Dash® Port 2 Docking Station

Service Manual

2000966-138 Revision A

GE Medical Systems

Information Technologies

gemedicalsystems.com

NOTE: Due to continuing product innovation, specifications in this manual are subject to change without notice.

Contents

1 Introduction

For your notes

Manual Information

Revision History

Each page of this manual has the document part number and revision letter at the bottom of the page. The revision letter identifies the document's update level. The revision history of this document is summarized below.

Table 1. Revision History

Revision	Date	Comment
A	18 August 2003	Initial release of this manual.

Manual Purpose

This manual supplies technical information for service representatives and technical personnel so they can maintain the equipment to the assembly level. Use it as a guide for maintenance and electrical repairs considered field repairable. Where necessary the manual identifies additional sources of relevant information and technical assistance.

See the operation instructions for the instructions necessary to operate the equipment safely in accordance with its function and intended use.

Manual Conventions

The Dash Port 2 docking station will be referred to as the docking station in this manual.

Intended Audience

This manual is intended for service representatives and technical personnel who maintain, troubleshoot, or repair this equipment.

Safety Information

Responsibility of the Manufacturer

GE is responsible for the effects of safety, reliability, and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The equipment is used in accordance with the instructions for use.

General

This device is not intended for home use.

Contact GE for information before connecting any devices to the equipment that are not recommended in this manual.

Parts and accessories used must meet the requirements of the applicable IEC 601 series safety standards, and/or the system configuration must meet the requirements of the IEC 60601-1-1 medical electrical systems standard.

Periodically, and whenever the integrity of the device is in doubt, test all functions.

The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

- use of the accessory in the PATIENT VICINITY; and
- evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.

If the installation of the equipment, in the USA, will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Hazard Definitions

The terms danger, warning, and caution are used throughout this manual to point out hazards and to designate a degree or level of seriousness. Familiarize yourself with their definitions and significance.

Hazard is defined as a source of potential injury to a person.

Term	Definition
DANGER	Indicates an imminent hazard which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.
NOTE	Provides application tips or other useful information to assure that you get the most from your equipment.

Equipment Symbols

ATTENTION: Consult accompanying documents.

equipotential

lock

unlock

communication indicator (front panel icon)
Ethernet (back panel icon)

video out

Alternating Current (AC)

4P41

Medical Equipment
With respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 NO. 601.1.

001A, 002A, 003A, 030A

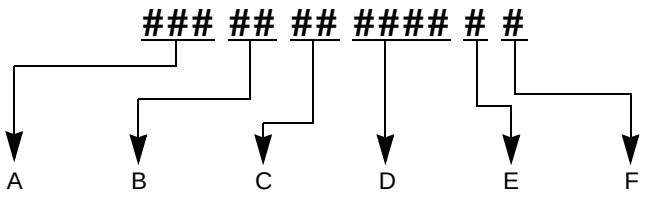
Service Requirements

Follow the service requirements listed below.

- Refer equipment servicing to GE authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user's responsibility to report the need for service to GE or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment will always be functional when required.

Equipment Identification

Every GE Medical Systems *Information Technologies* device has a unique serial number for identification. A sample of the information found on a serial number label is shown below.



	Description
A	product code[1]
B	year manufactured
C	fiscal week manufactured
D	production sequence number
E	manufacturing site
F	miscellaneous characteristic

1. The product code for the Dash Port 2 docking station is **AAA**.

2 Equipment Overview

For your notes

Equipment Description

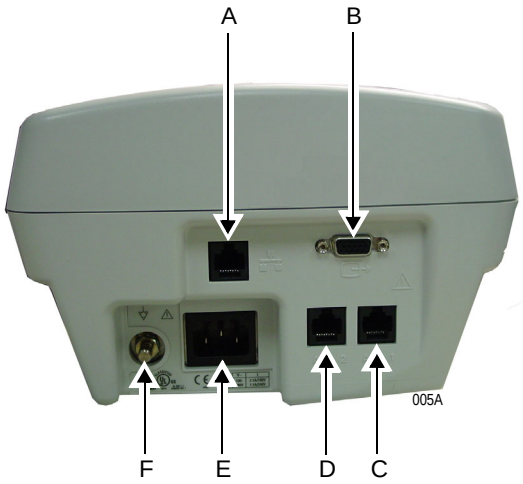
Basic Components

The docking station is a quick mount/dismount base for a Dash patient monitor. It gives the monitor easy connect/disconnect access to AC power, the Unity Network® (Ethernet), to a remote display, and to auxiliary devices.

Front View

	Name	Description
A	Security lever	Slide left to lock the monitor onto the docking station, then slide right to unlock the monitor.
B	AC mains power indicator	Illuminates green when AC power is applied to the docking station.
C	Communication indicator	green LED ■ A steady green color indicates the docking station has established communication with the monitor. amber LED ■ A flashing amber color indicates that the docking station and the Dash monitor are not compatible. See Chapter 5, “Troubleshooting” .

Back View



	Name	Description
A	Ethernet connector	Connect to the Unity Network. See "Network Connection" on page A-3.
B	video out connector	Connect to a compatible remote display. The remote display allows you to display the Dash monitor screen items in a larger size. See "Appendix B – Remote Display" for required and recommended remote display specifications.
C	**AUX 1** connector	Connect to a compatible auxiliary device that is supported by the Dash monitor and by the docking station. See "Compatible Auxiliary Devices" on page 2-10.
D	**AUX 2** connector	
E	AC power connector	Insert AC power cable. See "Power Requirements" on page A-3.
F	equipotential lug	Provides a means of maintaining equipotential ground reference between connected devices.

Optional Components

Remote Display

When a compatible remote display is connected to the docking station, the remote display allows you to view a docked monitor's waveform and text data at a remote location or on a larger display.

The following conditions apply:

- A Dash 3000/4000 monitor is required.
- The Dash 3000/4000 monitor must use software version 5.0 or later.
- The remote display must be compatible with the docking station. See "Appendix B – Remote Display" for required and recommended remote display specifications.
- The maximum video cable length between the docking station and the remote display is 45.72 meters (150 feet). See "Other Components" on page 6-14 for video cables and video cable extenders.

GCX Pedestal Mount

The GCX pedestal mount allows you to mount the docking station on a flat table-top surface.

Theory of Operation

Overview

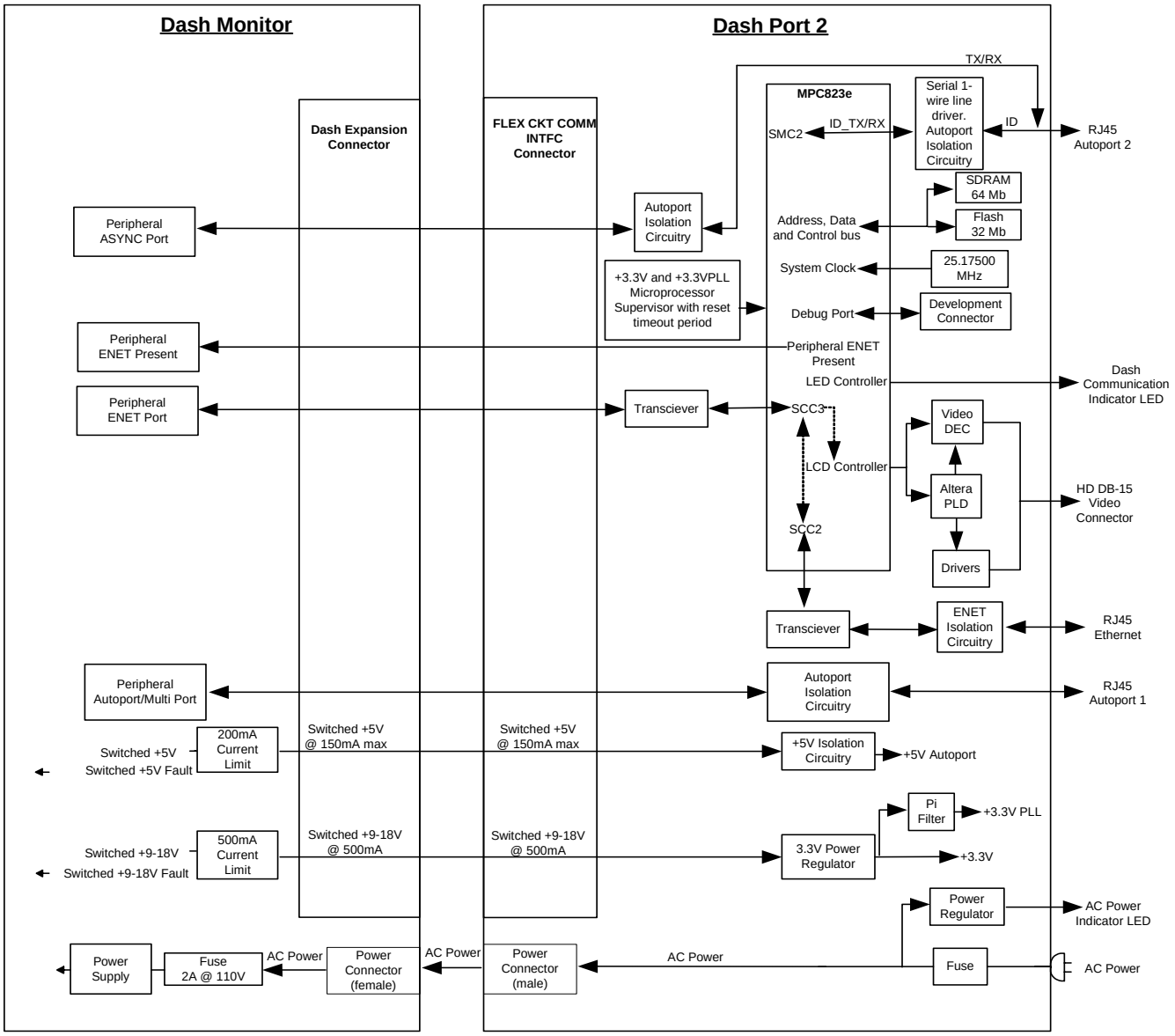
The Dash Port 2 docking station provides an external remote (640x480 VGA) video capability, two additional **AUX** ports, Ethernet connection (10BaseT), and AC power to a compatible Dash monitor.

The mechanical hardware is intended to be used in conjunction with the Dash Port Interface/Isolation PCB to provide a means to quickly and reliably attach/detach the Dash family of transport monitors.

The docking station can be installed at a bedside location in a health care facility and in an intra-hospital patient transport.

The docking station is designed to provide electrical and mechanical connection of AC power and communication devices to the Dash family monitors and combines AC power to the monitor's AC mains connector, Ethernet signals to communicate, DC power and asynchronous communication signals to communicate with ancillary devices.

Block Diagram



Controls and Indicators

Controls

Security Lever

When a monitor is placed onto the docking station, the security lever automatically moves from the full right unlock position to the midpoint position and firmly attaches the monitor.

Sliding the lever to the full left position inserts and locks the AC power/ communication connector up into the monitor to provide AC power and network communication.

Sliding the lever to the right will first retract the communication connector from the monitor. Then, as the lever is slid to the full right position it will unlock the monitor. Releasing the lever at this point will allow the lever to return to the midpoint position and prevent unintentional detachment.

To remove the monitor you must hold the lever in the far right position while lifting the monitor off the docking station.

Indicators

AC Power Indicator

A green colored LED is used to indicate that the docking station is connected to an AC power source.

Communication Indicator

A green or yellow colored LED is used to indicate the communication status between the docking station and the monitor.

Green LED

- A steady green color indicates the docking station has established communication with the monitor.

Amber LED

- A flashing amber color indicates that the docking station and the Dash monitor are not compatible. See Chapter 5, “Troubleshooting” .

Equipment Compatibility

Compatible Dash Monitors

NOTE

The docking station can be used with ALL Dash monitors. However, some Dash monitors DO NOT support the docking station's Ethernet network, auxiliary 1, auxiliary 2, or remote display communication links.

As shown in the table below, the communication links supported by a monitor are dependent upon the monitor's model and software version.

Monitor Model and Software Version	Supported Communication Links				
	AC Power	Ethernet Network	Auxiliary 1	Auxiliary 2	Remote Display
Dash 2000 (version 1 and 2 software)	Yes	No	No	No	No
Dash 2000 (version 3 or later software)	Yes	Yes	Yes	No	No
Dash 3000 (version 1 software)	Yes	Yes	No	No	No
Dash 3000/4000 (version 2 software)	Yes	Yes	No	No	No
Dash 3000/4000 (version 3 and version 4 software)	Yes	Yes	Yes	No	No
Dash 3000/4000 (version 5 or later software)	Yes	Yes	Yes	Yes	Yes

Compatible Auxiliary Devices

When a monitor is connected to the docking station, there are a total of three **AUX** connectors available for connecting supported devices. The docking station provides two **AUX** connectors and the monitor provides one **AUX** connector.

NOTE

Not all features/accessories related to this product are available in all markets. Please contact your local GE Medical Systems *Information Technologies* Sales Representative for product availability.

Supported GE Auxiliary Devices

The following GE devices are supported by the both the monitor and by the docking station's **AUX** connectors.

- DT-7000 Transceiver
- Patient Data Management System.
- RAC 2A module housing with one of the following modules inserted:
  - ICG module interface.
  - SAM® module.
- Remote alarm box.
- Remote control.
- Unity Network® ID

Supported Non-GE Auxiliary Device

The following non-GE auxiliary device is supported by both the monitor and by the docking station's **AUX** connectors.

- Nellcor N-395 pulse oximeter.

  See the "Nellcor 395 Pulse Oximeter Addendum to the Dash 3000/ 4000 Operator's Manual" for connection and configuration information.

How Many of Each Supported Auxiliary Device Can be Connected?

The following table identifies how many of each auxiliary device you can connect simultaneously to the monitor and to the docking station's three available **AUX** connectors.

How Many of Each Supported Device Can be Connected Simultaneously?		
Auxiliary Device	**Quantity**	**Constraints**
DT-7000 Transceiver	1	
Patient Data Management System	3	
RAC 2A module housing	2	When two RAC 2A module housings are connected to the **AUX** connectors, the monitor will monitor and display data received from one ICG module and one SAM module simultaneously. As a result, do NOT connect two ICG module interfaces or two Sam Modules to the monitor and docking station.
Remote Alarm Box	3	See the documentation provided with Remote Alarm Box to properly configure the Remote Alarm Box for use with a docking station.
Remote control	3	
Nellcor N-395 pulse oximeter	2	
Unity Network ID (auto-association cable)	1	

Compatible Remote Displays

The Dash Port 2 docking station is currently available with the following GE remote displays:

- 15-inch, medical-grade, flat panel, color LCD display
- 18-inch, medical-grade, flat panel, color LCD display

Off-the-shelf (computer-grade) displays are also compatible. See "Appendix B – Remote Display" for the required and recommended remote display specifications.

