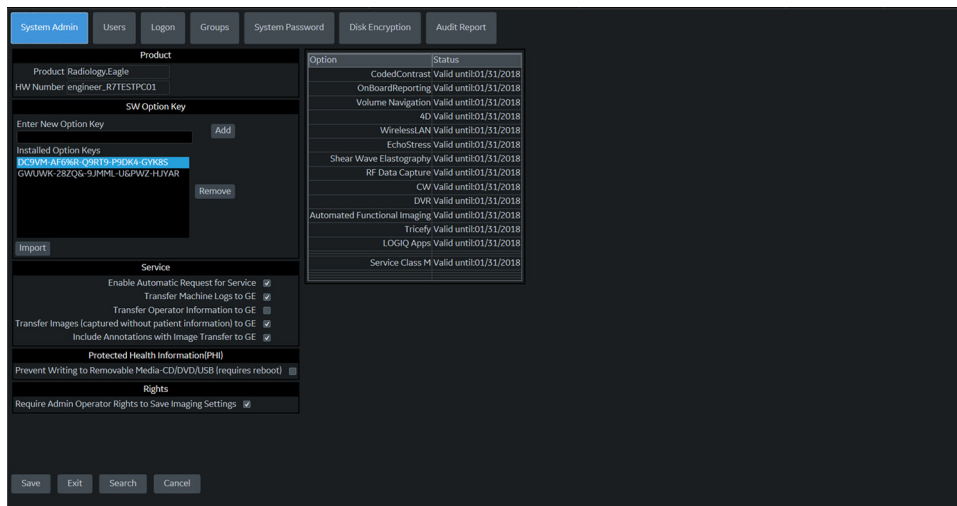
This table shows all the elements available on **Data Transfer** with descriptions.

**Table 5-40 Data Transfer**

Element	DESCRIPTION
Type of Upload	Type of log file. For example, <b>Incremental Logs</b> or <b>Full Logs</b> . <b>Monitoring Logs</b> , <b>System Logs</b> , and <b>Windows Logs</b> are incrementally transferred when automatic transfer is enabled. To enable automatic transfer, navigate to <b>System Admin</b> and, under <b>Service</b> , check <b>Enable Automatic Request for Service</b> .
Upload Permission	Whether the permission to upload the log file is allowed or not.
Last Upload Status	Whether the last log file upload was successful or not.
Last Upload Attempt	Date and time the last log file upload was attempted.
Last Successful Upload	Date and time the last log file was successfully uploaded.
Scheduler	When selected, enables the related day selections. For example, <b>All Days</b> , <b>Monday</b> , and <b>Tuesday</b> .
Save Settings	Saves the information.
Send All	Manually send the selected log files to the server.

To configure automatic data transfers:

1.) Navigate to **ADMIN > System Admin**.



2.) On **System Admin**, configure these settings:

- **Transfer Machine Logs to GE** – Default is checked
- **Transfer Operator Information to GE**
- **Transfer Images (captured without patient information) to GE** – Default is checked.

3.) Click **Save**.

4.) Navigate to **Utility (second page) > Service > Utilities > Data Transfer**.

5.) On **Data Transfer**, select **Scheduler**, and then select the days to perform the data transfer.

6.) Click **Save Settings**.

7.) To manually perform a data transfer, click **Send All**.

**For more information:**

- [Utilities on page 5-73](#)

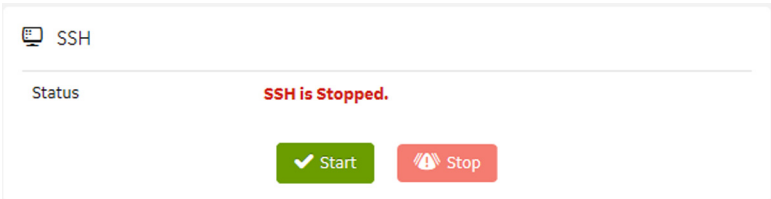
SSH

**SSH** displays the status of the Secure Shell (SSH) server. SSH is a cryptographic network protocol for operating network services securely over an unsecured network. This protocol is used for remote login to the operational system. SSH allows remote login to the LOGIQ P9/P7 and remote file transfer from the LOGIQ P9/P7. Remotely log into the LOGIQ P9/P7 using the username “GEService” and its password.

The information on **SSH** is available to Class M licenses.

To access **SSH**, select **Utility > Service > Utilities > SSH**.

Figure 5-64 SSH



This table shows all the elements available on **SSH** with descriptions.

Table 5-41 SSH

Element	DESCRIPTION
Status	When Disruptive mode is on, displays the status of the SSH server. Valid values are: <ul style="list-style-type: none"><li>• SSH is stopped</li><li>• SSH is running</li></ul>
Start	When Disruptive mode is ON, start the SSHD service.
Stop	When Disruptive mode is ON and the SSHD service is running, stops the SSHD service.

To start the SSH server:

- 1.) Navigate to **Utility > Service > Utilities > Disruptive Mode Utility** and set Disruptive mode to On.
- 2.) Navigate to **Utility > Service > Utilities > SSH**.
- 3.) Click **Start**.
- 4.) To stop the SSH server, select **Stop**.

For more information, see:

- [Utilities on page 5-73](#)

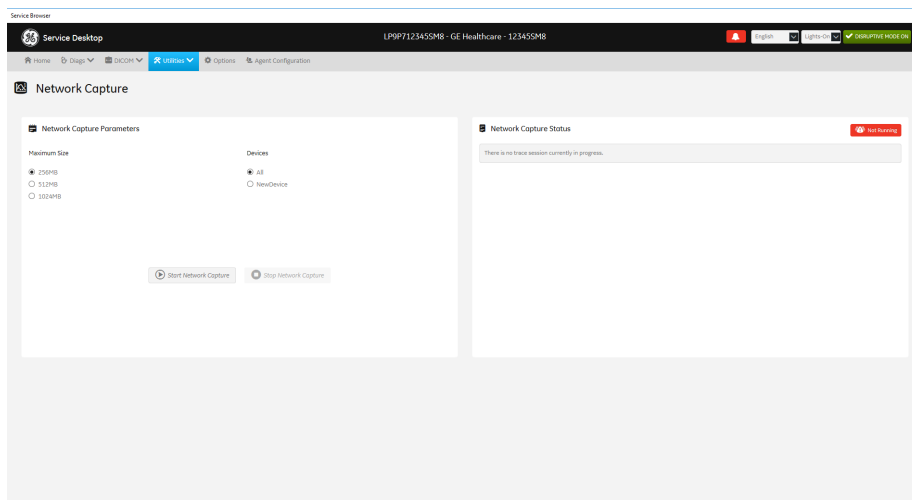
## Network Capture

**Network Capture** displays network traffic between the LOGIQ P9/P7 and configured devices. A network capture outputs two log files: one for main logging with no protected information and another including protected information. These log files are useful when debugging connectivity issues. Because these log files can be large, they are only kept for one week.

The information on **Network Capture** is available to all service class licenses.

To access **Network Capture**, select **Utility > Service > Utilities > Network Capture**.

**Figure 5-65 Network Capture**



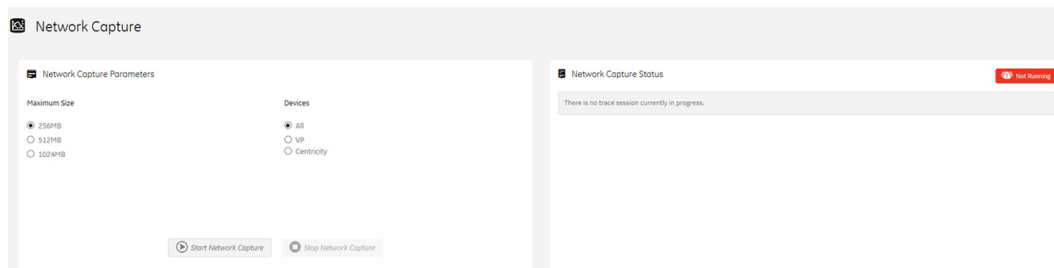
This table shows all the elements available on **Network Capture** with descriptions.

**Table 5-42 Network Capture**

Element	DESCRIPTION
<b>Network Capture Parameters</b>	
Maximum Size	Allowed size of the generated log file. Valid value are: <ul style="list-style-type: none"> <li>• 256MB</li> <li>• 512MB</li> <li>• 1024MB</li> </ul>
Devices	DICOM-configured devices for which you want to capture information. If no additional devices are configured, only All will be available.
Start Network Capture	Select to start the process. This causes the network capture to start, enables the <b>Stop</b> button, and updates the <b>Network Capture Status</b> pane and changes the Status to <b>Running</b> .
Stop Network Capture	Select to stop the process.
<b>Network Capture Status</b>	
	Displays information about the status of the network capture. The language setting for this information is set in Windows and not through the Service desktop or LOGIQ P9/P7 application software.
	Displays the current status of the network capture. Valid values are: <ul style="list-style-type: none"> <li>• Not Running</li> <li>• Running</li> </ul>

To perform a network capture:

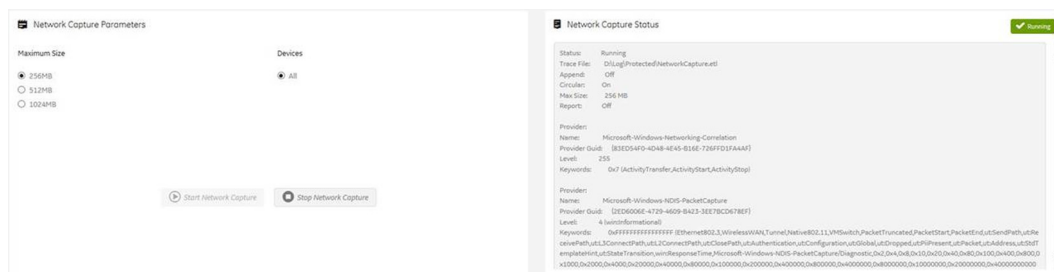
1.) Navigate to **Utility > Service > Utilities > Network Capture**.



2.) From **Network Capture**, do the following:

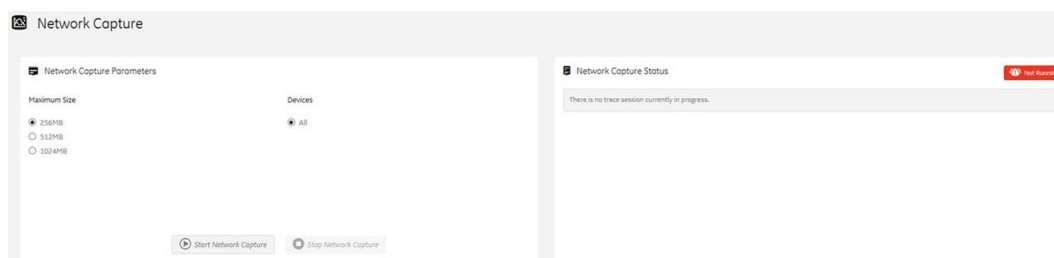
- Under **Maximum Size**, select the allowed size of the generated log file.
- Under **Devices**, select the DICOM-configured device for which you want to capture information. If no additional devices are configured, only **All** will be available.

3.) Select **Start Network Capture** to start the process. This causes the network capture to start, enables the **Stop** button, and updates the **Network Capture Status** pane and changes the **Status** to **Running**.



4.) Click the **Stop** button to end data collection. Stopping is a two-step process:

- Stops the data collection and immediately closes the .etl file.
- Collects additional diagnostic data that may help diagnose network issues. When the file is closed, you see “There is no trace session currently in progress”. When the remaining data is collected and the .cab file is closed, you are notified in the banner.



For more information, see:

- [Utilities on page 5-73](#)



5-11-10 Options

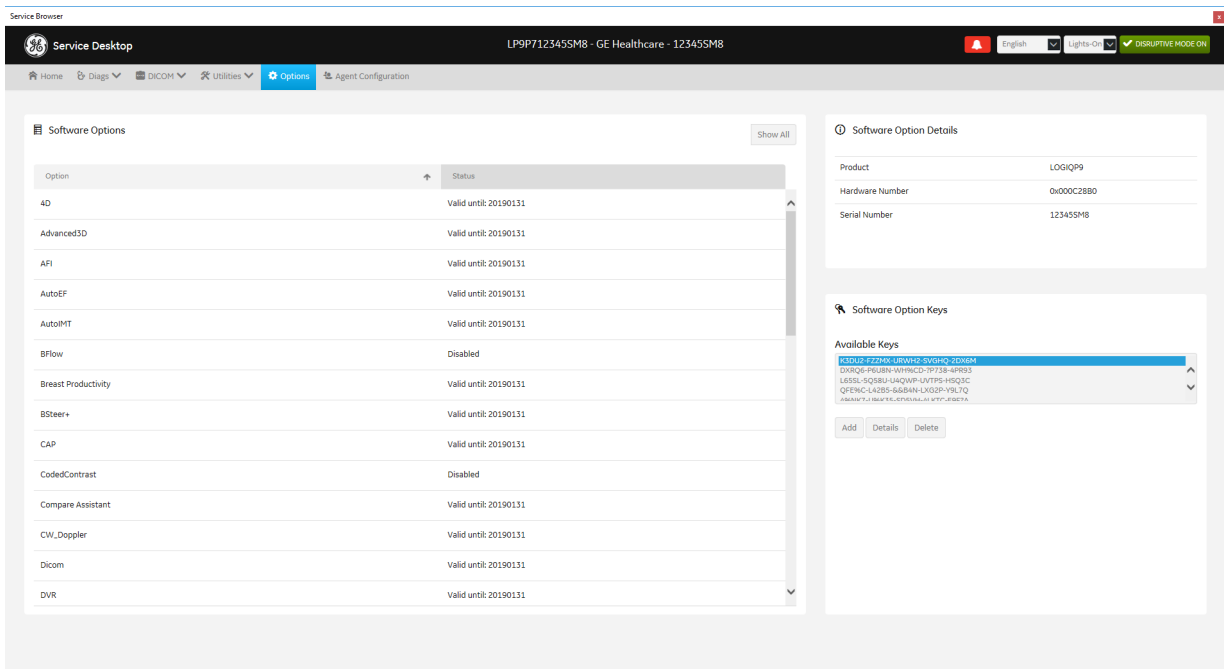
Use **Options** to:

- View software options.
- View software option details.
- Add (or delete) a valid option key, add a duplicate option key, not add an invalid option key, and ask for confirmation before deleting an option key.
- View software option key details. Key details are a list of options that are enabled by a particular key. Under **Available Keys**, highlight the option string, select **Details** and then view the options on the left side of the screen. Press **Show All** to view all of the activated options.

The information on **Options** is available to all service class licenses.

To access **Options**, navigate to **Utility > Service > Options**.

Figure 5-66 Options



This table shows all the elements available on **Options** with descriptions.

Table 5-43 Options

Element	DESCRIPTION
<b>Software Options</b>	
Option	Software options on the LOGIQ P9/P7.
Status	Status of the options on the LOGIQ P9/P7.
<b>Software Option Details</b>	
Product	Name of the product.
Hardware Number	Number for the hardware. The hardware number is the hash of the serial number that is used to generate the option key.
Serial Number	Serial number of the LOGIQ P9/P7.

Table 5-43 Options

Element	DESCRIPTION
Software Option Keys	
Available Keys	List of the option keys installed on the LOGIQ P9/P7.

5-11-11 Agent Configuration

Use **Agent Configuration** to:

- Edit and configure the following:
  - Enterprise host name in the agent
  - Enterprise port number in the agent
  - Proxy server in the agent
  - Proxy port in the agent
  - CRM number in the agent
  - Display name in the agent
- Set the serial number in the agent
- Enter the username and password for the proxy
- Reset the edited unsaved value
- Update contact details

The information on **Agent Configuration** is available to all service class licenses.

To access **Agent Configuration**, navigate to **Utility > Service > Agent Configuration**.

Figure 5-67 Agent Configuration

The screenshot displays the 'Agent Configuration' interface within the 'Service Desktop' application. The top navigation bar includes 'Home', 'Steps', 'DECOM', 'Utilities', and 'System', with 'Agent Configuration' currently selected. The main content area is divided into several sections. The 'Agent Configuration' section at the top shows a summary of the agent's status: 'Running', 'Registered: Yes', 'Quarantine: No', and 'CRM Verified: No'. Below this, there are input fields for 'Agent Model Number' (CS\_ULS\_LOGIQ\_E10\_801.6), 'Serial Number' (12345678), 'CRM No' (LP9P712345SM8), and 'Display Name'. The 'Advanced Configuration' section contains fields for 'Enterprise Server' (Staging), 'Enterprise Host' (itg-waitg.healthcare.com), and 'Enterprise Port' (443). The 'Proxy Configuration' section includes checkboxes for 'Enable Proxy' and 'Enable Proxy Credentials', along with fields for 'Proxy Server' (3.20.109.241), 'Proxy Port' (88), 'Username', and 'Password'. At the bottom of the form are two buttons: 'Submit Changes' and 'Reset Form'.

This table shows all the elements available on **Agent Configuration** with descriptions.

Table 5-44 Agent Configuration

Element	DESCRIPTION
<b>Agent Configuration</b>	
Contact Details	Phone number for the person at the customer site a GE remote service engineer would contact. The phone number is entered during installation and reviewed at every service call to make sure the information is correct.
Agent Status	Status for the agent. Valid values are: <ul style="list-style-type: none"><li>• Running</li><li>• Not Running</li></ul>

**Table 5-44 Agent Configuration**

Element	DESCRIPTION
Agent Registered	Registered status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent is registered in the back office.</li> <li>• No – The agent is not registered in the back office.</li> <li>• Not Available – The agent is not configured or running.</li> </ul>
Agent Quarantine	Quarantine status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent has more than one device registered with the same CRM Number in the back office. This scanner cannot send data back to GE or be remotely accessed.</li> <li>• No – The agent has one device registered with the listed CRM Number in the back office.</li> <li>• Not Available – The agent is not configured or running.</li> </ul>
Agent CRM Verified	CRM verified status of the agent. Valid values are: <ul style="list-style-type: none"> <li>• Yes – The agent is verified in the back office.</li> <li>• No – The agent is not verified in the back office.</li> <li>• Not Available – The agent is not configured or running.</li> </ul>
Agent Model Number	GE part number for the LOGIQ P9/P7. The same number as listed on the rating plate.
Serial Number	Serial number of the agent (read-only). If the agent is not registered with a serial number, this field is populated with the serial number of the LOGIQ P9/P7. The serial number of the agent is tied to the serial number of the LOGIQ P9/P7.
CRM No	Customer Relationship Management (CRM) number. System identifier assigned to the customer unit by the service region. CRM is pre-populated by adding P9P7 to the CRM number. The CRM number of the LOGIQ P9/P7 is editable.
Display Name	Displayed name of the agent.
<b>Advanced Configuration</b>	
Enterprise Server	Name of the enterprise server.
Enterprise Host	Number of the enterprise host.
Enterprise Port	Number of the enterprise port.
<b>Proxy Configuration</b>	
Enable Proxy	Enables the proxy server.
Proxy Server	When Enable Proxy is selected, name of the proxy server IP.
Proxy Port	When Enable Proxy is selected, number of the proxy server port.
<b>Credentials</b>	
Enable Proxy Credentials	Enables the proxy credentials.
Username	When <b>Enable Proxy Credentials</b> is selected, name of the user.
Password	When <b>Enable Proxy Credentials</b> is selected, password for the user.

# Chapter 6

## Service Adjustments

---

### Section 6-1 Overview

#### 6-1-1 Purpose of Chapter 6

This chapter describes how to test and adjust the mechanical capabilities of a scanner that may be out of specification. Although some tests may be optional they should only be performed by qualified personnel.

**Table 6-1 Chapter 6 Contents**

Section	Description	Page Number
6-1	Overview	6-1
6-2	Regulatory	6-1
6-3	LCD Monitor Adjustment	6-2

### Section 6-2 Regulatory

Verify, where applicable, that any regulatory information or tests required by national law are present and accounted for, and any regulatory tests required by national law are performed *and* documented.

## Section 6-3 LCD Monitor Adjustment

The LOGIQ P9/P7 has a free adjustable LCD monitor in relation to the user interface.

The digital control panel is located at the front of the color monitor. **It is NOT recommended to change the pre-adjusted settings.** However, if you are not satisfied with the factory settings, use these controls to program those you prefer in each resolution.

**NOTE:** All changed values will only be saved by selecting "Exit" from the OSD.  
If not, the adjusted values will be lost after loss of power.



Figure 6-1 Monitor Adjustment buttons

Table 6-2

	Main Menu	Sub Menu	Range	Setting for LOGIQ P9/P7
1	Color	Contrast	0~100%	100%
		Dim Brightness	0~100%	100%
		Brightness	0~100%	80%
		Gamma	2.2 or 2.4	2.4
		Color temperature	6500K/7500K/ 9000K/9500K/ 11000K/13000K/ USER	13000K
		Gain - R	0~100%	50%
		Gain - G	0~100%	50%
		Gain - B	0~100%	50%
		Return		
		Exit		

Table 6-2

	Main Menu	Sub Menu	Range	Setting for LOGIQ P9/P7
2	Others	H position	0~100%	50%
		V position	0~100%	50%
		Reset		
		Return		
3	Language		English/German/ French/Spanish/ Italian/Swedish/ Chinese/Japanese	English
4	Information	Resolution		
		Model Name		
		Part Number		
		Revision		
		S/W Version		
5	Exit			

Note : 1920 x 1080, 60Hz

## 6-3-1 Brightness/Contrast (R1.x.x)

### 6-3-1-1 Brightness

Adjusting the monitor's contrast and brightness is one of the most important factors for proper image quality. If these controls are set incorrectly, the Gain, TGC, Dynamic Range and even Acoustic Output may have to be changed more often than necessary to compensate.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the highest white should be bright, but not saturated.

- 1) Go to Utility -> System -> General.
- 2) Press the OSD Control button to adjust the BRIGHTNESS and Contrast by using scroll bar to decrease/increase value.



Figure 6-2 Brightness/Contrast Adjust

#### 6-3-1-1-1 Gamma

- 1) Go to Utility -> System -> General.
- 2) Press the OSD Control button.
- 3) Press RGB tab.
- 4) Select 2.2 or 2.4 by using scroll bar to decrease/increase the value in Gamma Correction box.



## 6-3-2 OSD Control on the Utility mode (R1.x.x)



**Figure 6-3 Monitor**

- 1) Go to Utility -> System -> General.
- 2) See Monitor category.
- 3) There are preset parameters below for monitor setting.

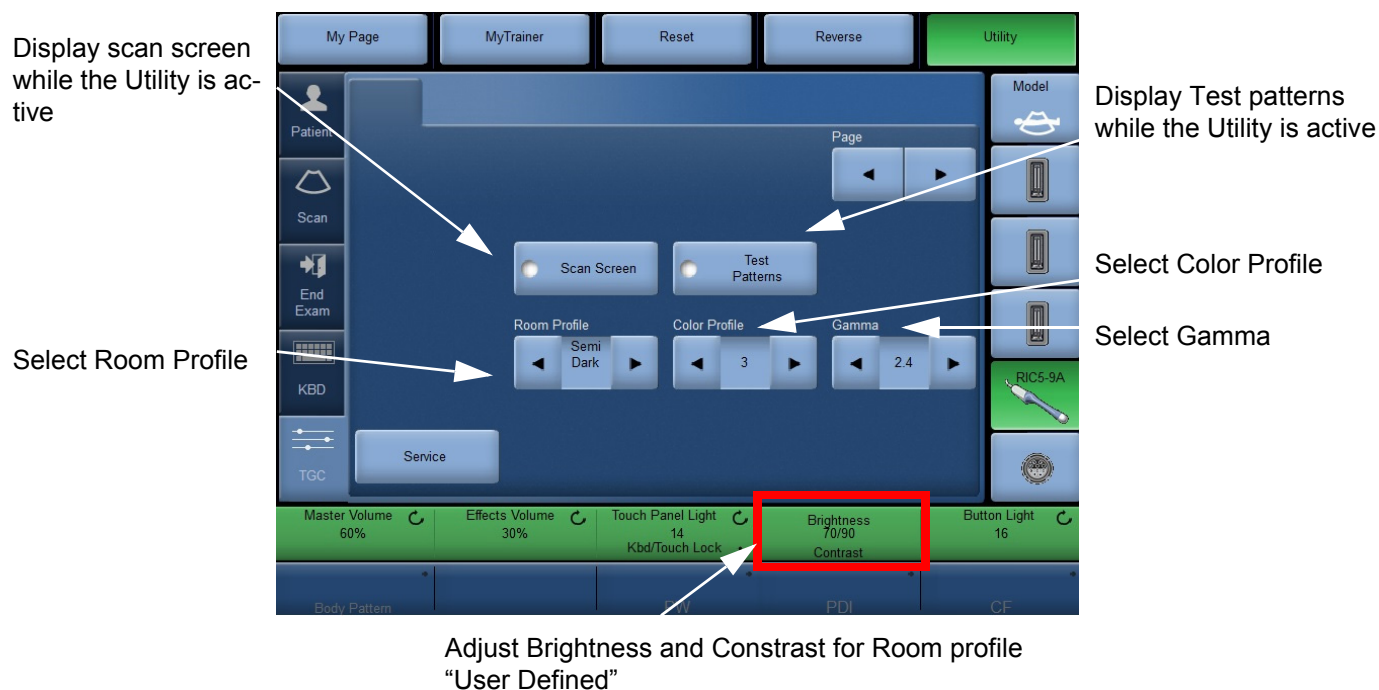
**Table 6-3**

Preset Parameter	Description
Dark	Pre-defined monitor settings for Dark Room
Semi Dark	Pre-defined monitor settings for Semi-Dark Room
Light	Pre-defined monitor settings for Light Room
OSD Control	The monitor can also be adjusted in brightness and contrast. For detailed adjustment press the [ OSD controls] buttons on the screen. The OSD menu will appear on the screen. Brightness, Contrast, Backlight and Sharpness can be adjusted in General tab. Monitor colors can be adjusted in RGB tab.

### 6-3-3 21.5 inch Wide Monitor Adjustment (R2.x.x and later)

All Monitor settings have been optimized at the factory, so normally, there should be no need for any further adjustments.

- 1) Go to Utility second touch panel
- 2) Adjust Room profile, Color Profile, Gamma, Brightness/Contrast (Roomprofile-User defined) as necessary.



**Figure 6-4 Monitor Adjustment**

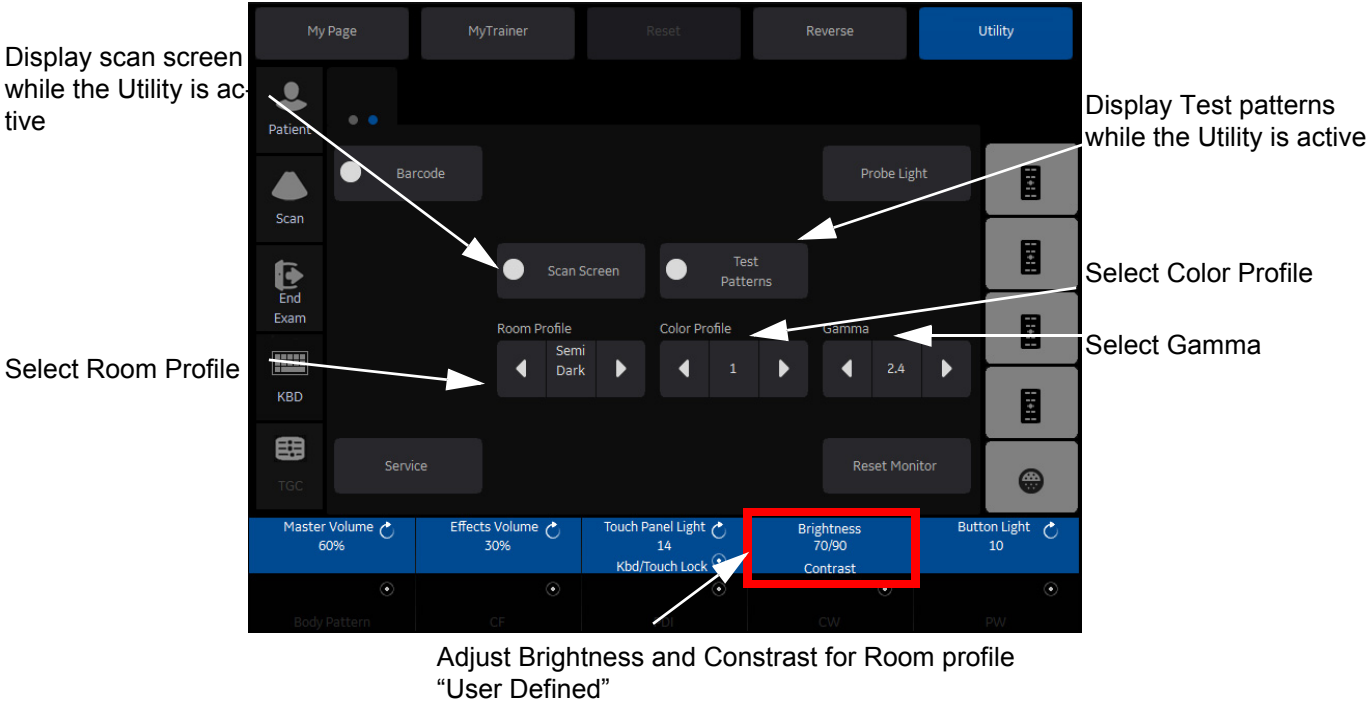


Figure 6-5 Monitor Adjustment (R3)

Table 6-4 Parameters for Wide Monitor

Parameter	Range	Note
Room Profile	Dark/Semi Dark/Light/User Defined	
Color Profile	0 - 6	0: 6500K 1: 9000K 2: 11000K 3: 13000K 4: 7500K 5: 9500K 6: USER
Gamma	2.2 or 2.4	
Brightness (Room Profile - User Defined)	0 - 100	
Contrast (Room Profile - User Defined)	0 - 100	

### 6-3-3-1 Scan Screen

In order to view the monitor while adjusting the Contrast/Brightness and Color Profile, press the **Scan Screen** on the second Utility Page.

- 1) Press **Scan Screen**. The scan screen displays on the main display while the Utility touch panel is active.
- 2) Adjust Room Profile/Color Profile as necessary.

### 6-3-3-2 Room Profile

Room Profile changes Brightness/Contrast of main display.

If "User Defined" is selected the user can adjust Brightness/Contrast by Brightness/Contrast control at the bottom of the Touch Panel.

*NOTE: Brightness/Contrast setting is displayed only when touch panel has Room profile button.*

*NOTE: Brightness/Contrast is changeable only when Room Profile setting is "User Defined"*

### 6-3-3-3 Color Profile

Color Profile controls temperature.

# Chapter 7

## Diagnostics/Troubleshooting

### Section 7-1 Overview

#### 7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Basic host, system, and board level diagnostics are run whenever power is applied.

Some Service Tools may be run at the application level.

#### 7-1-2 Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition through remote diagnostics or to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

**Table 7-1 Contents in Chapter 7**

Section	Description	Page Number
7-1	Overview	7-1
7-2	Collect Vital System Information	7-2
	7-2-1 Collecting System Information	7-2
	7-2-2 Request for Service (RFS) (R1, R2, R2.5 only)	7-3
	7-2-3 Request for Service (RFS) (R3 only)	7-5
7-3	Check Points Voltages	7-7
7-4	Screen Captures and Logs	7-8
7-5	Remote Access to Service Platform	7-15
	7-5-1 General	7-15
	7-5-2 How the Customer enables/disables Disruptive Mode and VCO	7-16
	7-5-3 GE Icon and Remote Connection	7-16
	7-5-4 Customer Granting Full Remote Access Permission to GE Service Technician	7-16
	7-5-5 Common Service Desktop (CSD)	7-18
	7-5-6 CSD: Configuration	7-18
7-6	Minimum Configuration to Boot/Scan	7-19
7-7	Troubleshooting Trees, Instructions and Tech Tips	7-20

## Section 7-2 Collect Vital System Information

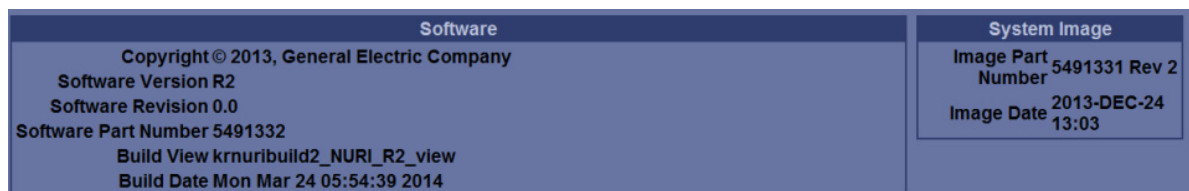
### 7-2-1 Collecting System Information

The following information is necessary to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

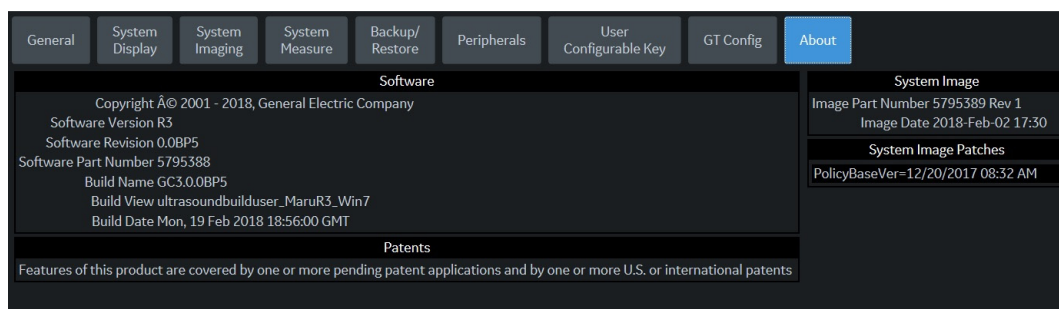
**NOTE:** This information is normally collected with the Alt+D or Gather Logs utility.

- Product Name = LOGIQ P9/P7

1) From the touch panel, select Utility -> System-> About.



**Figure 7-1 About (R1, R2, R2.5 only)**



**Figure 7-2 About (R3 only)**

2) Record software version and System Image version

#### Applications Software

- Software Version
- Software Revision
- Software Part Number
- Build View
- Build Date

#### System Base Image Software

- Base Image Revision
- Image Part Number
- Image Date

## 7-2-2 Request for Service (RFS) (R1, R2, R2.5 only)



**NOTICE** Service Connectivity has to be checked out once before you can request for service. i.e., Service platform has to be configured properly; see: [CSD: Configuration on page 7-18](#).

There are two possibilities to contact GE:

- by means of the GE “Remote Status Icon” that is displayed on the bottom of the screen.



Move the cursor to the GE icon and press the left trackball key (= left-click) to display the “Request For Service” form (see: [Figure 7-3](#) below).

- via the System Setup - SERVICE page
  - Press the UTILITIES key on the control panel.
  - In the “Utilities” menu select SYSTEM SETUP to invoke the setup desktop on the screen.
  - On the left side of the screen select ADMINISTRATION and then click the SERVICE tab.
  - Enter the password SHE and click the ACCEPT button to display the Service Tools window.
  - Click the GFS button and fill out the displayed form. (Enter detailed Problem description.)

fill out the form

[Send] button

Connection must be **Checked out**

Figure 7-3 Contact GE - Request for Service

- Click the SEND button to send the problem description to GE Service/Application representatives.

A request confirmation screen is displayed:

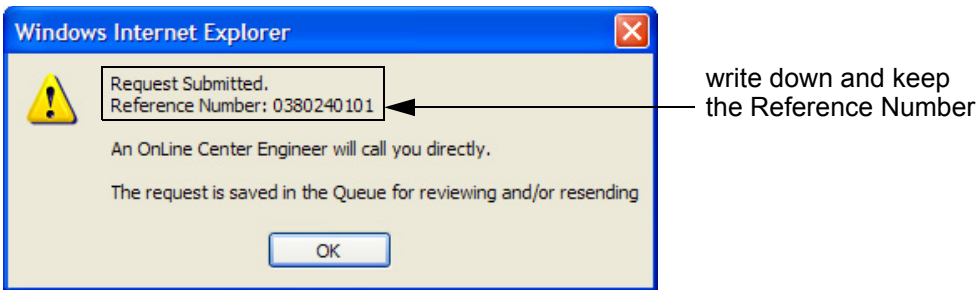


Figure 7-4 Request submitted

4) Write down and keep the Reference Number for follow up procedures, then click OK.

NOTE: If the service platform is not configured an Error message is displayed. The request is **NOT sent!**  
The request is saved in QUEUE for reviewing and/or resending.

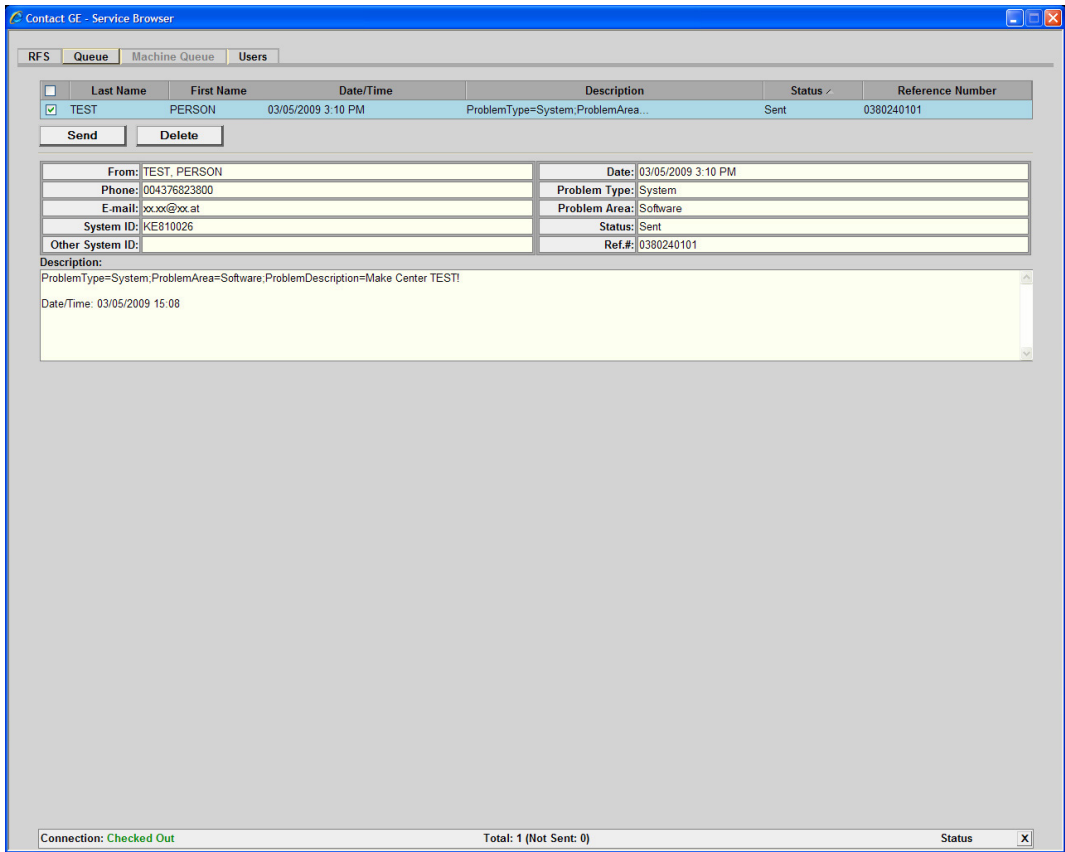


Figure 7-5 Contact GE - Queue



## 7-2-3 Request for Service (RFS) (R3 only)

### 7-2-3-1 Request for Service

- 1) Move the cursor to the GE icon and press the right-click, select “Contact GE”

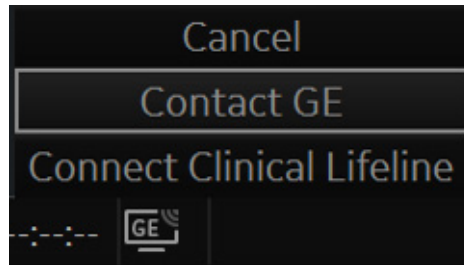


Figure 7-6 Contact GE

- 2) The Request for Service (RFS) page is displayed

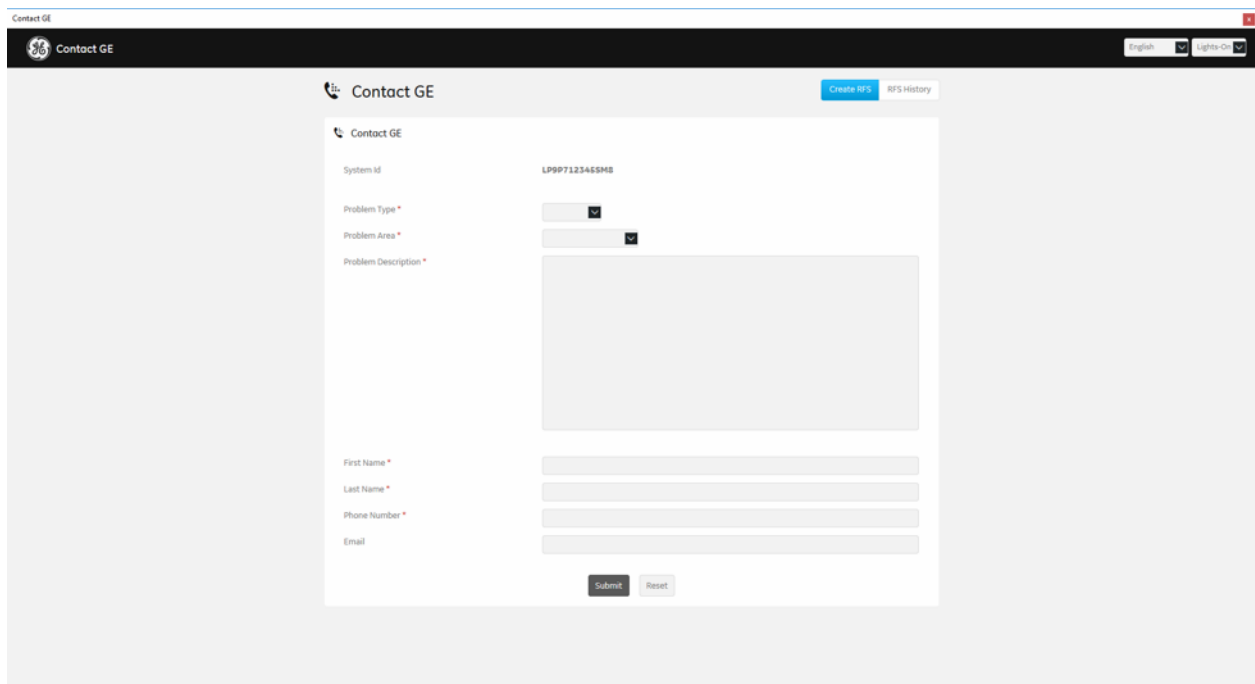



Figure 7-7 Contact GE – Request for Service

3) Click the “Sibmit” button to send the problem description to GE Service/Application representatives

 **NOTICE** If Agent configuration is not configured correctly, the "Submit" button is disabled. Refer to the below.

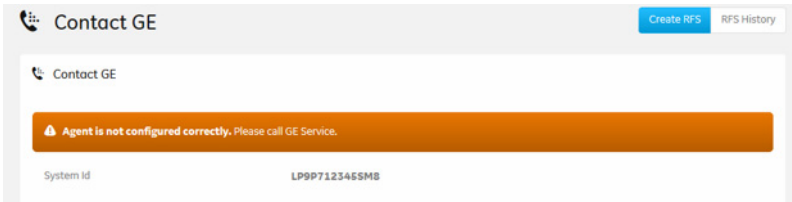


Figure 7-8 Contact GE – Not configured correctly of the Agent configuration

4) Click the “RFS History” button on Contact GE page  
The Request for Service History page is displayed. RFS histories are displayed up to 10 recently requested

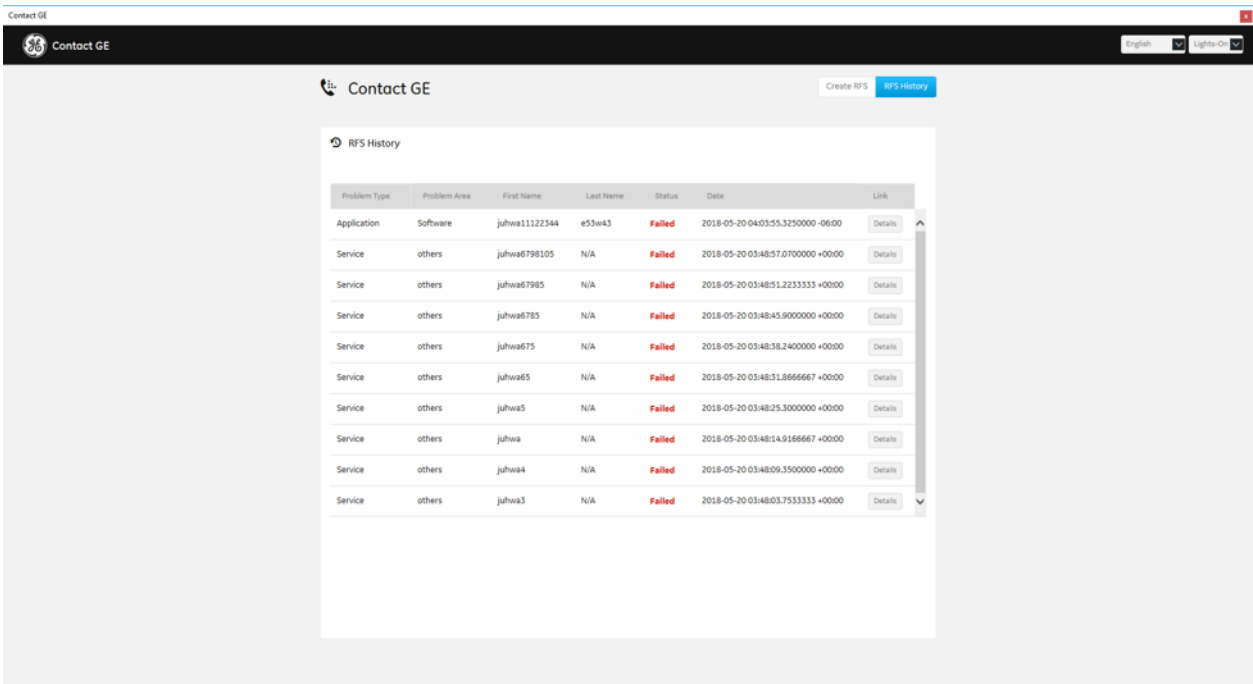


Figure 7-9 Contact GE – Request for Service History

Section 7-3  
Check Points Voltages

7-3-1 LED for Power Status

LEDs near the front cooling fan can provide information pertaining to the DC power distribution status.

- 1) Remove Front Cover (no tools required)

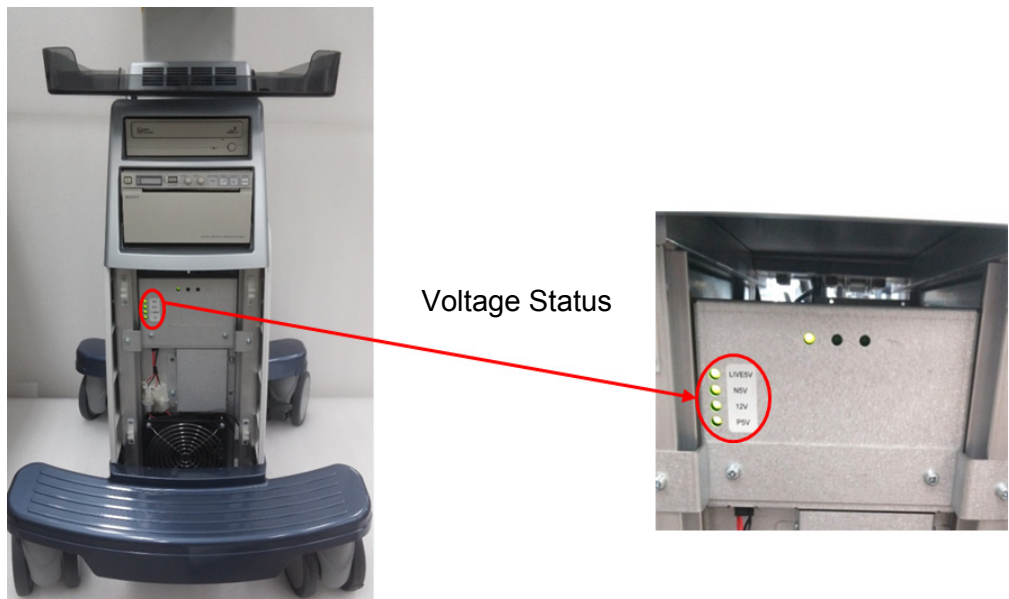


Figure 7-10 LED for Power Status

LED	Breaker OFF System OFF	Breaker ON System OFF	Breaker ON System ON	Breaker ON System Sleep
LIVE5V	OFF	ON	ON	ON
N5V	OFF	OFF	ON	OFF
12V	OFF	OFF	ON	OFF
P5V	OFF	OFF	ON	OFF

## Section 7-4 Screen Captures and Logs

Sometimes, the customer or field engineer wants to capture a presentation on the screen to identify the issue may be recovered by the Online Center (OLC). This is accomplished by saving the log files.

- A) To archive log files and current screen image put DVD-R/CD-R media to DVD drive tray or plug-in external USB drive.
- B) Press ALT+D to archive log files and a screen capture to the target media
- C) "System Problem Reporting" dialog will be popped up and please describe brief information about the issue.
- D) Please select destination drive (CD/ DVD recordable/ HDD/ USB drive).
- E) Press store button to save archive file to the destination drive.

### 7-4-1 Capturing a screen

The following is the generic process to capture any screen from the scanner.

- 1) Navigate and display the image/screen/volume to be captured.
- 2) Press the **P1**, **P2**, **P3** or **P4** key (depending on system configuration) on the control panel and store the image onto the clipboard (frame on left side of the screen).
- 3) Select the stored image(s) and export them to DVD-R/CD-R, an external USB drive (optional) or mapped Network drive (jpg, bmp, tiff).

### 7-4-2 Export Log's and System Data

- 1) "ALT + D" key to save a snapshot and "Full Backup" of the System status.  
See: Section 7-4-2-1 on page 7-8

#### 7-4-2-1 Export System Data (by pressing the ALT + D key)

Pressing ALT + D make "Full Backup" archive of the system status. In addition, it creates one screenshot of the point in time when "ALT + D" is pressed. The main usage of the archived files is to identify system problem based on logs and captured screen. (e.g., when experiencing strange behavior or when the problem should be investigated by engineering team.)

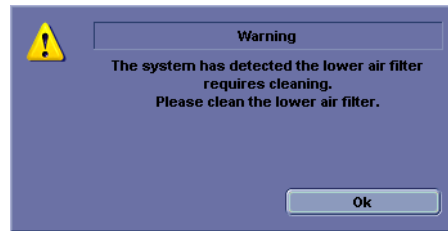


Figure 7-11 System Problem Reporting

**NOTE:** For capturing logs limitation, please refer to LP9/P7 R3 user manual in chapter 10 under the "Groups" for the preset parameters.

## 7-4-3 System Warning/Errors and Logs

### 7-4-3-1 Temperature warning



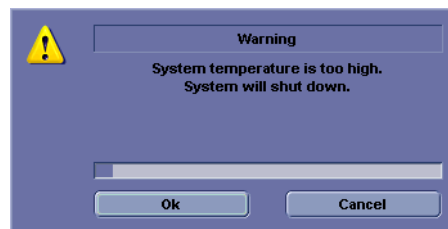
#### 7-4-3-1-1 Cause

CPU Temperature exceeded threshold (104°C).

#### 7-4-3-1-2 What to do

- 1) Shut down the system and Clean the filter.

### 7-4-3-2 Temperature exceeded threshold



#### 7-4-3-2-1 Cause

CPU Temperature exceeded threshold (100°C) and therefore, system must be shut down immediately.

#### 7-4-3-2-2 What to do

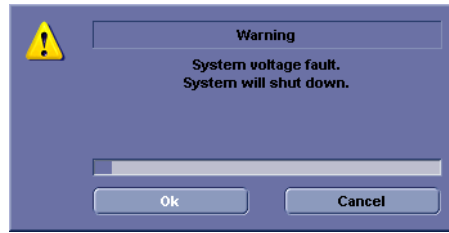
- 1) Shut down the system and Clean the filter.

#### 7-4-3-2-3 Log message of the high temperature

(Example)

Error ; acqHouseKeeping(\*\*\*\*); CPU Temperature Sensor BEP\_CPU\_TEMPERATURE = 105.00 degrees C is outside tolerance limits. UpperLimit = 104.00 LowerLimit = -10.00

### 7-4-3-3 System voltage failure



#### 7-4-3-3-1 Cause

System detected unexpected voltage level from voltage level monitoring circuits.

#### 7-4-3-3-2 What to Do

- 1) Press OK and reboot the system.
- 2) If problem persists, then shut down the system, turn OFF breaker and reboot.

#### 7-4-3-3-3 Log message of the Voltage error

(Example)

Error ; acqHouseKeeping(540); MCB\_AFE\_3V3\_0= 2.5 outside tolerance limits. UpperBound = 3.6 LowerBound = 2.970, Soft Limits are usually narrower than upperBound and lower bound

## 7-4-3-4 Hardware configuration error

### 7-4-3-4-1 Cause

Hardware(s) not detected as valid system. System will boot up but will not allow scanning.

### 7-4-3-4-2 What to do

- 1) Press OK, and shutdown the system and reboot.
- 2) If same issue persists, then shut down the system, system breaker.

### 7-4-3-4-3 Log message of the Invalid hardware error

#### Example

```
Error ; acqHWCAP(1776); *****
Error ; acqHWCAP(1776); *** ***
Error ; acqHWCAP(1776); *** HW RACK CONFIGURATION INVALID!!! ***
Error ; acqHWCAP(1776); *** ***
Error ; acqHWCAP(1776); *****
Error ; acqHWCAP(1776); *** ***
Error ; acqHWCAP(1776); *** Board FuncRevs Provided ***
Error ; acqHWCAP(1776); *** ----- ***
Error ; acqHWCAP(1776); *** MCB_FuncRev1A (qty=1)
Error ; acqHWCAP(1776); *** COMEXP_FuncRev1A (qty=1)
Error ; acqHWCAP(1776); *** MDC_FuncRev1A (qty=1)
Error ; acqHWCAP(1776); *** MPI_FuncRev1A (qty=1)
Error ; acqHWCAP(1776); *** MIO_FuncRev1A (qty=1)
Error ; acqHWCAP(1776); *** ***
Error ; acqHWCAP(1776); *****
Info ; DFEManager(1776); HandleRunFlag: setting RunDfe and RunBlock flags to true!
Error ; EAErrorHandler(1776); Error from acqHWCAP: Invalid Hardware Rack Configuration - Check
logs. Severity : FatalHW
```

## 7-4-3-5 System Error



### 7-4-3-5-1 Cause

Unrecoverable error occurred and unable to continue scan. Error dialog does not indicate the root cause of system error. To identify the root cause clearly, it is necessary to investigate the log files.

### 7-4-3-5-2 What to do

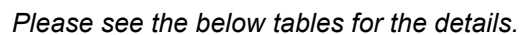
- 1) Press "OK", turn off the console and reboot.
- 2) If same issue persists, then shut down the system, and turn off the system breaker.



```
“Error ; ErrorHandler(****); Error from” + ErrorModuleName + ErrorMessage
```

7-4-3-5-4-1

Hardware error



GFI Hardware Exception
GFI Setup Exception
GFI Buffer Exception
GFI Processing Exception

Code	Error Name	Description
31	eSwHardwareException_ErrorHandler_GFIHardwareError	Hardware Error (MCB/ MDC/MPI..)
167	eSwProcessingException_TsLevelOk_Timeout	HV (High Voltage) is not available from MDC.

Error Descriptions:

Message	Description
GFE Ch0 empty-GFE Ch1 empty-CPS_ERROR(FAULT_HVLV). Severity :FatalHW	MDC Error.
GFE Ch0 empty-GFE Ch1 empty-CPS_ERROR(FAULT_POWER). Severity :FatalHW	MDC Error.
GFE Ch0 empty-GFE Ch1 empty-CPS_ERROR(FAULT_STOP). Severity :FatalHW	MDC Error.
GFE Ch0 empty-GFE Ch1 empty-BF_ERROR_A . Severity : FatalHW	MCB Error (One of Callisto FPGA)
GFE Ch0 empty-GFE Ch1 empty-BF_ERROR_B . Severity : FatalHW	MCB Error (One of Callisto FPGA)
scanctrl ScanControl::startScan: Tx Power Supply is not ready. HV setup timeout after 4127 ms, ScanSequencer NOT started!. Severity : NonFatalSW	MDC Error or MDC Error

7-4-3-5-4-2 Software Errors :

Software error

Error Module Name

“Error ; EAErrorHandler(2284); Error from DFEManager: DFEManager - RunDfe failed:!,

DFE ERROR: InPort is not connected (2); device "DelayValues\_CW.ceDelay". Severity :

NonFatalSW”

Error Module Name

## Section 7-5

### Remote Access to Service Platform

#### 7-5-1 General

If the console is setup to connect to InSite ExC server (refer to Chapter.3 for InSite ExC Configuration(R1, R2 and R2.5 only) or Agent Configuration(R3 only)), then remote access technology may provide GE technicians the possibility to view the entire customer's desktop and operation system for diagnostics and trouble shooting.

Using VCO (Virtual Console Observation) a service technician or the OnLine Center can access and modify all PC settings and programs or run diagnostics on the customer's ultrasound scanner. Remote access to the LOGIQ P9/P7 scanner requires permission and customer input before a GE service technician or OLC can access the customer's ultrasound scanner remotely. "Disruptive Mode" can be selected by the customer directly on the LOGIQ P9/P7 ultrasound system (see: Section 7-5-2 on page 7-16), or remotely by the service technician or OLC.

## 7-5-2 How the Customer enables/disables Disruptive Mode and VCO

- 1) If not already in read mode, **FREEZE** the image.
  - 2) Move the cursor to the GE icon and press the right trackball key (= right-click).
  - 3) Select **Connect Clinical Lifeline** (see: [Figure 7-12 on page 7-16](#) (R1, R2, R2.5 only) or [Figure 7-13 on page 7-16](#) (R3 only) below).
- This activates “Disruptive Mode” and “VCO” for the application OLC to quickly assist the customer.

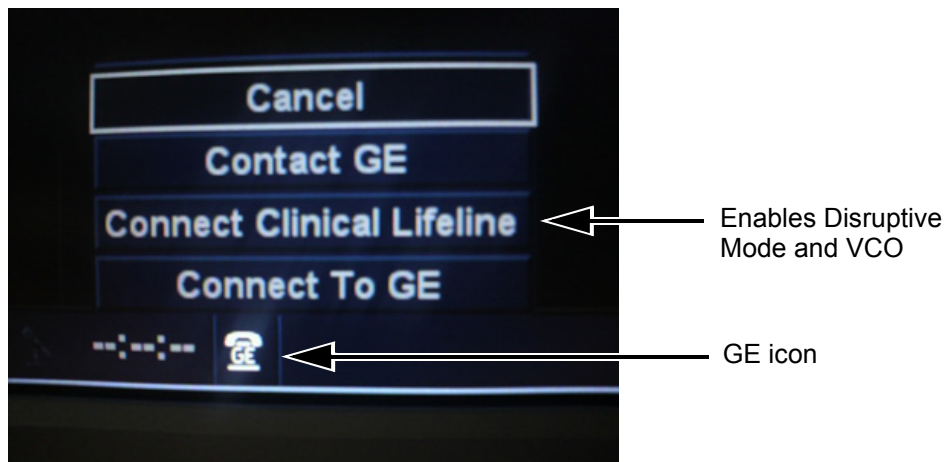


Figure 7-12 Connect Clinical Lifeline (R1, R2, R2.5 only)

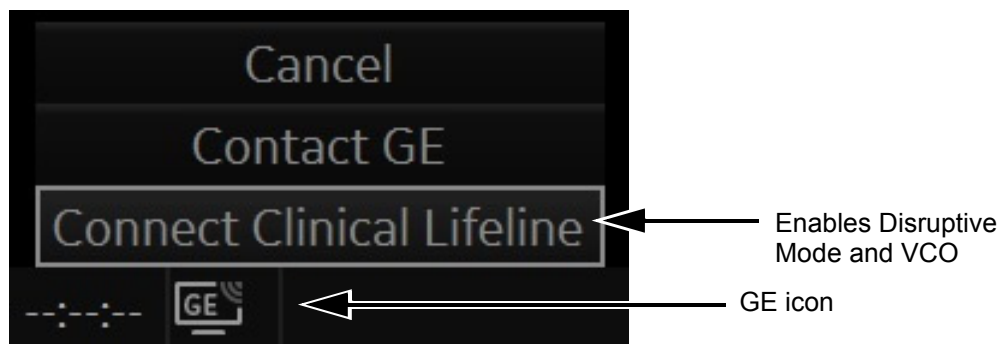


Figure 7-13 Connect Clinical Lifeline (R3 only)

**NOTE:** To disable disruptive mode, select “CANCEL”.

## 7-5-3 GE Icon and Remote Connection

Refer to [Section 5-9](#) for Remote Access Icons.

## 7-5-4 Customer Granting Full Remote Access Permission to GE Service Technician

### 7-5-4-1 If GE Service Technician requests Remote Access Permission

If a GE Service technician requests remote access to your LOGIQ P9/P7 scanner, following “InSite Notification” appears on the systems screen.

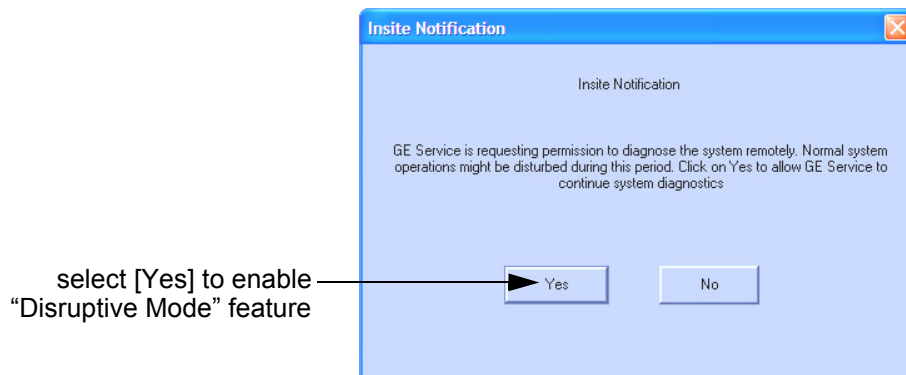


Figure 7-14 Insite Notification (R1, R2, R2.5 only)

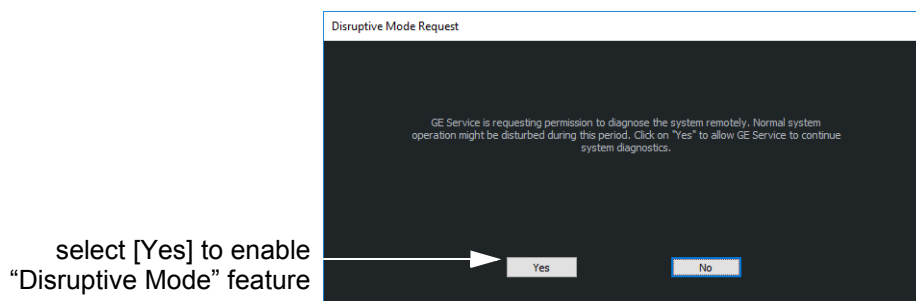


Figure 7-15 Insite Notification (R3 only)

- 1) Enable “Disruptive Mode” feature by confirming YES

**NOTE:** If the customer does not wish to have diagnostics running at the time of the request, they select NO. A message is sent back to the OLC or FE that “Disruptive Mode” is not enabled.

**7-5-5 Common Service Desktop (CSD)**

Refer to Section 3-13 for accessing Common Service Desktop remotely.

**7-5-6 CSD: Configuration**

Refer to Section 3-13 for accessing Common Service Desktop remotely.

## Section 7-6

### Minimum Configuration to Boot/Scan

LOGIQ P9/P7 will require at minimum MPI, MCB (with COMExpress),MDC, IO Box, HDD(Mounted on MBP) and OPIO to boot up.

Section 7-7

Troubleshooting Trees, Instructions and Tech Tips

Table 7-2 below outlines LOGIQ P9/P7 troubleshooting trees and instructions shown in the sub-sections.

Table 7-2      Troubleshooting Trees and Instructions

Sub-section	Description	Page Number
7-7-1	System does not boot up	7-21
7-7-1	System does not boot up	7-21
7-7-2	Noise disturbs the image	7-22
7-7-4	Printer Malfunction	7-24
7-7-5	Monitor Troubleshooting	7-25



## 7-7-1 System does not boot up

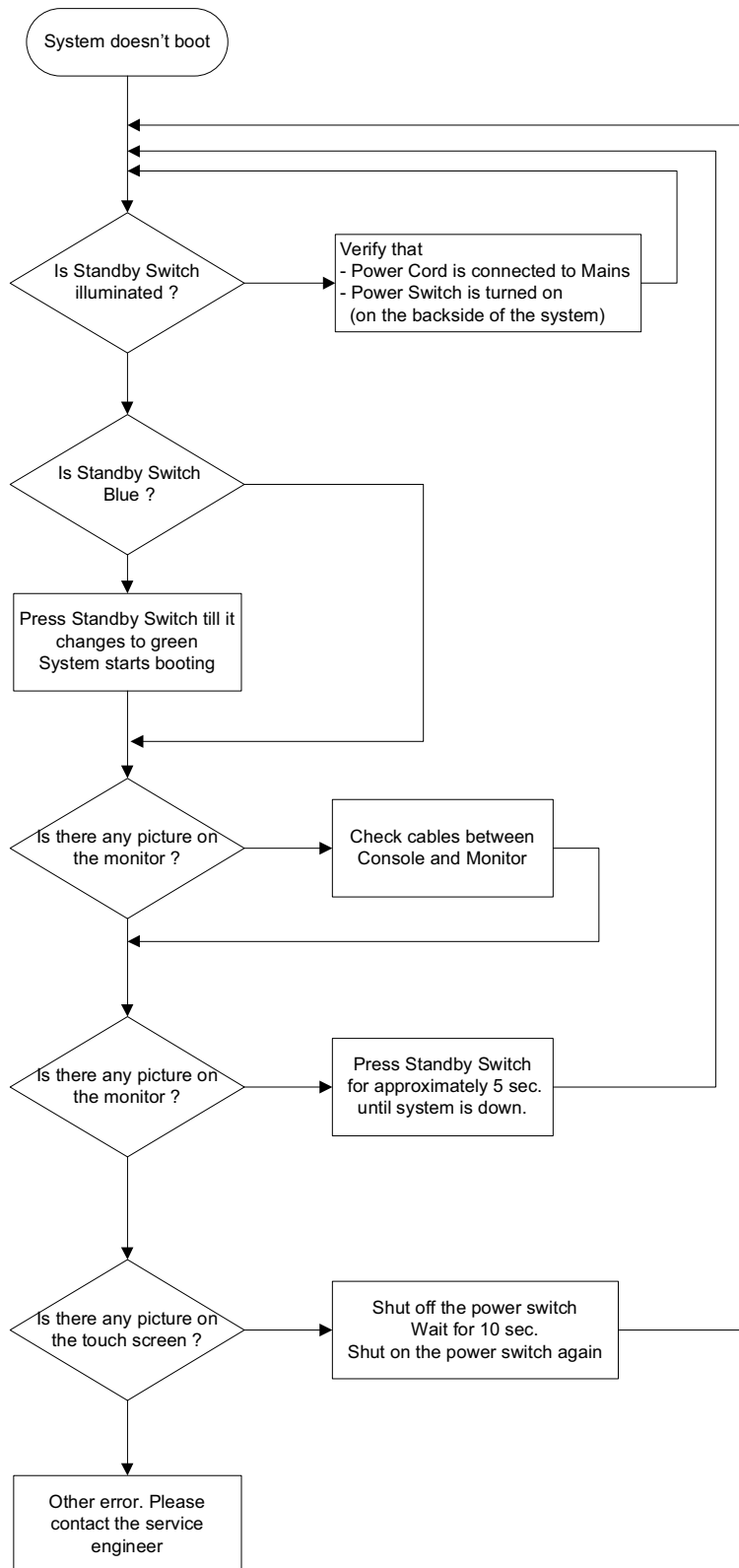


Figure 7-16 System does not Power On / Boot Up

## 7-7-2 Noise disturbs the image

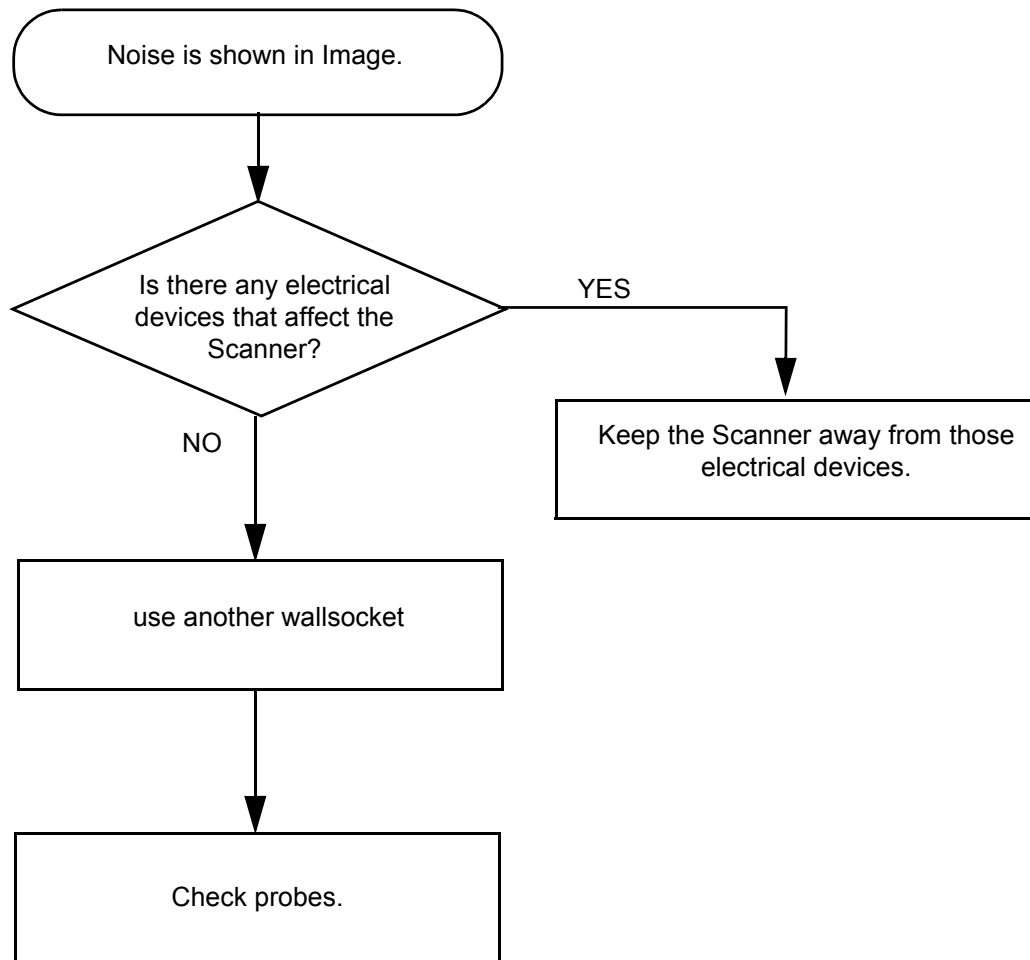


Figure 7-17 Noise disturbs the Image - Troubleshooting

### 7-7-3 Trackball - Impaired Sensitivity

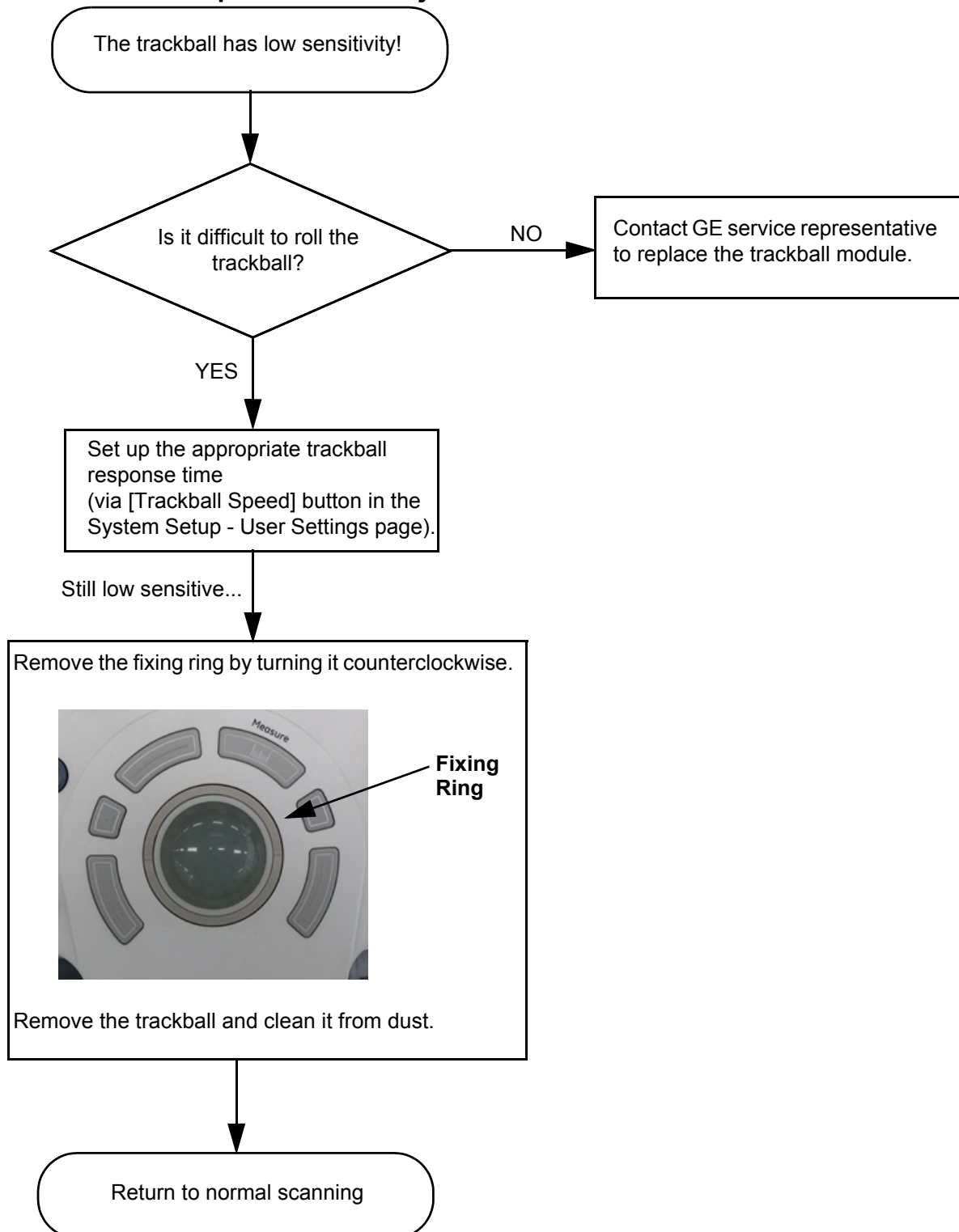


Figure 7-18 Trackball - Impaired Sensitivity

## 7-7-4 Printer Malfunction

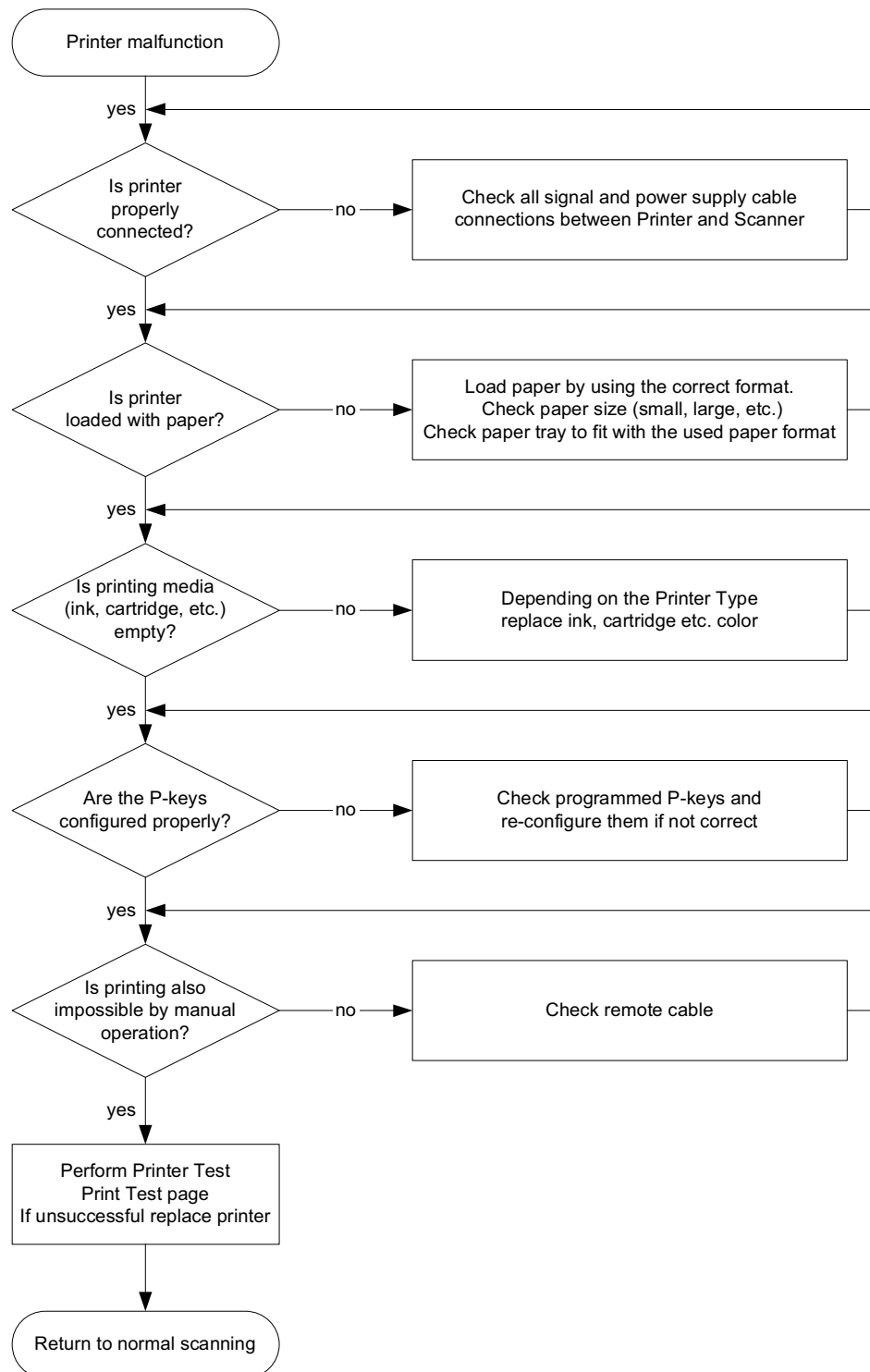


Figure 7-19 Printer Malfunction

## 7-7-5 Monitor Troubleshooting

Fault symptom	Check these items
No image	Check the power cord is properly connected.
	Check the video cable is properly connected.
	Check no pins of the video cable are bent.
	Check if video is present on backplane.
Color is not uniform	Turn ON the power to activate the Auto-Degauss function.
Colored streaks appear in image	Check for presence of magnetic sources near the monitor. Eliminate the sources and then degauss the monitor.
Screen image is not centered or sized properly	Adjust the picture location, picture size, picture rotation or pincushion distortion.
	Some video modes do not fill the screen to the edge of the monitor. There is no single answer to solve the problem. This phenomenon may occur on higher refresh rates (vertical frequency).
Picture is fuzzy	Adjust the picture contrast and picture brightness. Some SVGA cards having an excessive video output level will cause a fuzzy picture at the maximum contrast level.
	Turn ON the power to activate the Auto-Degauss function.
Video test patterns are not clear, bright, parallel or square	Replace the monitor.



