CIC Pro™ and Unity Network® Information Suite (IS) Server

Service Manual

2001099-019 Revision F

GE Medical Systems

Information Technologies

gemedicalsystem.com

NOTE

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

Listed below are GE Medical Systems *Information Technologies* trademarks used in this manual. All other trademarks contained herein are the property of their respective owners.

UNITY NETWORK, ApexPro, CD TELEMETRY, and RSVP are trademarks of GE Medical Systems *Information Technologies* registered in the United States Patent and Trademark Office.

CD TELEMETRY®–LAN, CENTRALSCOPE, CIC Pro, ICMMS, Prism, Octacomm, and Octanet are trademarks of GE Medical Systems *Information Technologies*.

Contents

1 Introduction

For your notes

License Agreement

IT IS IMPORTANT THAT YOU CAREFULLY READ THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT BEFORE COMMENCING THE USE OF THE CLINICAL INFORMATION CENTER WORKSTATION (THE "WORKSTATION") AND THE CLINICAL INFORMATION CENTER PROGRAM RECORDED THEREIN AND ANY ACCOMPANYING USER DOCUMENTATION ("PROGRAM"). THIS LICENSE REPRESENTS THE ENTIRE LICENSE AGREEMENT CONCERNING THE PROGRAM BETWEEN YOU AND GE MEDICAL SYSTEMS *INFORMATION TECHNOLOGIES* ("*INFORMATION TECHNOLOGIES*") AND SUPERSEDES ALL OTHER COMMUNICATIONS OR ADVERTISING RELATED TO THE PROGRAM EXCEPT ANY TERMS AND CONDITIONS OF SALE OR WARRANTIES OR WARRANTY LIMITATIONS RELATIVE TO THE PROGRAM AND/OR THE WORKSTATION AS MAY BE EMBODIED IN ANY DOCUMENTATION SUPPLIED WITH THE WORKSTATION. BY COMMENCING THE USE OF THE WORKSTATION AND THE PROGRAM CONTAINED THEREIN, YOU ARE ACCEPTING AND AGREEING TO BE BOUND BY ALL THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT. IF YOU ARE NOT WILLING TO BE BOUND BY THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT, YOU SHOULD PROMPTLY RETURN THE WORKSTATION TO GE Medical Systems *Information Technologies* AND YOU WILL RECEIVE A REFUND OF THE PURCHASE PRICE.

I. GRANT

The Program is capable of coupling one to sixteen patient monitoring units to the Workstation. GE Medical Systems *Information Technologies* hereby grants you a non-exclusive, non-transferable right and license to use the Program for coupling the number of patient monitoring units to the Workstation for which a per-unit royalty has been paid pursuant to Article II hereof.

II. ROYALTY

You have paid GE Medical Systems *Information Technologies* a one-time, per-unit royalty equal to GE Medical Systems *Information Technologies*' current published price for the use of the Program. The per-unit royalty is based on the actual number of patient monitors intended to be coupled by the Program to the Workstation as stated in the Purchase Order for the Workstation and the Program. If you use the Program to couple any patient monitoring units to the Workstation in addition to the number for which a per unit royalty was previously paid, you agree to pay GE Medical Systems *Information Technologies* an additional per-unit royalty equal to GE Medical Systems *Information Technologies*' then current published royalty for the Program for each such additional patient monitoring unit so coupled. The additional per-unit royalty shall be paid to GE Medical Systems *Information Technologies* within 30 days of the use of the Program to couple any such additional patient monitoring units to the Workstation.

III. LIMITATIONS

You hereby agree not to: (1) use the Program in any network or system other than to couple patient monitoring units to the Workstation; (2) make any copy of the Program for any reason, or allow or assist others to do so; (3) modify, reverse engineer, de compile or disassemble the Program or merge any part of the Program into any other program; (4) rent, sell, sublease, assign, transfer or otherwise share the Program or any of your rights in the Program under this Agreement with any third party; or, (5) remove or alter any copyright notice, labels or trademarks from the Program or the Workstation.

IV. TITLE

This License is not a sale. Title and all copyrights to the Program and any copy made by you remains the sole property of GE Medical Systems *Information Technologies*.

V. TERM

This Agreement shall continue in force until terminated. This Agreement shall terminate automatically when you cease using the Workstation and the Program for their intended purpose. GE Medical Systems *Information Technologies* may terminate this Agreement on 30 days written notice if you make any unauthorized copies of the Program or fail to comply with any of the restrictions on use of the Program as set forth herein.

VI. LIMITED WARRANTY, DISCLAIMER AND LIMITATION OF LIABILITY

A. Licensor warrants that on the acceptance date the Program shall be free from significant programming errors and shall operate and conform to the published functional specifications applicable thereto, and that the Program shall conform to the standards generally observed in the industry for similar software.

B. This warranty shall be invalidated by your modification of the Program if such modification or the interaction between such modification and the Program as supplied by *Information Technologies* is the cause of the defect, error or non-conformity.

C. Except as stated above, the warranty covering the Program and the Workstation shall be either *Information Technologies* Standard Warranty or Limited Extended Parts Warranty as published by *Information Technologies* and hereby made a part hereof.

D. EXCEPT FOR THE EXPRESS WARRANTIES STATED HEREIN, GE Medical Systems *Information Technologies* DISCLAIMS ALL WARRANTIES WITH REGARD TO THE PROGRAM INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

E. GE Medical Systems *Information Technologies* entire liability to you arising out of or in connection with this Agreement shall not exceed the per-unit royalty paid to GE Medical Systems *Information Technologies* for use of the Program. You acknowledge that the amount paid to *Information Technologies* for use of the Program is insufficient for *Information Technologies* to undertake any greater risk. IN NO EVENT SHALL *INFORMATION TECHNOLOGIES* BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR EXEMPLARY DAMAGES (INCLUDING WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, PERSONAL INJURY OR ANY OTHER PECUNIARY LOSS) ARISING FROM THE USE OF THE PROGRAM, EVEN IF *INFORMATION TECHNOLOGIES* HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

VII. GOVERNING LAW

This Agreement shall be governed by the laws of the State of Wisconsin.

VIII.PARTIAL INVALIDITY

If any provision of this Agreement is held invalid or unenforceable, the remaining portions of the Agreement shall continue in full force and effect.

Manual Information

Revision History

Each page of this manual has a revision letter located at the bottom of the page. It identifies the revision level of the entire manual. This may be important if you have more than one manual and you wish to know which is the most current.

For the initial release, all pages have the revision letter A. For the second update, all pages receive the revision letter B. The latest letter of the alphabet added to the table below corresponds to the most current revision

Table 1. Revision History

Revision	Date	Comment
A	22 January 2001	Initial Release
B	18 September 2001	■ Add new hardware platform information. ■ General manual updates.
C	18 December 2001	■ Revise BOM for Unity Network IS BCM box. ■ Add hard drive replacement for Unity Network IS.
D	5 June 2002	■ Revise Unity Network IS HL7 Registry Settings. ■ Added set-up for CIC mirroring. ■ Updated parts list for BCM Servers
E	26 August 2002	Added support for enhanced Full Disclosure features.
F	21 February 2003	■ General manual updates to support CIC and Unity Network IS software upgrades. ■ Updated parts list for BCM servers.

Purpose of Manual

This manual covers the:

- CIC Pro (***C***linical ***I***nformation ***C***enter) applications,
- CIC Pro with ApexPro®, and
- Unity Network Information Suite (IS) Server (formerly known as the Prism™ Information Server) computer platform and the software applications currently compatible with the server:
  - RSVP® (***R***emote ***S***ystem for ***V***iewing ***P***atients, V4.2 and earlier),
  - AVOA (***A***utomatic ***V***iew ***o***n ***A***larm; V2 or greater),
  - HL7 outbound (V3 or greater),
  - ICMMS™ (***I***ntegrated ***C***omputer ***M***aterial ***M***anagement ***S***ystem; V3 or greater), and
  - Service Web pages (V3 or greater).

The servers covered in this manual apply to:

- Nightshade Server
  - CIC Pro version 2.3 and earlier and
  - Unity Network IS version 3.0 and 4.0
- BCM Server
  - CIC Pro version 2.4 and later and
  - Unity Network IS version 4.1 and later

Nightshade servers can NOT be upgraded to Unity Network IS V4.1 or CIC Pro V2.4.

Nightshade servers CAN be upgraded to CIC Pro 3.0.

This manual provides technical information for service representatives and technical personnel involved in configuring and maintaining the system.

Users of this manual are expected to have a background in personal computers and the Microsoft® Windows™ NT operating system.

Scope of Manual

This manual consists of seven sections, summarized as follows:

Introduction

This section provides general information on the manual itself, safety advice, service requirements and contacts, equipment symbols, and serial number identification.

Equipment Overview

Includes brief descriptions of:

- Hardware,
- CIC Pro applications:
  - Without ApexPro and
  - With ApexPro.
- Unity Network IS, which includes:
  - RSVP,
  - AVOA,
  - HL7,
  - ICMMS, and
  - Service Web pages.

Calibration

Contains references to the proper documentation for calibrating the hardware.

Configuration

Includes information for installing and configuring:

- CIC Pro applications:
  - Without ApexPro and
  - With ApexPro.
- Unity Network IS, which includes:
  - RSVP,
  - AVOA,
  - HL7,
  - ICMMS, and
  - Service Web pages.

Maintenance

Includes a Preventive Maintenance program, including:

- Cleaning,
- Inspection, and
- Testing.

of the hardware, as well as forms for recording the maintenance steps.

Troubleshooting

Contains references to the proper documentation for troubleshooting the hardware.

Assembly Drawings

Contains diagrams and identification of the computer hardware.

Safety Information

Responsibility of the Manufacturer

GE Medical Systems *Information Technologies* 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 Medical Systems *Information Technologies*;
- the electrical installation of the relevant room complies with the requirements of the appropriate regulations; and
- the device is used in accordance with the instructions for use.

Intended Use

WARNINGS

LOSS OF MONITORING — If the monitoring at the CIC is temporarily interrupted, alternate monitoring devices or close observation should be used until the monitoring function at the CIC is restored.

Indications of a loss of the monitoring function at the CIC are as follows.

- RED SCREEN indicates the CIC application is restarting itself and patient monitoring at the CIC is NOT occurring. The monitoring function at the CIC will automatically resume. No user action is required.
- BLUE SCREEN indicates the Windows NT operating system has a functional error and patient monitoring at the CIC is NOT occurring. If the CIC does not automatically restart after 60 seconds, the monitoring function at the CIC will not resume until you turn off the power to the CIC and then turn the power back on. The monitoring function should resume in approximately 3 to 4 minutes.

Once the monitoring function at the CIC has been restored, you should verify the correct monitoring state and alarm function.

WARNINGS

CIC V3.x is NOT in-unit compatible with prior versions of CIC or any version of Centralscope. Sharing of the same care unit name across central stations having incompatible software versions can result in lost or corrupted telemetry alarm defaults data and loss of audible alarms.

Do not exceed a maximum of 15 CICs in a single logical care unit. Both hardwire and telemetry beds are limited in the number of remote view connections that can be supported. Attempting simultaneous displays of a patient monitor (bedside or telemetry) at too many CICs may cause lost or intermittent communication between CICs and the patient monitor. This is evidenced by NO COMM or intermittent communication conditions for the beds. The maximum CICs viewing a patient monitor can vary depending on patient monitor capabilities and network design.

CAUTION

Do not load any software other than that specified by GE Medical Systems *Information Technologies* onto the CIC or Unity Network IS server. Installation of software not specified by GE Medical Systems *Information Technologies* may cause damage to the server or loss or corruption of data.

- These devices are intended for use under the direct supervision of a licensed health care practitioner.
- These devices are not intended for home use.
- Federal law restricts these devices to be sold by or on the order of a physician.
- Contact GE Medical Systems *Information Technologies* 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.

Warnings, Cautions, and Notes

Warnings and cautions are used throughout this manual to designate a degree or level of hazardous situations. Hazard is defined as a source of potential injury to a person.

WARNING
A WARNING indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.

CAUTION
A CAUTION indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.

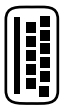
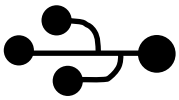
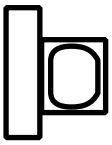
NOTE
A NOTE provides application tips or other useful information to assure that you get the most from your equipment.

Definitions

Black text	Indicates keys on the keyboard, text to be entered, or hardware items such as buttons or switches on the equipment.
Italicized text	Indicates software terms that identify menu items, buttons, or options in various windows.
Ctrl+Esc	Indicates a keyboard operation. A (+) sign between the names of two keys indicates that you must press and hold the first key while pressing the second key once. For example, "Press **Ctrl+Esc**" means to press and hold down the **Ctrl** key while pressing the **Esc** key.
<**Space**>	Indicates you must press the spacebar. When instructions are given for typing a precise text string with one or more spaces, the point where the spacebar must be pressed is indicated as: <**Space**>. The purpose of the < > brackets is to ensure you press the spacebar when required.
Enter	Indicates you must press the "**Enter**" or "**Return**" key on the keyboard. Do not type "enter".

Equipment Symbols

The following symbol appears on the transmitter.

	ATTENTION: Consult accompanying documents before using the equipment.
	KEYBOARD ICON: Denotes the keyboard port.
	MOUSE ICON: Denotes the mouse port.
	USB PORT ICON: Denotes the USB port. The USB port is NOT used on CIC or Unity Network IS.
	VGA MONITOR ICON: Denotes the VGA monitor port. Used only for Unity Network IS.
	PARALLEL (PRINTER) PORT ICON: Denotes the parallel port into which the optional laser printer is connected.
	SERIAL COMMUNICATION (COM) PORT ICON: Denotes the communication (COM) ports, used for optional service modem and optional PRN 50/PRN 50-M writer.
	ETHERNET ICON: Denotes the Ethernet ports, used for the Unity Network MC, Unity Network IX, and Unity Network RX/RS network connections. Optional Unity Network RX (CIC/ApexPro) or RS (Unity Network IS/RSVP) port is on an additional Ethernet card.
	SPEAKER OUT ICON: Denotes the speaker port connection.

Service Information

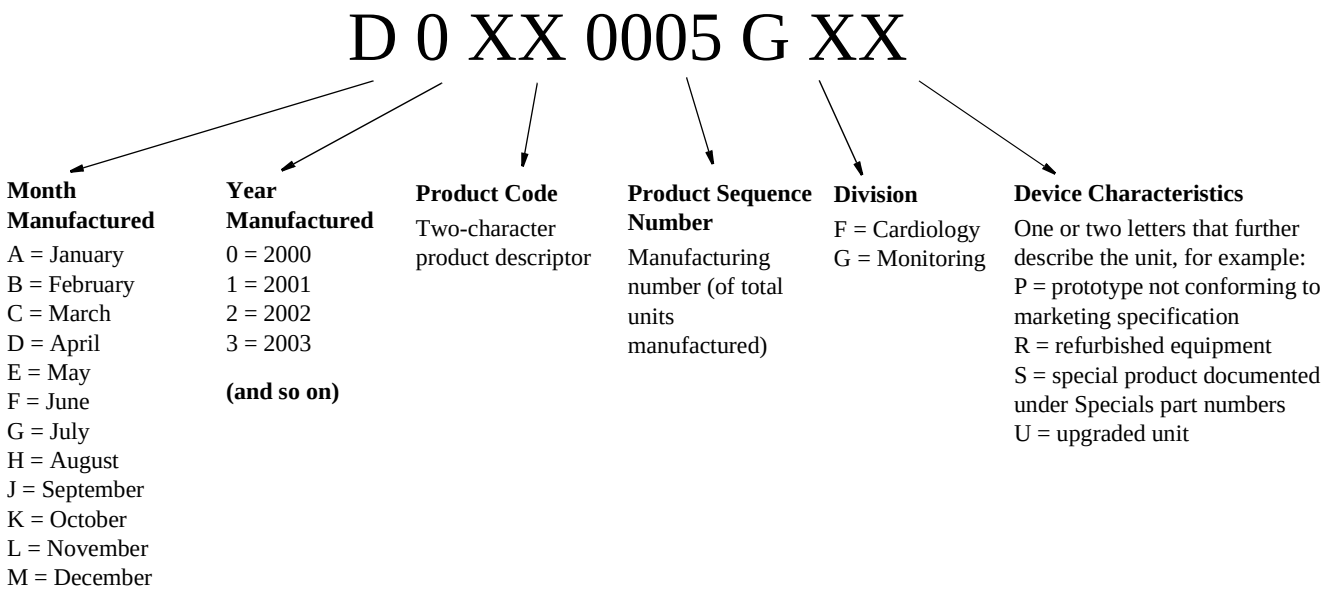
Service Requirements

Follow the service requirements listed below.

- Refer equipment servicing to GE Medical Systems *Information Technologies*' 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 Medical Systems *Information Technologies* 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 is always be functional when required.

Equipment Identification

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



Warranty

Standard warranty is one year.

2 Equipment Description

For your notes

General System Information

Network Information

Unity Network MC

The **Unity Network MC** (**M**ission **C**ritical) network is the network that is used to connect the server systems to the monitors and to the telemetry cabinets. This network contains all the waveforms, parameters, alarms and other time-sensitive data. The server should be connected to the Unity Network MC backbone.

Unity Network IX

The **Unity Network IX** (**I**nformation e**X**change) network is used by the network laser printer and to interconnect the server systems for license sharing between the server systems. The Unity Network IX network is also used for the Full Disclosure option (CIC Pro) or the web browsing option (Unity Network IS).

Unity Network RX

The **Unity Network RX** (**R**eceiver e**X**change) network, formally called **Unity Network RS** on Unity Network IS servers, is the connection to the ApexPro receiver for CIC Pro systems. This is a one-to-one link (i.e., only one receiver to one CIC Pro). If a hub is not used (not needed), you must use a null or crossover cable. This network connection is also used for the Unity Network IS RSVP option.The following tables specify the physical location of the Unity Network connections for Nightshade and BCM platforms for CIC Pro and Unity Network IS.

Network Connections

CIC Pro

CIC Pro Unity Network Connections		
Unity Network Connection	**Nightshade Server**	**BCM Server**
Unity Network MC	Ethernet Port on CPU	Ethernet Port marked “MC”
Unity Network IX	Ethernet card on back of CPU	Ethernet Port marked “IX”
Unity Network RX (ApexPro only)	Optional ethernet card on back of CPU	Optional ethernet card on back of CPU

Unity Network IS

Unity Network IS Unity Network Connections		
Unity Network Connection	**Nightshade Server**	**BCM Server**
Unity Network MC	Ethernet Port on CPU	Ethernet Port marked “MC”
Unity Network IX	Ethernet card on back of CPU	Ethernet Port marked “IX”
Unity Network RX (RS) (RSVP only)	Optional ethernet card on back of CPU	Optional ethernet card on back of CPU

Un-Interruptible Power Supplies

USP Installations

CAUTION
Connect the UPS to the PC CPU(s) and displays only. Do NOT connect printers or other devices to a UPS. Other devices my shorten estimated run times. If power is not restarted in time the unit shuts down and patients will not be monitored.

GE Medical Systems *Information Technologies* recommends the use of an un-interruptible power supply (UPS) with the system. If a UPS is NOT used, improper shut downs of the system could result in the event of a power outage and cause a lengthy disk scan procedure when the unit reboots. You could also lose data in the event of a power outage if you do not use a UPS.

Follow the manufacturer’s recommendations for installing the UPS.

UPS Runtime Estimates and Options

Runtimes are expressed in hours:minutes. Typical runtimes based on fully charged, new batteries operating under typical load conditions. Runtimes are affected by:

- Battery age,
- Ambient temperature,
- Site specific UPS usage patterns, and
- Load characteristics.

Your actual run time may be different.

UPS Runtimes (Hours:Minutes)			
Percent of Capacity	**ON400**	**ON600**	**ON900**
10	1:33	1:45	1:59
20	0:43	0:52	0:58
30	0:27	0:34	0:37
40	0:19	0:25	0:27
50	0:15	0:20	0:21
60	0:12	0:17	0:17
70	0:10	0:14	0:14
80	0:09	0:13	0:12
90	0:08	0:11	0:10
100	0:07	0:10	0:09

UPS Options		
Type	**Description**	**Limits**
UPS4=A	Oneac ON400XRA-HOE Domestic 120V 400VA, UL 1778, CSA 22.2	Will power one Server and 21-inch Display for approximately 10min.
UPS6=A	Oneac ON600A-HO Domestic 120V 600VA, UL 1778, CSA 22.2	Will power one Server and 21-inch Display for approximately 30min. Will power two Servers and two 21-inch Displays for approximately 10min.
UPS4=Y	Oneac ON4001-SN Intl. 220-240V 400VA, UL 1778, CSA 22.2	Will power 1 Server and 21-inch Display for approximately 10min.
UPS6=Y	Oneac ON6001-SN Intl. 220-240V 600VA, UL 1778, CSA 22.2	Will power one Server and 21-inch Display for approximately 30min. Will power two Servers and two 21-inch Displays for approximately 10min.
UPS4=C	Oneac ON900J-SN JAPAN 120V 50/60hZ 900VA, UL1778, CSA 22.2	Will power one Server and 21-inch Display for a minimum of 30min. Will power two Servers and two 21-inch Displays for a minimum of 10min.

How Trends are Calculated

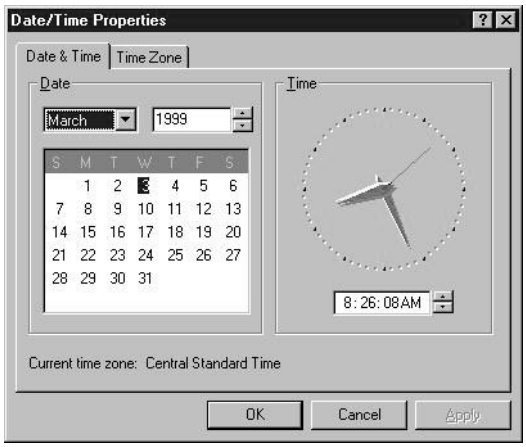
GE Medical Systems *Information Technologies* systems trend two types of physiological data, periodic and episodic.

Periodic data is constantly updated. Examples of periodic data include heart rate (HR) and blood pressure (BP). Episodic data are events that are user or system generated. Examples of episodic data include temperature (Temp) and non-invasive blood pressure (NiBP)

Periodic data is sampled every two seconds to get 30 samples per minute. The value that displays is the median of the 30 samples. Odd-number values are rounded down to the nearest even-number. The value is always the median of a one-minute time frame, regardless of the interval selected. The interval simply defines which trended data displays (i.e., five minute intervals means the trended data are one-minute samples spaced five minutes apart, NOT five-minute samples and NOT a median of the five one-minute samples from that period).

If the calibration of the system clock changes (for example, daylight savings time), the “time” for periodic data “slides” into the revised time. However, episodic data is time-stamped and retains its original time.

Time and Date Configuration

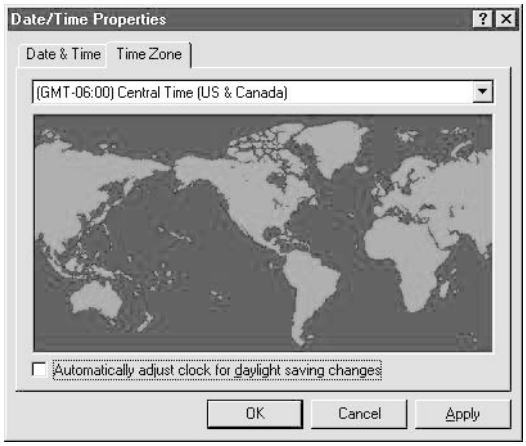


This option is used to adjust the CIC Pro and Unity Network IS Server time and date settings. Any time/date changes made at one CIC Pro is also transmitted over the GE Unity Network to all other devices. The Time Master CIC Pro re-broadcasts the time/date change information which causes all other devices to adjust their settings. The CIC Pro or Centralscope with the highest IP address is the Time Master.

CAUTION
Any change to the time/date data causes all units on the network to alter their time and date settings also. This change may cause other monitors to alter the time parameter of some patient data.

NOTE

You must manually make Daylight Savings Time changes in the monitoring system. This change may affect patient data as noted above.



Safe Shutdown Procedure

WARNING

Beds displayed on this server will be unmonitored while the unit is shut down. Any ApexPro beds admitted on a shutdown CIC Pro will display “no com” if displayed at other central stations and are not monitored.

If the need ever arises, it is important to shut down the system properly. Follow this procedure to properly shut down your machine. This prevents inadvertent errors from occurring during system shut down.

1. Open the *Start* menu located in the lower left corner of the Windows NT main screen.
2. Select *Shutdown...* from the *Start* menu.
3. From the *Shut Down Windows* dialog you can either restart the computer or shut it down. Select either *Shut down the computer* or *Restart the Computer* to achieve your desired result.

If you are shutting the computer down prior to logon, hold down the following keys simultaneously:

Ctrl+Alt+Delete

Then, select the *Shutdown* button.

CIC Pro and ApexPro System Components

Hardware

The CIC Pro system includes all of the Unity Network IS internal components (excluding one of the Ethernet circuit boards), and also contains the following:

- 1280 x 1024 x 65536 video card
- 16-bit sound card
- 2 external speakers

ApexPro Telemetry System

The ApexPro telemetry system includes all of the above internal components listed for a CIC system, plus:

- additional 128 MB RAM and
- an additional processor

CIC Pro and ApexPro Functional Description

CIC Pro

The CIC Pro (Clinical Information Center) application is connected to the Unity Network MC network via Ethernet to provide real-time patient data and alarms for central nurses' stations in hospitals.

The CIC Pro can display real-time waveforms and vital sign data with visual and audible alarms for up to 16 patients simultaneously. CIC Pro supports both hardwire and telemetry data.

The software allows the user to select any bed on the Unity Network MC network and to display an expanded view of that bed's real-time parameters and waveforms. This expanded view also allows the user to view and modify settings (within the care unit) and view other patient data including alarm histories, graphic trends and tabular trends.

The system is user-configurable for the number of patients to be displayed, and the number of displayed waveforms per patient. Waveform colors are configurable.

All configuration data is stored, and is restored after a system power cycle or software restart.

The system runs on the Microsoft Windows NT operating system (version 4.0 SP6 or later).

ApexPro Telemetry System

The ApexPro telemetry application is connected to the Unity Network MC network via Ethernet to provide real-time patient data and alarms for central nurses' stations in hospitals and also connects to the Receiver System via the Unity Network RX network.

ApexPro telemetry provides clinicians with patient physiological information while allowing for patient mobility. The physiological parameters monitored include ECG, non-invasive blood pressure, and SpO_2. This physiological information is sent to the CIC for processing and display via Ethernet or the Unity Network MC network.

Printed Output

Patient data may also be presented to the user in the following forms of printed output:

- Laser printer, or
- PRN 50/PRN 50-M Digital Writer.

Administrative and Service Access

Administrative and service users can interface to the server through standard Windows NT tools. The software creates logs to record significant events. Use standard Windows NT tools to load and update software.

Logs

Error Logs

The software records the occurrence of fatal and nonfatal errors in a user readable error log.

Connection Logs

The software records the usage of each available communication channel by noting when a connection is established and which beds are viewed.

CIC Pro Service Logons

General

The following procedures are for entering various levels of CIC Pro software. Each logon provides a different level of accessibility. Follow these steps to logon to the computer for these purposes.

> **CAUTION**
> The bed displayed at this CIC Pro is unmonitored while the CIC Pro is shut down. Any ApexPro beds admitted on this CIC Pro PC display "no com" if displayed at other centrals and are not monitored.

You must shut down the CIC Pro application before doing the logons.

It is also necessary to *Close All Programs And Log On As Different User* from Window's start button. To run the program, log in as user "administrator" from Window's login screen. To get the login screen to come up you have to hold down **Shift** while Windows is starting.

1. Select *Setup CIC*.
2. Select the *Service Password* tab.
3. Type **mms_com** as the Password.
4. In the command box that opens, type **stop** and then press **Enter**.
5. Click on *Start* then select *Shut Down* and *Close All Programs And Log On As Different User*.
6. Hold down **Shift** and select *Yes*.

   Continue holding until prompted for the password.
7. Choose from the following Logons and continue as instructed.

Full-Access Logons

The following logons are "full-access" administrative accounts used to update software and make changes in the operating system configuration.

The two accounts are separate but similar accounts, one to be used by the site administrator and the other to be used by field service personnel.

Site Administrator Logon

To logon as site administrator, complete the following when prompted for logon:

User name: type **administrator** and press **Tab.**

Password: type **admin1,3,5,7** and press **Enter**.

CIC Pro Administrator Logon

To logon as CIC Pro System Administrator, complete the following when prompted for logon:

User name: type **cicadm** and press **Tab**.

Password: type **cicadm1,3,5,7** and press **Enter**.

Limited-Access Logon

The following logon is a “limited-access” user account and should be used to review logs or restart CIC Pro.

For CIC Pro Limited Access logon, complete the following when prompted for logon:

User name: type **cicuser** and press **Tab**.

Password: type **cicuser1,3,5,7** and press **Enter**.

Run-Time Logon

The following logon is a “run time” user account and should be used to restart CIC Pro to run in the normal user interface mode.

For CIC Pro Run-Time logon, complete the following when prompted for logon:

User name: type **CIC** and press **Tab**.

Password: type **cic** and press **Enter**.

CIC Pro IP Address Information

Display All IP Addresses

To display all the IP addresses on the Unity Network IS server subnets:

1. Click on the *Setup CIC* button.
2. Click on the *Service Password* tab.
3. Position the cursor in the *Password* field and type **mms_com**. Click on *Apply*.
4. Type **ipconfig<space>/all** and press **Enter**. The IP Configuration information appears. (See the following example from the BCM Server.)

   Ethernet adapter E100B4:
   Description. . . . . : Intel(R) PRO Adapter
   Physical Address. . . . . : 00-10-F3-03-02-7F
   DHCP Enabled. . . . . : No
   IP Address. . . . . : 121.64.68.1 (IX)
   Subnet Mask . . . . . : 255.0.0.0
   Default Gateway . . . . . :

   Ethernet adapter E100B3:

   Description . . . . . : Intel(R) PRO Adapter
   Physical Address. . . . . : 00-10-F3-03-02-80
   DHCP Enabled. . . . . : No
   IP Address. . . . . : 126.64.68.2 (ApexPro Host)
   Subnet Mask . . . . . : 255.0.0.0
   IP Address. . . . . : 126.64.68.1 (MC)
   Subnet Mask . . . . . : 255.0.0.0
   Default Gateway . . . . . :

   Ethernet adapter E100B2:
   Description . . . . . : Intel(R) PRO Adapter
   Physical Address. . . . . : 00-50-DA-15-75-3D
   DHCP Enabled. . . . . : No
   IP Address. . . . . : 119.1.1.2 (RX)
   Subnet Mask . . . . . : 255.0.0.0
   Default Gateway . . . . . :

5. Close the *Command Prompt* window.
6. Close the *CIC Setup* window.

Change the Unity Network MC IP Address

Change the Unity Network MC IP Address for the CIC Pro Application

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the CIC Setup screen, select the *Service Password* tab.
3. At the *service password* prompt, type **mms_com** and press **Enter**. This enables the Service Menu and displays a command prompt window.
4. To determine the current IP address: At the *Command Prompt* window, type **C:\Program Files\Marquette\CIC*x.x*>ipaddr** to access the service utilities (*x.x* is the software version running on your CIC).
5. To change the current Unity Network MC IP address: At the *Command Prompt* window type **C:\Program Files\Marquette\CIC*x.x*>ipaddr<space>[new address]** (*x.x* is the software version running on your CIC).

Change the Unity Network MC IP Address for the Operating System

1. Logon as an administrator.
2. Go to *My Computer>Control Panel>Network*.
3. Click on *TCP/IP Protocol* to highlight it.
4. Click on the *Properties* button.
5. In the *Adapter* drop down menu, select the Unity Network MC network card as shown in the following table:

CIC Pro Adaptor Selections		
Unity Network/ Application	**Adaptor for Nightshade Server**	**Adaptor for BCM Server**
Unity Network MC for CIC Pro & ApexPro Host	**[1] Intel EtherExpress PRO Adapter**	**[3] Intel (R) PRO/100+ Management Adapter**
Unity Network IX	**[2] 3Com Fast EtherLink XL NIC (3C905B-TX)**	**[4] Intel (R) PRO/100+ Management Adapter**
ApexPro Rack	**[3] 3Com Fast EtherLink XL NIC (3C905B-TX)**	**[2] Intel (R) PRO/100 S Desktop Adapter**

6. In the *IP Address* field enter the new settings for the CIC Pro Unity Network MC IP address.
7. Optionally, in the IP subnet field enter the new settings.

   NOTE
   Typically the subnet mask should remain as **255.0.0.0**.

8. Click *OK*.

9. Click *Close*.
10. When prompted with *Do you want to restart your computer now?*, click *Yes*.
11. Wait for the CIC Pro to restart and monitoring to continue.
12. Verify all IP address and subnet mask changes by running *ipconfig*.

Change the Unity Network IX IP Address

1. Logon as an administrator.
2. For *Adapter* select the appropriate network card.
3. In the *IP Address* field enter the new settings for the CIC Pro Unity Network IX IP address.
4. If necessary, update the *Subnet Mask* field to the appropriate settings.

   NOTE

   Typically the ApexPro IP addresses and the Subnet Mask should remain as the factory default.

   Typically the Unity Network MC and Unity Network IX Subnet Masks should be set to **255.0.0.0**
5. Click *OK*.
6. Click *Close*.
7. When prompted with *Do you want to restart your computer now?*, click *Yes*.
8. Wait for CIC Pro to restart and monitoring to continue.
9. Verify all IP address and subnet mask changes by running *ipconfig*.

CIC Pro Setup Utility

Several characteristics of the CIC Pro software can be customized to some extent for each location. Items such as display formats, audio volumes, and display intensity can be adjusted by the users. Those changes are described in the operator's manual.

Other configuration items may only be changed while in the *Service Menu* (also referred to as Service Mode). These items are generally configured only by the Biomedical Engineering or technical support staff.

The CIC Pro defaults that may only be configured from within the *Service Menu* are found on the following tabs within *CIC Setup*:

- *CIC Defaults*,
- *Telemetry Unit Defaults*,
- *Telemetry Alarm Control Defaults*,
- *Current Telemetry Listings*,
- *Display Format*,
- *Screen Calibration*,
- *Service Password*, and
- *Full Disclosure Defaults*.

To access the Service Mode:

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *Setup CIC* screen, select the *Service Password* tab.
3. When prompted for the service password, type **mms_cic** and press **Enter**.

NOTE

When you are in Service Mode, a cross-shaped cursor replaces the normal arrow cursor.

To exit the Service Mode:

- If the *CIC Setup* window is open, click the *X* button located at the upper right corner of the window to exit the Service Mode.
- If the CIC Setup window is closed, click on the *Setup CIC* button at the bottom of the screen and click *Yes* to exit the Service Mode.

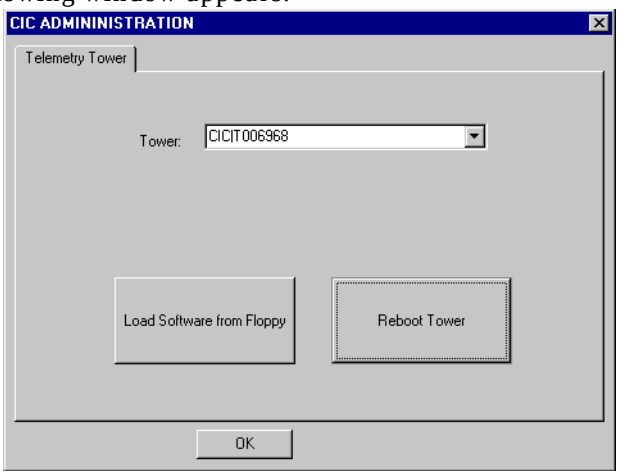
CIC Pro Telemetry Tower Option

The TELEMETRY TOWER option includes several selections that allow new software to be loaded into a CD Telemetry®–LAN™ cabinet assembly through its floppy disk drive. The software up-load process for the telemetry tower is controlled entirely through the CIC Pro system, since the tower does not have an input device (such as a keyboard). An alternative is to connect a personal computer or laptop to the cabinet assembly to load new software.

To upload software into the Telemetry Tower:

1. The Telemetry Tower function is invoked from the *Windows NT Command Prompt* window. To invoke the Telemetry Tower function, type the following command: **cicadmin**.

   The following window appears:



2. Click on the arrow next to the *Tower* box to open the drop down menu of tower names.

   NOTE

   Each tower (cabinet assembly) is described by its Care Unit name and Ethernet address. The Ethernet address is used since the towers are not named as monitors are.

3. Click on the desired name to select it
   or
   Enter a name in the *Tower* name box and press **Enter**.

4. Insert the floppy disc into the floppy disc drive of the Telemetry Tower and click on *Load Software from Floppy*.

   WARNING

   Perform software uploads according to the update instructions that accompany the software. Improper use of this option may result in loss of patient monitoring or patient data. Do NOT upload software unless instructed to do so by qualified service personnel and only after the telemetry system is properly prepared.

5. If necessary, click on *Reboot Tower* to reboot the CD Telemetry–LAN cabinet.

NOTE

A reboot causes a loss of patient monitoring functions while the software restarts the CD Telemetry–LAN cabinet power. Make arrangements for interim monitoring of patients before rebooting any cabinet.

Use this option in two circumstances:

- To reboot the cabinet, if as a result of troubleshooting you decide that the cabinet should be rebooted,
- To start the operation with newly-installed software. Software is uploaded into the cabinet in the background and only used when the cabinet has rebooted.

The procedure to reboot to initiate new software is the same as the troubleshooting reboot. The same concerns about loss of patient monitoring apply.

NOTE

Make sure you notify the responsible personnel for the admitted patients (monitored by the CD Telemetry–LAN cabinet that is rebooted) that the cabinet will be rebooted and they will lose patient monitoring for a few minutes.

WARNING

During the reboot period monitoring functions are lost. The buttons for the “lost” patients change on the central stations to show *ADMIT*. This may lead some monitoring system users to get the “lost” patients back by readmitting them. Instruct all personnel NOT to admit any of the “lost” patients during reboot. Once the cabinet finishes rebooting the “lost” patients return automatically. Note that when you activate new software, all patient histories and trends are lost.

CIC Pro Full Disclosure License Management Setup

BCM Server

Each CIC Pro with version 3.x software comes with the ability to store 16 beds of Full Disclosure (FD) data for one hour without a license. CIC Pros with the Full Disclosure option and version 3.x software has the ability to store up to16 beds for 72 hours with the appropriate licenses and license settings.

When operating two CIC Pros within the same "care unit" where one has the Full Disclosure option and the other does not, it is necessary to turn Full Disclosure OFF on the CIC Pro without the Full Disclosure option to prevent a conflict with the two different storage capacities of the CIC Pro units.

Nightshade Server Without Full Disclosure

The Nightshade platform may require a hardware modification to support anything greater than 1-hour Full Disclosure. However, for those Nightshade PCs that do not have a **F** drive and have purchased Full Disclosure licenses within the care unit, you must perform the following steps to disable Full Disclosure on this PC.

1. Select *Setup CIC* and click on the *Service Password* tab.
2. Type **mms_com** and press the **Enter** key.
3. Type **fdcmd -n OFF** and press the **Enter** key. Beds that were full disclosed on this PC are now deleted.
4. Type **stop**.
5. Select *Start > Shutdown > Close all programs and log on as a different user*. Allow the CIC to boot up in CIC mode.
6. Wait a few minutes and type **fdcmd -lu** and verify beds are now full disclosed on another CIC that support >1-hour Full Disclosure storage.
7. Type **exit** and close all open windows.

ApexPro PTSCONFIG Utility

The PTSCONFIG utility is a console application that allows you to configure the ApexPro application. Access the PTSCONFIG utility via the command prompt window.

display Commands

The commands listed below display ApexPro application information.

Table 2. display Commands

Command	displays...
help	list of available commands
tower	ApexPro tower's full name "UNIT|NAME"
software	software versions for all running software (main, rack, etc.)
build	date/time the software was built
patient	patient information: TTX, tower, and receiver numbers
patreceiver	information about the patient' receiver and transmitter
IP	IP address used by the ApexPro application to talk to the Unity Network
rack	IP address used by the ApexPro application to talk to the rack network
receiver	receiver/unit assignments for this ApexPro tower
ttx	network-wide in-use TTX list (from the TTX master list)
unitlist	network-wide unit/receiver list (from the TTX master list)

modify Command

The commands listed below permit modifications to the ApexPro application.

Table 3. modify Command

Command	allows modification to...
unit	ApexPro tower's unit name
tower	ApexPro tower's device name
ip	IP address used by the ApexPro application to talk to the Unity Network
rack	IP address used by the ApexPro application to talk to the rack network
receiver	receiver/unit assignments for this ApexPro tower
ttx	displays a network-wide in-use TTX list (from the TTX master list)
unitlist	displays a network-wide unit/receiver list (from the TTX master list)

listwhat Command

For information on using the listwhat command, refer to "List Network" in the Troubleshooting chapter.

Other Commands

The table below lists other ApexPro software commands.

Other Commands	
Command	**function...**
admit	admits a patient on this ApexPro tower (“admit” shows usage)
discharge	discharges a patient on this ApexPro tower (“discharge” shows usage)
dload	downloads rack software (“dload” shows usage)
resetrack	immediately (with no confirmation) resets all racks connected to the tower
blink patient rack receiver stop	blinks rack LED(s) according to: entered patient name (UNIT|BED) entered ApexPro tower IP address entered ApexPro tower IP address and receiver number stop any blinking
boot	reboots the PC (“DDMM” password required: confirmation is also requested)
shutdown	restarts ApexPro application (“DDMM” password required: confirmation is also requested)
statistics waveform wavereset histogram histreset	displays ApexPro software performance statistics: waveform data latency timing through ApexPro software reset waveform data latency timing counters waveform data timing through ApexPro software reset waveform data timing counters
storeecg	stores a file containing raw patient ECG sample data

Unity Network IS System Components

Hardware

The Unity Network IS system uses a PC tower with the choice of a 15-inch, 17-inch, or 20-inch color computer display. The entire system is assembled, loaded with software, and then shipped as a complete unit ready for setup and use.

To run the Unity Network IS system the PC tower comes with the following internal components:

Nightshade Server

The Nightshade server includes the following hardware:

- SCSI internal hard disk drive,
- CD-ROM drive,
- High density floppy disk drive,
- Integral video controller (one),
- 256kB DRAM video memory module,
- Integral audio controller (one),
- Ethernet PCI (PC interface) plug-in circuit board (two), and
- Dual CPU.

BCM Server

The BCM server includes the following hardware:

- SCSI internal hard disk drive,
- CD-ROM drive,
- High density floppy disk drive,
- Integral video controller (one),
- 256kB DRAM video memory module,
- Integral audio controller (one),
- Ethernet PCI (PC interface) plug-in circuit board (one), and
- Single or Dual CPU.

RSVP System

The RSVP system includes all of the above internal components and the following external components:

- a terminal port server and
- a modem rack with a capacity for twelve modems.

Unity Network IS Functional Description

The Unity Network Information Suite (IS) Server consists of an IBM compatible personal computer (PC) that is connected to the Unity Network MC network to act as a patient monitoring network file server. The server runs on the Microsoft Windows NT operating system and provides various applications with technical and clinical data from patient monitors and other devices connected to the GE Unity Network.

Currently the following software applications are available for the Unity Network IS server:

- RSVP (***R***emote ***S***ystem for ***V***iewing ***P***atients; V4.2 or earlier),
- AVOA (***A***utomatic ***V***iew ***o***n ***A***larm; V2 or greater),
- HL7 Outbound (V3 or greater),
- ICMMS (***I***ntegrated ***C***omputer ***M***aterial ***M***anagement ***S***ystem; V3 or greater), and
- Service Web pages (V3 or greater).

RSVP Option

Remote System for Viewing Patients (RSVP) allows access to the Unity Network MC network over ordinary phone lines. Using a PC and modem, clinicians can view four real-time waveforms and all vital signs from any monitor or telemetry device on the Unity Network MC network in the hospital.

The Unity Network IS Server is attached to the Unity Network MC network and the RSVP client software for use by the clinician. The server is configured with an external modem rack that can hold up to twelve modems to permit up to twelve simultaneous server connections.

The port server provides a connection between the serial lines of the modem and the server using a dedicated ethernet connection.

The server monitors network traffic on the Unity Network MC network to build a list of available bedside and telemetry products. It also manages the traffic from the modems that are used for incoming client requests.

The required software consists of:

- The RSVP Server Application and
- The RSVP Remote Program.

The remote program is designed to run on a 486DX2 PC with 9600 baud modem. The remote program can run on the Windows NT, Windows 95, Windows 3.1 or DOS operating systems.

NOTE

Disable the screen saver when you run this application. The screen saver could interfere with the RSVP program.

RSVP and Auto View can run on separate systems or be combined to run on the same server.

Waveform Data

The remote client requests waveform data by unit/bed name. After the request, the server continues to send a waveform response every quarter-second. Each waveform response contains 15 data points for each of the waveforms. Data is sent for up to four waveforms. The four waveforms sent are dependent on the display order set, top to bottom, at the selected bedside.

The response also contains scaling information. You can direct the remote client:

- To use an absolute scale passed in the response or
- To auto scale the data to fit in the available window size.

The response can indicate if the data for the waveform is invalid. This indication means all data for that particular quarter-second is invalid.

Server Status

The remote client requests the server status while simultaneously providing its own status.

Remote client status includes:

- Executing software revision
- Site name
- User name

Server status includes:

- Available remote client software revision
- Path name to remote client image

Auto View Option

With the Auto View application you can monitor alarm broadcasts from the bedside monitors. When it detects a new alarm, the application clones the alarming bed and notifies the other beds in the unit that an alarm is occurring. The other beds may choose to float the alarm information from the cloned bed. When you clear or silence the alarm, the other beds in the unit are notified and the clone is terminated

Only choose one alarm at a time for a unit. If there is more than one alarm active, the highest priority, oldest alarm is chosen. Once the alarm is chosen, it remains the chosen alarm for the unit until the condition is cleared or silenced, even if a higher priority alarm occurs.

NOTE

RSVP and Auto View can run on separate systems or combine them to run on the same server.

HL7 Outbound Option

The HL7 Outbound software provides the interface between the Unity Network IS Server software, the Unity Network MC network and the HIS server software. The HL7 Outbound Interface Software acts as the client by sending unsolicited HL7 Outbound messages to the HIS server. The software manages the connections with the HIS servers and maintains logs to track errors and connection statistics.

ICMMS Option

The Integrated Computer Material Management System (ICMMS) application provides information about devices attached through the Unity Network MC network and provides this information to other GE Medical Systems *Information Technologies* applications and to third party applications. The collected information assists in asset control and is not intended for clinical use. The information discovery varies based on the type of device and the device software revision. New software released for devices enhances the ability of devices to return information to the ICMMS application and in turn enrich the users of this information.

In versions V4.1 and later with parameter update functionality, ICMMS will collect data for up to 350 monitoring devices. The data collection proceeds serially until data for all devices has been collected. The time required to complete one update loop is dependent on the total number of network devices and the current network traffic load. The average update time required to retrieve all ICMMS data from one Unity Network device is approximately ten seconds. Therefore, the average update time is approximately one hour, given a network with 350 devices. This time is only an average and may be significantly longer depending on the current network load.

Typical information collected by ICMMS includes:

- Device type
- IP address
- Ethernet address
- Serial number
- Location
- Admission status
- Software revision of the device's components

St. Croix Systems, Inc.® WOSYST™ equipment management software is a third party application that uses the information collected by the ICMMS application. WOSYST is sold separately and is not part of this software release.

Service Web Option

The Service Web pages provide a web browser interface to the Unity Network IS operational information. The collected information assists in service and maintenance of the Unity Network IS equipment and is not intended for clinical use. The web pages provide the following information:

- ICMMS device information,
- Alarm Status,
- RWHAT data synopsis, and
- Intel® Server Control Console access (Nightshade box *only*).

Logs

A utility exists for maintaining most logs. The common characteristic of these logs are as follows:

- Each log is stored in its own subdirectory.
- Each day's log is stored in its own file with the date encoded in the name.
- Each entry in the log file is time stamped.
- Dates and times are all based on Greenwich Mean Time.
- Daily file sizes are limited to 30 megabytes.

Error Logs

The software records the occurrence of fatal and nonfatal errors in a user readable error log.

Event Logs

The RSVP Event Log – records the usage of each available RSVP modem communication channel by noting when a connection is established and which beds are viewed.

