Technical Publication

Venue 50

Basic Service Manual

Direction Number: 5604786-100 English

Rev. 9

Product Information

This manual is a reference for the Venue 50. It applies to all versions of the R4.x.x and R5.x.x software for the Venue 50 ultrasound system.

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Revision history

Revision History

Revision	Date (YYYY/MM/DD)	Reason for change
Rev. 1	2015/04/15	Initial Release
Rev. 2	2016/04/20	Add UDI label icon
Rev. 3	2016/06/29	Update UDI label
Rev. 4	2016/11/30	Update safety test frequency
Rev. 5	2017/02/06	Add new peripheral
Rev. 6	2017/06/09	Add new spare parts
Rev. 7	2017/08/28	Update the unpacking procedure of Docking Cart for sea transportation
Rev. 8	2018/03/28	Update the unpacking procedure of Docking Cart
Rev. 9	2018/07/25	Corrected revision number in footer

List of Effected Pages (LOEP)

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Important Precautions

Translation policy

English (EN)

WARNING

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.

Français (FR)

AVERTISSEMENT

Ce manuel de maintenance est disponible en anglais uniquement.

- Si un client de la personne responsable de la maintenance demande une langue autre que l'anglais, il est de la responsabilité du client de fournir les services de traduction.
- N'essayez pas d'effectuer vous-même la maintenance de l'équipement avant d'avoir préalablement lu et compris le manuel de maintenance.
- Le non-respect cet avertissement peut entraîner des blessures dues à un choc électrique, une défaillance mécanique ou à d'autres éléments dangereux chez la personne en charge de la maintenance, l'opérateur ou le patient.

Español (ES)

ADVERTENCIA

Este Manual de servicio está disponible en idioma inglés únicamente.

- Si un proveedor de servicio del cliente requiere un idioma distinto, es responsabilidad del cliente ofrecer servicios de traducción.
- No intente reparar el equipo a menos que haya consultado y comprendido este Manual de servicio.
- Si no presta atención a esta Advertencia, se pueden ocasionar lesiones al proveedor de servicio, al operador o al paciente por descarga eléctrica, por riesgos mecánicos o de otra índole.

WARNUNG

Deutsch (DE)

Dieses Wartungshandbuch ist nur auf Englisch verfügbar.

- Wenn der Kundendiensttechniker eines Kunden eine andere Sprache als Englisch benötigt, unterliegt es der Verantwortung des Kunden eine Übersetzung anfertigen zu lassen.
- Warten Sie das Gerät nur, wenn Sie dieses Wartungshandbuch gelesen und verstanden haben.
- Die Nichtbeachtung dieses Warnhinweises kann zu Verletzungen des Kundendiensttechnikers, Anwenders oder Patienten durch Stromschläge, mechanische oder andere Gefahren führen.

AVVERTENZA

italiano (IT)

Il presente Manuale di assistenza è disponibile solo in inglese.

- Se il fornitore di servizi di un cliente ne richiede una copia in una lingua diversa dall'inglese, è responsabilità del cliente fornire il servizio di traduzione.
- Non tentare di riparare l'apparecchio se questo Manuale di assistenza non è stato letto e compreso.
- Il mancato rispetto di questa avvertenza può comportare il rischio di lesioni al fornitore di servizi, all'operatore o al paziente causate da scosse elettriche o da pericoli di origine meccanica o di altro tipo.

WAARSCHUWING

Nederlands (NL)

Deze servicehandleiding is alleen beschikbaar in het Engels.

- Als de serviceleverancier van een klant vraagt om een andere taal dan Engels, is het de verantwoordelijkheid van de klant om een vertaalde versie te bieden.
- Probeer geen onderhoud aan de apparatuur uit te voeren tenzij deze servicehandleiding is geraadpleegd en begrepen.
- Het niet opvolgen van deze waarschuwing kan bij de serviceleverancier, de operator of de patiënt leiden tot letsel door elektrische schokken, mechanische of andere gevaren.

ADVERTÊNCIA

Português (PT-BR)

Este Manual de Manutenção está disponível apenas em Inglês.

- Caso um prestador de serviços do cliente solicite o manual em idioma diferente do inglês, é de responsabilidade do cliente o fornecimento de serviços de tradução.
- Não tente realizar a manutenção do equipamento antes de ler e compreender este Manual de manutenção.
- O não cumprimento desta advertência pode resultar em danos por choque elétrico e riscos mecânicos para o prestador de serviços, operador ou paciente.

HOIATUS!

Eesti (ET)

Service Manual (Hooldusjuhend) on saadaval ainult ingliskeelsena.

- Kui kliendi teenusepakkuja nõue on, et juhend oleks mõnes muus keeles, korraldab juhendi tõlkimise klient.
- Tutvuge enne seadme hooldustööde tegemist kindlasti juhendiga Service Manual (Hooldusjuhend).
- Selle nõude eiramise korral võib teenindaja, kasutaja või patsient saada elektrilöögi, samuti võivad kaasneda muud ohud.

OPOZORILO

Slovenščina (SL)

Ta servisni priročnik je na voljo samo v angleščini.

- Če ponudnik servisnih storitev za stranko potrebuje navodila v drugem jeziku, mora stranka sama poskrbeti za prevajanje.
- 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.

警告

日本語 (JA)

このサービスマニュアルは英語版のみ提供されています。

- お客様の保守担当者が英語以外のマニュアルを必要とされる場合は、お客様の負担にて翻訳サービスをご利用ください。
- 装置の保守を行う前に、必ずサービスマニュアルを読み、内容を理解してください。
- この警告に注意を払わない場合、保守担当者やオペレータ、患者に対して、電気ショック、機械またはその他の危険による傷害が発生する恐れがあります。

警告

简体中文 (ZH-CN)

本维修手册仅提供英文版。

- 如果客户需要其它语种版本，请自行翻译。
- 在维修机器前，请务必阅读并完全理解本维修手册。
- 若违反本警告，有可能会给维修提供商、操作员或患者带来电击伤害、机械损伤或其它危害。

VARNING

Svenska (SV)

Den här servicehandboken finns endast på engelska.

- Om en kunds servicetekniker kräver ett annat språk än engelska är det kundens ansvar att tillhandahålla en översatt version.
- Försök inte att utföra service på utrustningen om du inte har läst igenom och förstått den här servicehandboken.
- Om du inte tar hänsyn till den här varningen kan serviceteknikern, operatören eller patienten utsättas för elektriska stötar eller mekaniska eller andra faror, vilket kan leda till personskador.

警告

繁體中文 (ZH-TW)

此服務手冊僅推出英文版。

- 若客戶的維修人員需要英文以外的其他語言版本，客戶需自行負責提供翻譯服務。
- 在詳閱此服務手冊並充分理解其內容之前，請勿試圖開始維修設備。
- 若忽視此警告，可能導致維修人員、操作人員或病患因為觸電、機械問題或其他危險而受傷。

경고

한국어 (KO)

이 서비스 설명서는 영어로만 제공됩니다.

- 고객의 서비스 공급자가 영어 이외의 언어를 요구하는 경우 번역 서비스를 제공할 책임은 고객에게 있습니다.
- 이 서비스 설명서를 참조 및 이해하지 못한 경우 장비를 만지지 마십시오.
- 이 경고를 무시한 경우 서비스 공급자, 오퍼레이터 또는 환자가 감전, 기계적 위험 또는 기타 위험으로 인한 부상을 입을 수 있습니다.

ПРЕДУПРЕЖДЕНИЕ

На русском языке (RU)

Данное руководство по обслуживанию доступно только на английском языке.

- Если специалисту по техническому обслуживанию клиента требуется документация на каком-либо другом языке, ответственность за выполнение перевода возлагается на клиента.
- Приступайте к обслуживанию оборудования только после того, как изучите данное руководство по обслуживанию и полностью поймете его содержание.
- Несоблюдение данного требования может привести к травмированию специалиста по техническому обслуживанию, пользователя или пациента вследствие поражения электрическим током, механических и прочих повреждений.

OSTRZEŻENIE

Polski (PL)

Niniejszy podręcznik serwisowy jest dostępny wyłącznie w języku angielskim.

- Jeżeli dostawca usług klienta posługuje się językiem innym niż angielski, za zapewnienie usług tłumaczeniowych odpowiada klient.
- Przed przystąpieniem do czynności serwisowych należy zapoznać się z informacjami zawartymi w niniejszym podręczniku serwisowym i je zrozumieć.
- W przeciwnym wypadku dostawca usług, operator lub pacjent mogą odnieść obrażenia spowodowane porażeniem prądem elektrycznym, działaniem elementów mechanicznych lub innymi zagrożeniami.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ

Ελληνικά (EL)

Το παρόν Εγχειρίδιο σέρβις διατίθεται μόνο στα Αγγλικά.

- Εάν ο πάροχος σέρβις του πελάτη απαιτεί γλώσσα εκτός των Αγγλικών, η παροχή μεταφραστικών υπηρεσιών αποτελεί ευθύνη του πελάτη.
- Μην επιχειρήσετε να επισκευάσετε τον εξοπλισμό εάν πρώτα δεν συμβουλευτείτε και κατανοήσετε το παρόν Εγχειρίδιο σέρβις.
- Σε περίπτωση μη τήρησης της παρούσας προειδοποίησης, ενδέχεται να προκληθεί τραυματισμός στον πάροχο σέρβις, το χειριστή ή τον ασθενή εξαιτίας ηλεκτροπληξίας καθώς και μηχανικών ή άλλων κινδύνων.

FIGYELMEZTETÉS

Magyar (HU)

A szervizkézikönyv kizárólag angol nyelven érhető el.

- Amennyiben az ügyfél szolgáltatójának nem felel meg az angol nyelvű dokumentáció, úgy a fordításról az ügyfélnek kell gondoskodnia.
- Kizárólag úgy lásson hozzá a berendezés karbantartásához, hogy elolvasta és megértette a szervizkézikönyvben foglaltakat.
- Ezen figyelmeztetés figyelmen kívül hagyása esetén a szolgáltató, a kezelő vagy a páciens áramütést, mechanikus sérülést vagy más veszély által okozott személyi sérülést szenvedhet.

VAROVANIE

Slovenčina (SK)

Táto servisná príručka je dostupná iba v anglickom jazyku.

- Ak poskytovateľ služieb zákazníkom vyžaduje iný jazyk ako anglický jazyk, jeho povinnosťou je zabezpečiť prekladateľské služby.
- Zariadenie nepoužívajte bez prečítania a porozumenia tejto servisnej príručky.
- Nedodržanie tejto výstrahy môže viesť k zraneniu poskytovateľa služieb, operátora alebo pacienta spôsobeného elektrickým šokom, mechanickým alebo iným nebezpečenstvom.

VÝSTRAHA

česky (CZ)

Tato servisní příručka je k dispozici pouze v angličtině.

- Pokud poskytovatel služby zákazníkovi požaduje jiný jazyk než angličtinu, je odpovědností zákazníka poskytnout služby překladu.
- Nepokoušejte se provádět servis zařízení, dokud si neprostudujete a neporozumíte servisní příručce.
- Nevěnování pozornosti této výstraze může způsobit poskytovateli služeb, obsluze nebo pacientovi úraz elektrickým proudem, mechanická nebo jiná nebezpečí.

UYARI

Türkçe (TK)

Servis Kılavuzu yalnızca İngilizce olarak mevcuttur.

- Müşterinin servis sağlayıcısı için kılavuzun İngilizce dışında başka bir dile çevrilmesi gerekiyorsa çeviri hizmeti sağlamak müşterinin sorumluluğudur.
- Bu Servis Kılavuzu'na bakıp talimatları anlamadan ekipmanı kullanmaya çalışmayın.
- Bu Uyarının göz ardı edilmesi servis sağlayıcısının, operatörün veya hastanın, elektrik çarpması, mekanik arıza ya da diğer tehlikeler nedeniyle yaralanmasına neden olabilir.

ADVARSEL

Dansk (DA)

Denne servicemanual fås kun på engelsk.

- Hvis en kundes tjenesteudbyder kræver et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelsesydelserne.
- Forsøg ikke at udføre service på udstyret, medmindre denne servicemanual er læst og forstået.
- Manglende overholdelse af denne advarsel kan medføre skade på serviceudbyderen, operatøren eller patienten som følge af elektrisk stød, mekaniske eller andre farer.

ADVARSEL

Norsk (NO)

Denne servicehåndboken er bare tilgjengelig på engelsk.

- Hvis en kundes tjenestetilbyder krever et annet språk enn engelsk, er det kundens ansvar å tilby oversettelsestjenester.
- Ikke forsøk å utføre service på utstyret før denne servicehåndboken er lest og forstått.
- Dersom det ikke tas hensyn til denne advarselen, kan det føre til skader på tjenestetilbyderen, operatøren eller pasienten fra elektrisk støt, mekaniske eller andre farer.

VAKAVA VAROITUS

Suomi (FI)

Tämä huolto-opas on saatavana vain englanniksi.

- Jos asiakkaan palveluntarjoaja tarvitsee oppaan jollain muulla kielellä, käännöspalveluiden hankkiminen on asiakkaan vastuulla.
- Laitetta ei saa huoltaa ellei huolto-oppaaseen ole sitä ennen tutustuttu huolellisesti.
- Jos tätä varoitusta ei noudateta, palveluntarjoaja, käyttäjä tai potilas saattaa saada sähköiskun, ja saattaa aiheutua mekaanisia tai muita vaurioita.

ПРЕДУПРЕЖДЕНИЕ

Български (BG)

Настоящото Сервизно ръководство се предлага само на английски език.

- Ако доставчикът на сервизни услуги на клиента изисква ръководство на език, който се различава от английския, клиентът има отговорност да осигури адекватен превод.
- Не правете опити за сервиз на оборудването, без да проверите и да разберете съветите в Сервизното ръководство.
- Неспазването на това предупреждение може да доведе до нараняване на доставчика на сервизни услуги, оператора или пациента вследствие на токов удар, механична или други опасности.

AVERTISMENT

Română (RO)

Acest manual de service este disponibil doar în engleză.

- Dacă furnizorul de servicii al unui client solicită altă limbă decât engleza, este responsabilitatea clientului să ofere servicii de traducere.
- Nu încercaţi să efectuaţi lucrări de service asupra echipamentului, în afară de cazul când aţi consultat acest manual de service şi l-aţi înţeles.
- Nerespectarea acestui avertisment poate avea ca rezultat rănirea furnizorului de servicii, a operatorului sau a pacientului ca urmare a electrocutării, pericolelor mecanice sau a altor pericole.

UPOZORENJE

Hrvatski (HR)

Ovaj servisni priručnik dostupan je samo na engleskom jeziku.

- Ako klijentov serviser zahtijeva jezik koji nije engleski, odgovornost klijenta je pružiti usluge prijevoda.
- 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.

ĮSPĖJIMAS

Lietuvių k. (LT)

Šis priežiūros vadovas galimas tik anglų kalba.

- Jei kliento paslaugų teikėjas reikalauja kitos kalbos nei anglų, klientas atsako už vertimo paslaugos teikimą.
- Atlikite įrangos priežiūrą tik gerai susipažinę su priežiūros vadovu ir jį supratę.
- Nesilaikant šio įspėjimo galimas paslaugos teikėjo, operatoriaus ar paciento sužeidimas dėl elektros šoko, mechaninio ar kito pavojaus.

BRĪDINĀJUMS

Latviski (LV)

Šī apkalpes rokasgrāmata ir pieejama tikai angļu valodā.

- Ja klienta pakalpojumu sniedzējam ir nepieciešama cita valoda, kas nav angļu valoda, klienta pienākums ir nodrošināt tulkojumu.
- Nemēģiniet apkalpot aprīkojumu, ja apkalpes rokasgrāmata nav izlasīta un izprasta.
- Ja šis brīdinājums netiek ievērots, pakalpojumu sniedzējs, operators vai pacients var gūt traumas no elektrošoka vai var rasties mehānisks vai cita veida apdraudējums.

UPOZORENJE

Srpski (SR)

Ovaj priručnik za servisiranje dostupan je samo na engleskom jeziku.

- Ako klijentov serviser zahteva jezik koji nije engleski, odgovornost je na klijentu da pruži usluge prevođenja.
- Nemojte da pokušavate da servisirate opremu ako prethodno niste pročitali i razumeli ovaj priručnik.
- Ako ne poštujete ovo upozorenje, može doći do povređivanja servisera, operatera ili pacijenta uzrokovanog električnim udarom, mehaničkim i drugim opasnostima.

AVISO

Português (Portugal) (PT-PT)

Este manual de assistência está disponível apenas em inglês.

- Se o prestador de serviços de assistência do cliente necessitar do manual noutro idioma, a disponibilização dos serviços de tradução é da responsabilidade do cliente.
- Não tente reparar o equipamento se não tiver consultado e compreendido este manual de assistência.
- O não cumprimento das instruções constantes neste aviso pode resultar em ferimentos no prestador de serviços de assistência, no operador ou no paciente devido a choques eléctricos, perigos mecânicos ou outros problemas.

ПОПЕРЕДЖЕННЯ

Українська (UK)

Цей посібник із технічного обслуговування доступний лише англійською мовою.

- Якщо постачальнику послуг із технічного обслуговування потрібна інформація мовою, відмінною від англійської, відповідальність за надання послуг перекладу несе користувач.
- Технічне обслуговування обладнання можна виконувати лише після ознайомлення з посібником із технічного обслуговування та усвідомлення його змісту.
- Недотримання цього попередження може призвести до травм постачальника послуг, оператора або пацієнта, спричинених дією електричного струму, механічних або інших пошкоджень.

PERINGATAN

Bahasa Indonesia (ID)

Panduan Servis ini hanya tersedia dalam Bahasa Inggris.

- Jika penyedia layanan pelanggan memerlukan bahasa di luar Bahasa Inggris, maka pelanggan bertanggung jawab untuk memberikan layanan tersebut.
- Jangan mencoba menyervis peralatan ini, kecuali Panduan Servis ini telah dijadikan rujukan dan dipahami dengan baik.
- Kelalaian memperhatikan Peringatan ini dapat menyebabkan cedera terhadap penyedia layanan, operator, atau pasien akibat bahaya kejutan listrik, mekanik, dan bahaya lainnya.

คำเตือน

ไทย (TH)

คู่มือซ่อมบำรุงนี้มีเฉพาะภาษาอังกฤษเท่านั้น

- หากผู้ให้บริการของลูกค้าต้องการฉบับภาษาอื่นนอกเหนือจากภาษาอังกฤษ ลูกค้าต้องเป็นผู้รับผิดชอบในการจัดเตรียมคู่มือซ่อมบำรุงฉบับแปล
- โปรดอย่าซ่อมบำรุงอุปกรณ์โดยไม่ศึกษา และทำความเข้าใจคู่มือซ่อมบำรุงนี้
- หากไม่ปฏิบัติตามคำเตือนนี้อาจส่งผลให้ผู้ให้บริการ ผู้ใช้งานอุปกรณ์ หรือผู้ป่วยได้รับบาดเจ็บจากไฟฟ้าช็อต อันตรายจากกลไกของอุปกรณ์ หรืออันตรายอื่น ๆ

CẢNH BÁO

Tiếng Việt (VI)

Hướng dẫn sử dụng dịch vụ này chỉ sẵn dùng bằng tiếng Anh.

- Nếu nhà cung cấp dịch vụ của khách hàng yêu cầu ngôn ngữ khác ngoài tiếng Anh, thì khách hàng phải có trách nhiệm cung cấp các dịch vụ dịch thuật.
- Không được tìm cách sửa chữa thiết bị trừ khi đã tham khảo và hiểu rõ Hướng dẫn sử dụng dịch vụ này.
- Bỏ qua lời cảnh báo này có thể gây thương tích cho nhà cung cấp dịch vụ, nhân viên vận hành hoặc bệnh nhân do sốc điện, những nguy hiểm về máy móc hoặc yếu tố khác.

ЕСКЕРТУ

Қазақ тілінде (KK)

Осы қызмет көрсету нұсқаулығы тек ағылшын тілінде қолжетімді.

- Егер тұтынушылардың қызметтер жеткізушісі ағылшын тілінен басқа тілді талап етсе, аудару қызметтерімен қамтамасыз ету тұтынушының жауапкершілігіне кіреді.
- Осы қызмет көрсету нұсқаулығын түсініп, ол туралы кеңес алмайынша жабдыққа қызмет көрсетуге тырыспаңыз.
- Осы ескертуді орындамау электр тогының соғуы, механикалық немесе басқа да қауіптер салдарынан қызметтер жеткізушісінің, оператордың немесе емделушінің жарақаттануына алып келуі мүмкін.

BABALA

Tagalog (TL)

Available lamang sa Ingles ang Manwal ng Serbisyong ito.

- Kung ang kailangan lamang ng tagabigay ng serbisyo ng kustomer ng wika maliban sa Ingles , responsibilidad ng kustomer na magbigay ng serbisyo sa pagsasalin wika nito.
- Huwag subukan na iserbisyo ang mga kasangkapan maliban kung nakonsulta ang nauunawaan itong Manwal ng Serbisyo.
- Ang pagkabigong maunawaan ang Babalang ito ay maaring maging resulta ng pinsala sa tagabigay ng serbisyo, nagpapagana o pasyente mula sa pagkakakoryente, mekanikal o iba pang peligro.

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 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.

Omission and Errors

If there are any omissions, errors or suggestions for improving this documentation, contact the GE 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:

GE Medical Systems (China) Co., Ltd.
No. 19 Changjiang Road
Wuxi National Hi-Tech Dev. Zone
Jiangsu
P.R.China 214028

GE 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, refer to Chapter 1 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.

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Table of Contents

Chapter 1

Introduction

This chapter describes important issues related to safely servicing the ultrasound system and Docking Station/Cart. The service provider must read and understand all the information presented here before installing or servicing the units.

Overview

Contents in This Chapter

Manual Overview

This manual provides installation and service information for the Venue 50 Ultrasound system and Docking Station/Cart. It is divided in ten chapters as shown below.

Contents in This Manual

The manual is divided into ten chapters.

In the beginning of the manual, before Chapter 1, you will find the *Revision overview*, the *Important precautions* including *Translation policy*, *Damage in transportation*, *Certified electrical contractor statement*, *Omission & errors*, *Service safety considerations* and *Legal notes*, and the *Table of Contents* (*TOC*).

An Index has been included after Chapter 10.

Table 1-1: Contents in this manual

Chapter number	Chapter title	Description
1.	'Introduction'	Contains a content summary and warnings.
2.	'Site Preparations'	Contains pre-setup requirements for the Venue 50.
3.	'System Setup'	Contains setup procedure with procedure checklist.
4.	'General Procedures and Functional Checks'	Contains functional checks that must be performed as part of the installation, or as required during servicing and periodic maintenance.
5.	'Components and Functions (Theory)'	Contains block diagrams and functional explanations of the electronics.
6.	'Service Adjustments'	Contains instructions on how to make any available adjustments to the Venue 50.
7.	'Troubleshooting'	Provides procedures for running diagnostic or related routines for the Venue 50.

Table 1-1: Contents in this manual (Continued)

Chapter number	Chapter title	Description
8.	'Replacement Procedures'	Provides disassembly procedures and reassembly procedures for all changeable FRU.
9.	'Renewal Parts'	Contains a complete list of replacement parts for Venue 50.
10.	'Care and Maintenance'	Provides periodic maintenance procedures for Venue 50.
N/A	Index	A quick way to the topic you're looking for.

Typical Users of the Proprietary Service Manual

- GEHC Service Personnel (setup, maintenance, etc.)
- GEHC Online Center Personnel
- Licensed Hospital's Service Providers

Venue 50 models covered by this manual

Table 1-2: Venue 50 Model Designations

Part Number	Description
5452256	Venue 50 Console
5448623	Venue 50 Console with film
5560851	Venue 50 Korean Console
5561656	Venue 50 China Console

NOTE: When not otherwise specified, the contents of this manual applies to all Venue 50 models.

Important Conventions

Conventions used in book

Important conventions, used in this document, are described next.

Model designations

This manual covers the Venue 50 Ultrasound systems listed in:

‘Venue 50 models covered by this manual’ on *page 1-5*.

Icons

Pictures, or icons, are used wherever they will 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 to personnel are labeled in one of three ways:

- DANGER
- WARNING
- CAUTION

d  DANGER

Danger is used to indicate the presence of a hazard that will cause severe personal injury or death if the instructions are ignored.

w  WARNING

Warning is used to indicate the presence of a hazard that can cause severe personal injury and property damage if instructions are ignored.

c  CAUTION

Caution is used to indicate the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored. Equipment damage possible.

NOTE: Notes are used to provide important information about an item or a procedure.

NOTE: Be sure to read the notes; the information contained in a note can often save you time or effort.

Standard hazard icons

Important information will always be preceded by either the exclamation point (!) contained within a triangle, or the symbols for “Danger”, “Warning” or “Caution”, 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 possibly cause harm. Even if a symbol isn’t used in this manual, it may be included for your reference.

Table 1-3: Standard hazard icons

	ELECTRICAL
	MECHANICAL
	RADIATION
	LASER
	HEAT
	PINCH

NOTE: Even if a symbol isn’t used on the product or in this manual, it may be included for your reference.

Standard Icons that indicate that a special procedure is to be used

Some other icons make you aware of specific procedures that should be followed.

Table 1-4: Standard Icons that indicates that a special procedure is to be used

Avoid Static Electricity	Tag and Lock Out	Wear Eye Protection
		
Hand Protection	**Foot Protection**	**Wear Eye Protection**
		

Be sure to read the notes; the information contained in a note can often save you time or effort.

Product Icons

It is important to refer to the current revision of the Ultrasound system's User Manual for a full list of product labels prior to servicing the system.

Labels Locations

It is important to refer to the current revision of the Ultrasound system's User Manual for a full list of product labels prior to servicing the system.

Venue 50 labels are provided in English.

The labels are on the rear of the system. The label content may be different for different regions. Please refer to the labels on the system for the actual content.

Venue 50 Label Location

1. Rating Plate

Table 1-5: Label Icons

Label/Icon	Purpose/Meaning	Location
SN	**Serial number**	Rating Plate
Venue 50 xxxxxxxxx xxxx-xx-xx UDI (01) 0 0000123 00001 7 (11) 160517 (21) 000020WX1	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 Venue 50 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
Venue 50 R4 to R5 UPG P/N: xxxxxxx Rev: xxx UDI (01) 0 0840682 10539 2 (11) 160511 (21) 000020WX5		Upgraded Venue 50 systems, adjacent to the Rating Plate.

Safety Considerations

Contents in this section

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.

Human Safety

- Operating personnel must not remove the system covers.
- Servicing should be performed by authorized personnel only.

Only personnel who have participated in a Venue 50 Training Seminar are authorized to service the equipment.

d DANGER

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

w WARNING

If the covers are removed from an operating Venue 50, some metal surfaces may be warm enough to pose a potential heat hazard if touched, even while in shutdown mode.

w 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.

w WARNING

DO NOT substitute parts or modify equipment

Because of the danger of introducing additional hazards, ONLY install GE approved parts. DO NOT perform any unauthorized modification of the equipment.

w WARNING

Risk of electrical shock, Ultrasound system must be turned off and disconnected from power source. Cord must be controlled at all times.

Wait for at least 20 seconds for capacitors to discharge as there are no test points to verify isolation.

Ultrasound system components may be energized. Always refer to the Ultrasound system's Proprietary Service Manual for LOTO warnings and cautions

Human Safety (continued)

WARNING

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

WARNING

Beware of possible sharp edges on all mechanical parts. If sharp edges are encountered, the appropriate PPE should be used to reduce the risk of injury.

WARNING

Wear all PPE including gloves as indicated in the chemical MSDS.

Mechanical safety

While the software install procedure is designed to preserve data, you should save any patient data, images, system setups to removable media or hardcopy before doing a software upgrade.

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.

Never use a probe that has fallen to the floor. Even if it looks OK, it may be damaged.

Do not move Docking Cart with big incline angle.

When using Docking Cart, avoid water and blood enter into Docking Cart.

Put peripherals in correct position to avoid Docking Cart overload.

Mechanical safety (continued)

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

- *Before transporting, place the system in its special storage case.*
- *Ensure that the system is firmly secured while inside the vehicle.*
- Secure system with straps or as directed otherwise to prevent motion during transport.
- Prevent vibration damage by driving cautiously. Avoid unpaved roads, excessive speeds, and erratic stops or starts.

If the Venue 50 system is on a docking cart, please take special care of the following:

Make sure the Venue 50 be fixed well to avoid the console falling down when moving Docking Cart.

When the Venue 50 is raised for a repair or moved along any incline, use external caution since it may become unstable and tip over.

Venue 50 system weighs 4.0kg or more, depending on installed peripherals, when ready for use. Care must be used when moving it or replacing its parts.

ALWAYS:

- Use the handle to move the Ultrasound system.
- Do not let the Ultrasound system strike walls or door frame.

Electrical safety

Safe practices

Follow these guidelines to minimize shock hazards whenever you are using the Ultrasound system:

- To minimize shock hazard, the equipment chassis must be connected to an electrical ground.
- The Ultrasound system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground.
- 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 must meet international electrical standards

Connecting a Venue 50 to the wrong voltage level will most likely destroy it.

Probes

Follow these guidelines before connecting a probe to the Ultrasound system:

- Inspect the probe prior to each use for damage or degradation to the:
  - housing
  - cable strain relief
  - lens
  - seal
  - connector pins
  - locking mechanism
- Do not use a damaged or defective probe.
- Never immerse the probe connector or adapter into any liquid.

Peripherals

Refer to the Patient Safety Environment section of the User's Manual for peripheral isolation information.

Battery Safety

To avoid the risk of injury, follow the warning and cautions to make sure that the battery does not burst, ignite, or generate heat of fumes.

- The battery has a safety device. Do not disassemble or alter the battery.
- Charge and discharge the batteries only when the ambient temperature is between 3°C and 40°C (37°F and 104°F).
- 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 temperature over 50°C (122°F). Keep it 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 solder a battery.
- DO NOT connect the battery to an electrical power outlet.

If the Venue 50 is not being used on a monthly basis, the battery needs to be removed during the lengthy non-use period.

Battery Safety (continued)

To avoid the battery bursting, igniting, or fumes from the battery causing equipment damage, observe the following precautions:

- DO NOT immerse the battery in water or allow it to get wet.
- DO NOT put 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. If you have any questions about the battery, consult GE or your local representative.
- Short term (less than one month) storage of battery pack:
  - Store the battery in a temperature range between -5°C (23°F) and 50°C (122°F).

- Long term (3 months or more) storage of battery pack:
  - Store the battery in a temperature range between -5°C (23°F) and 50°C (122°F)
  - Upon receipt of the Venue 50 and before first time usage, it is highly recommended that the customer performs one full discharge/charge cycle. If the battery has not been used for 2 months or more, the customer is recommended to perform one full discharge/charge cycle. It is also recommended to store the battery in a shady and cool area with FCC (full current capacity).
  - One Full Discharge/Charge Cycle Process:

    1. Full discharge of battery to let the Venue 50 automatically shut down.

    2. Charge the Venue 50 to 100% FCC (full current capacity).

    3. Discharge of Venue 50 for complete shut down (takes one hour for discharge).
  - When storing batteries for more than 6 months, charge the batteries at least once every 6 months to prevent leakage and deterioration in performance.
- Use only GE approved batteries.

Dangerous Procedure Warnings

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

d DANGER

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

w WARNING

If the covers are removed from an operating Venue 50, some metal surfaces may be warm enough to pose a potential heat hazard if touched, even while in shutdown mode.

w 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.

w WARNING

Shut down forcedly or remove ACDC plug may cause the damage of the system files.

Lockout/Tagout (LOTO) Requirements

Follow Lockout/Tagout requirements by ensuring you are in total control of the AC power plug at all times during the service process.

To apply Lockout/Tagout (LOTO):

1. Plan and prepare for shutdown.
2. Shutdown the equipment.
3. Isolate the equipment.
4. Remove/disconnect the battery, if present.
5. Apply Lockout/Tagout Devices.
6. Control all stored and residual energy.
7. Verify isolation.

All potentially hazardous stored or residual energy is relieved.

WARNING

Energy Control and Power Lockout for Venue 50.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the Ultrasound system.
4. Maintain control of the Ultrasound system power plug.
5. Wait for at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery, if present.

Ultrasound System components may be energized.

Returning Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances. GE policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE 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.

NOTE: 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.

NOTE: The USER/SERVICE staff should dispose of all the waste properly, per federal, state, and local waste disposal regulations.

The Ultrasound system is not meant to be used for long-term storage of patient data or images. The user is responsible for the data on the system and a regular backup is highly recommended.

If the system is sent for repair, please ensure that any patient information is backed up and erased from the system before shipping. It is always possible during system failure and repair to lose patient data. GE is not responsible for the loss of this data.

If PHI (Patient Healthcare Information) data needs to be sent to GE employees for service purposes, GE will ascertain agreement from the customer. Patient information shall only be transferred by approved service processes, tools and devices restricting access, protecting or encrypting data where required, and providing traceability in the form of paper or electronic documents at each stage of the procedure while maintaining compliance with cross-border restrictions of patient information transfers.

EMC, EMI and ESD

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 of 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.

Compliance

Venue 50 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.

For applicable standards, refer to the Safety Chapter of the Ultrasound system's User's Manual.

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.

Electrostatic discharge (ESD) prevention

WARNING

DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions.

Follow general guidelines for handling of electrostatic sensitive equipment.

WARNING

Risk of electrical shock, Ultrasound 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.

Customer Assistance

Contact Information

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

Prepare the following information before you call:

1. System ID serial number.
2. Software version.
3. Date and time of occurrence.
4. Sequence of events leading to issue.
5. Is the issue repeatable?
6. Imaging mode, probe, preset/application.
7. Media brand, speed, capacity, type.
8. Save image capture, cine loop.

NOTE: Restart the application before resuming clinical scanning.

Phone Numbers for Customer Assistance

Table 1-6: Phone numbers for Customer Assistance

LOCATION	PHONE NUMBER	
USA GE Healthcare - GE Medical Systems Ultrasound & Primary Care Diagnostics, LLC 9900 Innovation Drive Wauwatosa, WI 53226	Service: On-site	1-800-437-1171
	Service Parts	1-800-558-2040
	Application Support	1-800-682-5327 or 1-262-524-5698
Canada	Phone	1-800-668-0732
Latin America	Service Application Support	1-800-321-7937 1-262-524-5698
Europe (OLC-EMEA) GE Ultraschall Deutschland Gmbh & Co. KG Beethovenstrasse 239 Postfach 11 05 60, D-42655 Solingen Germany	OLC - EMEA Phone:	+49 (0) 212-2802-652 +33 1 3083 1300
	Fax:	+49 (0) 2122-8024-31
Online Services Ultrasound Asia	Phone: • Australia • China • India • Japan • Korea • Singapore	 +(61) 1-800-647-855 +(86) 800-810-8188 +(91) 1800-425-8025 +(81) 42-645-2940 +(82) 2620 13585 +(95) 6277-3444

System Manufacturer

Table 1-7: System manufacturer

MANUFACTURER	PHONE NUMBER	FAX NUMBER
GE Medical Systems (China) Co., Ltd. No.19 Changjiang Road WuXi National Hi-Tech Development Zone Jiangsu P.R.China 214028	+86 510 85225888	+86 510 85226688

Chapter 2

Site Preparations

This chapter provides the information required to plan and prepare for the setup of an ultrasound system and Docking Station/Cart. Included are descriptions of the facility and electrical needs to be met by the purchaser of the units.

Overview

Contents in This Chapter

General Requirements

Contents in This Section

Ultrasound system environmental requirements

If the Ultrasound system is very cold or hot

When unpacking the Ultrasound system, allow the temperature of the Ultrasound system to stabilize before powering up. The following table describes guidelines for reaching operational temperatures from storage or transport temperatures.

If the Ultrasound system is very cold or hot, do not turn on its power until it has had a chance to acclimate to its operating environment.

Table 2-1: Ultrasound system acclimate time

°C	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
°F	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140	149	158
Hrs	20	18	16	14	12	10	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12

Environmental specifications for Ultrasound system

The system should be operated, stored, or transported within the parameters outlined below. Either its operational environment must be constantly maintained or the unit must be turned off.

Table 2-2: System Environmental Requirements

	Operational	Storage	Transport
Temperature	3 - 40°C 37 - 104°F	-5 - 50°C 23 - 122°F	-5 - 50°C 23 - 122°F
Humidity	30 - 80% non-condensing	10 - 90% non-condensing	10 - 90% non-condensing
Pressure	700 - 1060hPa	700 - 1060hPa	700 - 1060hPa

Cooling

The cooling requirement for a console Ultrasound system with monitor and on board peripherals, is up to 3800 BTU/h. 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/h demand on the cooling system.

*NOTE: Temperature in degrees Celsius (°C) conversion to degrees F (°F): (°F) = (°C * 9/5) + 32*

CAUTION

Ensure that the probe face temperature does not exceed the normal operation temperature range.

CAUTION

The Venue 50 system and probe connector is not waterproof. Do not expose the device to water or any kind of liquid.

Lighting

Bright light is needed for Ultrasound 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.

Electrical requirements

General requirements

NOTE: GE 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 Ultrasound system.

Sites with a mains power system with defined Neutral and Live:

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.

Sites with a mains power system without a defined Neutral:

The dedicated line shall consist of one phase (two lines), 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 system is only a conduit.

Electrical requirements for the Ultrasound system

Table 2-3: Electrical Specifications for Venue 50 system

Voltage	Power	Current	Frequency
100-240 VAC	180 VA max.	1.6A (max)	50/60HZ

Table 2-4: Electrical Specifications for Docking Cart

Voltage	Power	Current	Frequency
100-240 VAC	380 VA max.	2.7A (max)	50/60HZ

Inrush Current

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

Table 2-5: Inrush Current

Voltage	Inrush Current
100V	75A (max)
240V	120A (max)

Site circuit breaker

Power outage may occur. The Venue 50 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.

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

Site power outlets

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

Unit power plug

If the Ultrasound system arrives without a power plug, or with the wrong plug, you must contact your GE dealer or the installation engineer must supply what is locally required.

Power stability requirements

Voltage drop-out:

Max 10 ms.

Power transients (all applications):

Less than 25% of nominal peak voltage for less than 1 millisecond for any type of transient, including line frequency, synchronous, asynchronous, or aperiodic transients.

EMI limitations

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

Possible EMI sources should be identified before the Ultrasound system is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. Some of these sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave ovens
- light dimmers
- mobile phones
- in-house wireless phones (DECT phones)
- wireless computer keyboard and mouse
- air conditioning system
- High Frequency (HF) surgery equipment
- general AC/DC adapters

The presence of a broadcast station or broadcast van may also cause interference.

See: ‘EMI prevention/abatement’ on *page 2-9* for EMI prevention tips.

EMI prevention/abatement

Table 2-6: EMI prevention/abatement

EMI RULE	DETAILS
Be aware of Radio Frequency sources	• Keep the Ultrasound system at least 5 meters (15 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 Ultrasound system	Poor grounding is the most likely reason an Ultrasound system will have noisy images. Check grounding of the power cord and power outlet.
Replace all screws, Radio Frequency gaskets, covers, cores	• After you finish repairing or updating the Ultrasound system, replace all covers and tighten all screws. • Any cable with an external connection requires a magnet wrap at each end. • Install all covers. Loose or missing covers or Radio Frequency gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken Radio Frequency gaskets	If more than 20% or a pair of the fingers on an Radio Frequency gasket are broken, replace the gasket. Do not turn on the Ultrasound system until any loose metallic part is removed.
Do not place labels where Radio Frequency gaskets touch metal	Where applicable, never place a label where Radio Frequency gaskets meet the Ultrasound system. Otherwise, the gap created will permit Radio Frequency leakage. Or, if a label has been found in such a position, move the label.
Use GE specified harnesses and peripherals	The interconnect cables are grounded and require ferrite beads and other shielding. Also, cable length, material, and routing are all important; do not change from what is specified.
Take care with cellular phones	Cellular phones may transmit a 5 V/m signal; that could cause image artifacts.
Properly route peripheral cables	Where applicable, do not allow cables to lie across the top of the Card Rack 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.

Probes environmental requirements

Operation and storage temperatures for probes

Table 2-7: Operation and storage temperatures for probes

Conditions	Temperature
Operation:	10 to 40°C (50 to 104°F)
Storage:	-5 to 50°C (23 to 122°F)
Temperature in degrees Celsius (°C) conversion to degrees F (°F): (°F) = (°C * 9/5) + 32	

NOTE: Systems and electronic probes are designed for storage temperatures of -5 to +50°C. When exposed to large temperature variations, the product should be kept in room temperature for 10 hours before use.

Facility needs

Contents in This Section

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. 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.

NOTE: 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 Ultrasound 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 Ultrasound system. 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 Ultrasound system reliability.