**NOTICE** The monitor should automatically degauss itself each time power is applied if you wait at least 15 seconds before you turn power back ON.

For further details refer to [Section 6-3 "LCD Monitor Adjustment" on page 6-2](#).

## 7-7-6 How to import patient data base from older consoles

Customers should back up their dataset through DICOM Export from their older scanner to import back onto the LOGIQ P9/P7. The LOGIQ P9/P7 can only understand DICOM media and cannot understand GE-specific database or private xml.

## 7-7-7 EZbackup will not delete images to open disk space

Customers have to manually delete the patients after successful EZBackup operation to free up disk space.

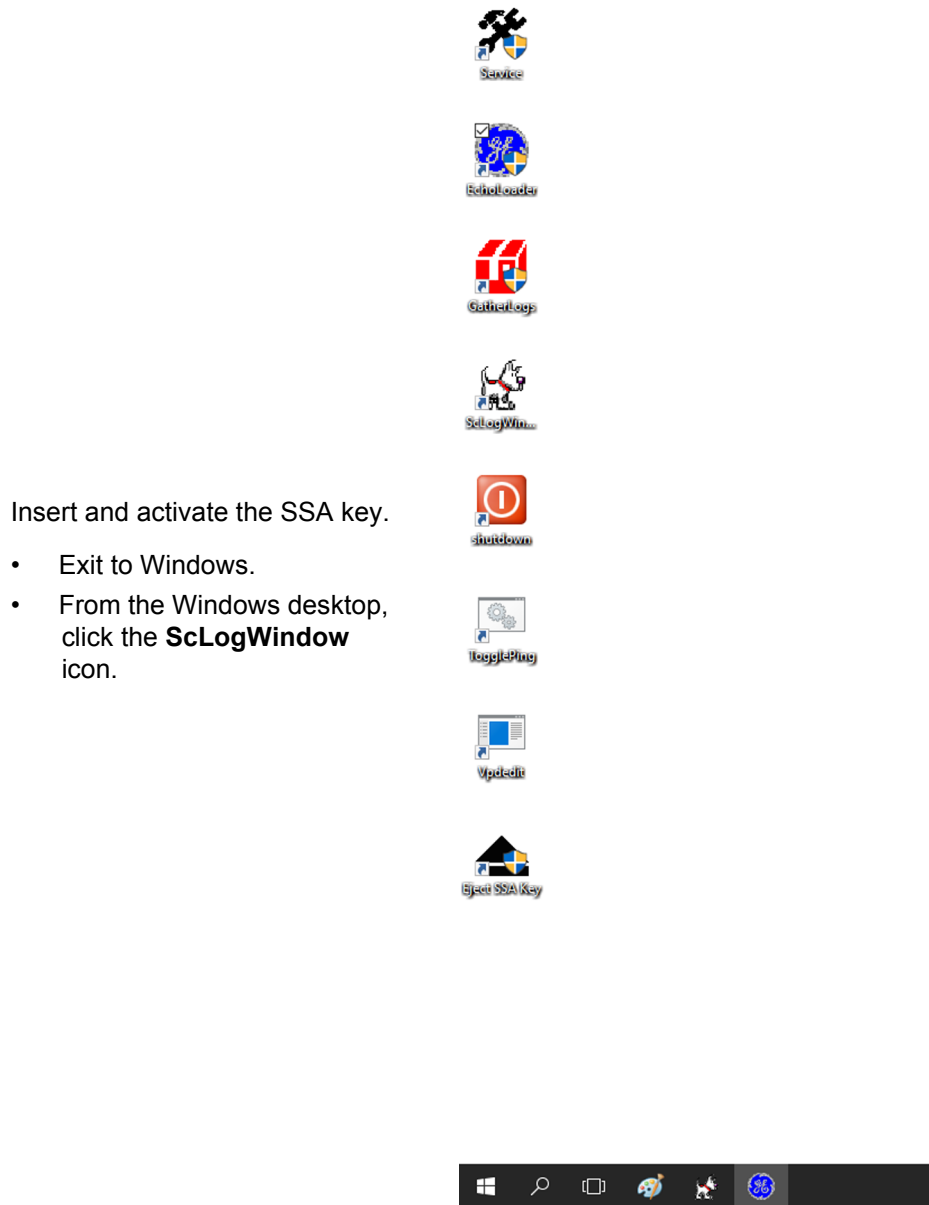
## 7-7-8 Use ScLogWindow

The ScLogWindow application helps identify errors while the system is running. Access this application from the Windows desktop or through Task Manager. From **ScLogWindow**, you can:

- View the logs
- Save the log
- Filter the log

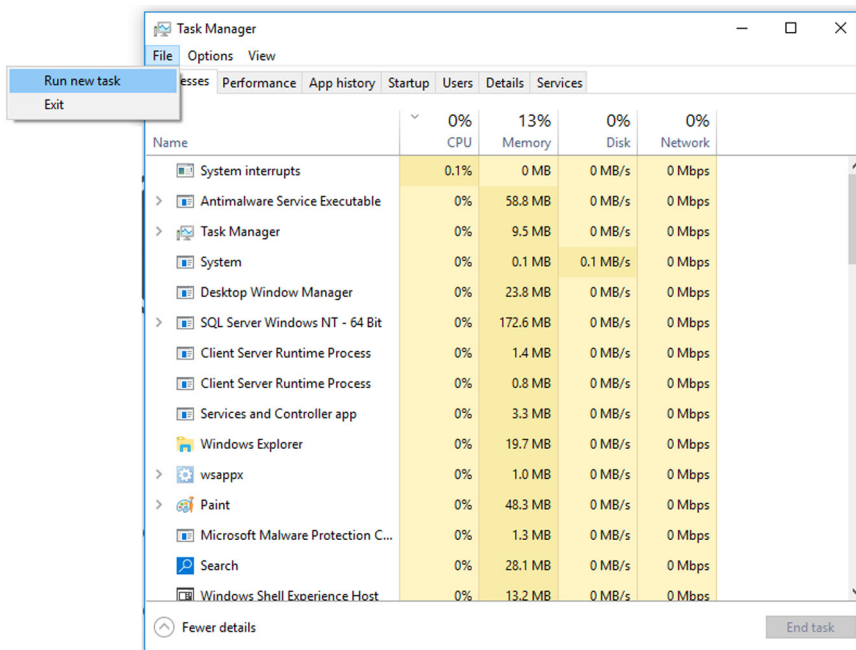
To open ScLogWindow from the Windows desktop:

Figure 7-20 ScLogWindow from the Windows desktop

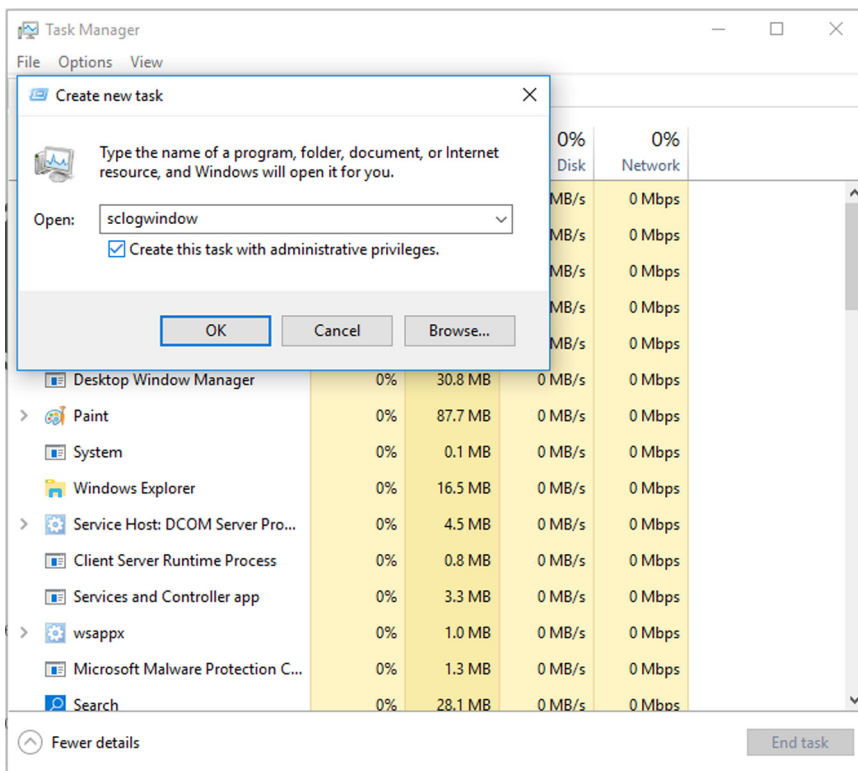


**To open ScLogWindow from Task Manager:**

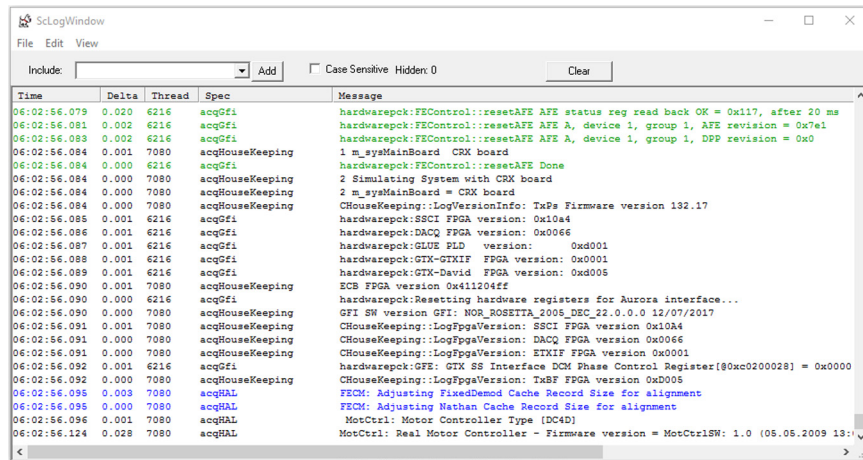
- 1.) Insert and activate the SSA key.
- 2.) Press **Ctrl+Alt+Del** and select **Task Manager**.
- 3.) In Task Manager, select **File > Run New Task**.



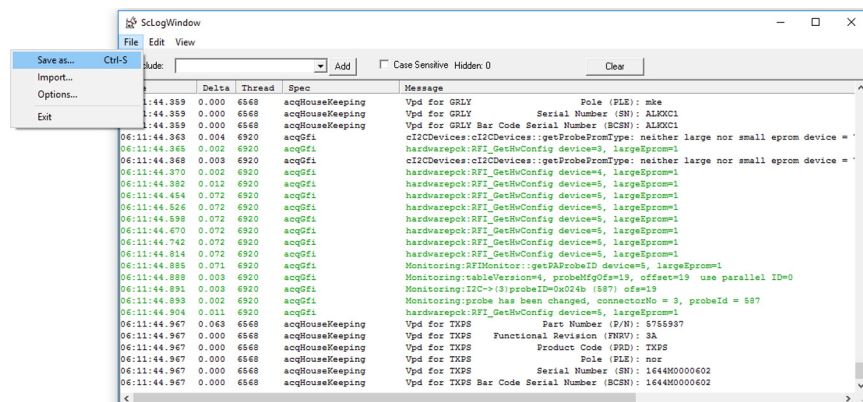
- 4.) In **Open**, enter **SclogWindow**, check **Create this task with administrative privileges**, and then press **OK**.



- 1.) With the ScLogWindow open, double-click the **EchoLoader** icon.
- 2.) Use **Alt+Tab** to put the ScLogWindow in front.
- 3.) While the application is booting up, observe logging in ScLogWindow.



- Select **File > Save as**



- 1.) Select **View** and check the entries to filter.
- 2.) Select **Stop** to stop the logging.
- 3.) View the filtered logs.
- 4.) To clear the window and start a fresh log capture, select **Clear**.



## 7-7-9 SSA key

### Expiration of an SSA key

When you plug in an SSA key to the LOGIQ P9/P7 and enter the code to unlock it, a message should display on the screen acknowledging the connection. If the message does not appear, the SSA key may have expired.

To check whether the SSA key has expired, navigate to **Service > Utilities > SSA License** and check the expiration status.

**Figure 7-21 Example of an expired SSA key**

 Class M key Details

Name	Value
Class M key Status	Plugged In
Drive Letter	F:
Expire Date	Expired
SSO ID	
Key Counter Value	-1
Max Key Counter Value	-1

### Dual Class M SSA key support

The SSA service does not support two Class M SSA keys plugged into the LOGIQ P9/P7 at the same time. The first key will validate. If a second key is plugged in, the SSA service will not validate the second key. Apart from validation, plugging two SSA keys into the LOGIQ P9/P7 could cause additional problems.

### Abnormal shutdown

If an abnormal shutdown occurs, there is a chance that the SSA service could corrupt and not validate the SSA key. In this occurs, see [To restore an SSA key that is not validating: on page 7-65](#).

### SSA key battery

There is a battery inside the SSA key. If the SSA key is not periodically charged, the battery may die. The battery life is approximately six months.

For more information, see [SSA License on page 7-64](#).

## 7-7-10 Log analysis

Error logs and monitoring logs are kept in a database format. If needed for troubleshooting, collect them with Alt+D or gather logs. Either process extract information from the database in a collection of files that are readable for the field.

### Crashes

Crash information is contained in **/Log/CrashDump**.

Use this log to troubleshoot issues with software crashes. Send these files to engineering for evaluation and determination of the root cause.

### Auto transfer errors

When auto transfer is enabled, error information is contained in **CSD\_LogFile.log**.

Auto transfer periodically logs data to the back office. For example:

```
13:27:49] ERROR data-transfer.js:764 DataTransfer Manual Data Transfer: Error in uploading full logs file D:\Scanner\upload\log_LogOther_E70034_171221_132748_DB.zip "error"
```

This example may indicate that network connectivity has been compromised on the LOGIQ P9/P7 or there is an issue with the facility reaching out to the back office. Check with the network administrator.

### Service alerts

Service alert information is contained in **/Log/SvcAlert\*.txt**.

Use this log to troubleshoot issues with alerts generated by the LOGIQ P9/P7. Alerts can also be viewed on the Service desktop. Review log file content to determine the errors the LOGIQ P9/P7 has generated in the past.

### USB issues

USB information is contained in **/Log/ScLogsDatabase/UsbLog.txt**.

Use this log to troubleshoot issues with a USB device that may be working intermittently. This log indicates connection and disconnection of USB devices during operation.

### Probe use

Probe use information is contained in **/Log/ScLogsDatabase/MainLog.txt**.

Use this log to troubleshoot issues with probes. This log indicates probe selection and mode.

### Monitoring logs

Monitoring log information is contained in **/Log/ScLogsDatabase/MonitoringLog.txt**.

Use this log to troubleshoot issues with voltage and temperature. This log contains the monitoring parameters for voltage and temperature, same used to the status indicators on the Service desktop. Use this log to evaluate details of red indicators in the Service desktop.

### **System configuration logs**

Hardware configuration information is contained in **/Log/SysCfg.csv**.

Use this file to troubleshoot issues with hardware configuration (also known as VPD). This log helps to determine the part numbers of boards installed along with versions and serial numbers.

### **Boot up issues**

To troubleshoot issues at boot up, refer to Bootup Issues on page 2-32.



# Chapter 8

## Replacement Procedures

### Section 8-1 Overview

#### 8-1-1 Purpose of Chapter 8

This chapter contains replacement procedures for different modules and their subsystems.



**NOTICE** The **Manpower**, time and **Tools** indicated in the Sub-sections include all requirements from **Preparations to Installation Procedures**.



**WARNING** *No covers or panels should be removed from the system (high-voltage risk). Service and repairs must only be performed by authorized personal. Attempting do-it-yourself repairs invalidate warranty and are an infringement to regulations and are inadmissible acc. to IEC 60601-1.*



**NOTICE** Energy Control and Power Lockout for LOGIQ P9/P7.

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:

1. Turn off the scanner.
2. Unplug the system.
3. Maintain control of the system power plug.
4. Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation.

Beware that the Power Supply, Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.



**The Waste of Electrical and Electronic Equipment (WEEE) must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company for information concerning the decommission of your equipment.**

**Table 8-1 Chapter 8 Contents**

Section	Description	Page Number
8-1	Overview	8-1
8-2	Warnings and important information	8-5
8-3	System Software - Installation/Upgrade Procedure	8-7
8-4	Software and Functional Checks after Installation Procedure	8-56
8-5	Settings - Backup and Restore	8-57
8-6	Replacement of Front Cover	8-62
8-7	Replacement of Top Cover	8-64
8-8	Replacement of Side Cover	8-66
8-9	Replacement of Rear Cover	8-70

**Table 8-1 Chapter 8 Contents**

Section	Description	Page Number
8-10	Replacement of Side Tray & Foot Rest Cover	8-71
8-11	Replacement of Monitor and LCD Arm Plastic Covers	8-73
8-12	Replacement of Monitor Covers	8-78
8-13	Replacement of Fixed Arm Cover and Fixed Arm Holder Grip	8-80
8-14	Replacement of OPIO and Related Parts	8-82
8-15	Replacement of the Caps for Hardkeys	8-96
8-16	Replacement of Key Caps (by special native language keys)	8-98
8-17	Replacement around Nest Box	8-101
8-18	Replacement of Front fan	8-118
8-19	Replacement of Bottom fan	8-119
8-20	Replacement of Rear Handle	8-122
8-21	Replacement of Link Arm Cable Hook	8-123
8-22	Replacement of Caster	8-124
8-23	Replacement of the COM Express	8-127
8-24	Replacement of the HDD/SSD	8-135
8-25	Replacement of Battery	8-137
8-26	Replacement of 4D	8-139
8-27	Replacement of Wireless LAN	8-141
8-28	Replacement of the Harness Cable and OPIO Cable Assy	8-142
8-29	Replacement of Peripheral Cable Assy	8-146
8-30	Replacement of the Probe Holder	8-153
8-31	Replacement of the Cable Hook	8-154
8-32	Replacement of the OPIO Tray	8-155
8-33	Replacement of the Paper tray	8-156
8-34	Replacement of AC Cable Holder	8-157
8-35	Replacement of the BW printer	8-158
8-36	Replacement of the Speaker	8-160
8-37	Replacement of the Monitor Arm	8-164
8-38	Replacement of Front Fan Filter	8-165
8-39	Replacement of Bottom Fan Filter	8-166
8-40	Replacement of SW CD set (R1, R2, R2.5 only) and SW USB (R3 only)	8-167
8-41	Replacement of Drawer	8-168
8-42	Replacement of ECG	8-170
8-43	Replacement of DCWD ASSY	8-172
8-44	Replacement of MCWD ASSY	8-174

Table 8-1 Chapter 8 Contents

Section	Description	Page Number
8-45	Replacement of battery pack for LP7-P9 R2 ext battery pack	8-174
8-46	Replacement of battery pack for LP7-P9 R2 Battery option	8-180
8-47	Replacement of MBOB	8-184
8-48	Replacement of MIO-B	8-189
8-49	Replacement of BBC	8-192
8-50	Replacement of LOGIQ P9 ROTATION MODULE KIT	8-198
8-51	Replacement of ODD Dummy Cover R3	8-204
8-52	Replacement of Probe Light assy	8-205

## 8-1-2 Returning/Shipping System, Probes and Repair Parts

When returning or shipping the LOGIQ P9/P7 system in the original packaging:

- system must be lowered to its minimum height with monitor flapped down (see: Figure on [page 3-8](#))
- the Control Console has to be centered and locked in “unextended” position

Equipment being returned must be clean and free of blood and other infectious substances.

GEHC policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEHC employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

*The US Department of Transportation (DOT) has ruled that “items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care” are “regulated medical waste” for transportation purpose and must be transported as a hazardous material.*




## Section 8-2


### Warnings and important information


#### 8-2-1 Purpose of this section

This section includes important information. Please read it before doing any of the procedures in this chapter.

#### 8-2-2 Warnings

 **WARNING** ***NO COVERS OR PANELS SHOULD BE REMOVED FROM THE SYSTEM (HIGH-VOLTAGE RISK). SERVICE AND REPAIRS MUST ONLY BE PERFORMED BY AUTHORIZED PERSONAL. ATTEMPTING DO-IT-YOURSELF REPAIRS INVALIDATE WARRANTY AND ARE AN INFRINGEMENT TO REGULATIONS AND ARE INADMISSIBLE ACC. TO IEC 60601-1.***


 **WARNING** ***DO NOT TOUCH ANY BOARDS WITH INTEGRATED CIRCUITS PRIOR TO TAKING THE NECESSARY ESD PRECAUTIONS.***

 ***ALWAYS CONNECT YOURSELF, VIA AN ARM-WRIST STRAP, TO THE ADVISED ESD CONNECTION POINT LOCATED ON THE REAR OF THE SCANNER (NEAR THE POWER CONNECTOR).***

***FOLLOW GENERAL GUIDELINES FOR HANDLING OF ELECTROSTATIC SENSITIVE EQUIPMENT.***

 **WARNING** ***THE WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT MUST NOT BE DISPOSED AS UNSORTED MUNICIPAL WASTE AND MUST BE COLLECTED SEPARATELY.***

 ***PLEASE CONTACT THE MANUFACTURER OR OTHER AUTHORIZED DISPOSAL COMPANY TO DECOMMISSION YOUR EQUIPMENT.***

 **NOTICE** ***Energy Control and Power Lockout for LOGIQ P9/P7.***

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:

1. Turn off the scanner.
2. Unplug the system.
3. Maintain control of the system power plug.
4. Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation.

Beware that the Power Supply, Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.



## 8-2-3 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GE Healthcare policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE Healthcare employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or an ultrasound probe). The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

Refer to [Section 1-3-10 "Returning/Shipping System, Probes and Repair Parts" on page 1-15](#).

*The US Department of Transportation (DOT) has ruled that "items that were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purposes and must be transported as a hazardous material.*

## Section 8-3 System Software - Installation/Upgrade Procedure

### 8-3-1 Introduction

This section describes procedure to install/upgrade software to system.

### 8-3-2 Manpower

1 person, 1 hour

- Depends on contents of System DVD, peripherals, etc. (R1.x.x or R2.x.x)
- Depends on contents of USB media, peripherals, etc. (R3.x.x or later)

### 8-3-3 Tools

- System DVD (R1.x.x or R2.x.x)
- Software Flash Drive with Base Load Image and Application Software. (R3.x.x or later)

### 8-3-4 Preparations

Before performing the Software Upgrade:

- make sure that all system functions are working correct
- check the current Application Software version and the installed Options

### 8-3-5 Preparation

#### 8-3-5-1 General Notes on LOGIS P7/P9 Software Loading

When preparing to load software, you must perform the following steps:

- Back up the entire Patient Archive and Reports (you can import the database from previous version into this version).
- Back up all presets, including Service.
- Record Connectivity settings (TCP/IP).
- Load Base System Software and install Application Software:
  - Reload entire drive (all partitions) or
  - Reload only C partition

- The Hard Disk Drive (HDD) on LOGIQ P7/P9 is divided into four visible (R1.x.x.) or five (R2.x.x or later) visible partitions.

**Table 8-2 Use of the Partitions (R1.x.x)**

Drive Letter	Label
C:	SYSTEM
D:	USER
E:	ARCHIVE
Z:	REPOSIT

**Table 8-3 Use of the Partitions (R2.x.x or later)**

Drive Letter	Label
C:	SYSTEM
D:	USER
E:	ARCHIVE
V:	DVR
Z:	REPOSIT

**NOTE:** Before loading the Base System Software, you must perform the following steps:

- Contact the customer to allow enough lead time to back up the system.
- Be sure no images are in the clipboard or opened exams.
- Review troubleshooting section to collect information for future analysis if you are troubleshooting loss of image or patient data.
- Disconnect the system from the network and remove all transducers from the system.
- Be sure all USB devices (printers only) are connected and turned on (except for USB Flash devices). If a printer is plugged in at this time, it is automatically installed.
- Save all Service Presets if you are connected to InSite to restore remote connectivity after something is completed.
- Save all User Presets.

**NOTE:** After a full or partial system software load, be sure to check the system date, time and time zone are set correctly.

## 8-3-5-2 Preparation for Software Loading

### 8-3-5-2-1 Recording important settings and parameters (optional)

If the system has not been deployed into a customer site yet (i.e. the system has been in the factory default and there has not been patient data), this step can be skipped.

#### 8-3-5-2-1-1 Overview

See the following pages to record data.

These subsections include descriptions for recording/setting up data for the following screens.

With the system Powered On, follow the procedures below to document basic system information and back up Presets, and if required, Patient Archive and Patient Images prior to software load.

- Utility -> Connectivity
  - TCP/IP (see: "Connectivity - Recording the TCP/IP settings").
  - Device (see: "Connectivity - Recording the AE Title and Port settings").
  - Miscellaneous (see: "Connectivity - Recording Miscellaneous settings").
- Utility -> Admin
  - System Admin (see: "Admin - Recording the Software Option Keys").

These subsections include descriptions for recording/setting up data for the following screens.

Hardcopy forms are provided here for convenience, but content will be included if selected during Backup process. Backing up this information is only required if an upgrade specifies the information be backed up or as an extra precaution against loss due to a corrupt back-up disk.

- Utility -> Connectivity
  - Device (see: "Connectivity - Recording Device Destination settings").
  - Service (see: "Connectivity - Recording Service settings").
  - Dataflow (see: "Connectivity - Recording Dataflow settings").
  - Buttons (see: "Connectivity - Recording the Print Key Assignments").
  - Removable Media (see: "Connectivity - Service settings").
- Utility -> Admin
  - Users (see: "Admin - Users").
- Utility -> System
  - Backup/Restore (see: "System - Data Store Management").
  - Peripherals (see: "System - Recording Peripheral settings").
  - About (see: "System - Recording software and hardware versions").
  - General, Record preset Region, Language and Regional Options. (See the latest revision of the LOGIQ P9/P7 Basic User Manual)

#### 8-3-5-2-1-2 Connectivity - Recording the TCP/IP settings

- 1) From the touch panel, select Utility -> Connectivity -> TCP/IP.

Computer Name PXV1-ME02

IP settings

Enable DHCP ☐

IP-Address 192.168.1.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.254

Network Speed: Auto Detect

Reboot the system to activate any changes saved from this page!

Figure 8-1 Connectivity - Recording the TCP/IP settings (R1.x.x)

Computer Name P0000

Wired Network Configuration

Enable DHCP ☐

IP-Address 0.0.0.0

Subnet Mask 255.255.255.255

Default Gateway

Network Speed: Auto Detect

Wired Connection

IP-Address

Subnet Mask

Default Gateway

MAC Address 00-E0-4B-4F-82-23

Speed (Mbps)

Connected (min)

Status

Restart the system to activate any changes saved from this page!

Figure 8-2 Connectivity - Recording the TCP/IP settings (R2.x.x and later)

2) Record all settings in [Table 8-4](#).

Table 8-4 Record settings from TCP/IP screen

Parameter	Value
Computer Name	
IP Settings	
Enable DHCP	ON / OFF
IP-Address	
Subnet Mask	
Default Gateway	
Network Speed	
MAC Address (R2.x.x)	

8-3-5-2-1-3 Connectivity — WLAN

- 1) Press Utility--> Connectivity--> TCP/IP--> Wireless Network Configuration--> Configuration.  
The Wireless Network Configuration tool appears. Available Wireless Networks appear.

2) Select the Properties Tab.



3) Record all settings in Table 8-5.

**Table 8-5      Record settings from WLAN screen**

PARAMETER	VALUE
NETWORK NAME (SSID)	
NETWORK AUTHENTICATION	
DATA ENCRYPTION	
NETWORK KEY	
KEY INDEX	
Specify Yes/No to "The Key is Provided Automatically"	
IEEE 802.1x AUTHENTICATION INFORMATION	
EAP TYPE	

8-3-5-2-1-4     Connectivity - Recording the AE Title and Port settings

- 1) From the touch panel, select Utility -> Connectivity -> Device.
- 2) Select My Computer in the List of Devices, if not already selected.

Properties

Name	MyComputer
IP Address	3.245.75.55
AE Title	LOGIQS7-000000
Port Number	104
MAC Address	68-70-73-75-73-62

Figure 8-3   Connectivity - Recording the AE Title and Port settings (R1.x.x)

Properties

Name	MyComputer
IP Address	
AE Title	LOGIQS7-000000
Port Number	104

Figure 8-4   Connectivity - Recording the AE Title and Port settings (R2.x.x and later)

- 3) Record all settings in [Table 8-6](#).

Table 8-6     Record settings for My Computer from Device screen

Parameter	Value
AE Title	
Port Number	
MAC Address (R1.x.x)	



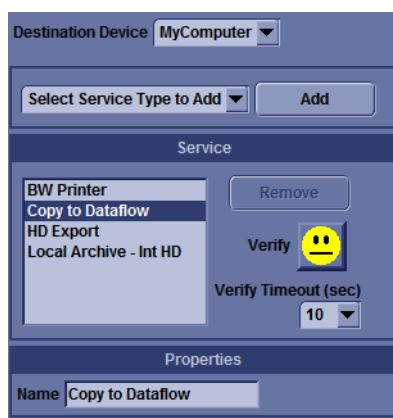
- 4) Record all settings in [Table 8-7](#).

**Table 8-7 Record settings for each device listed in Device table**

Name	IP Address

8-3-5-2-1-5 Connectivity - Recording Device Destination settings

- 1) From the touch panel, select Utility -> Connectivity -> Service.



**Figure 8-5 Connectivity - Recording Device Destination settings**

- 2) Record all settings in [Table 8-8](#) for each Destination Device and Service.

**Table 8-8 Record settings from Service screen**

Destination Device	Properties

8-3-5-2-1-6     Connectivity - Recording Dataflow settings

- 1) From the touch panel, select Utility -> Connectivity -> Dataflow.

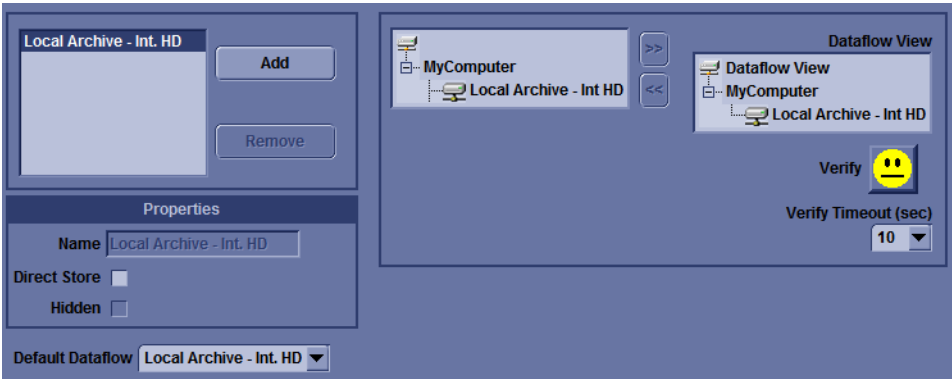


Figure 8-6    Connectivity - Recording Dataflow settings

- 2) Record all settings in Table 8-9 for each Destination Device and Service.

Table 8-9     Record settings from Dataflow screen

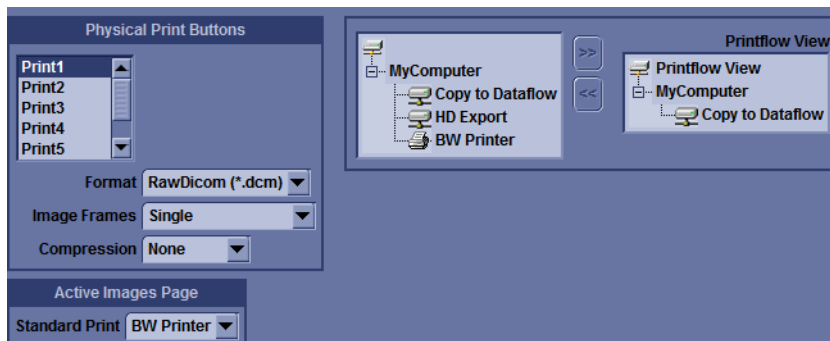
Properties Name	Direct Store	Dataflow	Verify Timeout (sec)
	ON / OFF		
	ON / OFF		
	ON / OFF		
	ON / OFF		
	ON / OFF		
	ON / OFF		
	ON / OFF		
	ON / OFF		

Table 8-10    Record settings from Dataflow screen 2

Default Dataflow	
------------------	--

### 8-3-5-2-1-7 Connectivity - Recording the Print Key Assignments

- 1) From the touch panel, select Utility -> Connectivity -> Buttons.



**Figure 8-7 Connectivity - Recording the Print Key Assignments**

- 2) Record all settings in [Table 8-11](#).

**Table 8-11 Record settings from Button screen**

Parameter	Format	Image Frames	Compression	Compression Quality	Printflow View
Print1					
Print2					
Print3					
Print4					
Print5					
Print6					
PrintScreen					

8-3-5-2-1-8     Connectivity - Recording other settings for Print

- 1) From the Touch Panel, select **Utility -> Connectivity -> Buttons.**

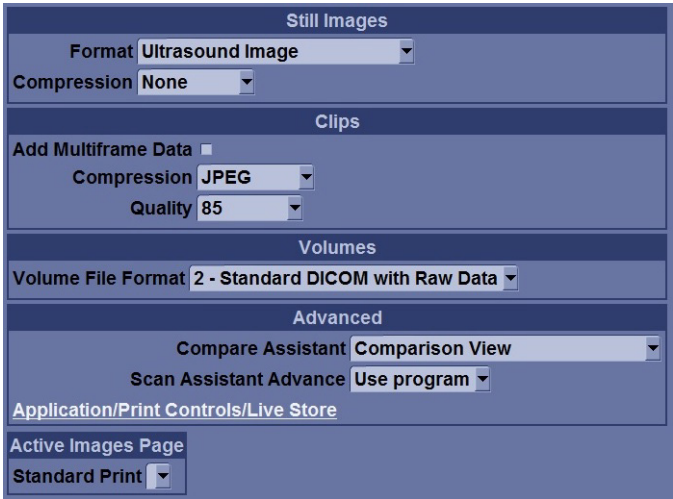


Figure 8-8    Button settings

- 2) Record all settings in [Table 8-16](#)

Table 8-12    Record settings from Button screen

Still Images	
Format	Ultrasound Image / Secondary Capture - Image / Secondary Capture - Video / Secondary Capture - Screen
Compression	None / RLE / JPEG / JPEG2000
Clip/Volumes	
Clips Add Multiframe Data	ON / OFF
Compression	None / RLE / JPEG / JPEG2000
Quality	
Volume File Format	1 - Standard DICOM / 2 - Standard DICOM with Raw / 3 - Enhanced DICOM / 2&3 (2 files)

8-3-5-2-1-9     Connectivity - Service settings

- 1) From the touch panel, select Utility -> Connectivity -> Service.

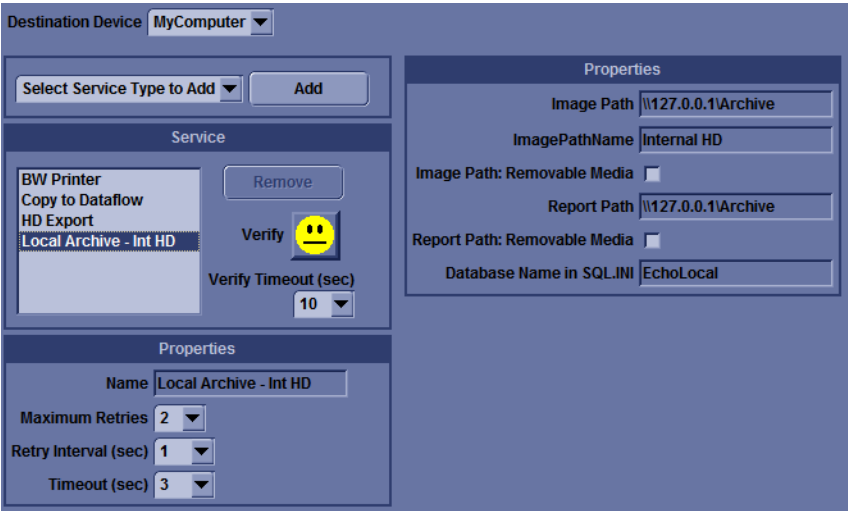


Figure 8-9 Connectivity - Service settings

2) Record all settings in [Table 8-13](#).

Table 8-13 Record settings from Service screen

Destination Device Name	Services (Types) for each Destination Device	Properties Name

8-3-5-2-1-10 Connectivity - Recording Miscellaneous settings

1) From the touch panel, select Utility -> Connectivity -> Miscellaneous.

Figure 8-10 Connectivity - Recording Miscellaneous settings

2) Record all settings in [Table 8-14](#).

Table 8-14 Record settings from Miscellaneous screen

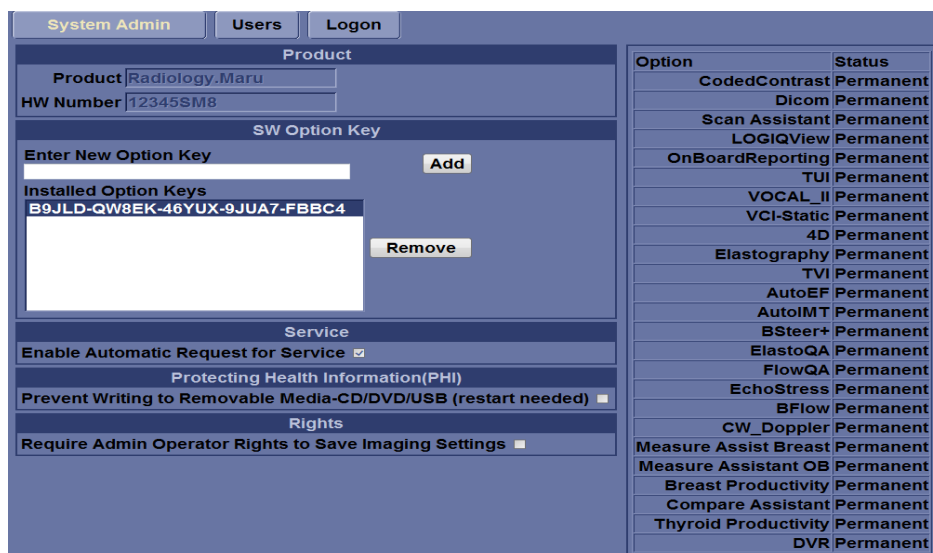
Patient/Exam Menu Options	ON/OFF or Value
Use birthdate	
Auto search for patient	
Automatic generation of Patient ID	
Auto Archiving patient data	
After [End Current Patient], go to:	
Keep Search String	
Worklist Auto Query	
Show BBT	
Double click on patient list to start:	
Detail Mode	
Export to USB HDD: Create DICOMDIR	
Export to Network Storage: Create DICOMDIR	
Automatic Disable Patient Data	
Remember cursor position on Transfer Screen	
Patient/Exam Message Options	ON/OFF or Value
Request acknowledge of End Exam action	
Warn Image store without patient	
Warn register to No Archive	
Warn Image store to Read Only dataflow	

**Table 8-14 Record settings from Miscellaneous screen**

Warn video titles exist in the internal storage	
<b>Columns in examination listings</b>	<b>ON/OFF or Value</b>
(Date   Category   Exam Description   Img. Size   M&A   Disk	
<b>Print and Store Options</b>	<b>ON/OFF or Value</b>
P[1-6] Key Sound	
Store Dual as Dicom Only	
Dual When Color Support is Mixed	
Store Multiframe for Sec Capture Loops	
Enable Smart Capture Area	
Store 2D Loop with Timeline Data	
Patient List Print - Font Size	
DICOM Multi-frame image resolution	
Show progress bar while storing image	
Image Order Scheme	
<b>Other ID Options</b>	<b>ON/OFF or Value</b>
Enable Other ID	
Validation Format	
Cloud Reporting	
Enable Cloud Reporting	


#### 8-3-5-2-1-11 Admin - Recording the Software Option Keys

- 1) From the touch panel, select Utility -> Admin -> System Admin.



**Figure 8-11 Admin - Recording the Software Option Keys**

- 2) Record the Software Option Key(s) - alphanumeric string(s) - from the Installed Option Keys field in [Table 8-15](#).



**WARNING** *Make sure that the Software Option Keys (alphanumeric passwords) have been recorded correctly. If the key is incorrect, you will not be able to log on after the software installation has been completed. The password is case sensitive. Hyphens must also be recorded. There may be more than one password.*

Table 8-15    Software Option Keys

Item	Value
HW Number	
Installed Option Keys	

8-3-5-2-1-12    Admin - Users

- 1) From the touch panel, select Utility -> Admin -> Users.

User List

ADM

T01

T02

USR

Add

Remove

Group Membership

Operator ☒

Ref.Phys. ☐

Perf.Phys. ☐

Operator Rights

Admin ☐

Identity

Id

T01

Password

.....

Prefix

Last Name

Last

First Name

First

Middle Name

Mid

Suffix

Phone Number

Figure 8-12    Admin - Users



2) Record all settings in [Table 8-16](#).

**Table 8-16** Record settings from Users screen

User ID	Prefix	Last Name	First Name	Group Membership	Op Rights

#### 8-3-5-2-1-13 System - Data Store Management

1) From the touch panel, select Utility -> System-> Backup/Restore.

The screenshot displays the 'System - Data Store Management' interface, which is split into two main panels: 'Backup' on the left and 'Restore' on the right.

**Backup Panel:**

- Patient Archive:** ☐ No Record
- Report Archive:** ☐ No Record
- User Defined Configuration:** ☐ No Record
- Service:** ☐ No Record
- For Report templates, use Utility/Report/Export
- Backup** button
- Media:** CD / DVD
- EZMove:**
  - Move Files Older Than in Days: 7
  - Media: CD / DVD
  - Media capacity for estimate (MB): 4500
- EZBackup:**
  - Reminder Dialog Interval Days: 1
  - Enable Reminder Dialog: ☐
  - Media: CD / DVD
  - Media capacity for estimate (MB): 4500

**Restore Panel:**

- Patient Archive:** ☐
- Report Archive:** ☐
- User Defined Configuration:** ☐
- Service:** ☐
- Restore** button
- Detailed Restore of User Defined:**
  - Imaging Presets: ☐
  - Connectivity Configuration: ☐
  - Measurement Configuration: ☐
  - Comment/Body Pattern Libraries: ☐
  - Protocol Templates: ☐
  - Report Templates (Same Software Version Only): ☐
  - 3D/4D: ☐
  - Fast Key: ☐
  - Utility->Application Presets: ☐
  - Custom Programs: ☐
  - All Others: ☐
- Restore** button

**Figure 8-13** System - Data Store Management

2) Record all settings in [Table 8-17](#).

**Table 8-17** Record settings from Backup/Restore screen

	Move Files Older than in (Days)	Reminder Dialog Interval Days	Media	Capacity
EZMove				
EZBackup				

### 8-3-5-2-1-14 System - Recording Peripheral settings

- 1) From the touch panel, select Utility -> System-> Peripherals.

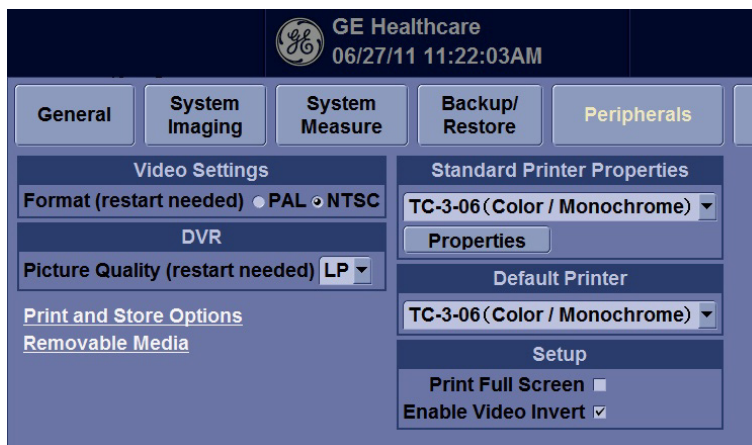


Figure 8-14 System - Recording Peripheral settings (R1.x.x.)

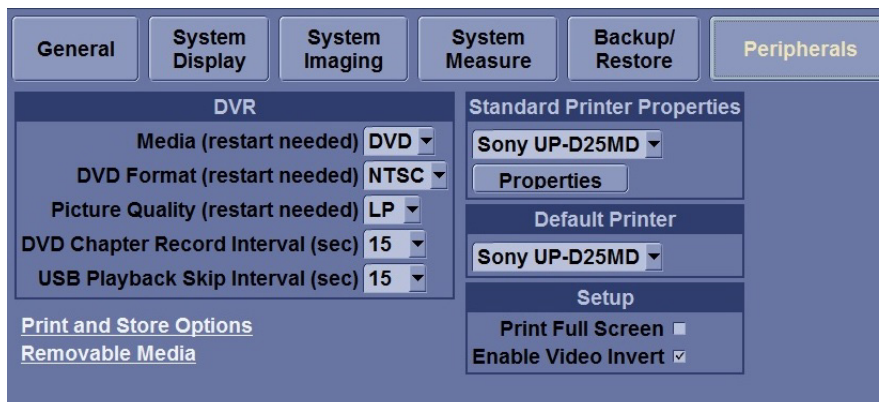


Figure 8-15 System - Recording Peripheral settings (R2.x.x. and later)

- 2) Record all settings in [Table 8-18](#).

Table 8-18 Record settings from Peripherals screen (R1.x.x)

Parameter	Value
Video Settings - Format	
Standard Printer	
Default Printer	
Setup - Print Full Screen	
Setup - Enable Video Invert	
DVR Picture Quality	

**Table 8-19 Standard printer and Default printer (R2.x.x. and later)**

Parameter	Value
Standard Printer	
Default Printer	

**Table 8-20 DVR (R2.x.x. and later)**

Parameter	Value
Media	___ DVR ___ USB
DVD Format	___ PAL ___ NTSC
Picture Quality	___ HQ ___ SP ___ LP ___ EP
DVD Chapter Record Interval	___ 15 ___ 30 ___ 60 ___ 120
USB Playback Skip Interval	___ 15 ___ 30 ___ 60 ___ 120
USB Video codec (R3.x.x)	___ H264 ___ MPEG2
USB Video Size (R3.x.x)	___ Full ___ Normal

#### 8-3-5-2-1-15 System - Recording software and hardware versions

1) From the touch panel, select Utility -> System-> About.



**Figure 8-16 System - Recording software and hardware versions**

2) Record software and hardware versions in [Table 8-21](#).

**Table 8-21 Record software and hardware versions**

Description	Record Versions
Application Software Version	
Application Software Part Number	
System Software Version (Image Rev)	
System Software (Image) Part Number	

8-3-5-2-1-16      Location, Region and Language

- 1) From the touch panel, select Utility -> System-> General.

The screenshot shows a 'Location' settings window. It contains the following fields and values: Hospital: GE Healthcare; Department: Development; Preset Region: None (dropdown); Language (requires reboot): ENG (dropdown); Units: Metric (dropdown). At the bottom is a button labeled 'Regional Options'.

Figure 8-17    Location, Region and Language (R1.x.x)

The screenshot shows a 'Location' settings window for R2.x.x and later. It contains the following fields and values: Hospital: GE Healthcare; Department: Development; Machine Description1: (empty); Machine Description2: (empty); Preset Region(restart needed): None (dropdown); Language (restart needed): ENG (dropdown); Units: Metric (dropdown). At the bottom is a button labeled 'Regional Options' followed by the text '(restart needed)'.

Figure 8-18    Location, Region and Language (R2.x.x and later)

- 2) Record all settings in [Table 8-22](#).

Table 8-22    Record settings from Location

Parameter	Value
Hospital	
Department	
Preset Region	
Language	
Units	
Machine Description1 (R2.x.x)	
Machine Description2 (R2.x.x)	
Dedicated Preset (R3.x.x)	

## 8-3-6 System Software - Installation Procedure

Two separate methods of software installation is offered in LOGIQ P9/P7.

A) Software Load from DVD(R1/R2) or USB media (R3)

B) Software Re-Load from Repository

Situation	<ul style="list-style-type: none"><li>• Harddrive is new</li><li>• Reload from Repository fails</li><li>• Wish to perform "Clean Install"</li></ul>	<ul style="list-style-type: none"><li>• Re-installation for application or operating system issues</li></ul>
	↓	↓
	Perform Software Load from DVD or USB media Refer to <i>section 8-3-7</i>	Perform Software Reload Refer to <i>section 8-3-8</i>

## 8-3-7 Software Installation from DVD

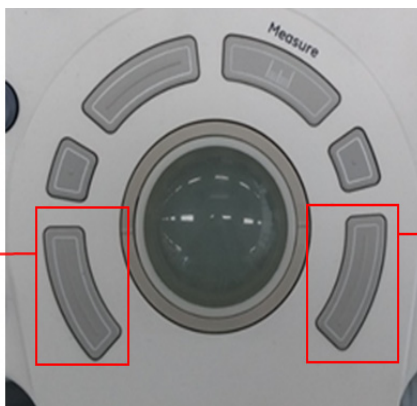
### 8-3-7-1 System Software - Installation Procedure (R1.x.x)

- 1) Prepare the Base System Software DVD.
- 2) Power ON the scanner and press "DEL"(If AN key is installed) or press left bottom key of trackball (If there's no AN Key) to enter BIOS



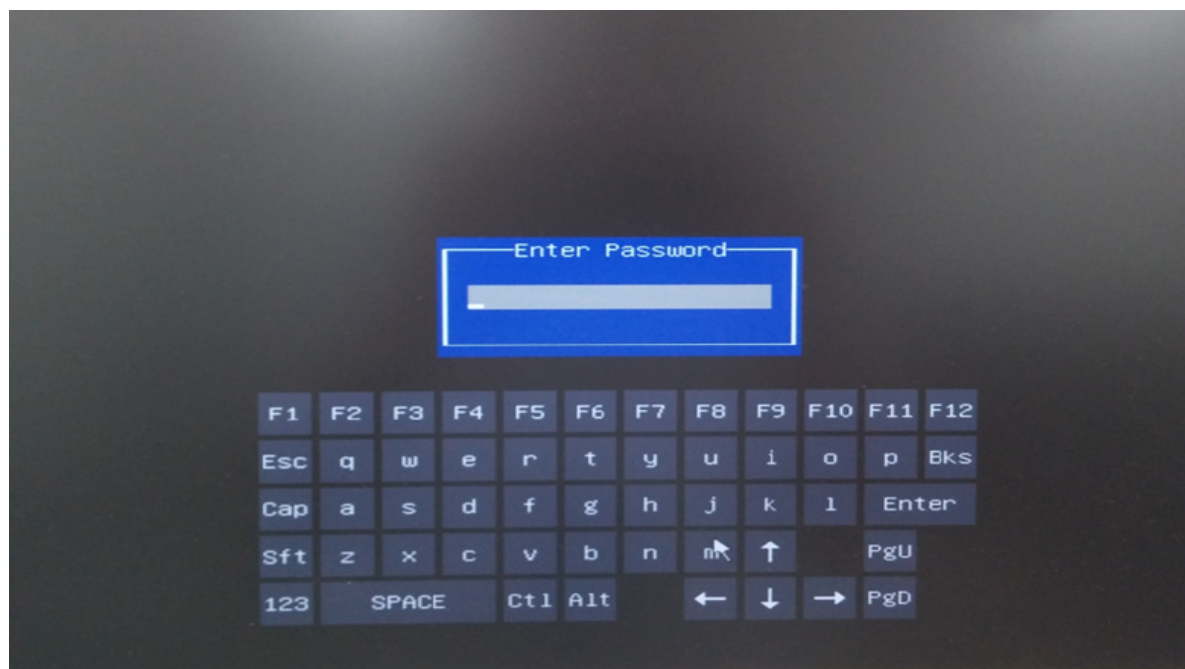
**NOTICE** If there's no AN key, please use trackball to move menu in BIOS mode and click left bottom key of trackball to select menu in BIOS and double-click to set or change the value in BIOS. Right bottom key of trackball is 'ESC' in BIOS.

Left bottom key of trackball to enter BIOS and select menu and set or change the value in BIOS

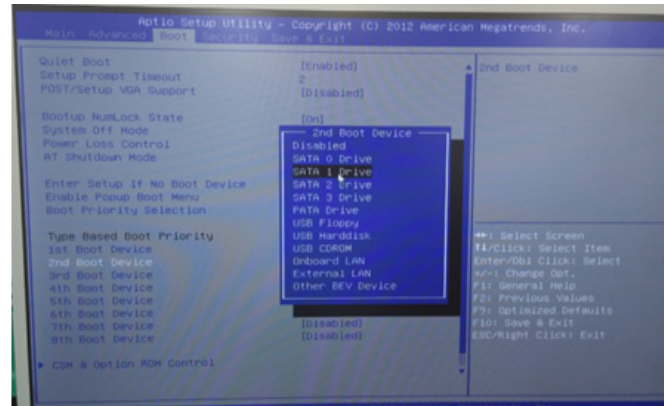
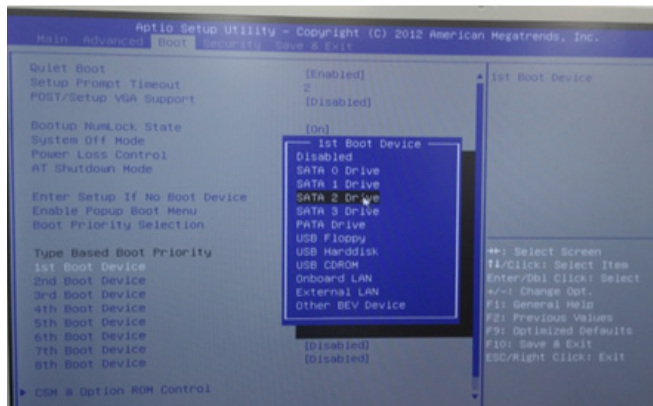


Right bottom key of trackball for 'ESC' in BIOS

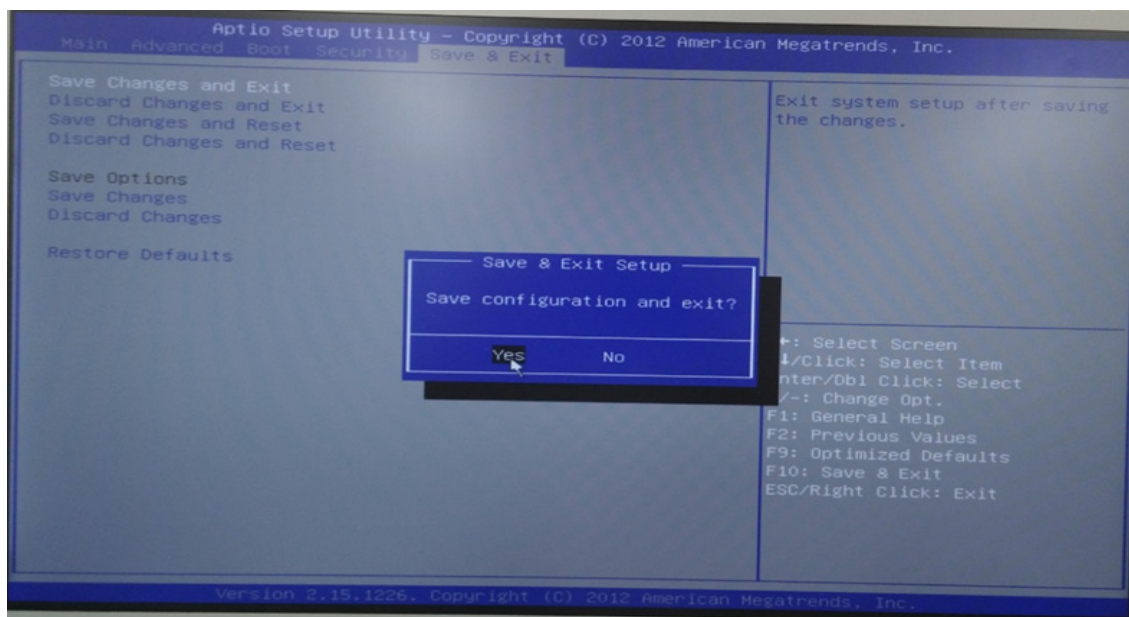
- 3) Type "maru" for password.



- 4) Go to "Boot" in BIOS menu and change the setting value from "SATA 1 Drive" to "SATA 2 Drive" in '1st Boot Device', change the setting value from "SATA 2 Drive" to "SATA 1 Drive" in '2nd Boot Device'



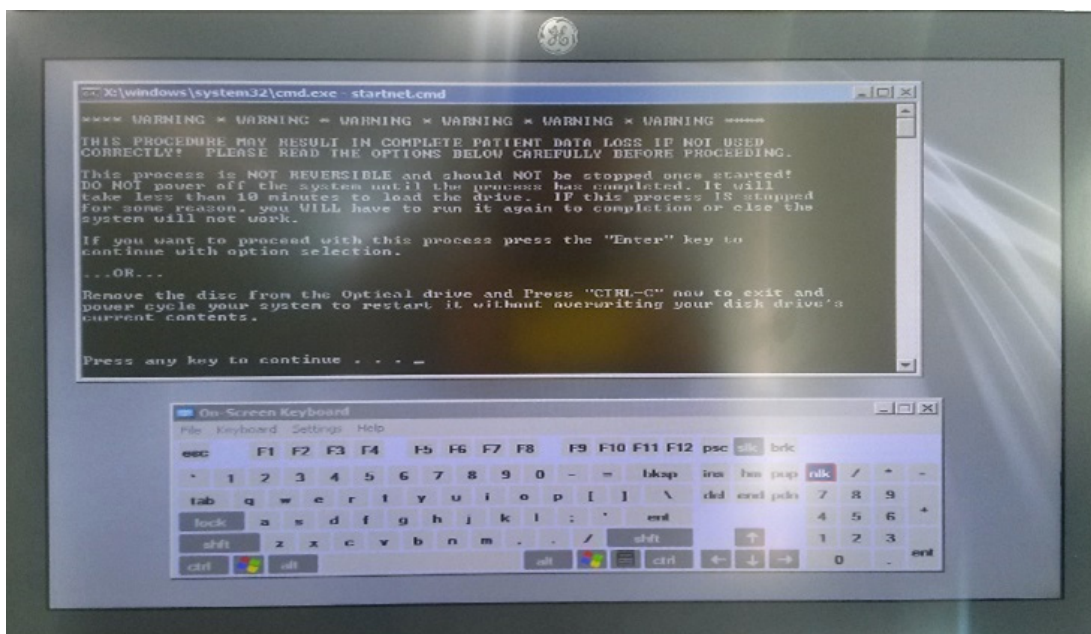
- 5) Go to "Save & Exit" in BIOS menu and select "Save Changes and Exit". Then, the system will re-boot.



- 6) Press DVD-Drive eject button.
- 7) Place the Base System Software DVD on the tray.
- 8) Wait few moments for DVD drive to read DVD contents.

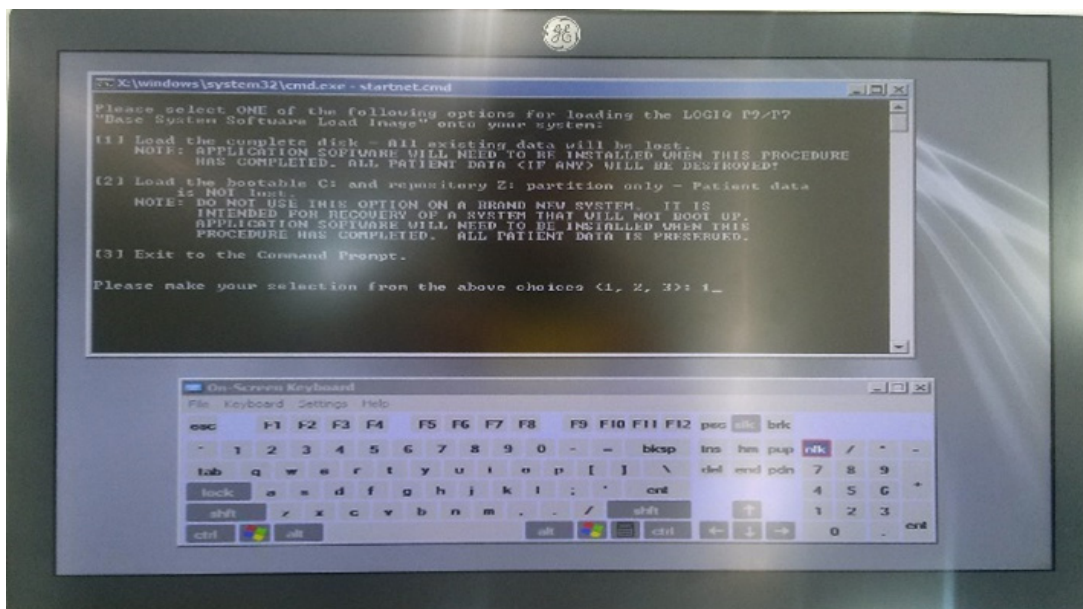


- 9) The notification screen appears, and then hit the Enter key.



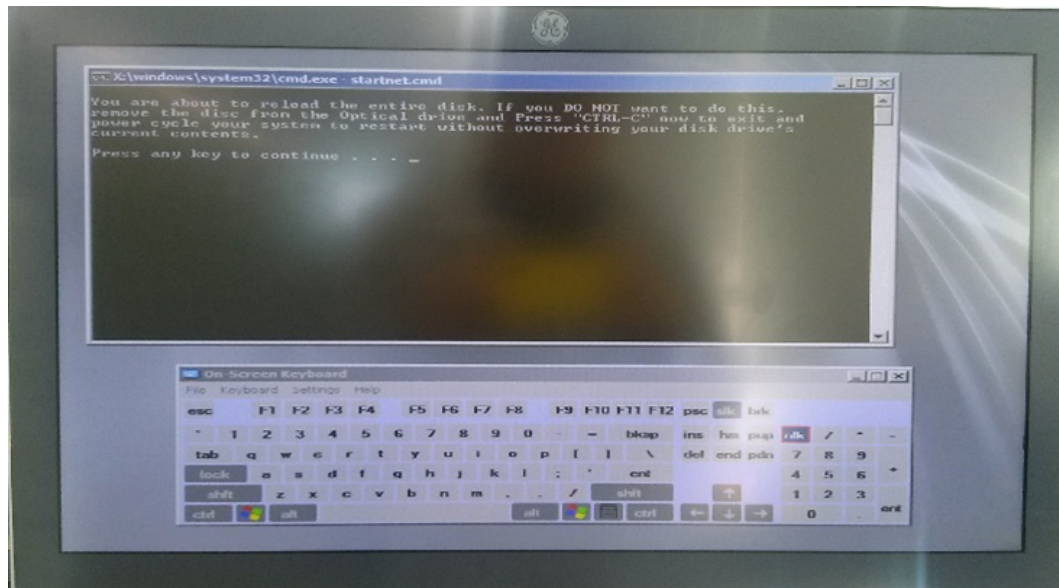
**NOTE:** Use simulator A/N keyboard if customer's system does not have external A/N keyboard

- 10) Select either  
 [1] "Load the complete disk", or  
 [2] "Load the bootable C: and repository Z: partition only" and hit the Enter key.



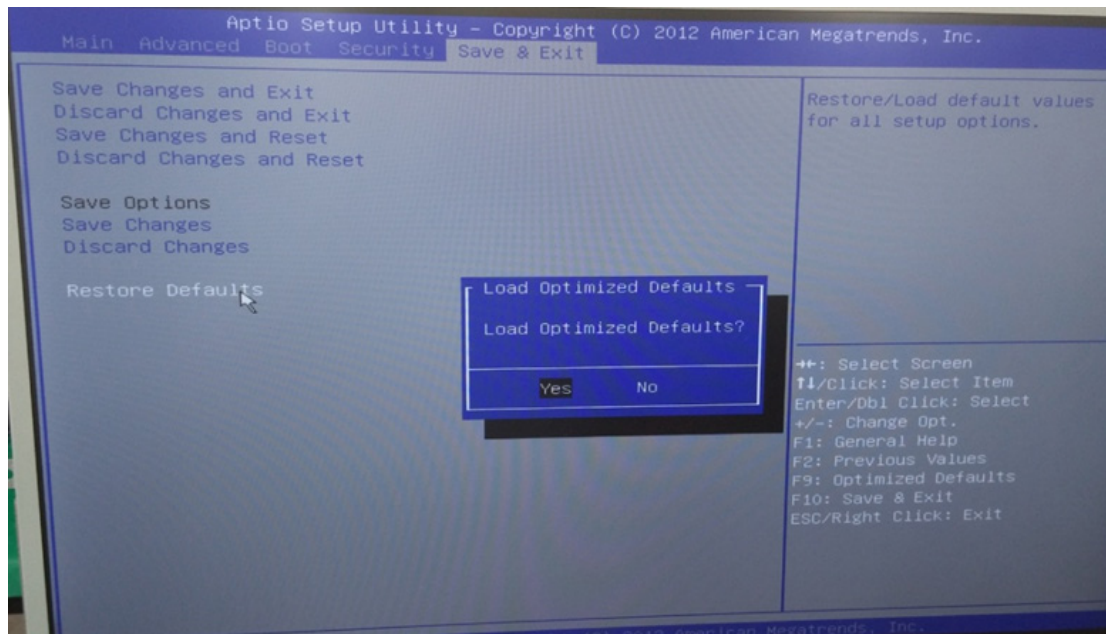


- 11) A confirmation window appears, and then hit the Enter key.

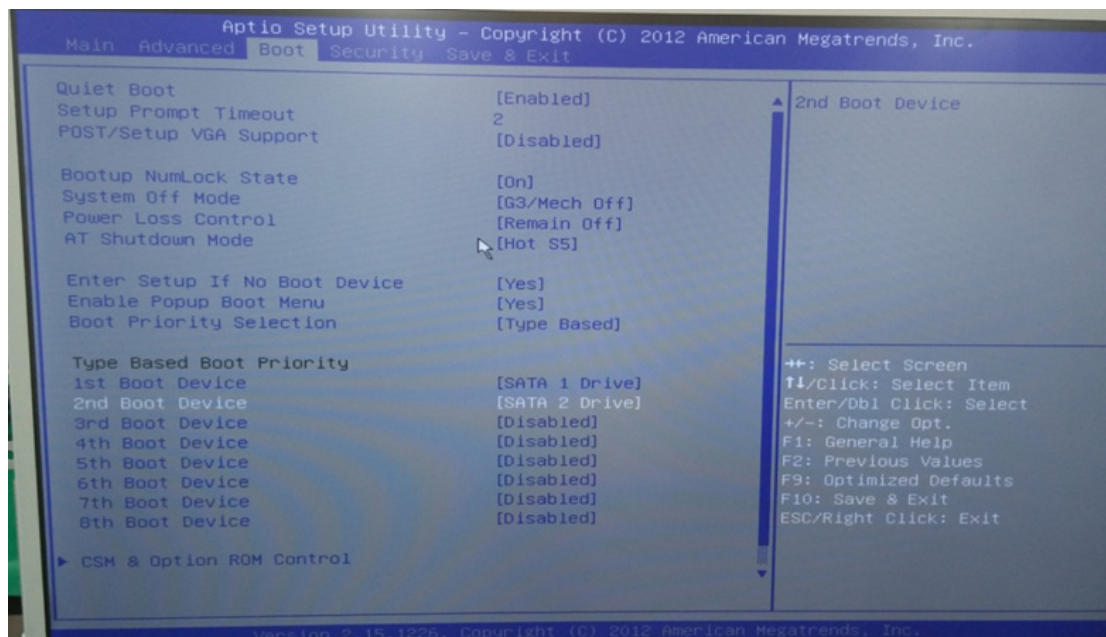


- 12) Approx. 40 minutes later, loading the software will be completed.  
13) Remove Base System Software DVD, and type "exit" to reboot the system.  
14) At the first system reboot after loading the software, the OS will reboot the system automatically.  
15) After the reboot, the installation of system (Windows Embedded Standard will be fully completed.  
16) Go to BIOS mode (Refer to the procedure 2) 3) above.)

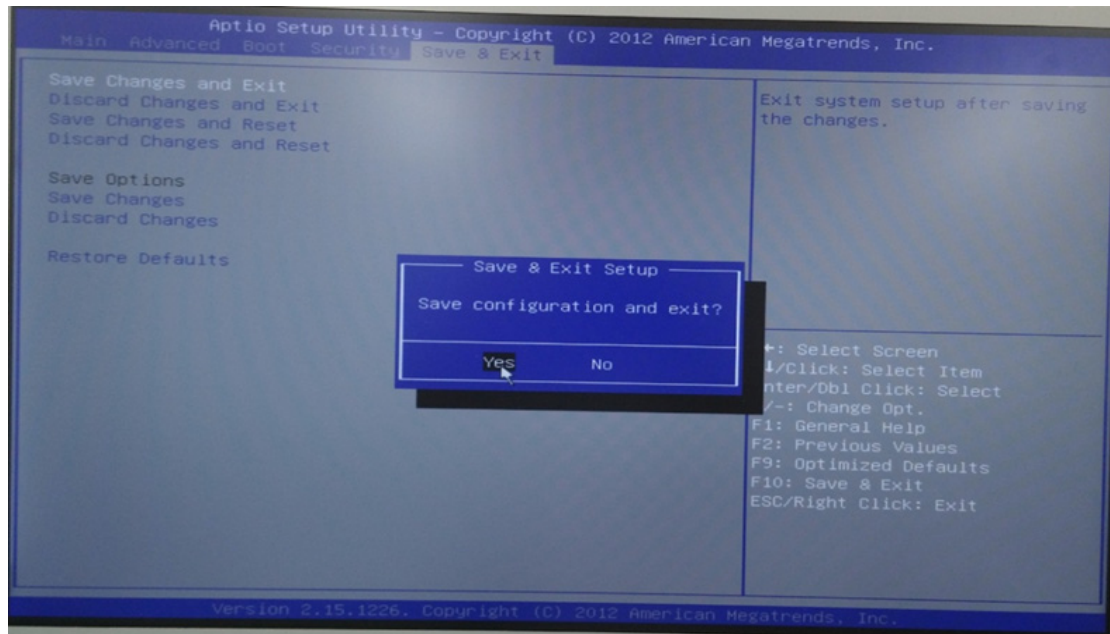
- 17) Go to "Save & Exit" in BIOS menu and select "Restore Defaults".



- 18) Go to "Boot" in BIOS menu and check that '1st Boot Device' is set to "SATA 1" and '2nd Boot Device' is set to "SATA 2".



- 19) Go to "Save & Exit" in BIOS menu and select "Save Changes and Exit". Then, the system will re-boot.