The Auto View Event Log – Records the beginning and end of each alarm along with other information.

The ICMMS Event Log – Records activity information including statistics on device data acquisition and data retrieval.

The HL7 Outbound Event Log – Records the acknowledgments for HL7 Outbound messages received by the HIS server(s) for all beds that data is collected for on the Unity Network MC network when two or more time intervals of data are transmitted. It also records:

- When beds are discharged, removed, or added on the network;
- PID changes; and
- When unit or bed name changes occur.

Unity Network IS Service Logon

The following logon is a “full-access” administrative account used to update software and make changes in the operating system configuration.

1. On the keyboard simultaneously press **Ctrl+Alt+Delete**.
2. When prompted for logon:

   User Name: type **administrator** and press **Tab**.

   Password: type **admin1,3,5,7** and press **Enter**.

Unity Network IS Configuration Utility

Control Functions

The Configuration Utility can be used to monitor and control the server software. To start the program, double click on the *MPIS Config* icon located on the left edge of the screen.

The *Control Functions* area of the *General* tab can be used to monitor and control the program.

Button Descriptions

The following is a list of each button in the *Control Functions* field along with a description of each button's function.

Start Unity Network IS (or Start Unity–IS)

This button starts the server applications. As normally configured, the software automatically starts when the computer starts. Activating this button also starts a 90-second interval which updates the *Number of Instances Running* fields described later in this section.

Stop Unity Network IS (or Stop Unity–IS)

This button stops all server applications. This button also starts a 90-second interval to update the *Number of Instances Running* fields.

Save Config Data

This button allows saving configuration changes made under any of the "tabs" without exiting the program.

Start Updates

This button starts a 90-second interval which updates the *Number of Instances Running* field.

Number of Instances Running

The *Number of Instances Running* field presents information about the current status of the server software. This area is updated as long as the *Remaining update time* is not displaying *Off* in the *Seconds* box. Always push the *Start Updates* >> button prior to using the information in the *Number of Instances Running* area.

Box Descriptions

The following is a list of boxes within the *Number of Instances Running* area along with a description of what each box represents.

Unity (or Unity IS)

This box should be “1” if the server applications are started. It should be “0” if the server is not running.

gbds (active beds)

This box should be “0” if the server applications are not running. When running, this number varies depending on the number of bedside monitors being used by the server application.

RSVP (Version 4.2 and Earlier)

This box should be “1” if the server applications are started and RSVP is enabled on the RSVP tab. It should be “0” if the server applications are not running or RSVP is not enabled on the RSVP tab.

Auto View

This box should be “1” if the server applications are started and Auto View is enabled on the *Auto View* tab. It should be “0” if the server applications are not running or Auto View is not enabled on the *Auto View* tab.

bootp

This box should always be “1” if the server is configured to support RSVP. The *bootp* service is started automatically on RSVP servers and is independent of the GE Unity Network Information Suite Server applications.

HL7

This box should be “1” if the server applications are started and HL7 Outbound is enabled on the *HL7* tab. It should be “0” if the server applications are not running or HL7 Outbound is not enabled on the *HL7* tab.

ICMMS

This box should be “1” if the server applications are started and ICMMS is enabled on the *ICMMS* tab. It should be “0” if the server applications are not running or ICMMS is not enabled on the *ICMMS* tab.

RSVP Port Status (Version 4.2 and Earlier)

On the *RSVP* tab, the status of each RSVP Port is displayed. The port status can be in one of the four states listed below:

Unknown

If RSVP is not running or no status updates have been received a "?" appears in the *Port Status* text field to indicate an unknown state.

Port Disabled

If RSVP is running but the *Active Ports* check box is empty or if the port failed to initialize correctly, *Port Disabled* appears in the status text field.

Waiting Call

If RSVP is running and the *Active Ports* check box is checked, and the port was initialized correctly, *Waiting Call* appears in the status text field.

Call Active

When a call is received on an enabled port and communications has been established with the remote client, *Call Active* appears in the status text field.

Unity Network IS Port Server Firmware

Use this procedure if it becomes necessary to update the firmware in the Central Data port server. To update the firmware:

1. Stop the Boot server as follows:
   a. Go to *Start>Settings>Control Panel* and open the *Services* menu.
   b. In the *Services* pop-up menu, select *Bootpd NT*.
   c. Select the *STOP* button, reply *Yes* to the *Are you sure?* prompt. Under the *STATUS* column, the message *STARTED* should disappear. Select *CLOSE* to close that menu.
2. From the main screen, open the *Start* menu and select *Command Prompt*. At the c:\ prompt type **cd**<**Space**>**c:\Program**<**Space**>**Files\Us\bin\elupdate** and press **Enter**.

   NOTE
   More detailed instructions can be found in the "README.TXT" file in this directory.

   Then at the c:\elupdate>_ prompt, type **start** <**Space**> **/b <Space> bootp** and press **Enter**.

   At this point the *Mini Bootp Server* window appears on the screen.

   Bring the c:\elupdate window to the front layer, making it the active window, and type **start <Space> /b <Space> tftpd** and press **Enter**.

   At this point the *TFTP Server* window appears on the screen.
3. Power cycle the port server. The LEDs flash at various rates during the download process. Once the download is complete, the LEDs remain steady on. Check the *TFTP Server* window. It should display:

   ```
   Client: 1.1.1.1 (port server IP address)
   Filename: el16.prm
   Status: Transfer Complete!
   ```
4. Close the *TFTP Server* window and type **start**<**Space**>**/b**<**Space**>**verlog**

   At this point, the *Version Information* window appears on the screen.
5. Select *MENU* from the list, then select *EDIT ADR* and enter the port server IP address by typing:

   1.1.1.1

   Select the *OK* button
6. Read the version information that appears. Verify that firmware version 5.9 or later appears.
7. Close all of the windows to exit and return to the main screen.
8. Restart the computer.

3 CIC Pro/ApexPro Installation & Configuration

For your notes

Pre-Installation Requirements

Read and fully understand the pre-installation requirements. Verify all requirements are met before attempting installation of the CIC Pro system.

Site Requirements

The computer tower is capable of producing heat and must be physically located to allow the heat load to be adequately dissipated. The site requirements listed below were written specifically for an Intel computer tower.

WARNING
SERVER LOCATION — The computer server is UL 1950/IEC 950 certified equipment which may not meet the leakage requirements of patient care area equipment. This equipment must not be located in the patient vicinity as a shock hazard may exist, unless the medical electrical system standard, IEC 60601-1-1 is followed.

Failure to adequately ventilate the computer tower may cause equipment failure or improper operating conditions which may endanger the patients being monitored.

CAUTION
Do not locate the computer tower or display in an enclosed area that may restrict dissipation of the heat generated by the components. Any air flow restrictions may cause a rise in internal temperature which may result in equipment failure. The computer tower uses an internal forced air cooling system, but most displays do not.

The user must determine the heat dissipation requirements of the selected display and design a ventilation system accordingly.

Environmental Limits

The server operates reliably within normal office environmental limits. Select a site that meets these criteria:

- Clean and relatively free of excess dust.
- Well ventilated and away from sources of heat.
- Away from sources of vibration or physical shock.

Electromagnetic Fields and Electrical Noise

The server should be isolated from strong electromagnetic fields and electrical noise produced by electrical devices such as elevators, copy machines, air conditioners, large fans, large electric motors, radio and TV transmitters, and high frequency security devices.

Clearance and Airflow

The site should provide sufficient clearance behind and around the server to ensure proper cooling and airflow. Keep ventilating openings on the server free of obstructions.

Allow about 31 centimeters (12.2 inches) of clearance in back of the server, 60 centimeters (23.6 inches) on the sides, and 22 centimeters (9 inches) in front.

Access Space

Plan access space for server maintenance. Make sure there is convenient access to disconnect the AC power cord from the wall outlet or from the back of the server, because disconnecting the cord is the only way to remove AC power from the server before doing maintenance or upgrade procedures. Pressing the DC push-button on/off switch on the front panel does NOT remove server AC power.

Physical Specifications

Table 1. Physical Specifications

	Nightshade Server	BCM Server
Height	49.02 cm (19.3 inches)	42.2 cm (16.6 inches)
Width	21.04 cm (8.3 inches)	20.1 cm (7.9 inches)
Depth	44.96 cm (17.7 inches)	48.0 cm (18.9 inches)
Weight	17.1 kg (38 lbs.) minimum configuration 22.9 kg (51 lbs.) maximum configuration	11.3 kg (25 lbs.) minimum configuration 13.1 kg (29 lbs.) maximum configuration

Power Requirements

Duplex Wall Receptacles

CAUTION
Loss of power to the computer tower results in loss of patient monitoring capabilities to the system, and to any remote display monitors connected via hardwire or modem.

Two properly grounded duplex wall receptacles should be provided for each system. Additional receptacles may be required to accommodate peripheral equipment connected to the system. The wall receptacles must be installed in an approved junction box. Use only three-prong, polarized, hospital-grade wall receptacles to accept the three-prong polarized plug on the computer equipment.

Un-Interruptible Power Supply (UPS)

GE Medical Systems *Information Technologies* recommends the use of a UPS with the system. If a UPS is NOT used, improper shut downs of the system could result in the event of a power outage and cause a lengthy disk scan procedure when the unit reboots. You could also lose data in the event of a power outage if you do not use a UPS.

CAUTION
Connect the UPS to the PC CPU(s) and displays only. Do NOT connect printers or other devices to a UPS. Other devices my shorten estimated run times. If power is not restarted in time the unit shuts down and patients will not be monitored.

Equipment Grounding

WARNING
SHOCK HAZARD — The computer tower and all peripheral equipment must be adequately grounded or a shock hazard may exist.

The grounding pin of all wall receptacles and all exposed metal parts (beds, radiators, water pipes, etc.) in any patient area should be electrically connected together. This common ground point should be connected to the nearest equipotential ground through a bonded grounding system, or with a 10 AWG stranded copper grounding cable.

The equipotential ground point should be as close to earth ground potential as possible. If a bonded grounding system is not available, the ground pin of each wall receptacle must be individually connected to a central grounding point. Do NOT jumper from ground pin-to-ground pin of the receptacles.

The grounding system must not carry current, such as a grounded neutral, since the current flow will produce potential differences along the ground path. These potential differences are a shock hazard source for equipment users and patients.

Do NOT use conduit as a ground conductor. Plastic (PVC) piping or fittings used in the conduit runs can break the electrical connection to ground, resulting in potential shock hazards.

The electrical grounding system should be connected on an earth ground. If this is not possible, then a good ground reference such as a metal water pipe or an electrically-conductive building component should be used. it is more important that all grounded objects in the patient area are at the same ground potential rather than at earth ground potential.

CIC Pro Installation

WARNINGS

CIC V3.x is NOT in-unit compatible with prior versions of CIC or any version of Centralscope. Sharing of the same care unit name across central stations having incompatible software versions can result in lost or corrupted telemetry alarm defaults data and loss of audible alarms.

Do not exceed a maximum of 15 CICs in a single logical care unit. Both hardwire and telemetry beds are limited in the number of remote view connections that can be supported. Attempting simultaneous displays of a patient monitor (bedside or telemetry) at too many CICs may cause lost or intermittent communication between CICs and the patient monitor. This is evidenced by NO COMM or intermittent communication conditions for the beds. The maximum CICs viewing a patient monitor can vary depending on patient monitor capabilities and network design.

WARNINGS

External equipment must be connected to the system only by qualified biomedical engineering personnel.

A shock hazard may exist if external devices are connected other than as described in this manual, or as directed by the manufacturer.

Only external devices specifically designed to be connected to the PC tower, or approved by GE Medical Systems *Information Technologies* for use with this system, should be connected, as specified in this manual or as otherwise specified by the manufacturer.

CAUTION

All external cabling used with the server systems must be routed so as not to interfere with access or operation of the system.

All cabling must be installed to protect against tripping and accidental disconnection of the cables.

Do NOT apply power until all equipment is installed and ready for use.

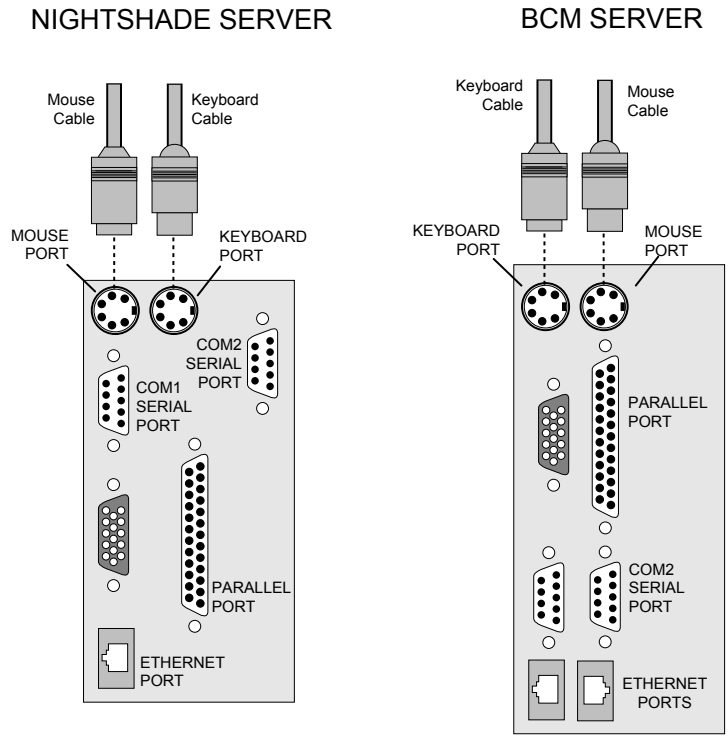
CAUTION
This assembly is static sensitive and should be handled using precautions to prevent electrostatic discharge damage.

Pre-Installation Check

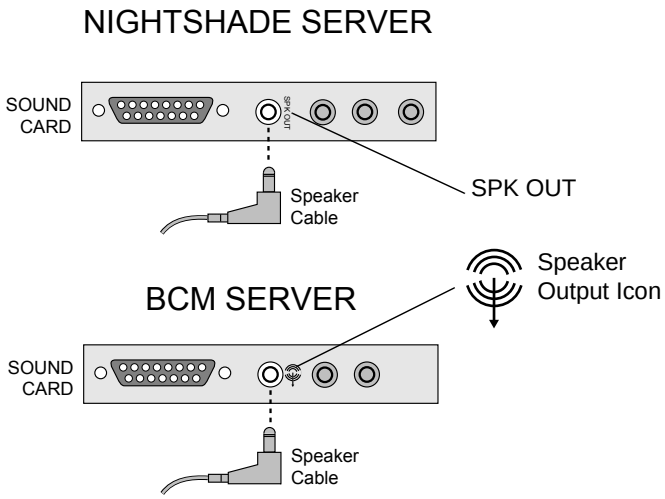
1. Remove all equipment, including all peripheral devices, from the shipping cartons and inspect for damage.
2. Identify all required cables and prepare them for installation.
3. Verify AC power is available for the computer tower and all peripheral equipment. Make sure the power supplies are installed, tested, and ready for use in accordance with the pre-installation requirements. This includes testing for proper grounding of the power source.
4. Verify the desired physical location for the computer tower is in accordance with the site requirements. Place the computer at the selected site.

Connect Keyboard and Mouse

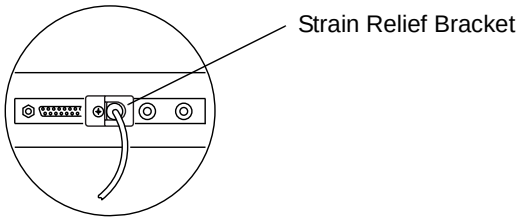
Connect the keyboard and mouse cables to the back of the PC tower.



Install the Speakers



1. Identify the speaker output jack on the sound card at the back of the PC tower. The speaker output jack is labeled **SPK OUT** or marked with an icon.

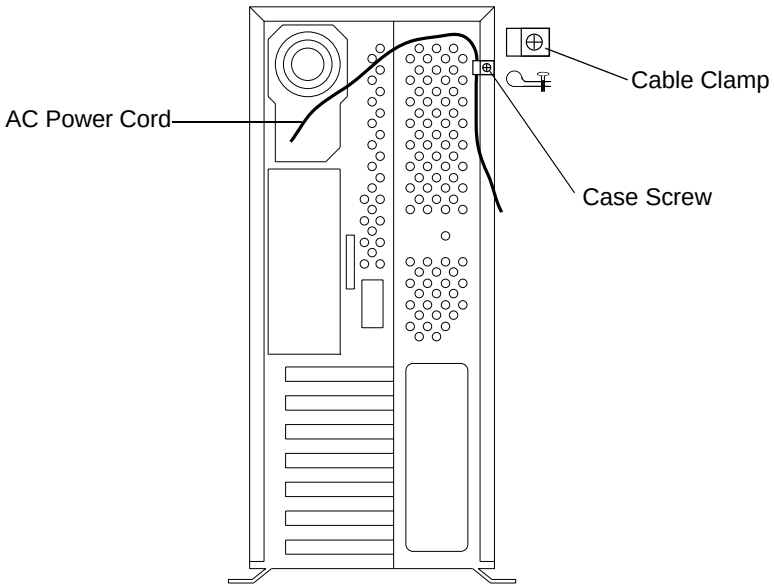


2. A bracket is used as a strain relief and to hold the speaker connector in place. Loosen the screw on the bracket just enough to insert the speaker connector through the bracket hole and into the speaker output jack. Make sure the connector is seated properly, then tighten the strain relief bracket screw to hold it in place.

NOTE

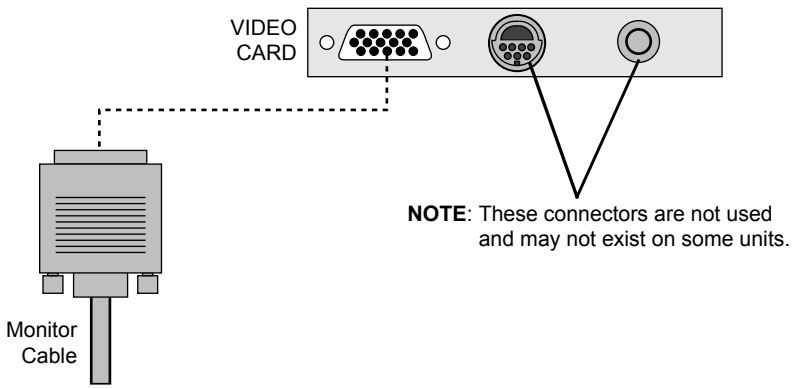
Accidental disconnect of the speaker cables will result in loss of audible patient alarms at the CIC monitoring location. Make sure the speaker connections at the PC tower and the speakers are properly secured with the provided strain relief brackets.

Install the Power Cord



1. Remove the upper right case screw from the rear of the chassis.
2. Plug the AC power cord into the PC tower.
3. Install the provided cable clamp around the AC power cord approximately 15 cm (6 in.) from the server connection end.
4. Secure the cable clamp to the chassis with the case screw installed in the upper right case hole. Tighten the screw.

Connect the Video Display Monitor

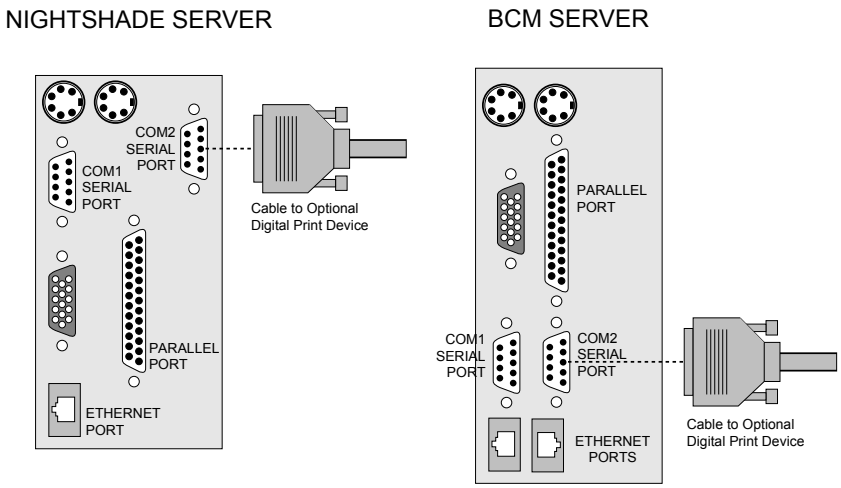


NOTE

Do not connect to the video connection on the mother board (near the parallel port connector).

Connect the video display monitor cable to the video card connection at the back of the PC tower.

Connect the Digital Writer Printer



1. Connect the PRN 50 or PRN 50–M Digital Writer cable to the **COM2** port at the back of PC tower and to the appropriate power source.

   NOTE

   To properly operate with the CIC Pro and telemetry systems, the PRN 50 or PRN 50-M must use software V2B or later.

2. Load the printer with paper.

ApexPro Option Installation

If installing a CIC that supports ApexPro, complete the Rx Network connection to interface the ApexPro Receiver System to the CIC with ApexPro. Refer to the ApexPro Receiver System Service Manual.

Do not connect the CIC Pro or ApexPro units to the network at this time.

CIC Pro Configuration

Logon

NOTE
Make sure none of the system components are connected to the network at this time.

1. Turn on the system.
2. Verify all components are energized and the system boots up completely. If the system has a blank display or the unit does not boot up, open the chassis and verify all boards and cables are seated properly. See the Troubleshooting section for more information.
3. With the CIC Pro application running, use the mouse to select *Setup CIC* at the bottom of the screen.
4. Select the *Service Password* tab.
5. Type **mms_com** at the password prompt. Press **Enter**.
6. At the command prompt window, type **stop** and press **Enter**.
7. Open the *Start* menu located in the lower left corner of the Windows NT main screen.
8. Select *Shut Down...* from the menu.
9. Select *Close all programs and log on as a different user?*
10. Hold down the **Shift** key and select *Yes*. Continue holding down the **Shift** key until prompted for logon.
11. At the user name prompt, type **administrator** and press the **Tab** key.
12. At the password prompt, type **admin1,3,5,7** and press **Enter**.

Configure Time/Date Settings

WARNING
Any change to the time/date data affects all units on the network. This can result in other monitors altering the time and date parameter of some patient data.

Make sure the unit you are configuring is not connected to the network at this time.

1. Select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.

3. Type **mms_com** at the password prompt. Press **Enter**. Verify the *GE Marquette Clinical Information Center* or *GEMS Information Technologies CIC* command window opens and the title bar is blue, indicating it is active. If not, place your cursor inside the window and click to activate it.

NOTE

Software version *2.0* shown in the following steps is used for example only. The version number appearing on your central station screens should match the version found in the lower left corner of the *CIC Setup* screen.

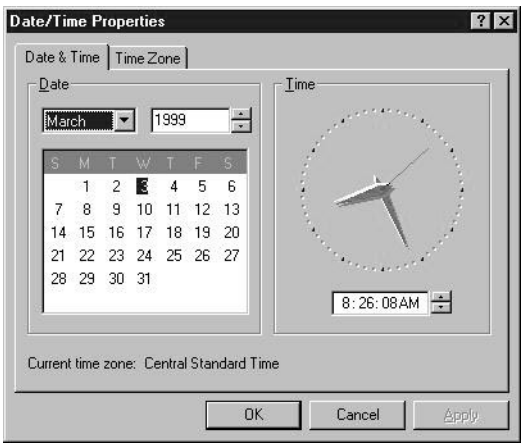
4. Verify *C:\Program Files\Marquette\CIC\2.0>* appears, indicating the current working directory. If not, type the following:

   cd\Program Files\Marquette\CIC\<your software version> and press **Enter**.

5. Type **su<space>cicadm<space>cicadm1,3,5,7** and press **Enter**. Verify the *C:\winnt\system32\cmd.exe* command window opens. If the window title bar is not blue, place your cursor inside the window and click to activate it.

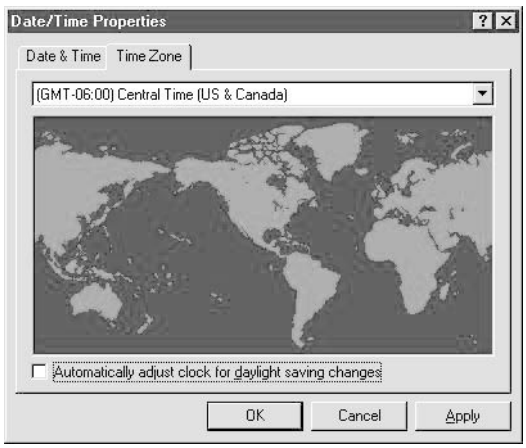
6. Verify *C:\Program Files\Marquette\CIC\2.0>* appears, indicating the current working directory. If not, type the following:

   cd\Program Files\Marquette\CIC\<your software version> and press **Enter**.



7. Type **timedate** and press **Enter**. The Windows NT Date & Time control applet appears.

8. Select the *Date & Time* tab. Set the correct date and time. Click on *Apply*.



9. Select the *Time Zone* tab, and verify the correct time zone is selected.
10. Verify the *Automatically adjust clock for daylight saving changes* box is NOT checked.
11. Click on *Apply*.
12. Click on *OK* to close all windows when finished.

Connect to Unity Network

Connect the Unity Network drop cables to the back of the computer tower using the table and figures to complete the proper connections.

NOTE

See Chapter 8 – Assembly Drawings for exact location of Ethernet cards.

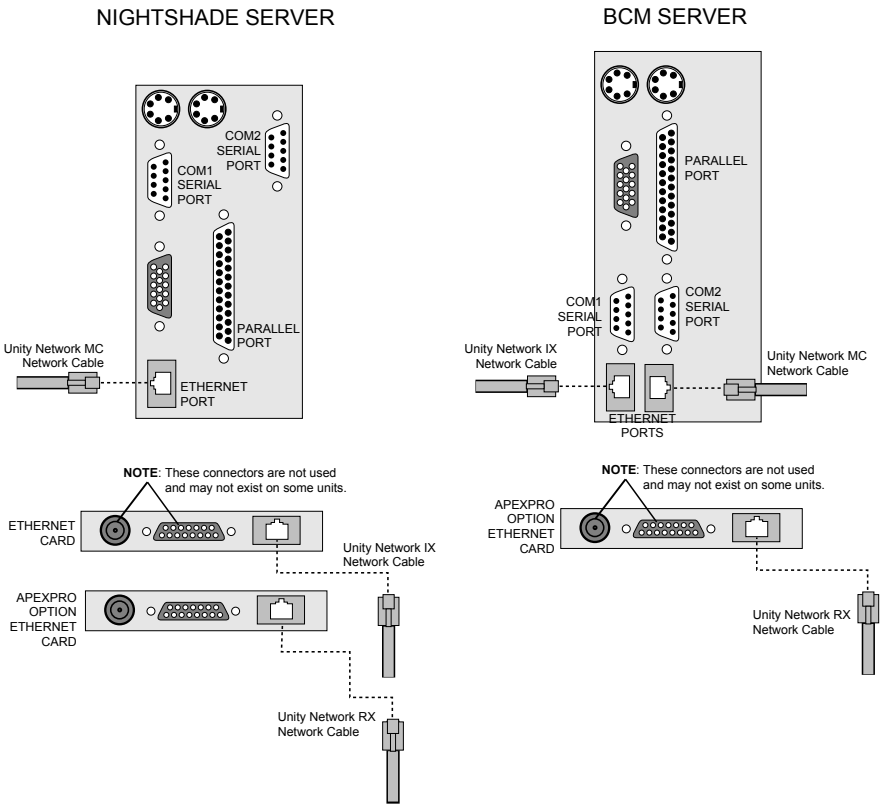


Table 2. Unity Network Connections		
Unity Network Connection	**Nightshade Server**	**BCM Server**
Unity Network MC	Ethernet Port on CPU	Ethernet Port marked “MC”
Unity Network IX	Ethernet card on back of CPU	Ethernet Port marked “IX”
Unity Network RX (ApexPro only)	Optional ethernet card on back of CPU	Optional ethernet card on back of CPU

Install Optional Licenses

Install any optional application licenses at this time. Refer to the GE Unity Network® License Configuration Guide.

Install Printer

Complete the appropriate procedure to configure the CIC for the desired printer connection.

Installing a Network Laser Printer

Perform the following procedure to install a network laser printer:

1. Select *Setup CIC* and click on the *Service Password* tab.
2. Type **mms_com** and press the **Enter** key. The *GEMS Information Technologies CIC* command window opens with the prompt: **C:\Program Files\Marquette\CIC***3.x***>**
3. Type **stop** and press the **Enter** key.
4. Select *Start > Shut Down*, then click the *Close all programs and log on as a different user* button.
5. Press and hold **Shift** and click on the *Yes* button. Continue to hold **Shift** until you get a log on screen.
6. Type **administrator**, press the **Tab** key and type **admin1,3,5,7** (with no spaces). Press the **Enter** key; this logs you onto the system as the administrator.
7. Select *Start > Settings > Printers*. This brings up a small window with an *Add Printer* icon. Double click on that icon.
8. Select *My computer* and click *Next* to display the available ports.
9. Click on *Add Port*, then double click on *LPR Port*. Enter the IP address assigned to the printer (e.g., 121.50.1.167).

   NOTE
   If the addressing scheme has been changed from the factory default, the assigned address must be tracked and maintained at the site. This includes the printer. The above scheme only applies when the Unity Network IX network IP addressing has not changed from the factory defaults and is not connected to your hospitals network.

10. Press the **Tab** key to move to the field labeled *Name of Printer* or *Print Queue*. On that server type **RAW** and click *OK*.
11. Click on the *Close* box in the Printer ports dialog box. This returns you to the ports screen. There should be a port labeled with the IP address you entered in the prior steps with a check mark in the box.
12. Click *Next* to proceed. The next screen has the manufacturers on the left and the printer device models on the right. Scroll to select the manufacturer of your printer. (CIC supports HP 4000N, 4050N, 4100N, and 4200N.)
13. A choice of printers appears on the screen. Select the HP LaserJet series PS driver for your model and click *Next*.
14. This brings up *Printer Name*. Use the default name and click *Next*.
15. This brings up a window asking if the printer is shared or not shared. Select *Not Shared*, then click *Next*.

16. Do you wish to print a test print? Select *Yes*, then click *Finish*. The system prints a test sheet on the printer.
17. If it prints correctly, select *Yes* then *Start > Shutdown > Close all programs and log on as a different user,* then select *Yes*. Allow the system to restore the CIC screen.

NOTE

The final printer selection steps are completed during the CIC setup procedures that follow.

Installing a Parallel Printer

Perform the following procedure to install a parallel printer to this CIC.

1. Select *Setup CIC* and click on the *Service Password* tab.
2. Type **mms_com** and press the **Enter** key. The *GEMS Information Technologies CIC* command window opens with the prompt: **C:\Program Files\Marquette\CIC***3.x***>**
3. Type **stop** and press the **Enter** key.
4. Select *Start > Shut Down*, then click the *Close all programs and log on as a different user* button.
5. Press and hold **Shift** and click on the *Yes* button. Continue to hold **Shift** until you get a log on screen.
6. Type **administrator**, press the **Tab** key and type **admin1,3,5,7** (with no spaces). Press the **Enter** key; this logs you onto the system as the administrator.
7. Select *Start > Settings > Printers*. This brings up a small window with an *Add Printer* icon. Double click on that icon.
8. Select *My computer* and click *Next* to display the available ports.
9. Click on the box next to *LPT1: Port*. A check mark appears in the box. Click *Next* to proceed.
10. Select *HP* from the Manufactures list & select the appropriate printer, and select *Next*.
11. Select *Yes* to keep existing drivers and select *Next*.
12. Select *Shared*. Keep the printer name the same in the *Shared Name* field. Do not select any alternate drivers. Select *Next*.
13. Select *Yes,* then click *Finish* to print a test page and verify that indeed a test page does print out.
14. Select *Start > Shutdown > Close all programs and log on as a different user*. Allow the CIC to boot up in CIC mode.

NOTE

The final printer selection steps are completed during the CIC setup procedures that follow.

Connecting to an Existing Parallel Printer

Perform the following procedure to connect the CIC to an existing shared parallel printer at a different location.

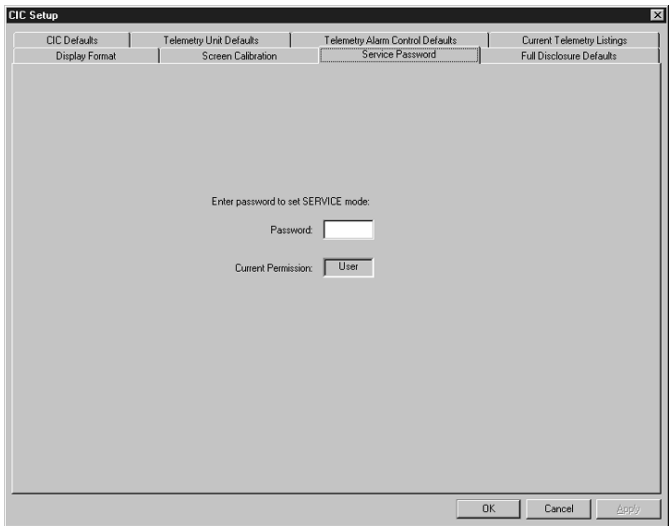
1. From the CIC patient monitoring screen, select *Start* > *Help*.
2. A *Help* topics Windows NT windows opens. Select the *Index* tab and type in the word **printer**. Press the **Enter** key.
3. Click on the icon arrow in step 1 of the Windows NT Help window to install a printer.
4. The *Add Printer* Wizard window opens, select *Network Printer Server* and select *Next*.
5. The *Connect to Printer* window opens. Double click on the PC in the workgroup to show the shared printer on the network.
6. Double click on the printer to open the next window telling you that the network printer has been successfully installed. Select *Finish*.

NOTE

The final printer selection steps are completed during the CIC setup procedures that follow.

Setup the CIC Pro

Access Service Mode

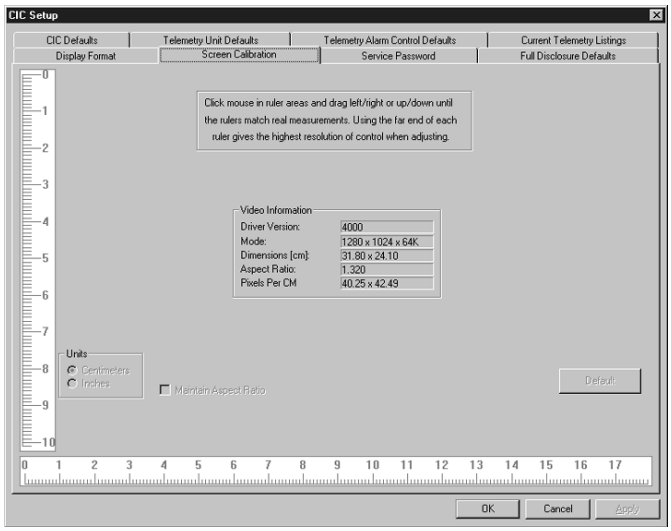


WARNING
The service mode is intended for use only by qualified personnel with training and experience in its use. The consequences of misuse include loss of alarm configuration, loss of patient data, corruption of the clinical information center operating system software, or disruption of the entire network.

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. When prompted for the service password, type **mms_cic** and press **Enter**.

NOTE
When you are in service mode, a cross-shaped cursor replaces the normal arrow cursor.

Calibrate the Screen



NOTE

A flexible clear plastic ruler calibrated in inches and centimeters is recommended for this procedure.

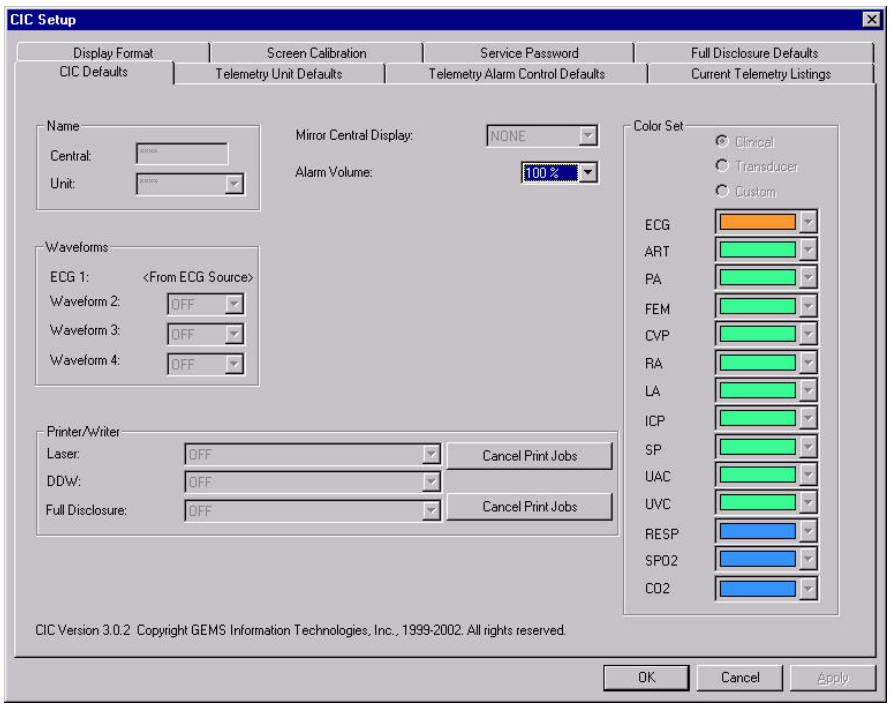
1. Click on the *Screen Calibration* tab as shown.
2. The illustration shows the *Screen Calibration* screen. In the *Units* box, use the mouse to choose *Inches* or *Centimeters* as desired.
3. Click on the *Default* button to set the display to the default resolution of the Windows NT operating system.
4. Hold your ruler on the computer screen, aligning the zero mark of your ruler with the zero mark of the screen ruler.
5. Position the arrow cursor on the screen ruler. Hold down the left mouse button while you drag (or pull) the screen ruler in either direction until the calibration marks of the screen ruler match the calibration marks of your ruler, then release the mouse button.
6. Repeat this procedure to calibrate the other screen ruler.
7. When you finish, click *Apply* at the lower right corner of the calibration screen to save the calibration settings.

NOTE

The *Maintain Aspect Ratio* button on the calibration screen allows you to adjust both screen rulers simultaneously. However, because of differences in monitors and screen resolution, it is recommended that each ruler be adjusted separately. (A check mark in the box indicates when this option is selected. Click on the check box to deselect it.)

Set the CIC Defaults

Open the CIC Default Screen



Click on the *CIC Defaults* tab to open the *CIC Defaults* screen shown.

Set the Central Name

NOTE

All other systems on the GE Medical Systems *Information Technologies*' Unity Network MC network use the *Central Name* to identify this CIC Pro system. Select the Central Name so that the name is relevant to the location, such as CS-2 or SDU3.

Make sure no other central stations have the same Central Name.

The maximum length of the name is four characters. Once you correctly enter the desired central name, click outside the box to enter the name.

Click the text cursor in the *Central* field.

Type in the *Central* name. When finished, click *Apply* at the lower right corner of the screen to save the setting.

Set the Unit Name

NOTE

All other systems on the Unity Network MC network use the entered care unit name to identify this CIC Pro system. Select the care unit name so that the name is relevant to the location, such as CCU or ICU-1.

It is very important to enter the correct Care Unit name. Be especially careful of the name's spelling.

If any other CIC Pro systems are intended to have the same care unit name, make sure the names match exactly.

Once the care unit name is programmed, and the CIC Pro system is placed in use, avoid changing the care unit name. Changing the care unit name causes all Full Disclosure data stored on this PC to be deleted and the list of beds and the list of transmitters stored in the CIC Pro system to be deleted. You must re-enter that data after you change the care unit name.

Click on the arrowhead next to the *Unit* name box to open the pull-down list of unit names. Click on the desired name to select it, or type a name in the Unit name box and press **Enter**.

When finished, click *Apply* at the lower right corner of the screen to save the setting.

Set the Waveform Parameters

Select the waveforms you wish to display (up to three in addition to the ECG).

- *Graph Waveform ECG 1:* Default from *ECG Source*.
- *Graph Waveform 2 – 4:*Allows you to enable/disable graphing for subsequent ECG leads. Choices are *Off, I, II, III, V, aVR, aVL*, and *aVF*.

When finished, click *Apply* at the lower right corner of the screen to save the setting.

Printer/Writer Selections

NOTE

Full disclosure and Flow Volume Loop information cannot print to a DDW. It must print to a laser printer.

Full disclosure reports can potentially be very large and take a very long time to print. This can block alarm graphs to that printer. Therefore, it is recommended that the print setup for full disclosure reports be different from other patient printing.

It is important to note that the printer selection list for full disclosure is different from the printer selection list for graphing patient data. The printer list shown here may not include printers defined on the GE Unity Network IX network.

Laser: – Select your network or installed parallel laser printer from the drop down list.

NOTE

Do not select a shared printer for *Laser*. The printer that is displayed in the Laser window is broadcasted over the Unity Network MC network for the bedside monitors to see as a service offered by this CIC. Only the CIC that has the printer physically connected to it should be selected in the Laser window.

DDW: – Select the COM port being used by the Digital Writer.

Full Disclosure: – Select your network or parallel printer.

Click *Apply* to save the new settings.

Setup a Mirrored CIC

The *Mirror Central Display* option allows double-monitoring of patients from remote, or secondary central stations. The display on the remote central station is configured to mirror the originating central station (i.e. the same patients are shown in the same display slots).

If the remote central station is located in the same care unit as the originating central station, users can perform the *Admit/Discharge* operations or any other display-type operations. The changes affect both central stations. For example, if the patient in a display slot is changed at one central station, the change is also automatically performed on the mirroring central station.

CAUTION

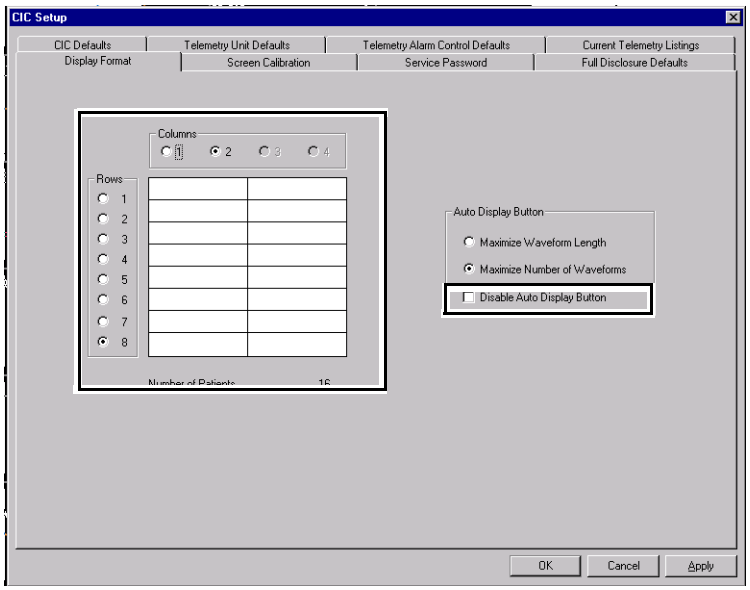
Use caution when configuring mirror central station displays. Since changes at one central station can affect the other display, there may be an inadvertent loss of patient monitoring at the primary central station.

You can set up a mirrored CIC Pro for remote monitoring. This is set in the service mode. Changes made on one CIC Pro are NOT always made at the other CIC Pro. The main and mirrored CIC Pro share bed lists. When a mirrored CIC Pro is set up, these rules are in place:

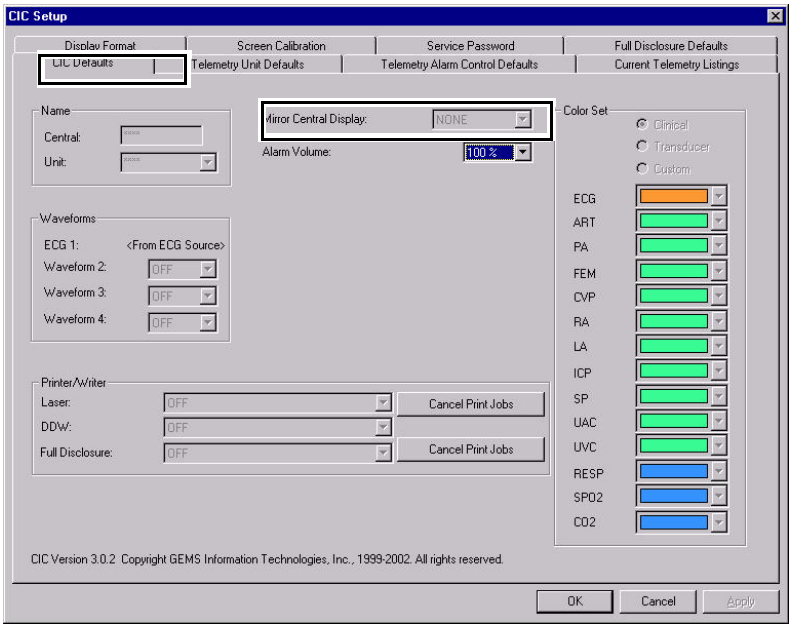
- If the user selects new parameters or colors to view on one display, that view is NOT “mirrored” on the other display.
- *Auto Display* is disabled at the mirrored CIC Pro. However, it is still active on the main CIC Pro. You must select *Disable Auto Display* on the *Display Format* tab of the main CIC Pro.
- When using the mirror feature on the CIC Pro product, set both the main and mirrored CIC Pro to the same display format for the mirror feature to work correctly. Set the *Columns* and *Rows* in the *Display Format* tab of the mirrored CIC Pro to match the main CIC Pro. Whenever you change this setting, the change is NOT reflected on the other CIC Pro.
- The title bar of the mirror CIC Pro displays *mirror of [CIC SELECTED].*

To set up a mirrored CIC Pro:

1. At the CIC Pro that mirrors the main CIC Pro, click on *Setup CIC*.
2. *Auto Display* is disabled on the mirror CIC Pro. However, it is still active on the main CIC Pro. Select the *Display Format* tab and then click the *Disable Auto Display* button.



3. Set both the main and mirrored CIC Pro to the same display format for the mirror feature to work correctly. Set the *Columns* and *Rows* in the *Display Format* tab of the mirrored CIC Pro to match the main CIC Pro.
4. Select the *CIC Defaults* tab.
5. At *Mirror Central Display* there is a drop-down box. All CIC Pros on the network are listed in this box. Select the CIC Pro you want mirrored on the mirror CIC Pro.

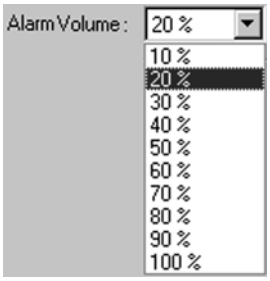


6. Check the title bar on the mirroring CIC Pro to assure that it is mirroring the correct CIC Pro.
7. When complete, click *Apply* at the lower right corner of the screen to save the new settings.

Set the Alarm Volume

This box allows you to set the alarm volume for the CIC Pro. To set the volume lower than 40%, you must be in service mode. To adjust the default alarm volume between 40-100% volume:

1. Click on the drop down menu in the *Alarm Volume* control area. The *Alarm Volume* drop down menu opens.



2. Click on the desired volume level. The volume can be set between *40%* and *100%* in the user mode.

NOTE

If the alarm level is set below 40% in service mode, the *Alarm Volume* is disabled for the user.

3. When you are satisfied with the new volume level, use the mouse to click *Apply* to activate your change.

Adjust the Color Set

This option allows you to set a color scheme for waveforms. Preset choices are *Clinical, Transducer,* or *Custom*.

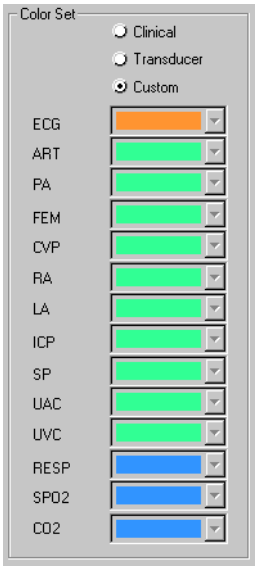
- *Clinical*—This sets the colors for single-parameter or double-parameter patient monitoring. *ECG* waveforms display in orange; *ART, PA, FEM, CVP, RA, LA, ICP, SP, UAC,* and *UVC* display in green; and *RESP, SPO2,* and *CO2* display in blue.
- *Transducer*—This sets the colors for multi-parameter patient monitoring. Display colors are: *ECG* in brown, *ART* in red, *PA* in yellow, *FEM* in red, *CVP* and *RA* in blue, *LA* and *ICP* in white, *SP* in green, *UAC* in red, *UVC* in blue, *RESP* and *SPO2* in green, and *CO2* in white.
- *Custom*—This selection allows you to set each waveform color individually.