WARNING
PATIENT RISK — Do not connect a monochrome display to the Dash Port 2 docking station. The visual alarm messages may not appear properly.

3 Installation

For your notes

Requirements

Safety Information

WARNINGS

CABLES — Route all cables away from patient's throat to avoid possible strangulation and to prevent interfering with the monitor's attachment to the docking station.

SITE REQUIREMENTS — For safety reasons, all connectors for patient cables and sensor leads are designed to prevent inadvertent disconnection, should someone pull on them. Do not route cables in a way that they may present a stumbling hazard. For devices installed above the patient, adequate precautions must be taken to prevent them from dropping on the patient.

INTERFACING OTHER EQUIPMENT — Devices may only be interconnected with each other or to parts of the system when it has been determined by qualified biomedical engineering personnel that there is no danger to the patient, the operator, or the environment as a result. In those instances where there is any element of doubt concerning the safety of connected devices, the user must contact the manufacturers concerned (or other informed experts) for proper use. In all cases, safe and proper operation should be verified with the applicable manufacturer's instructions for use, and system standards IEC 60601-1-1/EN 60601-1-1 must be complied with.

LEAKAGE CURRENT TEST — When interfacing with other equipment, a test for leakage current must be performed by qualified biomedical engineering personnel before using with patients.

DROP HAZARD — Verify the equipment mount used to hold both the docking station and the patient monitor will support a minimum of 30 pounds (13.60 kg). Otherwise, serious injury or death could result.

CAUTIONS

MPSO — Do not use a multiple portable socket outlet (MPSO) for a system because it could result in unacceptable enclosure leakage currents.

PERSONAL INJURY HAZARD — To reduce the potential for orthopedic injury, mount the docking station at a height which prevents overextension of the user's arms when connecting and disconnecting the monitor.

DOCKING STATION POWER REQUIREMENTS — Before connecting the device to the power line, check that the voltage and frequency ratings of the power line are the same as those indicated on the docking station and the monitor's label. If this is not the case, do not connect the system to the power line until you adjust the monitor to match the power source. See the Installation chapter of the Dash Patient Monitor Service Manual to change the voltage selector setting.

In U.S.A., if the installation of this equipment will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

This equipment is suitable for connection to the public mains as defined in CISPR 11.

Location

Docking Station

- Choose a location which provides an unobstructed view of the monitor screen and easy access to the operating controls.
- Use only the original power cable or an equivalent one.
- Ensure the power outlet is wired correctly. See "AC Line Voltage Test" on page 5-4.

Remote Display

- Follow the manufacturer guidelines and your facility guidelines to mount the remote display.
- The video cable should NOT exceed 45.72 meters (150 feet) in length.
- The remote display does NOT provide audible patient or system alarms. Therefore, GE recommends that you mount the remote display in a location that allows the clinician to see and hear the patient and system alarms that originate from the patient monitor.

Tools

No special tools are required to install this equipment.

Equipment Mounts

Mounting Options

NOTE

GE strongly recommends not using a non-locking variable height wall mount arm with this product. The weight of the monitor keeps the mounting arm in position. Removing the monitor from the mount could cause the mounting arm to unexpectedly spring upwards.

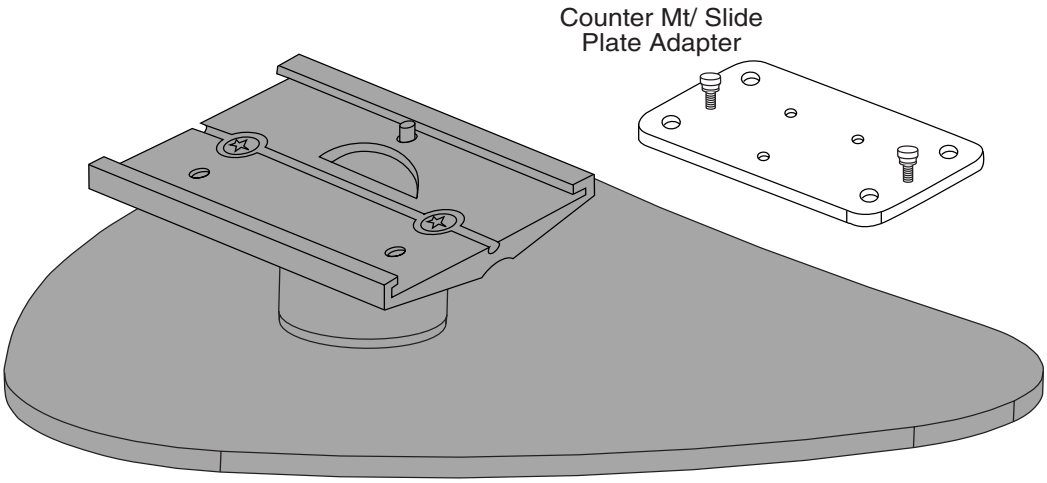
The docking station has a standard GCX mounting plate for quick mount/dismount access. The following are some of the GCX mounting devices available from GE:

- Multi-use pedestal style mount, PN 2007059-001.
- M series wall arm with pivot, PN 407349-009.
- Locking Variable Height Mount (VHM) arm, PN 2014448-001.

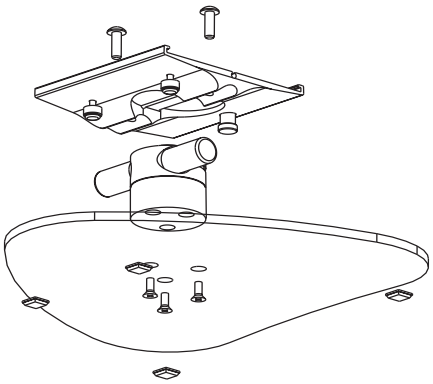
NOTE

For additional CGX mounting options and information, contact your local sales or service representative.

Multi-Use Pedestal Style Mount

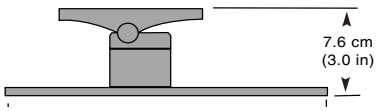


Multi-Use Pedestal Style Mount
2007059-001

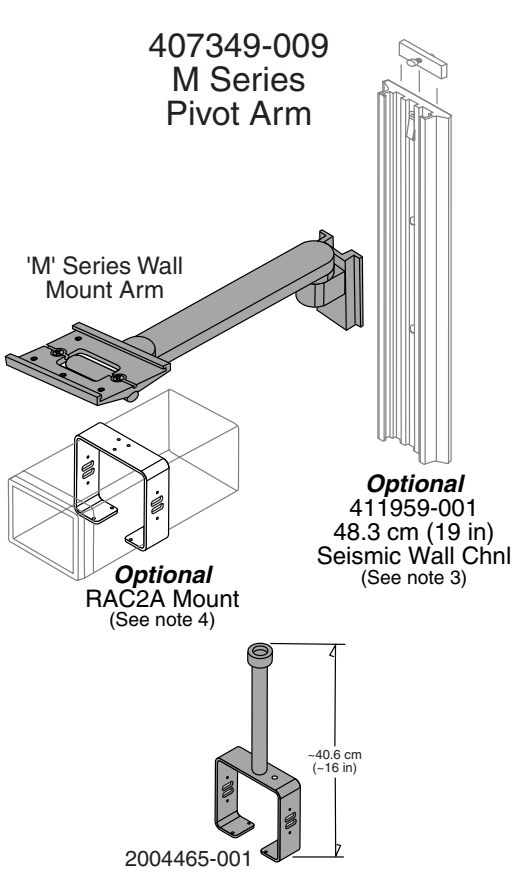


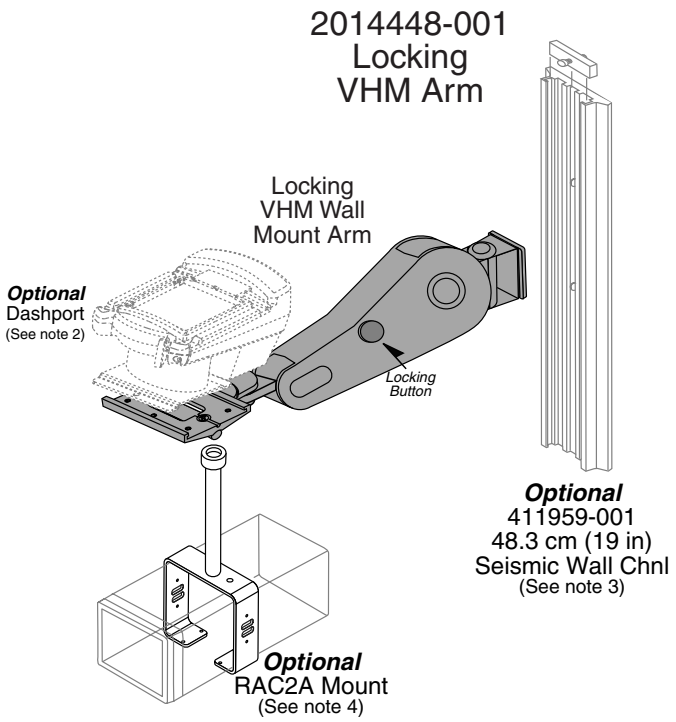
Notes
1. This Multi-Use mount for use with a docking station. It can be used as a stand-alone pedestal mount, bolt on counter mount or slide-in mount for use with anesthesia machine top mounted channel.

2. Mount, pn 2007059-001, includes triangular Pedestal base[~30.5cm (12in)], Tilt/Swivel head w/3.2cm (1.25in) pipe, 12.7cm (5in) Mounting plate and combination Counter Mt/Slide Plate Adapter.

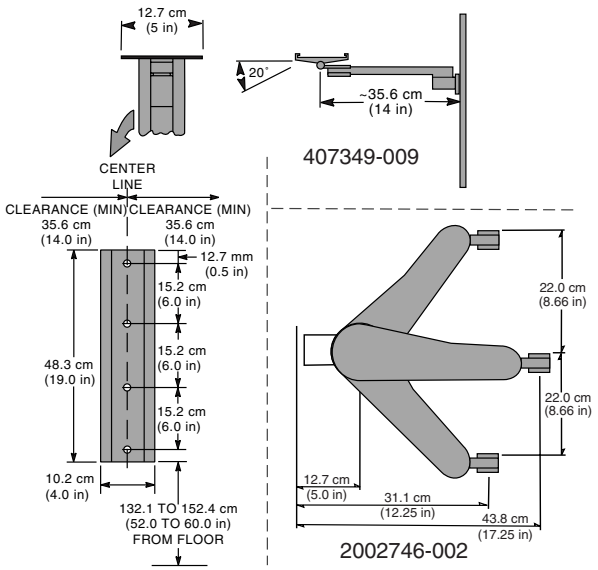


M Series Pivot Arm Wall Mount or Locking Variable Height Mount





2004465-001



2002746-002

Notes

1. Kit, pn 407349-009, includes mounting plate, M Series support arm and hardware.
2. Kit, pn 2014448-001 includes Locking VHM Arm, Mounting Plate w/Extension Bar and attaching hardware.

Note - *When using the Dashport on* ***either*** *arm, the Dashport must be modified by adding the spacer, included w/Dashport kit, between the bottom of the Dashport and adapter plate.*

3. Either kit does ***NOT*** include 48.3 cm (19 in) wall channel. Order p/n 411959-001if wall channel is required.
4. RAC2A mount, pn 2004465-001 is optional and ordered separately. See note below.

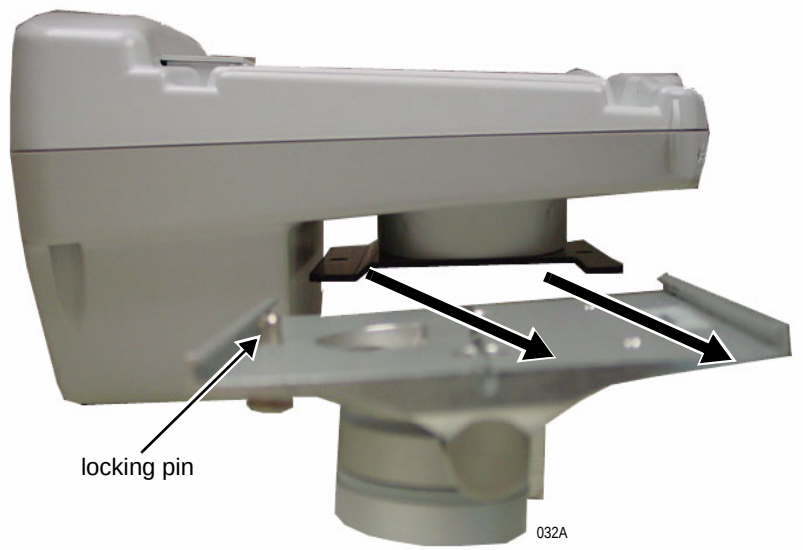
Note - *Depending upon the style of the wall arm used (existing 'box' style or new 'M' series) selecting the correct RAC2A mount is important. Existing arms use pn 404757-001 and new 'M' series arms use either pn 404757-001 or pn 2004465-001.*

5. Maximum allowable supported weight:
   13.6 kilograms (30 pounds)

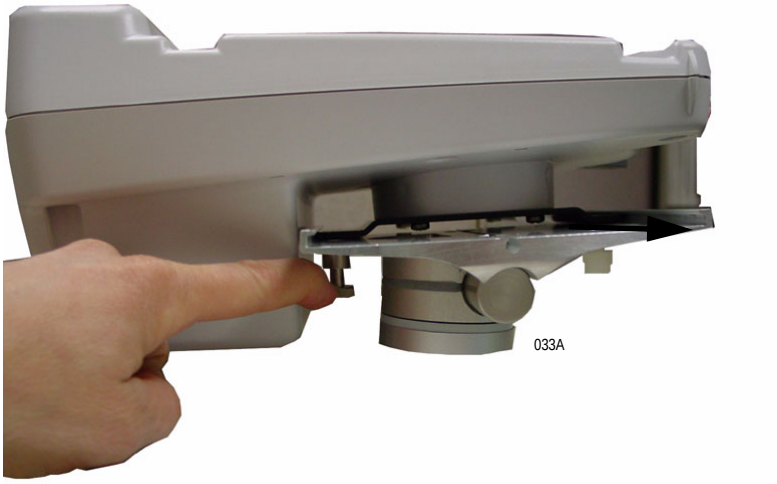
GCX Mounting Procedure

The following procedure shows how to mount the docking station to a GCX pedestal mount. This mounting procedure is the same for the M Series and Locking VHM arm wall mounts.

