GE Healthcare

447 Indio Ave, Sunnyvale, CA 94085

somo·v ABUS
Automated Breast Ultrasound System

Service Manual

Scan Station   Workstation

REVISION HISTORY			
REV	**CN #**	**DESCRIPTION**	**DATE**
01	514	Initial Release for ABUS	6/7/05
02	516	Update to add details	8/16/05
03	576	Update for November Release	01/04/06
04	872	Update to add DICOM features from software 3.2 release	07/29/08
05	894	Update to include field test instrument	3/17/09
06	1022	Updated for local and 3rd party service users	08/09/10
07	1216	Authorized Rep and Complaint Handling	08/15/11
08	N/A	Update with additional Replacement Procedure, Added MCU related contents and Removed TEM related contents	16-Jan-2016
09	MR2205218	Updated with Part Version Number, and Customer Service Phone Number	18-Jul-2016

TABLE OF CONTENTS

1. INTRODUCTION

U-Systems, A GE Healthcare Company.

447 Indio Ave
Sunnyvale, CA 94085, USA
Phone: (408) 245-1970
Fax: (408) 738-9156
E-Mail: sales@u-systems.com or service@u-systems.com

Purpose

This manual's purpose is to provide information to aid U-Systems Inc. factory trained service personnel in performing the service, maintenance, and repair procedures that may be required to support the U-Systems device, (USI) *somo•v. ABUS (***Automated Breast Ultrasound System***).*The somo•v *ABUS* consists of two major sub-systems:

- Automated Breast Scan Station (Scan Station)
- View Station (Breast View Station or somoVIEWer Workstation)

Indication for Use

- **United States**

  This device is currently FDA cleared. Please check the corresponding Section of the User Manual of the ABUS Scan Station to confirm the specific FDA Clear Code and its Indication for Use.

2.   SCAN STATION COMPONENTS

The somo•v Scan Station includes the following components:

- Ultrasound engine with articulated arm.
- Ultrasound Scanner Assembly with transducer.
- Barcode reader (optional).
- Rotating touch screen monitor.

Figure 2.A. Scan Station Components:

3. VIEW STATION OR SOMOVIEWER WORKSTATION COMPONENTS

- PC
- Display Monitor
- Keyboard
- Mouse

Figure 3.A View Station or somoVIEWer Workstation Components:

somo•VIEWer Workstation   Breast View Station

4. PRODUCT OVERVIEW AND FEATURES

For a complete overview of the ABUS list of features refer to the SomoV Marketing Brochure Part # 4140-0017-00

5. SAFETY SIGNS (WARNING AND CAUTION)

WARNING

The following precautions should be adhered to:

Only Personnel authorized by U-Systems Inc. must perform installation and service. Do not attempt to install or service the system yourself. Installation, readjustments, modifications, or repairs of this system must be performed by a U-Systems, Inc authorized service representative; otherwise the system warranty will be void.

- The ABUS product is not designed to operate in the presence of flammable substances. Such an environment could cause an explosion.

- Power-down the system before cleaning. Protect the system from water or other liquids that could drip into the electronics portion of the ABUS system components.

- Do not drop the detector(s) or allow them to strike a hard surface.

.

It is extremely important to read the following definitions of WARNING information, prior to beginning any service on any sub-system within the ABUS product. As you see applicability of each of these noted WARNINGS, during the course of the servicing process, be prepared to avoid harm to persons and equipment by proper adherence.

CAUTION: High current devices such as X-ray equipment should not be used on the same circuit as the Scan Station.

WARNINGS

Procedural safety, during service and maintenance of the ABUS sub-systems, includes the following WARNINGS. The following WARNINGS must be observed at all times.

WARNING

⚠ *The ABUS Probe's main connector, which attaches at the TI Module of the ultrasound engine within the ABUS Scan Station, should **NEVER** be disconnected at any time while the system is in a "Powered-On" state. Doing so may cause damage to the sensitive MUX devices that are located inside of the probe assembly!*

WARNING

⚠ *To insure proper isolation between the ABUS sub-systems, no peripheral devices operated by the user (e.g. printers, external monitors, interventional monitors, etc.), are allowed to be used on the ABUS Scan Station.*

WARNING

⚠ *Grounding integrity should never be defeated anywhere within any of the ABUS sub-systems. Protection against electrical shock includes chassis connections to ground. Chassis connections for ground include the three-wire cable and plug provided. The chassis is properly grounded when power plug is connected to a properly grounded receptacle.*

WARNING

⚠

Use properly rated fuses in the ABUS product sub-systems. Proper fuses protect against electric shock and fire hazard.

WARNING

⚠

Maintain distance and/or insulation between yourself and any live circuits. Do not replace components while power plug is inserted into site receptacle. Disconnect power and discharge circuits before touching components. Lethal voltages may exist, even with power cable removed from receptacle.

WARNING

⚠

Perform no unauthorized modification to any of the ABUS sub-systems. Unauthorized modifications can introduce additional hazards to servicing the product.

WARNING

⚠

Inspect all cables and power cords, before powering-on any of the ABUS sub-systems, at each service. Do not use the system if visual signs of external damage are observed.

WARNING

⚠

Do not activate any of the ABUS sub-systems in presence of flammable anesthetics or in a room recently washed with flammable cleaning and disinfecting agents. Cleaners can produce explosive vapors. Check labels of original containers of cleaners and disinfectants for warnings about vapors. Thoroughly ventilate the room, if such vapors may potentially be present, prior to activating any of the ABUS sub-system units.

CAUTIONS

CAUTION

⚠

Apply proper line voltage. Verify that ABUS sub-systems are set to match voltage of site receptacle. Also verify that all plugs match the receptacle. Mismatched voltage or plug configuration can damage system components.

CAUTION

⚠

Dry PCBs and components before activating any of the ABUS sub-systems. Excessive moisture in system can produce arcing during activation, and potentially damaging the system.

CAUTION

⚠

Carefully transport all ABUS sub-systems over uneven surfaces, including entrances to elevators. Mechanical shock can compromise mechanical integrity.

Warning Signs

| 1 | Type BF Equipment |

| 2 | Dangerous voltage |

3 Attention -- consult accompanying MANUAL

4 OFF (power: disconnection from the mains)

5 ON (power: connection to the mains)

Patient Safety

Proper cleanliness of the surfaces of the scanning area that come in contact with the patient during examinations should be maintained at all times.

Complaint Reporting

To report a complaint where the device may have caused or contributed to a death or serious injury: Users should contact your sales or service representative within 24 hours of the event. The sales or service representative is responsible for immediately reporting the potential event details to the U.S. manufacturer via phone 408-245-1970 or email at reporting@u-systems.com.

Emergency E-STOP

An Emergency *E-STOP* button is provided on the ABUS Scan station to allow the operator to instantly stop movement of all mechanical devices in the system.

Electrical Isolation

The ABUS sub-systems are electrically isolated. In order to maintain the electrical isolation, no peripheral devices (printers, external monitors, interventional monitors) *are allowed to be used on the ABUS Scan Station.*

WARNING

The integrity of the Protective Earthing is compromised when peripheral devices (printers, external monitors, interventional monitors…) receive power from any source other than the accessory outlets provided.

---

6. RELATED DOCUMENTS

0119-0003-01	Proc, Installation ABUS Imaging System
4140-0008-01	ABUS Product Spec Sheet
4140-0017-00	SomoV Marketing Brochure
4700-0007-00	User Manual, View Station, English
4700-0011-01	Scan Station User Manual (Insight PMA)
4700-0019-00	Scan Station User Manual (Platinum)
4700-0020-00	Scan Station User Manual (Insight 510K)
4700-0009-01	User Manual, *somo·VIEWer*, English
9000-0014-00	Site Planning Guide
9000-0014-01	Pre-Installation Site Survey Worksheet
9200-0059-02	ABS SW Install w-Antares 3.0
9200-0059-03	ABS SW Install w-Antares 5.0
9200-0059-04	ABS SW Install w-Antares 5.0B
9200-0074-00	PROC, HIPAA Compliance, Patient Info Removal
9900-0003-00	Diagram, ABUS Interconnection
9900-0004-01	Proc, ABUS Periodic Maintenance
9900-0004-02	Form, ABUS PM Inspection
9900-0008-00	somoVIEWer Installation and Service Guide
9904-0004-00	somo·v Service Manual Service Note 75002

7. SPECIFICATIONS

Power: ABUS Scan Station

Circuit provided for system must be a dedicated outlet meeting the below specifications.

The power requirements for the ABUS are:

- One (1) *dedicated* 115VAC, 50/60Hz., 15Amp (or greater) receptacle, *or*
- One (1) *dedicated* 230VAC, 50/60Hz., 6.5Amp (or greater) receptacle.

8. TOOLS NEED FOR SERVICE

- USB Keyboard,
- USB Mouse,
- Service Access Key,
- Field Service Hand Tools (typical)
- FRU List,
- Phantom (optional)

9. TOP-LEVEL PRODUCT OVERVIEW

Major Assembly Identification

9.1 ABUS Scan Station
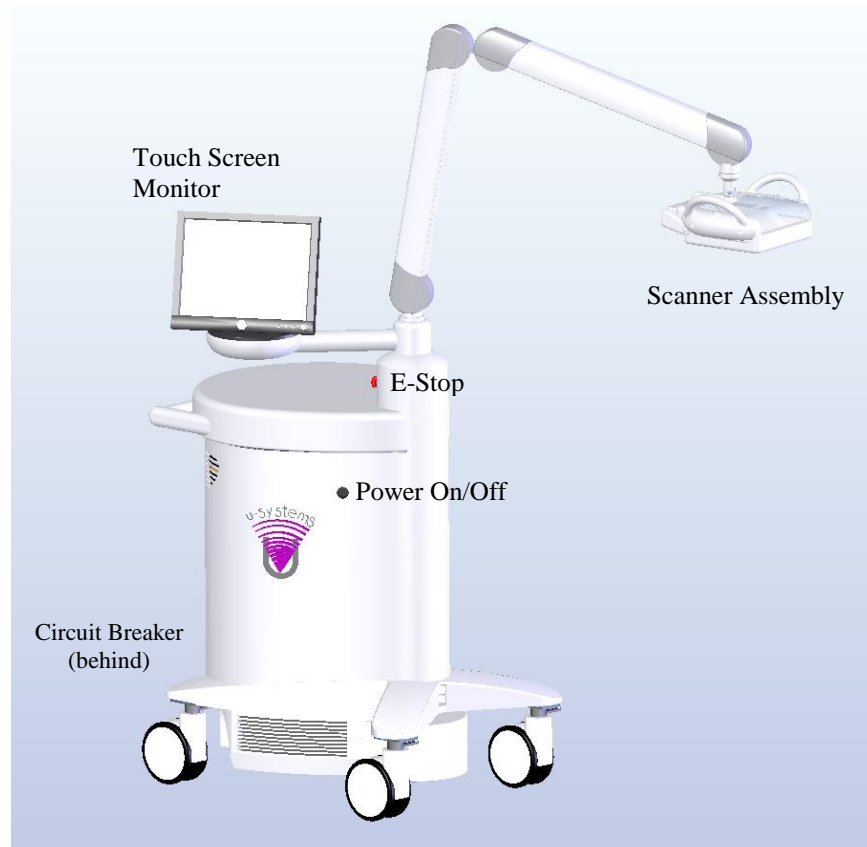
There are 3 versions of Scan Station Ultrasound Engines, System 3.0, System 5.0 and System 5.0B. Below are the pictures to identify their differences:
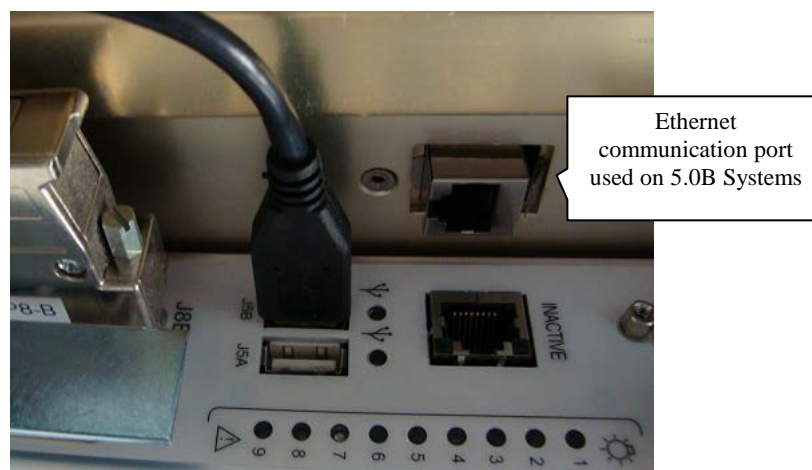
Above is the Back of IO Module for System 5.0B
Version (the extra Ethernet port distinguishes 5.0B systems
from 3.0 and 5.0 systems)
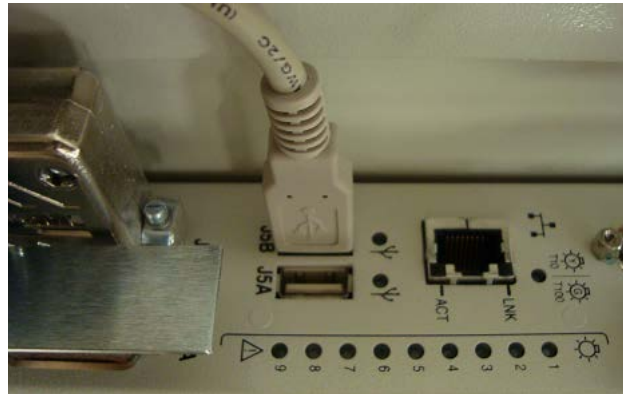
Above is the Back of IO Module for System 3.0 and 5.0 Versions

Above is the Top of IO Module for System 3.0 Version

3 extra USB ports for System 5.0 and 5.0B

Above is the Top of IO Module for System 5.0 and
5.0B Versions (the 3 USB ports at the right side
distinguish the 5.0 and 5.0B systems from 3.0 systems)

If you need to remove the network cable, note what location the
network cable is plugged into (the network socket location in 5.0B
System is different from those in 3.0 and 5.0 Systems).

9.2 somo·VIEWer Workstation

10. ABUS SCAN STATION SCHEMATICS

8601-0114-01

WITHIN SCAN HEAD ASSEMBLY

ZIF CONN

ZIF PLUG

PROBE HEAD

CABLE DISTRIBUTION
7500-0820-00

3500-0081 MK3E SCANNER

DELETED
ANTARES BOX
2100-0102-00

POWER SUPPLY ADAPTER
7500-0836-00

J1 USB   TO ANTARES USB PORT
"A" CONN

2110-0017-01 USB CABLE

"B" CONN   P2

P1   T2

J41 AC 230V

TERM 1 - 3

SLOT1   TERM 6,7

J7

2275-0720-01, AC POWER 230V

SLOT2   TERM 4,5

DC POWER

3300-0054-02 POWER E-STOP SWITCH

2110-0019-00
MINI POWER MODULE

CN1   T6

P5   T5   E-STOP

AUX POWER   P6

LAN CONN

FROM LAN CABLE

VIDEO PORT
J9

P3

TOUCH SCREEN
2110-0008-01

2100-0058-00
VIDEO CABLE

VIDEO PORT

2110-0010-00 USB CABLE

USB USB

USB

PS/2 PORT

KEYBOARD 3500-0637-00

BAR CODE READER
2100-0134-00

11. BLOCK DIAGRAM ADDED

Insight/Platinum
Scan Station Block Diagram
Rev. d

12. SCAN HEAD BLOCK DIAGRAM (NEEDS ADDIONAL INFO ADDED, I.E. PAN SENSOR)

Scanner Head Assembly
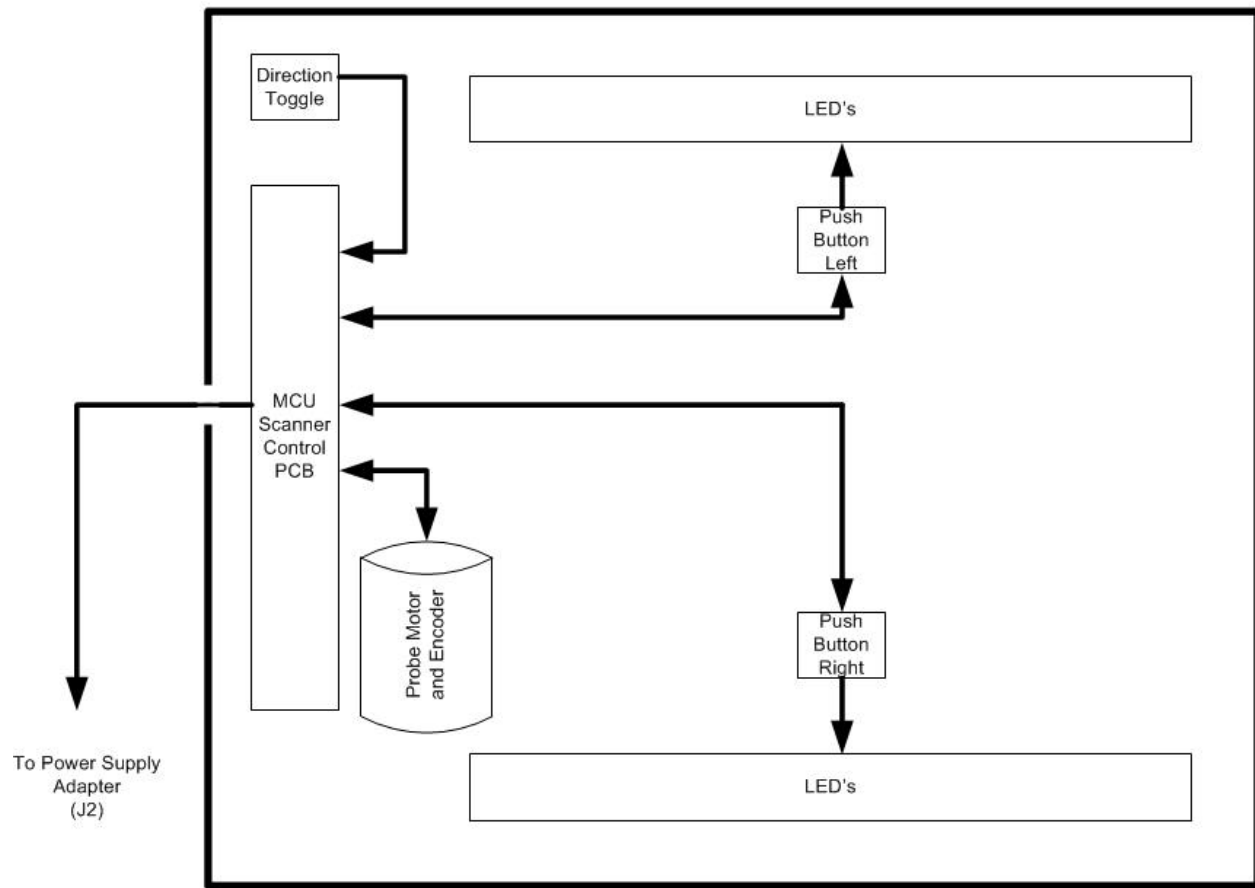
FUNCTIONAL DESCRIPTIONS

12.1 PC Boards and Electronic Modules

MCU Mini Power Module (2110-0019-00) and MCU Power Supply Adapter (7500-0836-00)

The MCU Mini Power Module is located under the Scan Station Countertop. This Module receives AC power from the AC Power Supply (located within the Antares ultrasound engine chassis) and distributes 230VAC, 115VAC, and 90VAC to the MCU Power Supply Adapter which, in turn, provides the power and control signals to the devices in the Scanner assembly.

Devices controlled and monitored by the MCU Power Adapter include:

- DC Motor Control (7500-0827-00)
- Scan Start Control (Left (L) and Right (R) buttons) (7500-0828-02)
- Membrane Pan Sensor (7500-0831-01)
- E-STOP Switch (3500-0054-02)
- Scan Orientation switch (3500-0650-01)

12.2 ANTARES "E-MODULE" PCAs   P/N: 7854685

12.2.1 TR Boards (Transmitter/Receiver)   Included in E-Module

There are three **TR boards** (TR0, TR1 and TR2), each handle 64 TX/RX channels, for a total of 192 channels in the system. The 192 dedicated transmit/receive channels are multiplexed in a 4-to-1 fashion, via high-voltage multiplexer boards (located inside the ABUS Scanner assembly) to allow for an effective aperture of 768-Elements in scanning.

12.2.2 RC Board (Receive Control)   Included in E-Module

The **RC board** is the front-end real-time controller. In addition to transmit and receive control, the RC board provides 192-channel digital receive beamforming. 12 beamformer ASICs on the RC board each provides 10-bit A-to-D conversion and signal processing for 16 channels.

12.2.3 BE Board (Back End)   Included in E-Module

The **BE board** receives digitized echo from the RC board and digitized CW from the CB board. The BE board handles the following main functions: B-mode scan

conversion, and cine data storage. Cine data are stored
before scan conversion. This allows for acoustic frame rates higher than video
display rates (important for cardiac imaging), and allows for user control of
various functions in cine playback.

12.2.4 VI Boards (Video Interface)   Included in E-Module

The **VI board** uses a chroma-key technique to mix the ultrasound image with
graphic overlays. Display video is output as 800 x 600 SVGA. OEM output video
is encoded for RGB and S-VHS in NTSC or PAL format.

12.2.5 RM Board (Realtime Manager)   Included in E-Module

The **RM board** is the host CPU with two 32-bit Pentium-III processors
controlling system imaging, user interface, measurements and reports, graphics
generation, DICOM functions. The RM board communicates with other PCBs via
a PCI bus. Interface to the system hard disk drive (**HDD**) is by EIDE bus;
interface to the read/write CD-ROM drive (**RDD**, removable disk drive) is by
SCSI bus.

12.2.6 TI Module (Transducer Interface)

The **TI module** is located on the front right side of the system. There are three
array type transducer ports and one CW Doppler pencil probe port. Only one of
the array-type transducer ports on the TI Module is used in the ABUS Scan
Station. The other 2 array-type ports and the CW port are NOT used in the ABUS
Scan Station. The TI module directly supports 192 element transducers, and with
the support of the 4-to-1 MUX switching logic inside of the ABUS probe housing,
these signals are distributed to the 768 Element ABUS probe. The desired
transducer port is connected by switching to the appropriate relay in the TI
module.
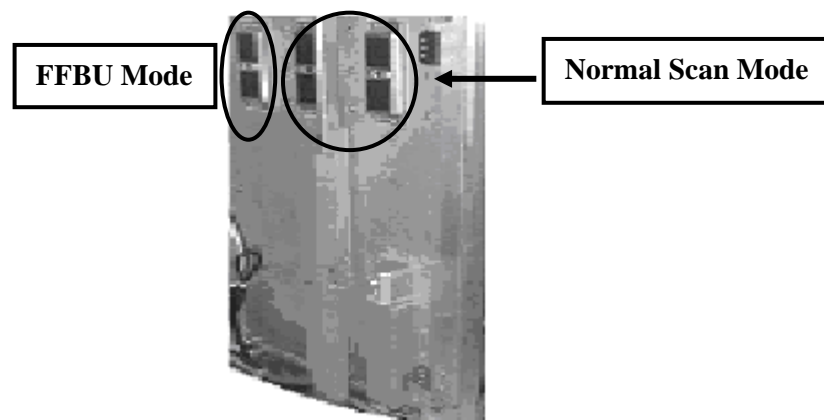
12.2.7 IO Module (Input-Output)   P/N: 7302149 One Assembly

The **IO module** is located on the rear left side of the system and interfaces the E-
Module to other FRUs, such as the monitor, control panel, disk drives, OEMs, and
network. IO module connections include video in and out, audio in and out, and
serial, parallel, SCSI, Ethernet, and USB data connections. The IO module also
contains audio amplifiers for headphones and system speakers.

A useful service feature of the IO Module is a column of
9 LEDs that indicate power, disk drive, and boot status.

1	RM Boot Status
2	HDD Disk Access
3	+12V HDD (Hard Disk)
4	+5V HDD (Hard Disk)
5	+12V RDD (CDROM Drive)
6	+5V RDD (CDROM Drive)
7	+3.3VF (not used for FFBU)
8	+5VF (not used for FFBU)
9	+12VF (not used for FFBU)
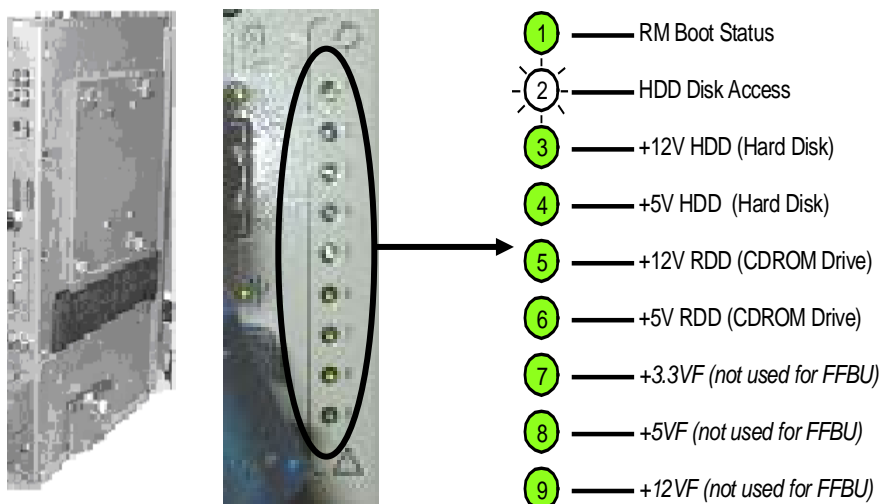
12.3 Electro/Mechanical Assemblies

12.3.1 Main Ultrasound Engine & Chassis

The ABUS Imaging System ultrasound core is based upon an OEM platform.
This platform consists of a rolling chassis base. AC and DC power supplies, and a
complete encased module that contains a full set of individual PC boards,
comprising the "ultrasound engine" portion of the product.

12.3.2 Main Power & Signal Distribution Diagram (ABUS Imaging System)

See "9900-0003-00 DIAGRAM, ABUS INTERCONNECTION", and the Section
10 of this Manual

12.3.3 Articulated Arm and Scanner Assembly

The Articulated Arm is mounted on the Scan Station with the other end
connecting with the transducer scanner

12.3.4 Micro Control Unit (MCU) Internal Distribution Diagram
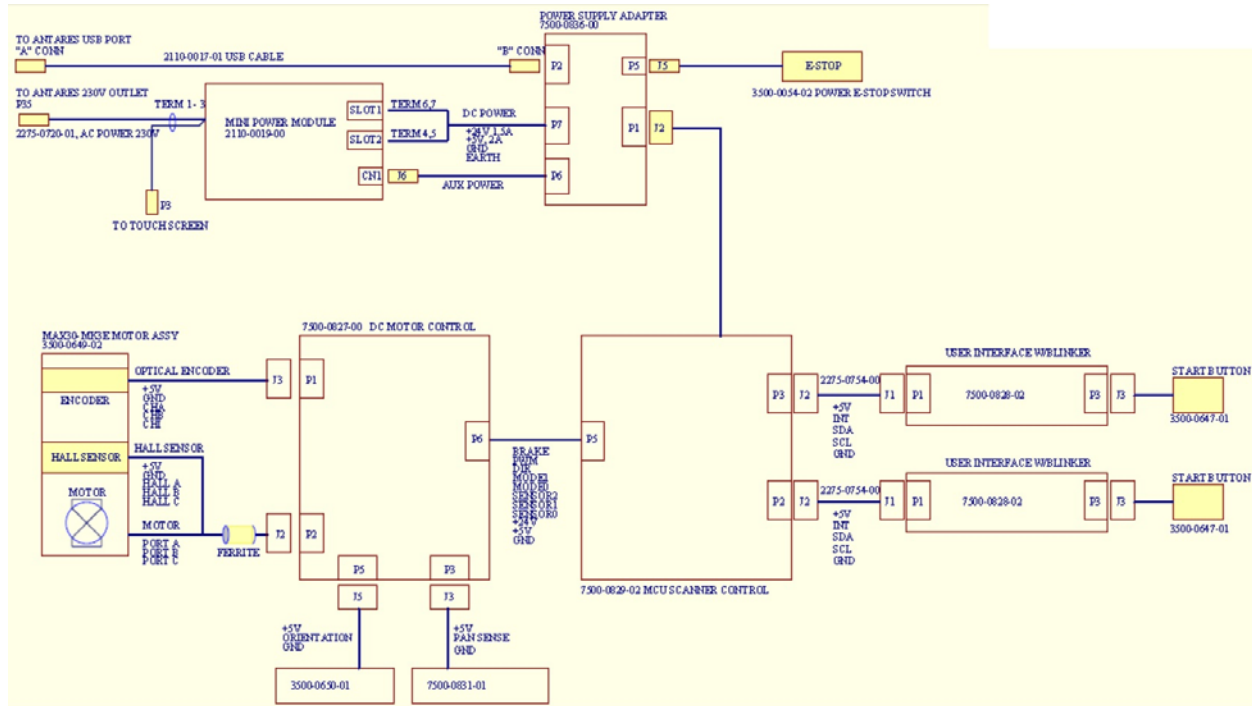
13. SYSTEM UNCRATING & INSTALLATION PROCEDURES

(Reference 0119-0003-01 Proc, Installation ABUS Imaging System)

13.1 ABUS Scan Station Installation

13.1.1 Product Shipment

Shipping containers should be inspected for damages, and any evidence of problems should be reported immediately to the carrier. The containers should be opened ONLY by the manufacturer or its authorized representatives. All installation and set-up of equipment must be done by U-Systems authorized personnel.

13.1.2 Electrical Requirements

Standard grounded (3-Prong) 110-120 VAC, 15 Amp, 50/60Hz. wall outlets (or proper 220-230 VAC, 6.5 Amp, 50/60Hz outlets for systems configured for these power requirements) are required for the Scan Station.

13.1.3 Environmental and Space Requirements

The Scan Station may be located anywhere within the facility, as long as there is adequate power outlets and remote network connectivity to the View Station. Any relocation of the unit must take into consideration space requirements and an active network connection to the View Station being available at the new target location.

13.1.4 Installation Steps: (Scan Station)

13.1.4.1 Remove Plastic wrap from system.

13.1.4.2 Be sure to check for any physical damage.

13.1.4.3 Check to ensure all peripherals, software level, and serial numbers correspond with sales order. Make note of any missing items or discrepancies.

13.1.4.4 Check the AC outlet and receptacle. Measure voltage at receptacle and record reading _____A.C.

WARNING

⚠️ *To maintain the integrity of the electronic equipment and disk drive based software inside the Scan Station, it is critically important that a specific sequence be followed at all times, for turning ON or OFF system power. The sequences listed below should always be followed.*

13.1.4.5 Check system AC Plug and ensure breaker is in the "**OFF**" position.

13.1.4.6 Plug system in wall outlet.

13.1.4.7 Make sure the red Emergency Stop (E-Stop) switch, located on the rear of the main tower, is disengaged by pulling it out.

13.1.4.8 Turn the circuit breaker at rear of system to the **"ON"** position.

13.1.4.9 Verify a single lit Green LED indicating "AC OK" next to the circuit breaker.

13.1.4.10 Momentarily press the Standby-Power (On/Off) button on the left side of the Scan Station.

13.1.4.11 Verify the 6 green LED'S are lit on the rear of the system by the AC input are now lit.

13.1.4.12 Verify the U-Systems Logo appears on the monitor.

13.1.4.13 Toward the end of the boot cycle verify the three Antares probe relays click.

13.1.4.14 Verify the Scan Station initializes (Probe goes to either side of the Scan Assembly)

13.1.4.15 Verify the Scan Station Pre-scan screen is displayed on the LCD display monitor.

13.1.5 Initial Checks: (Scan Station)

A. Scan Station Power On-Off Procedures

To maintain the integrity of the electronic equipment and disk drive based software inside the Scan Station, it is critically important that a specific sequence be followed at all times, for turning ON or OFF system power. The sequences listed below should always be followed:

B. Scan Station Power ON

To power up the Scan Station, use the following procedure:

1. Make sure the red Emergency Stop switch, located on the rear of the pole, is disengaged, by pulling it out.

2. Momentarily press the Standby-Power button on the left side of the Scan Station.

3. Wait until the 'Select Breast' screen is displayed on the LCD display monitor.

C. Scan Station Power OFF

To shutdown (power off) the Scan Station, use the following procedure:

1. Momentarily press the Standby-Power button on the left side of the Scan Station.

2. Wait until the LCD display monitor goes blank.

WARNING

⚠️

*Do not turn off the circuit breaker switch, located at the bottom-rear of the Scan Station or unplug the power cord until AFTER the complete normal shutdown procedure described above has been performed. If the above procedure does not shut down the system within **5 minutes,** hold down the green Standby-Power button for 5 seconds. Not following the above Power-Off procedure, may result in damage to the system or loss of data.*

13.1.6 System Connectivity Set Up: (Scan Station)

13.1.6.1 Required Equipment:

❑ None

13.1.6.2 Required Network Information:

You will need the following information prior to performing the Connectivity Setup of the Scan Station.