NOTE

When you select *Custom*, you can select color for each of the fourteen waveform types individually.

When you select either *Clinical* or *Transducer*, access to the color palettes for individual waveforms is disabled.

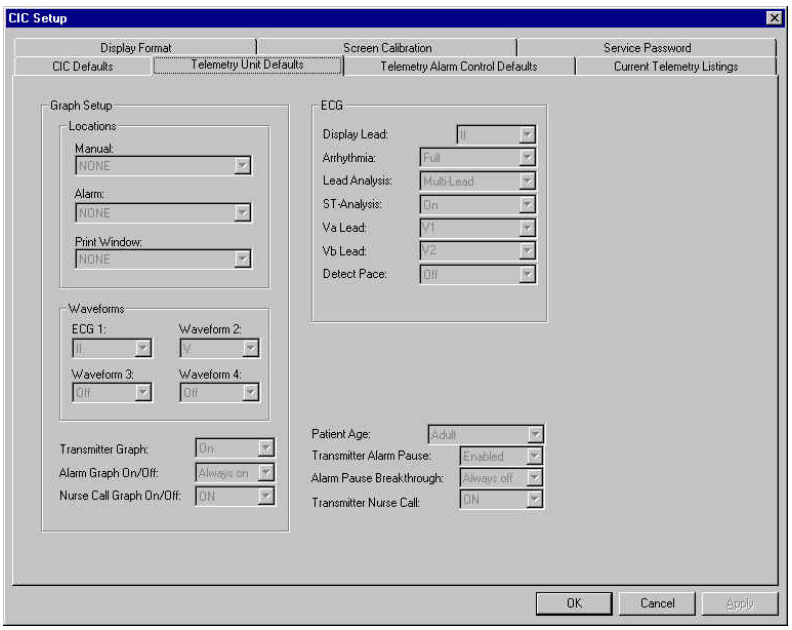
To access and change the *Color Set*:



1. Click on the arrow next to the waveform name box to open the pull-down list of colors.
2. Click on the desired color to select it.
3. When color selections are complete, click *Apply* at the lower right corner of the screen to save the new color settings.

Set the Telemetry Unity Defaults

Open the Telemetry Unit Defaults Screen



Click on the *Telemetry Unit Defaults* tab as shown.

This option allows you access to the telemetry default settings. In user mode, all of the controls on the *Telemetry Unit Defaults* tab sheet are view-only. You must be in the service mode to review and make modifications to the *Telemetry Unit Defaults* tab sheet at the CIC.

NOTE

For more information on setting Telemetry Unit Defaults, refer to the telemetry system's operator manual.

Graph Setup

Locations – The *Locations* defaults are only used for telemetry beds. These defaults determine where patient data prints for either manual or alarm conditions. Since a telemetry patient is not linked to a monitor, such as a Solar 8000 monitor, these defaults are necessary to specify the destination for alarm and manual graph printouts.

The *Location* options are:

- *Manual Graph Location* —allows you to designate the default manual graph location for telemetry patients.
- *Alarm Graph Location* —allows you to designate the default alarm graph location for telemetry patients.
- *Print Window Location* —allows you to designate the default print window location for telemetry patients.

Waveform – Under the Graph Setup Waveform option you can designate the primary ECG lead for printing and enable/disable graphing for subsequent ECG leads.

The *Waveform* options are:

- *Graph Waveform ECG 1:*—allows you to designate the primary ECG lead for printing.
- *Graph Waveform 2 – 4*—allow you to enable/disable graphing for subsequent ECG leads. Choices are *Off, I, II, III, V, aVR, aVL,* and *aVF.*

Transmitter Graph – This option allows you to turn on/off transmitter graph printing.

Alarm Graph On/Off – This option allows you to turn on/off alarm graph printing.

ECG

Display Lead – This option allows you to set the primary ECG lead for display in the patient's waveform window. Choices are I, II, III, V, aVR, aVL, and aVF.

Arrhythmia – This option allows you to enable/disable an arrhythmia analysis program. Choices are Full, Lethal, and Off.

Lead Analysis – This option allows you to designate Single-Lead or Multi-Lead analysis for ECG and arrhythmia analysis.

ST Analysis – This option allows you to enable/disable ST analysis. Choices are On or Off.

Va Lead/Vb Lead – This option allows you to set the default for the V leads that will be monitored in these positions. A 6-lead cable is required for multiple V-lead monitoring. Choices for Va are V1, V2, V3, V4, V5, and V6. Choices for Vb are V2, V3, V4, V5, and V6.

Detect Pace – This option allows you to enable/disable pacer detection. Choices are *Pace 1, Pace 2,* and *Off.*

Patient Age, Transmitter Alarm Pause and Alarm Pause Breakthrough

Patient Age – This option allows you to set patient age. Choices are 0–2 years, 3–11 years, 11–13 years, and Adult.

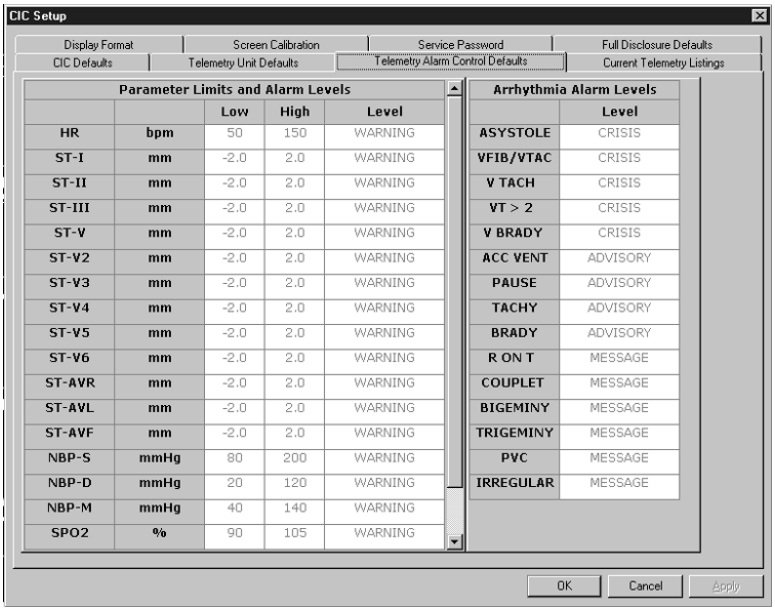
Transmitter Alarm Pause – This option allows you to turn on/off transmitter alarm pausing. Choices are Enabled, Disabled, and Off.

Alarm Pause Breakthrough – This option allows you to turn on/off transmitter pause breakthrough. Choices are *Always on* and *Always off.*

When finished, click *Apply* at the lower right corner of the screen to save the settings.

Set the Telemetry Alarm Control Defaults

Open the Telemetry Alarm Control Defaults Screen



Click on the *Telemetry Alarm Control Defaults* tab as shown.

In user mode, all of the controls on the *Telemetry Alarm Control Defaults* tab sheet are view-only. You must be in the service mode to set default limits and alarm settings for telemetry patients.

NOTE

For more information on setting Telemetry Alarm Control Defaults, refer to the telemetry system's operator manual.

Parameter Limits and Alarm Levels

This option allows you to set default parameter alarms limits and alarm levels for the following parameters: HR, NBP-S, NBP-D, NBP-M, SPO2, SPO2-R, ST-I, ST-II, ST-III, ST-V, ST-V2, ST-V3, ST-V4, ST-V5, ST-V6, ST-aVR, ST-aVL, ST-aVF, and PVC**.**

Arrhythmia Alarm Levels

This option allows you to set default alarm levels for the following arrhythmia calls: ASYSTOLE, VFIB/VTAC, V TACH, V BRADY, VT>2, ACC VENT, PAUSE, TACHY, BRADY, R ON T, COUPLET, BIGEMINY, TRIGEMINY, PVC and IRREGULAR.

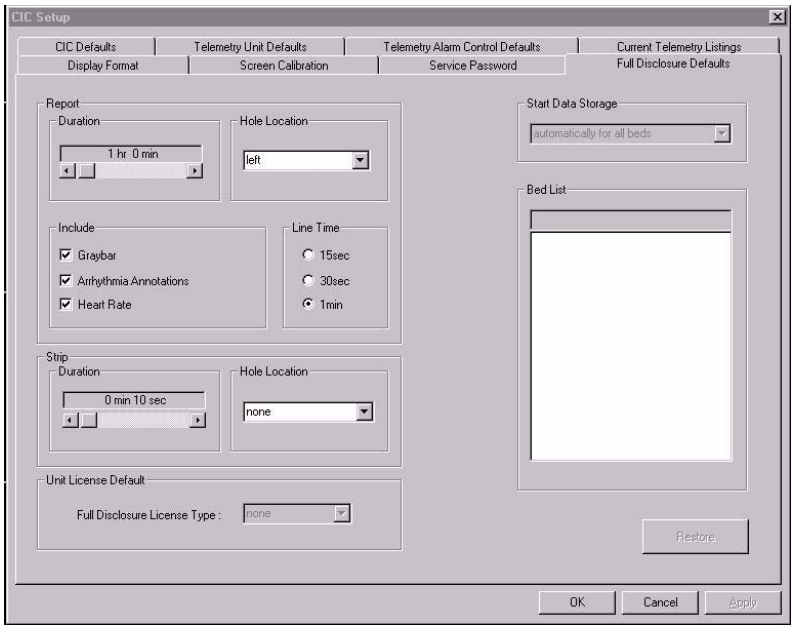
NOTE

The default alarm levels for ASYSTOLE and VFIB/VTACH cannot be moved from the Crisis level.

When finished, click *Apply* at the lower right corner of the screen to save the setting.

Set the Full Disclosure Defaults

Open the Full Disclosure Defaults Screen



Click on the *Full Disclosure Defaults* tab as shown.

Report Duration

This option allows you to designate how much data is included in the report. The maximum report duration is 72 hours.

To set the report duration, place the cursor on the scroll bar below the *Report Duration* display field. Move the scroll bar to the left for shorter duration or to the right for longer duration.

Report Hole Location

This option allows space for binding printed reports. Options are *none, top, bottom, left,* and *right.*

Report Include

This option allows you to enable print characteristics. Options include *Graybar, Arrhythmia Annotations,* and *Heart Rate.* You may select all or none of these options.

- In *Graybar*, every other line of the report appears on a shaded background to provide visual differentiation from other lines.
- In *Arrhythmia Annotations*, the name of an applicable arrhythmia call appears underneath its occurrence in the report.
- In *Heart Rate,* the last active heart rate included in the report appears at the end of the report line.

Report Line Time

This option allows you to designate how much data shows on an individual report line. Choices are *15sec, 30sec,* and *1min.*

Strip Duration

This option allows you to designate how much data is included in the strip. The maximum strip duration is 60 minutes.

To set the strip duration, place the cursor on the scroll bar below the *Strip Duration* display field. Move the scroll bar to the left for shorter duration or to the right for longer duration.

Strip Hole Location

This option allows space for binding printed report strips. Options are *none, top, bottom, left,* and *right.*

Start Data Storage

This option allows you to designate how full disclosure is enabled for patients at the time of admission. Choices are *automatically for all beds, automatically if listed,* and *manually.*

Bed List

This option shows a listing of beds for which full disclosure data is automatically stored.

Unit License Default: Full Disclosure License Type

This option shows a list of Full Disclosure license options. Choices are *none*, *24 hours*, *48 hours*, and *72 hours.*

NOTE

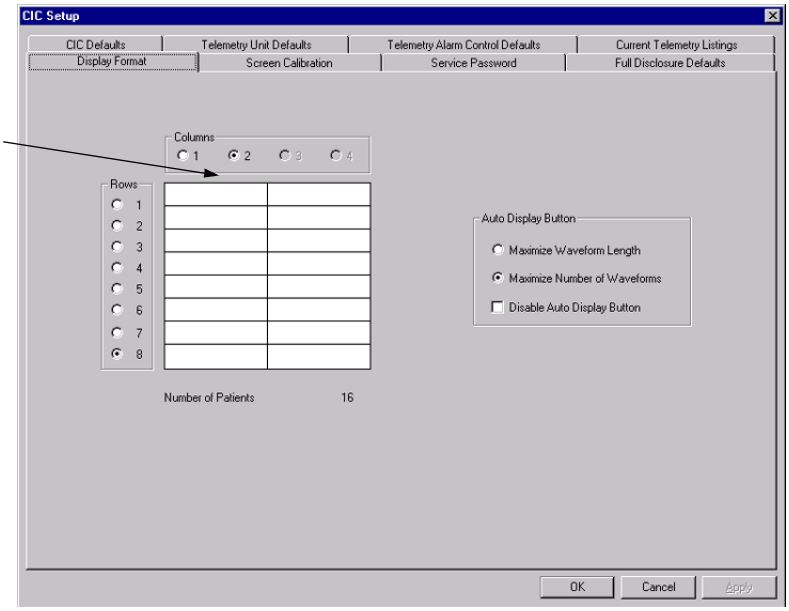
If the default does NOT match the actual license, Full Disclosure does NOT work.

Restore

This button allows you to clear any modifications made to the Full Disclosure tab sheet and revert to the previous settings.

Set the Display Format

Open the Display Format Screen



Click on the *Display Format* tab as shown.

The *Display Format* tab sheet allows you to format the clinical information center's multiple patient viewer with the required number of patient windows.

NOTE

Modifications to display format are subject to licensing restrictions.

Columns

This option allows you to designate the number of columns of patient windows in the multiple patient viewer.

Rows

This option allows you to designate the number of rows of patient windows in the multiple patient viewer.

Map of new display

This option reflects the current Columns/Rows selections graphically. When the Columns or Rows selections change, this map is immediately updated.

Auto Display Button

This option allows you to set the function of the *Auto Display* button in the Main Menu, or to disable it. Choices are *Maximize Waveform Length*, *Maximize Number of Waveforms*, and *Disable Auto Display Button*.

Changing the Display Format

To change the display format, follow these steps.

NOTE

You must remove admitted beds from the display before you can select a display format that would eliminate those patient slots from the display.

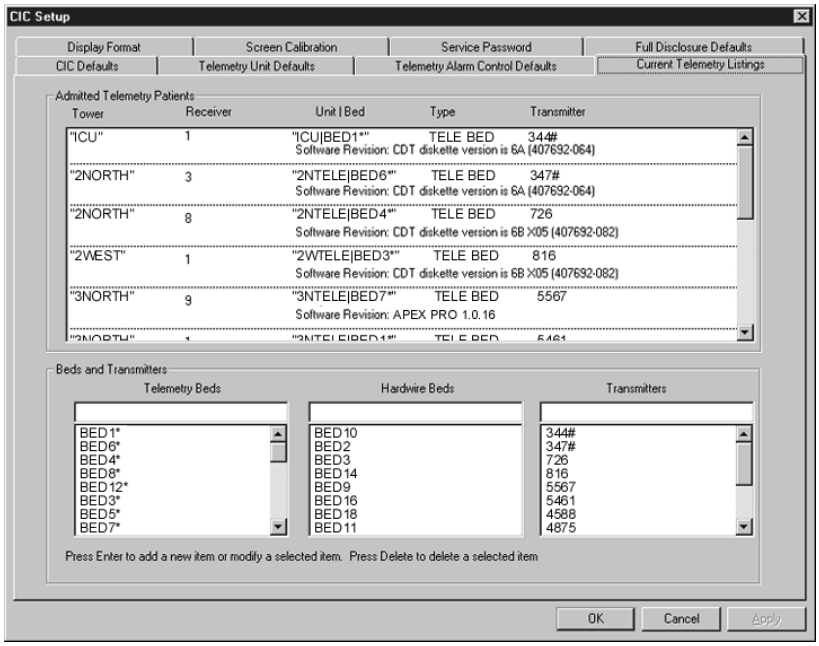
To do this, right-click the mouse pointer in the appropriate slot, and choose *None* from the *Select Care Unit then Bed Number* menu.

1. Click on the selection corresponding to the number of columns you want in the multiple patient viewer.
2. Click on the selection corresponding to the number of rows you want in the multiple patient viewer.
3. Visually verify in the map of the new display that the new setting is what you want.

When finished, click *Apply* at the lower right corner of the screen to save the settings.

Set the Current Telemetry Listings

Open the Current Telemetry Listings Screen



Click on the *Current Telemetry Listings* tab as shown.

In user mode, the *Current Telemetry Listings* tab sheet is view-only. You must be in the service mode to make modifications to the telemetry settings.

Admitted Telemetry Patients

The *Admitted Telemetry Patients* control is for information only.

NOTE

This overview covers the controls in a row. Each row contains information for one telemetry patient (sorted by TTX number).

The second line of an entry shows the current software level for the patient bed in question.

- *Tower*—indicates which telemetry receiver cabinet (tower) this telemetry patient is communicating with.
- *Receiver*—indicates which receiver assembly inside the telemetry receiver cabinet this telemetry patient is communicating with.

  NOTE

  This is information only applies to CDT-LAN with software versions prior to 6D, it does not apply to CDT-LAN at software version 6D or ApexPro.

- *Unit | Bed*—indicates the unit and bed to which this patient has been assigned.
- *Type* —indicates the type of patient this is: *Tele Bed* or *Tele Combo.*
- *Transmitter*—indicates the identification number assigned to this patient's transmitter.

When finished, click *Apply* at the lower right corner of the screen to save the setting.

Bed and Transmitters

The *Bed and Transmitters* controls can only be modified from within service mode.

- *Telemetry Beds*—allows you to add, modify, or delete a telemetry bed name.
- *Hardwire Beds*—allows you to add, modify, or delete a hardwire bed name.
- *Transmitters*—allows you to add, modify, or delete a telemetry transmitter.

Alpha-Numeric TTX ID Numbering – During setup, the CIC does NOT allow the user to enter alpha-numeric transmitter numbers. However, by entering the transmitter ID number (found in parenthesis on the back of the ApexPro transmitter), the CIC automatically converts the ID to an alphanumeric numbering scheme and displays this number under the patient's bed window.

NOTE

The TTX ID number is composed of either a three, four, or five-digit number.

Enter a New Item

Enter a new item in a list as follows:

1. Position the cursor in the blank box at the top of the list.
2. Type in the desired information and press **Enter** to add the entry to the list.
3. When selections are complete, click *Apply* at the lower right corner of the screen to save the new settings.

Editing Entries

Edit an existing entry as follows:

1. Locate the item in the scroll list.
2. When you click on the entry, it appears in the editing box.
3. Edit the information and press **Enter** to add the new entry to the list.
4. When selections are complete, click *Apply* at the lower right corner of the screen to save the new settings.

NOTE

Telemetry beds are distinguished from monitoring beds by an asterisk at the end of the bed number. When entering or editing information in the *Telemetry Beds* list, be sure to add an asterisk to the end of the bed name.

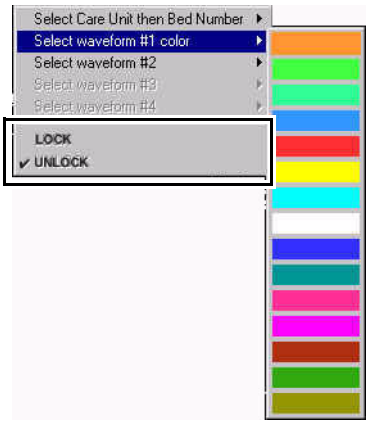
Lock or Unlock Beds

In the Service Mode, the clinical information center can be configured with the bed names either in lock or unlock mode. When locked, the bed name is permanently allocated to a particular slot on the CIC Pro and users are unable to move the bed to another slot on the CIC Pro.

NOTE

It is possible to admit a patient to a window with a bed name that is locked to NONE. To avoid duplication of patient waveforms, a window locked as NONE should not be used to admit a patient.

To lock or unlock a bed:



1. Position the mouse pointer in the patient's waveform window.
2. Press the right mouse button to open the right-click menu.
3. Check either *LOCK* or *UNLOCK*. The right-click menu closes, and the change takes effect immediately.

ApexPro Configuration

Complete this procedure for CIC Pro systems equipped with optional ApexPro telemetry system only.

For the sake of troubleshooting and identifying what beds are admitted on any CIC Pro running ApexPro for multiple receiver systems, it helps to configure the ApexPro application running on the computer by using the *ptsconfig* utility.

Complete the following steps to configure the ApexPro application:

1. From the *Setup CIC* window, select Service Password and enter **mms_com**. Press **Enter**. The MS-DOS window opens.
2. At the c:\Program Files\Marquette\CIC\3.x> type **cd<space>..\..\pts\1.*x*** and press **Enter** (*x* = current software revision).
3. At **c:\Program Files\Marquette\pts\1.*x*>** type in **ptsconfig** and press **Enter**.
4. Type **modify unit**, press **Enter**, then type **APRO**, and press **Enter**.
5. Type in **modify tower** and press **Enter**. Type in the name of the CIC Pro that the Receiver System is connected to.

   Example: If the CIC Pro is named CIC1, then name the tower CIC1. This helps when troubleshooting and trying to identify where receivers are admitted to which PC.

6. Type in **display tower** and press **Enter** to verify that the unit and tower names where entered properly.

   Example: APRO|CIC1

7. If installing or adding on an ApexPro Receiver System that is connected to separate isolated antenna system and if there is only one Unity Network MC network tying the associated CIC Pro w/ ApexPro systems together, then the use of the **"modify receiver"** command is required. This segments the Receiver Systems to the associated antenna system along with the assigned care unit.

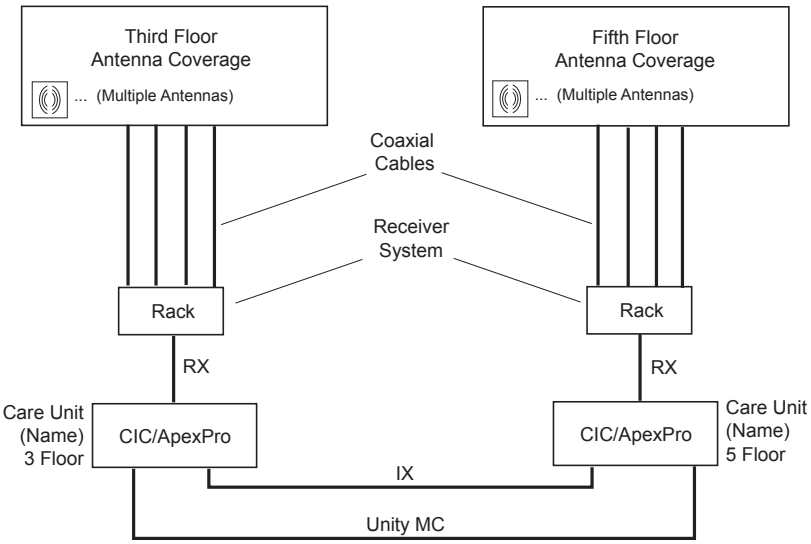
   The **modify receiver** command also allows a set number of reserved receivers assigned to a given care unit name. It also asks the user if unassigned receivers can be utilized.

   Use unassigned receivers? Y/N>

   Answer **Y** (yes), if receivers that have not been assigned to a given care unit and if they are available (discharged) then these can also be used for this care unit. If you select **N** (no), then this unit has the set number of receivers assigned. The admit master does not allow any more admissions to this care unit when this limit is reached. If someone attempts an admission, then an error message of "no available receivers" appears.

If you use the **modify receiver** command, then the user must also add to the list all other care units that could utilize the remaining unassigned receivers. This list of assigned care units is forwarded to the admit master.

Example: A Receiver System contains 16 receivers, the user has decided that 4 receivers are assigned to the "3Floor" care unit and has selected **Y** (yes) to use unassigned receivers. In this state only the care unit "3Floor" can utilize up to 16 receivers, no other care unit is allowed to admit. If the user wants other care units to utilize the remaining 12 unassigned receivers, then the user must add the remaining care units to the mod receiver list. The admit master is updated knowing that this tower now accepts admits, if receivers are available, to the assigned care unit names.



8. Press **Ctrl** + **]** to exit out of ptsconfig then close the MS–DOS window by typing **exit** at the prompt.

This concludes the ApexPro Configuration procedure.

Browser Configuration

WARNING

LOSS OF MONITORING — If the browser function is inappropriately used, loss of monitoring function may result. Use alternate monitoring devices or close patient observation until the monitoring function at the CIC Pro is restored.

When using the browser, follow these restrictions:

- Do NOT attempt to access the file systems of the CIC Pro through the use of the browser.
- Do NOT attempt to download files of any type. This includes, but is not limited to, audio or video files.

Before using the browser on the network, you must configure its name and address on the CIC Pro system. To configure the browser on the CIC Pro system:

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. In the *Password* field type **mms_com** and press **Enter**.

   The *GE Marquette Clinical Information Center* command window opens. The title bar of this window should be blue to indicate it is active. If the window is NOT active, place the cursor inside this window and click to make it active.

   The prompt should display:

   "**C:\Program Files\Marquette\CIC*2.0*>**"

   NOTE

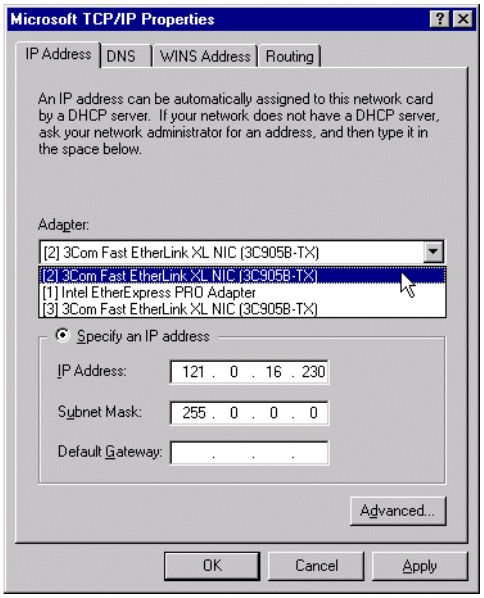
   Software version “2.0” is used only as an example in the prompt and directory strings. The current software version found in the lower left hand corner of the *CIC Setup* screen should display in this string.

4. With the cursor at the end of the text string type **stop** and press **Enter**.
5. At the bottom of the Windows screen select *Start>Shut Down*, then click button *Close all programs and log on as a different user*.
6. Press and hold **Shift** and click on the *Yes* button. Continue to hold **Shift** until you get a logon screen.
7. In the username field type **administrator**, press **Tab**, and type **admin1,3,5,7** (with no spaces) in the *Password* field (the password must be in lower case). Press **Enter**. This logs you onto the system as the administrator.
8. Right click on the *Network Neighborhood* icon and click on *Properties*.

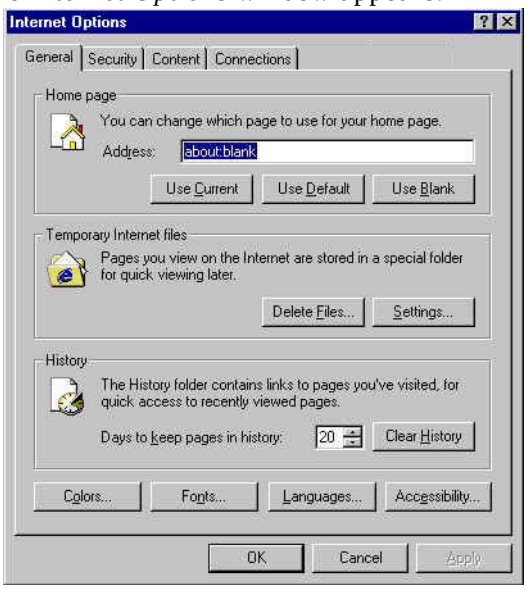
9. Next select the *Protocols* tab, then click on the *Properties*... button.
10. Under *Adapter:* select the 3Com card with a 121 *IP Address*, and then edit this page per your hospital IT Administrator and click *OK*. Record the IP Address on the top of the CIC Pro tower. Do NOT restart the computer at this time.

NOTE

If you have a DNS server, first select the DNS tab and configure DNS per your hospital IT Administrator.

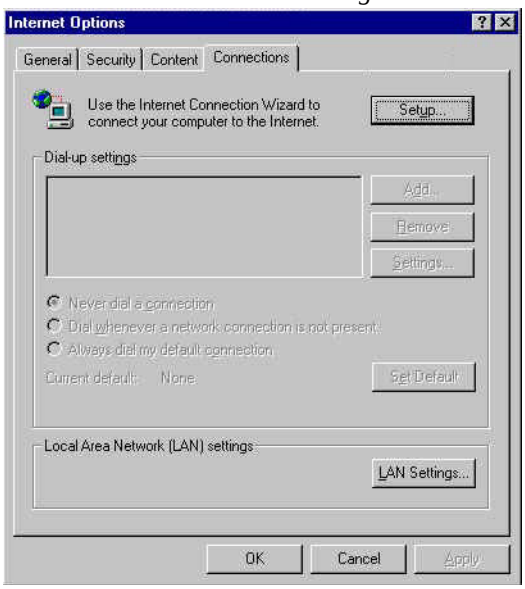


11. After you complete the address changes select *Apply>OK*. Restart the computer.
12. After the CIC Pro starts, select *Browser>Tools*, then click on *Internet Options*. The *Internet Options* window appears.

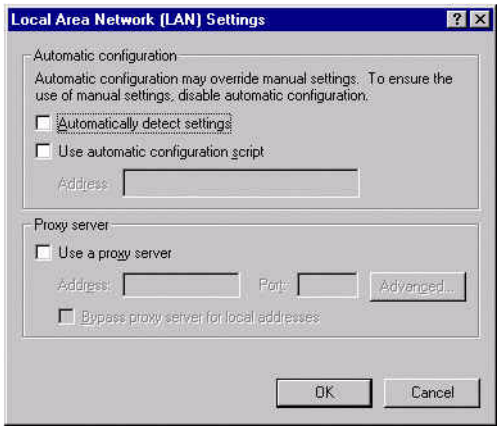


13. In the *Address* field enter the internet address you want your browser to default to. Select *Apply* and *OK*. The next time you open Internet Explorer your browser defaults to that address.

14. If you use *Automatic configuration* or a *Proxy server*, then select the *Connections* tab and click on *LAN Settings...*



15. Enter the *Automatic configuration* script or *Proxy server* address and port per your hospital IT Administrator, then click *OK*.



16. The setup is complete. Close the window or restart the browser to verify connections and the new home page.

Completion

Click on *Setup CIC* at the bottom of the screen and respond *Yes* to exit Service Mode. Proceed with the “Checkout Procedure” in the Maintenance chapter.

For your notes

4 Unity Network IS Installation & Configuration

For your notes

Pre-Installation Requirements

Read and fully understand the pre-installation requirements. Verify all requirements are met before attempting installation of the Unity Network IS system.

Site Requirements

The computer tower is capable of producing heat and must be physically located to allow the heat load to be adequately dissipated. The site requirements listed below were written specifically for an Intel computer tower.

WARNING
SERVER LOCATION — The computer server is UL 1950/IEC 950 certified equipment which may not meet the leakage requirements of patient care area equipment. This equipment must not be located in the patient vicinity as a shock hazard may exist, unless the medical electrical system standard, IEC 60601-1-1 is followed.

Failure to adequately ventilate the computer tower may cause equipment failure or improper operating conditions which may endanger the patients being monitored.

CAUTION
Do not locate the computer tower or display in an enclosed area that may restrict dissipation of the heat generated by the components. Any air flow restrictions may cause a rise in internal temperature which may result in equipment failure. The computer tower uses an internal forced air cooling system, but most displays do not.

The user must determine the heat dissipation requirements of the selected display and design a ventilation system accordingly.

Environmental Limits

The server operates reliably within normal office environmental limits. Select a site that meets these criteria:

- Clean and relatively free of excess dust.
- Well ventilated and away from sources of heat.
- Away from sources of vibration or physical shock.

Electromagnetic Fields and Electrical Noise

The server should be isolated from strong electromagnetic fields and electrical noise produced by electrical devices such as elevators, copy machines, air conditioners, large fans, large electric motors, radio and TV transmitters, and high frequency security devices.

Clearance and Airflow

The site should provide sufficient clearance behind and around the server to ensure proper cooling and airflow. Keep ventilating openings on the server free of obstructions.

Allow about 31 centimeters (12.2 inches) of clearance in back of the server, 60 centimeters (23.6 inches) on the sides, and 22 centimeters (9 inches) in front.

Access Space

Plan access space for server maintenance. Make sure there is convenient access to disconnect the AC power cord from the wall outlet or from the back of the server, because disconnecting the cord is the only way to remove AC power from the server before doing maintenance or upgrade procedures. Pressing the DC push-button on/off switch on the front panel does NOT remove server AC power.

Physical Specifications

	Physical Specifications	
	Nightshade Server	**BCM Server**
Height	49.02 cm (19.3 inches)	42.2 cm (16.6 inches)
Width	21.04 cm (8.3 inches)	20.1 cm (7.9 inches)
Depth	44.96 cm (17.7 inches)	48.0 cm (18.9 inches)
Weight	17.1 kg (38 lbs.) minimum configuration 22.9 kg (51 lbs.) maximum configuration	11.3 kg (25 lbs.) minimum configuration 13.1 kg (29 lbs.) maximum configuration

Power Requirements

Duplex Wall Receptacles

CAUTION
Loss of power to the computer tower results in loss of patient monitoring capabilities to the system, and to any remote display monitors connected via hardwire or modem.

Two properly grounded duplex wall receptacles should be provided for each system. Additional receptacles may be required to accommodate peripheral equipment connected to the system. The wall receptacles must be installed in an approved junction box. Use only three-prong, polarized, hospital-grade wall receptacles to accept the three-prong polarized plug on the computer equipment.

Un-Interruptible Power Supply (UPS)

GE Medical Systems *Information Technologies* recommends the use of a UPS with the system. If a UPS is NOT used, improper shut downs of the system could result in the event of a power outage and cause a lengthy disk scan procedure when the unit reboots. You could also lose data in the event of a power outage if you do not use a UPS.

For connecting the UPS, follow these steps:

CAUTION
Connect the UPS to the PC CPU(s) and displays only. Do NOT connect printers or other devices to a UPS. Other devices my shorten estimated run times. If power is not restarted in time the unit shuts down and patients will not be monitored.

Equipment Grounding

WARNING
SHOCK HAZARD — The computer tower and all peripheral equipment must be adequately grounded or a shock hazard may exist.

The grounding pin of all wall receptacles and all exposed metal parts (beds, radiators, water pipes, etc.) in any patient area should be electrically connected together. This common ground point should be connected to the nearest equipotential ground through a bonded grounding system, or with a 10 AWG stranded copper grounding cable.

The equipotential ground point should be as close to earth ground potential as possible. If a bonded grounding system is not available, the ground pin of each wall receptacle must be individually connected to a central grounding point. Do NOT jumper from ground pin-to-ground pin of the receptacles.

The grounding system must not carry current, such as a grounded neutral, since the current flow will produce potential differences along the ground path. These potential differences are a shock hazard source for equipment users and patients.

Do NOT use conduit as a ground conductor. Plastic (PVC) piping or fittings used in the conduit runs can break the electrical connection to ground, resulting in potential shock hazards.

The electrical grounding system should be connected on an earth ground. If this is not possible, then a good ground reference such as a metal water pipe or an electrically-conductive building component should be used. it is more important that all grounded objects in the patient area are at the same ground potential rather than at earth ground potential.

Unity Network IS Installation

WARNING
External equipment must be connected to the system only by qualified biomedical engineering personnel.

A shock hazard may exist if external devices are connected other than as described in this manual, or as directed by the manufacturer.

Only external devices specifically designed to be connected to the PC tower, or approved by GE Medical Systems *Information Technologies* for use with this system, should be connected, as specified in this manual or as otherwise specified by the manufacturer.

CAUTION
All external cabling used with the server systems must be routed so as not to interfere with access or operation of the system.

All cabling must be installed to protect against tripping and accidental disconnection of the cables.

Do NOT apply power until all equipment is installed and ready for use.

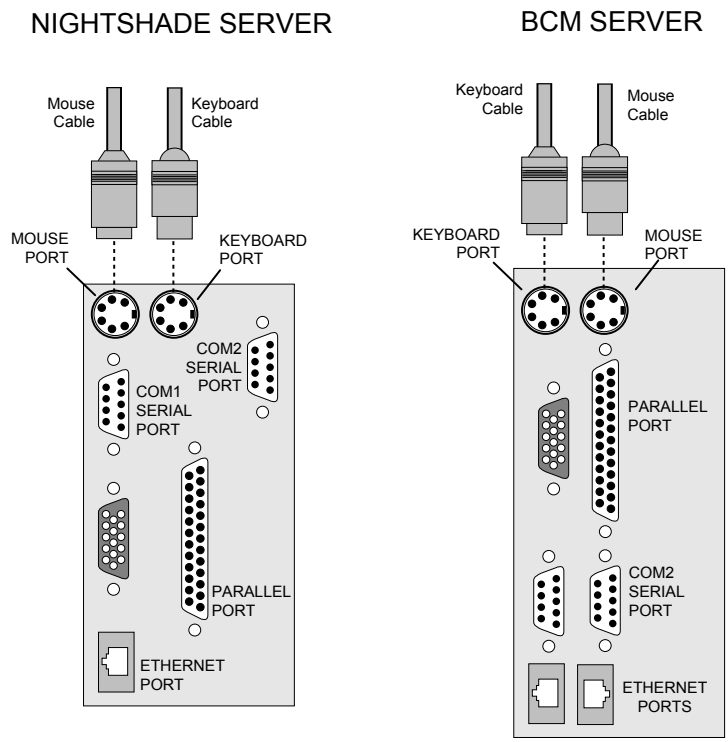
CAUTION
This assembly is static sensitive and should be handled using precautions to prevent electrostatic discharge damage.

Pre-Installation Check

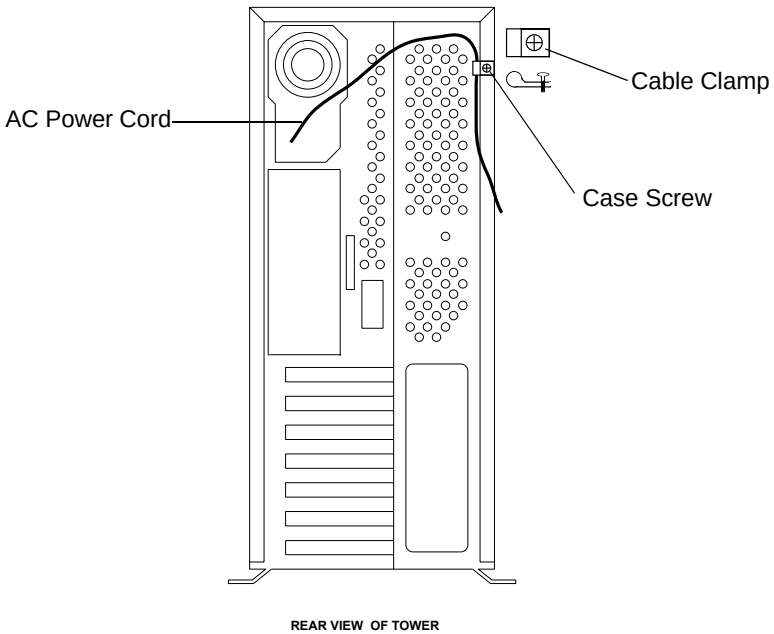
1. Remove all equipment, including all peripheral devices, from the shipping cartons and inspect for damage.
2. Identify all required cables and prepare them for installation.
3. Verify AC power is available for the computer tower and all peripheral equipment. Make sure the power supplies are installed, tested, and ready for use in accordance with the pre-installation requirements. This includes testing for proper grounding of the power source.
4. Verify the desired physical location for the computer tower is in accordance with the site requirements. Place the computer at the selected site.

Connect Keyboard and Mouse

Connect the keyboard and mouse cables to the back of the PC tower.



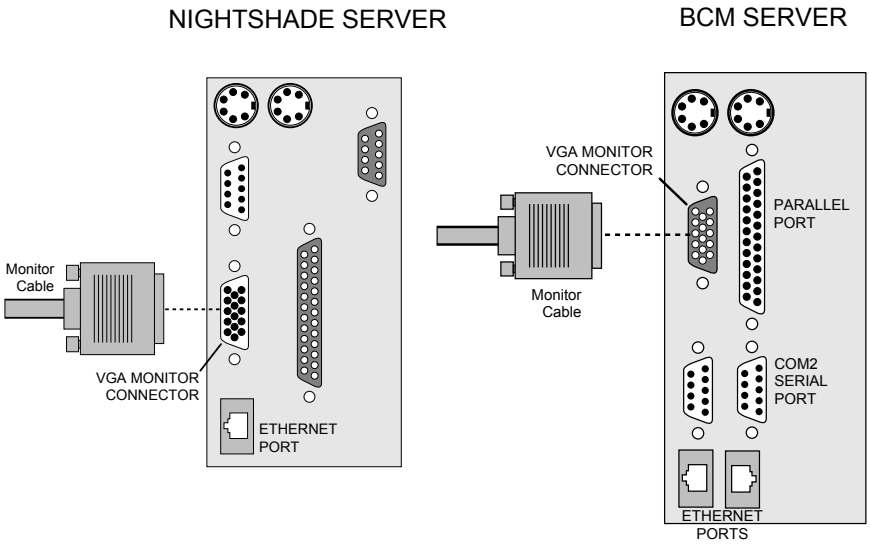
Install the Power Cord



1. Remove the upper right case screw from the rear of the chassis.
2. Plug the AC power cord into the PC tower.

3. Install the provided cable clamp around the AC power cord approximately 15 cm (6 in.) from the server connection end.
4. Secure the cable clamp to the chassis with the case screw installed in the upper right case hole. Tighten the screw.

Connect the Video Display Monitor



Connect the video display monitor cable to the video card connection at the back of the PC tower.

Unity Network IS Configuration

Logon

NOTE
Make sure none of the system components are connected to the network at this time.

1. Turn on the system.
2. Verify all components are energized and the system boots up completely. If the system has a blank display or the unit does not boot up, open the chassis and verify all boards and cables are seated properly. See the Troubleshooting chapter for more information.

As the Windows NT Operating System starts up, the screen prompts the user to log-in to the system. This prompt shows that the system is now ready for normal operation. At this logon prompt, enter the following information:

- User: type **administrator** and press **Tab**.
- Password: type **admin1**,**3**,**5**,**7** and press **Enter**.

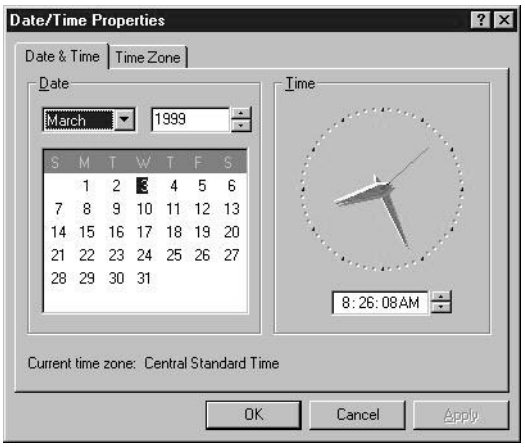
The Windows NT main screen appears on the display.

Configure Time/Date Settings

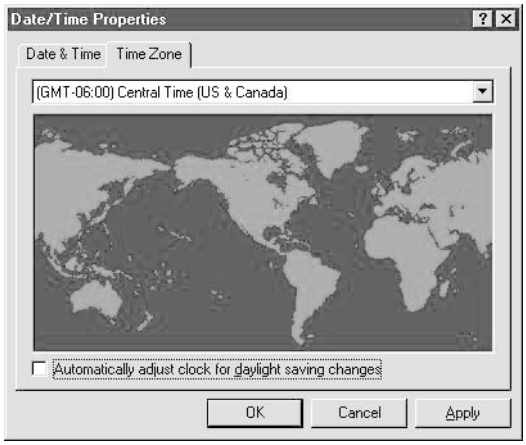
WARNING
Any change to the time/date data affects all units on the network. This can result in other monitors altering the time and date parameter of some patient data.

Make sure the unit you are configuring is not connected to the network at this time.

1. At the Windows NT main screen, right-click on the time displayed at the lower right corner of the screen.
2. Select *Adjust Date/Time* from the menu list. The Windows NT Date & Time control applet appears.



3. Select the *Date & Time* tab. Set the correct date and time. Click on *Apply*.



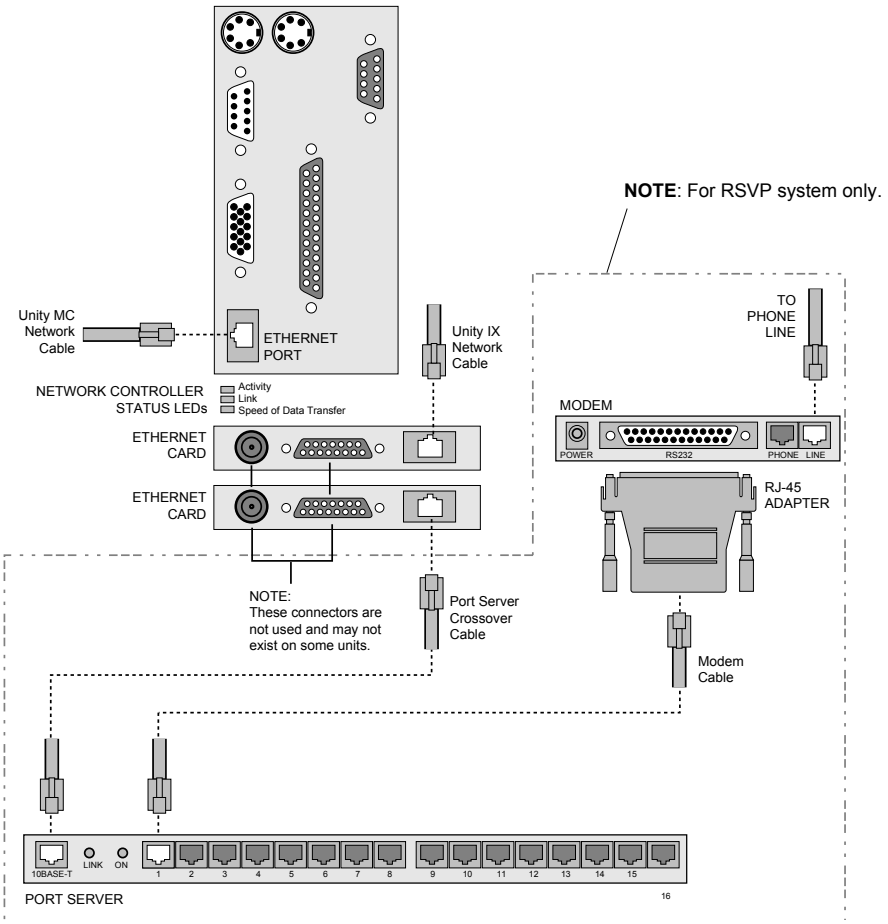
4. Select the *Time Zone* tab, and verify the correct time zone is selected.
5. Verify the *Automatically adjust clock for daylight saving changes* box is NOT checked.
6. Click on *Apply*.
7. Click on *OK* to close all windows when finished.