1. Slide the docking station onto the GCX mount until it bumps into the locking pin.



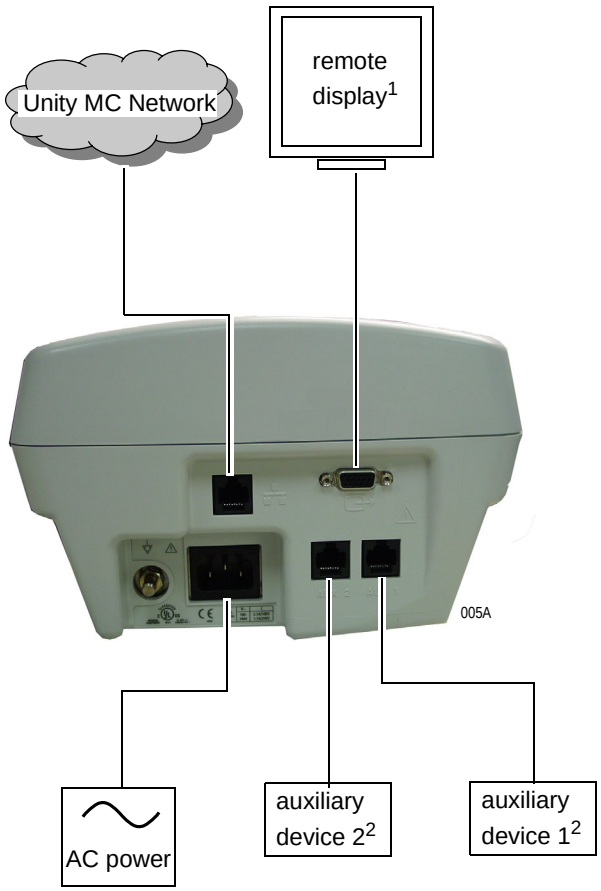
2. Pull down and hold onto the locking pin and continue to slide the docking station onto the GCX mount. Then let go of the locking pin.



3. Verify the locking pin clicks into position to secure the docking station to the GCX mount.

Connections

Connect the Cables to the Docking Station



[1] When connecting a remote display, the video cable should NOT exceed 45.72 meters (150 feet). See "Other Components" on page 6-14 for a list of video cables and video cable extenders.

[2] When connecting an auxiliary device, see the documentation that was provided with the device and the Dash Patient Monitor Operator's Manual for cable and configuration requirements.

Mount the Dash Monitor

WARNINGS

PATIENT/USER INJURY — Ensure the docking station is positioned a safe distance AWAY from the patient when connecting or disconnecting the monitor.

Hold onto the monitor's handle when the docking station's security lever is in the unlock position and until you verify the monitor is properly secured to the docking station.

Position and Lock the Monitor

1. Verify the security lever starts in the unlock (far right) position.
2. Position the front of the Dash monitor onto the front channel of the docking station.
3. Hold onto the monitor and allow the weight of the monitor to descend firmly onto the docking station. The security lever should move automatically to the central position and lock the monitor into place.
4. Try to pivot the monitor from front to back to verify it is secure.

Power Up

1. Slide the security lever to the far left position.
2. Verify the green-colored AC power indicator is illuminated on both the docking station and the monitor.
3. Verify a green-colored communication indicator is illuminated on the docking station[1].

[1] Some Dash 2000 monitors do not support the docking station's Ethernet or auxiliary communication links. See "Compatible Dash Monitors" on page 2-9.

Setup/Configure

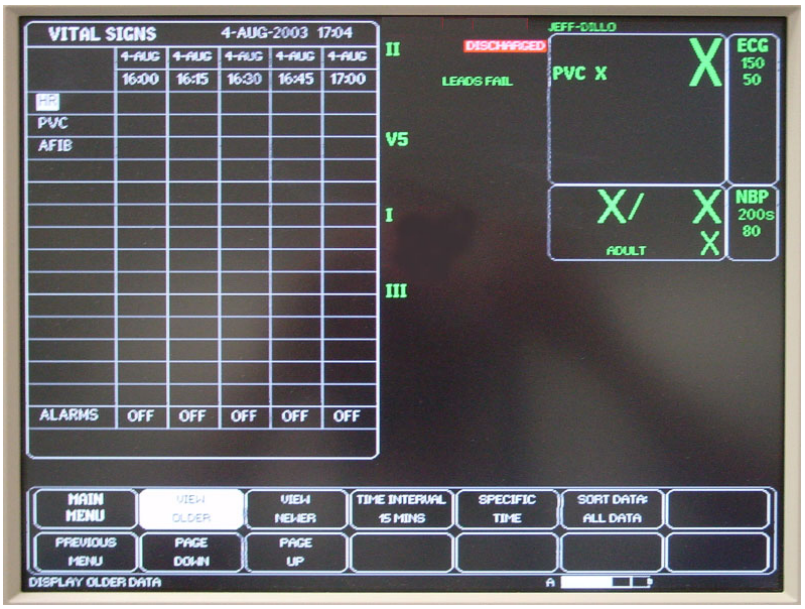
Adjust the Remote Display (Option) Video Signal

Some remote displays will automatically adjust to the docking station's video output signal. Other remote displays may require a manual adjustment.

Automatic Adjustment

1. Power up the monitor and the remote display.
2. From the monitor, select *MORE MENUS* > *PATIENT DATA* > *VITAL SIGNS*.
3. Verify the Vital Signs NRT displays correctly on the remote display.
   a. If the remote display image is good, no manual adjustments are required.

Good Remote Display Image - No Adjustement Required



040A

   b. If the remote display image is very blurry or cut-off, complete a "Manual Adjustment" on page 3-13

Manual Adjustment

1. Power up the monitor and the remote display.
2. From the monitor, select *MORE MENUS* > *PATIENT DATA* > *VITAL SIGNS*.
3. Verify the Vital Signs NRT displays correctly on the remote display.

Bad Remote Display Image - Blurry or Cut-Off Image

041A

4. If the Vital Signs NRT does NOT display correctly on the remote display, complete the following tasks:
   a. Display the Vital Signs NRT on the monitor and on the remote display.
   b. Complete an auto-adjust (auto-tune) procedure as described in the documentation provided with the remote display.

PM/Install Checkout

Complete the Electrical Safety Tests and Checkout Procedures identified in Chapter 4, “Maintenance” .

4 Maintenance

For your notes

Maintenance Schedule

Manufacturer Recommendations

WARNING
Failure on the part of all responsible individuals, hospitals or institutions, employing the use of this device, to implement the recommended maintenance schedule may cause equipment failure and possible health hazards. The manufacturer does not, in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

To ensure the docking station is always functional when required, qualified service personnel should perform the following regular maintenance.

- **Visual Inspection:** Perform a visual inspection upon receipt of the equipment, every 12 months thereafter, and prior to servicing the unit.
- **Cleaning:** Clean the unit upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
- **Electrical Safety Tests:** Perform safety tests upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
- **Checkout Procedures:** Perform the checkout upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.

Visual Inspection

The docking station and its components should be carefully inspected prior to installation, once every 12 months thereafter, and each time the equipment is serviced.

- Carefully inspect the equipment for physical damage. Do not use the docking station if damage is determined. Refer damaged equipment to qualified service personnel.
- Inspect all external connections for loose connectors or frayed cables. Have any damaged connectors or cables replaced by qualified service personnel.
- Safety labels and inscription on the device are clearly legible.

Cleaning

Cleaning Precautions

Unplug the equipment from the wall outlet before cleaning the equipment.

Use one of the following approved solutions:

- Cidex solution, or
- Sodium hypochlorite bleach (diluted), or
- Mild soap (diluted)
- Lint-free cloth
- Dust Remover (compressed air)

To avoid damage to the equipment surfaces, *never* use the following cleaning agents:

- organic solvents,
- ammonia based solutions,
- acetone solution,
- alcohol based cleaning agents,
- Betadine solution,
- a wax containing a cleaning substance, or
- abrasive cleaning agents.

Exterior Cleaning

Clean the exterior surfaces with a clean, lint-free cloth and one of the cleaning solutions listed in the table above.

- Wring the excess solution from the cloth. Do not drip any liquid into open vents, switches, plugs, or connectors.
- Dry the surfaces with a clean lint-free cloth.

Electrical Safety Tests

General

Electrical safety tests provide a method of determining if potential electrical health hazards to the patient or operator of the device exist.

Recommendations

WARNING
Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards. Unless you have an Equipment Maintenance Contract, GE does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. GE service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site.

GE recommends that you perform electrical safety tests:

- upon receipt of the device.
- every twelve months thereafter, and
- each time the main enclosure is disassembled or a circuit board is removed, tested, repaired, or replaced.

Test Conditions

Electrical safety tests may be performed under normal ambient conditions of temperature, humidity, and pressure.

First complete ALL the electrical safety tests with a Dash monitor connected to the docking station to verify proper operation of the interconnected devices.

Second, complete the following electrical safety tests to verify proper operation of the docking station as a stand-a-lone device:

- “Power Outlet Test” on page 4-7.
- “Ground (Earth) Integrity” on page 4-8.
- “Ground (Earth) Wire Leakage Current Tests” on page 4-10.
- “Enclosure Leakage Current Test” on page 4-11

Test Equipment

The recommended test equipment required to perform electrical safety tests is listed below.

Item	Specification
Leakage Current Tester	Equivalent to the circuits shown
Digital Multimeter (DMM)	AC volts, ohms (minimum of 10 milliohm resolution recommended)

Power Outlet Test

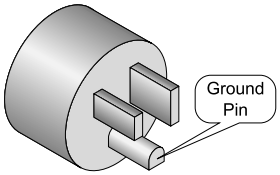
Before starting the tests, the power outlet from which the monitoring device will get electrical power must be checked. This test checks the condition of the power outlet to ensure correct results from leakage tests.

For international power outlets, refer to the internal standards agencies of that particular country. Use a digital multimeter to ensure the power outlet is wired properly.

If other than normal polarity and ground is indicated, corrective action must be taken before proceeding. The results of the following tests will be meaningless unless a properly wired power outlet is used.

Ground (Earth) Integrity

Listed below are two methods for checking the ground (earth) integrity, “Ground Continuity Test” and “Impedance of Protective Earth Connection.” These tests determine whether the device's exposed metal and power inlet's earth (ground) connection has a power ground fault condition.



Perform the test method below that is required by your Country/Local governing safety organization.

Ground Continuity Test

Completion of this test is checked by the following steps:

1. Disconnect the device under test from the power outlet.
2. Connect the negative (-) lead of the DMM to the protective earth terminal (ground pin in power inlet connector) or the protective earth pin in the Mains plug (ground pin in power cord). Refer to the US 120Vac power cord figure above.
3. Set the DMM to the milliohm (mΩ) range.
4. Connect the positive (+) lead of the DMM to all exposed metal surfaces on the device under test. If the metal surfaces are anodized or painted, scrape off a small area in a inconspicuous place for the probe to make contact with the metal.
5. Resistance must read:
   - 0.1 ohm or less without power cord
   - 0.2 ohms or less with power cord

Impedance of Protective Earth Connection

This test unlike a ground continuity test will also stress the ground system by using special ground bond testers.

This test normally is only required as a manufacturing production test to receive safety agency compliance (i.e. IEC601-1).

Some country agency's do require this test after field equipment repairs (i.e. Germany's DIN VDE 0751 standards).

Consult your country/local safety agency if in question.

Compliance is checked by the following steps:

1. A current not less than 10A and not exceeding 25A from a current source with a frequency of 50 or 60 Hz with a no-load voltage not exceeding 6 V is passed for at least 5 seconds through the protective earth terminal or the protective earth pin in the mains plug and each accessible metal part which could become live in case of failure in basic insulation.
2. The voltage drop between the parts described is measured and the impedance determined from the current and voltage drop. It shall not exceed the values indicated.

For equipment without a power supply cord the impedance between the protective earth terminal and any accessible metal part which is protectively earthed shall not exceed 0.1 ohms

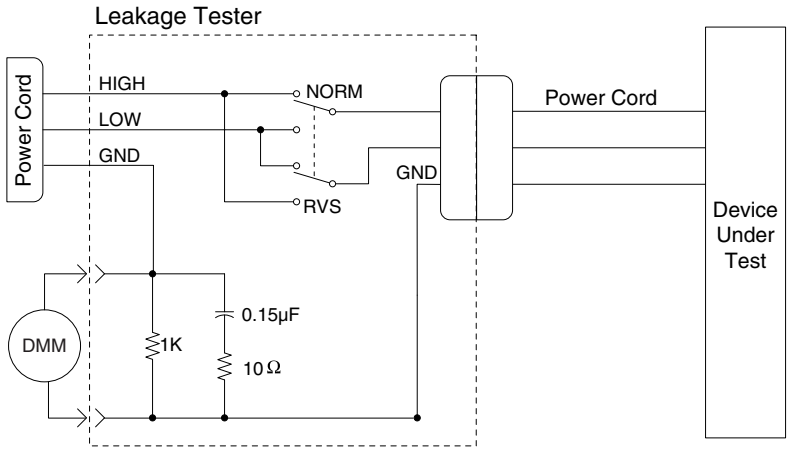
For equipment with a power supply cord the impedance between the protective earth pin in the mains plug and any accessible metal part which is protectively earthed shall not exceed 0.2 ohms.

When taking this measurement, move the unit's power cord around. There should be no fluctuations in resistance.

Ground (Earth) Wire Leakage Current Tests

Perform this test to measure current leakage through the ground (earth) wire of the equipment during normal operation.

1. Configure the leakage tester like the circuit shown below.



DMM set to measure AC voltage

2. Connect the power cord of the device under test to the power receptacle on the leakage tester.
3. The device under test is to be tested at its normal operating voltage.
4. Read the current leakage indicated on DMM.
5. Set the polarity switch on the leakage tester to RVS (reverse).
6. Read the current leakage indicated on DMM.

NOTE

If either reading is greater than the appropriate specification below, the device under test fails. Contact GE Medical Systems *Information Technologies* Technical Support.