❑ Scan Station IP Address: Provided by the Network Facilitator- or site survey

❑ Scan Station Subnet Mask: Provided by the Network Facilitator- or site survey

❑ Scan Station Gateway Address: Provided by the Network Facilitator- or site survey View Station (or SomoVIEWer) IP Address: Provided by the Network Facilitator- or site survey View Station (or SomoVIEWer) Subnet Mask: Provided by the Network Facilitator- or site survey View Station (or SomoVIEWer) Gateway Address: Provided by the Network Facilitator- or site survey DICOM device information: Provided by the Network Facilitator- or site survey

13.1.6.3 Network Setup Steps:

1. Press **Setup** soft button on the monitor.
2. Type in the View Station Host Name in space provided.

NOTE: ViewStation Host Name is the IP address of the ViewStation. Not required for somoVIEWer

3. Click on **"Save".**
4. Touch **Setup** on monitor– then **LAN Setup**.
5. Highlight "**internet protocol (TCP/IP)."**
6. Select "**Properties"**
7. Select radio button "**Use the following IP address**".
8. Type in the **IP address**, **Subnet Mask** and **Gateway** (if applicable) of the **Scan Station,** as provided by the network administrator.
9. Select **"OK"**
10. Select **"OK"**
11. Close the "**Network and Dial Up**" Window.

13.1.6.4 DICOM Configuration

The *DICOM Configuration* screen is used to set the system parameters and save them in the DICOM configuration file (see figure below).

DICOM should only be configured by qualified personnel.

DICOM CONFIGURATION SCREEN

To open the *DICOM Configuration* Screen, touch the DICOM button on the *System Setup* screen.

The *DICOM Configuration* screen contains the following groups which are described in more detail below:

- DICOM Local
- DICOM Store
- DICOM Storage Commitment
- DICOM Worklist
- DICOM MPPS

(a) DICOM Local

To configure the local Scan Station with a designated AE Title and Port (default 104).

(b) DICOM Store

Allows transfer of images to the workstation(s)

When DICOM Store is enabled in the *DICOM Configuration* screen:

- If either the **Transverse** or **Coronal** selection is checked,
  - o The Thickness represents how much original data is used to generate the slice image.
  - o The Step Size represents the distance in mm from the start of one slice to the start of the next slice.
- If **SomoVIEWer Transfer** is checked, scans

performed in an exam will be store as a Transverse multi slice sequence to the Storage Server with optimal setting for display on the somoVIEWer (0.5mm thickness and overlap, no slice data on images). No multi slice settings will be selectable by the user.

- Enabling the DICOM Storage Commitment ensures that a stored image will not be deleted from the system until the PACS or other storage commitment entity confirms that the image is permanently archived.
- To enable DICOM Storage Commitment select an AE Title from the SC AE Title list. If the AE Title is not in the list, a new entry needs to be created.

(c) DICOM Storage Commitment

This section allows the creation and editing of DICOM storage commitment entries that can be selected from the SC AE Title selection list in the DICOM Store section. The section does not enable or disable DICOM storage commitment.

Commitment Timeout sets the number of days the system will wait for a storage commitment response on any stored image.

If there has been no commitment response for an image for the configured number of days then the image will be deleted from the system.

(d) DICOM Worklist

Establish the connection between Scan Station and a Modality Worklist (MWL) Server to have the pre-entered Patient Data ready for use on the Scan Station.

A Modality Worklist Server could be a Hospital Information System (HIS) or a Radiology Information System (RIS).

To enable DICOM Modality Performed Procedure Step (MPPS), select an AE Title from the MPPS AE Title list. If the AE Title that does MPPS is not in the list then a new entry needs to be created, see DICOM MPPS below. Enabling DICOM Modality Performed Procedure Step allows feedback to a Modality Worklist Server (HIS or RIS) about the progress of a scheduled procedure.

Refresh Time	How often the server is requested for an update of the worklist
Name Format	The format that the patient's name is displayed in the worklist screens
Barcode	Defines whether barcodes contain patient IDs, Assession numbers, or neither
Modality	Specifics which modality's entries will be displayed in the worklist screen (US for ultrasound and blank for all modalities)

Scheduled Date   Only worklist entries scheduled on these dates will be displayed in the
worklist screens

Scheduled AE   If non blank, only worklist entries scheduled for the system with that AE
Title will be displayed in the worklist screens

(e) DICOM MPPS

This section allows the creation and editing
of DICOM Modality Performed Procedure
Step entries that can be selected from the
MPPS AE Title selection list in the DICOM
Worklist section. The section does not
enable or disable DICOM Modality
Performed Procedure Step.

```
┌─DICOM MPPS────────────────────────┐
│ AE Title : MYAETITLE          ▼    │
│ Port :    104      New  │ Delete   │
│ Host :    MYHOST                   │
│ End Procedure : Scan Completed ▼   │
│      Verify                        │
└────────────────────────────────────┘
```

End Procedure   Configures when the
system will inform the Modality Worklist Server (HIS or RIS) that a
procedure has been completed. Scan Completed (End Exam on the
Scan Station) is the only available selection.

13.1.7 somoVIEWer Workstation Connectivity Set Up

(a) General DICOM Setup

The DICOM page enables setting up DICOM print and storage devices. These settings should
only be configured by qualified personnel.

(b) Configure DICOM Application Entry for Storing

Enter new print/store device information in the last row with the * then click the Create button
from the bottom
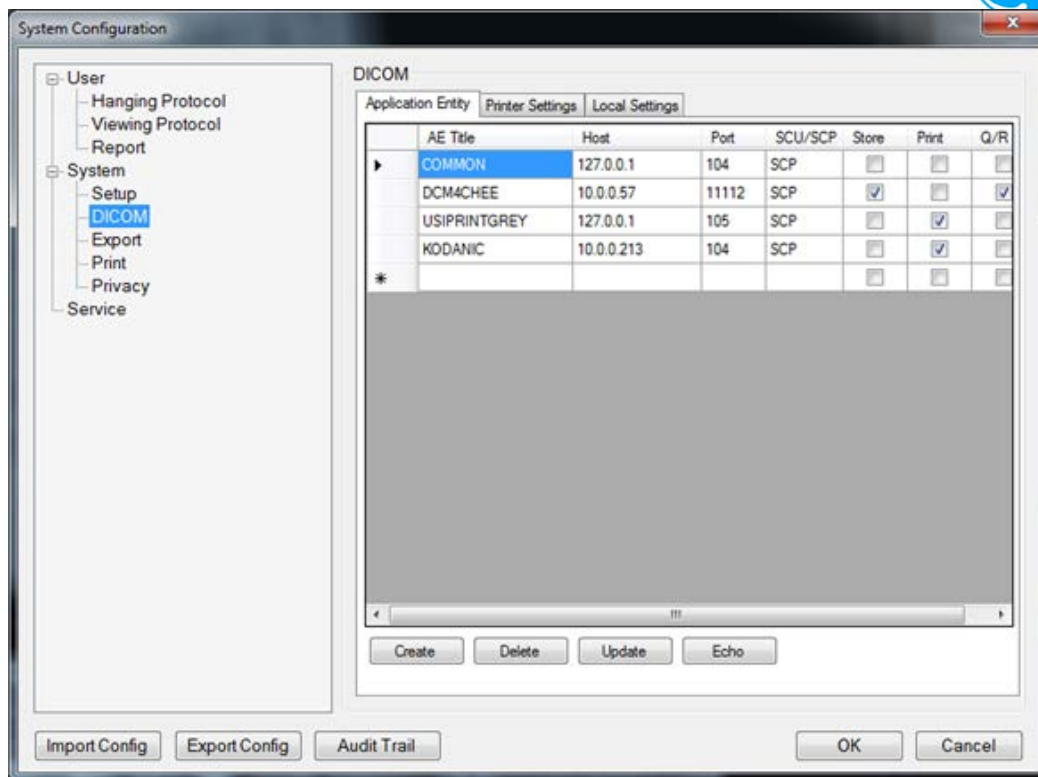
- Change information by clicking the item making the changes then clicking the Update button
- Select a DICOM item by clicking the left most column and clicking the Echo button to perform a DICOM Echo connectivity test

(c) Configure DICOM for Printing (setup Printer Settings)
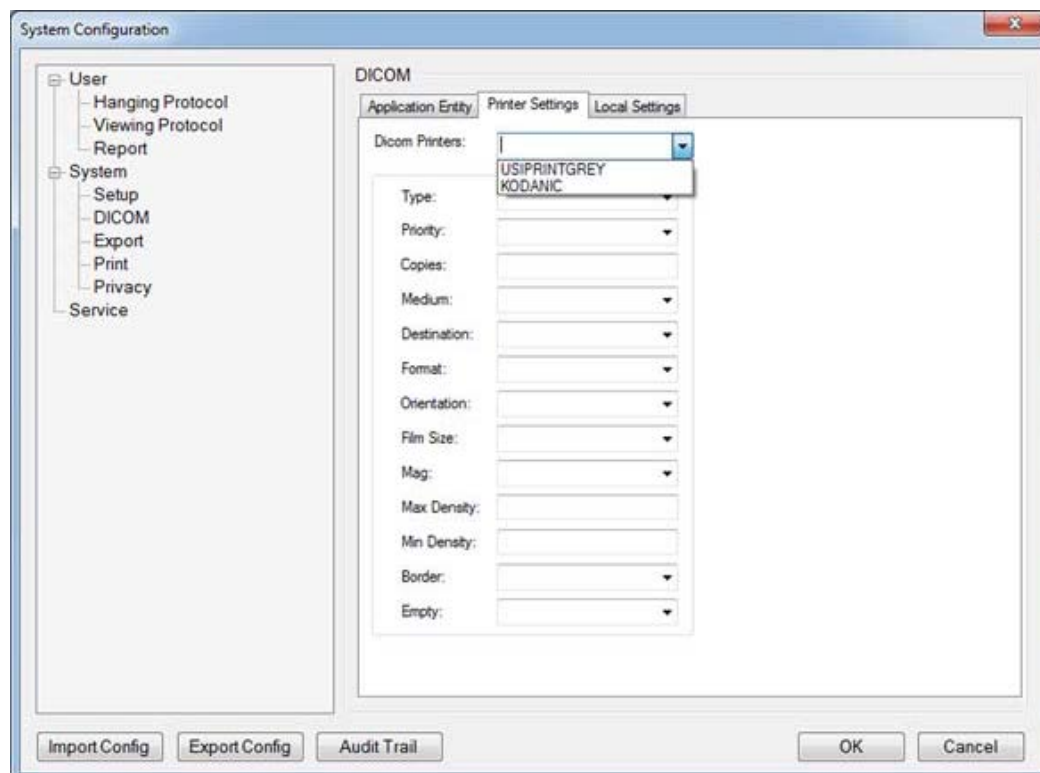
Properties	Preset Parameter Description
DICOM Printers	Specify PACS Vendor. This enables annotation on patient information since by definition patient information is missing on the title bar
Smoothing Type	Specify the printer's magnification interpolation for the output
Priority	Specify the print job priority: High, Medium, or Low
Copies	Enter the number of copies
Medium	Select the print medium: Clear Film, Paper, or Blue Film
Film Destination	Specify the film destination for the exposed film • Magazine – Store in a film magazine • Processor – Develop in a film processor
Format	Indicates how many prints to print per page, for example, 1,1, 1,2, 1,3, up to 7,5. Partial prints are displayed as one print job
Orientation	Specify whether to print the image Portrait (vertically) or Landscape (horizontally)
Film Size	Specify the dimensions of the film size

Magnification	Specify how the printer magnifies the image to fit it onto the film
	    • Replicate – Interpolated pixel are copies of the adjacent pixels
	    • Bilinear – Interpolated pixels are created by bilinear interpolations between the adjacent pixels
	    • Cubic – Interpolated pixels are created by cubic interpolations between the adjacent pixels
	    • None – No interpolation

Max Density	Enter a number indicating the maximum density level of the film
Min Density	Enter a number indicating the minimum density level of the film
Border	Select to have the border area surrounding and between the images of the film: Black or White
Empty Image	Select to have a Black or White empty image
Trim	Specify whether you want a trim box to be printed around each image on the film: Yes or No
Color	Select whether to have the image Color or Grey
Configuration Information	Enter vendor-specific image quality settings
Film Session Label	Type a name for the group of film labels associated with the print job

(d) Configure DICOM for Local Settings
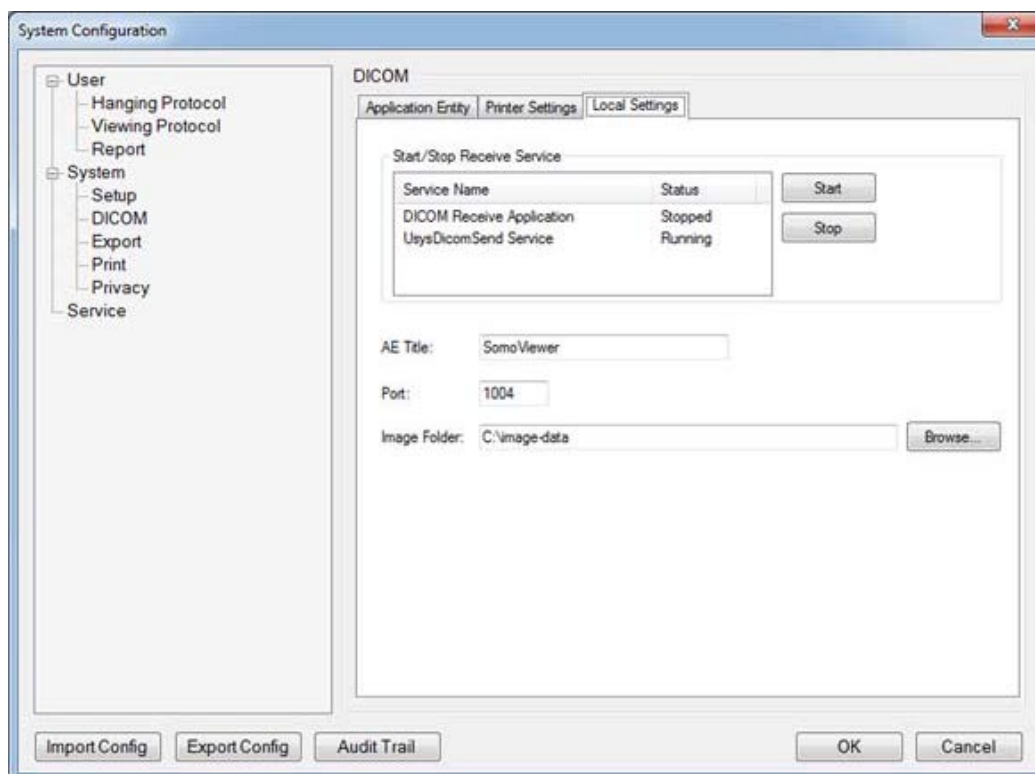
13.1.8 Mechanical Verification

(a) **E-STOP** – (Emergency) Pressing this button will immediately halt the movement of the transducer.

(b) Ensure proper operation of all controls (Articulated Arms, Scanner Head, Transducer, Left-Scan Button, Right-Scan Button and Scan Direction Switch).

13.2 View Station (or somoVIEWer Workstation) Installation

13.2.1 Product Shipment

Shipping containers should be inspected for damages, and any evidence of problems should be reported immediately to the carrier. The containers should be opened ONLY by the manufacturer or its authorized representatives. All installation and set-up of equipment must be done by USI authorized personnel.

13.2.2 Electrical Requirements

Standard grounded (3-Prong) 110-120 or 220-230 VAC, 50/60Hz. wall outlets are required for the components of the View Station or somoVIEWER Workstation.

13.2.3 Environmental and Space Requirements

The View Station may be located anywhere within the facility, as long as there is adequate power outlets and remote network connectivity to the Scan Station (and the DICOM Hook-up, or network connection if required).

13.2.4 Moving the System

The original environment in which the View Station is setup (desktop, cart mounted, etc.) will determine the ease at which it may be moved. Any relocation of the View Station must take into consideration an active network connection to the Scan Station being available at the new target location. The computer, monitor and trackball (or mouse) are all traditional PC industry devices and should be moved and handled according to those common standards.

In addition to the parameters that are configured directly in SYSTEM SETUP menu, the SYSTEM SETUP menu offers access to four additional functional configuration sub-menus (*PRIVACY, DICOM, FILM VIEWER, CONNECTION*) for the View Station only.

NOTE: Refer to the View Station User Manual 4700-0007-00 for more details on the View Station sub-menus.

NOTE: Refer to the somoVIEWer User Manual 4700-0009-01 for more details on the somoVIEWer sub-menus.

14. SCAN STATION CLEANING & DISINFECTING PROCEDURES

CAUTION

Gloves should be worn during all of the following cleaning and disinfecting procedures.

(A) CLEANING LCD MONITOR

LCD touch screen monitor is required to be in off position when cleaning. The LCD Cleaner (2102-0028-00, Klear Screen) is recommended.

(B) CLEANING AND DISINFECTING PATIENT CONTACT AREAS

Before cleaning and disinfecting, remove the Disposable Membrane.

Gloves are recommended to be worn for the following procedures.

Use a soft, lightly dampened cloth or tissue to clean the residual somo•v lotion and other debris from the patient contact areas prior to disinfecting.

Figure 12.A. Scanner Assembly with Patient Contact Areas Highlighted

Patient contact areas are highlighted in blue
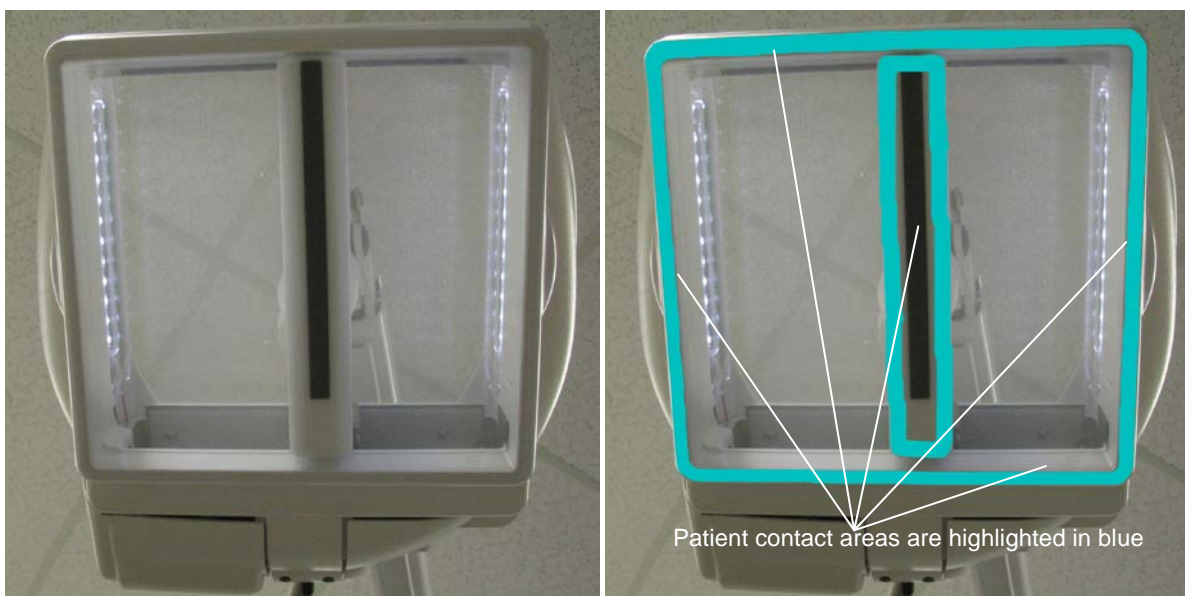
Once the patient contact areas have been cleaned, disinfect using recommended Disinfecting Wipes (2303-0009-01 "Protex" (brand)). Follow the manufacturer's instructions on the label.

NOTE: The "Cleaning Procedure", described above, must be performed <u>PRIOR</u> to the disinfection process.

15. PERIODIC MAINTENANCE

Refer to ABUS Periodic Maintenance Procedure (9900-0004-01)
and ABUS Periodic Maintenance Inspection Form (9900-0004-02**)**

16. SYSTEM TROUBLESHOOTING INFO & PROCEDURES

Foreword

Due to the mechanical nature of the ABUS Imaging System, repair procedures described in this manual should be performed ONLY by a GE Healthcare trained service personnel (Service Engineer, Bio-Med, etc.).

16.1 Trouble Shooting Tips

Scan Station will not power on.	1. Check the AC outlet is working, and to verify the outlet for correct voltage. 2. Verify system AC power cord is plugged in and circuit breaker is turned on (upper position). 3. If so, check green 'AC OK' LED down by AC cord. 4. If not, insure cable is seated into Antares properly (Even with gray cover over connector, cable can still come loose.) 5. Verify the orange light is illuminated on the power button. Press Power button to turn on the system and verify that the orange light turns green within 30 seconds.

Scan Station Boots, but have "Detector Error" message on monitor.	1. Verify 'E-Stop' is pulled out.
	
	 2. Push in E-Stop, Pull out, then press 'Reset' on the screen.
	
	 3. If still have same error massage, press the 'Reset' and check if the probe can reach both ends of its track during initialization.
	
	   a. If the probe cannot reach either end, check along the track for anything that blocks the motion of the probe.
	
	   b. If the probe does not move at all, check the power output connections between Antares and the scanner under the countertop cover of the system box.

Intermittent Detector Errors on bootup and during scanning	**Refer to FSB037 to diagnose the MCU probe driving problem.**

Scan Station Software validation failed!	Re-install Software (only specially trained service personnel can process): 1. Remove the side cover at the Power Button side. 2. Insert Scan Station software CD in the View Station. 3. Power off then power on the Scan Station. 4. Touch *Yes* when "Reinstall current software version?" message appears.
Scan Station System does not recognize probe, or other error message appears.	1. Disconnect probe, boot system, then plug probe back into the connector. 2. If another probe is available, connect to far left (ABUS) transducer connector.
Scan Station Buttons on the touch screen monitor do not respond when the correct spot are touched.	Perform monitor calibration: 1. Touch **Setup** [Setup (Logoff)] on the Scan Station Main Screen. The *System Setup* screen appears. 2. Touch **Screen Setup** button. 3. A screen opens with bulls' eye icons. 4. Follow the instructions as they appear on the screen. After touching all bulls' eye icons, the *Calibration Complete* screen appears. 5. Touch **Exit** to close the *System Setup* screen.
Scanner Membrane Sensor does not display membrane on and off conditions on the system touchscreen monitor.	Check this function with another Membrane. If the problem is consistent, Replace scan head frame.
Probe does not initialize or move.	Replace the Scanner Head Assembly.
Scanner LED lights not illuminating after boot up.	Replace the Scanner Head Assembly.

Image transfer is incomplete or image transfer is slow from the Scan Station to the somoVIEWer (or View Station).	1. Verify the somoVIEWer (or View Station) is turned on. 2. Verify the Network status icons are green. (If the Network status icon is red, indicating no connection between the Scan Station and somoVIEWer.) 3. Verify the Scan Station network cable is plugged into the Scan Station and the wall jack. 4. Verify the Workstation network cable is plugged into the somoVIEWer and the wall jack. 5. Reset the hub (if connected) by turning it off and back on. 6. Verify Transfer Mode is set to "End Exam" (touch **Setup** Setup (Logoff) on the Scan Station Main Screen to launch the *System Setup* window). The exam must be closed (End Exam) before the study will transfer. 7. Wait approximately two minutes and verify the Network status icon turns green. Studies will appear on the somoVIEWer as they are transferred.

16.2 Trouble Shooting Procedures

16.2.1 Antares Ultrasound Engine

16.2.1.1 PSAC (AC) Power Status LEDs: Functional Assignments

The following table describes the significance of the various patterns of illuminated combinations that can appear in the eight (8) Diagnostic Status LEDs located on the PSAC AC Power module.

PSA (Analog) Power Supply

PSD (Digital) Power Supply

48VAC Power

Battery (Not installed)

1   2   3   Bat

4   5   6   AC

AC Power In OK

Fans (2), AC Supply

Fans (2), P/S (Power Supply)

Fans (3), MAINS (E-Mod, TI, I/O)
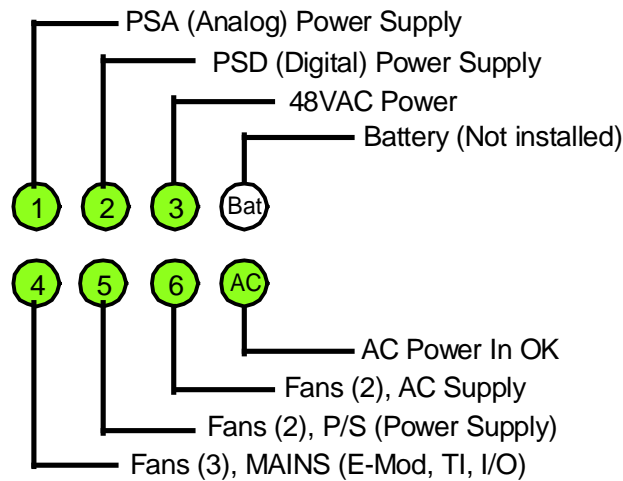
16.2.1.2 PSAC (AC) Power Status LEDs: Diagnostic Code Chart

The following table describes the significance of the various patterns of illuminated combinations that can appear in the eight (8) Diagnostic Status LEDs located on the PSAC AC Power module.

AC Power Supply Diagnostic Chart		
PSAC LEDs (see Legend)	Condition	Fault
1 2 3 BATTERY / 4 5 6 AC	Normal fully operating system condition.	None
1 2 3 BATTERY / 4 5 6 AC	No AC power. Cord unplugged, breaker open, wall outlet not powered, or PSAC thermal overload.	AC input or PSAC ℹ(Notes 1, 5)
1 2 3 BATTERY / 4 5 6 AC	Bad or missing battery; may take 2-3 hours to indicate.	Battery or PSAC ℹ(Note 1)
1 2 3 BATTERY / 4 5 6 AC	AC power in; system in standby. Normal standby condition. Battery LED will flash while charger tries to find and charge the battery.	ℹ(Note 1)
1 2 3 BATTERY / 4 5 6 AC	48V has come up.	ℹ(Note 2)
1 2 3 BATTERY / 4 5 6 AC	PSD has come up.	ℹ(Note 2)
1 2 3 BATTERY / 4 5 6 AC	PSA has come up.	ℹ(Note 2)
1 2 3 BATTERY / 4 5 6 AC	48V supply in PSAC has internal error: undervoltage, overvoltage, or overtemp.	PSAC ℹ(Note 3)

	Description	Cause
	PSD has internal fault: undervoltage, overvoltage, or overtemp.	PSD (Note 3)
	PSA has internal fault: undervoltage, overvoltage, or overtemp.	PSA (Note 3)
	PSD is overloading 48V.	PSD (Note 3)
	PSA is overloading 48V.	PSA (Note 3)
	PSD has external fault: overcurrent in one or more outputs.	E Module, CP, RDD, or HDD (Note 3)
	PSA has external fault: overcurrent in one or more outputs.	E Module (Note 3)
	Thermal overload in cardcage.	Cooling system, blocked airflow, or ambient temp too high (Note 3)
	One or more of three main fans are stuck, slow, or unplugged.	Main fans, cable, or PSAC (Note 4)
	Either or both of the PS fans are stuck, slow, or unplugged.	PS fans, cable, or PSAC (Note 4)
	Either or both of the AC fans are stuck, slow, or unplugged.	PSAC (Note 4)

NOTES: On PSAC Diagnostic Chart

NOTE #	INFORMATION

1. When AC power is first applied, the 'AC OK' LED should turn on (green). The battery LED will begin to blink even if no battery or if a damaged battery is installed. Depending on conditions, the battery LED will go dark after some period to indicate a battery problem, but this may take several hours. Battery problems will not prevent any system operations except for fast boot when moving the system and incurring a temporary loss of AC power. The battery LED turns solid green when fully charged.

2. The normal turn-on sequence is as follows: after the standby power button is pressed, there is a 4-second delay before LEDs 3, 2, and 1 turn on in rapid sequence. If the sequence stops at LED 2, for example, this indicates

a PSD fault. If the fault persists for 5 more
seconds, the error is latched and the LED turns yellow or flashing yellow
to indicate a problem. LED 1 will not come on if LED 2 does not indicate
green first, and LED 2 requires LED 3 first.

3. Serious errors cause the system to shut off and LEDS to indicate yellow.
Such errors are latched and prevent the user from re-starting the system
with the power standby button. To clear this condition, it is necessary to
remove AC power by turning off the breaker.

4. Serious errors cause the system to shut off and LEDS to indicate yellow.
Such errors are latched Less serious errors cause LEDs to flash green.
These errors are not latched. For example, if a fan is stuck and then
becomes free, the error condition is removed. When a fan is stuck, a bit is
set high to software so that a warning can be issued to the user that a
cooling problem has occurred. This may cause the system to shut down
without warning if not corrected.

The PSA and PSD will run for 10-15 minutes without cooling fans.
System problems occurring 10-15 minutes after startup indicate a thermal
problem.

5. If the system has been turned on and then off using the power standby
button and a battery is present and charged, there will be standby 5V
power to the CPU memory even with no AC present. No LEDs are
illuminated in this condition.

16.2.1.3 ANTARES System Status LED's (General)

❑ PSAC: AC Power Tray
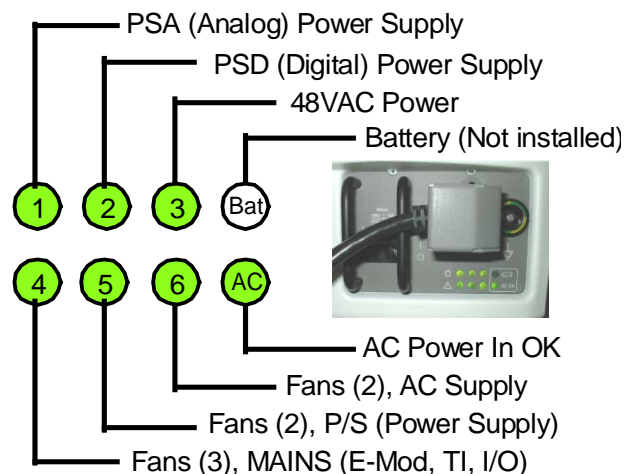
❑ I/O Module:

1 —— RM Boot Status

2 —— HDD Disk Access

3 —— +12V HDD (Hard Disk)

4 —— +5V HDD (Hard Disk)

5 —— +12V RDD (CDROM Drive)

6 —— +5V RDD (CDROM Drive)

7 —— *+3.3VF (not used for FFBU)*

8 —— *+5VF (not used for FFBU)*

9 —— *+12VF (not used for FFBU)*

The following table describes the basic assignment of function of the various LEDs in the Antares

System LEDs		
FRU	LED	Description
PSAC (see Diagnostic Chart)	1	PSA status
	2	PSD status
	3	48VAC status (PSAC output to PSA & PSD)
	4	Main fans status (E, TI, & I/O modules)
	5	PS fans status
	6	AC fans status
	Battery	Battery status
	AC OK	AC input status
I/O Module	1	RM boot status
	2	HDD disk access
	3	+5V HDD
	4	+12V HDD
	5	+5V RDD
	6	+12V RDD
	7	+3.3VF Control Panel
	8	+5VF Control Panel & Front Connector Panel
	9	+12VF Control Panel
Front Connector Panel	Power	Yellow = standby; Green = on

16.2.1.4 Power Test Points & Status LED's

❑ PSAC: AC Power Tray

❑ PSA: Analog Power Supply Module

❑ PSD: Digital Power Supply Module

❑ I/O Module

The following table lists all of the available test points, on the various power modules in the Antares ultrasound engine, for checking voltages. The normally expected voltage is listed in the "Comment" column.