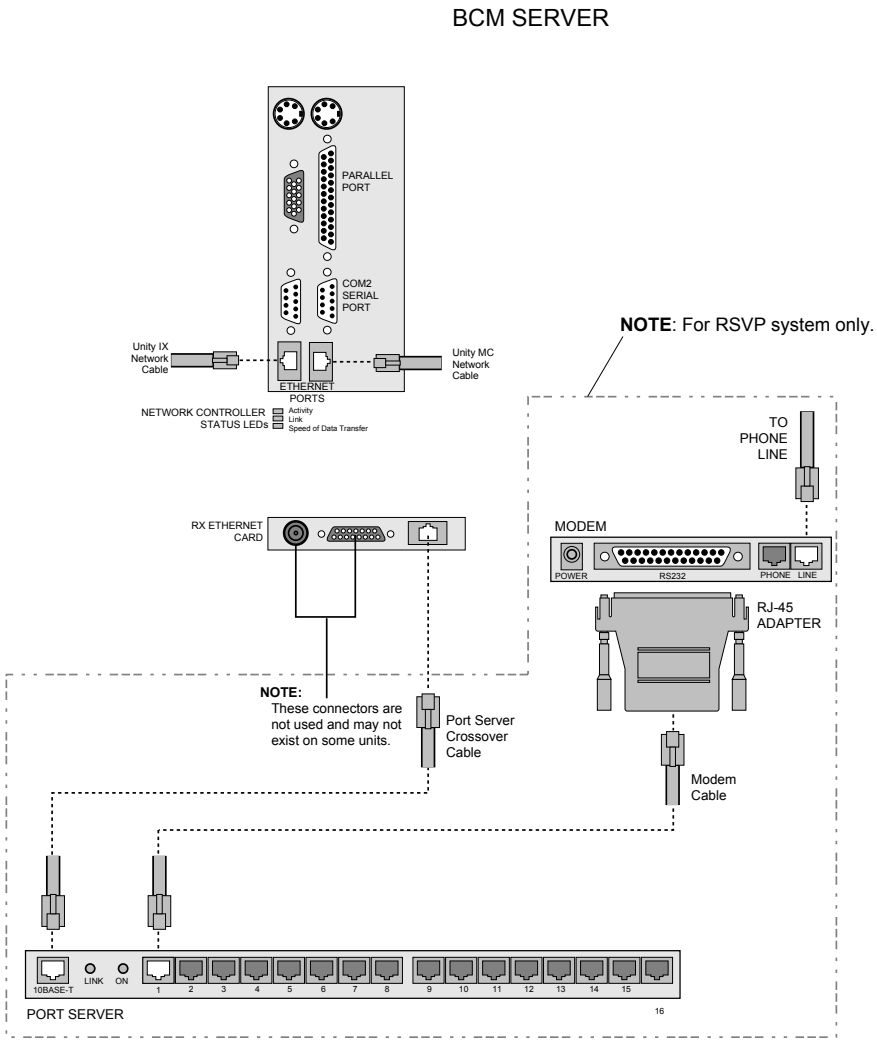
Connect to Unity Network

Connect the Unity Network drop cables to the back of the computer tower using the table and figures to complete the proper connections.

Unity Network Connections		
Unity Network Connection	**Nightshade Server**	**BCM Server**
Unity Network MC	Ethernet Port on CPU	Ethernet Port marked “MC”
Unity Network IX	Ethernet card on back of CPU	Ethernet Port marked “IX”
Unity Network RX (RSVP only)	Optional ethernet card on back of CPU	Optional ethernet card on back of CPU

NIGHTSHADE SERVER



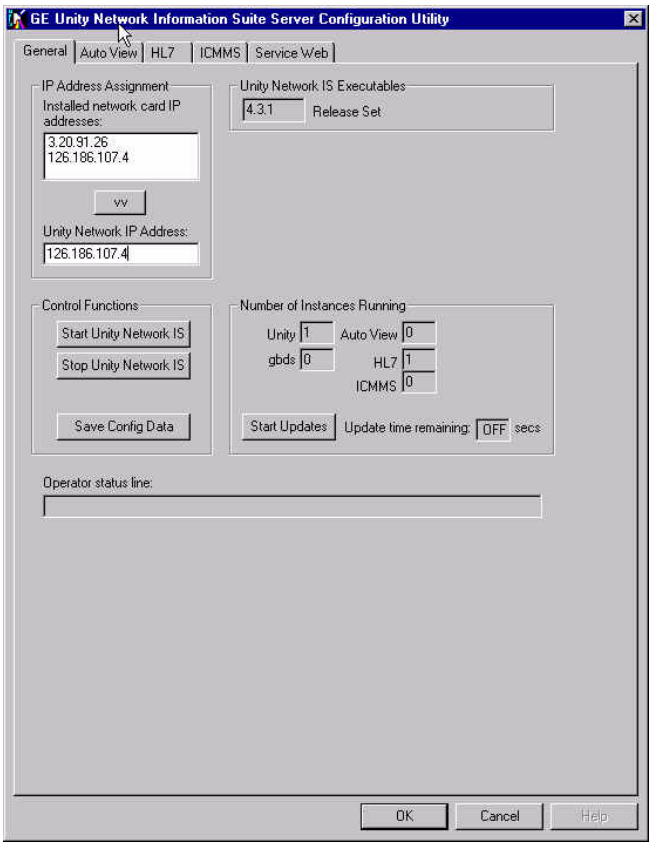


Install Optional Licenses

Install any optional application licenses such as AVOA, HL7 Outbound, ICMMS, and Service Web at this time. Refer to the GE Unity Network® License Configuration Guide.

Setup the Unity Network IS Server

General Configuration Settings



General Tab	
Field	**Description**
IP Address Assignment	Displays the Installed Network Cards IP Addresses as they are read from each installed network card during system start-up. Call Technical Support (see "How to Reach Us") if the network cards are installed but no IP Addresses appear in this field.
Unity Network IS Executables (or Unity-IS Executables)	Displays the software version.
Control Functions	Monitors and controls the program.
Number of Instances Running	Presents information about the current status of the server software.
Operator status line	Provides text line for further server status.

1. Double click the *MPIS Config* icon to start the *GE Unity Network Information Suite Server Configuration Utility*.
2. Select the *General* tab.

3. From the list of IP Addresses, use the mouse to select the address that is associated with the network card connected to the Unity Network MC network.

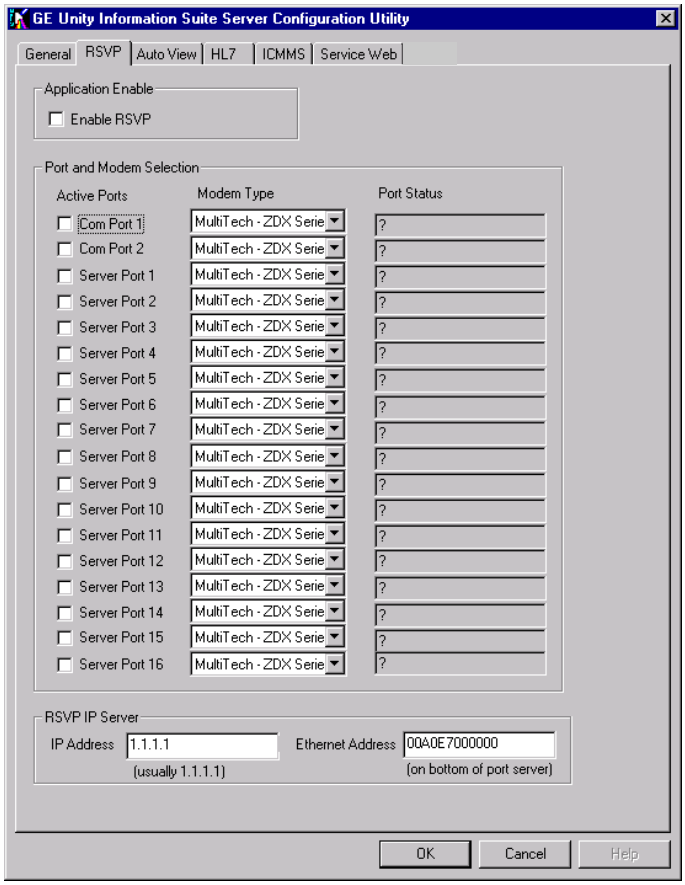
   NOTE

   The default IP Address for the Unity Network MC network is located on a label applied to the tower cabinet. The IP Address on screen will appear without preceeding zeros.

4. Within the *IP Address Assignment* field, there is a button with two arrows on it that are pointing downward (vv). Press this button with the mouse to enter the selected address into the *Unity Network IP Address* box.

5. Click the *Save Config Data* button on the screen to save the settings.

RSVP Settings (V4.2 and Earlier)



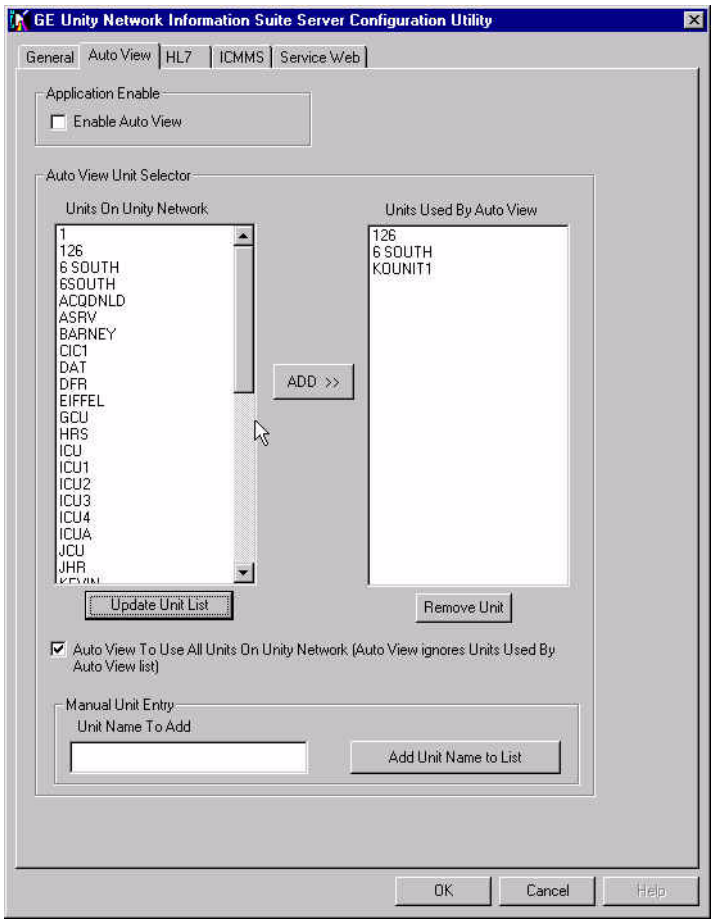
RSVP Tab	
Field	**Description**
Application Enable	Enables the RSVP option.
Port and Modem Selection	Enables the active ports for each RSVP modem connected to the Com Ports (PC tower's serial ports; **COM1**, **COM2**) and the Server Ports (port server's ports 1-16). Features include:
Active Ports	A check mark denotes activated ports.
Modem Type	Modems connected to the serial communication ports of the PC tower as well as those connected to the port server.
Port Status	Displays the active status of each port when RSVP is running. Not used during configuration.
RSVP IP Server	Enables communications between server, ports via IP, Ethernet addresses.

1. Click on the *RSVP* tab.
2. To enable the active ports for each RSVP modem connected to the Com Ports, point and click on the check boxes (to the left of each port listed under *Active Ports*) that correspond to each installed modem location.

   NOTE
   - A check mark appears in each "clicked" box to indicate a port is activated. The system only communicates with activated ports and ignores all others.
   - Connect the service modem to the **COM1** port on the back of the PC tower. This is NOT an RSVP modem so do NOT select *Com Port 1*.
   - Inspect the port server to determine which ports have a modem plugged into them. The ports on the port server itself are numbered 1–16 and directly relate to the Server Port numbers listed below *Active Ports* in the *Port and Modem Selection* field.
3. You can set the *Modem Type* for the modems connected to the serial communication ports of the PC tower and to the port server.

   NOTE
   The default MultiTech ZDX Series modem is currently the only one supported. Therefore, do NOT change this field.
4. On the bottom of the port server is an equipment tag with the Ethernet address for the port server. Enter this address directly below *Ethernet Address* in the *RSVP IP Server* section.
5. Under *Application Enable*, verify that the *Enable RSVP* box is checked. This causes Unity Network IS to start the RSVP Server program.
6. Click *OK* to enter this information as a permanent setting in this utility and reply *Yes* to all of the prompts.

Auto View Settings



Auto View Tab	
Field	**Description**
Application Enable	Enables the *Auto View* option. You must install a license to use this feature.
Auto View Unit Selector	Used to select units on *Auto View*. Features include:
Units On Unity Network	Displays a list of all the Units on the network.
Units Used By Auto View	Displays units currently used by *Auto View*.
Add>>	Enables *Auto View* feature to a unit.
Update Unit List	Adds units to the Unity Network.
Remove Unit	Disables *Auto View* feature to a unit.
Auto View To Use All Units On Unity Network	Enables *Auto View* for all units on the network. (Supersedes any selections in the *Units Used By Auto View* list.)
Manual Unit Entry	Manually enters a unit to the network list.

1. Click on the *Auto View* tab.
2. Select *Auto View To Use All Units On Unity Network* if you wish to enable Auto View for all units on the network.

NOTE

Checking this box supersedes any selections in the *Units Used By Auto View* list.

If you wish to configure the applications to only control certain units, enter the individual names in the *Unit Name To Add* box and then select the *Add Unit Name to List* button. The name then appears in the *Units Used By Auto View* list. Repeat this procedure for all units desired.

NOTE

Make sure the *Auto View To Use All Units On Unity Network* box is NOT checked to allow the list to be active.

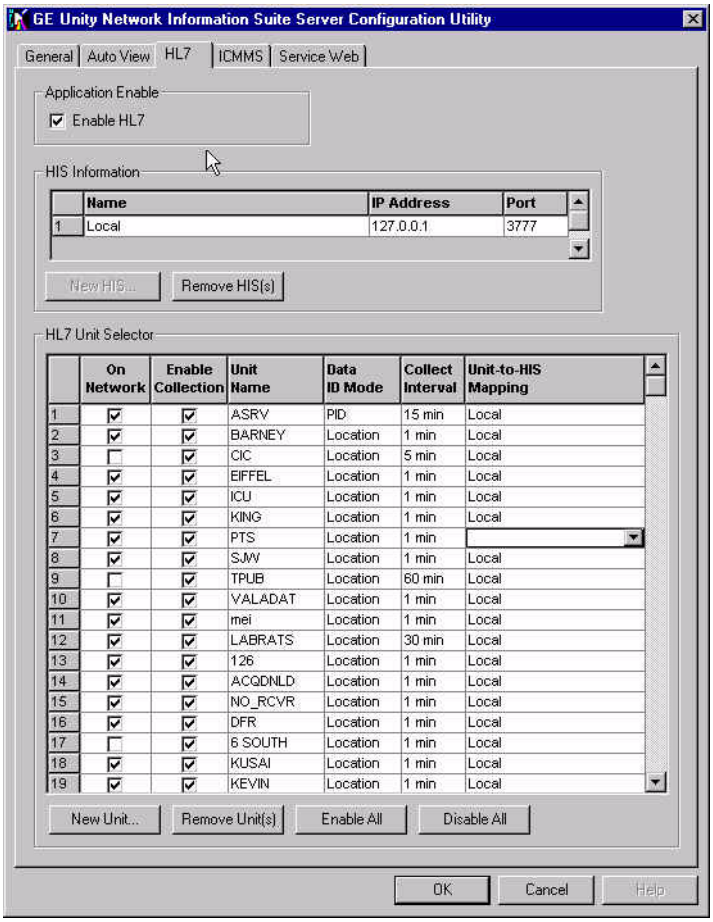
Units may also be selected from the *Units On Unity Network* list. This list is generated by the configuration utility from RWHAT traffic on the Unity Network MC network. The utility listens for 30 seconds to the network before making the list available. Select the *Update Unit List* button and the *Units On Unity Network* list displays a list of all the Units on the network. Highlight the units to be controlled and select the *ADD>>* button to place them in the *Units Used By Auto View* list.

NOTE

Make sure the *Auto View To Use All Units On Unity Network* box is NOT checked to allow the list to be active.

3. Under *Application Enable*, verify that the *Enable Auto View* box is checked. This causes Unity Network IS to start the AVOA Server program.
4. Click *OK* to enter this information as a permanent setting in this utility and reply *Yes* to all of the prompts.

HL7 Outbound Settings



HL7 Tab	
Field	**Description**
Application Enable	Enables the HL7 option. You must install a license to use this feature.
HIS Information	A three-column list consisting of *Name, IP Address* and *Port* provided by your information services department. Enables *Unit-to HIS Mapping* column in the *HL7 Unit Selector* group box.
HL7 Unit Selector	Six columns that list beds currently on line and configured by the user. Columns include:
On Network	A checked box=unit is on line; an unchecked checkbox=unit is off line. Cannot be selected by the user.
Enable Collection	A checked box=collecting data; an unchecked checkbox=not collecting data. Default is On. User selectable.
Unit Name	Bed(s) configured on the system or on line. When the maximum number of names is reached, the *New Unit...* button grays out and does not allows you to enter more names.
Data ID Mode	Selects how data is collected: *Location* (unit and bed name; default) or *PID* (Patient Identification) number.
Collect Interval	Data collection frequency for each unit. Default is *15 minutes*.

HL7 Tab	
Field	**Description**
Unit-to-HIS Mapping	Tells which HIS the data, obtained from the *HIS Information group* box, is sent to if *Enable Collection* is on.
At the bottom are four buttons:	
New Unit...	To configure a new unit before putting it on line. Selecting this button allows you to *Enable Collection* and enter *Unit Name, Data ID Mode* and *Collect Interval.*
Remove Unit(s)	To remove units no longer needed in list of units. **NOTE** First highlight these units and also ensure they are off line in the *On Network* column.
Enable All	Enables data collection from all units.
Disable All	Disables data collection from all units.

Compatibility

See the Unity Network Information Suite (IS) Server HL7 Outbound Reference Manual for products and software versions compatible with the HL7 interface.

HL7 Configuration

1. Click on the *HL7* tab.
2. To have the HL7 application active when the Unity Network IS starts up, click on the *Enable HL7* check box under *Application Enable.*
3. In the *HIS Information* group box is a three-column list consisting of *Name, IP Address* and *Port.* Your information services department provides this information. When all of this information is entered, the *Name* is available for you to select in the *Unit-to HIS Mapping* column in the *HL7 Unit Selector* group box.

   NOTE

   When the maximum number of names the program allows is reached, the *New Unit...* button grays out and allows no more names to be entered.

   Units mapped to the HIS Information server have the HIS Information name displayed in the *Unit-to-HIS Mapping* column.

   To remove a row of HIS information in the HIS Information group box, click on the number in front of the *Name* to highlight the row you wish to remove. Then click on the *Remove HIS(s)* button. Any unit that was mapped to send data to the HIS that is removed is modified as well. If you select a row you do not wish to remove, click the *Cancel* button and re-enter the configuration utility.
4. The *HL7 Unit Selector* group box has a six column list consisting of both beds currently on line and beds configured by the user. Configure *Enable Collection, Data ID Mode, Collect Interval,* and *Unit-to-HIS Mapping* (as needed).

5. At the bottom of the *HL7 Unit Selector* group box are four buttons; *New Unit...*, *Remove Unit(s)*, *Enable All*, and *Disable All*. Configure as needed.
6. Click on the *OK* button to enter this information as a permanent setting in this utility and reply *Yes* to all of the prompts.

HIS Test Simulation (HL7 Test)

Follow these steps to test the functionality from the Unity Network MC network to the Unity Network IS server.

1. Connect a networked source of Unity Network data (such as a Solar 8000) to the Unity Network MC network connector. Verify that simulated patient data displays on the monitor and is admitted.
2. Log into the system as an administrator:

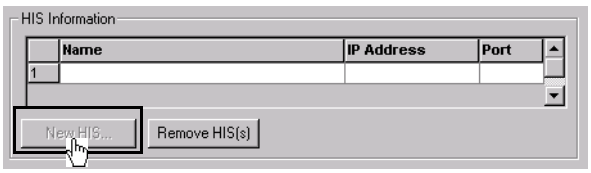
   User name: **administrator**
   Password: **admin1,3,5,7**

3. Double click the *MPIS Config* icon.
4. Click on the *General* tab.
5. Click on the *Stop Unity Network IS* (or *Stop Unity-IS*) button.
6. Click on the *HL7* tab.
7. Click on the *Enable HL7* check box to enable the service.

   NOTE

   In software version 3: If this box is grayed out, then either the RSVP or Auto View applications are running. You must disable these applications to enable the HL7 check box. To stop other applications, click on the *General* tab, click on the *Stop Unity Network IS* (or *Stop Unity-IS*) button, click on either the *RSVP* or the *Auto View* tab and uncheck the click boxes for these applications. Then check the *Enable HL7* check box.

8. In the *HIS Information* window, click the *New HIS...* button.



9. Enter the following information into the boxes:

   HIS Name: **Local**

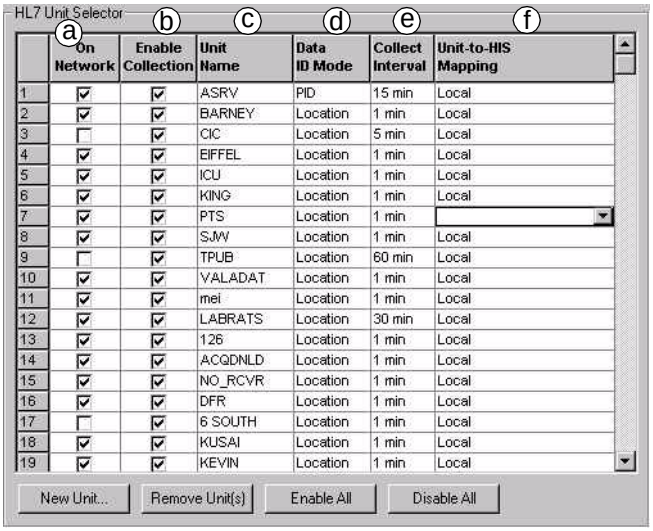
   NOTE

   Name is not dependent on anything. At installation use a name that can aid in identifying the HIS server location.

   IP Address: **127.0.0.1**

   Port: **3777**

10. In the HL7 Unit Selector, verify that the Unity Network MC care units you established in step one appear in the window. Unity Network IS automatically displays care units it can see. For this test select one or two care units. Upon installation, do NOT exceed 100 beds at one minute intervals.



    a. Verify *On Network* is checked. Unity Network IS displays all units it sees on the Unity Network MC network.

    b. Click on the *Enable Collection* check box.

    c. Verify the *Unit Name* displays.

    d. Identify *Data ID Mode* by *Location*. Click on the box to view the drop down menu.

    e. Identify *Collect Interval* to *1 min*. Click on the box to view the drop down menu.

    f. Identify *Unit-to-HIS Mapping* to *Local* is checked.

11. Click on the *General* tab.

12. Click on the *Save Config Data* button.

13. Click on the *Start Unity Network IS* (or *Start Unity-IS*) button and wait at least one minute. Verify the Unity and HL7 counts are both **1**.

14. Double click on the *cmd* icon.

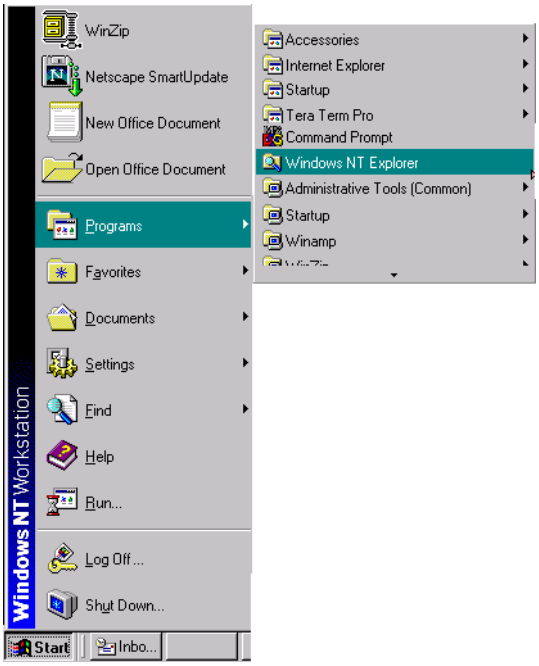
15. At the prompt, type **hl7test<space>-v<space>-a** then press **Enter**. Ignore any messages that appear.

    NOTE

    The latest time slot(s) of data appearing in this console window is/are stored to the **.hl7* data file(s) under *C:\temp\hl7*. Use the **-a** command line when starting the hl7test application to append additional time slots of data to these files. In the append mode, the data files are never limited in size as they grow since this is only intended as a temporary test mode.

16. Verify the trend data for admitted beds displays in the command prompt window. Allow up to one minute.

17. To verify that patient data files are stored, click on *Start*, *Programs*, and *Windows NT Explorer*.



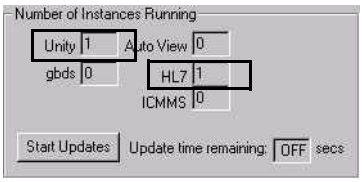
18. Click on the *[+]* next to *c:\Temp\HL7* to expand the directory tree.
19. Verify that data from each of the beds in the care units you selected earlier is collected and stored in **c:\temp\hl7\<*Unit*>_<*bed#*>.hl7**.

NOTE

The size of the file increases as more data is collected.

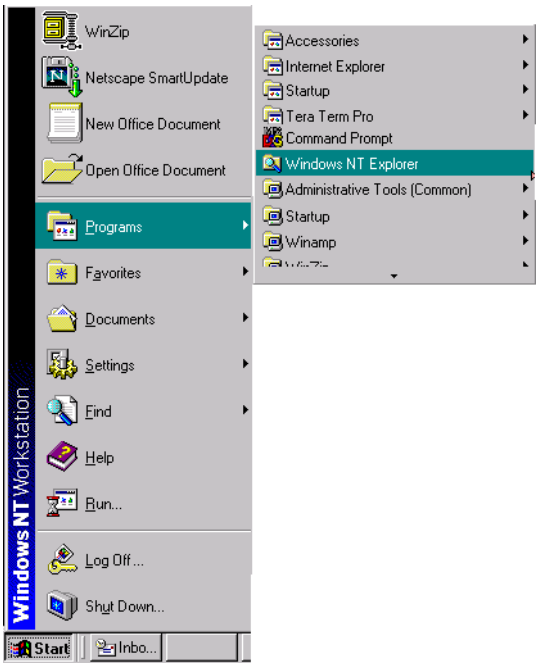
If the files are present, the HL7 feature is working properly. Next, uninstall and clean up the test with the following instructions.

1. Click on the *GE Unity Network Information Suite Server Configuration Utility* window to activate the window.
2. Click on the *Stop Unity Network IS* (or *Stop Unity-IS*) button.
3. Verify both the Unity and HL7 counts go to *0*.



4. Click on the cmd window to activate it.
5. Press the **Ctrl**+**C** at the same time to stop the HL7 test.
6. Type **exit** and press **Enter** to close the command prompt.
7. Click on the *HL7* tab.
8. Click on the *Enable HL7* check box to disable the service.
9. In the *HIS Information* window, click the numbered box next to the HIS named *Local* to highlight it.
10. Click on the *Remove HIS(s)* button.

11. Click on the *General* tab.
12. Click on the *Save Config Data* button.
13. Click on *Start*, *Programs*, and *Windows NT Explorer*.



14. To expand the directory trees, click on the *[+]* next to:

    [+] Program Files,

    [+] Marquette,

    [+] US, and

    [+] Log.

15. Click on the *hl7* directory which appears.
16. Verify the existence of the file:
    *c:\Program Files\Marquette\US\log\hl7\hl7**yyyymmdd**.log*.

    (Where ***yyyy***= year, ***mm***= month, and ***dd***=day.)

17. Press **Delete**, then click on *Yes* in the conformation window.
18. Click on the *hl7event* directory which appears.
19. Verify the existence of the file:
    *c:\Program Files\Marquette\US\log\hl7\hl7event**yyyymmdd**.log*.

    (Where ***yyyy***= year, ***mm***= month, and ***dd***=day.)

20. Press **Delete**, then click on *Yes* in the conformation window.
21. Click on the *[+]* next to *c:\Temp* to expand the directory tree.
22. Click on the *hl7* directory which appears.
23. Click on the top file (**c:\temp\hl7<*Unit*>_<*bed#*>.hl7**), press **Shift**, then click on the bottom file in (**c:\temp\hl7<*Unit*>_<*bed#*>.hl7**). All files should be highlighted.
24. Press **Delete**, then click on *Yes* in the conformation window.

25. To expand the directory trees, click on the *[+]* next to:

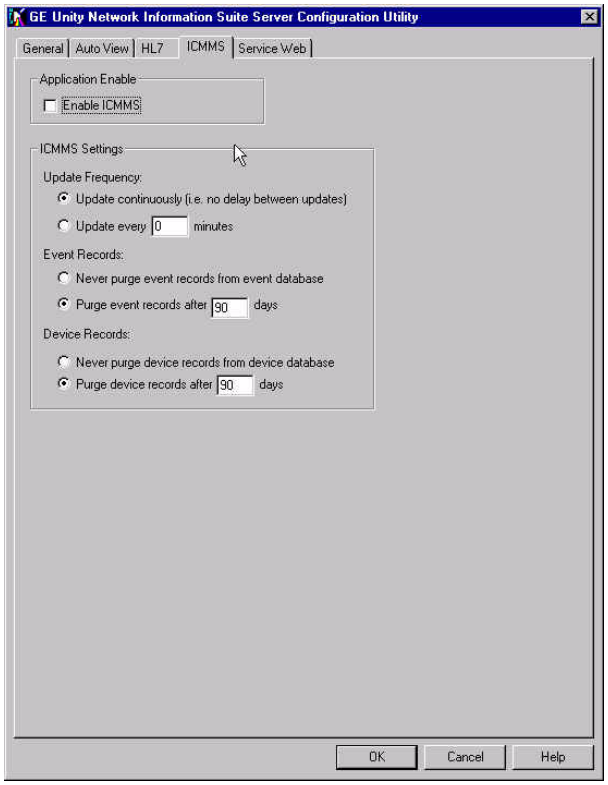
    [+] Program Files,

    [+] Marquette, and

    [+] US.

26. Click on the *cfg* directory which appears.
27. Verify the file *c:\Program Files\Marquette\US\cfg\hl7_2.dat* exists.
28. Click on the *hl7_2.dat* file in the right pane, press **Delete**, then click on *Yes* in the conformation window.
29. Close all open windows.

ICMMS Tab Settings



ICMMS Tab	
Field	**Description**
Application Enable	Enables the ICMMS option. You must install a license to use this feature.
ICMMS Settings	Allows you to *Update Frequency* to request device information and to set the age at which the *Event Records* and *Device Records* are purged.

1. Click on the *ICMMS* tab.
2. To have the ICMMS application active when the Unity Network IS starts up, click on the *Enable ICMMS* check box under *Application Enable.*

3. In *Update Frequency* you can change how often ICMMS requests device information on the Unity Network MC network.

   NOTE

   The information returned during updates is slow in changing (software revisions, configuration information, etc.). It is not necessary to update frequently. Decreasing this time adds to network congestion and increases the workload on interrogated devices. GE recommends a value of 15 minutes or greater.

4. In *Event Records* you can change the age at which the event records are purged. ICMMS creates event records every time a device changes in some way, including admission status and configuration information. On a large active system, the event database can grow rapidly. This parameter sets the age at which events are removed from the database.

   NOTE

   Applications accessing the event record need a reasonable history. It is recommended that the age be at least 90 days.

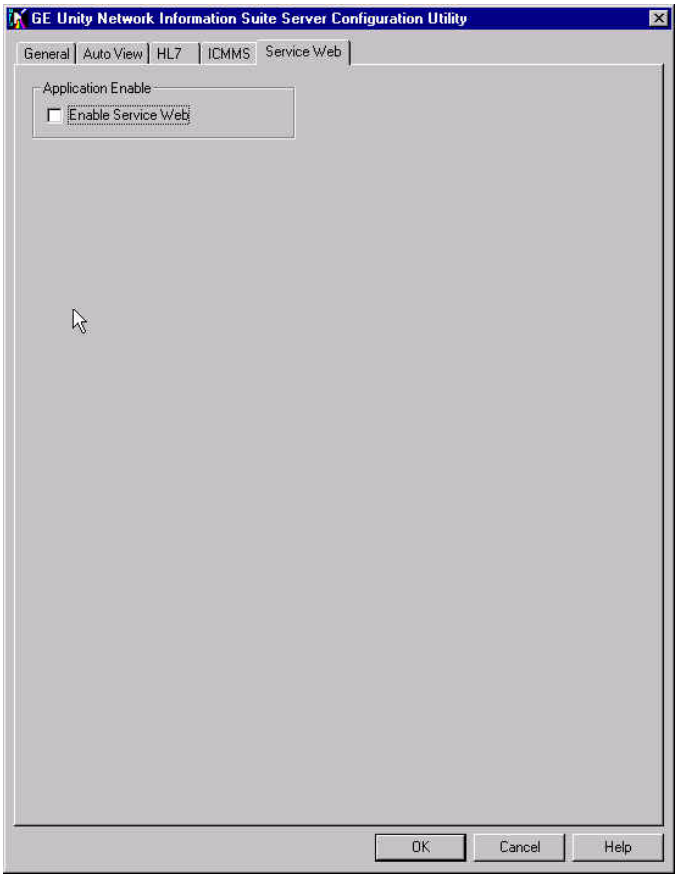
5. In *Device Records* you can change the age at which the device records are purged. This is how long the non-responsive devices remain in the device database and eliminates devices that are retired or have altered identities.

   NOTE

   This database does not grow fast so this parameter is more of a housekeeping item. It is recommended that the age be at least 90 days.

6. Click *OK* to enter this information as a permanent setting in this utility and reply *Yes* to all of the prompts.

Service Web Settings



Service Web Tab	
Field	**Description**
Application Enable	Enables the Service Web option. You must install a license to use this feature.

1. Click on the *Service Web* tab.
2. To have the Service Web application active when the Unity Network IS starts up, click on the *Enable Service Web* check box under *Application Enable.*
3. Click *OK* to enter this information as a permanent setting in this utility and reply *Yes* to all of the prompts.

Completion

After finishing the configuration on systems with RSVP (V4.2 and earlier only), the Unity Network IS Install Utility continues the installation with the Central Data port server installation. The current port server driver is un-installed. A new port server driver is installed. Follow the directions on the screen. When prompted, add an EL16 with an IP address of:

1.1.1.1

In order to save the new configuration settings, you must either restart the computer or stop and restart the Unity Network IS application.

Restarting the Computer

To restart the computer:

1. Hold down the **Ctrl+Alt+Delete** keys.
2. Select the *Shutdown* button.
3. Restart the computer and log on as an administrator:
   - User Name: type **administrator** and press **Tab**.
   - Password: type **admin1,3,5,7** and press **Enter**.

Restarting the Application

To restart the application software:

1. Double click the *MPIS Config* icon to start the *GE Unity Network Information Suite Server Configuration Utility*.
2. Select the *General* tab.
3. Press the *Stop Unity Network IS* (or *Stop Unity-IS*) button.
4. Wait for all the *Number of Instances Running* accounts to go to 0 (bootp may stay at 1 if the server is configured to support RSVP).
5. Press the *Start Unity Network IS* (or *Start Unity-IS*) button to start the server applications with the new configuration settings.

Checkout Procedure

Proceed with the “Checkout Procedure” in the Maintenance chapter of this manual.

5 Maintenance

For your notes

Schedule

Manufacturer Recommendation

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 make sure the CIC Pro or Unity Network IS Server hardware remains in proper operational and functional order, a good maintenance schedule must be adhered to. The manufacturer recommends the following:

- **Visual Inspection:** This should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and prior to servicing the unit.
- **Cleaning:** This should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and each time the unit is serviced.
- **Calibration:** No calibration is required.
- **Electrical Safety Checks:** These should be performed by service personnel upon receipt of the equipment, one time per year thereafter, and each time the unit is serviced.
- **Checkout Procedure:** This should be performed by qualified service personnel upon receipt of the equipment, one time per year thereafter, and each time the unit is serviced.
- **Replacing the Hard Drive:** You should replace the hard drive every three years.

PM Form

For the latest PM form regarding this product, contact GE Medical Systems *Information Technologies* Service. Make a copy of the GE Unity Network Information Suite Server PM form and use the copy to help guide you as you go through this section of the manual. The PM form can then be archived for reference after completion of all the steps required to completely test the equipment.

If, for any reason, any of the procedures or tests are not met to standards indicated, contact GE Medical Systems *Information Technologies* Technical Support (see “How to Reach Us”).

Visual Inspection

About the Visual Inspection

Carefully inspect the PC and its components prior to installation, one time each year thereafter, and each time the equipment is serviced.

Procedure

To perform a complete visual inspection of the equipment, follow these steps:

1. **GENERAL INSPECTION:** Inspect the external surfaces of the computer components and display monitor for obvious physical damage. Do NOT use the device if physical damage is evident. Refer damaged equipment to qualified service personnel for repair.
2. **FANS:** Inspect all cooling fans in the computer tower to make sure they are in good working order and are not clogged with dust. These fans draw outside air into the tower to cool the components inside.
3. **CONNECTORS:** Inspect all external connectors for damaged pins, prongs and connector housings. Refer damaged equipment to qualified service personnel for repair.
4. **CABLE INSULATION:** Inspect all cables, insulation, strain-reliefs and connectors for damage, cracks or degradation. Refer damaged equipment to qualified service personnel for repair.

Cleaning

General Rules

Following is a list of general rules for cleaning the equipment:

- Use a soft, lint-free cloth dampened with clean water to wipe down the external surfaces of the equipment,

> **CAUTION**
> Make sure water does not run into any of the openings of the equipment. An electrical shock hazard exists and/or the equipment can be damaged if water is allowed to get into the cabinets.

- Do NOT use aerosol liquid sprays, solvents, or abrasives.

Cleaning Procedure

To clean the equipment, follow these steps.

- Complete the “Safe shudown” procedure for the unit. Remove power from all components and disconnect the power plugs (pull on the plug itself, not on the cord).

Internal Components

Remove the access panels on the equipment. Using a compressed air duster recommended for computers and electronics, carefully blow out any dust that may have accumulated on internal components.

Fans

1. Clean the fans. The cooling fans generally accumulate the most dust in the equipment.
2. Remove all of the dust from the fans and the fan intakes to maintain proper cooling in the equipment.

Keyboard

Lightly wipe the keyboard with a clean, soft cloth dampened with water.

Mouse

The mouse contains a small ball that must roll smoothly for the mouse to work properly. You can keep this ball free of dirt and grease by using the mouse on a clean, lint-free surface and cleaning it occasionally.

You need a few cotton swabs and a clean, soft, lint-free cloth.

1. Turn off the computer.
2. Turn the mouse upside-down and turn the plastic ring on the bottom *counterclockwise* to disengage it.
3. On some mouse devices, you may need to press the plastic ring (rather than turn it) to disengage it. If the mouse is locked, see the next part of this procedure, "Locking and Unlocking the Mouse," for instructions on how to unlock it.
4. Turn the mouse right-side up with one hand and catch the ring and the ball with your other hand.
5. Clean the three small rollers inside the mouse with a cotton swab moistened with water. Rotate the rollers to clean all around them.
6. Wipe the mouse ball with a clean, soft, dry, and lint-free cloth.
7. If necessary, wash the mouse ball with warm, soapy water (use a mild soap such as a dish washing liquid) and then dry the mouse ball thoroughly.
8. Using a compressed air duster recommended for computers and electronics, blow into the mouse case to remove any dust that has collected there.
9. Put the ball and ring back in place.

Your mouse should roll smoothly across the mouse pad or desk. If it doesn't, repeat these instructions carefully.

Display Screen

To clean the display screen, put household glass cleaner on a soft cloth and wipe the screen.

CAUTION
DO NOT spray the cleaner directly on the screen because the liquid might drip into the monitor or computer and cause damage to the equipment.

Hard Drive Replacement

NOTE

This procedure requires approximately one hour to complete. Not all steps apply to Unity Network IS servers.

Record Configuration Information (CIC Pro)

Before you replace the hard drive it is necessary to record certain configuration information to re-enter later in this procedure. Use the following procedure to record the information.

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. In the *Password* field type in the following text:

   mms_com <**Enter**>

The *GE Marquette Clinical Information Center* command window opens. The title bar of this window should be blue to indicate it is active. If not, place cursor inside this window and click to make it active.

NOTE

Software version “2.0” is used only as an example in the prompt and directory strings. The current software version found in the lower left hand corner of the *CIC Setup* screen should display in this string.

The displayed prompt should be
"**C:\Program Files\Marquette\CIC*2.0*>**"

4. With the cursor at the end of the text string type **set** and press **Enter**. The “set command” information appears. (See following example pages.)
5. Record the *COMPUTERNAME*, *LANG*, *PCTYPE*, and *PRODID* (NT license number from certification) information for the CIC you are upgrading.
6. Type **ipconfig<space>/all** and press **Enter**. The “ip config /all” information appears. (See following example pages.) Record the IP Address information for the CIC Pro you are upgrading.
7. Type **stop** then press **Enter** at the command prompt.
8. Open the *Start* menu and select *Shut Down*.
9. Select *Shut down the Computer?* and click *Yes*.
10. Wait for the message *It is now safe to turn off your computer*.
11. Press the on/off button to shut down the computer.

Set Command Example Page

Computer Name _____

Language _____

PC Type _____

Product ID _____

```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

C:\Program Files\Marquette\CIC\x.x>set
CIC_PATH=C:\Program Files\Marquette\CIC\2.0.17
COMPUTERNAME=cic000016230
ComSpec=C:\WINNT\system32\cmd.exe
DMI_SIA_PATH=C:\Program Files\Intel\ISC\CI
HOMEDRIVE=C:
HOMEPATH=\
ISCPATH=C:\Program Files\Intel\ISC
IXIPADDRESS=121.0.16.230
LANG=English
LOGONSERVER=\\cic000016230
MCIPADDRESS=126.1.205.17
NEWNAME=cic000016230
NUMBER_OF_PROCESSORS=2
OS=Windows_NT
Os2LibPath=C:\WINNT\system32\os2\dll;
Path=C:\Program Files\Marquette\CIC\2.1.1;C:\WINNT\SYSTEM32;C:\WINNT;C:\PROGRAM FILES\INTEL\ISC;C:\P
ROGRAM FILES\INTEL\ISC\MI;C:\PROGRAM FILES\INTEL\ISC\CI;C:\WINNT\SYSTEM32\DMI\BIN;C:\Program Files\M
arquette\US\bin;C:\flexlm\bin
PATHEXT=.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH
PCTYPE=Nightshade
PROCESSOR_ARCHITECTURE=x86
PROCESSOR_IDENTIFIER=x86 Family 6 Model 5 Stepping 2, GenuineIntel
PROCESSOR_LEVEL=6
PROCESSOR_REVISION=0502
PRODID=30097OEM002722122057
PROMPT=$P$G
SU_USERNAME=administrator
SystemDrive=C:
SystemRoot=C:\WINNT
TEMP=C:\TEMP
TMP=C:\TEMP
UNIONSTATION=C:\Program Files\Marquette\US
USBIN=C:\Program Files\Marquette\US\bin
USCFG=C:\Program Files\Marquette\US\cfg
USERDOMAIN=cic000016230
USERNAME=CIC
USERPROFILE=C:\WINNT\Profiles\cic
USLOG=C:\Program Files\Marquette\US\log
WIN32DMIPATH=C:\WINNT\System32\DMI
windir=C:\WINNT

C:\Program Files\Marquette\CIC\2.1.1>
```

IP Config /All Example Page (Nightshade Server)

C:\Program Files\Marquette\CIC*x.x*>ipconfig /all

Windows NT IP Configuration

Host Name . . . . . : cic000016230
DNS Servers . . . . . :
Node Type . . . . . : Broadcast
NetBIOS Scope ID. . . . . :
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
NetBIOS Resolution Uses DNS : No

Ethernet adapter E100B1:

Description . . . . . : Intel EtherExpress PRO PCI Adapter
Physical Address. . . . . : 00-90-27-F6-84-40
DHCP Enabled. . . . . : No
IP Address. . . . . : 126.1.205.18 (ApexPro Host)
Subnet Mask . . . . . : 255.0.0.0
IP Address. . . . . : 126.1.205.17 (MC)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

Ethernet adapter El90x2:

Description . . . . . : 3Com 3C90x Ethernet Adapter
Physical Address. . . . . : 00-50-DA-15-75-3D
DHCP Enabled. . . . . : No
IP Address. . . . . : 119.1.1.2 (RX)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

Ethernet adapter El90x3:

Description . . . . . : 3Com 3C90x Ethernet Adapter
Physical Address. . . . . : 00-50-DA-15-75-3D
DHCP Enabled. . . . . : No
IP Address. . . . . : 121.186.102.52 (IX)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

C:\Program Files\Marquette\CIC\2.1.1>exit

MC IP Address _____

IX IP Address _____

IX IP Subnet Mask Address_____

RX IP Address _____

ApexPro Host IP Address _____

NOTE:This information is also recorded on labels on the top front of the CIC tower.

IP Config /All Example Page (BCM Server)

C:\Program Files\Marquette\CIC*x.x*>ipconfig /all

Windows NT IP Configuration

Host Name . . . . . : BCM_CIC_1
DNS Servers . . . . . :
Node Type . . . . . : Broadcast
NetBIOS Scope ID. . . . . :
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
NetBIOS Resolution Uses DNS : No

Ethernet adapter E100B4:

Description . . . . . : Intel(R) PRO Adapter
Physical Address. . . . . : 00-10-F3-03-02-7F
DHCP Enabled. . . . . : No
IP Address. . . . . : 121.64.68.1 (IX)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

Ethernet adapter E100B3:

Description . . . . . : Intel(R) PRO Adapter
Physical Address. . . . . : 00-10-F3-03-02-80
DHCP Enabled. . . . . : No
IP Address. . . . . : 126.64.68.2 (ApexPro Host)
Subnet Mask . . . . . : 255.0.0.0
IP Address. . . . . : 126.64.68.1 (MC)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

Ethernet adapter E100B2:

Description . . . . . : Intel(R) PRO Adapter
Physical Address. . . . . : 00-50-DA-15-75-3D
DHCP Enabled. . . . . : No
IP Address. . . . . : 119.1.1.2 (RX)
Subnet Mask . . . . . : 255.0.0.0
Default Gateway . . . . . :

C:\Program Files\Marquette\CIC\2.1.1>exit

MC IP Address _____

IX IP Address _____

IX IP Subnet Mask Address_____

RX IP Address _____

ApexPro Host IP Address _____

NOTE:This information is also recorded on labels on the top front of the CIC tower.

Record Configuration Information (Unity Network IS)

Before you replace the hard drive it is necessary to record certain configuration information to re-enter later in this procedure. Use the following procedure to record the information.

1. Press **Ctrl+Alt+Delete**.
2. Logon as:

   User name: **administrator**

   Password: **admin1,3,5,7**

   Press **Enter**.
3. Click *Start, Settings, and Control Panel*.
4. Double click the *Regional Settings* icon.
5. Click on the *Regional Settings* tab.
6. Record the language that appears in the drop down box.
7. Close all windows.
8. Go to *Start>Programs>Administrative Tools (Common)>Windows NT Diagnostics*.
9. On the *Version* tab, record the license number shown for your Windows NT software. Close the windows.
10. Double click the *Cmd* icon to open the command prompt window.
11. At the prompt, type **ipconfig<space>/all** and press **Enter**. The i*p config /all* information appears.
12. Record the *Host Name* (computer name) and the *IP Address* and *Subnet Mask* addresses for the installed network adapters.
13. Type **exit** and press **Enter** to close the command window.
14. Open the *Start* menu and select *Shut Down*.
15. Select *Shut down the Computer?* and click *OK*.
16. Wait for the message *It is now safe to turn off your computer*.
17. Press the on/off button to shut down the computer.

Preparation

Only a qualified service technician should perform these procedures. Observe these safety guidelines before you remove the system side cover to work inside the tower.

1. Turn off all peripheral devices connected to the tower.
2. Make sure the computer is shut down, then unplug the AC power cord from the back of the tower or from the wall outlet.

WARNING
The on/off button (a convex button) on the front panel does not turn off the system AC power. To remove power from the system, you must unplug the AC power cord from the wall outlet or power cord connector on the tower.

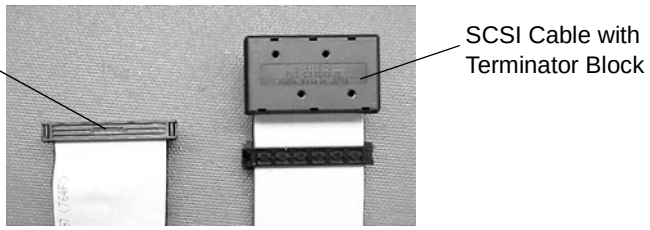
3. Label and disconnect all peripheral cables and telecommunication lines connected to the I/O connectors or ports at back of unit.
4. Provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to the chassis ground of the system (any unpainted metal surface) when handling components.

Remove and Install Hard Drive (Nightshade Server)

Removal

To remove the hard drive from a Nightshade server:

1. Remove the three screws from the side cover. Retain the screws.
2. Slide the left side panel towards the back and lift the panel off.
3. Remove the three screws that secure the hard drive mounting cage. Keep the screws for reassembly.
4. From the front, swing the mounting cage outward on the three hinged teeth.
5. Carefully disconnect the data and power cables from the hard drive.



6. Remove the hard drive mounting cage assembly from the system.
7. Remove and retain the four screws securing the hard drive to the mounting cage. Remove the hard drive.