### 8-3-7-2 System Software - Installation Procedure (R2.x.x)

- 1) Prepare the Base System Software DVD.
- 2) Power ON the scanner and press "DEL"(If AN key is installed) or press left bottom key of trackball (If there's no AN Key) to enter BIOS



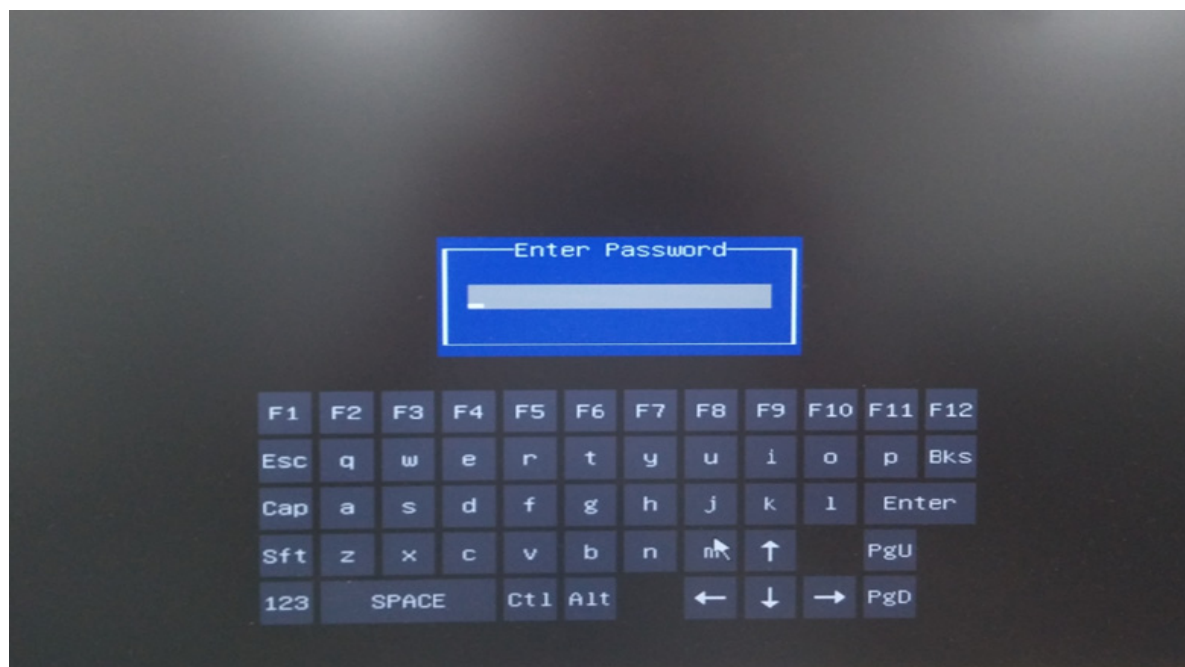
**NOTICE** If there's no AN key, please use trackball to move menu in BIOS mode and click left bottom key of trackball to select menu in BIOS and double-click to set or change the value in BIOS. Right bottom key of trackball is 'ESC' in BIOS.

Left bottom key of trackball to enter BIOS and select menu and set or change the value in BIOS



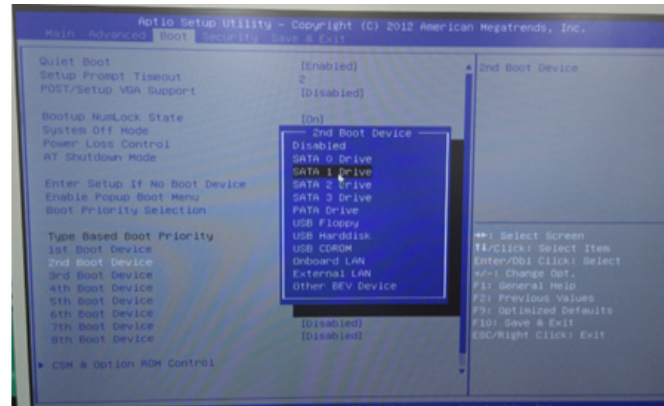
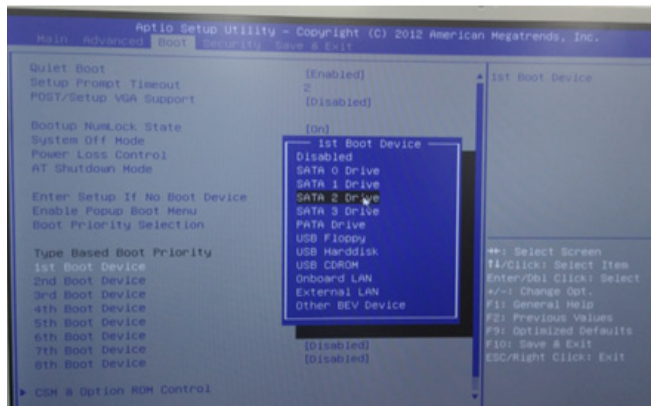
Right bottom key of trackball for 'ESC' in BIOS

- 3) Type "maru" for password.

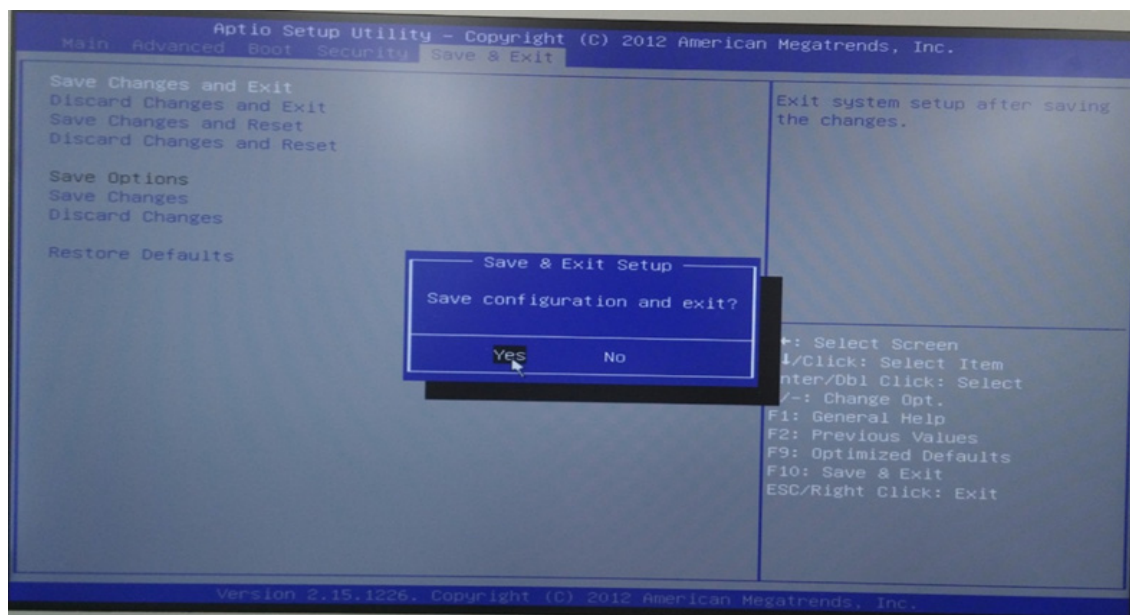




- 4) Go to "Boot" in BIOS menu and change the setting value from "SATA 1 Drive" to "SATA 2 Drive" in '1st Boot Device', change the setting value from "SATA 2 Drive" to "SATA 1 Drive" in '2nd Boot Device'.

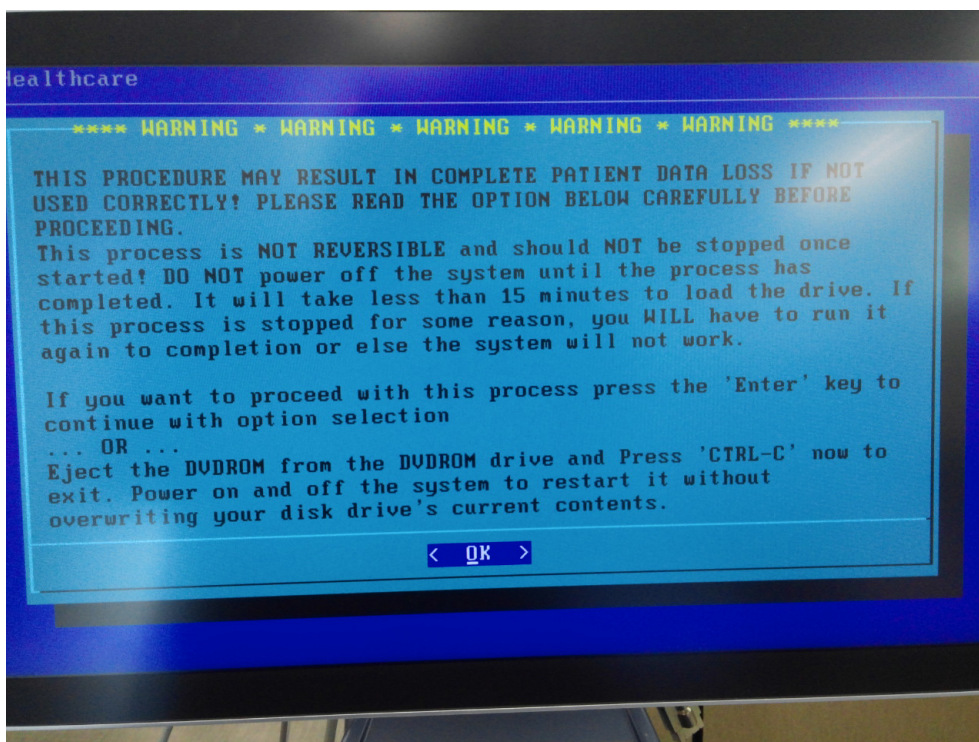


- 5) Go to "Save & Exit" in BIOS menu and select "Save Changes and Exit". Then, the system will reboot.



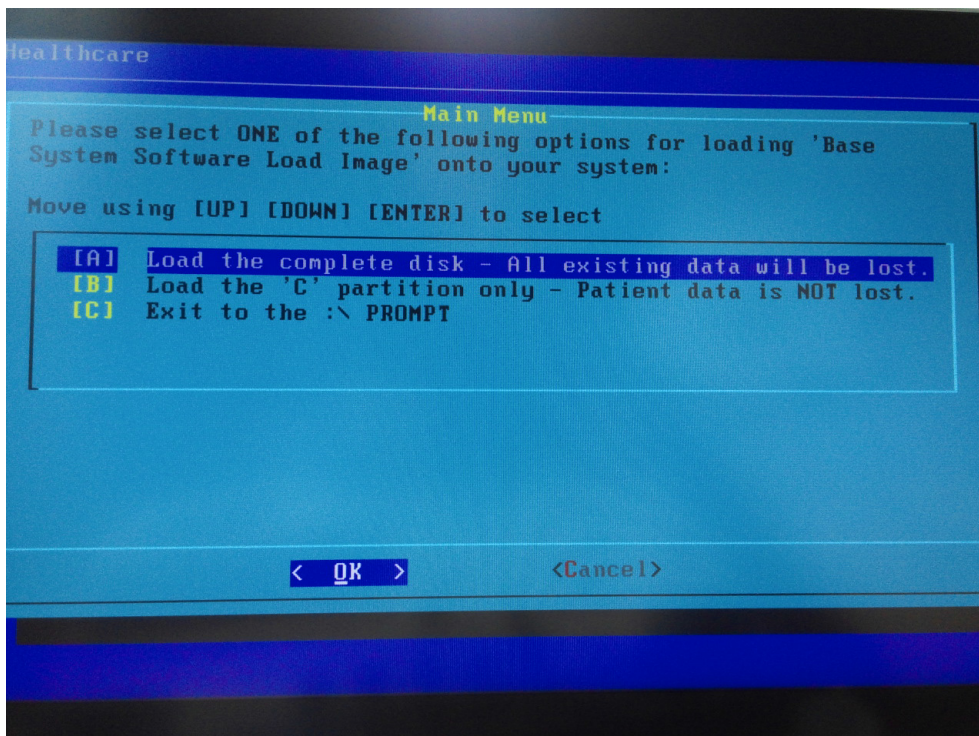
- 6) Press DVD-Drive eject button.
- 7) Place the Base System Software DVD on the tray.
- 8) Wait few moments for DVD drive to read DVD contents.

- 9) The notification screen appears, and then hit the Enter key.



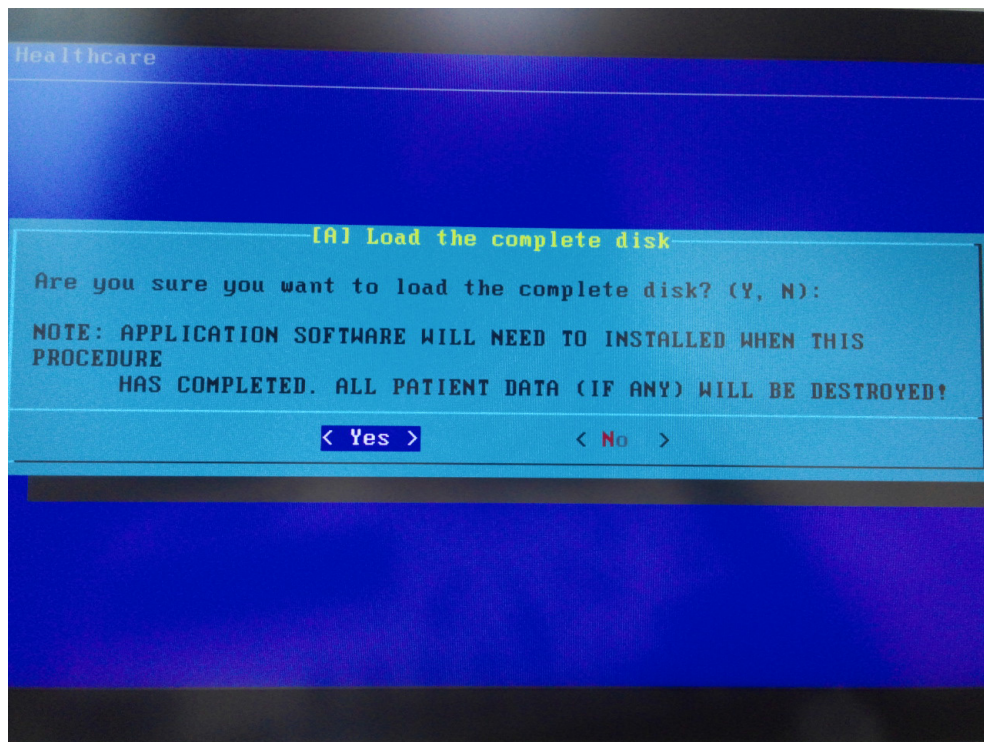
NOTE: Use the trackball and left set key if the customer's system does not have an external A/N keyboard.

- 10) Select either  
[A] "Load the complete disk", or  
[B] "Load the 'C' partition only" and hit the Enter key.



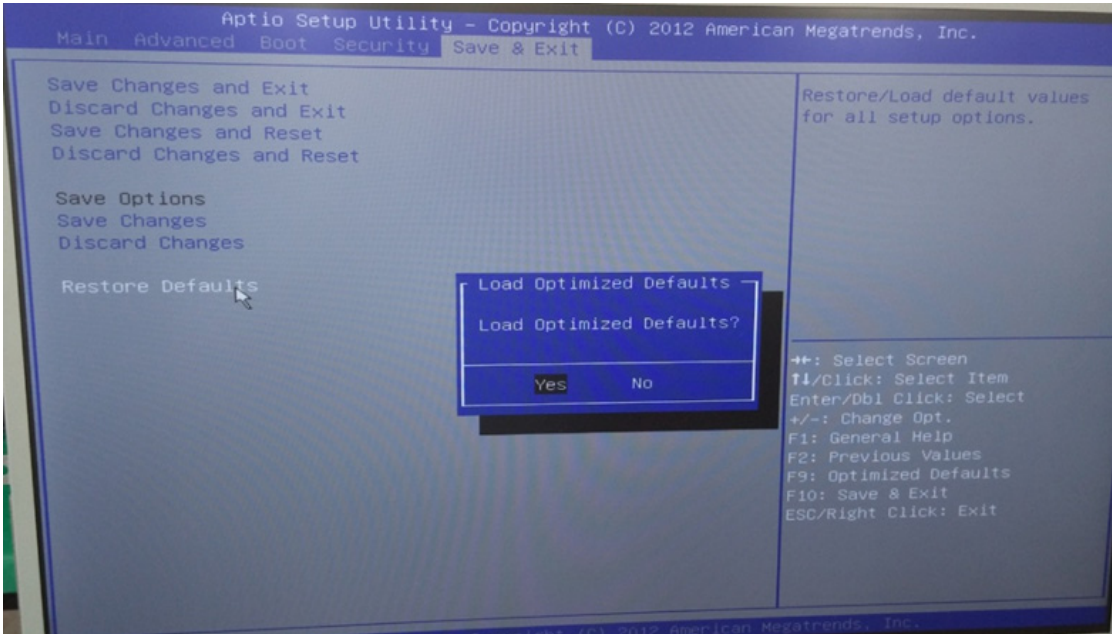


- 11) A confirmation window appears, and then hit the Enter key.

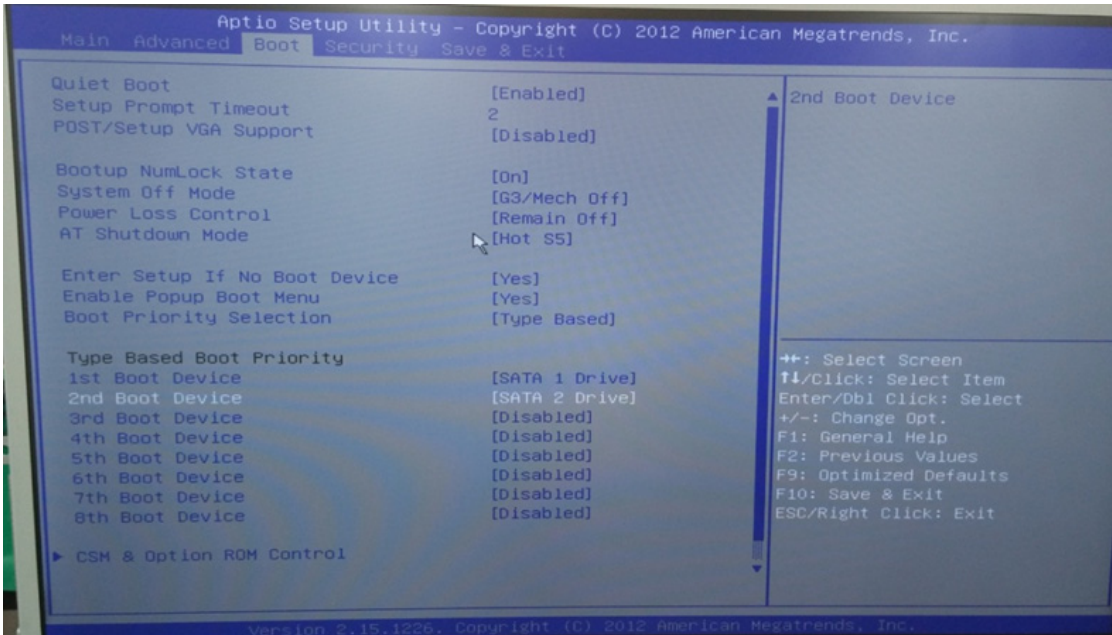


- 12) Approx. 30~40 minutes later, loading the software will be completed.  
13) Remove Base System Software DVD, and hit the Enter key to reboot the system.  
14) At the first system reboot after loading the software, the OS will reboot the system automatically.  
15) After the reboot, the installation of system (Windows Embedded Standard 7) will be fully completed.  
16) Go to BIOS mode (Refer to the procedure 2.) 3.) above.)

17) Go to “Save & Exit” in BIOS menu and select “Restore Defaults”.

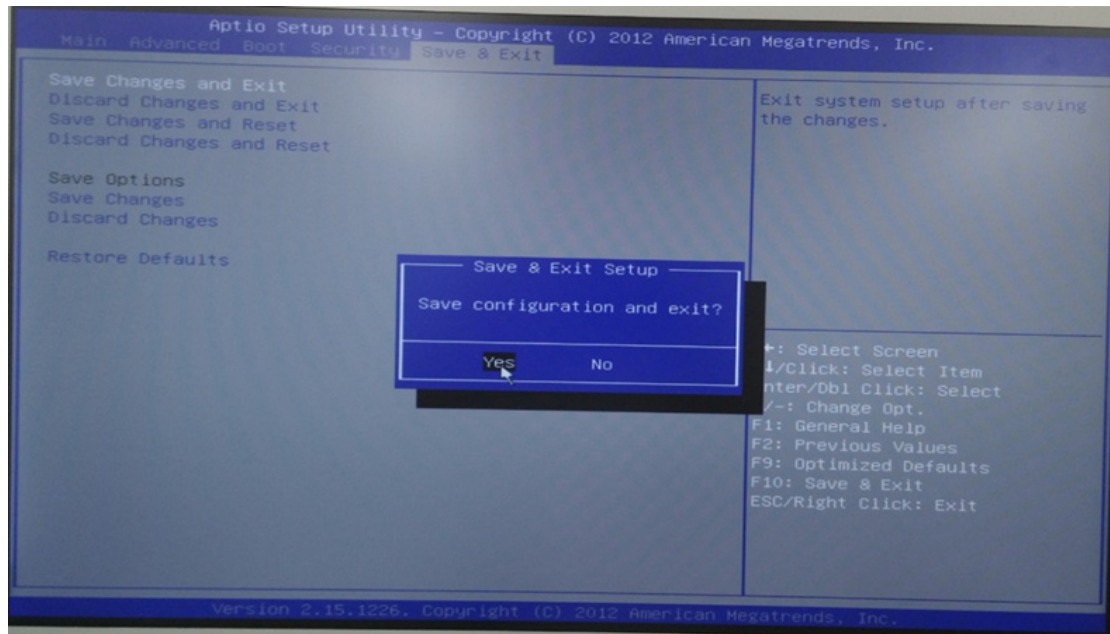


18) Go to “Boot” in BIOS menu and check that ‘1st Boot Device’ is set to “SATA 1” and ‘2nd Boot Device’ is set to “SATA 2”.





- 19) Go to "Save & Exit" in BIOS menu and select "Save Changes and Exit". Then, the system will re-boot.



### 8-3-7-3 System Software - Installation Procedure (R3.x.x)

#### 8-3-7-3-1 Set the system boot order (BIOS setting)

- 1.) Prepare the THUMB DRIVER R3.x.x (USB media) including Base Image Load Windows 10.
- 2.) Insert USB media to on the system USB port.



Figure 8-19 System USB port

- 3.) Power on the scanner
- 4.) Press “DEL” (If AN key is installed) or press left bottom key of trackball (If there’s no AN Key) to enter BIOS
- 5.) Enter the “maru” in Enter Password

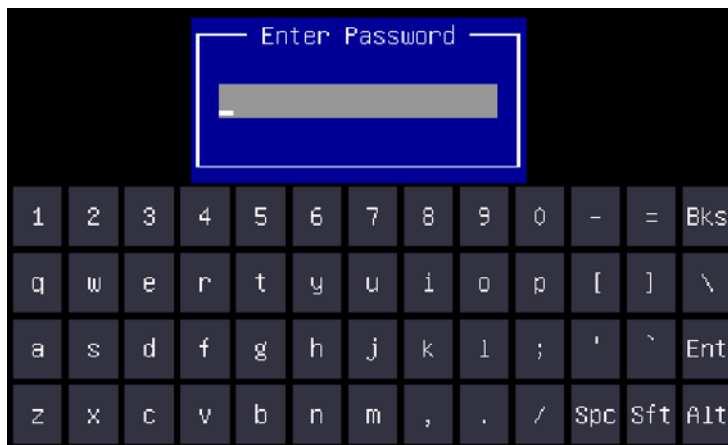


Figure 8-20 Enter Password

6.) In “Boot” page, Change “Boot Option #1” to USB memory which is inserted.

**NOTE:** The name of USB memory can be displayed different depend on the inserted USB memory.

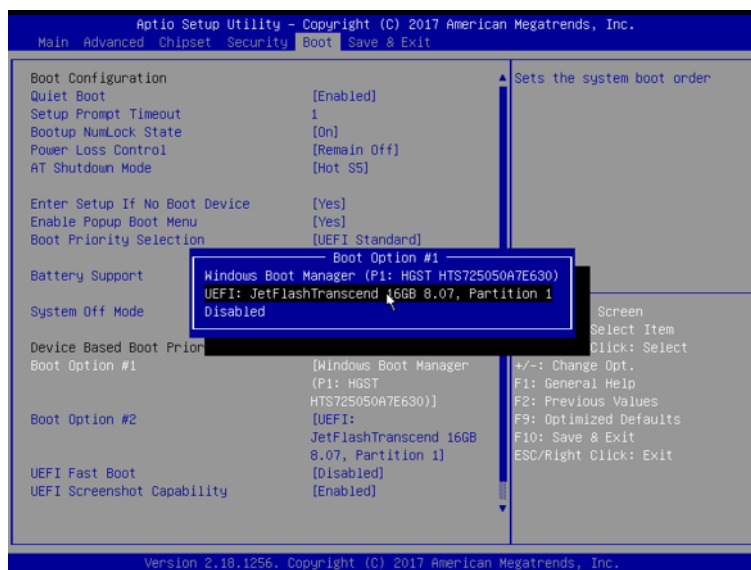


Figure 8-21 “Boot” page 1

7.) After changed the “Boot Option#1,” save the BIOS set and exit by pressing ‘F10’ key.

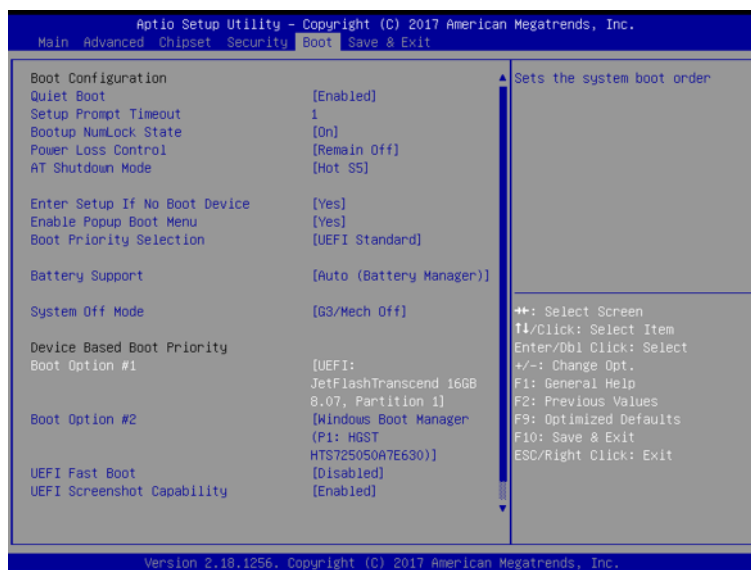
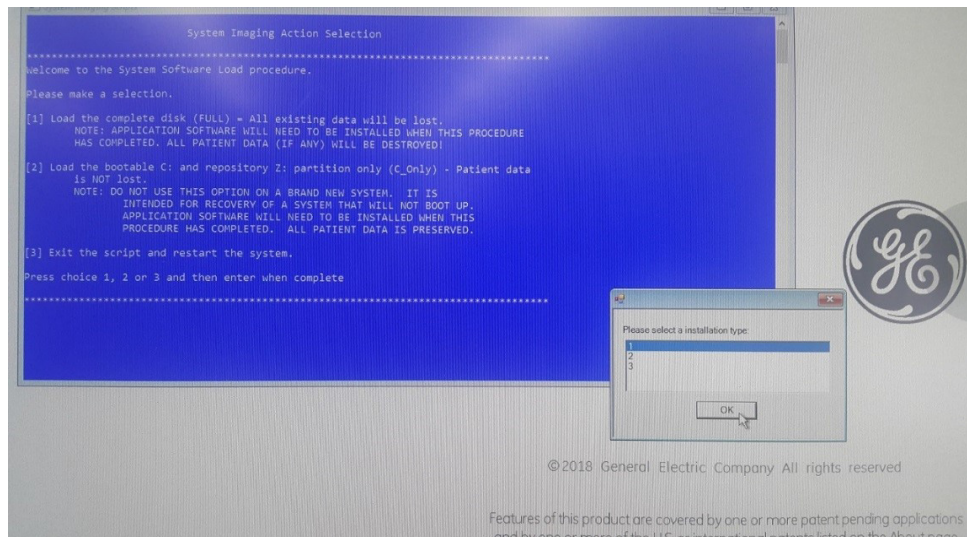


Figure 8-22 “Boot” page 2

## 8-3-7-3-2 Base and Application Software installation

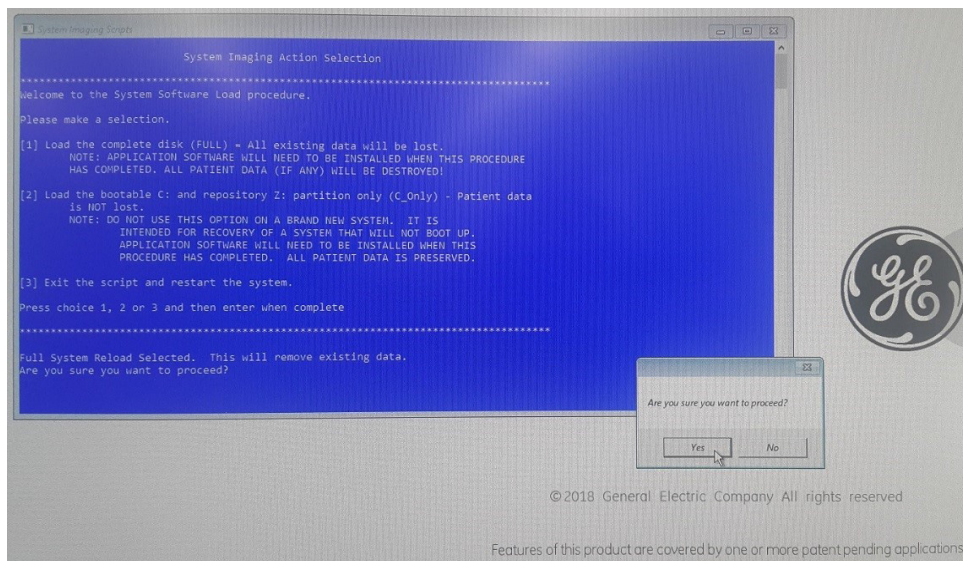
- Base Image Software Load Procedure
- 1.) Power ON the scanner.
  - 2.) Wait few moments for USB drive to read USB contents.
  - 3.) The notification screen appears like below.
  - 4.) Select [1] Load the complete disk (FULL), and Press [OK] button using the trackball key.

**NOTE:** If there is no physical keyboard option, use the external keyboard or on-screen menu.



**Figure 8-23 The notification screen 1**

- 5.) A confirmation window appears, and then Press [Yes] button using the trackball key.



**Figure 8-24 The notification screen 2**

6.) The Installation progress screen appears like below.

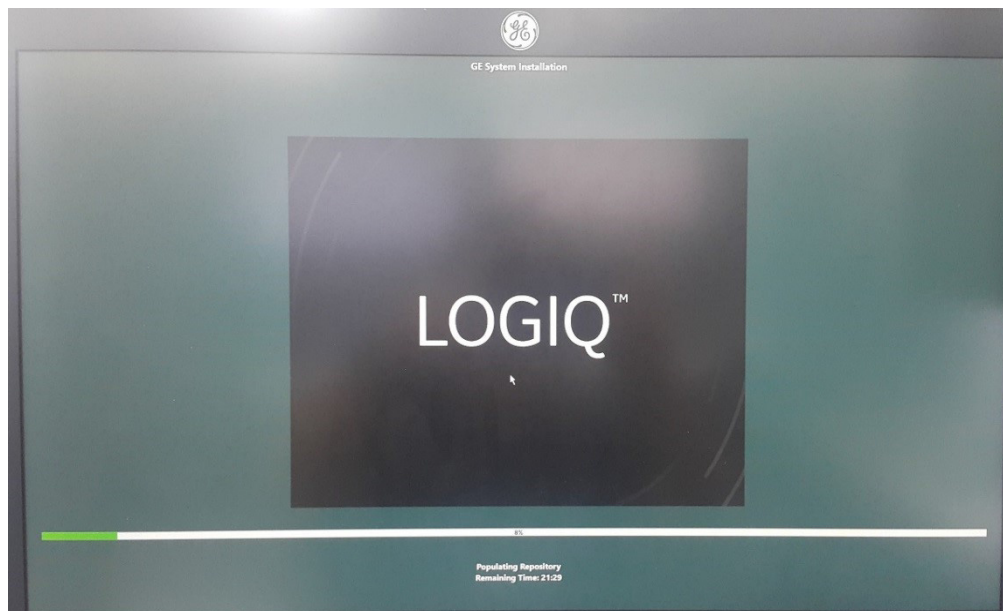


Figure 8-25 The notification screen 3

 **WARNING** *Do not interrupt the software loading at any time.*

- 7.) Approx.20~ 30 minutes later, loading the software will be completed.
- 8.) After completing, press [OK] button using the trackball key to reboot the system.
- 9.) At the first system reboot after loading the software, the OS will reboot the system automatically.
- 10.)After the reboot, the installation will be fully completed.

**NOTE:** *Do NOT touch the system during this process. Activating the keyboard, mouse or front panel could corrupt the installation. While the script is running, several window or dialog boxes appear on the screen. At times it may look like the system is unresponsive.*

8-3-7-3-3 Application Software Load Procedure

- 1.) After the reboot again, the application software installation will start automatically.
- 2.) About few minutes, the following options will appear. Select your product. Click “Start Installation” button.

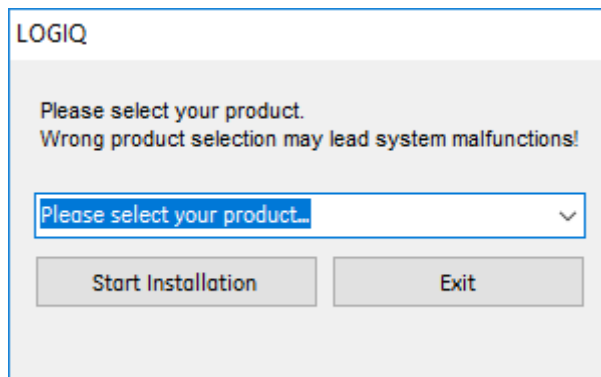


Figure 8-26 Click “Start Installation”

- 3.) Don't press any key and wait until the software installation is done.

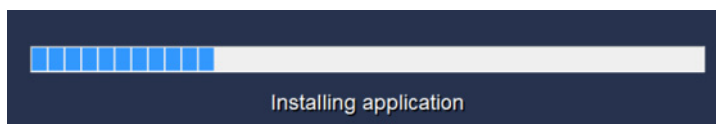


Figure 8-27 Installing application

- 4.) After the installation completes, the system will be rebooted automatically.
- 5.) SW License window may appear, then enter correct Option String and click “OK”.

**NOTE:** The HW Id shown in the picture is an example.

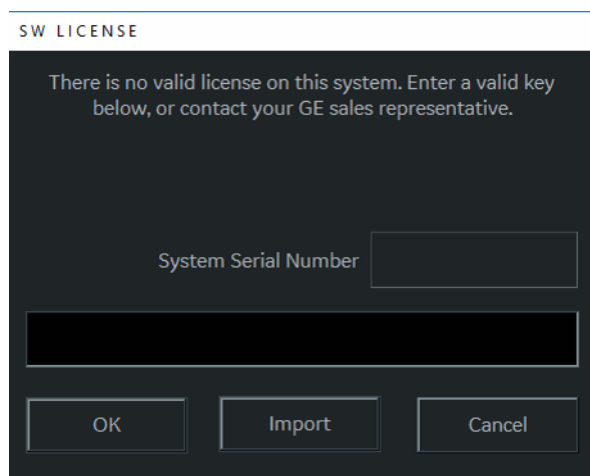


Figure 8-28 SW License window

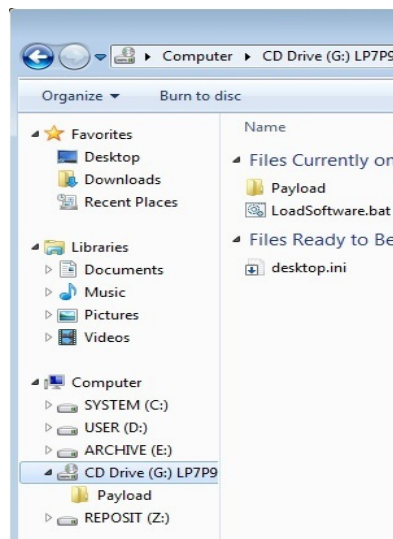


#### 8-3-7-4 Application Software Installation Preparation (R1.x.x or R2.x.x)

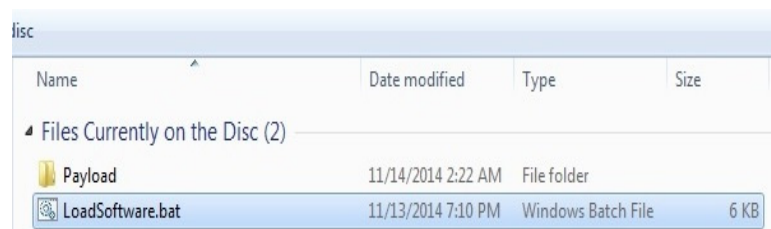
- 1) Verify the system boot up to Windows Screen
- 2) Prepare the Application Software DVD.
- 3) Press DVD-Drive eject button, and place the Application Software DVD on the tray.
- 4) Click Windows Explorer icon on the taskbar.



- 5) Select "G" drive in the tree view.

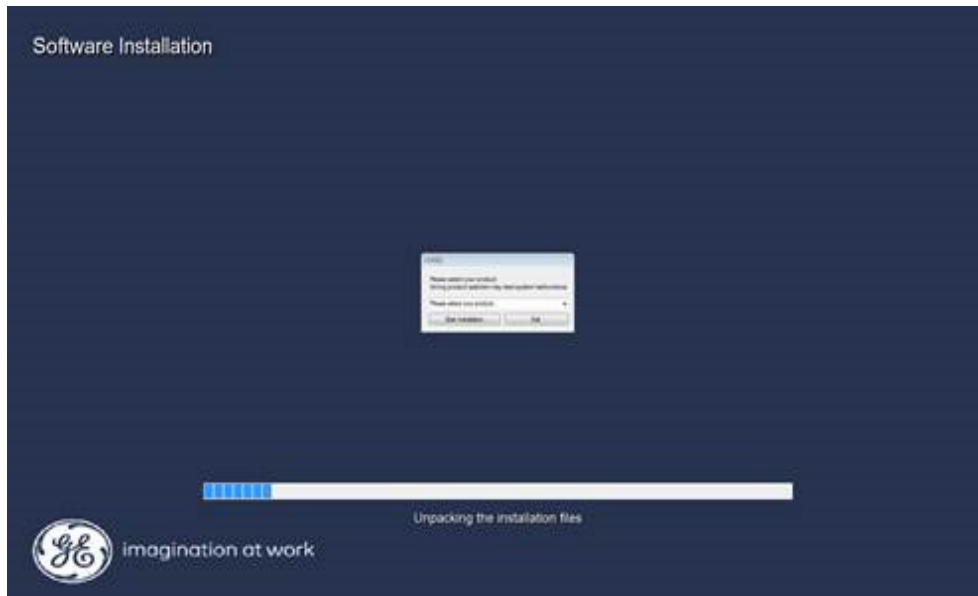


- 6) Double click "LoadSoftware.bat". Software Installation will begin.



### 8-3-7-5 Application Software Installation (R1.x.x or R2.x.x)

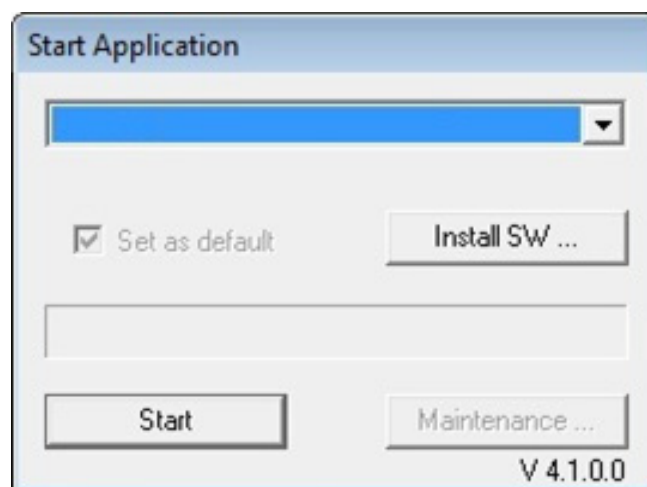
- 1) Application Software Installation process will take approximately 20 minutes



- 2) Select your product. Click "Start Installation" button.
- 3) After the installation completes, the system will be rebooted automatically.

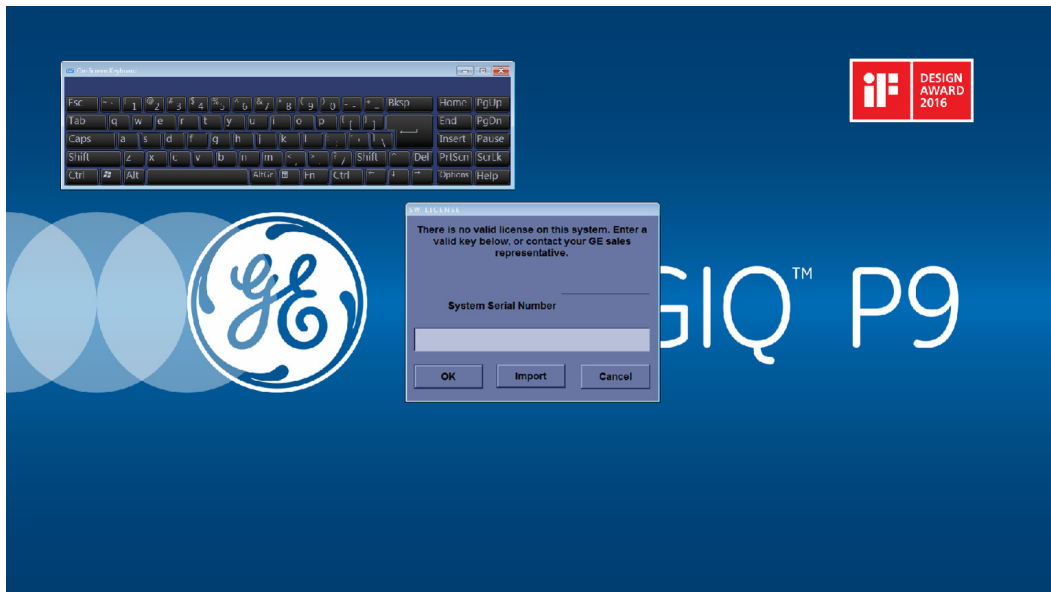
**NOTE:** Do not remove Application Software DVD from drive. (R1.x.x or R2.x.x)

- 4) After rebooting the system, the "Start Application" window appears. Remove the DVD from the tray (R1.x.x or R2.x.x), then click "Start" button.





- 5) If SW License window appears, then enter correct Option String and click “OK”.



### 8-3-7-6 Software DVD / USB Storage

Remove the rear cover and store the software DVD / USB in the system.

- 1) Remove the rear cover.

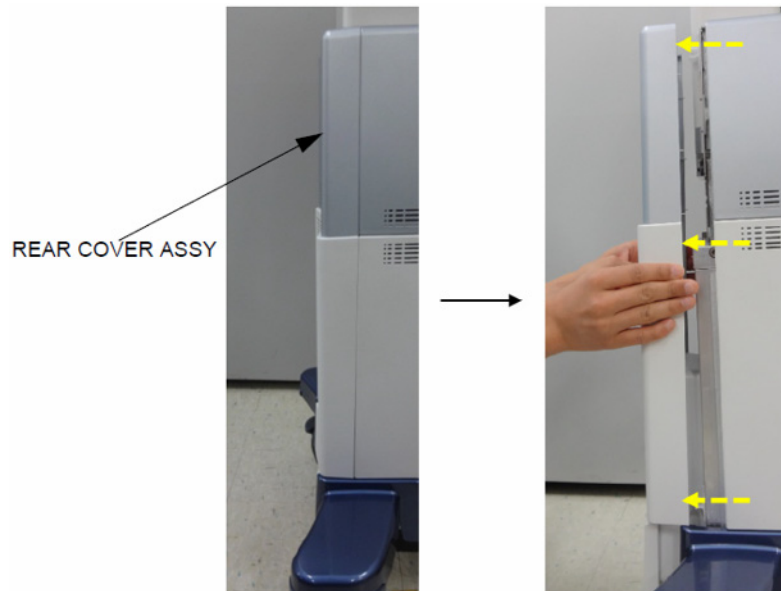


Figure 8-29 Removing the rear cover

- 2) Store the Software DVD in the pocket. (R1, R2, R2.5 only)



Figure 8-30 CD pocket

- 3) Store the Software USB STICK in the pocket as below picture. (R3 only)



Figure 8-31 USB stick pocket

8-3-8        Software Installation from Common Service Desktop (R1.x.x or R2.x.x)

NOTE:        This procedure requires PC with LAN connection capable of reaching to to GE Network

8-3-8-1      Involving Software Reload

- 1)    Select [SERVICE] from [UTILITY] Menu (R1.x.x) or Select [SERVICE] from [UTILITY] Menu (R2.x.x)



Figure 8-32    Utility menu (R1.x.x)

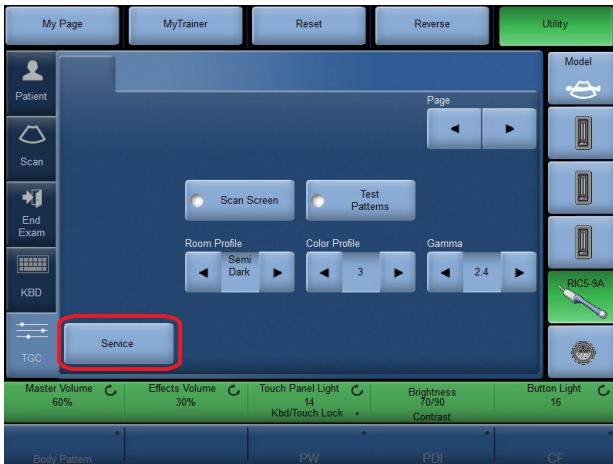


Figure 8-33    Utility menu (R2.x.x)

- 2)    Select “GE Service” and enter Password

Service Login

Hospital Name: GE Healthcare

System Type: LOGIQP9

CRM Number: LP912345

Select User Level

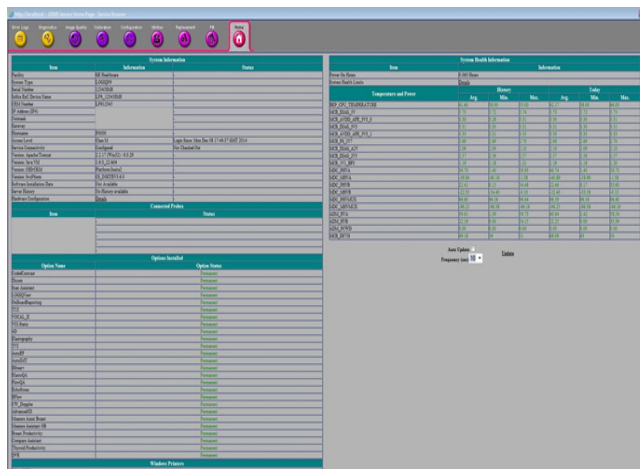
GE Service

Enter Password

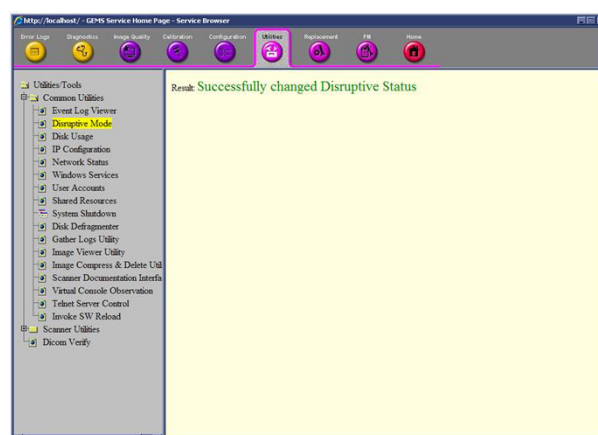
Okay

Clear

3) Verify entering to Common Service Desktop (CSD)



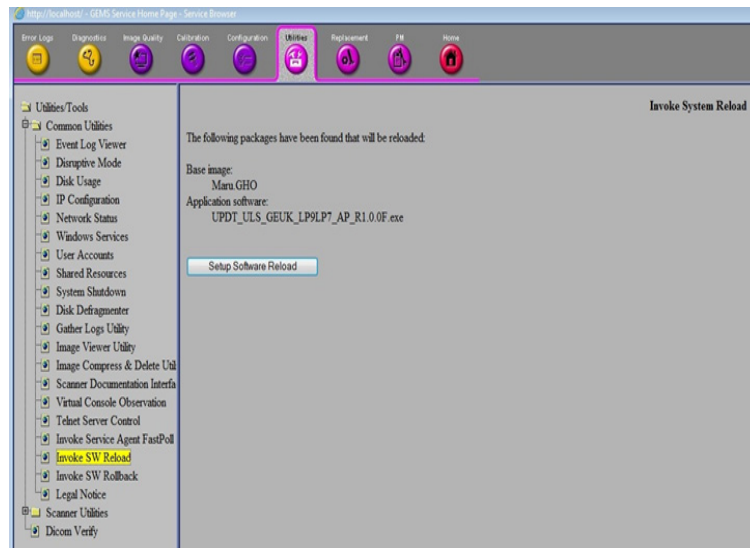
- 4) Select "Disruptive Mode" under Common Utility, in [Utilities] Tab
- 5) Acknowledge "Disruptive Mode" on Console Screen
- 6) Verify Disruptive Mode



**NOTE:** This operation cannot continue without user acknowledge

- 7) Select [Invoke SW Reload] under Common Utilities.

8) Click Setup software reload.

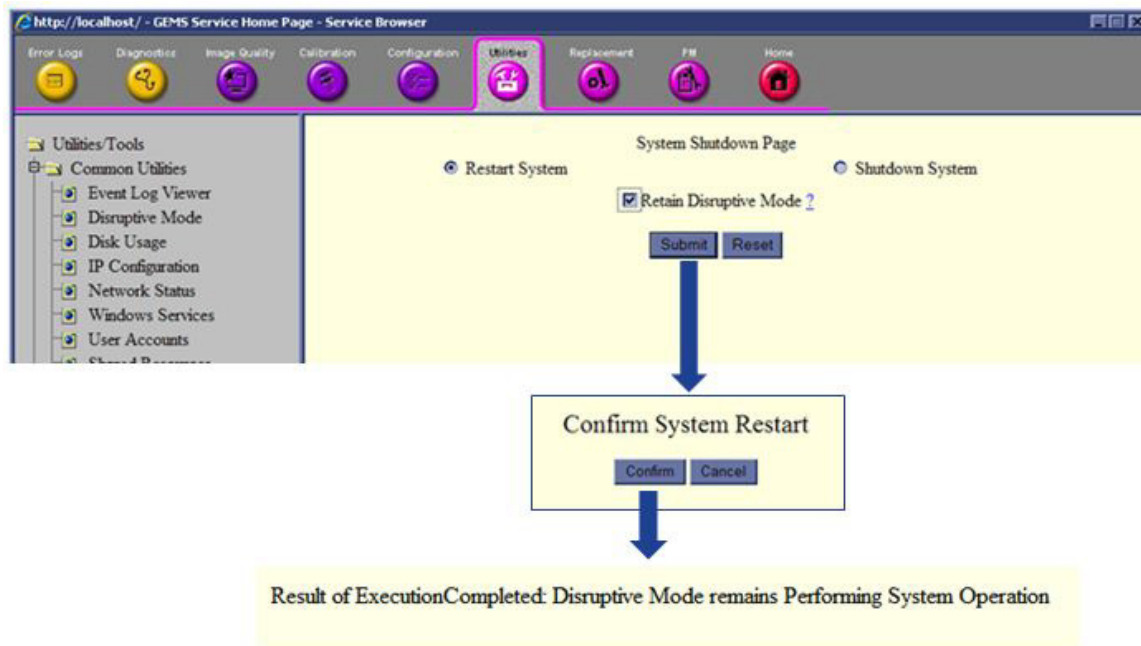


9) Select [SYSTEM SHUTDOWN] from Common Utility Menu in CSD

10) Select

- Restart System
- Retain Disruptive Mode

11) Press [SUBMIT]



12) On console side, wait until application software loading completes.

13) Rest of the processes are same as [8-3-7-4 Application Software Installation Preparation \(R1.x.x or R2.x.x\)](#)

---

**8-3-9      Software Installation from Common Service Desktop (R3.x.x)**

For detail information, please refer to 8-3-9 **Software Reload** [on page 5-81](#)

## 8-3-10 System Setup Procedure to display the messages in Japanese/Chinese

To setup the system to display the messages in Japanese/  
Chinese:

**NOTE:** You cannot enter text in Japanese/Chinese.

- 1) Press **Regional Options** in Utility--> System--> General.  
The "Region and Language pop-up" appears.
- 2) Select the "Administrative" tab. In the "Language for non-Unicode programs" section, select the "Change system locale..." button. The "Region and Language Settings" pop-up menu appears.

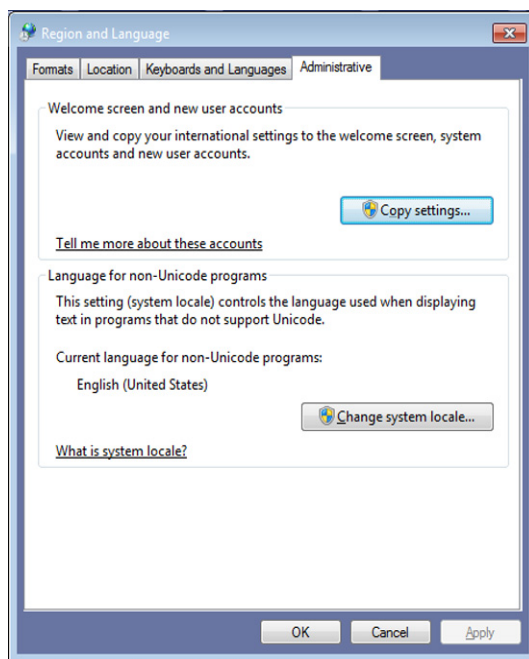


Figure 8-34 Administrative tab



- 3) Under "Current system locale:", select Japanese (Japan) or Chinese (Simplified PRC). Press OK.

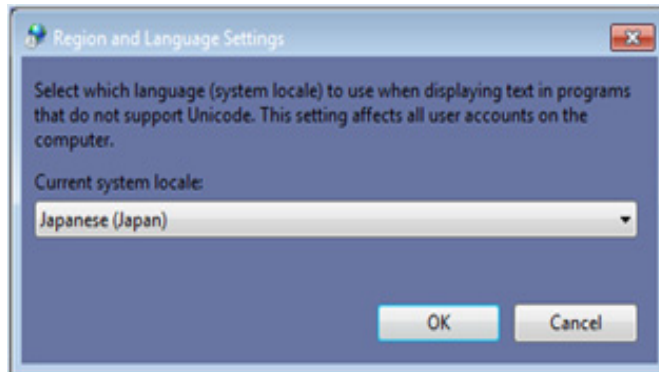


Figure 8-35 Set Language - example

- 4) The "Change System Locale" pop-up prompt appears. Select **Cancel** to not reboot the system yet.

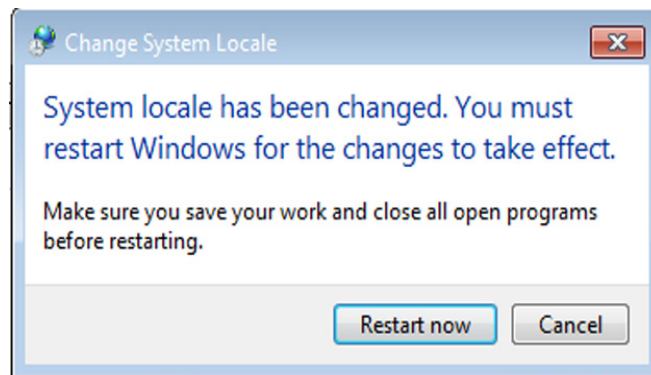


Figure 8-36 Change system locale

- 5) Select **Close** on the Administrative tab. The "Change System Locale" pop-up prompt appears again. Select **Cancel** to not reboot the system yet.
- 6) Reboot the system using Power on/off button.

- 7) Open the Administrative tab and check Japanese or Chinese displays under Current language for non-Unicode programs.

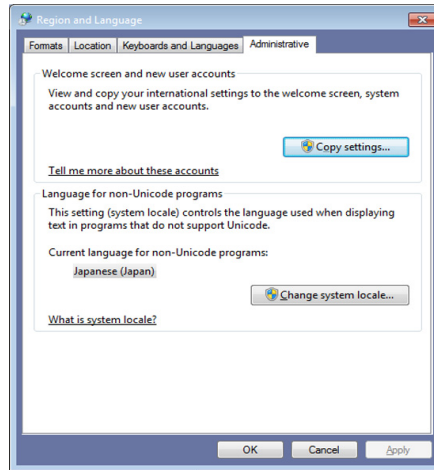


Figure 8-37 Administrative tab - example

- 8) Under "Format:", select "Japanese (Japan)"/"Chinese (Simplified PRC)". Press **Apply**, Press **OK**.

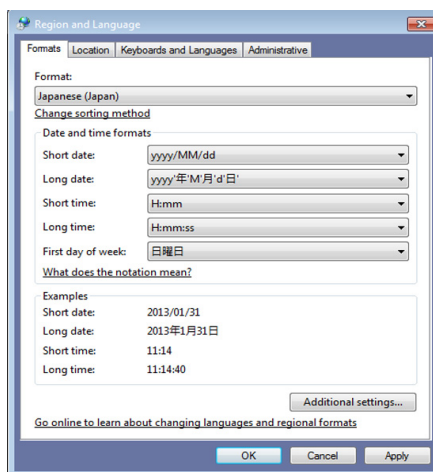


Figure 8-38 Formats

- 9) In Utility--> System--> General, set the Language as Japanese or Chinese. Press **Save** and reboot the system using Power on/off button.

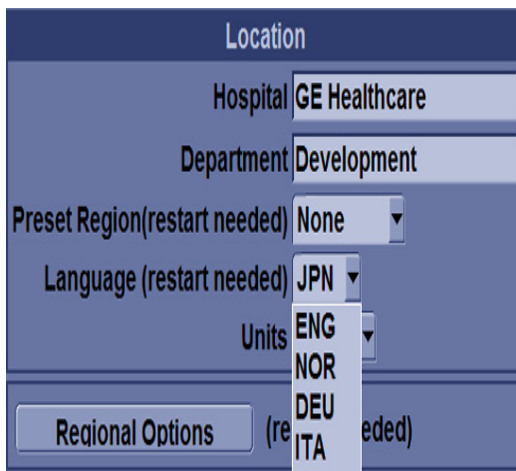


Figure 8-39 Change the system language

## Section 8-4 Software and Functional Checks after Installation Procedure

### 8-4-1 Functional Check

Table 8-23

Item	Test Procedure Reference	Note
Power ON	4-3-3 Power On/Off	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
System Info	4-3-4 System Information	Record software version and System Image version Application Software Part Number: _____ Software Revision: _____ Base Image Software Part Number: _____ Software Revision: _____  <input type="checkbox"/> Passed <input type="checkbox"/> Failed
Mode Transition	4-3-7 Mode Transition Checks	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Functional Checks	4-3-8 Functional Check	
CW Mode (Optional)		<input type="checkbox"/> Passed <input type="checkbox"/> Failed <input type="checkbox"/> N/A
WLAN (Optional)		<input type="checkbox"/> Passed <input type="checkbox"/> Failed <input type="checkbox"/> N/A
4D (Optional)		<input type="checkbox"/> Passed <input type="checkbox"/> Failed <input type="checkbox"/> N/A
Power Assistant (Optional)		<input type="checkbox"/> Passed <input type="checkbox"/> Failed <input type="checkbox"/> N/A
System Serial Number: Probe Used (Name and Serial Number written below):		
Overall Results: Passed / Failed Date (MMM/DD/YYYY): _____ SSO ID and Name (Print): _____ Signature: _____		

## Section 8-5 Settings - Backup and Restore

This section briefly describes Image Setting backup and restore function.

For detailed documentations and warnings, refer to Chapter.16, Section “System/Backup and Restore Preset Menu” in the Basic User Manual.

## 8-5-1 General Information

The Backup/Restore function enables the user to:

- Copy/Restore the patient archive.
- Copy/Restore the system configuration. The Copy/Restore system configuration feature enables the user to configure several units with identical presets, providing that the units have the same software version.

### 8-5-1-1 Supported Media

Depending on the system, you can use either a CD-R, DVD-R, USB Flash Drive, or USB Hard Disk for system backup/restore. System does NOT support CD-RW/DVD+R/DVD+RW.

For the sake of simplicity, we have used the CD-R in the examples in this section.

### 8-5-1-2 General Notes

**NOTE:** When you restore backup data from the Utility menu, the LOGIQ P9/P7 application usually restarts automatically when the restoring is complete.

**NOTE:** To perform backup and restore procedures, you must login with administrator privileges.

## 8-5-2 Backup Procedures

Back up patient data AFTER you've archived (via EZBackup/EZMove) images so that the pointers to the patients images reflect that the images have been moved to removable media and are no longer on the hard drive.

- 1) Insert a media into the drive or USB device into a USB port.

**NOTE:** About formatting media, See 'Formatting removable media' on Basic User Manual for more information.

- 2) In the patient screen, select the dataflow Local Archive - Int. HD.
- 3) On the touch panel, press Utility.
- 4) On the Utility touch panel, press System.
- 5) On the monitor display, select Backup/Restore.  
The Backup/Restore screen is displayed.
- 6) In the Backup list,
  - Select Patient Archive and Report Archive to backup the patient records.
  - Select User Defined Configuration to copy system settings and user presets.

**NOTE:** The detailed section of this menu decouples the user defined configuration above. This allows you to selectively restore what you want to restore across multiple machines.

- 7) Specify where to save data in the media field.
- 8) Select Backup.  
The system performs the backup. As it proceeds, status information is displayed on the Backup/Restore screen.
- 9) At the end of the process, the Backup completed message is displayed on the monitor.  
Press Eject (F3) for eject media/disconnect USB.
- 10) Make sure to physically label the media. An identification of the system should also be noted on the media and a backup log should be kept.  
File the media in a safe place.

## 8-5-3 Restore Procedures



**CAUTION** The restore procedure overwrites the existing database on the local hard drive. Make sure to insert the correct media.

You cannot restore the data between systems with different software versions.



**CAUTION** To avoid the risk of overwriting the local patient and report archives, **DO NOT** check Patient Archive when restoring userdefined configurations.

- 1) On the touch panel, press Utility.
- 2) On the Utility touch panel, press System.
- 3) On the monitor display, select Backup/Restore.  
The Backup/Restore screen is displayed.
- 4) In the Restore list,
  - Select Patient Archive and Report Archive to restore the patient archive.
  - Select User Defined Configuration to restore all system settings and user presets.or  
One or several system configuration items to restore parts of the Detailed Restore of User Defined.
- 5) In the Media field, select the appropriate Source device.
- 6) Select Restore.  
The system performs the restore. As it proceeds, status information is displayed on the Backup/Restore screen.
- 7) The LOGIQ P9/P7 restarts automatically when Restore is done.

## 8-5-4 EZBackup and EZMove



**CAUTION** ***EZBackup or move do not backup patients without images, or reports. If the entire patient archive plus images plus reports need to be backed up, it is recommended to use the Export/import utility. (Export/Import Utility: go to Patient, and select Data Transfer menu.)***

EZBackup or EZMove allows you to manage hard disk space (move images off the hard drive) while maintaining the patient database on the scanner, as well as to back up the patient database and images.

- EZBackup: Copy the data from the local HDD to the removable media.
- EZMove: Copy the data from the local HDD to the removable media. After copying the image file to the media, EZMove deletes the image file from the Local HD.

### 8-5-4-1 EZBackup and EZMove

Basically, when you perform the EZBackup or EZMove procedure, you insert the media (or connect USB HDD if applicable), the system backs up/moves the images, and creates a reference between the patient database and the media's volume.

EZBackup/EZMove can take up to 20 minutes (or longer, depending on the size of the backup). Make sure to schedule this at the same time daily, when no patients are scheduled.

- 1) Prepare unformatted media or the USB HDD before starting EZBackup/EZMove.

BEFORE starting the EZBackup, select Unlock All in Utility -> Admin -> Logon.

- 2) Specify the EZBackup/EZMove setup on the Utility -> System -> Backup/Restore page.
- 3) To start the EZBackup/EZMove procedure, go to the Patient menu and select EZBackup/EZMove. The EZBackup/EZMove Wizard starts.
- 4) Verify the information on the first page of the EZBackup/EZMove Wizard, then press Next.  
Full backup options display on the first page of the EZBackup wizard. If you want to backup all of the exams in the range (even if the exam was previously backed up, check this option). If you uncheck this option, the system only backs up exams which have not yet been backed up.  
  
EZBackup does not back up the exams which were previously backed up once by EZBackup or Export.
- 5) Verify the information on the EZBackup/EZMove Wizard, Page 2. The backup may span multiple media. This page tells you how many media you need to do this backup. After you have gathered the media (allow for one extra media, just in case), you are ready to begin the backup. Press Next.  
Free Space/Total Size: tells you the size of the data you have selected to store/and the total size of the USB Hard Drive storage media. If the storage capacity of the USB HD is insufficient, you will see the message, Selected Location does not have enough free space.
- 6) A pop-up message appears that provides you with the media label. Label the media, then insert the media. Press OK.

#### 8-5-4-2 To review EZBackup and EZMove

You can review backed up media via the Patient Menu, Import, and the DICOM Read dataflow.

To review EZMoved image,

- 1) Select the patient on the Patient Menu (on the same system where the EZMove was performed).
- 2) Insert the media volume indicated on the Patient Menu.
- 3) View the exam from the media.



## 8-5-5 Option Keys

- 1) From the touch panel, select Utility -> System-> Backup/Restore.
- 2) ADD or REMOVE new option key at "Enter New Option Key" field.

**System Admin** | **Users** | **Logon**

**Product**

Product: Radiology.Maru

HW Number: 12345SM8

**SW Option Key**

Enter New Option Key:  **Add**

Installed Option Keys

B9JLD-QW8EK-46YUX-9JUA7-FBBC4 **Remove**

**Service**

Enable Automatic Request for Service ☒

**Protecting Health Information (PHI)**

Prevent Writing to Removable Media-CD/DVD/USB (restart needed) ☐

**Rights**

Require Admin Operator Rights to Save Imaging Settings ☐

Option	Status
CodedContrast	Permanent
Dicom	Permanent
Scan Assistant	Permanent
LOGIQView	Permanent
OnBoardReporting	Permanent
TUI	Permanent
VOCAL_II	Permanent
VCI-Static	Permanent
4D	Permanent
Elastography	Permanent
TVI	Permanent
AutoEF	Permanent
AutoIMT	Permanent
BSteer+	Permanent
ElastoQA	Permanent
FlowQA	Permanent
EchoStress	Permanent
BFlow	Permanent
CW_Doppler	Permanent
Measure Assist Breast	Permanent
Measure Assistant OB	Permanent
Breast Productivity	Permanent
Compare Assistant	Permanent
Thyroid Productivity	Permanent
DVR	Permanent

Figure 8-40 Option Keys

**NOTE:** This screen shot and options may slightly differ between product type and releases.

- 3) Record de settings in Table 12.

## Section 8-6 Replacement of Front Cover

### 8-6-1 Manpower

1 person, 1 min.

### 8-6-2 Tools

None required.

### 8-6-3 Removal Procedure

- 1) Simply pull out Front Cover.



Figure 8-41 Front Cover

- 2) Front cover is attached using four "latches" as shown below.



Figure 8-42 latches

- 3) Pull out the Air filter from Front Cover.

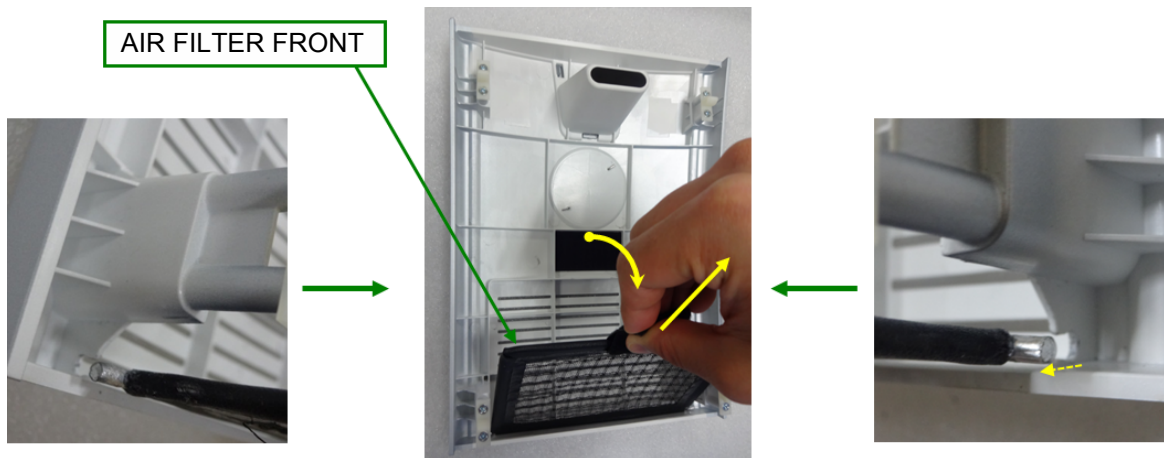


Figure 8-43 Removal of Air filter

#### 8-6-4 Installation Procedure

- 1) Front cover and Air filter to be installed in reverse order of removal.
- 2) Align the edges and simply push to make sure all four "latches" are engaged.

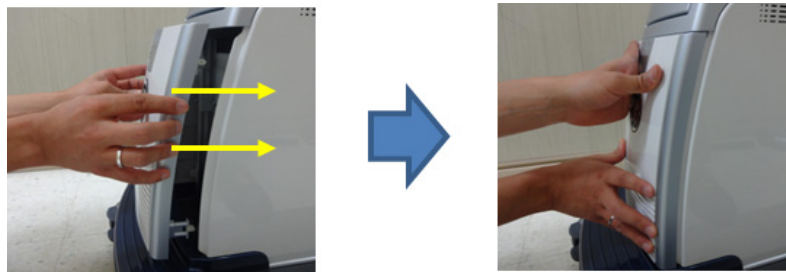


Figure 8-44 Installation of latches

#### 8-6-5 Functional Check

Visual inspection only.

## Section 8-7 Replacement of Top Cover

### 8-7-1 Manpower

1 person, 5 min.

### 8-7-2 Tools

None required.

### 8-7-3 Removal Procedure

- 1) Top Cover shapes differ for each configuration, but removal/installation procedure are the same.



Low Cabinet



High Cabinet

**Figure 8-45 Low Cabinet and High cabinet**

- 2) Slide out Top Cover toward front of the console. No tools required.



**Figure 8-46 Slide out Top Cover**

## 8-7-4 Installation Procedure

- 1) Cover to be installed in reverse order of removal.
- 2) Make sure “latches” on both sides are engaged.

**NOTE:** For Mid and High Cabinet type, there is “Guide Rail” for installation.

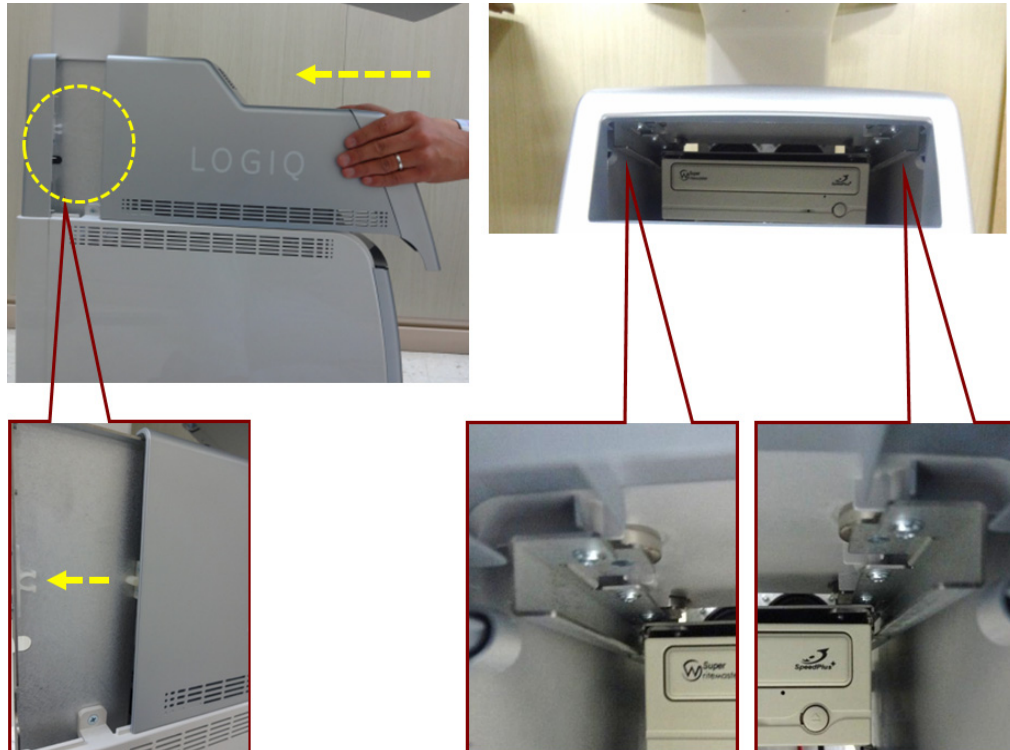


Figure 8-47 Guide Rail and latch

## 8-7-5 Functional Check

Visual inspection only.

## Section 8-8 Replacement of Side Cover

### 8-8-1 Manpower

1 person, 15 min.

### 8-8-2 Tools

Standard Phillips Screwdriver.

### 8-8-3 Removal Procedure

#### 8-8-3-1 Removal Procedure - Side Cover (L)

1) Remove Top Cover.



Figure 8-48 Removal of Top cover

2) Remove 3 screws for Side Cover (L).



Figure 8-49 Side Cover screw

- 3) Pull out Side Cover (L). There is mechanical hook on bottom of the part.

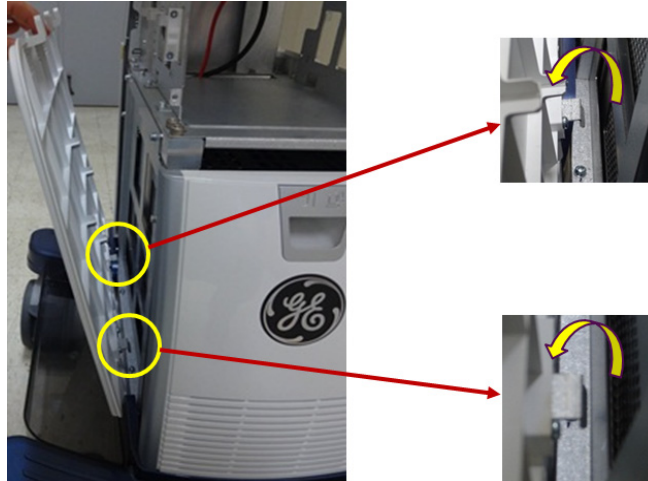


Figure 8-50 Pull out Side Cover(L)

### 8-8-3-2 Removal Procedure - Side Cover (R)

- 1) Remove Top Cover.



Figure 8-51 Removal of Top cover

- 2) Remove knobs

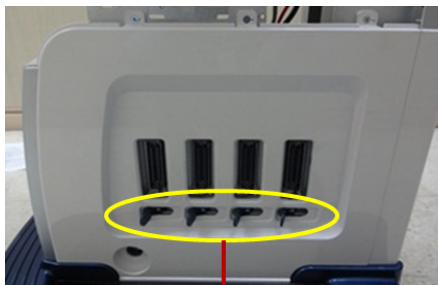


Figure 8-52 Removing RS probe knobs



- 3) Remove 3 screws for Side Cover (R).



Figure 8-53 Side Cover (R) screw.

- 4) Pull out Side Cover(R). There is mechanical hook on bottom of the part.