Required facility needs

- Dedicated single branch power outlet of adequate amperage meeting all local and national codes which is located less than 2.5 m (8 ft.) from the unit's proposed location
- Door opening is at least 76 cm (30 in) wide
- Proposed location for unit is at least 0.2m (0.67 ft.) from the wall for cooling
- 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.
- Power outlets for other medical equipment and gel warmer
- Power outlets for test equipment and modem within 1 m (3.2 ft.) of unit
- Clean and protected space to store transducers (in their cases or on a rack)
- Material to safely clean probes (done with a plastic container, never metal)

See 'Electrical requirements' on *page 2-6 for more information.*

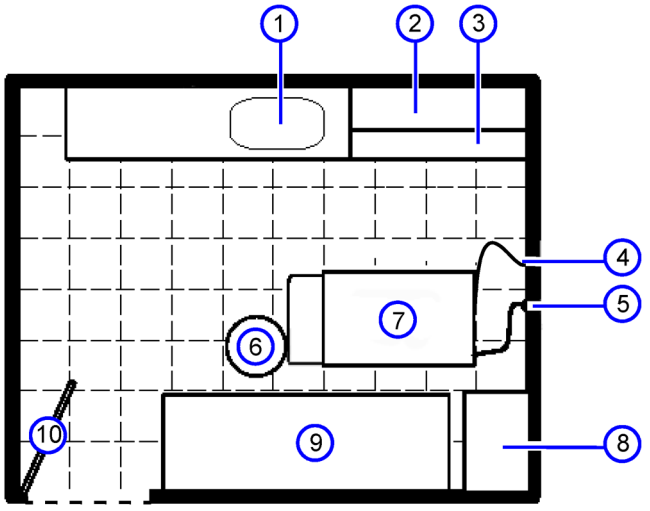
Desirable features

- Circuit breaker for dedicated power outlet is easily accessible
- Sink with hot and cold water
- Receptacle for bio–hazardous waste, like used probe sheaths
- Emergency oxygen supply
- Storage for linens and equipment
- Nearby waiting room, lavatory, and dressing room
- Dual level lighting (bright and dim)
- Lockable cabinet ordered by GE for its software and proprietary manuals

Recommended and Alternate Ultrasound Room Layout

A minimal floor plan and recommended standard floor plan for ultrasound equipment:

Minimal floor plan suggestion



Scale:
Each square equals one square foot (app. 31 x 31 cm)

1. Sink
2. Linens
3. Probes / supplies
4. Ethernet Connector
5. Power outlet
6. Stool
7. Ultrasound system
8. GE cabinet for software and manuals (optional)
9. Examination table
10. Door (76 cm)

Figure 2-1. Minimal floor plan, 2.5 m x 3 m (8 by 10 foot)

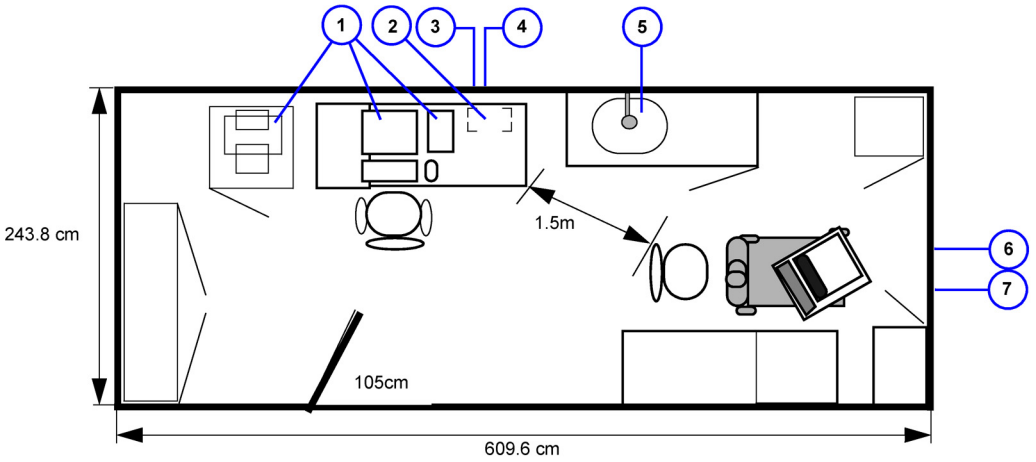
Recommended floor plan suggestion

Add graphic here, when available.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

Figure 2-2. A 14 by 17 foot recommended floor plan

Suggested floor plan, Ultrasound system, and EchoPAC PC in same room



1. EchoPAC PC workstation parts
2. UPS
3. Ethernet network wall outlet
4. 3x mains power outlets
5. Hot and Cold water
6. Dedicated mains power outlet
7. Ethernet network wall outlet

Figure 2-3. Suggested Room with EchoPAC PC workstation and Ultrasound Scanner

Networking setup requirements

Stand alone Ultrasound system (without network connection)

None.

Scanner connected to hospital's network

Supported networks:

Wireless LAN

Purpose of DICOM network function

DICOM 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.

DICOM Option Pre-installation requirements

To configure the Ultrasound system to work with other network connections, the site's network administrator must provide information to complete the form "Worksheet for DICOM Network Information". Ensure that there are no spaces in any field of the form.

See:

Entries must include:

- A host name, local port number, AE Title, IP address and Net Mask for the Ultrasound system.
- The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
- The host name, IP address, port and AE Title for each device the site wants connected to the Ultrasound system for DICOM APPLICATION INFORMATION. A field for the make (manufacturer) and the revision of the device, is also included. This information may be useful for error solving.

DICOM Option Pre-installation requirements (continued)

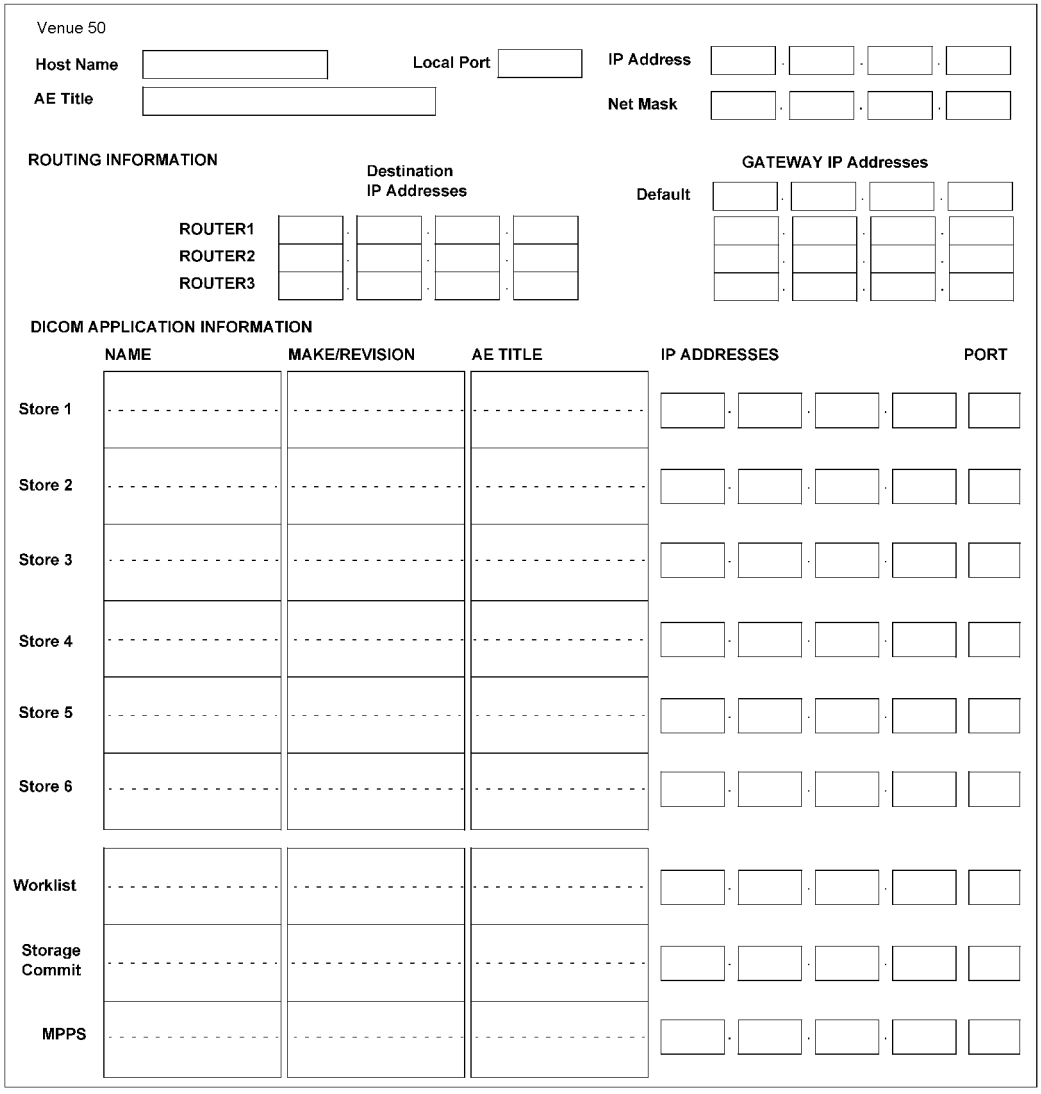


Figure 2-4. Worksheet for DICOM Network Information

Environmental Dangers

Commercial devices such as laser cameras, printers, VCRs and external monitors, usually exceed allowable leakage current limits and, when plugged into separate AC outlets, are in violation of patient safety standards. Suitable electrical isolation of such external AC outlets, or providing the device with extra protective earth, will be required in order to meet UL60601-1 and IEC60601-1 standards for electrical leakage.

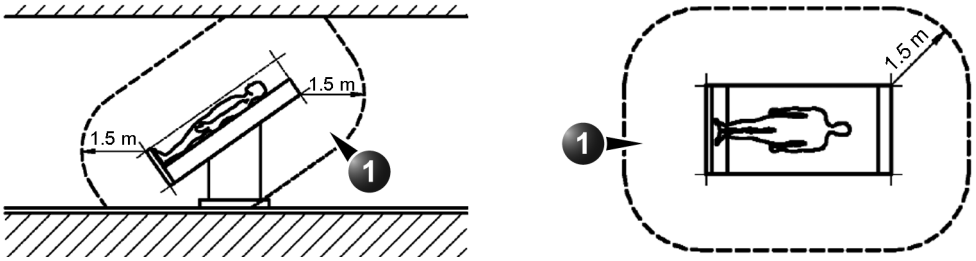
Patient Environment IEC60601-1 and ANSI AAMI ES60601-1

Sub Clause 3.79 and figure A.9 (IEC60601-1:2005 and ANSI AAMI ES60601-1:2005)

Such an area is an environment in which medical diagnosis, monitoring or treatment is carried out. It is very difficult to attach unique dimensions to the PATIENT ENVIROMENT.

In practice a distance of 2,5 m (8.2 ft.) above the floor on which the medical personnel stand and a horizontal distance of 1,5 m (4.9 ft.) have justified themselves as indicative of the dimensions of the Patient Environment.

The patient environment/vicinity will be depicted as a dashed line in this procedure. See example below.



1. Patient environment

Figure 2-5. Patient environment

Chapter 3

System Setup

This chapter contains information needed to install Venue 50 system.

Included is a procedure that describes how to receive and unpack the equipment and how to file a damage or loss claim.

How to prepare the facility and unit of the actual installation, and how to check and test the unit, probes, and external peripherals for electrical safety are also included in this procedure.

Overview

Contents in this chapter

Setup reminders

Average setup time

- Unpacking the Venue 50: 20 minutes
- Set up Venue 50 wo/options: 30 minutes (dependent on the configuration that is required)
- DICOM Network Configuration: 30 minutes

The Venue 50 installation and functional checkout will take approximately one hour. Venue 50 console with optional equipment may take slightly longer.

Setup warnings

d  DANGER

WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE ULTRASOUND SYSTEM!

c  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.

c  CAUTION

Do not wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.

c  CAUTION

Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.

Setup warnings (continued)

1. 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.

NOTE: *For information regarding packing labels, refer to LABELS ON PACKAGE.*

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

If the Ultrasound system is very cold or hot, do not turn on its power until it has had a chance to acclimate to its operating environment.

The following table describes guidelines for reaching operational temperatures from storage or transport temperatures.

°C	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
°F	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140	149	158
Hrs	20	18	16	14	12	10	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12

WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE UNIT!

Setup warnings (continued)

d DANGER

Do not operate this unit unless all board covers are securely in place.

c CAUTION

Operator Manual(s)

The User Manual(s) should be fully read and understood before operating the Venue 50 and kept near the Ultrasound system for quick reference.

c CAUTION

Acoustic Output Hazard

Although the ultrasound energy transmitted from the Venue 50 probe is within AIUM/NEMA standards, avoid unnecessary exposure. ultrasound energy can produce heat and mechanical damage.

Receiving and unpacking the equipment

Contents in this section

Receiving the Venue 50

Overview

Improper handling during transportation may harm the equipment inside the package even if the package itself is undamaged.

When a new system arrives, check that any components are not damaged and are not in short supply. If shipping damage or shortage occurs, contact the address shown in Chapter 1.

NOTE: Check the shipping container for special instructions. Verify that the container is intact. In some cases a secondary container may be used. If so, ask the carrier for unpacking instructions.

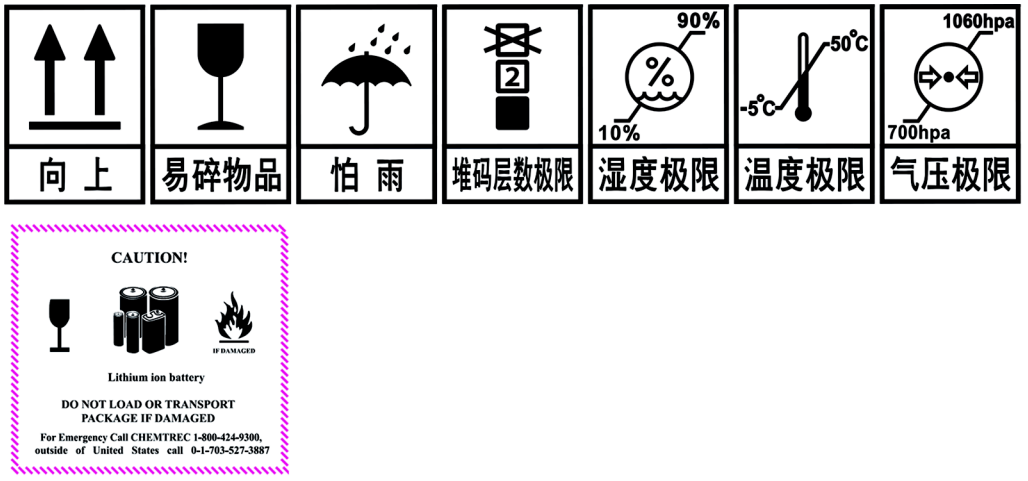


Figure 3-1. Labels on Package

Unpacking the Equipment

Please carefully unpack the system, and do not dispose the package of Venue 50, so that it can be reused for service.

Please keep the protective bag of Venue 50 in box, so that it can be used for shipping or transportation.

Remember to use relevant personal protecting equipment (PPE) during packing and unpacking. Check with your local EHS representative.

Unpacking the Venue 50

1. Cut the four PLASTIC BANDs
2. Cut the adhesive tape and open top covers of paper carton.

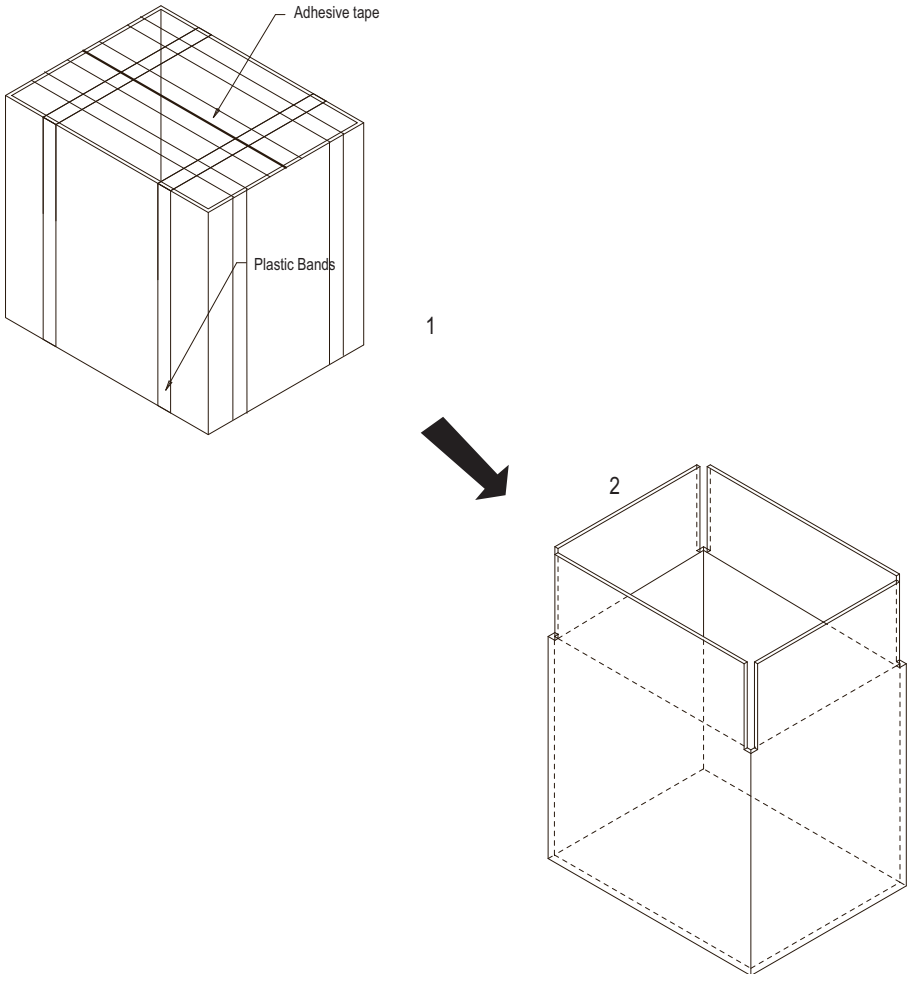


Figure 3-2. Open Top Covers of Paper Carton

Unpacking the Venue 50 (continued)

3. Take out the paper pad on the side. Refer to Figure 3-3 *on page 3-10*.
4. Take out the Accessories Package and Console Package. Refer to Figure 3-3 *on page 3-10*.

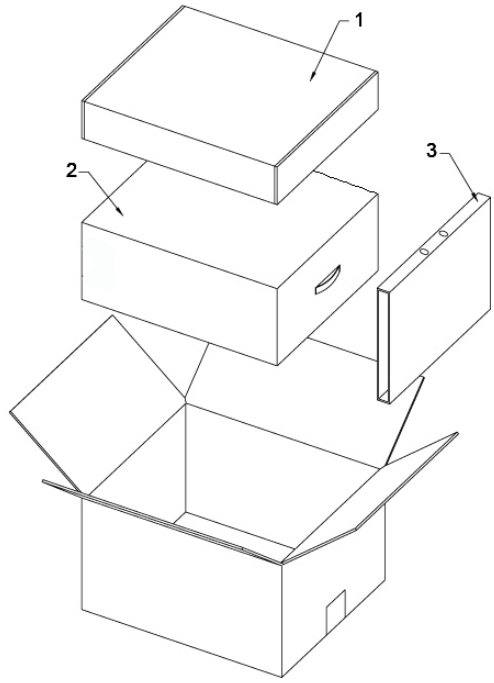


Figure 3-3. Unpacking the Venue 50

Table 3-1: Unpacking the Venue 50

Item	Description
1	Accessories Package
2	Console Package
3	Paper Pad

CAUTION

Do not lift the unit by the rubber band. Equipment damage may result.

Unpacking the Venue 50 (continued)

5. Open the Console Package, then remove the pad. Take out the battery package. Take out the console. Take off the protective bag and the PE bag. Refer to Figure 3-4 *on page 3-11*.

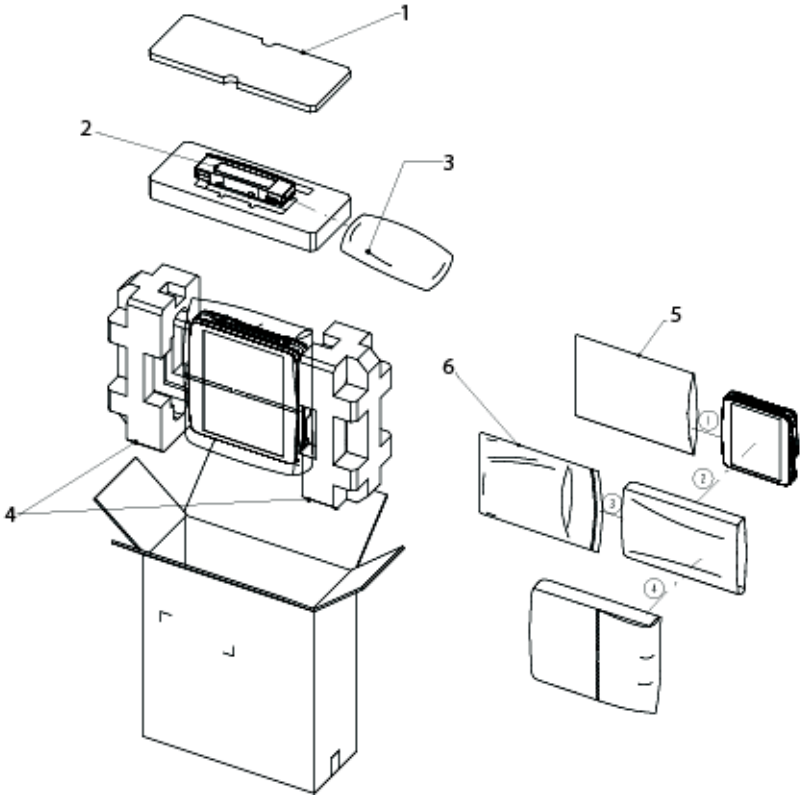


Figure 3-4. Taking out the system

Table 3-2: Taking out the system

Item	Description
1	Paper pad
2	Battery
3	Battery bag
4	Foam
5	PE bag
6	Venue 50 Protective bag

Unpacking the Venue 50 (continued)

6. Open the Accessories Package.

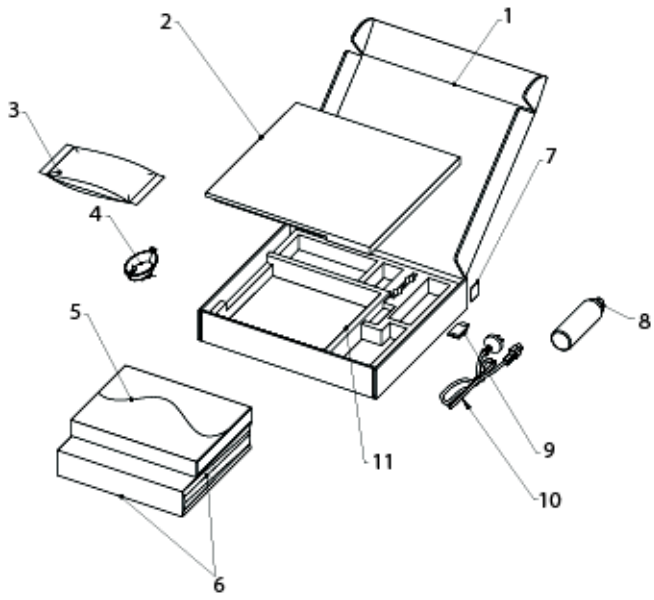


Figure 3-5. Opening Accessories Box

Table 3-3: Accessories Box

Item	Description
1	Venue 50 accessories carton
2	Cover pad
3	Biopsy kit (option)
4	Probe bracket for needle guide (option)
5	Manuals (option)
6	Manuals (standard)
7	Software SD Card - for re-loading software as needed
8	Aquasonic gel
9	SD Card adapter
10	Power Cable (option)
11	Foam

NOTE: Make sure all the items in the checklist are in the Accessories box, contact GE Service if any problem.

Unpacking Docking Station

1. Cut the four PLASTIC BANDS.
2. Cut the adhesive tape and open the top covers of the paper carton.

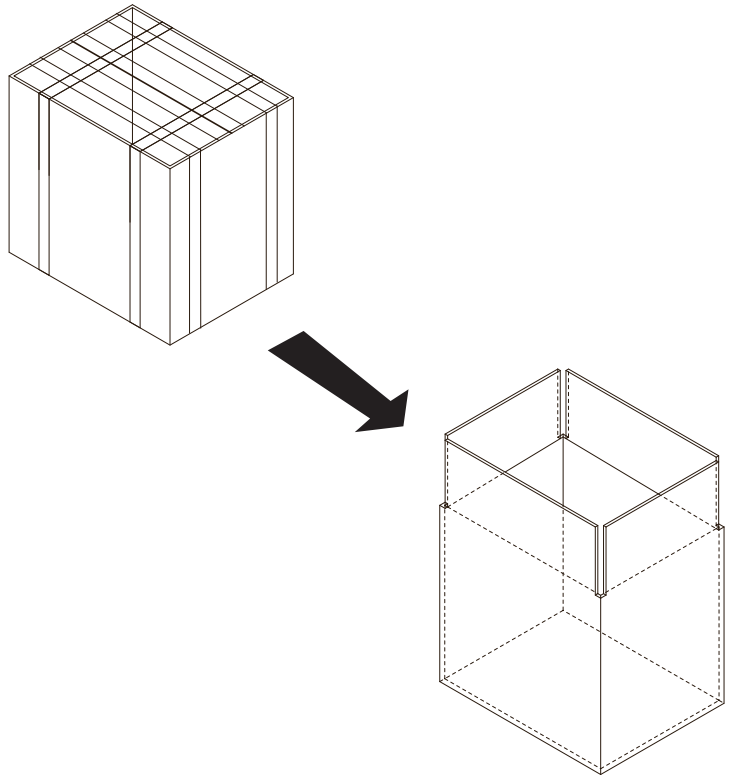


Figure 3-6. Open the top covers of the paper carton

Unpacking Docking Station (continued)

3. Remove top foam, take out the Docking Station Module and probe holders.
4. Take out the Base support module.

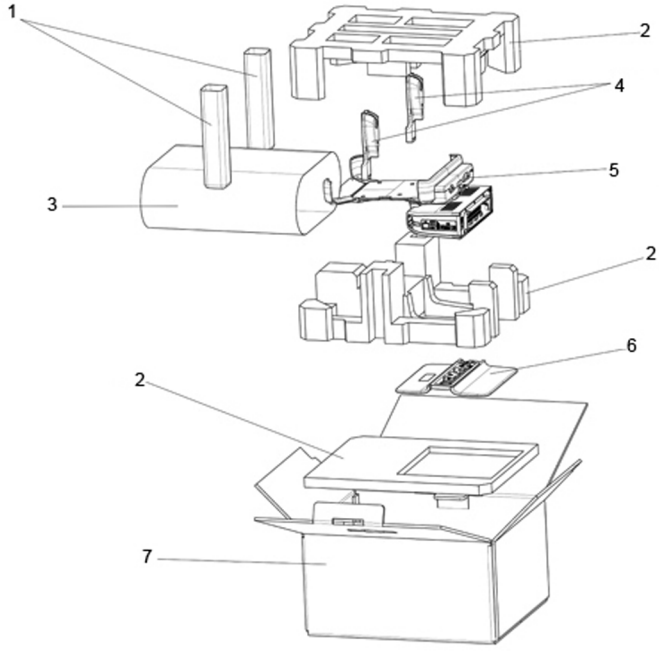


Figure 3-7. Unpacking Docking Station

Table 3-4: Docking Station

Item	Description
1	Probe holder bag
2	Foam
3	Docking Station bag
4	Probe holders
5	Docking Station module
6	Docking Station desk support module
7	Carton
8	Power cord

Unpacking Docking Station (continued)

5. Place the Docking Station Module on track of Base Support Module starting from the left, and slowly move it to the right till it clicks.

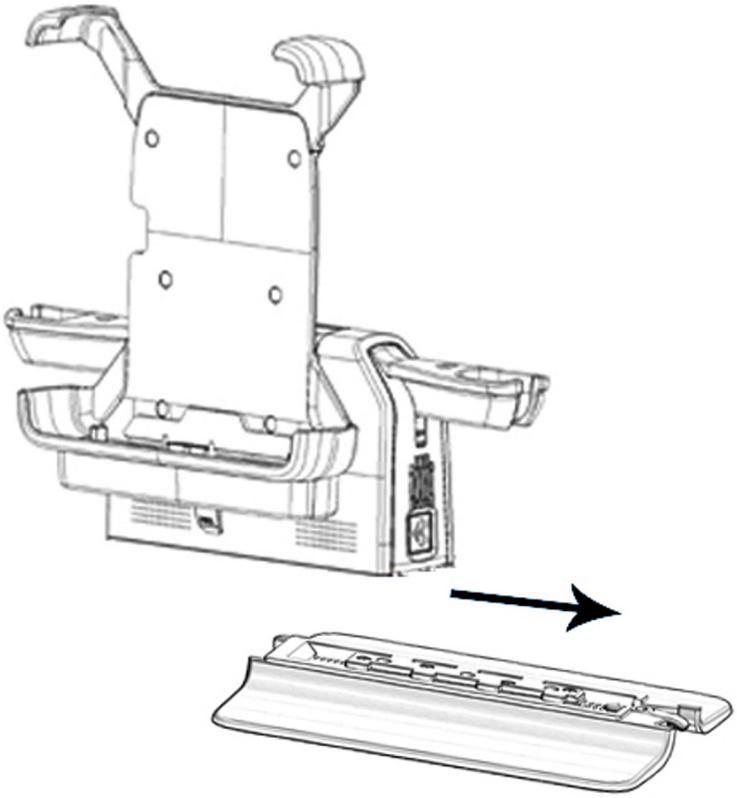


Figure 3-8. Install Docking Station

Unpacking Docking Cart

Table 3-5: Unpacking the Docking Cart

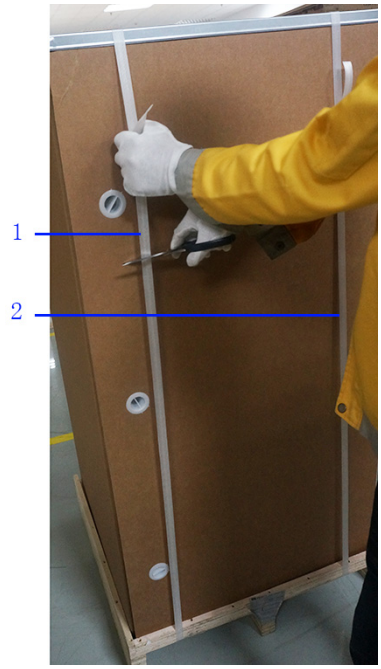
Step	Description	Corresponding Graphic
1.	Tear off the “stop open” mark.	
2.	Cut off the two packing straps around the crate. Note: *To avoid injury, hold the strap clasp with one hand when cutting the strap.*	
3.	Remove the top cover.	

Table 3-5: Unpacking the Docking Cart

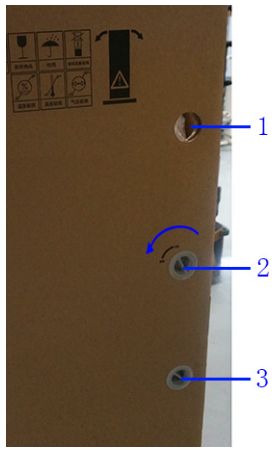
Step	Description	Corresponding Graphic
4.	Remove the three plastic locks on both sides. *Note: Rotate the inside plastic lock counterclockwise to remove it and then remove the outside lock.*	 
5.	Remove the outside shipping box.	
6.	Remove the clear plastic from the cart. *Note: To avoid damaging the cart, please use a pair of scissors instead of the knife.*	
7.	Remove the foams beside the wheels and unlock the strap.	

Table 3-5: Unpacking the Docking Cart

Step	Description	Corresponding Graphic
8.	Remove the barrier bag (wrapped around the Advanced Isolation Cart) from the cart. *Note: To avoid damaging the cart, please use a pair of scissors instead of the knife.*	
9.	Remove the clear plastic and the foams from the docking cart.	

Table 3-5: Unpacking the Docking Cart

Step	Description	Corresponding Graphic
10.	Hold the front handle with two hands and move the whole cart down to the ground.	

Unpacking 3-probe Port Box

1. Cut the four PLASTIC BANDs.
2. Cut the adhesive tape and open top covers of paper carton.

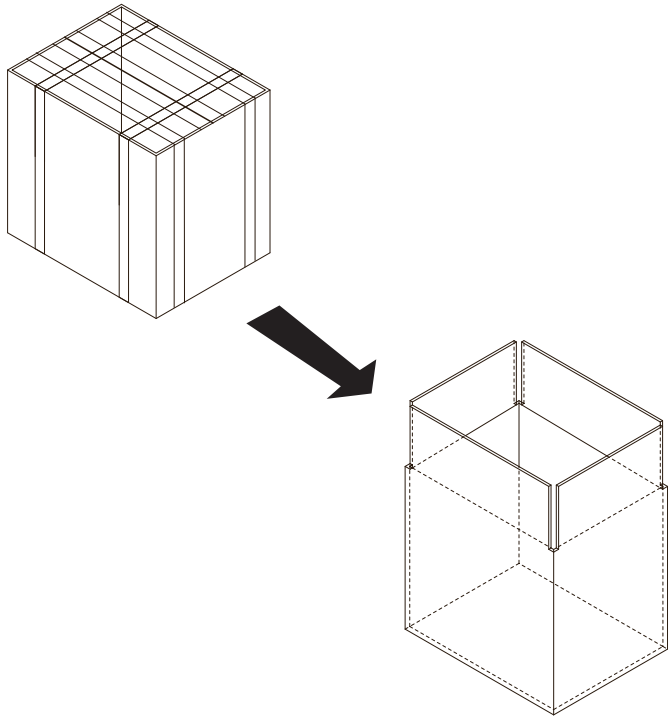


Figure 3-9. Open top covers of paper carton

Unpacking 3-probe Port Box (continued)

3. Remove the top foam, and take out the 3-probe Port Box, multi-probe holders, E8CS-SC probe holder and gel holder.
4. Continue to remove the foam, then take out the printer shelf and the drawer.

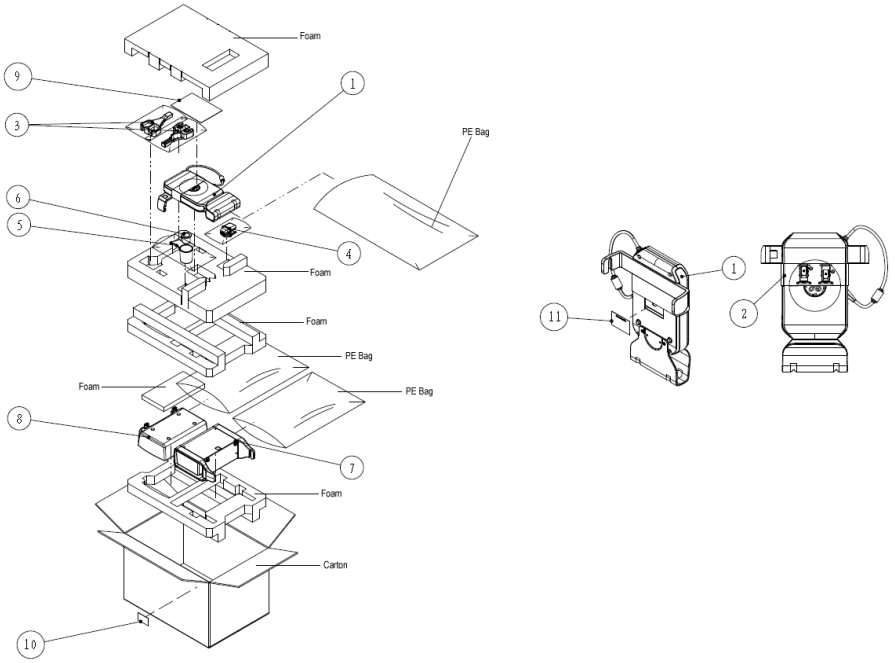


Figure 3-10. Unpacking the 3-probe Port Box

Table 3-6: 3-probe Port Box

Item	Description
1	3-probe Port Box
2	Installation instructions
3	Multi-probe holders
4	E8CS-SC probe holder
5	Gel holder
6	Gel holder
7	Printer shelf with drawer assy
8	On shelf basket assy
9	Venue 50 3-probe Port Box user instructions
10	Rating plate label for 3-probe Port Box option
11	Rating plate label for 3-probe Port Box

Unpacking Power Module Package

1. Cut the four PLASTIC BANDs.
2. Cut the adhesive tape and open top covers of paper carton.

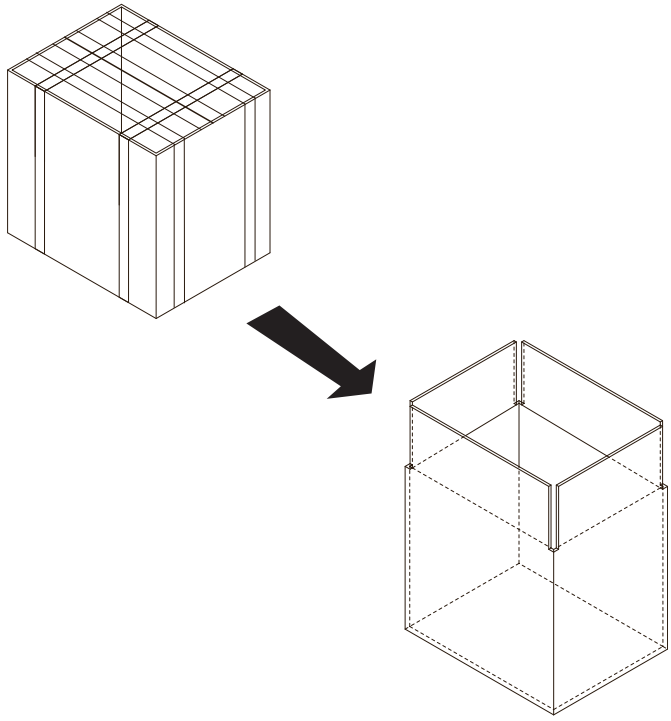


Figure 3-11. Open top covers of paper carton

Unpacking Power Module Package (continued)

3. Take out Power Module User Instruction.
4. Remove the top foam and take out the Power Module and Tray Assy.

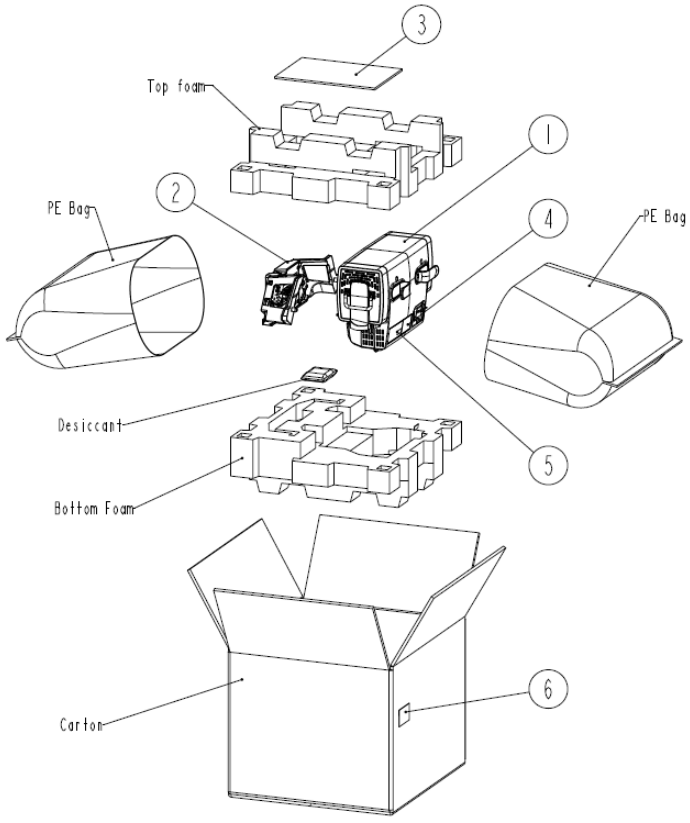


Figure 3-12. Unpacking the 3-probe Port Box

Table 3-7: Power Module Box

Item	Description
1	Power Module
2	Tray Assy
3	Power Module User Instruction
4	Warning Label
5	Rating Plate label for Power Module
6	Rating Plate label for carton

Moving into Position

In general, a single adult can move the Venue 50. Before moving, store all loose parts in original accessory box or in back pack. Return probes to original box.

Packing the Equipment

Please pack Venue 50 in the reverse order of unpacking.

Preparing for Setup

Verify customer order

Compare items received by the customer to that which is listed on the delivery order. Report any items that are missing, back ordered, or damaged.

Physical inspection

Verify that the system arrived intact (visual inspection).

If the system has been damaged, please refer to 'Damage in Transportation' on *page i-14* in the beginning of this manual.

System Voltage Settings

- Verify that the scanner is set to the correct voltage. The Voltage settings for the Venue 50 Scanner is found on a label located on the AC adapter.
- 220-240VAC(China); 100-120VAC(USA/Japan); 220-240VAC(Europe, Latin America).

NOTE: Check your local grid and confirm the voltage.

Connecting Docking Station/Cart to the wrong voltage level will most likely destroy the system.

EMI protection

The Venue 50 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.

See 'EMI limitations' on *page 2-8* for more information about EMI protection.

Completing the setup

Purpose of this section

This section describes how to complete the installation of Venue 50.

Contents in this section

Mounting the System to Docking Station/Cart

Follow these steps to mount the system to docking station/cart:

1. Place the docking station and system on a stable surface.
2. Carefully pick up the system. Align the port on the Venue 50 with the docking port and carefully push into place.

Figure 3-13. Mount to Docking Station/Cart

3. There are 2 options:

   Method 1: Push the system backward to ensure the back of system is close to the station/cart. Use the thumb to raise the front of the claw slightly, and then use two figures to press the locking lever down until it locks in place. Refer to Figure 3-14 *on page 3-27*.