- 300 µA (0.3 volts on the DMM), and the device under test is powered from 100-120 V/50-60 Hz
- 300 µA (0.3 volts on the DMM), and the device under test is powered from a centered-tapped 200-240 V/50-60 Hz, single phase circuit
- 500 µA (0.5 volts on the DMM), and the device under test is powered from a non-center-tapped, 200-240 V/50-60 Hz, single-phase circuit

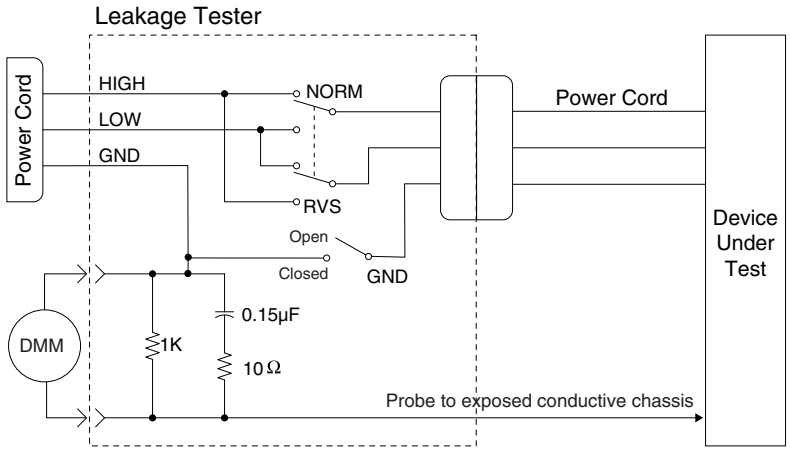
NOTE

Center-tapped and non-center-tapped supply circuits produce different leakage currents and the UL and IEC limits are different.

Enclosure Leakage Current Test

Perform this test to measure current leakage through exposed conductive surfaces on the device under test during normal operation.

1. Configure the leakage tester like the circuit shown below with GND switch OPEN and polarity switch NORM.



DMM set to measure AC voltage

2. Connect probe to an unpainted, non-anodized chassis ground on the unit under test (Equipotential lug).
3. Read the current leakage indicated on DMM.

NOTE

Center-tapped and non-center-tapped supply circuits produce different leakage currents and the UL and IEC limits are different.

4. Set the polarity switch to RVS.
5. Read the current leakage indicated on DMM.

NOTE

If either reading is greater than the appropriate specification below, the device under test fails. Contact GE Medical Systems *Information Technologies* Technical Support.

- 300 µA (0.3 volts on the DMM), and the device under test is powered from 100-120 V/50-60 Hz
- 300 µA (0.3 volts on the DMM), and the device under test is powered from a centered-tapped 200-240 V/50-60 Hz, single phase circuit
- 500 µA (0.5 volts on the DMM), and the device under test is powered from a non-center-tapped, 200-240 V/50-60 Hz, single-phase circuit

6. Set the GND switch on the leakage tester to CLOSED.
7. Read the current leakage indicated on DMM.
8. Set the polarity switch to RVS.

9. Read the current leakage indicated on DMM.

NOTE

If the reading is greater than the specification below, and the device under test is powered from 100-240 V/50-60 Hz, the device under test fails. Contact GE Medical Systems *Information Technologies* Technical Support.

- 100 microamperes (0.1 volts on the DMM), and the device under test is powered from 100-240 V/50-60 Hz

Test Completion

Disconnect all test equipment from the device. Disconnect the device power cord plug from the leakage tester power receptacle. Disconnect the leakage tester from the wall receptacle.

Checkout Procedures

Manufacturer Recommendations

Frequency

NOTE
Complete the checkout procedures with a Dash monitor connected to the docking station.

GE recommends that you perform checkout procedures:

- upon receipt of the device.
- every twelve months thereafter, and
- each time the main enclosure is disassembled or a circuit board is removed, tested, or replaced.

NOTE
To troubleshoot operation problems, see Chapter 5, "Troubleshooting".

Test Equipment

The following table lists GE recommended test equipment, adaptors, and cables you need to successfully complete the checkout procedures. The checkout procedures are written for the test equipment in the following table. If you use test equipment other than those GE recommends, you may need to slightly modify some test steps.

Patient Simulators and Cables
ECG Test ■ Marq-I ECG Simulator (no longer available for ordering) ■ MarqII-KIT (includes CO injectate box) ■ MarqIII-KIT (includes CO injectate box) **NOTE** You can use a MarqI, MarqII, or MarqIII patient simulator or an equivalent 12SL ECG patient simulator. ■ ECG Patient Cable ■ ECG Leadwire Set ■ Remote control, PN 418720-xxx, with an autoport to Mport adapter, PN 2001973-001
Auxiliary Test ■ Remote control, PN 418720-xxx, with an autoport to Mport adapter, PN 2001973-001

Docking Station Power-up Tests

1. Verify that a monitor is connected to the docking station.
2. Verify the docking station's security lever is in the far left position.
3. Remove the batteries from the monitor and unplug the docking station from AC power to turn the monitor off.
4. Restore the batteries to the monitor and plug the docking station into AC power to turn the monitor on.
5. Verify all the monitor's front panel indicators illuminate on power up.
6. Verify both of the docking station's front panel indicators illuminate on power up.
7. Verify the AC indicator on the monitor stays illuminated.

NOTE

If the AC LED stays on, but the screen is blank, the monitor is likely in "standby mode" (battery charging). Press the **Power** button to turn on the monitor.

Network Test

NOTE

Some Dash monitors do not support the docking station's Ethernet or auxiliary communication links. See "Compatible Dash Monitors" on page 2-9 and "Compatible Auxiliary Devices" on page 2-10.

NOTE

To complete this test, there must be at least one other bed located on the network.

1. Verify that a monitor is connected to the docking station.
2. Verify the docking station's communication indicator is illuminated green.
3. Verify the docking station's security lever is in the far left position.
4. Verify that the docking station (not the monitor) is connected to the Unity-MC (Mission Critical) network.
5. Press the **Power** key on the monitor to turn it on and wait for all of the parameter boxes to display on the monitor.
6. Select *MORE MENUS > VIEW OTHER PATIENTS > SELECT ANOTHER CARE UNIT*.
7. Verify that you can see at least one care unit.
8. Select a care unit.
9. Select *SELECT A BED TO VIEW*.
10. Select a bed.
11. Verify that the patient window appears on the monitor's split-screen.

Auxiliary Port Test

Complete the remote control test to verify the docking station's two auxiliary connectors are functioning.

Remote Control Test

1. Verify the remote control is connected into an Autoport-to-Mport adapter and is inserted into the docking station's **Aux** connector.
2. From the monitor, select *MORE MENUS -> MONITOR SETUP -> REVISION AND ID*.
3. Select *NEXT* from the popup menu to display the port connectors.
4. Verify the *REMOTE CONTROL* label appears after the appropriate port and the software version for the remote control is *1A*.
5. Press each remote control key and verify a beep tone sounds at the monitor.

Remote Display (Option) Test

1. Verify the docking station is connected to the remote display.
2. Power up the monitor and the remote display.
3. From the monitor, select *MORE MENUS* > *PATIENT DATA* > *VITAL SIGNS*.
4. Verify the Vital Signs NRT displays correctly on the remote display. See "Adjust the Remote Display (Option) Video Signal" on page 3-12.

PM/Repair Log

Unit Serial Number:

Institution Name:

Date	Maintenance/Repair	Technician

Unit Serial Number:

Institution Name:

Date	Maintenance/Repair	Technician

5 Troubleshooting

For your notes

General Fault Isolation

Visual Inspection

A thorough visual inspection of the equipment may help identify the problem.

Area to Inspect	Problems
connectors and cables	■ frayed cables or other damage ■ bent prongs or pins ■ cracked housing ■ loose screws ■ excessive tension or wear ■ loose connection ■ strain reliefs out of place
circuit boards	■ moisture, dusts, or debris (top and bottom) ■ loose or missing components ■ burn damage or smell of over-heated components
ground wires/wiring	■ loose wires or ground strap connections ■ faulty wiring ■ pinched wires
mounting hardware	■ loose or missing screws or other hardware
AC power outlet	■ faulty wiring of power source

Calibration

Connector Assembly Plunger Spring

The connector assembly plunger spring is calibrated at the factory. As a result of use over a long period of time, the spring tension may become loose and cause the connector assembly not to stay extended out of the docking station's base. To adjust the tension on the plunger spring, see the applied force specification identified in the "Exploded View PN 2004740-002, Revision A" on page 6-11.

Remote Display Option

Some remote displays will automatically adjust to the docking station's video output signal. Other remote displays may require a manual adjustment to display the monitor data correctly.

See "Adjust the Remote Display (Option) Video Signal" on page 3-12 if the remote display image shows any of the following symptoms:

- The image on the remote display appears to flicker.
- Part of the image on the remote display cut-off.

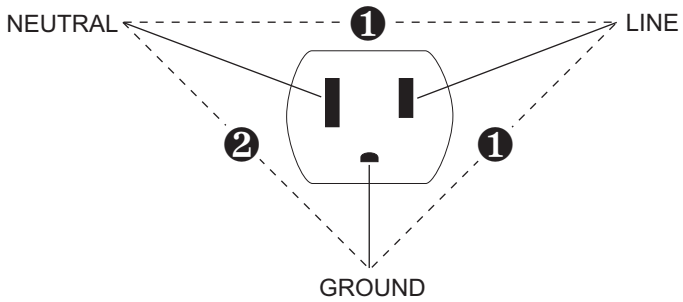
AC Line Voltage Test

This test verifies that the domestic wall outlet supplying power to the equipment is properly wired. For international wiring tests, refer to the internal standards agencies of that particular country.

120 VAC, 50/60 Hz

Use a digital voltmeter to check the voltages of the 120-volt AC wall outlet (dedicated circuit recommended). If the measurements are significantly out of range, have a qualified electrician repair the outlet. The voltage measurements should be as follows:

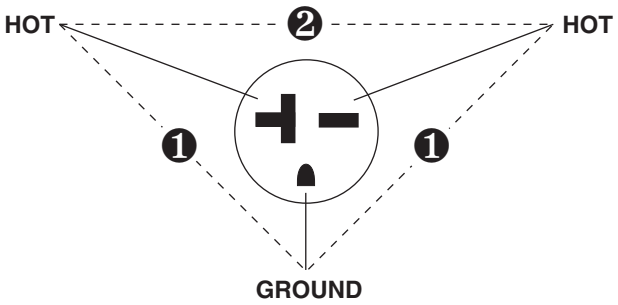
1. 120 VAC (± 10 VAC) between the line contact and neutral and between the line contact and ground.
2. Less than 3 VAC between neutral and ground.



240 VAC, 50/60 Hz

Use a digital voltmeter, set to measure at least 300 VAC, to check the voltages of the NEMA 6-20R, AC wall outlet (dedicated circuit recommended). If the measurements are significantly out of range, have a qualified electrician repair the outlet. The voltage measurements should be as follows:

1. 120 VAC (± 10 VAC) between either “hot” contact and ground.
2. 210 to 230 VAC between the two “hot” contacts.



Troubleshooting Procedures

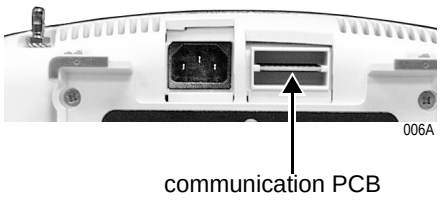
Problems and Solutions

First Things to Verify

When troubleshooting problems, ALWAYS rule out that the easiest solution is NOT the cause of the problem:

- Verify all cables are securely connected to the equipment and to the wall outlets.
- Verify the cables are inserted into the correct equipment connectors. See "Back View" on page 2-4.
- Verify dirt or other objects are not obstructing the connector ports.
- Verify the docking station's security lever is in the far left position when a monitor is connected to the docking station. See "Mount the Dash Monitor" on page 3-10.

Problems and Solutions Table

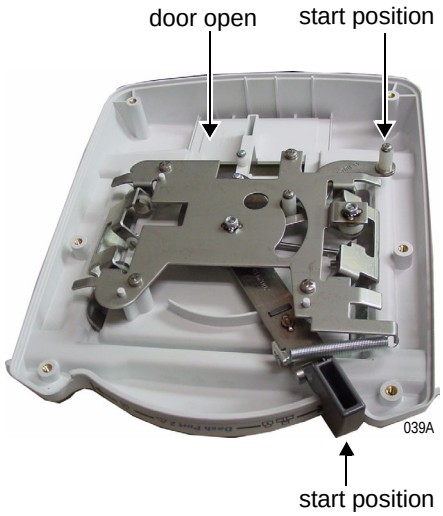
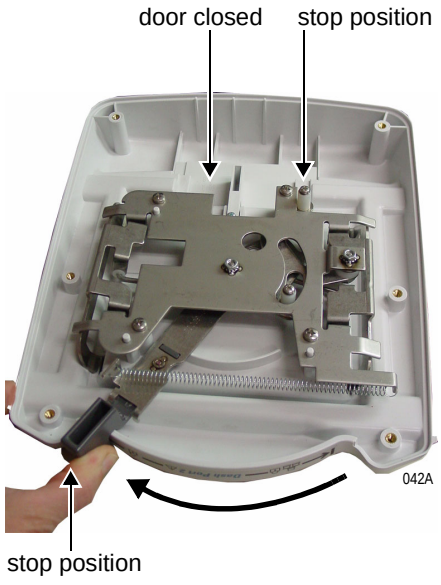
Problem	Cause	Solution
The docking station's amber-colored communication indicator IS flashing.	The monitor does not support the remote display and auxiliary 2 communication links.	Use a monitor that is fully compatible with the docking station. See "Compatible Dash Monitors" on page 2-9.
The docking station's communication indicator is NOT illuminated.	The Dash 2000 monitor does not have the communication PCB required to interface with the docking station.	Use a Dash 2000 monitor that has the communication PCB installed. See "Compatible Dash Monitors" on page 2-9. 