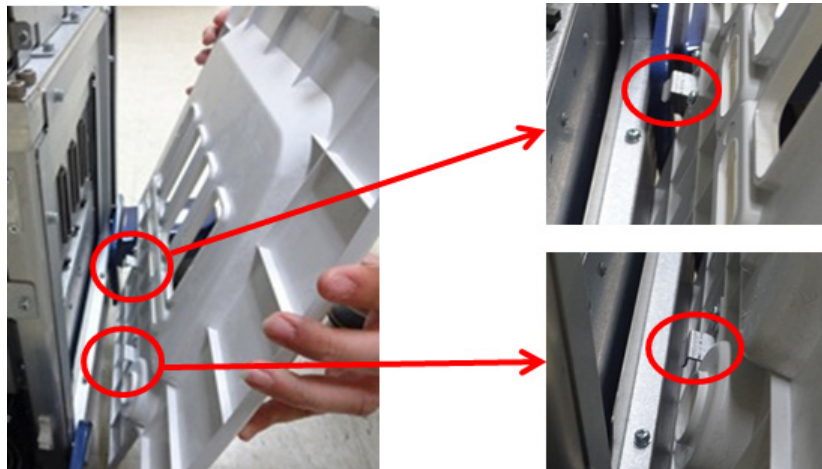


Figure 8-54 Pull out Side Cover (R)

#### 8-8-4 Installation Procedure

Cover to be installed in reverse order of removal.

#### 8-8-5 Functional Check

Visual inspection only.

## Section 8-9 Replacement of Rear Cover

### 8-9-1 Manpower

1 person, 1 min.

### 8-9-2 Tools

No tool.

### 8-9-3 Removal Procedure

- 1) Pull the rear cover and remove it as following figure

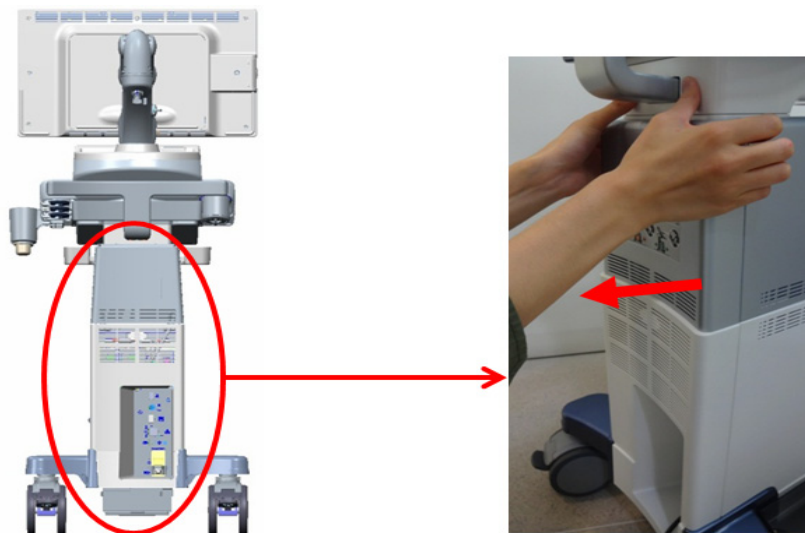


Figure 8-55 Removal of Rear Cover.

### 8-9-4 Installation Procedure

- 1) Cover to be installed in reverse order of removal.

### 8-9-5 Functional Check

Visual inspection only.

## Section 8-10 Replacement of Side Tray & Foot Rest Cover

**8-10-1 Manpower**  
1 person, 15 min.

**8-10-2 Tools**  
Standard Phillips Screwdriver.

*NOTE: "Short" type driver preferable for Foot Rest Cover removal/installation.*

### 8-10-3 Removal Procedure

#### 8-10-3-1 Removal Procedure - Side Tray.

Procedures are common for both the Left and Right Side Tray.

- 1) Remove 2 screws and carefully lift up the side tray.

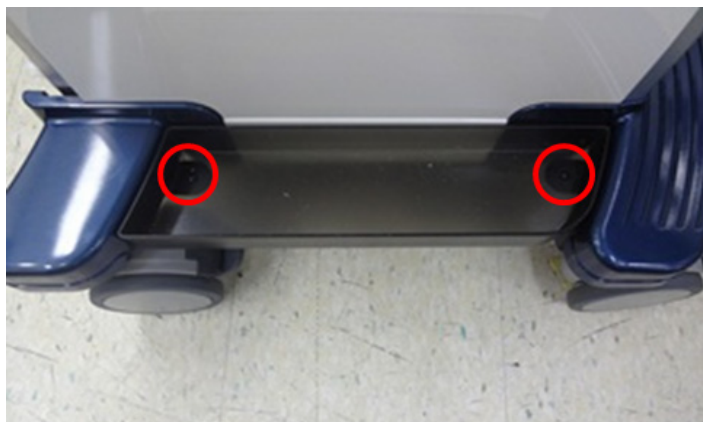


Figure 8-56 Side Tray screw points

- 2) Remove 2 screws and carefully lift up the side tray.

SIDE TRAY FIX BRKT



Figure 8-57 SIDE TRAY FIX BRKT screw points

#### 8-10-3-2 Removal Procedure - Foot Rest Cover

- 1) Remove Front Cover (refer to *section 8-6*)
- 2) Remove Top Cover (refer to *section 8-7*)
- 3) Remove Side Cover (refer to *section 8-8*)
- 4) Remove 3 screws.

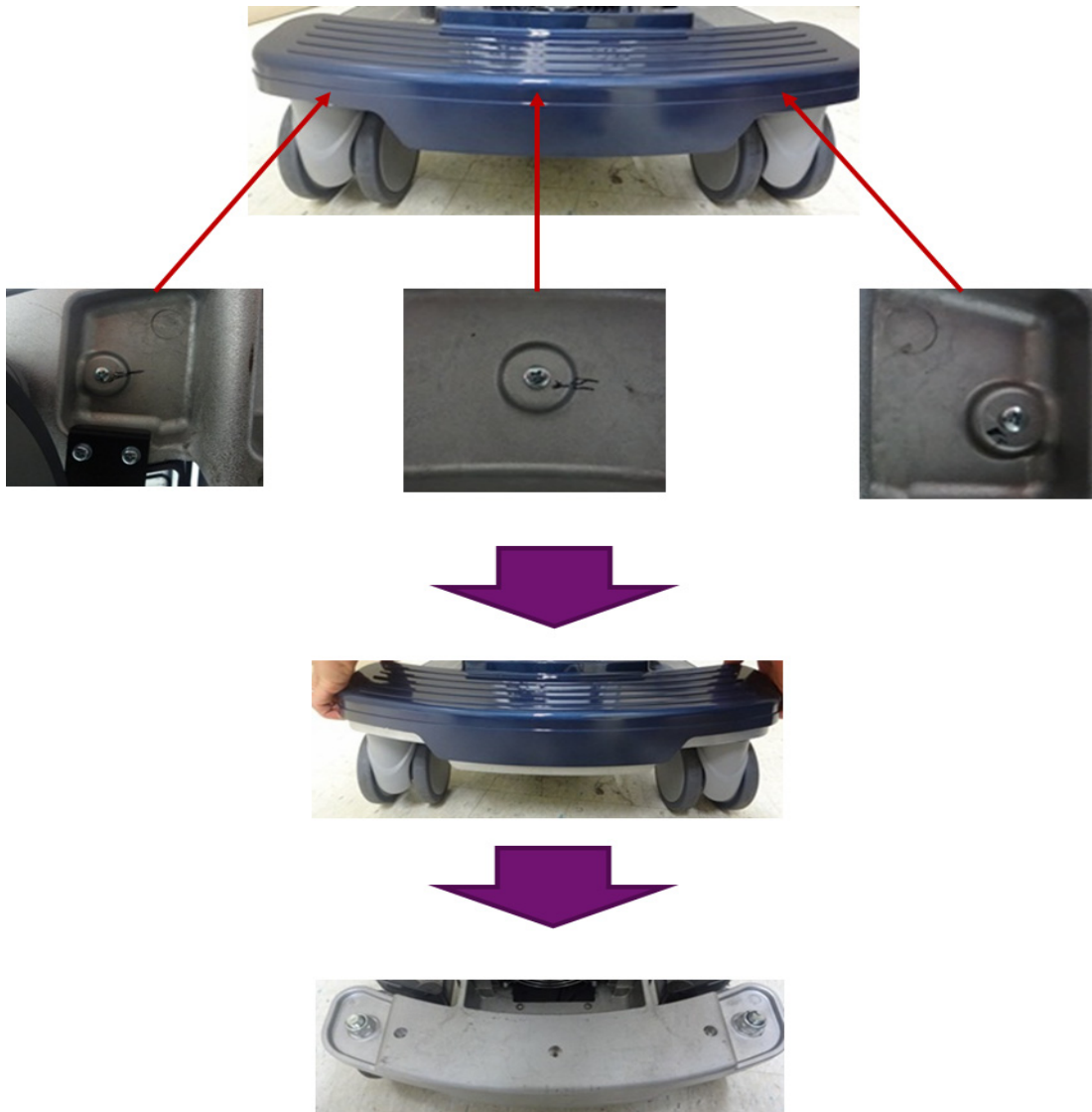



Figure 8-58 Foot Rest Cover

#### 8-10-4 Installation Procedure

Parts to be installed in reverse order of removal.

## Section 8-11

### Replacement of Monitor and LCD Arm Plastic Covers

 **WARNING** Be care that the monitor does not fall during the replacement process.

#### 8-11-1 Manpower

2 person, 15 minutes.

#### 8-11-2 Tools

Standard Phillips Screwdriver, 4 mm Hex Wrench.

#### 8-11-3 Preparations

- 1) Lock the Monitor Arm to prevent hazard. Refer to the figure below.

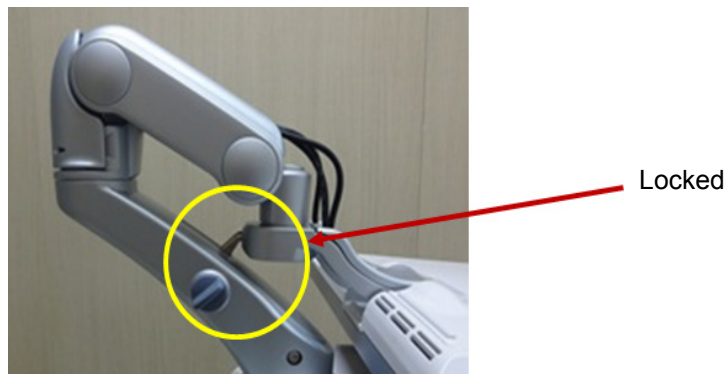


Figure 8-59 Locking the Monitor Arm

#### 8-11-4 Monitor Remove Procedure

- 1) Unscrew 2 screws, then remove the Monitor rear panel. Refer to the figure below.

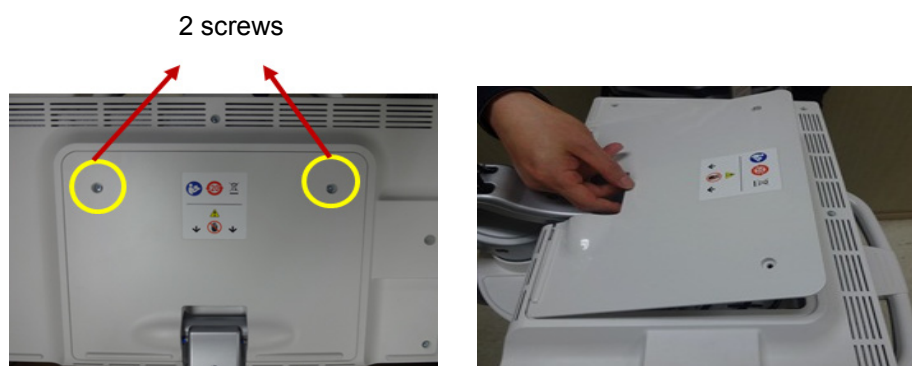
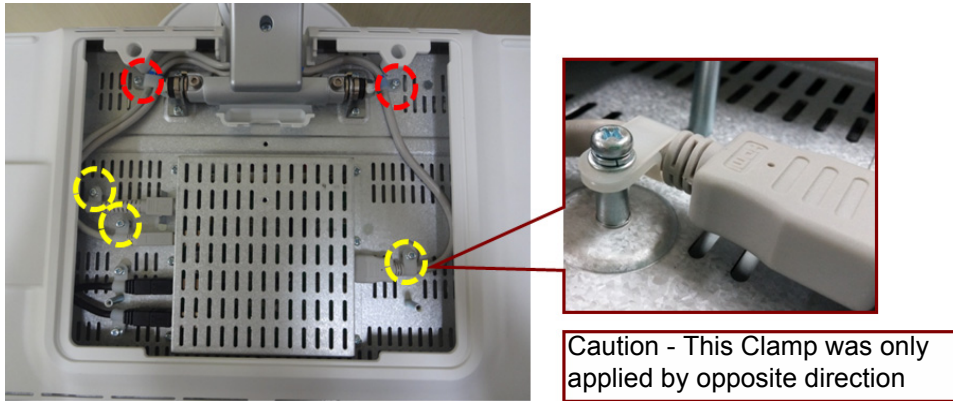


Figure 8-60 Removing the Monitor cover



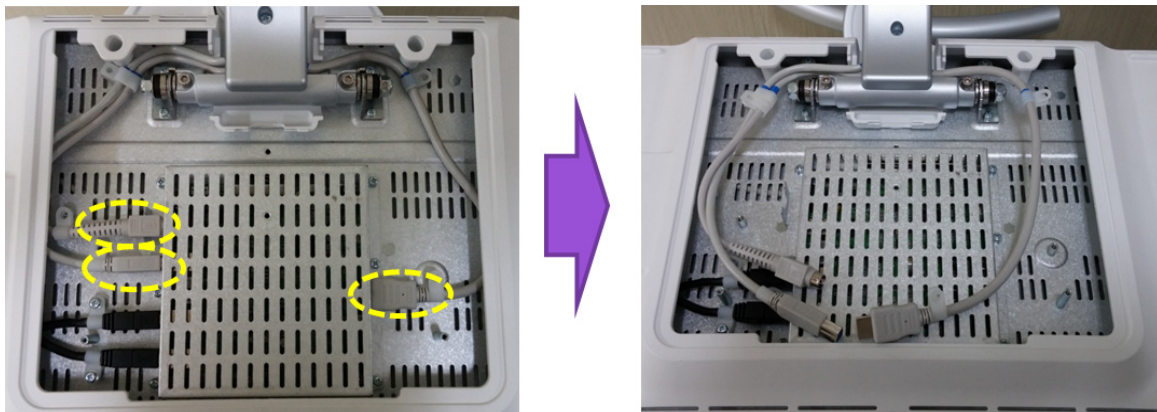
- 2) Unscrew 5 screws, then remove cable clamp.

**NOTE:** There is cable position marker at red circle.



**Figure 8-61 Unscrew cable clamp screws**

- 3) Disconnect three Monitor cables. Refer to the figure below.



**Figure 8-62 Disconnecting Monitor cables**

- 4) Unscrew 2 screws, then separate the Monitor from the Monitor Stand Arm. Refer to the figure below.

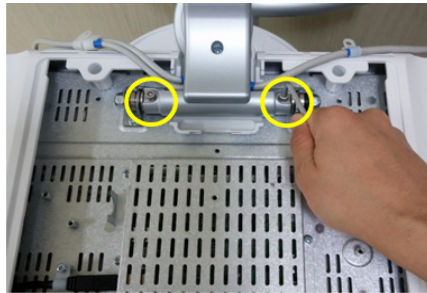


Figure 8-63 Unscrewing 2 screws & separating the Monitor

#### 8-11-5 Monitor Installation Procedure

Parts to be installed in reverse order of removal.

## 8-11-6 LCD Arm Plastic Covers Remove Procedure

- 1) Unscrew 1 screw, then remove 3rd Arm Cover. Refer to the figure below.



Figure 8-64 Removing the 3rd Arm Cover

- 2) Remove 2nd Axis Cover. Refer to the figure below.



Figure 8-65 Removing 2nd Axis Cover

- 3) Remove 2nd Arm Cover. Refer to the figure below.



Figure 8-66 Removing 2nd Arm Cover



- 4) Unscrew 1 screw and Remove the 1st Arm Cover. Refer to the figure below.

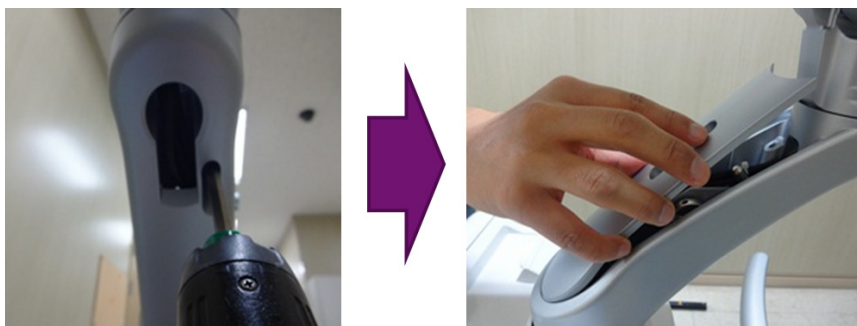


Figure 8-67 Removing the 1st Arm Cover

#### 8-11-7 LCD Arm Plastic Covers Installation Procedure

Parts to be installed in reverse order of removal.

## Section 8-12 Replacement of Monitor Covers

### 8-12-1 Manpower

2 persons, 10 minutes.

### 8-12-2 Tools

Standard Phillips Screwdriver, Hex Wrench

### 8-12-3 Pre-Work

- 1) LCD Monitor and Monitor Cable Cover removed (refer to *section 8-11*)

### 8-12-4 Removal Procedure

- 1) Remove 9 screws and remove the Monitor Rear Cover.



Figure 8-68 Monitor Rear Cover screw points

- 2) Remove 11 screws and remove the Monitor Front Cover and Glass Filter Assy.

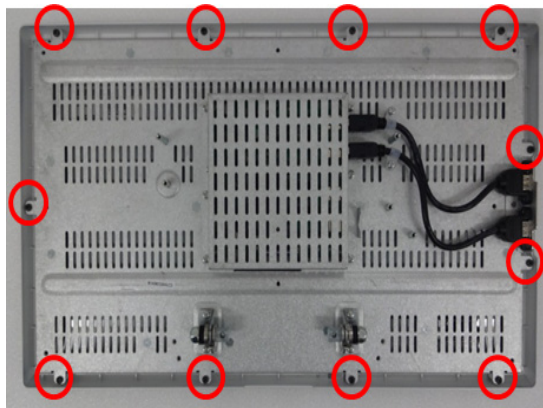


Figure 8-69 Monitor Front Cover screw points

## 8-12-5 Installation Procedure

- 1) Parts to be installed in reverse order of removal.



### CAUTION

**Make sure not to remain any dust on Glass during Front Cover and Glass Filter Assy installation**

## 8-12-6 Functional Check

Visual Check only.

## Section 8-13

### Replacement of Fixed Arm Cover and Fixed Arm Holder Grip

#### 8-13-1 Manpower

2 person, 5 minutes.

#### 8-13-2 Tools

Standard Phillips Screwdriver, Hex Wrench.

#### 8-13-3 Removal Procedure

##### 8-13-3-1 Removal Procedure - Fixed Arm Cover

- 1) Remove 1 screw and lift up the Fixed Arm Cover.



Figure 8-70 Fixed Arm Cover screw point

##### 8-13-3-2 Removal Procedure - Fixed Arm Holder Grip

- 1) Remove 2 screws and pull out the Fixed Arm Holder Grip.



Figure 8-71 Fixed Arm Holder Grip Cover screw points

---

**8-13-4      Installation Procedure**

Parts to be installed in reverse order of removal.

**8-13-5      Functional Check**

Visual Check only.

Section 8-14

Replacement of OPIO and Related Parts

*NOTE: This section describes removal and installation of OPIO and related parts. OPIO Assy itself, Main PWA Assy, LCD Touch module Assy, HUB Board, Encoder, Freeze key Assy, OPIO AN Key & Gel warmer board and Trackball Assy.*

8-14-1

Manpower

1 person, 5 minutes.

8-14-2

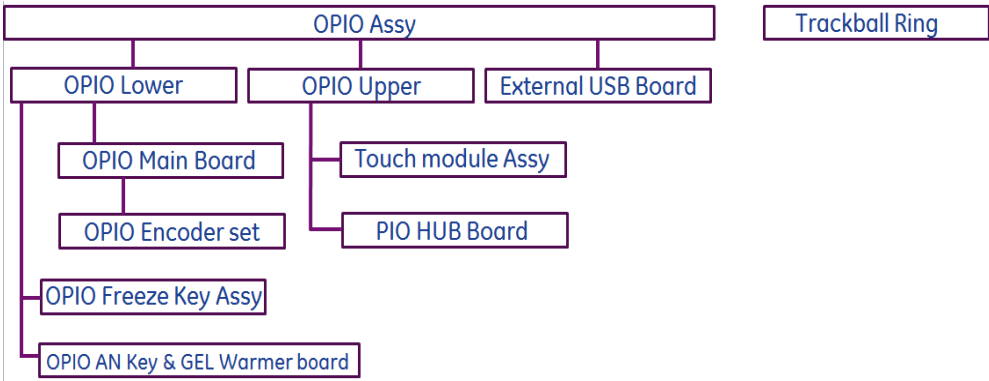
Tools

Standard Phillips Screwdriver.

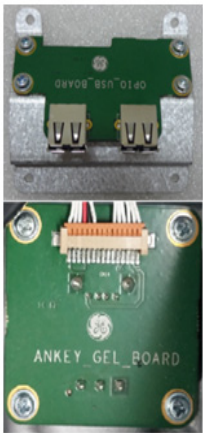
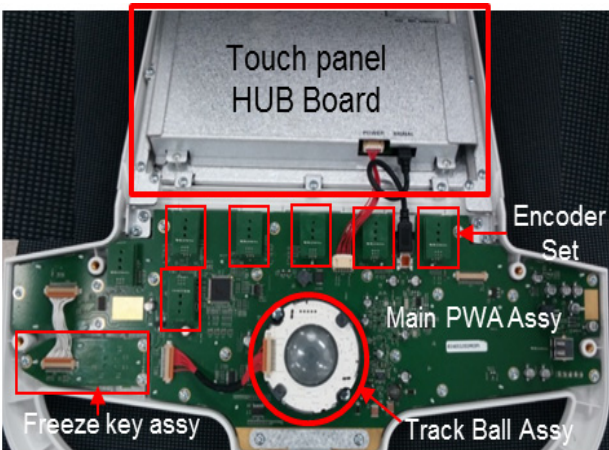
8-14-3

Removal Procedure

Nesting of the parts are as follows.



For example, to access Encoder for repair, OP Panel must be removed and then OPIO Main PWA assy must be removed.



External USB Board

OPIO AN Key & GEL Warmer board

Figure 8-72 OP Panel Assy

#### 8-14-3-1 Removal Procedure - Trackball Ring

**NOTE:** Removal of Trackball Ring and Cleaning does not require tools.

- 1) Turn the ring counter clock-wise
- 2) Lift trackball from OP Panel

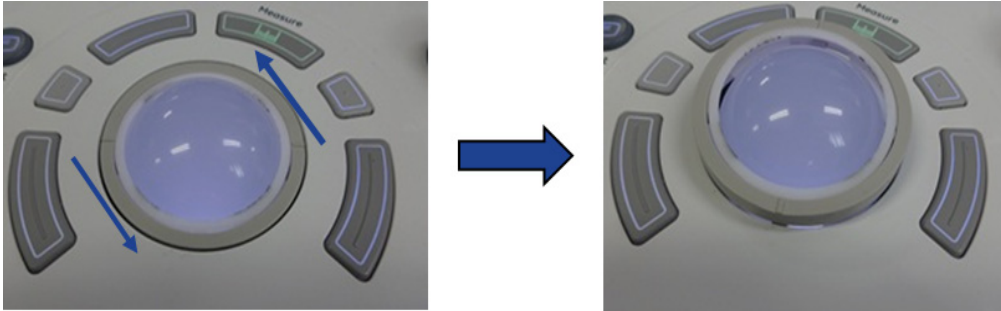


Figure 8-73 Trackball Ring

#### 8-14-3-2 Removal Procedure - OP Panel Assy



Figure 8-74 OP Panel Assy

- 1) Remove 7 screws from bottom of the OPIO Base.



Figure 8-75 Bottom of OPIO Base

- 2) Remove 2 screws on OPIO covers.



Figure 8-76 Rear of OPIO Base

- 3) Remove USB cables on Touch panel and unscrew 2 screws. Refer to following figure.

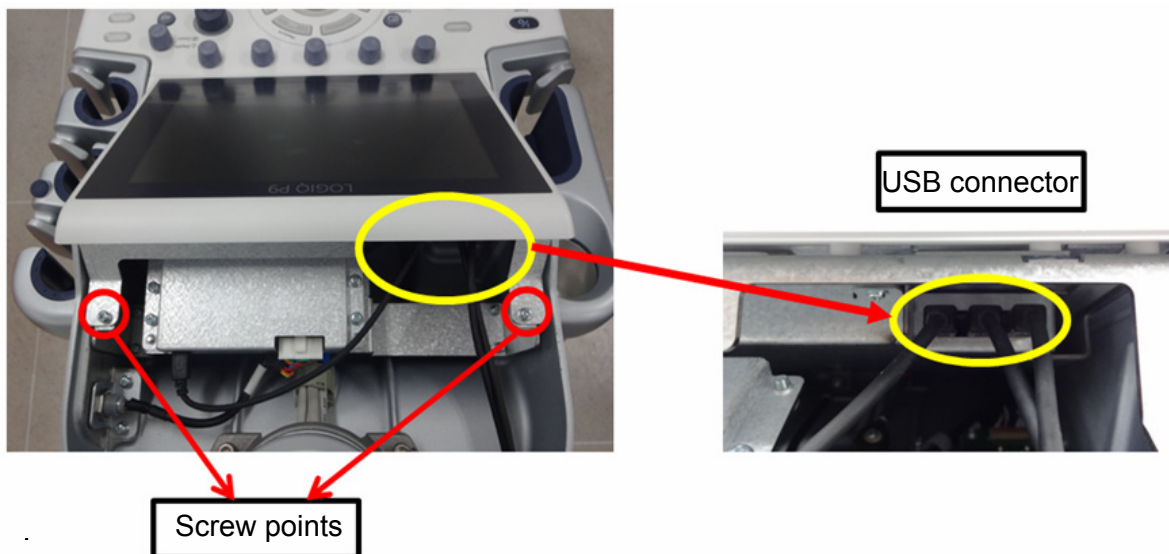
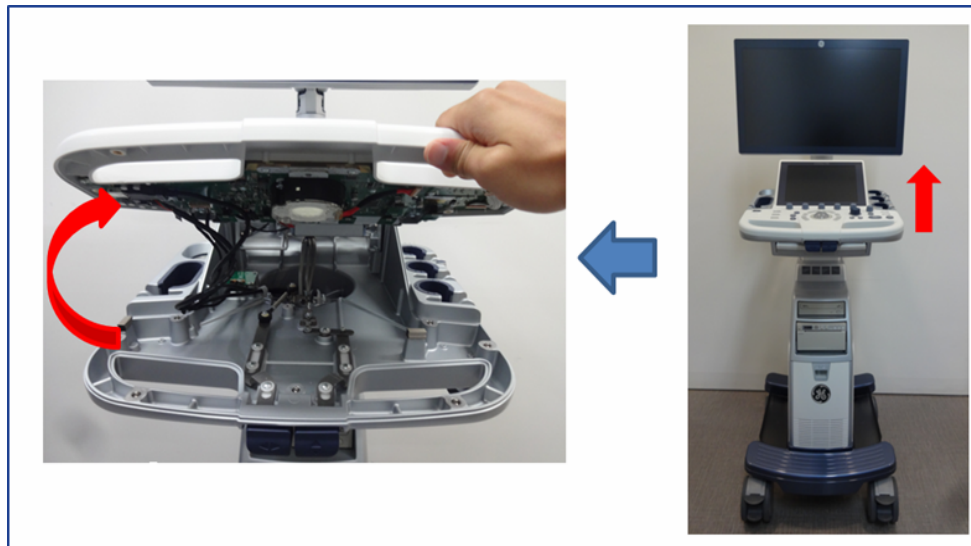


Figure 8-77 USB cable position and screw points.

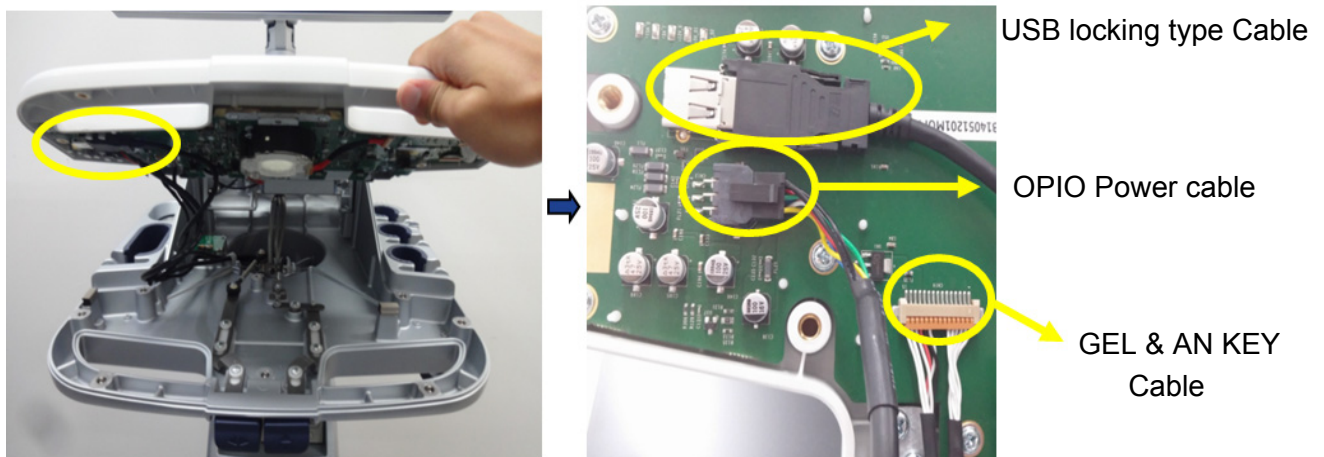


- 4) Lift OP Panel.



**Figure 8-78 Lift OP Panel**

- 5) Remove USB locking type Cable  
6) Remove OPIO Power cable.  
7) Remove USB locking type connector.



**Figure 8-79 Removal of connectors**

- 8) OP Panel can now be separated from the console.

### 8-14-3-3 Removal Procedure - AN Keyboard (Option)

- 1) Remove 4 screws on AN keyboard Brkt. ( 2 screws on right side and 2 screws on left side)



Figure 8-80 Removal of screws

- 2) Unscrew 2 screws on AN keyboard Brkt only half . ( 1 screw on right side and 1 screw on left side). Do not remove these screws.(Red circle in following figure)



Figure 8-81 Half unscrewing points

- 3) Push the AN keyboard so that screw holes meet the screw head as following figure.

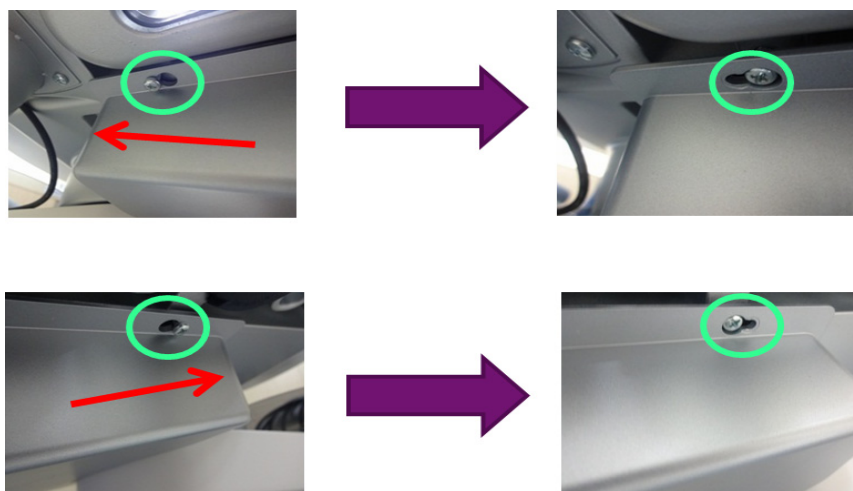


Figure 8-82 Half unscrewing points

- 4) Disconnect USB cables as following figure.

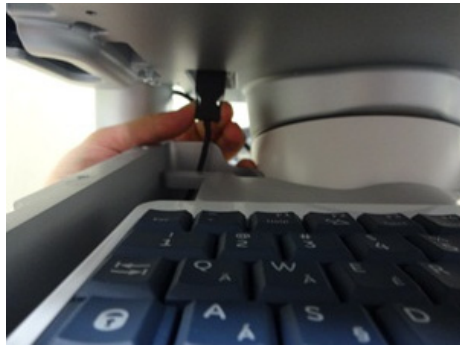


Figure 8-83 Disconnecting USB cable

#### 8-14-3-4 Removal Procedure - Trackball

- 1) Remove a connector from back of the LCD Touch Panel Assy.
- 2) Remove 2 screws.
- 3) Slowly lift up trackball from OP Panel.

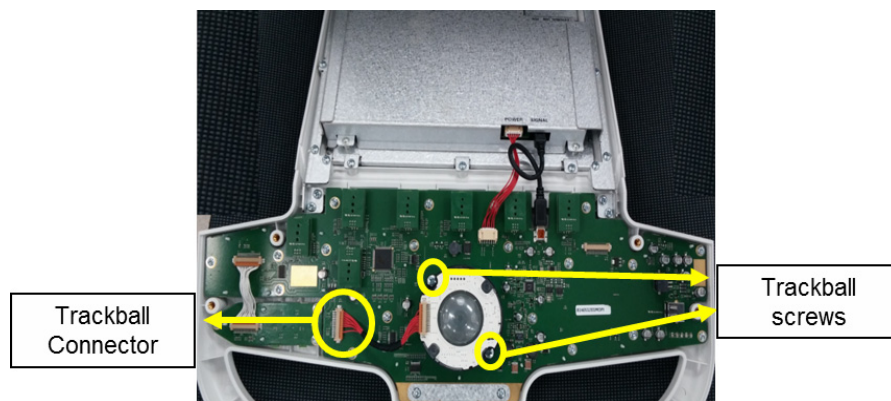


Figure 8-84 Trackball removal

### 8-14-3-5 Removal Procedure - LCD Touch Panel Assy

- 1) Disconnect connectors as following figure.

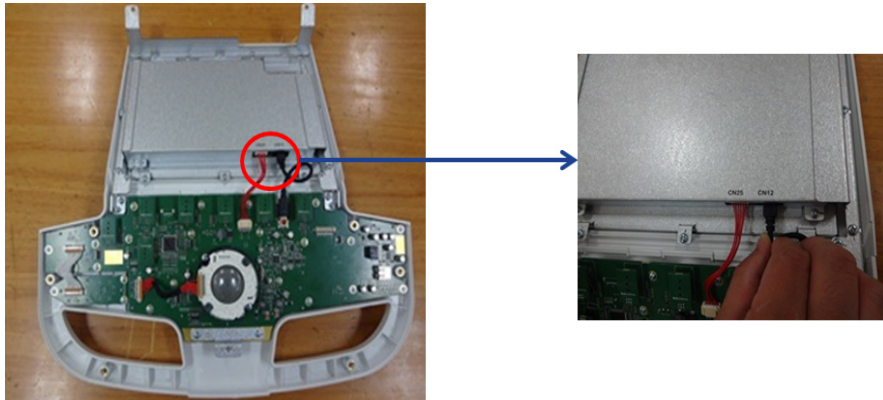


Figure 8-85 Disconnection of LCD Touch panel Assy

- 2) Remove 4 screws as following figure.

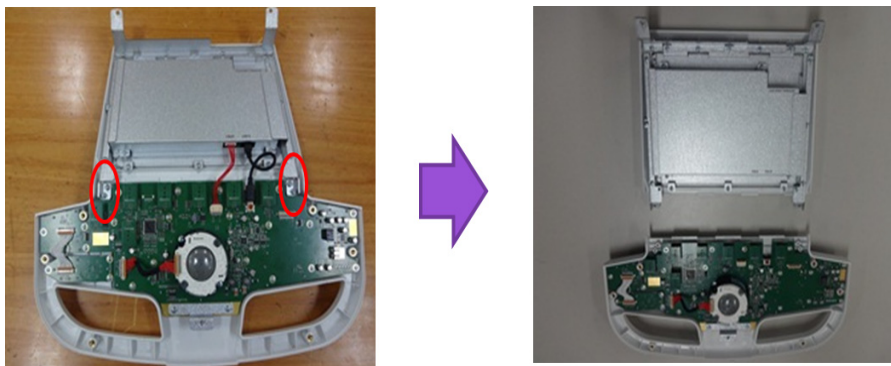
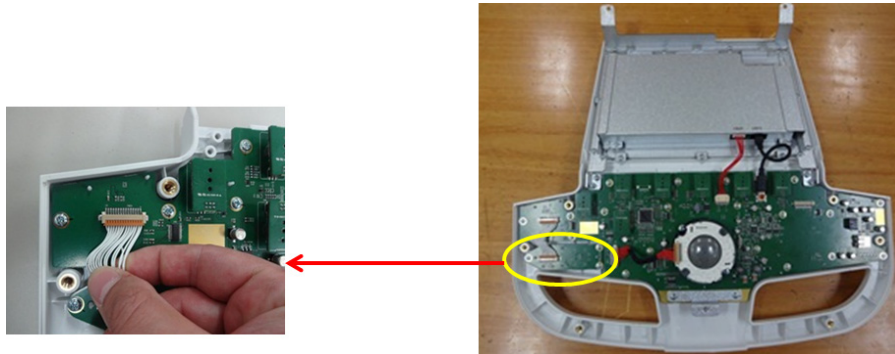


Figure 8-86 Removal of 4 screws of LCD Touch panel Assy

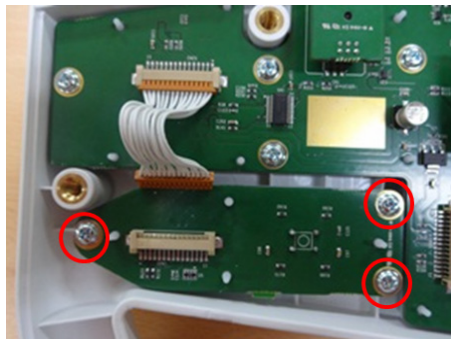
**8-14-3-6 Removal Procedure - Freeze key assy**

- 1) Remove connector as following figure



**Figure 8-87 Disconnection of freeze key Assy connector**

- 2) Remove 3 screws from Freeze key Assy



**Figure 8-88 Screw points of freeze key assy .**

- 3) Slowly lift board from OP Panel.



#### 8-14-3-7 Removal Procedure - OP Panel Main PWA Assy

- 1) Carefully lift up knobs as following figures
- 2) Place the new knobs.



Figure 8-89 Position of knobs

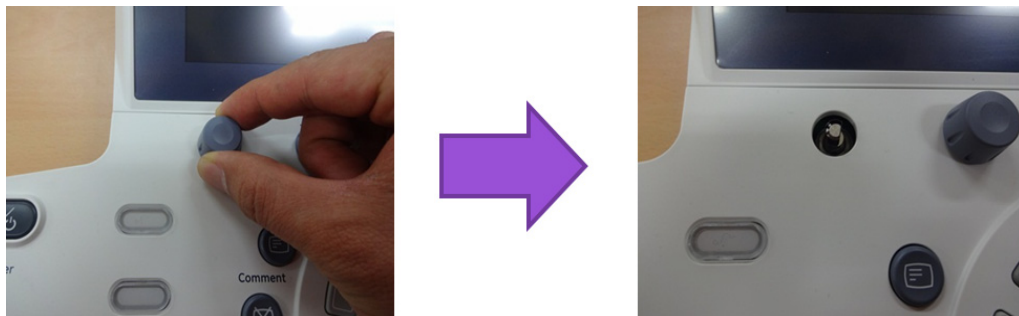


Figure 8-90 Removal of knobs

- 3) Disconnect freeze key assy connector, trackball connector and Touch panel connectors. Refer to following figure.

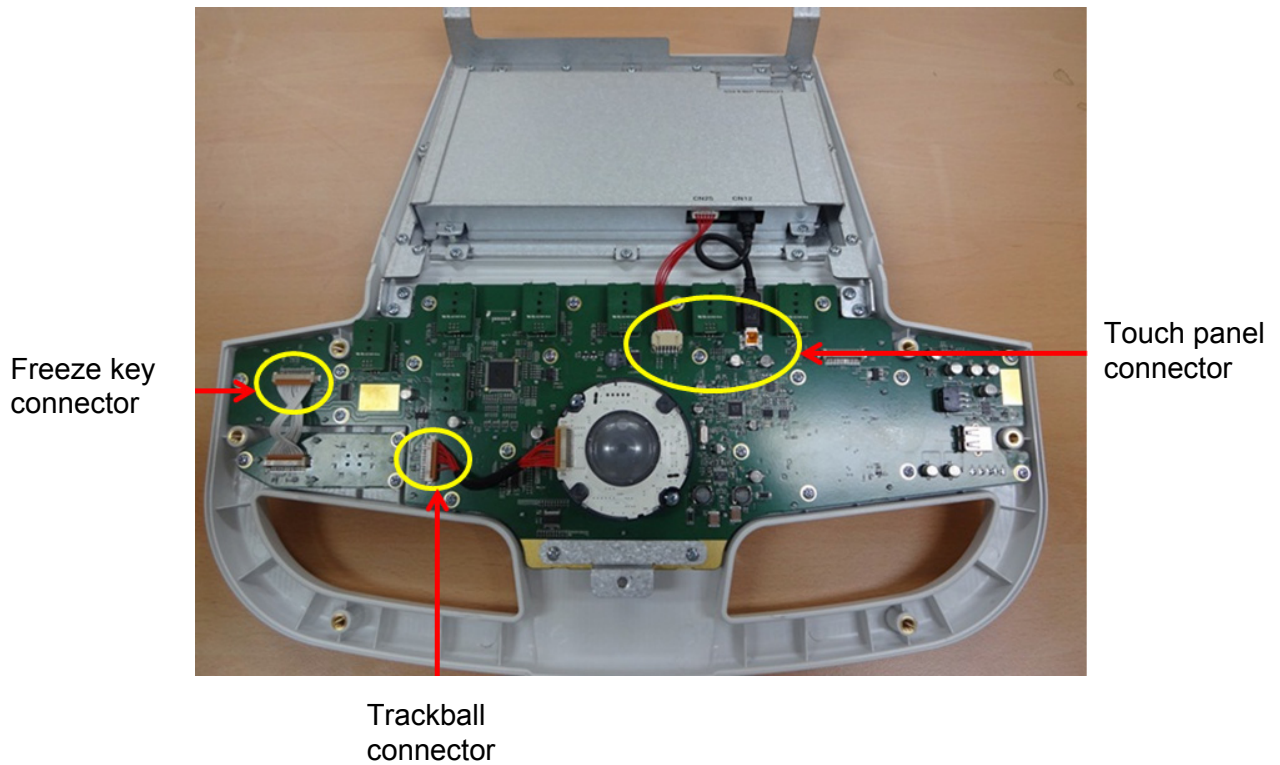


Figure 8-91 Removal of connectors on Main PWA assy

- 4) Remove 23 screws around PWA. Refer to following figure.



Figure 8-92 Screw points on Main PWA Assy



#### 8-14-3-8 Removal Procedure - Encoder on PWA

- 1) Remove OP Panel Main PWA Assy.
- 2) Loosen nut.
- 3) Remove part

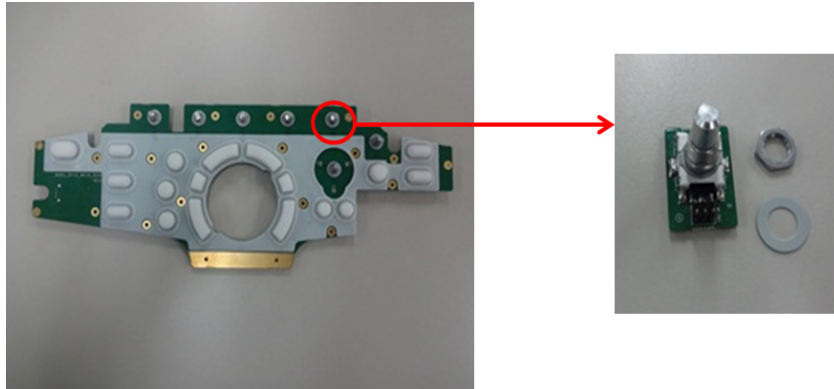


Figure 8-93 Removal of Encoder

#### 8-14-3-9 Removal Procedure - Touch panel

- 1) Remove OP Panel Assy.
- 2) Separate LCD Touch Panel Assy from OP Panel Assy.
- 3) Remove 12 screws on 3 BRKT and remove 3 BRKT Refer to following figure.

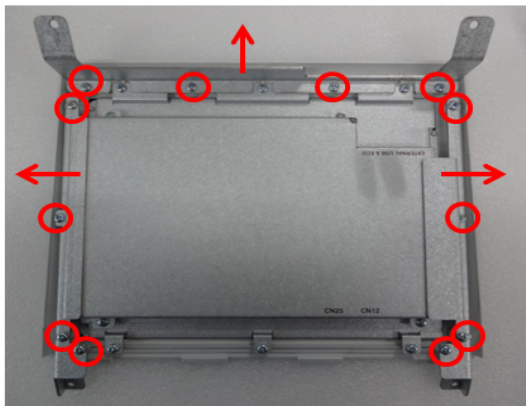


Figure 8-94 Screw points to remove 3 BRKT

- 4) Remove 10 screws on BRKT and remove 1 BRKT Refer to following figure.

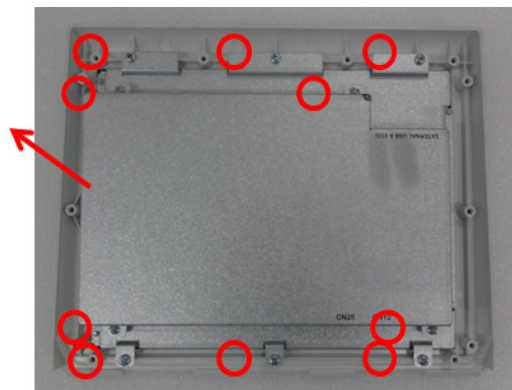


Figure 8-95 Screw points to remove 3 BRKT

- 5) Remove flexible connectors and carefully lift up Touch panel.

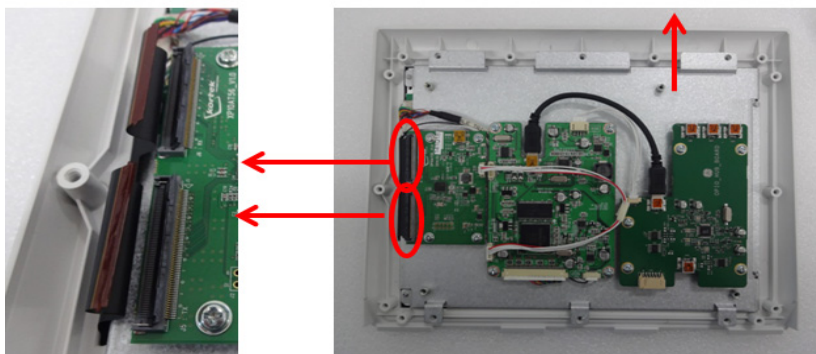


Figure 8-96 Disconnection of Touch panel connector

#### 8-14-4 Installation Procedure

- 1) Parts to be installed in reverse order of removal.

**NOTE:** Make sure to assemble "Rubber Sheet" securely to PWA.

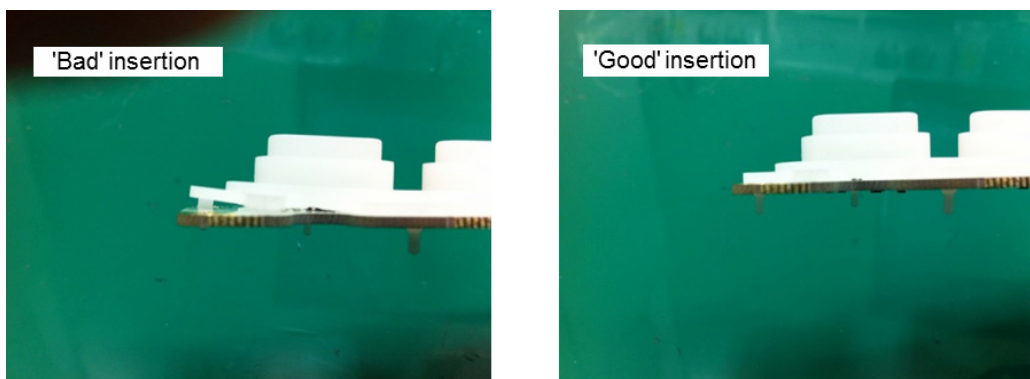


Figure 8-97 Installation of PWA

**NOTE:** Make sure to connect Touch panel connector to hub board as blow figure.



**Figure 8-98 Installation of Touch panel connector**



**CAUTION** Make sure not to remain any dust on Glass during OPIO Upper Cover and Touch Screen Assy installation

**NOTE:** In some cases, when OPIO is replaced the Windows base system may recognize new OPIO as 'new' hardware device.  
This could bring Touch Panel graphics to top of main screen resulting to have only the wall paper (ping, cherry blossom) without touch panel buttons.  
When this occurs, go into Windows desktop, and double click "OPIO Position Reset" icon.  
Alternatively, go to Windows graphics property manager, and bring SCREEN3 to below SCREEN1.

#### 8-14-5 Functional Check

Test	Refer to	Note
System Exterior Visual Check	section 4-3-1	Control panel visual check only
Power On/Off	section 4-3-3	
System Integration Checks	section 4-3-5	section 4-3-5-1 OPIO Test only
OPIO Interface Check	section 4-3-8	

## Section 8-15 Replacement of the Caps for Hardkeys

### 8-15-1 Manpower

1 person, approx. 1 minute/cap.

### 8-15-2 Tools

Small-sized slotted screwdriver or tweezers.

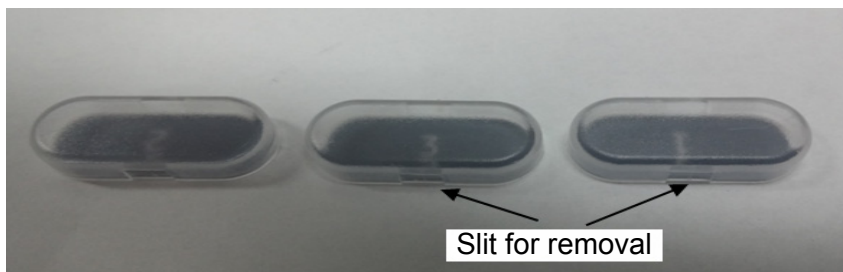
### 8-15-3 Removal Procedure

- 1) By means of a small slotted screwdriver, carefully push against the hardkey cap.
- 2) Lift the cap, until it is completely loosened from its base.
- 3) Place the new hardkey cap down until it snaps into position.



**Figure 8-99 Push against the circle cap and lift it**

**NOTE:** Each of the key have "Slit" where flathead screwdriver can be inserted for easy removal.



**Figure 8-100 Slit for removal**

### 8-15-4 Installation Procedure

Parts to be installed in reverse order of removal.

## 8-15-5 Functional Check

Test	Refer to	Note
System Exterior Visual Check	<i>section 4-3-1</i>	Control panel visual check only
Power On/Off	<i>section 4-3-3</i>	
System Integration Checks	<i>section 4-3-5</i>	<i>section 4-3-5-1</i> OPIO Test only
OPIO Interface Check	<i>section 4-3-8</i>	

## Section 8-16

### Replacement of Key Caps (by special native language keys)

#### 8-16-1 Manpower

1 person, 30 minutes.

#### 8-16-2 Tools

- Regular Standard Phillips Screwdriver
- Screwdriver (Diameter : 3mm)

#### 8-16-3 Preparations

- 1) Power Off/Shutdown the system.



**CAUTION** Before you replace the boards, please make sure you wear the Ground strap, which prevents ESD problems just in case.

#### 8-16-4 Removal Procedure

- 1) Remove '1' Key, 'Left Shift' Key, 'F5' Key, '6' Key, '7' Key, 'H' Key, 'J' Key, 'N' Key, 'Back space' Key, 'Right Shift' Key and 'Pg Up' Key by using fingertips. Refer to below Figure 8-75.



**Figure 8-101** Remove key : '1', 'Left Shift', 'F5', '6', '7', 'H', 'J', 'N', 'Back space', 'Right Shift', 'Pg Up'

- 2) Remove the 6 screws using the plus(+) screwdriver. Refer to below Figure 8-76



**Figure 8-102** Loosen the 6 screws

- 3) Carefully pull out key caps. Refer to below Figure 8-77



Figure 8-103 Detaching key caps.

#### 8-16-5 Installation Procedure

- 1) Parts to be installed in reverse order of removal.

#### 8-16-6 Replacement Checking Procedure

- 1) Insert service dongle key in the front USB port of OPIO.
- 2) Push the power button and then click the exit.
- 3) Exit to windows mode by inputting the password.

- 4) Run the OPIO Test tool (ScFpApiTest.exe) in the desktop screen and then click the “Op-panel Open” button of test tool. (Program path: C:\scanner\target\bin\ScFpApiTest.exe)



Figure 8-104

- 5) Check on the “Keyboard Test on” check box.
- 6) Check that pressed key is displayed except for ‘Fn’ key, when AN Keyboard is pressed.
- 7) End ScFpApiTest by click the “Op-Panel Close” button.



Figure 8-105

8-16-7      Functional Check

Test	Refer to	Note
System Exterior Visual Check	section 4-3-1	Control panel visual check only
Power On/Off	section 4-3-3	
System Integration Checks	section 4-3-5	section 4-3-5-1 OPIO Test only
OPIO Interface Check	section 4-3-8	



## Section 8-17

### Replacement around Nest Box

**NOTE:** This section covers replacement of components related to Nest Box.  
: MPI, MCB, MDC, MIO, CWD, DCWD, EEPROM, DC4D, Battery, HDD and SOM

#### 8-17-1 Manpower

1 person, 15 minutes for each part.

#### 8-17-2 Tools

Standard Phillips Screwdriver.

#### 8-17-3 Pre-Work

- 1) Front cover removed. (refer to section 8-6-3)
- 2) Rear cover removed. (refer to section 8-9-3)

#### 8-17-4 Nest Box Access

- 1) Remove Rear Cover. (refer to section 8-9)
- 2) Remove 2 screws and Power Cord Fix Bracket.

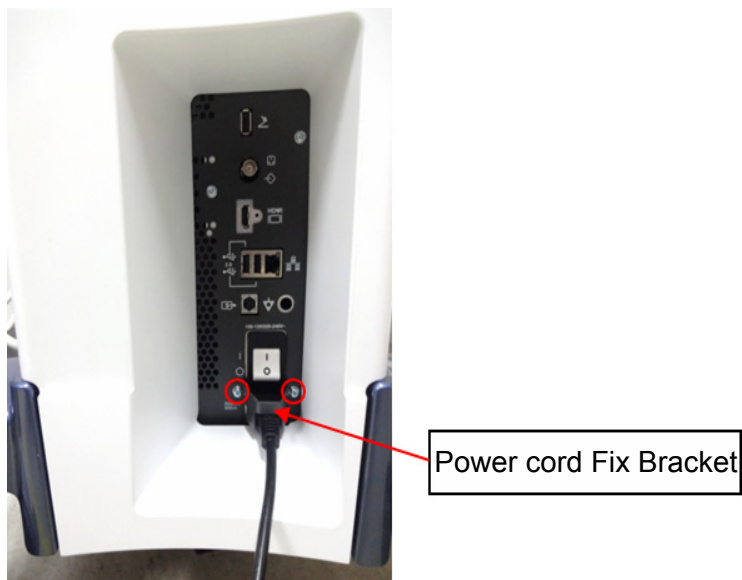


Figure 8-106 Power Cord Fix Bracket.

- 3) Remove 5 screws and Cable Cover Bracket.

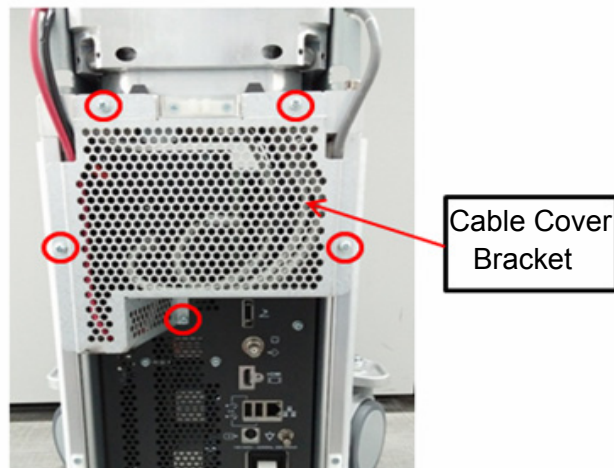


Figure 8-107 Cable Cover Bracket

- 4) Disconnect Cables.



Figure 8-108 Cable Disconnecting points

## 8-17-5 Removal Procedure - Nest Box

**NOTE:** Before working with Nest box, be sure to remove probes.

- 1) Remove front cover. (refer to *section 8-6*)
- 2) Disconnect 1 fan connector of bottom fan.
- 3) Unlock cable clamp, then pull out connector and cable of bottom fan. Refer to following figures.

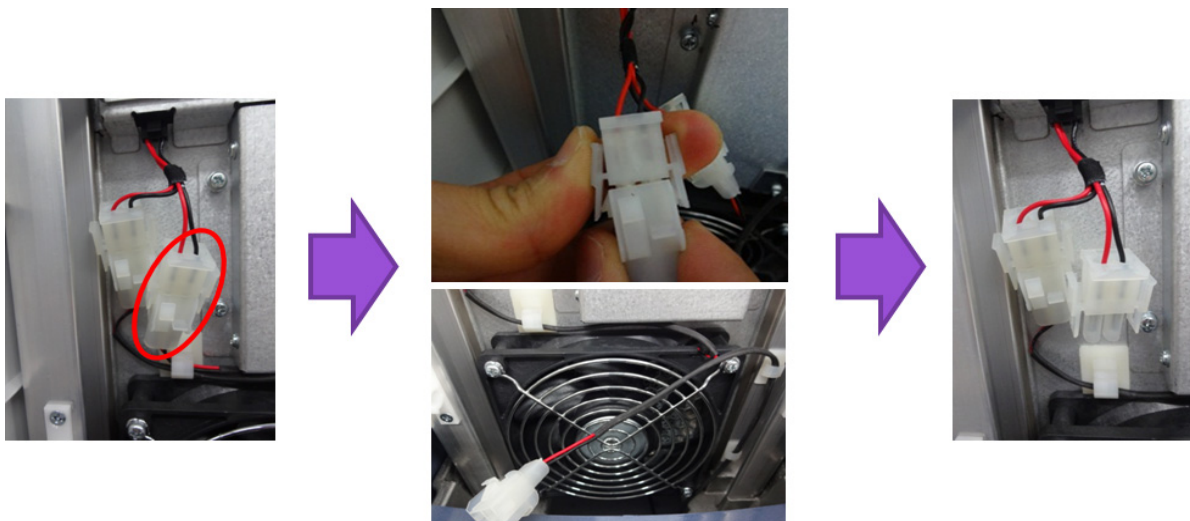


Figure 8-109 Fan Connector

- 4) Remove 2 screws on front side.



Figure 8-110 Front side screw points

- 5) Remove the rear cover. (refer to *section 8-9*)
- 6) Remove Power cord fix bracket and power cord. (refer to *section 8-17*)
- 7) Remove cable cover bracket and disconnect cables. (refer to *section 8-17*)

- 8) Remove 2 screws on rear side.



Figure 8-111 Rear side screw points

- 9) Pull out Nest Box.



Figure 8-112 Nest Box

## 8-17-6 Installation Procedure - Nest Box.

Parts to be installed in reverse order of removal.

## 8-17-7 Removal Procedure - Board Assy in Nest Box

- 1) Get Next Box access.
- 2) Remove 7 screws on EMI bracket.

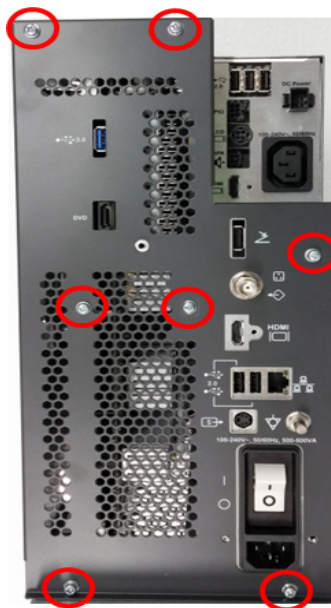


Figure 8-113 Screw points on Nest Box

3) Draw MPI, MCB and IO Box out of the Nest Frame.

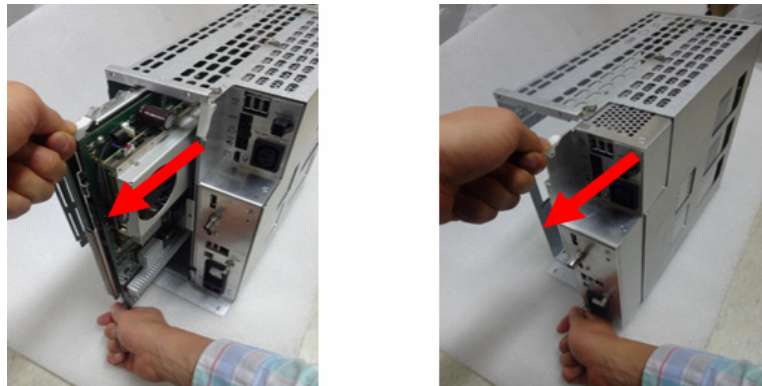
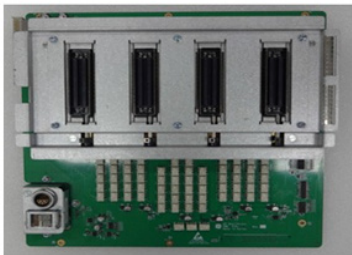


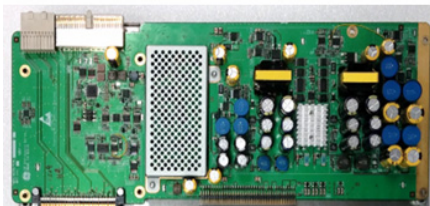
Figure 8-114 Separating Board Assy



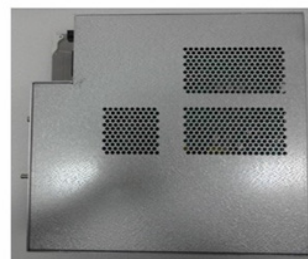
MPI board assy



MCB board assy



MDC board assy



IO BOX assy

Figure 8-115 Board assys in Nest Box



## 8-17-8 Removal Procedure - Separating MPI and MCB

- 1) Unscrew 6 screws. Refer to following figure.

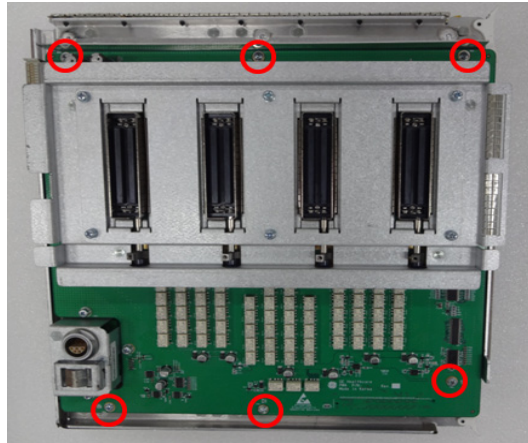


Figure 8-116 Screw points on MPI assy

- 2) Carefully separate MPI assy from MCB assy. Refer to following figure.

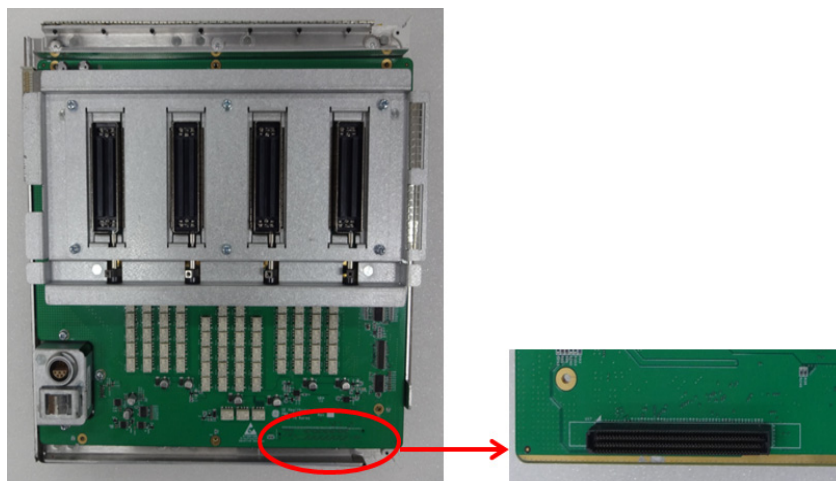


Figure 8-117 Lifting up MPI and position of Stacking up connector on MPI assy

## 8-17-9 Removal Procedure - Separating DCWD Board(Optional) from MPI

Philips screw-driver required to add this part.

- 1) Remove 3 screws on MPI assy.

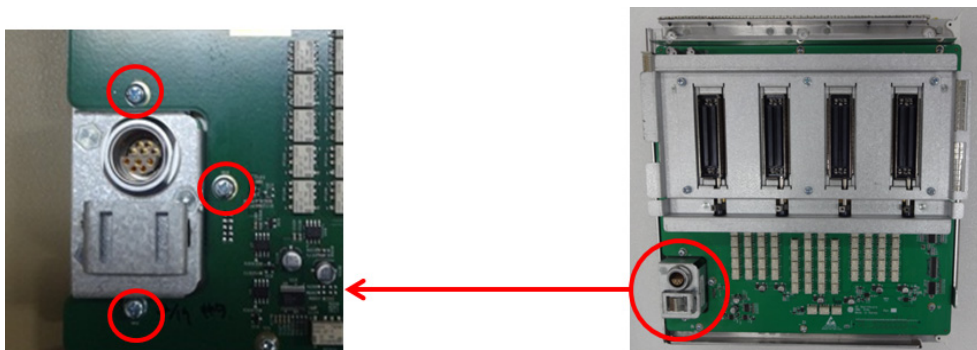


Figure 8-118 DCWD Board screw points

- 2) Carefully separate DCWD board from MPI assy not to damage the DCWD connector. Refer to following figure.

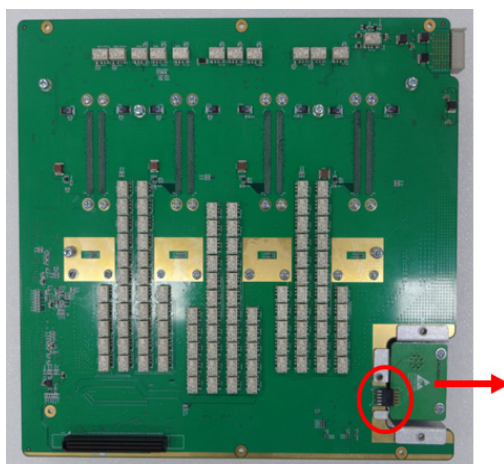


Figure 8-119 Position of DCWD board connector



## 8-17-10 Separating MDC assy from MCB assy

- 1) Remove 7 screws around MDC assy. Refer to following figure.

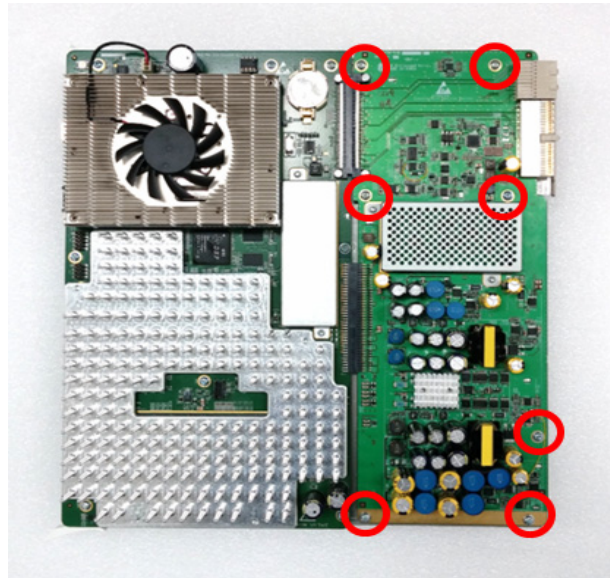


Figure 8-120 Screw points around MDC assy

- 2) Carefully separate MDC assy from MCB assy. Refer to following figure.

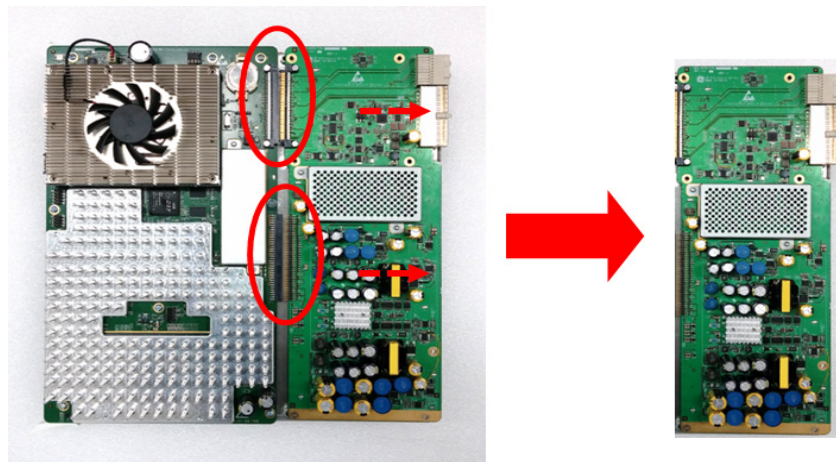


Figure 8-121 Removal of MDC assy

## 8-17-11 Handling EEPROM on MCB Board

EEPROM on MCB board contains vital information.

- A) System Serial Number that is matched against stored software option key.
- B) ComExpress Functional REV that is monitored for sub-system compatibility.

Therefore, when MCB board is replaced, EEPROM must be moved from one board to the other to make sure vital information pertaining to the system is transferred to the new MCB board.

EEPROM must be moved.

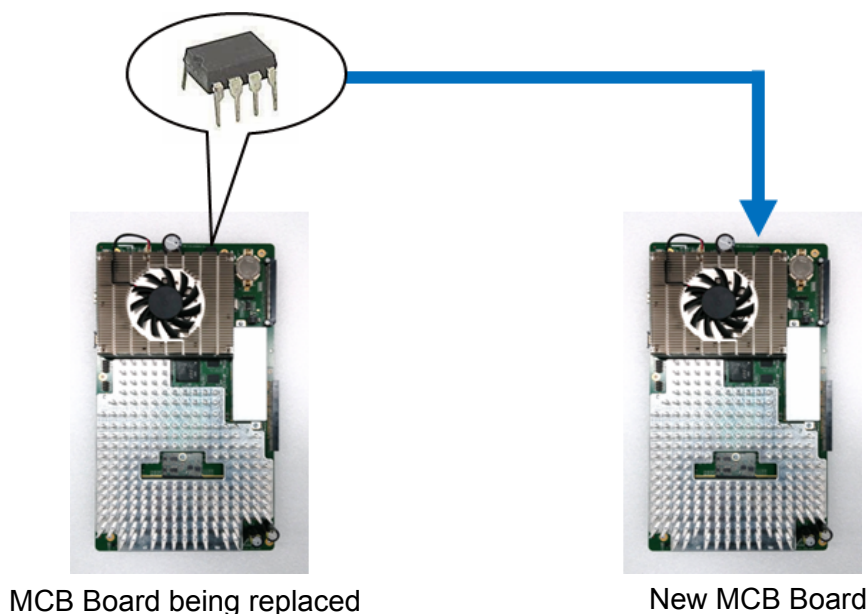


Figure 8-122 EEPROM

- 1) Locate EEPROM on MCB Board.

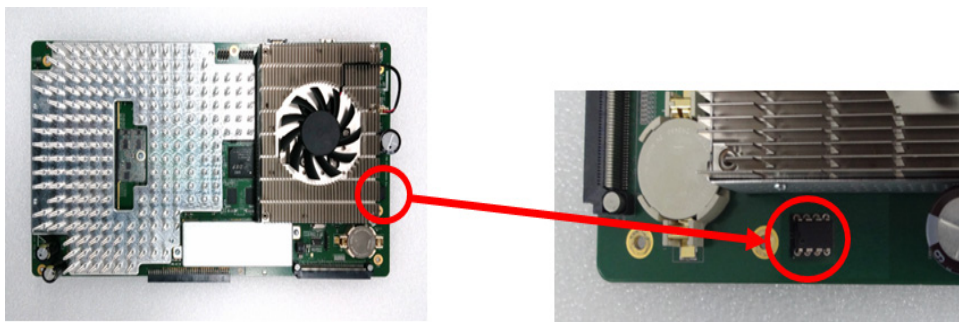


Figure 8-123 Location of EEPROM (example)

- 2) Gently lift up EEPROM from its socket by using a chip-puller or a small straight blade screwdriver.

**NOTE:** Be sure not to bend "legs" of EEPROM. They are fragile.



- 3) Remove EEPROM from replacement MCB board if present.
- 4) Verify direction of the EEPROM Slot by aligning EEPROM “notch” mark to that of MCB board. print mark.

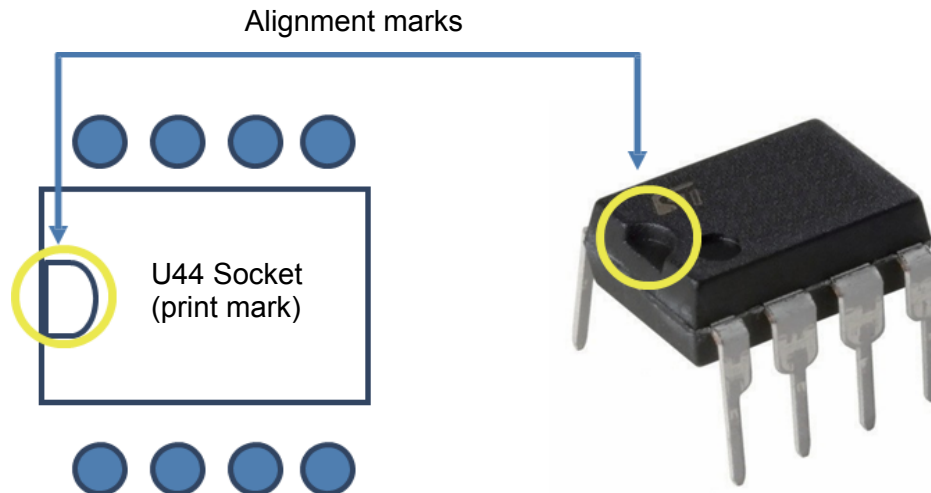


Figure 8-124 Aligning EEPROM

**NOTE:** Inserting EEPROM in wrong direction will result in permanent damage to EEPROM or to MCB board. Proceed with caution.

- 5) Verify tips of all 8 pins are aligned with socket.
- 6) Gently push down EEPROM to its position.

#### 8-17-12 Separating MCB assy from Brackets and COM Express

- 1) Remove 7 screws around MCB assy. Refer to following figure.