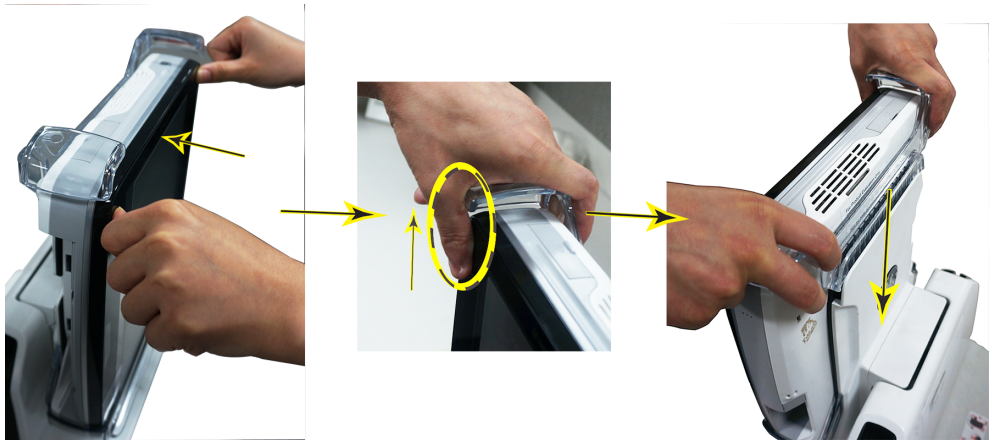


Figure 3-14. Press the locking lever

Mounting the System to Docking Station/Cart (continued)

Method 2: Push the system towards the docking station/cart, and then press the back of docking station/cart down. Refer to Figure 3-15 *on page 3-28*.

Figure 3-15. Press the back of locking

Connecting probes

Connect a probe

NOTE: It is not necessary to turn OFF power to connect or disconnect a probe.

Do not allow the probe head to hang freely. Excessive impact to the probe will result in irreparable damage.

To prevent probe connector pins damage, or PCB board damage, do not use excessive force when connecting the probes.

Keep the probe cables away from the wheels.

Do not bend the probe cables.

Do not cross cables between probes.

Connect a probe (continued)

Follow these steps 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 cable.
3. DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.
4. Before connecting the probe:
   a. Do a visual check of the probe pins and system sockets.
   b. Remove any dust or foam rests from the probe pins.
   c. Verify the probe and the probe cable for any visual damage.
5. Plug the probe connector into the probe port on right side of Venue 50 with the label facing the front.

Figure 3-16. Connect a probe

6. Carefully position the probe cable so that it is free to move and is not resting on the floor.

Disconnect a probe

Follow these steps to disconnect a probe:

1. Press the locking lever to pop up the connector.

Figure 3-17. Pop up the locking lever

2. Pull the probe and connector straight out of the probe port.

Figure 3-18. Disconnect a probe

NOTE: Please do not drag the probe cable in order to avoid cable damage.

Power On / Boot Up

For procedure, please refer to ‘Power ON/Boot Up’ on *page 4-4*.

Power shut down

For procedure, please refer to ‘Power shut down’ on *page 4-7*.

System Configuration

System specifications

System requirements verification

- Verify that the site meets the requirements listed in Chapter 2.

  (See: 'Facility needs' on *page 2-11*.)
- Verify that the specifications below don't conflict with any on-site conditions.

Physical dimensions

Table 3-8: Physical Dimensions of Venue 50

Height	Width	Depth	Unit
282	274	56	mm
11.1	10.8	2.2	inches

Electrical specifications

WARNING

Connecting a Venue 50 to the wrong voltage level will most likely destroy it.

Verification of the system's voltage setting

Verify that the mains voltage specified for the Venue 50 is available on-site.

The voltage setting for the unit is found on the rating plate of the system.

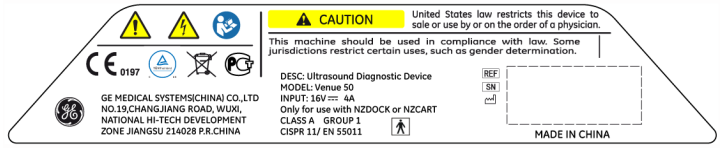


Figure 3-19. Rating Plate Label

Electrical specifications for Venue 50

In the table below, the electrical specifications for Venue 50 includes on board peripherals.

Table 3-9: Electrical specifications for Venue 50

Part Number	Description	Voltage	Tolerances	Power consumption	Frequency
5448430	Venue 50 Console	100-240 VAC	± 10%	1.6A max.	50/60Hz

Approved peripherals

Table 3-10: Approved peripherals

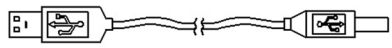
Device	Manufacturer	Model	Interface	Remark
B/W Printer	SONY	UP-D897,UP-D898	USB	
USB Memory Stick	SanDisk	SanDisk 4G	USB	
SD Card Reader	Transcend	TS-RDP5K	USB	
Wireless Network Card	Edimax	EW-7711UTn	USB	
Barcode Reader	Honeywell	Xenon 1900	USB	
Footswitch	Steute	MKF 21S/1S-MED HID GP26	USB	
DVD-RW	LITEON	LITEON eBAU 108 DVD Writer	USB	

Connecting Cables

WARNING

Equipment damage possibility. Be sure to use the following recommended connecting cables to connect recording devices and a network with Venue 50 console.

Table 3-11: List of Connecting Cables

Name	Part No.	Figure	NOTE
Printer USB Cable			For USB Printer

Peripheral/Accessories Connector Panel

Venue 50 peripherals and accessories can be properly connected using the side connector panel.

Docking Station/Cart Connector Panel

Located on the two sides of Docking Station/Cart are input and output connectors.

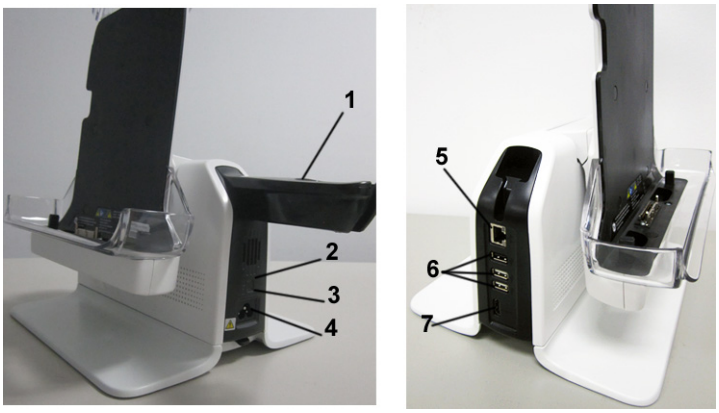


Figure 3-20. Docking Station/Cart Connector Panel

1. Probe Holder (Holder on each side)
2. AC Power Indicator
3. Battery Charging Indicator
4. AC Power Input Socket
5. LAN Port
6. 3 USB Ports (for peripherals connection)
7. HDMI Port (for external monitor connection)

NOTE: Without AC power, only the first USB port (from top to bottom) is available.

NOTE: Without AC power, LAN port, the second and third USB ports and HDMI port are not available.

NOTE: Each outer (case) ground line of peripheral/accessory connectors are protectively grounded. Signal ground lines are not isolated.

Pin Assignment for each connector

Pin Assignment of USB

Table 3-12: Pin Assignment of USB

Pin No.	Signal	Pin No.	Signal
1	+5VDC	3	DATA+
2	DATA-	4	GND

Pin Assignment of External HDMI

Table 3-13: Pin Assignment of HDMI

Pin No.	Signal	Pin No.	Signal
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock-
3	TMDS Data2-	13	CEC
4	TMDS Data1+	14	Reserved (N.C. on device)
5	TMDS Data1 Shield	15	SCL
6	TMDS Data1-	16	SDA
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 Shield	18	+5V Power
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

Peripherals Connection

1. Insert SD Card to the system.
   a. Pull the SD Socket cover towards the back of the Venue 50 to make it easy to open.

Figure 3-21. Open SD Card Socket cover

   b. Insert the SD Card into the SD Card Socket on top of the system with the labeled side facing the front of the Venue 50.

Figure 3-22. Insert SD Card to the system

Peripherals Connection (continued)

2. Connect B/W printer to the system. B/W Printer can be properly connected to the USB port of the Docking Station/ Cart.

Figure 3-23. B/W Printer Connection

3. Connect USB Memory stick to the system. USB Memory stick can be properly connected to the USB port on the Docking Station/Cart.

Figure 3-24. USB Memory Stick Connection

Peripherals Connection (continued)

4. Connect external LCD to the HDMI port of the Docking Station/Cart.

Figure 3-25. External LCD Connection

5. Connect the Wireless Network Card to the USB port of the Docking Station/Cart.

Figure 3-26. Wireless Network Card Connection

Peripherals Connection (continued)

6. Connect the footswitch to the USB port of the Docking Station/Cart.

Figure 3-27. Footswitch Connection

7. Connect the barcode reader to the USB port of the Docking Station/Cart.

Figure 3-28. Barcode Reader Connection

DVD-RW Connection (Only for software version R5.0.4 and above)

- Connect the DVD-RW to the USB port of the Docking Station.

  a. Connect the USB Y Cable to the DVD-RW.

Figure 3-29. DVD-RW Connection (1)

  b. Connect the two USB connectors to the USB ports on the docking station.

Figure 3-30. DVD-RW Connection (2)

NOTE: Do not connect the DVD-RW to the system while scanning.

NOTE: Be sure the 2 connectors on the USB Y cable are connected to the docking station at the same time.

NOTE: The system only support DVD, does not support CD.

DVD-RW Connection (Only for software version R5.0.4 and above) (continued)

- Connect the DVD-RW to the USB port of the Docking Cart.
  a. Connect the USB Y Cable to the DVD-RW. Refer to Figure 3-29 *on page 3-43*.
  b. Place the DVD-RW on the basket And connect the two USB connectors to the USB ports on the docking cart.

Figure 3-31. DVD-RW Connection (3)

NOTE: *Do not connect the DVD-RW to the system while scanning.*

NOTE: *Be sure the 2 connectors on the USB Y cable are connected to the docking cart at the same time.*

NOTE: *The system only support DVD, does not support CD.*

Connect 3-probe Port to Docking Cart

1. Remove any storage trays from the front of the Docking Cart. Mount the 3-probe Port on the Docking Cart.

Figure 3-32. 3-probe Port Connection

NOTE: Be sure to fully inset the grooves into the top side slides.

NOTE: The 3-probe Port shall be mounted to the front of the Docking Cart.

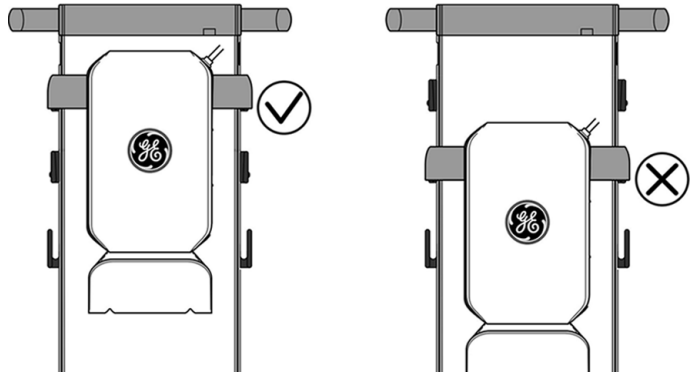


Figure 3-33. 3-probe Port Position

Connect 3-probe Port to Docking Cart (continued)

2. Connect the 3-probe Port to the Venue 50.

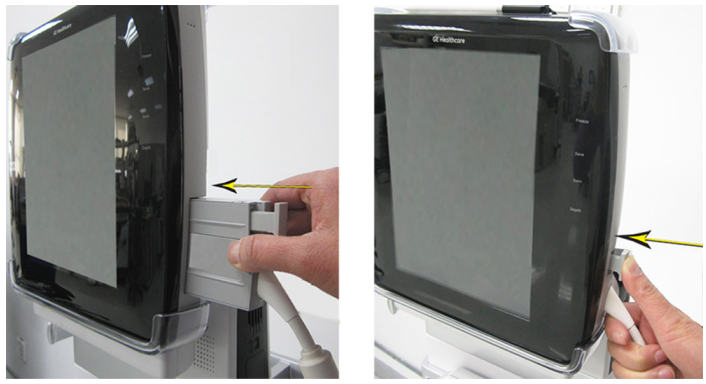


Figure 3-34. 3-probe Port Connection

3. Press the cable hook and put the cable into the hook.

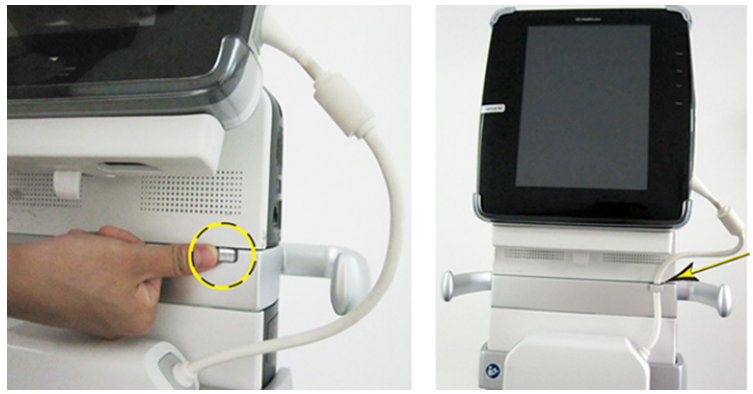


Figure 3-35. Cable Hook

NOTE: Pull the cable hook if it does not pop out completely.

4. Connect the probe holders to the Docking Cart.

Figure 3-36. Probe Holders Connection

Connect 3-probe Port to Docking Cart (continued)

5. Connect the E8CS-SC probe holder and gel holder to the probe holders.

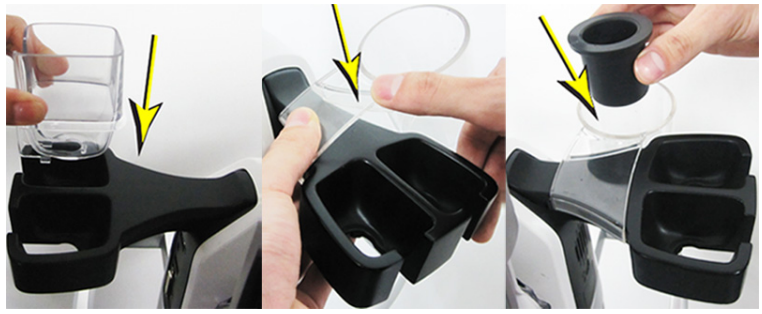


Figure 3-37. Probe Holder Connection

6. Connect the probes to the 3-probe port.

Figure 3-38. Probe Connection

Connect 3-probe Port to Docking Cart (continued)

7. Mount the printer shelf to the Docking Cart.

   Attach the basket to the printer shelf and mount the printer shelf to the Docking Cart.

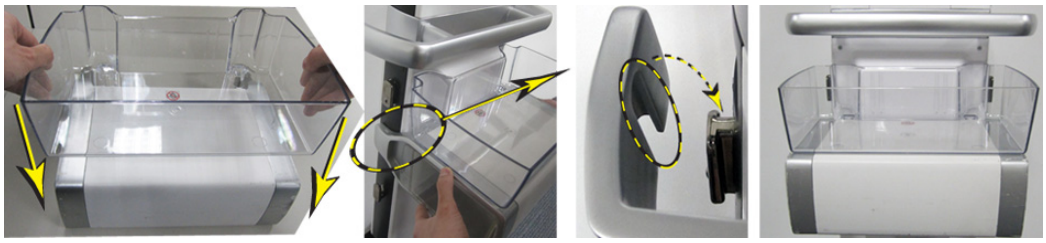


Figure 3-39. Printer Shelf Connection

NOTE: Be sure to fully inset the grooves into the second side slides.

NOTE: The printer shelf shall be mounted to the back of the Docking Cart.

NOTE: The console in the figures above is only for your reference. Please connect Venue 3-probe port to Venue 50.

Connect 3-probe Port to Docking Cart (continued)

8. Choose probes.

   Power on the system and press **Home** to choose the appropriate probe.

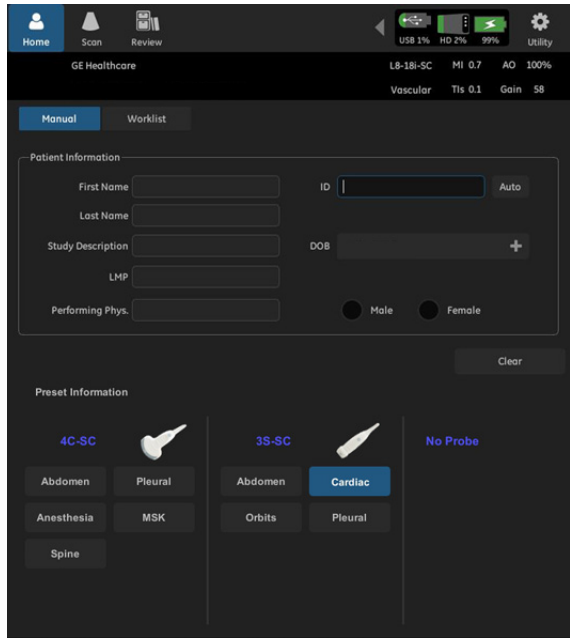


Figure 3-40. Choose Probes

NOTE: *The order of the probes shown on the screen is the same as that of the probes connected to the 3-probe Port.*

"**No Probe"** may display on the screen due to the following:

- No probe is connected to the relevant port.
- The probe may not be fully inserted into the slot. Recheck the connection to insure proper connection.
- The probe is connected to the relevant port, but the software option key for this probe has not been activated. Please contact your local GE representative and place an order for the additional software option. See *"Add new software option keys"* in Basic User Manual for more information

Connect Power Module to Docking Cart

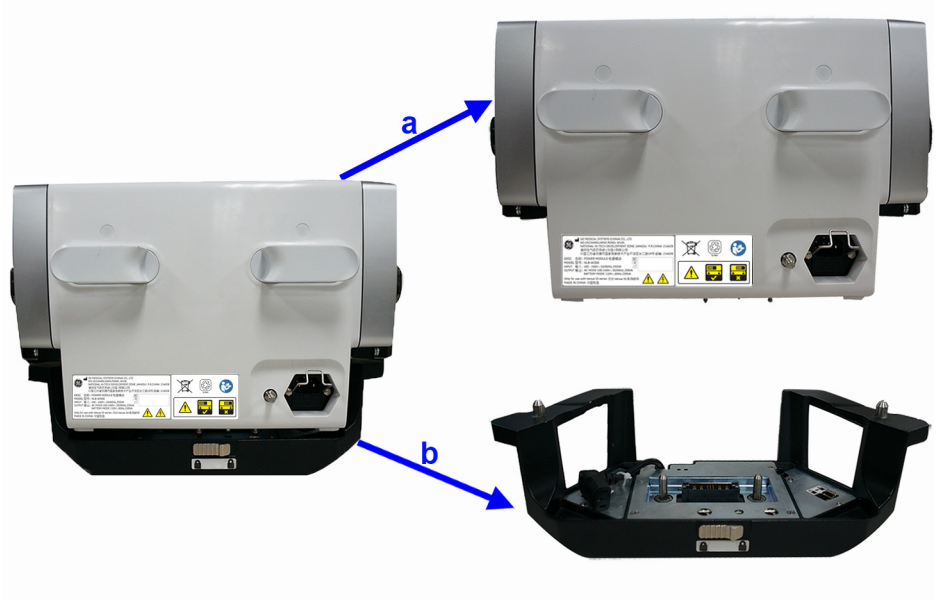
Preparation

Shutdown Venue 50 and disconnect the power cord from the docking cart.

Overview

The whole Power Module kit includes 2 parts:

a. Power Module
b. Tray Assy



CAUTION

It is not permitted to disassemble the Power Module by operators.

Explosion Hazard

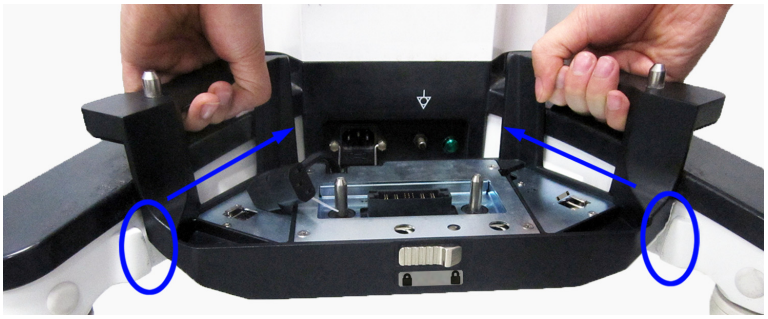
The Power Module shall be kept away from fire. There is risk of explosion if it is used in an explosive atmosphere.

Mounting Procedure

1. Press the reset tippers to ensure that both hooks pop out.
   a. Reset tippers
   b. Hooks

2. Lift the Tray Assy to ensure the bottom of it and the base chasis are at the same height.

3. Push the Tray Assy inward along the edge of the base chasis. Ensure both edges of the Tray Assy are inside of the guide slides of the base chasis.



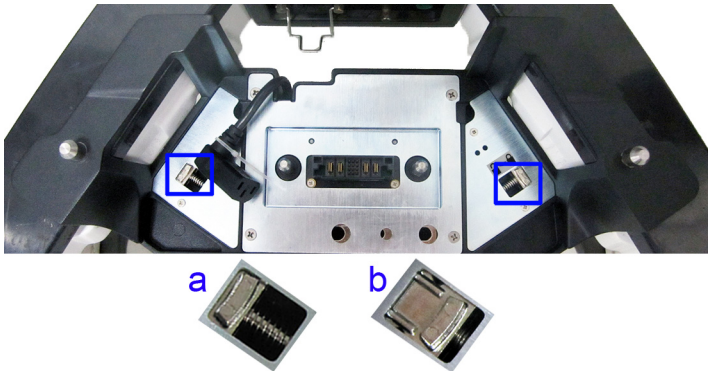
Mounting Procedure (continued)

4. Push it down and fix it to the base chasis.

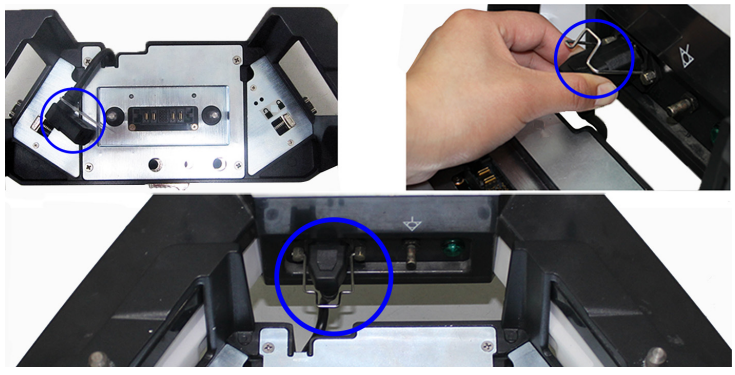
NOTE: *After the Tray Assy is installed successfully, both hooks should be at the lock position.*

a. Lock Position

b. Unlock Position

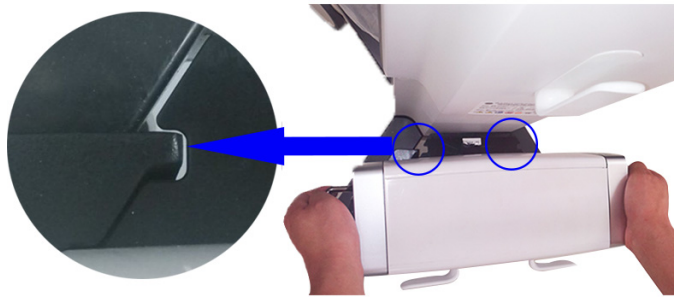


5. Disconnect the cable tie, connect the power cord to the Docking Cart, then position the retaining clip over the power cord.



Mounting Procedure (continued)

6. Install the Power Module to the Tray Assy vertically and ensure both ribs are located in the slots.



NOTE: *After installed successfully, the lock button should be at the lock position. If the lock button moves to the unlock position while the Venue 50 is in use,* ***the Power Module needs to be re-mounted***

Table 3-14: Label/Icon Explanations

Label/Icon	Explanations
	If the lock button is at the left side, it means it is at the lock position.
	If the lock button is at the right side, it means it is at the unlock position.

Disconnect Power Module from Docking Cart

Preparation

Shutdown Venue 50 and Power Module, disconnect the power cord from Power Module.

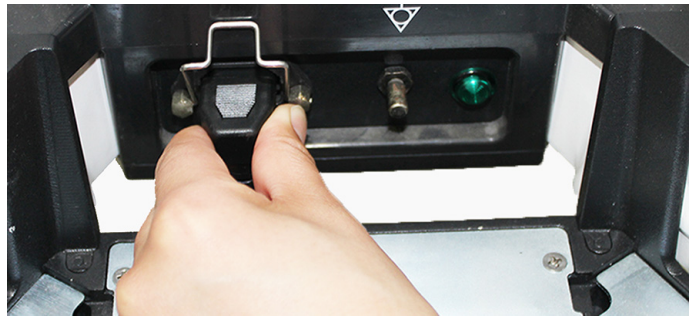
Dismounting Procedure

1. Slide the lock button to the unlock position.

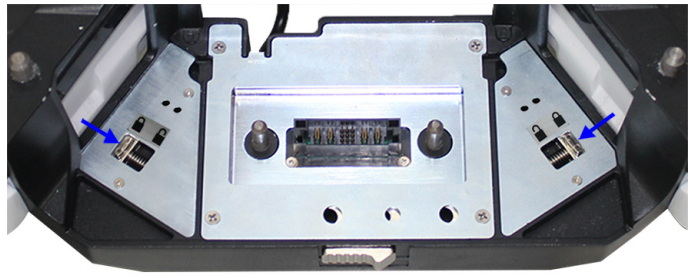
2. Lift up the Power Module vertically.

Dismounting Procedure (continued)

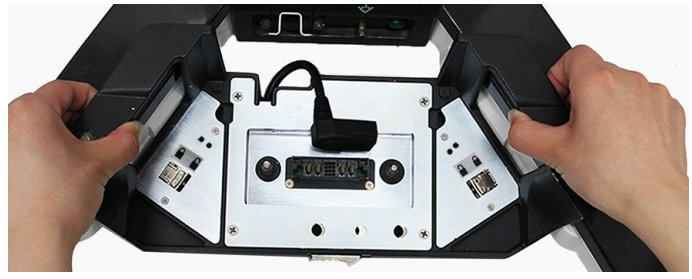
3. Position the retaining clip up the power cord and disconnect the power cord.



4. Slide both hooks to unlock position.



5. Lift up the Tray Assy from the base chassis of Docking Cart vertically.



Power Module Usage

Power Module Charging

Connect the Power Module to an active AC outlet with the power cord of the Docking Cart.

CAUTION

If you plan on storing the Power Module for an extended period, fully charge it once every three months.

Power Module Storage

Press and hold the **Power On/Off** switch for three seconds to turn off the Power Module, and it will be ready for storage.

NOTE: To avoid Power Module drain, all connected equipment should be turned off and disconnected from the Power Module after use or during Power Module storage.

CAUTION

If you leave the Power Module discharged for three months or more, its lifecycle may be shortened.

Power on /off the Power Module

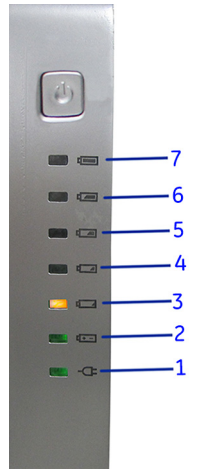
Press **Power On /Off** switch for one second to turn on the Power Module. LED2 will turn green.

Press **Power On /Off** switch for three seconds or more to turn off the Power Module. LED2 will be off.

*NOTE: If the Power Module is not turned off after three seconds or more, try again to press **Power On/Off** switch to turn it off.*

*NOTE: Press **Power On /Off** switch to turn it on even when an active AC outlet is connected. Otherwise the docking cart, console and peripherals can not get electricity.*

LED Indicators



LED indicators show different status of the Power Module as below:

Table 3-15: LED Indication

LED	Color	Indication
LED1	green	on charging
LED2	green	discharging
LED3	flashing	remaining capacity<10%
	yellow	remaining capacity>=10%
LED4	green	remaining capacity>=20%
LED5	green	remaining capacity>=40%
LED6	green	remaining capacity>=60%
LED7	green	remaining capacity>=80%

NOTE: When the Power Module is fully charged, all lights are off except when it is discharging. In this case, only LED2 will be green.

CAUTION

When LED3 is flashing, connect the Power Module with a live AC outlet and record the data at once. Otherwise the data will be missing when the system powers off suddenly

Matrix of Peripheral Working Power Load

NOTE: The working power load is the sum of all the connected peripherals and the console. The console power consumption is 40W.

NOTE: When the B/W USB Printer stands by, the power load is 10W.

NOTE: The maximum rated power load of the Power Module is 200W. Please do not overload.

Table 3-16: Working Power Load of Printer

Device	B/W USB Printer
Model	UP-D897
Manufacturer	SONY
Working Power Load (W)	101

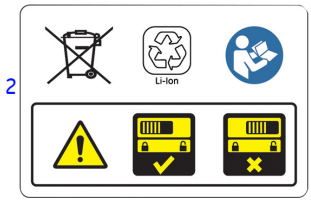
NOTE: Do not remove the console battery from Venue 50 system. If the power, with the operating voltage 110v or below, goes off, the Power Module may fail to function.

NOTE: Please avoid dropping the Power Module.

NOTE: If the Power Module is splashed with water or other liquid, it must be shut down and cleaned immediately.

NOTE: Ensure that no condensate is on the Power Module before turning it on. If there is condensate, please put the Power Module in a dry and ventilated place. It is not allowed to turn on the Power Module until the condensate completely disappears.

Power Module Rating Plate/Warning Lable



1. Rating Plate/Warning Label Explanations

Table 3-17: Label/Icon Explanations

Label/Icon	Explanations
AC MODE	The power is supplied by the Alternating Current (AC)
BATTERY MODE	The power is supplied by the battery when the Alternating Current (AC) is off.

2. If the lock button moves to the unlock position while the Venue 50 is in use, the Power Module needs to be re-mounted.

For the explanation of other labels/Icons on Rating Plate/Label, please refer to the latest revision of Venue 50 Basic User Manual.

NOTE: Please refer to the operation manual of each peripheral for information needed by the user to operate the system safely.

Available probes

For different software versions, please see in specification in the Venue 50 Basic User Manual for probes and intended uses.

Table 3-18: List of Probes for Venue 50

Probe Name	Material of Headshell	TYPE	Catalog Number	Part Number
3S-SC	VALOX	SECTOR	H40452LD	5499959
12L-SC	VALOX	LINEAR	H40452LB	5499958
L12n-SC	VALOX	LINEAR	H48062AE	5505774
4C-SC	VALOX	CONVEX	H40452LM	5499960
L8-18i-SC	VALOX	LINEAR	H40452LZ	5499595
E8CS-SC	VALOX	CONVEX	H40462LL	5499966
10C-SC	VALOX	CONVEX	H48862LZ	5456227

Software Options configuration

Software Option installation introduction

Refer to the Venue 50 *Basic User Manual*, Chapter 4, ‘Customizing Your System’ for information on configuring items like Hospital, Department, Language, Date and Time.

For information on configuring Software Options, please refer to the Venue 50 Basic User Manual, Chapter 4, Customizing Your System.

Data Privacy/Encryption (for R5.x.x)

NOTE: The encryption process will erase all existing patient data on the system, please ensure that any patient data on the system has been backed up before encryption.

To set Data Privacy passcode:

1. Press **Set Data Privacy Passcode**.
2. If the patients'data have been backup, press **Continue**.

   If the patients'data have not been backup, press **Backup**. The screen will show as below.

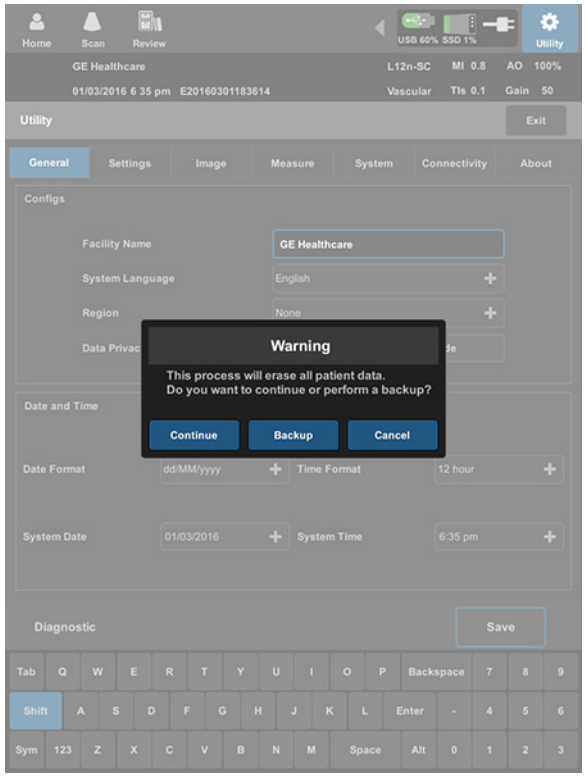


Figure 3-41. General - Data Privacy/Encryption (for R5.x.x)

Data Privacy/Encryption (for R5.x.x) (continued)

3. Enter a passcode of four numbers.

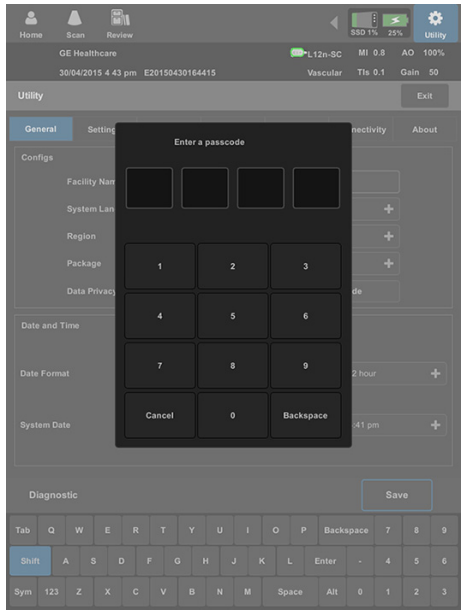


Figure 3-42. Data Privacy/Encryption - Passcode setting (1)

4. Re-enter the passcode.

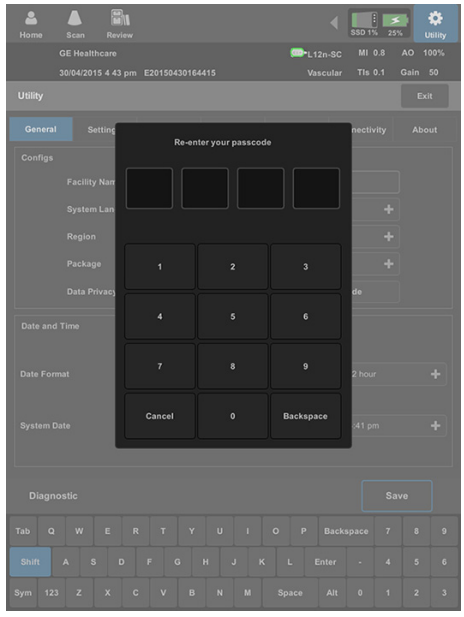


Figure 3-43. Data Privacy/Encryption - Passcode setting (2)

Data Privacy/Encryption (for R5.x.x) (continued)

5. Press **OK** to confirm.

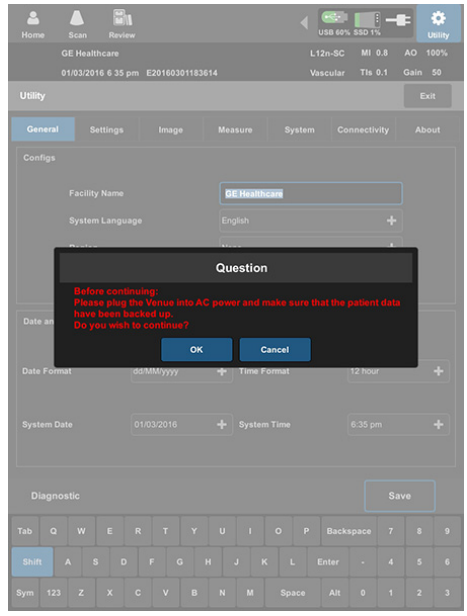


Figure 3-44. Data Privacy/Encryption - Confirmation

6. The system will encrypt SSD.

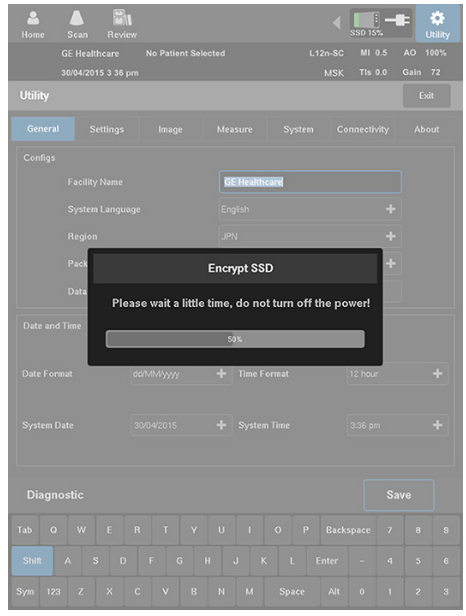


Figure 3-45. SSD Ecryption

Data Privacy/Encryption (for R5.x.x) (continued)

7. Press **OK**.

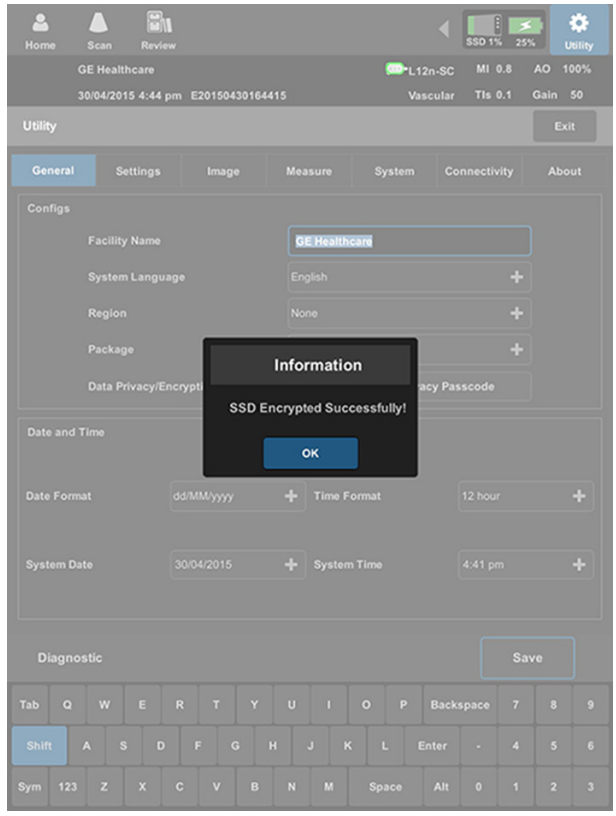


Figure 3-46. Data Privacy/Encryption - Completion

Data Privacy/Encryption (for R5.x.x) (continued)

8. Press **OK**.

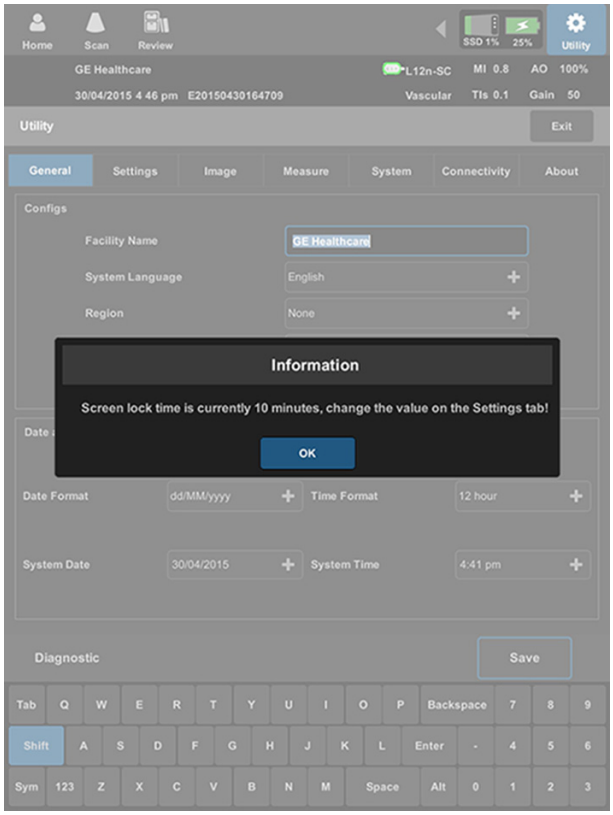


Figure 3-47. Data Privacy/Encryption - Screen Lock

NOTE: *If you want to change the screen lock time, please go to **Utility** - **Settings** - **Common** - **Lock Scanner After (minutes)***

NOTE: *Don't forget the correct passcode at any time. Lost passcode need to reinstall the system, the patient data on the system will be lost during reinstall process.*

Software version check-out

1. Power on Venue 50 scanner and wait until system booting to main screen.
2. Press **Utility**, then select **About**.
3. Check whether the software version is the right one for use.