Power Test Points			
FRU	**TP**	**Description**	**Comment**
PSAC	1	48V output	Tolerance: 47V +/- 1V
	6	Fan voltage	Tolerance: 45V +/- 1V
	2	48V return	
	3	Signal ground	
	5	ACRMVRS (Power for LAN and start-up circuitry.)	Tolerance: 5.0V +/- 0.2V
	4	ACRMMSV (Standby power to keep DRAM alive.)	Tolerance: 5.0V +/- 0.2V
PSA *	1	VTX0 (TP at top)	0 - 18.5V (C-, P-, D-mode)
	2	P14AQ	+14.2V +/- 5%
	3	P5AQ	+5.0V +/- 5%
	4	EBN	-3V +/- 5%
	5	M9.6A	-9.6V +/- 5%
	6	M2.0AQ	-2.2V +/- 5%
	7	M100HV	+7.5V +/- 5%
	8	M14AQ	-14.2V +/- 5%
	9	VTX1	0 - 18.5V (B-, M-mode)
	10	P7A	7.0V +/- 5%
	11	P3.3A	+3.3V +/- 5%
	12	P5A	+5.0V +/- 5%
	13	P3.3AQ	+3.45V +/- 5%
	14	P100HV	+3.87V +/- 5%
	15	Ground (TP at bottom)	
PSD *	1	Ground (TP at top)	
	2	M12D	-12V +/-5%
	3	P12D	+12V +/-5%
	4	P5D	+5.1 +/-5%
	5	P3.3D	+3.4V +/-5%
	6	P2.5D (TP at bottom)	+2.575 +/-5%
I/O Module	1	Ground	
	2	+3.3VF (Control Panel)	I/O LED 7
	3	+5VF (Control Panel & Front Connector Panel)	I/O LED 8
	4	+12VF (Control Panel)	I/O LED 9
	5	+12V DP (HDD)	I/O LED 4
	6	+5V DP (HDD)	I/O LED 4
	7	+5V RDD	I/O LED 5
	8	+12V RDD	I/O LED 6
	9	+5V MIC	
	12	P2-5D	Not used
	16	-12V	I/O Module only

* PSA and PSD test points are not labeled. Test point number 1 is at the top.

16.2.1.5 Power Connection Table

❑ RDD: Remote Disk Drive (CD ROM Drive)

❑ PSA : Analog Power Supply Module

❑ PSD : Digital Power Supply Module

❑ I/O Module

The following table lists all of the available points of connection for various power signals in the Antares ultrasound engine.

AC / DC Power Connections			
FRU	Connector	Pin	Signal
AC transformer primary	J50/P50	2	115/230 VAC
		3	100 VAC
		4	0 VAC
		6	115/230 VAC
		7	0 VAC
		8	0 VAC
AC transformer secondary	J49/P49	1	48V PS AC MAIN N
		2	48V PS AC MAIN H
Isolation transformer	J41 Monitor AC fused at F1	1	216 VAC, not switched
		2	216 VAC, not switched
		3	Safety ground to monitor and system chassis
		4	Shield drain to chassis
	J35 OEM AC fused at F2		115/230V selectable AC outlet
PSA Power	J36/P36	A1	48V_PSA
		A2	48V_PSA_RET
PSD Power	J37/P37	A1	48V_PSD
		A2	48V_PSD_RET
PS Fans	J32/P32, J92/P92	1	PFANS1
		2	PFANS1 TACH
		3	PFANS1 RET
		5	PFANS2
		6	PFANS2 TACH
		7	PFANS2 RET
Main Fans	J31/P31, J91/P91	1	FANS1
		2	FANS1 TACH
		3	FANS1 RET
		4	FANS2
		5	FANS2 TACH

		6	FANS2 RET
		7	FANS3
		8	FANS3 TACH
		9	FANS3 RET
Monitor AC	J41/P41, J63/P63	1	Hot (Brown)
		2	Neutral (Blue)
		3	Safety ground (Grn/Yel)
		4	Shield ground
Front Connector Panel	J11A/P11A, J67/P67	1-5	+12V RDD
		6-10	+5V RDD
		13-15	+5V Fused
		33, 34	Mic Power
		35-39	+12V RDD RET
		40-44	+5V RDD RET
HDD	J13/P13, J130/P130	1	+12V
		2	+12V RET
		3	+5V RET
		4	+5V
RDD	P72	1	+12V
		2	+5V
		3	+12V RET
		4	+5V RET
	J133/P133, J135/P135	1	+12V
		2	+12V RET
		3	+5V RET
		4	+5V
Physio module	J12A/P12A, J76/P76	2	+12V RET
		8	+12V DC

16.2.1.6 Viewing Antares Startup Script, Entering CMOS Setup

(a) While starting the Antares the script booting information is hidden behind a splash screen.

(b) To view this data press Ctrl & F8 on the keypad.

(c) To enter the motherboard setup press Ctrl & F2.

16.2.2 Scanner

Refer to FSB037 to troubleshoot the MCU Probe Scanner driving problem

16.2.3 Articulated Arm

Refer to Appendix A to diagnose and adjust the Articulated Arm

16.2.4 Probe

If the probe needs to replace, refer to 16.1.5 to remove the probe from scanner assembly

17. REPAIR PROCEDURES

Foreword

Due to the mechanical nature of the ABUS Imaging System, repair procedures described in this manual should be performed ONLY by a USI trained service personnel (Service Engineer, Bio-Med, etc.).

17.1 Hardware Service/Replacement Procedures

17.1.1 Remove and Re-install Side Covers of Scan Station System Box

To remove the side covers, remove the screw close to the top of each side cover (under the Counter Top) using 5/32" Allen key, and pull the side cover out (see Figure 17.A. below). Please note that the Side Covers can be fragile, **Do Not** grab by vent louvers.

With reverse order of the above instruction to re-install left and right side covers back.
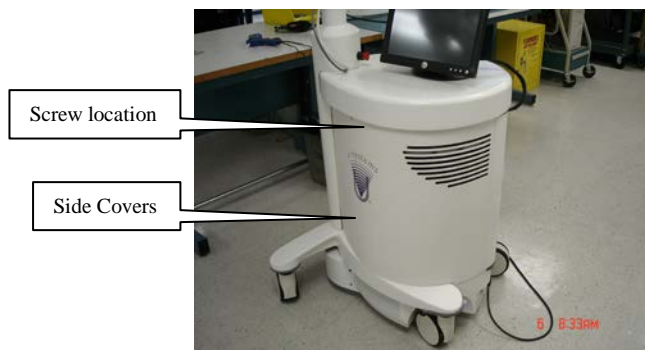
Figure 17.A. Scan Station Side Covers

17.1.2 Replace the Scan Station Power Cord

(a) Shut down the Scan Station and turn off (down) main system Power Breaker located next to the power cord connection, as shown in the Figure 17.B. below.

(b) Remove the 2 screws for the Power Cord Cover.

Power Cord Cover

Screws Locations

Main System Power Breaker
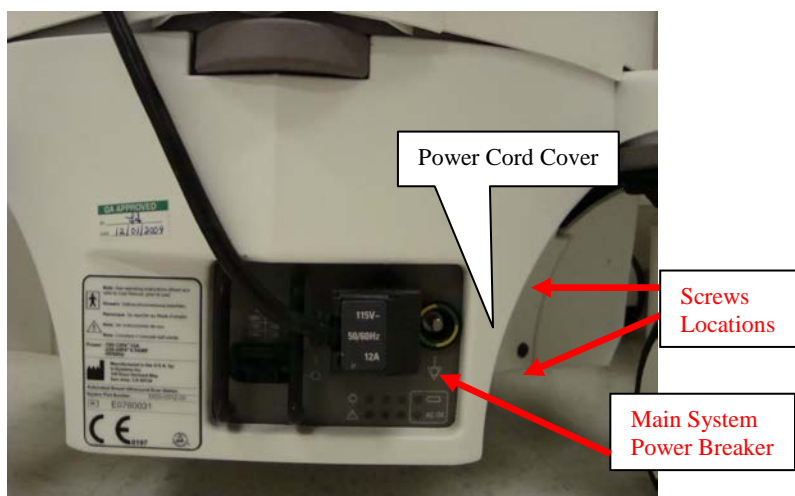
Figure 17.B. Main Power Cord Assembly (bottom-rear side of the Scan Station)

(c) Completely remove the Power Cord and the metal Cover from the socket by unplugging the Power Cord, the metal Cover may not separate from the Power Cord during this portion of the process (see the Figure 17.C. below).

(d) Replace an appropriate Power Cord, and follow the reverse order of this instruction to finish the re-installation
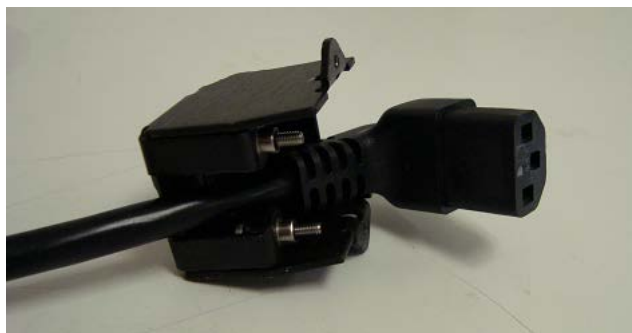
Figure 17.C. Power Cord and its Cover

17.1.3 Remove and Replace Scanner Head Assembly

(a) Shut down the Scan Station and turn off (down) main system Power Breaker located next to the power cord connection.

(b) If you need to remove the network cable, note what location the network cable is plugged into (the network socket location in 5.0B System is different from those in 3.0 and 5.0 Systems).

(c) Remove 2 Side Covers off of Scan Station using 5/32 inch Allen key. Please note that the Side Covers can be fragile, **Do Not** grab by vent louvers.

(d) Loosen and remove the Countertop retaining screw under the Countertop. For Insight Systems this screw is a Knob, Comfort Grip 2100-0257-00 (see Figure 17.D. below), and can be removed by hand. For Platinum Systems the screws can be removed using a 3/16 inch T-handle 8 inch long ball end Allen wrench.
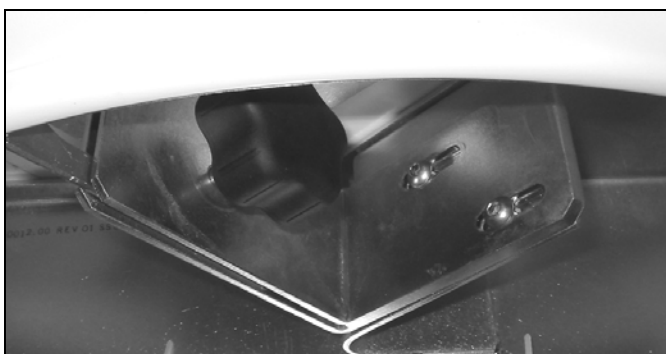
Figure 17.D. The Knob, Comfort Grip and screws, under the Counter Top

(e) Hold the handles of the Countertop, and slide it towards you (rear of system).
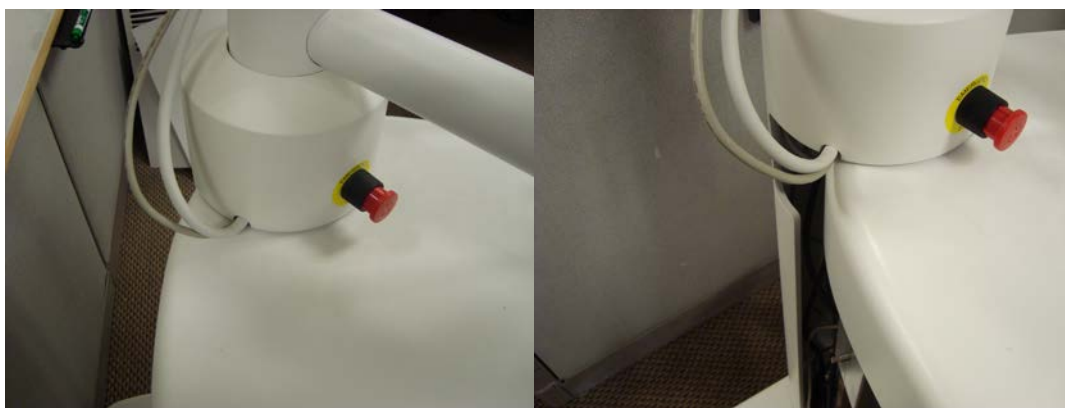
(f) Slide counter top out towards you. Rotate the Large Post clockwise to allow cables to slip out of groove in slot between Post and Countertop

Figure 17.E. The Large Post and Scanner Head Cables

(g) Disconnect probe connector using dedicate tool as shown below:
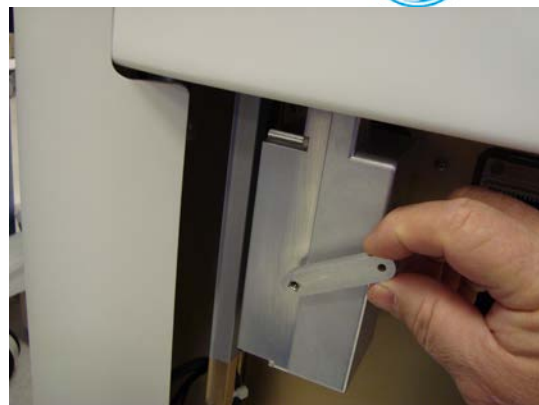
(h) To remove the probe connector, turn the tool counter clockwise to release the tension on ZIF connector
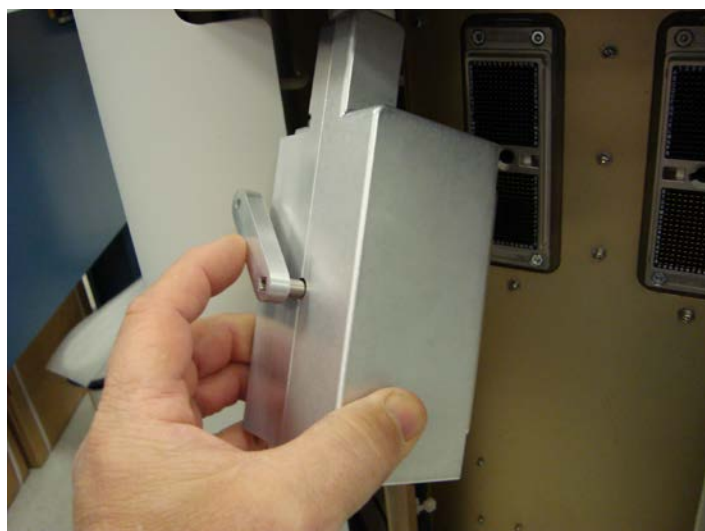
Figure 17.F. The tool and the procedure to remove the probe connector

(i) The articulated arm(s) on the system has plastic conduit raceways to enclose the cables that run from the MCU Power Supply Adapter to the Scanner Assembly as shown in Figure 17.G. below. Manually unclip the covers of the plastic conduit to release the Scanner cables as shown Figure 17.H. below.

Figure 17.G. Plastic conduit raceways to enclose the Scanner cables
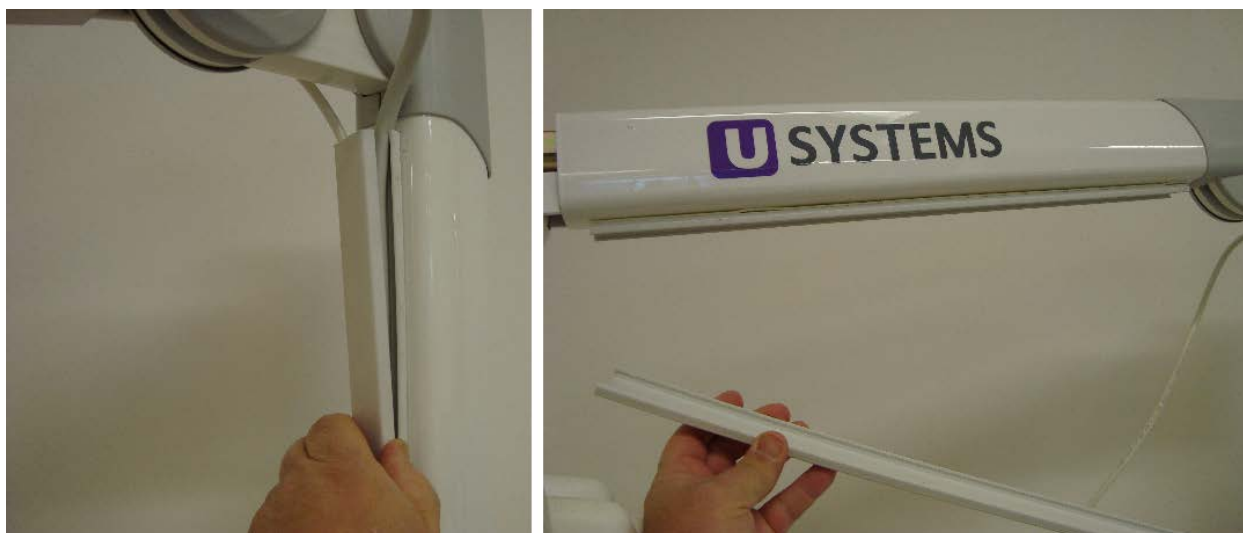
Figure 17.H. Unclip the covers of the plastic conduit to release the Scanner cables

WARNING: DO NOT RELEASE THE ARM. Continue to hold the arm with following steps as it is spring loaded and can be a hazard if it is released.

(j) Move scanner assembly onto a flat soft surface. Using a 1/16 inch Allen wrench to loosen the 2 set screws on the scanner assembly retainer collar as in Figure 17.I. below. These screws should be backed out past the surface of the collar.

Figure 17.I. The 2 set screws on the scanner assembly retainer collar

(k) While holding the articulation arm, rotate collar clockwise to separate the scanner assembly from the arm as shown in Figure 17.J. below. DO NOT RELEASE THE ARM. Continue to hold the arm as it is spring loaded and can be a hazard if it is released randomly. Move the arm down to a vertical position before you release it as shown in Figure 17.K. below (**NOTE: Secure the arm in its vertical position by wrapping masking tape or a bungee cord around it**).

Figure 17.J. Must hold the arm while separating the Scanner assembly

Figure 17.K. Articulated Arm in vertical position

(l) Re-install a Scanner assembly with the reverse order of this instruction.

17.1.4 Articulated Arm Assembly Replacement

(a) Remove the Scanner as described in 17.1.3

(b) Fold the Articulated Arm (2102-0005-00) to its vertical position as shown in Figure 17.K

(c) Use both hands lift the Articulated Arm from its support pole.

(d) Plug in the new Articulated Arm in to the top of the support pole

17.1.5 Remove Probe from Scanner Assembly

(a) Remove the Scanner as described as 17.1.3

(b) Remove four screws that hold on the left and right handle covers. See Figure 17.L. below.

(c) Remove four screws that hold on the clear plastic containment cover and the six screws that hold on the truss support. See Figure 17.M. below.

(d) Lift containment cover and truss to expose the probe.

2 handle cover screws located here

2 handle cover screws located here

Figure 17.L. Locations of the screws to hold the handles

4 Truss support screws located here. The other two are located on the other side

2 containment cover screws located here. The other 2 are located on the other side
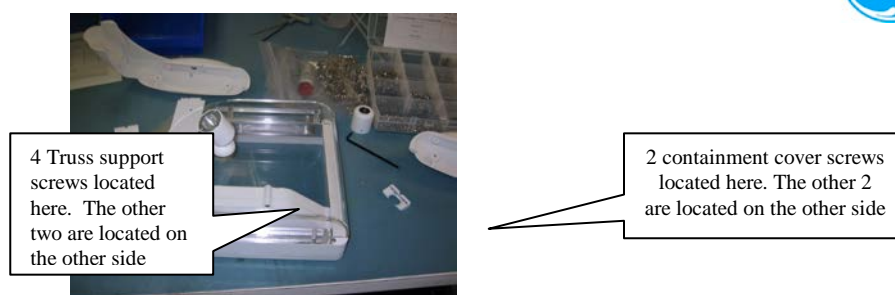
Figure 17.M. Locations of screws to hold the Scanner covers

(e) Remove the two probe screws that hold the probe to the assembly as Figure 17.N. below.

Probe screws located here
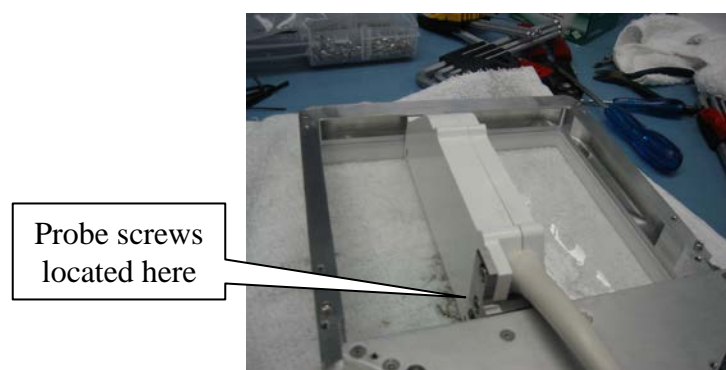
Figure 17.N. Location of screws to hold the probe

(f) Re-install a probe into Scanner assembly with reverse order of these instructions

17.1.6 Scan Station MCU Power Supply Assembly Replacement

(a) Shut down the Scan Station and turn off (down) main system breaker located at bottom of system near power cord connection.

(b) Remove both Side Covers, and remove the Knob, Comfort Grip 2100-0257-00, under the Countertop (as shown. Figure 17.O. below)
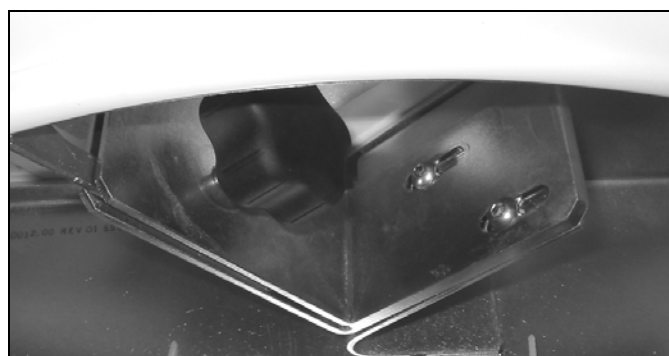
Figure 17.O. The Knob, Comfort Grip, under the Countertop

(c) Use its hadles to pull the Countertop outward fully, then lift handle, slide leftward as you face the system and then rest it on a higher position. The MCU Power Supply assembly is located under the Countertop as shown below.

USB Type B Cable
from Antares I/O

MCU Scanner
Control Cable

E-Stop Cable

Ground for
Scanner Control
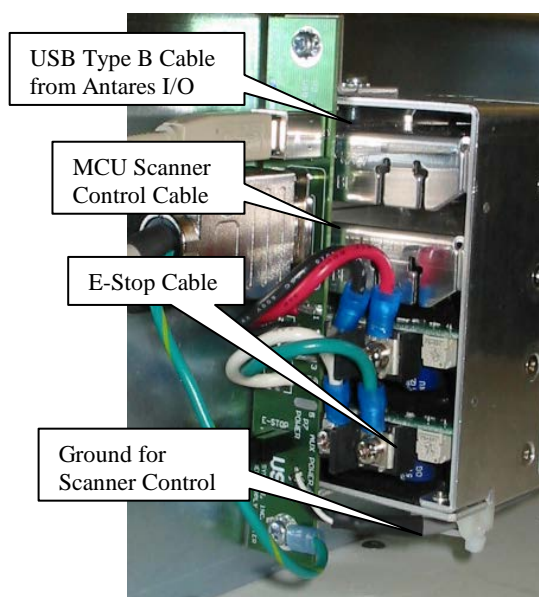
Figure 17.P. MCU Power Supply Assembly (front view1)

(d) Disconnect the USB Cable, the E-Stop Cable, the Scanner Control Cable and its ground, from the front of the MCU Power Supply Assembly.
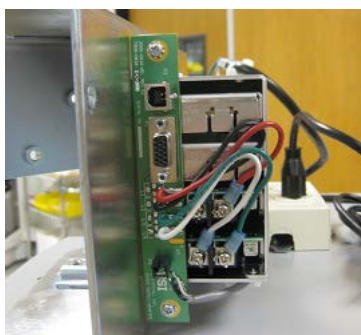
Figure 17.Q. MCU Power Supply Assembly (front view2)

(e) Loosen the screws and remove the 3 AC power wires from the rear side of the assembly (as shown in Figure 17.R. below). Be sure to note the color positions of the terminal wires before disconnecting them!
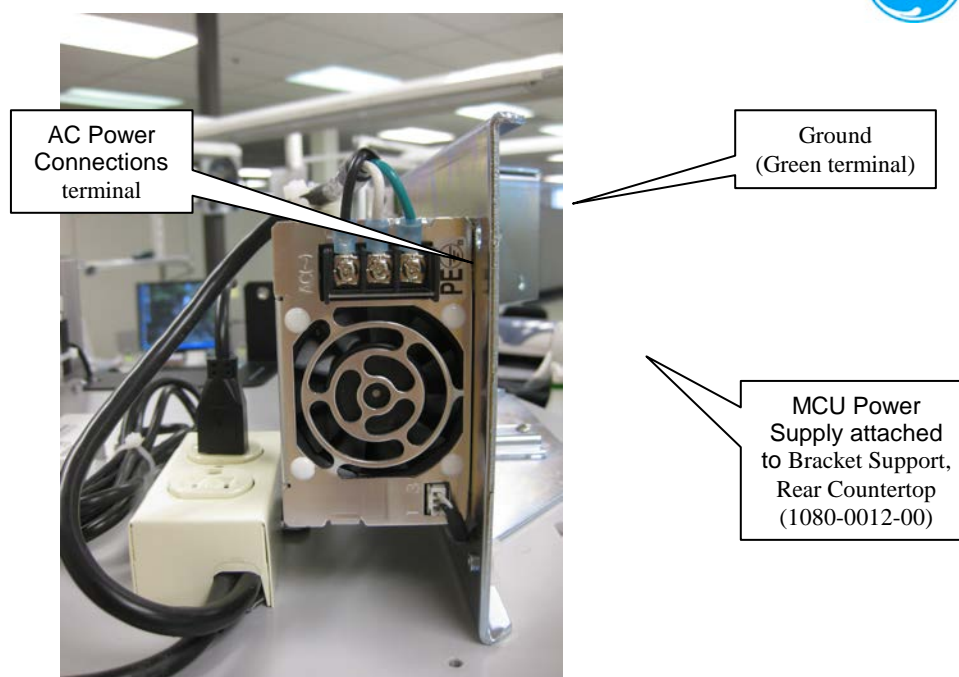
Figure 17.R. MCU Power Supply Assembly (rear view)

(f) Remove the 4 screws from the other side of the Bracket Support to detach the MCU Power Supply assembly as shown below in Figure 17.S.
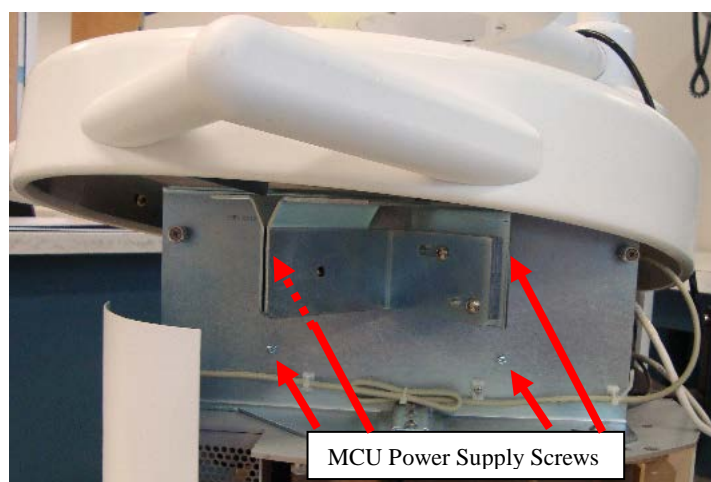
Figure 17.S. 4 Holing Screws of MCU Power Supply Assembly

(g) Reverse the order of these instructions to re-install the new MCU Power Supply assembly, and recover the Countertop.

17.1.7 Power Switch Button Replacement or Upgrade

(a) The Power Button Overview
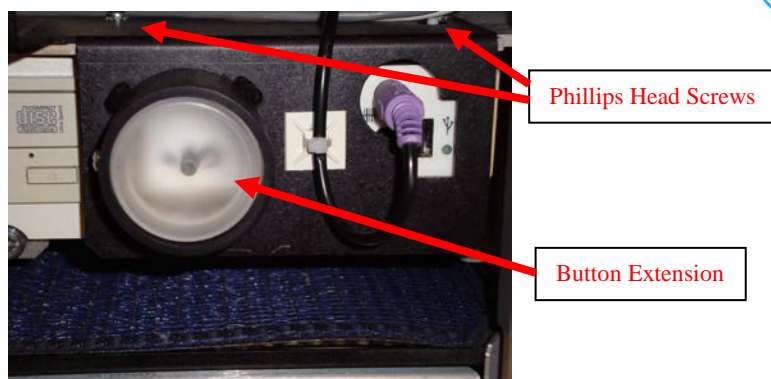
Figure 17.T. Power Switch Button Assembly

(b) Shut down the Scan Station and turn off (down) main system breaker located at bottom of system near power cord connection.

(c) Remove the Scan Station left Side Cover as described previously.

(d) Unplug the optional keyboard (purple) connector if it is present as shown in Figure 17.T. above.

(e) Remove 2 Philips head screws (PPH SEMS M4x10mm screw 1613-0004-00) from top of the power switch button assembly.

(f) Slide the power switch button assembly out and place on shelf (be careful that there is a dowel pin (1500-0043-00) and spring (1500-0042-00) assembly behind the Button Extension (see in Figure 17.U below).

(g) Glue a new spring and dowel pin together with 5 minute epoxy gel and let set for fifteen minutes before use (it is better to use the alignment tool as shown in Figure 17.U below). Only a small amount of epoxy is to be applied between the spring and dowel pin. Clean any excess epoxy before installation.

Figure 17.U. Spring - Dowel Pin Assembly and Alignment Tool

(h) Remove the 6-32x.25 PHPD SEMS 1516-0021-00 screw that holds the Button Extension (1080-0917-00) in place (see the Figure 17.V below), and remove the Button Extension.
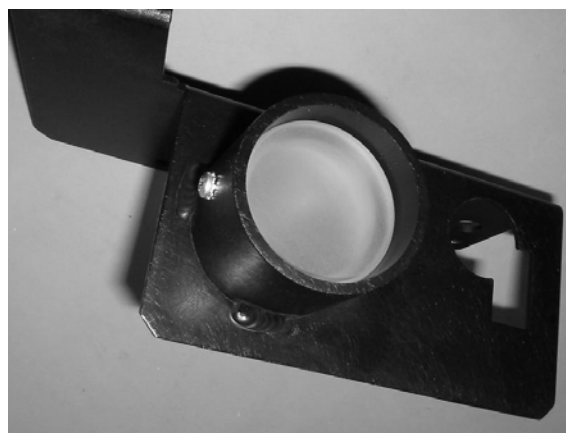
Figure 17.V. Button Extension and its Holding Screw

(i) Install spring side into the center hole of the Button Extension (as shown below).

Figure 17.W. Button Extension and Spring - Dowel Pin Assembly

(j) Install Support, EM Skin, Left 1065-0350-00 back using 2 Philips head screws from top of the power switch button assembly.

(k) Install the Button Extension with the dowel pin facing the system into the "Support, EM Skin, Left" and hold in place using the 6-32x.25 PHPD SEMS 1516-0021-00 screw as shown below in Figure 17.X

Screw holds button in

Slot towards the front,
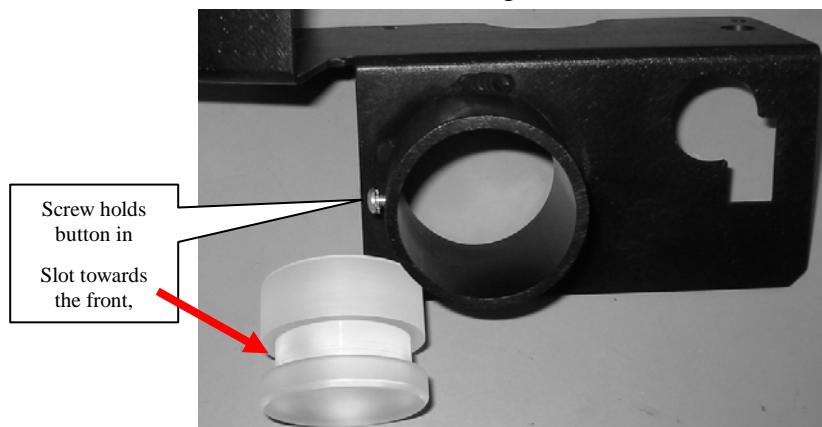
Figure 17.X. Button Extension Installation

17.1.8 Scan Station Hard Disk Drive (HDD) Replacement

(a) Shut down the Scan Station and turn off (down) main system breaker located at bottom of system near power cord connection.

(b) Remove the Scan Station left Side Cover as described previously.