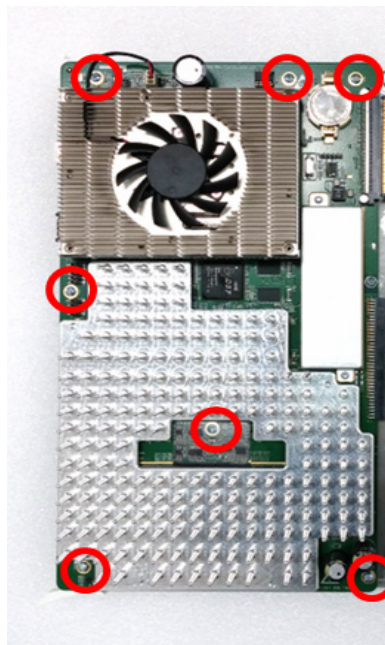
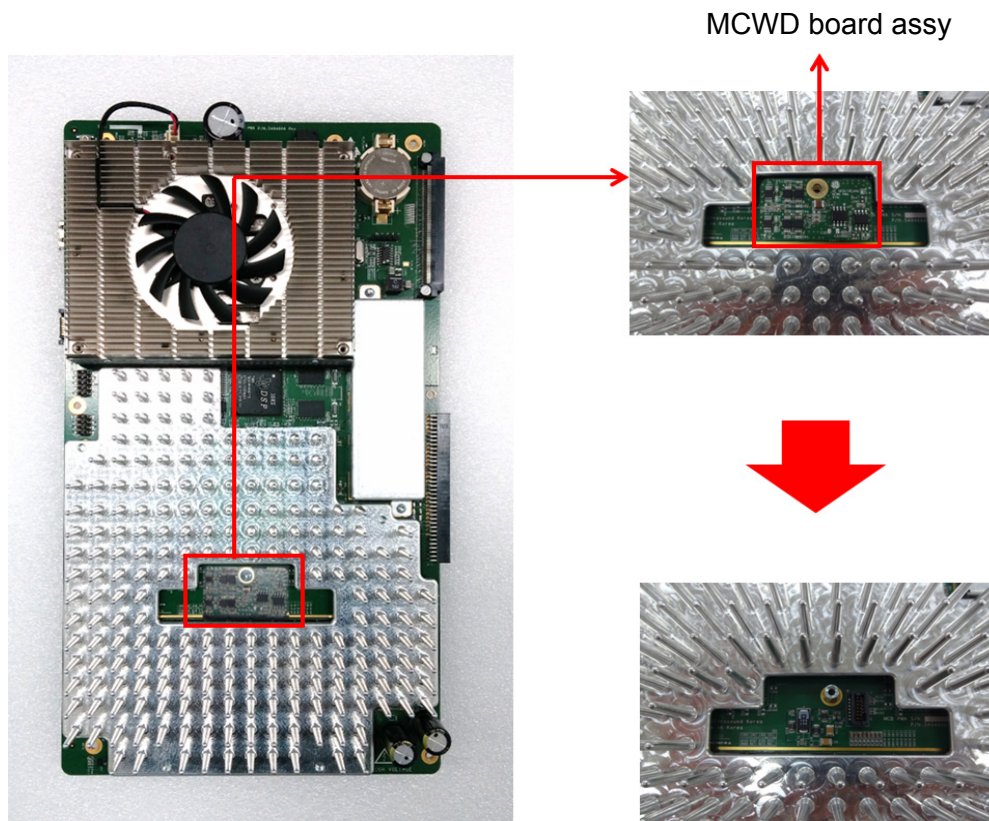


Figure 8-125 Screw points around MCB assy



- 2) Remove MCWD board from MCB assy. Refer to following figure.

**NOTE:** Be careful not to damage CWD connector.



**Figure 8-126 Removal of MCWD board.**

- 3) Remove Stud on MCB assy and carefully lift up the MCB assy. Refer to following figure.



**Figure 8-127 Stud position on MCB board.**

## 8-17-13 Separating DC4D Unit from IO BOX

- 1) Unscrew 12 screws to remove the IO BOX Cover.

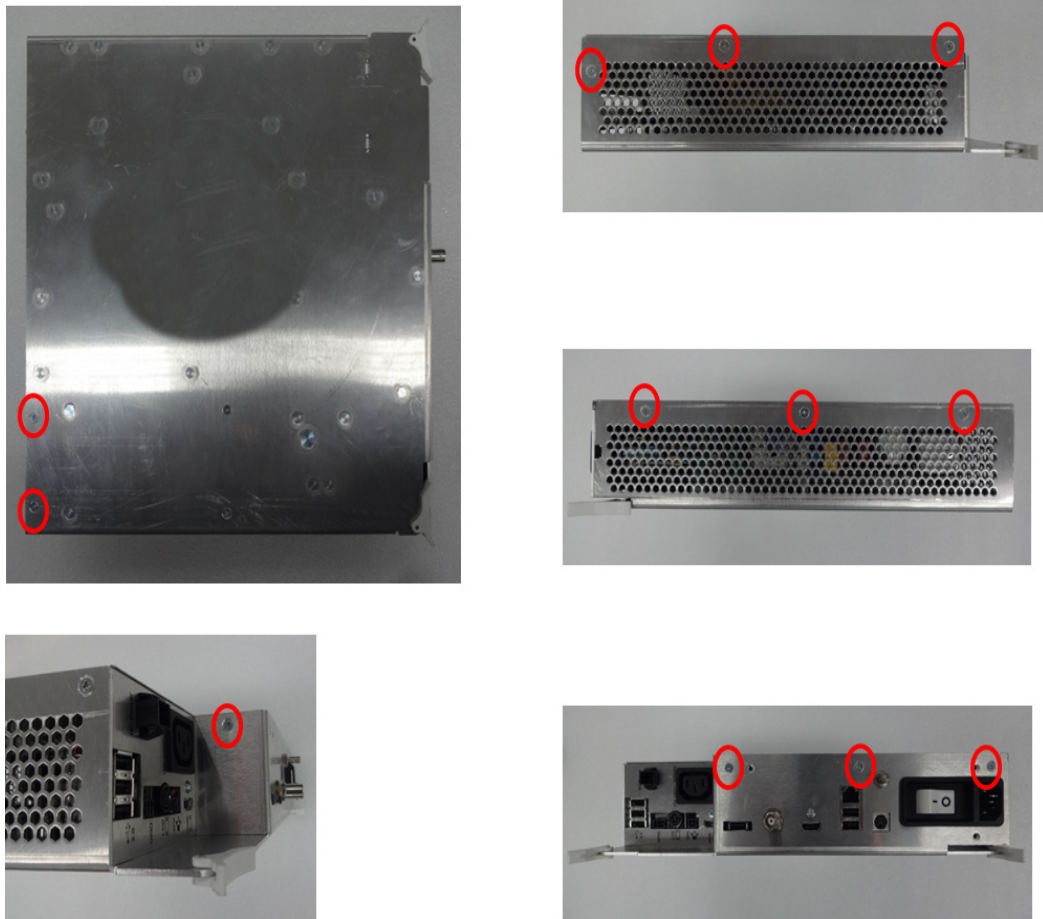


Figure 8-128 Screw points of IO BOX cover

- 2) Unscrew five screws to remove the DC4D from the MIO Assy. Refer to following figure.

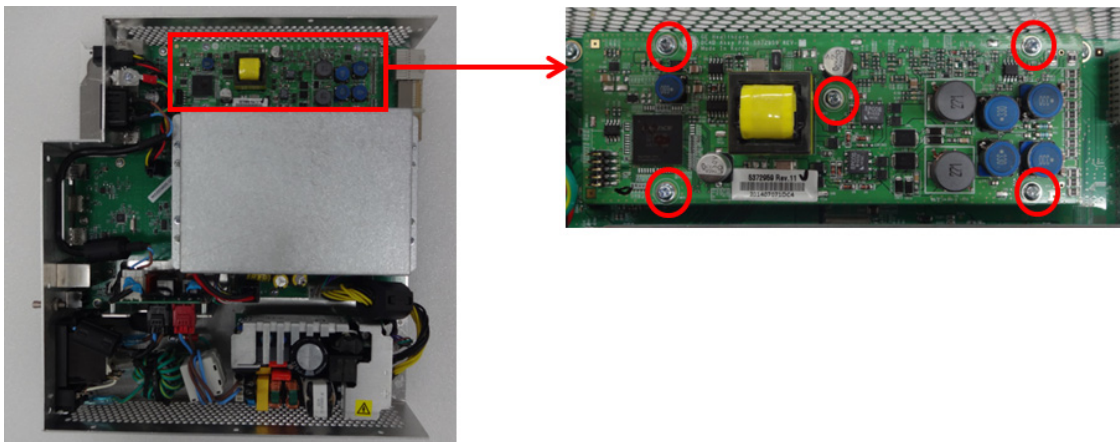


Figure 8-129 Screw points of DC4D Assy

- 3) Carefully lift up the DC4D unit.

## 8-17-14 Separating Battery Unit from IO BOX

- 1) Unscrew 12 screws to remove the MIO Cover. (refer to *section 8-17-13*)
- 2) Unscrew 8 screws and 2 Battery connectors. Refer to following figure.

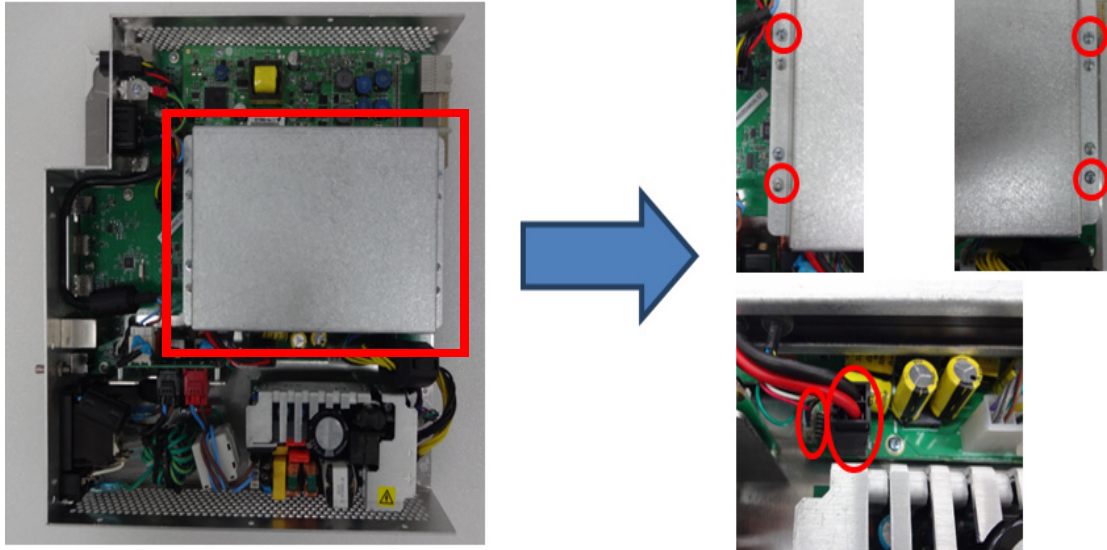


Figure 8-130 Screw points and Connectors on battery assy

- 3) Carefully lift up the battery unit

## 8-17-15 Separating HDD

- 1) Open the front cover. (refer to section 8-6)
- 2) Remove 4 screws around HDD Bracket Refer to following figure.



Figure 8-131 Screw points around HDD Bracket.

- 3) Carefully pull down HDD assy. Refer to following figure.

**NOTE:** Be careful not to damage HDD connector

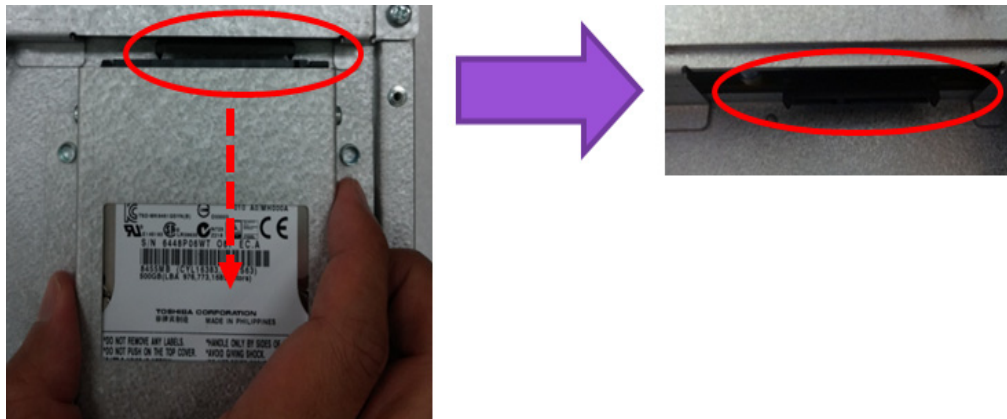


Figure 8-132 Removal of HDD assy and position of HDD connector



## 8-17-16 Separating COM Express

- 1) Unscrew 5 screws on bottom side of MCB board assy. Refer to following figure.

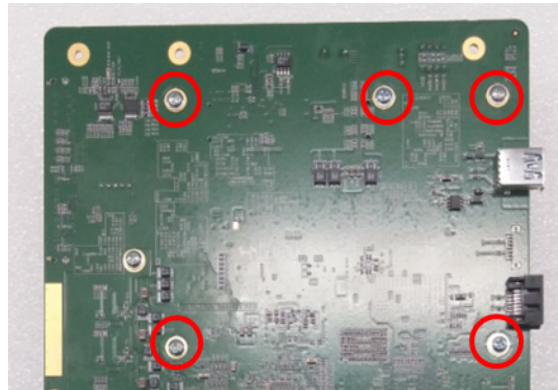


Figure 8-133 Screw points for removal of COM Express.

- 2) Disconnect fan cable and carefully detach COM Express module. Refer to following figure.

**NOTE:** Be careful not to damage COM Express connector

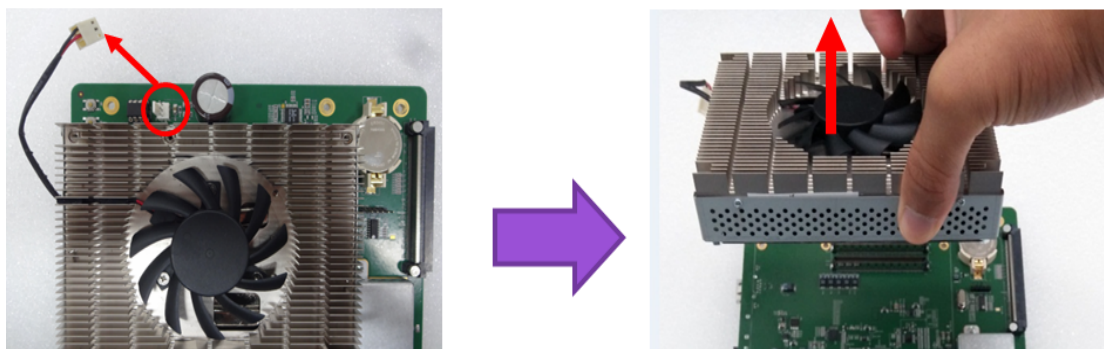


Figure 8-134 Detaching COM Express.

- 3) Unscrew 4 screws in the side of COM Express to remove SOM bracket and carefully lift up the COM express from the bracket. Refer to following figure

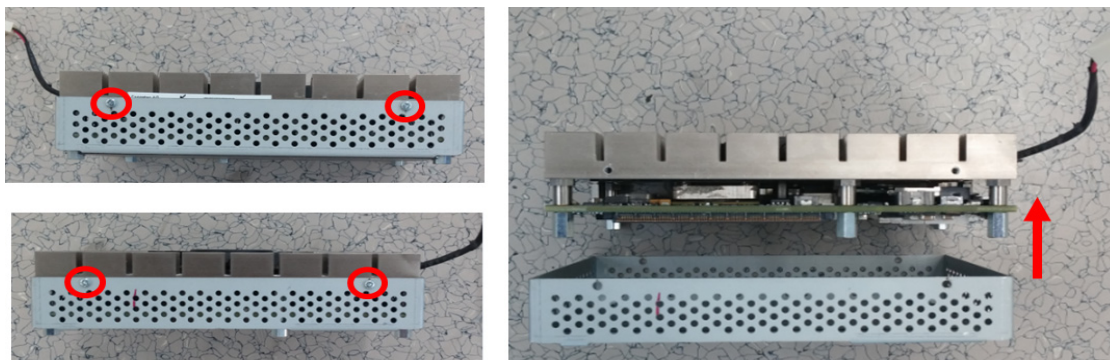


Figure 8-135 Removal COM Express Bracket.



## 8-17-17 Installation Procedure - MPI, MCB, MDC, DC4D, HDD, Battery and COM Express

- 1) Parts to be installed in reverse order of removal.

## 8-17-18 Functional Check - MPI, MCB, MDC, IO Box

Refer to *section 4-4* for Functional Diag Test List

## 8-17-19 Removal Procedure - MBP assy

- 1) Remove Nest Box from system.
- 2) Remove MPI, MCB and IO Box out of Nest Frame
- 3) Remove 4 screws (Circle) and fan connector (Square).



Figure 8-136 Screw points and connector point to remove MBP

- 4) Remove 6 screws.

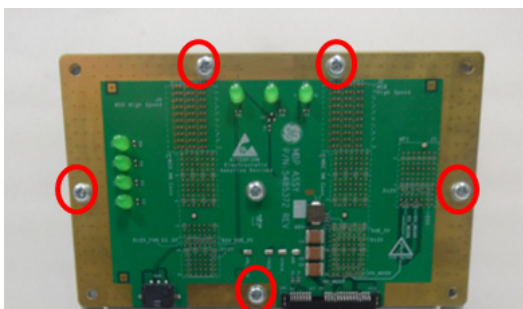


Figure 8-137 Screw points to remove MBP

## 8-17-20 Installation Procedure - MBP assy

Parts to be installed in reverse order of removal.

## 8-17-21 Functional Check

Refer to *section 4-4* for Functional Diag Test List.

## Section 8-18

### Replacement of Front fan

#### 8-18-1 Manpower

1 Person, 10 minutes.

#### 8-18-2 Tools

Standard Phillips Screwdriver.

#### 8-18-3 Removal Procedure

- 1) Remove the Front Cover from system. (refer to *section 8-6*)
- 2) Remove 4 screws and disconnect fan connector.
- 3) Unlock cable clamp (square), then pull out connector and cable. Refer to following figures.

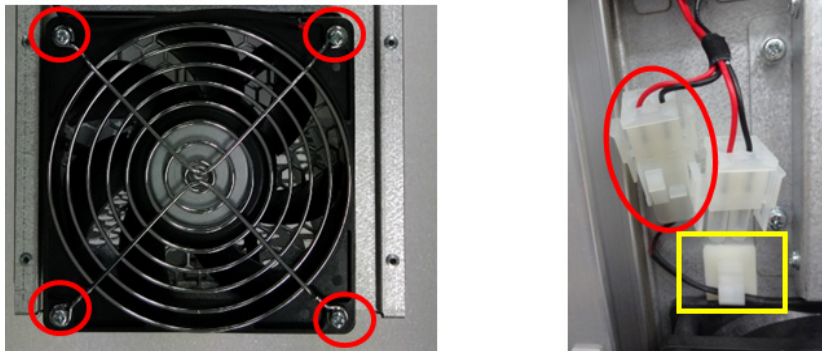


Figure 8-138 Fan screw points and disconnecting fan connector

#### 8-18-4 Installation Procedure

Parts to be installed in reverse order of removal.

#### 8-18-5 Functional Check

Visual examination.

- 1) Verify that Fan is rotating when system is turned ON.

## Section 8-19 Replacement of Bottom fan

### 8-19-1 Manpower

1 Person, 10 minutes.

### 8-19-2 Tools

Hex Wrench.

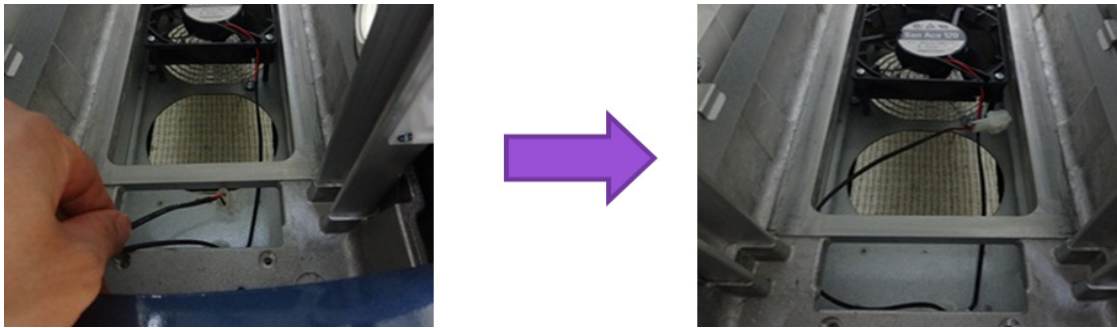
### 8-19-3 Removal Procedure

- 1) Remove the Front Cover from system. (refer to *section 8-6*)
- 2) Remove the nest Box from system. (refer to *section 8-17-5*)
- 3) Remove 4 Hex screws, front bottom and rear side.



Figure 8-139 Fan screw points of bottom fan assy

- 4) Place bottom fan cable not to be entangled on system frame as following figure



**Figure 8-140 Placing bottom fan connector**

- 5) Pull out bottom fan assy as following figure



**Figure 8-141 Removal of bottom fan Assy**

- 6) Remove 4 screws on the fan.

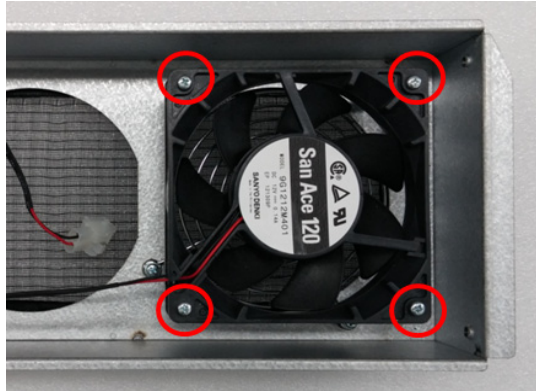


Figure 8-142 Screw points of bottom fan.

#### 8-19-4 Installation Procedure

Parts to be installed in reverse order of removal.

#### 8-19-5 Functional Check

- 1) After turn on the system, confirm the fan rotating by feeling wind at the bottom fan dust filter.

## Section 8-20 Replacement of Rear Handle

### 8-20-1 Manpower

1 Person, 10 minutes.

### 8-20-2 Tools

Standard Phillips Screwdriver and 6mm Hex Wrench.

### 8-20-3 Removal Procedure

- 1) Remove 1 screw and remove the Link Arm Top Cover as following figure.

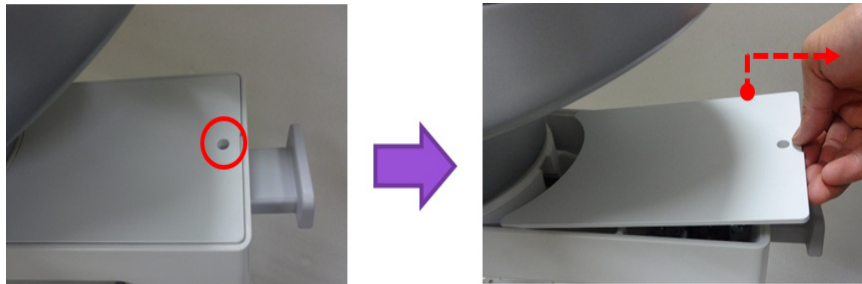


Figure 8-143 Removal of Link Arm Top Cover.

- 2) Remove 2 Hex screws. Refer to following figure.



**CAUTION** Rear Handle will not stay in position without screws. Make sure not to drop the part when removing/installing Rear Handle

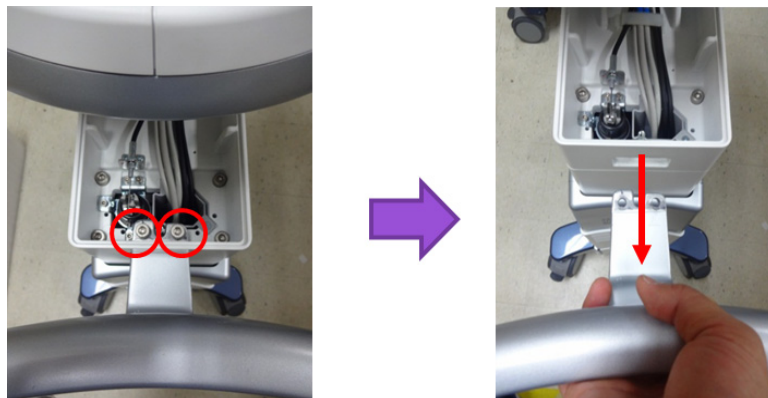


Figure 8-144 Hex screw points of Rear Handle

### 8-20-4 Installation Procedure

Parts to be installed in reverse order of removal.

*NOTE:* Hex screws should be tightened.

### 8-20-5 Functional Check

Visual Check only.



## Section 8-21 Replacement of Link Arm Cable Hook

### 8-21-1 Manpower

1 Person, 10 minutes.

### 8-21-2 Tools

Standard Phillips Screwdriver.

### 8-21-3 Removal Procedure

- 1) Remove 1 screw and remove the Link Arm Top Cover as following figure.

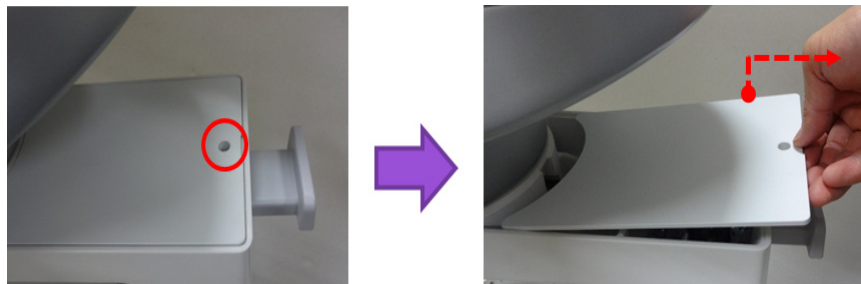


Figure 8-145 Removal of Link Arm Top Cover.

- 2) Remove 2 screws. Refer to following figure.



Figure 8-146 screw points of Link Arm Cable Hook

### 8-21-4 Installation Procedure

Parts to be installed in reverse order of removal.

### 8-21-5 Functional Check

Visual Check only.

## Section 8-22 Replacement of Caster

### 8-22-1 Manpower

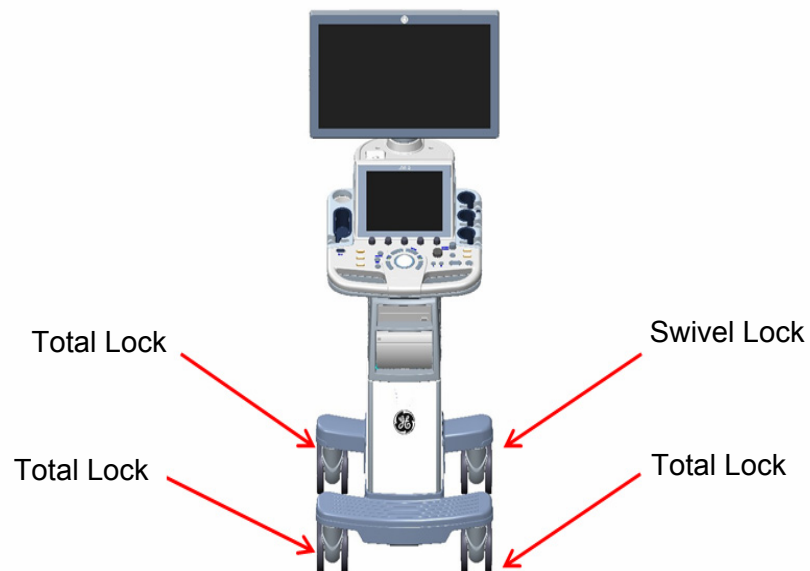
2 persons, 15 minutes.

### 8-22-2 Tools

24mm Socket or adjustable Wrench, Standard Phillips Screwdriver

*NOTE:* "Short" type driver preferable for Foot Rest Cover removal/installation.

### 8-22-3 Removal Procedure



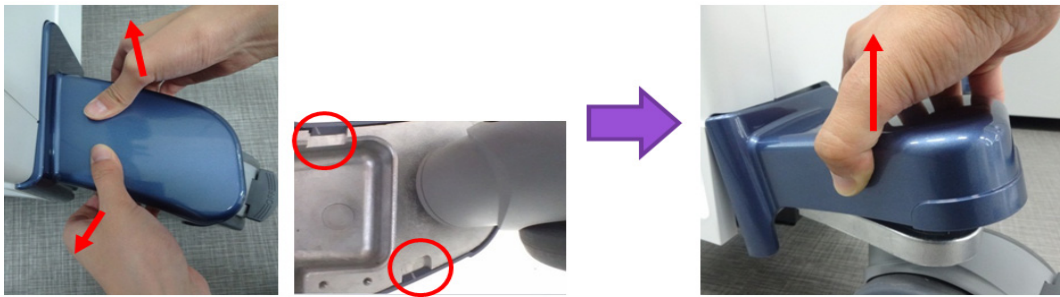
**Figure 8-147 Caster**

*NOTE:* Press the caster wheel locks and ensure that they prevent the system from moving.

- 1) Remove Front Cover (refer to section 8-6)
- 2) Remove Top Cover (refer to section 8-7)
- 3) Remove Side Cover (refer to section 8-8)

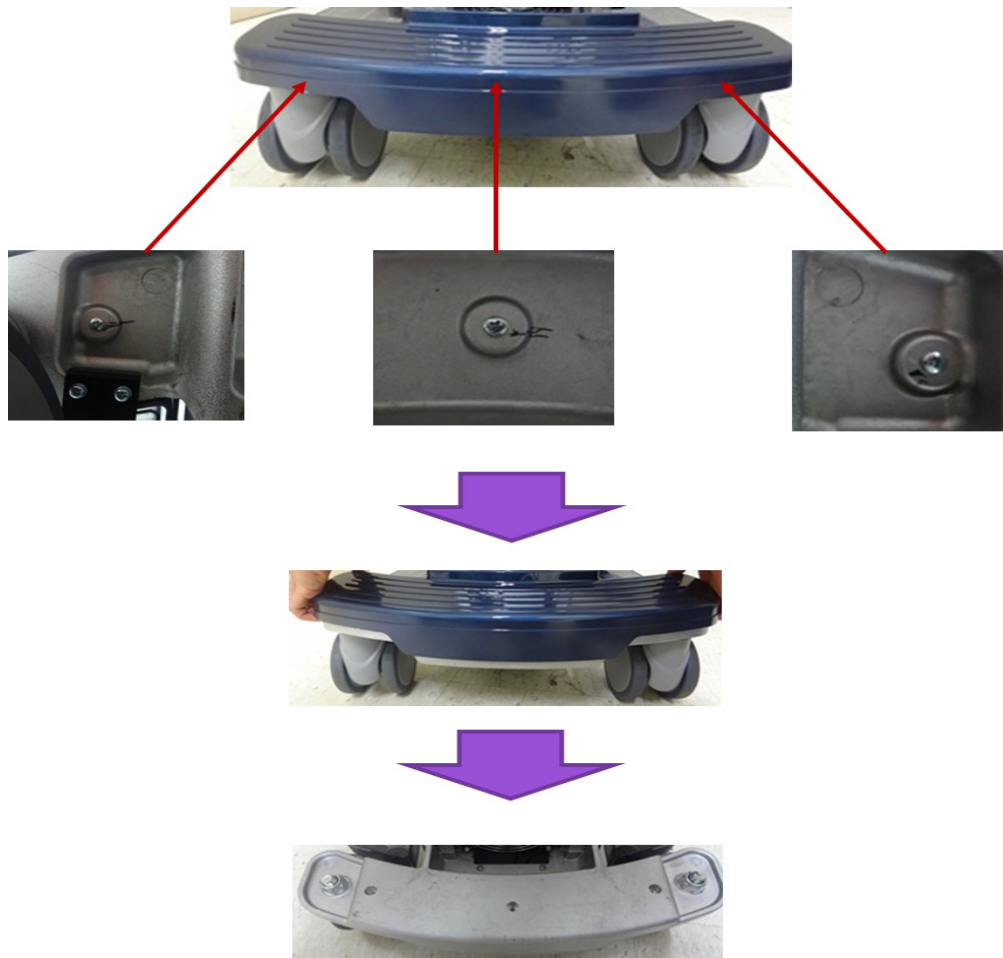


**NOTE:** This does not require any tools. Be careful not to damage Hand during pulling hook of the cap



**Figure 8-148 Caster Cap and hook points**

- 4) Remove Caster Cap by slightly pulling hook of the cap to outside and then move upward. Procedures are common for both the Left and Right Caster Cap.
- 5) Remove 3 screws.




**Figure 8-149 Foot Rest Cover**

- 6) Remove Nut and replace Caster.



Figure 8-150 Removable Nut of Caster

 **CAUTION** Proceed with extreme caution and avoid system tipping over. The system weighs approximately 60kg.

#### 8-22-4 Installation Procedure

Parts to be installed in reverse order of removal.

*NOTE:* Hex screws should be tightened.

#### 8-22-5 Functional Check

Visual inspection Only.

## Section 8-23 Replacement of the COM Express

### 8-23-1 Manpower

1 Person, 5 minutes.

### 8-23-2 Tools

Standard Phillips Screwdriver.

### 8-23-3 Removal Procedure

- 1) Separate MCB Assy and MDC Assy. (Refer to *section 8-17-10*)
- 2) Remove 8 screws around MCB assy and carefully separate MCB assy from MPI assy. Refer to following figure.

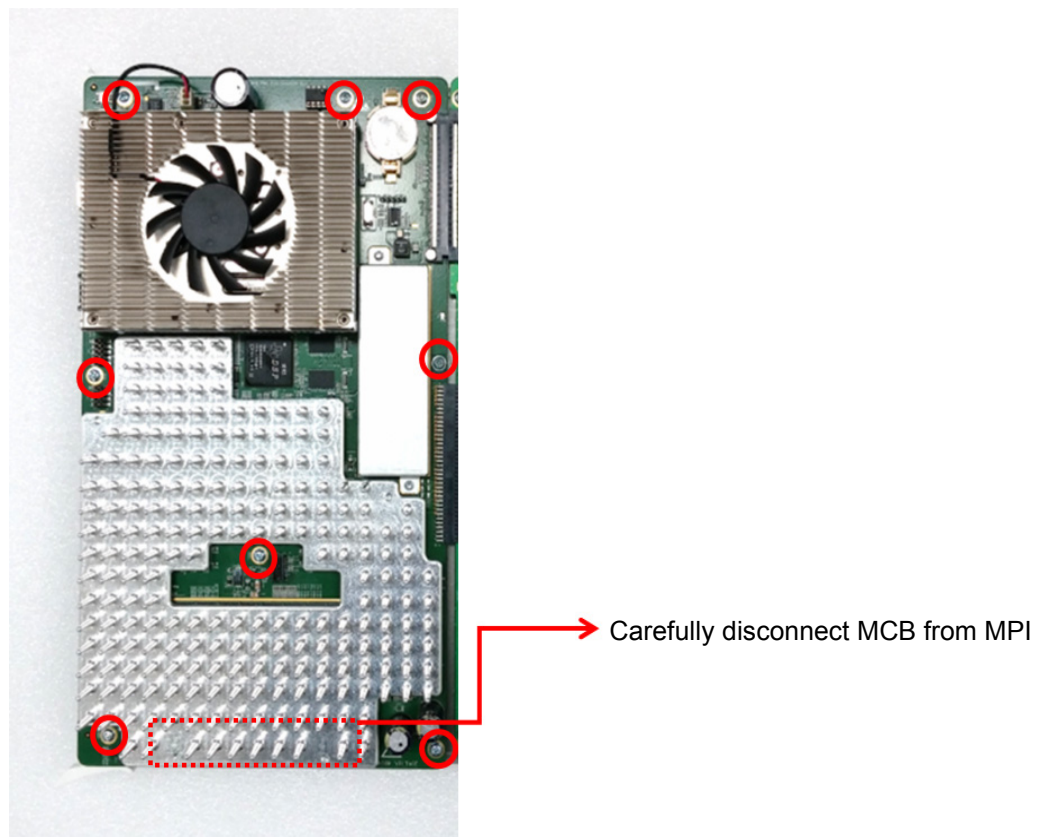
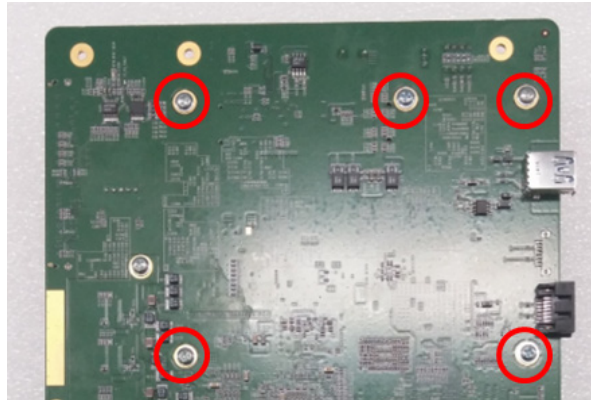


Figure 8-151 Separating MPI and MCB

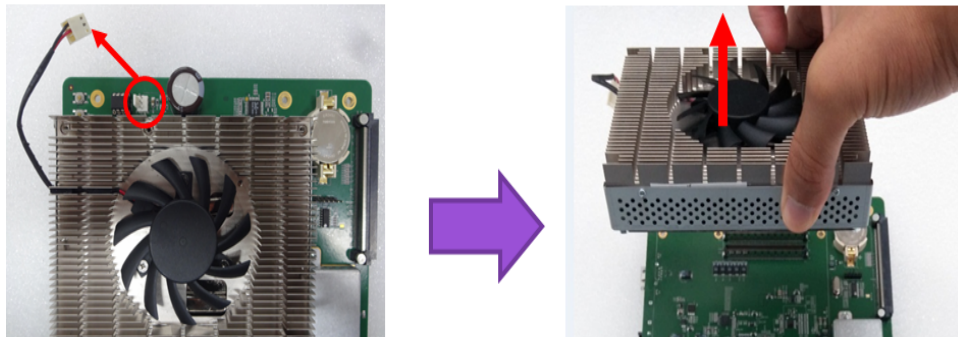
- 3) Unscrew 5 screws on bottom side of MCB board assy. Refer to following figure.



**Figure 8-152 Screw points for removal of COM Express.**

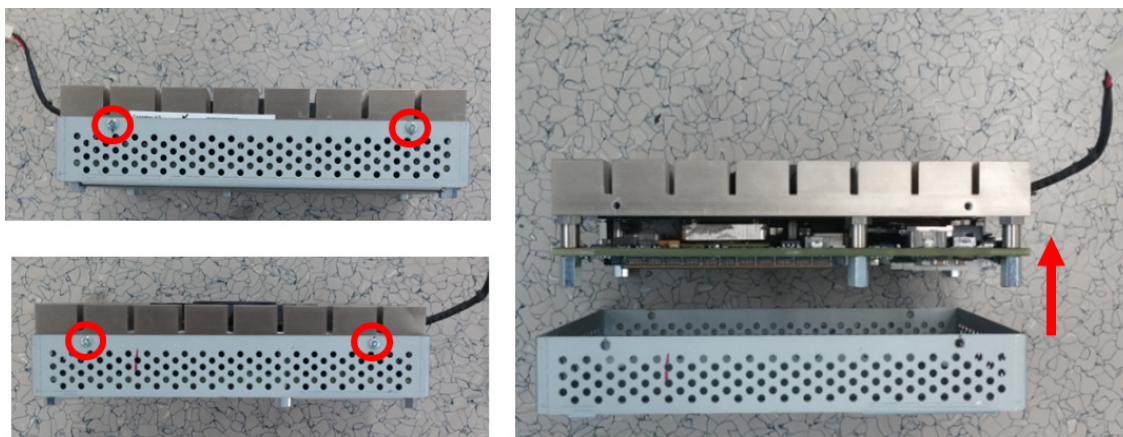
- 4) Disconnect fan cable and carefully detach COM Express module. Refer to following figure.

**NOTE:** Be careful not to damage COM Express connector



**Figure 8-153 Detaching COM Express.**

- 5) Unscrew 4 screws in the side of COM Express to remove SOM bracket and carefully lift up the COM express from the bracket. Refer to following figure



**Figure 8-154 Removal COM Express Bracket.**



## 8-23-4 Installation Procedure

Install components in reverse order of removal.



**CAUTION**

When replacing with new SOM, Push the SOM in both side of MCB Assy like as below Figure 8-130.

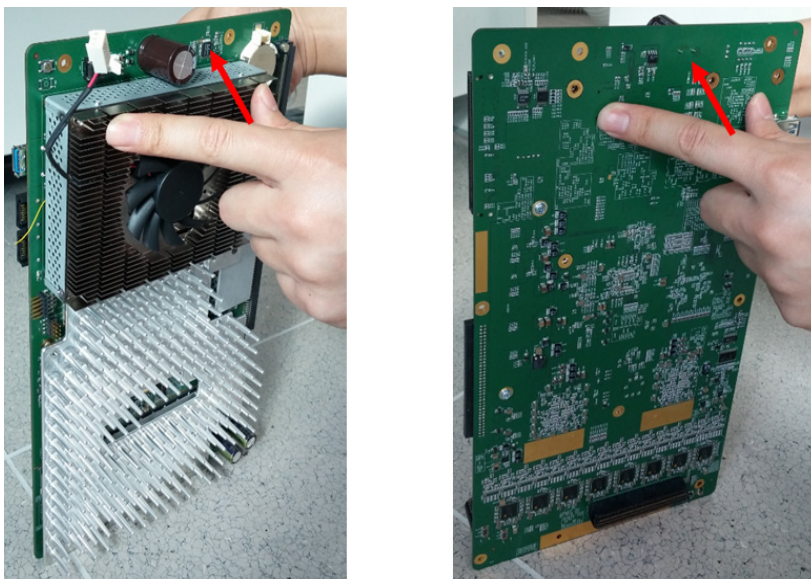


Figure 8-155 Push the SOM in both side of GFS Assy

## 8-23-5 Note on COM Express Replacement

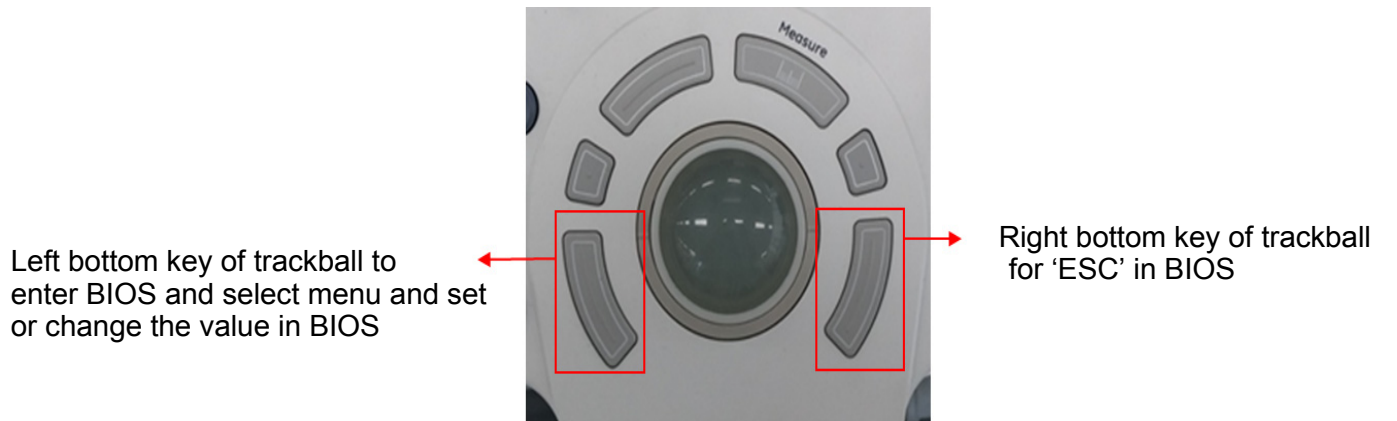
COM Express retains its memory (date/time/BIOS setting) by receiving 3V from coin battery on MCB Board. Therefore, when COM Express and MCB boards are separated, COM Express is likely to loose its date/time setting. In such case, follow the procedure outlined below to update BIOS information.

### 8-23-5-1 Configuring BIOS

- 1) Power ON the scanner and press "DEL"(If AN key is installed) or press left bottom key of trackball (If there's no AN Key) to enter BIOS.



**NOTICE** If there's no AN key, please use trackball to move menu in BIOS mode and click left bottom key of trackball to select menu in BIOS and double-click to set or change the value in BIOS. Right bottom key of trackball is 'ESC' in BIOS.



- 2) Type “maru” for password.
- 3) After successfully entering BIOS, verify the following parameters

Table 8-24    Configuring BIOS.

TAB	top menu
Main	System Time
	System Date

- 4) Change date/time parameters as needed, and save the changes.
- 5) Reboot the console.

8-23-6    Note on EEPROM Replacement

*NOTE:    EEPROM on MCB contains VPD (Vital Product Data) for SOM (ComExpress). This VPD contains information such as system serial number to be matched to Software License Key, or Board revision number that is cross referenced to system software for compatibility. Service personnel may require to initialize EEPROM or to modify EEPROM contents for proper operation of the system.*

EEPROM on MCB Board Memory

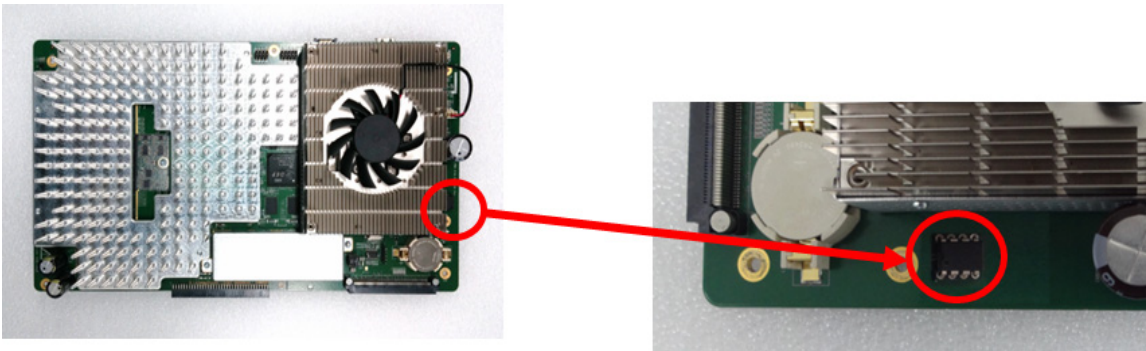


Figure 8-156    EEPROM on MCB Board

**NOTE:** There are various types of VPD EEPROM integrated in the system.

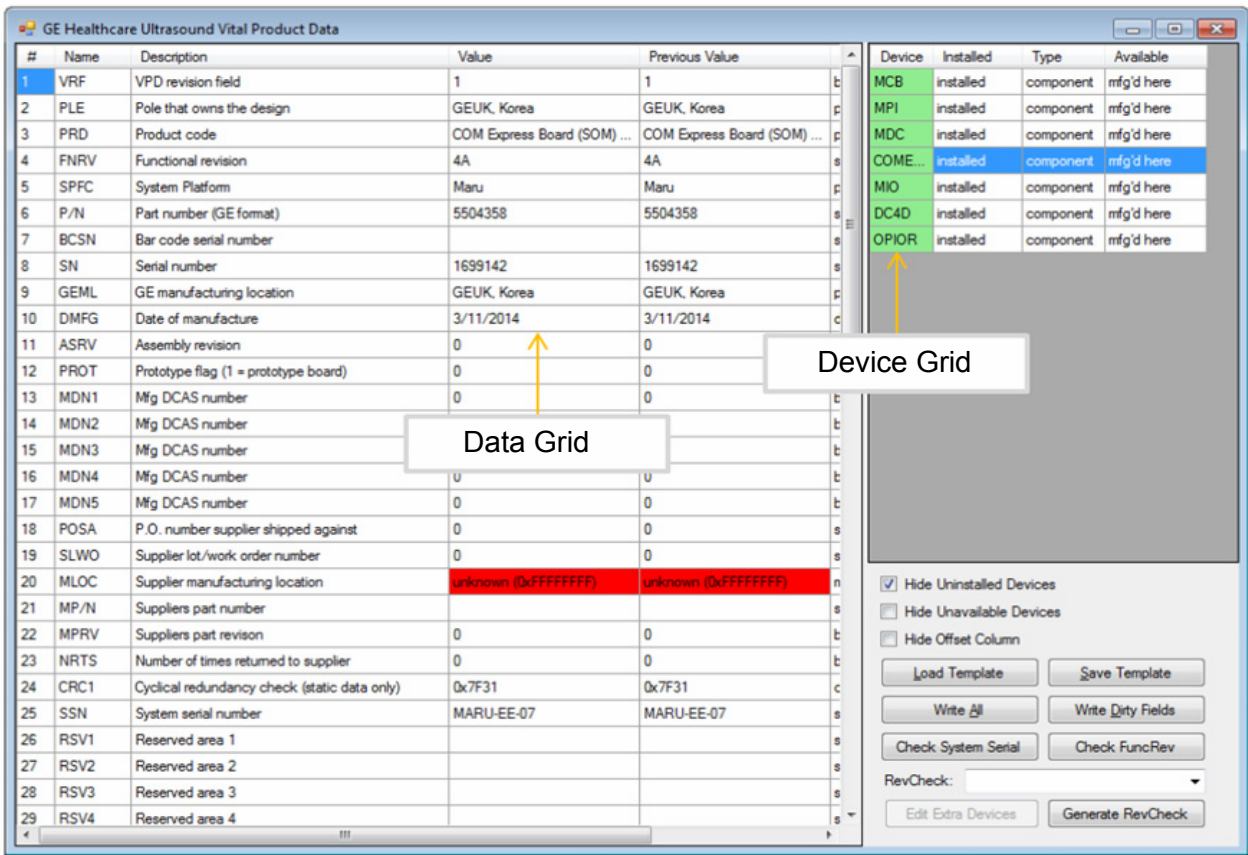
Board Name	Main VPD Contents	Replaceable	Physical VPD location
MCB	FuncRev	No	Integrated with MCB
MPI	FuncRev	No	Integrated with MPI
MDC	FuncRev	No	Integrated with MDC
COMEXP	FuncRev, , SSN (System Serial Number	Yes	On MCB board as replaceable EEPROM.
MIO	FuncRev	No	Integrated with MIO
DC4D	FuncRev	No	Integrated with DC4D
OPIOR	FuncRev	No	Integrated with OPIO

#### 8-23-6-1 Accessing EEPROM

- 1) Exit to Desktop (Refer to *section 5-10* for details)
- 2) Start VPD Editor by clicking icon on the desktop. ("Vpdedit")

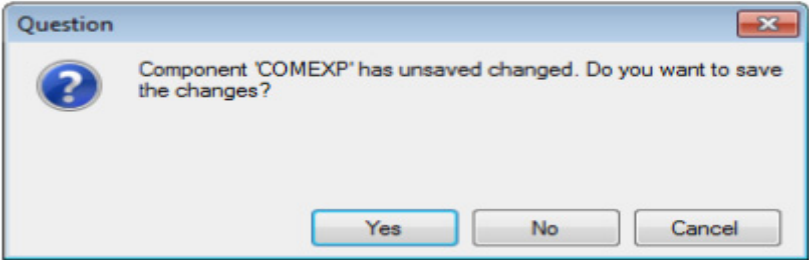


- 3) Select COMEXP from device grid.



Device Grid	The list of devices in the system that support VPD. Click on a row in this grid to select a device and view the VPD fields. For Maru, MCB, MPI, MDC, COMEXP, MIO, DC4D, and OPIOR supports VPD.
VPD Field Grid	A list of data items that make up the selected VPD.

- 4) Note: If the following windows pop up without changing any parameters (i.e. simply browsing through the VPD contents), then press “NO” before continuing.

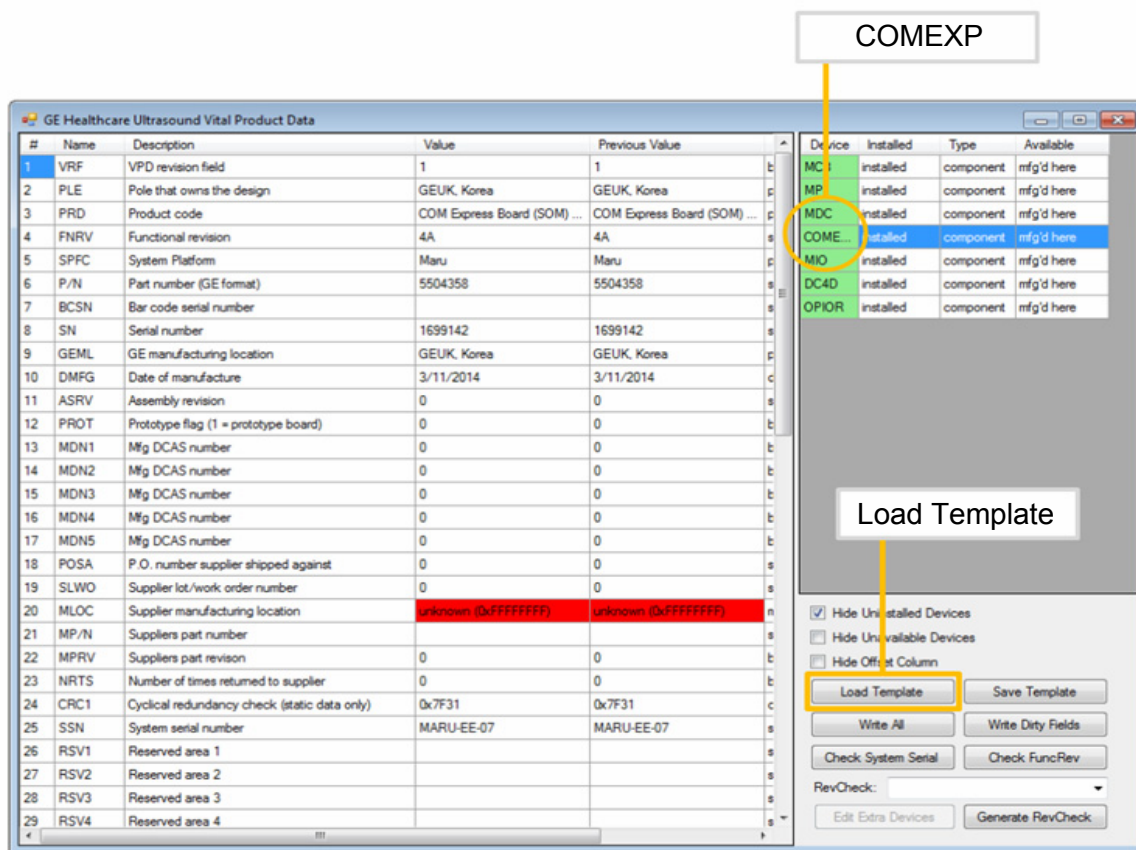


### 8-23-6-2 Initializing EEPROM

When a new EEPROM is attached to a system, it will require initialization.

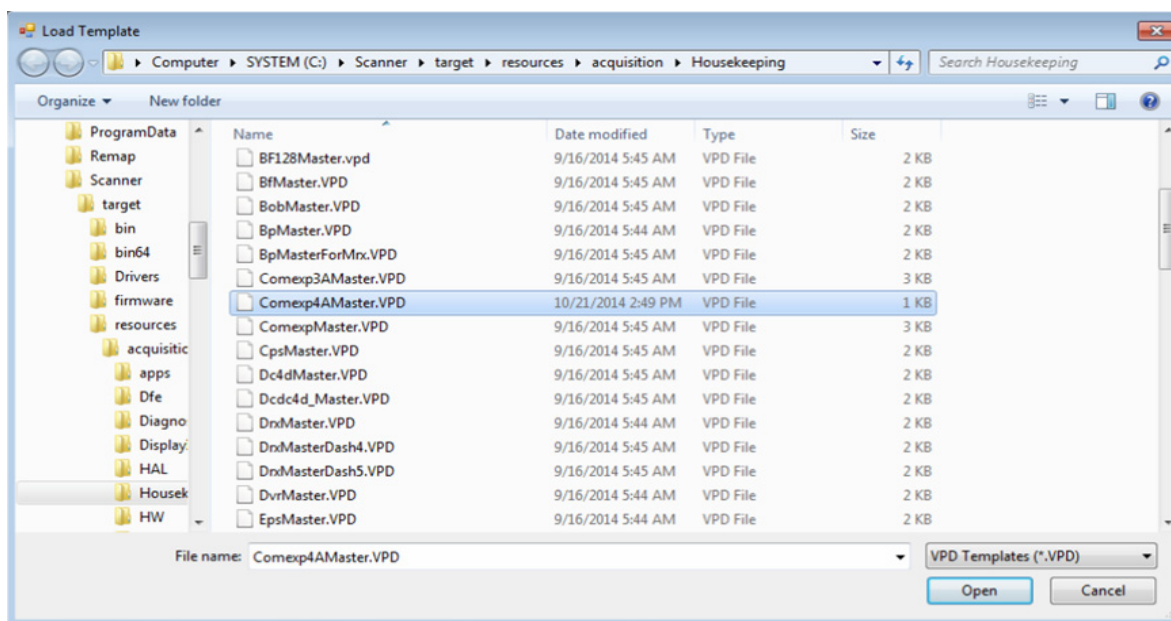


- 1) Select "COMEXP" from device grid. (right pane).



- 2) Select "Load Template" from right pane.
- 3) Select "Comexp4amaster.vpd".

The file can be found under c:\Scanner\target\resources\Acquisition\Housekeeping



- 4) Click "Open" to load the selected template.

**NOTE:** This procedure can be applied to other components with VPD, for example, for initializing MPI VPD. However, it is unlikely needed for such event arises, as these components are hardware-integrated into boards.

VPD templates to use EEPROM initialization of each board are stored in *c:\Scanner\target\resources\acquisition\Housekeeping* and please refer to the following table to template file names.

Board Name	VPD Template File Name
MCB	MCB.VPD(R1 to R2.5), MCB-R3_2C.VPD(R3)
MPI	MPI.VPD
MDC	MDC.VPD
COMEXP	Comexp4AMater.VPD(R1 to R2.5), MARU_COMEXP.VPD(R3)
MIO	MIOMaster.VPD(R1 to R2.5), MIO-B.VPD
DC4D	Dc4dMaster.VPD
OPIOR	OpPanelMaruMaster.VPD

### 8-23-6-3 Modifying contents of EEPROM (ComExpress VPD)

System checks that the SSN (System serial number) is valid for the installed software option. If you need to update SSN to replace software option string for other SSN, please follow the below instruction.

- 1) Select COMEXP from device grid.
- 2) Double-click value for "System Serial Number (SSN)" .
- 3) Type in the console serial number (SSN)
- 4) Click "write dirty files" button on the right pane.

### 8-23-7 Functional Check

Test	Refer to	Note
Board Diagnostics	section 4-4	

## Section 8-24 Replacement of the HDD/SSD

### 8-24-1 Manpower

1 Person, 5 minutes.

### 8-24-2 Tools

Standard Phillips Screwdriver.

### 8-24-3 Removal Procedure

- 1) Open the front cover. (refer to *section 8-6*)
- 2) Remove 4 screws around HDD/SSD Bracket Refer to following figure.



Figure 8-157 Screw points around HDD/SSD Bracket.

- 3) Carefully pull down HDD/SSD assy. Refer to following figure.

**NOTE:** Be careful not to damage HDD/SSD connector

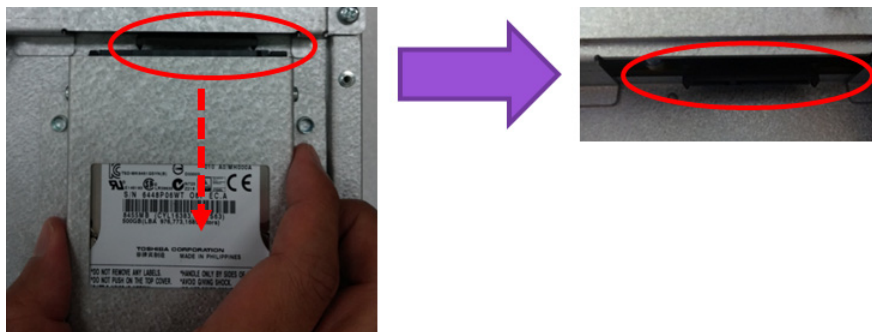


Figure 8-158 Removal of HDD/SSD assy and position of HDD/SSD connector

4) Unscrew 4 screws to remove HDD/SSD bracket. Refer to following figure.

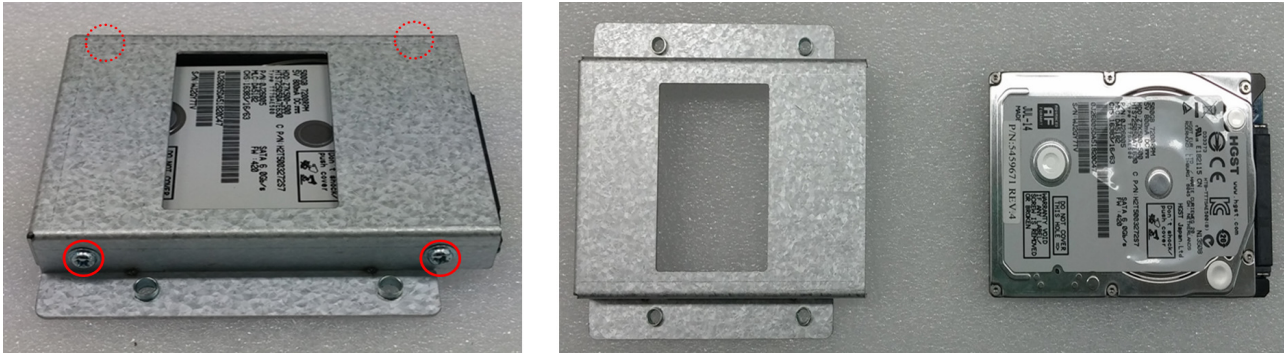


Figure 8-159 Removal of HDD/SSD bracket

8-24-4      Installation Procedure

Install components in reverse order of removal.

8-24-5      Functional Check

Test	Refer to	Note
Board Diagnostics	section 4-4	

## Section 8-25 Replacement of Battery

### 8-25-1 Manpower

1 person, 1 hour

**NOTE:** LP9/P7 BUM 5504583 provides the information, "Refreshing the battery" in Chapter 3 Preparing to System for Use. The recommended procedure can be executed by user for maintaing battery life.

### 8-25-2 Tools

Standard Phillips Screwdriver.

### 8-25-3 Removal Procedure

- 1) Unscrew 12 screws to remove the IO BOX Cover.

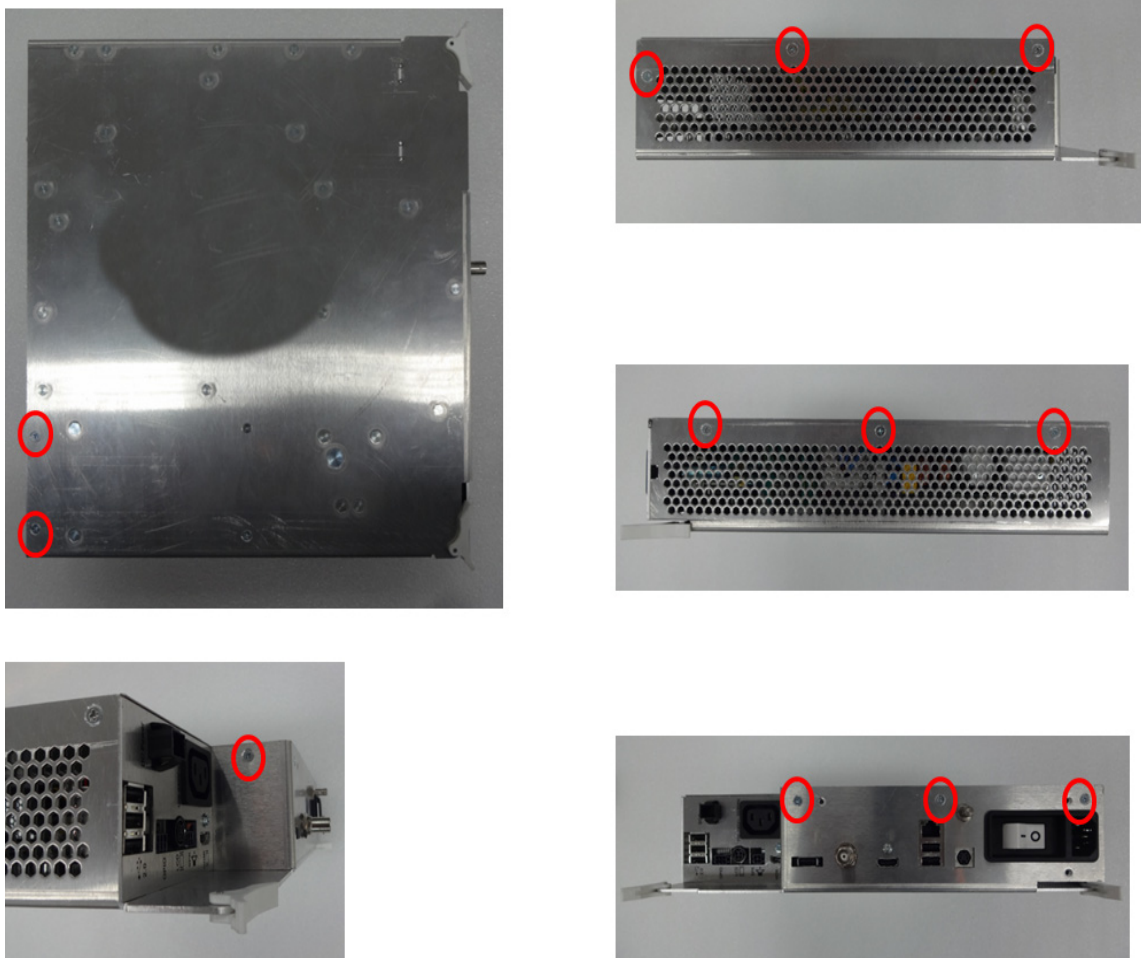


Figure 8-160 Screw points of IO BOX cover



- 2) Unscrew 4 screws and disconnect 2 connectors from Battery. Refer to following figure.

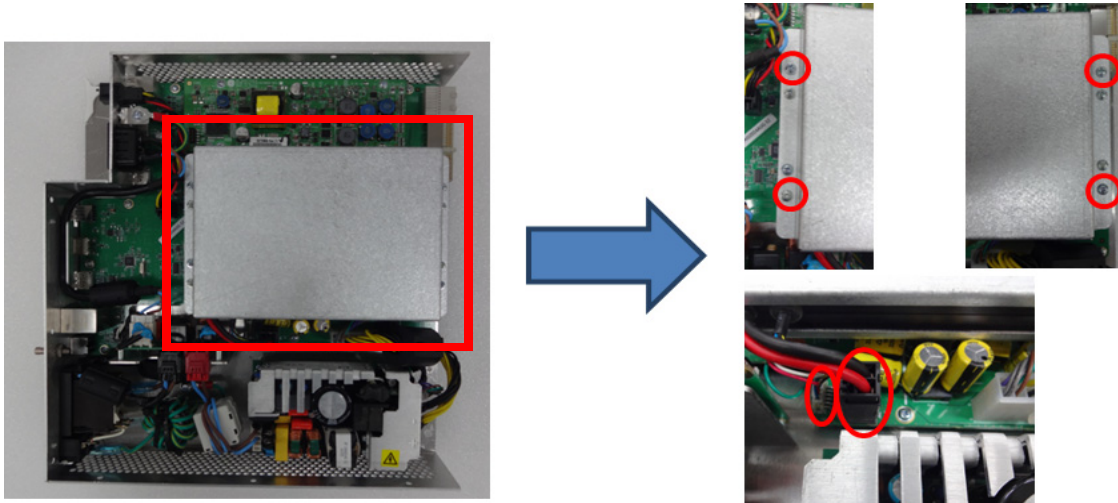


Figure 8-161 Screw points and Connectors on battery assy

- 3) Unscrew 4 screws to remove Battery bracket

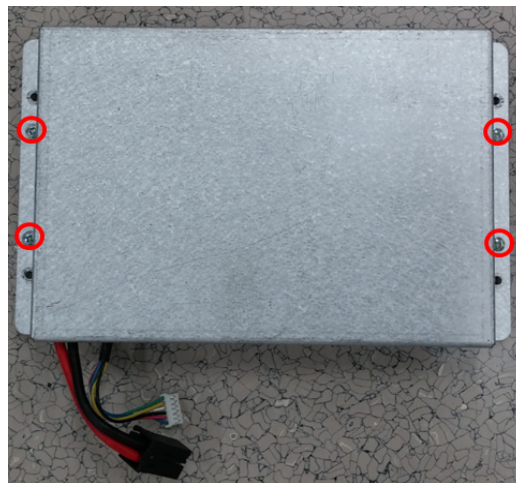


Figure 8-162 Removal of Battery bracket

#### 8-25-4 Installation Procedure

Install components in reverse order of removal.

#### 8-25-5 Functional Check

Refer to *section 4-4* for Functional Diag Test List.

## Section 8-26 Replacement of 4D

### 8-26-1 Manpower

1 Person, 1 hour.

### 8-26-2 Tools

Standard Phillips Screwdriver.

### 8-26-3 Removal Procedure

- 1) Unscrew 12 screws to remove the IO BOX Cover.

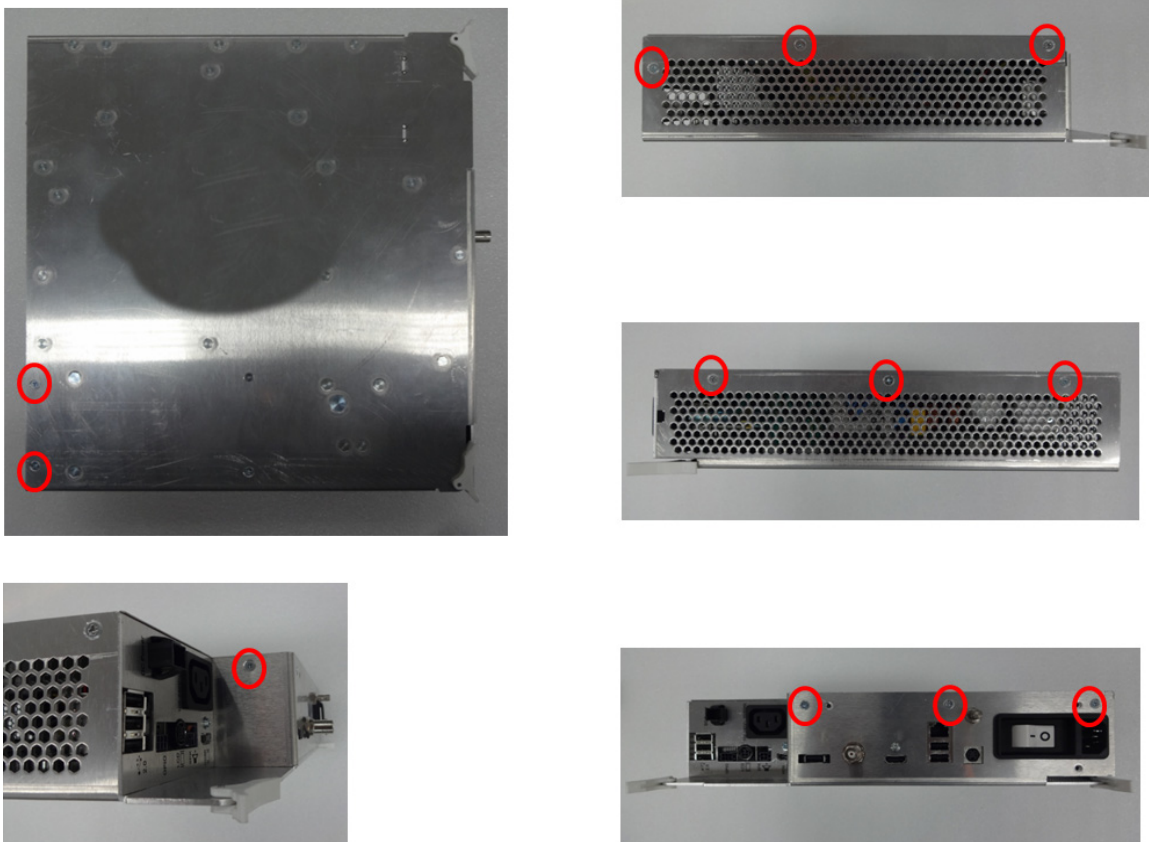
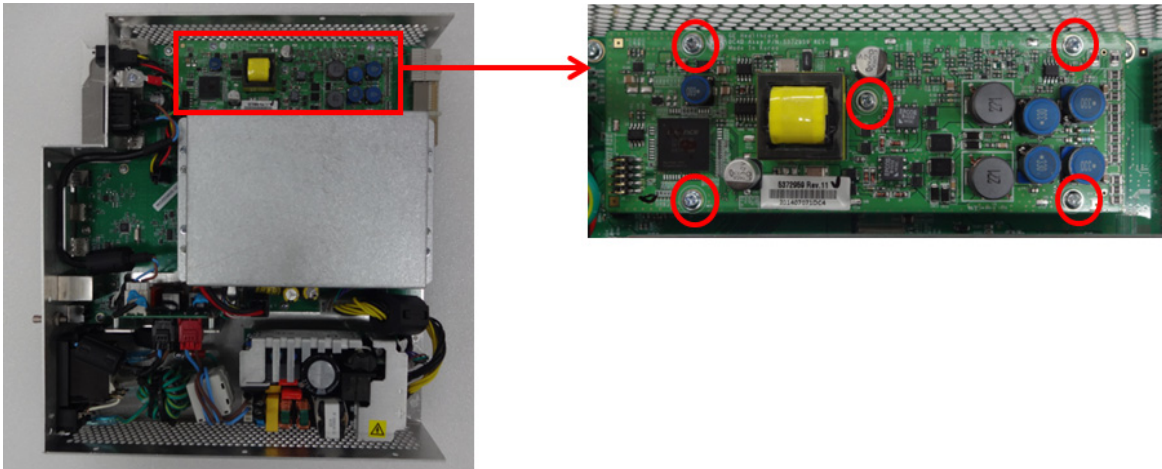


Figure 8-163 Screw points of IO BOX cover

- 2) Unscrew five screws to remove the DC4D from the IO BOX. Refer to following figure.



**Figure 8-164** Screw points of DC4D Assy

- 3) Carefully lift up the DC4D unit.

#### **8-26-4** Installation Procedure

Install components in reverse order of removal.

#### **8-26-5** Functional Check

Refer to *section 4-4* for Functional Diag Test List.



## Section 8-27 Replacement of Wireless LAN

### 8-27-1 Manpower

1 Person, 5 minutes.

### 8-27-2 Tools

None Required.

### 8-27-3 Removal Procedure

- 1) Remove Top Cover (refer to *section 8-7*)
- 2) Attach loop sheet on Wireless LAN dongle. Refer to below figure.

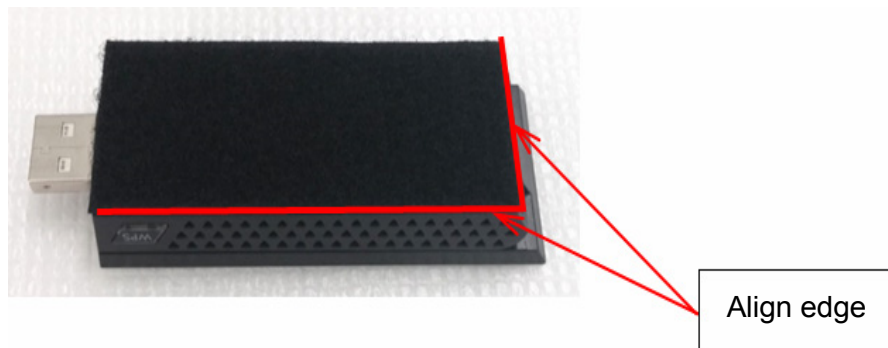


Figure 8-165 Attachment of loop sheet.

- 3) Disconnect connector and carefully detach out Wireless LAN. Refer to following figure.

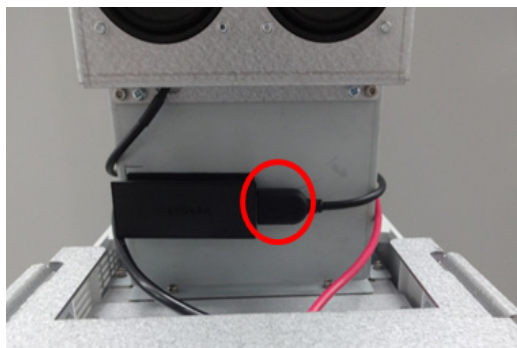


Figure 8-166 Removal of Wireless LAN

### 8-27-4 Installation Procedure

Parts to be installed in reverse order of removal.