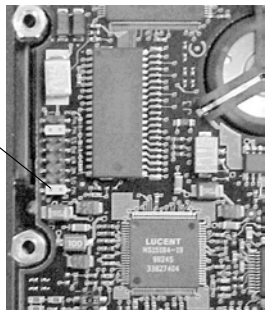
Installation

To install the new hard drive:

NOTE

Check the hard drive label. If the model number is ST39173W, remove the terminator jumper from connector J2.

011B

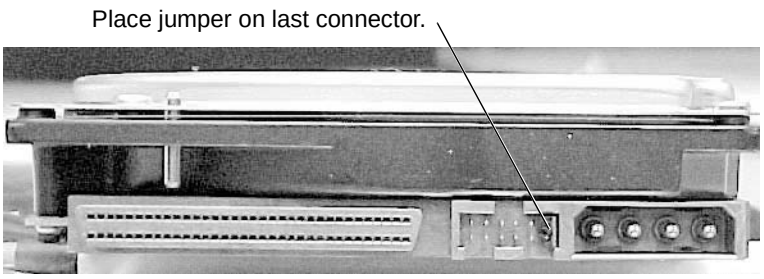


012B

1. Install the new hard drive in position 1 of the hard drive mounting cage. Do not tighten the screws completely.

004B

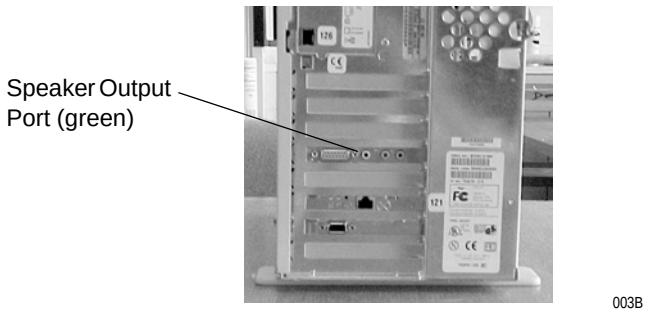
2. Verify full disclosure; verify SCSI ID 1.



013B

3. Verify full disclosure, install full disclosure 18.6 drive is in position 3 of hard drive mounting cage.
4. Tighten the screws on the drives.
5. Install the hard drive mounting cage.
6. Install the hard drive power cables.

7. ***If there is a full disclosure drive,*** connect the last SCSI connector to the full disclosure drive. Otherwise, connect the last SCSI connector to the hard drive.
8. Install the side cover on the unit with the three screws.
9. Connect the keyboard, monitor, printer and mouse to unit.
10. Connect the speakers to the green speaker output port.

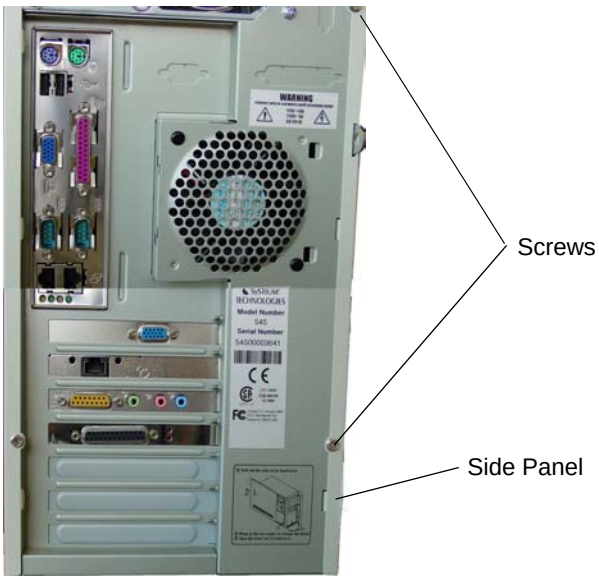


11. Connect the power cord to the AC source.
12. Do NOT connect the unit to the network.
13. Perform the “Electrical Safety Tests” found in this chapter.

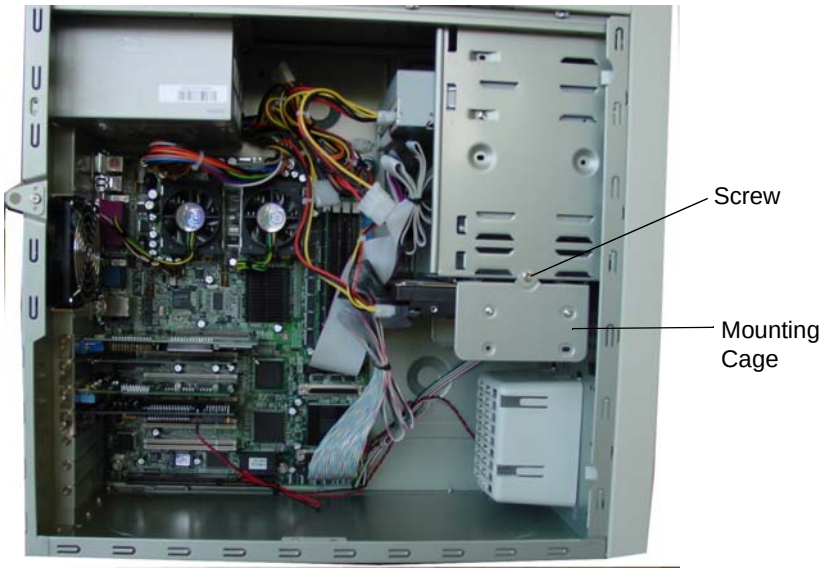
Remove and Install Hard Drive (BCM Server)

Removal

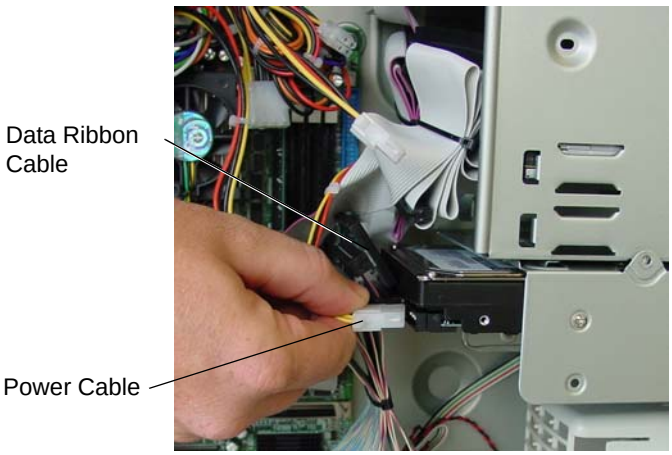
To remove the hard drive:



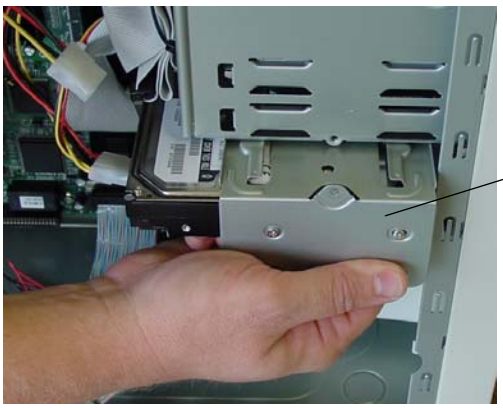
1. Remove and retain two screws from left side panel.
2. Slide the left side panel rearward and remove panel.



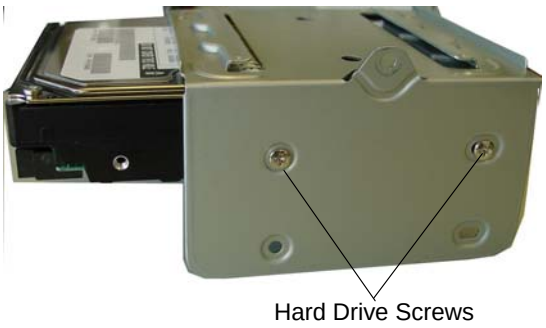
3. Remove and retain screw securing the hard drive mounting cage to the CPU.
4. Slide the mounting cage outward only enough to access the power cable and data ribbon cable connections.



5. Carefully disconnect the power cable from the hard drive.
6. Carefully disconnect the data ribbon cable from the hard drive.



7. Remove the hard drive mounting cage assembly from the unit.



8. Remove and retain two hard drive screws from each side of mounting cage. Remove the hard drive.

Installation

To install the new hard drive:

1. Install the new hard drive to the mounting cage with original four screws.
2. Slide the hard drive mounting cage assembly back into the unit.
3. Carefully connect the data and power cables to the hard drive.
4. Slide the mounting cage all the way into the slot. Secure cage to CPU with original mounting screw.
5. Install side panel and secure with original two screws.
6. Connect the keyboard, monitor, printer and mouse to the unit.
7. Connect the speakers to the green speaker output port.
8. Connect the power cord to the AC power source.
9. Do not connect the unit to the network.
10. Perform the “Electrical Safety Tests” found in this chapter.

Install Gold Drive Image

Load the Gold drive (ghost) image per the installation instructions provided with the Gold drive image CD.

Configure Gold Drive to Product Drive (G2P)

CIC Pro G2P Procedure

To configure the CIC Pro Gold drive:

NOTE

To navigate between windows, left click the *Back* or *Next* button. Left click *OK* if *DMI Indication Notice* windows appear. If G2P should fail to load, double left click on the G2P icon.

1. Make sure you have recorded the CIC configuration information, so it can be restored later.
2. In the first *CIC G2P* dialog window, verify Windows NT Version is 4.0, service pack level is 6, and build is 1381. Left click *Next*.

   NOTE

   Select *Cancel* if the incorrect language displays. Then select *Yes*. Return to "Selecting WIN-NT Language" section.

3. In the second *CIC G2P* dialog window, verify program displays selected language version. Left click *Next*.
4. In the third *CIC G2P* dialog window, select *Yes* and enter the Host and Rack address if the system has ApexPro, if not, select *No*. Select *Next*.

   NOTE

   Do NOT use leading zeros for address entries, e.g. **126.000.067.001** enter as **126.0.67.1**.

5. In the fourth *CIC G2P* dialog window, the default Unity Network MC IP Address, *126.126.126.126*, displays. Enter the assigned UUT Unity Network MC IP Address. The address starts **126**, e.g. **126.0.67.1**. Select *Next*.
6. In the fifth *CIC G2P* dialog window, the default Unity Network IX IP Address, *121.121.121.121*, displays. Enter assigned UUT Unity Network IX IP Address. The address starts 121, e.g. 121.0.67.1. Select *Next*.

NOTE

The Product ID can be found on the Microsoft Windows NT Workstation Certificate of Authenticity. Each system contains an MS Windows NT license (418836-003).

Use UPPER CASE alpha characters for the Product ID number. Do NOT include "-" (dash), e.g. **02399-OEM-0040271-66234** enter as **02399OEM004027166234**.

7. In the sixth *CIC G2P* dialog window, the Windows NT license number (Product ID number) is displayed. Enter Product ID number for UUT. Select *Next*.

NOTE

Insert zeros in place of missing digits to yield 12-digits, e.g. if Unity Network MC IP Address is **126.0.67.1**, the computer name is **CIC_000067001**.

8. In the seventh *CIC G2P* dialog window, the default computer name is displayed. Enter assigned UUT unique computer name CIC_*xxxxxxxxx* (the *x*'s are the last 9 digits of the Unity Network MC IP Address). Select *Next*.
9. In the eighth *CIC G2P* dialog window, verify *Nightshade* is selected if you have a Nightshade box or *BCM* is selected if you have a BCM box.

NOTE

Left click the *Back* and *Next* buttons to review entries.

10. Check the *No Unity* box if the CIC Pro/ApexPro is a stand alone unit that does not talk to any external Unity Network devices.

CAUTION

Checking the *No Unity* box results in disabling the Unity Network ethernet port. If the *No Unity* box is checked, this CIC Pro is not able to communicate with any devices on the external Unity Network. This includes, but is not limited to, other CIC Pros, hardwire bedsides and telemetry systems not installed on this PC. Once this box is checked and saved, it can only be reversed by swapping hard drives.

11. Left click *Finish* to continue the installation. The installation program displays dialog windows and reboots the UUT several times automatically.

NOTE

Do NOT touch the unit. This process takes approximately 30 minutes. Attach a note to unit indicating, "Do NOT touch unit."

12. When the installation is complete, the CIC Pro program automatically starts to run.

You must activate the NO COMM Alarm after you complete the CIC Pro hard drive installation. To activate the NO COMM Alarm:

1. Select *Setup CIC*.
2. Select *Service Password*.
3. Type **mms_com** for service password.
4. Select *Apply*.
5. Enter the DOS prompt path:
   C:\Program Files\Marquette\CIC\2.*x*.

   NOTE

   Software version *2.x* shown above is used for example only. The version number appearing on your central station should match the version found in the lower left corner of the *CIC Setup* screen.
6. Type **setflags<space>-no_comm<space>on** and press **Enter**.
7. Restart the CIC Pro application for the changes to take effect.
   - Type **stop** and press **Enter**.
   - Select *Start* → *Shutdown*.
   - Close all programs and Log On as a different user.

Change the CIC Pro audio level as follows:

1. Select *Setup CIC*.
2. Select *Service Password*.
3. Type **mms_com** for the service password.
4. Select *Apply*.
5. Enter the DOS prompt path:
   C:\Program Files\Marquette\CIC\2.*x*.

   NOTE

   Software version *2.x* shown above is used for example only. The version number appearing on your central station should match the version found in the lower left corner of the *CIC Setup* screen.
6. Verify the audio values. Type **setaudio<space>-d** and press **Enter**.
7. Compare the speaker values on your CIC Pro to the tables below.If values agree go to step 10, if not, got to the next step.

8. Type **setaudio<space>-*xx*%<space>####** and press **Enter** (***xx***% = 10% to 100% and **####** = audio value setting). Type values from each of the following lines and press **Enter** after each line..

Table 1. Speaker Values			
For HDM/5 Speakers		**Koss HD/20 Speakers (pn 419817-001)**	
10%	4,895	10%	5652
20%	6,219	20%	7172
30%	7,902	30%	9101
40%	10,041	40%	11549
50%	12,758	50%	14656
60%	16,211	60%	18599
70%	20,598	70%	23602
80%	26,172	80%	29951
90%	33,255	90%	38008
100%	42,254	100%	48232

9. Repeat Step 6 to verify the audio levels.
10. Restart the CIC Pro application for the audio values to take effect.
    - Select *Start, Shutdown, Close all programs and log on as a different user*.
11. Complete the "CIC Pro Configuration" procedure found in the CIC Pro Installaton & Configuration chapter.
12. Complete the "Checkout Procedure" in this chapter.

Unity Network IS G2P Procedure

NOTE
You must also complete this procedure for the extra drive if the system supports HL7 Outbound.

To configure the Unity Network IS Gold drive:

1. Power up the system.
2. Press and hold **Ctrl**+**Alt**+**Delete** simultaneously when the message *Press Ctrl+Alt+Delete to log on* appears. Logon as:

   User name: **administrator**
   Password: **admin1,3,5,7**
   Press **Enter**.

   NOTE
   An auto-configuration program runs. There are delays in some of the screens. It may seem like a response is needed when it is actually automatically responding to the screens. Do NOT click any keys unless it is stated in this procedure to do so.

3. For software versions that support RSVP: A window stating *Is RSVP being configured on this system* appears. Click either *Yes* or *No* as appropriate.

4. A window appears showing the current versions of software. Verify they match the following, then click *Next*:

   WindowsNT Version: 4.0
   Build Number: 1381
   Service Pack 6

   NOTE
   The serial number can be found on the NT 4.0 License. Do not include spaces or dashes.

5. Enter the WindowsNT product ID for this server.

6. Click on *Next*.

   NOTE
   Do NOT enter leading zeroes on any IP address octet.

7. A window prompts you for the server MC and IX IP addresses. Enter the IP addresses in the text boxes and then click *Next*.

8. A window prompts you for the computer name. All dots [.] must be replaced with underscores [_] in this window. (i.e. PRISM_6.103 becomes PRISM_6_103). Click *Next*.

9. For software versions that support RSVP: If RSVP was selected for this PC, a prompt appears asking for the Port server Ethernet (MAC) address. Enter this without any colons [:]or dashes [-] then click *Next*.

   NOTE
   Do NOT include a modem in port 12, only ports 1 – 11

10. For software versions that support RSVP: If RSVP was selected, a prompt appears for the modem configuration. Click each checkbox next to the appropriate ports on the modem rack which you are filling. When you finish, click on *Next*.

11. Click on *Finish*.

12. Click *Yes* to begin the MPIS product setup process.

13. Insert the application CD into the server CD–ROM drive and then click *OK*. The server will shut down and reboot.

14. For software versions that support RSVP: If RSVP was selected, the system runs until pass 2 where it prompts you to cycle power on the port server. Disconnect and then reconnect power to the port server. Wait until the TFTP window status states *Transfer Complete* and then click *OK* in the message box.

15. During pass 3, a window appears to set the Unity Network IP Address. Click *OK*. Click the appropriate (**126**) address to highlight it. Then press the *vv* button. Click *OK*, then click *Yes*. The server will shut down and reboot.

16. During pass 4, a window appears asking whether an error message appeared on the web page. Click *OK* to save changes and continue.

17. The program performs some cleanup and then prompts you with a message box stating the program is complete. Click *OK*. The server reboots to a login screen. The automated setup program is complete.

18. If a language other than English is required per customer order, perform the language configuration steps as follows:

- Press **Ctrl+Alt+Delete**.
- Logon as:

  User name: **administrator**
  Password: **admin1,3,5,7**
  Press **Enter**.

- Click *Start*, *Settings*, and *Control Panel*. Double click the *Regional Settings* icon. Click the *Regional Settings* tab.
- Select the appropriate language from the list below:

  Dutch (Standard)
  Spanish (Modern Sort)
  Italian (Standard)
  Swedish
  French (Standard)
  German (Standard)

  Click *OK*.

19. Continue with the “Unity Network IS Configuration” procedure in the Unity Network IS Installation & Configuration chapter.
20. Complete the “Checkout Procedure” in this chapter.

Electrical Safety Tests

General

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

These tests apply to the server, all peripherals, and their three-prong plugs.

Recommendations

To help you establish a systematic maintenance routine, GE Medical Systems *Information Technologies* recommends that you perform all safety tests presented in this chapter:

- Upon receipt of the device,
- Every twelve months thereafter,
- Each time the main enclosure is disassembled or a circuit board is removed, tested, repaired, or replaced, and
- Record the date and results on the “Repair Log” included in this chapter.

CAUTION
Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards. Unless you have an Equipment Maintenance Contract, GE Medical Systems *Information Technologies* 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. *Information Technologies* service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site.

Test Conditions

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

Test Equipment

The manufacturer recommended test equipment required to perform electrical safety tests is listed below. Equivalent equipment may be substituted as necessary.

Table 2. Required Tools/Equipment

Item	Specifications
Leakage Current Tester	3.5 mA
Digital Multimeter (DMM)	0 - 200 AC millivolts

Wall Receptacle Test

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

For international wall receptacles, refer to the internal standards agencies of that particular country. Use a digital multimeter to ensure the wall receptacle 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 wall receptacle is used.

Ground (Earth) Integrity

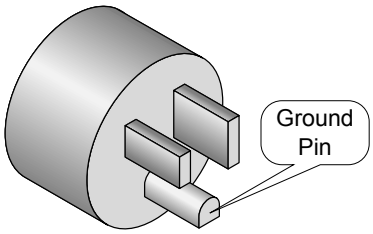
Listed below are two methods for checking the ground (earth) integrity, “Ground Continuity Test” and “Impedance of Protective Earth Connection.” These tests determine whether the device's exposed metal and power inlet's earth (ground) connection has a power ground fault condition.

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 DUT (device under test) from the wall receptacle.
2. Connect the negative (–) lead of the ohm meter to the protective earth terminal (ground pin in power in-let connector) or the protective earth pin in the MAINS PLUG (ground pin in power cord). Refer to the US 120Vac power cord figure below.



3. Set the Ohm meter to the milliohm (mΩ) range.
4. Connect the positive (+) lead of the Ohm meter to all exposed metal surfaces on the DUT. If the metal surfaces are anodized or painted scrape off a small area in a inconspicuous area for the probe to make contact with the metal.
5. Resistance should read to pass:
   - 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 i.e. Kikusui (model 872 or TOS 6100) or Associated Research model HYAMP® Jr. Model 3030D.

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 25 A 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 s 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 customer's power cord around, no fluctuations in resistance should be observed.

Ground (Earth) Wire Leakage Current Tests

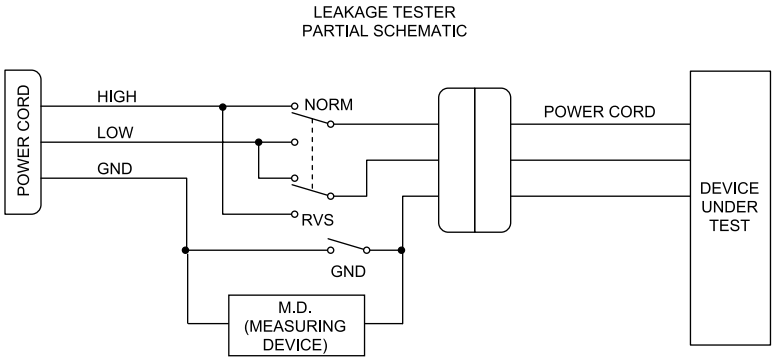
Perform this test to measure current leakage through the ground (earth) wire of the equipment during normal operation.

1. Set the leakage tester switches as follows:
   - Set the GND switch to **GND OPEN**.
   - Set the polarity switch to **NORM/FORWARD**.
   - Set the power switch to **OFF**.
2. Connect a digital multimeter (DMM) to the METER jacks on the leakage tester. Set the DMM to measure AC millivolts.
3. Connect the power cord of the device under test to the power receptacle on the rear of the leakage tester.

   NOTE:

   The device under test is to be tested at its normal operating voltage.
4. Set the leakage tester power switch to ON.
5. Set the power switch of the device under test to ON.
6. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA, the device under test fails and should be repaired and tested again.
7. Set the polarity switch on the leakage tester to RVS (reverse).
8. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA, the device under test fails and should be repaired and tested again.

9. Set the leakage tester power switch to OFF.



NOTE

The MD (measuring device) is the circuitry defined by the appropriate standard for measuring leakage current.

The measuring devices, defined by various standard organizations (IEC, UL, etc.), produce almost identical test measurement results.

Enclosure (Chassis) Leakage Current Test

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

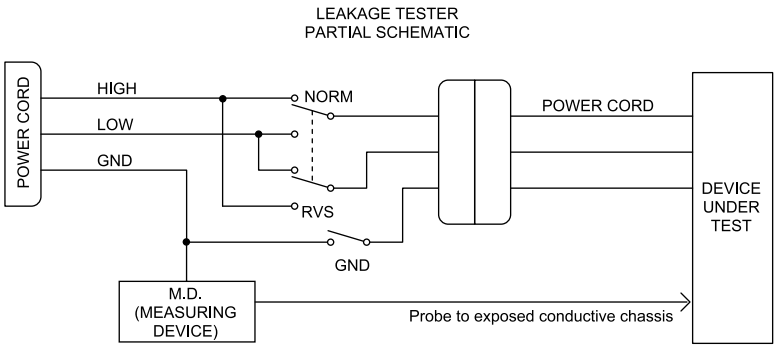
1. Set the leakage tester switches as follows:
   - GND switch - OPEN,
   - Polarity switch - NORM.
2. Connect a meter lead between the CHAS connector on the rear of the leakage tester and an unpainted, non-anodized chassis ground on the unit under test.
3. Set the leakage tester power switch to ON.
4. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA the device under test fails and should be repaired and tested again.

   NOTE

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

5. Set the polarity switch to RVS and observe the same meter readings as in the previous step.
6. Set the GND switch on the leakage tester to CLOSED.
7. Read the current leakage indicated on DMM. If the reading is greater than 3.5 mA the device under test fails and should be repaired and tested again.
8. Set the polarity switch to RVS and observe the same meter readings as in the previous step.

9. Set the leakage tester power switch to OFF and remove the meter lead connected in step 2.



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 Procedure

About the checkout procedure

This part of the section contains all of the checkout procedures for the equipment. The checkout procedures provide service personnel with a method of verifying operational and functional performance of the equipment without having to disassemble the unit. Failure to attain the prescribed results indicates a need for calibration, configuration, or repair of the equipment.

Perform the checkout procedures upon receipt of the equipment, every year thereafter, and each time a component is removed or replaced.

The checkout procedures are based on the assumption that the equipment being tested is used with known, good cables. It also requires that the user be somewhat familiar with the operation of the system. For more information concerning the operation of these components, refer to the respective operator manual.

Instructions

Follow these instructions to completely test the system for proper function and operation.

CAUTION
All monitored beds must have a unit name assigned. Failure to assign a unit name will cause loss of data.

NOTE
You must close all files for this process to run. If the disk drive is currently in use, a message asks if you want to reschedule the disk checking for the next time you restart your system. Then, the next time you restart your system, disk checking runs. Your disk drive will not be available to run other tasks while this process runs.

General

1. To detect disk errors, you can run disk checking on your drives. To run disk checking:
   a. In *My Computer* or *Windows NT Explorer*, click the disk drive you want to check.
   b. On the *File* menu, click *Properties*.
   c. Select the *Tools* tab.
   d. Under *Error-checking*, click *Check Now*.
   e. Check both selections and click *Start*.

2. Check the keyboard to make sure all of the keys work properly and do not stick when pressed. If keys do stick, replace the keyboard.
3. Check the mouse to make sure the cursor follows mouse movements smoothly and the mouse buttons function properly. Refer to "Cleaning" in this chapter if necessary.

   NOTE

   Consult the *Computer Display Operating Instructions*, packaged with the computer display monitor, for completing steps 4-7.

4. Check out the computer monitor's display screen for proper contrast and color and adjust as necessary for best viewing in the environment in which the monitor is normally viewed.
5. Check out the computer monitor's display screen focus and adjust as necessary to obtain best viewing.
6. Check out the computer monitor's display screen for correct horizontal and vertical linearity and adjust as necessary.
7. Check out the computer monitor's display screen for correct horizontal and vertical position and adjust as necessary.
8. If equipped with a service modem, call GE Medical Systems *Information Technologies* Technical Support and verify that the service modem allows the technicians access to the system. (See "How to Reach Us...".)

RSVP Only

9. For RSVP systems only, test the RSVP modems as follows:
   a. Make sure the service modem is installed on the computer tower prior to beginning this test.
   b. Move the serial communication cable that connects the modem to the PC tower from the **COM1** port on the rear panel of the tower to the **COM2** port.
   c. Use the mouse to select the *Start* icon located in the lower left-hand corner of the Windows NT main display screen on the PC tower monitor. From the *Start* menu, select *Programs*, then from the programs menu select *RSVP* and finally from that menu, select *RSVP*.
   d. The *RSVP* application starts and the *RSVP* menu appears on the screen.
   e. At this point verify each modem, one at a time.
   f. Select the telephone number from the list that appears on the screen.
   g. Watch the modem LEDs to determine which modem was selected by the port server to establish this communication through the service modem.

10. Verify access to all care units through the *RSVP Client* screen that appears on the PC monitor display.

NOTE

If the analog phone lines are configured as a Hunt Group (i.e. one number for multiple phone lines), perform this test:

a. To test each modem in the modem rack, remove the power connector from the modem that you tested last and perform sub-steps **d, e, f,** and **g** in step 9 until each modem is tested. Restore power to all modems after you test each modem.

b. After you test all the modems, reconnect the service modem to the **COM1** port on the back panel of the PC tower.

Auto View Only

11. For Auto View only, test as follows:

a. While logged in as "administrator" start the GE Unity Network Information Suite Server Configuration Utility and verify that Auto View is enabled and one instance is running.

b. View the *Auto View* tab to determine which units are under Auto View control.

c. Go to a unit under Auto View control. Verify that at least one monitor is enabled for Auto View operation. (See *Solar Patient Monitor Operator's Manual, Solar Software Version 5* for details).

- If a bed in the unit is already generating a crisis, system, or warning alarm, and the alarm is not yet silenced, the other enabled monitors in the unit should already display the alarming bed's data in split screen mode.
- If there are no un-silenced crisis, system, or warning alarms, artificially generate an alarm using a simulator or other means.

  When you generate the alarm, the other enabled monitors in the unit should display the alarming bed's data in split screen mode.

  When you is silence or eliminate the alarm, the split screens should disappear, if no other alarms are present.

ICMMS and Service Web

To test ICMMS and Service Web, complete the following:

1. Logon as an administrator.
2. Determine the systemName (host) name for the Unity Network IS server being tested:
   a. Double click the *Cmd* icon to open the command prompt window.
   b. At the prompt, type **ipconfig<space>/all** and press **Enter**.
   c. Write down the *Host Name*. Type **exit** and press **Enter** to close the command window.
3. While logged on as "administrator" start the GE Unity Network Information Suite Server Configuration Utility and verify ICMMS and Service Web are enabled and one instance of ICMMS is running.
4. Start the web browser and go to URL:

   http://systemName/scripts/mms/unityrt.dll

   where "systemName" is the host name of the Unity Network IS server being tested.
5. View the ICMMS Data page and verify the status and configuration of a sampling of devices. The time required for a full device status update is controlled by the Update Frequency parameter on the ICMMS tab page.
6. If the site has St. Croix Systems, Inc. WOSYST Equipment Management Software installed, refer to their documentation for procedures to verify correct access to the ICMMS data.

HL7 Outbound Only

To test the HL7 Outbound only, complete the following:

1. Start the GE Unity Network Information Suite Server Configuration utility and select the *HL7* tab page.
2. Verify that HL7 Outbound is enabled in the *Application Enable* group box.
3. Verify that a *Name, IP Address* and *Port* are configured in the *HIS Information* group box.
4. Verify the current list of all care units is displayed in the *HL7 Unit Selector* group box and all units are enabled for collection and mapped to an HIS server.
5. Verify that the HIS server is running and ready for receiving unsolicited HL7 Outbound messages.
6. Select the General tab page, start Unity Network IS and verify one instance of HL7 Outbound is running.
7. Verify HL7 Outbound data is being received by the HIS server by periodically opening the *hl7eventyyyymmdd.log* file and ensuring HIS acknowledgments are logged at the unit collect interval.

CIC Pro Only

Verify Audio

To test the audio output of your CIC Pro system:

NOTE

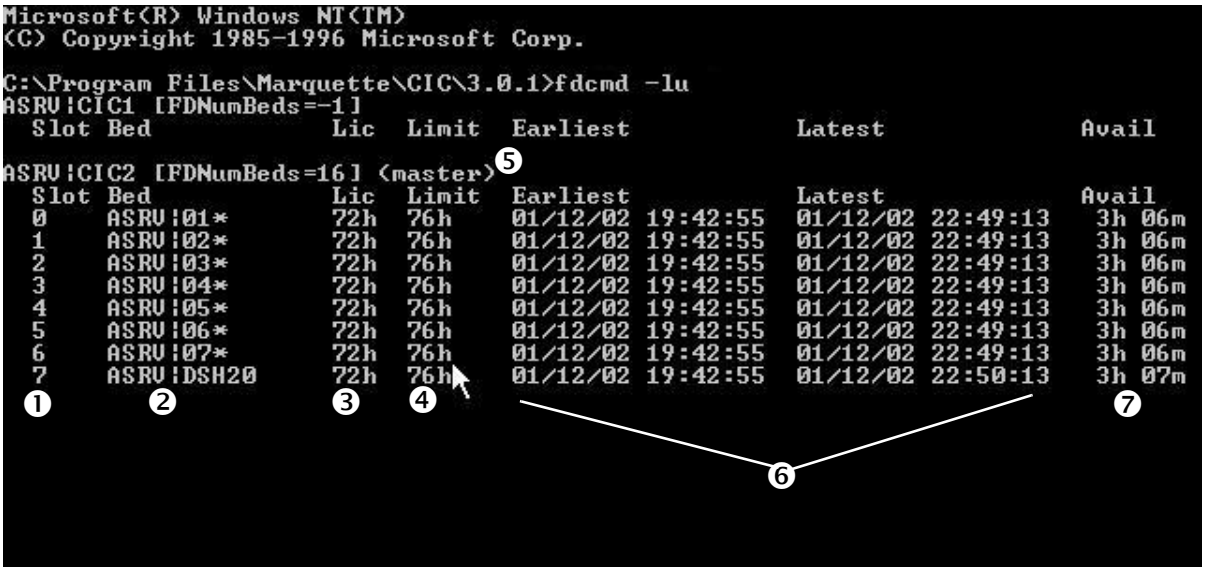
Active alarms override this test.

1. Select the Patient View window.
2. Select the *Alarm Control* tab.
3. Select the *Alarm Help* button.
4. Select the *Advisory Alarm* button.
5. Verify you can hear an audio tone from both speakers.
6. Select the *Close* button in the lower right corner of the screen.
7. To verify access to all care units:
   a. Select the *View Other* button.
   b. Verify that the current list is complete.

Verify Full Disclosure

Verify that all admitted beds in the care unit are full disclosed with the correct license type.

1. Select *Setup CIC* > *Service Password* and type **mms_com**.
2. At the DOS Window type **fdcmd -lu** and press the **Enter** key The utility may take several seconds to execute (allow up to two minutes after boot up or after changing the Full Disclosure License type).
3. If the Full Disclosure Licenses type has been changed, verify that all the beds are being full disclosed and that the correct license type is used for the admitted beds. Refer to the figure below for an explanation of the fdcmd -lu command.



❶	Up to 16 FD slots per CIC.
❷	Shows Unit|Bed name of the bed being Full Disclosed.
❸	Identifies that a license was pulled from FlexLM and matches the Full Disclosure license type. 1hr is displayed if no licenses and Full Disclosure License type is set to NONE.
❹	Displays the maximum amount of time that data is available in the database.
❺	Identifies who is the FD Master within the care unit.
❻	Shows earliest and latest time of data collected. If the date shown as 01/01/70, then data not being collected. Run fdcmd –lu command again to view changes.
❼	Shows the amount of data collected thus far. In this example, only 3 hours of data is collected and it will max out at 76 hours.

Verify Each CIC Can Print a Full Disclosure Report

1. View an admitted patient from the single viewer screen.
2. Select the *Full Disclosure* tab and verify waveforms appear. (Full Disclosure data will not appear for approximately 2-minutes for newly admitted patients).
3. Select *Print Report* and modify the report for a one-page report and select print.
4. Verify the Full Disclosure report printed out at the laser printer.

Repeat this step for every V3 CIC within the unit.

ApexPro Only

To test the ApexPro only:

1. At the CIC Pro with ApexPro, select *Setup CIC*.
2. Select the *Service Password* tab.
3. Type the password **mms_com**, then press **Enter**.
4. An MS-DOS command window opens and displays the prompt:

   *c:\Program Files\Marquette\CIC**x.x***

   (***x***= ApexPro software version)
5. Type **cd<Space>..\..\pts*x.x*** and press **Enter.**
6. Verify the prompt

   *c:\Program Files\Marquette\PTS**x.x***
7. Type **ptsconfig** and press **Enter**.
8. Type **display receiver** and press **Enter**.
9. Note the number of unassigned receivers and subtract this number from the number of admitted beds noted above.

   The number of beds correlates to the number of receivers indicated by the number of green **Receiver Slots** LEDs on the back of the Receiver System. Four receivers per one green **Receiver Slots** LED.

   1 LED = 4 receivers

   2 LEDs = 8 receivers

   3 LEDs = 12 receivers

   4 LEDs = 16 receivers

Repair Log

A repair log is included for your convenience to record the repair history of this product.

Unit Serial Number: **Institution Name:**		
Date	**Maintenance/Repair**	**Technician**

Unit Serial Number: **Institution Name:**		
Date	**Maintenance/Repair**	**Technician**

For your notes

6 Troubleshooting

For your notes

Hardware General

Blank Display, Unit Doesn't Boot

1. Verify that all components are connected correctly and the unit is plugged into a known good outlet.
2. Ensure that all internal components and cables are properly seated.

Troubleshooting the Components

Consult the computer and display monitor manufacturers' manuals, which accompanied each component, for troubleshooting information for each component of the system.

The display monitor manufacturer provides a hard-copy manual and the PC tower manufacturer provides a manual in PDF format on CD-ROM. The PDF file reader software is already installed on the computer.

Audio Card Replacement

If you replace an Audio card, you must use the custom GE Medical Systems *Information Technologies* Audio card because the Sound Table settings can be affected.

CPU Board Replacement

If you replace a CPU board, you must reconfigure the License File. See the *License Configuration Guide* for information on configuring the unit.

Controlling Electrostatic Discharge Damage

All external connector inputs and outputs of the device are designed with protection from ESD damage. However, if the device requires service, exposed components and assemblies contained within are susceptible to ESD damage. This includes human hands, non-ESD protected work stations and/or improperly grounded test equipment.

The following guidelines help make a service workstation more resistant to the ESD damage:

- Discharge any static charge you may have built up before handling semiconductors or assemblies containing semiconductors.
- A grounded, antistatic wristband (3M part number 2046 or equivalent) or heel strap should be worn at all times while handling or repairing assemblies containing semiconductors.
- Use properly grounded soldering and test equipment.
- Use a static-free work surface (3M part number 8210 or equivalent) while handling or working on assemblies containing semiconductors.

- Do NOT remove semiconductors or assemblies containing semiconductors from antistatic containers (Velo-stat bags) until absolutely necessary.
- Make sure power to an assembly is turned off before removing or inserting a semiconductor.
- Do NOT slide semiconductors or electrical/electronic assemblies across any surface.
- Do NOT touch semiconductor leads unless absolutely necessary.
- Semiconductors and electrical/electronic assemblies should be stored only in antistatic bags or boxes.

These guidelines may not guaranty a 100% static-free workstation, but greatly reduce the potential for failure of any electrical/electronic assemblies.

Accessing Service Utilities

The Service Utilities provide several advanced and specialized functions for configuring and troubleshooting the CIC Pro software.

WARNING
The Service Utilities are intended for use ONLY by qualified personnel with training and experience with their use. Do NOT "experiment" with any commands other than those shown in this manual. The consequences of misuse include loss of patient data, corruption of CIC Pro or operating system software, or disruption of the entire Unity Network MC network.

Command Prompt

To run any of the Service Utilities, invoke the *Windows NT Command Prompt*:

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the CIC Setup screen, select the *Service Password* tab.
3. At the *service password* prompt type **mms_com** and press **Enter**.

   This enables the *Service Menu* and displays a command prompt window.

CIC Pro Log Files

Log files are kept by most devices on the Unity Network MC network.

The CIC Pro log files are located in the following directory:

\Program Files\Marquette\CIC\Log

The naming convention for the log files is as follows:

yyyymmdd.log

For example: 20020422.log is the log file for April 22,2002. There is one log file per day.

Copy CIC Pro Logs

1. Insert a formatted 1.4Meg disk into drive A.
2. From C:\Program Files\Marquette\CIC\2.*x*

   Type **cd..** and press **Enter**.

   You should be at the C:\Program Files\Marquette\CIC directory.
3. Type **cd log**, press **Enter**, type **dir**, and press **Enter** again.

   The logs should now display by year, month, and day.
4. Type **COPY<Space>20010916.LOG<Space>A:**

   (Example date is September 16, 2001.)
5. When done type **EXIT** and press **Enter**.

getlog Function

Once you locate the desired error log, you can copy the log over the network to a floppy disk or to another drive. Since error logs are text files, you can copy and read them into other computers using most text editors or word processing applications.

To retrieve the desired log files, use the *getlog* function as follows:

Usage: getlog [-n] [-s] [-d] [-t] [-p]

Table 3. Function Descriptions

Function		Description
-n	[UNIT|]BED	Fetches logs from BED ('UNIT' is optional, 'BED' is mandatory).
-s	YYYYMMDD	Starts on date *yyyymmdd* as in '19940428' (default is today's date).
-d	#days	Number of days prior to start date (default is ALL available days).
-t	type	Formats the output to a specific type (default is determined by device type): **1** - Tramscope Version 6 **2** - Tramscope Version 7 **3** - Tramscope Version 17 **4** - Eagle 3000 **5** - Eagle 4000 **6** - Eagle Tmp **7** - Type 1TTX:Dropout
-p	[dev:]/path	Saves logs to dev:/path (default outputs logs to this device).

Troubleshooting a CIC Pro Server Tower

Verify the green circle Health icon is present under the Intel Server Control icon (ISC).

1. Log on as *Administrator*
2. Double click on the *ISC* icon on the desktop
3. Double click on the server under the *Windows NT Server* Directory. The PC identifies itself by displaying its own Unity Network MC IP address (i.e. **126.*x.x.x*** [**126.*x.x.x***]).
4. Double click on the *ISC* icon on the right side of the window. Wait about 30 seconds for the application to initialize as shown in the lower left corner of the window.
5. When the *Ready* message appears on the lower left corner of the window, double click on the folder with the Unity Network MC IP address.
6. If the **Green** circle health icon is present, the system is good.

   If a **Red** circle with an "X" inside appears, then double click on this icon to see the system failure. Contact GE Medical Systems *Information Technologies* Technical Support for further diagnostic troubleshooting.

Intel *S*erver *C*ontrol (ISC–Nightshade Box *Only*)

System administrators can also use ***I***ntel ***S***erver ***C***ontrol (ISC) to:

- Remotely monitor server hardware sensors,
- Configure sensor thresholds,
- Configure, receive, and act upon alert events in the system event log (SEL),
- Configure audio or visual notifications in response to an event, or
- Configure options to shut down, reboot, or power-off the system automatically in response to an event.

Tracking System Status

Using ISC, you are also able to track system status and manage hardware conditions such as:

- Temperature,
- Voltage,
- Cooling fan status,
- Chassis intrusion,
- ECC memory,
- Processor status, and/or
- Power supply status.

Each of these conditions has a threshold or range of acceptable values. Default values are configured during system manufacturing. These values, along with the current readings, error status, and timer settings, can be configured and monitored through ISC. An event occurs when a parameter crosses a defined threshold. At the time an event occurs, ISC initiates the action you have configured.

For example, if the temperature reaches a level that is outside of the user-defined threshold, an event has occurred. You can configure ISC to respond to this event in multiple ways, such as:

- Display a message or sound an alert,
- Shut down the server, or
- Record the event in a system log.

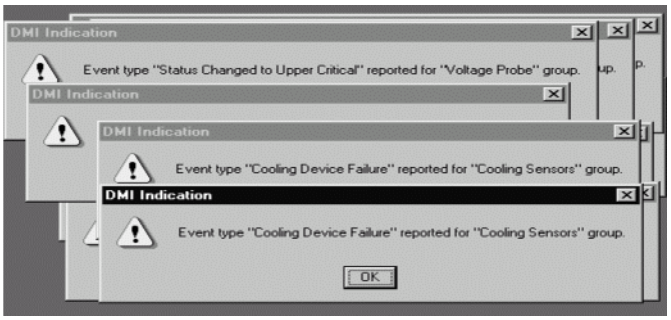
You can also use ISC to view:

- System hardware inventory,
- BIOS and system slot information, and/or
- Onboard Adaptec SCSI controller status.

DMI Error Message (Nightshade Box *Only*)

Problem:

DMI Indication error message appears on the screen (for CIC Pro towers with the GE Medical Systems *Information Technologies* product code "GU" or "GQ").

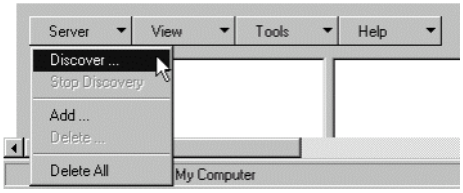


Solution:

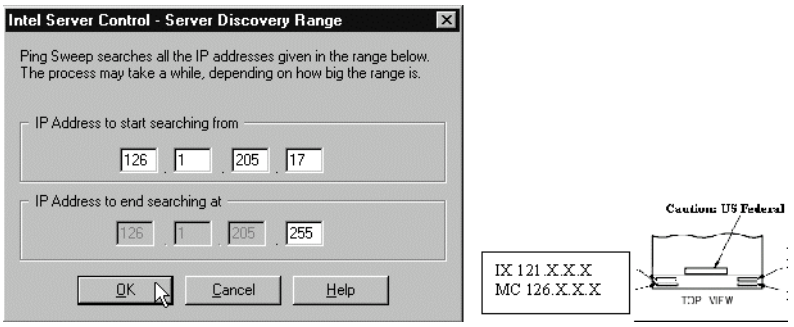
To restore the ISC to factory defaults:

1. Select *Setup CIC*.
2. Select the *Service Password* tab.
3. Type **mms_com** as the Password.
4. In the command box that opens, type **stop** then press **Enter**.
5. Click on *Start* then select *Shut Down* and *Close All Programs And Log On As Different User*.
6. Hold down **Shift** and select *Yes*.

   Continue holding until prompted for the password.
7. Type "**administrator**" as the User name and "**admin1,3,5,7**" as the Password then press **Enter**.
8. Double click on the "*isc*" icon on the desktop.
9. When the window opens select *Server* then *Discover*.

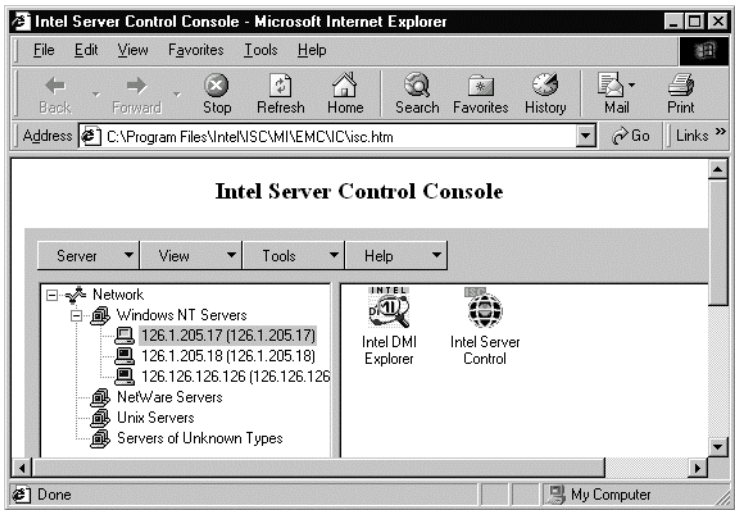


10. The *Intel Server Control - Server Discovery Range* window now opens.



11. Enter the CIC Pro's Unity Network MC IP address located on the top front left side of the tower and select *OK*.

12. After the IP addresses appear, select *Server*. Scroll down and select *Stop Discovery* and "*Yes*".



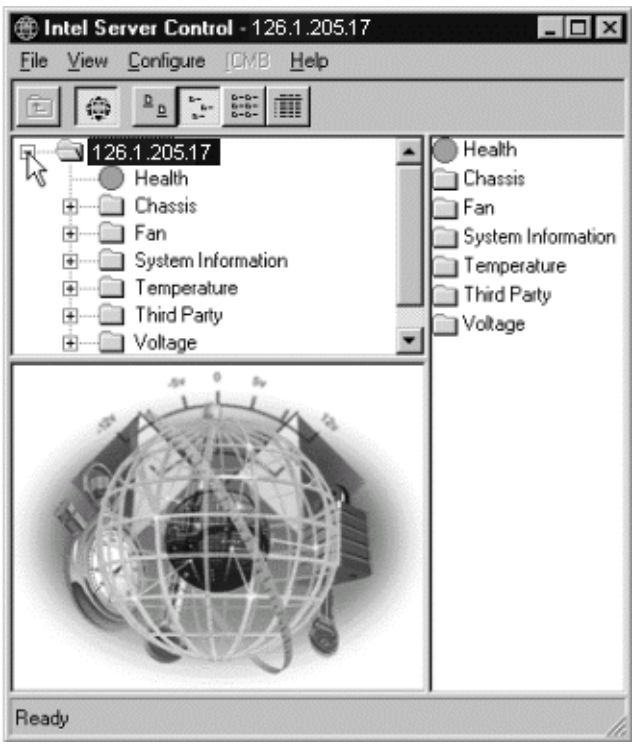
13. Double click on *Windows NT Servers* to expand the list of servers found.

14. Click on the IP address from the list that corresponds to your CIC Pro and the Intel Server Control icon appears on the right.