Problems and Solutions Table		
Problem	**Cause**	**Solution**
The monitor IS NOT communicating with the Unity Network. ■ The docking station's illuminated communication indicator is green.	The network cable is damaged.	1. Disconnect the network cable from the docking station. 2. Remove the monitor from the docking station and connect the network cable to the monitor. 3. If the monitor cannot view a remote bed from the network: ■ Replace the network cable. ■ Investigate the network for network problems. 4. If the monitor can view a remote bed from the network the docking station's PCB must be replaced. See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.
The monitor IS NOT communicating with the Unity Network. ■ The docking station's illuminated communication indicator is flashing amber.	The docking station or the monitor is defective.	1. Remove the monitor from the docking station. 2. Manually depress the locking lever pin and slide the security lever to the far left position. 3. Verify the AC power/communication mechanism extends out of the docking station's base and locks into position. 4. If the AC power/communication mechanism does NOT extend out of the docking station's base, see "The AC power/communication mechanism does NOT extend out of the docking station's base." on page 5-10. 5. If the AC power/communication mechanism extends out of the docking station's base, then complete the following tasks. a. Replace the docking station with a known good docking station. b. If the monitor now communicates with the Unity Network, then the docking station's PCB must be replaced. See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19. c. If the monitor still does NOT communicate with the Unity Network, replace the monitor.
The monitor IS NOT communicating with the Unity Network. ■ The docking station's illuminated communication indicator is green.	The network cable is connected to the monitor instead of the docking station.	Disconnect the network cable from the monitor and reconnect it to the docking station.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
The monitor is NOT communicating with the auxiliary device.	The monitor does not support the auxiliary device.	Use a monitor that supports the auxiliary device. See "Compatible Auxiliary Devices" on page 2-10.
	The monitor's software version does not support the **AUX 2** connector on the docking station.	To use the **AUX 2** connector on the docking station, the monitor must use Dash 3000/4000 software version 5.0 or later. See "Compatible Dash Monitors" on page 2-9.
	The auxiliary cable is damaged.	1. Disconnect the auxiliary cable from the docking station. 2. Connect the auxiliary cable to the monitor. 3. If the monitor cannot communicate with the auxiliary device, replace the auxiliary cable.
	The auxiliary device may need to be configured to function with a docking station.	See the Dash Patient Monitor Operator's Manual and the operator's manual provided with the auxiliary device for configuration recommendations.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
No AC power to the monitor and the following condition applies: ■ The monitor and the docking station's AC power indicator is NOT illuminated.	The docking station is not connected to an electrical power outlet.	Connect the docking station to an electrical power outlet.
	The electrical power outlet does not have power.	1. Verify the electrical power outlet is functioning by connecting a known good device to the outlet. 2. If the known good device does not work, then plug the docking station into a known good electrical power outlet.
	The electrical power cable wires are loose.	1. Verify that the line, neutral, and ground wires are firmly connected to the plug and are not short-circuited. 2. Replace the power cable if necessary.
	The room's fuses are blown.	Contact facility maintenance department to identify and repair the problem.
	The room's circuit breaker has been tripped.	Contact facility maintenance department to identify and repair the problem.
	The electrical power cable to the docking station is defective.	1. Verify the electrical power cable is defective by connecting a known good electrical power cable to the docking station. 2. If the docking station's AC power indicator is now illuminated, replace the defective power cable.
	The docking station may be defective.	1. Verify the docking station is defective by connecting a known good docking station. 2. If the docking station's AC power indicator is now illuminated, complete the following steps for the defective docking station. a. Verify there is AC power at the **J2** PCB connection. b. If AC power is present at the **J2** PCB connection, then the docking station's PCB must be replaced. See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19. c. If AC power is NOT present at the **J2** PCB connection, verify the **J2** connector is securely seated. If it is securely seated, then "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
No AC power to the monitor and the following conditions apply: ■ The monitor's AC power indicator is NOT illuminated. ■ The docking station's AC power indicator is illuminated.	The monitor may be defective.	1. Replace the monitor with a known good monitor. 2. If the monitor's AC power indicator is now illuminated, then repair the defective monitor. See the Dash Patient Monitor Service manual for more information.
No AC power to the monitor and the following conditions apply: ■ The monitor's AC power indicator is NOT illuminated. ■ The docking station's AC power indicator is illuminated.	The docking station's Connector Assembly FRU may be defective.	1. Remove the monitor from the docking station. 2. Manually depress the locking lever pin and slide the security lever to the far left position. 3. Verify the AC power/communication mechanism extends out of the docking station's base and locks into position. 4. If the AC power/communication mechanism does NOT extend out of the docking station's base, see "The AC power/communication mechanism does NOT extend out of the docking station's base." on page 5-10. 5. If the AC power/communication mechanism extends out of the docking station's base, then complete the following tasks. a. Verify the integrity of the **J1** connection on the PCB. b. Verify AC power is available at **J1**. c. Verify AC power is available at the Connector Assembly's AC connector. d. If AC power is available at **J1** but not at the Connector Assembly's AC connector, then "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.
The AC power/communication mechanism extends out of the docking station's base, but does NOT lock into position.	■ The spring plunger ball and socket may have an accumulation of stainless steel debris. ■ The tension applied by the spring plunger may be out of specification. ■ The Connector Assembly may be defective.	1. Wipe the spring plunger ball and socket with a soft, clean cloth to remove any accumulated stainless steel debris. 2. Verify the spring plunger meets the force specifications identified on page 2 of the "Exploded View PN 2004740-002, Revision A" on page 6-10. ■ Adjust the spring plunger if necessary. 3. If adjusting the spring plunger does not resolve the problem, then "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
The AC power/communication mechanism does NOT extend out of the docking station's base.	■ The Top Housing FRU may be defective, or ■ Plunger spring and pin are missing.	Complete the following tasks to verify the Top Housing FRU is functioning properly: 1. "Separate the Top and Bottom Housings" on page 6-17. 2. Move the security lever to the far left position. 3. Verify the top housing mechanisms move through their full range of motion.   e. If a mechanism is defective, "Replace the Top Housing FRU" on page 6-18.
	The locking lever pin or spring are either missing or not installed correctly.	See "Join the Top and Bottom Housings" on page 6-25.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
The monitor is not properly secured to the docking station.	The docking station's clamping mechanism is not properly engaged or is defective.	See "Mount the Dash Monitor" on page 3-10. 1. Verify the security lever starts in the far right position BEFORE placing the monitor onto the docking station. 2. Verify the monitor is seated properly on the docking station. 3. Move the security lever to the far left position. 4. If the monitor cannot be properly secured to the docking station, "Replace the Top Housing FRU" on page 6-18.
	The monitor's GCX plate or footpad is either missing or not installed correctly.	See the assembly drawings provided in the Dash Patient Monitor's Service Manual to verify that the GCX plate and footpad are installed correctly.
The text and waveforms on the remote display appear broken-up.	The remote display's horizontal and vertical adjustments are not synchronized with the monitor's video output. As a result, not all of the pixels required to make a complete text or waveform image are being displayed.	1. Allow the remote display to automatically adjust to the video signal. See "Automatic Adjustment" on page 3-12. 2. If the text and waveforms continue to appear broken-up, manually adjust the remote display's video signal. See "Manual Adjustment" on page 3-13.
No picture appears on the remote display and the following conditions apply: ■ The remote display's illuminated LED is flashing amber. ■ The docking station's illuminated communication indicator is green.	The remote display or the docking station is defective.	1. Connect the docking station to a known good remote display. 2. If the picture appears on the remote display, replace the defective remote display. 3. If a picture does not appear, then the docking station's PCB must be replaced. See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.
No picture appears on the remote display and the following conditions apply: ■ The remote display's illuminated LED is flashing amber. ■ The docking station's illuminated communication indicator is amber.	The docking station is defective.	1. Remove the docking station and connect a known good docking station. 2. If a picture appears on the remote display, then the docking station's PCB must be replaced. See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
No picture appears on the remote display and the following conditions apply: ■ The remote display's illuminated LED is amber. ■ The docking station's communication indicator is either illuminated green OR is NOT illuminated at all.	The docking station or the monitor is defective.	1. Remove the monitor from the docking station. 2. Manually depress the locking lever pin and slide the security lever to the far left position. 3. Verify the AC power/communication mechanism extends out of the docking station's base and locks into position. 4. If the AC power/communication mechanism does NOT extend out of the docking station's base, see "The AC power/communication mechanism does NOT extend out of the docking station's base." on page 5-10. 5. If the AC power/communication mechanism extends out of the docking station's base, then complete the following tasks. a. Replace the docking station with a known good docking station. b. If a picture appears on the remote display, then replace the PCB in the defective docking station. See "Replace the Connector Assembly FRU or PCB FRU" on page 6-19. c. If a picture still does NOT appear on the remote display, replace the monitor.
The security lever is already in the central position BEFORE the monitor has been placed on the docking station.	The locking mechanism may have been accidentally activated before the monitor was placed on the docking station.	1. Remove the monitor. 2. Re-set the docking station's locking mechanism by moving the security lever to the unlock (far right) position.
The security lever doesn't move to the central position when the monitor has been placed on the docking station.	The monitor's footpad and/or GCX plate may have been removed. Without both components, the monitor WILL NOT safely or correctly function with the docking station.	Replace the missing footpad and/or GCX plate. See the Dash Patient Monitor's Service Manual.
	Cables or other objects may be preventing the monitor from activating the locking mechanism.	Verify the docking station's base is free of objects.
	The monitor might not be positioned correctly on the docking station to activate the locking mechanism.	Remove and re-position the monitor.
	The Top Assembly FRU has failed.	"Replace the Top Housing FRU" on page 6-18.

Problems and Solutions Table		
Problem	**Cause**	**Solution**
The monitor pivots when the security lever is in the lock position.	The docking station's locking mechanism may have been accidentally activated before the monitor was placed on the docking station.	1. Remove the monitor. 2. Re-set the locking mechanism by moving the security lever to the unlock (far right) position. 3. Reposition the monitor.
	The monitor might not be positioned correctly on the docking station to allow all four clamps to secure the monitor's GCX plate.	1. Remove and re-position the monitor on the docking station. 2. Verify the monitor doesn't pivot.
	The Top Assembly FRU has failed.	"Replace the Top Housing FRU" on page 6-18.
The docking station will not release the monitor when the security lever is moved to the unlock position.	The security lever was not moved and held in the unlock position while the monitor was removed.	Slide and hold the security lever in the unlock (far right) position until you remove the monitor from the docking station.
	The Top Assembly FRU has failed.	1. Remove the six screws from the bottom of the docking station to separate the top housing of the docking station from the bottom housing of the docking station. 2. Use a bladed screw driver to manually release the docking station's clamps from the base of the monitor. 3. If necessary, contact Technical Support. 4. "Replace the Top Housing FRU" on page 6-18.
The security lever doesn't move to the far left position.	Cables or other objects may be blocking the monitor's AC power or communication ports.	1. Remove the monitor from the docking station. 2. Remove any cables or other objects from the connector ports located on the bottom of the monitor. 3. Reposition the monitor.
	The monitor's expansion PCB may be damaged.	Replace the monitor's damaged expansion PCB. See the Dash Patient Monitor's Service Manual.
	The monitor may not be positioned correctly on the docking station.	Remove and reposition the monitor.
	Foreign objects may be blocking the monitor's expansion PCB.	1. Remove foreign objects blocking the expansion PCB. 2. Reposition the monitor.
	The Connector Assembly FRU has failed.	See, "Replace the Connector Assembly FRU or PCB FRU" on page 6-19.

For your notes

6 Part Lists, Drawings, and Replacement

For your notes

Ordering Parts

The parts lists and assembly drawings in this chapter supply enough detail for you to order parts for the assemblies considered field serviceable. If you require additional information or troubleshooting assistance, contact Technical Support.

To order parts, contact Service Parts at the address or telephone number listed on the “How to Reach Us...” page found in the front of this manual.

Field Replaceable Units (FRUs)

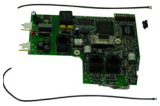
The following Field Replaceable Units are available for this product:

034A, 037A

See “Top Assembly — PN 2013500-002, Rev. A” on page 6-5.

035A, 037A

See “Connector Assembly — PN 2013500-003, Rev. A” on page 6-6.



036A, 037A

See “PCB Board — PN 2013500-004, Rev. A” on page 6-7.

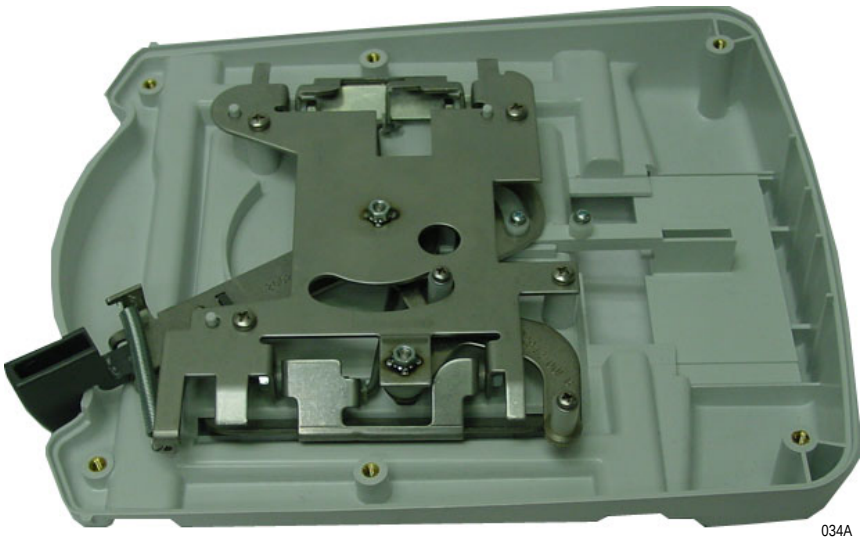
037A

See “Hardware and Fasteners” on page 6-8.

NOTE

The hardware and fasteners are included with the top assembly, connector assembly, and the PCB FRUs.