### 8-27-5 Functional Check

Visual Check Only

## Section 8-28

### Replacement of the Harness Cable and OPIO Cable Assy

#### 8-28-1 Manpower

1 person, 30 minutes

#### 8-28-2 Tools

Standard Phillips Screwdriver, Nipper, 4mm Hex Wrench, 3 Cable ties (GEPN: 2160955).

#### 8-28-3 Pre-Work

- 1) Rear Cover removed. (refer to *section 8-9*)
- 2) OPIO removed. (refer to *section 8-14*)
- 3) LCD Monitor removed and Covers from LCD Arm removed. (refer to *section 8-11*)
- 4) Main monitor cables disconnected. (refer to *section 8-28*)
- 5) All monitor and OPIO cables on rear connectors are disconnected. (refer to *section 8-17*)
- 6) Link arm top cover removed. (refer to *section 8-20*)

#### 8-28-4 Removal Procedure (Harness Cable Assy)

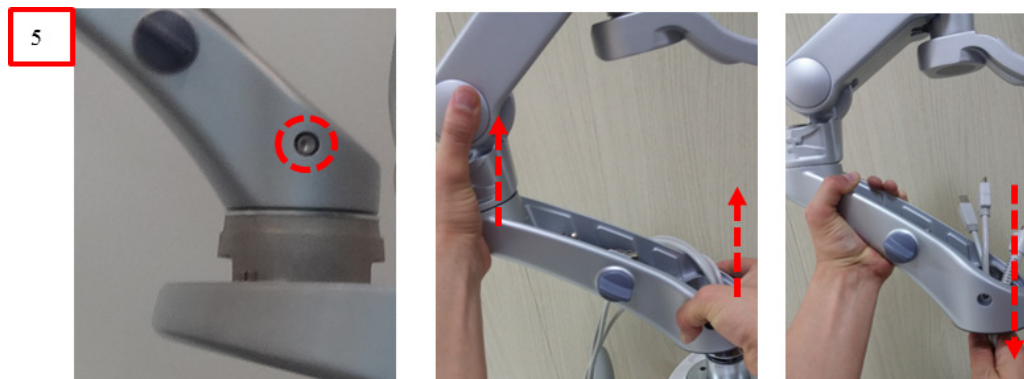
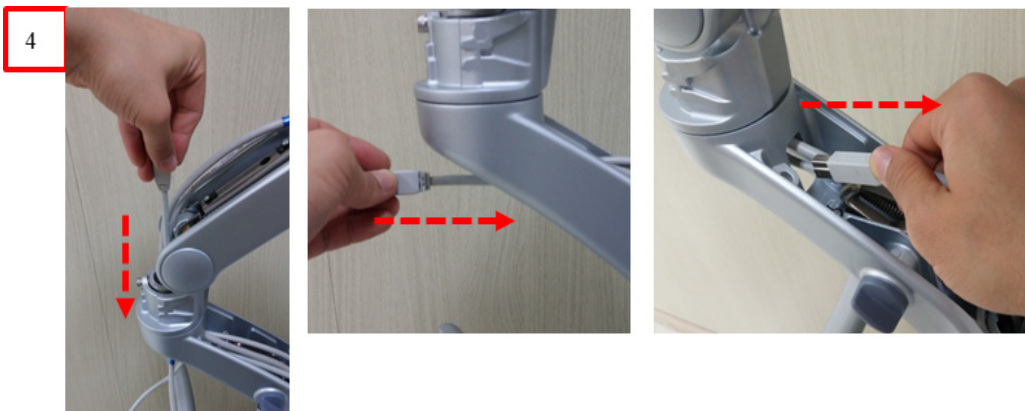
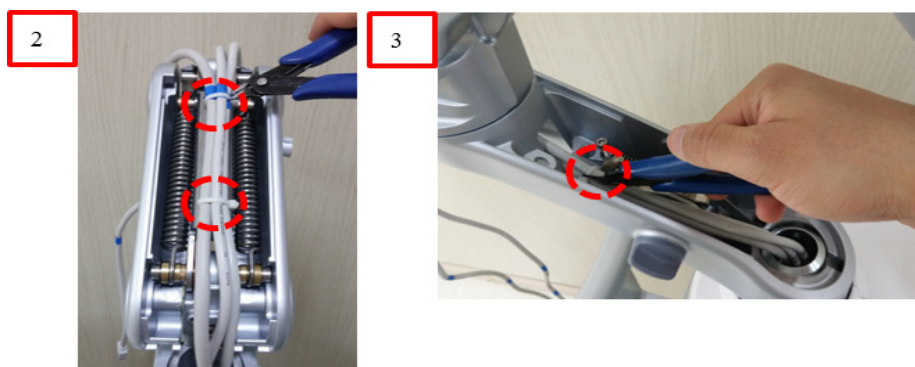
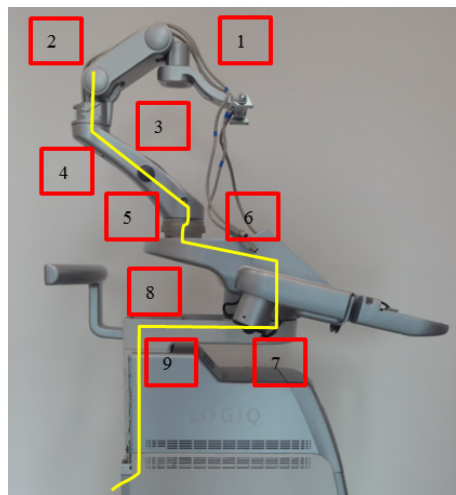
- 1) Loosen Cable through 3rd Arm (1).
- 2) Remove 2 Cable ties and loosen Cable from 2nd Arm.

**NOTE:** *There is cable position marker at this location.*

- 3) Remove 1 Cable tie and loosen Cable from 1st Arm.
- 4) Loosen cable around 2nd and 1st Axis as following figure.
- 5) Unscrew 1 screw and carefully lift up arms and loosen all cables.

**NOTE:** *There is cable position marker at this location.*

- 6) Release the cable holder and carefully pull down cables.
- 7) Unscrew 2 screws and remove Link arm cable fix brkt.
- 8) Carefully pull up cables and remove cables



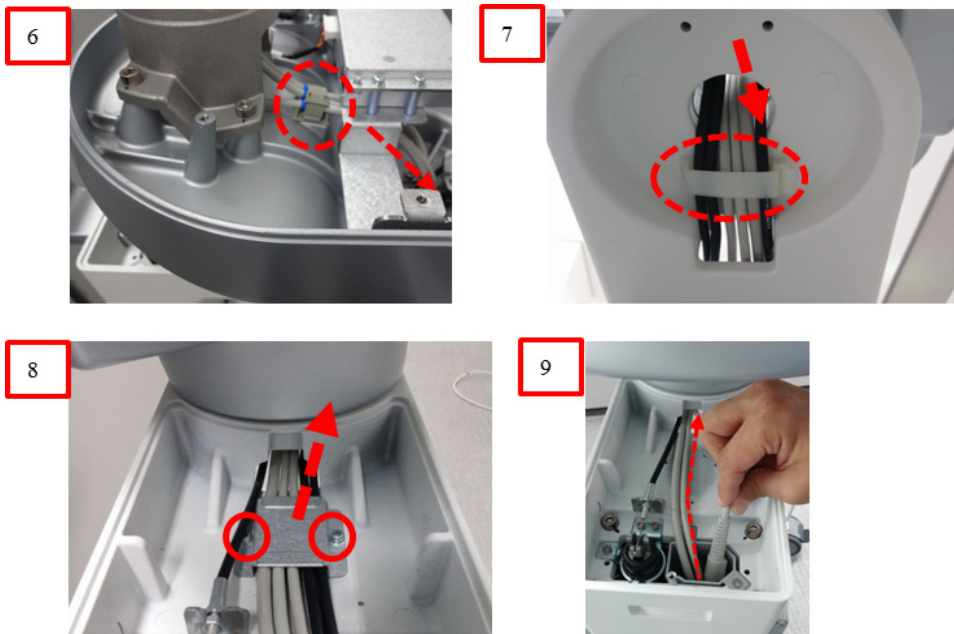


Figure 8-167 Removal of Harness Cable Assy

#### 8-28-5 Removal Procedure (OPIO Cable Assy)

- 1) Unscrew 1 screw, remove cable clamp, and then loosen cable through hole.

**NOTE:** *There is cable position marker at this location.*

- 2) Release the cable holder and carefully pull down cables.
- 3) Unscrew 2 screws and remove Link arm cable fix brkt.
- 4) Carefully pull up cables and remove cables

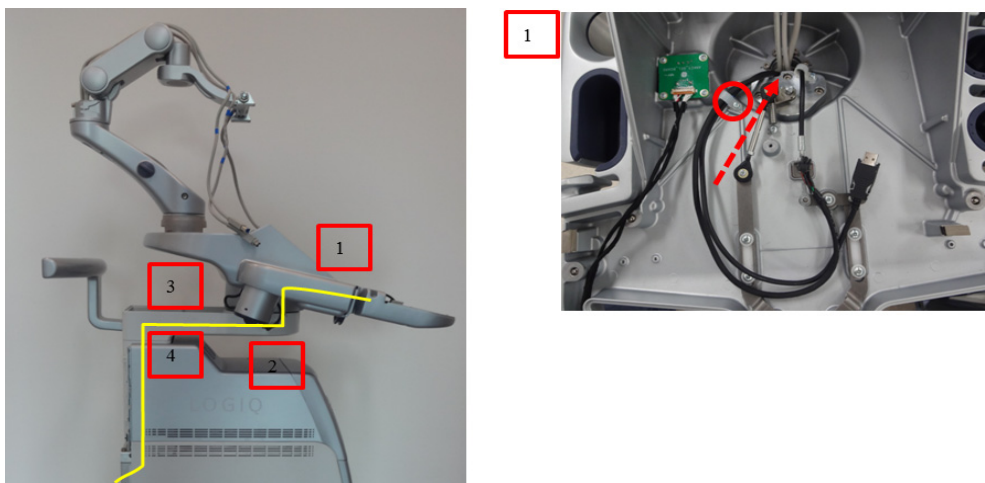


Figure 8-168 Removal of Harness Cable Assy

#### 8-28-6 Installation Procedure

Install components in reverse order of removal. Replace the cut cable ties with new ones of the appropriate length.

## 8-28-7 Functional Check

Test	Refer to	Note
System Exterior Visual Check	<i>section 4-3-1</i>	Control panel visual check only
Power On/Off	<i>section 4-3-3</i>	

Visual check on LCD monitor to see if image displays without color distortion

Check OSD Control function operates. Refer to *section 6-3-1* Brightness/Contrast

## Section 8-29

### Replacement of Peripheral Cable Assy

#### 8-29-1 DVD Cables

##### 8-29-1-1 Manpower

1 person, 5 minutes.

##### 8-29-1-2 Tools

Nipper, 2 Cable ties (GEPN: 2160955).

##### 8-29-1-3 Pre work

- 1) Remove Rear Cover. (refer to *section 8-9*)
- 2) Remove Top Cover. (refer to *section 8-7*)
- 3) Remove Cable Cover Bracket. (refer to *section 8-17*)

##### 8-29-1-4 Removal Procedure

- 1) Remove the cable ties.

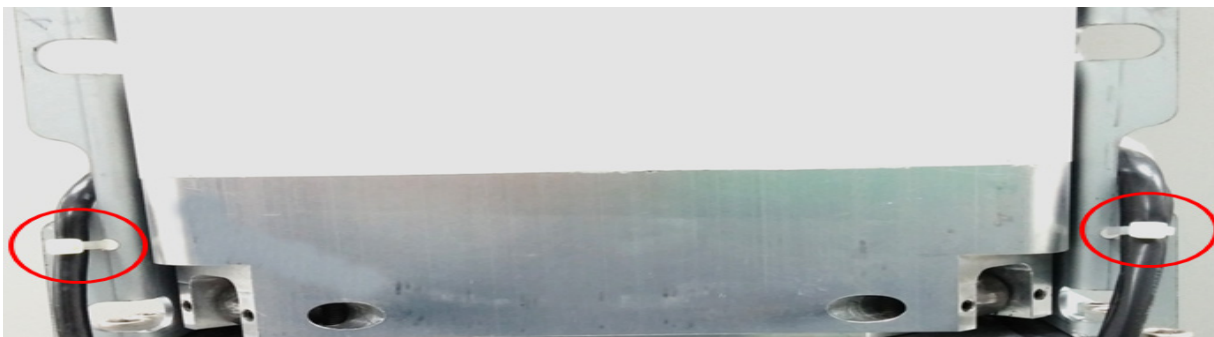


Figure 8-169 Cable tie points

- 2) Unlock cable clamp. Refer to following figure.

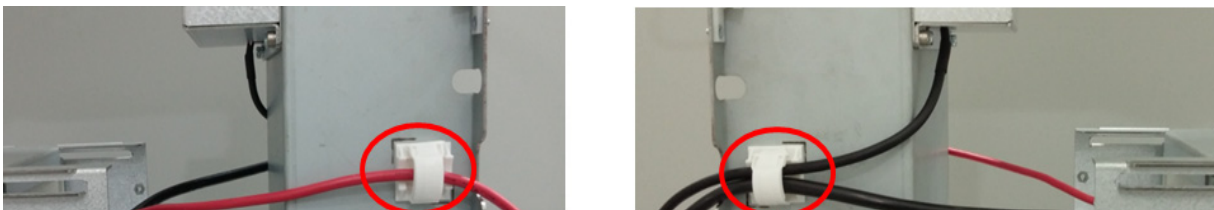


Figure 8-170 Cable clamps



- 3) Disconnect 2 DVD cables from the rear panel. Refer to following figure.



Figure 8-171 DVD cable connectors

- 4) Disconnect 2 DVD cables from the DVD.



Figure 8-172 Removal of DVD cables from the DVD

- 5) Carefully pull out the cables.

8-29-1-5    Installation Procedure

Parts to be installed in reverse order of removal. But, refer to below procedure for cable ties.

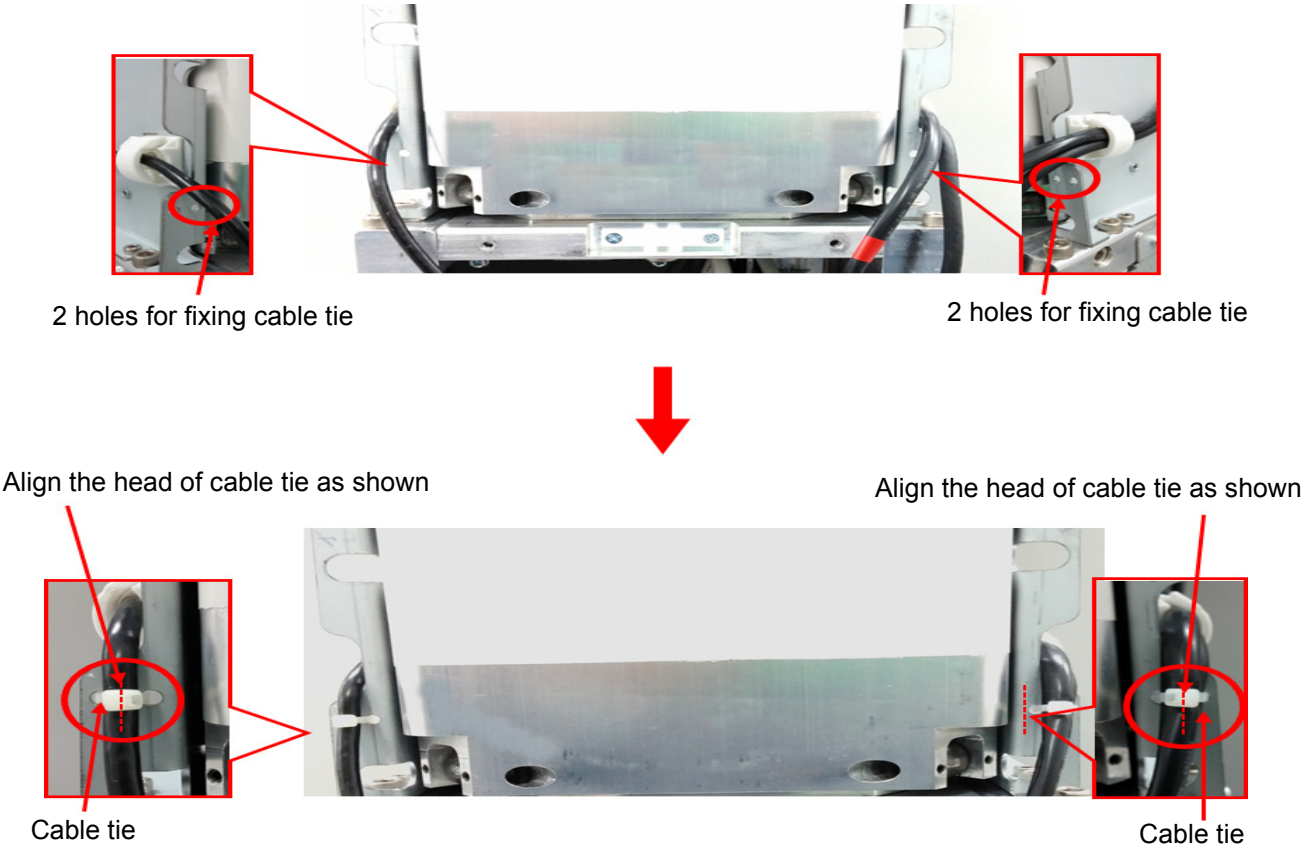


Figure 8-173    Tie cables with the ties through the holes



## 8-29-2 B/W Printer Cables

### 8-29-2-1 Manpower

1 person, 5 minutes.

### 8-29-2-2 Tools

Standard Phillips Screwdriver.

### 8-29-2-3 Pre work

- 1) Remove Rear Cover. (refer to *section 8-9*)
- 2) Remove Top Cover (refer to *section 8-7*)
- 3) Remove Cable Cover Bracket. (refer to *section 8-17*)

### 8-29-2-4 Removal Procedure

- 1) Remove the cable tie.



Figure 8-174 Cable tie point

- 2) Remove 2 screws on left side of BW printer and remove BW printer Power fix Bracket

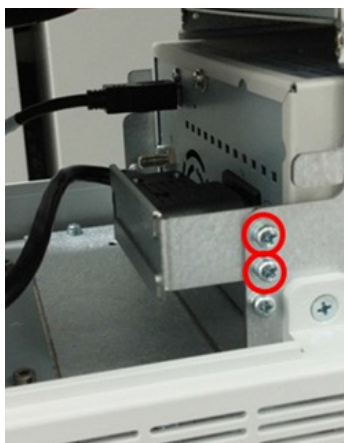


Figure 8-175 Screw points to remove BW power fix bracket.

- 3) Unlock cable clamp. Refer to following figure.

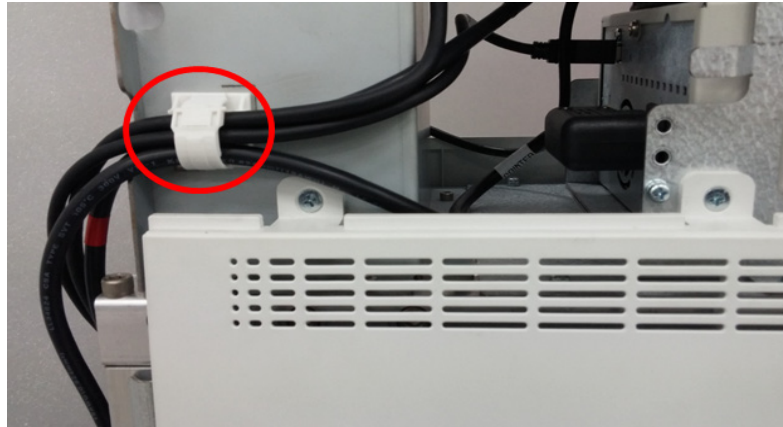
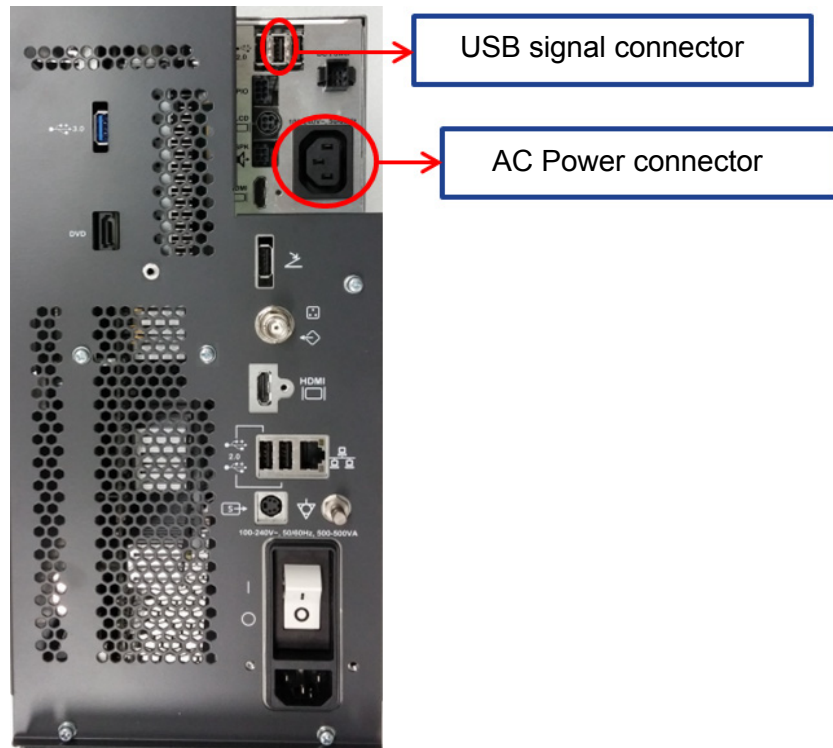


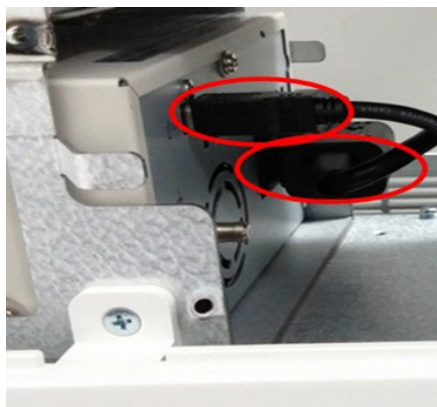
Figure 8-176 Cable clamp

- 4) Disconnect 2 BW printer cables from the rear panel. Refer to following figure.



**Figure 8-177 BW printer connectors**

- 5) Disconnect 2 BW printer cables from printer and carefully pull out the cables.



**Figure 8-178 Removal of printer cables from the printer**

#### 8-29-2-5 Installation Procedure

Parts to be installed in reverse order of removal. But, refer to below procedure for cable ties.

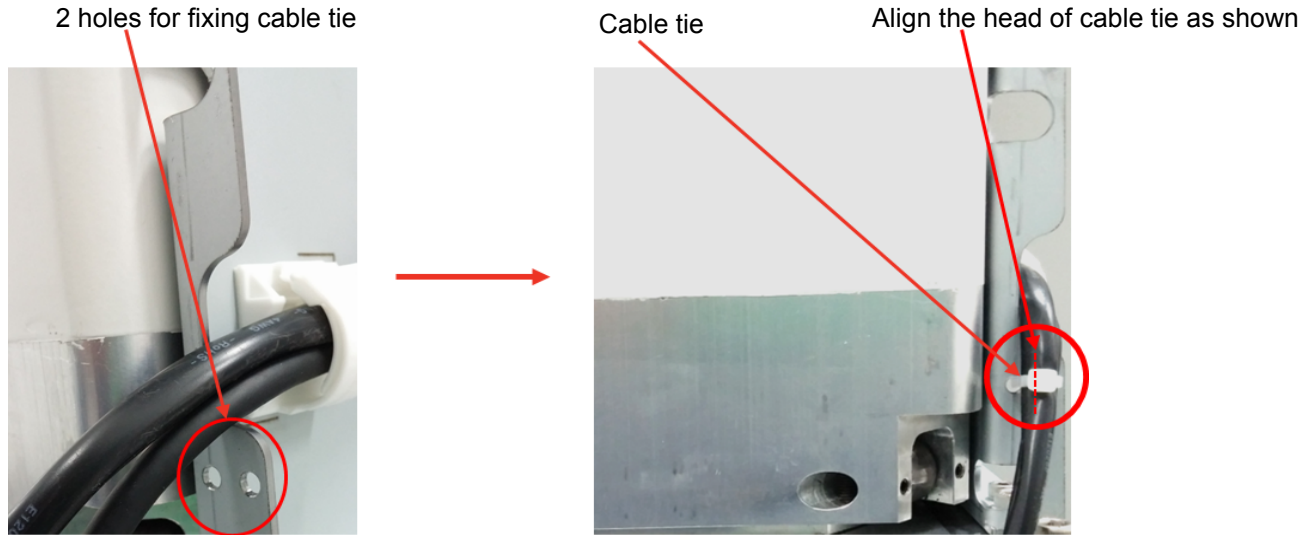


Figure 8-179 Tie cables with the tie through the holes

#### 8-29-2-6 Functional Check

Test 1: Print an image by pressing the button P1 on the operator panel. (P1 key should be configured correctly. Refer to *section 3-8-4 Adding Printer to the system*)

Verify1: - Verify that image can be printed.

Verify2: - Verify that printed image has no distortion as compared the image on screen.

## Section 8-30 Replacement of the Probe Holder

### 8-30-1 Manpower

1 Person, 5 minutes.

### 8-30-2 Tools

No tool is required.

### 8-30-3 Removal Procedure

- 1) Simply pull out Probe Holder from its location.

**NOTE:** This procedure applies to all locations of probe holder.



Figure 8-180 Removal of Probe Holder

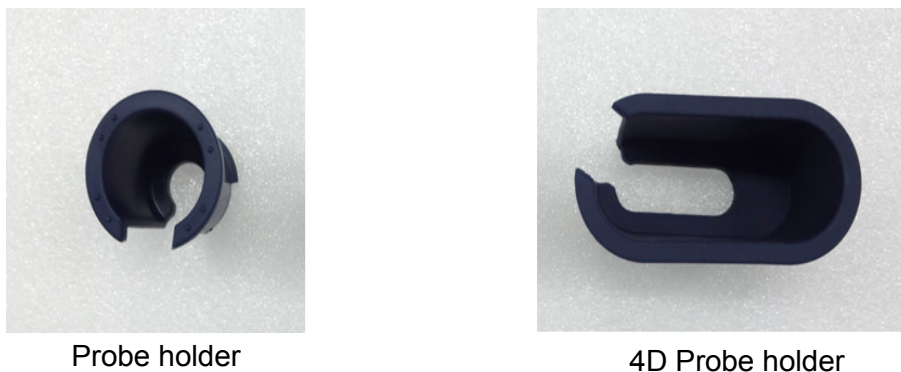


Figure 8-181 Probe Holders

### 8-30-4 Installation Procedure

Parts to be installed in reverse order of removal.

### 8-30-5 Functional Check

Visual inspection Only.

## Section 8-31 Replacement of the Cable Hook

### 8-31-1 Manpower

1 Person, 5 minutes.

### 8-31-2 Tools

Standard Phillips Screwdriver.

### 8-31-3 Removal Procedure

1) Remove screws as following figure and carefully remove cable hook.

**NOTE:** Make sure not to lose washers when removing hooks.

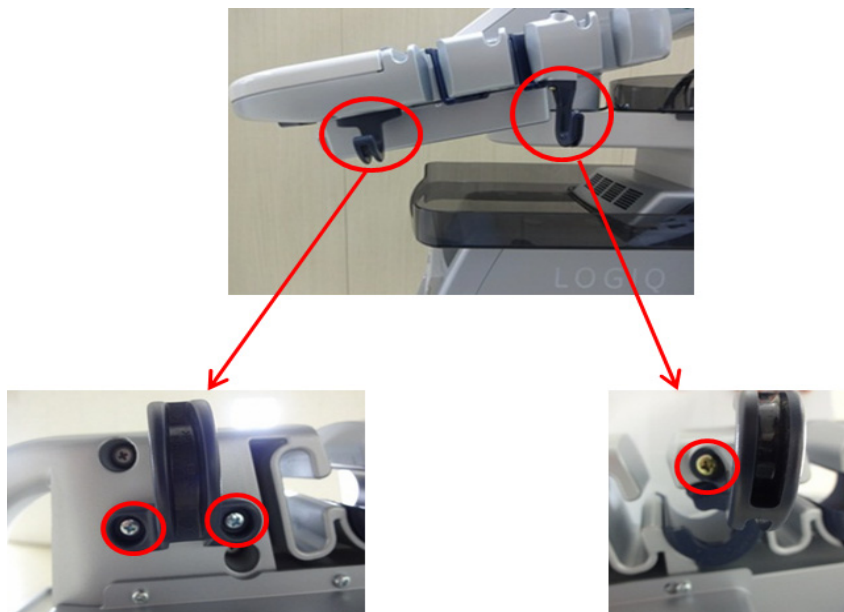


Figure 8-182 Removal of Cable hook

### 8-31-4 Installation Procedure

Parts to be installed in reverse order of removal.

### 8-31-5 Functional Check

Visual inspection Only.

## Section 8-32

### Replacement of the OPIO Tray

#### 8-32-1 Manpower

1 Person, 5 minutes.

#### 8-32-2 Tools

Standard Phillips Screwdriver.

#### 8-32-3 Removal Procedure

- 1) Remove screw as following figure and carefully remove OPIO Tray.

**NOTE:** Make sure not to lose tray fix brkt when removing OPIO Tray.

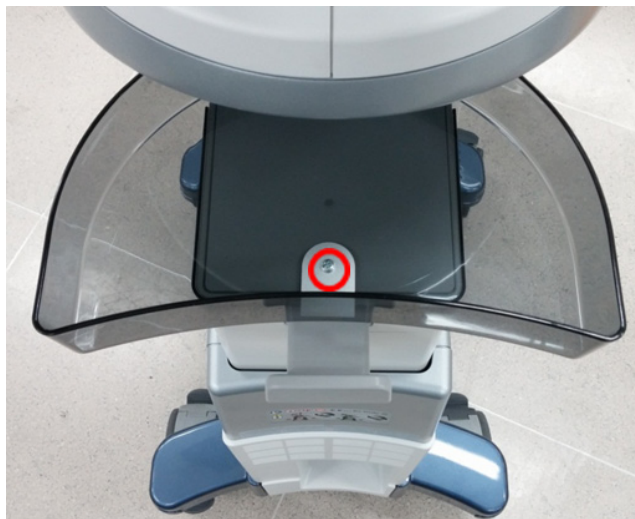


Figure 8-183 Removal of OPIO Tray

#### 8-32-4 Installation Procedure

Parts to be installed in reverse order of removal.

#### 8-32-5 Functional Check

Visual inspection Only.



## Section 8-33 Replacement of the Paper tray

### 8-33-1 Manpower

1 Person, 1 minutes.

### 8-33-2 Tools

None Required.

### 8-33-3 Removal Procedure

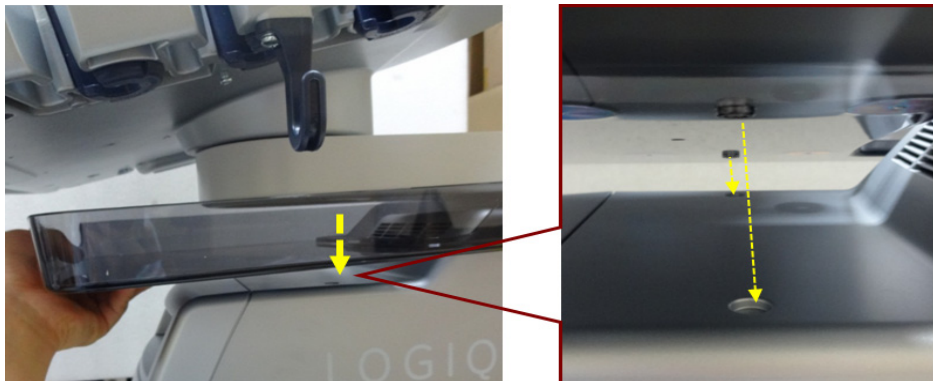
- 1) Remove Paper tray from Top Cover.



Figure 8-184 Removal of Paper tray

### 8-33-4 Installation Procedure

- 1) Align the assembly point and put the Paper Tray on Top Cover.



### 8-33-5 Functional Check

Visual inspection Only.



## Section 8-34 Replacement of AC Cable Holder

### 8-34-1 Manpower

1 Person, 5 minutes.

### 8-34-2 Tools

Standard Phillips Screwdriver.

### 8-34-3 Removal Procedure

- 1) Remove 2 Screws from AC Cable Holder

*NOTE: This procedure applicable to all AC Power Cord replacement*



Figure 8-185 AC Cable Holder

### 8-34-4 Installation Procedure

Parts to be installed in reverse order of removal.

### 8-34-5 Functional Check

Visual inspection Only.

## Section 8-35

### Replacement of the BW printer

#### 8-35-1 Manpower

1 person, 10 minutes

#### 8-35-2 Tools

Standard Phillips Screwdriver.

#### 8-35-3 Pre work

- 1) Remove Rear Cover. (refer to *section 8-9*)
- 2) Remove Top Cover (refer to *section 8-7*)
- 3) Remove Cable Cover Bracket. (refer to *section 8-17*)
- 4) Remove BW printer Power fix Bracket and Disconnect 2 BW printer cables from printer (refer to *section 8-29-2*)

#### 8-35-4 Removal Procedure

- 1) Remove 4 screws around BW printer. Refer to following figure.



Rear left



Rear right



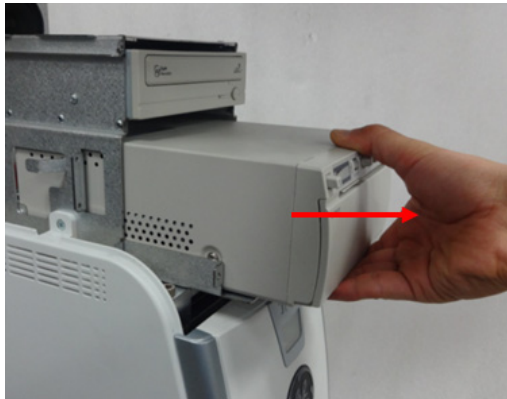
Front left



Front right

Figure 8-186 4 screws points for removal of BW printer

- 2) Pull out BW printer as following figure.



**Figure 8-187 Pulling out the BW printer**

- 3) Remove 4 screws on BW printer bottom part. Refer to following figure.



**Figure 8-188 4 screws points**

### 8-35-5 Installation Procedure

- 1) Parts to be installed in reverse order on removal.

### 8-35-6 Functional Check

Test 1: Print an image by pressing the button P1 on the operator panel. (P1 key should be configured correctly. Refer to *section 3-8-4 Adding Printer to the system*)

Verify1: - Verify that image can be printed.

Verify2: - Verify that printed image has no distortion as compared the image on screen.

## Section 8-36

### Replacement of the Speaker

#### 8-36-1 Manpower

1 Person, 10 minutes.

#### 8-36-2 Tools

Standard Phillips Screwdriver, Hex Wrench, Nipper, 1 Cable ties (GEPN: 2160955).

#### 8-36-3 Pre work

- 1) Remove Rear Cover. (refer to *section 8-9*)
- 2) Remove Top Cover (refer to *section 8-7*)
- 3) Remove Cable Cover Bracket. (refer to *section 8-17*)

#### 8-36-4 Removal Procedure

- 1) Disconnect Speaker cable. Refer to following figure.



Figure 8-189 Speaker cable connector position

- 2) Remove the cable tie.



Figure 8-190 Cable tie point

- 3) Unlock cable clamp. Refer to following figure.

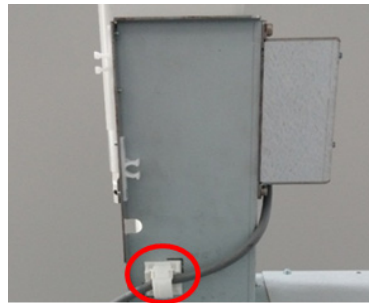


Figure 8-191 Cable clamp

- 4) Remove 4 screws around speaker assy. Refer to following figure.

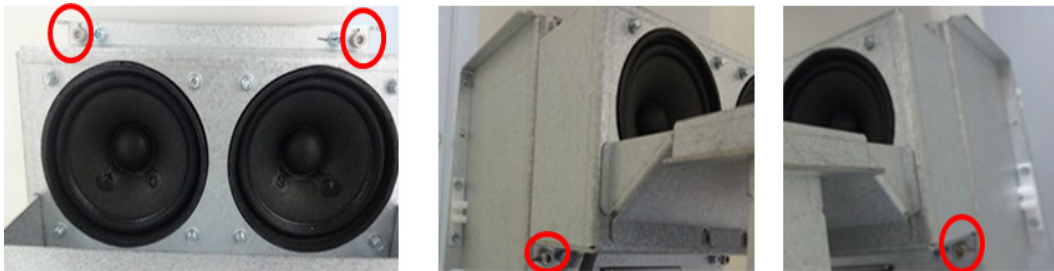


Figure 8-192 4 screws points to remove speaker assy

- 5) Remove 4 screws, and then remove speaker brkt. Refer to following figure.

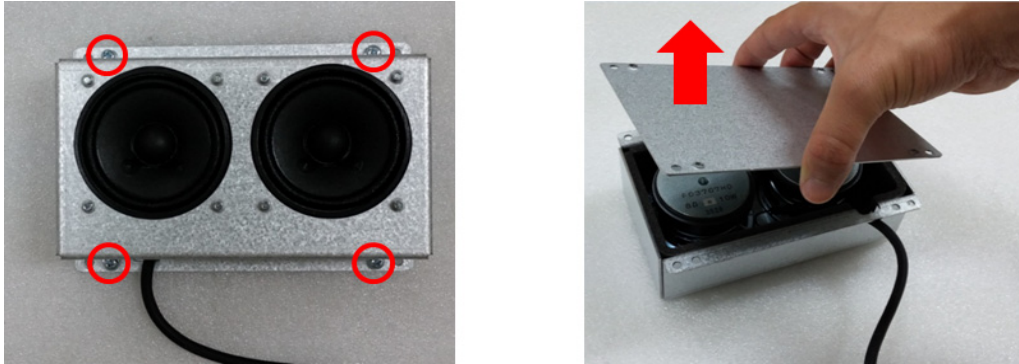


Figure 8-193 4 screw points to remove speaker brkt

- 6) Remove 8 screws and carefully pull out speaker assy. Refer to following figure.

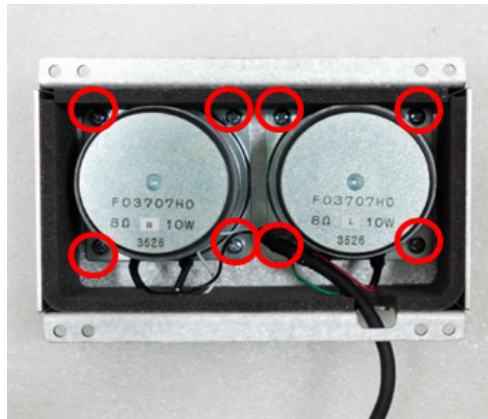


Figure 8-194 8 screws points to remove speaker

### 8-36-5 Installation

Parts to be installed in reverse order of removal. But, refer to below procedure for cable ties.

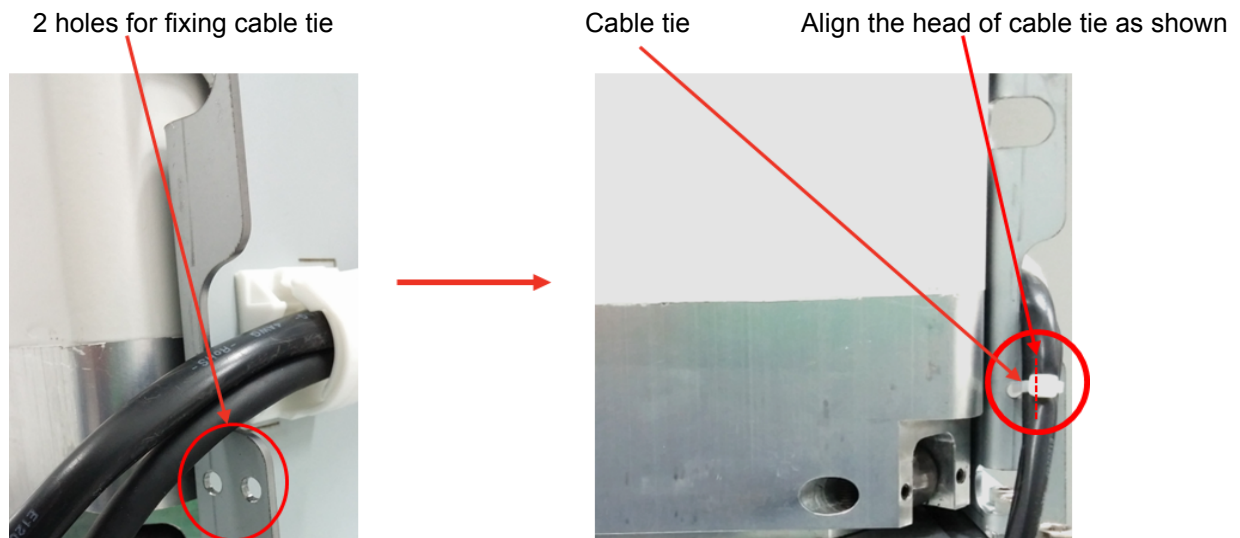


Figure 8-195 Tie cables with the tie through the holes

### 8-36-6 Functional Check

Perform Diagnostics

- 1) Enter Common Service Desktop
  - 2) Select Diagnostics -> Service Diag -> Doppler Audio -> Execute
- Make sure audible sound comes out of the speaker

**NOTE:** Make sure system volume is not set to zero.

## Section 8-37

### Replacement of the Monitor Arm

#### 8-37-1 Manpower

1 person, 15 minutes.

#### 8-37-2 Tools

Standard Phillips Screwdriver, Nipper, 4 mm Hex Wrench, 3 Cable ties (GEPN: 2160955).

#### 8-37-3 Removal Procedure

- 1) Remove LCD monitor and LCD Arm Plastic Covers.(refer to *section 8-11*)
- 2) Remove Harness Cable Assy and Monitor Arm. (refer to *section 8-11-4 1)~4)*)

#### 8-37-4 Installation Procedure

In reverse order of removal.

#### 8-37-5 Functional Check

- 1) Visually check LCD monitor
- 2) LCD Arm Test. (Refer to *section 4-3-2-2*).



## Section 8-38 Replacement of Front Fan Filter

### 8-38-1 Manpower

1 Person, 2 minutes.

### 8-38-2 Tools

None Required.

### 8-38-3 Removal Procedure

- 1) Remove Front Cover. (refer to *section 8-6*)
- 2) Pull out Filter upward. Refer to following figure.



Figure 8-196 Pulling out the front fan filter.

### 8-38-4 Installation Procedure

In Reverse Order.

### 8-38-5 Functional Check

Visual inspection Only.

## Section 8-39

### Replacement of Bottom Fan Filter

#### 8-39-1 Manpower

1 Person, 3 minutes.

#### 8-39-2 Tools

None Required.

#### 8-39-3 Removal Procedure

- 1) Pull out bottom fan filter as following figure.

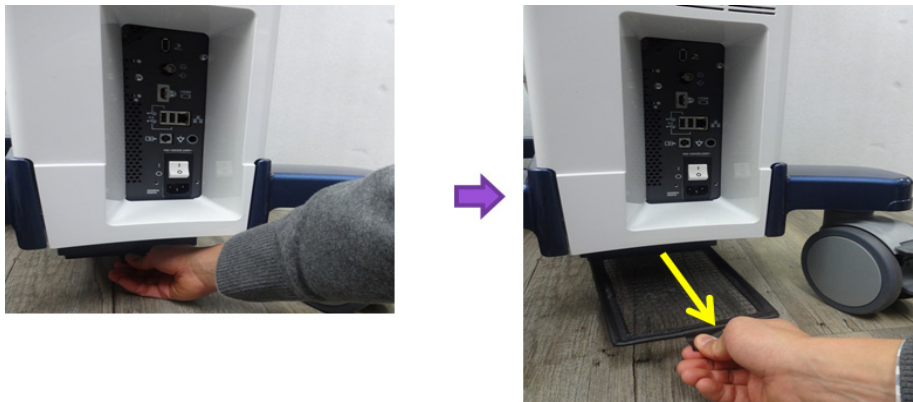


Figure 8-197 Removal of bottom fan filter

#### 8-39-4 Installation Procedure

In Reverse Order.

#### 8-39-5 Functional Check

Visual inspection Only.

## Section 8-40

### Replacement of SW CD set (R1, R2, R2.5 only) and SW USB (R3 only)

#### 8-40-1 Manpower

1 Person, 3 minutes.

#### 8-40-2 Tools

None Required.

#### 8-40-3 Removal Procedure

- 1) Remove Rear Cover. (refer to *section 8-9*)
- 2) CD or USB is placed on Rear Cover.

#### 8-40-4 Installation Procedure

In Reverse Order.

#### 8-40-5 Functional Check

Visual inspection Only.

## Section 8-41 Replacement of Drawer

### 8-41-1 Manpower

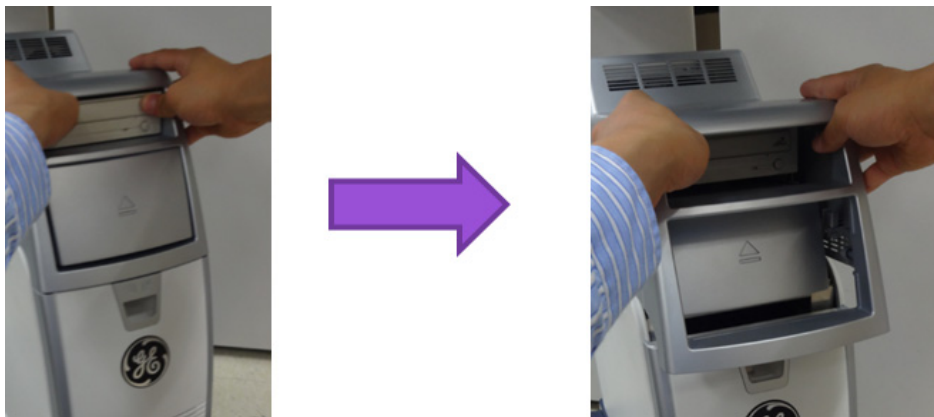
1 Person, 5 minutes.

### 8-41-2 Tools

Standard Phillips screwdriver.

### 8-41-3 Removal Procedure

- 1) Pull out the Top cover.



**Figure 8-198 Drawing out Top cover.**

- 2) Remove 4 screws. Refer to following figure.



Rear left



Rear right



Front left



Front right

**Figure 8-199 Screw point around drawer.**

- 3) Carefully pull out the Drawer.

---

**8-41-4      Installation Procedure**

Parts to be installed in reverse order on removal.

**8-41-5      Functional Check**

Visual Check Only

## Section 8-42 Replacement of ECG

### 8-42-1 Manpower

1 Person, 5 minutes.

### 8-42-2 Tools

Standard Phillips screwdriver.

### 8-42-3 Removal Procedure

- 1) Remove OPIO covers (refer to *section 8-14*)
- 2) Remove cables on ECG Assy (square) and unscrew 4 screws (circle). Refer to following figure.

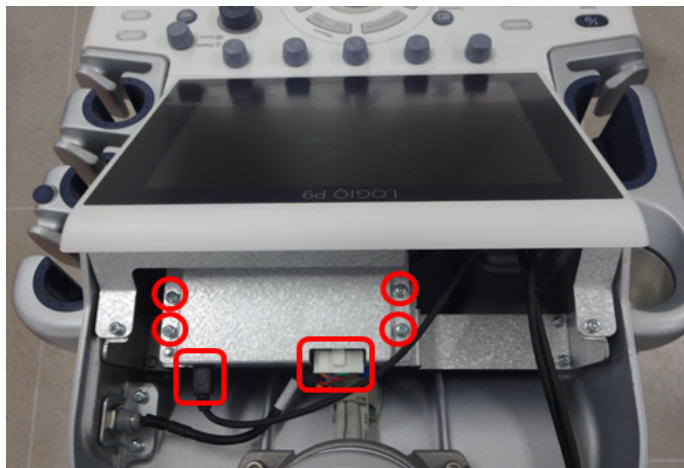


Figure 8-200 Cables position and points.

- 3) Remove ECG Assy.
- 4) Unscrew 4 screws and remove ECG BRKT.

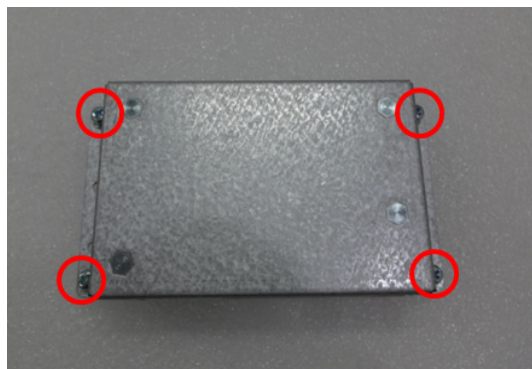


Figure 8-201 ECG BRKT screw points.

- 5) Unscrew 4 screws and remove ECG BRKT

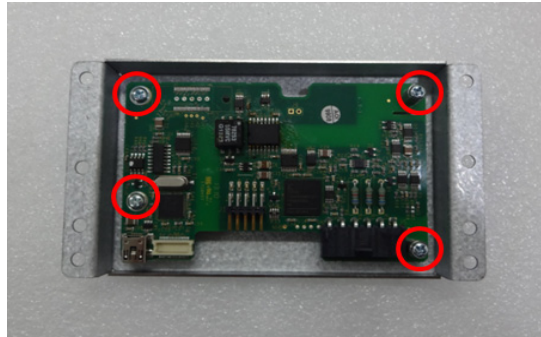


Figure 8-202 ECG screw points.

#### 8-42-4 Installation Procedure

Parts to be installed in reverse order on removal.

#### 8-42-5 Functional Check

Visual Check Only

## Section 8-43 Replacement of DCWD ASSY

### 8-43-1 Manpower

1 person, 15 minutes

### 8-43-2 Tools

Standard Phillips screwdriver.

### 8-43-3 Removal Procedure

- 1) Separate MPI assy from MCB and MDC. Refer to the *section 8-17-8* Removal Procedure - Separating MPI and MCB.
- 2) Remove 3 screws on MPI assy.

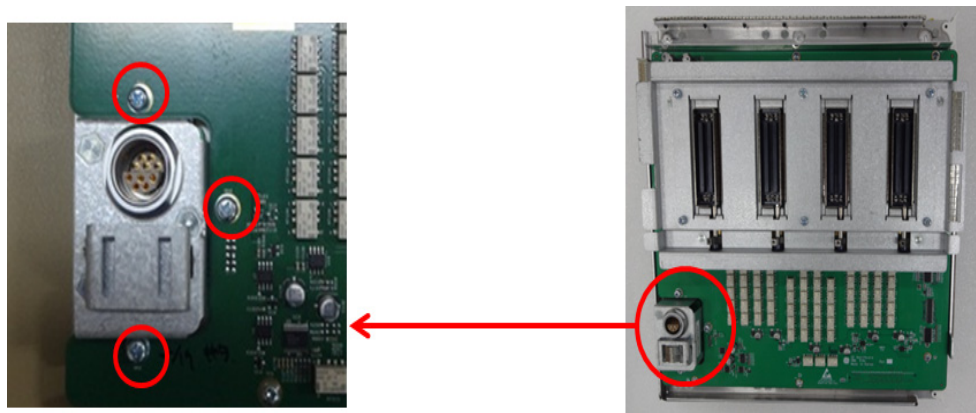


Figure 8-203 DCWD Board screw points

- 3) Carefully separate DCWD board from MPI assy not to damage the DCWD connector. Refer to following figure.

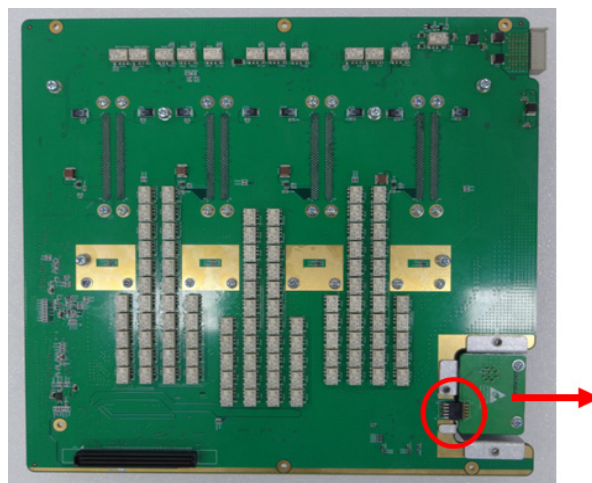


Figure 8-204 Position of DCWD board connector



**8-43-4      Installation Procedure**

Parts to be installed in reverse order on removal.

**8-43-5      Functional Check**

Refer to *section 4-4* Functional Diag Test List

## Section 8-44

### Replacement of MCWD ASSY

#### 8-44-1 Manpower

1 person, 15 minutes

#### 8-44-2 Tools

Standard Phillips Screwdriver.

#### 8-44-3 Removal Procedure

- 1) Separate MCB Assy and MDC Assy. (Refer to section 8-17-7)
- 2) Unscrew 1 screw and remove MCWD assy

*NOTE: Be careful not to damage MCWD connector.*

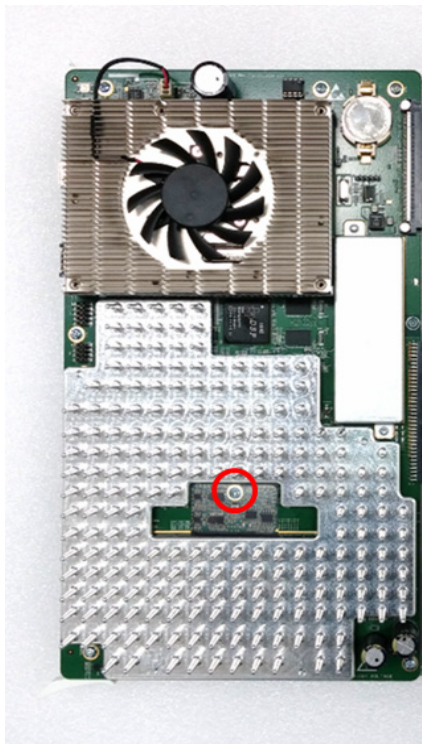


Figure 8-205 Removal of MCWD board.

#### 8-44-4 Installation Procedure

Parts to be installed in reverse order on removal.

#### 8-44-5 Functional Check

*NOTE: Refer to section 4-4 Functional Diag Test List*

## Section 8-45

### Replacement of battery pack for LP7-P9 R2 ext battery pack

#### 8-45-1 Manpower

1 person, 30 minutes

#### 8-45-2 Tools

Standard Phillips Screwdriver, Hex-Wrench

#### 8-45-3 Removal Procedure

- 1) Unscrew 2 screws and then pull out the BATTERY PACK COVER BRKT LP7\_P9 from 6 points of LATCH.

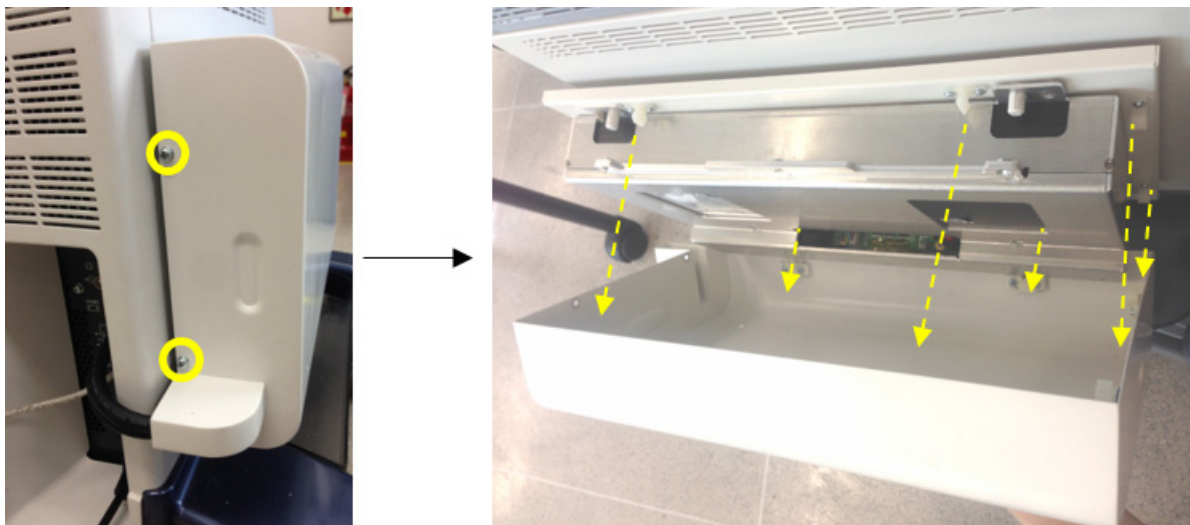


Figure 8-206 Removing the BATTERY PACK COVER BRKT LP7\_P9

- 2) Unscrew 2 screws to remove CONNECTOR BRKT.

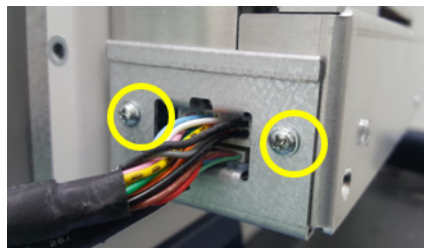


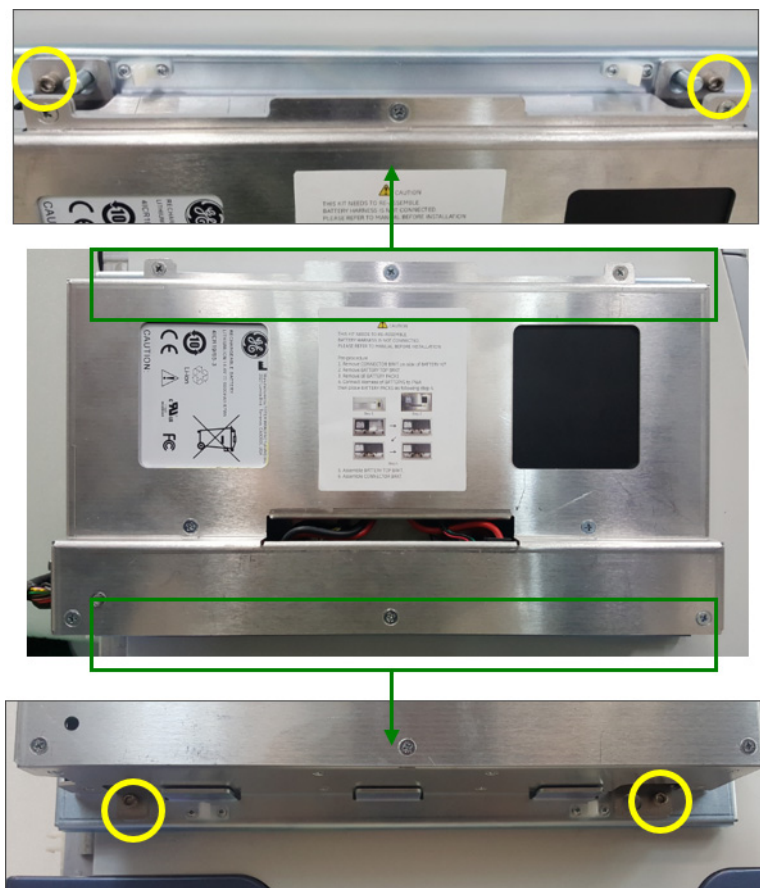
Figure 8-207 Unscrewing 2 screws to remove CONNECTOR BRKT

- 3) Disconnect BATTERY SIG Harness and PWR Harness.



**Figure 8-208 Disconnecting BATTERY Harnesses**

- 4) Unscrew 4 screws.



**Figure 8-209 Unscrewing 4 screws**

- 5) Disassemble LP7-P9 R2 EXT BATTERY PACK from extrude shape of BATTERY PACK FRAME BRKT.

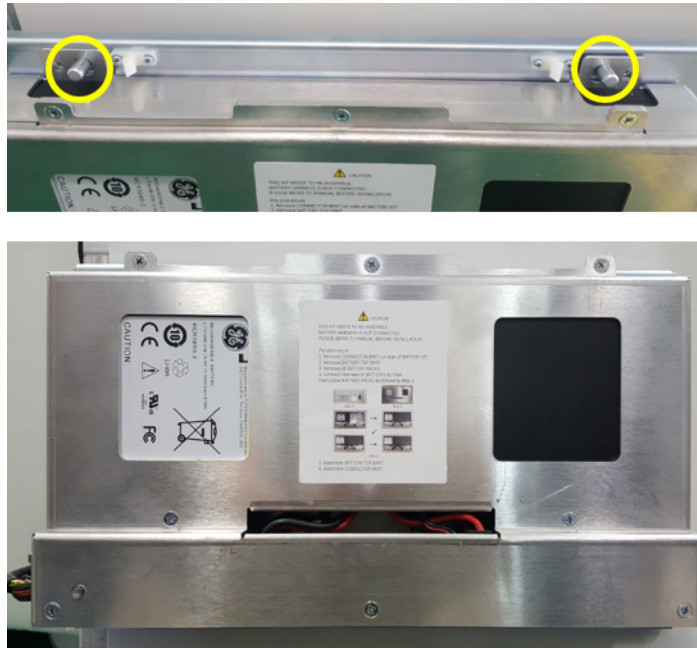


Figure 8-210 Removing LP7-P9 R2 EXT BATTERY PACK

- 6) Unscrew 8 screws to remove BATTERY PACK TOP BRKT.

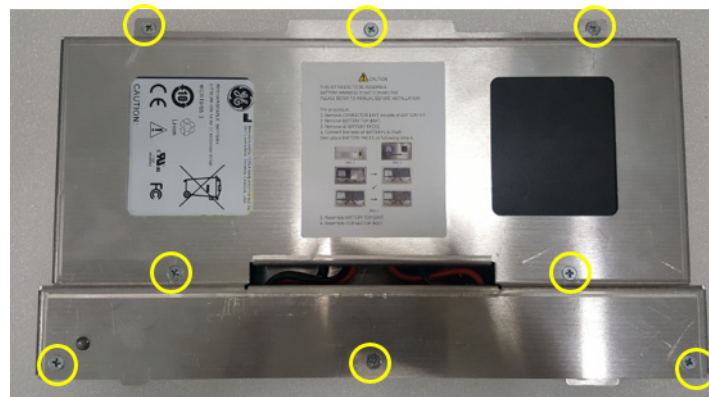


Figure 8-211 Unscrewing 8 screws to remove BATTERY PACK TOP BRKT

- 7) Lift up POLARIS BATTERY PACK and disconnect BATTERY Harness from PWA. Then remove POLARIS BATTERY PACK.

**NOTE:** Once replacing battery pack, all of battery packs (4 pcs) need to be replaced in same time.

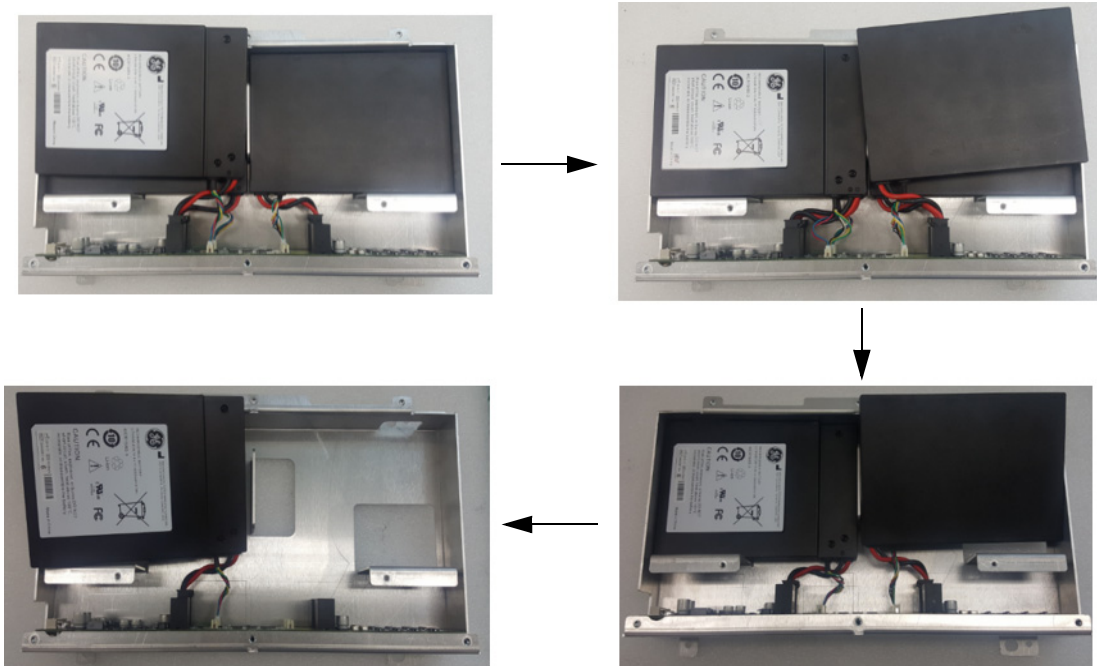


Figure 8-212 Removing POLARIS BATTERY PACKS

#### 8-45-4 Installation Procedure

**NOTE:** Once replacing battery pack, all of battery packs (4 pcs) need to be replaced in same time.

All components to be installed in reverse order of removal.

#### 8-45-5 Functional Check

- 1) Turn on the circuit breaker.



Figure 8-213 Turning on circuit breaker



- 2) Boot-up the console using power button on OPIO ASSY.



**Figure 8-214 Booting-up using power button**

- 3) Check that battery icon is displayed on left bottom side.



**Figure 8-215 Checking battery icon**

- 4) Switch off the circuit breaker (Wall power mode -> Battery mode). Confirm that is operating with battery mode.

## Section 8-46

### Replacement of battery pack for LP7-P9 R2 Battery option

#### 8-46-1 Manpower

1 person, 30 minutes

#### 8-46-2 Tools

Standard Phillips Screwdriver, Hex-Wrench, Socket driver

#### 8-46-3 Removal Procedure

- 1) Unscrew 2 screws to remove POWER CORD FIX BRKT. Then disconnect POWER CORD and remove REAR COVER.



Figure 8-216 Removing POWER CORD FIX BRKT, POWER CORD and REAR COVER

- 2) Unscrew 5 screws to remove REAR CABLE COVER BRKT. Then disconnect all cables.

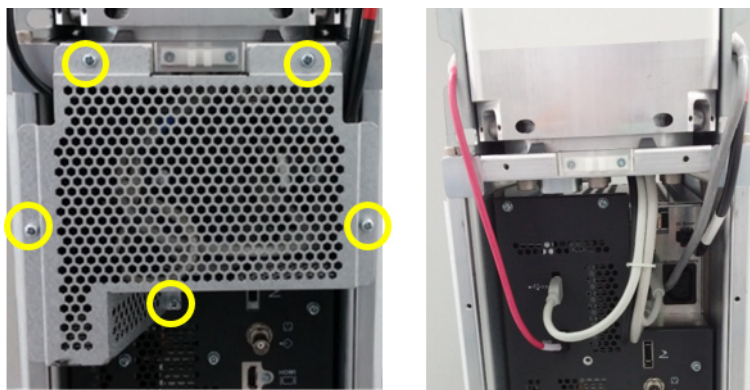


Figure 8-217 Unscrewing 5 screws to remove REAR CABLE COVER BRKT and disconnect cables



- 3) Unscrew 7 screws to remove the NEST EMI BRKT and pull out MIO ASSY from system.

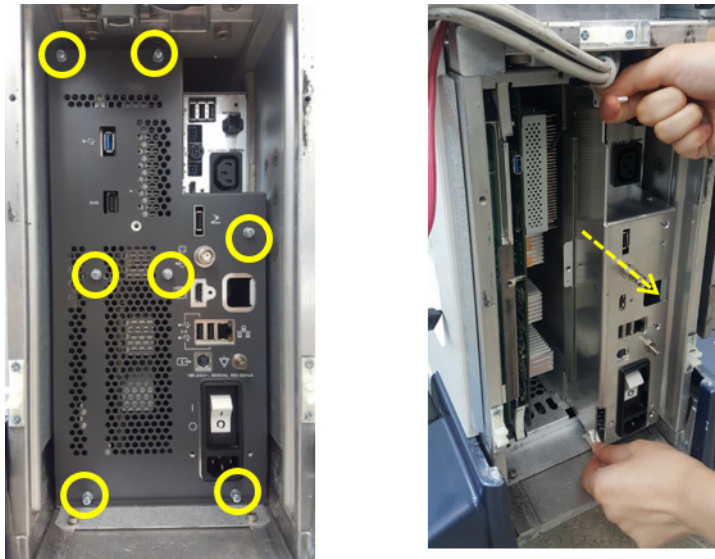


Figure 8-218 Unscrewing 7 screws to remove NEST EMI BRKT and MIO ASSY

- 4) Unscrew 12 screws to remove the MIO BOX BRKT.

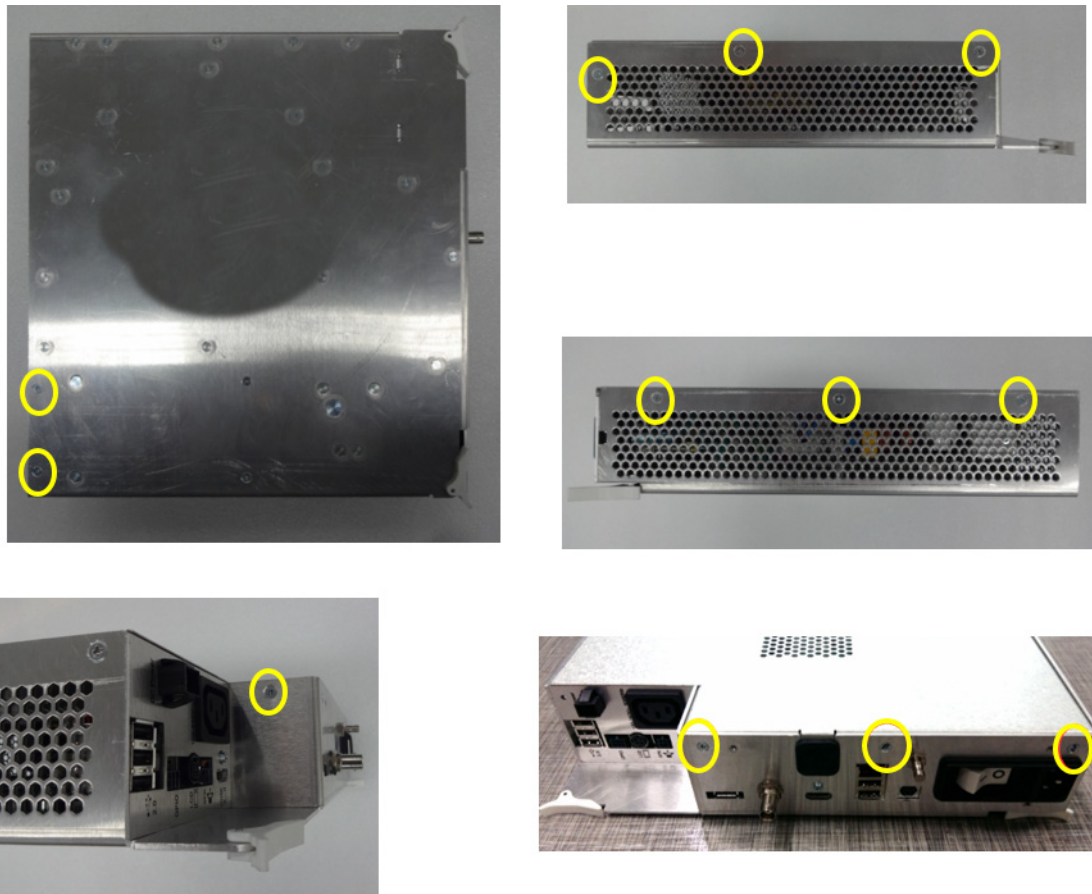


Figure 8-219 Unscrewing 12 screws to remove MIO BOX BRKT

- 5) Disconnect 2 connectors of BATTERY and unscrew 4 screws to remove BATTERY ASSY.

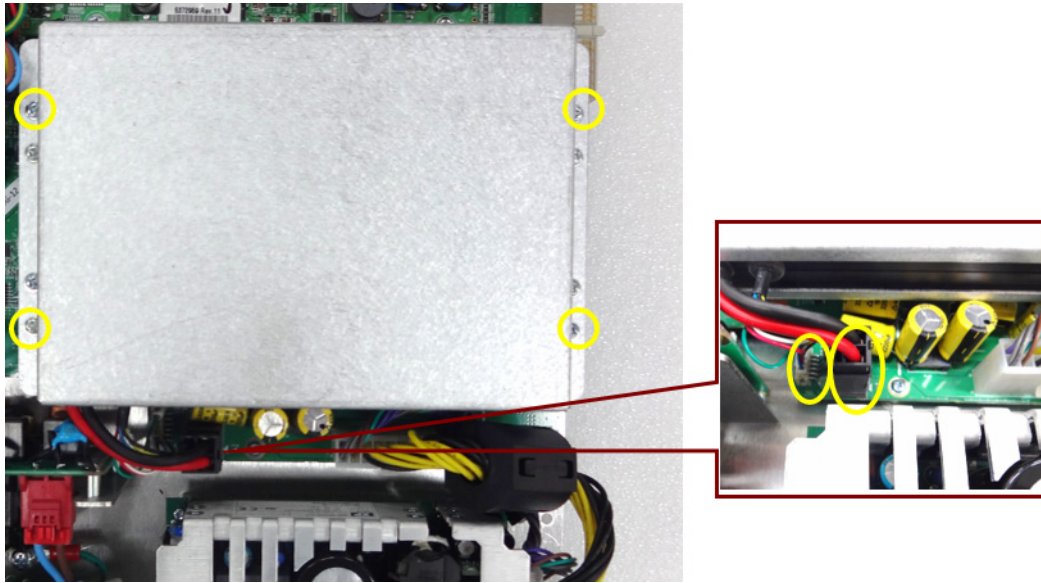


Figure 8-220 Removing BATTERY ASSY

- 6) Unscrew 4 screws to remove BATTERY TOP BRKT. Then remove POLARIS BATTERY PACK.

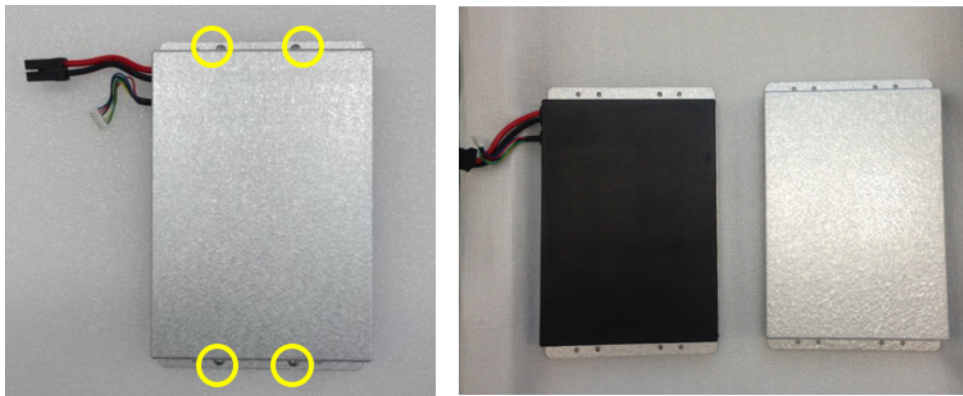


Figure 8-221 Removing BATTERY TOP BRKT to remove POLARIS BATTERY PACK

#### 8-46-4 Installation Procedure

All components to be installed in reverse order of removal.