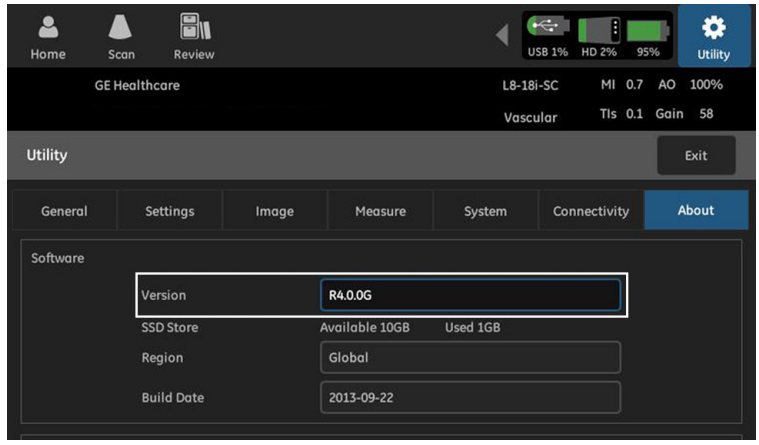


Figure 3-48. Software Version

Paperwork after setup

NOTE: During and after setup, the documentation (i.e. User Manuals, Installation Manuals, etc.) for the Venue 50 and the peripherals must be kept as part of the original Ultrasound system documentation. This ensures that all relevant safety and user information is available during the operation and service of the complete Ultrasound system.

User's 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.

For a complete list of User's Manuals for Venue 50, refer to Chapter 9 in this manual.

Product Locator Installation Card

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

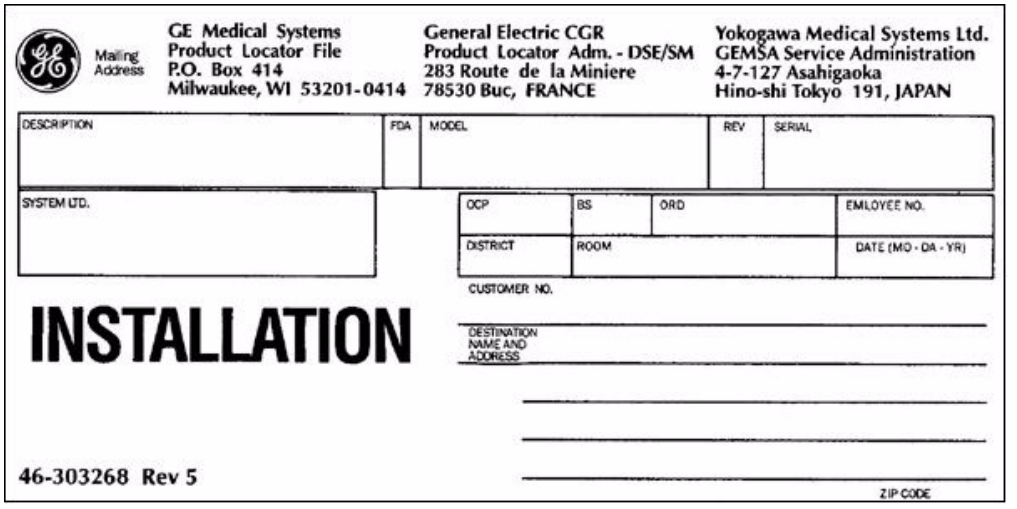


Figure 3-49. Product Locator Installation Card (Example)

Chapter 4

General Procedures and Functional Checks

This chapter provides procedures for quickly checking major functions of the Venue 50 and diagnostics instructions using the built-in service software and power supply adjustments.

Overview

Contents in this chapter

Equipment required

To perform these tests, you'll need any of the sector, linear, or convex transducers. (Normally you should check all the transducers used on the system).

General procedures

WARNING

Energy Control and Power Lockout for Venue 50.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the Ultrasound system.
4. Maintain control of the Ultrasound system power plug.
5. Wait for at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery, if present.

Ultrasound System components may be energized.

Overview

Some procedures are used more often than other. The intention with this section is to keep the most used procedures in one place.

Power ON/Boot Up

Warnings

d  DANGER

ALWAYS CONNECT THE ULTRASOUND SYSTEM TO A FIXED POWER SOCKET WHICH HAS THE PROTECTIVE GROUNDING CONNECTOR.

d  DANGER

NEVER USE A THREE-TO-TWO PRONG ADAPTER; THIS DEFEATS THE SAFETY GROUND.

d  DANGER

ENSURE THAT THE POWER CORD AND PLUG ARE INTACT AND THAT THE POWER PLUG IS THE PROPER HOSPITAL-GRADE TYPE (WHERE REQUIRED).

c  CAUTION

Ultrasound system requires all covers.

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

c  CAUTION

Use only power supply cords, cables and plugs provided by or designated by GE.

Connect AC/DC to the Docking Station/Cart

Mount the Venue 50 to the docking station/cart. Connecting AC/DC to the docking station/cart, involves preliminary checks of the power cord, voltage level and compliance with electrical safety requirements.

1. Ensure that the wall outlet is of appropriate type.
2. Uncoil the power cable, allowing sufficient slack so that the docking station/cart 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 system.
5. Connect the Power Cable to the Power Inlet in the docking station/cart.

Figure 4-1. Docking Station AC/DC Connection

6. Connect the Power Cable's other end to a hospital grade mains power outlet with the proper rated voltage, and the unit is ready for Power ON/Boot Up.

Power on

Press Power On/Off key once, the system starts.

Figure 4-2. Power on the Venue 50

Power shut down

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

Follow these steps to shut down the system:

1. Slightly press the **Power On/Off** switch once.
2. The System-Exit window is displayed.
3. Select **OK**.
4. The shutdown process takes several seconds and the power off sequence is complete when the power status LED is turned off.
5. Disconnect the probes. Clean or disinfect all probes as necessary. Store them in their shipping cases to avoid damage.

DO NOT unplug and/or transport the unit until after the power off sequence has been completed. Failure to do so may result in corrupted patient files.

Adjusting the Display Monitor

See ‘Adjust Brightness’ on *page 6-3 for more information.*

Functional checks

Overview

In this section, the functional checks for Venue 50 are described. Functional checks are used to verify that the product works as intended. Functional checks may also be used during troubleshooting.

Touch Panel

The touch panel contains exam function and mode/function specific controls.

Figure 4-3. Venue 50 Menu Bar

1. Home: Enter home page
2. Scan, Review: Perform various functions
3. Learn: eSmart Trainer (option)
4. Utility: Activate system configuration menus
5. TGC, Gain, Depth: Adjust the image information
6. B, Color, PDI, M: Switch to different modes
7. : configurable parameters
8. Needle: Enhance visualization of the needle
9. Split: Split the screen into two
10. Zoom: Magnify a region of interest
11. Guide: Display the biopsy guidelines
12. End Exam: Press to end an exam
13. Dataflow Button: Store the patient information or print the scanning images.
14. Freeze: Stop the acquisition of ultrasound data and freeze the image in system memory.
15. GT: Activate the needle tracking

CAUTION

Use only fingers, or fingers with gloves to operate on the system. Never use any sharp tools to scratch the LCD.

Monitor Display

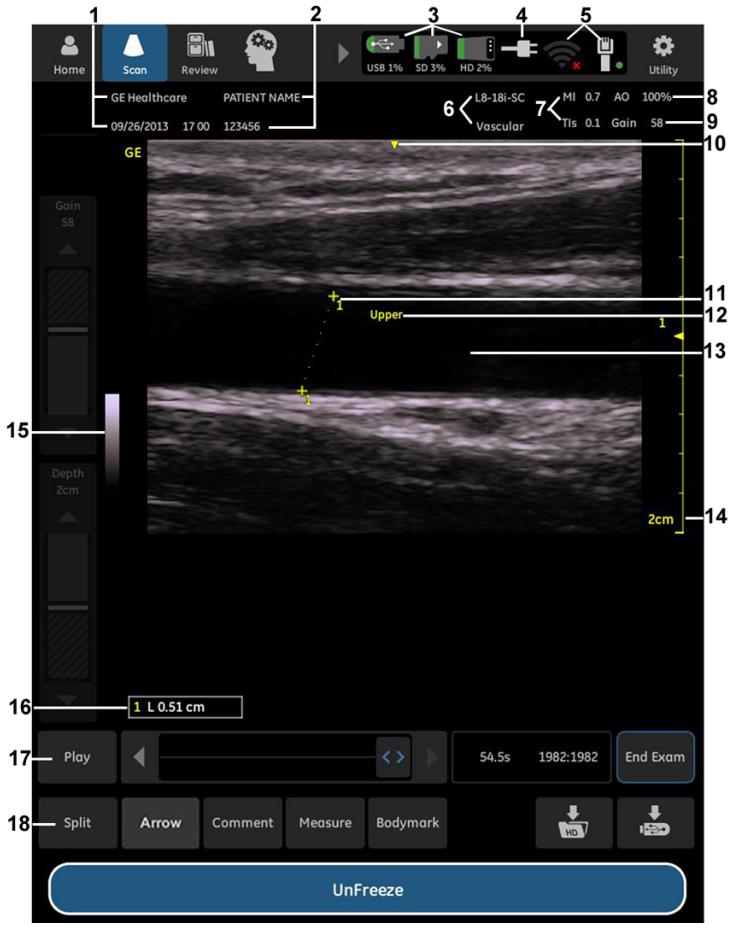


Figure 4-4. Monitor Display

1. Institution/Hospital Name, Date, Time
2. Patient Name, Patient ID
3. Storage device status
4. Battery status
5. Wireless and local network connection status
6. Probe and application
7. MI, TI
8. Acoustic Output
9. Gain
10. Center line mark
11. Measurement caliper
12. Comment
13. Image area
14. Depth scale
15. Gray/Color bar
16. Measurement result window
17. Cine Gauge
18. Function controls

Performance Tests

Before performing the tests, please follow the steps first.

1. Connect one of the probes.

   For available probes, See ‘Available probes’ on *page 3-60 for more information.*.

   See ‘Connect a probe’ on *page 3-29 for more information.*
2. Turn ON the scanner (if it isn’t turned on already).

B Mode Checks

Introduction

B Mode is intended to provide two dimensional images and measurement capabilities concerning the anatomical structure of soft tissue.

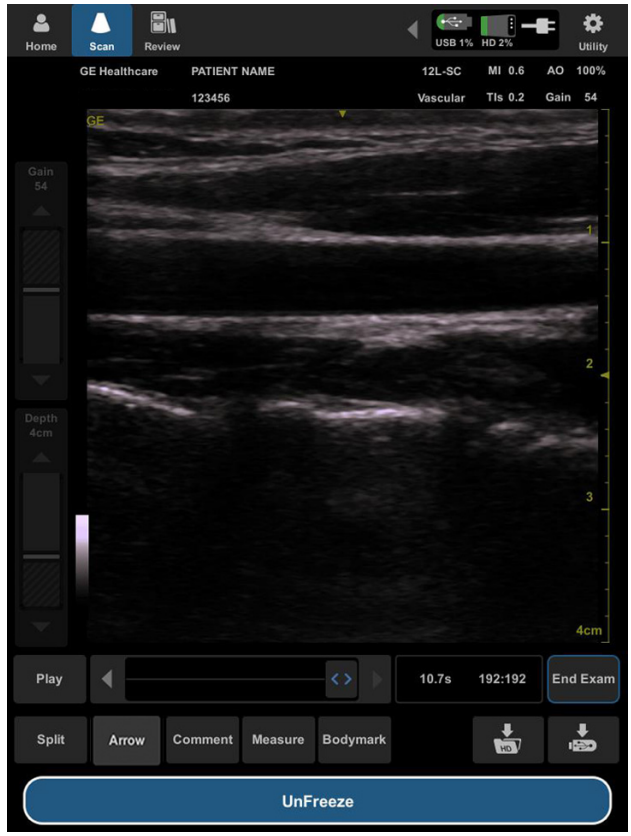


Figure 4-5. B Mode Screen

B Mode Controls

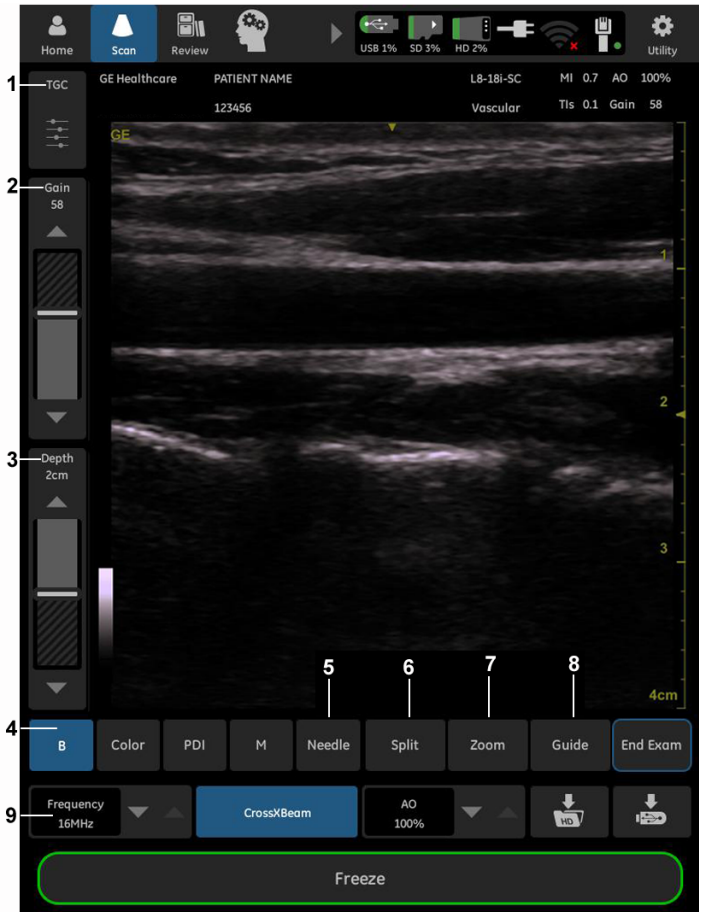


Figure 4-6. B Mode Controls

Table 4-1: B Mode Controls

Controls	Affect on Image
TGC	Adjust TGC to balance the image so that the density of echoes is the same throughout the image.
Gain	Makes images brighter or darker.
Depth	Press to increase or decrease scanning depth.
B/Color/PDI/M	Switch to PDI/Color Flow/M mode, different option for different packages.
Needle	Press to activate the Needle mode. Gain, Angle and Tilt  can be activated. The needle function only applies to linear probes. Note: Before activating the Needle mode, please make sure to select Interventional preset first.

Table 4-1: B Mode Controls

Controls	Affect on Image
Split	Press to split the screen into two.
Zoom	Press to magnify the region of interest.
Guide	Press to display the biopsy guidelines.
Configurable Parameters	• LiveGain: To balance echo contrast so that cystic structures appear echo-free and reflecting tissue fills in. • Frequency: This optimizes the probe's wide band imaging capabilities at multiple frequencies to image at greater depths. • CrossXBeam: Improve contrast resolution with increased conspicuity of low contrast lesions, better detection of calcifications, biopsy needle visualization, and cystic boundary definition. • Gray Map: Affects the presentation of B Mode information. • Focus Pos: Focus optimizes the image by increasing the resolution for a specific area. • Reverse: Used for anatomical correctness. • ATO Level: Select the Auto Tissue Optimize Level to pick a preference for the contrast enhancement in the resulting image. • Dynamic Range: It is useful for optimizing tissue texture for different anatomy. • Compression: Suppress the noise in the image. • Rejection: Allow for the elimination from the display of low level echoes caused by noise. • Frame Aver: Smooth the image. • SRI HD: Smooth the image when image speckle interferes with the desired image detail • Edge Enhance: Make the image edge clearer/sharper. • FOV: Adjust field of view • AO: Adjust acoustic output
Note: The configurable parameters can be configured in Utility->Settings->ScanConfig.	

Color Flow Mode Checks

Introduction

Color Flow Mode is a Doppler Mode intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the B-Mode image.

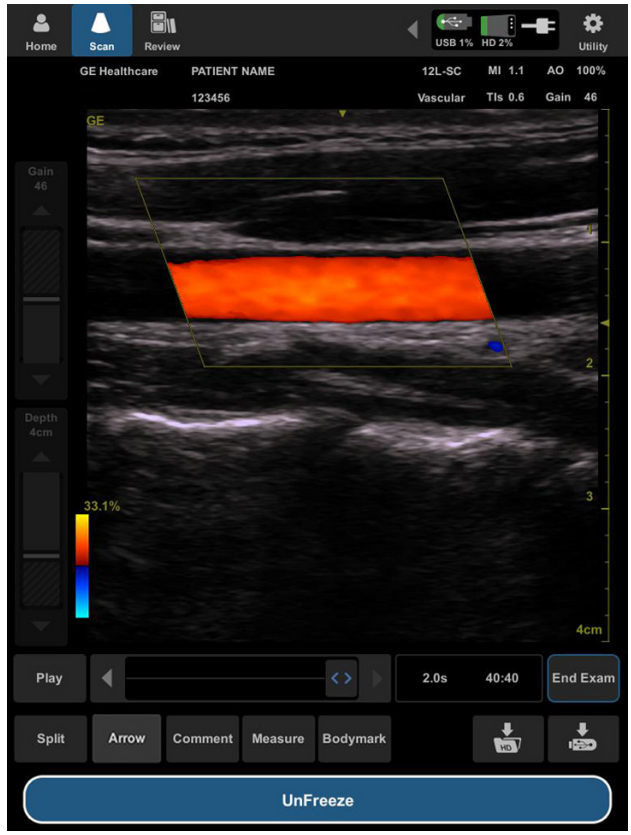


Figure 4-7. Color Flow Mode Screen

Color Flow Mode Controls

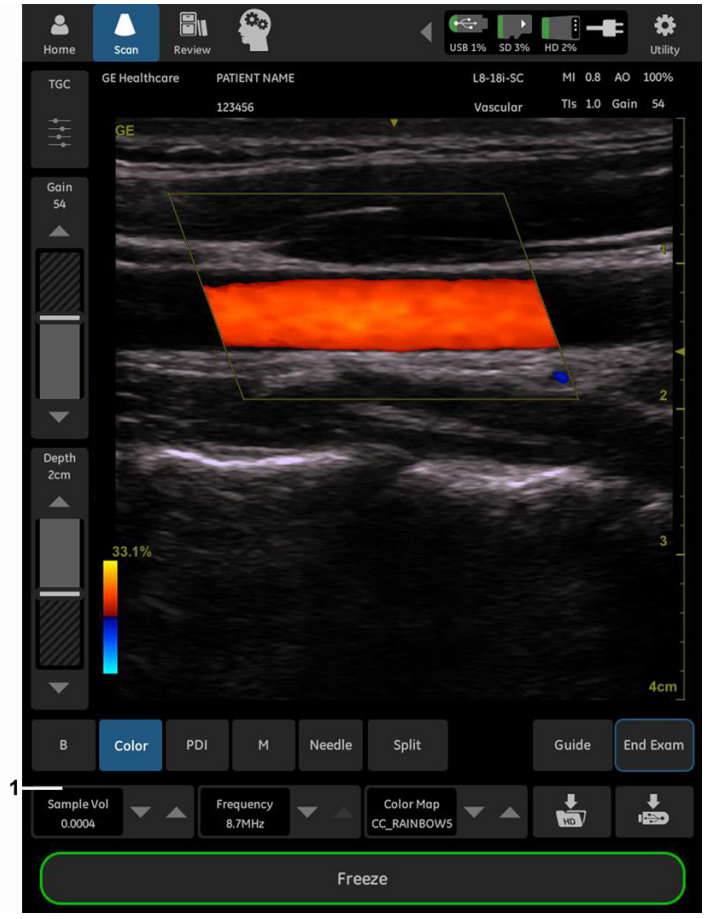


Figure 4-8. Color Flow Mode Controls

Table 4-2: CF Mode Controls

Controls	Affect on Image
Configurable Parameters	• Scale: Imaging of higher velocity flow requires increased scale values to avoid aliasing. • Threshold: Limit color flow overlay to low level echoes inside vessel walls. Help to minimize color 'bleeding' outside vessel walls. • Sample Vol: Place the sample volume gate to sample blood flow. • Steer: Provide a doppler cursor angle suitable for linear probe orientation. • Wall Filter: Decrease, unnecessary low frequency signals caused by motion. • Color Map: Show the direction of the flow and highlight the higher velocity flows. • Invert: Allow to view blood flow according to personal preference, without flipping the probe.
See Table 4-1 for more information.	

Power Doppler Imaging Mode Checks

Introduction

Power Doppler Imaging (PDI) is a color flow mapping technique used to map the strength of the Doppler signal coming from the flow rather than the frequency shift of the signal.

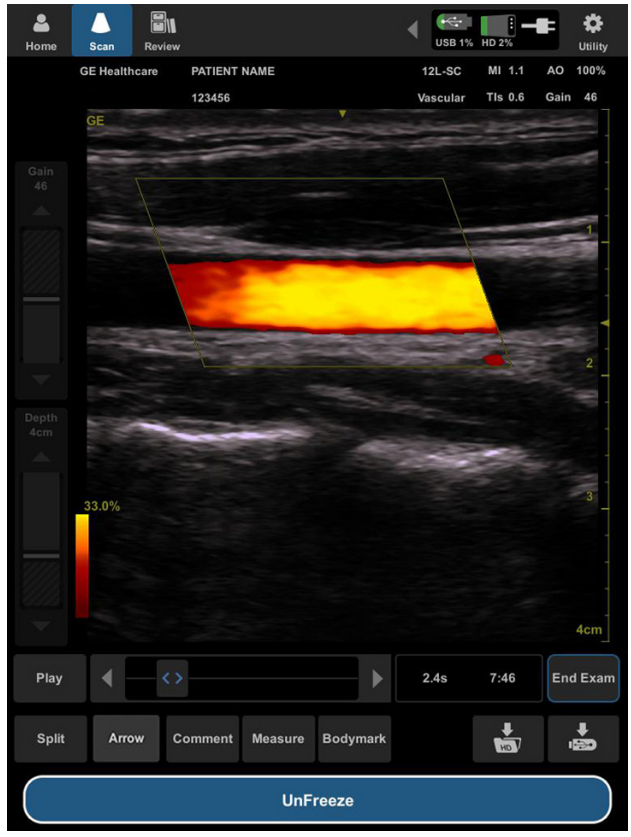


Figure 4-9. Power Doppler Imaging Mode Screen

Power Doppler Imaging Mode Controls

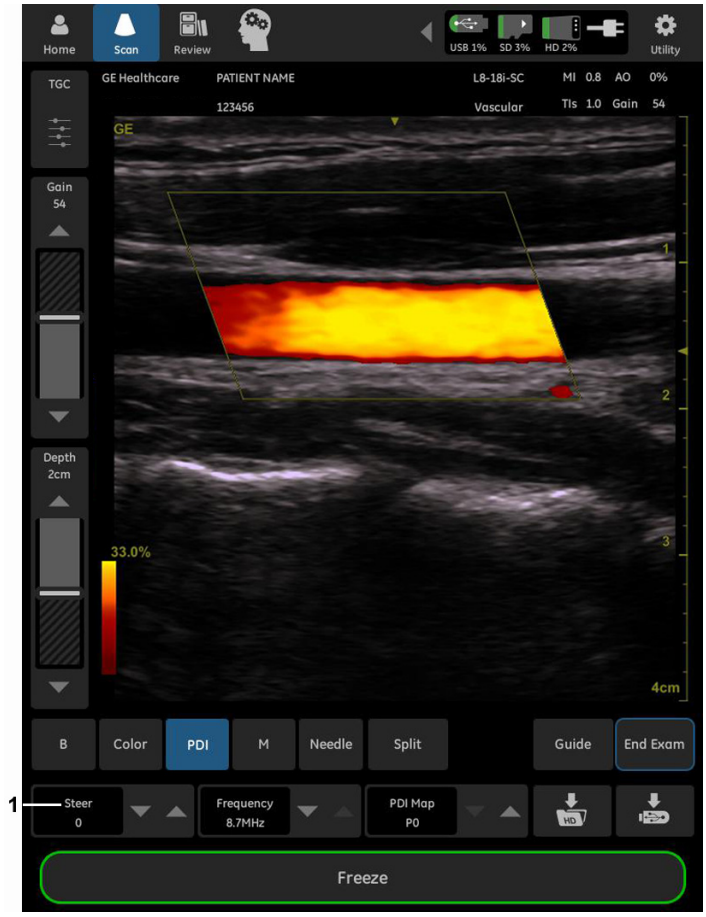


Figure 4-10. Power Doppler Imaging Mode Controls

Table 4-3: PDI Mode Controls

Controls	Affect on Image
Configurable Parameters	• PDI Map: Show the power of the flow and highlight the stronger power flows.
See Table 4-1 and Table 4-2 for more information.	

M Mode Checks

Introduction

M Mode is intended to provide a display format and measurement capability that represents tissue displacement (motion) occurring over time along a single vector.

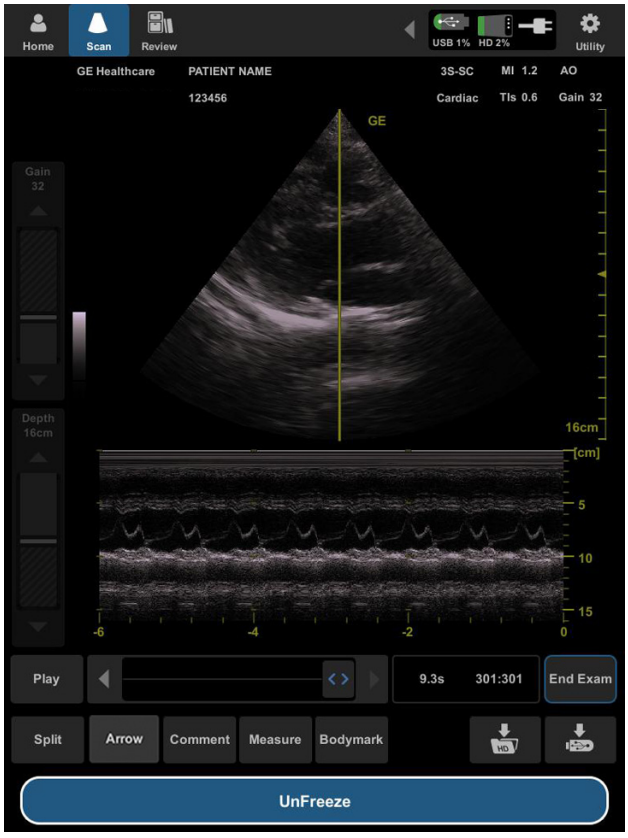


Figure 4-11. M Mode Screen

M Mode Controls

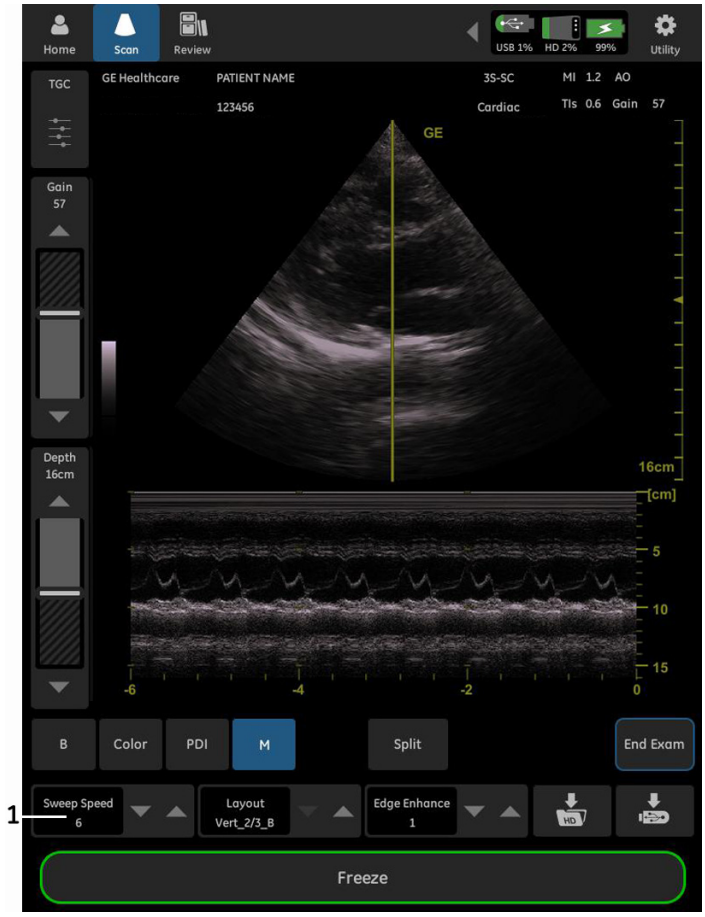


Figure 4-12. M Mode Controls

Table 4-4: M Mode Controls

Controls	Affect on Image
Configurable Parameters	• Sweep Speed: Change the speed of the timeline. • Layout: Change the Horizontal/Vertical layout between B Mode and M Mode.
See Table 4-1 for more information.	

Basic Measurements

*NOTE: The following instructions assume that you first scan the patient and then press **Freeze**.*

Distance Measurements

1. Press **Measure**.
2. Select **Distance**.
3. Touch the screen, and two active calipers display.
4. Move the calipers to the desired position.
5. Press **Set**, then the value is displayed in the results window.

Circumference/Area (Ellipse) Measurement

1. Press **Measure**.
2. Select **Ellipse**.
3. Touch the screen, and three active calipers display.
4. Move the calipers to the desired position.
5. Press **Set**, then the value is displayed in the results window.

M Mode Measurements

1. Press **Measure**.
2. Select **Depth** or **Heart Rate**.
3. Touch the screen and two active calipers display.
4. Move the calipers to the desired position.
5. Press **Set**, then the value is displayed in the results window.

Probe/Connectors Check

NOTE: Probes can be connected at any time, whether the unit is ON or OFF

Connecting a Probe

See 'Connect a probe' on *page 3-29 for more information.*

Activating the probe

The probe activates in the currently-selected operating mode. The probe's default settings for the mode and selected exam are used automatically.

Deactivating the probe

When the probe is deactivated, it is automatically placed in standby mode.

1. Press ***Freeze***.
2. Gently wipe the excess gel from the face of the probe. (Refer to the Basic User Manual for complete probe cleaning instructions).
3. Carefully put the probe to the probe holder.

Disconnecting the probe

Probes can be disconnected at any time. However, the probe should not be selected as the active probe.

See 'Disconnect a probe' on *page 3-31 for more information.*

Take the following precautions with the probe cables: Do not bend. If you have purchased the cart option, be sure to keep probe cables free from the wheels.

Be careful not to trip on the probe cables if using the device without the optional cart.

Cineloop Check

Introduction

A cineloop is a sequence of images recorded over a certain time frame. You can view cine as a continuous loop via cine loop or manually review cine images frame by frame. Data in cine is available until new data is acquired. Cine can be archived in the storage device.

Activating CINE

Press **Freeze** to activate CINE. To start CINE Loop playback, press **Play/Pause**. To stop CINE Loop playback. press **Play/Pause**.

Moving through a CINE Loop Frame By Frame

Press < or > to move through CINE memory one frame at a time.

Image Management

For Image Management functionality refer to the Venue 50 User Manual. It talks about several topics:

- Zooming an Image
- Split Screen
- Using Cine
- Review Archived Information
- Image Storage
- eSmart Trainer (Option)

Software Configuration Checks

Table 4-5: Software Configuration Checks

Step	Task to do	Expected Result(s)
1.	Check Date and Time setting	Date and Time are correct
2.	Check that Location (Hospital Name) is correct	Location Name is correct
3.	Check Language settings	Desired Language is displayed
5.	Check that all of the customer's options are set up correct	All authorized functions are enabled

Peripheral Checks

This section describes the final setup for the Peripherals and the Operational Check-out. For Peripherals installtion information, See ‘Peripherals Connection’ on *page 3-39 for more information.*

Check that peripherals work as described below:

SD Card Checks

Table 4-6: SD Card Checks

Step	Task to do	Expected Result(s)
1.	Insert SD card to the SD card socket on top of the system.	The storage device status icon will display the SD Card capacity on top of the screen.
2.	Press Utility->Connectivity->Dataflow, configure SD card as D1 or D2.	The SD card icon will be shown on the Dataflow Button.
3.	Press Dataflow Button with SD Card Icon to store the patient information.	The patient information is stored to the SD Card.

USB Memory Stick Checks

Table 4-7: USB Memory Stick Checks

Step	Task to do	Expected Result(s)
1.	Connect USB Memory Stick to the USB port on top of the system or to Docking Station/ Cart.	The storage device status icon will display the USB Memory Stick capacity on top of the screen.
2.	Press Utility->Connectivity->Dataflow, configure USB Memory Stick as D1 or D2.	The USB Memory Stick icon will be shown on the Dataflow Button.
3.	Press Dataflow Button with USB Memory Stick Icon to store the patient information.	The patient information is stored to the USB Memory Stick.

B/W Printer Checks

Table 4-8: B/W Printer Checks

Step	Task to do	Expected Result(s)
1.	Connect Printer to Docking Station/Cart, then plug power cord into wall outlet. Power on the printer.	The printer is powered on.
2.	Press Utility->Connectivity->Dataflow, configure Printer as D1 or D2.	The Printer icon will be shown on the Dataflow Button.
3.	Press Dataflow Button with Printer Icon to print the images.	The images are printed.

Wireless Network Card Checks

Table 4-9: Wireless Network Card Checks

Step	Task to do	Expected Result(s)
1.	Connect the wireless network card to the USB port.	
2.	Press Utility->Connectivity->Wireless.	
3.	Connect to the desired wireless network.	The wireless network status icon will display as “Connected” or “Connceting”on the screen.

Footswitch Checks

Table 4-10: Footswitch Checks

Step	Task to do	Expected result(s)
1.	Connect the footswitch to the USB port.	
2.	Configure footswitch in Utility->Settings->USB Accessories.	
3.	Press the configured pedal of the footswitch.	The system will respond as the configured function for the footswitch.

Barcode Reader Checks

Table 4-11: Barcode Scanner Checks

Step	Task to do	Expected result(s)
1.	Connect Barcode Scanner to the USB port.	
2.	Activate Barcode Reader in Utility->Settings->USB Accessories.	
3.	Scan barcode.	A beep should be heard and the patient information will be shown on the Home screen.

DVD RW Checks

Table 4-12: DVD RW Checks

Step	Task to do	Expected result(s)
1.	Connect DVD RW to the USB port.	The storage device status icon will display the DVD capacity on top right hand corner of the screen.
2.	Press Utility->Connectivity->Dataflow, configure DVD as D1 or D2.	The DVD icon will be shown on the Dataflow Button.
3.	Press Dataflow Button with DVD icon to store the patient information.	The patient information is stored to the DVD.

Chapter 5

Components and Functions (Theory)

This chapter explains Venue 50's system concepts, component arrangement, and subsystem functions.

It also describes the power distribution system and probes.

Overview

Contents in this chapter

Block Diagram and Theory

Block Diagram of Venue 50 and Docking Station/Cart

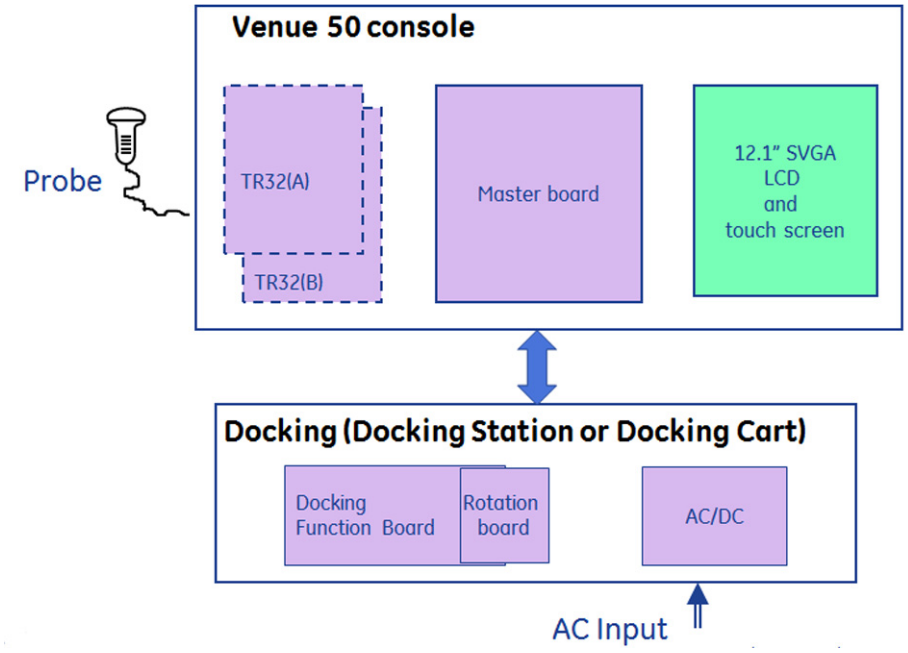


Figure 5-1. Venue 50 and Docking Station System Block Diagram

Chapter 6

Service Adjustments

This chapter describes how to test and make adjustments to the Venue 50. You can use these to test the system for errors.

Overview

Contents in this chapter

Monitor Adjustments

Adjust Brightness

To adjust the brightness:

1. Press **Utility**->**Settings**->**Common**, then choose the desired brightness in the **Brightness** select box.

Adjust Volume

To adjust the volume:

1. Press **Utility**->**Settings**->**Miscellaneous**, then choose the desired volume in the **Volume** select box.

Adjust Monitor on Docking Station/Cart

To adjust the monitor on Docking Station/Cart:

1. Tilt the LCD monitor for the optimum viewing angle. The maximum angle is 45 degrees.

Figure 6-1. Tilt the LCD monitor

Adjust Monitor on Docking Station/Cart (continued)

To adjust the height of Docking Cart:

1. Hold the cart handle by both hands, step on the pedal, push down or lift to adjust the height.

Figure 6-2. Cart height adjustment

Adjust Monitor on Docking Station/Cart (continued)

Be sure to lock the wheels before adjusting the Docking Cart height.

When the cart handles are used for power cable management, the sudden raising of the cart to a higher position may cause the AC plug to break.

When adjusting the cart while scanning, the power cord and wheels may become entangled causing cable damage.

Damage to the probe cable may result if the brake pedal catches the cable and pulls it tight against the base leg. This puts stress on the probe and connector while in the holder.

Chapter 7

Troubleshooting

This chapter describes how to setup and run the tools and software that help maintain image quality and system operation. Very basic host, system and board levels are run whenever power is applied. Some Service Tools may be run at the application level.