Top Assembly — PN 2013500-002, Rev. A

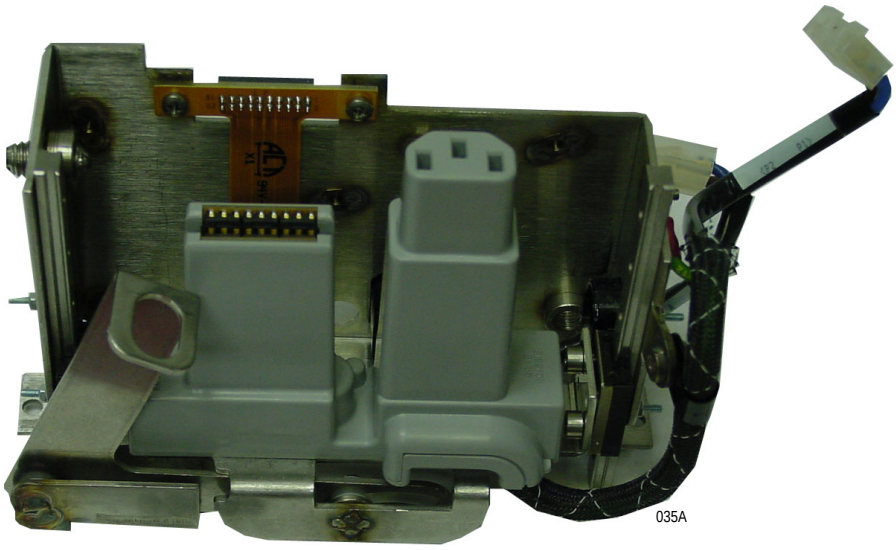


034A

037A

Find Number	Item Description	Qty
1	ENCL TOP DOCKING STATION	1
3	DOOR CONNECTOR	1
6	ASSY LEVERS DOCKING STATION	1
9	LABEL DASH PORT 2 FRONT PANEL	0
20	SPACER ACETAL .25 LG	2
22	SCR MACH PNHD M4X6LG SST W/THD LOCK	4
26	WASHER M3 PLAIN S/S	2
27	SCR TAPPING TF M3 X 6 LG	2
50	PKG BAG CUSHION ZIP 15 X 15 STATIC SHLD	1
51	BOX MAILER 11.75L 11.00W 2.88H	1
52	LABEL CARTON FRU - DASHPORT 2	1
	Hardware FRU (See"Hardware and Fasteners" on page 6-8.	1
	Label Kit Dash Port 2	1

Connector Assembly — PN 2013500-003, Rev. A

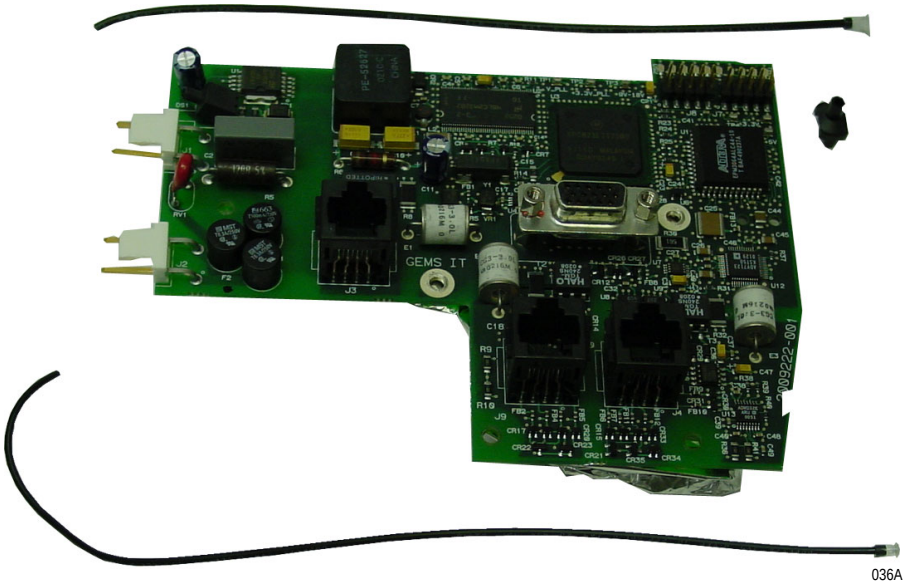


035A

037A

Find Number	Item Description	Qty
7	ASSY CONNECTOR DOCKING STATION	1
50	PKG BAG BUBBLE ZIP 8 X 12 ANTI-STATIC	1
51	BOX MAILER 9.75L 2.88H 7.38W	1
52	LABEL CARTON FRU - DASHPORT 2	1
	Hardware FRU (See"Hardware and Fasteners" on page 6-8.	1

PCB Board — PN 2013500-004, Rev. A



036A

037A

Find Number	Item Description	Qty
5	LED VERT LIGHT PIPE ASSY 235MM	1
11	PCB ACCESSORY INTERFACE DASH PORT 2	1
50	PKG BAG BUBBLE ZIP 6 X 10 ANTI-STATIC	1
51	BOX MAILER 7.00L 6.00W 2.50H	1
52	LABEL CARTON FRU - DASHPORT 2	1
	Hardware FRU (See"Hardware and Fasteners" on page 6-8.	1

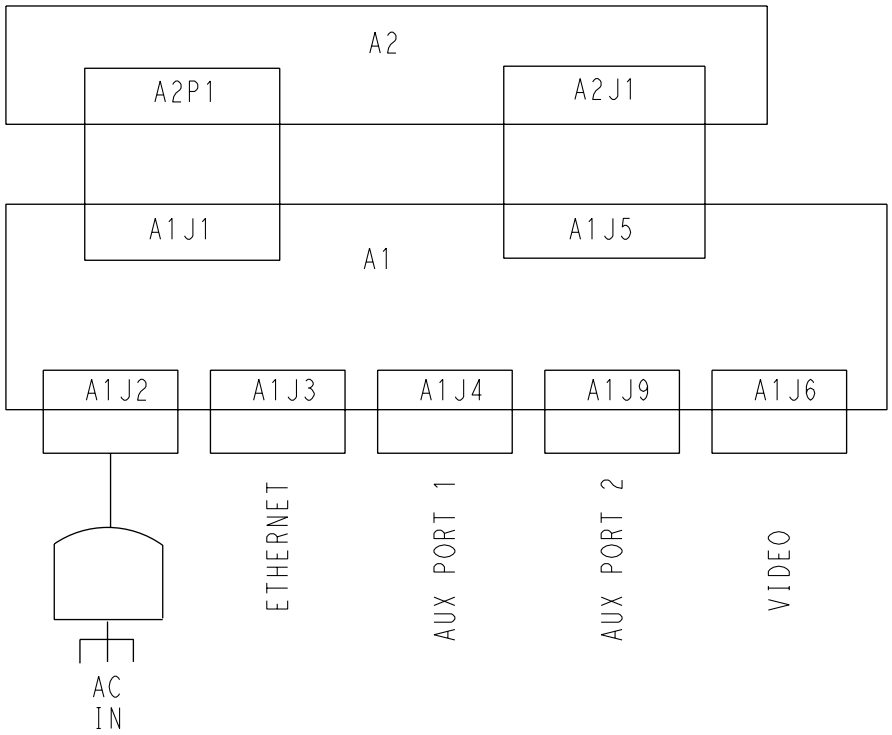
Hardware and Fasteners

The following hardware and fasteners are Included with each FRU item.

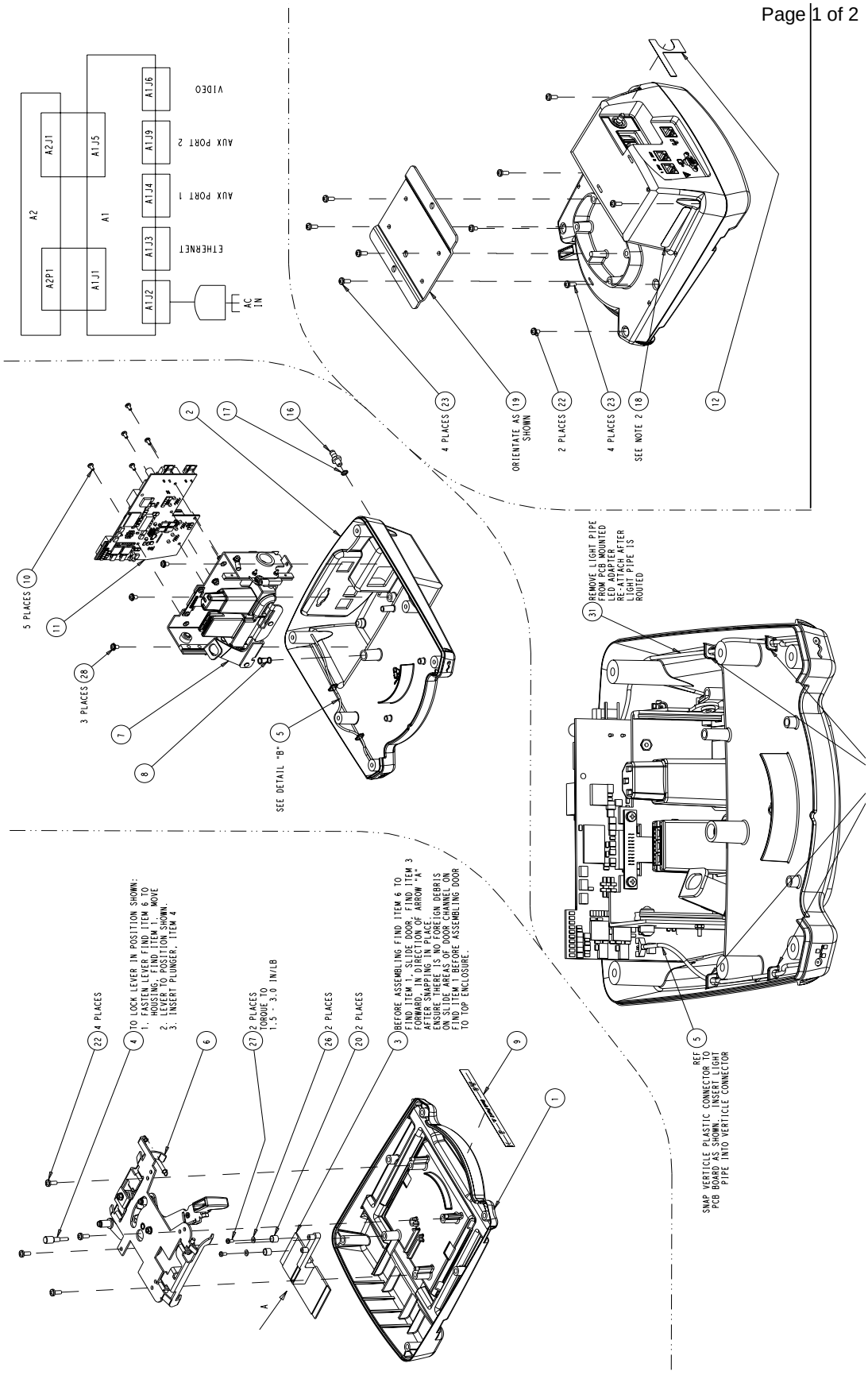
037A

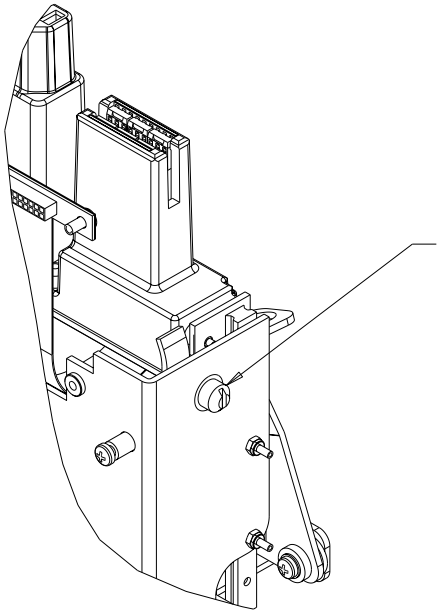
Find Number	Item Description	Qty
4	PIN LOCK LEVER	1
8	SPRING CPRSN 7.6 OD X 14.2 LG	1
10	SCR MACH PNHD M3X6LG SST W/THD LOCK	5
16	PLUG MC EQUIPOTENTIAL	1
17	WASHER LOCK SERRATED F/M-6	1
22	SCR MACH PNHD M4X6LG SST W/THD LOCK	2
23	SCR MACH PNHD M4X10LG SST THD LOCK	4
28	SCR PH M4X .7X6.0LG SEMS	3
50	BAG ZIPLOCK CLR 2MIL POLY 5X7	1
52	LABEL CARTON FRU - DASHPORT 2	1

Interconnection Diagram



Exploded View PN 2004740-002, Revision A

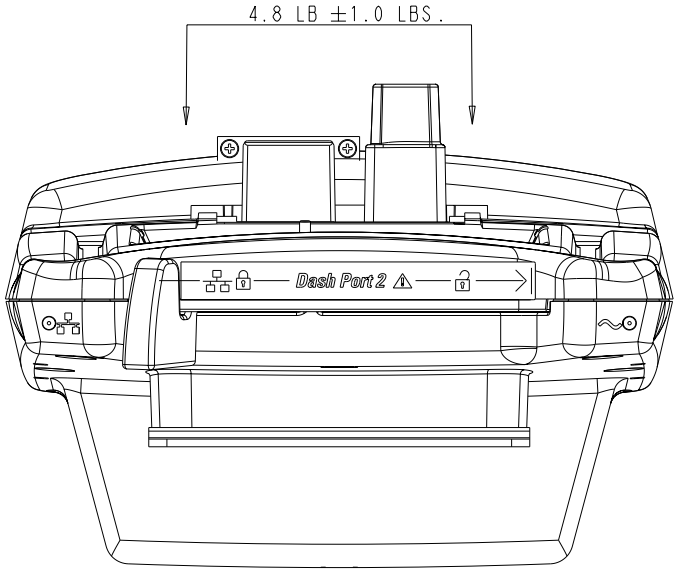




DETAIL A

TEST STEPS:

1. DEPRESS PIN IN CENTER OF TOP HOUSING TO RELEASE FRONT LEVER.
2. MOVE FRONT LEVER TO THE FAR LEFT LOCK POSITION AS SHOWN. A DETENT SHOULD BE FELT.
3. CONNECTOR SHOULD BE RETAINED IN THIS UP POSITION BY THE INTERNAL LOCK.
4. A FORCE OF 4.8 LB +/- 1.0 LB, APPLIED WHERE SHOWN, SHOULD UNLOCK CONNECTOR FROM THE UP POSITION. SEE DETAIL "A" IF ADJUSTMENT IS NECESSARY.



Parts List PN 2004740-002, Revision A

Use the Find Number to identify the FRU an item number is associated with.