## 8-46-5 Functional Check

- 1) Turn on the circuit breaker.



Figure 8-222 Turning on circuit breaker

- 2) Boot-up the console using power button on OPIO ASSY.



Figure 8-223 Booting-up using power button

- 3) Check that battery icon is displayed on left bottom side.



Figure 8-224 Checking battery icon

- 4) Switch off the circuit breaker (Wall power mode -> Battery mode). Confirm that is operating with battery mode.

## Section 8-47 Replacement of MBOB

### 8-47-1 Manpower

1 person, 20 minutes

### 8-47-2 Tools

Standard Phillips Screwdriver

### 8-47-3 Removal Procedure

- 1) Remove POWER CORD FIX BRKT and POWER CORD.



Figure 8-225 Removing POWER CORD FIX BRKT and POWER CORD

- 2) Remove REAR COVER ASSY.

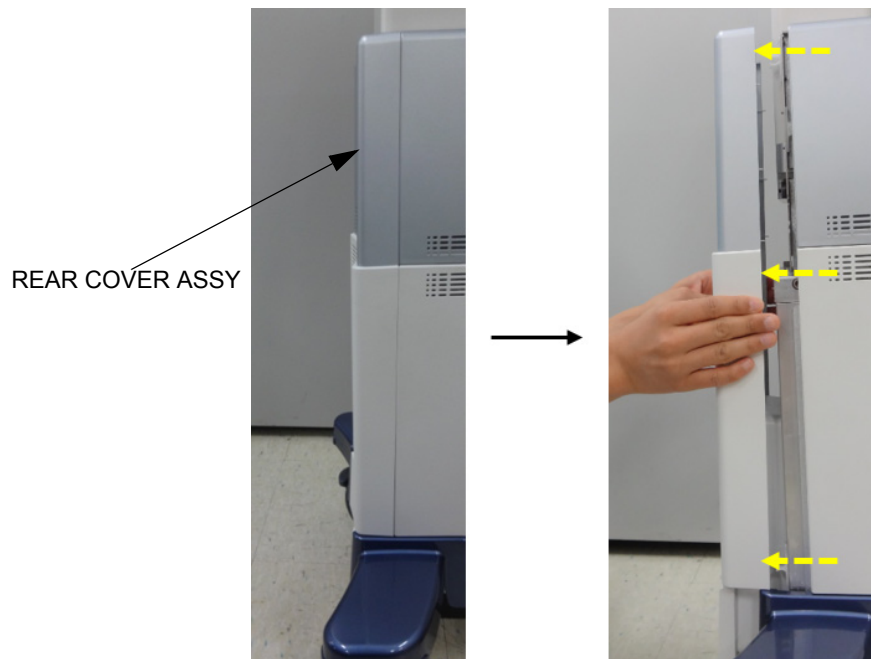


Figure 8-226 Removing REAR COVER ASSY



- 3) Unscrew 5 screws and remove REAR CABLE COVER BRKT.

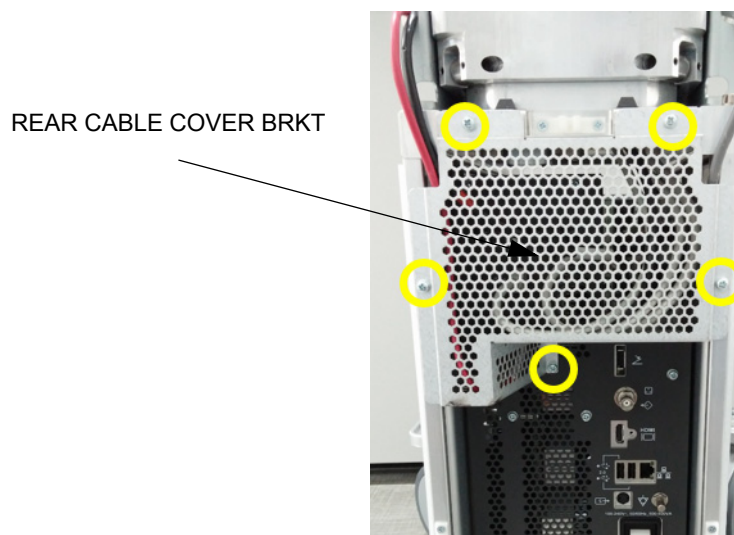


Figure 8-227 Unscrewing 5 screws

- 4) Remove CABLES (RED CIRCLE) and unscrew 7 screws, then remove NEST EMI BACK BKRT.

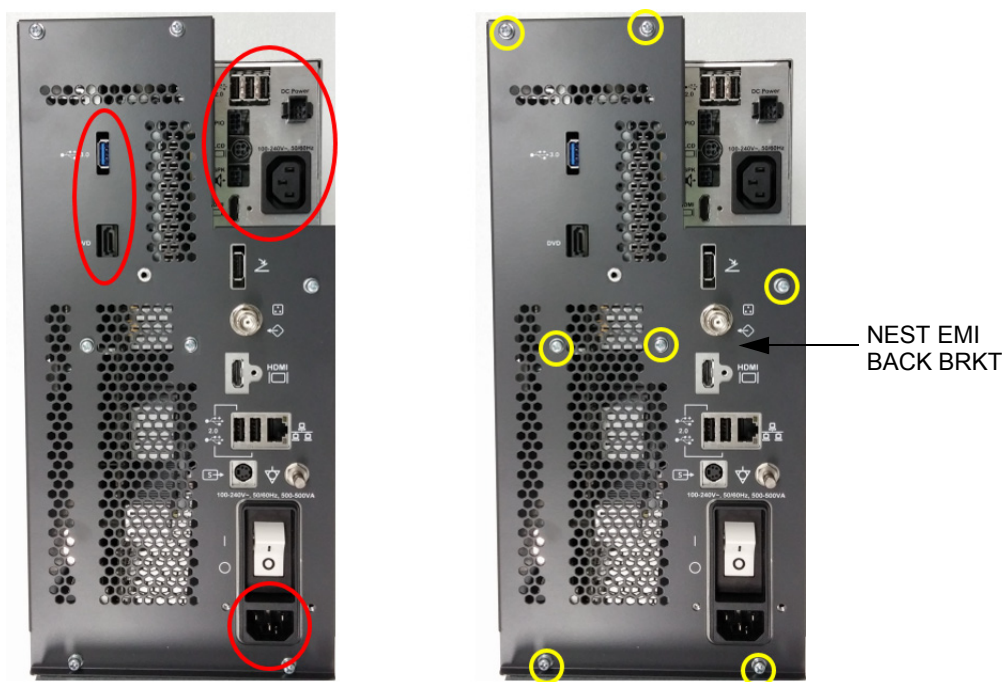


Figure 8-228 Removing CABLES (RED CIRCLE) and unscrewing 7 screws

- 5) Draw IO BOX from NEST FRAME.

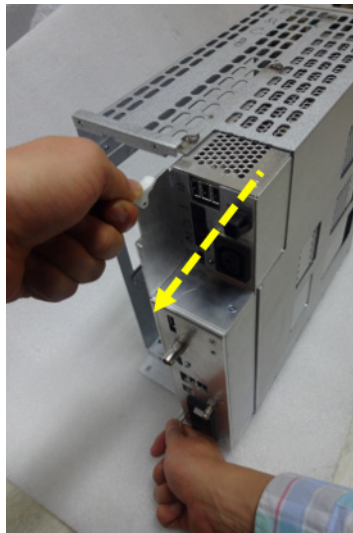


Figure 8-229 Drawing IO BOX from NEST FRAME

- 6) Unscrew 12 screws and remove MIO BOX BRKT.

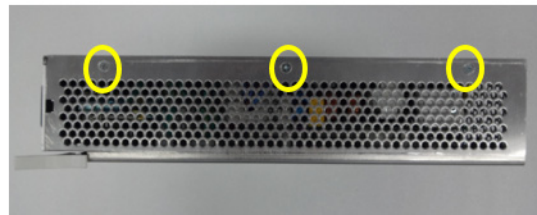
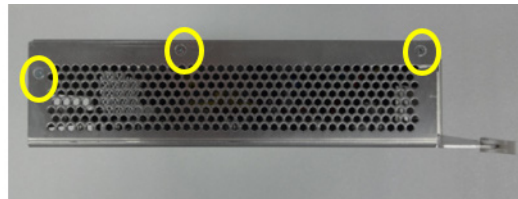
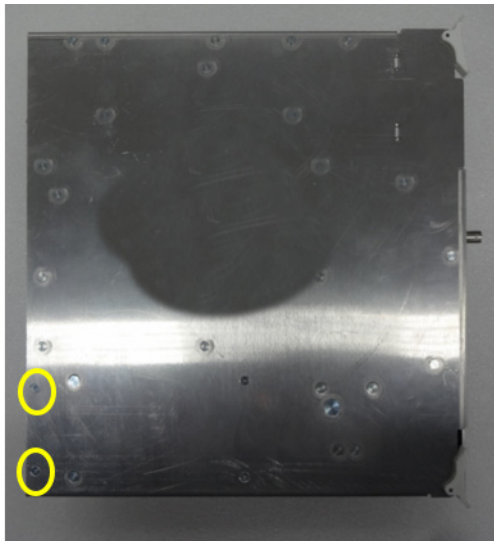


Figure 8-230 Unscrewing 12 screws

- 7) Disconnect PWR and SIG connectors.

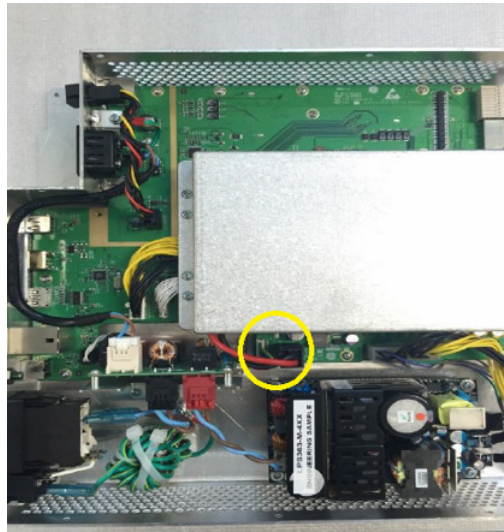


Figure 8-231 Disconnecting PWR and SIG connectors

- 8) Disassemble BATTERY ASSY.

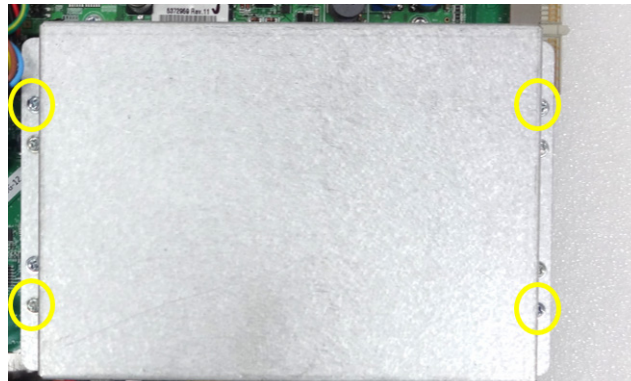


Figure 8-232 Disassembling BATTERY ASSY

- 9) Disassemble MBOB PWR HARNESS (5728317) and MBOB SIG HARNESS (5728318)

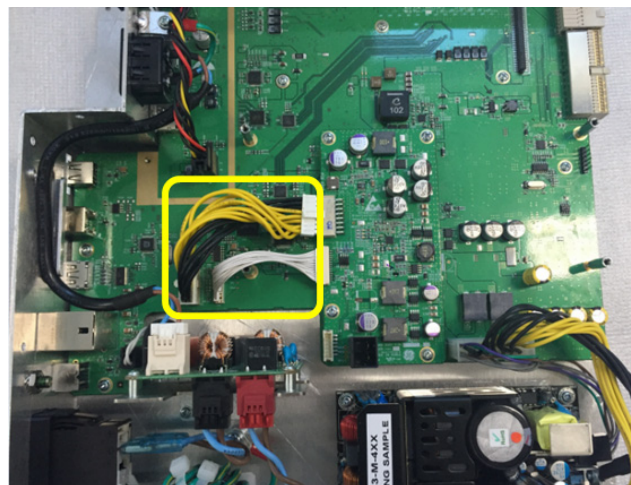


Figure 8-233 Disassembling MBOB PWR HARNESS (5728317) and MBOB SIG HARNESS (5728318)

10) Disassemble MBOB PWA from MIO-B PWA

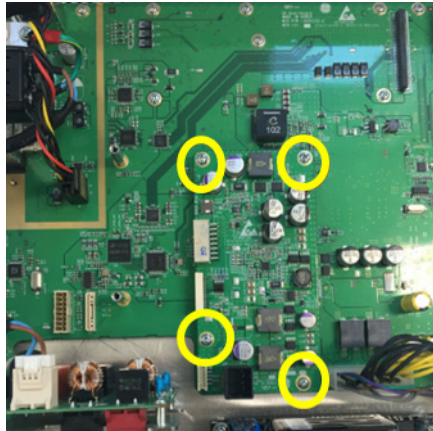


Figure 8-234 Disassembling MBOB PWA

#### 8-47-4 Installation Procedure

All components to be installed in reverse order of removal.

#### 8-47-5 Functional Check

Refer to *section 4-4* for Functional Diag Test List.



## Section 8-48 Replacement of MIO-B

### 8-48-1 Manpower

1 person, 20 minutes

### 8-48-2 Tools

Standard Phillips Screwdriver

### 8-48-3 Removal Procedure

- 1) Unscrew 12 screws and remove MIO BOX BRKT.

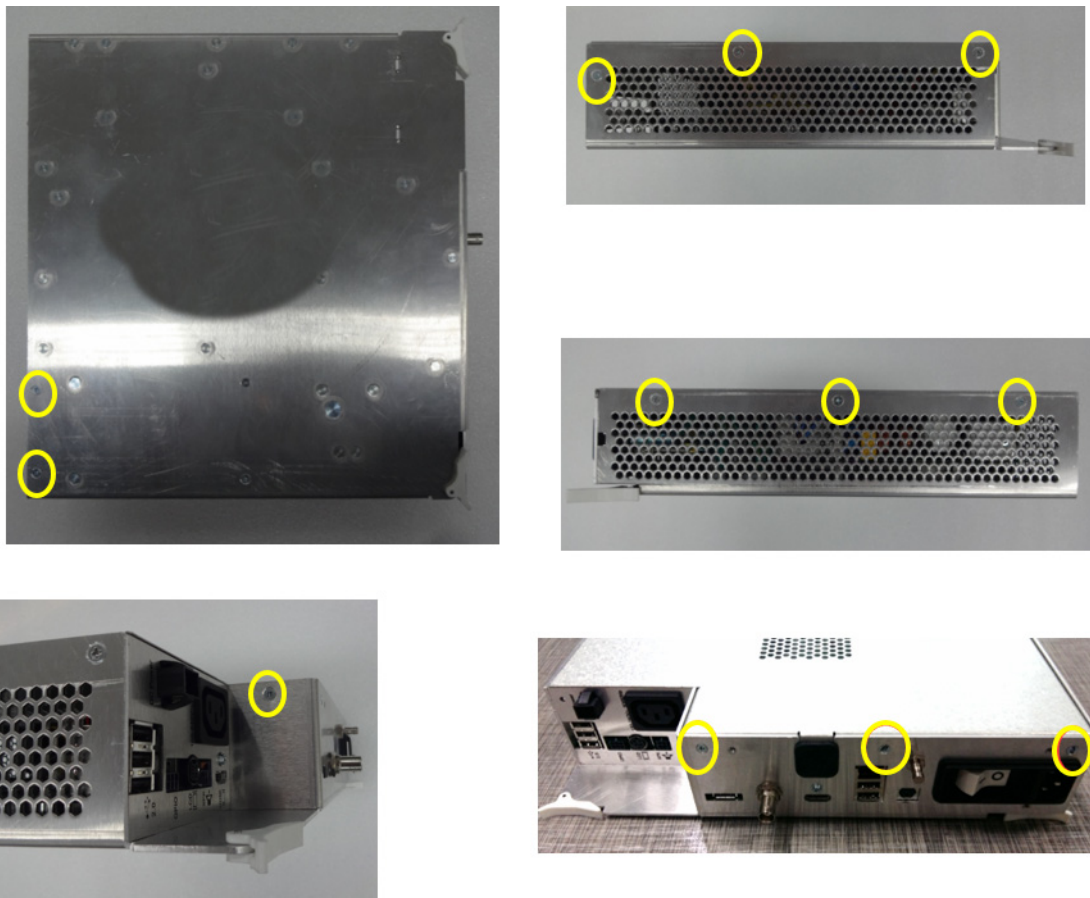


Figure 8-235 Unscrewing 12 screws

- 2) Disassemble ACFL BOARD FIX BRKT(5538682).

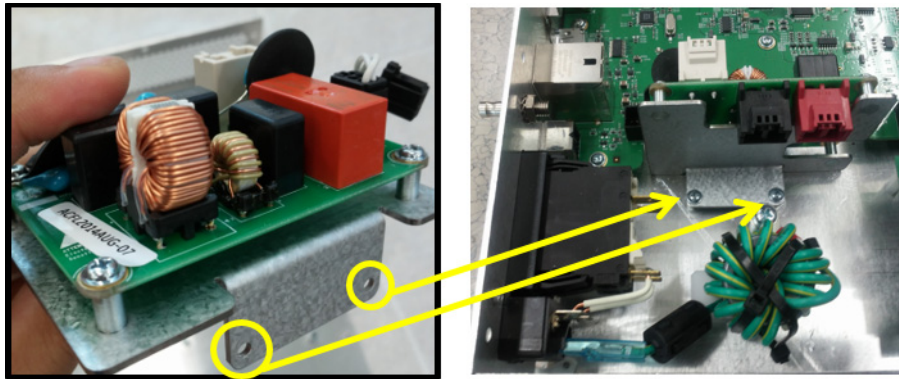


Figure 8-236 Disassembling ACFL BOARD FIX BRKT(5538682)

- 3) Disassemble Nut from the IOBOX-B Chassis Bracket

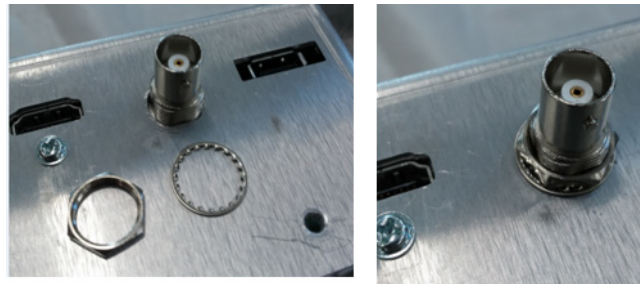


Figure 8-237 Disassembling Nut from the IOBOX-B Chassis Bracket

- 4) Disassemble the following screws

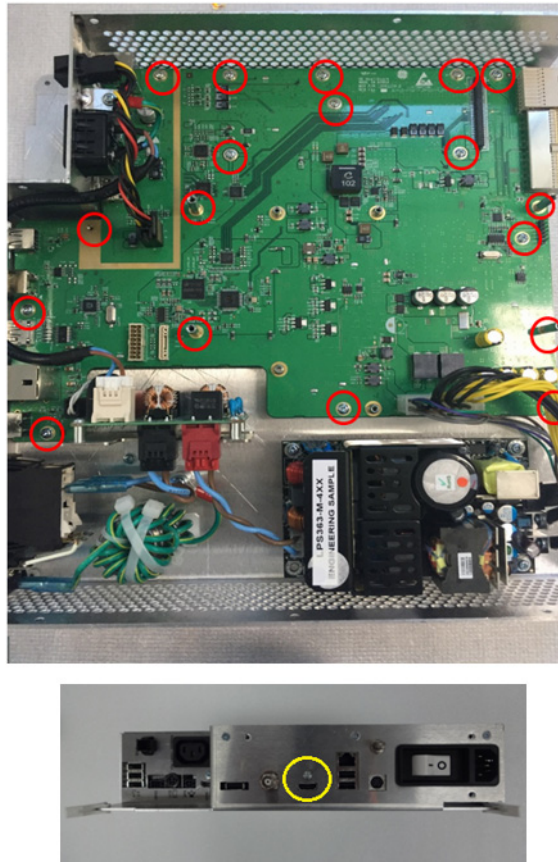


Figure 8-238 Disassembling the following screws

#### 8-48-4 Installation Procedure

All components to be installed in reverse order of removal.

#### 8-48-5 Functional Check

Refer to *section 4-4* for Functional Diag Test List.

## Section 8-49 Replacement of BBC

### 8-49-1 Manpower

1 person, 30 minutes

### 8-49-2 Tools

Standard Phillips Screwdriver, Hex-Wrench

### 8-49-3 Removal Procedure

- 1) Unscrew 2 screws to remove COVER BRKT.

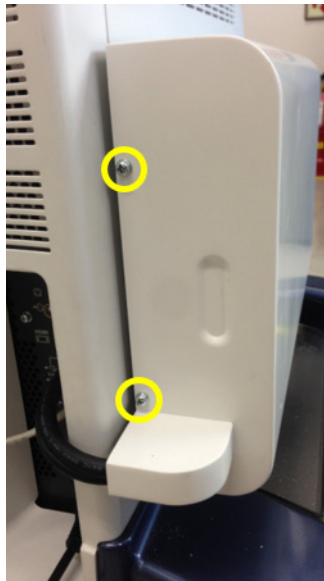


Figure 8-239 Unscrewing 2 screws to remove COVER BRKT

- 2) Disassemble BATTERY PACK COVER BRKT.

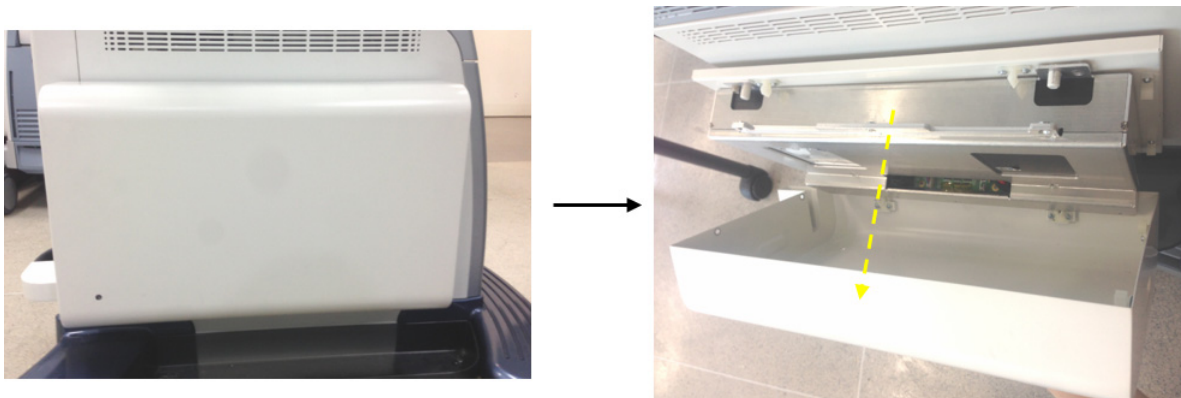
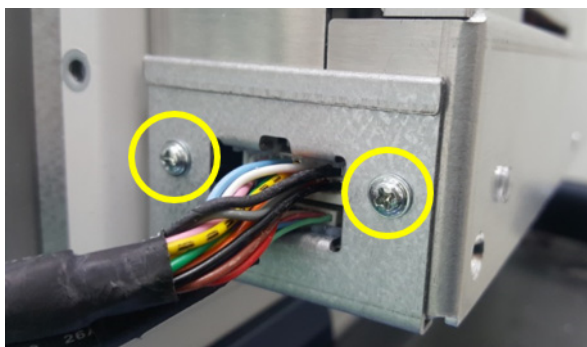


Figure 8-240 Disassembling BATTERY PACK COVER BRKT

- 3) Disassemble CONNECTOR BRKT using 2 screws. (2327596, SCREW WH M3X6)



**Figure 8-241 Disassembling CONNECTOR BRKT using 2 screws**

- 4) Disconnect BATTERY SIG HARNESS and PWR HARNESS.

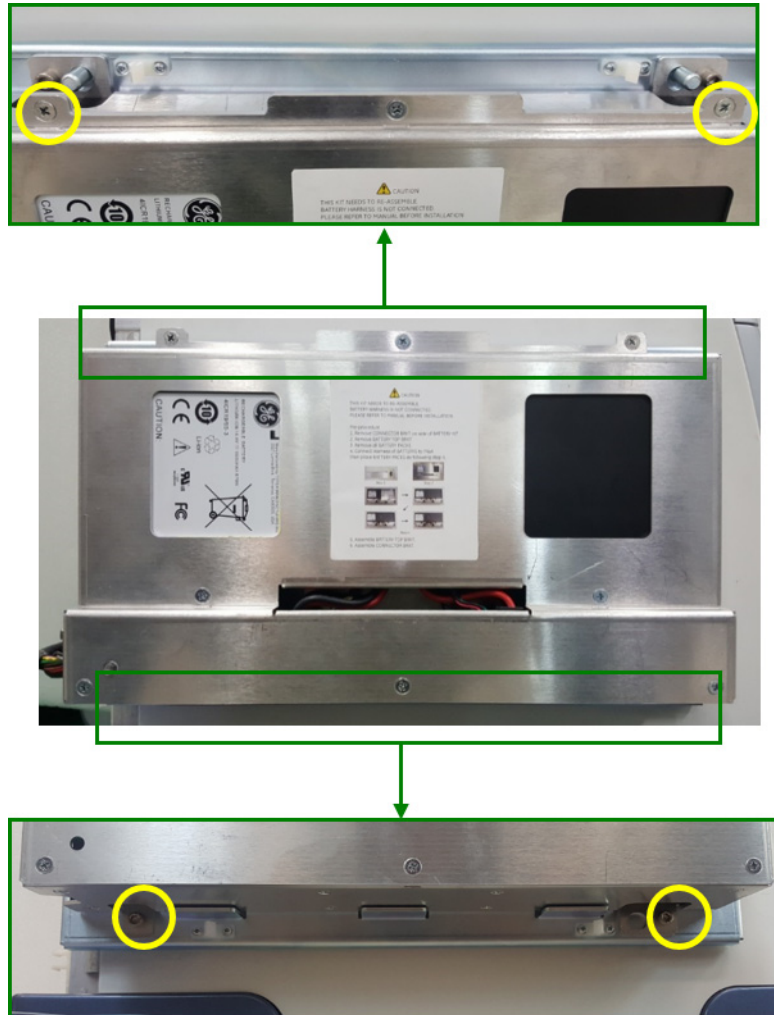


**Figure 8-242 Disconnecting BATTERY SIG HARNESS and PWR HARNESS**

**NOTE:** Both connectors are locking type. Please pull out connectors pressing locking points.



- 5) Unscrew LP7-P9 R2 EXT BATTERY PACK from BATTERY PACK FRAME BRKT LP7\_9 using 4 screws (5431313, SCREW HSH M5X10).



**Figure 8-243** Unscrewing LP7-P9 R2 EXT BATTERY PACK from BATTERY PACK FRAME BRKT LP7\_9 using 4 screws

- 6) Pull out LP7-P9 R2 EXT BATTERY PACK from BATTERY PACK FRAME BRKT



Figure 8-244 Pulling out LP7-P9 R2 EXT BATTERY PACK from BATTERY PACK FRAME BRKT

- 7) Unscrew 8 screws to remove BATTERY PACK TOP BRKT.

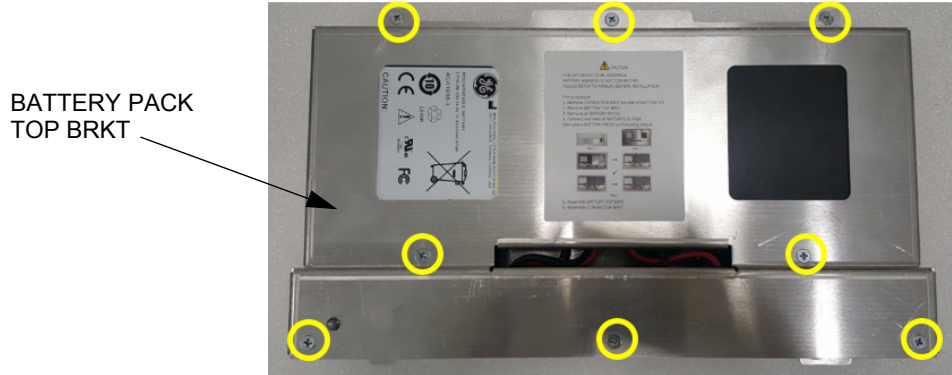


Figure 8-245 Unscrewing 8 screws to remove BATTERY PACK TOP BRKT

- 8) Remove 4 BATTERY PACKS.

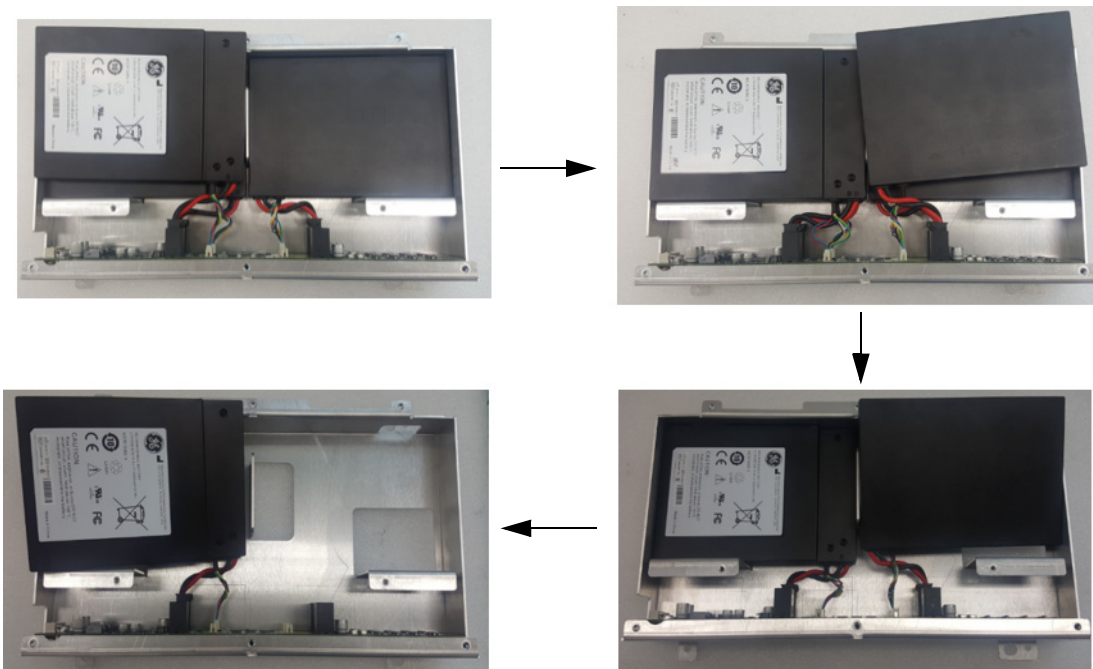


Figure 8-246 Removing 4 BATTERY PACKS



9) Disassemble BBC PWA

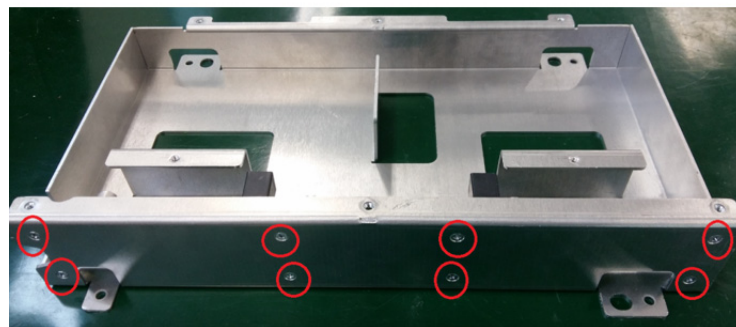
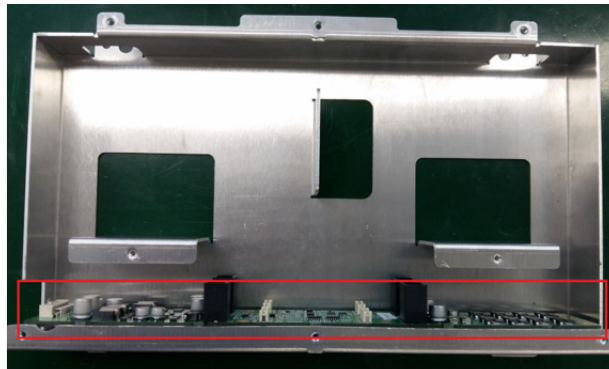


Figure 8-247 Disassembling BBC PWA

**8-49-4 Installation Procedure**

All components to be installed in reverse order of removal.

**8-49-5 Functional Check**

Refer to *section 4-4* for Functional Diag Test List.

## Section 8-50

### Replacement of LOGIQ P9 ROTATION MODULE KIT

#### 8-50-1 Manpower

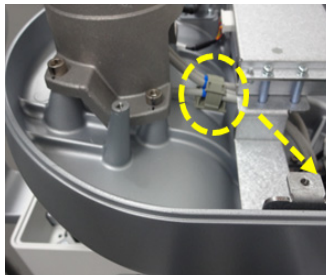
1 person, 30 minutes

#### 8-50-2 Tools

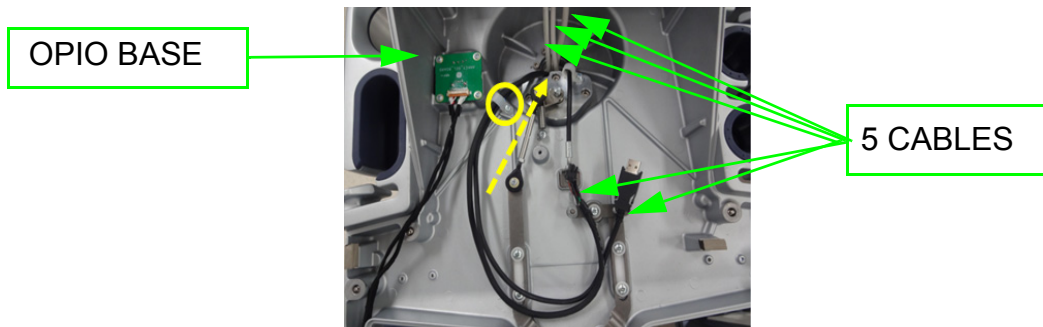
Standard Phillips Screwdriver, Nipper, Torque wrench: Needed HEX wrench - 4mm HEX wrench (For M5 HEX Screw), Needed force - 60 Kgf·cm (For screw tighten force), Monkey Spanner (For NUT M4), Hot air blower or Electric hair dryer

#### 8-50-3 Removal Procedure

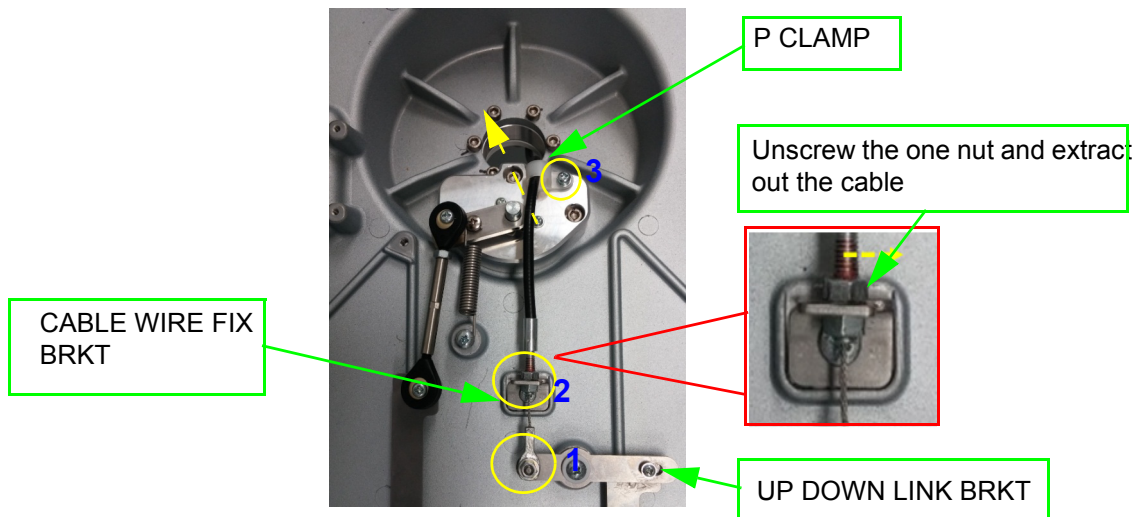
- 1) Remove the Monitor, Monitor Arm and OPIO Assy.
- 2.) Unlock cable clamp and carefully pull down 3 cables.



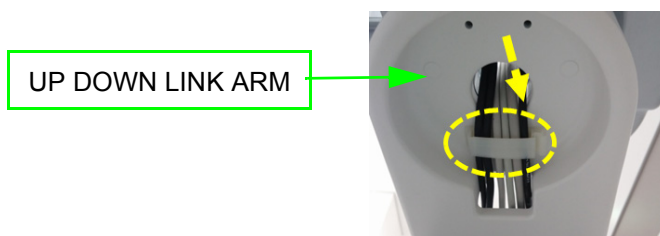
- 3.) Unscrew 1 screw and remove the cable clamp, and then extract out the 5 cables through the hole of OPIO BASE.



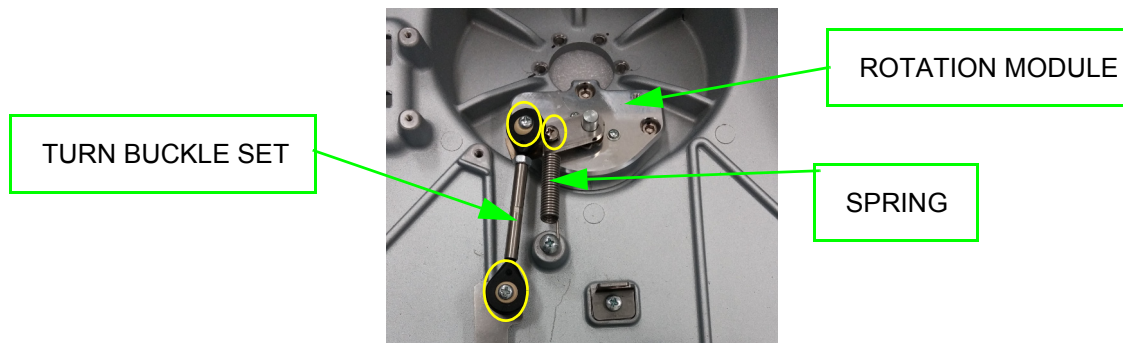
- 4.) Unscrew nut and unfix the cable wire from the UP DOWN LINK BRKT.
- 5.) Unscrew nut and unfix the cable wire from the CABLE WIRE FIX BRKT.
- 6.) Unscrew 1 screw and remove the P CLAMP, and then extract out the cable through hole of the OPIO base.



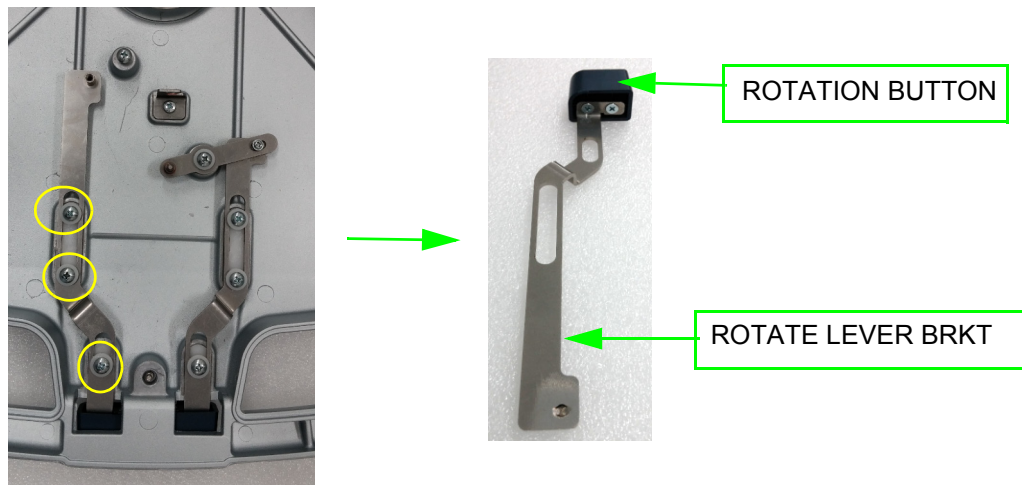
- 7.) Unlock CABLE CLAMP, and then extract out the all cables from the OPIO base and the UP DOWN LINK ARM.



- 8.) Unscrew 3 screws and remove the TURN BUCKLE SET and SPRING from the ROTATION MODULE ASSY.



- 9.) Unscrew 3 screws and remove the ROTATE LEVER BRKT from OPIO base.  
10.) Unscrew 2 screws and remove the ROTATION BUTTON from ROTATE LEVER BRKT.



- 11.) Unscrew 3 screws and remove the ROTATION MODULE ASSY from the OPIO base.

 **CAUTION** When reassemble the ROTATION MODULE ASSY, HSH screw should be tightened proper torque (60kgf-cm)

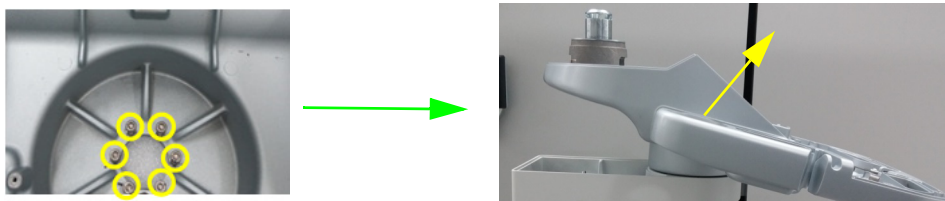
 **CAUTION** When reassemble the screws, please use SCREW HSH M5X16 NYLOK(5729013).



12.) Unscrew 6 screws and carefully remove the OPIO base.

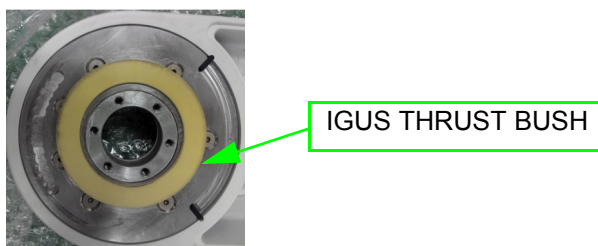
 **CAUTION** When reassemble the OPIO base, HSH screw should be tightened proper torque (60kgf-cm).

 **CAUTION** When reassemble the screws, please use SCREW HSH M5X16 NYOK (5729013).

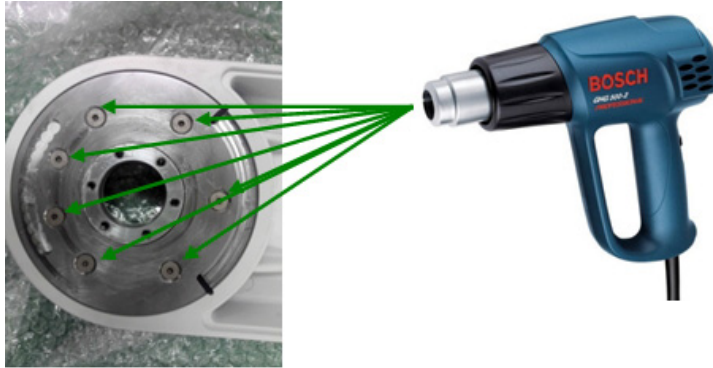


13.) Remove the IGUS THRUST BUSH.

 **CAUTION** DO NOT wipe out grease from part.



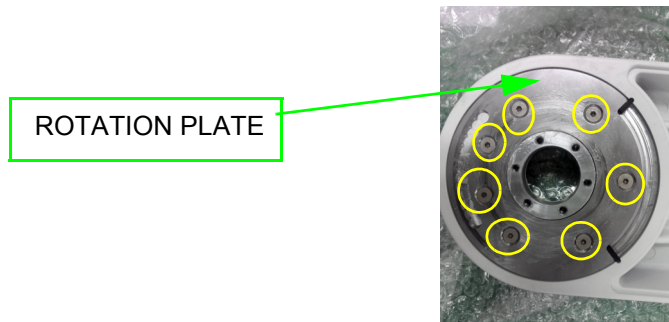
- 14.) Each screws should be heated for 5 minutes by HOT AIR BLOWER or ELECTRIC HAIR DRYER to melt LOCTITE on screw before unscrew the screw. ( **Caution hot surfaces** )



- 15.) Unscrew 7 screws and then remove the ROTATION PLATE.

**CAUTION** When reassemble the ROTATION MODULE ASSY, HSH screw should be tightened proper torque (60kgf-cm). When reassemble the screws, please use SCREW FSH M5X16 NYLOK(5729014).

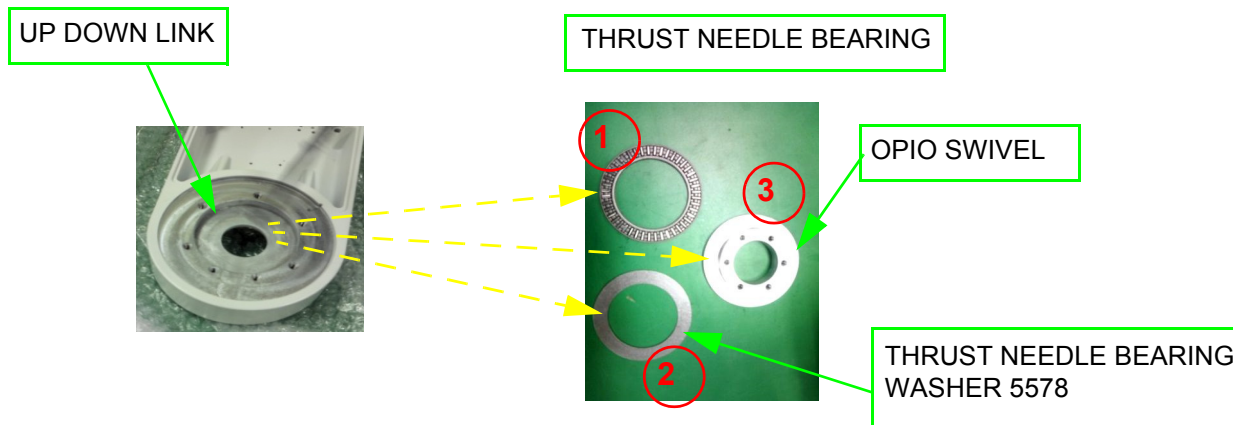
**CAUTION** Carefully unscrew the each screw to prevent wear of screw head.



- 16.) Remove the THRUST NEEDLE BEARING WASHER 5578, THRUST NEEDLE BEARING 5578, OPIO SWIVEL SHAFT from the UP DOWN LINK ARM in order.



**CAUTION** Do not wipe out grease from part.



#### 8-50-4 Installation Procedure

Parts to be installed in reverse order on removal. But ROTATION PLATE, OPIO SWIVEL SHAFT, ROTATE LEVER BRKT and ROTATION MODULE ASSY should be reassembled using new parts.

#### 8-50-5 Functional Check

Test	Refer to	Note
System Exterior Visual Check	section 4-3-1 of LOGIQ P9P7 PSM(GPN : 5599028)	
Mechanical Parts Functional Check	section 4-3-2 of LOGIQ P9P7 PSM(GPN : 5599028)	
Power On/Off	section 4-3-3 of LOGIQ P9P7 PSM(GPN : 5599028)	
System Integration Checks	section 4-3-5 of LOGIQ P9P7 PSM(GPN : 5599028)	OPIO Test only



## Section 8-51

### Replacement of ODD Dummy Cover R3

#### 8-51-1 Manpower

1 person, 5 minutes

#### 8-51-2 Tools

Standard Phillips Screwdriver

#### 8-51-3 Pre work

- 1) Remove Rear Cover (refer to *section 8-9*)
- 2) Remove Top Cover (refer to *section 8-7*)

#### 8-51-4 Removal Procedure

- 1) Unscrew 2 screws and disassemble ODD Dummy cover.

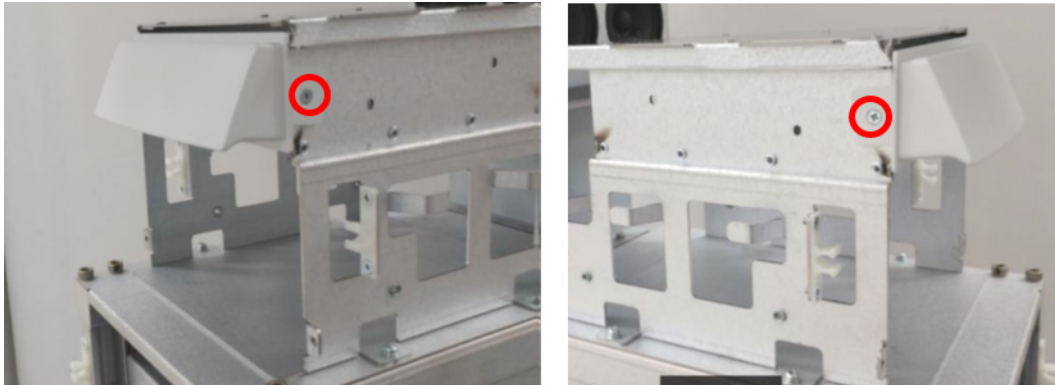


Figure 8-248 Unscrewing 2 screws and disassembling ODD Dummy cover

#### 8-51-5 Installation Procedure

All components to be installed in reverse order of removal.

#### 8-51-6 Functional Check

Visual inspection only



## Section 8-52

### Replacement of Probe Light assy

#### 8-52-1 Manpower

1 person, 20minutes

#### 8-52-2 Tools

Standard Phillips Screw driver

#### 8-52-3 Pre work

1) Remove OPIO Panel assy (refer to section 8-14)

#### 8-52-4 Removal Procedure

1) Remove probe light cable.

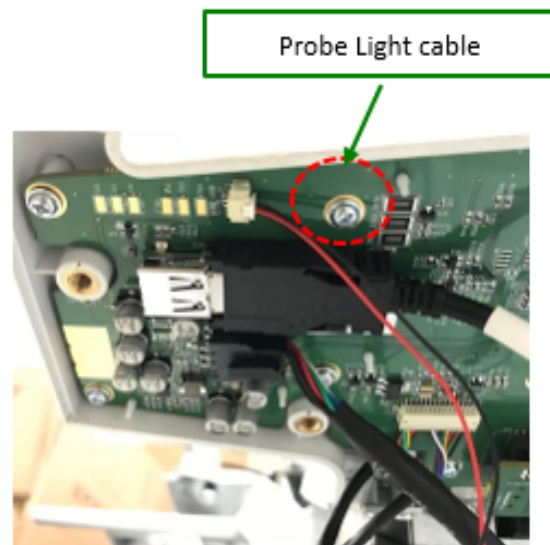
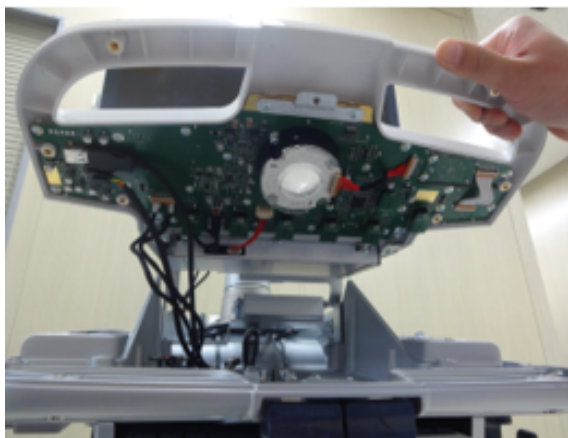


Figure 8-249 Remove of probe light cable from LP7P9 OPIO MAIN BOARD PWA

- 2) Untie clamp for release Probe light cable

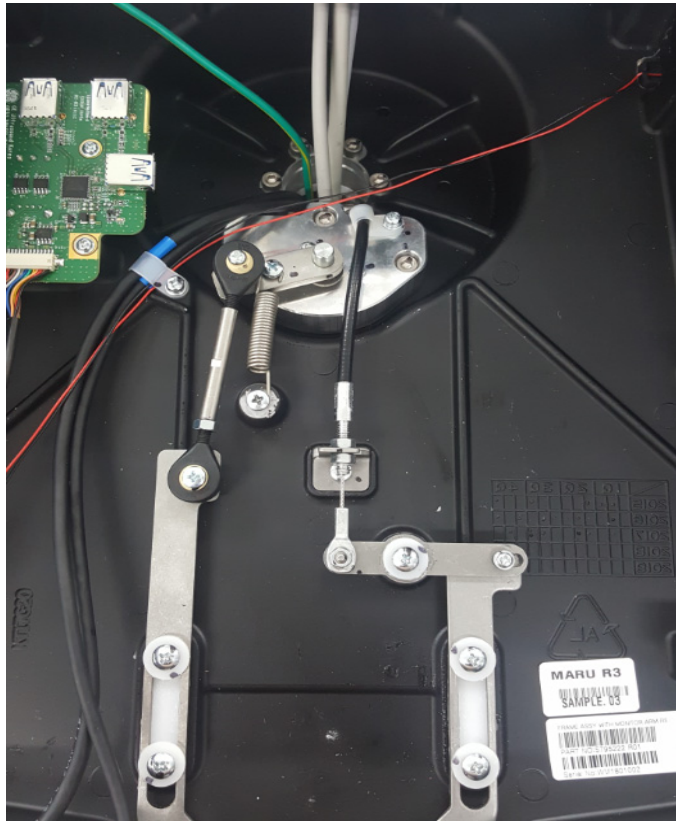


Figure 8-250 Un-tie of Probe light cable from OPIO base

# Chapter 9

## Renewal Parts

---

### Section 9-1 Overview

#### 9-1-1 Purpose of Chapter 9

This chapter gives an overview of replacement parts available for the LOGIQ P9/P7.

**Table 9-1 Contents in Chapter 9**

Section	Description	Page Number
9-1	Overview	9-1
9-2	List of Abbreviations	9-2
9-3	LOGIQ P9/P7 Software	9-3
9-4	Parts List Groups	9-4
9-5	Plastics Covers (Front/Sides/Rear)	9-6
9-6	LCD Monitor	9-10
9-7	OPIO	9-12
9-8	Nest Box Parts	9-17
9-9	Mechanical Part	9-21
9-10	Options	9-21
9-11	Optional Peripherals and Accessories	9-29
9-12	Probes	9-30
9-13	Power Cord	9-31

## Section 9-2

### List of Abbreviations

<b>AC</b>	Alternating Current
<b>ADC</b>	Analog to Digital Converter
<b>A/N Key</b>	Alpha Numeric Keys
<b>ASIC</b>	Application Specific Integrated Circuit
<b>Assy</b>	Assembly
<b>MCB</b>	MARU Core board(Merged Radio frequency module and Beaforming board)
<b>MBP</b>	Backplane interface module
<b>CPU</b>	Central Processing Unit
<b>MCWD</b>	Continuous wave doppler module
<b>DAC</b>	Digital to Analog Converter
<b>DC</b>	Direct Current
<b>DSP</b>	Digital Signal Processing
<b>DVD</b>	Digital Video Disc
<b>DVI</b>	Digital Visual Interface
<b>ECGP</b>	Electrocardiography module
<b>EUM</b>	Electronic User Manual
<b>FRU 1</b>	Replacement part available in parts hub
<b>FRU 2</b>	Replacement part available from the manufacturer (lead time involved)
<b>HDD</b>	Hard Disk Drive
<b>Int</b>	Internal
<b>I/O</b>	Input/Output
<b>LCD</b>	Liquid Crystal Display
<b>PCI</b>	Peripheral Component Interconnect
<b>PWA</b>	Printed Wire Assembly
<b>SOM</b>	System On Module
<b>SSD</b>	Solid State Drive
<b>USB</b>	Universal Serial Bus

## Section 9-3 LOGIQ P9/P7 Software

Table 9-2 LOGIQ P9/P7 software (R1 to R2.5)

Item	SW Version	Base SW Part Number	Application SW Part Number	Qty	FRU	R1	R2	R2.5
1	R1.0.0	5507300	5507301	1	1	Y	N	N
2	R1.0.1	5507300-2	5507301-2	1	1	Y	N	N
3	R1.0.2		5507301-3	1	1	Y	N	N
4	R1.0.3		5507301-4	1	1	Y	N	N
5	R1.0.4	5507300-3	5507301-5	1	1	Y	N	N
6	R1.0.5	5507300-4	5507301-6	1	1	Y	N	N
7	R2.0.2	5724300	5724301	1	1	N	Y	N
8	R2.0.3	5724300-2	5724301-2	1	1	N	Y	N
9	R2.0.4		5724301-3	1	1	N	Y	N
10	R2.0.5	5724300-2(Ivybridge)	5724301-4	1	1	N	Y	N
11	R2.0.6	5724300-3(Skylake)	5724301-5	1	1	N	Y	N
12	R2.5.3	5766409	5760487	1	1	N	Y	Y
13	R2.5.4	5781578	5760487-2	1	1	N	N	Y
14	R2.5.5	5781578-2(Skylake)	5760487-3	1	1	N	N	Y
15		5766409-2(Ivybridge)		1	1	N	N	Y

Table 9-3 LOGIQ P9/P7 software (R3)

Item	SW Version	SW FRU Number	Qty	FRU	R3
1	R3.0.2	5795390	1	1	Y
2	R3.0.3	5795390-2	1	1	Y

**NOTE:** How to check CPU code name, Ivybridge or Skylake

- 1.) Turn the system on and go to BIOS mode by pressing 'Del' key
- 2.) Go to 'Main -> 'Platform Information'
- 3.) Check 'Codename'. There is 'IvyBridge' or 'SkyLake'

**NOTE:** SOM 6324558 -x is only allowed for Ivybridge.  
SOM 7324558 is only allowed for Skylake.

Section 9-4  
Parts List Groups

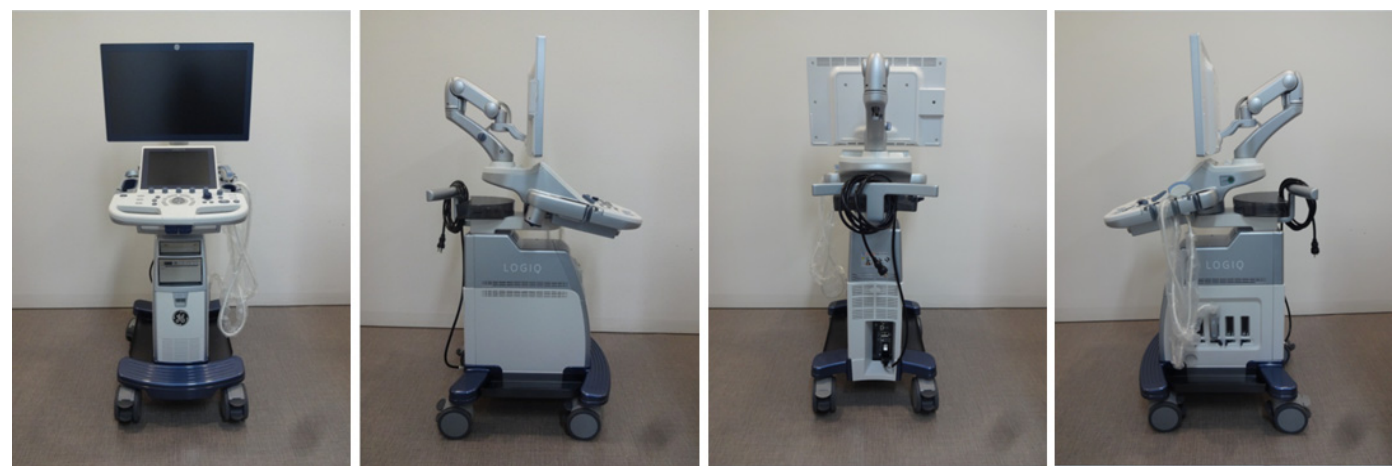


Figure 9-1 Console Views (R1 to R2.5)



Figure 9-2 Console Views(R3)

Table 9-4 Mechanical and user accessible parts

Item	Part Group Name	Table Number	Description
100-109-	Plastics Covers (Front/Sides/Rear)	Table 9-5 on page 9-6	Housing Covers
	Plastics Covers (Front/Sides/Rear) (R3)	Table 9-6 on page 9-8	Housing Covers
200-202	LCD Monitor	Table 9-7 on page 9-11	Monitor and its covers
301-323	OPIO	Table 9-8 on page 9-15	User interface parts
401-416	Nest Box Parts	Table 9-9 on page 9-19	Main board modules Including front/back end boards

**Table 9-4 Mechanical and user accessible parts**

Item	Part Group Name	Table Number	Description
501- 516-	<a href="#">Mechanical Part</a>	<a href="#">Table 9-10 on page 9-22</a>	Mechanical Parts and speaker
701- 707	<a href="#">Mechanical Part</a>	<a href="#">Table on page 9-25</a>	
811- 812	<a href="#">Optional Peripherals and Accessories</a>	<a href="#">Table 9-12 on page 9-29</a>	B/W Printer, Color Printer, Line Printer Bluetooth
	<a href="#">Probes</a>	<a href="#">Table 9-10 on page 9-21</a>	Probes
930- 941	<a href="#">Power Cord</a>	<a href="#">Table 9-13 on page 9-32</a>	Power Cord

## Section 9-5 Plastics Covers (Front/Sides/Rear)

### 9-5-1 Plastics Covers (Front/Sides/Rear) (R1 ~ R2.5)



Figure 9-3 Plastics Covers (Front/Side/Rear)

Table 9-5 Plastic Covers

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
101	Side Cover R Assy	5499849	Assy Plastic	1	1	Y	Y	Y	N
102	Side Cover L Assy R2	5499847-2	Assy Plastic	1	1	Y	Y	Y	N
103	Front Cover Assy	5499845	Assy Plastic	1	1	Y	Y	Y	N
104	Rear Cover Assy R2.5	S5499822	Assy Plastic(with e-IFU label)	1	1	N	N	Y	N
	Rear Cover Assy	5499846	Assy Plastic(without e-IFU label)	1	1	Y	Y	Y	N
105	Top Cover - High Cabinet	5499645	High Cabinet Cover	1	1	Y	Y	Y	N
106	Top Cover - Low Cabinet	5499661	Low Cabinet Cover	1	1	Y	Y	Y	N
107	High Cabinet Dummy Cover	5499660	Plastics, BW PRT Bezel, Dummy for High Cabinets	1	1	Y	Y	Y	N
108	Dummy Cover Set	5582883	RS Dummy Cover, RS Lever Dummy Cover, CWD Dummy Cover	1	1	Y	Y	Y	N
109	Foot Cover Set	5582885	Foot Cover Front, Foot Cover Rear L, Foot Cover Rear R	1	1	Y	Y	Y	N



**Table 9-5 Plastic Covers**

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
110	Link Arm Top Cover	5507028	Plastic	1	1	Y	Y	Y	Y
111	OPIO Top Cover Set	5582886	OPIO Top Cover L, OPIO Top Cover R, OPIO USB COVER	1	1	Y	Y	Y	Y

## 9-5-2 Plastics Covers (Front/Sides/Rear) (R3)



Figure 9-4 Plastics Covers (Front/Side/Rear) (R3)

Table 9-6 Plastic Covers (R3)

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
101-1	Side Cover R Assy R3	5794893	Assy Plastic	1	1	N	N	N	Y
102-1	Side Cover L Assy R3	5794894	Assy Plastic	1	1	N	N	N	Y
103-1	Front Cover Assy R3	5794912	Assy Plastic	1	1	N	N	N	Y
104-1	Rear Cover Assy R3	5794891	Assy Plastic	1	1	N	N	N	Y
105-1	High Cabinet Assy R3	5794899	Assy Plastic	1	1	N	N	N	Y
106-1	Low Cabinet Assy R3	5794892	Assy Plastic	1	1	N	N	N	Y

**Table 9-6 Plastic Covers (R3)**

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
107-1	High Cabinet Dummy Cover R3	5794085	Plastics, BW PRT Bezel, Dummy for High Cabinets	1	1	N	N	N	Y
108-1	Dummy Cover Set R3	S5794033	RS Dummy Cover, RS Lever Dummy Cover, CWD Dummy Cover	1	1	N	N	N	Y
109-1	Foot Cover Set R3	S5794020	Foot Cover Front, Foot Cover Rear L, Foot Cover Rear R	1	1	N	N	N	Y
110-1	ODD Dummy Cover R3	5794027	Plastic	1	1	N	N	N	Y

Section 9-6  
LCD Monitor



Figure 9-5 LCD Monitor

Table 9-7 User Interface

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
201	21.5" LCD	5501560-121	Full 21.5" LCD Monitor set with hinge	1	1	Y	N	N	N
202	21.5 INCH LCD MONITOR with USB 2.0 and without glass filter	5501560-14	Full 21.5" LCD Monitor set with hinge	1	1	N	Y	Y	N
203	MARU R3 21.5 monitor	7501560	MARU R3 21.5 monitor	1	1	N	N	N	Y
204	21.5" LCD Cover SET	5582887	Plastics, Front, Rear and Cable cover, Monitor USB cap, Glass Filter for 21.5" LCD	1	1	Y	N	N	N
205	21.5 INCH LCD Cover SET w/o glass filter	5727721	Plastics, Front, Rear and Cable cover, Monitor USB cap	1	1	N	Y	Y	N
206	21.5inch LCD Cover SET R3	S5792901	Plastics, Front, Rear and Cable cover, Monitor USB cap	1	1	N	N	N	Y

Section 9-7 OPIO

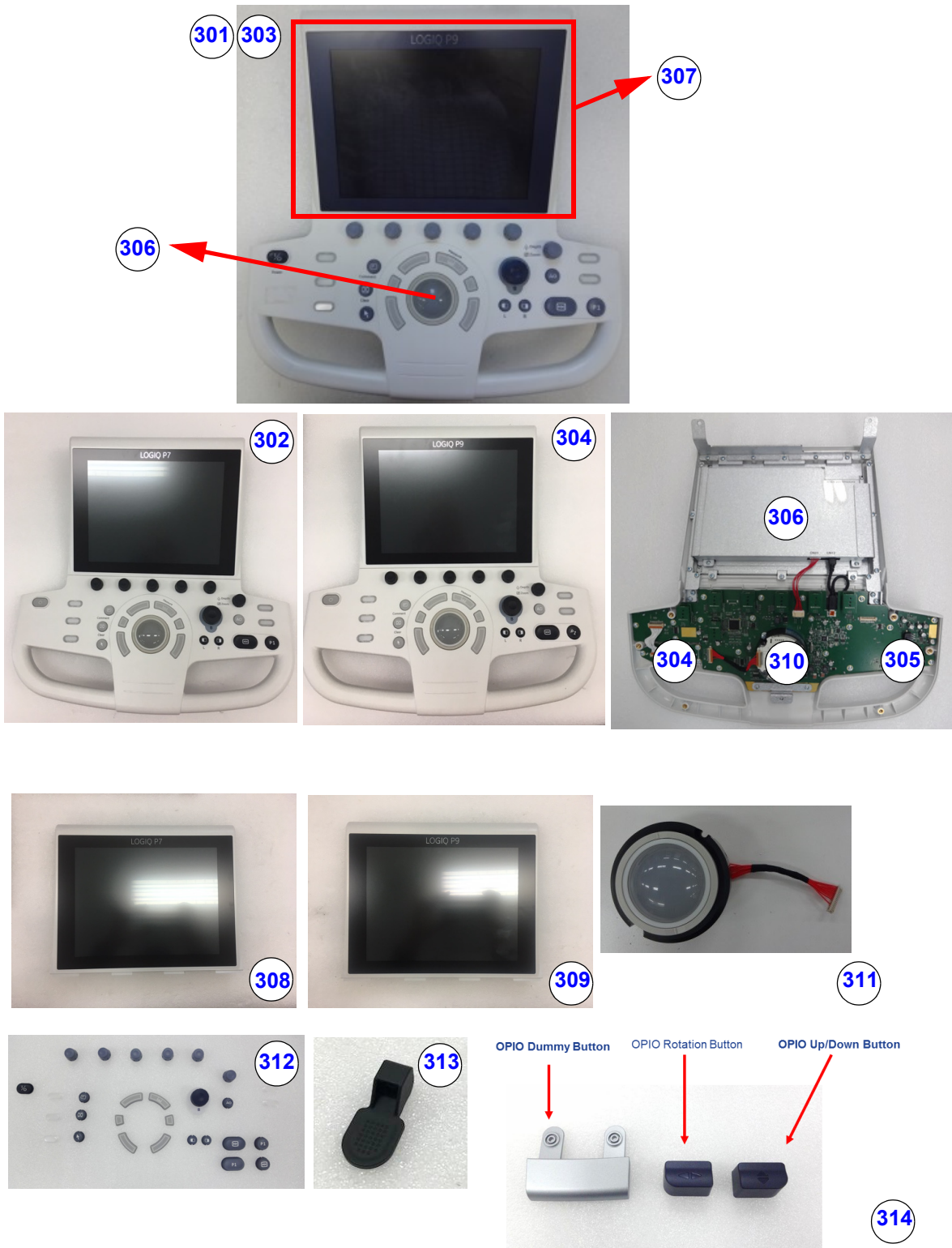
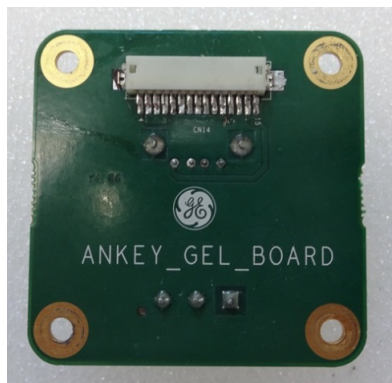


Figure 9-6 OPIO



315



316



318

OPIO Upper Cover and Touch Screen P7



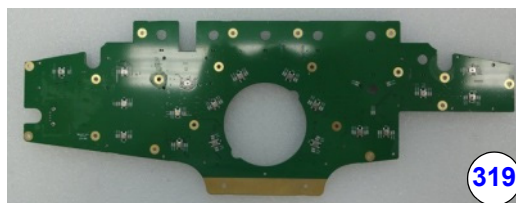
OPIO Upper Cover and Touch Screen P9



OPIO Lower Cover



317



319



320

Figure 9-7 OPIO





Figure 9-8 OPIO 5



Table 9-8 OPIO

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
301	LOGIQ P7 OPIO ASSY	S5503848	Full OPIO set, including Main and Sub OPIO sets for LOGIQ P7 (Different Emblem)	1	1	Y	N	N	N
	OPIO ASSY LOGIQ P7 SET	S5781418-2	OPIO ASSY LOGIQ P7 SET	1	1	Y	Y	Y	N
302	OPIO ASSY LOGIQ P7 R3	7503848	Full OPIO set, including Main and Sub OPIO sets for LOGIQ P7 R3(Different Emblem)	1	1	N	N	N	Y
303	LOGIQ P9 OPIO ASSY	S5603848	Full OPIO set, including Main and Sub OPIO sets for LOGIQ P9 (Different Emblem)	1	1	Y	N	N	N
	OPIO ASSY LOGIQ P9 SET	S5781419-2	OPIO ASSY LOGIQ P9 SET	1	1	Y	Y	Y	N
304	OPIO ASSY LOGIQ P9 R3	7603848	Full OPIO set, including Main and Sub OPIO sets for LOGIQ P9 R3 (Different Emblem)	1	1	N	N	N	Y
305	OPIO Main PWA Assy	5503847	OP Main PWA Assembly	1	1	Y	N	N	N
306	LOGIQ P7/P9 OPIO 10.4 inch LCD module set	5561038	Maru OPIO 10.4 LCD Set	1	1	Y	N	N	N
307	LP7 Upper ASSY SET	S5781423	LP7 Upper ASSY SET	1	1	Y	Y	Y	N
	LP7 Upper ASSY SET	S5788926		1	1	Y	Y	Y	N
307	LP9 Upper ASSY SET	S5781424	LP9 Upper ASSY SET	1	1	Y	Y	Y	N
	LP9 Upper ASSY SET R3	S6788927	LP9 Upper ASSY SET R3	1	1	N	N	N	Y
308	LP7 Upper ASSY SET R3	S6788926		1	1	N	N	N	Y
309	LP9 Upper ASSY SET R3	S6788927	LP9 Upper ASSY SET R3	1	1	N	N	N	Y
310	Trackball Assy	5554918	Trackball Assy	1	1	Y	N	N	N
311	LP7P9 OPIO Trackball with cable - H	6554918-2	LP7P9 OPIO Trackball with cable - H	1	1	N	Y	Y	Y
312	OPIO Button and Knob Sets	S5582808-2	OP Button+Knob sets	1	1	Y	Y	Y	N
313	RS KNOB SET R3	S5794028	RS KNOB SET R3	1	1	N	N	N	Y
314	OPIO Up/Down Button Sets	5582809	Up/Down Button, Rotation Button, OPIO Dummy Button Sets	1	1	Y	Y	Y	N
315	OPIO AN Key Gel Board	5503844	OPIO AN Key Gel Board	1	1	Y	N	N	N
		S5781421	LP7P9 OPIO ANKEY GEL BOARD PWA - H	1	1	N	Y	Y	N
316	LP7P9 OPIO ANKEY GEL BOARD PWA	7503844	LP7P9 OPIO ANKEY GEL BOARD PWA	1	1	Y	Y	Y	N
317	LOGIQ P7 OPIO Plastic Covers with Touch Screen	5582805	Full Cover set	1	1	Y	Y	Y	N
	LOGIQ P9 OPIO Plastic Covers with Touch Screen	5582806	Full Cover set	1	1	Y	Y	Y	N
318	OPIO LOWER COVER	5507036	OPIO LOWER COVER	1	1	Y	Y	Y	N
319	OPIO Main PWA Assy	S5781422	OPIO Main PWA Assy	1	1	N	Y	Y	Y

Table 9-8 OPIO

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
320	LP7P9 OPIO MAIN BOARD PWA SET	S5781465	LP7P9 OPIO MAIN BOARD PWA SET	1	1	N	N	N	Y
321	Probe Light Assy	S7503830	Probe Light Assy	1	1	N	N	N	Y
322	LP7P9 OPIO FREEZE AND P1 BOARD SET	S5781426	LP7P9 OPIO FREEZE AND P1 BOARD SET	1	1	Y	Y	Y	Y
323	LP7P9 OPIO 10.4 LCD Set - E	6561038	LP7P9 OPIO 10.4 LCD Set - E	1	1	N	Y	Y	N
324	LP7P9 OPIO lower Assy - H	S5781425	LP7P9 OPIO lower Assy - H	1	1	N	Y	Y	N
325	LP7P9 R3 OPIO lower assy	7554917	LP7P9 R3 OPIO lower assy	1	1	N	N	N	Y
326	COMMON ROTARY ENCODER SET FOR LP9_LP7	S5718726-2	COMMON ROTARY ENCODER SET FOR LP9_LP7	1	1	Y	Y	Y	N
327	LP7P9 R3 COMMON ROTARY ENCODER SET	S5794055	LP7P9 R3 COMMON ROTARY ENCODER SET	1	1	N	N	N	Y
328	B MODE ROTARY ENCODER SET FOR LP9_LP7	S5718727-2	B MODE ROTARY ENCODER SET FOR LP9_LP7	1	1	Y	Y	Y	N
329	LP7P9 R3 B MODE ROTARY ENCODER SET	S5794057	LP7P9 R3 B MODE ROTARY ENCODER SET	1	1	N	N	N	Y
330	OPIO HUB BOARD PWA FOR LP9_LP7	5503846-3	OPIO HUB BOARD PWA FOR LP9_LP7	1	1	Y	Y	Y	N
331	Op Button_Knob Sets R3	S5794044	OP Button+Knob sets	1	1	N	N	N	Y
332	OPIO Up_Down Button Set R3	S5794070	Up/Down Button, Rotation Button, OPIO Dummy Button Sets	1	1	N	N	N	Y
333	OPIO LOWER COVER R3	5794065	OPIO LOWER COVER	1	1	N	N	N	Y