Overview

Contents in this chapter

Troubleshooting

Console Troubleshooting Trees

System Doesn’t Boot

This is an overall diagram showing a recommended sequence for troubleshooting a no-boot situation

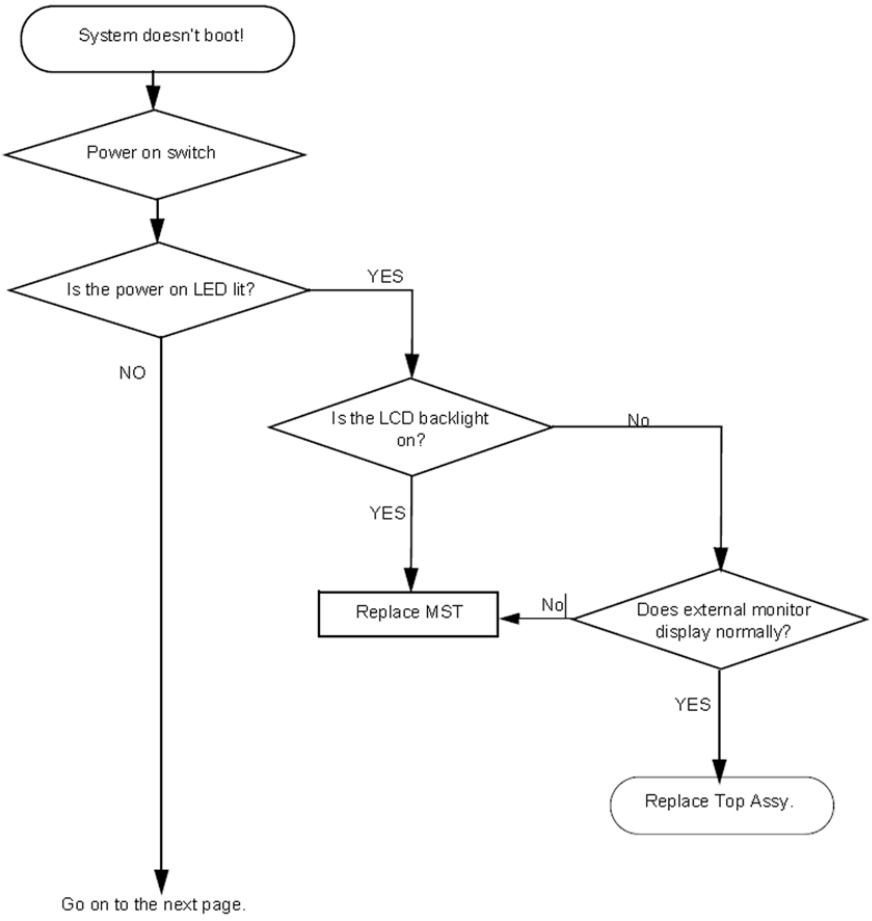


Figure 7-1. System Doesn’t Boot

System Doesn’t Boot (continued)

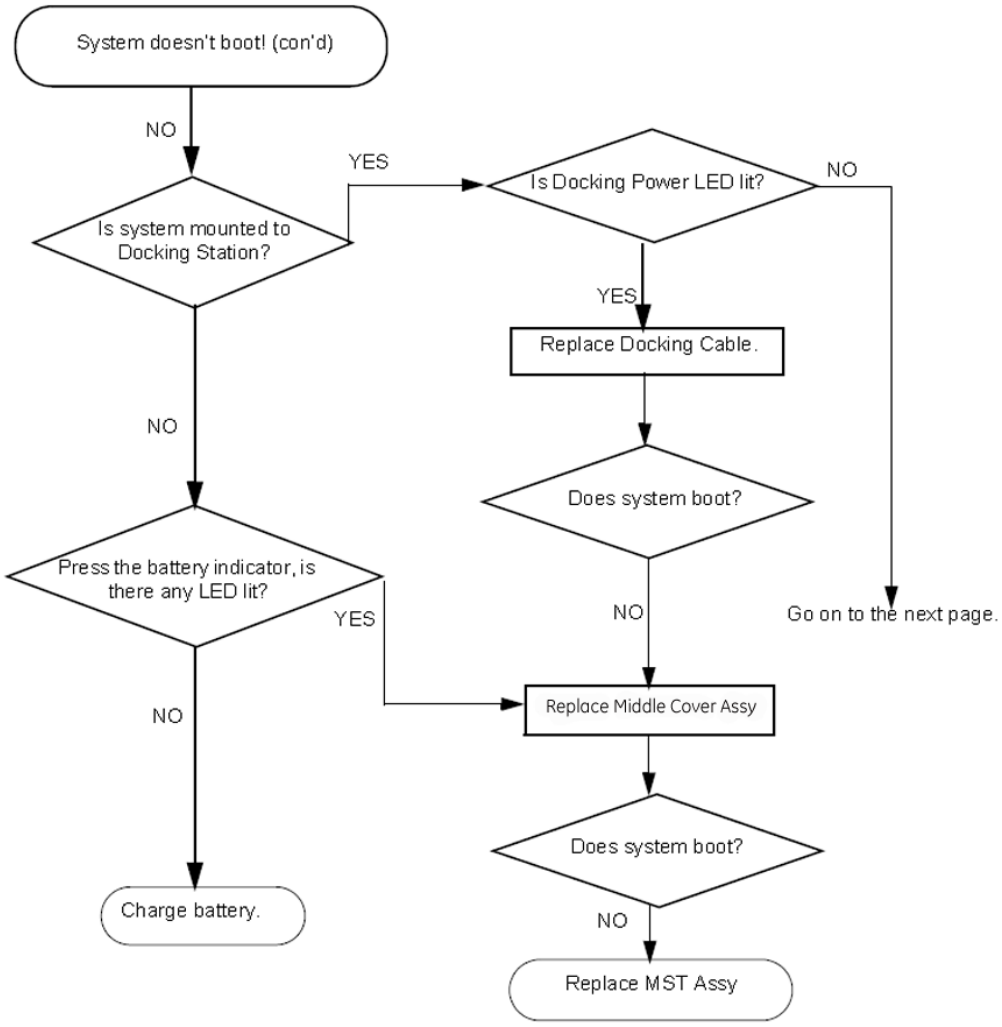


Figure 7-2. System Doesn’t Boot (Cont’d)

System Doesn't Boot (continued)

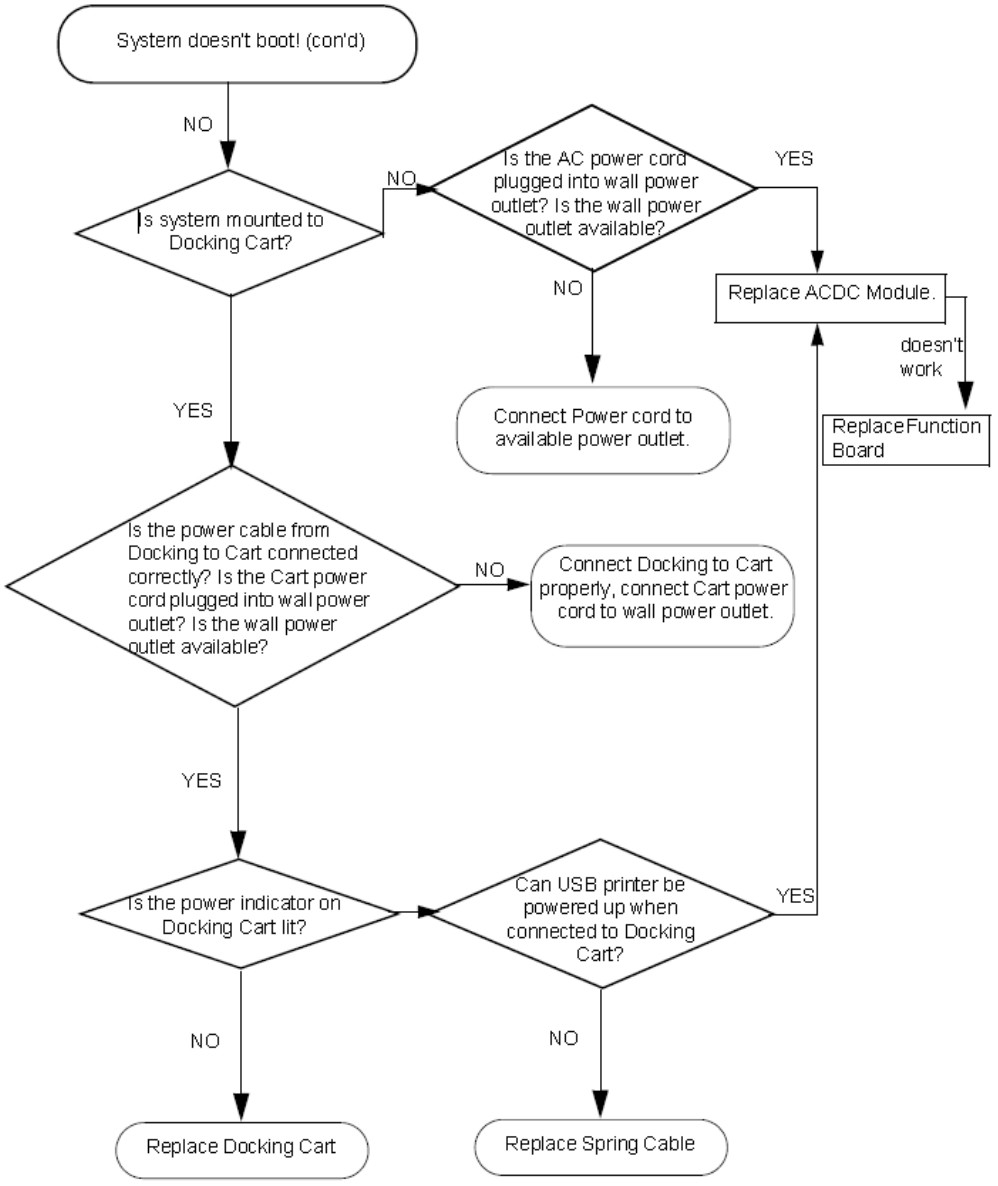


Figure 7-3. System Doesn't Boot (Cont'd)

Structured Artifact in the image

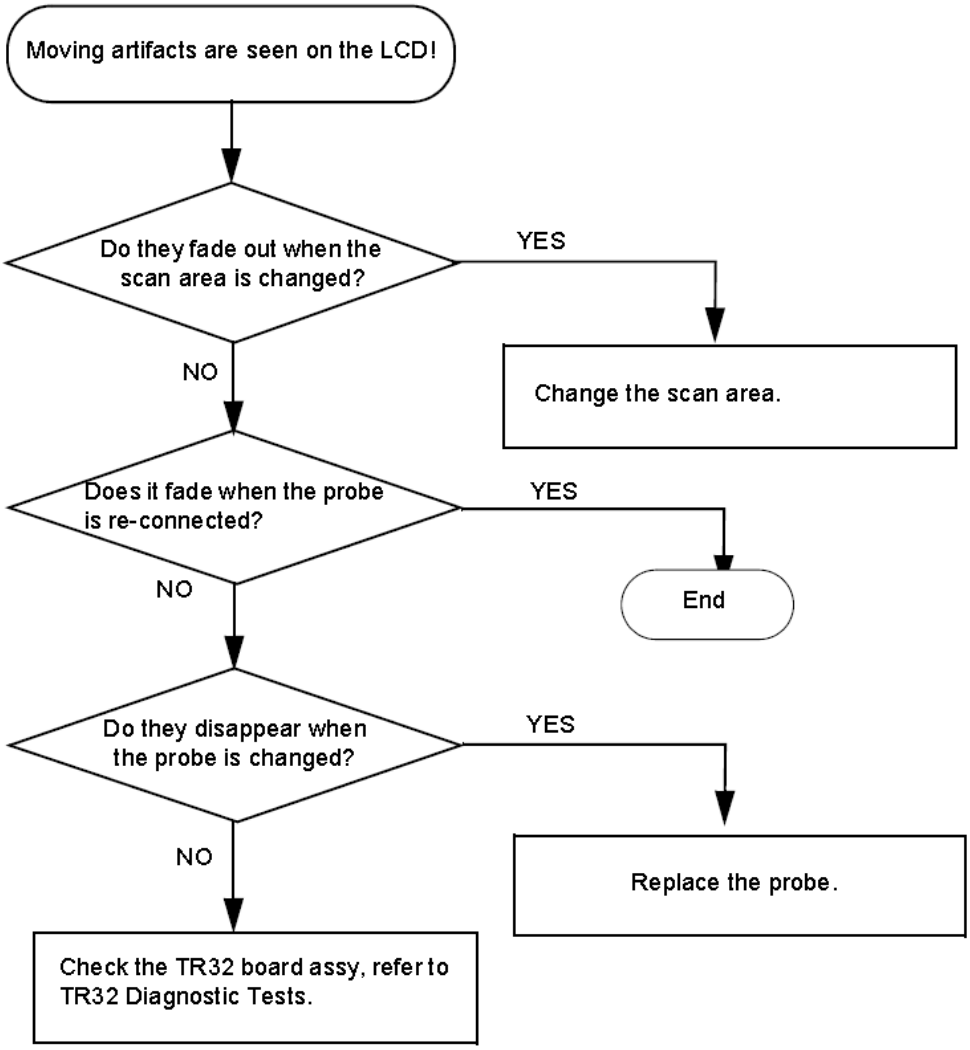


Figure 7-4. Structured Artifact in the image

Structured Artifact in the image (continued)

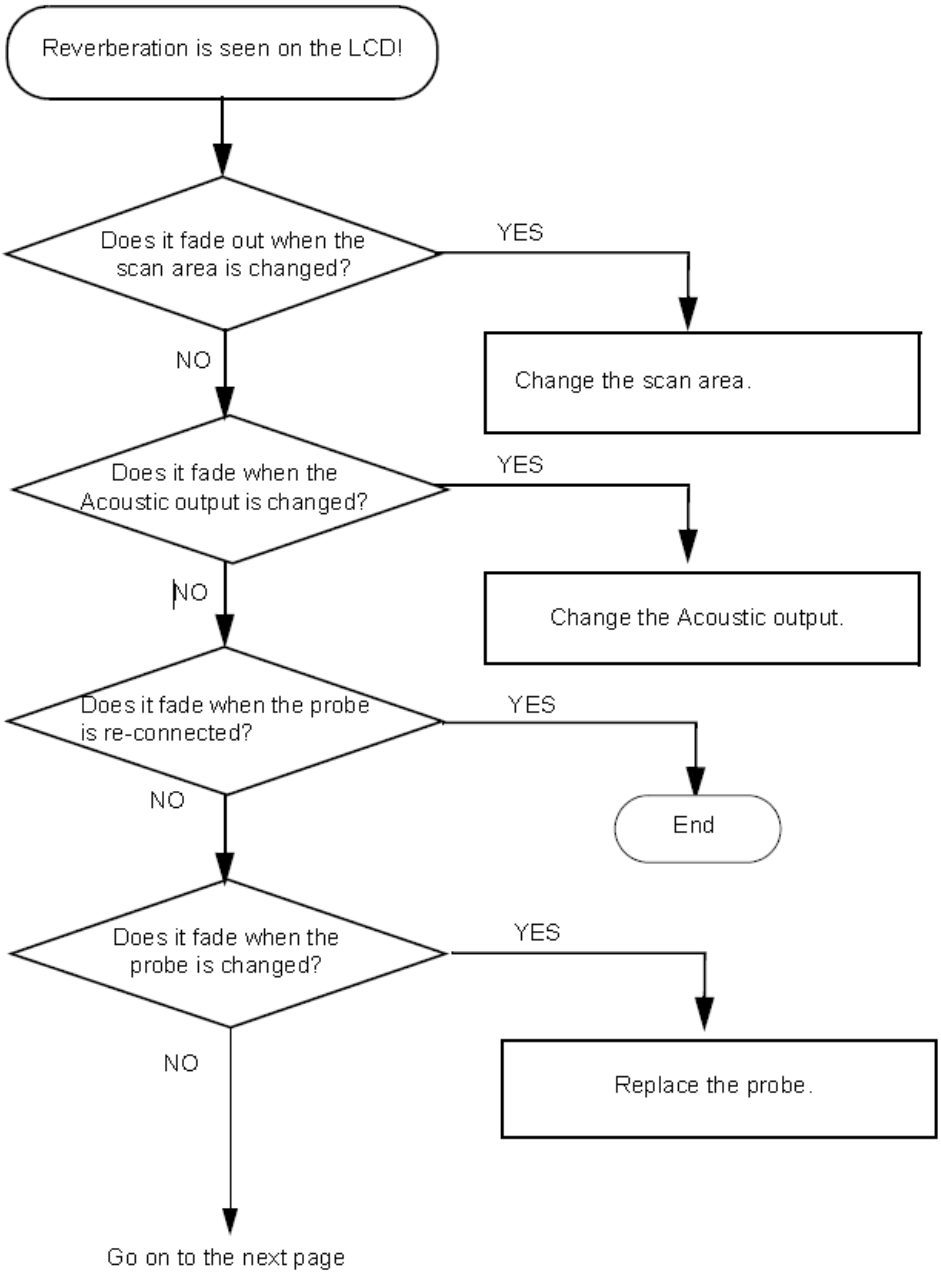


Figure 7-5. Structured Artifact in the image (Cont'd)

Structured Artifact in the image (continued)

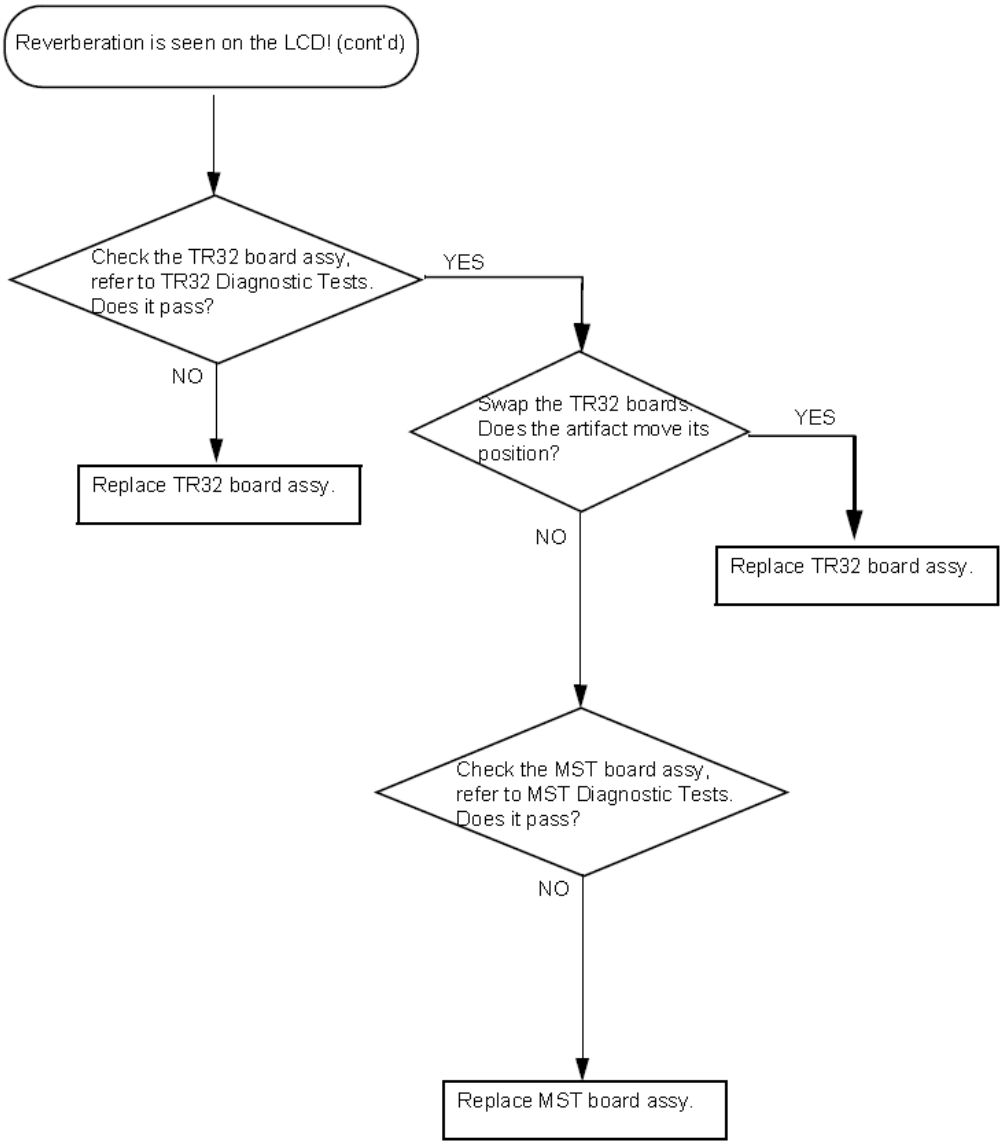


Figure 7-6. Structured Artifact in the image (Cont'd)