Find Number	Item Description	Reference Designator	Qty
1	ENCL TOP DOCKING STATION		1
2	ENCL BOTTOM DOCKING STATION		1
3	DOOR CONNECTOR		1
4	PIN LOCK LEVER		1
5	LED VERT LIGHT PIPE ASSY 235MM		1
6	ASSY LEVERS DOCKING STATION		1
7	ASSY CONNECTOR DOCKING STATION		1
8	SPRING CPRSN 7.6 OD X 14.2 LG		1
9	LABEL DASH PORT 2 FRONT PANEL		0
10	SCR MACH PNHD M3X6LG SST W/THD LOCK		5
11	PCB ACCESSORY INTERFACE DASH PORT 2	A1	1
12	LABEL DASH PORT RATINGS		0
13	PACKAGING CORRUGATE SLEEVE DASHPORT		1
14	INSERT PACKAGING DOCKING STATION TOP		1
15	INSERT PACKAGING CONN PROTECTOR		1
16	PLUG MC EQUIPOTENTIAL		1
17	WASHER LOCK SERRATED F/M-6		1
18	LABEL BLANK 2.6IN X.4IN		1
19	PLATE MOUNT GCX DASH		1
20	SPACER ACETAL .25 LG		2
21	PACKAGING ENCLOSURE 12.12X11.0X13.6		1
22	SCR MACH PNHD M4X6LG SST W/THD LOCK		6
23	SCR MACH PNHD M4X10LG SST THD LOCK		8
24	LABEL CARTON DASH PORT		1
25	BAG INTISTATIC POLY 18 X 20		1
26	WASHER M3 PLAIN S/S		2
27	SCR TAPPING TF M3 X 6 LG		2

Find Number	Item Description	Reference Designator	Qty
28	SCR PH M4X .7X6.0LG SEMS		3
31	LED RT-ANG GREEN LIGHT PIPE ASSY 292MM		0

Other Components

Displays

Item Number	Item Description
FPD15AD-PS	FLAT PANEL DISP 15" ANA/DIG PWR SUP
FPD18AD-PS	18" FLAT PANEL A/D DISP W/PWR SUPPLY

GCX Mounts

Item Number	Item Description
2007059-001	Multi-use pedestal style mount
407349-009	M series pivot arm wall mount
2014448-001	Locking VHM arm wall mount

Video Cables and Video Cable Extenders

Item Number	Item Description
415301-301	CA VID 75OHM HD15M-HD15M 4FT (male to female video extender cable)
415301-302	CA VID 75OHM HD15M-HD15M 10FT (male to female video extender cable)
415301-303	CA VID 75OHM HD15M-HD15M 25FT (male to female video extender cable)
415301-304	CA VID 75OHM HD15M-HD15M 50FT (male to female video extender cable)
415301-305	CA VID 75OHM HD15M-HD15M 75FT (male to female video extender cable)
415301-306	CA VID 75OHM HD15M-HD15M 100FT (male to female video extender cable)
415301-307	CA VID 75OHM HD15M-HD15M 150FT (male to female video extender cable)
415301-401	Video Cable, HD15M-HD15F, 4’ (male to female video extender cable)
415301-402	Video Cable, HD15M-HD15F, 10’ (male to female video extender cable)
415301-403	Video Cable, HD15M-HD15F, 25’ (male to female video extender cable)

Item Number	Item Description
415301-404	Video Cable, HD15M-HD15F, 50’ (male to female video extender cable)
415301-405	Video Cable, HD15M-HD15F, 75’ (male to female video extender cable)
415301-406	Video Cable, HD15M-HD15F, 100’ (male to female video extender cable)
415301-407	Video Cable, HD15M-HD15F, 150’ (male to female video extender cable)
2002215-001	Analog Video Cable, 6’ (male to male 15 pin D connector video replacement cable)
2002215-002	Analog Video Cable, 10’ (male to male 15 pin D connector video replacement cable)
2002215-003	Analog Video Cable, 15’ (male to male 15 pin D connector video replacement cable)
2002215-004	Analog Video Cable, 25’ (male to male 15 pin D connector video replacement cable)

Disassembly/Assembly of FRUs

Guidelines for Disassembly

WARNING
REPAIR TO THE FRU LEVEL — Field repairs are recommended to the field replaceable unit (FRU) only. Attempting a field repair on a PCB or a factory sealed component or assembly could jeopardize the safe and effective operation of the docking station.

NOTE
GE recommends that you assemble the docking station using the NEW fasteners (screws, washers, etc.) provided in the Field Replaceable Unit kit. Some fasteners, like the screws with a thread locking coating, are NOT intended to be re-used more than three times.

Tools Required

A standard set of hand tools is required for disassembly and assembly.

Before Disassembly

Before you disassemble the docking station, you should ALWAYS remove AC power.

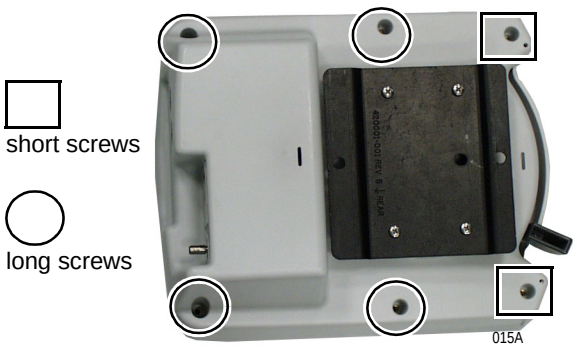
Hardware Assemblies

When disassembling the docking station, observe the following guidelines:

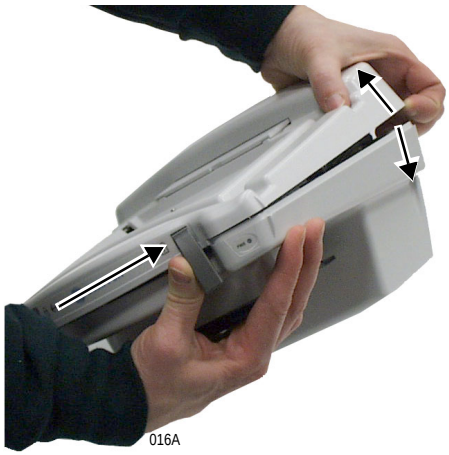
- Provide appropriate electrostatic discharge protection and handle all PCB assemblies by their edges to prevent damaging the PCB.
- Note the positions of wires, cables, and different sized screws; marking them if necessary to ensure they are replaced correctly.
- Save and set aside all hardware for re-assembly.

Dissassembly Procedures

Separate the Top and Bottom Housings



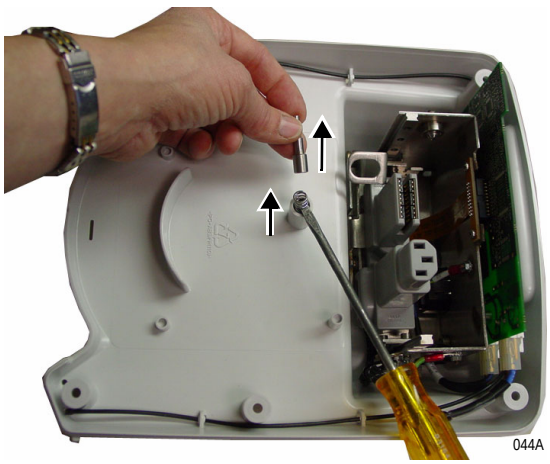
1. Loosen the six screws from the bottom housing.



NOTE

The loosened screws are not self-capturing and will fall out onto your work surface.

2. Hold onto both housings and turn the unit over a clean work surface.
3. Slide and hold the security lever in the far right position while separating the top and bottom housings.
4. Continue to hold onto the security lever and gently let it slide back into its resting position.

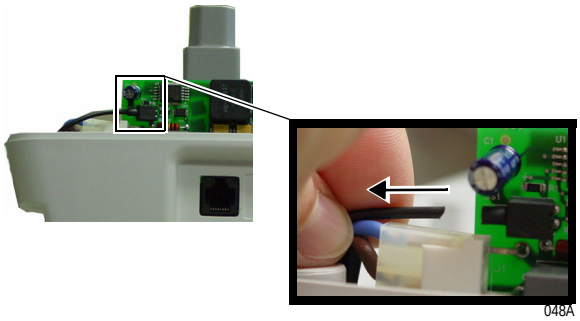


5. Remove the locking lever spring and pin.

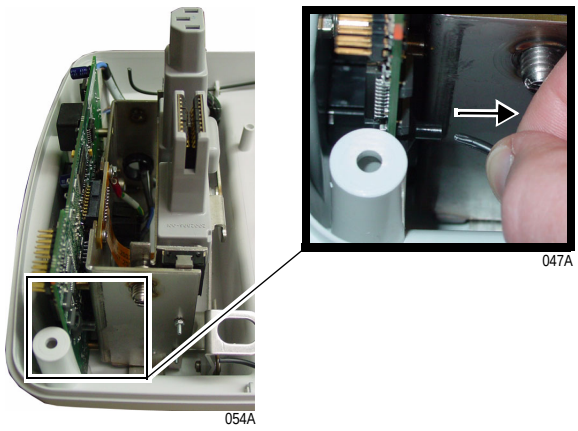
Replace the Top Housing FRU

1. "Separate the Top and Bottom Housings" on page 6-17.
2. Discard the defective top housing and install the replacement Top Housing FRU.
3. "Join the Top and Bottom Housings" on page 6-25.

Replace the Connector Assembly FRU or PCB FRU

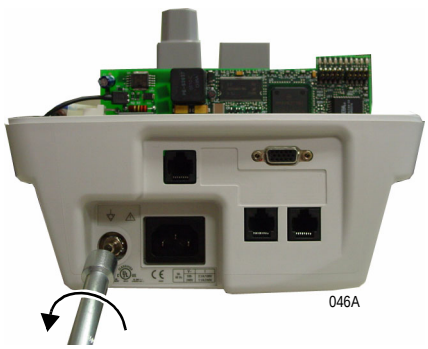


1. "Separate the Top and Bottom Housings" on page 6-17.
2. Stabilize the PCB LED connector and gently remove the AC power indicator light pipe.

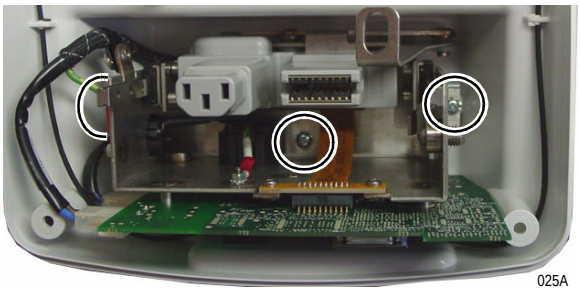


3. "Separate the Top and Bottom Housings" on page 6-17.
4. Stabilize the PCB LED connector and gently remove the communication indicator light pipe.

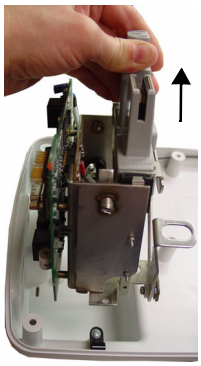
5. If the light pipes are defective, replace them.
   a. Push the light pipes out from the bottom assembly housing.
   b. Discard the defective light pipes.



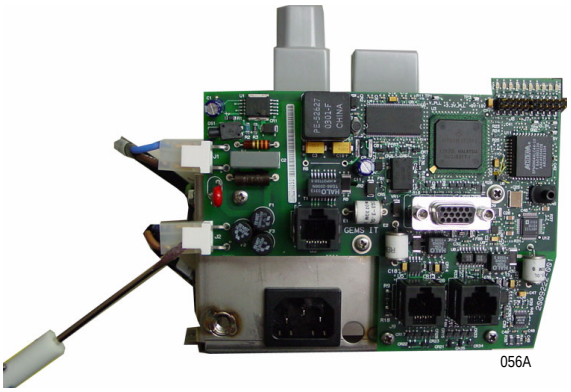
6. Use a 10 mm wrench or nut driver to remove the equipotential lug.


025A

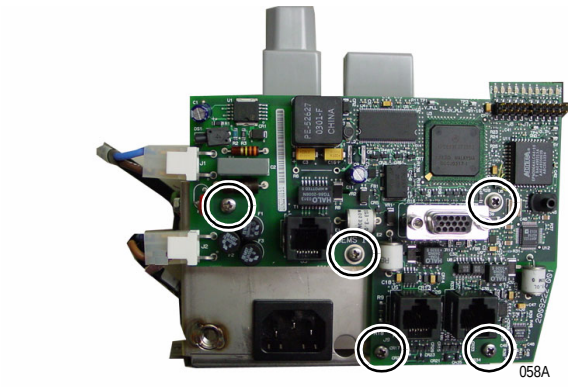
7. Remove the three connector assembly bracket screws from the bottom housing.


051A

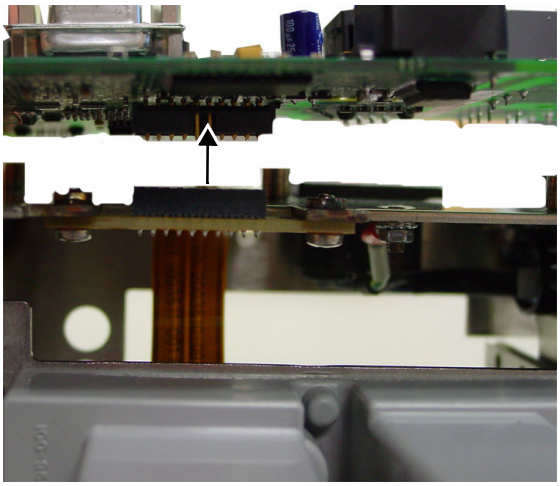
8. Lift out the connector assembly.


056A

9. Unclip the two power connectors from the PCB.


058A

10. Remove the five PCB screws.



055A

11. Remove the PCB ribbon cable friction connector.

12. Lift off the PCB.

    PCB

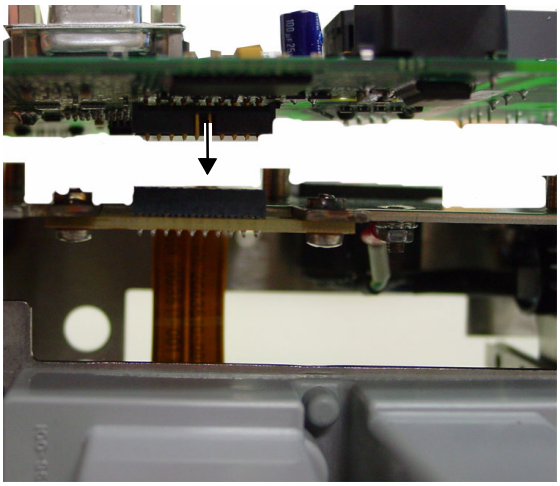
    a. If the PCB is defective, follow your country requirements for disposal and install the PCB FRU.

    b. If the PCB is not defective, reinstall the PCB into the connector assembly.

    Connector Assembly

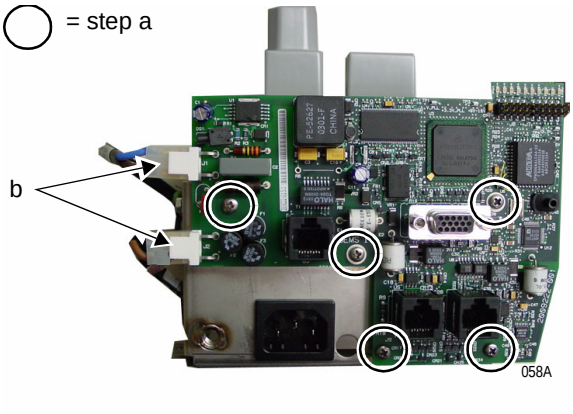
    a. If the connector assembly is defective, dispose of it and install the PCB FRU.

    a. If the connector assembly is not defective, reinstall the connector assembly.