(c) Remove the smaller system Air Dust Filter as shown in Figure 17.Y. below.
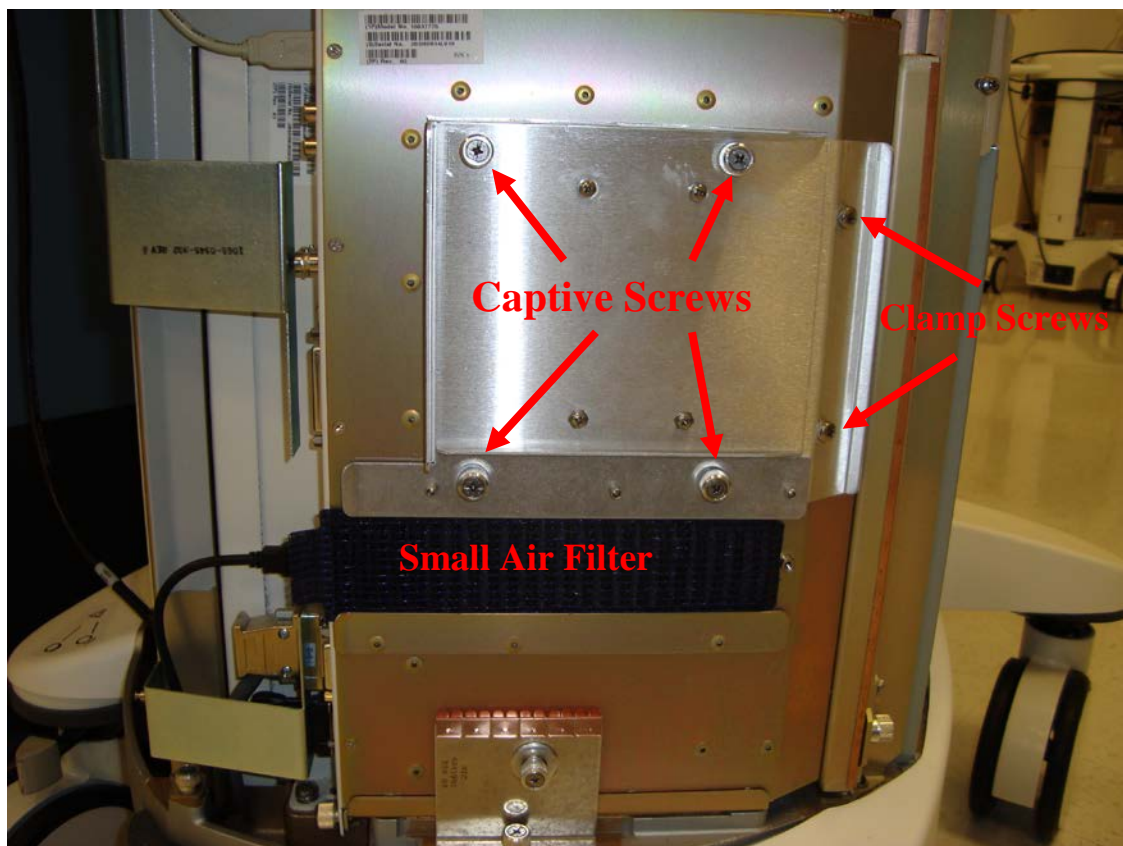
Figure 17.Y. Hard Disk Drive Cover

(d) Unscrew the 4 captive screws and loosen the 2 Philips clamp screws. Gently slide out the Hard Disk far enough that you can get access to the cable connectors. If you have difficulty sliding the Hard Disk assembly in or out of its mounting position, loosen the clamp screws more.

(e) Push on the connector retainer clips such that you can disconnect the cables from the Antares PCB as shown in Figure 17.Z. below.

(f) Replace with an appropriate Hard Disk.

(g) Reverse the order of these instructions to re-install.
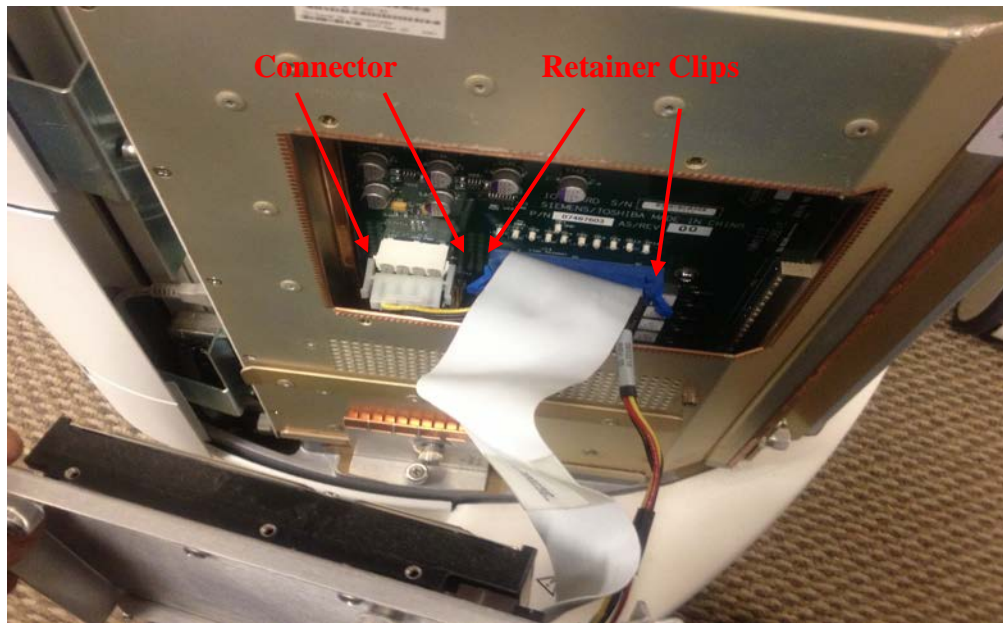
Figure 17.Z. Hard Disk Removal

17.1.9 Scan Station DVD Drive Replacement

(a) Shut down the Scan Station and turn off (down) main system breaker located at bottom of system near power cord connection.

(b) Remove the Scan Station left Side Cover as described previously.

(c) Unplug the optional keyboard (purple) connector if it is present as shown in Figure 17.AA. below.

(d) Remove 2 Philips head screws from the power switch button assembly.

(e) Slide the power switch button assembly out and place on shelf.
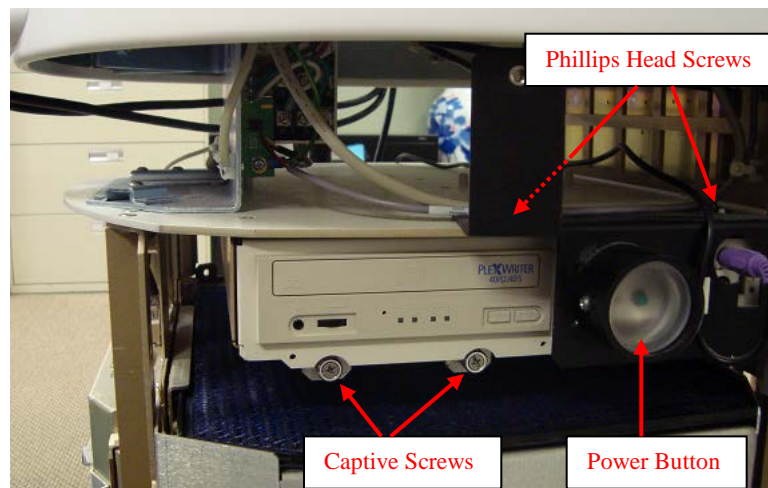
Figure 17.AA. DVD Drive Removal (front view)

(f) Remove the 2 cable/connector assemblies at the rear of the DVD Drive (see the Figure 17.BB. below). The smaller connector has 2 retainer screws locking it into

position. The larger connector has side clips that lock the
connector into position. They must be "squeezed inward to release the connector
from its locked position.
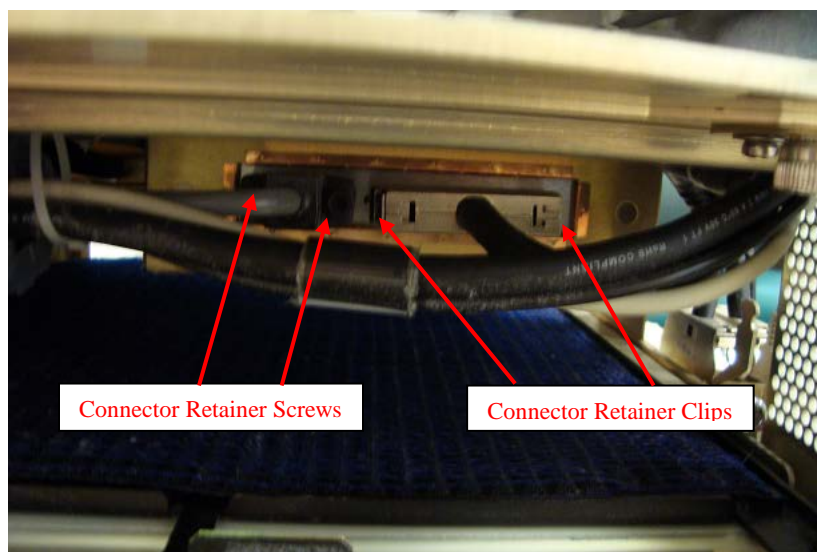
Figure 17.BB. Scan Station DVD Drive Removal (rear view)

(g) Unscrew the 2 captive screws at the front of the DVD drive and slide unit out.

(h) Reverse the order of these instructions to re-install a drive.

17.1.10   Adjusting or Replacing Motor Belt in Scanner

(a) Shut down the Scan Station and turn off (down) main system breaker located at
bottom of system near power cord connection.

(b) Remove the 2 screws that hold on the left handle covers of the Scanner as shown
in Figure 17.L in Section 17.1.5.

(c) The Motor Belt should look like below:
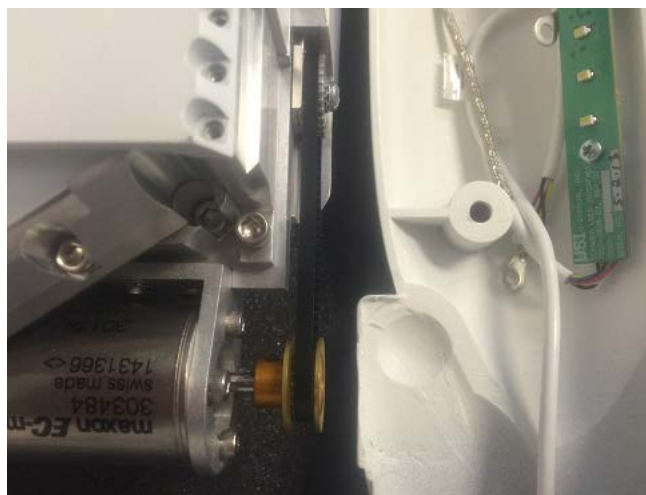
Figure 17.CC. Motor and Motor Belt in Scan Station Scanner

(d) To replace the motor belt, use finger to roll out the current belt (start from probe
shaft side) and roll in the new belt.

(e) There are 2 versions of motor belts: Gray colored (2102-0008-00) and Black colored (2012-0008-02) as shown below in Figure 17.DD. Make sure the new belt should have the right version.

Figure 17.DD. Motor Belt: Gray (2102-0008-00) and Black (2012-0008-02)

(f) To adjust the motor belt, loosen the 4 screws around the motor as shown below
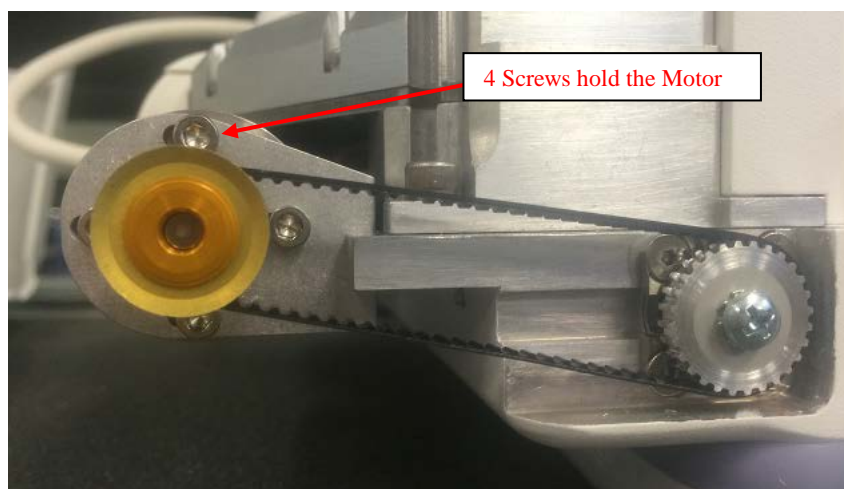
Figure 17.EE. 4 screws holding the motor

(g) Use finger to push the motor towards far-side from the probe shaft and tighten the 4 screws up.

(h) It might need several trials to check if the belt is too loose or too tight.

17.1.11   Replacing Scan Station Monitor

See the Appendix C of this document.

17.1.12   Replacing E-Stop (Emergency Stop) Kit

See the Appendix D of this document.

17.1.13 Replacing somoVIEWer Workstation PC

When it is decided to replace the Workstation, PC appropriate backups must be attempted if possible. (It may not be possible to make those backups in all cases, i.e. no boot condition or hard drive issues.)

If unable to boot, remove the Hard Drive from the Workstation that you are replacing and leave it at the site.

17.1.13.1 Backup Patient Data and Configuration, Cleaning the Hard Disk

- Log on to the Workstation as service
- Two locations must be attempted for backup System Configuration and User's Information are shown in Figure 17.FF. below. (use attachment):
- Back up to a USB Drive, suggested back up file names: "account name_config" for one file and "account name_user" for the other file
- Check with customer on the status of Patient Information. GE is not responsible for the loss of these data.
- If patient studies must be saved, use the Study Browser's EXPORT function to export all patient data to an external hard drive.
- Minimize the application.
- Use windows explorer to get to C drive.
- Open the image-data folder C:\image-data.
- Double check and make sure all the useful Patient Data are exported.
- Delete all folders in the C:\image-data folder.
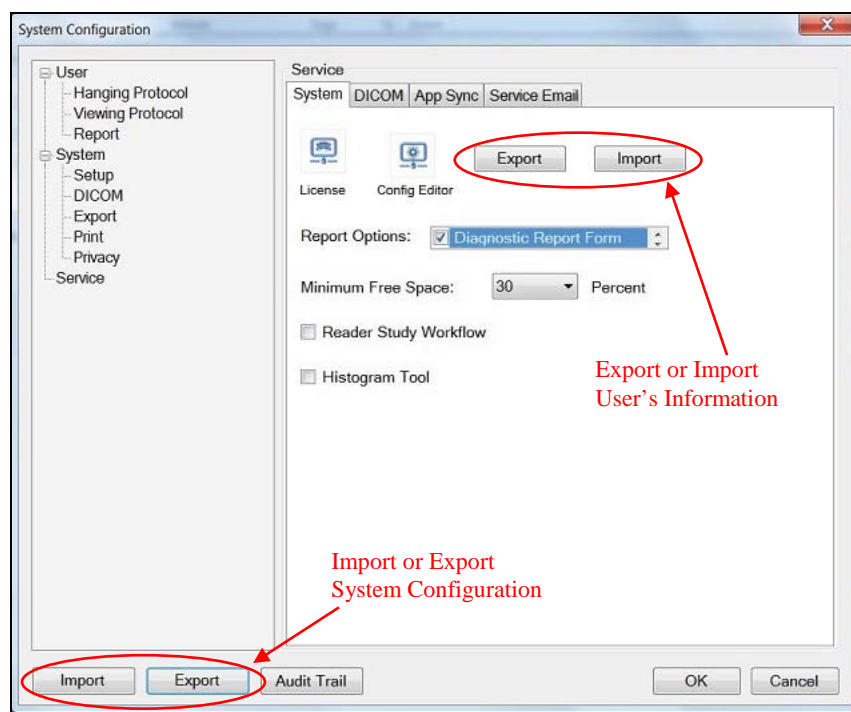
Figure 17.FF. Two locations must be attempted for backups

17.1.13.2 Replacing the Workstation PC

- Shut down the Workstation.

- Remove all cables, mouse and keyboard
- Remove the Workstation
- Replace with a new Workstation.
- Plug in cables, mouse and keyboard.
- Turn on the Workstation and log onto the application as service.
- Click on the configuration icon.
- Click on the service tab.
- Import the User and System configuration using the respective import buttons.
- Verify connectivity to the Scan Station.
- Confirm Study transferred from Scan Station to Workstation.
- Confirm PACS operation.

17.2   Software Service Procedures

17.2.1 Scan Station "SHORTCUT" Key Combination Sequences

NOTE: The keys listed below, reference keys that are located on the ABUS externally connected Keyboard.

NOTE: A Service Key Disk (or a Service Jump Drive) must be installed to use the shortcuts.

Ctrl + **Esc**

Simultaneously depressing these two keys will bring up the *WINDOWS* **"START"** popup bar, onto the ABUS Scan Station 's display monitor.

Alt + **Tab**

Simultaneously depressing these two keys will bring up a menu showing all of the active Applications that are running on the ABUS Scan Station, within the *WINDOWS* environment; and tap the Tab key will toggle across each offered.

Patient Image Folder
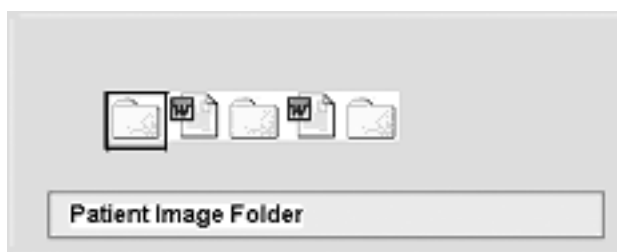
17.2.2 Accessing the Service Menu (Scan Station)

1. Touch the upper left corner of the Monitor
2. A screen will appear that asks for the password. Type in the service password.

3. The main Engineering Menu, as displayed below, will appear.

4. Note: Only those options highlighted are allowed with the Service Key Disk. Depending on the level of Key Disk (Engineering, Service, Applications, Sales) more or less buttons will be highlighted.

5. Select the desired soft-button function, as required. Descriptions of the functions of each of these service menu selections, and the required procedure for use, are discussed below.

17.2.3 SERVICE TOOLS Menu

Select the **Svc Tools** soft-button, to bring up the Service Tools menu.
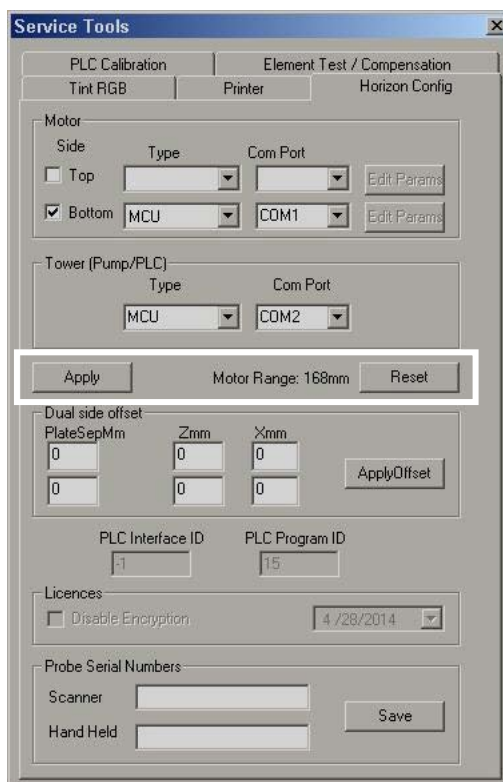
Select Horizon Config Tab (See the figure above)

   (a) The Horizon Config screen includes the 'Motor Range' measurement along with a 'Reset' and 'Apply' function.

   (b) The motor system remembers the largest transducer travel from all initialization sequences. If the current initialization falls below 98% of that travel, a detector error occurs and a *Stuck Detector* prompt appears. (This will protect from initializations that are cut short due to probe cable wrapping around the scanner arm, or other reasons that block the full track for probe to take images.)

   (c) The current value of the transducer travel limit is displayed in the Motor Range field as shown above.

   (d) Click the **Motor Range** [*Reset*] button to reset this value and re-initialize the motor system, allowing the initialization to complete without error for a shorter travel range.

   (e) For Scan Station with MCU system, the "Motor" and "Tower" sections must set same as the figure above

17.2.4   "View Log" or "Clear Log" Buttons

   Display or Clear the log for Scanner Status Report

17.2.5   "Ship To View Station" Button
   Toggle the settings between the data shipping to DICOM (somoVIEW Workstation) or to View Station (needs to reboot the system in order to activate the changes)

17.2.6   "Save Config" Button
   Save all the user's configurations to a group of files, including Hospital Name, Department Name, Operator's Name, system IP addresses, to a USB drive

17.2.7   "Restore Config" Button
   Restore all the user's configurations from a group of files saved in a USB drive, including Hospital Name, Department Name, Operator's Name, system IP addresses. The system SW will ask the user if each and every individual setting is to be restored

17.2.8   "Test Key Disk" Button
   Check and test what kind of Access Key Disk (or Access Jump Drive) is connected

17.2.9   "To Speed 1450" Button
   Toggle the program settings of ultrasound speed between 1540m/s and 1450m/s for phantom imaging collections (needs to reboot the system in order to activate the changes)

17.2.10   "Set PMA" Button
   Toggle the Clinical Purposes of the ABUS system between PMA and 510K (must be authorized to change!)

17.2.11   "Set Platinum" Button
   Toggle the disposition and configurations of the ABUS system between Platinum and Insight (must be authorized to change!)

17.2.12 "Dump Log" Button

Dump the system running information log to saved files to folder "E:/USI/Data/Log"

17.2.13 "Exit USI-2000" Button

Exit the USI Ultrasound Application SW and display the desktop window.

17.2.14 "Close" Button

Close the current "Engineering Manu" window

17.2.15 "Antares Svc" Button

Exit the USI Ultrasound Application SW and bring out the Antares Service window

17.2.16 "Enable Clinical Data Collection" Button

This button is not relevant to the available Service Work. Service personnel should NOT touch it!

17.3 ABUS Lock-up After Touchscreen USB Moved

NOTE: Steps to follow if ABUS will not boot up and hangs up on a blue screen after moving the Monitor USB control cable to another USB port. It may be caused by a corrupted Monitor Touch Screen driver file "MTSUSB.Sys".

(a) Power down the ABUS and unplug the Monitor USB cable from the I/O module.
(b) Insure you have an external keyboard connected to the system.
(c) Power up and Install a service disk or service jump drive on the ABUS.
(d) At the message "Do you want to start the system" select No to go to Desktop.
(e) Use the procedure in Appendix I. to access mouse cursor.
(f) Select the Windows Explorer Icon and select the C: drive.
(g) Find the MTSUSB.Sys file in the C:\Winnt\System32\Drivers directory
(h) Delete the "MTSUSB.Sys" file. (This file will be created from a backup directory after the system is rebooted).
(i) Plug in the Monitor USB cable to the I/O module and reboot the system.
(j) Verify the ABUS boots up correctly and the Monitor Touch screen is operating correctly.

17.4 ABUS Scan Station Application Software Reinstallation

1. Insert a Service Key Disk (or a Service Jump Drive), touch the top-left corner of the screen to bring out the Engineering Menu
2. Before reinstall the Application SW, save Configuration files by touching the "Save Config" button in the Engineering Menu then follow the instructions (you may save files to the Service Jump Drive or any external USB drive)
3. Shut down the Scan Station and reboot it, and touch "No" at the prompt. The system will boot to Desktop window. Remove the Key Disk or Jump Drive.
4. Insert the ABUS Scan Station SW Disk (or a disk with newer version of ABUS Scan Station Software Build) into the DVD Drive and verify the E-Stop switch (Red button) is enabled (pulled out).
5. Double click on [My Computer], and double-click the DVD drive (R:).
6. Find the executable "usiSWInstall.exe" and double click on it.
7. At the Warning Screen "This software will only transfer patient exam data to a SomoViewer workstation" touch [Yes].

8. If a message "Unable to Set System Parameters" appears
touch [OK] and the system will shut down. Wait 15 - 20 seconds then power the
system back on.

9. At the prompt "Is this an Insight system?" touch [Yes] for an Insight system or [No]
for a Platinum system (P/N 5500-0500-00).
NOTE: All changes to the graphics may not be visible until the second re-boot of
the system

10. If an Insight system was selected in the previous step, a second prompt will be
displayed "Was this Insight system purchased for screening and the site trained
(Installed after September, 2012)?". Touch [Yes] for systems installed after
September 2012 and [No] for system installed prior to September 2012.

NOTE: If software is being installed in the field for service, make sure the correct
installation date of the system at the site is known. The installation date can be
obtained from SalesForce.com or by contacting U-Systems.

11. The system will boot to the USI Probe Select Screen. Remove the ABUS Scan
Station Software disk from the DVD drive.

12. Insert a Service or higher access key into the ABUS Scan Station.

13. On the keyboard select [Ctrl]+[Shift]+[E] or touch the top-left corner of the screen,
to display the Engineering menu. If prompted, enter the service password.

14. For Platinum systems (P/N 5500-0500-00) touch the [Set Platinum] button if it was
not set in the step 9. Note that all changes to the graphics may not be visible until
the second re-boot of the system.

15. If the workstation is a somoVIEWer, touch the [ShipToDICOM] button and then
OK to the prompt displayed about re-starting.

16. Touch "Restore Conifg" to load back previous Configurations after each prompt

17. Touch the [Svc Tools] button then the [Horizon Config] tab to open the "Horizon
Config" window.

18. Remove the access key

19. For Scanner HW setup (see the figure in 17.2.3):
    a. In the 'Motor' section select [Bottom] and for Type select [MCU] from 'Drop
       down' menu.
    b. Select [COM 1] for "Com Port" from the 'Drop down' menu.
    c. In the 'Tower' section select [MCU] for Type and [COM 2] for "Com Port" from
       their respective 'Drop Down' menus.

20. Select [Apply] and the Scanner Assembly will initialize. The probe in the scanner
will move to each end of the scanner then return to a central position.

21. Close any open windows.

22. Turn the system off with the Power button to allow U-Systems software to control
the power down sequence, then reboot in order for all changes to take effect.

23. One more time, power down the system then power it back up for the system to be
ready to use.

17.5 somoVIEWer Workstation Application Software Reinstallation

1   Insert somoVIEWer Installation Disc (P/N: 9505-0016-01) into the DVD drive.

2   At the **Auto Play** screen click the **Run install.exe** item.

3 An installation screen will be displayed. Make sure that there is a check mark **only** in the **somoVIEWer** item then click the **Install** button to install the application. The system may appear to be inactive for several minutes and the CD/DVD drive will eventually be accessed.

4 After installing some software packages silently (.NET, Acrobat Reader) the installation of the somoVIEWer software occurs shown by a small progress bar.

5 If the Aladdin HASP prompt appears click **OK** to continue.

6 The installation continues to install the graphics card drivers, if not installed already. On **NVIDIA Display Driver** Installation window, click **Cancel**, as this is NOT the correct setup for SW reinstallation.

7 When the software installation screen is removed, remove the somoVIEWer SW CD from the CD/DVD drive. Software installation is complete.

8 Delete all icons from the desktop other than the **Recycle Bin** and the **somoVIEWer**.

9 Double click on the icon to open somoVIEWer login window then enter Service **User Name** and **Password** to start the application.

10 Expand the **System** pane then click the Help button to open the **somoVIEWer User Manual**.

11 **Accept** the License Agreement for Adobe Reader 8.

12 Close the user manual display.

13 Click the **Log Out** button to exit somoVIEWer application.

14 Run **Adobe Acrobat 8** from the Windows **Start** menu. On the **Beyond Adobe Reader** window, check the box "**Do not show at startup**" then close the Reader's window by clicking the "x" at its top right corner.

15 On the Desktop screen, right click and move mouse to item **New**. Click **Shortcut** from the dropdown list.

16 Type in the following text to create an Internet Explorer shortcut to the web address: http://www.gotoassist.com/ph/usystems

17 Click **Next**. Change the name of the shortcut to "**GoToAssist U-Systems**", and click **Finish**.

18 Move the shortcut to the top right corner of the desktop screen.

18. SYSTEM CHECKS AFTER SERVICE COMPLETION

These checks run through a high-level system verification. The intention is to verify that the main functions of the ABUS system are operational and have not been impacted by the service performed.

Pre-Test Checks
1. Record the probe name and serial number on the ELECTRONIC SERVICE RECORD (ESR).
2. Record also the serial numbers of the ABUS System (ABUS Scan Station, somoVIEWer Workstation as well as thesoftware revisions).
3. Confirm that the Workstation is powered up.

Scan Station Mechanical Checks
1. Insure Scan Station power is 'Off' and the AC power cord is unplugged.
2. Release the footbrakes and verify that the machine can be rolled with minimum effort.
3. Set the footbrakes and verify that the machine cannot be rolled while pushing on the system.

4. Plug the power cord into the wall outlet, turn on the circuit breaker,
insure E-Stop switch is 'on' (Pulled out) and verify that the Power On Indicator lamp is on (amber).
5. Verify that momentarily pressing the Standby-Power button turns the power indicator lamp to
green.
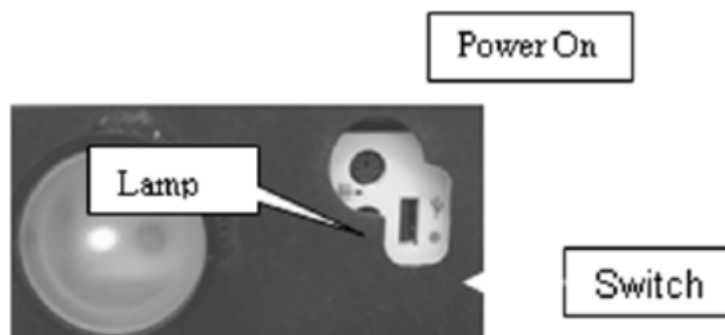
Figure 18-1. Verify Standby Power Button

6. Once the system has powered up (~7 minutes), login to the system, if applicable.
7. Press the Emergency Stop and verify that a message "Emergency Stop Pressed. Pull it out and
Press Reset to Continue" appears on the monitor within 3 seconds.
8. Pull out the E-Stop, wait approximate 10 seconds, press the [Reset] soft key and verify the
probe re-initializes.
9. Visually examine the Scanner Assembly and verify no loose or missing hardware is visible.
10. Verify set screws are present and screwed into the Scanner Ball Socket Assy.
11. Place the Scanner Assembly so that the two sections of the articulated arm are both at
approximately 45 degrees relative to the ground.
12. Inspect the Articulating Arm tension. Arm and head should stay in the location where it is
moved to. It should not 'creep.'
To adjust the arm,
    a. Use the long "Tee" handle 6mm Allen Wrench with the ball end.

Figure 18-2. 6mm Allen Wrench

    b. If the arm tends to go down, compared to the release position, rotate this wrench
clockwise.
    c. If the arm tends to go up, compared to the release position, rotate this wrench
counterclockwise.

Figure 18-3. Insertion Point for Head Arm Adjustment

13. Rotate the Scanner Arm in both directions, verify the probe cable and motor control cable are
flexible enough for Scanner's movement, and do not impede arm movement.
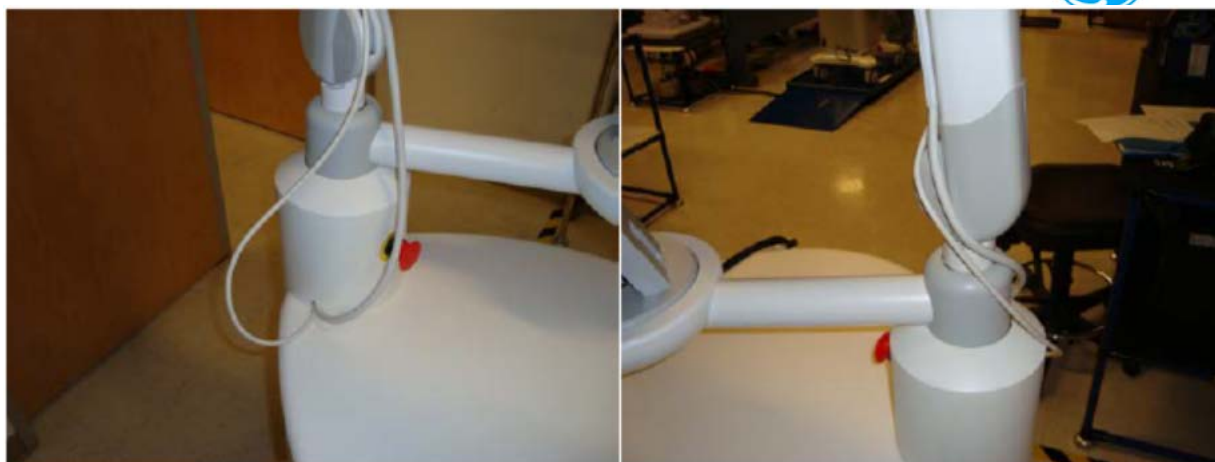
Figure 18-4. Proper Cable Length

14. Remove the membrane from the Scanner, and verify the "Membrane removed. Attach membrane to continue" message appears.
15. Re-attach the membrane and verify the message disappears.