## Section 9-8 Nest Box Parts



Figure 9-9 Nest Box Parts



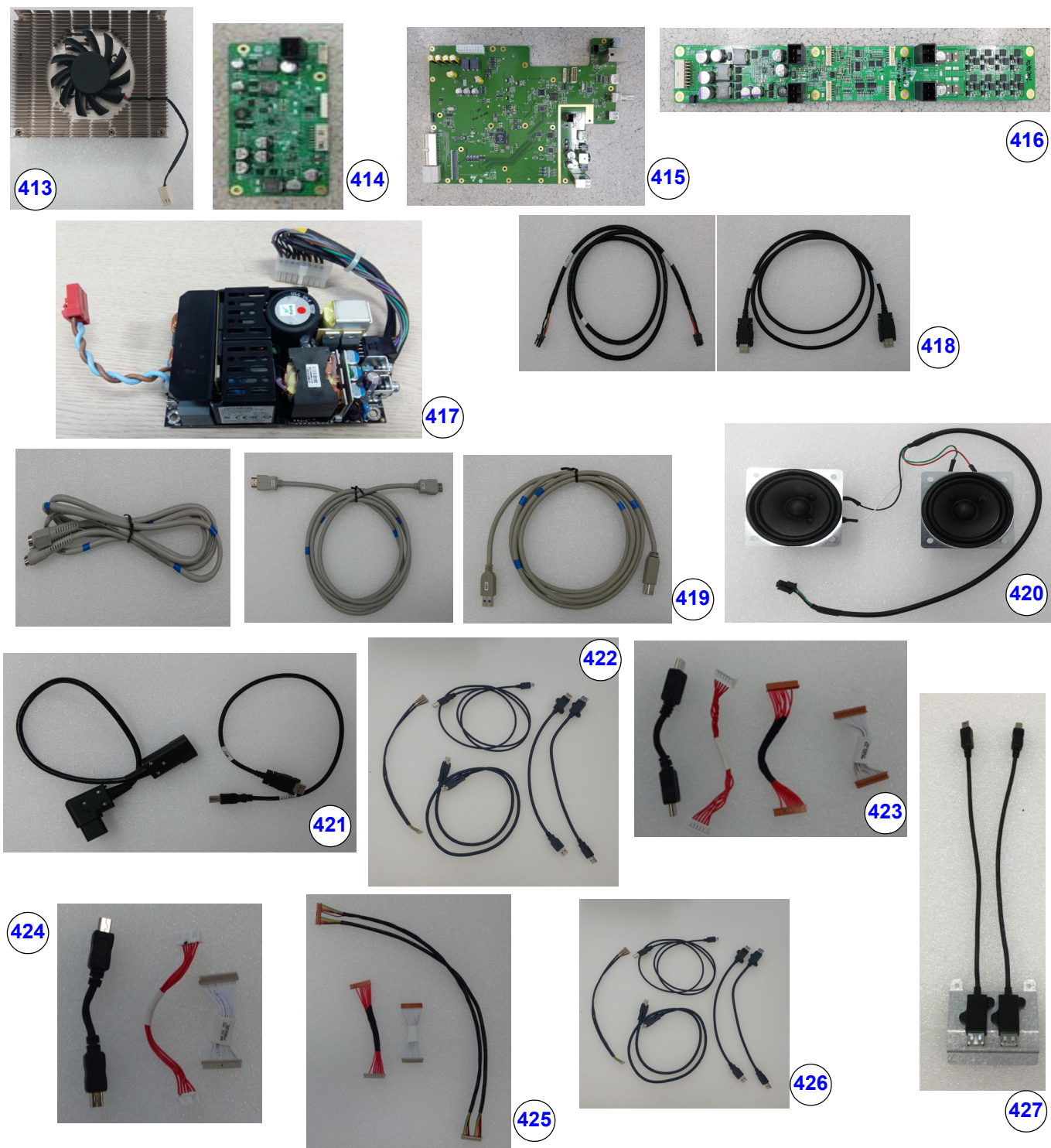


Figure 9-10 Nest Box Parts(Cont‘)

Table 9-9 Nest Box Parts

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
401	MBP Assy	5503745	MBP Assy	1	1	Y	Y	Y	Y
402	MCB PWA	5494666-4	MCB PWA	1	1	Y	N	N	N
	MCB-H	6494666-2	MCB-H Assy	1	1	N	Y	Y	N
402-1	MCB-R3	7494666	MCB-R3 Assy	1	1	N	N	N	Y
403	MDC Assy	5552220-2	MDC Assy	1	1	Y	Y	Y	N
403-1	MDC-R3 Assy	5552220-3	MDC-R3 Assy	1	1	N	N	N	Y
404	3 port MPI Assy	5582646-5	LOGIQ_P7_P9_Three_ports_MPI_H_Assy	1	1	Y	Y	Y	Y
405	4 port MPI Assy	5504162-5	LOGIQ_P7_P9_Four_ports_MPI_H_Assy	1	1	Y	Y	Y	Y
406	IOBOX-B Assy	5554921-4	IOBOX Assy	1	1	Y	N	N	N
	IOBOX-B Assy	5991830-3	IOBOX-B Assy	1	1	N	Y	Y	Y
407	DC4D Assy	5372959	DC4D Assy	1	1	Y	Y	Y	Y
408	HDD	5459671	HDD	1	1	Y	Y	Y	N
409	SSD	5959671	2.5inch SSD 500GB	1	1	N	N	N	Y
410	DVD Drive (ODD)	5393433	Without Cables	1	1	Y	Y	Y	N
411	Nest front FAN with Cable Assy MARU	5549305	Nest front FAN with Cable Assy MARU	1	1	Y	Y	Y	Y
412	Nest Bot FAN with Cable Assy MARU	5549309	Nest Bot FAN with Cable Assy MARU	1	1	Y	Y	Y	Y
413	COM module	6324558-2	COM module	1	1	Y	N	N	N
		6324558-4*	COM module(IvyBridge)	1	1	N	Y	Y	N
		7324558-2*	COM Express MODULE,Type6,i3-6100E,DDR4 8G Memory, Heatsink with FAN for MARU(SkyLake)	1	1	N	Y	Y	N
		7324560	COM Express MODULE,Type6,i3-6100E,DDR4 8G Memory, Heatsink with FAN for MARU R3	1	1	N	N	N	Y
414	MBOB with Harness and screws	5758146	MBOB with Harness and screws	1	1	N	Y	Y	N
415	MIO-2 PWA	5551110-2	MIO-2 PWA Assy	1	1	Y	N	N	N
	MIO-B PWA	6426420-2	MIO-B PWA Assy	1	1	N	Y	Y	N
416	BBC with Harness and Screws	5758147	BBC with Harness and Screws	1	1	N	Y	Y	N
417	Artesyn LPS363 ACDC Assy for FRU	5737480-4	Artesyn LPS363 ACDC Assy for FRU	1	1	N	Y	Y	Y
418	OPIO Cable Assy MARU	5582888	OPIO Power Cable OPIO USB Cable	1	1	Y	Y	Y	N

Table 9-9 Nest Box Parts

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
419	LCD Montior Cable Assy MARU	5582890	Lcd Power Cable Lcd Hdmi Cable Lcd USB Cable	1	1	Y	Y	Y	N
420	Speaker with Cable Assembly MARU	5549296	Including Speaker Cable	1	1	Y	Y	Y	N
421	Peripheral Cable Assy MARU	5582891	Usb*2/Pwr -Bw Color USB Cable Assy Usb*2/Pwr -Bw Color Power Cable Assy	1	1	Y	Y	Y	N
422	LP9P7 Cable Set R3	S7503831	LP9P7 Cable Set R3	1	1	N	N	N	Y
423	LP9_LP7 OPIO Cable Set	S5716942-2	LP9_LP7 OPIO Cable Set	1	1	Y	N	N	N
424	LP9_LP7 OPIO Cable Set - JH	5761351	LP9_LP7 OPIO Cable Set - JH	1	1	N	Y	N	N
425	LP9_LP7 OPIO Cable Set - H	6716942	LP9_LP7 OPIO Cable Set - H	1	1	N	Y	Y	N
426	LP9P7 Cable Set R3	S7503831	LP9P7 Cable Set R3	1	1	N	N	N	Y
427	LOGIQ P9P7 External USB port ASSY	S5808601	LOGIQ P9P7 External USB port ASSY	1	1	Y	Y	Y	N

\*Ivybridge and SkyLake COM module can be determined by checking the BIOS Codename.  
Mechanical Parts

## Section 9-9 Mechanical Part



Figure 9-11 Mechanical Parts 1





Figure 9-12 Mechanical Parts 2

Table 9-10 Mechanical Parts

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
501	Total Lock Caster	5400391-2	except Swivel Lock Caster (3 per console)	3	1	Y	Y	Y	N
502	Swivel Lock Caster	5400392-2	Rear-Right Caster (1 per console)	1	1	Y	Y	Y	N
503	Castor Total Lock N9	5746120	except Swivel Lock Caster (3 per console)	3	1	N	N	N	Y
504	Castor Dual Lock N9	5746121	Rear-Right Caster (1 per console)	1	1	N	N	N	Y
505	Air Filter set	5582810	Front Air Filter, Bottom Air Filter	1	1	Y	Y	Y	N
506	Probe Holder set	5582811	Probe cup, Small Probe Cup, 4D Probe Holder, Hanger Cap Rubber	1	1	Y	Y	Y	N
507	Probe Holder set R3	S5794066	Probe cup, Small Probe Cup, 4D Probe Holder, Hanger Cap Rubber	1	1	N	N	N	Y
508	Front Cable Hook	5394432	OPIO Front Hook	1	1	Y	Y	Y	N
509	OPIO Front Hook R3	5730659	OPIO Front Hook	1	1	N	N	N	Y
510	Fixed Arm set	5507554	Full Assy for LCD Monitor	1	1	Y	Y	Y	N
511	Fixed Arm Assy R3	5794897	Full Assy for LCD Monitor	1	1	N	N	N	Y



Table 9-10 Mechanical Parts

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
512	Fixed Arm Cover sets	5582893	Plastic Cover	1	1	Y	Y	Y	N
513	Fixed Arm Cover Set R3	S5794075	Plastic Cover	1	1	N	N	N	Y
514	AC Cable Holder set	5589119	Power Cord Fix BRKT 220V, Power Cord Fix BRKT 110V	1	1	Y	Y	Y	N
515	Gel Holder R2	5508055-2	Gel holder	1	1	Y	Y	Y	N
516	Gel Holder R3	5794072	Gel holder	1	1	N	N	N	Y
517	Link Arm Cable Hook	5507026	Link Arm Cable Hook	1	1	Y	Y	Y	N
518	Link Arm Cable Hook R3	5794895	Link Arm Cable Hook	1	1	N	N	N	Y
519	Option Tag Label	5573772	Option Tag Label	1	1	Y	Y	Y	N
520	Option Tag Label R3	5794163	Option Tag Label	1	1	N	N	N	Y
521	LOGIQ P9 ROTATION MODULE KIT	5728965	LOGIQ P9 ROTATION MODULE KIT	1	1	Y	Y	Y	N
522	RS KNOB SET R3	S5794028	RS KNOB SET R3	1	1	N	N	N	Y

Section 9-10 Options



Figure 9-13 Options 1



Figure 9-14 Options 2



Figure 9-15 Options 3

Table 9-11 Options

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
701	Multi Purpose Holder set	5582894	Multi Purpose Holder and Gel Cup	1	1	Y	Y	Y	N
702	USB Footswitch, 3 button	5380960-2	3 button switchs operated by the feet	1	1	Y	Y	Y	N
703	LCD Arm	5538531	Full assy for LCD Monitor	1	1	Y	Y	Y	N
704	LCD Arm R3	5794197	Full assy for LCD Monitor	1	1	N	N	N	Y
705	LCD Arm Plastic Covers	5548571	Plastics	1	1	Y	Y	Y	N
706	LCD Arm Plastic Covers 3	S5794170	Plastics	1	1	N	N	N	Y
707	OPIO Tray set	5603831	OPIO Tray, Tray Fix BRKT	1	1	Y	Y	Y	N
708	Paper Tray	5499671	Plastics	1	1	Y	Y	Y	N
709	Side Tray Assy	5582897	Side Tray L, R	1	1	Y	Y	Y	N
710	Drawer Assy	5537774	Drawer Assy	1	1	Y	Y	Y	N
711	Drawer Assy R3	5794898	Drawer Assy	1	1	N	N	N	Y
712	Rear Handle	5730809	Rear Handle	1	1	Y	Y	Y	N
713	Rear Handle R3	5794081	Rear Handle	1	1	N	N	N	Y
714	Probe cable hanger	5172249	Probe cable hanger	1	1	Y	Y	Y	N
715	Rear Cable Hook	5394433	Rear Cable Hook	1	1	Y	Y	Y	N
716	OPIO Side Rear Hook R3	5730661	Rear Cable Hook	1	1	N	N	N	Y
717	Card Reader BRKT set	5599965	Card Reader BRKT, Self adhesive hook and loop	1	1	Y	Y	Y	N
718	MCWD assy	5717876	MCWD assy	1	1	Y	Y	Y	N
719	ECG	5570914	ECG	1	1	Y	Y	Y	N
720	Gel Warmer	5537501-2	Gel warmer 2 LP7P9	1	1	Y	Y	Y	N
721	Gel Warmer Cap	5491354	Bottom of Gel Warmer	1	1	Y	Y	Y	N
722	Gel Warmer 2 LP7P9 R3	5794080	Gel Warmer	1	1	N	N	N	Y
723	Gel Warmer Cap LS8 R3	5692045	Bottom of Gel Warmer	1	1	N	N	N	Y
724	Multi Purpose Holder Set R3	S5794159	Multi Purpose Holder and Gel Cup	1	1	N	N	N	Y
725	ECG Assy	5599525	LOGIQ P7_P9 ECG Module Assy	1	1	Y	Y	Y	N
726	MARU WIRELESS LAN ASSY for Japan MARU WIRELESS LAN ASSY except for Japan	5599724 5599725	MARU WIRELESS LAN ASSY for Japan MARU WIRELESS LAN ASSY except for Japan	1	1	Y	Y	Y	N
727	BT820-02 Laird Bluetooth dongle R3 only	5799898	BT820-02 Laird Bluetooth dongle R3 only	1	1	N	N	N	Y



Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
728	Battery	5450061-2	Battery	1	1	Y	Y	Y	Y
729	IEC Type ECG CABLE	5341188	ECG Patient cable only for EU, ASIA	1	1	Y	Y	Y	N
730	Universal Video Converter S300, UVC-S300	5750263	Universal Video Converter S300, UVC-S300	1	1	Y	Y	Y	Y
731	DCWD assy	5507749	DCWD assy	1	1	Y	Y	Y	N
732	IEC Type ECG CABLE	5341188	ECG Patient cable only for EU, ASIA	1	1	Y	Y	Y	N
733	BW USB Cable Assy	5363487	BW USB Cable Assy	1	1	N	N	N	Y
734	DC SPLITTER POWER CABLE	5756405	DC SPLITTER POWER CABLE	1	1	N	N	N	Y
735									
736	AN KEYBOARD ASSY R3	5794155	AN KEYBOARD ASSY ENGLISH	1	1	N	N	N	Y
737	AN KEYBOARD ASSY GREEK R3	5794900	AN KEYBOARD ASSY GREEK	1	1	N	N	N	Y
738	AN KEYBOARD ASSY NORWEGIAN R3	5794902	AN KEYBOARD ASSY NORWEGIAN	1	1	N	N	N	Y
739	AN KEYBOARD ASSY RUSSIAN R3	5794904	AN KEYBOARD ASSY RUSSIAN	1	1	N	N	N	Y
740	AN KEYBOARD ASSY FRENCH R3	5794906	AN KEYBOARD ASSY FRENCH	1	1	N	N	N	Y
741	AN KEYBOARD ASSY SWEDISH R3	5794908	AN KEYBOARD ASSY SWEDISH	1	1	N	N	N	Y
742	AN KEYBOARD ASSY GERMAN R3	5794910	AN KEYBOARD ASSY GERMAN	1	1	N	N	N	Y
743	AN KEYBOARD ASSY R3	5582898	AN KEYBOARD ASSY ENGLISH	1	1	Y	Y	Y	N
744	AN KEYBOARD ASSY GREEK R3	5611226	AN KEYBOARD ASSY GREEK	1	1	Y	Y	Y	N
745	AN KEYBOARD ASSY NORWEGIAN R3	5611228	AN KEYBOARD ASSY NORWEGIAN	1	1	Y	Y	Y	N
746	AN KEYBOARD ASSY RUSSIAN R3	5611234	AN KEYBOARD ASSY RUSSIAN	1	1	Y	Y	Y	N
747	AN KEYBOARD ASSY FRENCH R3	5611237	AN KEYBOARD ASSY FRENCH	1	1	Y	Y	Y	N
748	AN KEYBOARD ASSY SWEDISH R3	5611239	AN KEYBOARD ASSY SWEDISH	1	1	Y	Y	Y	N
749	AN KEYBOARD ASSY GERMAN R3	5611241	AN KEYBOARD ASSY GERMAN	1	1	Y	Y	Y	N

## Section 9-11 Optional Peripherals and Accessories

### 9-11-1 Printers



Figure 9-16 Optional Peripherals and Accessories - Printers

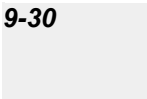
Table 9-12 Optional Peripherals and Accessories - Printers

Item	Part Name	Part Number	Description	Qty	FRU
811	Digital B/W Video Printer (Sony UP-D898)	H46992LS	Digital B/W Video Printer, USB-Port	-	1

NOTE: The illustrations may not correspond to the actual product!

Section 9-12  
Probes

Refer to the [Table 3-21 Probe Description](#)





## Section 9-13 Power Cord



### Figure 9-17 Power Cord

**Table 9-13 Power Cord**

Item	Part Name	Part Number	Description	Qty	FRU	R1	R2	R2.5	R3
930	Power Cord for India	5182611	Power Cord for India	1	1	Y	Y	Y	Y
931	Power Cord for Switzerland	5182235	Power Cord for Switzerland	1	1	Y	Y	Y	Y
932	Power Cord for UK/HK	5182816	Power Cord for UK/HK	1	1	Y	Y	Y	Y
933	Power Cord for ANZ	5182296	Power Cord for ANZ	1	1	Y	Y	Y	Y
934	Power Cord for Denmark	5182083	Power Cord for Denmark	1	1	Y	Y	Y	Y
935	Power Cord for Italy	5182940	Power Cord for Italy	1	1	Y	Y	Y	Y
936	Power Cord for Argentina	5182942	Power Cord for Argentina	1	1	Y	Y	Y	Y
937	Power Cord for Israel	5182453	Power Cord for Israel	1	1	Y	Y	Y	Y
938	Power Cord 110V for Canada/USA	2388982	Power Cord 110V for Canada/USA	1	1	Y	Y	Y	Y
939	Power Cord 220V for EU	2327990	Power Cord 220V for EU	1	1	Y	Y	Y	Y
940	Power Cord for China	2388981	Power Cord for China	1	1	Y	Y	Y	Y
941	Power Cord for Brazil	5399665	Power Cord for Brazil	1	1	Y	Y	Y	Y
942	Power Cord for South Africa	5408183	Power Cord for South Africa	1	1	Y	Y	Y	Y
943	Power Cord for Japan	5408490	Power Cord for Japan	1	1	Y	Y	Y	Y
944	Taiwan Power Cord	5792418	Taiwan Power Cord	1	1	Y	Y	Y	Y

# Chapter 10

## Care & Maintenance

### Section 10-1 Overview

#### 10-1-1 Preventive Maintenance Inspections

It has been determined by engineering that your LOGIQ P9/P7 system does not have any high wear components that fail with use, therefore no Preventive Maintenance Inspections are mandatory. However, some Customers Quality Assurance Programs may require additional tasks and/or inspections at a different frequency than listed in this manual.

#### 10-1-2 Purpose of Chapter 10

This chapter describes **Care & Maintenance** on the LOGIQ P9/P7 system and its peripherals. These procedures are intended to **maintain the quality** of the ultrasound **systems performance**. Read this chapter completely and familiarize yourself with the procedures before performing a task.

**Table 10-1 Contents in Chapter 10**

Section	Description	Page Number
10-1	Overview	10-1
10-2	Why do Maintenance	10-2
10-3	Maintenance Task Schedule	10-2
10-4	Tools Required	10-5
10-5	System Maintenance	10-6
10-6	System Software Updates(Software Download) (R1, R2, R2.5 only)	10-12
10-7	Using a Phantom	10-21
10-8	Electrical Safety Tests	10-21
10-9	When There's Too Much Leakage Current...	10-32
10-10	Ultrasound INSPECTION CERTIFICATE	10-35




**CAUTION** Practice good ESD prevention. Wear an anti-static strap when handling electronic parts and even when disconnecting/connecting cables.



**DANGER** THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE SYSTEM POWER PLUG AND SWITCH OFF THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.



**CAUTION** Do not pull out or insert circuit boards while power is ON.

 CAUTION

DO NOT operate this unit unless all board covers and frame panels are securely in place, to ensure optimal system performance and cooling.  
When covers are removed, EMI may be present.

## Section 10-2

### Why do Maintenance

#### 10-2-1      Quality Assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer’s responsibility to have a quality assurance program in place for each scanner. The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designer.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program. Please contact us for coverage information and/or price for service.

## Section 10-3

### Maintenance Task Schedule

#### 10-3-1      How often should care & maintenance tasks be performed?

The Customer Care Schedule (see: [page 10-3](#)) specifies how often your LOGIQ P9/P7 should be serviced and outlines items requiring special attention.

*NOTE: It is the customer’s responsibility to ensure the LOGIQ P9/P7 care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.*

Your GE Service Representative has an in-depth knowlegde of your LOGIQ P9/P7 ultrasound scanning system and can best provide competent, efficient service.  
Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Customer Care Schedule assumes that you use your LOGIQ P9/P7 for an average patient load (10-12 per day) and not use it as a primary mobile unit which is transported between diagnostic facilities.

*NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the maintenance frequencies.*

Abbreviations used in the Customer Care Schedule [Table 10-2](#):

D = Daily      W = Weekly      M = Monthly      A = Annually

## 10-3-1 How often should care & maintenance tasks be performed? (cont?)

**Table 10-2 Customer Care Schedule**

Item	Service at Indicated Time	D	W	M	A	Notes
Air Filter Grid	Remove the filter grid and clean the air filter.		•			Recommend to clean filter at least bi-weekly
AC Mains Cable	Inspect AC Mains Cable			•		Mobile Unit Check weekly
Cables and Connectors	Check if all cables are fixed well seated at the correct position and if there is no mechanical damage visible.				•	also after corrective maintenance
User Interface	Clean alphanumeric keyboard, Functional keys, Digital potentiometers, TGC-Shift potentiometers. (vacuum cleaner, lukewarm soap water on a soft, damp cloth)		•			Be careful not to get the cloth too wet so that moisture does not enter the loudspeakers, TGC-Slider, or other keys!
LCD Monitor, Touch Panel and Probe holder	Clean LCD Monitor surface and Probe holder with a fluid detergent in warm water on a soft, damp cloth.		•			Be careful not to get the cloth too wet so that moisture does not enter the entire system.
Mechanical parts	Clean and inspect the mechanical function of wheels, casters, brakes and swivel locks as well as side door, foot rest, front and rear handle, and monitor holder. Remove Dust and Coupling gel.			•		Mobile Unit Check Daily
Control Console movement	Check Translation/Rotation and Height Adjustment (Elevation)				•	more frequently at Mobile Units
Trackball Check	Check proper operation (Cursor movement X, Y direction)	•				If failure occurs go to trackball cleaning.
Trackball Cleaning	Remove trackball ring; open the trackball housing and take out the trackball to clean it with soft tissue and screwdriver shaft.				•	Please record it in the systems setup maintenance report
Disk Drives (Data Backup)	Test Image filing (Archive) Import and Export data capability (DVD/CD Drive)		•	•*		* save the image filing data weekly or at least monthly on DVD/CD depending on the number of examinations
Safe Probe Operation	Clean probes and probe cables and check acoustic lens housing (cracks) and probe cables. In case of mechanical damage, don't use them! <b>Danger:</b> Safety risk for operator and patient.	•*				* or before each use
Probe Air bubbles	To detect air bubbles in filling liquid, shake the probe carefully and check abnormal noise.					
Probe connectors	Remove dust/dirt of all probe connectors. Clean with vacuum cleaner if dust is visible.			•		
Console Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Peripheral Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.

**Table 10-2 Customer Care Schedule**

Item	Service at Indicated Time	D	W	M	A	Notes
Surface Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Endocavity Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Measurement Accuracy Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Probe/Phantom Checks	Check axial and lateral resolution (see Basic User Manual Technical specifications). Check Gain and TGC changes, vary the focus and check reaction on screen.				•	Also after corrective maintenance or as required by your facilities QA program.
Functional Checks of all probes <a href="#">Section 10-5-2 on page 10-7</a>					•	Also after corrective maintenance or as required by your facilities QA program.

## Section 10-4 Tools Required

### 10-4-1 Special Tools, Supplies and Equipment

#### 10-4-1-1 Specific Requirements for Care & Maintenance

**Table 10-3 Overview of Requirements for Care & Maintenance**

Tool	Part Number	Comments
Digital Volt Meter (DVM)		minimum 5% accuracy, 3.5 digit and 200 Ohm range required
Anti Static Kit	46-194427P231 46-194427P279 46-194427P369 46-194427P373 46-194427P370	Kit includes anti-static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46-194427P278 46-194427P279	120V 230V
Safety Analyzer	46-285652G1	DALE 600 KIT (or equivalent) for electrical tests
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS
CD-RW Media		(minimum quad speed)
DVD+RW Disc Media blank	H48641D	blank 4,7GB DVD+RW disc
B/W Printer Cleaning Sheet		see printer user manual for requirements
Color Printer Cleaning Sheet		see printer user manual for requirements
Disposable Gloves		
Screwdriver PH0		
Screwdriver PH1		
Screwdriver PH2		

## Section 10-5 System Maintenance

### 10-5-1 Preliminary Checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

**Table 10-4 System Checks**

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Ultrasound Inspection Certificate (see: <a href="#">page 10-35</a> ). Note all probes and system options.
3	Power up	Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the LCD monitor and Touch Panel.
6	Presets	"Full Backup" all customer presets on Hard disk and/or DVD (see: <a href="#">Settings - Backup and Restore on page 8-57</a> ).
7	Image Archive	Backup the Image Archive on DVD, USB-Stick, etc. (see: <a href="#">see: "Settings - Backup and Restore" on page 8-57</a> ).



## 10-5-2 Functional Checks

The functional checks take about 60 minutes to perform.  
Refer to the LOGIQ P9/P7 Basic User Manual whenever necessary.

### 10-5-2-1 System Checks

**Table 10-5 System Functional Checks**

Step	Item	Description
1	B Mode	Verify basic B Mode (2D) operation. Check the basic system controls that affect this mode of operation.
2	M Mode	Verify basic M Mode operation. Check the basic system controls that affect this mode of operation.
3	CFM Mode	Verify basic CFM Mode (Color Flow Mode) operation. Check the basic system controls that affect this mode of operation.
4	PD Mode	Verify basic PD Mode (Power Doppler Mode) operation. Check the basic system controls that affect this mode of operation.
5	Doppler Modes	Verify basic Doppler Mode operation (PW ). Check the basic system controls that affect this mode of operation.
6	*Applicable Software Options	Verify the basic operation of all optional modes. Check the basic system controls that affect each options operation.
7	Keyboard Test	Perform the Keyboard Test Procedure to verify that all keyboard controls are OK.
8	LCD Monitor	Verify basic LCD Monitor display functions.
9	Measurements	Scan a gray scale phantom and use the measurement controls to verify distance and area calculation accuracy. Refer to the Basic User Manual, for measurement accuracy specifications.

**NOTE:** \* Some software may be considered standard depending upon system configuration.

## 10-5-2-2 Peripheral/Option Checks

If any peripherals or options are not part of the system configuration, the check can be omitted.

**Table 10-6 Approved Peripheral/Hardware Option Functional Checks**

Step	Item	Description
1	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
2	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
3	Color Deskjet (Bluetooth) Printer	Verify hardcopy output of the Deskjet (Bluetooth) printer. Clean heads and covers if necessary.
4	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
5	Footswitch	Verify that the footswitch is functioning as programmed. Clean as necessary.
6	DVD-Drive	Verify that the DVD-drive reads/writes properly (export/recall image in Image Management System = Archive)

## 10-5-3 Input Power

### 10-5-3-1 Mains Cable Inspection

**Table 10-7 Mains Cable Inspection**

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kind.
3	Terminals	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Inlet Connector	Inlet connector retainer is functional.

## 10-5-4 Cleaning

### 10-5-4-1 General Cleaning

Frequent and diligent cleaning of the LOGIQ P9/P7 ultrasound system reduces the risk of spreading infection from person to person, and also helps to maintain a clean work environment.

**Table 10-8 General Cleaning**

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console. <b>Caution:</b> DO NOT allow any liquid to drip or seep into the system.
2	LCD Monitor	Clean LCD Monitor surface with a fluid detergent in warm water on a soft, damp cloth. <b>Caution:</b> DO NOT spray any liquid directly onto the LOGIQ P9/P7 covers, LCD Monitor, keyboard, etc.

#### 10-5-4-2 Air filter cleaning

Clean the system's air filters to ensure that a clogged filter does not cause the system to overheat and reduce system performance and reliability. It is recommended the filters be cleaned every two weeks, but the requirements will vary with environment.



**CAUTION** Be sure to lock the wheels before cleaning the air filters to avoid injury by any unexpected movement of the system.

**DO NOT** operate the unit without the air filters in place.

**Allow the air filters to dry thoroughly before re-installing them on the unit.**

##### Plastic Air filter

- 1) Pull the front cover with hand and pull out the front air filter.



Figure 10-1 Front Air filter location

- 2) Pull out the Bottom air filter.

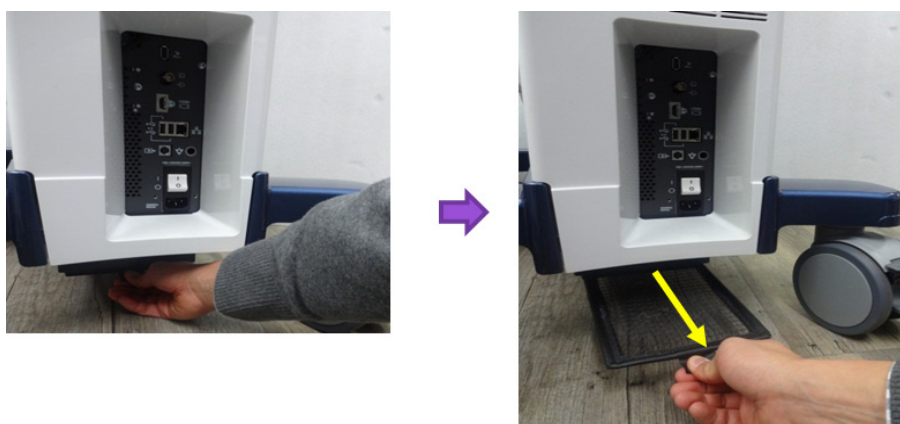


Figure 10-2 Bottom Air filter location

- 3) Dust the filter with a vacuum cleaner and/or wash it with a mild soapy solution. If washed, rinse and dry the filter before re-installation.
- 4) Put back the air filters and the front cover.

**NOTE:** For your convenience or if the air filter is too dirty, replacement filters are available. Refer to Chapter 9 for the air filter replacement part number.

## 10-5-5 Physical Inspection

**Table 10-9 Physical Checks**

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	LCD Monitor Display	Inspect the LCD Monitor Display for scratches and raster burns. Verify proper operation of Contrast and Brightness controls.
4	Control Panel and Keyboard	Inspect the Control Panel and Keyboard. Note any damaged or missing items. (Replace faulty components, as required). Verify proper operation of Control Panel backlighting and TGC sliders.
5	DVD Drive	Clean the drive head and media with the vendor-supplied cleaning kit. Advise the user to repeat this often, to prevent future problems. DVDs/CDs must be stored away from dust and cigarette smoke. Do not use alcohol or benzene to clean the drive
6	Wheels & Brakes	Check all wheels and casters for wear and verify operation of foot brake, to stop the unit from moving, and release mechanism. Check all wheel locks and swivel locks for proper operation.
7	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
8	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation or other deterioration, and verify continuity. Tighten the clamps that secure the power cord to the unit and the outlet plug to the cord.
9	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems during scanning.
10	Peripherals	Check and clean the peripherals according to the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
11	External I/O	Check all connectors for damage and verify that the labeling is good.
12	Op Panel Lights	Check proper operation of all control panel key illuminations (flash once during system start-up).

## 10-5-6 Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapters 5 or 7.  
View the error logs and run desired diagnostics.

### 10-5-6-1 View the logs

- 1) Review the system error log for any problems.
- 2) Check the temperature log to see if there are any trends that could cause problems in the future.
- 3) Check the Configuration Log; update if needed.

## 10-5-7 Probe Maintenance

### 10-5-7-1 Probe Related Checks

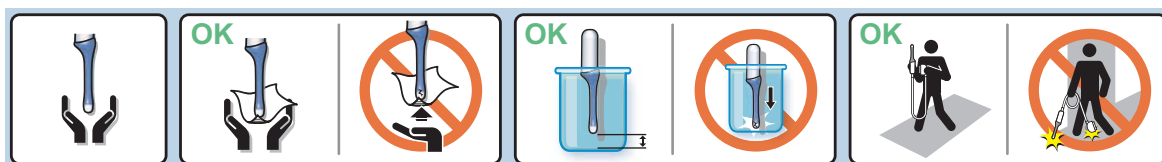
Table 10-10 Probe Related Checks

Step	Item	Description
1	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins.
2	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).

### 10-5-7-2 Basic Probe Care

The Basic User Manual and/or care card provides a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. Review the Basic User Manual of LOGIQ P9/P7 for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.



Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

### 10-5-7-3 Basic Probe Cleaning and/or Disinfection

Refer to the Basic User Manual of LOGIQ P9/P7 for details on cleaning.

**CAUTION** Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty. **DO NOT** soak or wipe the lens with any product not listed in the LOGIQ P9/P7 Basic User Manual and/or care card. Doing so could result in irreparable damage to the probe and/or LOGIQ P9/P7 system.

**CAUTION** Follow the Care Card instructions supplied with each probe (inside the transducer boxes) for disinfectants and gels that are compatible with the surface material of the probes.

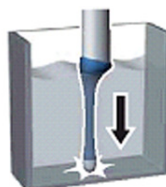
**CAUTION** To help protect yourself from blood borne diseases, when cleaning and handling probes, wear approved, non-allergenic disposable gloves.

**NOTICE** Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.

**CAUTION**



Please be aware of the sensitive probe head.  
**TAKE EXTREME CARE!**



**NEVER** place or store a probe on its scan head!

**OK**



When disinfecting a probe, ensure that there is sufficient space between the probe and the container bottom!

## Section 10-6

### System Software Updates(Software Download) (R1, R2, R2.5 only)

Software Updates for the unit may be available for download and installation. When a Software Update is available, a message icon is displayed on the system exit window.

Only users with administrator rights are allowed to download Software Upgrades. You first download the software, then install the software. It is a two-step process.

Once the software installation has begun, the system is not useable until the software installation is done. The installation can take up to 45 minutes to complete. While installing, **DO NOT** turn off system power or the system can be left in a unusable mode. For this reason, you may want to perform the software download one evening and then install the software the next evening.

After the software installation is complete, you will be asked to perform a few system functional checks to determine normal system operation.

**NOTE:** *A software download may take more than 1 hour (and may take several hours), depending on local network conditions. During this time, you cannot perform any other function. Please allow sufficient time to complete the software download and installation.*

**NOTE:** *A wired network connection is recommended for faster software download.*

**NOTE:** *After you press a software download button, it may take up to three (3) seconds for the system to respond.*

**NOTE:** *Software Updates through the GE service platform may not be available in all countries.*

## 10-6-1 Software download and installation

You receive notification of available software updates via the envelope icon that appears in the status bar on the bottom of the monitor.

**NOTE:** To update the software, you must login with administrator privileges.

- 1) Press the on/off button on the control panel. The Exit dialog window with software download displays.

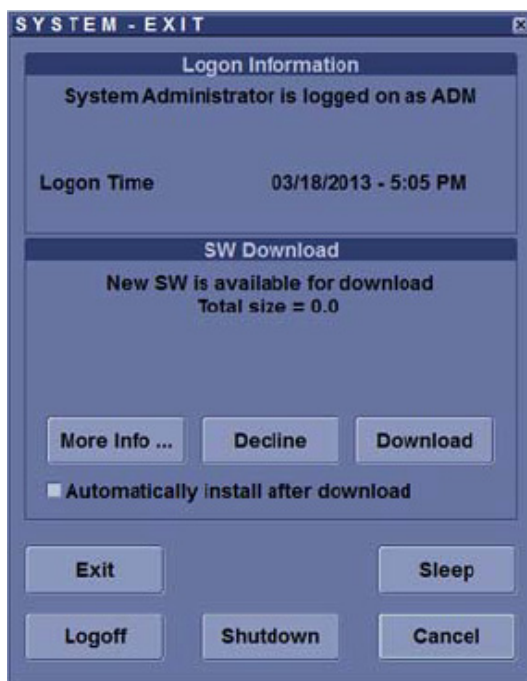


Figure 10-3 System - Exit Dialog Window

- **Automatically install after download:** The software installation starts automatically after the software has been downloaded if this box is checked.
- **More Info:** Displays a window with information about the software to download.



Figure 10-4 More Info

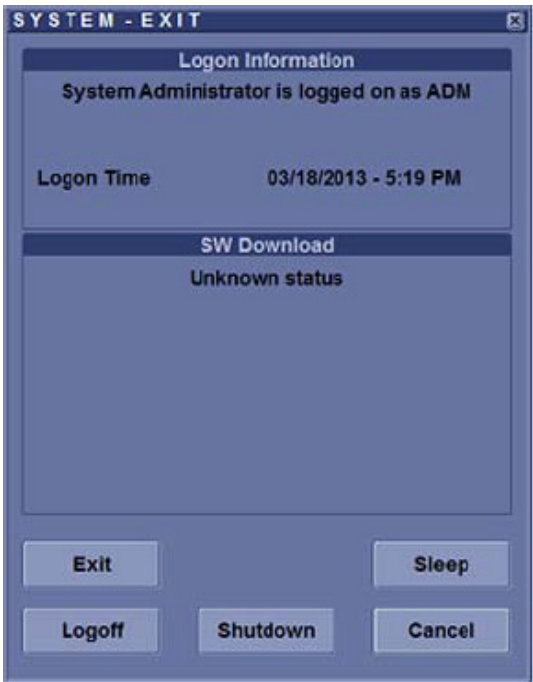
- **Decline:** You decline the software download; the software is not downloaded, no update will be performed. The software download will not occur and you will not be informed about this package again.
- **Download:** Starts the software download.

*NOTE: If you are not logged in as an Administrator and there is a software package to download, you will see the following dialog when shutting down the system:*



**Figure 10-5 Software Download Dialog If Not an Administrator**

If you get a dialog with “Unknown status,” this may mean that your system has lost connection with the network. In this case, ensure that your system is connected to the network. Then restart your system.



**Figure 10-6 Check the Network Connection**

However, if the network appears to be connected, then the problem may have resolved itself and no further action on your part is required.



2) Press **Download**.

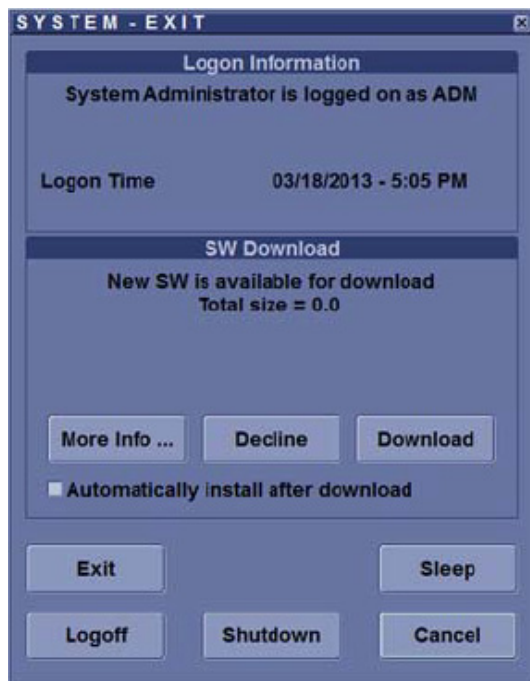


Figure 10-7 System - Exit Dialog Window

The download process starts. The progression of the download process is displayed.

**NOTE:** The download step can be paused. While paused, you can return to normal operation. However, once the software installation has begun, the system is not useable until the software installation is done. The installation can take up to 45 minutes to complete. While installing, **DO NOT** turn off system power or the system can be left in a unusable mode. For this reason, you may want to perform the software download one evening and then install the software the next evening.

**NOTE:** A typical software update of about 600 Mb may take up to 60 minutes to download, but times may vary depending on your location and network connection. If you are downloading **both** the Operating System **and** software update, the total size is about 9 GB and will take much longer to download.

Press **Download**.

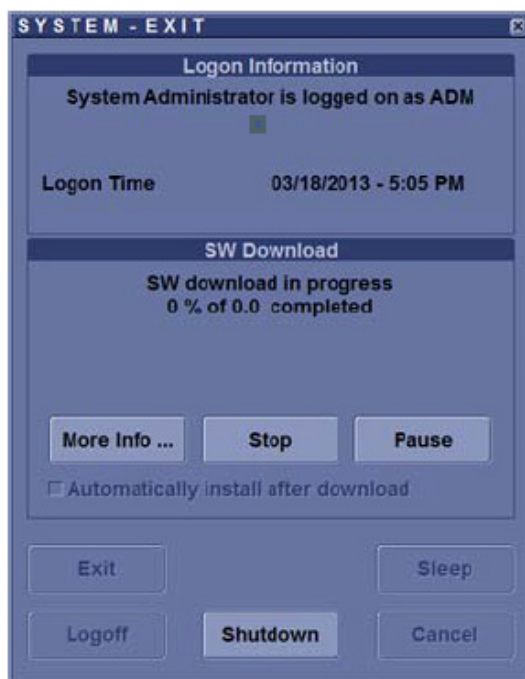


Figure 10-8 Download in Progress Options

- **Stop:** Stops the download process; no software upgrade is performed. If you select Stop, you **WILL NOT** be given an opportunity to download this package again.

The following dialog appears (it is the same dialog as the Decline option):



Figure 10-9 Stop (or Decline) the Software Download Dialog

- **Pause:** Pauses the software download process. If you select Pause, you can cancel out of this dialog and return to normal scanning or you can power off the scanner. A paused download can be resumed by logging in as Administrator, pressing the power switch, and selecting Resume.

When you press Pause, the following dialog displays:

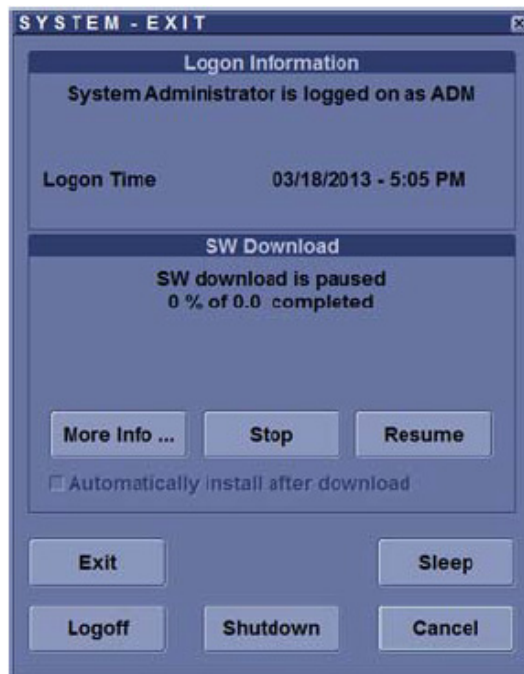


Figure 10-10 Paused Software Download

- **Resume:** Press Resume to continue the software download.
- 3) If auto-install was not checked, you will see the following dialog when the software download has finished (the message, "SW is ready to be installed," and the "Install" button appear.

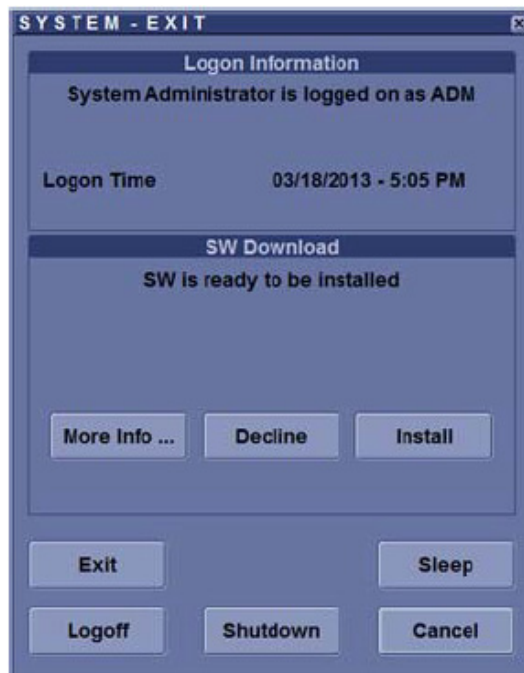


Figure 10-11 Software Ready To Be Installed

Press **Install**.

The system reboots automatically and the installation process is started. **Do not interrupt the installation.** The system may reboot automatically during installation or you may be prompted to restart the system.

- NOTE: At this time, you can also select to stop, or decline, the software installation process.
- Decline:** DO NOT install the downloaded software; no software upgrade will be performed. If you decline this installation, you **WILL NOT** be offered the chance to install this software package again. You can select Cancel to return to normal scanning. You can perform the install at a later time.

NOTE: If auto-install was checked, the system will reboot automatically and start the software installation as soon as the download has finished.


Multiple screens appear during the software installation process. **DO NOT** interrupt this process **AND** follow instructions as they appear on the display.

NOTE: A typical installation may take up to 15 minutes. When the installation is complete, the New Software Verification Checklist window is displayed.

- 4) When the system starts up after the software installation has finished, the following dialog displays: the “New Software Verification” Checklist.
- This dialog is **critical**. You **MUST** perform software verification after downloading and installing a software update.



Figure 10-12 New Software Verification Checklist



**CAUTION** Perform a check for all the features listed. You **MUST** ensure that the entire system functions normally, as expected, in each of the categories listed on the New Software Verification checklist.

These verification results are tracked for regulatory purposes, sent back to GE for tracking, and approved with your signature.

**NOTE:** Press the Question mark to get information on how to check each feature.

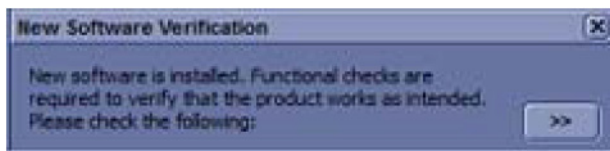


The dialog box titled "New Software Verification" contains the following text: "New software is installed. Functional checks are required to verify that the product works as intended. Please check the following:". Below this text is a list of features with radio buttons for "Passed" and "Failed", and a question mark icon for each. The features are: 2D Mode, M Mode, CF Mode, PW / CW Doppler Mode, Probes, Patient Archive, Presets, and Peripherals. At the bottom, there is a "Signature" field and a button with the text ">>".

**Figure 10-13 New Software Verification Checklist**

**NOTE:** You can move this dialog, but **DO NOT** close it. You can also minimize this dialog by clicking on the "<<" button at the top, right-hand corner of the dialog.

A minimized window looks like this. To maximize the Checklist again, click on the ">>" button at the lower, right-hand corner of the dialog.



The minimized dialog box titled "New Software Verification" shows the same text as Figure 10-13, but the list of features is not visible. The ">>" button is visible in the bottom right corner.

**Figure 10-14 Minimized New Software Verification Checklist**

- 5) As you verify that each feature works correctly, select "Passed." If all features work correctly and "Passed" is filled in for all features, then the signature field is enabled at the bottom of the New Software Verification Checklist.  
Type your signature (minimum of three characters) and press **OK**. The system is now ready for use.



**WARNING** However, if any of the features **DID NOT** function as expected, you need to select "Failed" next to the feature that failed. Type your signature (minimum of three characters) and press **Reload**.

When there is a failed feature noted on the New Software Verification Checklist, the following Warning dialog displays:

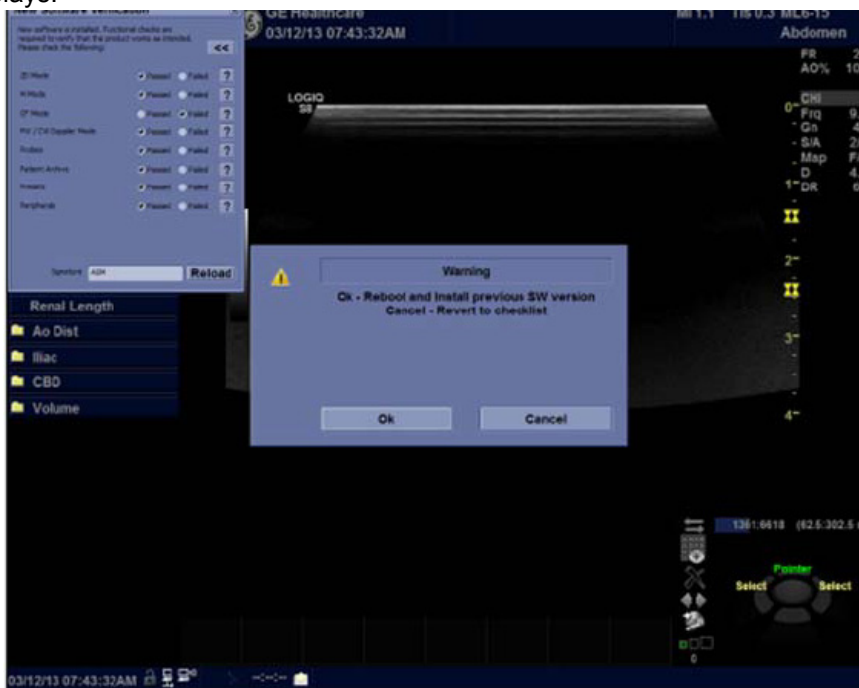


Figure 10-15 Re-Install Previous Software Version Dialog

When the New Software Verification Checklist contains a 'Failed' feature, you have two options available: 1) Re-Install the previous version of software ("OK"), or 2) Revert to the Checklist ("Cancel") and continue with the software version you just downloaded and installed.

If you press "OK," the system re-images the hard drive and reloads the previous version of software. This takes approximately 30 minutes. Select Cancel to return to the dialog window. Here you can either 1) change the New Software Verification Checklist items to Pass and then use the just-installed version of the software; or 2) select OK and to reload your original software.

Multiple screens appear during the software re-imaging installation process. **DO NOT** interrupt this process **AND** follow instructions as they appear on the display.

## Section 10-7 Using a Phantom

Refer to the User Manual of the Phantom for information on using a phantom and quality assurance tests. For measurement accuracy of the system review chapter 13.5 of the Basic User Manual of LOGIQ P9/P7. To get comparable results, use Multi-purpose phantom, Model 539-05 from ATS Laboratories Inc.

## Section 10-8 Electrical Safety Tests

### 10-8-1 Safety Test Overview

The electrical safety tests in this section are based on and conform to ANSI/AAMI ES60601-1(For USA) and IEC60601-1 Medical Equipment Safety Standards. They are intended for the electrical safety evaluation of cord-connected, electrically operated, patient care equipment. If additional information is needed, refer to the ANSI/AAMI ES60601-1(For USA) and IEC 60601-1 documents.



**WARNING** *THE USER MUST ENSURE THAT THE SAFETY INSPECTIONS ARE PERFORMED AT LEAST EVERY 12 MONTHS ACCORDING TO THE REQUIREMENTS OF THE PATIENT SAFETY STANDARD UL60601-1 AND IEC60601-1. ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE SAFETY INSPECTIONS MENTIONED ABOVE.*



**CAUTION** To avoid electrical shock, the unit under test must not be connected to other electrical equipment. Remove all interconnecting cables and wires. The unit under test must not be contacted by users or patients while performing these tests.



**CAUTION** Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.



**WARNING** *Test the system, peripherals and probes for leakage current. Excessive leakage current can cause FATAL INJURY OR DEATH. High leakage current can also indicate degradation of insulation and a potential for electrical failure. DO NOT use probes or equipment having excessive leakage current.*

To minimize the risk of a probe causing electrical shock, the customer should observe the following recommendations:

- DO NOT use a probe that is cracked or damaged in any way
- Check probe leakage current:
  - \* once a year on surface probes
  - \* once a year on endocavitary probes
  - \* whenever probe damage is suspected

## 10-8-2 GEHC Leakage Current Limits

The following limits are summarized for ANSI/AAMI ES60601-1(For USA), IEC 60601-1 Medical Equipment Safety Standards and IEC 62353 Medical Electrical Equipment - Recurrent test and test after repair of medical electrical equipment.

Measurement limits per ANSI/AAMI ES60601-1(For USA) and IEC 60601-1 Medical Equipment Safety Standards.

**Table 10-11 Enclosure Leakage Current Limits - Accessible Surfaces not protectively earthed**

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.1mA*	0.1mA***
Close Protective earth and close neutral with reverse polarity	0.1mA*	0.1mA***
Open Protective earth and close neutral with normal polarity	0.3mA**	0.5mA***
Open Protective earth and close neutral with reverse polarity	0.3mA**	0.5mA***
Open neutral and close Protective earth with normal polarity	0.5mA*	0.5mA***
Open neutral and close Protective earth with reverse polarity	0.5mA*	0.5mA***

**Table 10-12 Earth Leakage Current Limits**

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.3mA**	0.5mA***
Close Protective earth and close neutral with reverse polarity	0.3mA**	0.5mA***
Open neutral and close Protective earth with normal polarity	1mA*	1mA***
Open neutral and close Protective earth with reverse polarity	1mA*	1mA***

**Table 10-13 Type BF Patient Leakage Limits - Non-Conductive Surface**

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.1mA*	0.1mA***
Close Protective earth and close neutral with reverse polarity	0.1mA*	0.1mA***
Open Protective earth and close neutral with normal polarity	0.5mA*	0.5mA***
Open Protective earth and close neutral with reverse polarity	0.5mA*	0.5mA***
Open neutral and close Protective earth with normal polarity	0.5mA*	0.5mA*
Open neutral and close Protective earth with reverse polarity	0.5mA*	0.5mA***



**Table 10-14 Type BF Patient Auxiliary Limits**

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	0.1mA*	0.1mA***
Close Protective earth and close neutral with reverse polarity	0.1mA*	0.1mA***
Open Protective earth and close neutral with normal polarity	0.5mA*	0.5mA***
Open Protective earth and close neutral with reverse polarity	0.5mA*	0.5mA***
Open neutral and close Protective earth with normal polarity	0.5mA*	0.5mA***
Open neutral and close Protective earth with reverse polarity	0.5mA*	0.5mA***

**Table 10-15 Isolation between Mains and Applied Limits**  
\*\*\*\* Patient Leakage Main to Type BF Applied part

Conditions	Country	
	USA	Others
Close Protective earth and close neutral with normal polarity	5mA*	5mA***
Close Protective earth and close neutral with reverse polarity	5mA*	5mA***

**NOTE:**

- \* Measurement limits per ANSI/AAMI ES60601-1 Medical Electrical Equipment Safety Standards Table IV
- \*\* Measurement limits per ANSI/AAMI ES60601-1 Medical Electrical Equipment Safety Standards, Table 19.5DV.1
- \*\*\* Measurement limits per IEC 60601-1 Medical Electrical Equipment Safety Standards, Table IV
- \*\*\*\* Isolation between Mains and Applied Limits refers to the measurement of leakage current flow which would flow from mains to patient if the patient were to come into contact with mains voltage.

The following tests are performed at the factory and should be performed at the customer site as well.

- Grounding Continuity
- Earth Leakage Current.
- Enclosure Leakage Current
- Patient Leakage Current

All measurements should be made with an electrical safety analyzer.

### 10-8-3 Outlet Test - Wiring Arrangement - USA & Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

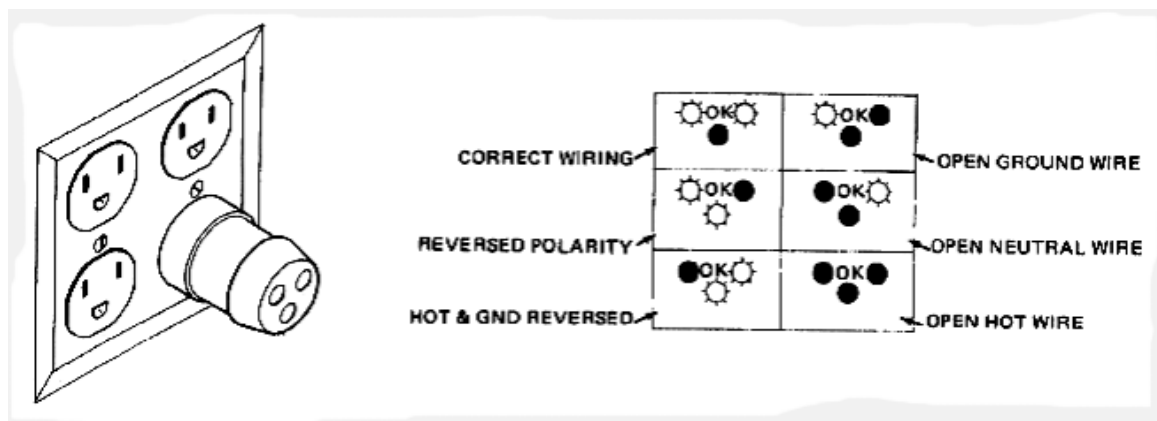


Figure 10-16 Typical Outlet Tester

**NOTE:** No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

## 10-8-4 Grounding Continuity



### CAUTION Electric Shock Hazard!

The patient or operator **MUST NOT** come into contact with the equipment during this test

Measure the resistance from the third pin of the attachment plug to the exposed protectively - earthed metal parts of the case. The ground wire resistance should be less than **0.2 ohms**.

Reference the procedure in the IEC60601-1.

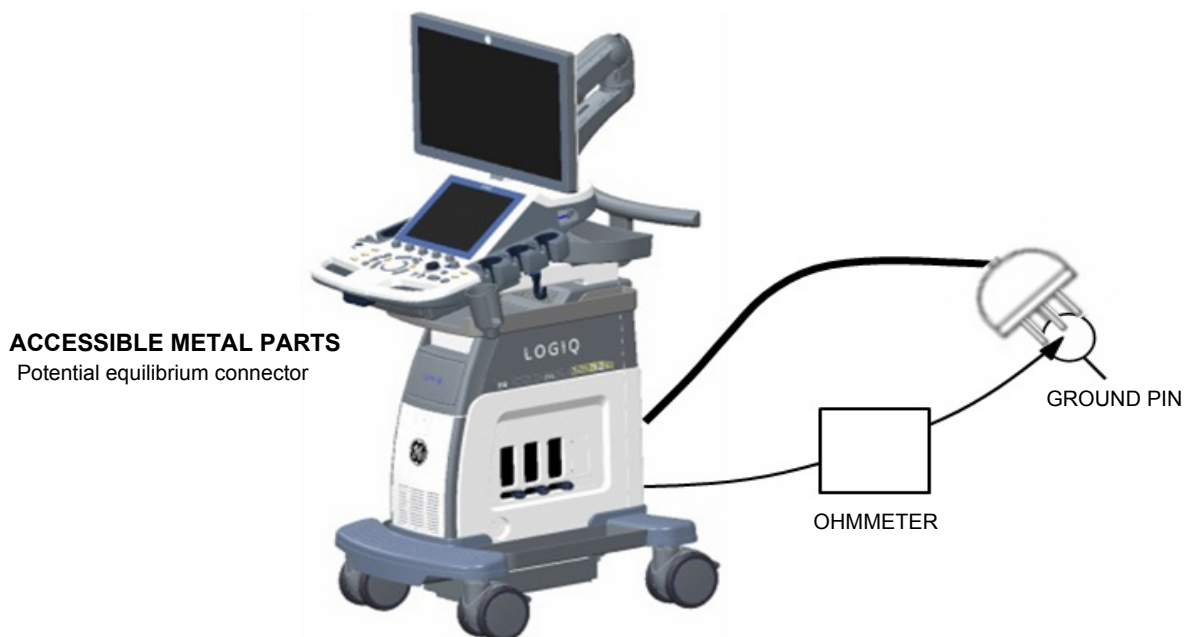


Figure 10-17 Ground Continuity Test



### CAUTION Lacquer is an isolation barrier! Resistor may be high-impedance!

Measure only on blank parts, stated in [Figure 10-17](#) above.

#### 10-8-4-1 Meter Procedure

Follow these steps to test the Ground wire resistance.

- 1) Turn the system unit OFF.
- 2) Plug the unit into the meter, and the meter into the tested AC wall outlet.
- 3) Plug the black chassis cable into the meter's "CHASSIS" connector and attach the black chassis cable clamp to an exposed protectively earthed metal part of the system, such as Potential equilibrium connector.
- 4) Set the meter's "FUNCTION" switch to the RESISTANCE position.
- 5) Set the meter's "POLARITY" switch to the OFF (center) position.
- 6) Measure and record the Ground wire resistance. This should be less than 0.2 Ohms.

## 10-8-5 Enclosure Leakage Current Test

### 10-8-5-1 Definition

This test measures the current that would flow in a grounded person who touched accessible non-protectively-earthed parts of equipment if the ground wire were to break. The test verifies the isolation of the power line from the chassis.

The meter is connected from accessible non-protectively-earthed parts of the case to ground. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading.



#### **DANGER Electric Shock Hazard.**

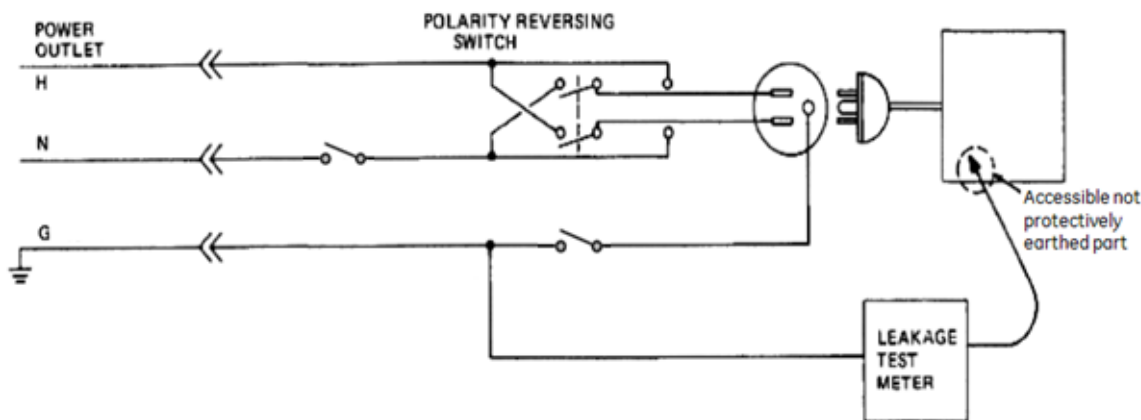
When the meter's ground switch is OPEN, DO NOT touch the unit!



**CAUTION Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

### 10-8-5-2 Generic Procedure

The test verifies the isolation of the power line from the enclosure. The testing meter is connected from accessible non-protectively-earthed parts of the case to ground. Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading of current.



**Figure 10-18 Set Up for Test of Enclosure Leakage Current, UL60601-1/IEC 60601-1 Clause 19**

**NOTE:** Color of Power outlet cable

i) USA and Canada

Hot: Black

Neutral: White

Ground: Green or Green-yellow

ii) Others

Hot: Brown

Neutral: Blue

Ground: Green-yellow

When using Dale 600/601 or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges. The maximum allowable limit for enclosure leakage current is shown in [Table 10-11 on page 10-22](#)

### 10-8-5-3 Data Sheet for Enclosure Leakage Current

The test passes when all readings measure less than the value shown in [Table 10-11](#).  
Record all data on the Ultrasound Inspection Certificate.

**Table 10-16 Typical Data Sheet for Enclosure Leakage Current**

Tester Neutral	Tester Polarity Switch	Protective Earth Switch	Test 1 Wheel	Test 2 LCD	Optional Test 3	Optional Test 4
Enter Name of tested peripheral here:						
Closed	Normal	Closed				
Closed	Normal	Open				
Closed	Reversed	Closed				
Closed	Reversed	Open				
Open	Normal	Closed				
Open	Reversed	Closed				

## 10-8-6 Earth Leakage Current Test

### 10-8-6-1 Definition

This test measures the current that would flow to a grounded person who touched accessible protectively-earthed parts of equipment if the ground wire should break.

The meter is connected from accessible protectively-earthed parts of the equipment to ground. Measurements should be made with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading.



**CAUTION** Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.

10-8-6-2    Generic Procedure

The testing meter is connected from accessible protectively-earthed parts of the equipment to ground. Measurements should be made with power line polarity normal and reversed, and with the neutral open and closed. Record the highest reading of current.

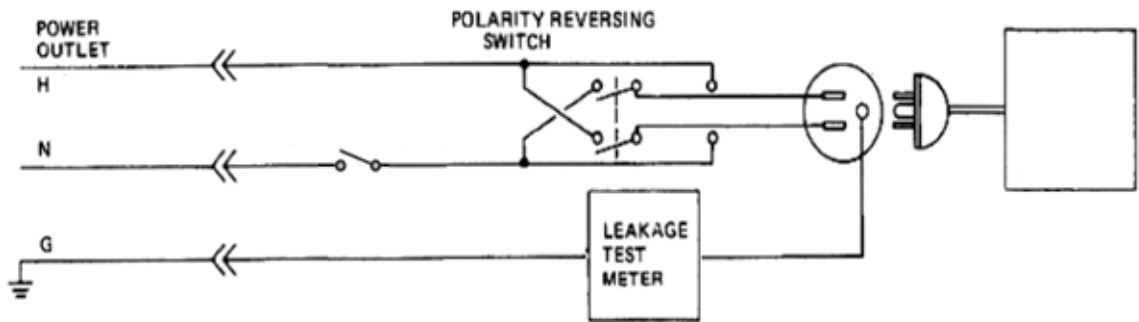


Figure 10-19    Set Up for Test of Earth Leakage Current, UL60601-1/IEC 60601-1 Clause 19

- NOTE:     Color of Power outlet cable
- i)   USA and Canada
    - Hot:     Black
    - Neutral: White
    - Ground: Green or Green-yellow
  - ii) Others
    - Hot:     Brown
    - Neutral: Blue
    - Ground: Green-yellow

When using Dale 600/601 or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter. This places the meter in the grounding conductor and the current flowing through protective earth will be indicated in any of the current ranges. The maximum allowable limit for earth leakage current is shown in [Table 10-12](#).

Table 10-17    Typical Data Sheet for Earth Leakage Current

Tester Neutral	Tester Polarity Switch	Measured Earth leakage current
Enter Name of tested peripheral here:		
Closed	Normal	
Closed	Reversed	
Open	Normal	
Open	Reversed	

## 10-8-7 Type BF Patient Leakage Current Test - Probe

### 10-8-7-1 Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

**NOTE:** Some leakage current is expected on each probe, depending on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured. If no leakage current is detected, check the configuration of the test equipment.



**CAUTION** Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.

### 10-8-7-2 Generic Procedure on Leakage Current

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with neutral open and closed. For each combination, the probe must be active to find the worst case condition.

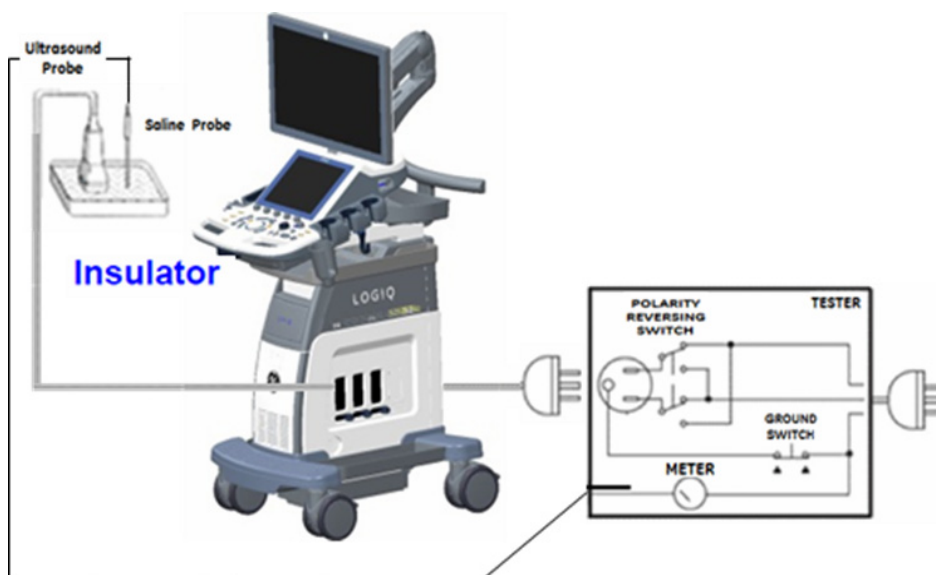


Figure 10-20 Set Up for Probe Leakage Current

**NOTE:** Saline water pod should be insulated from floor and earth ground

Table 10-18 Typical Data Sheet for Type BF Patient Leakage Current Test

Tester Neutral	Tester Polarity Switch	Ground Switch	Measured leakage current
Closed	Normal	Closed	
Closed	Normal	Open	
Closed	Reversed	Closed	
Closed	Reversed	Open	

Table 10-18 Typical Data Sheet for Type BF Patient Leakage Current Test

Tester Neutral	Tester Polarity Switch	Ground Switch	Measured leakage current
Open	Normal	Closed	
Open	Reversed	Closed	



## 10-8-8 Type BF Patient Leakage current - Mains to Probe

Reference the procedure in the IEC 60601-1. Measure leakage current flow from mains to Probe.



### **DANGER Electric Shock Hazard.**

Line voltage is applied to Probe during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone during testing.



**CAUTION** Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.

**Table 10-19 Typical Data Sheet for Type BF Patient Leakage Current - Mains to Probe**

Tester Neutral	Tester Polarity Switch	Ground Switch	Measured leakage current
Closed	Normal	Closed	
Closed	Reversed	Closed	

**NOTE:** *It is not necessary to test each lead individually or power condition combinations as required in previous tests.*

## Section 10-9 When There's Too Much Leakage Current...

### 10-9-1 Earth and/or Enclosure Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part. Tighten all grounds. Ensure star washers are under all ground studs. Inspect wiring for bad crimps, poor connections, or damage. Test the wall outlet; verify it is grounded and is free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a workaround, check the other outlets to see if they could be used instead.

**NOTE:** *No outlet tester can detect the condition where the neutral wire and the grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.*

### 10-9-2 Probe Fails

- Test another probe to isolate if the fault lies with the probe or the scanner.

**NOTE:** *Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from an inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.*

- Test the probe in another connector to isolate if the fault lies with the probe or the scanner. If excessive leakage current is slot dependent, inspect the system connector for bent pins, poor connections, and ground continuity.

If the problem remains with the probe, replace the probe.

### 10-9-3 Peripheral Fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

### 10-9-4 Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, and then the on-board peripherals one at a time while monitoring the leakage current measurement.

## 10-9-5 New Unit

If the leakage current measurement tests fail on a new unit and if situation cannot be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

### ELECTRICAL SAFETY

Outlet and Ground Continuity test

**Table 10-20**

Outlet/Ground Continuity	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground & wiring config.)	N/A	N/A		
System Ground Continuity	0.2 Ohm			

Earth leakage current test

**Table 10-21**

Tester Neutral	Tester Polarity Switch	Max Value Allowed	Value Measured	OK?	Comments
Enter Name of tested peripheral here:					
Closed	Normal	0.3mA(USA)/0.5mA(Others)			
Closed	Reversed	0.3mA(USA)/0.5mA(Others)			
Open	Normal	1mA			
Open	Reversed	1mA			

Enclosure leakage current test

**Table 10-22**

Tester Neutral	Tester Polarity Switch	Protective Earth Switch	Max Value Allowed	Test 1 Wheel	Test 2 LCD	Optional Test 3	Optional Test 4	OK?	Comments
Enter Name of tested peripheral here:									
Closed	Normal	Closed	0.1mA(USA)/ 0.1mA(Others)						
Closed	Normal	Open	0.3mA(USA)/ 0.5mA(Others)						
Closed	Reversed	Closed	0.1mA(USA)/ 0.1mA(Others)						
Closed	Reversed	Open	0.3mA(USA)/ 0.5mA(Others)						
Open	Normal	Closed	0.5mA(USA)/ 0.5mA(Others)						
Open	Reversed	Closed	0.5mA(USA)/ 0.5mA(Others)						

Type BF Patient Leakage Current Test - Probes (This test should be done for all probe)

**Table 10-23**

Tester Neutral	Tester Polarity Switch	Ground Switch	Max Value Allowed	Value Measured	OK?	Comments
Closed	Normal	Closed	0.1mA			
Closed	Normal	Open	0.5mA			
Closed	Reversed	Closed	0.1mA			
Closed	Reversed	Open	0.5mA			
Open	Normal	Closed	0.5mA			
Open	Reversed	Closed	0.5mA			

Type BF Patient Leakage Current Test - Mains to Probe (This test should be done for all probes)

**Table 10-24**

Tester Neutral	Tester Polarity Switch	Ground Switch	Max Value Allowed	Value Measured	OK?	Comments
Closed	Normal	Closed	5mA			
Closed	Reversed	Closed	5mA			

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: \_\_\_\_\_

## Section 10-10 Ultrasound INSPECTION CERTIFICATE

Customer Name:		System ID:		Dispatch Number / Date Performed:		Warranty/Contract/HBS	
System Type		Model Number:		Serial Number:		Manufacture Date:	
Probe 1:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 2:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 3:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 4:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 5:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 6:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 7:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 8:	Frequency:	Scan Format*:		Model Number:		Serial Number:	
Probe 9:	Frequency:	Scan Format*:		Model Number:		Serial Number:	

\* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

### FUNCTIONAL CHECKS

### PHYSICAL INSPECTION AND CLEANING

Functional Check (if applicable)	OK? or N/A	Physical Inspection and Cleaning (if applicable)	Inspect	Clean
B-Mode Function		Console		
M-Mode Function		Monitor		
Doppler Modes Functions				
Color Modes Functions		Air Filter		
3D/4D-Mode Function		Probe Holders		
Applicable Software Options		External I/O		
Applicable Hardware Options		Wheels, Brakes & Swivel Locks		
Control Panel		Cables and Connectors		
Monitor		Approved Peripherals (VCR, DVD Drive, Printers, etc.)		
Measurement Accuracy				

### COMMENTS:

---



---



---



---

## ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground & wiring config.)				
System Ground Continuity				
Chassis Source Leakage Current - Probe				
Chassis Source Leakage Current - Wheel				
Chassis Source Leakage Current - CRT				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1 Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2 Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3 Ground Continuity				

### PROBES

Probe Number (from previous page)	Max Value Allowed	Max Value Measured	OK?	Comments
Probe 1:				
Probe 2:				
Probe 3:				
Probe 4:				
Probe 5:				
Probe 6:				
Probe 7:				
Probe 8:				
Probe 9:				

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: \_\_\_\_\_

---

This page was intentionally left blank.

---

© 2017 General Electric Company.

GE Ultrasound Korea, Ltd.  
9, Sunhwan-ro 214beon-gil, Jungwon-gu, Seongnam-si,  
Gyeonggi-do,  
Korea

[www.gehealthcare.com](http://www.gehealthcare.com)