NOTE

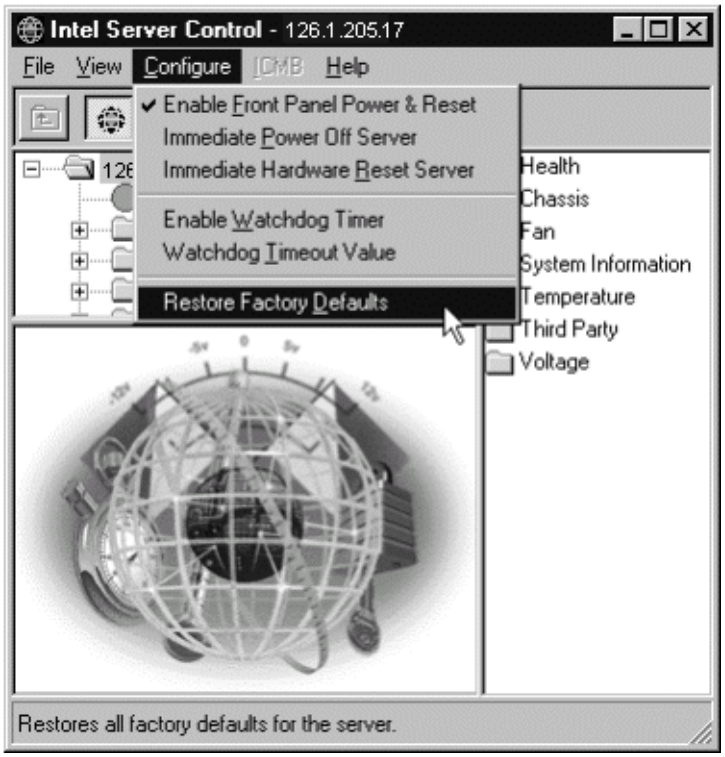
If you see only address **126.126.126**..., and not your IP address, repeat step 9.

15. Double click on the "Intel Server Control" icon and the following window appears.



16. Wait till the *Ready* message appears in the bottom left corner then double click on your IP address folder to expand it and verify that the "*Health*" button is Green.

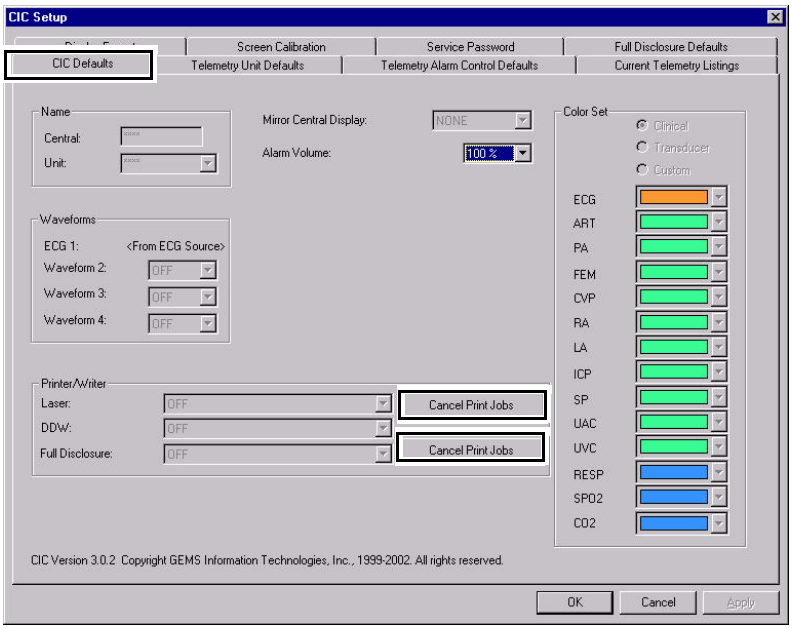
17. Click on *Configure* at the top pull-down menu.



18. Click on *Restore* then select "*Yes*" at the confirmation window.
19. Wait at least five minutes the select *Start* > *Shut Down* > *Shut Down the Computer*.
20. When the message "*It is safe to turn off your computer*" appears, press the power button on the front of your computer tower and wait for about two minutes.
21. Press the power button again and allow the system to power up normally. The restore defaults process is now complete.

Canceling CIC Pro Print Jobs

Use the following procedure to cancel a print job from a CIC Pro:



1. Select *CIC Setup* at the bottom of the screen.
2. Click on the *CIC Defaults* tab.
3. Click the appropriate *Cancel Print Jobs* button.

NOTE

This only cancels print jobs that originate from the same CIC Pro. You cannot cancel print jobs at another CIC Pro server.

Capture All Logs on the CIC Pro

Use the Get All Logs Tool

Introduction

In an attempt to diagnose a problem, Field Service personnel are frequently called on to collect log files created by various software applications, such as CIC Pro and ApexPro. In addition, Windows NT provides an Event Log facility that records NT-related system information, and a utility called Dr. Watson records information in the event of an application crash. All of these files might need to be gathered and sent to Engineering for analysis. In addition, all of these files can be quite large; easily more than the 1.44 megabyte limit on a floppy disk. Currently, floppy disks are the only real method we have for transporting these files.

This document describes a tool that simplifies log file collection. This tool lets the user select all log files from a Windows program, and then compresses them all into a small ZIP archive file.

The following steps describe how to capture the log files using the *Get All Logs* program.

Operation

This chapter describes how to operate the Tautologies program. This program archives CIC Pro, ApexPro, and Windows NT log files.

CAUTION
The bed displayed at this CIC Pro is unmonitored while the CIC Pro is stopped. Any ApexPro beds admitted on this CIC Pro PC display “no com” if displayed at other centrals and are not monitored.

Stopping the Program

You must stop the CIC Pro application for the log capture tool to run reliably. Stop the CIC Pro application in the normal manner.

It is also necessary to “*Close all programs and log on as a different user*” from Window’s start button. To run the program log in as user “administrator” from Window’s login screen. Recall that to get the login screen to come up you have to hold down the shift key while Windows starts.

1. Select *Setup CIC*.
2. Select the *Service Password* tab.
3. Type **mms_com** as the Password.
4. In the command box that opens, type **stop** then press **Enter**.

5. Click on *Start* then select *Shut Down* and *Close All Programs And Log On As Different User*.
6. Hold down **Shift** and select *Yes*.

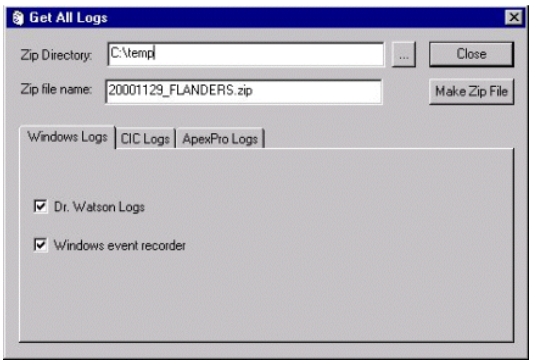
   Continue to hold the key until prompted for the password.
7. Type "**administrator**" as the User name and "**admin1,3,5,7**" as the Password then press **Enter**.

Starting the Program

After you are logged in as user "administrator", get into an "NT Command Prompt" window. On CIC Pro version 2.2 or greater, *GetAllLogs* is located at the c:\Program Files\Marquette*2.2*> directory. At this directory type:

GetAllLogs <Enter>

The program should load and the following window should appear as shown in the *Get All Logs* startup window below.



Selecting the ZIP directory and file name

The directory that the ZIP file writes to displays next to the *Zip Directory:* label, as shown in the *Get All Logs* startup window. Press the Browse button "..." to select another directory to write to. The default value is *C:\temp*, which works in most cases.

The ZIP file name displays next to the *Zip file name:* label, as shown in the *Get All Logs* startup window. The default file name consists of the Year/Month/Date plus the NT machine name. In most cases, there is no need to change this name.

From the example shown in the *Get All Logs* startup window, the ZIP file writes to:

C:\temp\20001129_FLANDERS.zip

Selecting the Windows NT Logs

Use the *Windows Log* tab (see the *Get All Logs* startup window) to configure which Window NT logs are stored in the ZIP file.

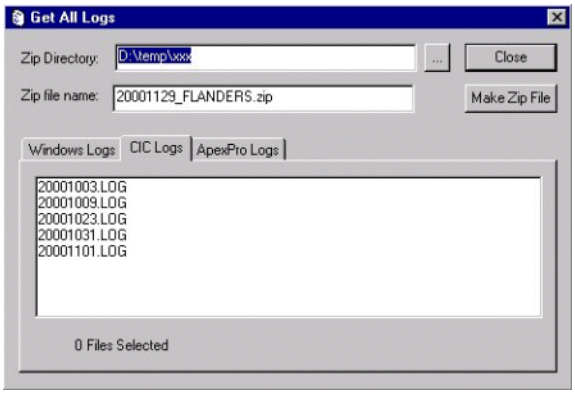
"Dr. Watson" log files are included when you check the *Dr. Watson Logs* label.

Windows NT event log files are included when the *Windows event recorder* label is checked.

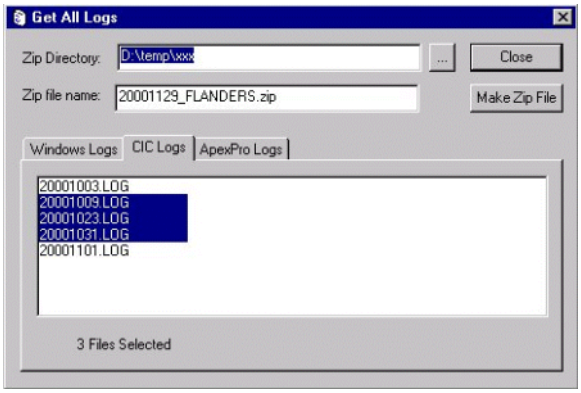
In most cases check both of these items.

Selecting the CIC Logs

Use the *CIC Logs* tab to configure which CIC Pro logs are stored in the ZIP file.

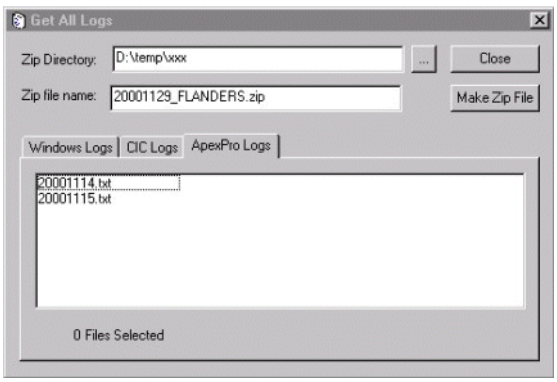


The CIC Pro log files are named after the date they are created. Click on the files that should be archived in the ZIP file. Three files were selected as shown in below.

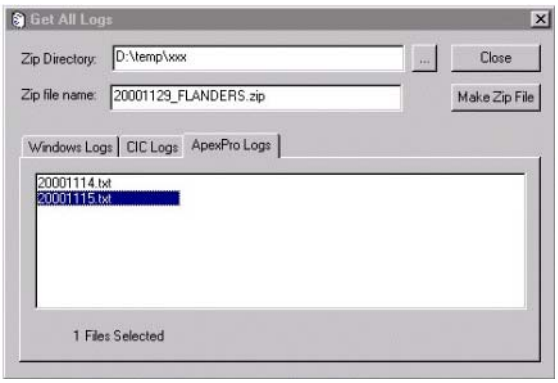


Selecting the ApexPro Logs

The *Apex Pro Logs* tab (see figure below) can be used to configure which ApexPro logs are to be stored in the ZIP file.



The ApexPro log files are named after the date they are created. Click on the files to archive in the ZIP file. One file was selected as shown in the figure below.



Creating the ZIP file

After you select all the files for archiving, press the *Make Zip File* button. This initiates the procedures to create the ZIP file. If the *GetAllLogs* program is run from a floppy drive, it takes time for the program to complete.

CAUTION

If you configure the program to archive the Windows NT event logs, the warning dialog box (shown in the figure below) pops up to ask the user not to touch the mouse or keyboard while the script program is running. Please do NOT touch the mouse or keyboard while the script program runs. Doing so may confuse the script program.

After the program finishes creating the ZIP file that contains the archived log files, it displays the following informational dialog box.

Exiting the Program

Click on the *Close* button to exit the program.

Copying the ZIP file from the hard drive to a floppy drive

If the newly created ZIP file is smaller than 1.44MB, then it can be directly copied onto an empty floppy disk. Insert an empty floppy disk into drive A:, and then issue the following command from a *Command Prompt*. Using the directory and file name used throughout this example, the command would be:

copy<Space>C:\temp\20001129_FLANDERS.zip<Space>a:

If the newly created ZIP file is larger than 1.44MB, it cannot fit on a single floppy. In that case, use the file splitting utility called *FileSplit.exe*. See "FileSplit" in this chapter.

FileSplit

Use "FileSplit" to break a large file up into smaller files as follows:

NOTE

The FileSplit program provides several options regarding how to split up a file and where to place the resultant smaller files. Follow these directions to split up the file and copy the smaller files directly to floppy disks. Have a supply of formatted floppies available before you begin this procedure.

1. Change the directory to "**\Program Files\Marquette\Pts\<version>**" where "<version>" is the software version string (for example, "1.1") of the currently running version of ApexPro.
2. Enter "**tools\filesplit**". The *FileSplit utility* window appears.
3. In the *Source:* box, you can enter the name of the (large) file being broken-up either manually or by clicking on the "…" button to the right of the *Source:* box.

   NOTE

   When using the "…" button, the initial list of files only shows files with file extensions that pertain to log file types, i.e., ".txt" and ".log". If necessary, change this by using the selection in the *Files of type:* specification box.

4. In the *Target:* box, type "**A:/**". This writes the smaller files directly to the floppy drive.
5. Leave the *Max split file size:* selection at *Limited only by space available*. This ensures that all available space is used on each floppy written to.
6. Once all entries are correct, press the *Copy* button to begin the file split and copy process. A progress bar displays while it copies the files. When each floppy is full, a message box saying, *Insert next disk* appears. After you remove the full floppy, and insert a blank floppy, press the *Retry* button to continue.
7. After you copy all the small files to floppies, a message box saying *File copy complete* appears.

Duplicate TTX

The CIC Pro software does not allow you to enter duplicate transmitter TTX numbers when you admit a patient. Many problems could arise if two transmitters operating at the same frequencies are used in the telemetry system at the same time.

But there are circumstances where having duplicate transmitters is beneficial, such as troubleshooting a telemetry system. This situation can occur when multiple CD Telemetry-LAN cabinets or an ApexPro telemetry system has a failure. The easiest method to continue coverage of the patients that were on the failed cabinet is to move them to open receivers on other telemetry cabinets.

But since the CIC Pro software won't allow duplicate TTX numbers in the system, it is impossible to admit the transferred patients. This option overrides the software to allow duplicate TTX numbers. You can then admit the patients to open receivers on the other central stations.

Once you enable this option you have five minutes to admit the patients to the CIC Pro system. Once the 5-minute period expires the software again prevents the admission of patients with duplicate TTX numbers.

The admitted patients with duplicated TTX numbers have an indication shown on the CIC Pro display that identifies them. This helps to identify the transferred patients when the failed telemetry cabinet is repaired. You can then discharge these patients and return them to the repaired telemetry cabinet.

The normal state for this option is NOT ALLOWED.

This function is enabled/disabled via the command **setflags** invoked from the Windows NT Command Prompt window.

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. At the service password prompt type **mms_com** and press **Enter**.

   This enables the *Service Menu* and displays a command prompt window.

   setflags<Space>-dup<Space>on and press **Enter** to allow duplicate TTX).
   setflags<Space>-dup<Space>off and press **Enter** to turn off duplicate TTX).

   NOTE
   Once you select this option you have five minutes to enter the duplicate TTX numbers. If that is not enough time simply select this option again and continue entering TTX numbers.

During the five minute period you can admit patients with TTX numbers that are duplicates. You also can change admission information during this time.

List Network

The list network function provides a list and summary of all devices that are communicating over the network.

The list network function is invoked from the Windows NT Command Prompt window.

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. At the service password prompt type **mms_com** and press **Enter**.

   This enables the *Service Menu* and displays a command prompt window.

   To invoke list network, enter the following command:

   Example: **lw<Space>-d** and press **Enter**.

   lw [-d] [-s] [-u] [-a] [-l] [-c] [-q] [-h], where:

   -d <device> limits the search to <device> device types

   -s <service> limits the search to devices offering <service>

   -u <unit> limits the search to devices in <unit>

   -a <IP:port> limits the search to devices which have <IP:port>

   A "?" within any search string matches any character

   -l lists resource matches

   -c print a summary count of search results

   -q suppress printing of search criteria summary

   -h presents help screen

   A typical listing would include the following data.

Table 1. List Network

IP Address	Device Type	Secondary Address	Care Unit: Device Name	Patient Name
126.0.17.206	TELE TOWER	(2000)	"SICU: TOWR7e0011	
126.0.17.206	TELE BED	(2001)	"SICU:214-A"	"JACKSON"
126.0.6.77	TRAMSCOPE	(2000)	"ICU:BED1"	"HUNTER"
126.0.6.61	TRAMSCOPE	(2000)	"ICU:BED4"	"BLAND"
126.0.177.21	CENTRAL	(2000)	"ICU:CS4"	

IP Address – Uniquely identifies each device on the network, whether the devices are manufactured by GE Medical Systems *Information Technologies* or are part of the hospital information system.

Device Type - Includes:

CENTRAL: Centralscope central station

MONITOR: Eagle, Solar, Tramscope monitors

MRT2: Monitoring Review Terminal 2

MUSE: MUSE system

TELE BED: Telemetry bed, CD, or APEX

TELE TOWER: Telemetry cabinet

Secondary Address – Identifies telemetry receivers in the cabinet assembly. Ignoring the base 2000 number, the last digit indicates which receiver is related to each telemetry bed. Identifies the receivers by numbers in the cabinet assembly.

Care Unit: Device Name – Identifies the device in terms more understandable to the user.

Patient Name – Identifies the patient currently being monitored.

Open RTERM Session

The remote terminal (RTERM) capability operates in a manner very similar to having a terminal physically connected to a remote device except that the CIC Pro system is functioning as a terminal and it is using the network to connect to the other devices.

NOTE

You cannot use this function to log into other CIC Pros. It only allows you to log into CD Telemetry-LAN Cabinets or Centralscope Central Stations.

WARNING

Using the RTERM session option can cause other central stations to lose monitoring functions, patient data, or even the operating software. Only trained service personnel should use this option.

To invoke the RTERM function from the *Windows NT Command Prompt* window:

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. At the *service password* prompt type **mms_com** and press **Enter**.

   This enables the *Service Menu* and displays a command prompt window.

To invoke RTERM, enter the following command:

rterm "UNIT|CENTRAL"

where UNIT|CENTRAL is the fully specified UNITY Network device name.

Description of this option is beyond the scope of this manual. Specialized training in service monitor-level troubleshooting is necessary before you use this option. Consult with GE Medical Systems *Information Technologies* Service for information about the advanced training.

Copying CDT LAN Telemetry Logs From CIC Pro

To retrieve TELE Tower error log files from the CIC Pro:

1. Use the mouse to select *Setup CIC* at the bottom of the screen.
2. From the *CIC Setup* screen, select the *Service Password* tab.
3. At the *service password* prompt type **mms_com** and press **Enter**. This enables the *Service Menu* and displays a command prompt window.
4. Insert a formatted 1.4Meg disk into drive A. Type **rterm<Space>"UNIT|TOWER"** and press **Enter**.

   Example: rterm "MEI|TOWER1"

5. Type **CD LOG** and press **Enter** to change to the log directory.
6. Type **COPY *yyyymmdd*.LOG FL0:*yyyymmdd*.LOG**

   (Where *yyyymmdd* is the date of the desired log to copy with *YEAR, MONTH* and *DAY.)*

   This copies the log to the diskette in the CPU's drive (FL0:\)

ApexPro Application Log Files

ApexPro logs are located in the c:**Program Files\Marquette\PTS\Log> directory.** To copy ApexPro log files from the CIC Pro do the following:

Log files are kept by most devices on the Unity Network MC network.

The CIC log files are located in the following directory:

\Program Files\Marquette\CIC\Log

The naming convention for the log files is as follows:

yyyymmdd.log

For example: 20020422.txt is the log file for April 22,2002. There is one log file per day.

File Handling

General

In an attempt to diagnose a problem, Field Service personnel are frequently called on to collect log files created by various software applications, such as CIC Pro and ApexPro. In addition, Windows NT provides an Event Log facility that records NT-related system information, and a utility called Dr. Watson records information in the event of an application crash. All of these files might need to be gathered and sent to Engineering for analysis. In addition, all of these files can be quite large; easily more than the 1.44 megabyte limit on a floppy disk. Currently, floppy disks are the only method we have for transporting files.

Towers, ApexPro and CIC Pro

All monitoring devices on the GE Unity Network periodically broadcast information about themselves in “RWHAT” packets. These packets contain each device’s IP address and port number, name, and offered services, among other things. In addition, all monitoring devices listen for such packets, and maintain a database of information about all other devices on the network. When one device needs to communicate with another device, this database is used to obtain the remote device’s IP address. Unity Network-protocol messages are created, and the device’s operating system services are used to transmit the message on the Unity Network.

The CIC Pro is a software application that runs on a Unity Network IS server PC. When a CIC Pro wants to communicate with a CDT-LAN tower, for example, it retrieves the CDT-LAN tower’s IP address from its RWHAT database, creates Unity Network messages, and requests that the Windows NT operating system on its PC send them to the CDT-LAN tower. A CDT-LAN tower is a separate piece of hardware, connected to the same Unity Network as the CIC Pro.

ApexPro software can also be loaded and executed on a Unity Network IS server, just as CIC Pro. Within Windows NT on such a system, two IP addresses are assigned to the (one) Unity Network card. The CIC Pro software is configured to use one, and the ApexPro software is configured to use the other. The ApexPro software transmits its RWHAT packets with its IP address, and the CIC Pro transmits its RWHAT packets with its IP address. Thus, to any device on the Unity Network, the CIC Pro and ApexPro systems, although running on the same PC, have different IP addresses. It’s impossible to determine whether those two pieces of software are running on the same or different Unity Network IS server PCs.

When a receiver rack is connected to such a PC (via a third network card), an ApexPro "tower" results. When a CIC Pro wants to communicate with an ApexPro tower, it retrieves that ApexPro tower's IP address from its RWHAT database, creates Unity Network messages, and requests that the Windows NT operating system on its Unity Network IS server PC send them to the ApexPro tower. If the ApexPro tower is "on" the same Unity Network IS server PC, Windows NT realizes this and passes the Unity Network message to ApexPro without sending it onto the Unity Network; it's merely routed internally using Windows NT services. If it's "on" a different PC, Windows NT routes the message onto the physical Unity Network.

Thus, an ApexPro "tower" is composed of a Unity Network IS server PC (which could be running other software), the ApexPro software running on that PC, and a separate receiver rack, attached to the PC by a network connection.

Admit/TTX Master

When a reference is made to the "Admit Master," it is referring to the part of the master software that controls telemetry patient admissions. When reference is made to the "TTX Master," it is referring to the part of the master software that maintains the list of all in-use transmitters on all telemetry towers (both CDT-LAN and ApexPro) on the Unity Network. If reference is made to the "master tower," it's probably just referring in a generic way to the tower itself.

One telemetry tower is the "Admit/TTX Master" on the Unity Network. This tower has two specific duties:

- It receives all telemetry patient admit requests and directs them to appropriate ApexPro or CDT-LAN towers and
- It maintains a list of all in-use transmitter numbers, so that patient admissions can be prevented from using an already-allocated transmitter.

Each telemetry tower, whether ApexPro or CDT-LAN, monitors the network to determine if it has the highest IP address. If so, it assumes the duties of the Admit/TTX Master. On a mixed network, where both ApexPro and CDT-LAN towers are present, we require CDT-LAN towers to run Version 6 software. This software recognizes when an ApexPro tower is on the network; in such a case, a CDT-LAN tower does not become the master tower, even with the highest IP address. Each ApexPro tower checks only other ApexPro towers for the highest IP address. Thus, these two pieces of software work together to ensure that an ApexPro tower is the master on a mixed network.

In a CDT-LAN-only system, a CDT-LAN tower is obviously the Admit Master. A CDT-LAN Admit Master, admitting to a CDT-LAN tower, performs the admit operation in the same manner as an ApexPro Admit Master, when it receives a CDT-LAN admit request.

Telemetry Towers, Receivers, and Unit Names

In order to control receiver utilization at patient admission, both CDT-LAN and ApexPro systems allow qualified personnel to configure the receivers in each tower.

CDTLAN Receiver Configuration

The basic CDT-LAN systems have no receiver unit assignments; that is, a receiver can accept an admission for a patient in any unit. However, each receiver in a CDT-LAN tower can be assigned to a specific care unit. When this is done, it tells the admit master that the receiver should only be sent admit requests for patients in that unit. (The admit master actually sends the admit request to the receiver's *tower*.) Receivers are assigned unit names using the "modify unit" terminal monitor command.

Additionally, each CDT-LAN tower has a service-entered list containing all the unit names that the tower accepts admissions from. This allows control of admissions when multiple antenna fields are present with only one Unity Network. If the list is empty, the tower accepts an admissions for any unit. When an admit request comes in to a CDT-LAN tower, the request's unit name is checked against this list. If the list is empty or contains the unit name in the admit request, it processes the admit.

ApexPro Receiver Configuration

As in CDT-LAN, the basic ApexPro systems have no receiver unit assignments; that is, a receiver can accept an admission for a patient in any unit. However, individual receivers are not assigned unit names as in CDT-LAN, but you can configure the units from which an ApexPro tower's receivers accept admits. Each ApexPro tower contains a list of unit names, along with how many receivers should be reserved to each unit. As unit names are assigned a number of receivers, the number of unassigned receivers in the tower decrements by that same count. If this count is greater than zero after all desired units have been entered into the list, the tower has "unassigned receivers" available. Unit names are assigned some number of receivers using the "modify receiver" PTSCONFIG command.

Also associated with each unit in the list is an indication whether admits to this unit can use unassigned receivers. This item is entered for each unit name in the list. If a unit's "use-unassigned-receivers" flag is "yes," admits to the unit can use not only the number of explicitly assigned receivers, but any discharged, unassigned receivers. If a unit's "use-unassigned-receivers" flag is "no," the unit can only use the number of receivers allocated for it, and no more.

Any unit's reserved receiver count can be zero; a unit with a count of zero has no receivers explicitly assigned to it. This implies that the unit's "use-unassigned-receivers" flag must be "yes" for this unit to be able to admit to the tower. If no receivers need to be allocated to specific units, all units entered in the list can have their reserved-receiver counts set to zero, and their "use-unassigned-receivers" flag set to "yes."

If the list of unit names and their count of reserved receivers is empty (i.e., no unit names are entered), the ApexPro tower accepts admits from any unit. However, if *any* unit name is entered, *all* unit names (that the user desires to be admitted to this tower) must be entered.

Sequence of Events When Admitting a Patient

When any device on the Unity Network wants to admit a telemetry patient, it must send an admit request to the Admit Master. As was discussed earlier, there is one and only one master tower on the Unity Network. The tower that is the master broadcasts the Admit Master and TTX Master services in its RWHAT packets. By looking for these services in its RWHAT database, any Unity Network device can determine which tower is the master.

If any step along this path fails, the device that requested the admit is informed of the failure in a response packet sent back to it by the Admit Master.

Admit Master Receives the Admit Request

The admit master tower receives the admit request. The request is in the form of a Unity Network-protocol packet, which contains the desired unit name, bed name, patient name, transmitter number, graph location, and age group.

TTX Master Validation

Since the TTX Master and the Admit Master are on the same tower, the Admit Master uses local TTX Master services to ensure that the requested transmitter number is not in use by another patient. If it is, an error response indicating an in-use transmitter is returned to the device that requested the admit.

Admit Master Decision

The Admit Master decides which receiver or tower should be sent the actual admit command. When the Admit Master receives an admit request, it uses the transmitter number to determine which type of telemetry system to send the admit request to. If the number is between 1 and 960, it sends it to a CDT-LAN tower; if it's between 1000 and 9999, it sends it to an ApexPro tower.

CDT–LAN Admissions

CDT–LAN towers broadcast an RWHAT packet for all receivers, whether discharged or admitted. When the Admit Master wants to admit a CDT-LAN bed, it examines the RWHAT database, looking for a receiver offering the ADMIT service. The priority order used to pick a receiver is:

1. Discharged receiver with the same unit name as is contained in the admit packet.
2. Discharged universal receiver (unit name “mei”).

If neither of these is found, then an admit failure response is sent to the requesting device, indicating that no CDT–LAN receivers are available. If found, the admit request is sent to the selected receiver. Note that this is different than in ApexPro, where admit requests are sent to a selected tower, not a receiver.

In order to ensure that an admit/discharge/admit sequence does not continually use the same receiver, the Admit Master sequences CDT–LAN admissions through all available receivers. This ensures that if a particular receiver is bad, and the user discharges and then readmits a patient, that the second admit goes to a different receiver.

ApexPro Admissions

Every minute, each ApexPro tower on the network sends the Admit Master a list containing the names of units it can accept admits from, and whether the tower has an explicitly-names receiver available for that unit. The lists received from all towers are compiled into one master, receivers-available list, used when admitting a patient. After all allocated receivers for a particular unit on a tower have been admitted, the list still contains the unit name only if the unit was set-up to accept admits to unassigned receivers. The only time that a universal receiver (unit name “mei”) is sent in the list is if no unit names are entered for a tower (i.e., the tower accepts admits for any unit). This list has no individual receiver information in it; a unit’s presence in the list only indicates that at least one receiver in the unit is available on the ApexPro tower.

When an ApexPro admit request is received by the Admit Master, it uses the following priority order to choose a tower to send the admit request:

1. A tower that has a receiver reserved for the unit name in the admit packet.
2. A tower that has a receiver available for the unit name in the admit packet, but not reserved. (This indicates that all receivers assigned to the unit are admitted, that the unit is configured to use unassigned receivers, and that an unassigned receiver is still available.)
3. A tower that has a universal receiver available (unit name “mei”).

If none of these is found, then it sends an admit failure response to the requesting device. This indicates that no ApexPro receivers are available. If found, the admit request is sent to the selected tower. Note that this is different than in CDT–LAN, where admit requests are sent to a receiver, not a tower.

In order to ensure that an admit/discharge/admit sequence does not continually use the same receiver, the Admit Master sequences ApexPro admissions through all available towers. Once an admit request is in a tower, the main ApexPro software determines which receiver to use, sequencing through all available receivers. This ensures that if a particular receiver is bad, and the user discharges and then readmits a patient, that the second admit goes to a different receiver, potentially on a different tower.

Full Disclosure

The CIC Full Disclosure (FD) system stores all waveform and parametric data from a patient for up to 76 hours. This data can be randomly accessed later in a static display that looks very similar to the real-time display window. To accomplish this every Unity Network waveform packet (4/sec) and every parameter packet (1 every 2 seconds) are stored to disk on the CIC. In addition one Rwhat packet and one admit packet are stored every minute to help recreate the patient's history.

Unlike an alarm history event stored by the bedside, which only stores a 10 second snap-shot surrounding the event, with Full Disclosure the user can scroll back in time prior to the event to see what was going on with the patient, leading up to the event. Each CIC can handle up to 16 patients. This is an enormous amount of data being stored and managed by the system.

Behaviors/Rules

Installation

- Incompatible with old FD system (CIC v2.2).
- Certain Unit Defaults are incompatible with old CIC v2.x systems.
- Software has protected itself from older systems. Older systems may exhibit unknown behavior.
- Installation deletes all FD Data (including data stored by old system).
- Installation clears all FD slots.
- Installation removes a few old FD registry entries.

Hardware

- Nightshade Platform
  - FD systems have two hard drives, one dedicated to FD.
  - Non-FD systems have only one hard drive (restricted to 1 hour/ patient).
  - C: ~8GB, F: 18GB.
- BCM Platform
  - Single hard drive, partitioned into two logical.
  - C: ~8GB, D: ~26GB.

Start-up modes

- **Auto For All –** Automatically detects admitted beds that are not currently being FD'd anywhere and attempts to start FD on one of the CICs within the unit. This works regardless of whether the bed was admitted directly at the bedside or the CIC. FD cannot be stopped on a particular bed until the bed is discharged.
- **Auto If Listed –** Same as Auto For All but only if the bed in question is entered into the list on the FD Unit Defaults setup screen. All other beds are not Full Disclosed.
- **Manual Mode –** Beds are NOT automatically full disclosed upon admission. User can manually start and stop FD for a particular bed by using a button located on the Full Disclosure tab sheet. All FD data is deleted when Full Disclosure is stopped for a bed.

Licensing

- Support for up to 16 patients per CIC
- Stores 76 hours of data per patient, unless disk drive is less than 10GB (considered a non-FD machine. Nightshade servers only), then only 1 hour of data is stored.
- Stores 76 hours of data regardless of license type. Licensing controls amount of data that is viewable.
- Unit Licensing Mode sets which type of license is requested. Supported types: None (1 hour), 24, 48, 72 hours.
- Failure to obtain a license results in that bed not being FD'd (0 hours).
- Once a license is successfully obtained, if the license server goes away access is clamped down to 1 hour until the server comes back.
- Licensing information is stored with data so restrictions follow data regardless of where viewed, even if viewed in a different unit with a different Unit License Mode.

Control

- One "master" CIC per unit (w/ respect to FD). Lowest IP address as ASCII text compare.
- Master Responsibilities
  - Detect admitted (but not FD'd) beds within unit, for Auto modes.
  - Assign beds (to be FD'd) to CICs within unit.
  - Apply Multi-FD and Twin-Bed Rules.
  - Wakes up every minute to perform these activities.
- Multi-FD Rule
  - Every wake-up cycle the master scans all CICs within the unit to determine if more than one CIC is FD'ing the same bed. This can happen as part of normal operation. If the master detects this condition, all CICs are instructed to stop FD'ing the bed *except* for the one CIC with the **oldest** data for the bed.
  - The LocateFD service (provided by FDSvr) guarantees that the right CIC is contacted if retrieving data while a multi-FD condition is occurring.

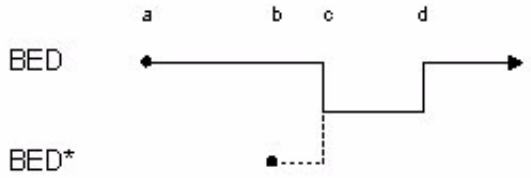
- 30 Minute Rule
  - NO COMM – If no data is received from a bed for a continuous 30 minute period, all data for the bed is deleted and the bed is removed from the slot assignment. If the bed comes back on line later and the mode is Auto, the master will detect and reassign as if a new bed.
  - Re-Boot – When FD first starts up, the DB is checked as to when the last data was received for all beds assigned to slots. If the latest data is less than 30 minutes old, then FD continues as normal (time-gap present in data). If the latest data is more than 30 minutes old, the data is first deleted before FD continues on the bed.
  - The Re-Boot version of this rule works in conjunction with the Multi-FD Rule to produce a reasonable handling of CICs coming and going off-line.
  - Example Scenario 1 (Assuming Auto Mode):

CICA is FD'ing BED1 (line A1). CICA then goes off-line for some reason. After a delay of up to one minute, the master detects the un-FD'd bed and assigns it to CICB. CICB then FD's the bed (line B1). CICA then comes back on line in less then 30 minutes. The 30 Minute Rule (Re-Boot) dictates that CICA keep the previous data. CICA then resumes FD'ing the bed (line A2). After a delay of up to one minute, the master detects both CICs FD'ing the same bed and applies the Multi-FD Rule. Since CICA has the oldest data (line A1), CICB is instructed to stop FD'ing the bed, while CICA continues on. The resultant data stream is shown with the dashed box.

  - Example Scenario 2 (Assuming Auto Mode):

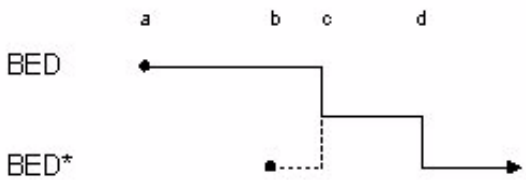
CICA is FD'ing Bed1 (line A1). CICA then goes off-line for some reason. After a delay of up to one minute, the master detects the un-FD'd bed and assigns it to CICB. CICB then FD's the bed (line B1). CICA then comes back on line, but more than 30 minutes has gone by (perhaps even days). The 30 Minute Rule (Re-Boot) dictates that CICA delete the old data (line A1). CICA then resumes FD'ing the bed (line A2). After a delay of up to one minute, the master detects both CICs FD'ing the same bed and applies the Multi-FD Rule. Since CICB now has the oldest data (line A1 was deleted), CICA is

- Twin-Bed Rule (Combo)
  - Combo mode creates some unique problems for full disclosure. In combo mode there are two beds with the same name on the network, except for a * that is added to the telemetry bed. However, these beds are really the same patient. This rule was created to deal appropriately with the transition into and out of combo mode.
  - BED and BED* are treated as two different patients when not in combo mode. Each has its own data storage.
  - When BED and BED* both exist but are in combo together, the master checks for the existence of independent previous data stores for each bed. If found, the data store which has the oldest data is kept while the other is deleted. FD continues under the name of BED. FD stops on BED* (even if BED*'s data was kept) since all data is now coming from BED.
  - When BED/BED* break combo the master ensures that the DB will follow the patient. Breaking combo (without completely discharging) can only be done either by discharging BED* or discharging BED. If discharging BED*, FD simply continues FD'ing BED. If discharging BED, all data accumulated for BED remains in the DB, but is renamed to BED*. FD then continues on BED*.
  - Scenario 1:



Hardwired (HW) bed "BED" is admitted at point 'a' and is being FD'd. At point 'b' tele bed BED* is admitted. At this point the beds are not yet in combo and the master will assign BED* to a CIC, creating two independent FD data stores, possibly even on different CICs. At point 'c' BED & BED* are put into combo mode. At this point the master detects the combo and determines that BED has the oldest data so BED's data stream is kept while BED*'s is deleted and FD stops on BED*. Collection continues under the name of BED until point 'd' where combo is broken by discharging BED*. FD continues on BED. The solid line indicates the resultant data storage under the name BED.

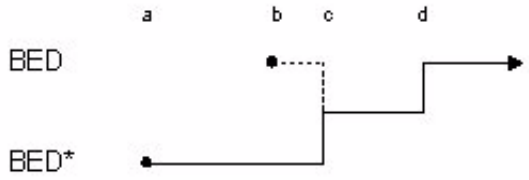
  - Scenario 2:



Same as scenario 1 except that at point 'd' combo is broken by discharging HW bed BED. In this case, the collection up to this point has been under the name BED. The master instructs the

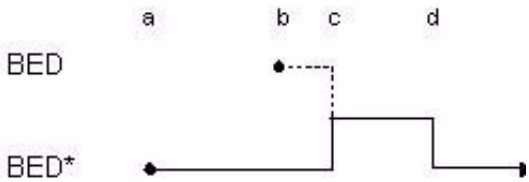
CIC FD'ing BED to rename the DB storage to BED*. FD continues on BED*. The solid line indicates the resultant data storage now under the name BED*.

- Scenario 3:



Tele bed BED* is admitted at point 'a' and is being FD'd. At point 'b' HW bed BED is admitted. At this point the beds are not yet in combo and the master will assign BED to a CIC, creating two independent data stores, possibly even on different CICs. At point 'c' BED & BED* are put into combo mode. At this point the master detects the combo and determines that BED* has the oldest data so BED*'s data is kept while BED's is deleted. However, because in combo mode data comes from the HW bed, data for BED* is renamed to BED and FD continues on BED. FD is stopped on BED* even though BED*'s data was kept. At point 'd' the combo is broken by discharging the tele bed BED*. FD continues on BED. The solid line indicates the resultant data storage now under the name BED.

- Scenario 4:



Same as scenario 3 except that at point 'd' combo is broken by discharging the HW bed BED. In this case data collection from 'c' to 'd' has been under the name BED in the DB. This data get renamed to BED* and FD continues forward on BED*. Note there are two DB name changes in this scenario, one at 'c' and one at 'd'. The solid line indicates the resultant data storage now under the name BED*.

- If a bed changes its name (but not Unit) at any time, the FD system will follow the name change by renaming the DB for the bed to the new name and continuing FD under the new name.
- No CIC acts as a master during the first minute after start-up. This allows time for the local Rwhat database to update with information about other CICs on the network and helps reduce the probability of multiple masters. If there are multiple CICs that think they're the master, this will self correct itself after a couple minutes. Once all Rwhat DBs are updated, the true master will detect and resolve all Multi-FD conditions that occurred.

- The FDSvr process advertises the “FULL DISCLO” service in Rwhat for the purpose of identifying that CIC as having FD capabilities. This service is used by the master when looking for other CICs to query, control, and assign beds. However, the version of the remote CIC is first checked. CICs with a version of less than 2.5 are ignored.

Unit Boundary

- Each Unit operates independently with respect to Full Disclosure. The only interaction is when displaying data across Units.
- License Mode – All beds within a Unit will have access to the same amount of data storage (based on time) unless there is a failure to get a license (0 hours). Can be different across different Units (i.e. UnitA-72hours, UnitB-None(1hour)).
- Start-up Mode – Same start-up rules applied to all beds within a Unit.
- Default – Same FD defaults used on all CICs within a Unit.
- Master – One per Unit.
- Acquisition/Storage – The master will only assign beds within the Unit to CICs within the Unit. At no time will data for a bed be stored on a CIC in a different Unit.
- Bed Unit Changes – If a bed changes its Unit name while being FD'd, all data for the bed is deleted. The Unit to which the bed moved is responsible for dealing with the bed.
- CIC Unit Changes – If a CIC changes its Unit name while FD'ing beds, all data for all beds being FD'd by that CIC is deleted. The Unit to which the beds belonged is responsible for dealing with those beds.

Storage

- The FD Data interface uses the IX network used to retrieve data from the database.
- Each bed stored in separate directory. Consists of one index file and many record files.

Printing

- The Report printout is a configurable, long-time-period overview of waveform activity. It is activated by pressing the Report Print button on the FD display.
- The Strip printout is a quick snapshot of what is currently on the screen. It is activated by pressing the Print button while the FD tab page is being viewed.
- There is a separate FD printer selection from the main laser printer selection on the setup page. Specifying a printer here does not advertise this CIC as a print server on Rwhat (like the main laser selection). It is used exclusively by the local FD system. A printer must be “Added” to the NT system before it will show up in the drop-down list.

Troubleshooting the ApexPro System

Use the following chart as an aid for troubleshooting a CIC Pro with ApexPro.

Table 2. ApexPro Troubleshooting Tips		
How to tell if the CIC Pro has the ApexPro option.	There are two ways to tell if the CIC Pro has the ApexPro option.	1. A unit with ApexPro has four IP address stickers on the top front of the tower. 2. A unit with ApexPro has a total of three network interfaces.
Explanation of how to enter *ptsconfig*.	Use this to help troubleshoot the system for other problems that may be seen.	1. At the CIC Pro with ApexPro that is connected to the Receiver System, click *Setup CIC*. 2. Select the *Service Password* tab. 3. Type the service password **mms_com**. 4. An MS-DOS command window opens displaying the prompt: *C:\Program Files\Marquette\CIC*\x.x> (x= software version) 5. Type **cd..** and press **Enter**. 6. Type **cd..** and press **Enter** again to get the prompt *C:\Program Files\Marquette>* 7. Type **cd pts*x.x*** (*x*= software version) and press **Enter**. 8. Verify the prompt *C:\Program Files\Marquette\PTS*\x.x> (x= software version) 9. In the MS-DOS window at the *PTS*\x.x prompt, type **ptsconfig** and press **Enter**. **NOTE** Type **help** at any time to see a list of commands. 10. Verify new prompt, Unity Network MC IP address of the ApexPro application, then *C:Program Files\Marquette\PTS*\x.x.
How to identify what beds are admitted to the ApexPro Receiver system.	It may become necessary to shut down a CIC Pro with ApexPro. Use this to identify what telemetry beds are admitted to the CIC Pro w/ ApexPro before shutting down the PC. Notify nursing staff that these beds will go “No Comm” during the reboot.	Enter *CIC Setup*, select *List current telemetry listings*. This list is pulled from the Admit Master showing the Unit|Tower name, Port #, Unit|bed* and TTX#. Use this command to help identify who is admitted to each PC tower. The UNIT|Tower name should be setup per the ApexPro configure section in this manual.
How does the system capture events and/or errors?	Error logs are captured and you can be either view or save them to a diskette for further evaluation.	*Setup CIC*, Password **mms_com**, type **cd c:\program files\marquette\pts\logs**; type **dir** to see the logs for the past 60 days. The name of the file is the *yyyymmdd.log* ■ To view a log type: type **yyyymmdd.log** |more <Enter> ■ To save a log to diskette, insert a formatted HD diskette in the floppy drive and type: copy YearMonthDay.log a: ■ If you cannot save a log file due to the size of the file, then utilize Wiz.exe to condense the file, see Zipping logs section for details.

Table 2. ApexPro Troubleshooting Tips		
When admitting a patient, message of "No available receivers" is present.	All the receivers assigned to the CIC Pro's care unit name are already in use.	To see the assigned receivers per care unit, enter into ptsconfig and **type modify receiver** and press **Enter**. ■ Unassigned receivers = any care unit can admit to these receivers, this is the factory default. ■ Care unit names can be assigned or deleted depending on the need. Refer to the ApexPro configuration procedure for explanation of the Modify Receiver command.
Explanation of the 5 ApexPro colors from the command, setflags -mark ttx<Enter>	No waveform, only yellow tick marks for one patient.	1. Transmitter is out of range from the antenna system. 2. Transmitter may be programmed to a different TTX# than is labeled. Refer to *Transmitter Service Manual* to verify. 3. Transmitter is defective. Refer to the *Transmitter Service Manual* for troubleshooting the transmitter.
	Waveform mixed with yellow tick marks for one patient.	1. Transmitter is on the border of the antenna coverage area. 2. Transmitter is defective. Refer to *Transmitter Service Manual* for troubleshooting the transmitter. 3. Quad Receiver Module may be defective. Refer to *Receiver System Service Manual* for troubleshooting the receiver system. 4. Antenna system may be defective or improperly tuned. Refer to the *Site Survey and Installation Manual* for Troubleshooting guidelines.
	Waveforms mixed with yellow tick marks for multiple patients.	1. Antenna system may be defective or improperly tuned. Refer to the *Site Survey* and *Installation Manual* for Troubleshooting guidelines. 2. For up to 4 waveforms, a Quad Receiver Module may be defective. Refer to *Receiver System Service Manual* for troubleshooting the receiver system. 3. For up to 16 waveforms, a Receiver System may be defective. Refer to the *Receiver System Service Manual* for troubleshooting the receiver system.
	Dark Green tick marks. Missing data from the receiver.	The defective receiver should be identified by entering ptsconfig and use the command display patient UNIT|BED*. May also be helpful to use the blink command to physically identify the suspect bad receiver card. When in ptsconfig use the command blink patient UNIT|BED* 5. This allow the receiver status led to flash amber for 5 minutes for easy identification. Replace Quad receiver module assembly.
	Magenta tick marks. Missing data from the Receiver System.	1. Unity Network RX network cable has become disconnected. Try to ping the Receiver System by entering the CIC Setup, Service password mms_com and type ping 119.1.1.1. If timed out, then the network connection has been lost. 2. Quad Receiver Module has become disconnected from the Receiver System. Power down the Receiver System to reseat the module. Upon Power up, verify the Quad Receiver Module initialized. Refer to the Receiver System manual for further details.
	Light Gray tick marks	The batteries in the transmitters are dead. Replace the batteries.

Unity Network IS Event and Error Logs

Event Logs and Error Logs may be requested by *Information Technologies* Service for use in diagnostic troubleshooting. To access these logs, complete the following steps:

1. When prompted for a logon, type **administrator** and press **Tab**.
2. Type password **admin1,3,5,7** and press **Enter**.
3. Click on *Start*, point to *Programs***,** and then click *Windows NT Explorer*. Open directory

   "**C:\Program<Space>Files\Marquette\US\log\X"**.

   Let X equal one of the application directories: unityis, unityisevent, HL7, HL7event, ICMMS, ICMMSevent, AVOA, or AVOAevent.

If the Unity Network IS is running the selected application, a directory log should be seen.

The naming convention for the log files is ***yyyymmdd*.log**. For example: **20020422.log** is the log file for April 22, 2002. There is one log file per day.

Once the desired error log is located, it can be copied over the network to a floppy disk or to another drive. Since error logs are text files, they can be copied into other computers and read using most text editors or word processing applications.

Log Registry Settings (Version 4.3 and Later)

The log registry variable <*UseLocalTimeStamp*> is found in the registry under HKEY_LOCAL_MACHINE\SOFTWARE\Marquette\Logger and is used to provide log time stamps recorded using GM time or local time.

This registry variable can be manually set to a value of 1 using regedit so that all log files use local time stamps. The registry setting defaults to using GM time stamps. This registry setting is only read once when Unity Network IS is started. Therefore, Unity Network IS must be stopped and restarted if this registry setting is changed in order for the new value to take affect.