Scan Station Power On Check

1. Perform the following test:

a. Power on system and verify it comes up to the ABUS Scan Station Main Screen within approximately < 7 minutes (appears as shown below):
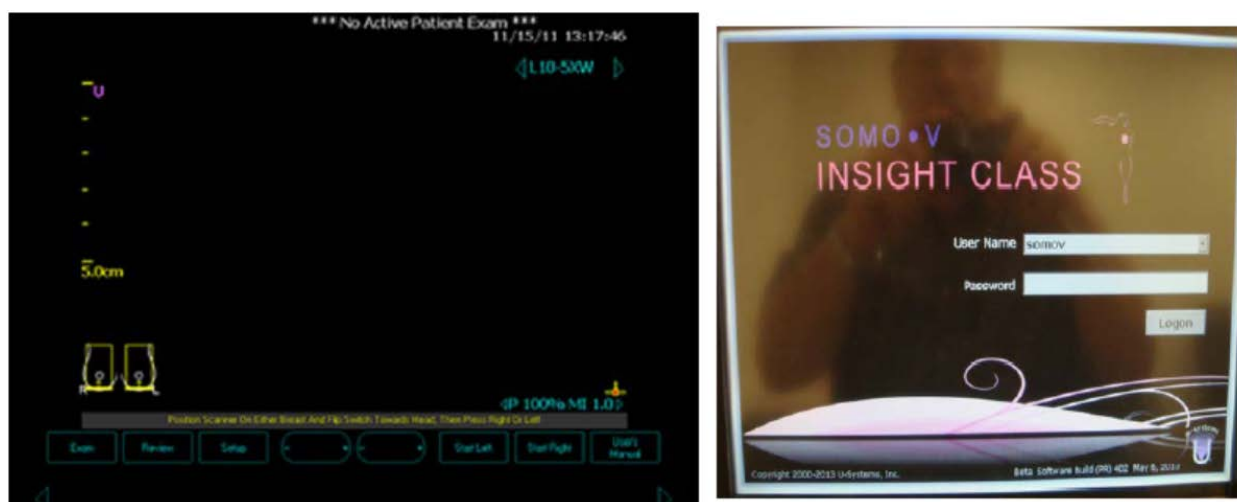
Figure 18-5. ABUS Scan Station Main Screen and Example Login Screen

b. Verify the probe initializes correctly, moving to both sides of the scanner and returning to approximately the middle.
c. If you are required to login, login as "Service".
d. Select [Exam], input a Patient Name "ServiceTest" and a Patient ID "ServiceTest".
e. Touch [Begin Exam] and verify that an image is displayed (this is the 'ready-to-scan' status)

ABUS Scan Station and somoVIEWer Workstation Communication Setup Checks

This Check assumes that the connection configurations between Scan Station and somoVIEWer Workstation have been setup correctly.

1. Verify an Ethernet Networking cable (2100-0078-00) is connecting the LAN connector (on the I/O Module of the Antares) of the Scan Station and with the somoVIEWer Workstation (through either direct connection, a LAN hub, a switch or a wall jack).

2. With both Scan Station and somoVIEWer on, verify that the
connection indicator on the Scan Station screen is green.

Figure 18-6. Network Indicator

Scan Station Setup and User Interface Checks

1. Touch the 'Patient ID' field and enter "ServiceTest" before touching [OK].
2. Touch [Begin Exam] to return to the ABUS Scan Station Main Screen.
3. Verify that when the Patient Orientation Switch on the Scanner is towards the outside of the
Scanner the orientation indicator "U" (in purple color) is on the LEFT side of the screen.
4. Verify that when the Patient Orientation switch on the Scanner is towards the center of the
Scanner the orientation indicator "U" is on the RIGHT side of the screen.

Image Scan Operation Checks

1. Use a phantom (optional) as the imaging target when doing these checks

> ⚠️ **CAUTION** If using a phantom (optional), hold the Scanner in place with just
> enough pressure to make good contact with the relevant phantom. DO NOT
> PRESS DOWN HARD!
> DAMAGE TO THE PROBE MAY OCCUR!

2. Place a small amount of lotion on top of the target object.
3. Place the Scanner Assembly carefully on top of the target object and directly over the lotion.
4. Hold the Scanner Assembly against the relevant target object with Slight compression to insure
good contact.
5. Press the [L] key on the Scanner Assembly and verify the LED's flash momentarily.
6. Confirm that the probe moves to one edge and starts scanning.
7. Verify that on completion of the scan, a Top-View of the recorded image is displayed and a
green dot (nipple marker) appears.
8. Touch the Top-View image on the screen and verify the green nipple marker changes to yellow
and moves to the touched location. Touch several locations on the Top-View image and verify that
the yellow dot moves to the newly touched location with the Scan-Type display changes
accordingly.
9. Touch the [Accept] button to save the scan. After a short delay, verify that the thumbnail of the
scan was displayed at the bottom of the screen as expected.

10. Press the [R] button on the Scanner Assembly to begin the next
scan and verify the LED's flash momentarily.
11. Touch the [Abort] soft key and verify it stops the scan and returns to the 'ready-to-scan'
display.
12. Perform a coronal scan (phantom optional) that covers the maximum image area (full
scanning range and almost full probe width). Ensure that in at least one location the full probe
width is imaged (this requires a wide contact of the probe with the target).

> *NOTE: This may require the scanner to be moved more than once against the target as
> the probe moves.*

> Confirm that there are no dead elements in the image.

> *NOTE: Check this on the workstation or you may not see lines on the scanner coronal
> image.*
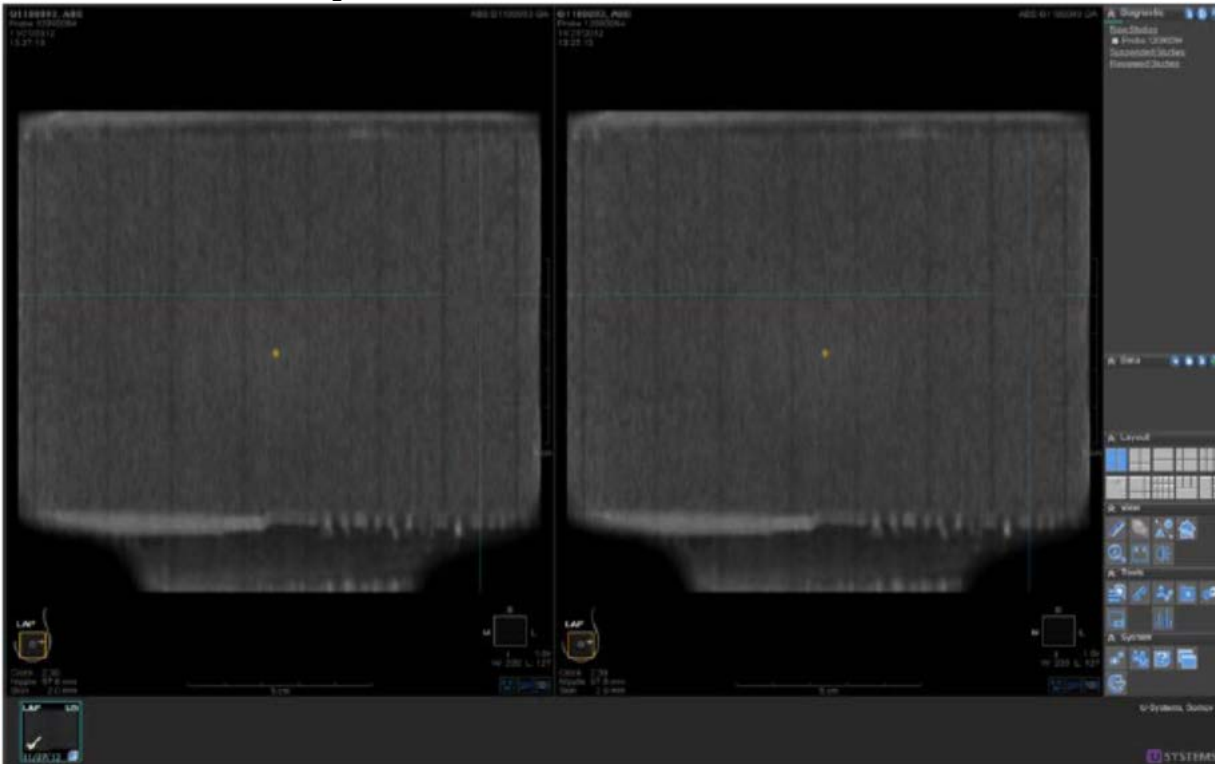
Figure 18-7. Look for Dead Elements

13. Close the Exam by touch the [Exam] soft button and then touching the [End Exam].
14. Touch the [Review] soft button to verify all the coronal views of the scanned cases are
displayed on the Image Review screen.
15. If the Image Transfer Mode at the Scan Station is set to "Off", touch the [Viewer Send] button
to transfer the scanned images to the somoVIEWer Workstation manually, and verify that there is
an amber or green dot displayed on the left of the Exam name. Wait until the indicator light turns
green (approximately 20 seconds per scan performed)
16. Touch the [Exit] button to return to the Scan Station Main Screen.
17. Go back into image review. Confirm that the image transferred to the Workstation on the Scan
Station.

Image Data Transfer Checks

1. On the somoVIEWer Workstation, verify that within a couple of minutes the transfer is
completed, and the Study with Patient Name "ServiceTest" or Patient ID "ServiceTest" is
displayed in the "New Studies" list.
2. Allow time for the images to be processed then open the study and verify that all the views were
correctly transferred and can be opened and displayed for transverse views and length for coronal
views.

3. Open the ServiceTest scan case, move the transverse view display
to the widest frame, adjust the brightness higher and verify that there are no artifacts and
repeated target images visible on both transverse view and coronal view.
4. Look for dead elements, i.e., dark lines.
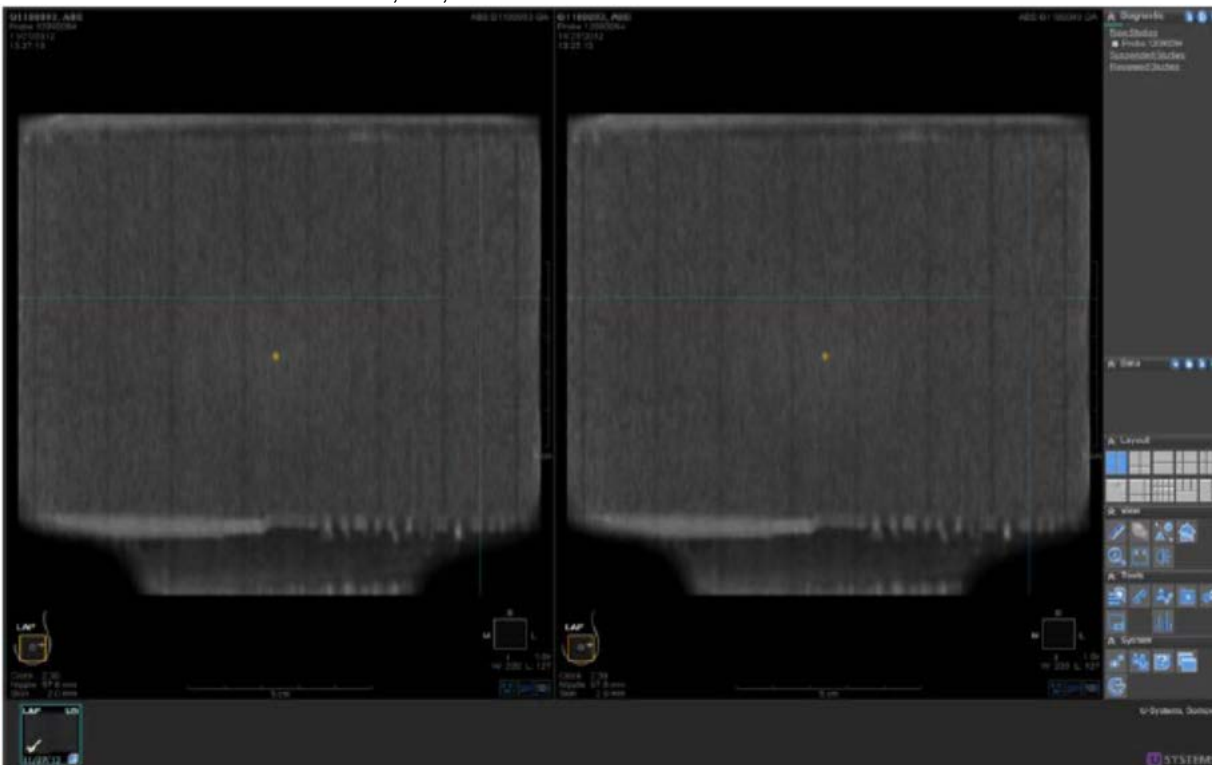
Figure 18-8. Look for Dead Elements

Probe leakage current test

⚠️ **WARNING** Energy Control and Power Lockout for Somo v ABUS.
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.
Ultrasound System components may be energized.

⚠️ **DANGER** DO NOT USE THE PROBE IF THE INSULATING MATERIAL HAS
BEEN COMPROMISED.

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

Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

Procedure on probe leakage current

The most common method of measuring probe leakage is to partly immerse the probe into a saline bath while the probe is connected to the Ultrasound system and active. This method measures the actual leakage current resulting from the transducer RF drive.
This test is also known as Patient Auxiliary Current.
1. Turn the Somo.v ABUS **OFF**:
2. Connect Safety analyzer to wall AC power outlet.
3. Set the Safety analyzer's function switch to "Chassis" or "Enclosure Leakage".
4. Set meter switches to:
   • L2 or Neutral Switch - Closed
   • Outlet Switch - Normal
5. Plug the Somo.v ABUS's power cord into the test meter.
6. Plug the Chassis Ground Probe clip (saline probe clip) into the test meter's "CHASSIS" connector.
7. Prepare the transducer for testing:
   a. Obtain a plastic tray (at least 11"x15"x1").
   b. Obtain a sponge (at least 7"x3"x1").
   c. Saturate the sponge with saline solution.
   NOTE: The Saline solution is a mixture of water and salt. The salt adds free ions to the water, making it conductive. Normal saline solution is 0.9% salt and 99.1% water. If ready-mixed saline solution is not available, a mixture of 1 quart or 1 liter water with 9 or more grams of table salt, mixed thoroughly, will substitute.
   d. Place the sponge in the plastic tray.
   e. Clip the saline probe clip to the sponge.
8. Immerse the Ultrasound Probe's probe face (imaging area of the probe) onto the saline-saturated sponge.
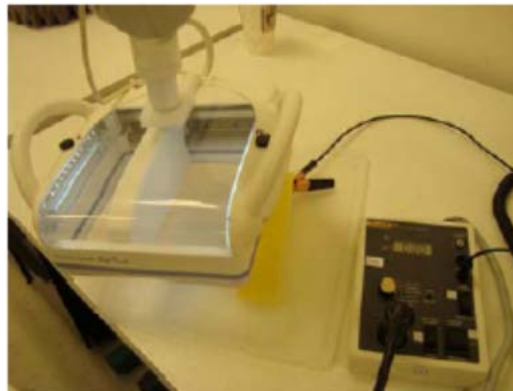
Figure 18-9. Immersing the Probe in the Saline Bath

9. Power ON the Somo.v ABUS.
   a. After the Somo.v ABUS unit has completed the boot process, create an exam. Begin the exam. DO NOT push the right or left buttons. (When you click begin exam, the probe RF is active.)
   b. Depress the MAP (lift ground) rocker switch and record the highest current reading on ESR.
   c. End the exam on the Somo.v ABUS system.
10. Turn the Somo.v ABUS **OFF**:
11. Connect Safety analyzer to wall AC power outlet.

12. Set the Safety analyzer's function switch to "Chassis" or "Enclosure Leakage".

13. Set meter to:
- • L2 or Neutral Switch - Closed
- • Outlet Switch - Reverse

14. Plug the Somo.v ABUS's power cord into the test meter.

15. Plug the Chassis Ground Probe clip (saline probe clip) into the test meter's "CHASSIS" connector.

16. Prepare the transducer for testing:
- a. Obtain a plastic tray (at least 11"x15"x1").
- b. Obtain a sponge (at least 7"x3"x1").
- c. Saturate the sponge with saline solution.
- d. Place the sponge in the plastic tray.
- e. Clip the saline probe clip to the sponge.

17. Immerse the Ultrasound Probe's probe face (imaging area of the probe) into the saline bath.
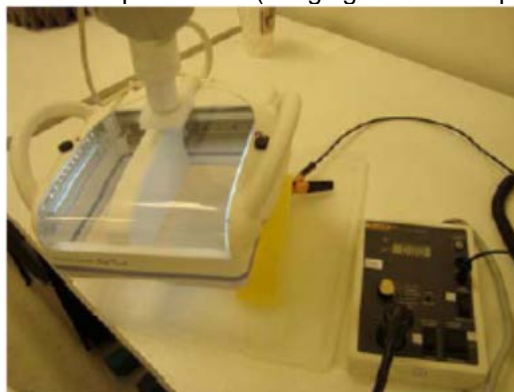
Figure 18-10. Immersing the Probe in the Saline Bath

18. Power ON the Somo.v ABUS.

a. After the Somo.v ABUS unit has completed the boot process, create an exam. Begin the exam. DO NOT push the right or left buttons. (When you click begin exam, the probe RF is active.)

b. Depress the MAP (lift ground) rocker switch and record the highest current reading on ESR.

c. End the exam on the Somo.v ABUS system.

The test passes when all readings measure less than the stated limits (refer to Table 18-2 or Table 18-3).

19. Keep a record of the results with other hard copies of maintenance data.

For each combination, the probe must be active to find the worst case condition.
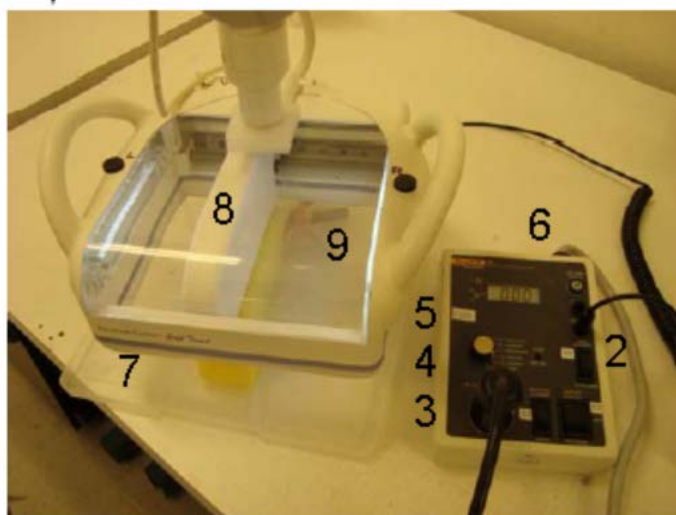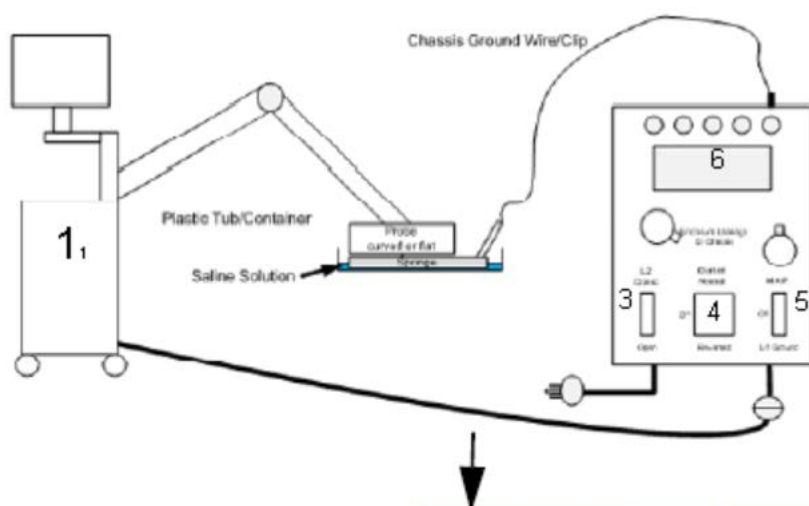
Figure 18-11. Set up for Probe Leakage Current

Table 18-1: Probe Leakage Setup

Item	Item	Itam
1) Scan Station	4) Ground Switch	7) Isolator
2) Tester	5) Polarity Reversing Switch	8) Ultrasound Probe
3) Neutral Switch	6) Meter	9) Saline Probe

NOTE: Follow manufacturer's recommendations for handling saline solution. Refer to their Material Safety Data Sheet (MSDS) for more information.
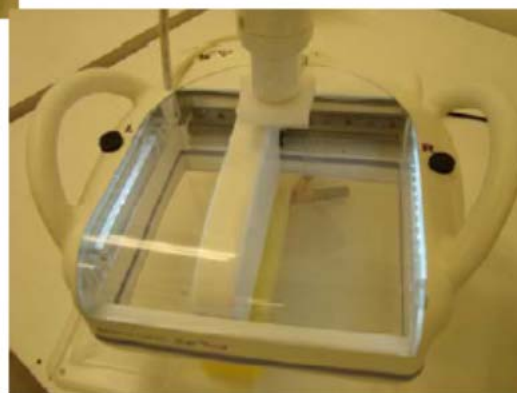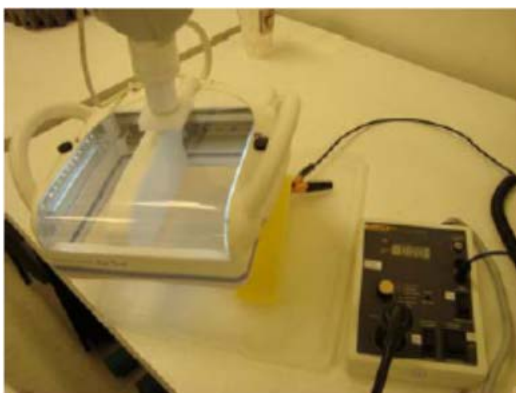
Figure 18-12. Immersing Transducer in Saline

The ultrasound probe's imaging area is immersed in the Saline solution along with a grounding probe from the test meter to complete the current path.

> NOTE: The Saline solution is a mixture of water and salt. The salt adds free ions to the water, making it conductive. Normal saline solution is 0.9% salt and 99.1% water. If ready-mixed saline solution is not available, a mixture of 1 quart or 1 liter water with 9 or more grams of table salt, mixed thoroughly, will substitute.

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

Follow the test conditions and test limits described in the Leakage Current Limits section below.

 CAUTION Equipment damage possibility. Never switch the Polarity or the status of the Neutral when the Ultrasound system is powered on. Power off the Ultrasound system, allow the stored energy to bleed down, and turn the circuit breaker off BEFORE switching the POLARITY switch and/or the NEUTRAL switch on the leakage meter to avoid possible power supply damage.

Leakage current limits

The following acceptance limits and test conditions are summarized from NFPA 99 and IEC 62353 and in some cases are lower than that specified by the standards.

In accordance with these standards, fault conditions like Reverse Polarity of the supply mains and Open Neutral are no longer required for field evaluation of leakage current. Because the main

source of leakage current is the mains supply, there are different
acceptance limits depending on the configuration of the mains (100-130, 220-240, or 230-240).

⚠️ **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.

NOTE: Open Grounding is also known as "Lift Ground"

Table 18-2: Leakage current limits for Ultrasound system operation on 100-130 Volt mains (US/Canada/Japan)

Leakage Current Test	System Power	Grounding/ PE onductor	Limit mA
Chassis/Enclosure Leakage	On and Off	Open	0.3
Type BF Applied Parts	On (transmit)	Closed	0.1
		Open	0.5
Type BF Applied Parts (sink leakage, mains voltage on applied part)	On and Off	Closed	5

Table 18-3: Leakage current limits for Ultrasound system operation on 220-240 Volt mains

Leakage Current Test	System Power	Grounding/ PE onductor	Limit mA
Chassis/Enclosure Leakage	On	Open and Closed	0.5
Type BF Applied Parts	On (transmit)	Closed	0.1
		Open	0.5
Type BF Applied Parts (sink leakage, mains voltage on applied part)	On and Off	Closed	5

Table 18-4: ISO and Mains Applied Limits*

Probe Type	Measurement
BF	5.0 mA

*ISO and 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.

Table 18-5: 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.	
Sink Leakage	The current resulting from the application of mains voltage to the applied part. This test is required for Type BF applied parts	

.

Mains on applied part

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 contacted mains voltage.

Mains on applied part is one of the described leakage current tests applicable for probes (Ref: IEC60601-1). This is to be performed with the probe disconnected from the Ultrasound system. Apply mains voltage over the insulation barrier. (Between protective earth on the probe connector, and an electrical anode in saline solution. The patient applied part of the probe is immersed into the saline solution.) Measure current flowing in the circuit. = leakage current.

As a minimum, tests according to IEC60601-1 must be performed once a year.

The symbol for BF is indicated on the probe connector label below:

Figure 18-13. Representative Example of System Label

The test passes when the reading measure less than the values in Table 18-2 or Table 18-3.

System Clean-Up
1. If the check above passed, launch the Study Explorer on the somoVIEWer Workstation, and delete all the studies with Patient Name "ServiceTest".
2. On the ABUS Scan Station, touch the [Review] soft button, then touch one Exam with Patient Name "ServiceTest" from the Exam list, and touch the [Delete Exam] button to delete all the Exams with Patient Name "ServiceTest" one by one.
3. On the ABUS Scan Station, clean the Probe and Scanner, and replace a new membrane.
4. Notify customer the system id operational.

Service Dispatch Debrief Instructions (ESR)
Please use the following verbiage to debrief service dispatches:

"Per Somo v ABUS Automated Breast Ultrasound System Service Manual (p/n 9900-0002-01, Rev 07), Equipment passed all required checks and is ready for use."

19. PART NUMBER INFORMATION

ABUS Scan Station

19.1.1 PC Boards

PART NUMBER	DESCRIPTION
7500-0836-00	PCA, Power Supply Adapter
7500-0827-00	PCA, DC Motor Driver
7500-0028-02	PCA, User Interface with Blinker
7500-0829-02	PCA, MCU Scanner Control (Arm Master)

19.1.2 Assemblies

PART NUMBER	DESCRIPTION
1700-0007-00	DC Power Supply
2110-0019-00	Mini Power Module
3500-0642-02	ASSY, MCU Module
8601-0114-01	ASSY, L10-5XW Probe,
8601-0117-01	ASSY, C14-6XW Probe,
8601-0118-01	ASSY, L14-6XW Probe,
9505-0008-00	Media (CDROM), w-ABUS Scan Station Software (Prism)
9505-0018-00	Media (CDROM), w-ABUS Scan Station Software (new)
2110-0008-01	Monitor 15" LCD Touchscreen (DELL)
2110-0008-02	Monitor, 15" NEC LCD Touch
2110-0075-00	Planar 17" Touchscreen Monitor
2100-0134-01	Barcode Reader (Option)

19.1.3 Antares Ultrasound Engine FRUs (Siemens part numbers)

MFG. PART NUMBER	DESCRIPTION
7854685	E-Module (complete)
7308450	Backend Board (BE) P2.5
7472421	Backend Board (BE) P2.61
7476810	Receive Control Board (RC) RCB/L
7466043	Receive Control Board (RC)
7476737	Receive Control Board (RC) RCB/K
7469765	Receive Control Board (RC) RCB/I
7466043	Receive Control Board (RC) RCB/G
7470490	Transmit/Receive Board (T/R) TRB/H

MFG. PART NUMBER	DESCRIPTION
7854685	E-Module (complete)
7308450	Backend Board (BE) P2.5
7472421	Backend Board (BE) P2.61
7476810	Receive Control Board (RC) RCB/L
7466043	Receive Control Board (RC)
7299444	Transmit/Receive Board (T/R) TRB/F
7854693	Realtime Manager Board, 2GB (RM)
7306041	Video Interface Board (VI)
7298289	Assy, Card Cage
7302149	Assy, Module, Input/Output (*I/O Module* - complete)
7303295	Assy, Module, XDCR Int Bd,TIB/D (*TI Interface* - complete)
7846681	**PSA** Power Supply (analog power supply)
7303659	**PSD** Power Supply (digital power supply)
7469195	PRS, Power Supply, AC Tray
7472355	Assy, Hard Disk Drive (complete)

19.1.4 Maintenance Items

PART NUMBER	DESCRIPTION
	ABUS
2303-0008-01	Lotion, Ultrasound Coupling 1.0 gal.
2303-0007-01	Lotion, Ultrasound Coupling 8.5 oz.
2303-0009-01	Protex Disinfecting Wipes
3500-0653-01	Disposable Vented Membrane (10 Pack)

19.2 View Station and somoVIEWer Assemblies

PART NUMBER	DESCRIPTION
2100-0002-03	ASSY, Breast View Station Computer
2103-0008-00	View Station Monitor, NEC 20" (Black)
2100-0134-00	Barcode Reader
2100-0073-00	Keyboard
9505-0007-00	Media (CDROM), w-ABUS Breast View Station Software
2100-0154-01	Cordless Optical Mouse, w/scroll
2110-0169-00	somoVIEWer Computer
2110-0043-00	somoVIEWer Monitor, Dell 24" LCD
9505-0016-00	Media (CDROM), w-ABUS somoVIEWer Software
9505-0016-01	Media (CDROM), w-ABUS somoVIEWer(x64) Software

APPENDIX A. ADJUSTMENT OF ARTICULATED ARM

Adjusting the first arm

- Proceed as follows to adjust the scissors' first arm:

(a) Adjusting the friction (for small corrections - Picture A below**)**

1. Close the arm scissors-arm; remove the plastic coordinator covers.

NOTE: This must be done carefully to avoid breaking the covers themselves.

2. Using an M5 hexagon wrench, loosen the dowel (**1**).

3. Using two 13 wrenches, adjust the frictioning mechanism (**2**) by rotating one of the wrenches l/4 of a turn each time.

4. When you have finished the adjustment, tighten the previously loosened dowel and reassemble the plastic covers.

(b) Adjusting the spring (Picture B below**)**

If adjustment of the friction is not enough, you can adjust the spring to optimize the balance:

1. Close the arm scissors-arm; remove the plastic coordinator covers.

NOTE: This must be done carefully to avoid breaking the covers themselves.

2. Insert an 8mm hexagon wrench (about 200mm long).

NOTE: This wrench must rotate clockwise if the arm tends to go down compared to the release position; anticlockwise if it tends to go up.

3. When you have finished the adjustment, reposition the plastic covers.

Adjusting the second arm

- Proceed as follows to adjust the scissors' second arm:

(a) Adjusting the friction (for small corrections - Picture A below**)**

1. Put the arm in a horizontal position; remove the plastic coordinator covers.

NOTE: This must be done carefully to avoid breaking the covers themselves.

2. Using an M5 hexagon wrench, loosen the dowel (**1**).

3. Using two 13 wrenches, adjust the frictioning mechanism (**2**) by rotating one of the wrenches l/4 of a turn each time.

4. When you have finished the adjustment, tighten the previously loosened dowel and reassemble the plastic covers.

(b) Adjusting the spring (Picture B below**)**

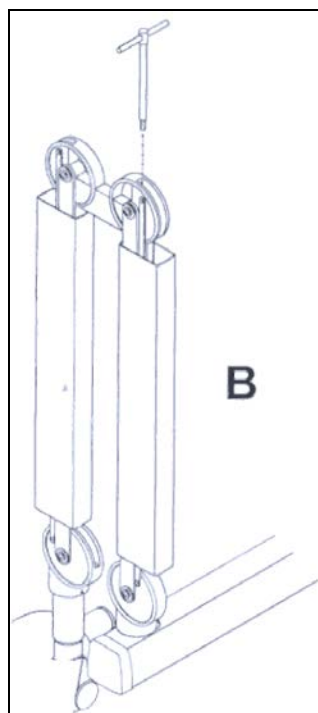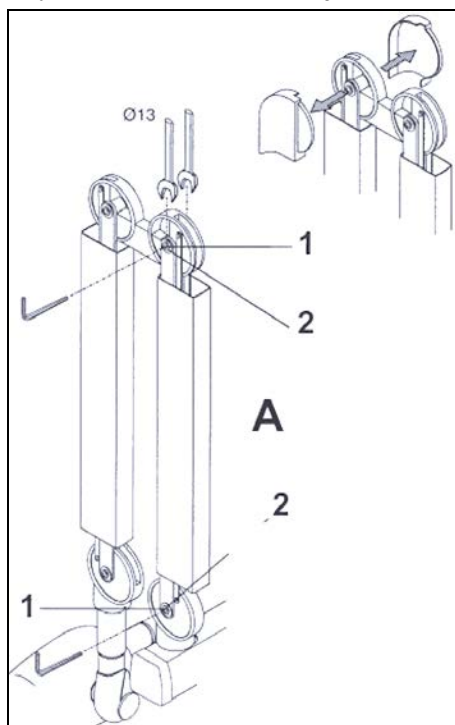If adjustment of the friction is not enough, you can adjust the spring to optimize the balance:

1. Put the arm in a horizontal position; remove the plastic coordinator covers.

NOTE: This must be done carefully to avoid breaking the covers themselves.

2. Insert an 8mm hexagon wrench (about 200mm long).

NOTE: This wrench must rotate clockwise if the arm tends to go down compared to the release position; anticlockwise if it tends to go up.