B Mode Low Sensitivity

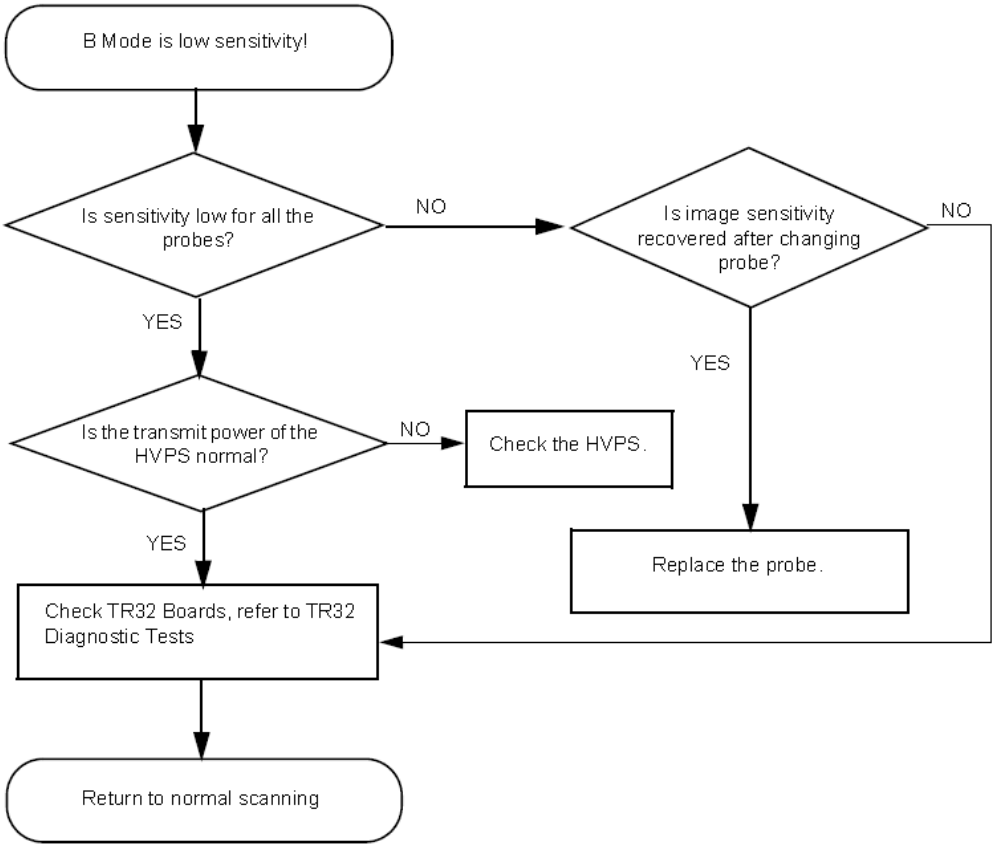


Figure 7-7. B Mode Low Sensitivity

B Mode Low Image Quality

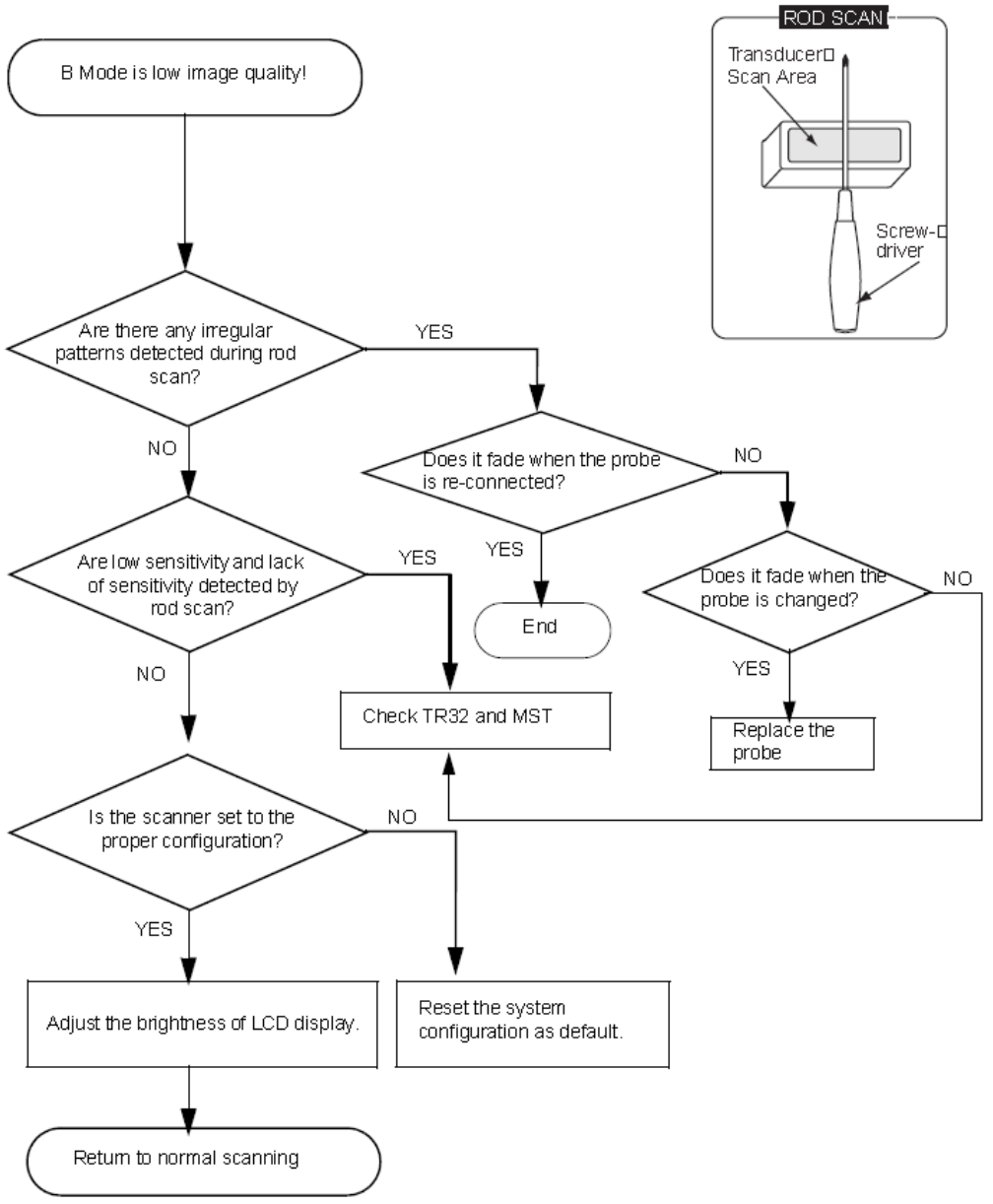


Figure 7-8. B Mode Low Image Quality

Noise in B Mode

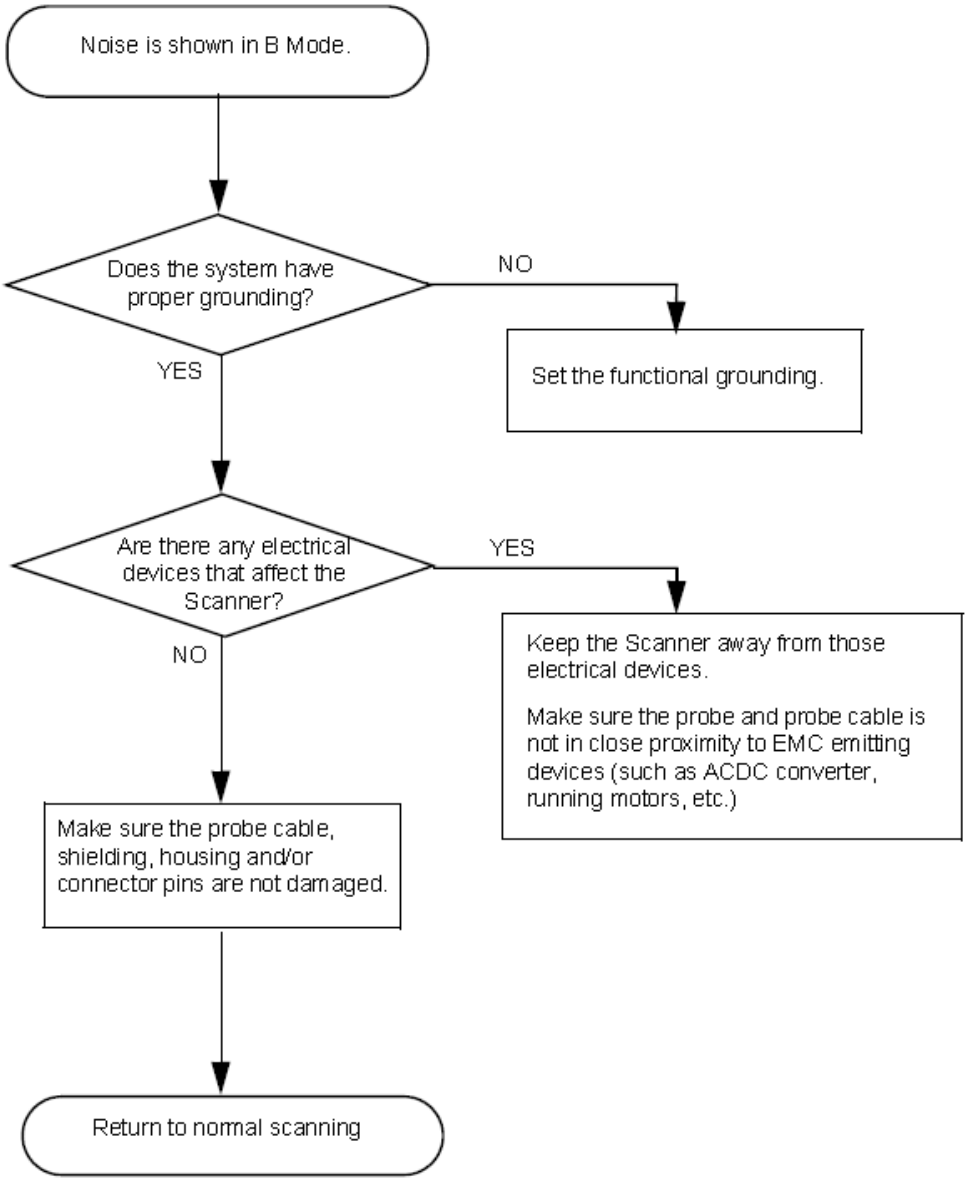


Figure 7-9. Noise in B Mode

Color Flow Low Sensitivity

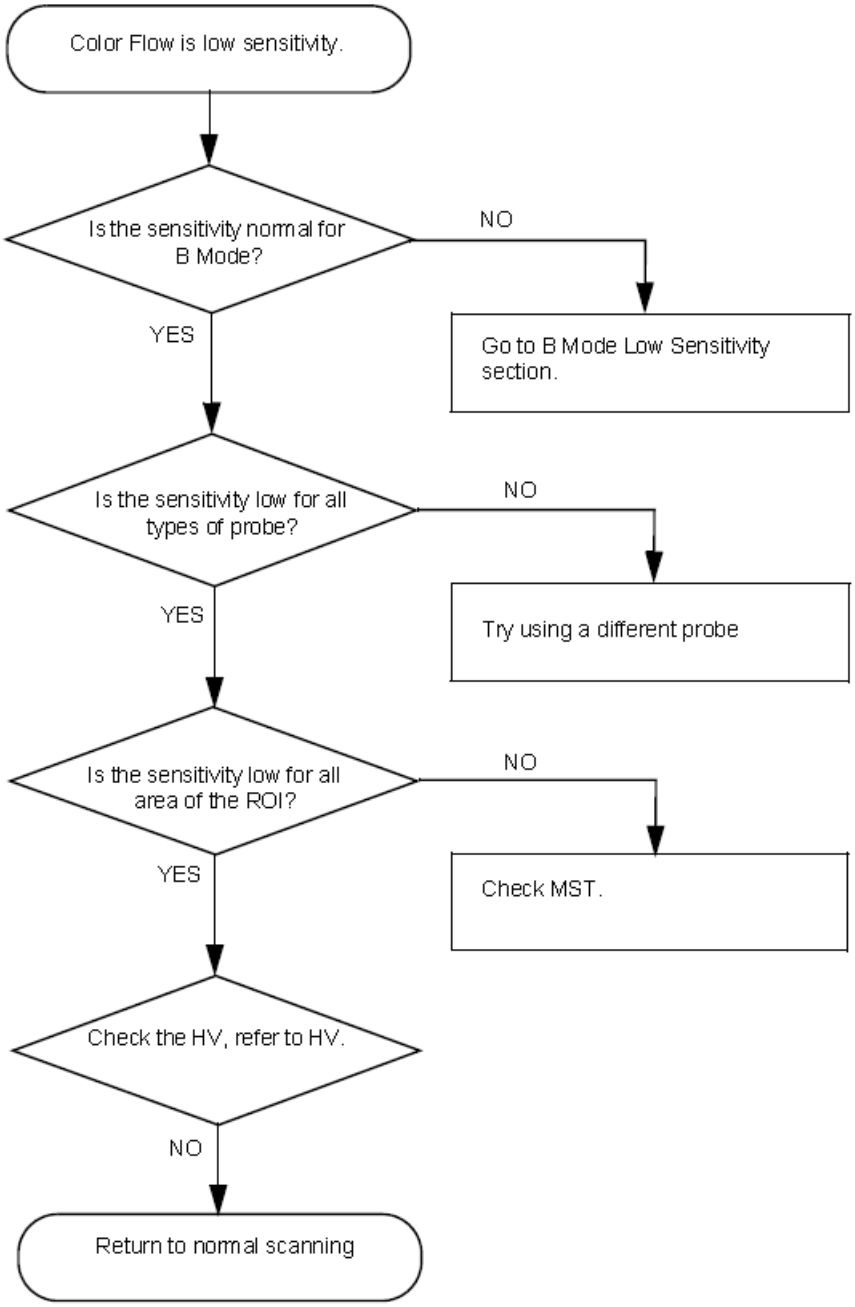


Figure 7-10. Color Flow Low Sensitivity

Noise in Color Flow

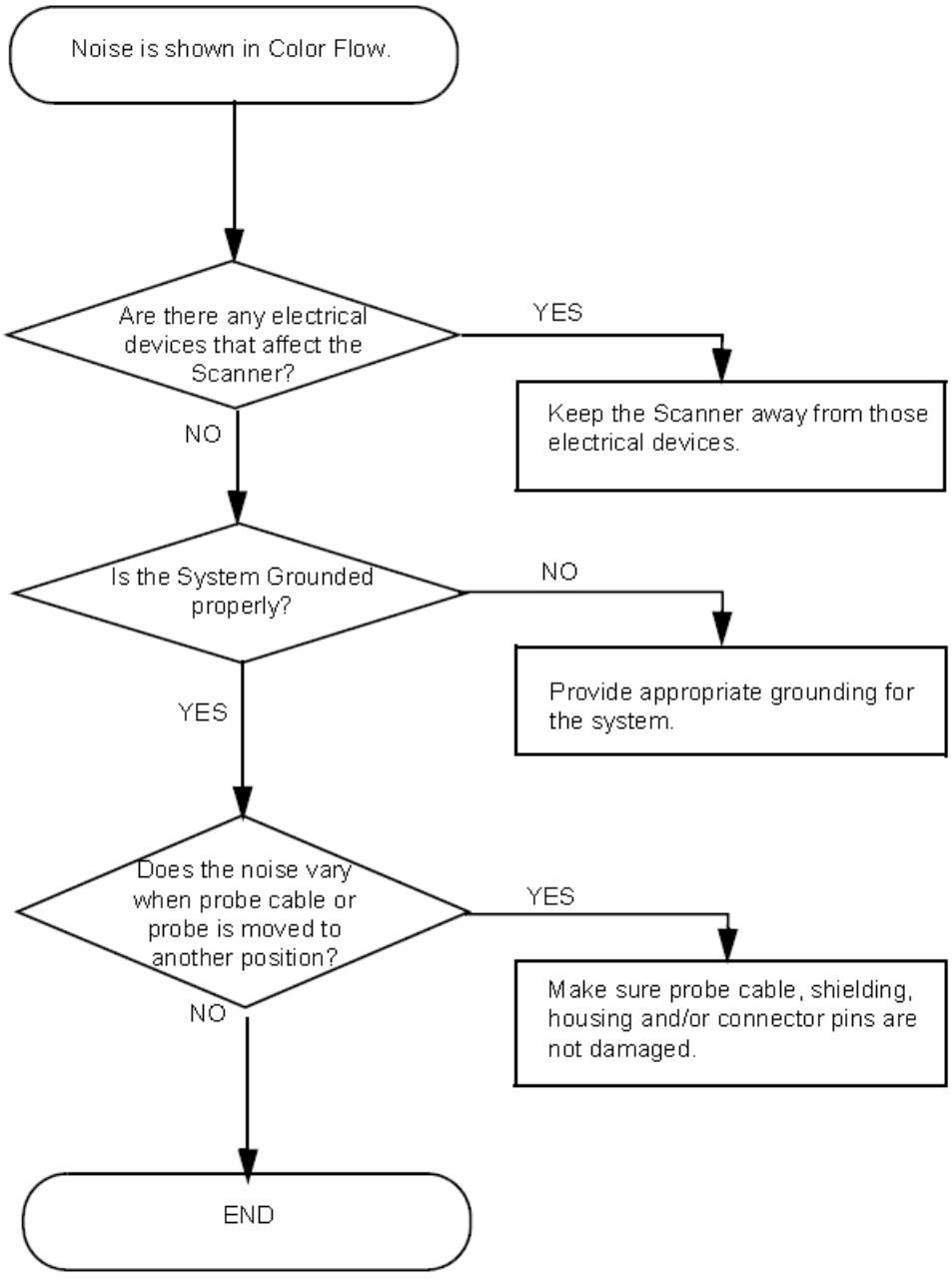


Figure 7-11. Noise in Color Flow

Touch panel - Impaired Sensitivity

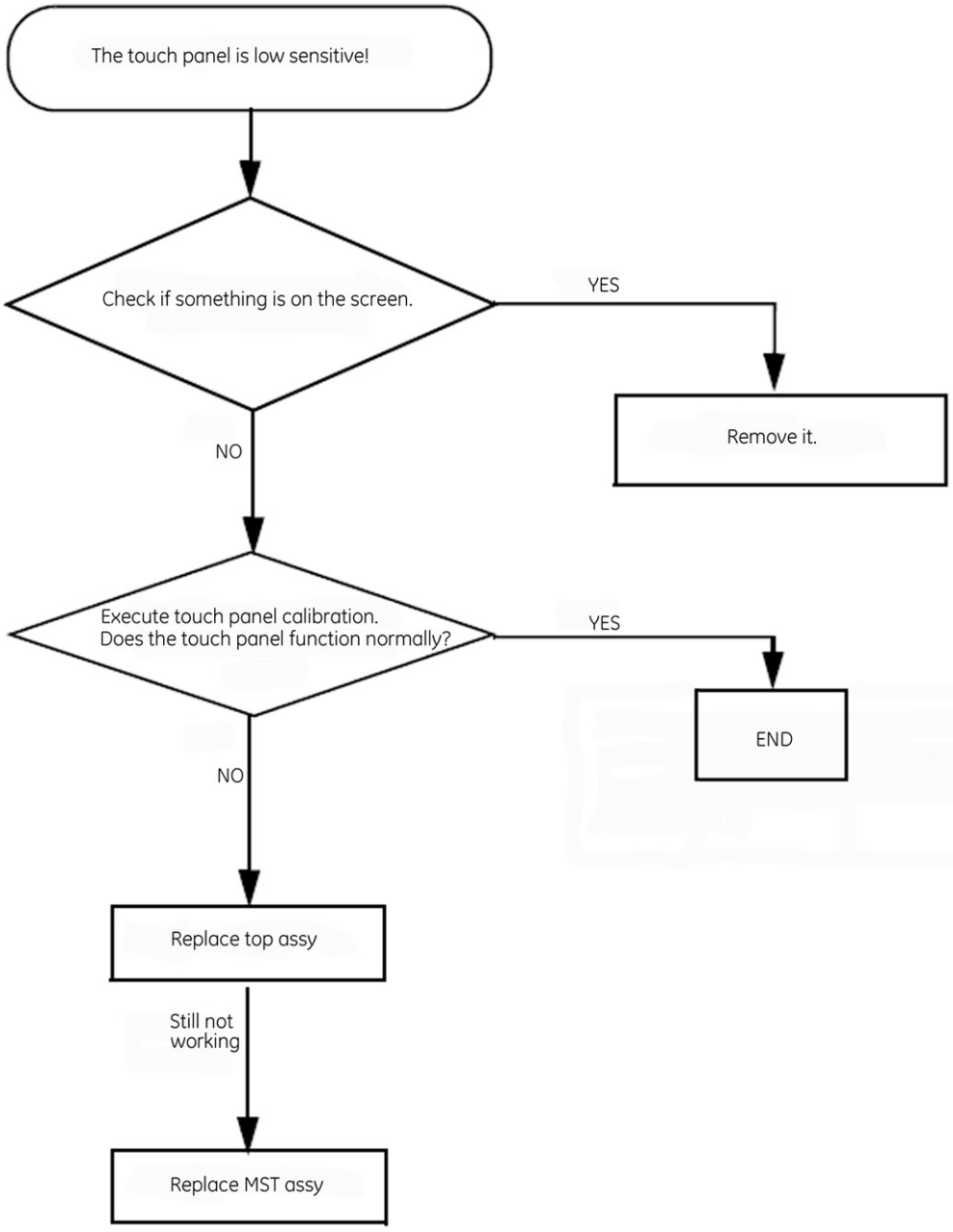


Figure 7-12. Unable to Scan

LCD Display - Impaired Function

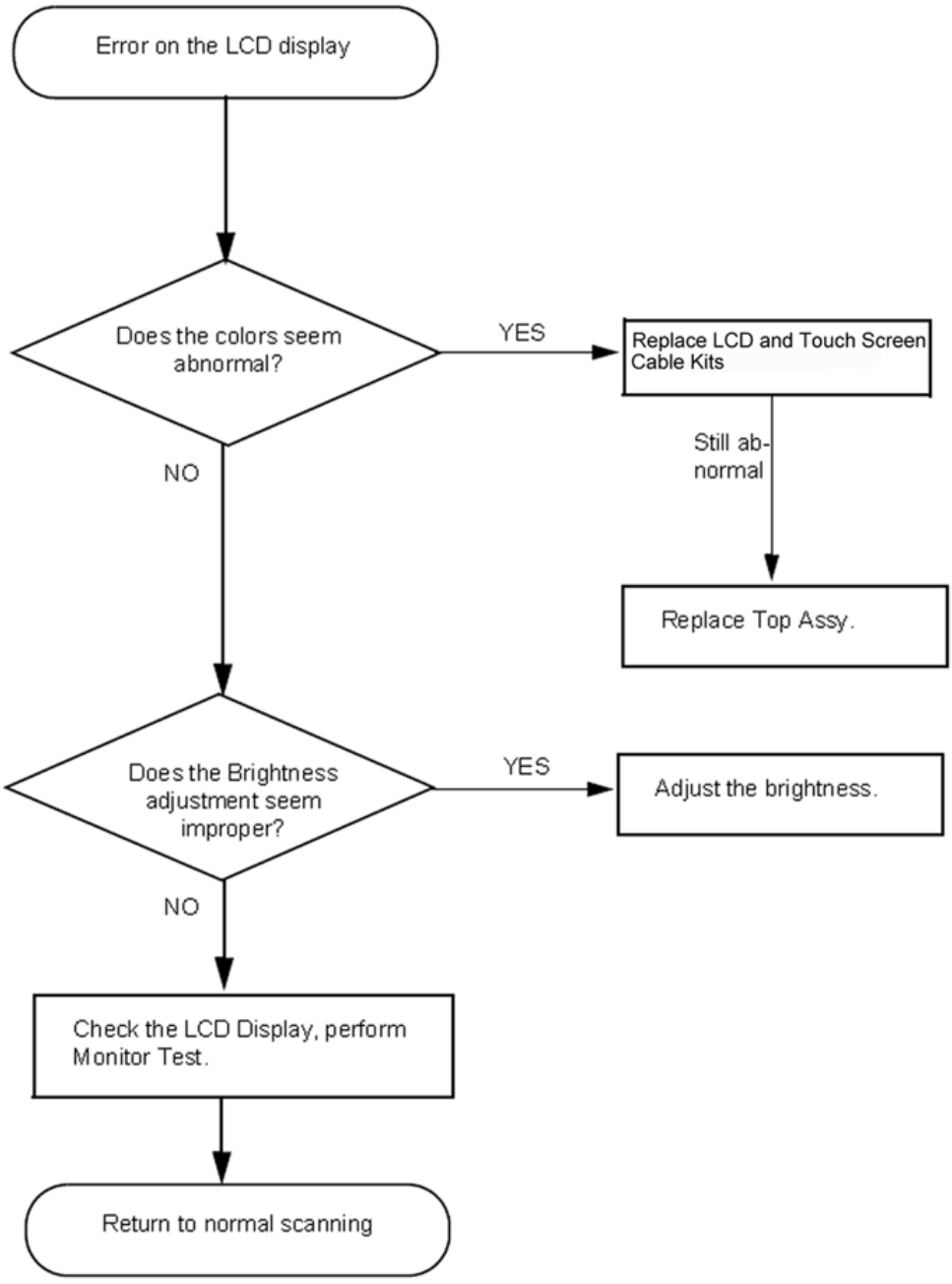


Figure 7-13. LCD Display

Peripheral Troubleshooting Trees

Unable Recording by Printer

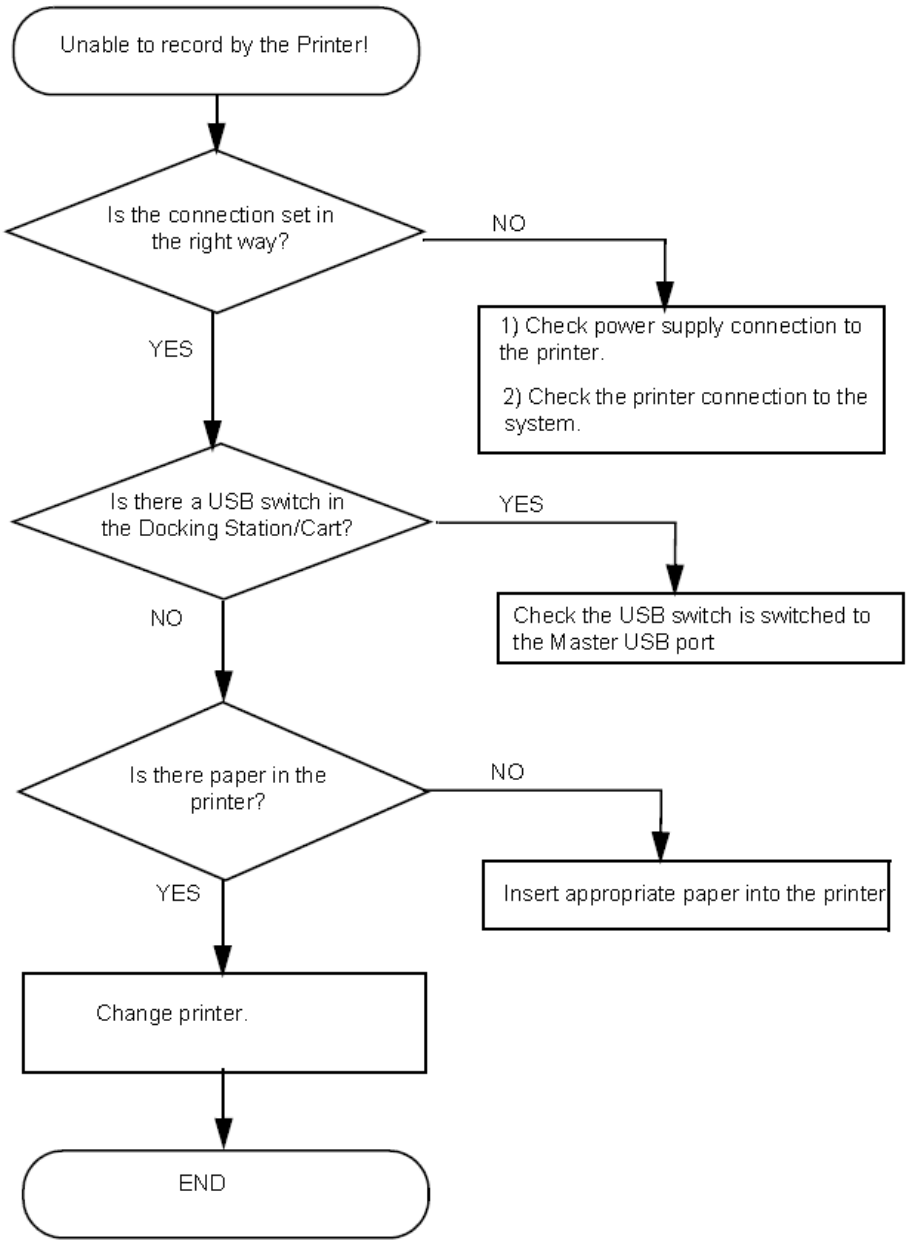


Figure 7-14. Unable Recording by Printer

SD Card

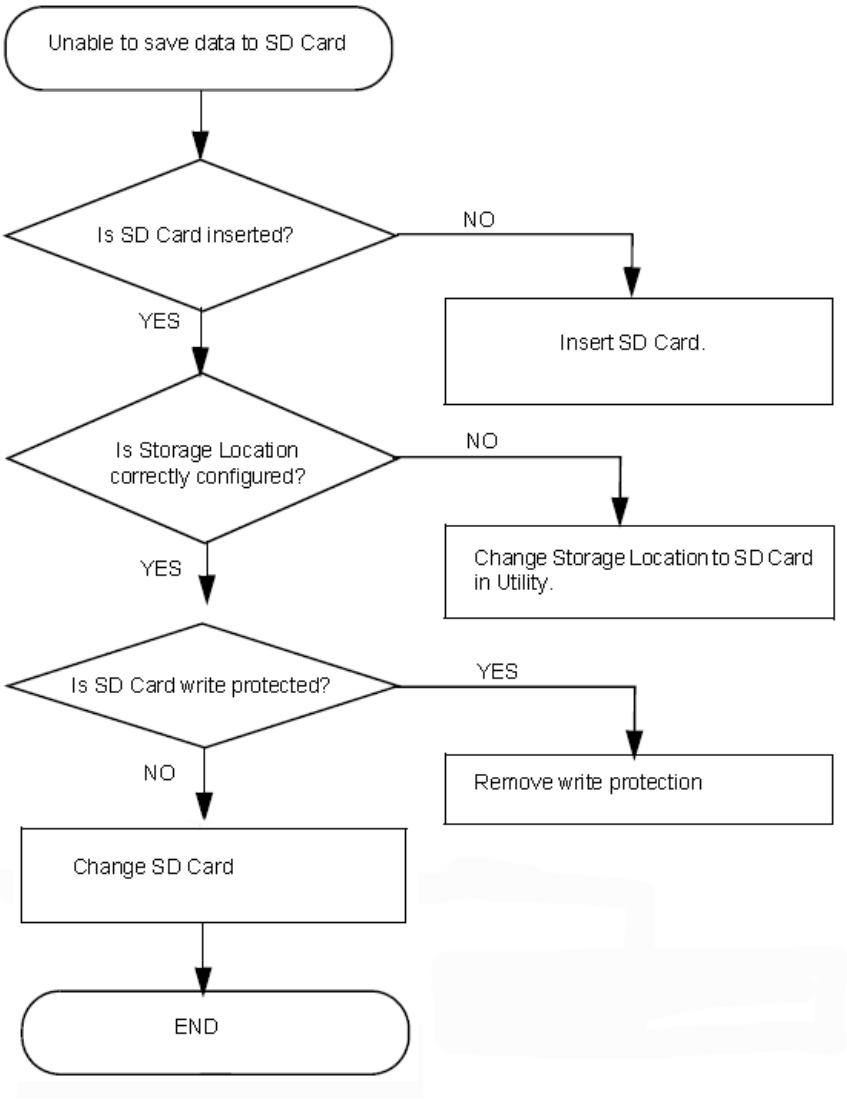


Figure 7-15. Unable to save data to SD Card

USB Memory Stick

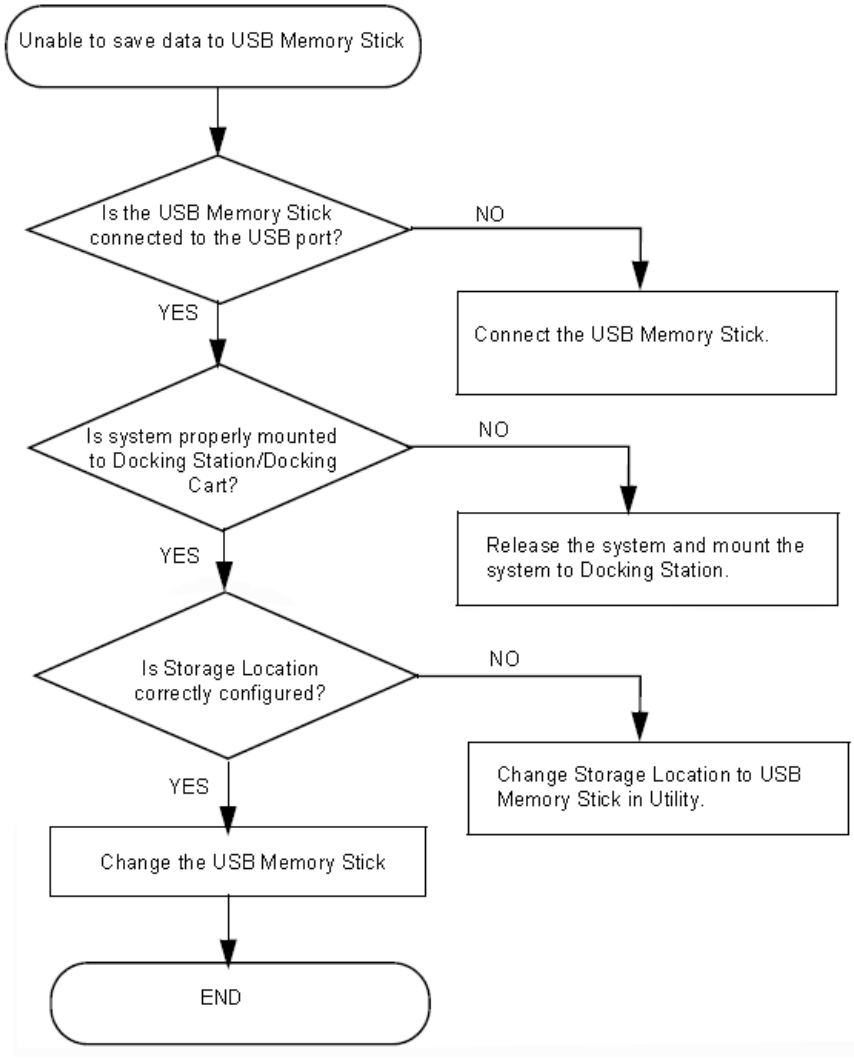


Figure 7-16. Unable to save data to USB Memory Stick

Battery Troubleshooting

System can’t work with battery only.

Table 7-1: Battery Troubleshooting

Num	Reason
1	Battery Broken.
2	Battery is not connected well.
3	Charger block issue, change charge board.

Remote Service

Gateway Installation

Preparations

Before installing the gateway, please assure that the computer meets the minimum requirements listed in the table below.

Table 7-2: Minimum Requirements for the computer

Item	Minimum Requirements
OS	Windows XP Professional SP3 Windows Vista Windows 7 32-bit and 64-bit versions are supported. Windows 7 running in VMware Virtualization Software on Mac OS X 10.6 is supported.
CPU	Pentium 4 (2.4GHz) or Pentium M (1.6GHz)
RAM	1GB
Disk space	1000MB on system partition 200MB on partition where program is installed
Graphic	DirectX 9c compatible display adapter such as: • NVIDIA GeForce 6 Series or later • AMD/ATI X1000 series or later (or Radeon R520 or later) • Inter GMA X3000 series or later Min. resolution: 1024x768
Ports	At least on USB port or SD Card Reader available
pointing device	Mouse with left and right buttons
Alphanumeric	Keyboard required
Network	Wired or Wireless network connection required

Installation Procedure

The software upgrade SDHC card contains the software Gateway. Please follow the steps to install the Gateway.

NOTE: When installing Venue Gateway software to a computer, the gateway installer will add some items to registry and also create some shortcuts. If anti-virus software or some other software pops up tips about these actions, please allow our installer to do the changes, otherwise Venue Gateway software may not work properly.

1. Insert the software upgrade SDHC card to the computer and double click the corresponding drive.
2. Double click **Setup.exe**. The screen is displayed as below. Press **Next**.

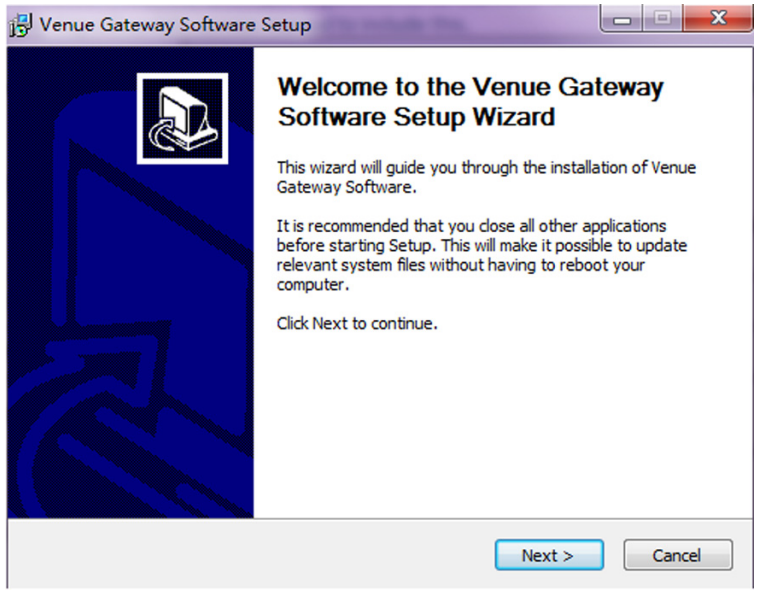


Figure 7-17. Installation Setup

Installation Procedure (continued)

3. If the computer does not meet the minimum requirements in Table 7-2, the screen is displayed as below. Press **Install All**. After all requirements are installed, press **Next**.

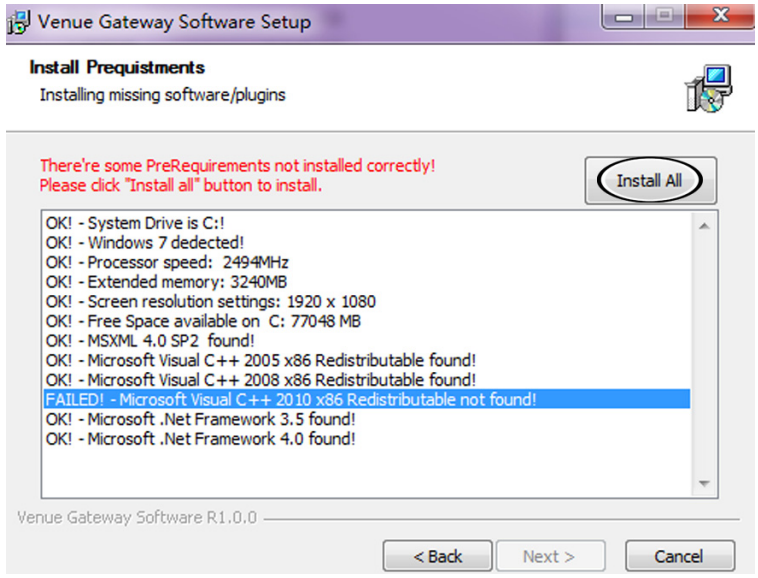


Figure 7-18. Install All

4. When the screen is displayed as below, press **Install**.

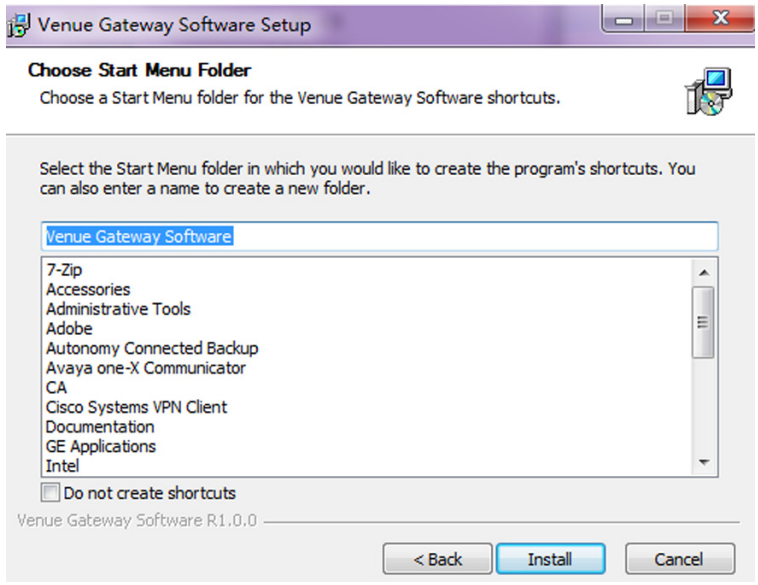


Figure 7-19. Install the software

Installation Procedure (continued)

5. When the installation procedure begins, the screen is displayed as below.

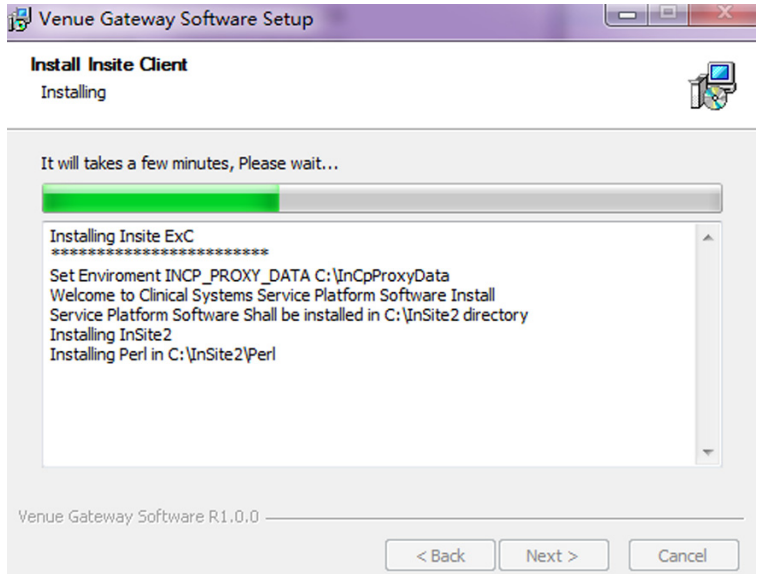


Figure 7-20. Installation Procedure

6. When the installation procedure completes, the screen is displayed as below. Press **Next**.

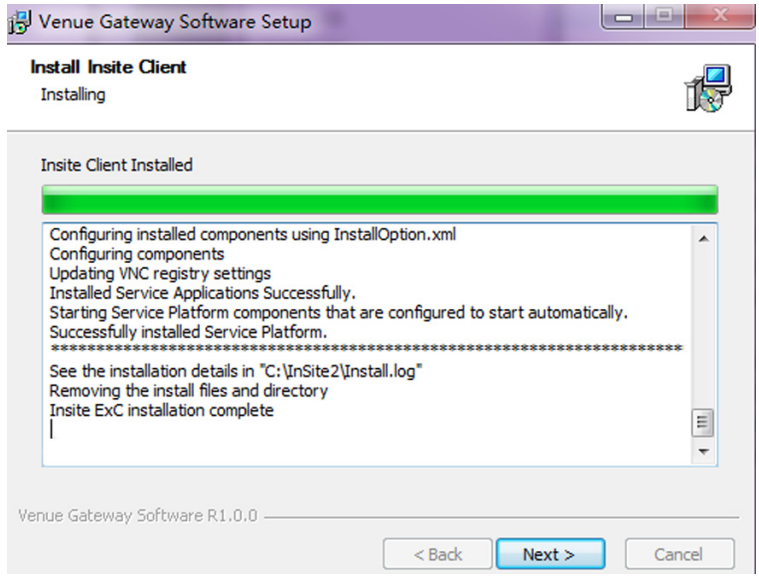


Figure 7-21. Installation Completed

Installation Procedure (continued)

7. When the screen is displayed as below, press **Finish** to reboot the computer.

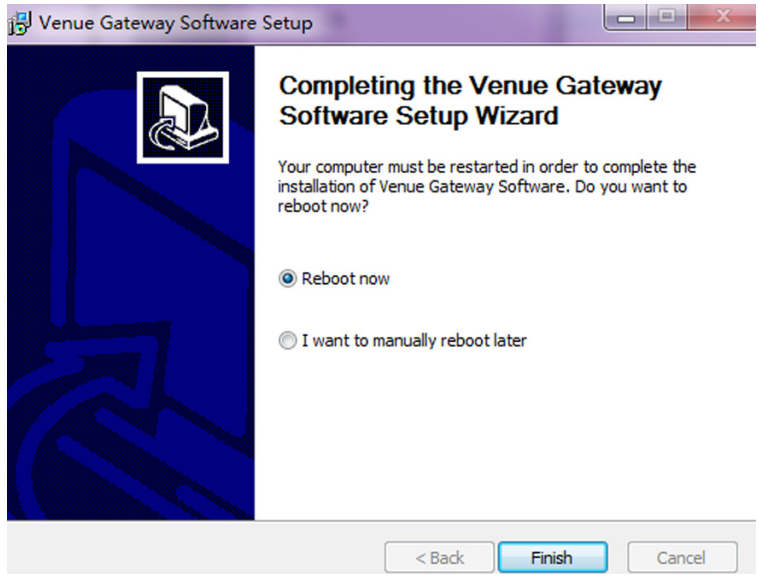


Figure 7-22. Reboot the computer

Gateway Running

Preparations

Please follow the steps below to do some configuration when the Gateway is used for the first time.

NOTE: When you are following the steps below, please read the directions shown on the screen carefully.

1. Double click the Venue Gateway Software icon in the customer PC.
2. Input the Serial Number of Venue device into the field. Then press **Next**.

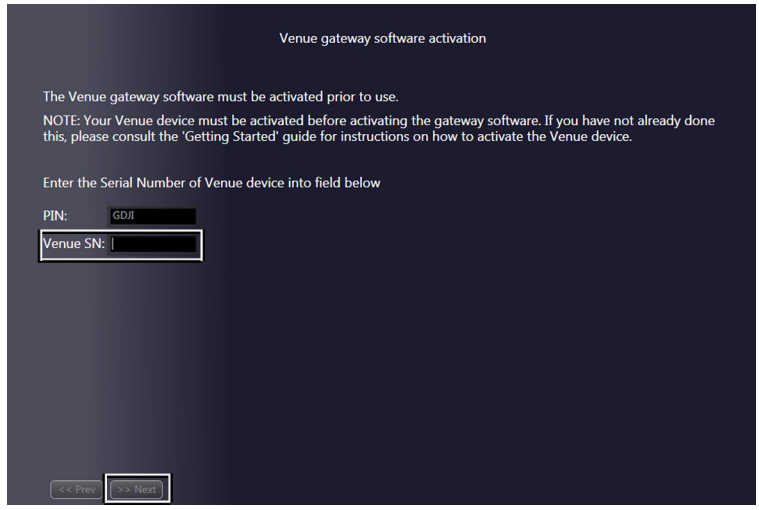


Figure 7-23. Input Venue SN

3. Press **Configure** to open the Insite Service Platform.

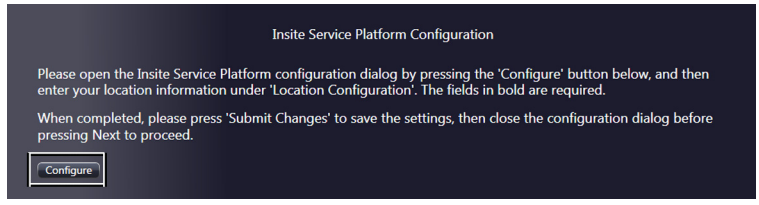


Figure 7-24. Press Configure

Preparations (continued)

4. Input the corresponding information. The fields in bold are required. Then press **Submit Changes**.

NOTE: ***Device Name*** *and* ***CRM No.*** *are automatically filled in. Do not need to modify the information.*

NOTE: *The operator does not need to modify the fields in* ***Advanced Configuration****.*

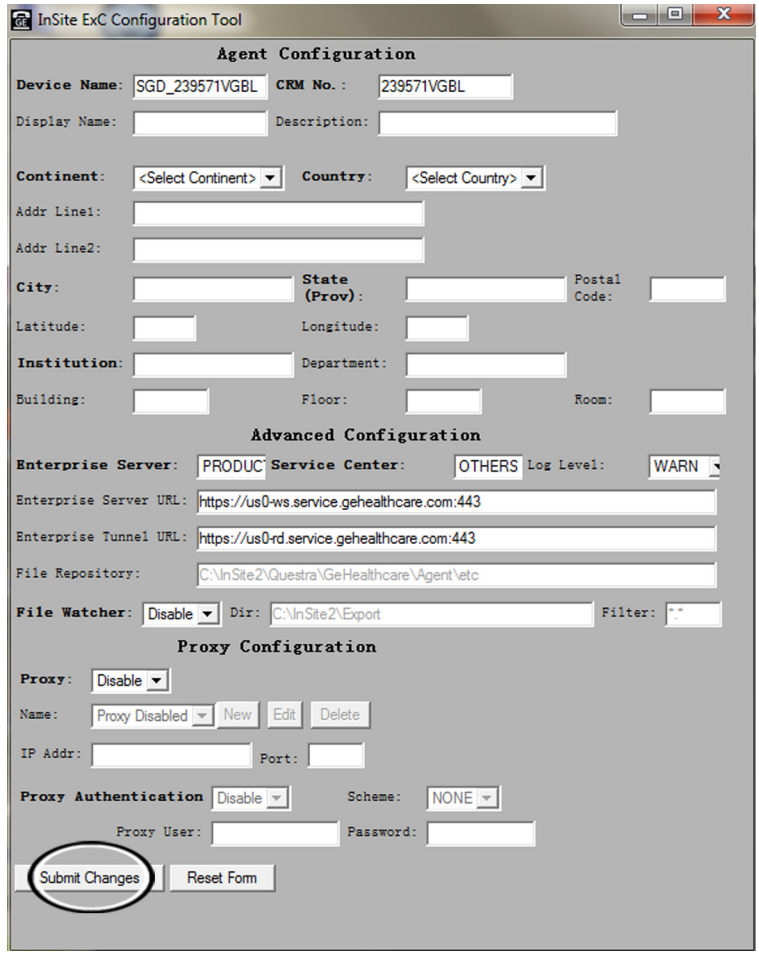


Figure 7-25. Insite Service Platform Configuration

Preparations (continued)

5. When the configuration is saved. Press **OK**. Then close the configuration screen.

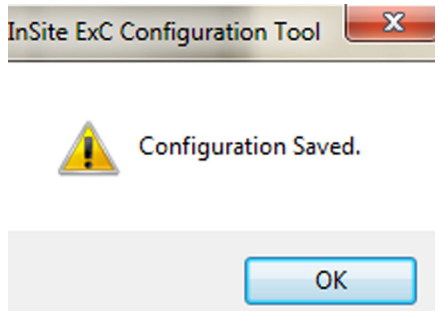


Figure 7-26. Configuration Saved

6. Press **Next** to run the Gateway.

Figure 7-27. Run Gateway

Gateway Running Procedure

1. Run Gateway by double clicking **Gateway** in the customer PC.

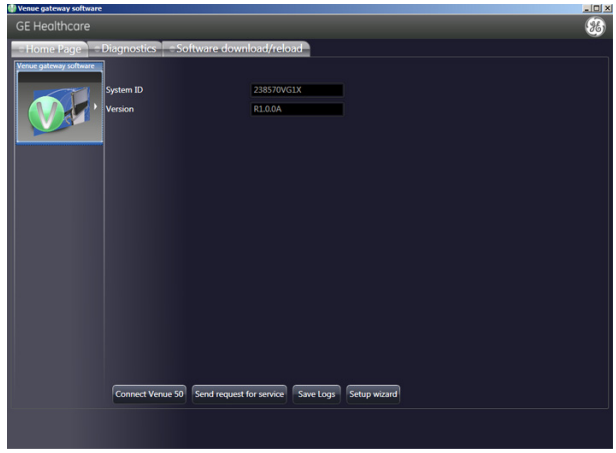


Figure 7-28. Run Gateway

2. Select **Start Remote Desktop Service** at the lower right corner.

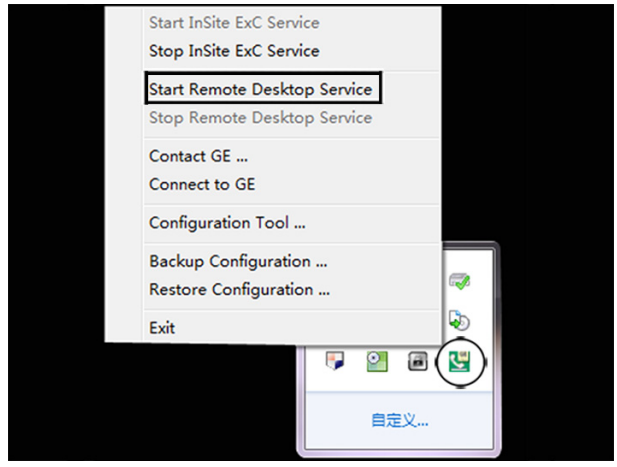


Figure 7-29. Start Remote Desktop Service

Remote Software Download/Reload

To download/reload the software packages, please follow the steps as below:

1. Access to https://insite2.health.ge.com/qss/gelogin.jsp.
2. Select **Device Type**, find the customer PC. Or click **Search**  , then input some information to find the customer PC.

*NOTE: You may review and check if the customer PC is the right one by click **Device Profile Dialog** Icon.*

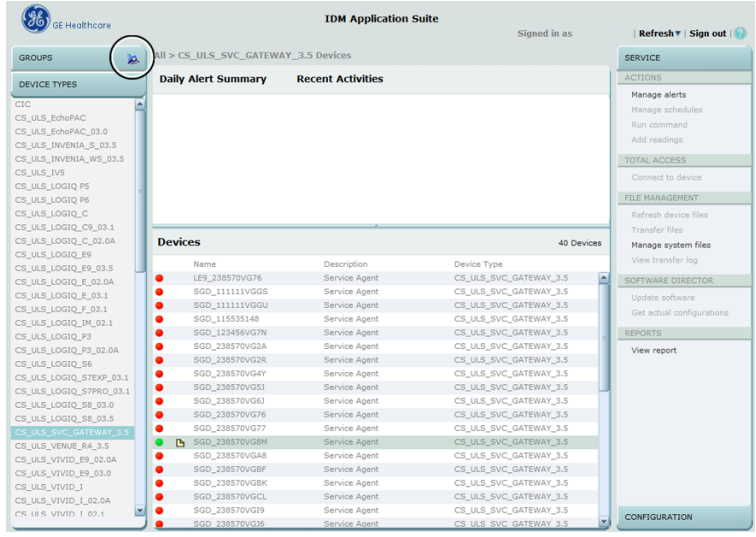


Figure 7-30. Search Customer PC

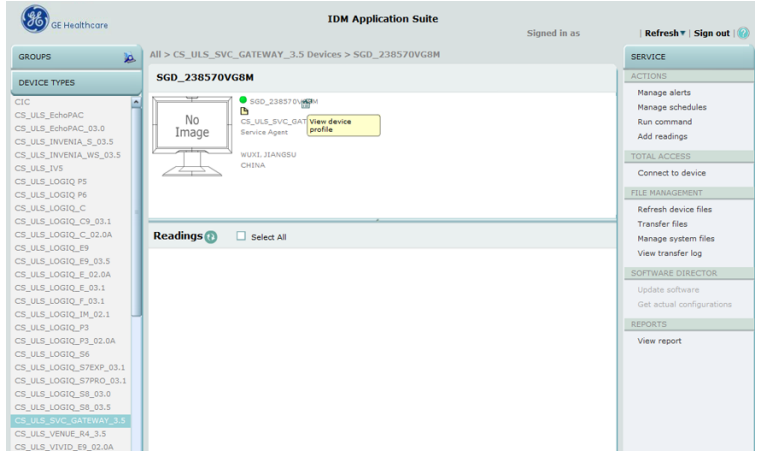


Figure 7-31. View Device Profile

Remote Software Download/Reload (continued)

3. To upload the software to the website, select the customer PC, press **Manage System Files**, select My File, click **+** to select the desired software package, press **Upload**. The software package is uploaded to the website.

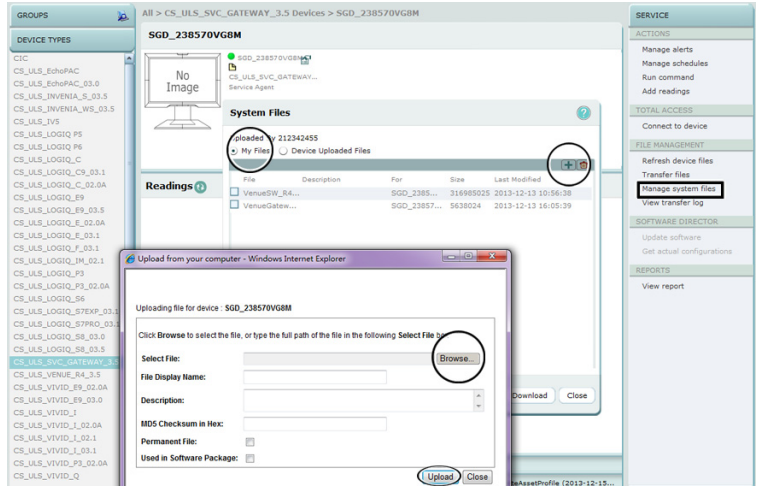


Figure 7-32. Upload the software package

4. To download the software from the website to the customer PC, go to **Transfer File** -> **System File** to find the desired software package, then input **/SWInput** to the target directory path.

*NOTE: The download process will take some time. Please press **View Transfer Log** to check if the software has been downloaded successfully.*

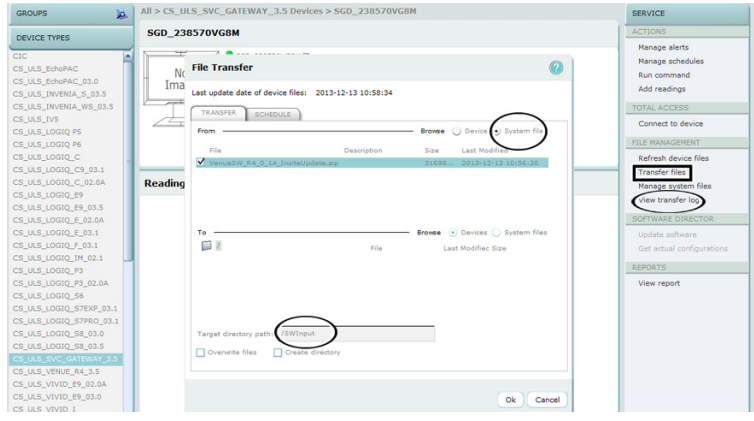


Figure 7-33. Download the software package

Remote Software Download/Reload (continued)

5. Select **Connect to device**. Click **Connect**, **OK**, **OK**, then the customer PC screen will show.

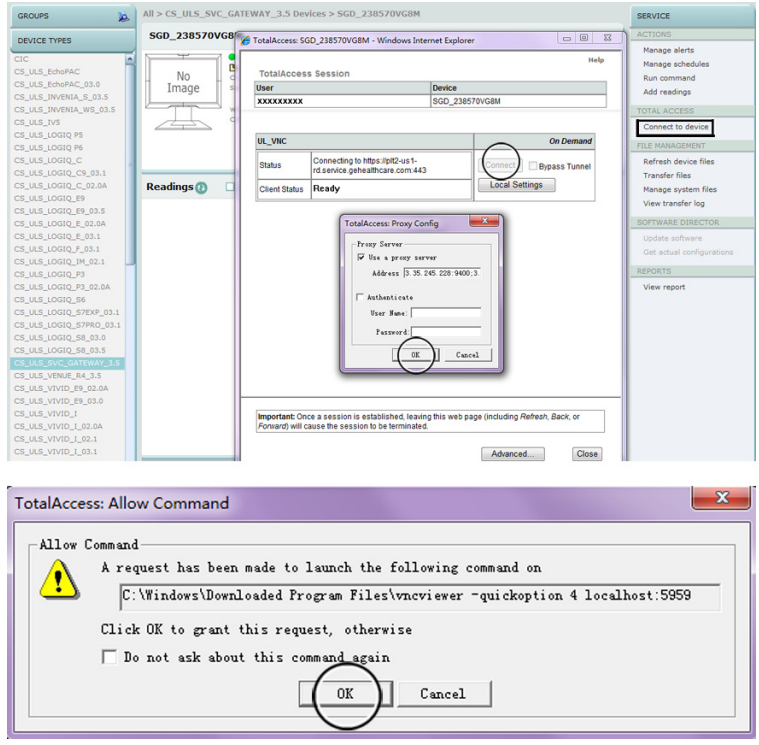


Figure 7-34. Connect to Customer device

Remote Software Download/Reload (continued)

6. Go to **Homepage->Venue Gateway Software->Connect Venue 50**, then input the Console IP Address and click **Ok**.

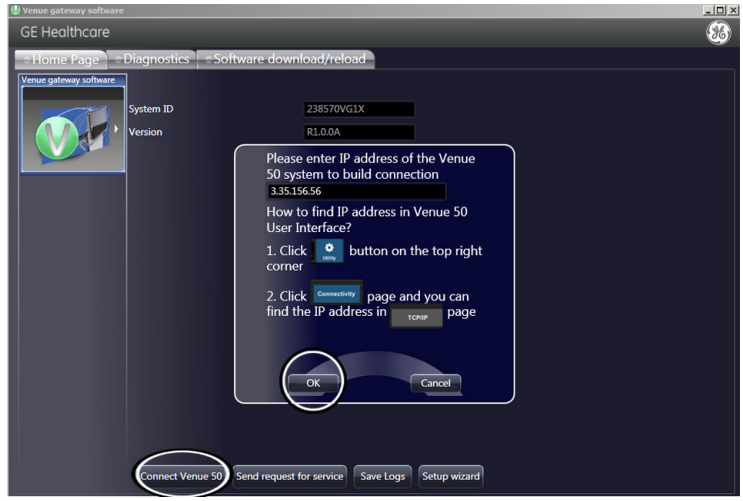


Figure 7-35. Input Scanner IP

7. When the figure below appears, press **OK**.

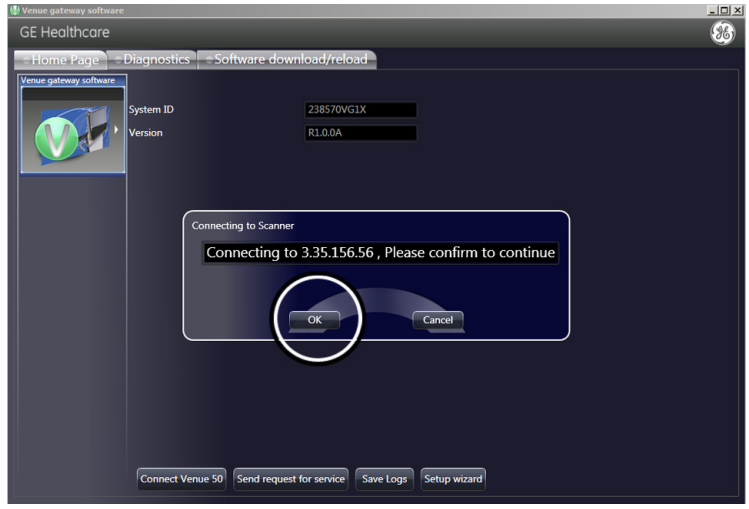


Figure 7-36. Connect to Scanner

Remote Software Download/Reload (continued)

8. The customer press **OK** on the console.

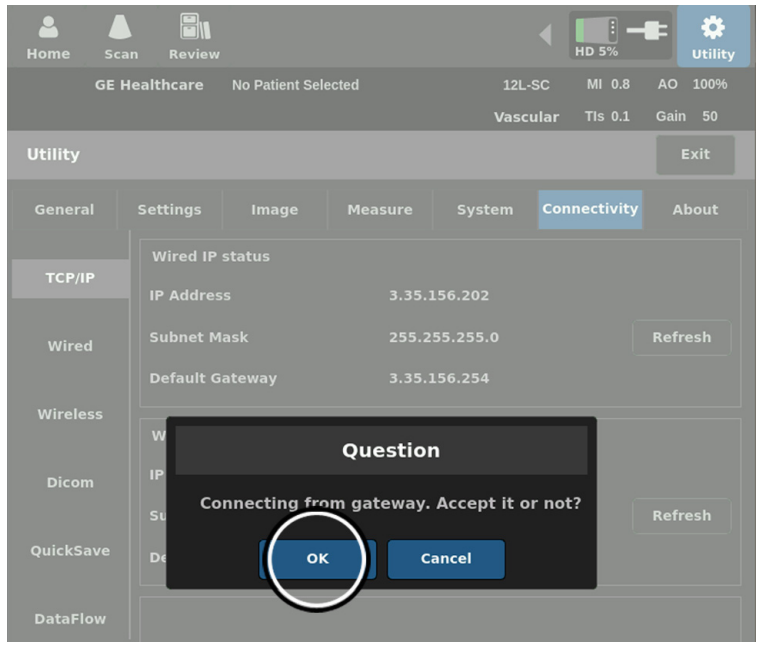


Figure 7-37. Scanner Connected

*NOTE: Press **OK** as soon as possible once the box appears.*

9. When the figure below appears, press **OK**. Then the customer PC is connected to the console.

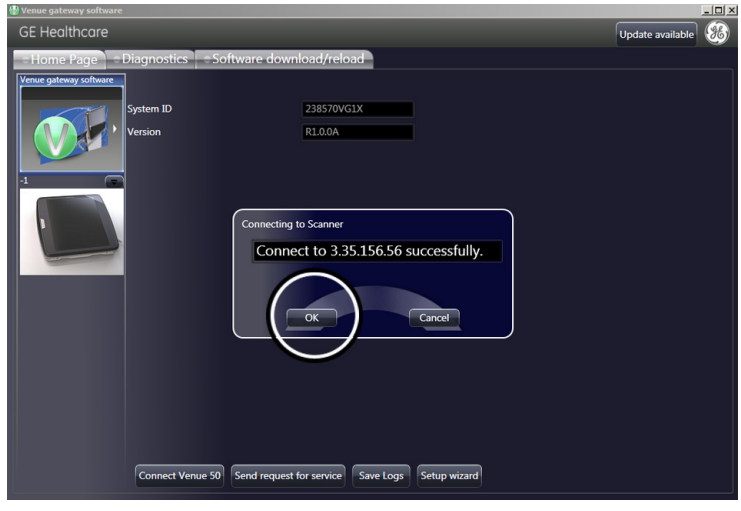


Figure 7-38. PC Connected

Remote Software Download/Reload (continued)

10. Press **Software download/reload**, select the console, select the desired software package, press **Install** / **Reinstall**. When a dialogue box appears, press **OK**. .