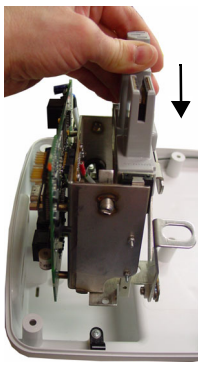


055A

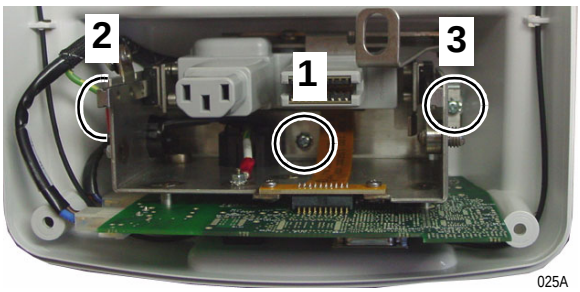
13. Insert the PCB ribbon cable friction connector.



14. Install the new PCB FRU.
    a. Install the five PCB screws.
    b. Insert the two power connectors.

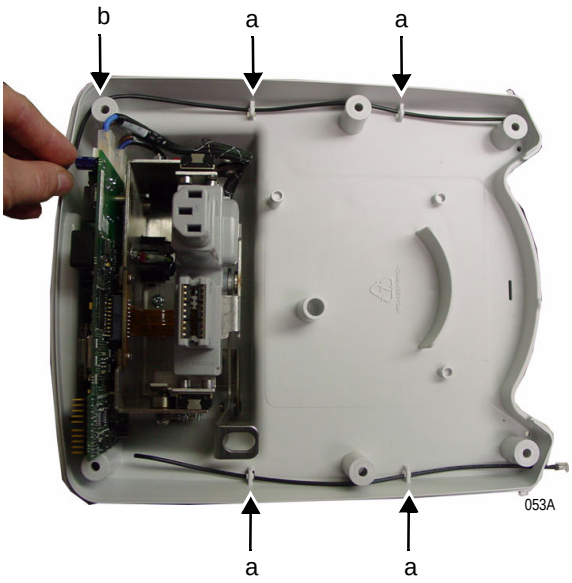


15. Position the replacement Connector Assembly FRU into the bottom housing.

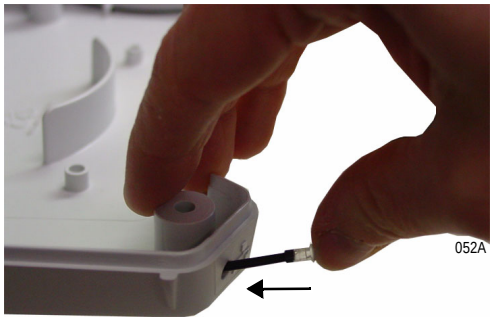


16. Start with the center screw and install the three connector assembly bracket screws.

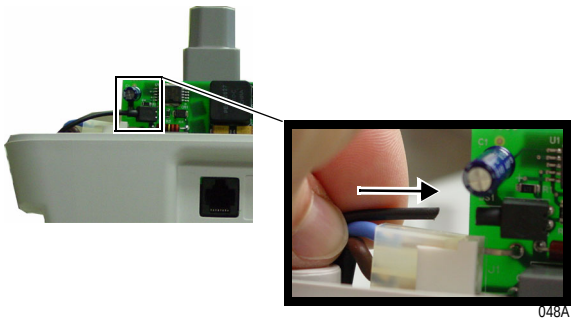
17. If the light pipes are to be replaced, route the light pipes through the bottom housing's LED opening.



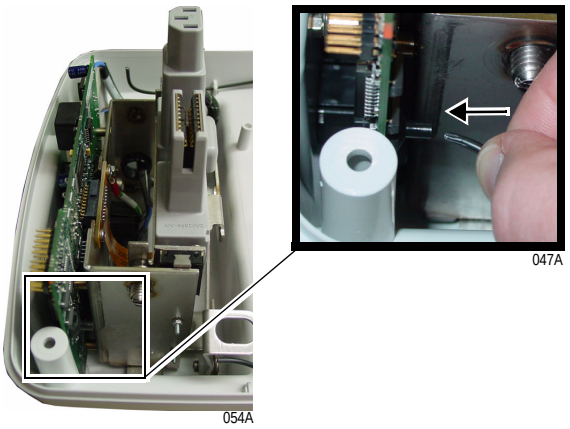
18. Route the light pipes to the PCB light pipe connectors.
    a. Insert the light pipes through the molded guide holes.
    b. Be sure to route the AC power indicator light pipe BEHIND the plastic stand-off.



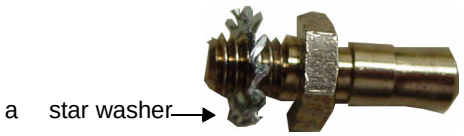
19. Gently push the light pipe lens into the lens opening until it is seated.



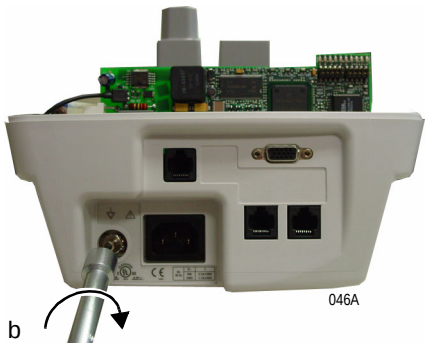
20. Stabilize the PCB LED connector and gently insert the AC power indicator light pipe.

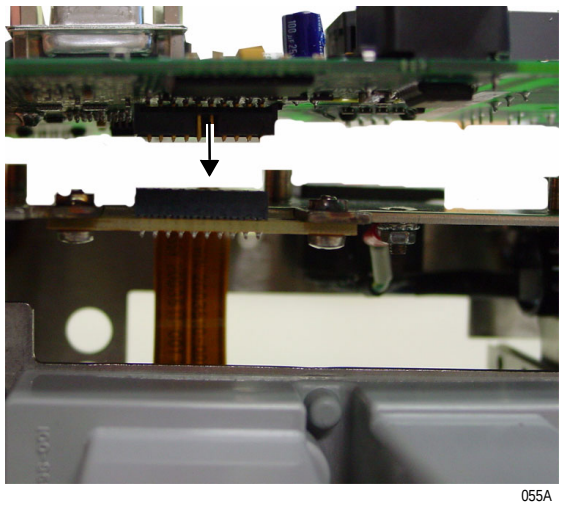


21. Gently insert the communication indicator light pipe into the PCB connector.



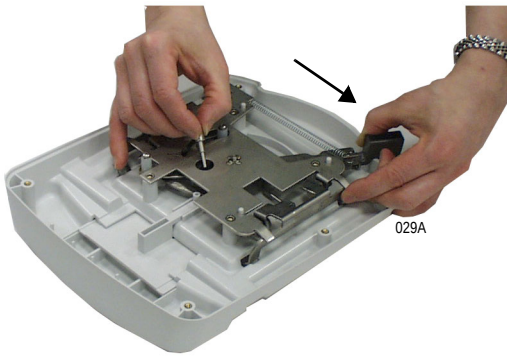
22. Replace the equipotential lug.
    a. Place the star washer onto the equipotential lug.
    b. Insert the lug into the threaded hole and tighten the lug
23. "Join the Top and Bottom Housings" on page 6-25





24. Insert the PCB ribbon cable friction connector.

Join the Top and Bottom Housings



1. Insert the locking lever spring into the spring opening.
2. Slide and hold the security lever in the unlock position (far left) while inserting the locking lever pin into the locking assembly.
3. Release the security lever and place the top and bottom housing pieces together.
4. Hold onto both housings and turn the unit over and install the six screws into the bottom housing.
5. See "After Reassembly" on page 6-25 to identify the electrical safety tests and checkout procedures you must complete.

After Reassembly

After reassembling the docking station, ALWAYS complete ALL of the checkout procedures, electrical safety tests, and regular maintenance procedures identified and described in this service manual.

Recommended Electrical Safety Tests and Checkout Procedures

Replacement Procedure	Electrical Safety Tests	Checkout Procedures
Top Housing Assembly FRU Connector Assembly FRU PCB FRU	■ "Power Outlet Test" on page 4-7. ■ "Ground (Earth) Integrity" on page 4-8. ■ "Ground (Earth) Wire Leakage Current Tests" on page 4-10. ■ "Enclosure Leakage Current Test" on page 4-11.	■ "Docking Station Power-up Tests" on page 4-14. ■ "Network Test" on page 4-15. ■ "Auxiliary Port Test" on page 4-15. ■ "Remote Display (Option) Test" on page 4-16.

For your notes

A Appendix A – Technical Specifications

NOTE

Due to continual product innovation, specifications are subject to change without notice. The following specifications are accurate as of the date of this publication, and pertain to the monitor.

For your notes

Technical Specifications

Docking Station

Item	Specification
Power Requirements	
without monitor	88-270 VAC RMS, 47-63 HZ Maximum input current is125 mA RMS
with monitor at 115V setting	88-135 VAC RMS, 47-63 HZ
with monitor at 230V setting	176-270 VAC RMS, 47-63 HZ
Power Consumption (fully loaded)	75 W
Communication	
Network Connection	RJ45 connector/10BaseT.
Video Output	15 pin female D connector. 640 x 480. See "Appendix B – Remote Display" for additional specifications.
AUX Port	RJ45 connector/RS232 (hardware interface type autoport). To connect M-port devices to the **AUX** port use the M-port to Auto-port adapter, PN 2001973-001.
Operating Conditions	
operating temperature	0 to 40°C (32 to 104°F)
relative humidity, non-condensing	5 to 95% at 40°C (104°F)
altitude	-610 to 4,570 m (-2000 to 15, 000 ft.)
atmospheric pressure	425 to 817 mmHg (56 to 109 kPa)
Cooling Method	convection
Storage Conditions	
maximum	70°C (158° F) at 95% relative humidity
minimum	-40°C (104° F) at 85% relative humidity
Physical Specifications	
height	13.9 cm (5.5 in)
width	27 cm (10.5 in)
depth	20 cm (8.0 in)
weight	1.95 kg (4.3 lb.)
maximum load	6.8 kg (15 lb.)
Certification	UL 2601-1 classified UL classified for CAN/CSA C22.2 No. 601.1 IEC 60601-1 and EN 60601-1 certified CE Marking for 93/42/EEC concerning medical devices

Remote Display

See "Appendix B – Remote Display" for the required and recommended remote display specifications.

For your notes

Appendix B – Remote Display

For your notes

The Dash Port 2 docking station is currently available with the following GE remote displays:

- 15-inch, medical-grade, flat panel, color LCD display
- 18-inch, medical-grade, flat panel, color LCD display

Off-the-shelf (computer-grade) displays are also compatible (see the required and recommended specifications in this appendix).

WARNING
PATIENT RISK — Do not connect a monochrome display to the Dash Port 2 docking station. The visual alarm messages may not appear properly.

Purchaser's Responsibility

The display purchaser is responsible for meeting the docking station's display specifications. GE Medical Systems *Information Technologies* (GE) does not make recommendations regarding specific display models other than those it offers for sale. For questions regarding display specifications or compatibility of displays not purchased from GE, contact the display manufacturer.

The GE warranty only applies to equipment purchased from GE. Service repairs resulting from failures of equipment not purchased from GE are billable.

NOTE
An isolation transformer must be used with a computer-grade display to meet UL and IEC specifications.

Medical-Grade Displays

The docking station with a medical-grade display meets applicable UL and IEC specifications for a medical electrical system. For this system, an isolation transformer is not required.

Computer-Grade Displays

The docking station with a computer-grade display meets UL and IEC specifications if an isolation transformer is used, regardless of whether the computer-grade display meets the leakage current specification on its own.

The party assembling or modifying the medical electrical system is responsible to insure compliance with IEC 60601-1-1. Therefore, if GE installs a Dash Port 2 docking station system with a computer-grade display, GE is responsible for meeting the specification.

As a result GE will only install computer-grade displays with appropriate isolation transformers. (See the following information.)

Isolation Transformers

Powervar has designed an isolation transformer specifically for this application. Powervar headquarters (listed below) will process orders and drop-ship to any destination requested. When calling Powervar, identify yourself as a GE representative/customer to receive the GE partnership discount.

Powervar
28457 North Ballard Drive, Suite C
Lake Forest, Illinois 60045
Phone: 847-816-8585
Fax: 847-816-8988

Contact your local sales/service representative for part numbers and unit information.

Required Specifications for Computer/Flat Panel Displays

The following are REQUIRED specifications:

Electrical:

Horizontal:	Sync Rate:	31.47 KHz (*see note)
	Sync Input:	TTL negative
Vertical:	Refresh Rate:	60 Hz (*see note)
	Sync Input:	TTL negative
Video:	Non-composite:	0.7Vp-p analog RGB
	Polarity:	Black-negative
	Resolution:	640 x 480
	Input Impedance:	75 ohms

***NOTE**

Multiscan displays indicate the sync rate and the refresh rate as ranges (e.g., 20 KHz to 80 KHz), rather than a single value. To meet the required specifications, ensure that the ranges indicated on your display include a 31.47 KHz horizontal sync rate and a 60 Hz vertical refresh rate.

Monitor (Display) Connections:

Captive cable, or interconnect cable (processor unit to display):

	15 pin (3 row) Dsub male connector, standard VGA pinout
Connector(s):	15 pin (3 row) Dsub female connector, standard VGA pinout; or 5 BNC connectors
Emissions:	MPR II, CISPR 11B
Agency Approvals:	UL1950, CSA 950, IEC 950, CE

GE Medical Systems
Information Technologies

CE
0459

gemedical.com

World Headquarters
GE Medical Systems
Information Technologies, Inc.
8200 West Tower Avenue
Milwaukee, WI 53223 USA
Tel: +1 414 355 5000
1 800 558 5120 (US only)
Fax: +1 414 355 3790

European Representative
GE Medical Systems
Information Technologies GmbH
Munzinger Str. 3-5
D-79032 Freiburg
Germany
Tel: + 49 761 45 43 - 0
Fax: + 49 761 45 43 - 233

Asia Headquarters
GE Medical Systems
Information Technologies Asia
24th Floor, Shanghai MAXDO Center,
8 Xing Yi Road, Hong Qiao Development Zone
Shanghai 200336, P.R. China
Tel: + 86 21 5208 2008
Fax: + 86 21 5208 2006