3. When you have finished the adjustment, reposition the plastic covers.
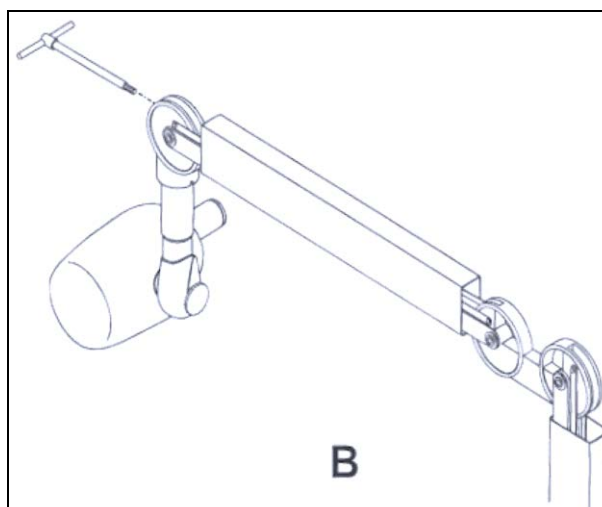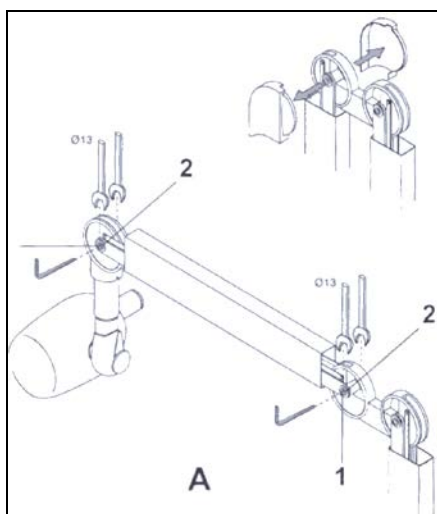
APPENDIX B. ANTARES SERVICE MENU

B1. Select **Antares Svc** soft-button from **Engineering Menu** (need Service Access Key to get this Menu, see Section 16.2.2 of this document), to bring up the following Siemens menu. This menu will allow access to the Antares Service Tests, once the password information, unique for each system, has been entered.
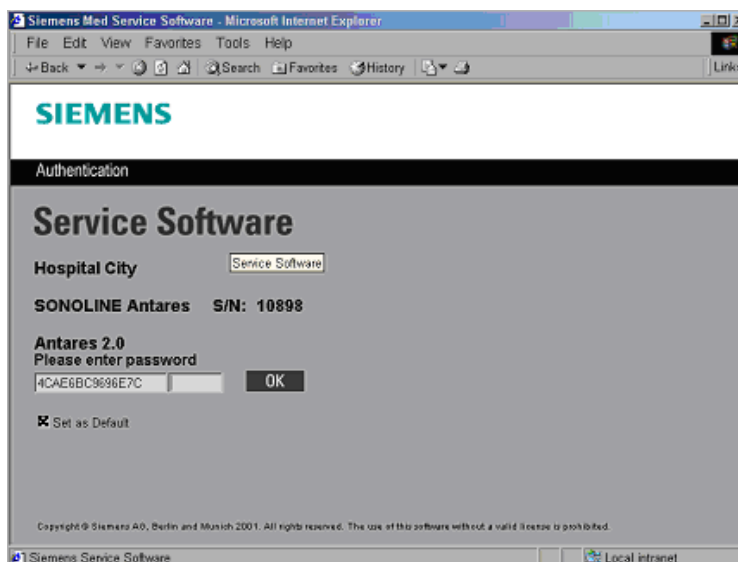
NOTE: Checking the "SET AS DEFAULT" box within this menu, will enable Service Personnel to only have to enter in the last "6" digits of the password (License Key), each time the Service Software is accessed. The system will archive the first 14 characters, to save time in reentering the password during each visit.

B2. Enter in the last 6 digits of password (License Key), and click on the 'OK' soft-button. The Service Software screen, as shown below, should be displayed.

B3. Selecting the Reports tab, will bring up the Reports Screen. The Report information that will be the most helpful for Service Personnel are shown in the illustration below.

In Report Screen, the 'License' selection under the SiteInfo heading will give the System S/N (Listed as Hardware ID), the Service Level available (If last 6 digits are entered on Main Service Screen), and the Expiration Date of the Service SW

B4. Selecting the **Configuration** soft-button, will bring up up the screen below. Select 'Licensing' to see what options are available on the HOST ultrasound system. (The ABUS uses ONLY the TEQ option)
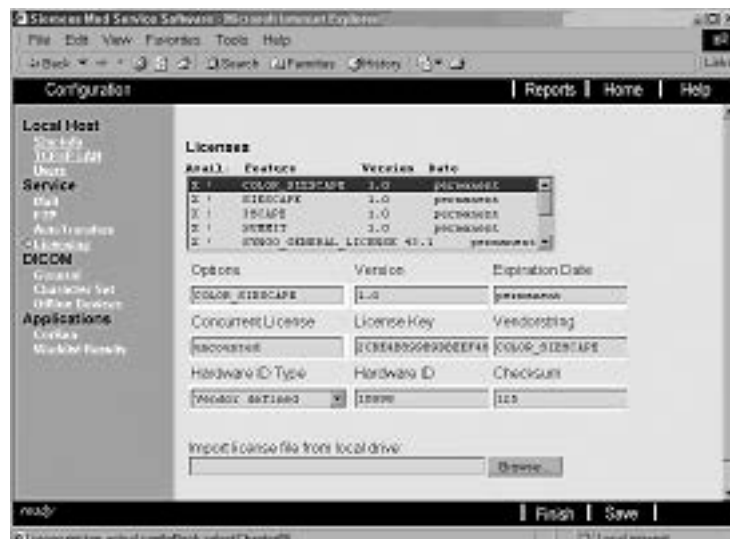
B5. Back to Report Screen, selecting the **System Configuration** soft-button, will bring up the screen below. This shows more detailed information such as SW version (Listed as DIAG version), and the P/N, S/N and Rev of the PC boards inside of the Host ultrasound system.

B6. Selecting the **Test Results** soft-button, will bring up the screen below. This selection will allow best viewing of the results of all of the available tests that have been previously performed on the Host ultrasound system.
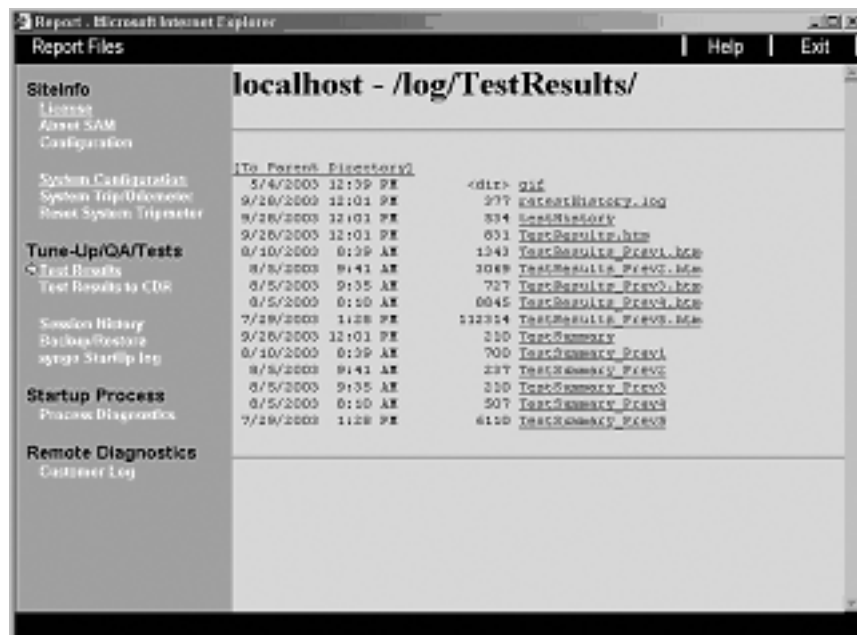
B7. Selecting the **Test Results to CDR** will allow copying of the Test Results Log to a CDR for archiving or sending to SW Engineering.

B8. Selecting the Process Diagnostics will give access to logs generated automatically by the
Antares during start-up and use.

B9. From Section B2., pressing the Test Tools button on the Antares Service Main screen brings
up the screen below. Selecting each of the Test Options individually will only run the tests
for that Module.

EM   Electronics Module
TI   Transducer Interface
CP   Control Panel (Not used in ABUS)
PwrSply   Read out of Power Supply voltages
Physio   Physio Panel (Not used in ABUS)
Advanced Allows individual testing of selected portions of the above modules as shown in
                following screen.

Selecting the [**Advanced**] button on the Test Tools screen brings up the following screen. This allows the Service Engineer to select a specific test.
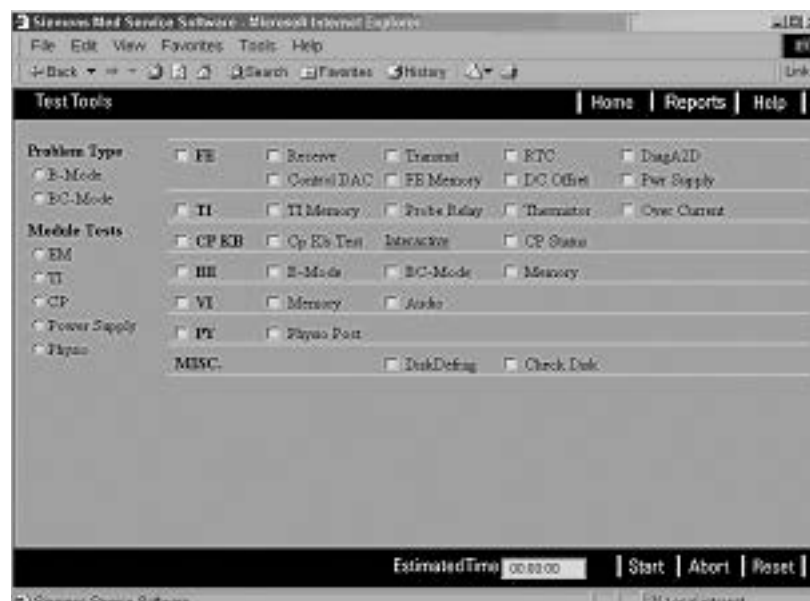
B10. Pressing the TuneUp button on the Antares Service Main screen brings up the screen below. The only Calibration Function that should be selected by a Service Engineer is the [Monitor Patterns] choice. This gives options for selecting various Monitor graphics for aligning of monitor.

APPENDIX C. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

This Appendix is the procedure to replace current Scan Station monitor with a Planar Monitor (part number: 2110-0075-00). The Appendix also lists and describes both NEC and Hyundai monitor replacement procedures.

SUGGESTED TOOLS:

- Keyboard and mouse
- Field Service hand tools (typical)

PLANAR MONITOR REPLACEMENT KIT

- ABUS Scan Station Monitor Upgrade Kit -- Part Number: 3500-0689-00.
- Optional -- as needed MCU 3 Module Power Supply 3500-0678-00   ***see note below**

The ABUS Scan Station Monitor Upgrade Kit includes the following parts:

Monitor being replaced ----->		NEC	Hyundai w/ MCU PS - 2 Module	Hyundai w/ MCU PS - 3 Module
P/N	**Description**			
2110-0075-00	Planar Monitor	1	1	1	1
1080-1474-00	Plate, Monitor Mount	1	1	1	1
1500-0057-00	Screw	4	4	4	4
1080-0969-00	Mount Monitor Hinge	1	1	1	1
2275-0086-00	Planar Power Cable	1	Not used	1	1
2208-0001-02	Cable Ties 4" BLK	5	5	5	5
2102-0300-00	Capacitive Touch Pen	1	1	1	1
2302-0013-00	Velcro, Hook, Adh Back 1" Blk	3"	3"	3"	3"
N/A	Planar Drivers		Use drivers located on customer application disc		
N/A	USB Cable		Use cable included in Planar Monitor Box		
3500-0678-00	MCU Power Supply		**Order separately as needed, see note below**		

NOTE: MCU Power Supply is <u>NOT</u> included in the Monitor Replacement Kit. However, MCU Power Supply will be <u>needed for some Scan Stations with Hyundai Monitors and an older MCU Power Supply (PS-2 module) installed</u>. Verify the MCU Power Supply module before ordering the Monitor Replacement Kit. If necessary, order newer MCU part number: 3500-0678-00. The new version of MCU Power Supply is the PS-3 module power supply.
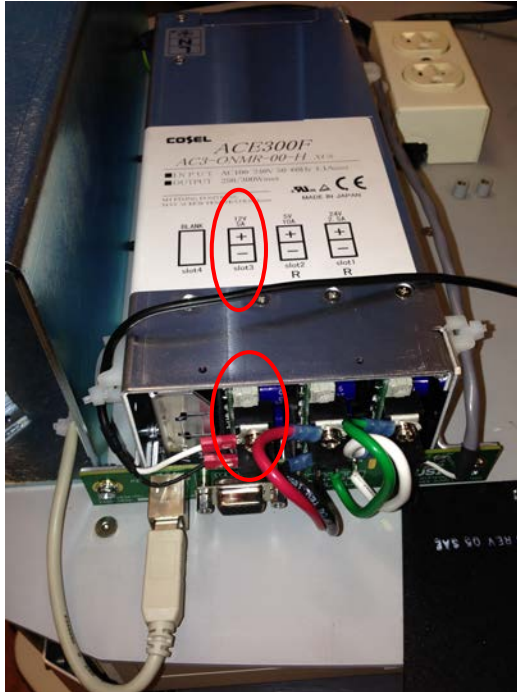
PS-3 Module MCU Power Supply	PS-2 Module MCU Power Supply

C1. Uninstall Existing Monitor Touch Screen Driver:

a) Boot up the ABUS Scan Station with Service Key plugged in
b) Touch "No" when prompt if continue to start the system
c) The system will be in the Windows desktop
d) From the bottom-left corner of the screen, touch Start->Programs->Touchkit->Uninstall
e) The old Touch Screen Driver will be uninstalled and select "Yes" to reboot the system.
f) Select "No" to the start system prompt again to have the system finished the driver uninstallation process
g) When system back to the Windows desktop, shut down the system
h) Turn off (down) main system Power Breaker, or unplug main power cord

C2. NEC Monitor Removal (for Hyundai Monitor Removal, go to Section C3)

Removing the NEC Monitor

a) Save all hardware as some of it will be reused.
b) Remove the stylus and holder from the monitor.
c) Tilt Monitor Upside Down, and remove Power and Video Cables on rear of NEC Monitor

d) Tilt Monitor Right-side up and remove 2 plate screws (top)
e) Carefully tilt monitor upside down and then remove the last 2 plate screws
f) Lay Monitor Down on Station countertop
g) Remove Ground Wire on Monitor Mount located on the hinge
h) Remove Bottom plate (3 screws) off of the bird bath
i) Cut the cable tie on the cable bundle
j) Thread the NEC Monitor USB cable up through the bird bath center hole
k) Remove monitor from the countertop

Skip to step C4

C3. Hyundai Monitor Removal:

NOTE: Verify that the system has the newer MCU Power Supply Module prior to removing the Hyundai Monitor. If Older MCU Power Supply PS-2 module is installed, you will need to order the new MCU PS-3 Module Part Number: 3500-0678-00 before attempting the monitor replacement.

Removing the Hyundai Monitor
a) Save all hardware as some of it will be reused.
b) Remove the stylus and holder from the monitor.
c) Tilt Monitor Upside Down, and remove Power, Video, and USB Cables on rear of the Hyundai Monitor as shown below:

d) Tilt Monitor Right-side up and remove 2 plate screws (see figure above)
e) Carefully tilt monitor upside down and then remove the last 2 plate screws
f) Remove the monitor

C4. Monitor Cable Assembly Instructions:

If the monitor you are replacing was a NEC monitor, use the existing 110V AC power cable that is routed already through the monitor arm to provide power to the Planar replacement monitor.

For the Hyundai monitor, the FE must remove the prior cable (wrong size power side connector for the Planar monitor), and add the correct 12V DC Power cable for the Planar monitor. The monitor arm must be partially disassembled, the following steps apply:

a) Remove the bottom plate of the bird bath (if not already removed)
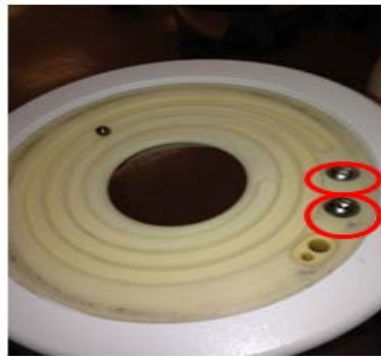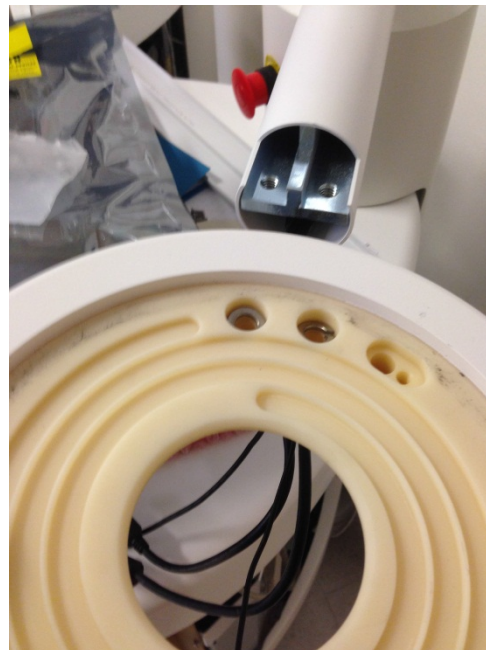
b) Remove the monitor pedestal by removing the 3 screws that are located in the gray ring

c) Remove the two bird bath screw

Do not lose the steel ball!

d) Remove the bird bath by sliding it outward

---

e) Carefully remove the tube paying attention to not damaging the cables or connectors by sliding outward

f) Cut the cable ties inside the arm support member

g) Locate the new 12V Power cable (Part Number: 2275-0086-00, included in the Monitor Replacement Kit)

h) Tape the ring terminals of the new cable to the existing Hyundai power cable. You will be using the old cable to help guide the installation of the new one.
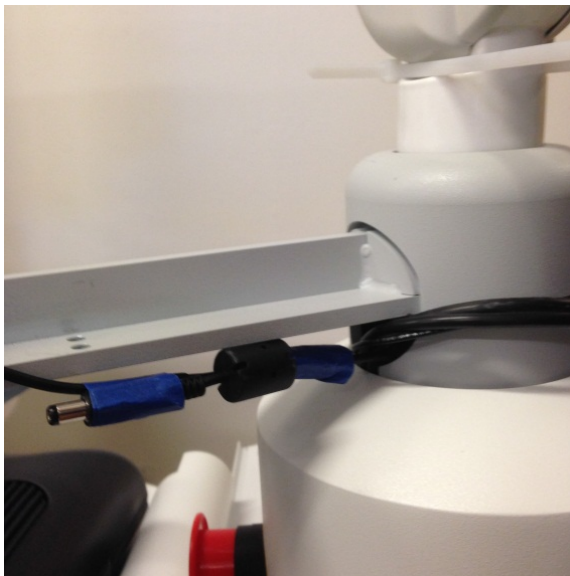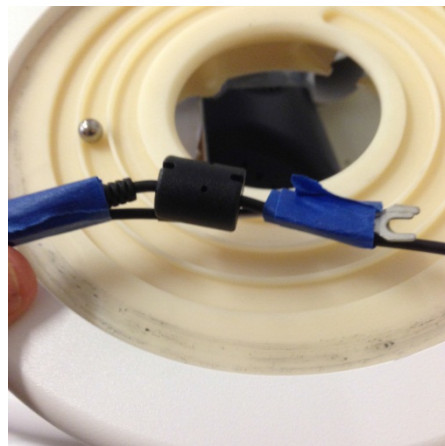
i) Carefully pull the existing power cable while guiding the new cable through the system column. Leave existing cables in place. After fishing the new cable through the column, remove the tape.

j) Remove the Hyundai monitor power supply (power module; brick style) by cutting the cable ties and removing the brick from the system. The power connector on the brick is not compatible with the Planar monitor

k) If the PS-2 Module MCU Power Supply is currently installed on the system, it must be replaced, go to section C5. MCU Power Supply Replacement Procedure. Return here after replacing the MCU Power Supply. If the existing supply is a PS-3 Module MCU power Supply, proceed to next step.

l) Connect new Planar Power Cable to the PS-3 Module MCU Power Supply. White wire gets connected to +12V and Black wire gets connected to the negative terminal of the -12V section of the MCU Power Supply as shown below:

m) Verify that connections and all internal cables are secure, and reassembly the monitor arm including adding cable ties previously cut (Section C4, Step f.)

n) Skip to Planar Monitor Installation Procedure in Section C6.

C5. MCU Power Supply Replacement Procedure

NOTE: This step is only necessary if replacing the Hyundai Monitor on units that have the old MCU Power Supply.

a) Remove Scan Station Side Covers (if not done so already)

b) Locate the MCU Power Supply:

c) From the front of MCU Assembly, remove USB, RS232, and DC power cables circled below
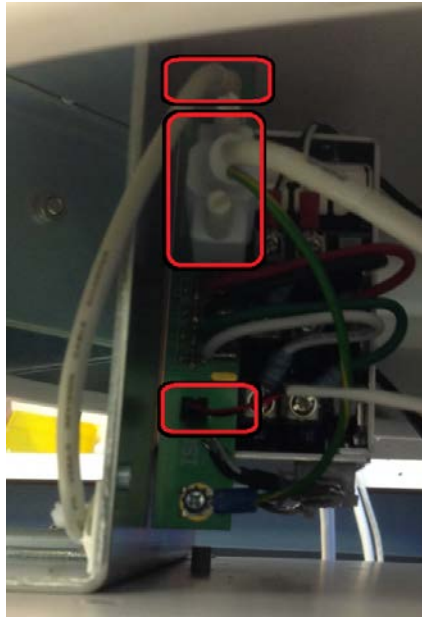
d) From the back of MCU Assembly, remove the AC connection of the MCU Power Supply (Only the circled cables from the top of the box)

e) Once all cables have been removed, remove the 4 screws that hold the power supply to the chassis.

f) Tip the MCU Power Supply to the side, and slide it back until it can be removed from the Scan Station.

g) Install the new MCU Power Supply (screw the PS back, and re-attached cables).

h) For a Hyundai Monitor replacement, install the new Monitor Power Cable -- White wire = positive terminal; Black wire = negative terminal (see step "l)" of previous Section C4.)

i) For a NEC Monitor replacement, use the existing AC power cord as the power source for the Planar Monitor.

C6. Installing the Planar Monitor:

a) Open Planar box and remove all of its contents.
b) Remove Planar factory stand (see Planar Manual included in its box)
c) Assemble the monitor plate with the monitor mount hinge using existing hardware as shown below.
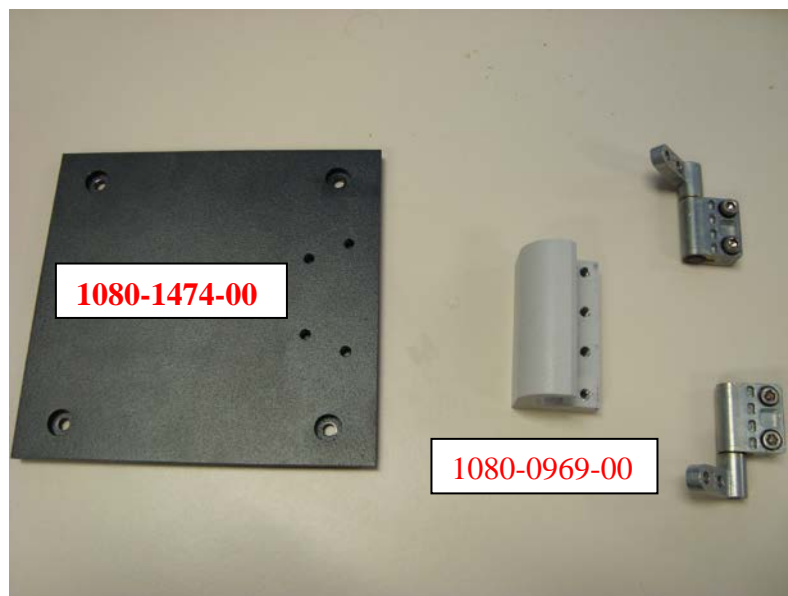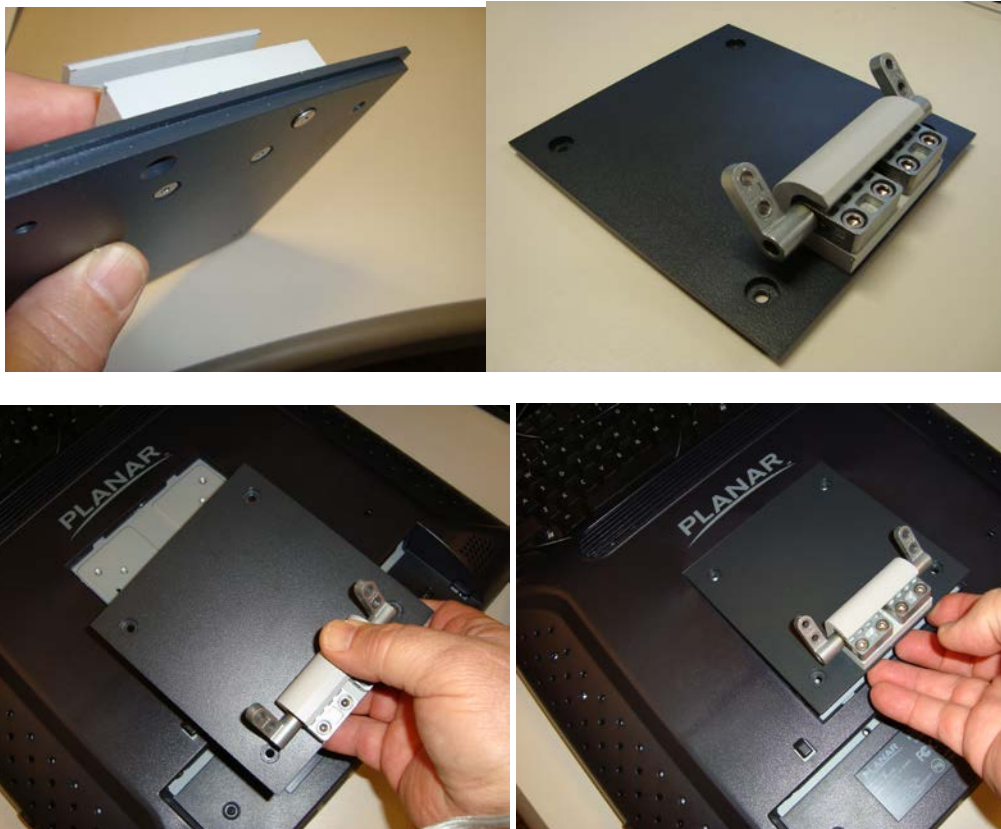
d) The orientation of the hinges should be set to approximately to the angles as shown in the pictures.

e) With the hinges set at the approximate angle shown above, the monitor assembly with back plate and hinges can be "shoe horned" into the diagonal mount and screwed into place.
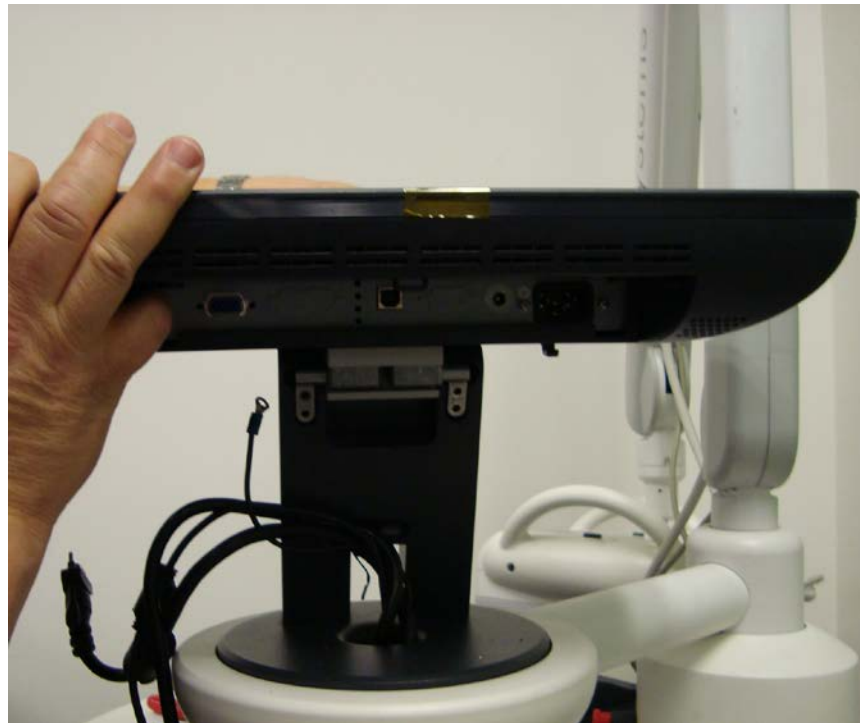
f) Install the screws into the hinges to hold the monitor in place. Remember to connect to ground wire. **NOTE:** Caution, the Planar monitor is "Top Heavy" when mounted and if not supported can fall backwards on the hinges striking the birdbath.

g) Reinstall the connectors of the Power, VGA, and the USB Cables.
If needed, add USB cable from Planar box to USB plug in lower section of bird bath (if needed, for NEC replacement)

h) Connect the AC Power cable (for NEC monitor replacement) or the DC Power cable (for Hyundai monitor replacement), Video, and USB cables to Planar Monitor

i) Using the stylus pen and holder that was removed in previous steps, thread off the old stylus and thread on new stylus (2102-0300-00) type which is specifically used on the Planar Monitor. Renew Velcro strip if needed.

j) Attach Keyboard and mouse to assist the Planar monitor Driver software.