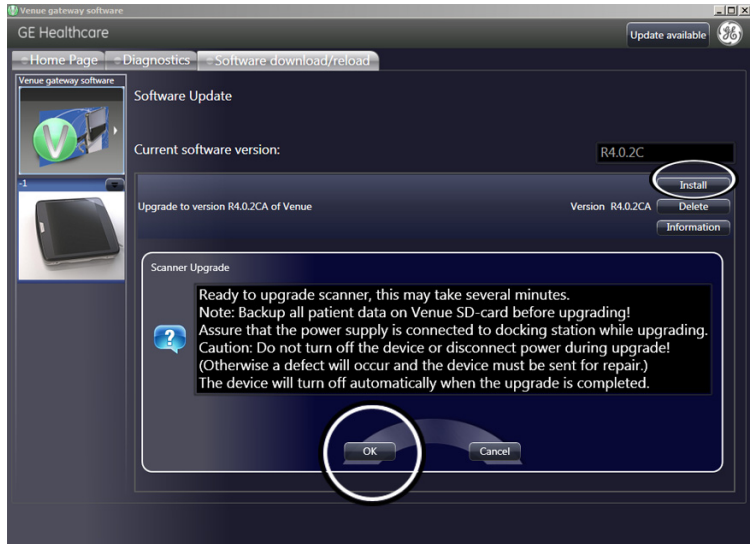


Figure 7-39. Software Installed

11. When the figure below appears on the scanner, press **OK** to receive package. The installation process begins.

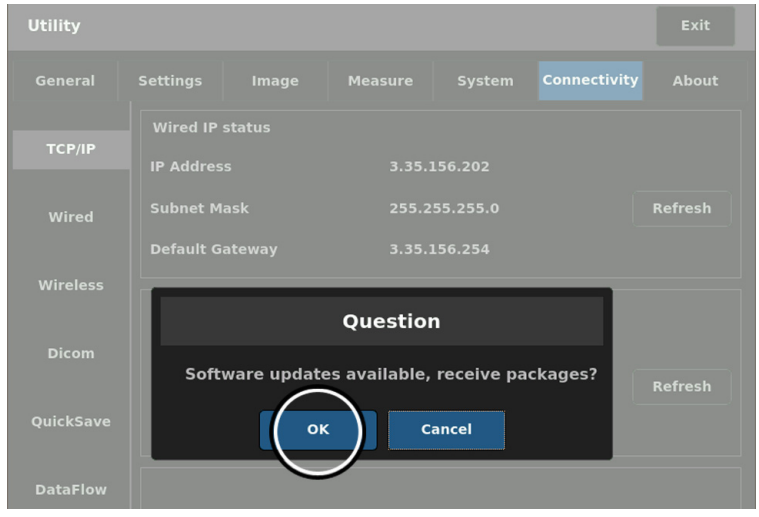


Figure 7-40. Installation Process

Remote Software Download/Reload (continued)

12. After the installation process is completed, a dialogue box will appear on the PC screen. Press **OK**.

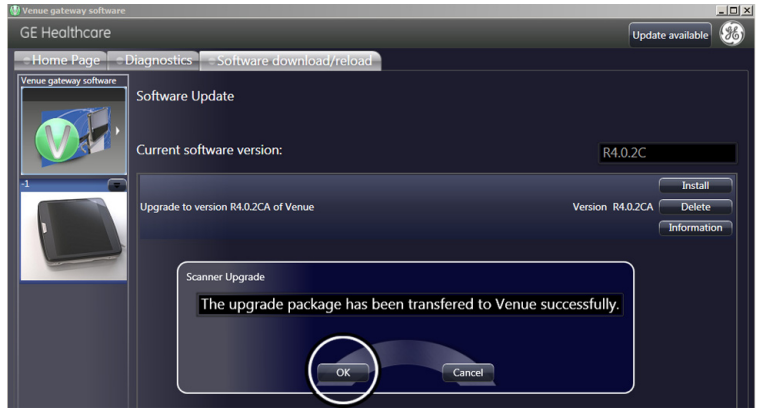


Figure 7-41. Installation Completed

13. After the installation process is finished, a dialogue box will appear on the scanner. Press **OK** to shut down the system. Reboot to upgrade the system.

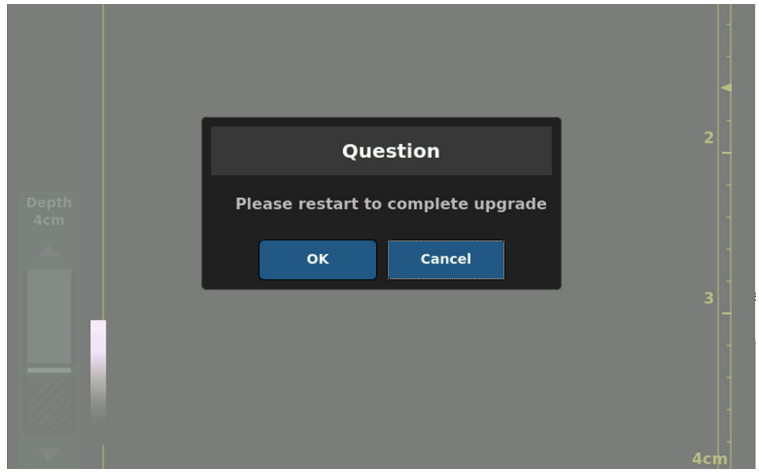


Figure 7-42. System Shutdown

Remote Diagnostics

To diagnose the customer console, please follow the steps as below:

1. Access to https://insite2.health.ge.com/qss/gelogin.jsp.
2. Select **Device Type**, find the customer PC. Or click **Search**  , then input some information to find the customer PC.

*NOTE: You may review and check if the customer PC is the right one by click **Device Profile Dialog** Icon.*

3. Select **Connect to device**. Click **Connect**, **OK**, **OK**, then the customer PC screen will show.
4. Go to **Homepage->Venue Gateway Software->Connect Venue 50**, then input the Console IP Address and click **Ok**. The customer press **OK** on the console. Then the customer PC is connected to the console.
5. Press **Diagnostics**, select the console, then press **Run All Diagnostics** or select the desired test and press **Run Diagnostics**. The summary will show on the screen.

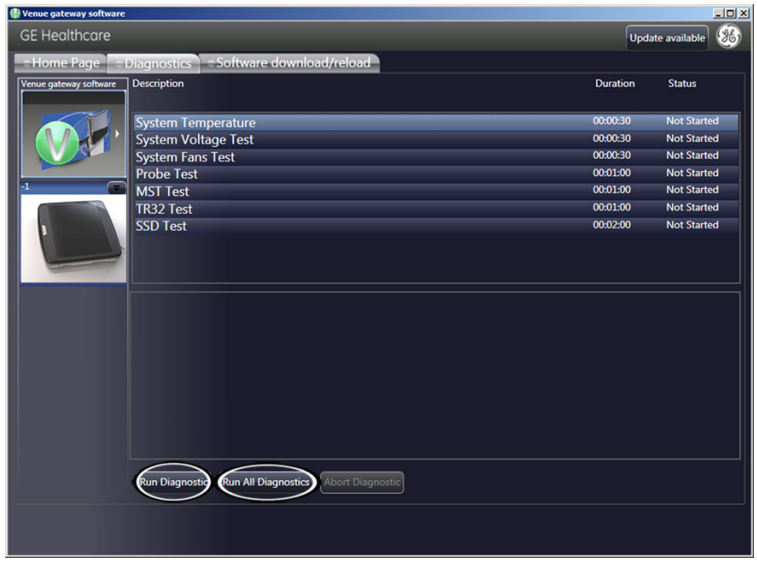


Figure 7-43. Diagnostics Screen

Remote Log

To get the log from the customer console, please follow the steps as below:

1. Access to https://insite2.health.ge.com/qss/gelogin.jsp.
2. Go to **Transfer Files** -> **Device** -> **Devlog** -> the customer console name, select log file and press **OK**.

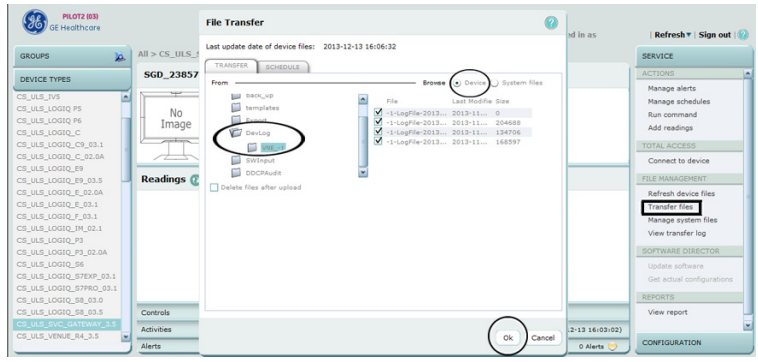


Figure 7-44. Log Screen

Chapter 8

Replacement Procedures

This chapter describes how to remove and install, or replace, modules and subsystems in the Venue 50. It also includes instructions for installing and re-installing the software.

Overview

Contents in this chapter

Warnings and important information

Warnings

WARNING

Energy Control and Power Lockout for Venue 50.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the Ultrasound system.
4. Maintain control of the Ultrasound system power plug.
5. Wait for at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery, if present.

Ultrasound System components may be energized.

WARNING

Because of the limited access to cabinets and equipment in the field, placing people in awkward positions, GE has limited the lifting weight for one person in the field to 16 KG (35 LBS). Anything over 16 KG (35 LBS) requires 2 people.

Warnings (continued)

WARNING

DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions.

Follow general guidelines for handling of electrostatic sensitive equipment.

NOTE: Use an ESD compatible work space or the ESD-kit during parts replacement.

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.

Returning/shipping probes and repair parts

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

GE policy states that body fluids must be properly removed from any part or equipment prior to shipment. GE 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.

NOTE: 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.

If the Venue 50 needs to be sent for repair, ensure that any patient information is erased from the storage device, or that the storage device is removed from the Venue 50 before shipping. In case that any patient information is still residing on the Venue 50, GE will contact the customer and request for urgent collection of that patient information. GE will keep this patient information in a secure environment for a maximum period of 1 month. All patient information will be permanently deleted at that point.

If PHI (Patient Healthcare Information) data needs to be sent to GE employees for service purposes, GE will ascertain agreement from the customer. The patient information shall only be transferred by approved service processes, tools and devices restricting access, protecting or encrypting data where required, and providing traceability in the form of paper or electronic documents at each stage of the procedure while maintaining compliance with cross-border restrictions of patient information.

Disassembly/Re-assembly

Warning and Caution

ONLY QUALIFIED SERVICE PERSONNEL SHOULD REMOVE ANY COVERS OR PANELS. ELECTRICAL HAZARDS EXISTS AT SEVERAL POINTS INSIDE. BECOME THOROUGHLY FAMILIAR WITH ALL HAZARDOUS VOLTAGES AND HIGH CURRENT LEVELS TO AVOID ACCIDENTAL CONTACT

Do not wear the ESD wrist strap when you work on live circuits and more than 30V peak is present.

Tools needed for servicing Venue 50

Table 8-1: Standard tools list for Venue 50

No	Part Name	Part No.	QTY	Screw Description	Screwdriver Description
1	Screw	5138465	30	Screw FH M2.5X5 (NL)	Phillips #1
2	Screw	5162727	5	Screw M3x25 (NL)	TORX #10
3	Screw	5308509	2	Screw M3x15 (NL)	TORX #10
4	Screw	2327793	14	D2 Screw SJ2836-87 M3x8	Phillips #1
5	Screw	5307880	5	Screw M3x825 with Cushion	Phillips #1
6	Screw	2327764	7	D2 Screw M2X3 (NYLOK)	Phillips #2
7	Screw	5307881	7	Screw M2x3 OD 7.80	Phillips #1
8	Screw	5307883	8	Screw M2.5x4 OD 3.60	Phillips #1
9	Screw	5307887	6	Screw FH M2.5x15 (NL)	Phillips #1

NOTE: This is ultra-portable device in small size, please carefully keep all the screws, cables aside during service activities.

NOTE: When disassembling the Top Assy, please make sure to lay it on soft and stable surface to avoid scratching the LCD.

Docking Station Desk Support Assy

Tools

- NA

Needed Manpower

- 1 person, 1 minute

Preparation

- Cut off the AC Power input.

Removal Procedure

Table 8-2: Removal Procedure for Docking Station Desk Support Assy

No.	Steps	Corresponding Graphic
1.	Remove probe holders.	
2.	Push the trigger to the other side, then use the other hand to take the Docking module off track.	

Mounting Procedure

1. Install the new parts in the reversed order of removal.

Docking Cart Plastic Shelf

Tools

- NA

Needed Manpower

- 1 person, 1 minute

Preparation

- Cut off the AC Power input.
- Lift the cart to the highest position.
- Lock the wheels.

Removal Procedure

Table 8-3: Removal Procedure for Docking Cart Plastic Shelf

No.	Steps	Corresponding Graphic
1.	Lift the Plastic Shelf and remove it from Docking Cart.	

Mounting Procedure

1. Install the new parts in the reversed order of removal.

Docking Cart Printer Shelf

Tools

- Common phillips screwdrivers

Needed Manpower

- 1 person, 2 minutes

Preparation

- Cut off the AC Power input.
- Lift the cart to the highest position.
- Lock the wheels.

Docking Cart Printer Shelf (continued)

Removal Procedure

Table 8-4: Removal Procedure for Docking Cart Printer Shelf

No.	Steps	Corresponding Graphic
1.	Disconnect the printer power cable and USB Cable from Docking module.	
2.	Lift the Printer Shelf and remove it from Docking Cart.	

Table 8-4: Removal Procedure for Docking Cart Printer Shelf

No.	Steps	Corresponding Graphic
3.	Reverse the printer shelf with printer, unscrew 4 screws [M3*8], take out the printer.	

Mounting Procedure

1. Install the new parts in the reversed order of removal.

Loading Base Image Software

Purpose of this section

This section describes how to reinstall and/or install software on Venue 50.

Data Management - moving all images

An error, or a power loss may occur.

Always backup the Patient Archive and the Presets (System Configurations) before loading the software!

In order to complete a successful restore of the Patient Database, as needed after a hard disk replacement, or if all the content on the hard disk has been erased, the images must be moved away from Venue 50 before doing backup of the Patient Database.

Depending on the location set-up, either move the images to a remote server or to removable media like SD Card or USB Memory Stick.

Recording important settings and parameters

If any modification has been made to system default settings, the user presets will be lost after software upgrade. Please record current user presets and re-config the system after the upgrade is complete.

An error, or a power loss may occur.

It is considered to be best practice to always keep a record on paper of the settings for the Venue 50. Verify if it is current before you start to load software!

You may go to **Utility** to record the settings and parameters for **General**, **Settings**, **Image**, **Measure**, **System**, **Connectivity** and **About**. You may refer to Chapter 4 in Basic User Manual (the latest version).

Loading the System Software

NOTE: Before loading the system software, please ensure that the power can be continuously supplied and there is no risk of power cut off during loading procedure.

NOTE: Before starting this procedure, remove all probes and peripherals.

NOTE: While it is believed to be unnecessary, it would not hurt to disconnect the system from the network and remove all transducers.

NOTE: Do not plug and unplug the probe, mount to or release from the Docking Station/Cart during the upgrading process.

1. Insert the SD Card labeled “VENUE Software” into the SD Card Socket.
2. Power on the system, then the software upgrading startup screen displays. Time in the upper right corner shows system time, and the time in the lower right corner shows the time of upgrading process.

Loading the System Software (continued)

3. Select **Semi** or **Full** for the installation type.
   - **Semi**: install the software to system partition only. All the user data and log will be kept.
   - **Full**: format the whole disk and then install the software to system partition. All the user data and log will be cleared.

WARNING

Full installation will clear all the user data and log.

4. Press **Confirm** to confirm the selection. Press **Exit** to cancel.

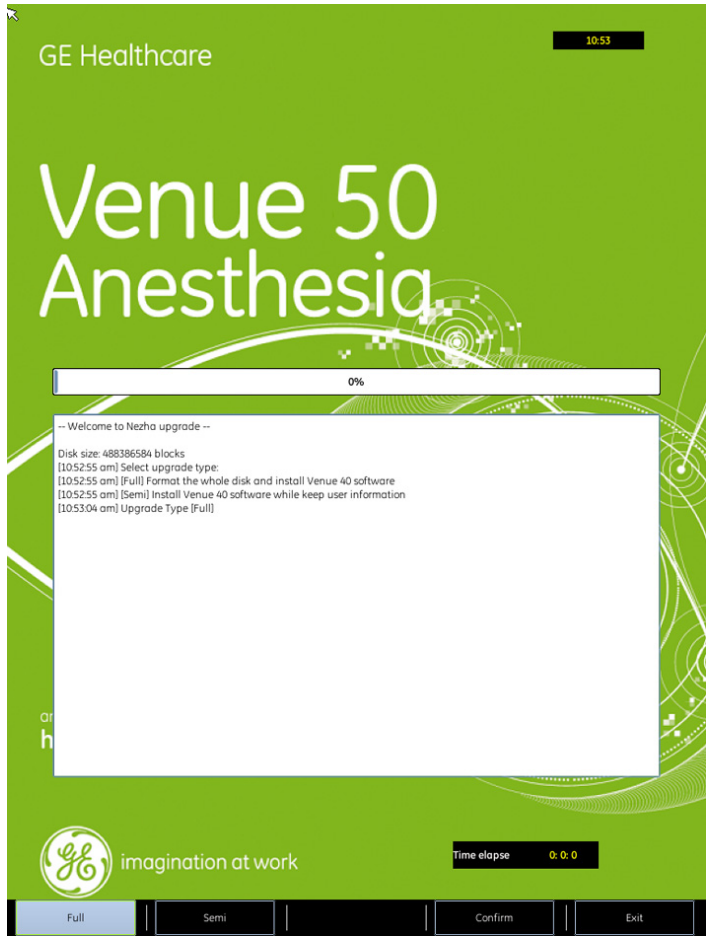


Figure 8-1. Select Installation Type

Loading the System Software (continued)

5. Press **Start** to begin the upgrading process.

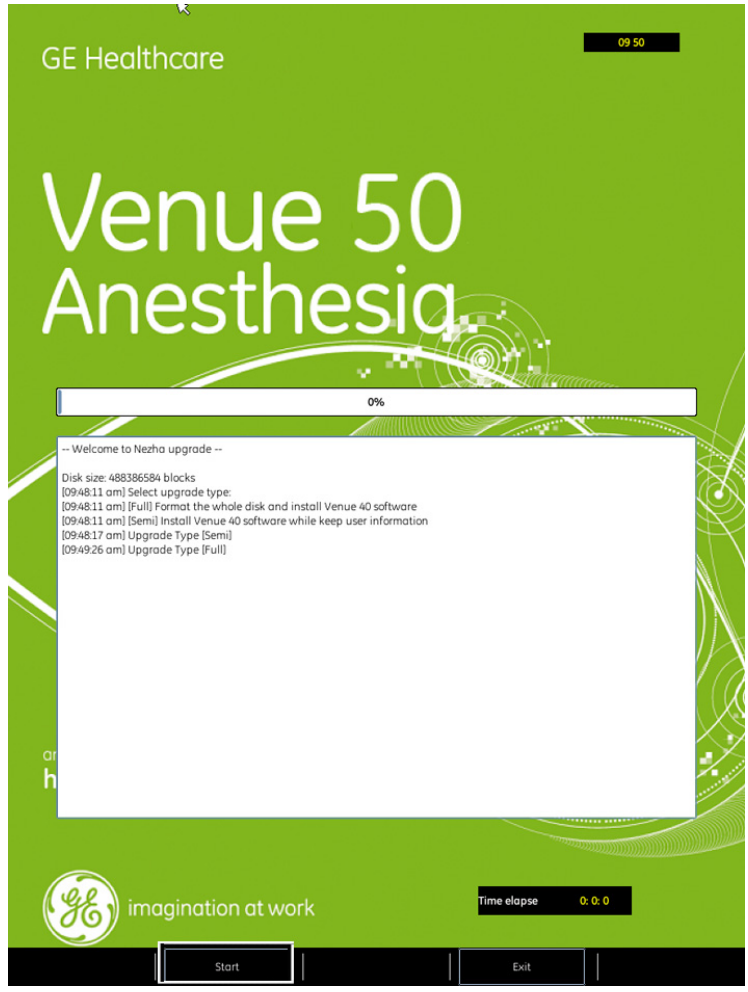


Figure 8-2. Start Installation Process

NOTE: Before the process is started, the system will count down 10 seconds.

Loading the System Software (continued)

6. If you need to pause the upgrade process, press **Abort**.

NOTE: You may need to wait for a few seconds before you can go to the next step.

CAUTION

It is not recommended to press Abort during the upgrading process, for system crash may occur. Shut down the system and restart the upgrading process again.

7. When the process is paused, press **Continue** to go back to the upgrading, press **Exit** to cancel the upgrading.

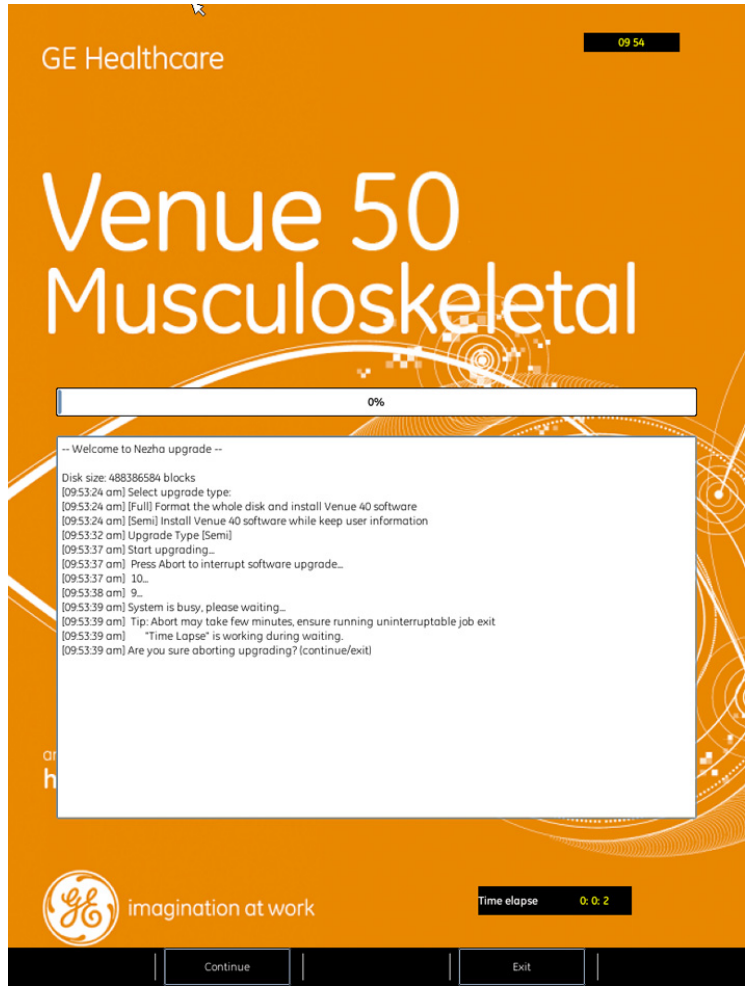


Figure 8-3. Upgrading process paused

Loading the System Software (continued)

8. After the process is completed, press **Shutdown** to shut down the system. Take out the SD card and reboot the system.

CAUTION

If the SD card is taken out before the system shutdown, system crash may occur. Press and hold down the On/Off switch until the system shutdown.

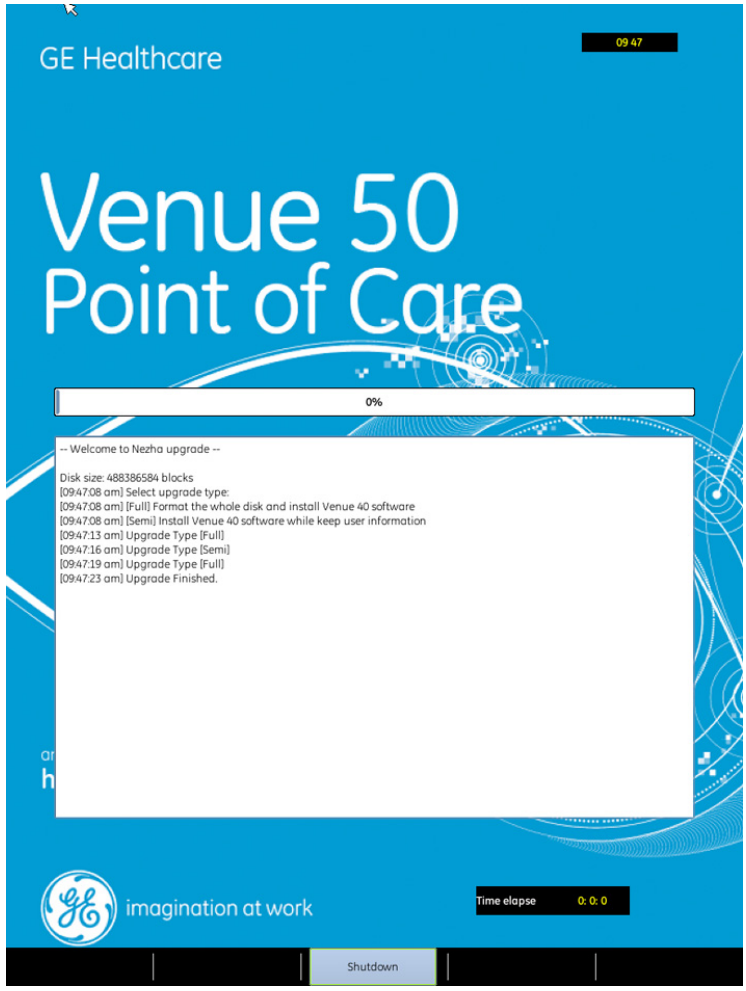


Figure 8-4. Upgrading process complete

9. Perform Touch Screen Calibration: go to **Utility**->**Diagnostics**->**Miscellaneous** to execute touch screen calibration.

Software Version check out

Functional Check-out

1. Press **Utility**, select **About** to check whether the software version is the right version for use.

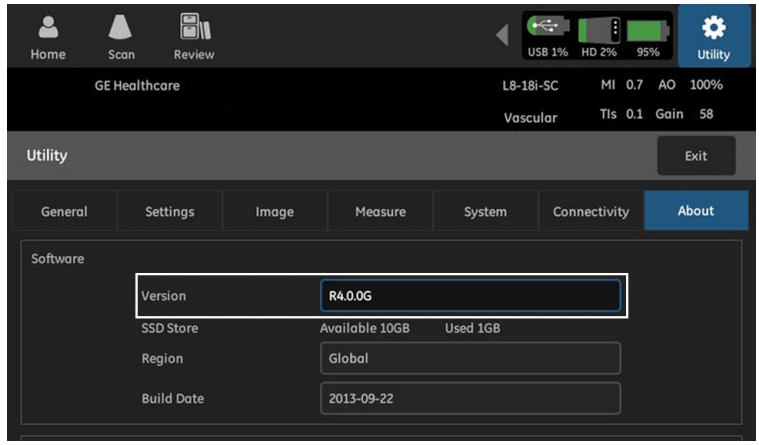


Figure 8-5. Software version check

Option Strings Check

NOTE: After the system software loading completion, please check the option strings to ensure that the options are activated and working.

1. Reboot the system.
2. Select **Utility** ->**System**.
3. Ensure that all the installed option keys are displayed and the status of Options are valid.
   - The status “Permanent” means the option keys are activated and working.
   - The status “disabled” means the option keys are not activated and not working. Check if the option is installed and if the serial number and option key are correct.

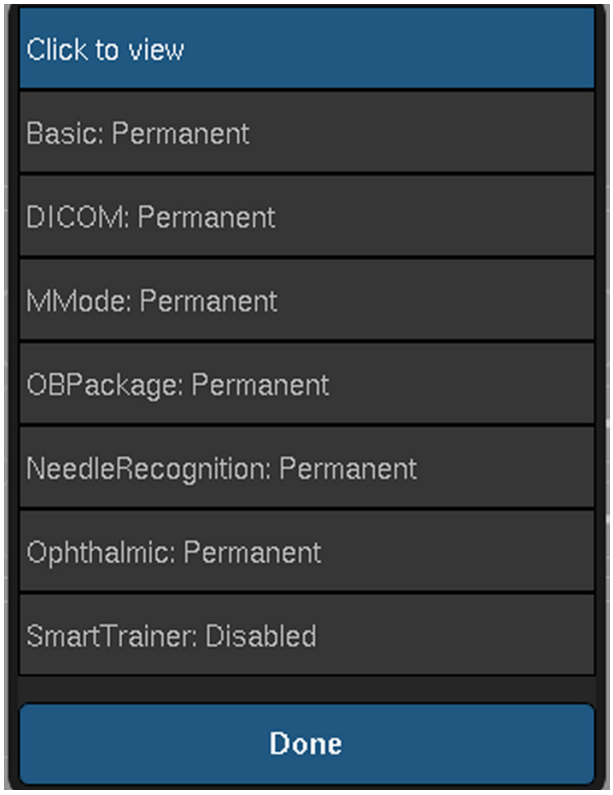


Figure 8-6. Strings check

Probe Recognition Check

NOTE: After the system software loading completion, please check to ensure that the system can recognize the probes.

Plug in the probe. In scanning mode, the probe information is displayed on the right top location of the screen.

Plug in at least one of each type of the probes and check if each of the probes is recognized and the probe information is displayed correctly.

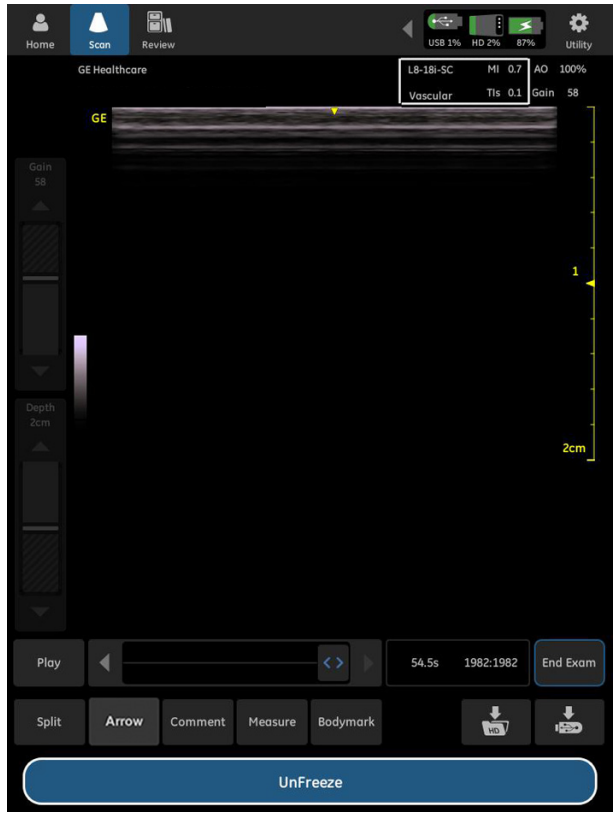


Figure 8-7. Probe identification

Peripheral Device Check

Check to ensure that all the peripheral devices work properly.

For instruction of peripheral device check, See ‘Peripheral Checks’ on *page 4-25 for more information.*

Used Media and Used Parts Disposal

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.

1. Properly dispose of all old or used parts and media according to current policies and procedures. Never keep old software or leave old software at the customer site.
2. Ensure that no Proprietary Material, such as this installation manual and the Venue 50 Proprietary Manual, are left at the customer.

Chapter 9

Renewal Parts

This chapter lists the renewal parts available for the Venue 50.

Overview

Contents in this chapter

List of Abbreviations

Table 9-1: List of Abbreviations

ABBREVIATION	DESCRIPTION
Assy	ASSEMBLY
FRU Y	Replacement Part
FRU N	Non Stock Part
PWA	Printed Wire Assembly
HDD	Hard Disk Drive
LCD	Liquid Crystal Display
Ctrl	Control
MST	Master Board

Renewal Parts Lists

NOTE: The part replacement is shown by the item numbers. If the part is replaced by a new version, the item number for the new version will have a letter in the alphabetical order after the Arabic numerals. For example, item 300B is to replace item 300A, and item 300A is to replace item 300. So please refer to the item numbers for the latest version of the parts.

Power Cables

Table 9-2: Power Cord for Docking Cart

Part Name	Part Number	Description	Quantity
ACDC Power Cable	5177146-2	ACDC Power Cable for USA	1
ACDC Power Cable	5177123-2	ACDC Power Cable for Europe	1
ACDC Power Cable	5176304-2	ACDC Power Cable for China	1
ACDC Power Cable	5177126-2	ACDC Power Cable for Japan	1
ACDC Power Cable	5177187-3	ACDC Power Cable for Australia and New Zealand	1
ACDC Power Cable	5176907-2	ACDC Power Cable for United Kingdom/Ireland	1
ACDC Power Cable	5176773-2	ACDC Power Cable for India/South Africa	1
ACDC Power Cable	5177195-2	ACDC Power Cable for Argentina	1
ACDC Power Cable	5177153-2	ACDC Power Cable for Denmark	1
ACDC Power Cable	5176753-2	ACDC Power Cable for Israel	1
ACDC Power Cable	5177154-2	ACDC Power Cable for Switzerland	1
ACDC Power Cable	5400868-2	ACDC Power Cable for Brazilian	1

Table 9-3: Accessory parts for Docking Cart Power cable

Part Name	Part Number	Description	Quantity
Retaining clip KT0006	5317638	Retaining clip for AC inlet 	1

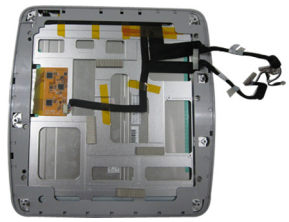
Power Cables (continued)

Table 9-4: Power Cord for Docking Station

Part Name	Part Number	Description	Quantity
ACDC Power Cable	5314913	ACDC Power Cable for USA	1
ACDC Power Cable	5314914	ACDC Power Cable for Europe	1
ACDC Power Cable	5120439	ACDC Power Cable for China	1
ACDC Power Cable	5120440	ACDC Power Cable for Japan	1
ACDC Power Cable	5125218	ACDC Power Cable for Australia and New Zealand	1
ACDC Power Cable	5125219	ACDC Power Cable for United Kingdom	1
ACDC Power Cable	5125220	ACDC Power Cable for Denmark	1
ACDC Power Cable	5125221	ACDC Power Cable for India/South Africa	1
ACDC Power Cable	5125223	ACDC Power Cable for Argentina	1
ACDC Power Cable	5125227	ACDC Power Cable for Israel	1
ACDC Power Cable	5125228	ACDC Power Cable for Switzerland	1
ACDC Power Cable	5400793	ACDC Power Cable for Brazilian	1

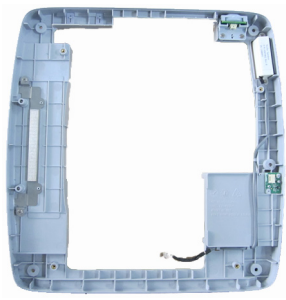
Top Assy

Table 9-5: Top Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
100	5437203-S	Top Assy		1
101	5262177-4S	LCD and touch screen cable kits		1

Middle Cover Assy

Table 9-6: Middle Cover Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
200	5441974-S	Middle Cover Assy		1

Bottom Assy

Table 9-7: Bottom Assy

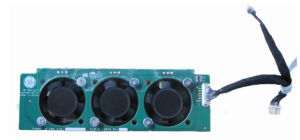
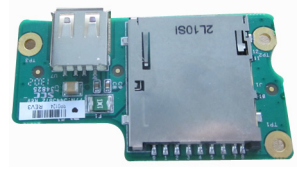
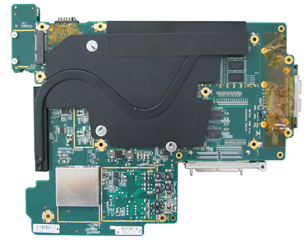
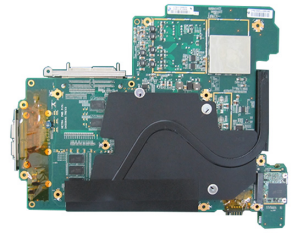
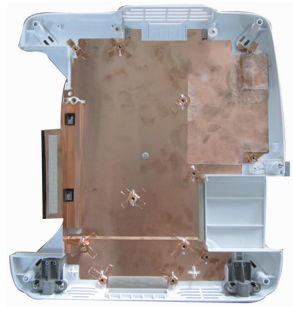
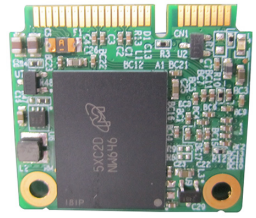
Item	Part Number	Part Name	Corresponding graphic	Qty
300	5406280	TR32 V12 with heatpipe assy		1
301	5439562-S	Fans		1
302	5445872-S	SD/USB board		1
303	5436553-2S	MST board (without SSD. For R4.x.x system, 5436553-2S is replaced by 5729480-S)		1
303A	5729480-S	MST board (with SSD)		1

Table 9-7: Bottom Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
304	5694024	SSD		1
305	5487314-S	Bottom Cover Assy		1
306	5195559-2	Battery		1
307	5694024-S	Venue Empty SSD service part		1

Docking Station Assy

Table 9-8: Docking Station Assy

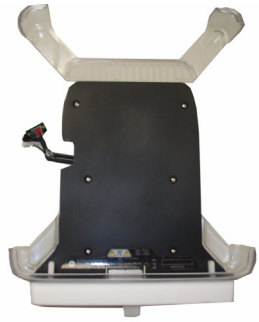
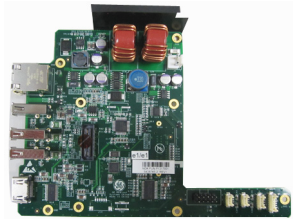
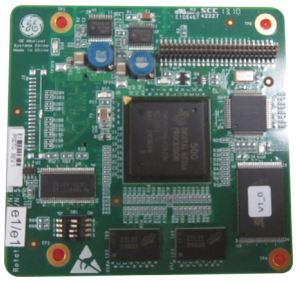
Item	Part Number	Part Name	Corresponding graphic	Qty
400	5457181-S	Docking Holder Assy		1
401	5316476	Docking Hinge Assy		1
402	5446802-2S	Docking Cable		1
403	5316922-2	Docking Probe Holder		1
404	5316130	Docking Desk Support		1

Table 9-8: Docking Station Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
405	5438745-2S	Docking Function Board		1
406	5323387-3S	Docking Rotating module PWA		1
407	5339194	Docking ACDC Module		1
408	5341629	Docking Fan		1

Docking Cart Assy

Table 9-9: Docking Cart Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
500	5459463-S	Cart Handle Assy		1
501	5321852	2 front wheels and 2 back wheels		1
502	5721026-S	Secure brake castor		1
503	5321889	Front Cover		1
504	5321891-3	Back Cover		1
505	5321893-2	Upside Covers		2
506	5321895	Below front and back covers		1