HL7 Registry Settings (Version 4.1 and Later)

HL7 Outbound Registry Configuration

HL7 has several configurable registry settings that allow for slightly different communication protocols with various HIS vendors. If you change a setting, you must stop and restart the HL7 Outbound application for the changes to be in effect. Enter the following at a command console to stop the HL7 Outbound application if it is running:

```
hl7 <space> -stop
```

When you change all communication settings, start the HL7 application from a command console as follows:

```
start hl7
```

NOTE

You do NOT need to stop and restart the Unity Network IS server except when changes are made to the HL7 tab page of the *GE Unity Network Information Suite Server Configuration Utility*.

Communication Channel Configuration

Socket connections established with Hospital Information Systems (HIS) vary based on the data collection interval selected for a care unit and HL7 Outbound registry settings. There are five data collection intervals that you can configure by using the *GE Unity Network Information Suite Server Configuration Utility*. You can configure collection intervals of 1, 5, 15, 30 and 60 minutes per care unit. Toggle the registry settings from a command prompt using predefined switches.

-close – The **-close** switch forces a new socket connection per message and overrides all other HL7 registry settings. This mode establishes a new socket connection for every message transmitted to a HIS regardless of the data collection interval. Configure this from a command line using the following:

```
hl7 <space> -close
```

The above command simply toggles the state of a flag in the registry. The user can revert back to the previous setting by reentering the command.

-socket – The second switch you may invoke from a command prompt to toggle a registry setting is the **-socket** switch. However, this switch is only effective when the message per socket switch is off as discussed above. This switch only applies when data collection intervals of one minute have been selected for a care unit. Socket connections for data collection intervals of 5, 15, 30 and 60 minutes are always opened and closed every time a data collection cycle begins and ends for all monitoring devices within a given care unit. Data collection for the one-minute collection interval defaults to maintaining a persistent connection with the HIS.

Use the **-socket** switch to toggle the registry setting to allow the one-minute collection interval to function the same as the other collection intervals. Configure this from a command line using the following:

```
hl7 <space> -socket
```

The above command simply toggles the state of a flag in the registry. The user can revert back to the previous setting by reentering the command.

The default mode, for the one-minute data collection interval, is to maintain a persistent connection for each configured care unit to the Hospital Information System (HIS). The default mode for all other collection intervals is to open a unique socket connection to the configured HIS vendor for each unit that has been configured for data collection on every data collection cycle. Each connection to the HIS vendor remains open until all HL7 outbound messages for periodic and episodic data transmit for all recognized monitoring devices within each unit. Each connection then closes and reopens at the next configured unit collect interval and the process repeats.

Some HIS vendors are capable of maintaining a persistent connection while others require a new socket connection per message. The switches discussed above allow the user to configure the communication channels to specific HIS vendors as needed.

Acknowledgement Timeout Configuration

The user can configure the HL7 Outbound application to acknowledge timeouts in the range of 1 to 300 seconds inclusive. The default timeout that the HL7 application waits for an acknowledgement response from a HIS is 30 seconds. In congested network and WAN environments, data retransmits if message acknowledgements are not received before the timeout period elapses. If the HIS functions properly but continues to receive repeated data from the HL7 Outbound application, the recommendation is to increase the acknowledgement wait time using the following command:

```
hl7 <space> -regdf <value in seconds>
```

Verbose Communication Logging

You can execute the HL7 Outbound application in a verbose mode to allow logging of communication data files. Use this mode only as a temporary aid when troubleshooting connections with a new HIS vendor for the first time. The log files record all HL7 messages that occur between the HL7 Outbound application and HIS. These communication log files are found under unit specific directory names in the *C:\Program Files\Marquette\us\log* directory. Each unit-specific directory is pre-pended with an *hl7_* (i.e. a unit named NICU would correspond to the directory *hl7_NICU*). Each of these unit-specific directories has a log file that contains log entries of all communication that has occurred between the HL7 application and the HIS, for all monitoring devices within the unit. The log file is pre-pended with an *hl7_* and post-pended with the date in the format *yyyymmdd* (e.g. *hl7_NICU20020329.log*).

To execute the HL7 Outbound application in the verbose mode, stop the Unity Network IS server if it is running. On the *HL7* tab page of the configuration utility, uncheck the *Enable HL7* checkbox and enter an IP Address of **127.0.0.1** and a Port of **3777** for the HIS Information.

NOTE

The loop back address of 127.0.0.1 and a port of 3777 are only used for test purposes when using the hl7test application to simulate the HIS server; otherwise, enter the address of the HIS server with a specific port provided by the HIS vendor.

On the *General* tab page, select *Save Config Data* and *Start Unity Network IS (or Start Unity-IS)*. At a command console on the Unity Network IS server, enter the following:

```
hl7 <space> -v
```

NOTE

Ignore any data appearing in this console.

At another console, enter the command:

```
hl7test <space> -v
```

NOTE

Any data appearing in this console can be useful.

Verbose Registry Settings (Version 4.3 and Later)

The HL7 Outbound application has two verbose registry variables that are used to aid potential communication problems. These registry settings are dynamically read by the HL7 Outbound application every minute. Therefore, Unity Network IS does not need to be stopped when these values are changed. The following verbose registry variables are found in the registry under HKEY_LOCAL_MACHINE\SOFTWARE\Marquette\HL7 and can be set to provide increasing levels of verbose logging:

- VerboseUnity – used to debug any potential communication problems between Unity Network IS and Unity monitoring devices.
- VerboseHIS – used to debug any potential communication problems between Unity Network IS and an HIS.

Each verbose registry variable can be set to four different levels of verbose logging by setting individual bits. For example, to set <*VerboseUnity*> to verbose level 1, the variable is set to 0x0001; Verbose levels 2, 3 and 4 are enabled by setting the variable to 0x0002, 0x0004 and 0x0008 respectively. All four levels can be turned on simultaneously by setting the variable to 0x000F. Verbose levels 2, 3 and 4 can only be set by modifying the variables manually using regedit. Verbose level 1 can be toggled on and off from a command window, for <*VerboseUnity*> and <*VerboseHIS*> respectively, using the following commands:

```
hl7 <space> -v
```

```
hl7 <space> -vhis
```

NOTE

Toggling verbose level 1 on and off from a command window for either variable will cause verbose bits for level 2, 3 and 4 to be toggled off for the respective variable.

The <*VerboseHIS*> registry variable can be manually set to level 3 to allow logging of communication data files. This should be done only as a temporary aid when troubleshooting connections with a new HIS vendor for the first time since these log files are not size limited in any way as they grow. The log files record all HL7 messages that occur between the HL7 Outbound application and the HIS; These communication log files are found under unit specific directory names in the C:\Program Files\Marquette\us\log directory. Each unit specific directory is pre-pended with an *hl7_* (i.e. a unit named NICU would correspond to the directory *hl7_NICU*). Each of these unit specific directories has a log file that contains log entries of all communication that has occurred between the HL7 application and the HIS, for all monitoring devices within the unit. The log file is pre-pended with an *hl7_* and post-pended with the date in the format *yyyymmdd* (e.g. hl7_NICU20020329.log).

Missed Data Span Time Configuration (Version 4.3 and Later)

The user can configure the amount of time the HL7 Outbound application will go back to retrieve missed data. This value is stored in the <*MissedDataSpanTimeInMins*> registry variable found in the registry under HKEY_LOCAL_MACHINE\SOFTWARE\Marquette\HL7. This registry setting is dynamically read by the HL7 Outbound application every minute. Therefore, Unity Network IS does not need to be stopped when this value is changed. The amount of time to span backwards from the current Unity time and collect missed data can be set to 1 to 480 minutes inclusive. The default value is 480 minutes (8 hours). This value applies across all units that have been enabled for data collection regardless of the collection intervals (e.g., 1, 5, 15, 30 or 60 minutes) that have been selected for different care units. For example, if the value has been set to 60 minutes, a unit configured to collect at 60 minute intervals would retrieve 1 time slot of missed data, 30 minutes - 2 time slots, 15 minutes - 4 time slots, 5 minutes - 12 time slots and 1 minute - 60 time slots. This value is configurable from a command line using the following:

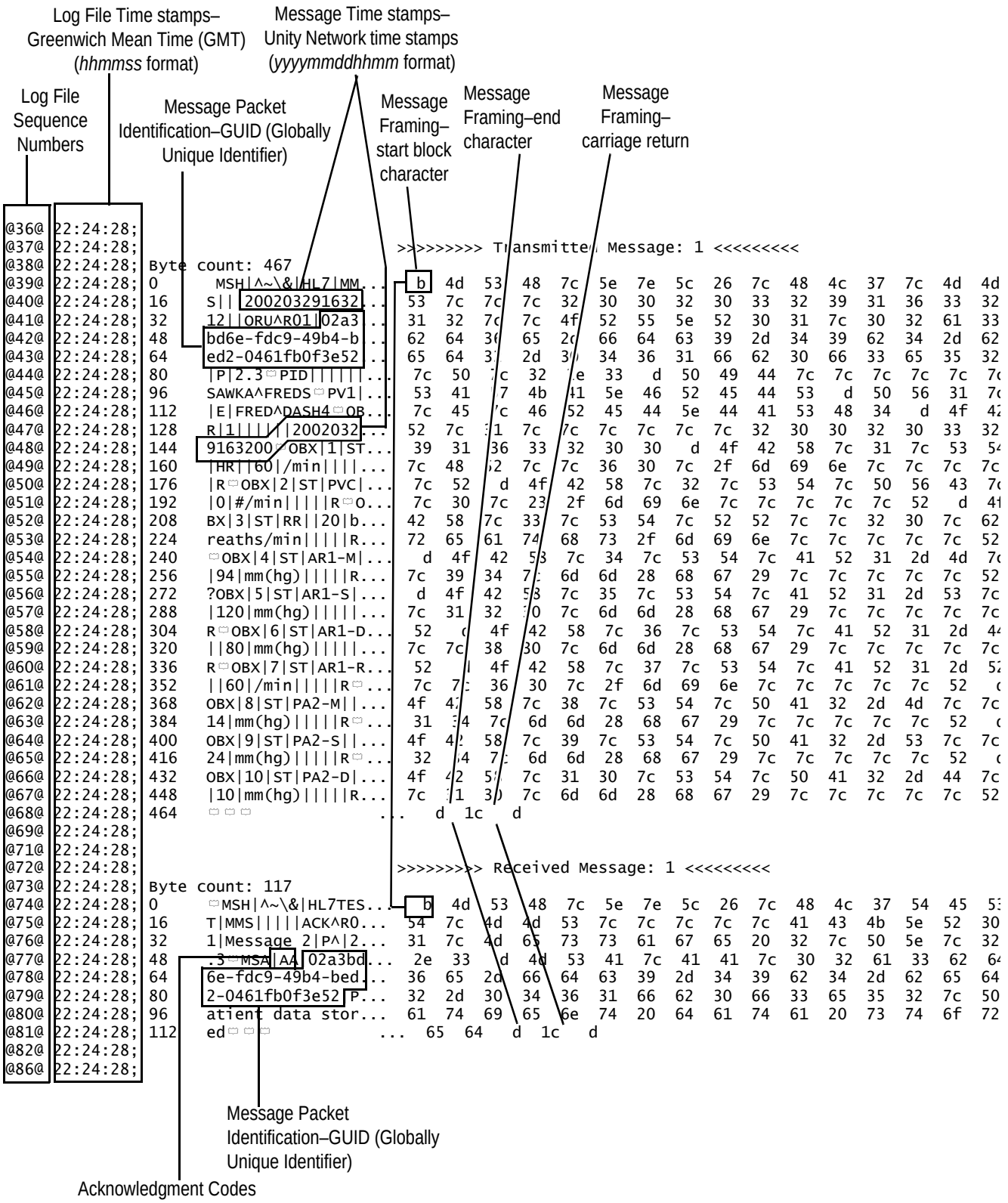
hl7 <space> -mdst <space> <value in minutes>

NOTE

If no value is provided, the default value is stored in the registry (e.g., *hl7 <space> -mdst*).

Communication Log File

On the following pages is an example of a communication log file created by setting the <*VerboseHIS*> registry variable to level 3 (0x0004) and using the hl7test application to simulate the HIS server. This example shows log files for a system configured for one minute collection intervals.



Transmit/Receive Logs

```
@87@ 22:24:28;    >>>>>>>>> Transmitted Message: 2 <<<<<<<<<
@88@ 22:24:28; Byte count: 195
@89@ 22:24:28; 0     ▯MSH|^~\&|HL7|MM...    b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  7c  4d  4d
@90@ 22:24:28; 16    S|||200203291632...  53  7c  7c  7c  32  30  30  32  30  33  32  39  31  36  33  32
@91@ 22:24:28; 32    13||ORU^R01|d628...  31  33  7c  7c  4f  52  55  5e  52  30  31  7c  64  36  32  38
@92@ 22:24:28; 48    b791-baab-496e-a...  62  37  39  31  2d  62  61  61  62  2d  34  39  36  65  2d  61
@93@ 22:24:28; 64    280-9d719f278eda...  32  38  30  2d  39  64  37  31  39  66  32  37  38  65  64  61
@94@ 22:24:28; 80    |P|2.3▯PID|||▯PV...  7c  50  7c  32  2e  33   d  50  49  44  7c  7c  7c   d  50  56
@95@ 22:24:28; 96    1||E|FRED^MDLA1▯...  31  7c  7c  45  7c  46  52  45  44  5e  4d  44  4c  41  31   d
@96@ 22:24:28; 112   OBR|1||||||20020...  4f  42  52  7c  31  7c  7c  7c  7c  7c  7c  32  30  30  32  30
@97@ 22:24:28; 128   329163200▯OBX|1|...  33  32  39  31  36  33  32  30  30   d  4f  42  58  7c  31  7c
@98@ 22:24:28; 144   ST|HR||68|/min||...  53  54  7c  48  52  7c  7c  36  38  7c  2f  6d  69  6e  7c  7c
@99@ 22:24:28; 160   |||R▯OBX|2|ST|PV...  7c  7c  7c  52   d  4f  42  58  7c  32  7c  53  54  7c  50  56
@100@ 22:24:28; 176   C||0|#/min|||||R... 43  7c  7c  30  7c  23  2f  6d  69  6e  7c  7c  7c  7c  7c  52
@101@ 22:24:28; 192   ▯▯▯           ...  d  1c   d
@102@ 22:24:28;
@104@ 22:24:28;
@105@ 22:24:28;                          >>>>>>>>> Received Message: 2 <<<<<<<<<
@106@ 22:24:28; Byte count: 117
@107@ 22:24:28; 0     ▯MSH|^~\&|HL7TES...    b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  54  45  53
@108@ 22:24:28; 16    T|MMS|||||ACK^R0...  54  7c  4d  4d  53  7c  7c  7c  7c  7c  41  43  4b  5e  52  30
@109@ 22:24:28; 32    1|Message 3|P^|2...  31  7c  4d  65  73  73  61  67  65  20  33  7c  50  5e  7c  32
@110@ 22:24:28; 48    .3▯MSA|AA|d628b7...  2e  33   d  4d  53  41  7c  41  41  7c  64  36  32  38  62  37
@111@ 22:24:28; 64    91-baab-496e-a28...  39  31  2d  62  61  61  62  2d  34  39  36  65  2d  61  32  38
@112@ 22:24:28; 80    0-9d719f278eda|P...  30  2d  39  64  37  31  39  66  32  37  38  65  64  61  7c  50
@113@ 22:24:28; 96    atient data stor...  61  74  69  65  6e  74  20  64  61  74  61  20  73  74  6f  72
@114@ 22:24:28; 112   ed▯▯▯           ...  65  64   d  1c   d
@115@ 22:24:28;
@121@ 22:25:27;
@122@ 22:25:27;                          >>>>>>>>> Transmitted Message: 3 <<<<<<<<<
@123@ 22:25:28; Byte count: 467
@124@ 22:25:28; 0     ▯MSH|^~\&|HL7|MM...    b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  7c  4d  4d
@125@ 22:25:28; 16    S|||200203291633...  53  7c  7c  7c  32  30  30  32  30  33  32  39  31  36  33  33
@126@ 22:25:28; 32    12||ORU^R01|a4bd...  31  32  7c  7c  4f  52  55  5e  52  30  31  7c  61  34  62  64
@127@ 22:25:28; 48    423f-5e62-4eb3-8...  34  32  33  66  2d  35  65  36  32  2d  34  65  62  33  2d  38
@128@ 22:25:28; 64    84e-c951b7e9c0ff...  38  34  65  2d  63  39  35  31  62  37  65  39  63  30  66  66
@129@ 22:25:28; 80    |P|2.3▯PID||||||...  7c  50  7c  32  2e  33   d  50  49  44  7c  7c  7c  7c  7c  7c
@130@ 22:25:28; 96    SAWKA^FREDS▯PV1|...  53  41  57  4b  41  5e  46  52  45  44  53   d  50  56  31  7c
@131@ 22:25:28; 112   |E|FRED^DASH4▯OB...  7c  45  7c  46  52  45  44  5e  44  41  53  48  34   d  4f  42
@132@ 22:25:28; 128   R|1||||||2002032...  52  7c  31  7c  7c  7c  7c  7c  7c  32  30  30  32  30  33  32
@133@ 22:25:28; 144   9163300▯OBX|1|ST...  39  31  36  33  33  30  30   d  4f  42  58  7c  31  7c  53  54
@134@ 22:25:28; 160   |HR||60|/min||||...  7c  48  52  7c  7c  36  30  7c  2f  6d  69  6e  7c  7c  7c  7c
@135@ 22:25:28; 176   |R▯OBX|2|ST|PVC|...  7c  52   d  4f  42  58  7c  32  7c  53  54  7c  50  56  43  7c
@136@ 22:25:28; 192   |0|#/min|||||R▯O...  7c  30  7c  23  2f  6d  69  6e  7c  7c  7c  7c  7c  52   d  4f
@137@ 22:25:28; 208   BX|3|ST|RR||20|b...  42  58  7c  33  7c  53  54  7c  52  52  7c  7c  32  30  7c  62
@138@ 22:25:28; 224   reaths/min|||||R...  72  65  61  74  68  73  2f  6d  69  6e  7c  7c  7c  7c  7c  52
@139@ 22:25:28; 240   ▯OBX|4|ST|AR1-M|...   d  4f  42  58  7c  34  7c  53  54  7c  41  52  31  2d  4d  7c
@140@ 22:25:28; 256   |94|mm(hg)|||||R...  7c  39  34  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c  52
@141@ 22:25:28; 272   ▯OBX|5|ST|AR1-S|...   d  4f  42  58  7c  35  7c  53  54  7c  41  52  31  2d  53  7c
@142@ 22:25:28; 288   |120|mm(hg)|||||...  7c  31  32  30  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c
@143@ 22:25:28; 304   R▯OBX|6|ST|AR1-D...  52   d  4f  42  58  7c  36  7c  53  54  7c  41  52  31  2d  44
@144@ 22:25:28; 320   ||80|mm(hg)|||||...  7c  7c  38  30  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c
@145@ 22:25:28; 336   R▯OBX|7|ST|AR1-R...  52   d  4f  42  58  7c  37  7c  53  54  7c  41  52  31  2d  52
@146@ 22:25:28; 352   ||60|/min|||||R▯...  7c  7c  36  30  7c  2f  6d  69  6e  7c  7c  7c  7c  7c  52   d
@147@ 22:25:28; 368   OBX|8|ST|PA2-M||...  4f  42  58  7c  38  7c  53  54  7c  50  41  32  2d  4d  7c  7c
@148@ 22:25:28; 384   14|mm(hg)|||||R▯...  31  34  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c  52   d
@149@ 22:25:28; 400   OBX|9|ST|PA2-S||...  4f  42  58  7c  39  7c  53  54  7c  50  41  32  2d  53  7c  7c
@150@ 22:25:28; 416   24|mm(hg)|||||R▯...  32  34  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c  52   d
@151@ 22:25:28; 432   OBX|10|ST|PA2-D|...  4f  42  58  7c  31  30  7c  53  54  7c  50  41  32  2d  44  7c
@152@ 22:25:28; 448   |10|mm(hg)|||||R...  7c  31  30  7c  6d  6d  28  68  67  29  7c  7c  7c  7c  7c  52
@153@ 22:25:28; 464   ▯▯▯           ...   d  1c   d
@154@ 22:25:28;
@156@ 22:25:28;
@157@ 22:25:28;                          >>>>>>>>> Received Message: 3 <<<<<<<<<
@158@ 22:25:28; Byte count: 117
@159@ 22:25:28; 0     ▯MSH|^~\&|HL7TES...    b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  54  45  53
@160@ 22:25:28; 16    T|MMS|||||ACK^R0...  54  7c  4d  4d  53  7c  7c  7c  7c  7c  41  43  4b  5e  52  30
@161@ 22:25:28; 32    1|Message 4|P^|2...  31  7c  4d  65  73  73  61  67  65  20  34  7c  50  5e  7c  32
@162@ 22:25:28; 48    .3▯MSA|AA|a4bd42...  2e  33   d  4d  53  41  7c  41  41  7c  61  34  62  64  34  32
@163@ 22:25:28; 64    3f-5e62-4eb3-884...  33  66  2d  35  65  36  32  2d  34  65  62  33  2d  38  38  34
@164@ 22:25:28; 80    e-c951b7e9c0ff|P...  65  2d  63  39  35  31  62  37  65  39  63  30  66  66  7c  50
@165@ 22:25:28; 96    atient data stor...  61  74  69  65  6e  74  20  64  61  74  61  20  73  74  6f  72
@166@ 22:25:28; 112   ed▯▯▯           ...  65  64   d  1c   d
@167@ 22:25:28;
@170@ 22:25:28;
```

```
@171@ 22:25:28;                          >>>>>>>>> Transmitted Message: 4 <<<<<<<<<
@172@ 22:25:28; Byte count: 195
@173@ 22:25:28; 0     ▯MSH|^~\&|HL7|MM...   b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  7c  4d  4c
@174@ 22:25:28; 16    S|||200203291633...  53  7c  7c  7c  32  30  30  32  30  33  32  39  31  36  33  33
@175@ 22:25:28; 32    13||ORU^R01|cc98...  31  33  7c  7c  4f  52  55  5e  52  30  31  7c  63  63  39  38
@176@ 22:25:28; 48    078e-4dc2-43ea-9...  30  37  38  65  2d  34  64  63  32  2d  34  33  65  61  2d  39
@177@ 22:25:28; 64    94b-b9ac609df799...  39  34  62  2d  62  39  61  63  36  30  39  64  66  37  39  39
@178@ 22:25:28; 80    |P|2.3▯PID|||▯PV...  7c  50  7c  32  2e  33   d  50  49  44  7c  7c  7c   d  50  5
@179@ 22:25:28; 96    1||E|FRED^MDLA1▯...  31  7c  7c  45  7c  46  52  45  44  5e  4d  44  4c  41  31   c
@180@ 22:25:28; 112   OBR|1||||||20020...  4f  42  52  7c  31  7c  7c  7c  7c  7c  7c  32  30  30  32  30
@181@ 22:25:28; 128   329163300▯OBX|1|...  33  32  39  31  36  33  33  30  30   d  4f  42  58  7c  31  7c
@182@ 22:25:28; 144   ST|HR||68|/min||...  53  54  7c  48  52  7c  7c  36  38  7c  2f  6d  69  6e  7c  7c
@183@ 22:25:28; 160   |||R▯OBX|2|ST|PV...  7c  7c  7c  52   d  4f  42  58  7c  32  7c  53  54  7c  50  56
@184@ 22:25:28; 176   C||0|#/min|||||R...  43  7c  7c  30  7c  23  2f  6d  69  6e  7c  7c  7c  7c  7c  52
@185@ 22:25:28; 192   ▯▯▯               ...   d  1c   d
@186@ 22:25:28;
@188@ 22:25:28;
@189@ 22:25:28;                          >>>>>>>>> Received Message: 4 <<<<<<<<<
@190@ 22:25:28; Byte count: 117
@191@ 22:25:28; 0     ▯MSH|^~\&|HL7TES...   b  4d  53  48  7c  5e  7e  5c  26  7c  48  4c  37  54  45  53
@192@ 22:25:28; 16    T|MMS|||||ACK^R0...  54  7c  4d  4d  53  7c  7c  7c  7c  7c  41  43  4b  5e  52  30
@193@ 22:25:28; 32    1|Message 5|P^|2...  31  7c  4d  65  73  73  61  67  65  20  35  7c  50  5e  7c  32
@194@ 22:25:28; 48    .3▯MSA|AA|cc9807...  2e  33   d  4d  53  41  7c  41  41  7c  63  63  39  38  30  37
@195@ 22:25:29; 64    8e-4dc2-43ea-994...  38  65  2d  34  64  63  32  2d  34  33  65  61  2d  39  39  34
@196@ 22:25:29; 80    b-b9ac609df799|P...  62  2d  62  39  61  63  36  30  39  64  66  37  39  39  7c  50
@197@ 22:25:29; 96    atient data stor...  61  74  69  65  6e  74  20  64  61  74  61  20  73  74  6f  72
@198@ 22:25:29; 112   ed▯▯▯            ...  65  64   d  1c   d
@199@ 22:25:29;
```

Table 3. Log File Elements

Element	Description
Log File Sequence Numbers	In the example log file, each log entry starts with a sequence number; The sequence number is shared by all log files so it will not necessarily be consecutive in any one file. Message numbering begins at one each time the Unity Network IS server is started and a byte count is recorded for every message.
Message Framing	Each message is framed using the HL7 Minimal Lower Layer Protocol. All messages begin with one start block character (0xb) and are completed by an end character (0x1c) and a carriage return (0xd). Every HL7 message in the log file has text on the left side with the actual bytes in hexadecimal to the right. There is a maximum of 16 bytes per line.
Message Time stamps	All HL7 messages transmitted by the HL7 Outbound application contain Unity Network time stamps. The Date/time of message field in the MSH segment is a Unity Network time stamp of when the message was transmitted. The time stamp in the OBR segment is the Unity Network time stamp given by the monitoring device to the trend data contained in the OBX segments that follow. Finally, each log entry has a time stamp, which is a GM time stamp. The Unity Network IS server system time is not synchronized with the Unity Network time and may be different from the Unity Network time. The user should not modify the Unity Network IS server system time since it is used as a reference internally by Unity Network IS applications.
Message Packet Identification	Every Transmitted Message should have a corresponding Received Message unless communication is aborted for some reason (e.g. a time out error waiting for an HIS acknowledge response). Each transmitted message contains a GUID (Globally Unique Identifier) in the Message control ID field of the MSH. The receiving system must echo this GUID in the Message control ID of the MSA in the returned acknowledgement response. If the received GUID does not match the transmitted GUID, the HL7 Outbound application rejects the returned response and logs the error: "Message Control ID mismatch - MsgOut ID: <GUID> MsgIn ID: <GUID>". Transmitted and received messages in the log files can always be paired properly by checking for matching GUIDs.

Table 3. Log File Elements	
Element	**Description**
Message Data	The HL7 application can retrieve up to 8 hours of missed data (see "Interrupted Connections" in the *HL7 Reference Manual*). HL7 messages that get transmitted when retrieving missed data can be very large. However, the maximum HL7 message size is always limited to less than or equal to 32K. A worst case load would be to retrieve 8 hours of missed data for 350 monitoring devices; This would impose a greater than normal network load until all data has been retrieved up to the current Unity Network time. In normal operation, the application only retrieves data for the latest configured collection interval. HL7 Outbound messages can contain either periodic of episodic data, but never both in the same message. An HL7 message can contain multiple episodic events (i.e. there are multiple OBR segments) or multiple periodic data (i.e. old data is being retrieved). The number of episodic events that are transmitted in the same message varies per collect interval depending on how many episodic events have occurred since the last collect time. Only one sample of periodic data comes over per configured collect interval (e.g. 1, 5, 15, 30 or 60) if old data is not being retrieved. For example, if the configured collection interval is set for 15 minutes, one sample of 15 minute trended data will be sent.
Acknowledgment Codes	The HL7 Outbound application also checks the Acknowledgment Code field of the MSA returned by the HIS; If it contains an AA (Application Accept) code nothing is logged and it is assumed the HIS server received and stored the data. If the field contains an AE (Application Error) or AR (Application Reject), the Text Message field is checked for a text message that is logged to aid in troubleshooting. It may also be necessary to check the HIS log files of the 3rd party system to determine why an HL7 message was rejected.
System Error Codes	The following is a list of possible error conditions that may be logged in the *hl7yyyymmdd.log* file found in the directory *C:\Program Files\Marquette\us\log\hl7* and can be used as an aid in troubleshooting communication problems: **10058** Data could not be sent or received because the socket connection was shutdown in that direction respectively. The HIS server may only be capable of receiving one message per socket connection; The -close switch can be used to force a new socket connection per message. **10061** A connection could not be made because it was refused. Verify HIS server is running. **20002** HL7 Outbound timed out waiting for an acknowledgment response.

HL7 Communication Troubleshooting

Use the HL7 Outbound application (hl7.exe) with the HL7 test application (hl7test.exe) to verify basic communication. The test application simulates a HIS server and receives HL7 messages and return acknowledgment responses. Start both applications from the command line for test purposes. Use the *-h* switch with either application at a command console to view all available command arguments as follows:

hl7 <space> -h
hl7test <space> -h

If you start either application from a command console, first check the task manager to verify there are not any instances of that application already running. You can stop either application from a command console with the *-stop* switch as follows:

hl7 <space> -stop
hl7test <space> -stop

Finally, run neither application in test mode for extended periods of time. If you use the *-v* switch with the hl7 application, communication log files generate in the *C:\Program Files\Marquette\us\log* directory that continues to grow in size indefinitely. If you use the *-a* switch with the hl7test program, data files are created in the *C:\tmp\hl7* directory and data continually appends to them.

For the test simulation procedure, see “HIS Test Simulation (HL7 Test)” in the Unity Network IS Installation & Configuration chapter.

7 Assembly Drawings

For your notes

General

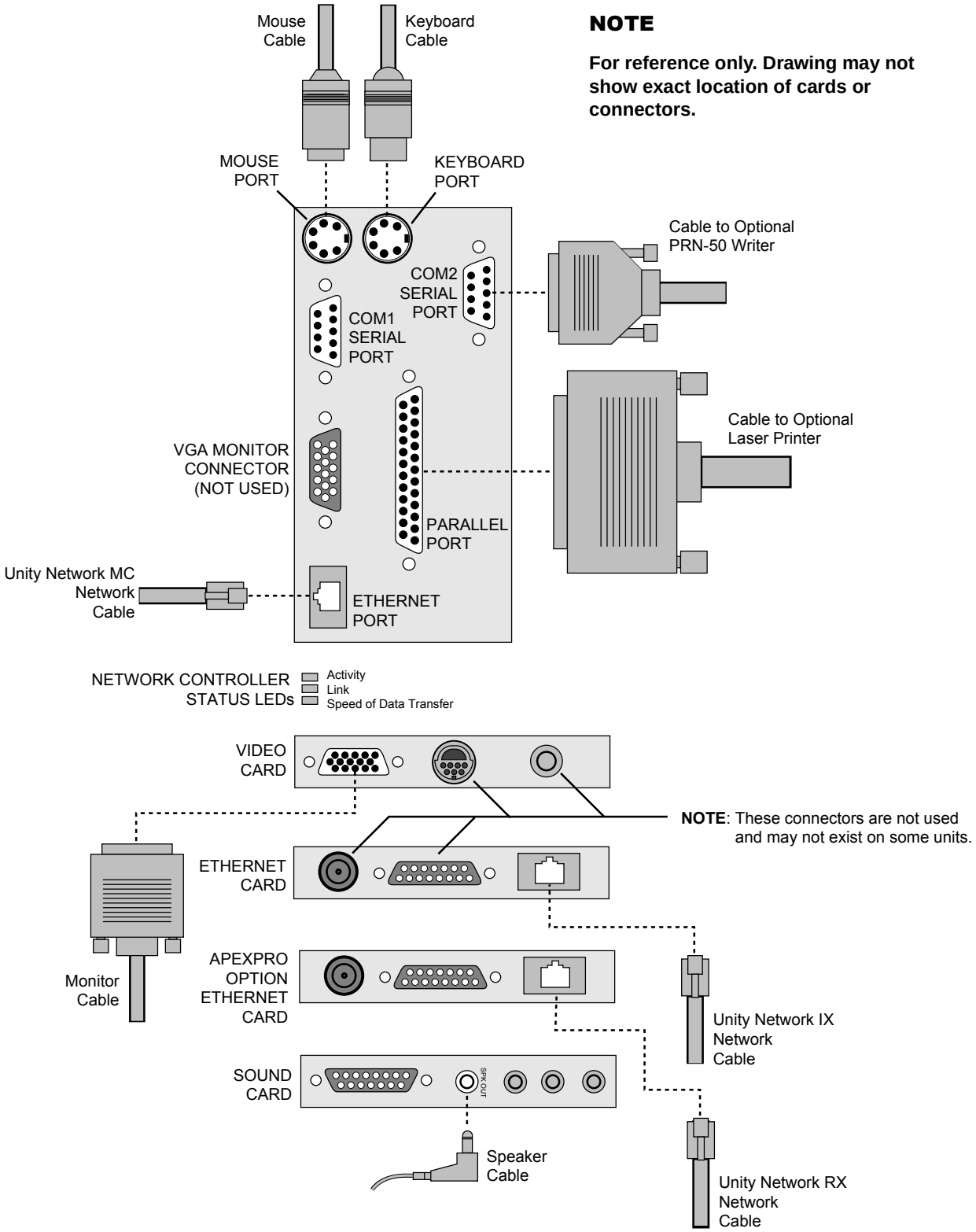
This section provides hardware connection diagrams and identification and ordering information for replacement parts. The Unity Network IS server configuration can be further enhanced with the RSVP option (Versions 4.2 and earlier). The CIC Pro server configuration can be further enhanced with the ApexPro telemetry option.

A system diagram and corresponding parts list is provided for each system configuration.

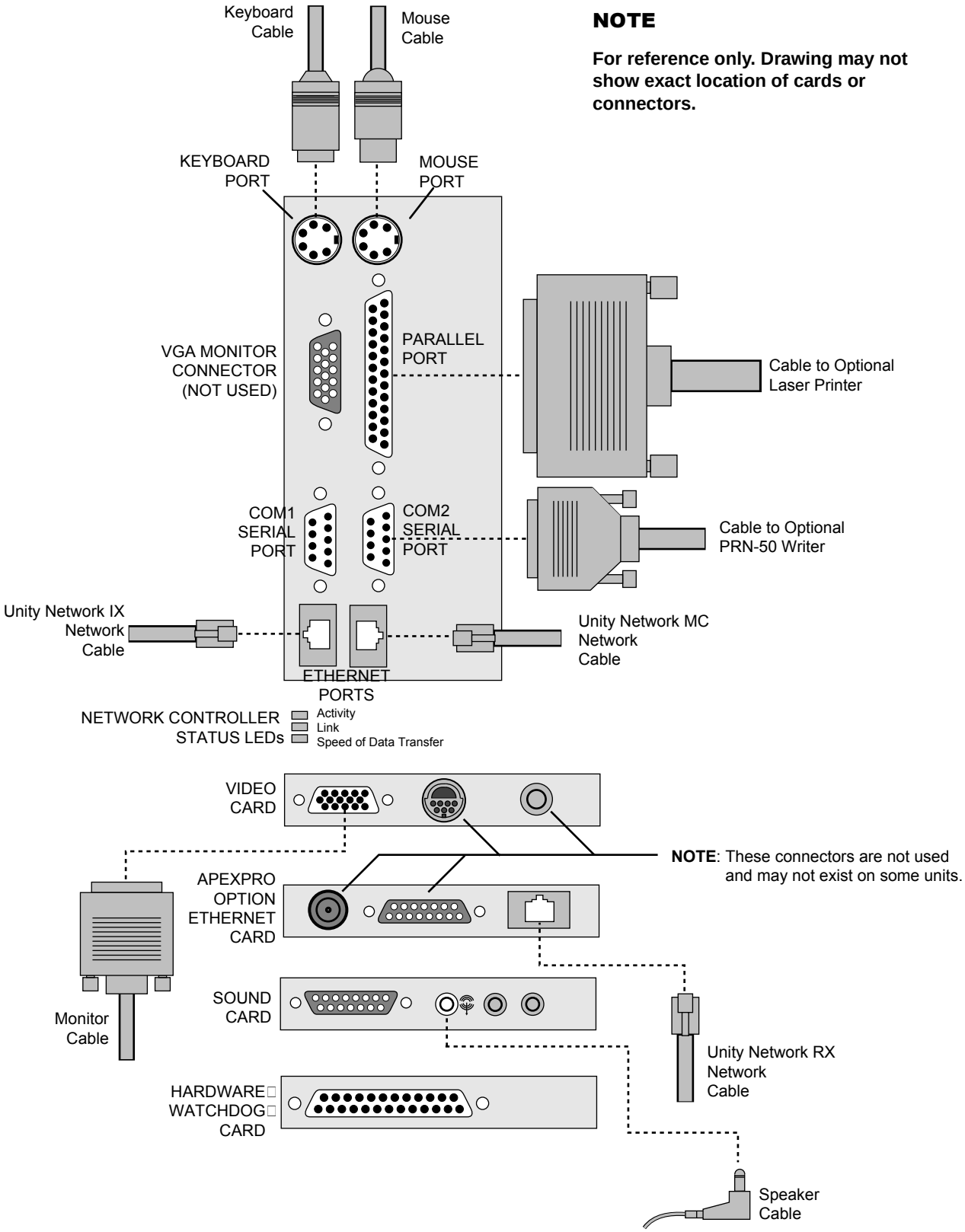
CAUTION
This assembly is extremely static sensitive and should be handled using precautions to prevent damage caused by electrostatic discharge.

Back Panel Connections

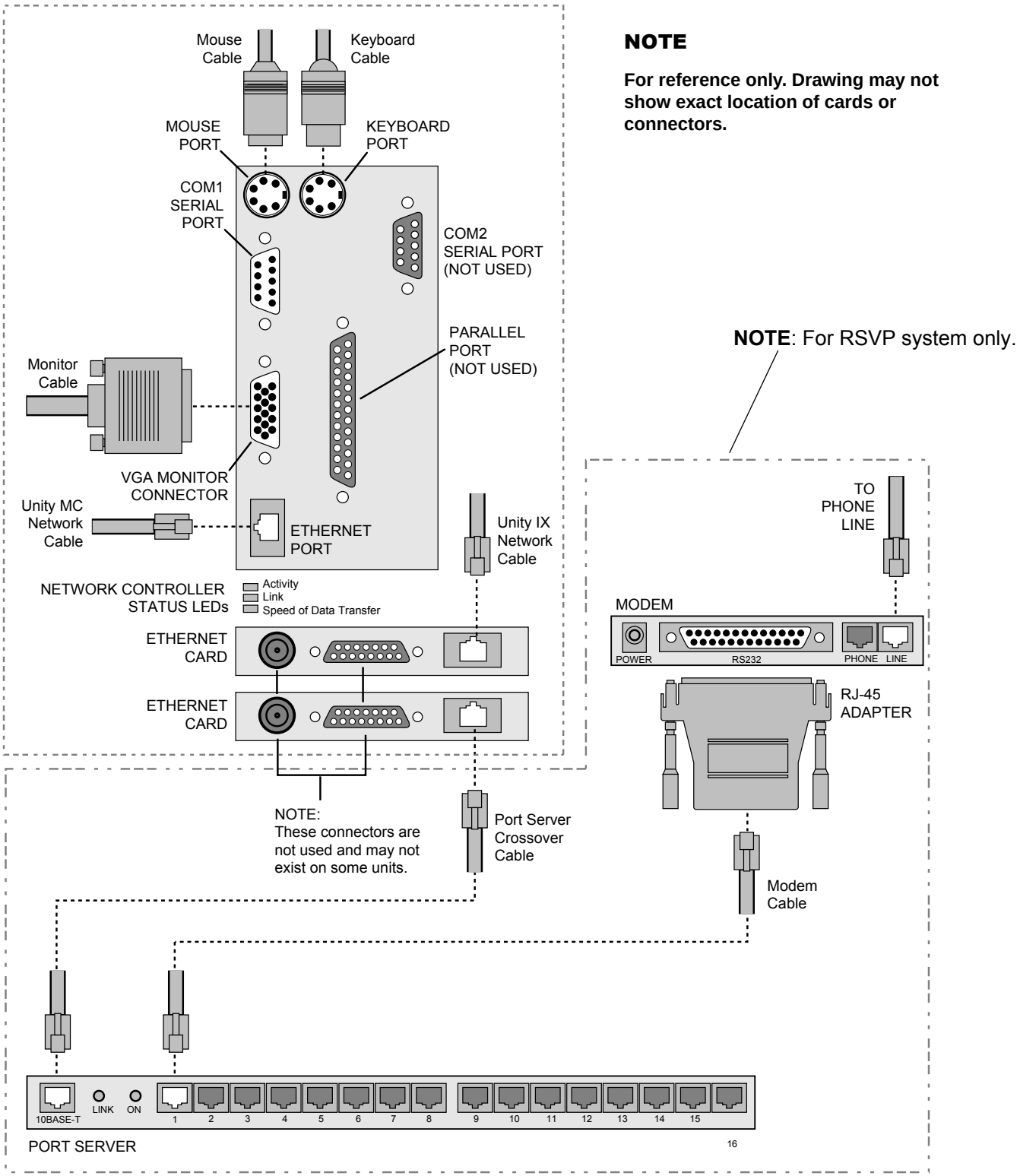
CIC Pro Nightshade Server



CIC Pro BCM Server



Unity Network IS Nightshade Server



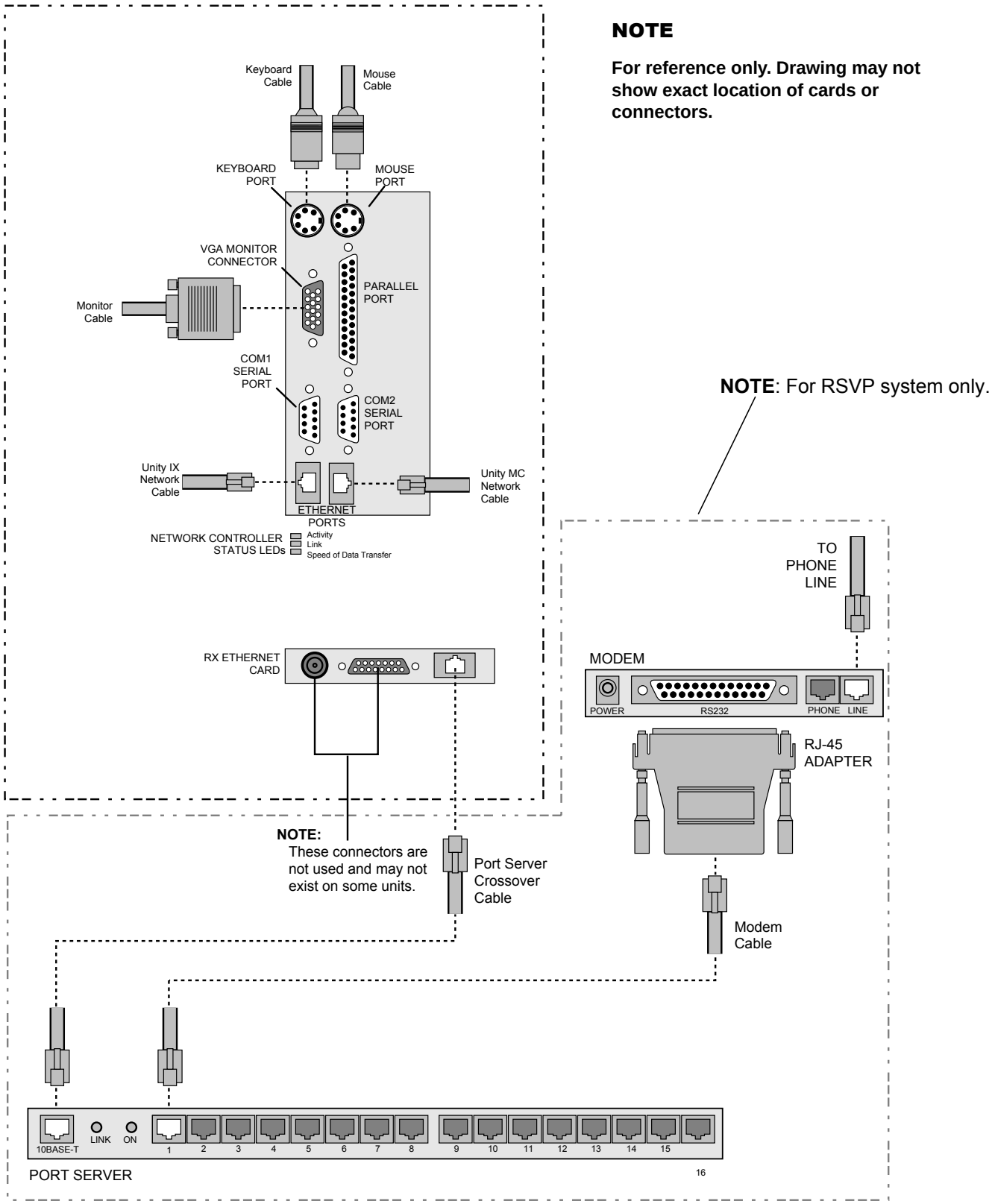
NOTE

For reference only. Drawing may not show exact location of cards or connectors.

Unity Network IS BCM Server

NOTE

For reference only. Drawing may not show exact location of cards or connectors.

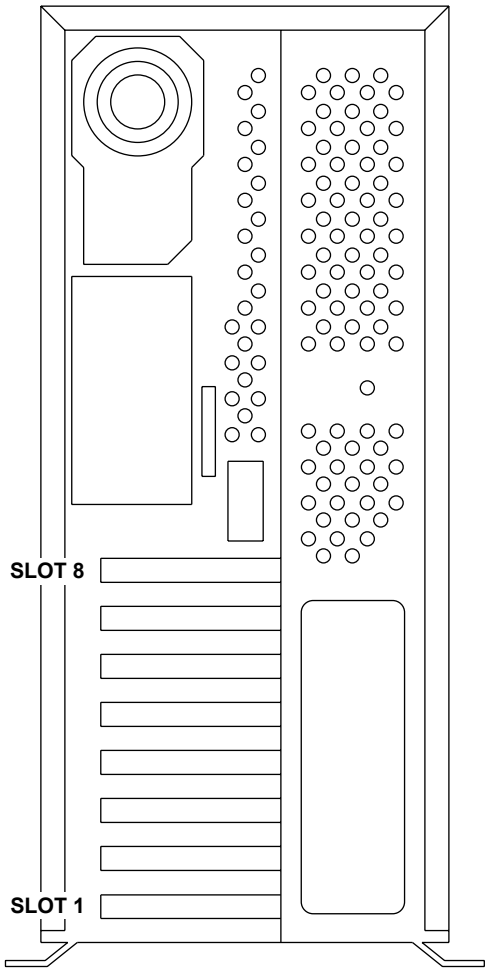


Server Tower

Nightshade Server

Use the chart below to associate software application and hardware with slot locations..