C7. Installing the Planar Monitor Driver:

a) Power up ABUS Scan Station system with Service Key or Jump Drive connected.
b) Push monitor POWER button on side of Planar Monitor
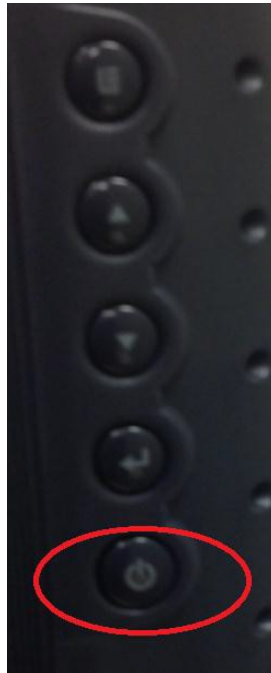
c) Push AUTO ADJUST button on Planar Monitor Menu

d) Use keyboard to toggle to "No", and press the Enter key to get into Windows
e) Driver can be found at the following location: E:\USI\DriversTouchkit_5.10.5 , if you cannot find the driver, you will need to use the system software CD (F:\USI\DriversTouchkit_5.10.5)
f) Once you open the folder, you will need to double click on "Touchscreen.exe" file

   (You may need to scroll down the screen to be able to see the Planar drive loading screen)

g) Choose the following options from the Driver Installation Application:
   --Monitor Size: **17"** -- Model Number: **PT1785P** -- Operating System: **Windows XP/2000**
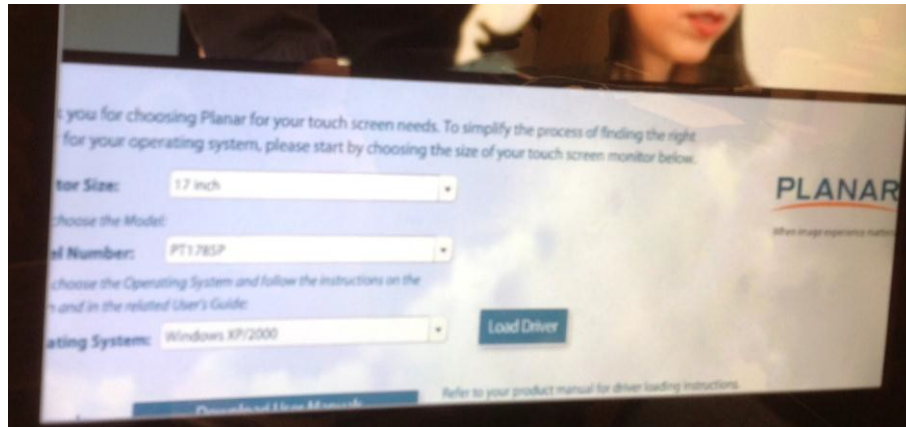
h) Select "Load Driver" button
i) "**Uncheck**" - Install PS/2 interface driver, and select "Next"
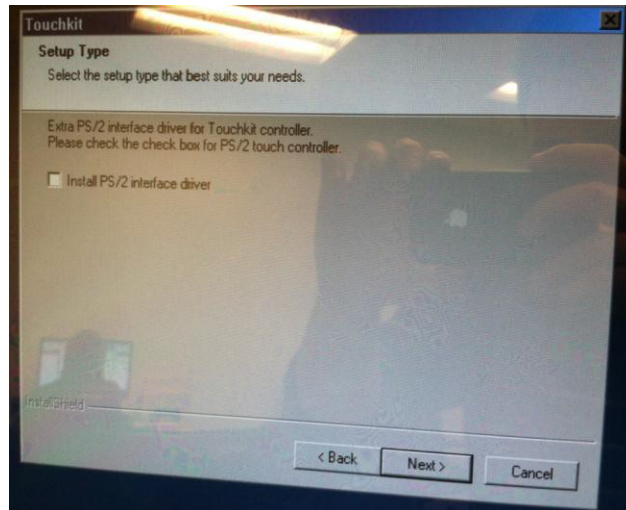
j) "**Uncheck**" - Install RS 232 interface driver, and select "Next"
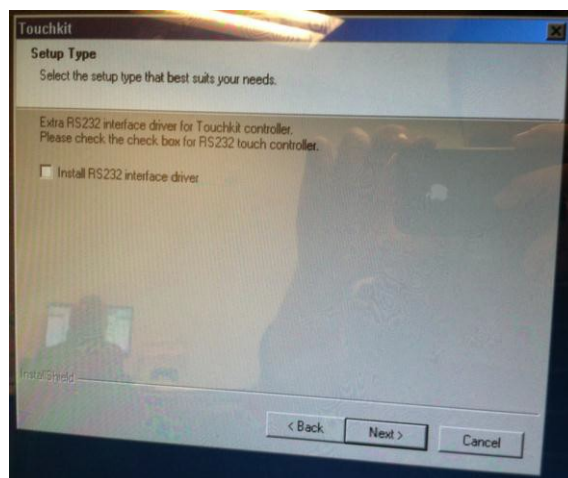
k) Select "**None**" for 4 point calibration, and select " Next"
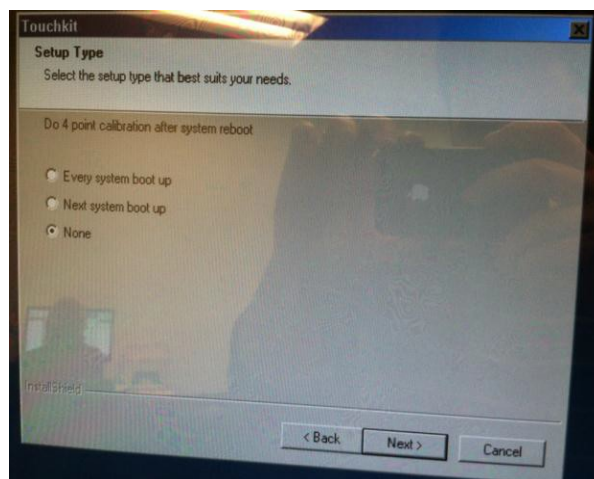
l) USB Connection – "**OK"**
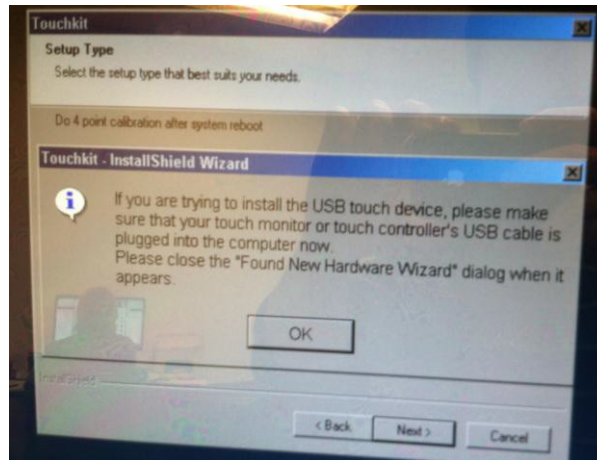
m) "**Uncheck**" - Support Multi-monitor System, and select "Next"
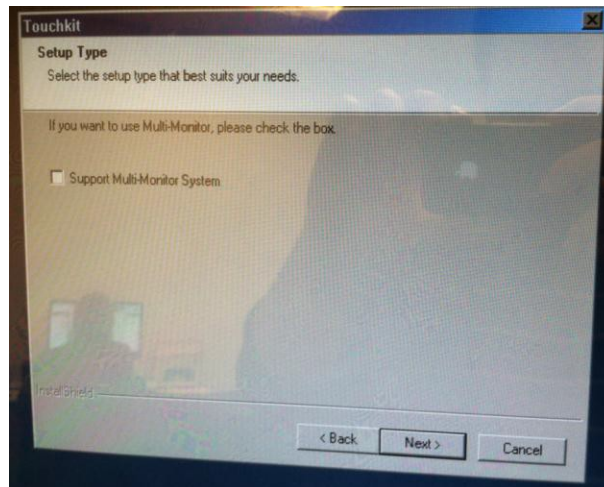
n) Select Program Folder – leave default "C:\Program\Touchkit" and select "Next"
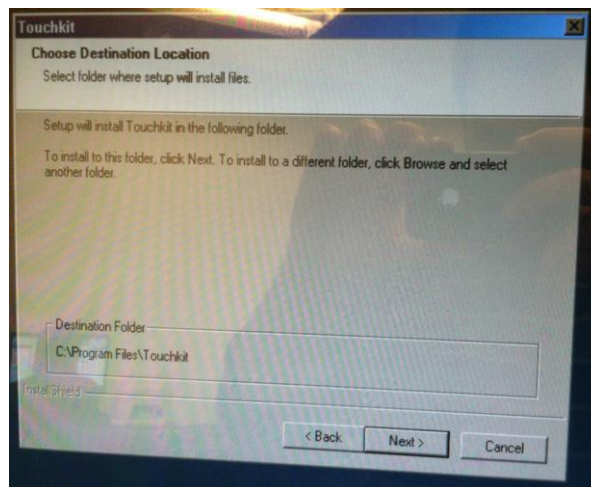
o) Select Program Folder – Select "Next"
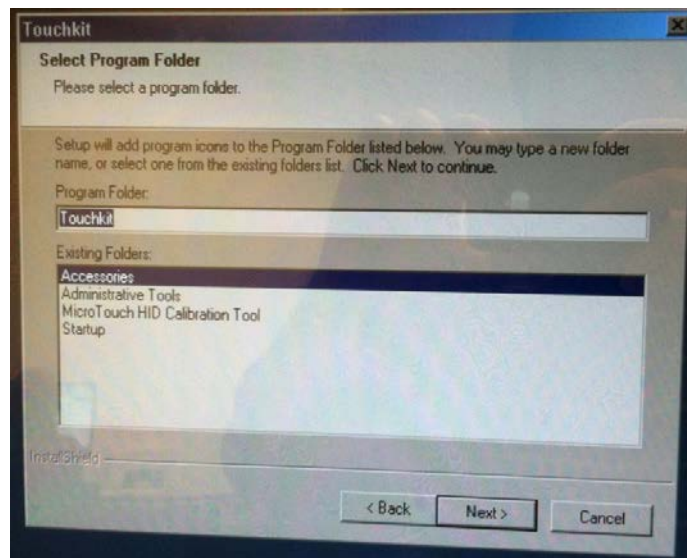
p) Create a Touchkit Utility shortcut on desktop, and select " Next"
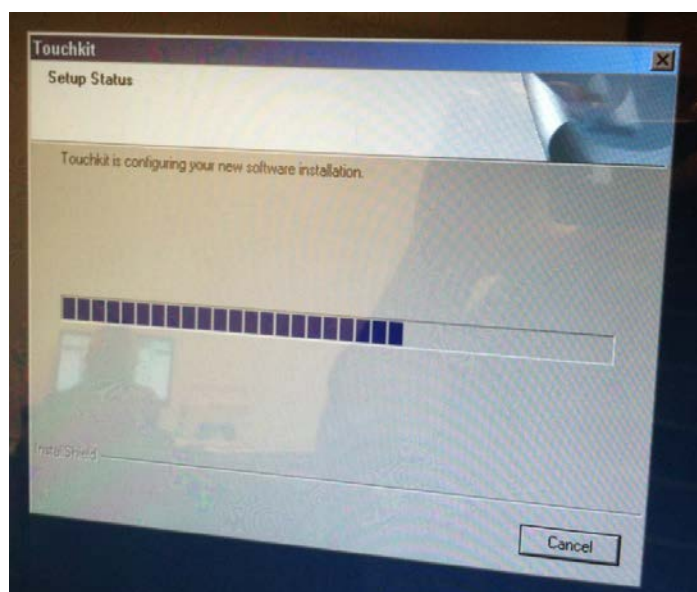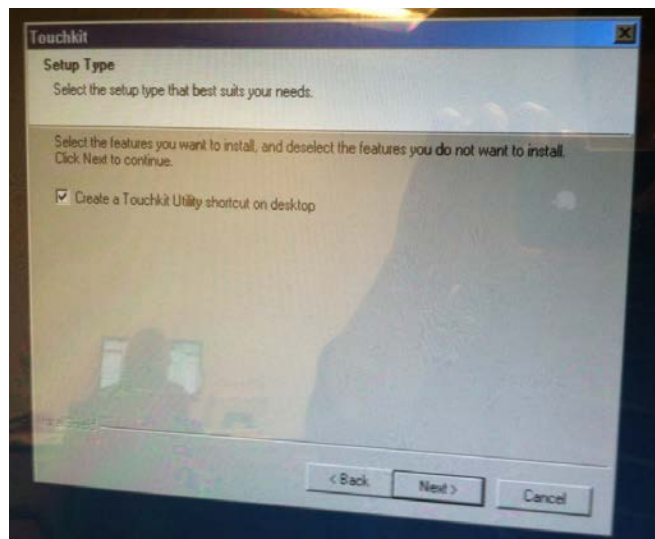
q) (This process may take a couple of minutes)

r) Once driver has been installed, perform the 4 point calibration by
   clicking on "Yes"
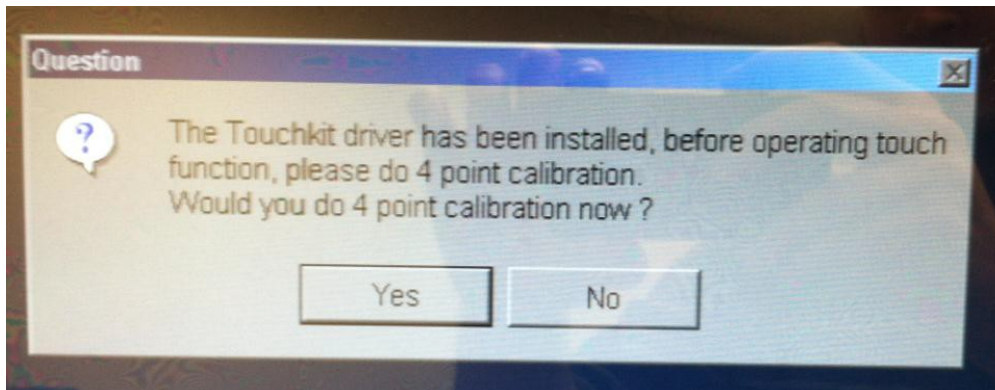
s) Touch and hold on the center of the red targets as they are displayed in each corner of the screen. You can release and move to the next point after OK is displayed.
t) Close the "Touchscreen" window that started the install.
u) Remove the USB mouse as the touch screen can now be used.
v) Double touch the [Touchkit] shortcut on the desktop and select the [Setting] tab.
w) Ensure the settings are as shown below then touch [Apply].
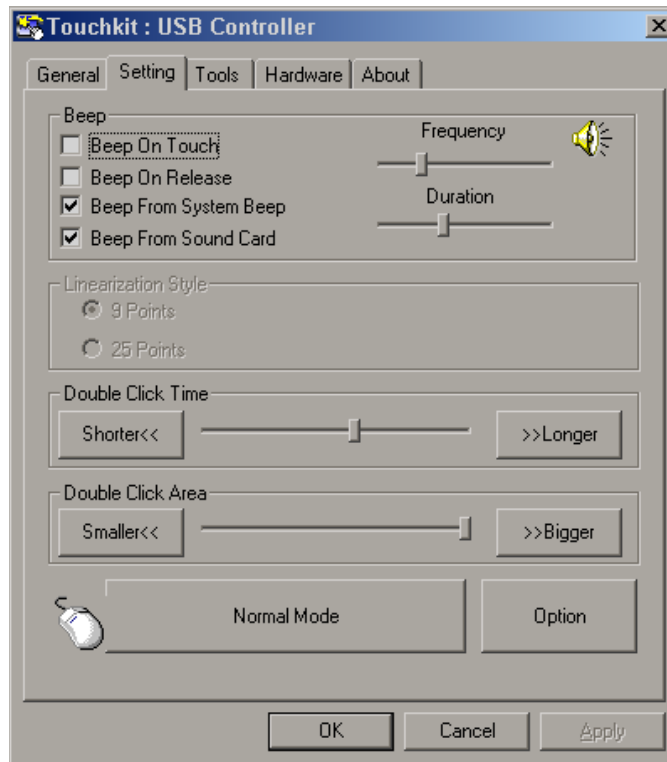
x) Touch the [Option] button and ensure the settings are as shown below. Touch the [Bigger] button then the [Smaller] before touching [OK] to save the changes.
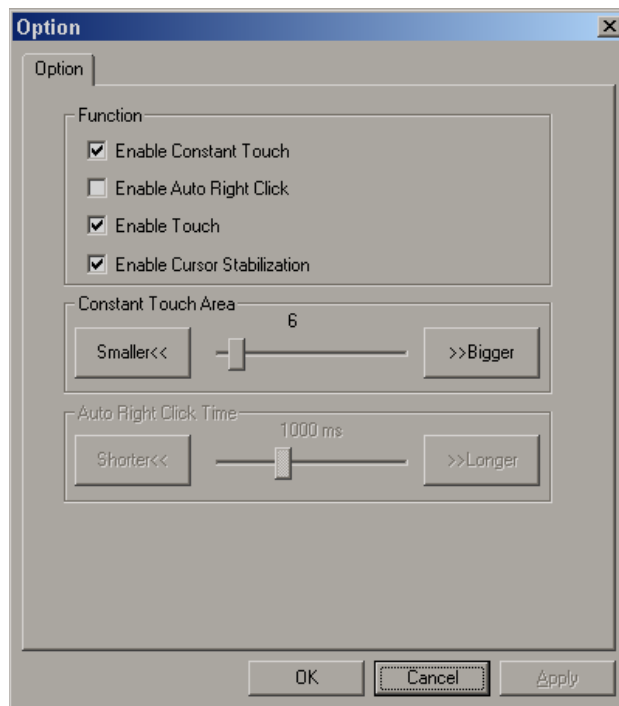
y) Touch [OK] to save the changes and exit the "Touchkit" utility.

z) Remove the ABS Software Install Disk, if used.

aa) Once calibration has been completed, turn off system

bb) Remove Keyboard, Mouse, Service Key

cc) Reboot System

dd) Perform System Functional Check

APPENDIX D. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

D1. The E-Stop Assembly looks like in Figure D.1.:
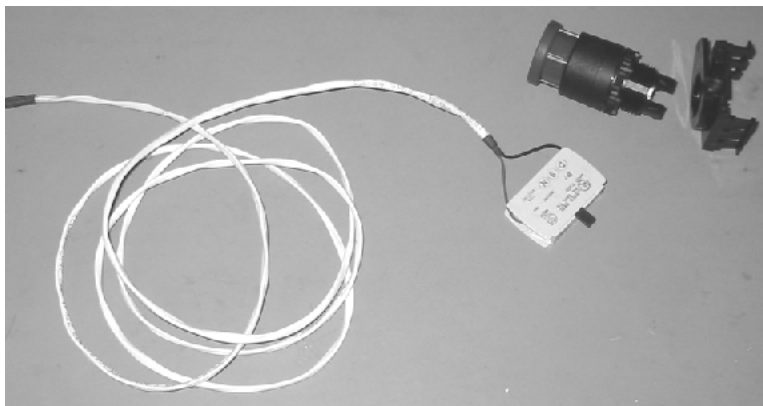
Figure D.1. E-Stop Switch Assembly

D2. Remove Scanner from Scan Station as described in 16.1.3

D3. Remove Articulated Arm as described in 16.1.4

D4. Remove Touch Screen Monitor as described in C2 or C3 and C4 of APPENDIX C. in this document

D5. After cutting the cable ties inside the arm support member as described in Step f) of APPENDIX C4., lift the T-Arm as shown in Figure D.2. below:

Figure D.2. T-Arm Assembly

D6. Pull the Countertop outward completely, and remove it from the system, the Large Post should looks like in Figure D.3. below:
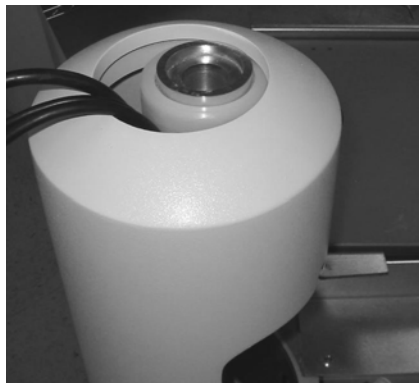
Figure D.3. Large Post
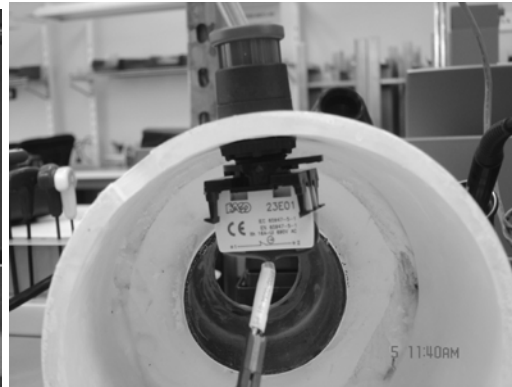
Figure D.4. E-Stop Switch in position

D7. Remove the E-Stop cable from the P5 connector of the Scanner Power Supply Adaptor as shown in Figure 16.P, if it is still connected.

D8. Slowly lift the Large Post out of the Pole Support (be careful the E-Stop Switch, the switch cable and other monitor cables), the E-Stop assembly should look like in the Figure D.4. above.

D9. Disassemble the E-Stop switch from the Large Post by unscrewing the black ring from inside wall of the Large Post, as shown in Figure D.5. below:
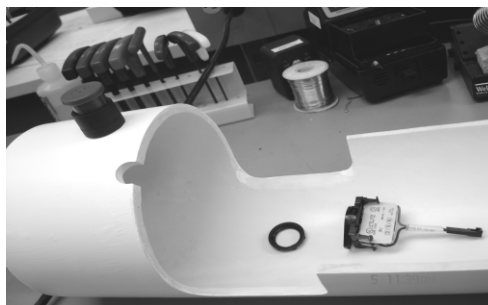
Figure D.5. E-Stop Disassembly and the Large Post

D5. Replace a new E-Stop Switch assembly, and reverse the order of these instructions to restore the Scan Station

GE Healthcare

Pre-Installation Site Survey Worksheet

SITE INFORMATION & CONTACT PERSONNEL		
Facility Name: _____		Clinic Hours: _____ AM until _____ PM ☐ M-F ☐ Other _____
Physical Address: _____		
Primary Site Contact: _____	Phone: _____	E-Mail: _____
Delivery/Install Contact: _____	Phone: _____	E-Mail: _____
IT/Network Admin Contact: _____	Phone: _____	E-Mail: _____
PACS or ABUS Image Data Storage Contact: _____	Phone: _____	E-Mail: _____
Secondary IT, Network Admin or PACS Contact: _____	Phone: _____	E-Mail: _____

INSTALLATION SCHEDULING INFORMATION

Scheduled Installation Date: _____-_____-_____	PO Number: _____	SO Number: _____
ABUS Delivery Date: _____-_____-_____	Applications Date: _____-_____-_____	ABUS "Go-Live" Date: _____
Comments: _____		

ABUS DELIVERY INSTRUCTIONS

Delivery Address (if different then Site Physical Address):		_____ _____
Is a loading dock available at the facility?	☐ Yes ☐ No If Yes, what are the hours?	_____ AM to _____ PM ☐ M-F ☐ Other _____
Will a delivery truck with a lift gate be required?	☐ Yes ☐ No Elevator Dimensions:	Size: _____ X _____ cm ☐ Freight ☐ None
What will happen to the ABUS crate after delivery?	☐ Return to GE ☐ Disposal by Customer ☐ Storage by Customer	
Site specified delivery time: _____ ☐ AM ☐ PM	Special notes: _____	

WORKFLOW DIAGRAMS – PLEASE IDENTIFY DESIRED WORKFLOW

☐ Single Site	☐ Site(s) with Multiple Workstation

Note: PACS is used for Storage only

Note: PACS is used for Storage only
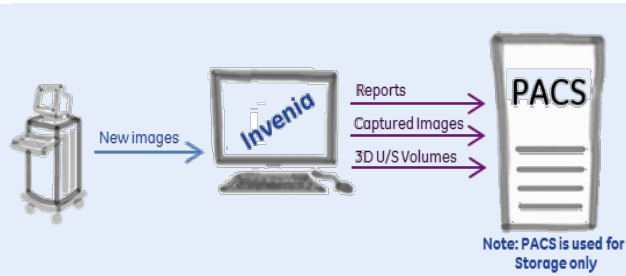
Special Notes:

_____

Special Notes:

_____

WORKFLOW DIAGRAMS, CONTINUED – PLEASE IDENTIFY DESIRED WORKFLOW

☐ Custom Workflow 1

Please diagram your desired workflow below:

☐ Custom Workflow 2

Please diagram your desired workflow below:

Special Notes:

_____

Special Notes:

_____

Please indicate the process by which prior ABUS exams will be manually retrieved or prefetched from PACS ☐
No Priors Retrieved

☐ Priors Retrieved Manually
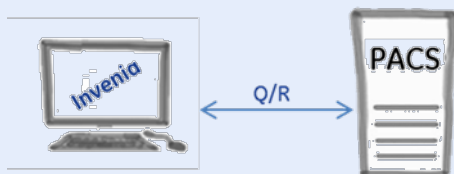
☐ Priors Prefetched Automatically
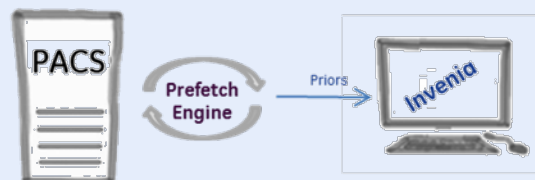
SITE LAYOUT & MINIMUM REQUIREMENTS

Do all of the ABUS scan rooms meet the minimum size requirements of 244cm x 305cm?	☐ *Yes* ☐ *No* *Size:* _____ X _____ *cm*
Do all of the ABUS scan rooms have a dedicated Power Outlet (115V, 10A *or* 230V, 5A)?	☐ *Yes* ☐ *No*
Do all of the ABUS reading rooms have desktop space to accommodate the ABUS workstation? (76cm W X 24cm D recommended for monitor, keyboard, mouse and PC tower)	☐ *Yes* ☐ *No* *Size:* _____ X _____ *cm*
Do all of the ABUS scan rooms have a dedicated Network Drop?	☐ *Yes* ☐ *No*
Do all of the ABUS reading rooms have a dedicated Network Drop?	☐ *Yes* ☐ *No*
Do all of the ABUS scan rooms have adequate air conditioning/cooling? (ABUS Scan Station is rated at approx. 2,000 BTU/hr)	☐ *Yes* ☐ *No*

Comments: _____

RADIOLOGY IT SYSTEMS INFORMATION

HIS Vendor	_____	Product Name	_____	Product Version	_____
RIS Vendor	_____	Product Name	_____	Product Version	_____
EMR Vendor	_____	Product Name	_____	Product Version	_____
Mammo WS	_____	Product Name	_____	Product Version	_____
Reporting System	_____	Product Name	_____	Product Version	_____

Comments: _____

Please print duplicate copies of this last page in order to supply separate Networking, Storage, and Modality Worklist information for each remote site. Location Name: _____

NETWORKING INFORMATION

☐ Check here to acknowledge that the ABUS System [Scan Station(s) and workstation(s)] must be operated outside of any domain

Device	Network					DICOM	
	IP address	Subnet Mask	Gateway	Internet Access	Network Speed	AE Title	Port
ScanStation 1 _____	___.___.___.___	___.___.___.___	___.___.___.___	☐ Yes ☐ No	☐ 1G ☐ 100BaseT ☐ Half ☐ Full ☐ Auto	_____	_____
ScanStation 2 _____	___.___.___.___	___.___.___.___	___.___.___.___	☐ Yes ☐ No	☐ 1G ☐ 100BaseT ☐ Half ☐ Full ☐ Auto	_____	_____
Workstation 1 _____	___.___.___.___	___.___.___.___	___.___.___.___	☐ Yes ☐ No	☐ 1G ☐ 100BaseT ☐ Half ☐ Full ☐ Auto	_____	_____
Workstation 2 _____	___.___.___.___	___.___.___.___	___.___.___.___	☐ Yes ☐ No	☐ 1G ☐ 100BaseT ☐ Half ☐ Full ☐ Auto	_____	_____

Comments: _____ DNS: ___.___.___.___

Alt DNS: ___.___.___.___

DICOM MODALITY WORKLIST

Does your facility intend to utilize a DICOM modality worklist to supply patient appointment data to ABUS?	☐ Yes ☐ No	If Yes, where does your DICOM worklist reside?	☐ HIS/RIS ☐ PACS ☐ Other
If yes, please provide the following DICOM modality worklist information:	AE Title: _____	Port: _____	IP Address: _____.____.____.____
Will a separate exam code be used for ABUS exams?	☐ Yes ☐ No	If Yes, please specify the ABUS exam code:	_____

Comments: _____

STORAGE of PATIENT IMAGE DATA

☐ Check here to indicate your acknowledgment that the ABUS workstation cannot accept compressed image data files from PACS

3D volume image data for a typical bilateral ABUS exam, consisting of 6 volumes (3 views per breast) is approximately 1GB total.

What image data do you plan to archive long-term?   ☐ Full 3D ABUS (1GB) ☐ Only select 2D images ☐ No image data will be stored

Where do you plan to archive the image data?   ☐ Data will be stored on PACS   ☐ Data will be stored on a 3rd party DICOM archive

If 3D volume image data will be stored on a 3rd party DICOM archive, or on another system, please supply additional details: _____

Can your PACS store 3D volume sets? ☐ Yes ☐ No Are files compressed during push/retrieval to/from PACS?		☐ Yes ☐ No
PACS Name: _____ Store	☐	Archive Name: _____ Store ☐
AE Title: _____ Print	☐	AE Title: _____ ☐ Print
Port: _____ IP Address: ____.____.____.____ Query/Retrieve	☐	Port: _____ IP Address: ____.____.____.____ Query/Retrieve ☐

How many complete 3D ABUS exams do you plan to push to your storage system during a typical week?   _____

This document must be signed off by the technical representative at your institution who is responsible for the completeness and accuracy of the information supplied on this document and success of the installation.

SIGN OFF:	Facility Representative Name: _____ Date: _____ Signature: _____

APPENDIX F. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

The Appendix covers the procedure on installing image software into the ABUS system when Antares system needs to be reconfigured (somoV software needs to be installed afterward).

F1. Install Antares 3.0 Image Software

1. Connect a Keyboard (USB or PS2) and USB Mouse into the Antares.

> **NOTE:** When the Splash Screen appears, use 'Ctrl+F8' to hide the splash screen. This will allow you to be able to see the boot up sequence and the warnings to begin the Antares SW load

2. Plug the power cord into the wall outlet if not already plugged in, turn on (up) the circuit breaker, and verify that the Power On indicator lamp is yellow.
3. Prepare for installation:
    a. Power on Scan Station and allow system to completely boot.
    b. Install a Jump Drive Access Key into the Scan Station and wait for approximately 10 seconds.
    c. Touch the upper Left corner of the monitor to access the Engineering Menu.
    d. Select 'Save Config' to back up the configuration files to the Jump Drive Access Key.
    e. Insert Antares PX-230 Pre-Install Disc (Siemens P/N 10037663 Rev01) into the CD Rom drive.
    f. Power down the system and remove the Jump Drive before continuing with this procedure.
4. From the I/O module, disconnect the Touch screen USB cable; CV Dongle at J1 (if installed) and MCU USB cable (if installed).
5. Power the Scan Station back on. While system is powering up, if 'Resolution Notifier' appears on the monitor, use the buttons on the front of the monitor as follows to turn it off:
    a. 'Select', '+' to cycle to highlight 'Tools'.
    b. Use '+' to highlight XYI, 'Select', '-'to highlight 'Off'.
    c. 'Select', '+' to highlight 'Exit', 'Select', '+' to highlight 'Exit', 'Select'.
6. The message: "**RM 145 CPU detected, please insert disk 1 (RM 145 disk 1 of 5) and *Enter* to continue…*" will appear at the bottom of the screen.
7. Insert Antares '3.0.09x' Software disk 1 of 2 into the CD Rom and press [Enter].
8. The message "Drive C: = Driver sym 001 unit 0" may appear at the bottom of the screen, and then after 20 - 30 seconds the warning screen will appear.

> **Note:** When next step is completed all partitions are deleted. Verify there is no required information on the hard drive prior to proceeding.

9. Once the warning screen appears, make sure all the useful information in the system are backed up and type "1", and then type "1" again at the next warning to start a new software load.
10. At the prompt, remove Antares SW Disk 1 and insert Antares SW disk 2.

NOTE: If Antares has a **PlexWriter PX230S 52/32/52S - Blank Face** use the following procedure to complete loading of Antares software:

- When the first disk is complete, the system displays the following message:
- *Please either insert the next disk and choose OK or browse to select the next part of the image.*
- Remove the first disk from the CD-ROM drive
- Insert the next disk of the software into the CD-ROM drive.
- *Immediately* after the disk tray closes, press the keyboard **Enter** key.
- The system will prompt: *Span Volume [x] done*
- Press **Enter** a second time.
- The system prompts: **Error**
- Wait ten seconds for disk to spin up.
- Press **Enter** again to select **Ok.**

11. The system will reboot several times with the Siemens Stellar Plus splash screen present and will then shut down. (~45 minutes)
12. Power on system, remove Antares SW disk 2, install the Combined Code 3.0.097A CD into the CD-ROM Drive.
13. Allow to boot. (~10 minutes)
14. If system reboots to a Black screen with cursor is all that can be seen, power down the system, turn off the breaker for a few seconds, then reboot. (~5 minutes)
15. The system will not boot to the imaging mode, it will show the 'Service Software' screen.
16. Minimize this window and the 'Files needed' window will appear behind it.
17. Click [Browse] and find the drive R:\MTXPARHM.sys
18. Double-click this file and click OK to install the **Matrox** video driver.
19. Wait approximately 30 seconds, until the found new hardware message is removed from screen then restart the system by pressing the reset button on the bottom of the I/O module.
20. Allow system to fully boot.
21. If Antares 'Alert Window' or message appears stating 'new hardware found, system requires re-testing', perform the re-test by following the Antares process as follows:
    - Click the "Close" button to remove the "Transducer not connected "error message and then click "OK" to close the "Alert Window" error message.
    - Then Select the 'Preset' icon, then 'Service' and 'Local Service'.
    - Enter the Service License Key for the Antares (obtained from U-Systems).
    - Select 'Test Tools' and follow instructions to perform testing of Antares modules then reboot system.
22. Once the system boots to Antares User Interface screen click the "Close" button to remove the "Transducer not connected "error message.
23. Install the Combined Code 3.0.097A CD into the CD-ROM Drive.
24. Using the mouse, select the Presets icon down at the bottom of the screen.
25. On the new screen click on [Service] and then [Install Software] and then OK.
26. At the Welcome window, click Next.
27. At the Setup Complete window select Yes, "I want to restart my computer now" and then click Finish.
28. The system will shut down after 5 minutes, Power system back on and allow system to fully boot before removing the CD.