Table 9-9: Docking Cart Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
507	5321896	Below side covers		2
508	5321897	Below chasis covers		1
509	5321899	Pedal cover		1
510	5321900	Pedal Assy		1
511	5321901	Plastic shelf		1
512	5321853-3	Printer shelf		1
513	5374990	Deep basket		1

Table 9-9: Docking Cart Assy

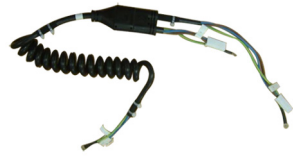
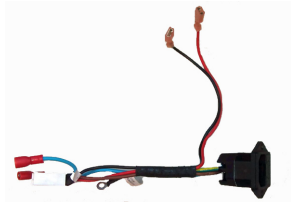
Item	Part Number	Part Name	Corresponding graphic	Qty
514	5491956	Printer shelf with drawer and on shelf basket		1
515	5317236	Spring Cable		1
516	5323553	Fuse		1
517	5317527	Printer USB cable		1
518	5323734	Printer power cord		1
519	5342989	Power Cable Hook		1
520	5363498	Probe Cable Hook kit		1

Table 9-9: Docking Cart Assy

Item	Part Number	Part Name	Corresponding graphic	Qty
521	5357568	Docking AC Inlet Cable		1
522	5447044	Cart AC Inlet Cable		1
523	5371446	Gas spring		1
524	5440423-S	3-probe Port Box with package SVC		1
525	5491955	Multi-probe holder, gel holder and E8CS holder		1
526	5459877	Power Module		1

Accessories and Kits

Table 9-10: Accessories and Kits

Item	Part Number	Part Name	Qty
600	5443754-4	Venue 50 R4.0.3 software upgrade SD Card	1
600A	5443754-5	Venue 50 R4.0.4 software upgrade SD Card	1
600B	5443754-6	Venue 50 R4.0.5 software upgrade SD Card	1
600C	5443754-7	Venue 50 R4.0.6 software upgrade SD Card	1
601	5315799	SD Card Reader	1
602	5396398-2	USB wireless adapter	1
603	5420425	USB footswitch	1
604	5151259	UP-D897Digital B/W Printer (USA)	1
605	5151261	UP-D897Digital B/W Printer (EU)	1
606	5151259-2	UP-D898Digital B/W Printer(USA)(for R4.0.6 and above)	1
607	5151261-2	UP-D898Digital B/W Printer(EU)(for R4.0.6 and above)	1
608	5151262-2	UP-D898Digital B/W Printer(China)(for R4.0.6 and above)	1
609	5151263-2	UP-D898Digital B/W Printer(Japan)(for R4.0.6 and above)	1
610	5151264-2	UP-D898Digital B/W Printer(Brazil)(for R4.0.6 and above)	1
611	5446188	Barcode Reader	1
612	5508253	Venue 50 SSD wipe tool	1
613	5610692-1	Venue 50 R5 R5.0.1 Software	1
614	5610692-2	Venue 50 R5 R5.0.2 Software	1
615	5610692-3	Venue 50 R5 R5.0.3 Software	1
616	5610692-4	Venue 50 R5 R5.0.4 Software	1
617	5582355-S	Venue 50 R5 Haystack USB cable SVC part	1
618	5653589	LITEON eBAU108 DVD Writer Kit	1

Probe

Table 9-11: Probes for Venue 50

Item	Part Number	Part Name	Graphic	Description
700	5499959 to replace 5309652	3S-SC		Sector Probe (Frequency Range: 2.0 ± 20%)
701	5499958 to replace 5304023	12L-SC		Linear Array Probe (Frequency Range: 7.5 ± 20%)
702	5499595 to replace 5384872	L8-18i-SC		Linear Probe (Frequency Range: 9.5 ± 20%)
703	5499960 to replace 5337604	4C-SC		Convex Probe (Frequency Range: 3.1 ± 10%)
704	5499966 to replace 5413888	E8CS-SC		ConvexProbe (Frequency Range: 6.5 ± 20%)
705	5456227	10C-SC		ConvexProbe (Frequency Range: 8.0 ± 20%)

Table 9-11: Probes for Venue 50

Item	Part Number	Part Name	Graphic	Description
706	5505772	L12n-SC		Linear Array Probe (Frequency Range: 7.5 ± 20%)

Manuals

Table 9-12: Manuals for Venue 50

Item	Part Number	Description	Qty
800	5604786-100	Venue 50 Basic Service Manual	1
System User Manual			
801	5589758-100	Venue 50 Basic User Manual, English	1
802	5589758-101	Venue 50 Basic User Manual, French	1
803	5589758-106	Venue 50 Basic User Manual, Spanish	1
804	5589758-108	Venue 50 Basic User Manual, German	1
805	5589758-111	Venue 50 Basic User Manual, Italian	1
806	5589758-121	Venue 50 Basic User Manual, Dutch	1
807	5589758-127	Venue 50 Basic User Manual, Brazilian Portuguese	1
808	5589758-129	Venue 50 Basic User Manual, Estonian	1
809	5589758-140	Venue 50 Basic User Manual, Japanese	1
810	5589758-141	Venue 50 Basic User Manual, Chinese	1
811	5589758-142	Venue 50 Basic User Manual, Swedish	1
812	5589758-144	Venue 50 Basic User Manual, Korean	1
813	5589758-145	Venue 50 Basic User Manual, Russian	1
814	5589758-150	Venue 50 Basic User Manual, Polish	1
815	5589758-151	Venue 50 Basic User Manual, Greek	1
816	5589758-153	Venue 50Basic User Manual, Hungarian	1
817	5589758-154	Venue 50 Basic User Manual, Slovakian	1
818	5589758-155	Venue 50 Basic User Manual, Czech	1
819	5589758-159	Venue 50 Basic User Manual, Turkish	1
820	5589758-160	Venue 50 Basic User Manual, Danish	1
821	5589758-161	Venue 50 Basic User Manual, Norwegian	1
822	5589758-162	Venue 50 Basic User Manual, Finnish	1
823	5589758-165	Venue 50 Basic User Manual, Bulgarian	1
824	5589758-167	Venue 50 Basic User Manual, Romanian	1
825	5589758-168	Venue 50 Basic User Manual, Croatian	1
826	5589758-174	Venue 50 Basic User Manual, Lithuanian	1
827	5589758-175	Venue 50 Basic User Manual, Latvian	1

Table 9-12: Manuals for Venue 50

Item	Part Number	Description	Qty
828	5589758-176	Venue 50 Basic User Manual, Serbian	1
829	5589758-177	Venue 50 Basic User Manual, European Portuguese	1
830	5589758-180	Venue 50 Basic User Manual, Ukrainian	1
831	5589758-181	Venue 50 Basic User Manual, Indonesian	1

Chapter 10

Care and Maintenance

This chapter describes Care and Maintenance on the Ultrasound system and peripherals. These procedures are intended to maintain the quality of the Ultrasound system's performance. Read this chapter completely and familiarize yourself with the procedures before performing a task.

Overview

Periodic maintenance inspections

It has been determined by engineering that your Venue 50 does not have any high wear components that fail with use, therefore no Periodic 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.

Contents in this chapter

Warnings

d  DANGER

BE SURE TO DISCONNECT THE ULTRASOUND SYSTEM POWER PLUG AND OPEN THE MAIN CIRCUIT BREAKER BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.

c  CAUTION

Practice good ESD prevention. Wear an anti–static strap when handling electronic parts and even when disconnecting/ connecting cables.

c  CAUTION

Do not pull out or insert circuit boards while power is on.

c  CAUTION

Do not operate this Ultrasound system unless all board covers and frame panels are securely in place. System performance and cooling require this.

Why do maintenance

Keeping records

It is good business practice that ultrasound facilities maintain records of periodic and corrective maintenance. The Ultrasound Periodic Maintenance Inspection Certificate provides the customer with documentation that the Ultrasound system is maintained on a periodic basis.

A copy of the *Ultrasound Periodic Maintenance Inspection Certificate* should be kept in the same room or near the Ultrasound system.

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 Ultrasound system. The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designee.

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. Contact GE for coverage and/or price for service.

Maintenance task schedule

How often should maintenance tasks be performed?

The Care and Maintenance task schedule (provided in Table 10-1 *on page 10-6*) specifies how often your Venue 50 should be serviced and outlines items requiring special attention.

NOTE: *It is the customer's responsibility to ensure the Venue 50 care and 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 knowledge of your Venue 50 and can best provide competent, efficient service. Contact GE for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Care and Maintenance Task Schedule assumes that you use your Venue 50 for an average patient load (10-12 per day) and not use it as a primary mobile Ultrasound system which is transported between diagnostic facilities.

How often should maintenance tasks be performed? (continued)

NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the periodic maintenance frequencies.

Table 10-1: Customer Care Schedule

Service at Indicated Time	Daily	Weekly	Monthly	Per Facilities QA Program	Notes
Clean Probes	•*				* or before each use
Inspect AC Mains Cable			•		Mobile Ultrasound system: Check Weekly
Inspect Cables and Connectors			•		
Inspect Battery			•		
Clean Console			•		
Clean LCD			•		
Console Leakage Current Checks				See Notes	Twice Annually
Peripheral Leakage Current Checks				See Notes	Twice Annually
Surface Probe Leakage Current Checks				See Notes	Twice Annually
Measurement Accuracy Checks				See Notes	Twice Annually
Functional Checks				See Notes	also after corrective maintenance

NOTE: The maintenance may require specialized equipment to complete.

NOTE: The periodic maintenances are not mandatory. The table above is for reference only.

Tools required

NOTE: For a list of required tools for servicing the Venue 50, refer to chapter 8.

Standard GE tool kit

The following is a description of the “Standard” GE tool kit in the USA. Not all tools are required.

Table 10-2: Overview of GE-1 tool kit contents

Tool ID	Description	Tool ID	Description
9-45358	Pliers Retaining Ring	9-XL9971MM	Xcelite-hex Blade 1.27mm
9-4078	Scribe	9-XL9972MM	Xcelite-hex Blade 1.5mm
9-44572	Wrench Open End 3/8 - 7/16	9-XL9973MM	Xcelite-hex Blade 2 mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9974MM	Xcelite-hex Blade 2.5mm
9-44579	Wrench Open End 1/2 - 9/16	9-XL9975MM	Xcelite-hex Blade 3mm
9-45385	Pliers, Arc Joint 7 inch	9-XL9976MM	Xcelite-hex Blade 4mm
9-45378	Pliers, Slip Joint	9-XL9977MM	Xcelite-hex Blade 5mm
9-4518	Pliers, Long Nose, Miniature	9-XL991CM	Handle
9-4518	Pliers, Long Nose, Miniature	C2356E	Screw starter - Kedman Quick Wedge
9-44776	Ignition Wrench Set, 10 pc.	BLBO	Box - 18 Compartment
9-44601	Wrench, Adj., 4 inch	DWL4283T	Box - 5 Compartment
9-4151	Screwdriver, Blade, Stubby	9-41322	Pickup Tool, Claw type
9-41421	Screwdriver, Blade, Pocket clip	9-6757	6 pc Needle File Set
9-41594	Screwdriver, Blade 1/8 in. × 4 in.	9-9487	Utility Knife
9-41581	Screwdriver, Blade 3/16 in. × 4 in.	9-45341	Pliers Vice Grip 10 inch
9-39451	20' Steel Tape, locking Spring load	9-3001	Xacto Pen Knife

Table 10-2: Overview of GE-1 tool kit contents (Continued)

Tool ID	Description	Tool ID	Description
9-GH807	Ratchet, Offset, Slotted	9-HT62002	Solder Aid, Fork and Hook
68-412	Ratchet, Offset, Phillips	9-4099	Mirror, Round, Telescoping
9-GH130	Tapered Reamer	9-GH3001	Steel Rule Decimal 6 inch
9-41584	Screwdriver, slotted 1/4 in. × 6 in.	9-GH300ME	Steel Rule Metric 6 inch
9-4118	Screwdriver, Phillips #2, Stubby	9-XL9920	Xcelite-hex Blade.050 inch
9-41293	Screwdriver, Phillips #0	9-XL9921	Xcelite-hex Blade 1/16 inch
9-41294	Screwdriver, Phillips #1	9-XL9922	Xcelite-hex Blade 5/16 inch
9-41295	Screwdriver, Phillips #2	9-XL9923	Xcelite-hex Blade 3/32 inch
9-46677	Hex Keys, 20 pc., Metric	9-XL9924	Xcelite-hex Blade 1/8 inch
9-34701	1/4 in. Standard Socket set (19 pc)	9-XL9925	Xcelite-hex Blade 5/32 inch
9-43499	1/2 inch Socket 1/4 inch drive	9-XL9926	Xcelite-hex Blade 3/16 inch
9-4355	Flex Spinner	9-XL99764	Xcelite-hex Blade 7/64
9-43523	Breaker	9-XL99964	Xcelite-hex Blade 9/64
9-43531	6 inch Ext.	9-XLM60	Mini-screwdriver kit
9-65283	Case 8.5 in. × 4.5 in. × 2 in. Deep	9-45072	Pliers 6 inch Diagonal
9-46696	Hex Keys	9-XL100X	Wire Stripper/Cutter 5 inch - 100X
9-39829	Torpedo Level, Magnetic	9-XL87CG	Pliers - very fine needle nose-87CG
9-38461	Hammer, Ball Peen, 4 oz.	9-WEWDT-07	Weller-Soldering-Replacement Tip(1)
9-4280	Universal Joint 1/4 inch	9-WS175-E	Wiss - Surgical Scissors
9-WEW60P3	Weller - Soldering Iron, 3 wire	KH174	Hemostat 5 inch Straight
9-WECT5B6	Weller - Soldering Iron Tip	KH175	Hemostat 5 inch curved
9-WEWDP12	Weller - Desoldering Pump	9-Z9480121	Alignment tool (red)
93383	Flashlight Mini-Mag Lite (AAA Bat.)		
9-GH408	Tweezers		
21576	Brush - Bristle		

Table 10-2: Overview of GE-1 tool kit contents (Continued)

Tool ID	Description	Tool ID	Description
9-4516	Pliers 4 1/4 inch Diagonal		

GE-2 tool kit

Table 10-3: Overview of GE-2 tool kit contents

GE-2 Sears Kit (#99034)			
Tool ID	**Description**	**Tool ID**	**Description**
9-45381	Pliers, Arc Joint 9 1/2 inch	9-44067	Socket 1 1/16 in. for 1/2 in. drive
9-45092	Pliers, Linesman 8 1/2 inch	9-42679	Socket 10MM Hex for 1/2 in. drive (2273333)
9-42882	Punch, Pin 3/32 inch	9-44262	Extension 10 inch for 1/2 in. drive (2273405)
9-42884	Punch, Pin 5/32 inch	9-4258	3/8 inch to 1/2 inch Adapter
9-42886	Punch, Pin 1/4 inch	9-34374	3/8 inch Metric Socket Set - 12 PT
9-42973	Cold Chisel 1/2 inch	9-44311	16mm Socket 12 pt.
9-GH77	Center Punch Automatic	9-33485	Metal Socket Tray
9-GH890	File Handle, Adj.	9-33484	Metal Socket Tray
9-31276	File, Round, Bastard 8 inch	9-33484	Metal Socket Tray
9-31277	File, Half Round, Bastard 8 inch	9-52068	Tap and Drill Set
9-31263	File, Flat Mill 8 inch	9-52722	#6 Tap
21045C	Close Quarter Saw	9-52723	#8 Tap
9-44604	Wrench, Adj. 10 inch		High Speed Drill Set
9-41587	Screwdriver 5/16 inch × 8 inch		#36 Drill
9-41586	Screwdriver, Stubby 5/16 inch		#29 Drill
9-GH19512	Countersink 1/2 inch	9-44046	3/8 inch Socket Set
9-44741	12 PC Combination Wrench Set		

Special tools, supplies and equipment used for maintenance

Table 10-4: Overview of tool requirements for periodic maintenance

Tool / kit	Part Number	Comments
Safety Analyzer		The safety Analyzer tool should be calibrated and compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551.
B/W Printer Cleaning Sheet		See printer user manual for requirements
Color Printer Cleaning Sheet		See printer user manual for requirements
Disposable Gloves		

System maintenance

Preliminary checks

The preliminary checks take about 15 minutes to perform. Refer to the Ultrasound system user documentation whenever necessary.

Table 10-5: System preliminary checks

Step	Item	Description
1.	Ask and Listen	Ask the customer if they have any problems or questions about the equipment.
2.	Paperwork	Fill in the top of Ultrasound Inspection Certificate (see Figure 10-6 *on page 10-34*). Record all probes and Ultrasound system options.
3.	Power up	• Turn the Ultrasound 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. • Where applicable, confirm that the battery is charged. If no AC Input present, use the internal battery.
4.	Probes	Verify that the Ultrasound system properly recognizes all probes.
5.	Displays	Verify proper display on the monitor.

Functional checks

NOTE: See also Chapter 4.

The functional checks take about 60 minutes to perform. Refer to the Ultrasound system user documentation whenever necessary.

System checks

Table 10-6: System functional checks

Step	Item	Description
1.	B Mode	Verify basic B Mode (2D) operation. Check the basic Ultrasound system controls that affect this mode of operation.
2.	CF Mode	Verify basic CF Mode (Color Flow Mode) operation. Check the basic Ultrasound system controls that affect this mode of operation.
3.	PDI Modes	Verify basic PDI Mode operation (Power Doppler Imaging). Check the basic Ultrasound system controls that affect this mode of operation.
4.	M Mode	Verify basic M Mode operation. Check the basic Ultrasound system controls that affect this mode of operation.
5.	Probe Elements	Perform an Element Test on each probe to verify that all the probe elements and system channels are functional.
6.	Applicable Software Options	Verify the basic operation of all optional modes such as Contrast. Check the basic Ultrasound system controls that affect each options operation.
7.	Xmit/Recv Elements	Use the Visual Channel Utility on the loop connect to verify that all system xmit/recv channels are functional.
8.	Operator Touch Panel test	Perform the Operator Touch Panel Test Procedure.
9.	LCD	Verify basic LCD display functions. Refer to Chapter 2 of the User Manual.
10.	Software Menu check	Verify Software Menu display functions. Refer to Chapter 2 of the User Manual.
11.	Peripherals	See: 'Peripheral Checks' on *page 4-25*.
12.	Measurements	In measurement mode, make distance measurement, get result in result window. Verify the distance by graduated rule. Distance Accuracy should be within ±5%. (Name result from result window Result A, result from graduated rule Result B; Distance Accuracy = (Result B-Result A)/Result A)

Peripheral/option checks

If any peripherals or options are not part of the system configuration, the check can be omitted.

See ‘Functional checks’ on *page 4-8 for more information.*

Mains cable inspection

Table 10-7: Mains Cable Inspection, As Appropriate

Step	Item	Description
1.	Unplug Cord	Disconnect the mains cable from the wall and Ultrasound system.
2.	Inspect	Inspect it and its connectors for damage of any kinds.
3.	Verify	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.

Cleaning

Table 10-8: General Cleaning

Step	Item	Description
1.	Console	Remove the battery. 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.
2.	Probe Holder	Clean probe holders. (they may need to be soaked to remove excess gel).
3.	LCD	Use a soft, non-abrasive folder cloth or use the clearners listed in Chapter 6 of User Manual. Gently wipe the LCD face. DO NOT use a glass cleaner that has a hydrocarbon base (such as Benzene, Methy Alcohol or Methy Ethyl Ketone) on LCD with the filter (anti-glare shield).

Physical inspection

NOTE: These features may not be present on all Ultrasound systems.

Table 10-9: Physical checks

Step	Item	Description
1.	Labeling	Verify that all Ultrasound system labeling is present and in readable condition.
2.	Scratches & Dents	Inspect the exterior for dents, scratches or cracks. .
3.	Input Power	Refer to: 'Mains cable inspection' on *page 10-13*.
4.	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.
5.	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 while scanning.
6.	Control Panel	Inspect control panel. Note any damaged or missing items.
7.	Control Panel Lighting	Check for proper operation of all operator panel light.
8.	External I/O	Check all connectors for damage.
9.	Power and System Status Indicators	Check for proper operation of all Power and System Status Indicators.
10.	Battery	Where applicable, check that the battery is not damaged, does not leak, does not emit an odor, and is not deformed or discolored. Observe all warnings and cautions for battery handling, recharging, storing, and/or disposal, as listed in 'Battery Safety' on *page 1-19*.

Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapter 7. View the error logs and run desired diagnostics.

View the Log

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.

Probe maintenance

Probe related checks

Table 10-10: System preliminary checks

Step	Item	Description
1.	Probe Holder	Clean probe holders. (they may need to be soaked to remove excess gel).
2.	Probes	Thoroughly check the Ultrasound system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins. Verify that the Ultrasound system properly recognizes all probes.

Basic probe care

The Ultrasound system user manuals and various probe handling cards provide 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. See the User Manual and probe care cards 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 Ultrasound system sockets before plugging in a probe.

The Interoperative probes often have special considerations and individual probe user manuals. For Interoperative probes also refer to their separate user manuals.

Basic probe cleaning

Refer to the User's Manual for details on probe cleaning.

To help protect yourself from blood borne diseases, wear approved disposable gloves. These are made of nitrile derived from vegetable starch to prevent allergic latex reactions.

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 User Manual. Doing so could result in irreparable damage to the probe.

Follow care instructions that came with the probe.

Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.

Battery Performance Maintenance

Battery replacement every three years is recommended.

It is recommended to do battery performance maintenance one time per year.

Please follow the chart below to carry out battery performance maintenance.

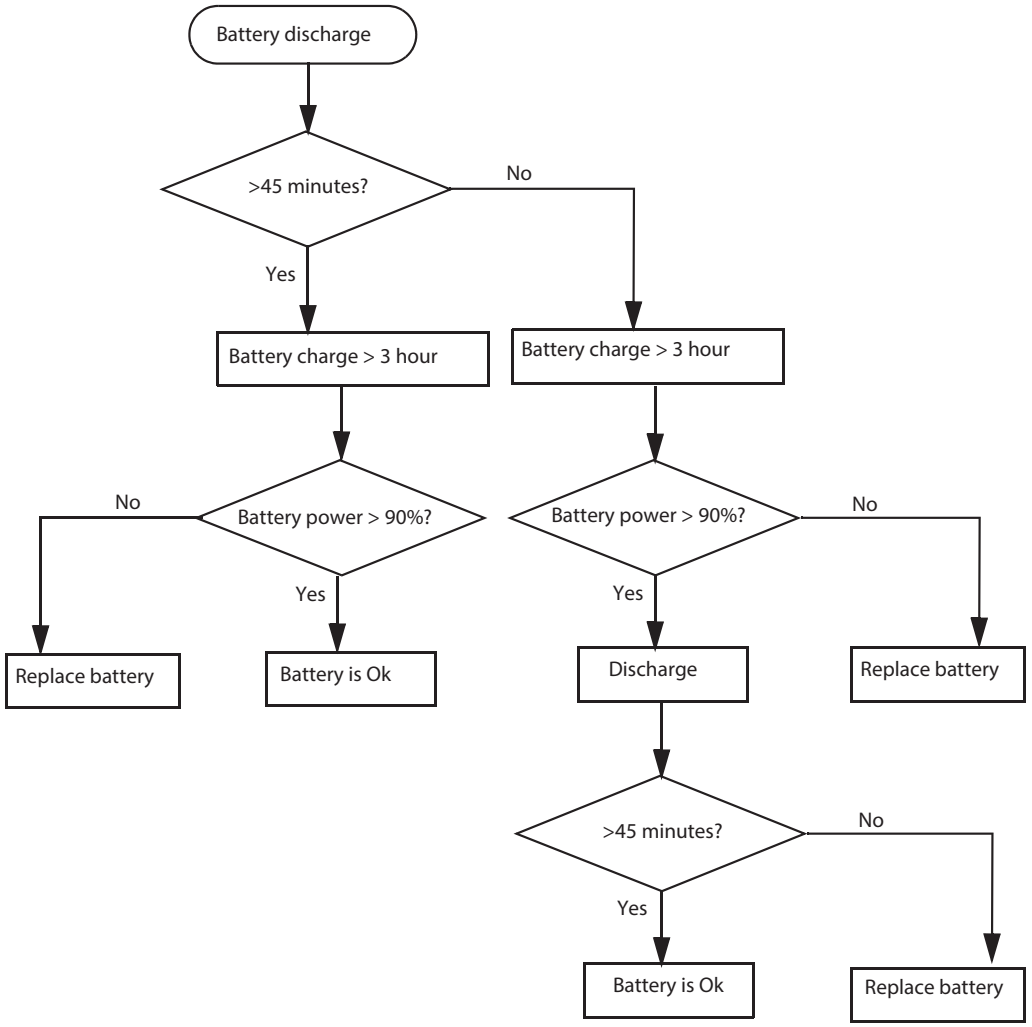


Figure 10-1. Flow chart of Battery Performance Maintenance

NOTE: Disconnect all probes when discharge battery.

NOTE: Discharge the battery to let the system automatically shut down.

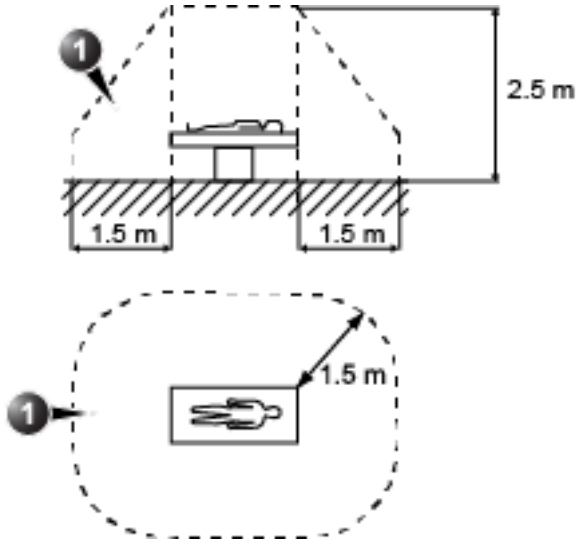
Electrical safety tests

Overview

NOTE: *For all instructions in the "Electrical safety tests" section in case of using a UPS (uninterruptible power supply) the terms outlet, wall outlet, AC wall outlet and power outlet refer to the AC power outlet of the UPS. In case of further available AC (or DC) power outlets at the same used UPS, these must remain unused i.e. not connected to any other devices.*

CAUTION

Please observe that some Uninterruptible Power Supplies (UPS) may not be medical devices! If the UPS is no medical device, it has to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).



1. Patient environment

Overview (continued)

The following topics and measurements are covered in this subsection:

Safety test overview

The electrical safety tests in this section are based on and conform to IEC 60601-1 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 IEC 60601-1 documents

WARNING

THE USER MUST ENSURE THAT THE SAFETY INSPECTIONS ARE PERFORMED WHENEVER DAMAGE IS SUSPECTED AND AT LEAST EVERY 12 MONTHS ACCORDING TO THE HISTORICAL DATA. DO NOT USE THE ULTRASOUND SYSTEM OR INDIVIDUAL PROBES WHICH FAIL ANY PORTION OF THE SAFETY TEST.

DANGER

TO MINIMIZE RISK OF ELECTRICAL SHOCK, ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE ELECTRICAL SAFETY INSPECTIONS AND TESTS.

DANGER

TO AVOID ELECTRICAL SHOCK, THE ULTRASOUND SYSTEM UNDER TEST **MUST NOT** BE CONNECTED TO OTHER ELECTRICAL EQUIPMENT. REMOVE ALL INTERCONNECTING CABLES AND WIRES. THE ULTRASOUND SYSTEM 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.

Safety test overview (continued)

Prior to initiating any electrical test, the Ultrasound system must be visually inspected. Perform the following visual checks:

- Check for missing or loose enclosure covers that could allow access to internal live parts.
- Examine the mains cord, mains plug and appliance inlet for damaged insulation and adequacy of strain relief and cable clamps.
- Locate and examine all associated transducers. Inspect the cables and strain relief at each end. Inspect the transducer enclosure and lens for cracks, holes and similar defects.

Test the system, peripherals and probes for leakage current. Excessive leakage current can cause injury or death in sensitive patients. 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 that a probe may shock someone the customer should:

- Not use a probe that is cracked or damaged in any way.
- Check probe leakage current:
    - Based on your facilities QA program for surface probes.
    - Based on your facilities QA program for endocavitary probes.
    - whenever probe damage is suspected.

Leakage current limits

WARNING

Energy Control and Power Lockout for Venue 50.

When servicing parts of the Ultrasound system where there is exposure to voltage greater than 30 volts:

1. Follow LOCK OUT/TAG OUT procedures.
2. Turn off the breaker.
3. Unplug the Ultrasound system.
4. Maintain control of the Ultrasound system power plug.
5. Wait for at least 30 seconds for capacitors to discharge as there are no test points to verify isolation.
6. Remove/disconnect the battery, if present.

Ultrasound System components may be energized.

CAUTION

Compare all safety-test results with safety-test results of previously performed safety tests (e.g. last year etc). In case of unexplainable abrupt changes of safety-test results consult experienced authorized service personnel or GE for further analysis.

The following limits are summarized for IEC 60601-1 Medical Equipment Safety Standards. These limits are GE standards and in some cases are lower than the above standards listed.

Table 10-11: Chassis Leakage Current Limits - Accessible Metal Surface

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral
All (Except USA & Canada)	0.1 mA	0.5 mA	0.5 mA	0.5 mA
USA & Canada	0.1 mA	0.3 mA	0.3 mA	0.3 mA

Table 10-12: Type BF Applied Part Leakage Current Limits - Probes Surface

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral	*Mains Applied
All	0.1 mA	0.5 mA	0.5 mA	0.5 mA	5.0 mA

Leakage current limits (continued)

Table 10-13: Type CF Applied Part Leakage Current Limits - ECG Connections

Country	Normal Condition	Open Ground	Reverse Polarity	Open Neutral	*Mains Applied
All	0.01 mA	0.05 mA	0.05 mA	0.05 mA	0.05 mA

NOTE: **Mains Applied refers to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient is in contact with mains voltage.*

The following tests are performed at the factory and should be performed at the site. These tests are: chassis leakage current, and probe leakage current. All measurements are made with an electrical safety analyzer which should be calibrated and compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551.

Table 10-14: Equipment Type and Test Definitions

Applied Parts (AP)	Parts or accessories that contact the patient to perform their function. For ultrasound equipment, this includes transducers and ECG leads.	
Type BF	Body Floating or non-conductive ultrasound probes which are marked with the 'man in box' BF symbol. this includes all transducers.	
Type CF	Cardiac Floating or non-conductive intraoperative probes for direct cardiac contact and isolated ECG connections so marked with the 'heart in box' CF symbol.	
Sink Leakage	The current resulting from the application of mains voltage to the applied part. This test is required test for Type CF applied parts.	

Outlet test - wiring arrangement

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.

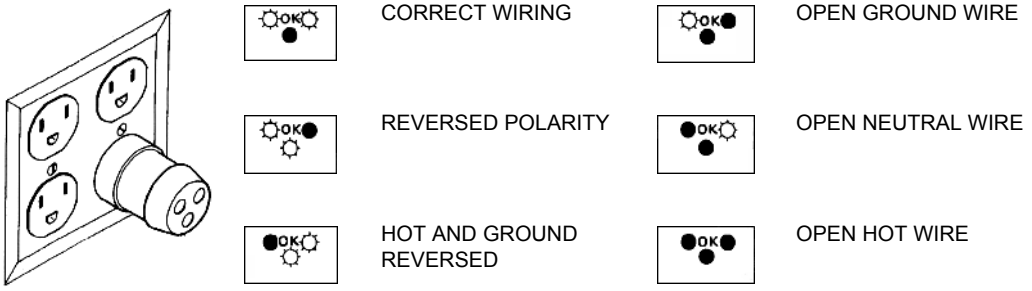


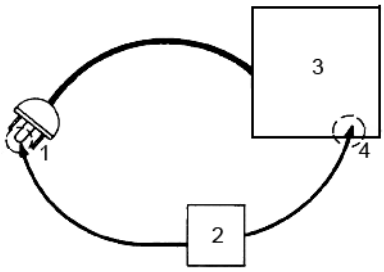
Figure 10-2. Typical alternate outlet tester

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.

Grounding continuity

DANGER ELECTRIC SHOCK HAZARD. THE PATIENT MUST NOT BE CONTACTED TO THE EQUIPMENT DURING THIS TEST.

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case. The ground wire resistance should be less than **0.1** ohms. Reference the procedure in the IEC60601-1.



1. GROUND PIN
2. OHMMETER
3. DOCKING CART
4. ACCESSIBLE METAL PART:
   - I/O Board
   - Probe cable hook

Figure 10-3. Ground continuity test

Chassis leakage current test

DANGER ELECTRIC SHOCK HAZARD. WHEN THE METER'S GROUND SWITCH IS OPEN, DON'T TOUCH THE ULTRASOUND SYSTEM!.

CAUTION Equipment damage possibility. Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON. Be sure to turn the Ultrasound system power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the Ultrasound system may be damaged.

Definition

This test measures the current that would flow in a grounded person who touched accessible metal parts of the bedside station if the ground wire should break. The test verifies the isolation of the power line from the chassis. The meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit On and Off, with the power line polarity Normal and Reversed. Record the highest reading.

CAUTION Electric Shock Hazard. When the meter's ground switch is OPEN, don't 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.

Generic procedure

The test verifies the isolation of the power line from the chassis. The testing meter is connected from accessible metal parts of the case to ground. Measurements should be made with the unit ON and OFF, with the power line polarity Normal and Reversed. Record the highest reading of current.

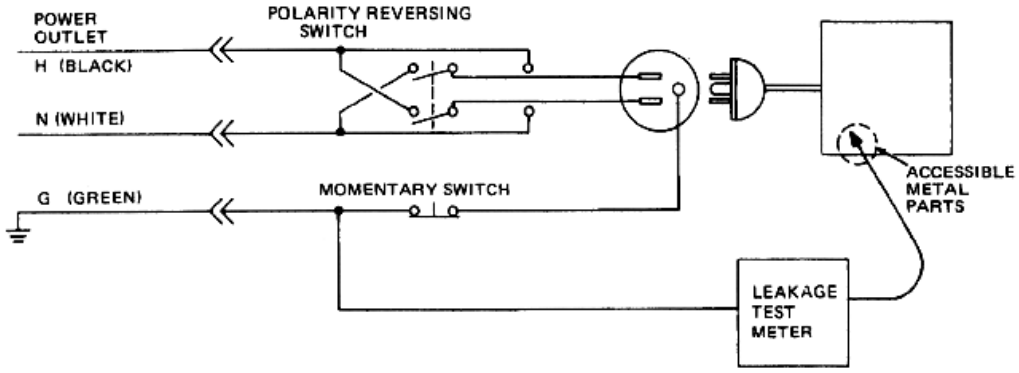


Figure 10-4. Set Up for Chassis Source Leakage Current, IEC 601-1 Clause 19 - Continuos Leakage Currents and Patient, Auxiliary Currents

When using the Microguard 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 chassis source leakage is shown in Table 10-11 *on page 10-22*.

Data Sheet for enclosure Source Leakage Current

The test passes when all readings measure less than the value shown in Table 10-11 *on page 10-22*. Record all data on the PM Inspection Certificate.

Table 10-15: Typical Data Sheet for enclosure Source Leakage Current

Unit Power	Tester Polarity Switch	Tester Neutral or Ground Switch	Test 1 Speaker Cover	Test 2 Real Panel Metal Parts	Optional Test 3	Optional Test 4
Enter Name of tested peripheral here:						
ON	NORM	OPEN				
ON	NORM	CLOSED				
ON	REV	OPEN				
ON	REV	CLOSED				
OFF	NORM	OPEN				
OFF	NORM	CLOSED				
OFF	REV	OPEN				
OFF	REV	CLOSED				

Probe leakage current test

DANGER

DO NOT USE THE PROBE IF THE INSULATING MATERIAL HAS BEEN PUNCTURED OR OTHERWISE COMPROMISED.

INTEGRITY OF THE INSULATION MATERIAL AND PATIENT SAFETY CAN BE VERIFIED BY SAFETY TESTING ACCORDING TO IEC60601-1.

CAUTION

Equipment damage possibility. Never switch the Polarity and the status of Neutral when the Ultrasound system is powered ON. Be sure to turn the Ultrasound system power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the Ultrasound system may be damaged.

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.

Tools

For needed tools, see: ‘Tools required’ on *page 10-7*.

Generic procedure on probe leakage current

Measurements should be made with the ground open and closed, with power line polarity normal and reversed, and with the unit Off and On. For each combination, the probe must be active to find the worst case condition.

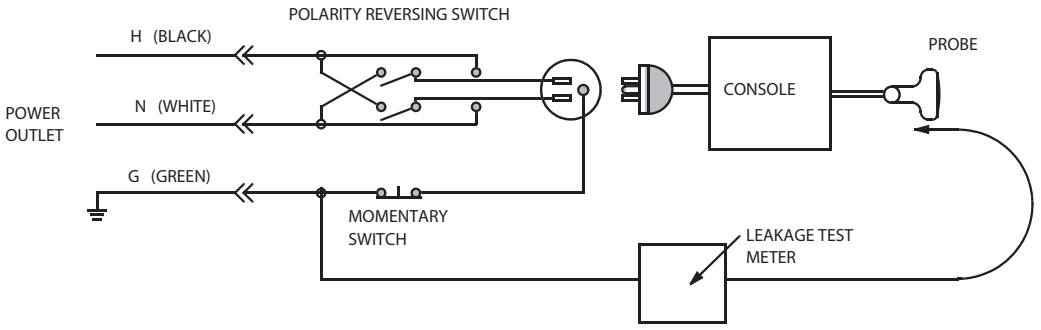


Figure 10-5. Set up for probe leakage current

NOTE: Each probe will have some amount of leakage current, 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.

DANGER TO AVOID PROBE DAMAGE AND POSSIBLE ELECTRIC SHOCK, DO NOT IMMERSE PROBES INTO ANY LIQUID BEYOND THE LEVEL INDICATED IN THE PROBE USERS MANUAL. **DO NOT TOUCH THE PROBE, CONDUCTIVE LIQUID OR ANY PART OF THE UNIT UNDER TEST WHILE DOING THE TEST**.

Meter Procedure Using Probe Adapter

Follow the Safety Analyzer tool instruction to test each transducer for leakage current.

The electrical Safety Analyzer tool should be calibrated and compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551.

No Meter Procedure Using Probe Adapter

Follow the Safety Analyzer tool instruction to test each transducer for leakage current.

The electrical Safety Analyzer tool should be calibrated and compliant with AAMI/ESI 1993 or IEC 60601 or AS/NZS 3551.

Data Sheet for Transducer Source Leakage Current

The test passes when all readings measure less than the values shown in Table 10-12 *on page 10-22*. Record all data on the PM Inspection Certificate.

Table 10-16: Typical Data Sheet For Transducer Source Leakage Current

Transducer Tested:			
Unit Power	**Tester Power Polarity Switch**	**Tester GROUND or NUETRAL Switch**	**Measurement**
ON	NORM	OPEN	
ON	NORM	CLOSED	
ON	REV	OPEN	
ON	REV	CLOSED	
OFF	NORM	OPEN	
OFF	NORM	CLOSED	
OFF	REV	OPEN	
OFF	REV	CLOSED	

When there's too much leakage current …

AC/DC Fails

Where applicable, check the AC/DC adapter and its cable. Replace a new one if any portion is defective.

Enclosure Fails

Check for any damage to the enclosure. Replace any defective part.

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 work around, check the other outlets to see if they could be used instead.

NOTE: No outlet tester can detect the condition where the white neutral wire and the green 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.

Probe Fails

Change another probe to confirm if the fail is caused by console.

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 inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

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.

Peripheral Fails

Inspect wiring for bad crimps, poor connections, or damage.

Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

New Unit

If the leakage current measurement tests fail on a new Ultrasound system and if situation can not be corrected, submit a Safety Failure Report to document the Ultrasound system problem. Remove Ultrasound system from operation.

Inspection Paperwork

Ultrasound Inspection Forms

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:

* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

Figure 10-6. Ultrasound Inspection Certificate

* Scan Format: Phased Array, Linear Array, Curved Array, Mechanical Array or Other

Ultrasound Inspection Forms (continued)

FUNCTIONAL CHECKS

Functional Check (if applicable)	OK? or N/A
B-Mode Function	
Doppler Modes Function	
CF-Mode Function	
M-Mode Function	
Applicable Software Opti ons	
Applicable Hardware Options	
Control Panel	
LCD	
Measurement Accuracy	
GE Approved Peripherals	

PHYSICAL INSPECTION AND CLEANING

Physical Inspection and Cleaning (if applicable)	Inspect	Clean
Console		
LCD		
External I/O		
Cables and Connectors		
GE Approved Peripherals (DVD-RW, Printer)		
Labeling (see User Manual for Labeling)		

COMMENTS:

_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____

Figure 10-7. Functional Checks

ELECTRICAL SAFETY

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground &wiring config.)				
Type BF Applied Part Leakage Current Limits- Probe				
enclosure Source Leakage Current - Chassis Leakage Current Limits				
Peripheral 1 Leakage Current				
Peripheral 2 Leakage Current				

PROBES

Probe Number (from previous page)	Max Value Allowed	Max Value Measured	OK?	Comments
Probe 1:				
Probe 2:				
Probe 3:				

Final Check. All system covers are in place. System scans with all probes as expected.

Accepted by: _____

Figure 10-8. Electrical Safety

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