29. Once the system boots to the Antares User Interface screen click the "Close" button to remove the "Transducer not connected" error message.
30. Using the mouse, select the Presets icon down at the bottom of the screen.
31. On the new screen, click on [Service] and then [Local Service].
32. Click on the [OK] button. Do not put in password or login.
33. Click on [Configuration].
34. Click on the [Next] button at the bottom of the screen.
35. Select [TCP/IP LAN], change the 'Computer Name' Field to the Serial Number of Scan Station including letter.
36. Change IP Address by checking "**Obtain an IP Address from DHCP Server**". No other changes!
37. Select [Save], then [OK], [OK]
38. Select [Home] at top of screen, and then select [OK]. System will reboot (this reboot may take ~30-40 minutes).
39. After system completes rebooting, click "Close" button to remove the "Transducer not connected "error message.
40. Using the mouse, click the Presets icon down at the bottom of the screen.
41. On the new screen click on [Service] and then [Local Service].
42. Click on the [OK] button. Do not put in password or login.
43. Click on [Configuration].
44. Click on the [Next] button at the bottom of the screen.
45. Click on the [Licensing] item at the left of the screen.
46. Click on the [Browse] button then OK and in the browser select [Desktop] if not already at the Desktop.
47. **'Right'** Click on [Windows Explorer] and select [Open].
48. **'Right'** Click on [My Computer], select [Properties].
49. Select [Network Identification] Tab
50. Select [Properties]
51. In 'Member of:' section, select [Workgroup] and then enter "**HORIZON**" in the Workgroup field.
52. Select [OK], and at 'Welcome to HORIZON workgroup' click [OK].
53. At 'You must reboot the computer for changes to take effect' click [OK].
54. Click [OK] on "System Properties" Window.
55. At the 'Do you want to restart your computer now?' prompt click [No].
56. Click on [My Computer]; double-click [O/S & APPS (C :)]
57. Double-click on file [devset.js]
58. ******At the question "**Do you want to delete the DATABASES**?" click [**No].**
59. Dialogue box "System is shutting down" will appear. (The reboot of the system may take several minutes to complete.)
60. While system is shutting down, plug in the Bar Code Scanner into the PS2 port if required and not already plugged in.
61. The system will reboot to the desktop. (~7 minutes)
62. Verify Bar Code Scanner initialized properly by performing the following:
    (a) Scan the four barcodes below in sequence to configure the Barcode Scanner.

KEYBOARD WEDGE HOST TYPE

SCAN OPTIONS

<DATA><SUFFIX>

ENTER

    (b) Select [Start], [Programs], [Accessories], [Notepad], scan a Bar Code and verify the scanned texts appear correctly in 'Notepad'.

    (c) Close the Notepad, do not save changes.

F2. Removal of Keiman.sys driver and Update DST

1. Select [Start], [Settings], click [Control Panel], and double-click [Add/Remove Programs]
2. Select [Syngo Uninstallation], then [Change/Remove]
3. On the components for Uninstallation dialog select [Clear All]
4. Select [Drivers] from the list. (A checkmark will be placed next to it).
5. Select [Details]
6. Unselect [Drivers Win 2000] and make sure 'Keiman W2K' remains selected.
7. Select [OK], [Next], verify the Keiman W2K is the only driver to be removed, then select [Uninstall]
8. Select [Restart Later], [OK], and then close all windows.
9. If system is in Domestic U.S. time zone, update Daylight Savings time by performing the following:
    a. Install the **DST Updates CD** in the Scan Station CD-ROM Drive.
    b. Open the **SS Time Update** folder and double click on **TimezoneUpdateAntares.reg**
    c. Answer Yes to import the settings.
    d. After the import completes, click on OK to close the completed message.
    e. Double click on the clock on the right hand end of the task bar.

   f. Select the Time Zone tab.

   g. From the drop down combo box note the current setting then select a different time zone before clicking on Apply.

   h. Restore the original time zone setting and click OK.

   i. Remove the DST Updates CD.

10. Restart the Scan Station and proceed to the correct Touch Screen Monitor install.

F3. Installation of NEC Touch Screen Monitor

1. After system has rebooted, install the Touchscreen USB cable.
2. Install the ABUS Scan Station Software Install CD.
3. Select the CD-ROM, Drive R: from 'My Computer', then go to 'USI', 'Drivers', then double-click the Touchware Calibration Tool 7.0 folder to open it.
4. Double-click 'Setup.exe'.
5. At the instructions screen select 'Next', then 'I accept'.
6. Follow instructions to get to the 'Typical' or 'Custom' install screen.
7. Choose 'Typical' installation, 'Next'.
8. Follow remaining instructions to load touchscreen software and select 'Finish', close windows.
9. From the desktop double-click the 'Microtouch Calibration Tool' and follow the instructions to calibrate the monitor.

> **NOTE:** When the system re-boots there may still be a Siemens BIOS splash screen displayed the first time

10. With system is still at Desktop, go to 'My Computer', double-click "DATABASE (D:)", rename the **DATABASE** folder inside to **DATABASE Old.**
11. Go to File, New, Folder and create a new folder named **DATABASE.**
12. Return to My Computer, double-click "IMAGE (E:)" rename the **IMAGE** folder inside to **IMAGE Old**, press "**Yes**" to the sharing lost warning.
13. Go to File, New, Folder and create a new folder named **IMAGE.**
14. Right click **IMAGE** folder, select Properties, Sharing.
15. Make the folder sharing by checking "Share This Folder'.
16. Change the Sharing Name to be **IMAGES** instead of original **IMAGE.**
17. Check the "Maximum Allowed" in User Limit item and press "Apply" then "OK" button to close the Folder Property Window, close all windows.

APPENDIX G. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

The Appendix covers the procedure on installing image software into the ABUS system when Antares system needs to be reconfigured (somo•V software needs to be installed afterward).

G1. Install Antares 5.0 Software

NOTE: When the Splash Screen appears, use 'Ctrl+F8' to hide the splash screen. This will allow you to be able to see the boot up sequence and the warnings to begin the Antares SW load

---

1. Plug the power cord into the wall outlet if not already plugged in, turn on (up) the circuit breaker, and verify that the "Power On" Indicator lamp is yellow.
2. Save current customer configuration:
   a. Power on Scan Station and allow to completely booting.
   b. Install a Jump Drive Access Key into the Scan Station and wait for approximately 10 seconds.
   c. Touch the upper left corner of the monitor to access the Engineering Menu.
   d. Select [Save Config] to back up the configuration files to the Jump Drive Access Key.
   e. Power down the system and remove the Jump Drive before continuing with this procedure.
3. On the I/O module unplug the Touch Screen USB cable, MCU USB cable, USB keyboard and USB mouse (if installed).
4. Power the Scan Station back on and immediately insert Siemens' SomoV 210.0.000 System SW DVD (Siemens P/N 10044420) into DVD Drive.
5. When the system powers up, a "Select Language" dialog window appears on the monitor
6. Connect a USB Keyboard and USB Mouse to the Antares. Use the mouse or keyboard arrow buttons to select [English] and click the [OK] button.
7. A warning dialog window will appear: "If you have not backed up your data, please ……. Are you sure you wish to continue?"

WARNING: When the next step is completed all partitions are deleted. Verify there is no required information on the hard drive prior to proceeding.

If you do not have data to back up and want to continue, click the [Yes] button.

8. Once again another warning window appears: "If you have not backed up your system, ALL DATA FILES WILL BE LOST!", "Are you sure you wish to continue?" If you do not have data to back up, click the [Yes] button.
9. The system will continue to install the Antares' 5.0 system image software and reboot several times with the Siemens splash screen present. The system will finish all the installation and then reboot to the Antares' User Interface screen (~35 minutes)
10. The Siemens Antares DVD should be ejected from the DVD Drive. Remove the disk as it is no longer needed.

---

11. If there is no Antares' Control Panel connected, click the [Close] button to remove the "Service ID: US_CP_0_0810XXXXXXXX" system error message. If there is no Antares' transducer connected, click the [Close] button to remove the "Transducer not connected "error message.

12. Use the mouse, select the "Presets" icon ![] down at the bottom of the screen.

13. On the displayed screen click on [Service] and then [Local Service].

14. Click on the [OK] button on the browser. Do not put in password or login.

15. Click on [Configuration].

16. Select [TCP/IP LAN], Change the 'Computer Name' Field to the Serial Number of Scan Station being worked on including the prefix letter (e.g. K0880068, do not use this value, only an example). Make sure DNS Domain box is empty.

17. Click [Save], then click [OK] 4 times.

18. Click [Home] at the top-right corner of screen, click [OK] on the displayed window and wait for the system rebooting.

19. After the system completes rebooting, click the [Close] button to remove the "Service ID: US_CP_0_0810XXXXXXXX" system error message, and click the [Close] button to remove the "Transducer not connected" error message.

20. Using the trackball or mouse, select the Presets icon ![] down at the bottom of the screen.

21. On the displayed screen click on [Service] and then [Configure Local Printer].

22. On the keyboard press the "←BackSpace" key 3 times.

23. Double click [Windows Explorer] then 'Right' click [My Computer] and select [Properties].

24. Select the [Computer Name] Tab then click the [Change…] button.

25. In the 'Member of:' section select [Workgroup], and then enter "HORIZON" in the Workgroup field.

26. Click [OK] then click [OK] again at the 'Welcome to HORIZON workgroup' message.

27. Click [OK] at the 'You must restart this computer for changes to take effect' message.

28. Click [OK] on "System Properties" Window.

29. Click [No] at the 'Do you want to restart your computer now?' prompt.

30. Click on [My Computer] then click [O/S & APPS (C:)]

31. Double-click on the [devset.js] file.

32. A "System Shutdown" dialog box will appear. (The reboot of the system may take several minutes to complete.)

33. While the system is shutting down, plug the Bar Code Scanner into the PS2 port if required and not already plugged in.

34. The system will reboot to the Windows desktop.

35. Move the [Recycle Bin] icon to the left edge of the screen below the other icons.

36. Click [Start], [Settings], and then [Network Connections].

37. Right click [Local Area Connection] then select [Properties]. Highlight the [Internet Protocol (TCP/IP)] item then click the [Properties] button.

38. Remove any address in [Default gateway] of the [Use the following IP address:] section.

39. Remove any addresses in [Preferred DNS server] and [Alternate DNS server] items of the [Use the following DNS server addresses] section (click after the last number of the address then use the backspace key).
40. Click the [Advanced...] button, and select the [DNS] tab. Remove any items in the [DNS server addresses, in order of use:] box.
41. Select the [Append primary and connection specific DNS suffixes] item and clear any text in the [DNS suffix for this connection:] box.
42. Select [WINS] tab and remove any addresses in the [WINS address, in order of use:] box.
43. Click [OK] in the "Advanced TCP/IP Settings window", and click [OK] in the "Internet Protocol (TCP/IP) Properties" window.
44. Click [Close] in the "Local Area Connection Properties" window then close the "Network Connections" window.
45. If Bar Code Scanner is required, check the Bar Code Scanner setup:
    (a) Scan the four sets of barcodes below in sequence to configure the Barcode Scanner. If the Bar Code Scanner does not beep as items are scanner then it did not initialize properly (check the connections and power cycle the system).

KEYBOARD WEDGE HOST TYPE

SCAN OPTIONS

<DATA><SUFFIX>

ENTER

    (b) Select [Start]→[Programs]→[Accessories]→[Notepad], then scan a Bar Code and verify the scanned texts appear correctly in 'Notepad'.
    (c) Close the Notepad, do not save changes.

G2. Installation of Updated Network Driver

1. Insert the ABUS Scan Station Software Install Disk.

2. Select the DVD Drive R:, from 'My Computer', then open the folders [Usi]→[Drivers] → [Network]. Double-click the [PRO02KXP_v13.3.exe] file to install the network driver.

3. When the "Intel Network Connection – Install Shield Wizard" screen is displayed click [Next], [I accept], [Next], [Next], [Install] then [Finish]. This just leaves all the default selections for the install of the drivers.

G3. Installation of Touchkit (TouchScreen) Driver for Touch Screen Monitor

G3.1 HYUNDAI, G70TR

1. Insert the ABUS Scan Station Software Install Disk.
2. Connect the USB cable for the Touch Screen Monitor.
3. Select the "DVD Drive R:" from 'My Computer', then open the folders [Usi] → [Drivers] → [TouchKit].
4. Double click on the 'AutoRun.exe' file in this folder.
5. Click the [Install Driver] button then click the [Win2000/XP] button in TouchScreen tool to start installation.
6. In the "Setup" window click [Next], [Next] and [Next].
7. Make sure the USB cable of Touch Screen Monitor is plugged in then click the [Ok] button.
8. Uncheck the [Support Multi-Monitor System] item then click [Next].
9. Make sure the destination folder is "C:\Programs\TouchKit", then click [Next] and [Next].
10. Make sure the "USB Controller" logo is displayed in the 'General' tab of the "TouchKit : USB Controller" window and click [Yes] at the prompt to do a "4 Point" calibration.
11. Click [Ok] on the "TouchKit: USB Controller" window after the calibration is finished.
12. Click the [Back] button and [Exit] button on the TouchScreen tool.
13. Close all windows when complete.
14. Remove the USB mouse as the touch screen can now be used.

G3.2 PLANAR, PT1785P

1. Insert the Planar Business Displays Touch Screen Drivers (012-0037-001) disk.
2. Connect the USB cable for the Touch Screen Monitor.
3. Select the "DVD Drive R:" from 'My Computer', then. Double click on the 'Touchscreen.exe' file in this folder.
4. When the installation screen displays make the following selections:

Monitor Size:	**17 inch**
Model Number:	**PT1785P**
Operating System:	**XP/2000**

5. Click the [Load Driver] button.
6. On the "Touchkit Welcome" screen click [Next].
7. On the following "Setup Type" screens make the indicated selections and click the [Next] button.

Install PC/2 interface driver: **Unchecked**

Install RS232 interface driver: **Unchecked**
Bootup Calibration: **None**

8. At the USB connection message click [OK] as the cable has already been connected.
9. Uncheck the "Support multi-Monitor System" item then click [Next].
10. On the "Choose Destination Location" screen leave the default "C:\Program Files\Toolkit" and click [Next].
11. On the "Select Program Folder" screen leave the default and click [Next].
12. On the "Setup Type" screen leave the "Create a Touchkit Utility shortcut on the desktop" item checked and click [Next].
13. A "Setup Status" screen is displayed as the installation is performed. There will be a pause of about 2 minutes while it scans COM ports.
14. At the "Question" prompt click [Yes] to do the 4 point calibration.
15. Touch and hold on the center of the red targets as they are displayed in each corner of the screen. You can release and move to the next point after OK is displayed.
16. Close the "Touchscreen" window that started the install.
17. Remove the USB mouse as the touch function can now be used.
18. Double touch the [Touchkit] shortcut on the desktop and select the [Setting] tab.
19. Ensure the settings are as shown below then touch [Apply].
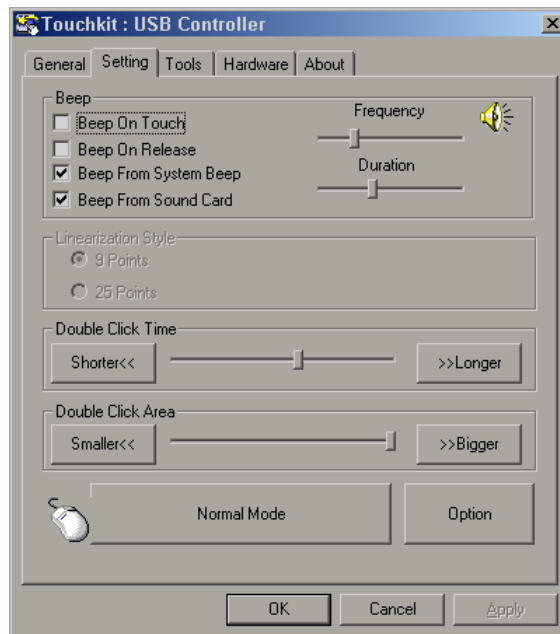
20. Touch the [Options] button and ensure the settings are as shown below. Touch the [Bigger] button then the [Smaller] before touching [OK] to save the changes.
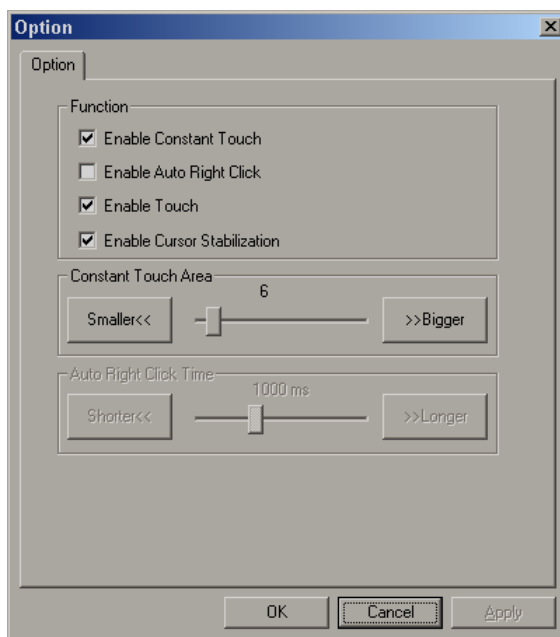
21. Touch [OK] to save the changes and exit the "Touchkit" utility.

APPENDIX H. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

The Appendix covers the procedure on installing image software into the ABUS system when Antares system needs to be reconfigured (somo•V software needs to be installed afterward).

H1. Install Antares 5.0B Image Software

1. Unplug the network cable if one is connected.

> **NOTE:** When the Splash Screen appears, use 'Ctrl+F8' to hide the splash screen. This will allow you to be able to see the boot up sequence and the warnings to begin the Antares SW load

2. Plug the power cord into the wall outlet if not already plugged in, turn on (up) the circuit breaker, and verify that the "Power On" Indicator lamp is yellow.
3. Save the current customer configuration:
   a. Power on Scan Station and allow it to completely booting.
   b. Install a Jump Drive Access Key into the Scan Station and wait for approximately 10 seconds.
   c. On the keyboard, use combined [Ctrl], [Shift] and [E], or touch the upper left corner of the monitor to access the Engineering Menu.
   d. Select [Save Config] to back up the configuration files to the Jump Drive Access Key.
   e. Insert Siemens' System SW DVD (Antares 5.0 System SW 210.0.002, RM220 Only) into DVD Drive, and power down the system.
   f. Remove the Jump Drive before continuing with this procedure.

4. On the I/O module unplug the Touch Screen USB cable, MCU USB cable, USB keyboard and USB mouse (if installed).
5. Power on the Scan Station and immediately insert Siemens' installation disk (Antares 5.0 System SW 210.0.002, RM220 Only) into the DVD Drive.
6. When the system powers up, a "Select Language" dialog window appears on the monitor.
7. Connect a USB Keyboard and USB Mouse to the Antares. Use the mouse or keyboard arrow buttons to select [English] and click the [OK] button.
8. A warning dialog window will appear: "If you have not backed up your data, please ……. Are you sure you wish to continue?"

> **WARNING: When the next step is completed all partitions are deleted. Verify there is no required information on the hard drive prior to proceeding.**

If you do NOT have data to back up and want to continue, click the [Yes] button.

9. Once again another warning window appears: "If you have not backed up your system, ALL DATA FILES WILL BE LOST!", "Are you sure you wish to continue?"

If you do NOT have data to back up, click the [Yes] button.

10. The system will continue to install the Antares' 5.0B system image software and reboot several times. The system will finish all the installation and then reboot up to a "Start Up Check" window with the words "Please enter license" (~35 minutes).

11. The Siemens Antares DVD should be ejected from the DVD
    Drive. Remove the disk as it is no longer needed.
12. A "Start Up Check" window will display with the words "Please enter license":
    a. Plug in the License Disk or USB Drive that contains the License Data (obtained
       from U-Systems).
    b. Click the "Click here to start the Local Service Configuration", and click [OK] in
       the "Siemens Med Service Software" window without put in a password or login.
    c. Click [Configuration], and then select [Licensing].
    d. Click "Select New License File".
    e. Click [Browse], click "My Computer" from the left column of the "Choose File"
       window, and then click the corresponding drive that contains the license data.
    f. Click the license data file, and click [Open], and watch the text changes in the
       "Path" areas.
    g. Click [Save] at the bottom-right corner, and make sure that the "Available
       Features" area are filled with text.
    h. Remove the License Disk or Drive, click [Home] at the top-right corner of the
       screen, and then click [OK] to have the system restarted.
13. Using the mouse, select the [Presets] icon [image] down at the bottom of the screen.
14. On the displayed screen click on [Service] and then [Local Service].
15. Click on the [OK] button on the browser. Do not put in password or login.
16. Click on [Configuration].
17. Select [TCP/IP LAN]. Change the 'Computer Name' Field to the Serial Number of
    the Scan Station being worked on, including the prefix letter (e.g. K0880068, do not
    use this value, only an example). Make sure DNS Domain box is empty.
18. Click [Save], then click [OK] 4 times.
19. Click [Home] at the top-right corner of the window, click [OK] on the displayed
    window and wait for the system to reboot.
20. As the system boots press the [F2] key on the keyboard several times until the BIOS
    "System Settings" screen is displayed.
    a. Use the right-arrow key to select the "Boot" screen.
    b. Use the down-arrow key to highlight the [Boot Display Options] item then press
       [Enter] to get into the Boot screen.
    c. Move down to the [POST Function Hotkeys] item and press [Enter] to change it
       to [Disable].
    d. Press the [F10] key and then the [Y] key to save and exit the BIOS System
       Settings status.
21. After the system completes rebooting, click the [Close] button to remove the
    "Transducer not connected" error message.
22. Using the mouse, select the Presets icon [image] down at the bottom of the screen.
23. On the displayed screen click on [Service] and then [Configure Local Printer].
24. On the keyboard press the "←BackSpace" key 3 times.
25. Double click [Windows Explorer] then 'Right' click [My Computer] and select
    [Properties].
26. Select the [Computer Name] Tab then click the [Change…] button.

27. In the 'Member of:' section, select [Workgroup] and then enter "HORIZON" in the Workgroup field.
28. Click [OK], then click [OK] again at the 'Welcome to HORIZON workgroup' message.
29. Click [OK] at the 'You must restart this computer for changes to take effect' message.
30. Click [OK] on "System Properties" Window.
31. Click [No] at the 'Do you want to restart your computer now?' prompt.
32. Click on [My Computer] then double click [O/S & APPS (C:)]
33. Double-click on the [devset.js] file.
34. A "System Shutdown" dialogue box will appear. (The reboot of the system may take several minutes to complete.)
35. The system will reboot to the Windows desktop.
36. Move the [Recycle Bin] icon to the left edge of the screen below the other icons.
37. Click [Start], [Settings], and then [Network Connections].
38. Rename the "Local Area Connection 2" item to "Local Area Connection".
39. Right click [Local Area Connection] then select [Properties]. Highlight the [Internet Protocol (TCP/IP)] item then click the [Properties] button.
40. Remove any address in the [Default gateway] item of the [Use the following IP address:] section.
41. Remove any addresses in [Preferred DNS server] and [Alternate DNS server] items of the [Use the following DNS server addresses] section (click after the last number of the address then use the backspace key).
42. Click the [Advanced...] button and select the [DNS] tab. Remove any items in the [DNS server addresses, in order of use:] box if present.
43. Select the [Append primary and connection specific DNS suffixes] item and clear any text in the [DNS suffix for this connection:] box.
44. Select the [WINS] tab and remove any addresses in the [WINS address, in order of use:] box.
45. Click [OK] in the "Advanced TCP/IP Settings" window. Click [OK] in the "Internet Protocol (TCP/IP) Properties" window. Click [No] in "Microsoft TCP/IP" window.
46. Click [Close] in the "Local Area Connection Properties" window then close the Network Connections window.

H2. Installation of Touchkit (TouchScreen) Driver for Touch Screen Monitor

PLANAR, PT1785P

1. Insert the ABUS Scan Station Software Install Disk.
2. Connect the USB cable for the Touch Screen Monitor.
3. Select the "DVD Drive R:" from 'My Computer', then open the folders [Usi] → [Drivers] → [TouchKit_5.10.5].
4. Double click on the 'Touchscreen.exe' file in this folder.
5. When the installation screen displays make the following selections:
   Monitor Size: **17 inch**
   Model Number: **PT1785P**
   Operating System: **XP/2000**
6. Click the [Load Driver] button.

7. On the "Touchkit Welcome" screen click [Next].
8. On the following "Setup Type" screens make the indicated selections and click the [Next] button.

    Install PC/2 interface driver: **Unchecked**
    Install RS232 interface driver: **Unchecked**
    Do 4 Point Calibration After system reboot: **None**

9. At the USB connection message click [OK] as the cable has already been connected.
10. Uncheck the "Support multi-Monitor System" item then click [Next].
11. On the "Choose Destination Location" screen leave the default "C:\Program Files\Toolkit" and click [Next].
12. On the "Select Program Folder" screen leave the default and click [Next].
13. On the "Setup Type" screen leave the "Create a Touchkit Utility shortcut on the desktop" item checked and click [Next].
14. A "Setup Status" screen is displayed as the installation is performed. There will be a pause of about 2 minutes while it scans COM ports.
15. At the "Question" prompt click [Yes] to do the 4 point calibration.
16. Touch and hold on the center of the red targets as they are displayed in each corner of the screen. You can release and move to the next point after OK is displayed.
17. Close the "Touchscreen" window that started the install.
18. Remove the USB mouse as the touch function can now be used.
19. Double touch the [Touchkit] shortcut on the desktop and select the [Setting] tab.
20. Ensure the settings are as shown below then touch [Apply].
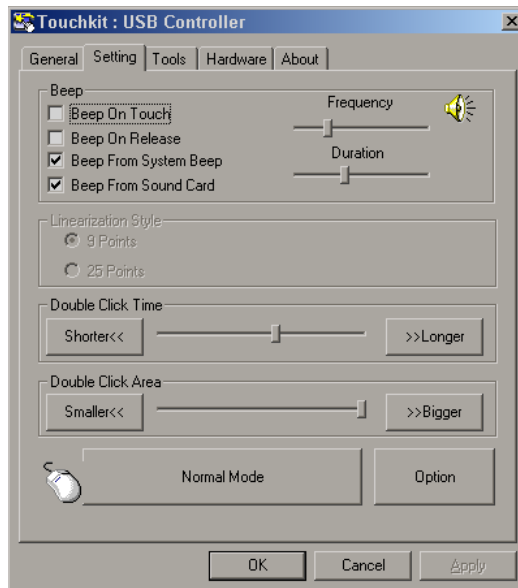
21. Touch the [Options] button and ensure the settings are as shown below. Touch the [Bigger] button then the [Smaller] before touching [OK] to save the changes.
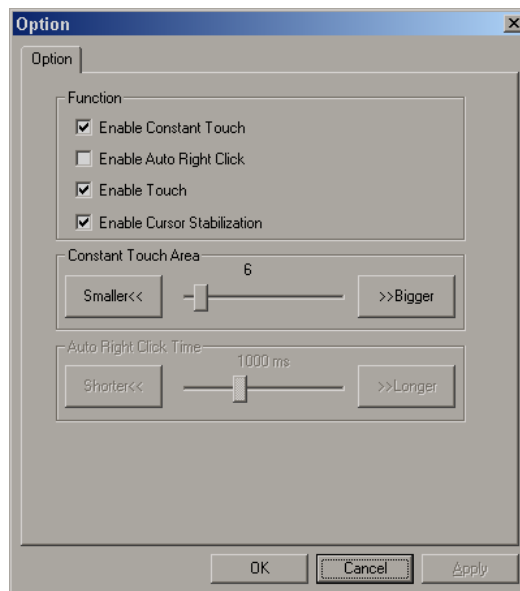
22. Touch [OK] to save the changes and exit the "Touchkit" utility.
23. Remove the ABUS Scan Station Software Installation disk.

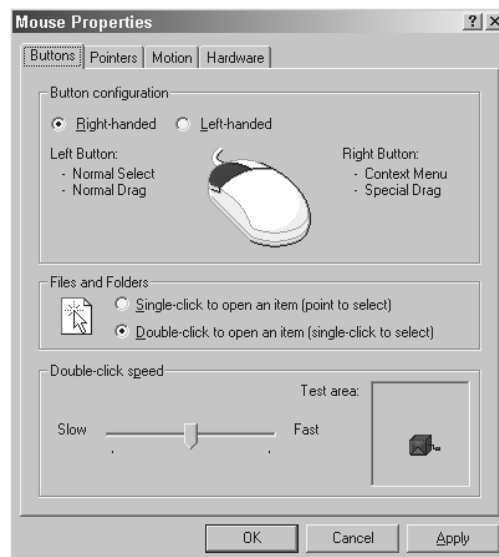## APPENDIX I. 9900-0002-01 REV9_SOMO V ABUS SERVICE MANUAL.DOC

1. Plug in a USB Key board and a USB mouse into the Scan Station.
2. Insert a Service Access Key, then boot up the Scan Station.
3. When 'Service Access' window appears asking if you want to start the system, use the 'Alt'+'Tab' keys to activate the 'Service Access' window.
4. Use the 'Tab' key to highlight 'No' then press 'Enter' (or press the 'N' key) to exit to the Desktop.
5. Press 'Ctrl'+'Esc' to open the 'Start' menu.
6. Use the 'Down' arrow to scroll to and highlight 'Settings'.
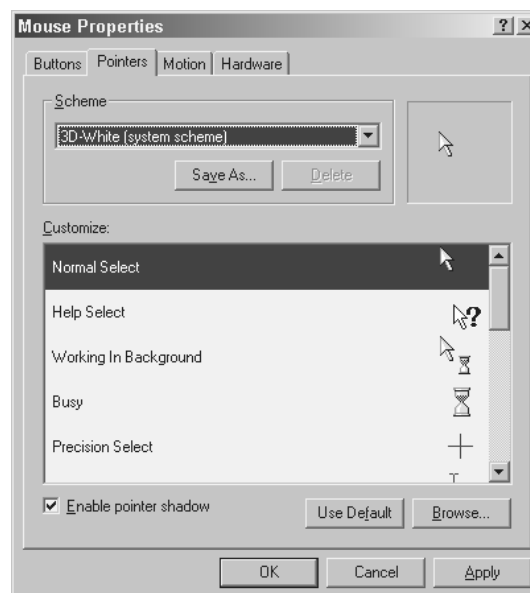7. Use the 'Right' arrow to open the 'Settings' menu screen. ('Control Panel' is highlighted)
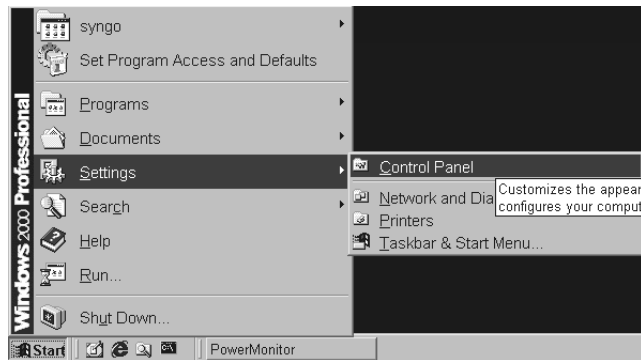
8. Press 'Enter' to open the Control Panel window as shown below.
9. Use the 'Down' arrow to scroll to and highlight the 'Mouse' selection and press 'Enter'.
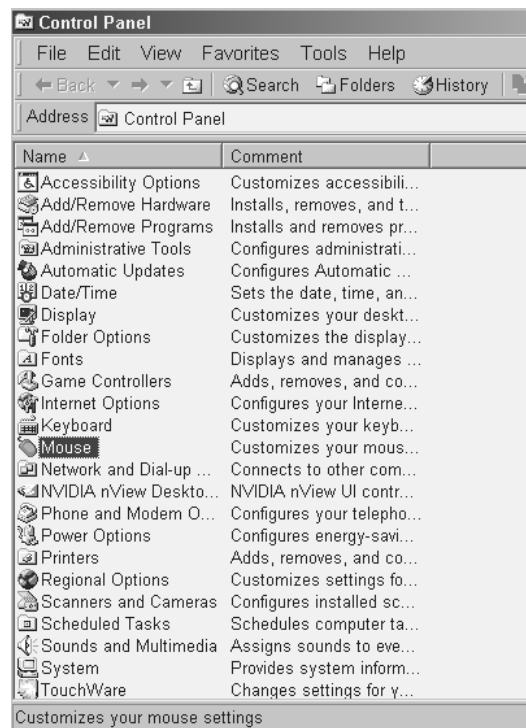
10. Use the 'Tab' key to cycle through the Mouse menu and highlight the 'Buttons' tab located at the top of the window

Mouse Properties

Buttons | Pointers | Motion | Hardware

Button configuration

○ Right-handed   ○ Left-handed

Left Button:
- Normal Select
- Normal Drag

Right Button:
- Context Menu
- Special Drag

Files and Folders

○ Single-click to open an item (point to select)
● Double-click to open an item (single-click to select)

Double-click speed

Test area:

Slow ———————— Fast

OK   Cancel   Apply

11. Use the 'Right' arrow to highlight the 'Pointers' tab, then press 'Enter' key.
12. Use the 'Tab' key to highlight the 'Scheme' field.
13. Use the 'Down' arrow to select a cursor, and then press 'Enter' key.

Mouse Properties

Buttons | Pointers | Motion | Hardware

Scheme

3D-White (system scheme)

Save As...   Delete

Customize:

Normal Select

Help Select

Working In Background

Busy

Precision Select

☑ Enable pointer shadow   Use Default   Browse...

OK   Cancel   Apply

14. The Mouse cursor will now be visible.