Software Applications [Use Product BOM for actual items]		**APEXPRO** 418779-009/010 2004294-002/003 ***418774-004*** 419805-002	**CIC Pro** 418779-008/012 2004294-001/004 ***418774-004*** 419805-002	**PRISM/ UNITY NETWORK IS** 418779-005 418774-005 419805-002
Base PC: Intel S0NSCL0X0KSD - • N440BX Motherboard, Columbus II Chassis, 300 Watt Power Supply, Floppy Drive, Internal Cage/Rack, Filler Panels/Plates.				
• Integrated Ethernet connection		Labeling - [NET = MC] [I.P. = 126.x.x.x]	Labeling - [NET = MC] [I.P. = 126.x.x.x]	Labeling - [NET = MC] [I.P. = 126.x.x.x]
External Drives/Bays				
Front Top 5 1/4" Bay		N/A	N/A	N/A
Front Middle 5 1/4" Bay		N/A	N/A	N/A
Front Bottom 5 1/4" Bay		CD-ROM	CD-ROM	CD-ROM
Cable Ribbon IDE (N440BX PCB: **J3G2** connector)		J3G2 to CD-ROM	J3G2 to CD-ROM	J3G2 to CD-ROM
PC Case Slots (PCI, ISA, USB…etc.)				
Back Case Slot Plate (top), #8		N/A	N/A	N/A
Back Case Slot Plate #7		N/A	N/A	N/A
Back Case Slot Plate #6		N/A	N/A	N/A
Back Case Slot Plate #5 [PCI slot #4]		sound card	sound card	N/A
Back Case Slot Plate #4 [PCI slot #3]		NIC Labeling - [NET = RX] [I.P. = 119.1.1.1]	N/A	N/A
Back Case Slot Plate #3 [PCI slot #2]		NIC Labeling - [NET = IX] [I.P. = 121.x.x.x]	NIC Labeling - [NET = IX] [I.P. = 121.x.x.x]	NIC Labeling - [NET = RS] [I.P. = 1.1.1.2]
Back Case Slot Plate #2 [PCI slot #1] , shared		Video card	Video card	NIC Labeling - [NET = IX] [I.P. = 121.x.x.x]
Back Case Slot Plate #2 [ISA slot #2] , shared		N/A	N/A	N/A
Back Case Slot Plate (bottom), #1 [ISA slot #1]		N/A	N/A	N/A
Sound/Audio cable (Sound card to CD)		Remove - not used	Remove - not used	N/A
WOL cable (Wake On LAN)		Remove - not used	Remove - not used	Remove - not used
CPU Additions (BIOS dependencies)				
CPU #1		Primary CPU Slot	Primary CPU Slot	Primary CPU Slot
CPU #2		Secondary Slot	N/A	Secondary Slot
CPU Processor Termination (1-CPU only)		N/A	Secondary Slot	N/A
CPU Fan cables, if applicable		#1: J6E1, #2: J8F1	J6E1	#1: J6E1, #2: J8F1

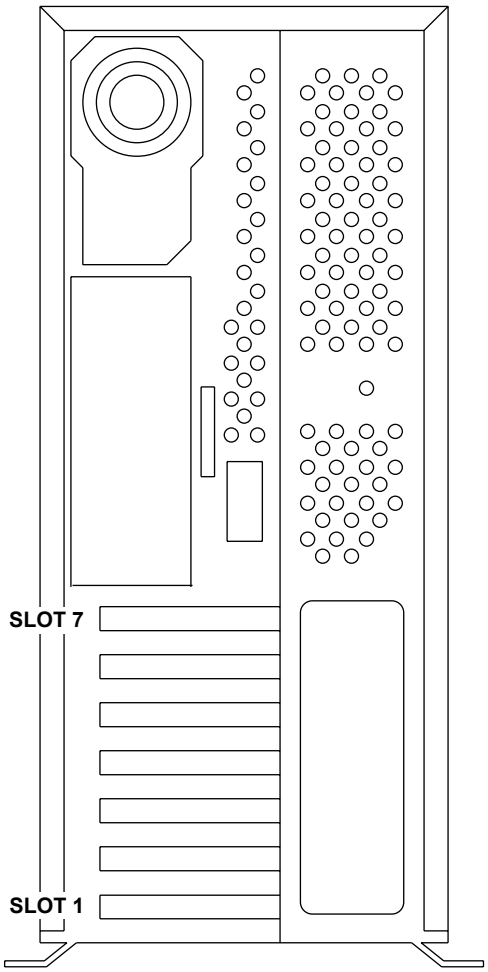


REAR VIEW OF TOWER

BCM Server

Use the chart below to associate software application and hardware with slot locations..

Software Applications [Use Product BOM for actual items]	**APEXPRO**	**CIC Pro**	**PRISM/ UNITY NETWORK IS**
Base PC: Intel S0NSCL0X0KSD - • I440BX Motherboard, Systium Chassis, 300 Watt Power Supply, Floppy Drive, Internal Cage/Rack, Filler Panels/Plates.			
• Integrated Ethernet connections	Labeling - [NET = MC] [I.P. = 126.x.x.x]	Labeling - [NET = MC] [I.P. = 126.x.x.x]	Labeling - [NET = MC] [I.P. = 126.x.x.x]
	Labeling - [NET = IX] [I.P. = 121.x.x.x]	Labeling - [NET = IX] [I.P. = 121.x.x.x]	Labeling - [NET = IX] [I.P. = 121.x.x.x]
External Drives/Bays			
Front Top 5 1/4" Bay	N/A	N/A	N/A
Front Middle 5 1/4" Bay	CD-ROM	CD-ROM	CD-ROM
Front Bottom 5 1/4" Bay	N/A	N/A	N/A
Front Top 3 1/2" Bay	3 1/2" Floppy Drive	3 1/2" Floppy Drive	3 1/2" Floppy Drive
Front Bottom 3 1/2" Bay	N/A	N/A	N/A
Cable Ribbon IDE (I440BX PCB: **J3G2** connector)	J3G2 to CD-ROM	J3G2 to CD-ROM	J3G2 to CD-ROM
Internal Drives/Bays			
Front Top Hard Drive Bay	Hard Drive	Hard Drive	Hard Drive
Front Bottom Hard Drive Bay	N/A	N/A	N/A
PC Case Slots (PCI, ISA, USB…etc.)			
Back Case Slot Plate (top), #7	Video card	Video card	N/A
Back Case Slot Plate #6	NIC Labeling - [NET = RS] [I.P. = 1.1.1.2]	NIC Labeling - [NET = RS] [I.P. = 1.1.1.2]	NIC Labeling - [NET = RS] [I.P. = 1.1.1.2]
Back Case Slot Plate #5 [PCI slot #4]	sound card	sound card	N/A
Back Case Slot Plate #4 [PCI slot #3]	Hardware Watchdog card	Hardware Watchdog card	N/A
Back Case Slot Plate #3 [PCI slot #2]	N/A	N/A	N/A
Back Case Slot Plate #2 [ISA slot #2] , shared	N/A	N/A	N/A
Back Case Slot Plate (bottom), #1 [ISA slot #1]	N/A	N/A	N/A
Sound/Audio cable (Sound card to CD)	Remove - not used	Remove - not used	N/A
WOL cable (Wake On LAN)	Remove - not used	Remove - not used	Remove - not used
CPU Additions (BIOS dependencies)			
CPU #1	Primary CPU Slot	Primary CPU Slot	Primary CPU Slot
CPU #2	Secondary Slot	N/A	Secondary Slot
CPU Processor Termination (1-CPU only)	N/A	Secondary Slot	N/A
CPU Fan cables, if applicable	#1: J6E1, #2: J8F1	J6E1	#1: J6E1, #2: J8F1



REAR VIEW OF TOWER

CIC Pro System Block Diagrams

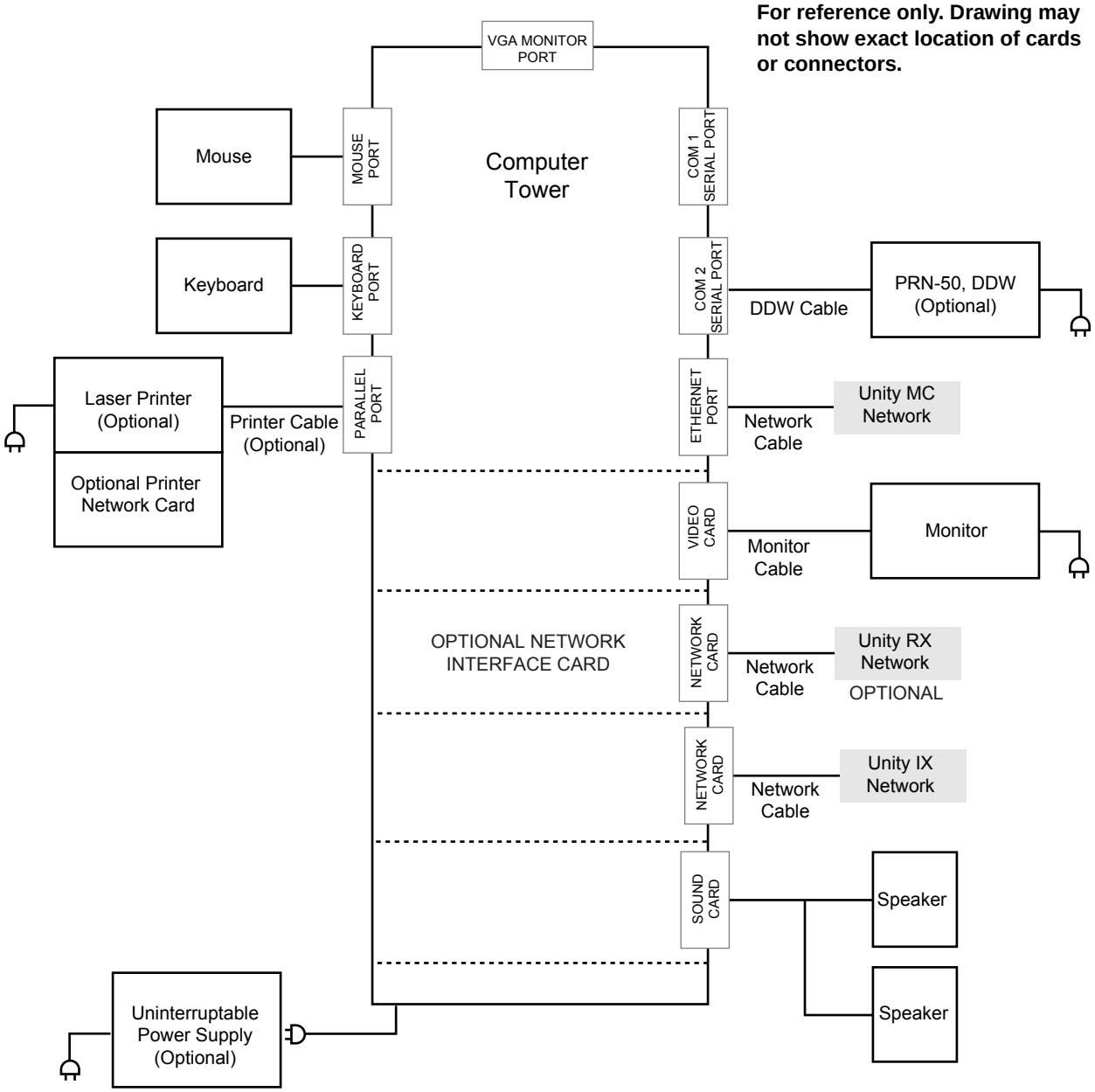
Nightshade Server

NOTE

When replacing an optional NIC (Network Interface Card), all bedside monitors need to be rebooted (turned off for 1 minute and then turned back on). This allows for proper communication between the CIC Pro and the bedsides.

NOTE

For reference only. Drawing may not show exact location of cards or connectors.



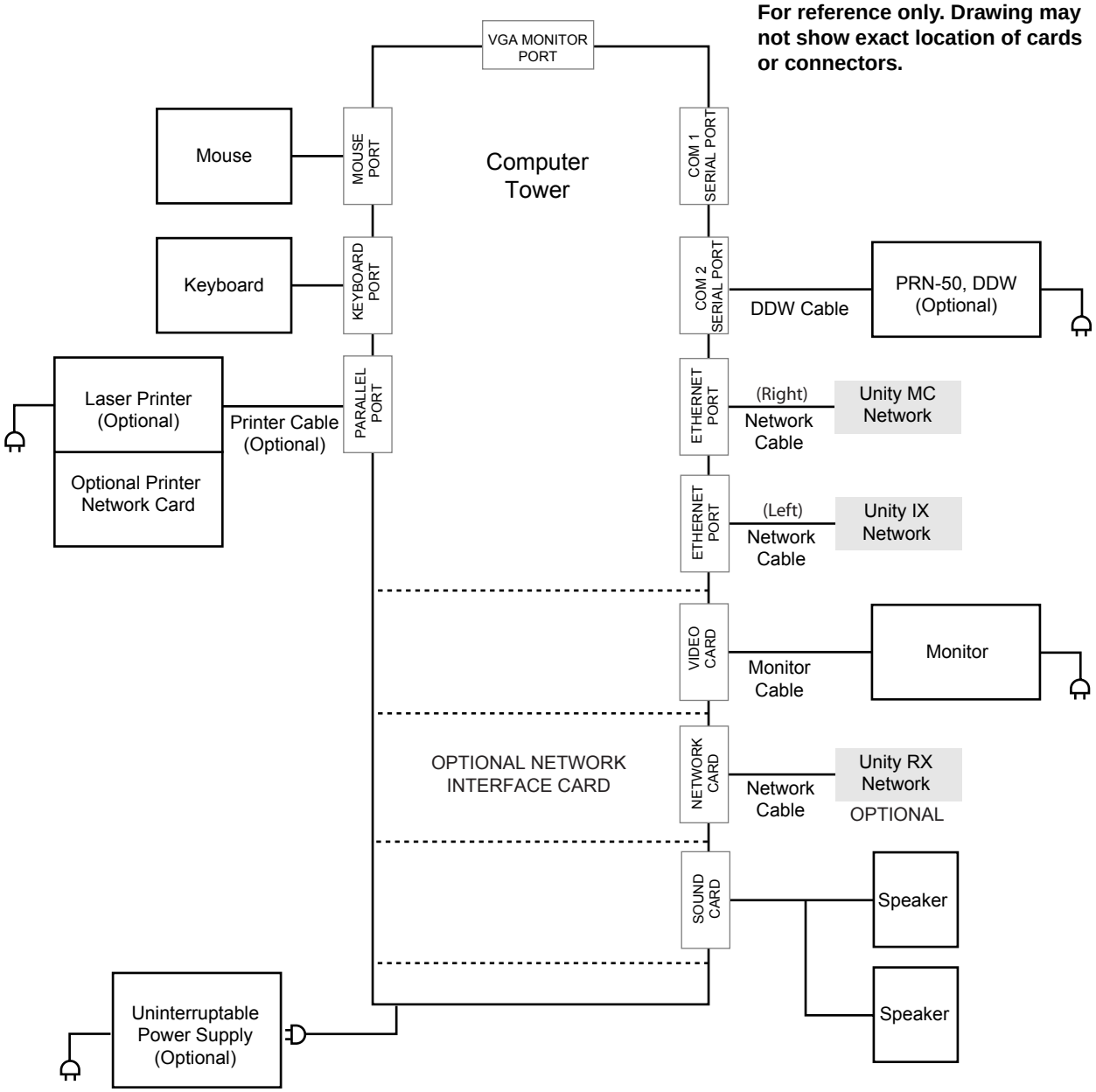
BCM Server

NOTE

When replacing an optional NIC (Network Interface Card), all bedside monitors need to be rebooted (turned off for 1 minute and then turned back on). This allows for proper communication between the CIC Pro and the bedsides.

NOTE

For reference only. Drawing may not show exact location of cards or connectors.



CIC Pro Parts Lists

CIC Nightshade Server

Item Number	Item Description	Qty
418774-926	INTEL N440BX SERVER BOARD WITH BIOS V14. DOES NOT INCLUDE: ■ 350MHZ PROCESSOR MODULES OR 2ND PROCESSOR TERMINATOR BD ■ MEMORY AND ADD ON CIRCUIT BOARDS	1
421948-001	BOXED INTEL PII 350MHZ/512 PROCESSOR WITH FAN ASSEMBLY.	1
421774-907	INTEL 300 WATT POWER SUPPLY	1
421948-001	SIMPLE TECHNOLOGY SDRAM DIMM 8X72 10NS 64MB (ST1728118UD1-10AVG)	2
418774-922	3.15" FLOPPY DISK DRIVE	1
200433-001	DISK DRIVE CDROM IDE 48X SONY (CDU482-110/10)	1
2009058-001	HARDRIVE WITH CIC AND APEXPRO SOFTWARE. NOTE: SPECIFY SOFTWARE VERSION WHEN ORDERING.	1
2001640-007	68P SCSI 5 CONN 3FT RIBBON INTERFACE CABLE W/TERMINATION.	1
418774-911	FRONT 120 MM FAN	2
420403-001	LOGITEC MOUSE	1
2001323-001	KOSS HDM/5 COMPUTER SPEAKERS	1
414582-103	3COM 3C905B-TX 10/100 MHZ FAST ETHERLINK XL PCI ETHERNET CARD RJ45	1
419819-002	ATI EXPERT 98 PCI VIDEO ACCELERATOR CARD; 8MB; HIGH RES: 2D 1600X1200 @75HZ W 16.7 MILLION COLORS; @ 85HZ W 65K COLORS; 3D 1280X1024 MILLION COLORS; 3D 1600X1200 65K COLORS. NOTE: CIC USES 1280X1024 @75HZ.	1
2005471-001	CREATIVE LABS CT4815 PCI SOUND BLASTER VIDEO CARD.	1
2004766-001	AC POWER CORD CLAMP KIT	1
2001263-001	BRACKET SPEAKER CONN CIC	1
45000-403	PH 4-40X3/16 SCREW	1
418836-003	MS WIN NT 4.0 DOMESTIC/INTL. LICENSE	1
This Additional Part with Full Disclosure Option		
2001640-005	SEAGATE TECH. ST318275LW 18GB ULTRA-2 SCSI DRIVE. NOTE: MUST USE A SCSI CABLE WITH BUILT IN TERMINATION.	1

CIC BCM Server

Item Number	Item Description	Qty
2001263-001	BRACKET SPEAKER CONN CIC	1
2004766-001	KIT UPGRADE AC POWER CORD CLAMP	1
2012217-XXX	KEYBOARD KIT (see CIC Keyboard Kit table)	1
422310-001	MOUSE PAD GE	1
2006550-001	ADAPTER DB9F TO RJ-45	1
418335-001	CABLE ASSEMBLY RJ45 WHITE 5FT	1
45000-403	SCREW SEMS PH 4-40X3/16	1
2015873-001	HD SCSI 36 GB 10,000 RPM 68 PIN CONNECT	1
2012144-001	IC PRCSR 850 MHZ 256K 100FSB PENTIUM III	2
2005083-003	MOTHERBOARD NEX6320A-25BB DUAL-CPU 440BX	1
2005471-001	CARD SOUND BLASTER 16 PCI	1
2005992-005	MEMORY DIMM 128MB PC-133 SDRAM ECC	2
2007021-001	ADPTR NETWORK 10/100 PILA8460C3	1
2007022-001	ADPTR PCI WATCHDOG	1
2007249-001	DISK DRIVE CDROM IDE 52X SONY	1
2007645-001	CHAS COMPUTER ATX MID TOWER 300W PS	1
2011694-001	ASSY TEAC FLOPPY 3.5 W/BIEGE BEZEL	1
2013654-001	VIDEO CARD MATROX G450 AGP OEM	1
2007646-001	CABLE RIBBON SCSI ULTRA2 3 CONN 68P	1
2007645-002	HARN POWER BUTTON FOR SYSTIUM CHASSIS	1
2011696-002	HTSK FAN FOR PENTIUM III	2
420403-001	MOUSE 2 BUTTON CE LOGITECH	1
418836-003	LIC MS WIN NT WS 4.0 DOM/INTL	1

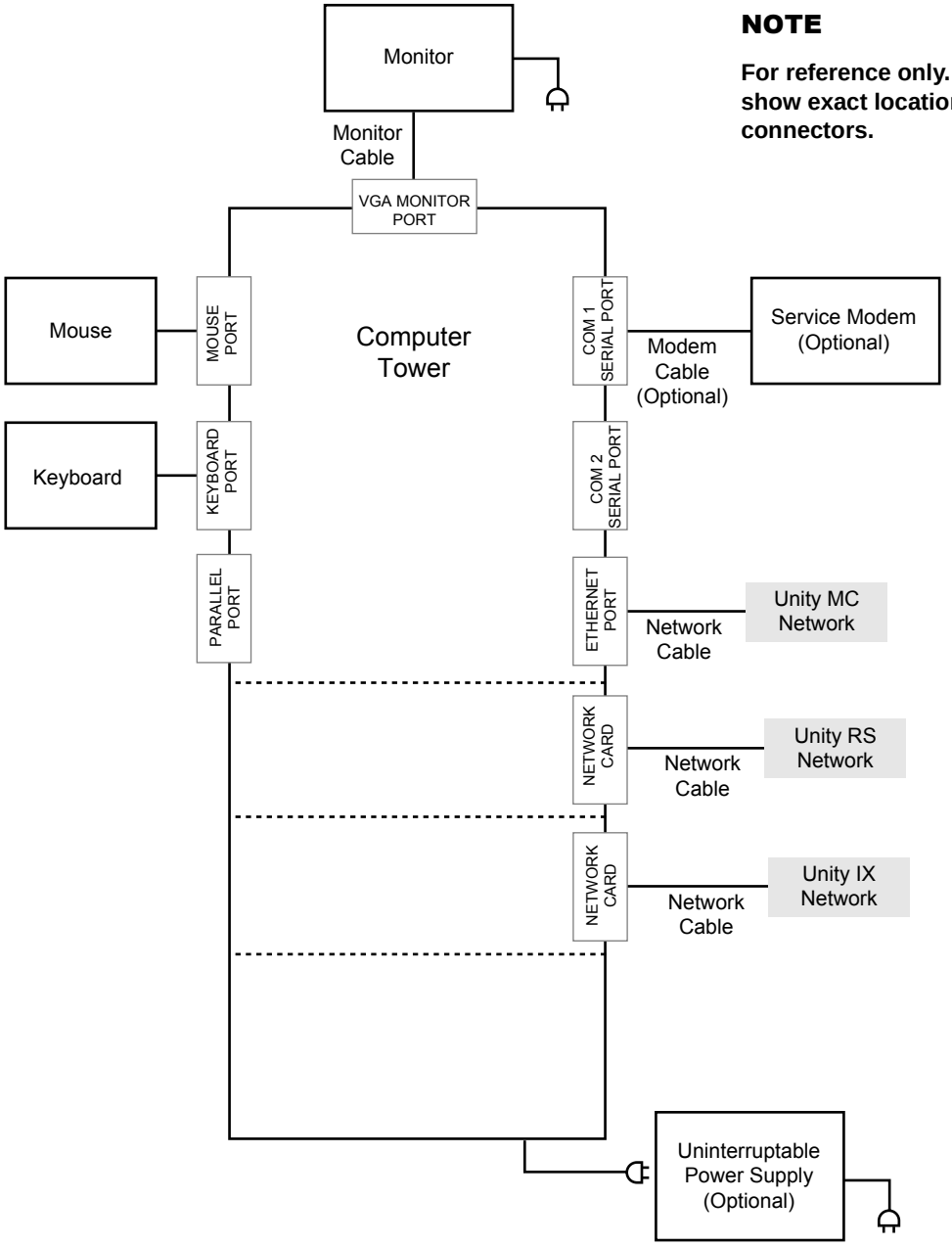
Item Number	Item Description	Qty
2011097-005	KIT SERVICE CIC V2.3 GHOST IMAGE	1
2011097-004	KIT SERVICE CIC V2.4 GHOST IMAGE	1
2011097-003	KIT SERVICE CIC V3.0.2 GHOST IMAGE	1
2011097-025	KIT SERVICE CIC V3.0.2 W/DRIVERS GHOST IMAGE	1
2011097-045	KIT SERVICE CIC V3.1 GHOST IMAGE	1
2011097-026	KIT UPGRADE CIC PRO V3.1/APEXPRO ENG	1
2011097-027	KIT UPGRADE CIC PRO V3.1/APEXPRO GER	1
2011097-028	KIT UPGRADE CIC PRO V3.1/APEXPRO FRE	1
2011097-029	KIT UPGRADE CIC PRO V3.1/APEXPRO ITL	1
2011097-030	KIT UPGRADE CIC PRO V3.1/APEXPRO SWE	1
2011097-031	KIT UPGRADE CIC PRO V3.1/APEXPRO SPA	1
2011097-032	KIT UPGRADE CIC PRO V3.1/APEXPRO DUT	1
2011097-033	KIT UPGRADE CIC PRO V3.1/APEXPRO DAN	1
2011097-034	KIT UPGRADE CIC PRO V3.1/APEXPRO NOR	1
2011097-035	KIT UPGRADE CIC PRO V3.1/APEXPRO POR	1
2011097-036	KIT UPGRADE CIC PRO V3.1/APEXPRO CHI	1
2011097-037	KIT UPGRADE CIC PRO V3.1/APEXPRO HUN	1
2011097-038	KIT UPGRADE CIC PRO V3.1/APEXPRO POL	1
2011097-039	KIT UPGRADE CIC PRO V3.1/APEXPRO RUS	1
2011097-040	KIT UPGRADE CIC PRO V3.1/APEXPRO LAT	1
2011097-041	KIT UPGRADE CIC PRO V3.1/APEXPRO CZE	1
2011097-042	KIT UPGRADE CIC PRO V3.1/APEXPRO GRE	1
2011097-043	KIT UPGRADE CIC PRO V3.1/APEXPRO EST	1
2011097-044	KIT UPGRADE CIC PRO V3.1/APEXPRO JPN	1

CIC Keyboard Kit Table

Item Number	Item Description	Item Number	Item Description
2012217-001	KYBD KIT CIC PS-2 GERMAN	2012217-010	KYBD KIT CIC PS-2 NORWEGIAN
2012217-002	KYBD KIT CIC PS-2 FRENCH	2012217-011	KYBD KIT CIC PS-2 BELGIAN
2012217-003	KYBD KIT CIC PS-2 ITALIAN	2012217-012	KYBD KIT CIC PS-2 SWISS
2012217-004	KYBD KIT CIC PS-2 SPANISH	2012217-013	KYBD KIT CIC PS-2 SI/HR/YU/B
2012217-005	KYBD KIT CIC PS-2 SWE-FIN	2012217-014	KYBD KIT CIC PS-2 ENG-UK
2012217-006	KYBD KIT CIC PS-2 DUTCH	2012217-015	KYBD KIT CIC PS-2 ENG-US
2012217-007	KYBD KIT CIC PS-2 JAPANESE	2012217-016	KYBD KIT CIC PS-2 HUNGARIAN
2012217-008	KYBD KIT CIC PS-2 CHINESE	2012217-017	KYBD KIT CIC PS-2 PORTUGUESE
2012217-009	KYBD KIT CIC PS-2 DANISH	2012217-018	KYBD KIT CIC PS-2 BRAZIL-PORTUGUESE

Unity Network IS System Block Diagrams

Nightshade Server Basic (Software Version 3.0)



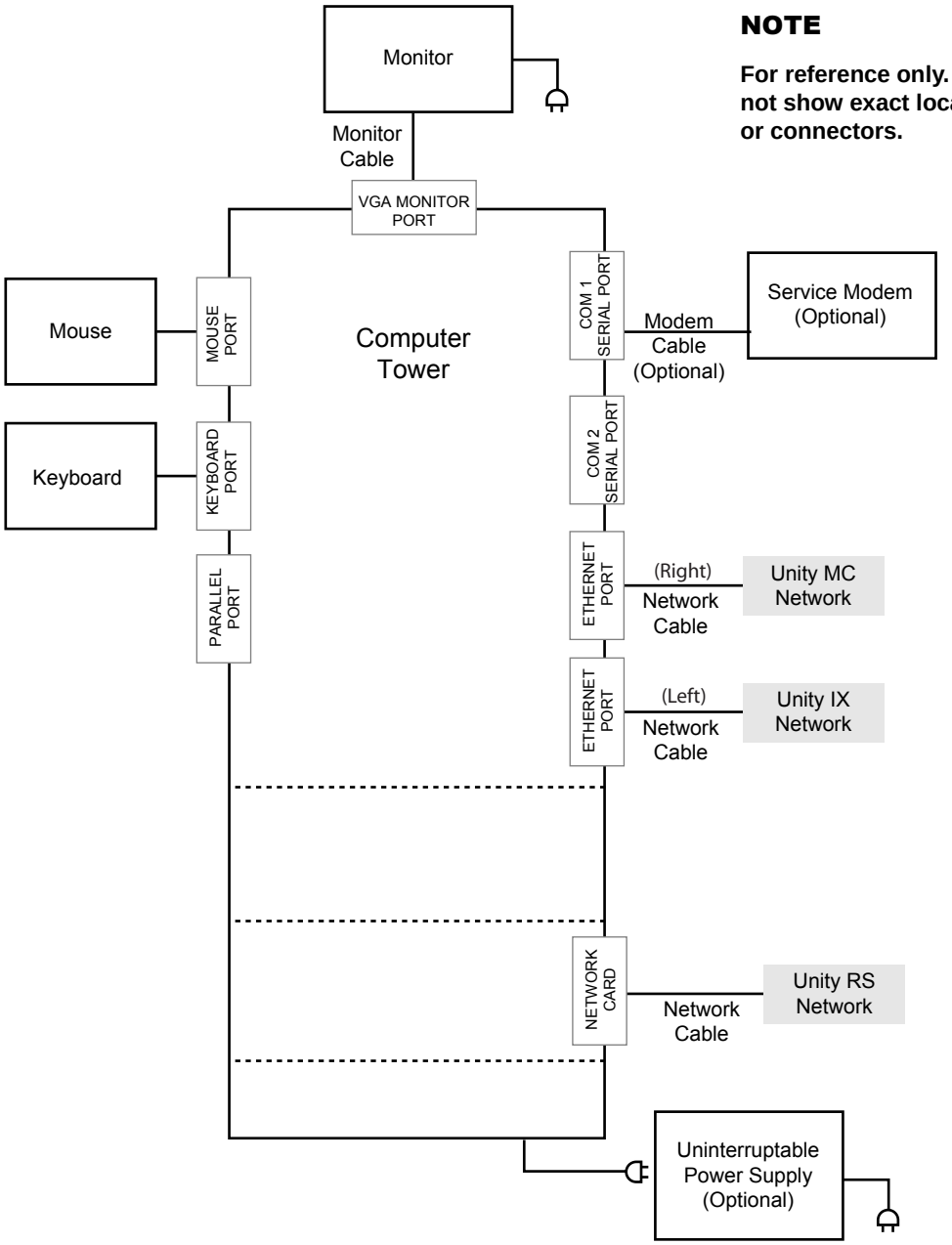
NOTE

For reference only. Drawing may not show exact location of cards or connectors.

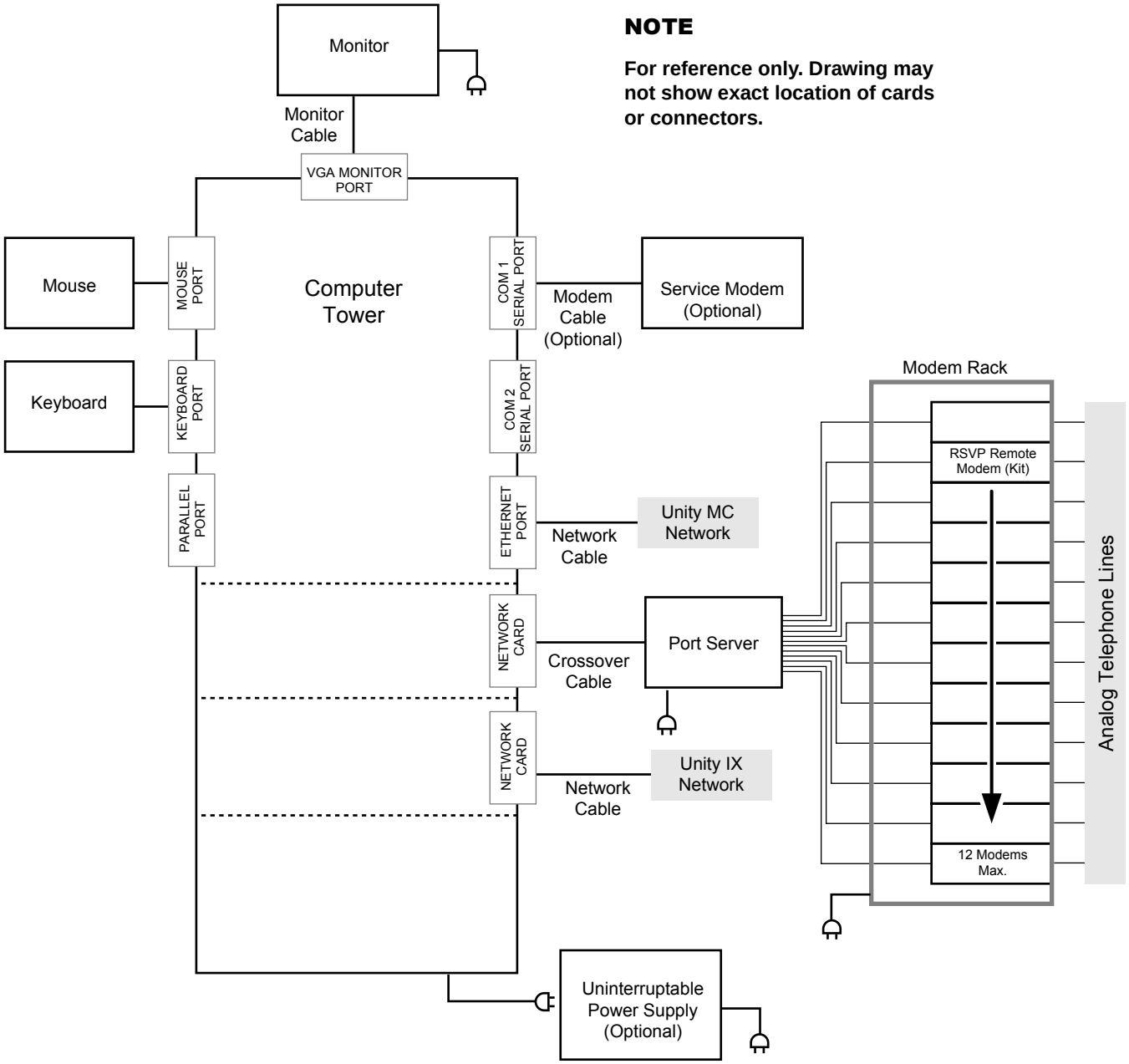
BCM Server Basic (Software Version 4.1, 4.2, and 4.3)

NOTE

For reference only. Drawing may not show exact location of cards or connectors.



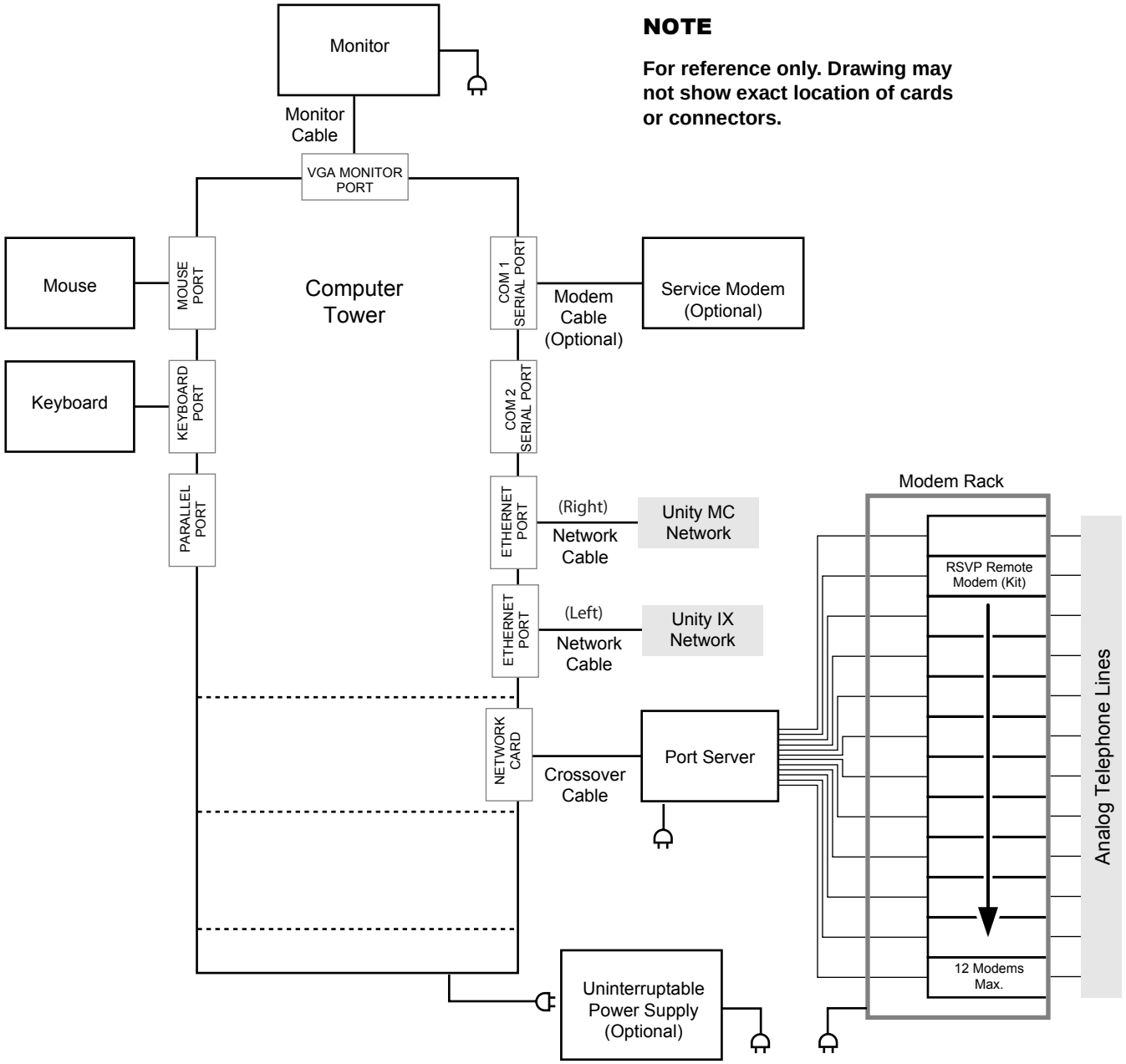
Nightshade Server with RSVP (Software Version 3.0)



NOTE

For reference only. Drawing may not show exact location of cards or connectors.

BCM Server with RSVP (Software Version 4.1 and 4.2)



NOTE

For reference only. Drawing may not show exact location of cards or connectors.

Unity Network IS Parts Lists

Unity Network IS Assembly Nightshade Server (V3.0)

Item Number	Item Description	Qty
418774-926	INTEL N440BX SERVER BOARD WITH BIOS V14. DOES NOT INCLUDE: ■ 350MHZ PROCESSOR MODULES OR 2ND PROCESSOR TERMINATOR BD ■ MEMORY AND ADD ON CIRCUIT BOARDS	1
421948-001	BOXED INTEL PII 350MHZ/512 PROCESSOR WITH FAN ASSEMBLY.	1
421774-907	INTEL 300 WATT POWER SUPPLY	1
418774-922	3.15” FLOPPY DISK DRIVE	1
200433-001	DISK DRIVE CDROM IDE 48X SONY (CDU482-110/10)	1
2001640-007	68P SCSI 5 CONN 3FT RIBBON INTERFACE CABLE W/TERMINATION.	1
418774-911	FRONT 120 MM FAN	2
420403-001	LOGITEC MOUSE	1
2001323-001	KOSS HDM/5 COMPUTER SPEAKERS	1
2004766-001	AC POWER CORD CLAMP KIT	1
45000-403	PH 4-40X3/16 SCREW	1
418836-003	MS WIN NT 4.0 DOMESTIC/INTL. LICENSE	1

Unity Network IS Assembly BCM Server—PN 2008540-001

Item Number	Item Description		Qty
2007024-003	COMPUTER UNITY IS BCM	(SN _ _**EY**_ _ _ _G)	1
2007024-009		(SN _ _**EX**_ _ _ _G)	1
2004766-001	KIT UPGRADE AC POWER CORD CLAMP		1
421670-XXX	KEYBOARD KIT (see Unity Network IS Keyboards table)		1
408230-008	LABEL CE MARK		1
415043-002	LABEL PRESCRIPTION DEVICE		1
2007786-008	NAMEPLATE 20MM GE LOGO DK BLUE		2
45000-403	SCREW SEMS PH 4-40X3/16		1
2006705-001	LICENSE CODE MAS GHOST SOFTWARE		1
418836-003	LIC MS WIN NT WS 4.0 DOM/INTL		1
2002966-004	CD-ROM UNITY-IS V4.2 SW		1
Country dependant	POWER CORD		1
420403-001	MOUSE 2 BUTTON CE		1
422310-001	MOUSE PAD GE		1

Unity Network IS Computer Assembly—PN 2007024-003 (SN _ _**EY**_ _ _ _G)

Item Number	Item Description	Qty
2005680-002	HD UNITY-IS SW V4.1 MULTI	1
2012920-001	HD REPLACEMENT KIT (V4.2, RSVP COMPATIBLE)	
2012920-002	HD REPLACEMENT KIT (V4.3, NOT COMPATIBLE WITH RSVP)	
2004348-007	IC PRCSR PENTIUM3 866MHZ FC370	2
2005083-002	MOTHERBOARD NEX6320A DUAL-CPU 440BX	1
2005992-005	MEMORY DIMM 128MB PC-133 SDRAM ECC	2
2007021-001	ADPTR NETWORK 10/100 PILA8460C3	1
2007249-001	DISK DRIVE CDROM IDE 52X SONY	1
2007645-001	CHAS COMPUTER ATX MID TOWER 300W PS	1
419559-001	DRIVE FLOPPY 3.5	1
2007646-001	CABLE RIBBON SCSI ULTRA2 3 CONN 68P	1
2007645-002	HARN POWER BUTTON FOR SYSTIUM CHASSIS	1
These Additional Parts with RSVP Option		
2002241-001	MODEM MULTITECH ANALOG 56K GLOBAL 220V	1
418508-001	MNL RSVP OP/SERV	1
418765-001	MODEM CABLE DB9F/DB25M 10FT	1
418781-001	KIT RSVP SERVER	1
418768-001	MODEM RACK 12 POSITION	1
422705-001	PORT SERVER W/UNIV PWR SUPPLY	1
418772-001	CROSSOVER CABLE CAT 5 25FT	1
418801-002	DISK RSVP V4.0	1
411642-001	KIT MEDIA 3.5IN 1.44MB DISK	1
418800-002	CODE RSVP CLIENT V4.0	1
418930-001	KIT RSVP MODEM	1
418773-002	CABLE RJ45 TO RJ45 - 7FT LONG	1
422671-001	RJ45/DB25 CONVERTER DTE	1
These Additional Parts HL7 Option		
2001099-015	MNL REF PRISM HL7 OUTBOUND V4.0	1
2001609-001	LIC PRISM HL7 OUTBOUND	1

Item Number	Item Description	Qty
2005680-002	HD UNITY-IS V4.1 SW MULTI	1
45000-603	SCREW SEMS PH 6-32 X 3/16 PHIL	1

Unity Network IS Computer Assembly—PN 2007024-009 (SN _ _**EX**_ _ _ _G)

Item Number	Item Description	Qty
2005680-003	HD UNITY-IS SW V4.2 MULTI	1
2012920-001	HD REPLACEMENT KIT (V4.2, RSVP COMPATIBLE)	
2012920-002	HD REPLACEMENT KIT (V4.3, NOT COMPATIBLE WITH RSVP)	
2012144-001	IC PRCSR 850 MHZ 256K 100FSB PENTIUM III	2
2005083-003	MOTHERBOARD NEX6320A-25BB DUAL-CPU 440BX	1
2005992-005	MEMORY DIMM 128MB PC-133 SDRAM ECC	2
2007021-001	ADPTR NETWORK 10/100 PILA8460C3	1
2007249-001	DISK DRIVE CDROM IDE 52X SONY	1
2007645-001	CHAS COMPUTER ATX MID TOWER 300W PS	1
2011694-001	ASSY TEAC FLOPPY 3.5 W/BIEGE BEZEL	1
2007646-001	CABLE RIBBON SCSI ULTRA2 3 CONN 68P	1
2007645-002	HARN POWER BUTTON FOR SYSTIUM CHASSIS	1
2011696-002	HTSK FAN FOR PENTIUM III	2
These Additional Parts with RSVP Option		
2002241-001	MODEM MULTITECH ANALOG 56K GLOBAL 220V	1
418508-001	MNL RSVP OP/SERV	1
418765-001	MODEM CABLE DB9F/DB25M 10FT	1
418781-001	KIT RSVP SERVER	1
418768-001	MODEM RACK 12 POSITION	1
422705-001	PORT SERVER W/UNIV PWR SUPPLY	1
418772-001	CROSSOVER CABLE CAT 5 25FT	1
418801-002	DISK RSVP V4.0	1
411642-001	KIT MEDIA 3.5IN 1.44MB DISK	1
418800-002	CODE RSVP CLIENT V4.0	1
418930-001	KIT RSVP MODEM	1
418773-002	CABLE RJ45 TO RJ45 - 7FT LONG	1
422671-001	RJ45/DB25 CONVERTER DTE	1
These Additional Parts HL7 Option		
2001099-015	MNL REF PRISM HL7 OUTBOUND V4.0	1
2001609-001	LIC PRISM HL7 OUTBOUND	1

Item Number	Item Description	Qty
2005680-002	HD UNITY-IS V4.1 SW MULTI	1
45000-603	SCREW SEMS PH 6-32 X 3/16 PHIL	1

Unity Network IS Assembly BCM Server—PN 2008540-002

Item Number	Item Description		Qty
2007024-018	COMPUTER UNITY IS BCM V4.3	(SN _ _**EE**_ _ _ _G)	1
421670-XXX	KEYBOARD KIT (see Unity Network IS Keyboards table)		1
2002966-004	CD-ROM UNITY-IS V4.3 SW		1
408230-008	LABEL CE MARK		1
415043-002	LABEL PRESCRIPTION DEVICE		1
2007786-008	NAMEPLATE 20MM GE LOGO DK BLUE		2
45000-403	SCREW SEMS PH 4-40X3/16		1
2006705-001	LICENSE CODE MAS GHOST SOFTWARE		1
418836-003	LIC MS WIN NT WS 4.0 DOM/INTL		1
420403-001	MOUSE 2 BUTTON CE		1
422310-001	MOUSE PAD GE		1

Unity Network IS Computer Assembly—PN 2007024-018 (SN _ _**EE**_ _ _ _G)

Item Number	Item Description	Qty
2015873-001	HD SCSI 36 GB 10,000 RPM 68 PIN CONNECT	1
2012920-002	HD REPLACEMENT KIT (V4.3, NOT COMPATIBLE WITH RSVP)	
2012144-001	IC PRCSR 850 MHZ 256K 100 FSB PENTIUM III	2
2005083-004	MOTHERBOARD	1
2005992-005	MEMORY DIMM 128MB PC-133 SDRAM ECC	2
2007021-001	ADPTR NETWORK 10/100 PILA8460C3	1
2007249-001	DISK DRIVE CDROM IDE 52X SONY	1
2007645-001	CHAS COMPUTER ATX MID TOWER 300W PS	1
2011694-001	DRIVE FLOPPY 3.5	1
2007646-001	CABLE RIBBON SCSI ULTRA2 3 CONN 68P	1
2007645-002	HARN POWER BUTTON FOR SYSTIUM CHASSIS	1
2011696-002	HTSK FAN FOR PENTIUM III	2
These Additional Parts with HL7 Option		
2001099-119	CD MNL REF UNITY IS HL7 OUTBOUND V4.3 ENG	1
2001609-001	LIC PRISM HL7 OUTBOUND	1

Item Number	Item Description	Qty
2015873-001	HD SCSI 36 GB 10,000 RPM 68 PIN CONNECT	1
45000-603	SCREW SEMS PH 6-32X3/16 PHIL	1

Unity Network IS Keyboards

Item Number	Item Description	Item Number	Item Description
421670-001	KEYBOARD PS-2 GERMAN	421670-010	KEYBOARD PS-2 NORWEGIAN
421670-002	KEYBOARD PS-2 FRENCH	421670-011	KEYBOARD PS-2 BELGIAN
421670-003	KEYBOARD PS-2 ITALIAN	421670-012	KEYBOARD PS-2 SWISS
421670-004	KEYBOARD PS-2 SPANISH	421670-013	KEYBOARD PS-2 SI/HR/YU/B
421670-005	KEYBOARD PS-2 SWE-FIN	421670-014	KEYBOARD PS-2 ENG-UK
421670-006	KEYBOARD PS-2 DUTCH	421670-015	KEYBOARD PS-2 ENG-US
421670-007	KEYBOARD PS-2 JAPANESE	421670-016	KEYBOARD PS-2 HUNGARIAN
421670-008	KEYBOARD PS-2 CHINESE	421670-017	KEYBOARD PS-2 PORTUGUESE
421670-009	KEYBOARD PS-2 DANISH	421670-018	KEYBOARD PS-2 BRAZIL-PORTUGUESE

PC Motherboard Settings

Nightshade Server Motherboard Jumper Settings

PC Motherboard Jumper Settings -

- All jumpers left in default state (see items in bold in the table below).
- Reference: OEM P/N 243701-002 (Ver. 2.0, April/99), Jumpers (section 1.4) -

  Enterprise Server Group

  Intel N440BX Server

  Technical Product Specification

Nightshade Jumper Settings		
Jumper Block	Pins (default in bold)	What it does at system reset
J3 J2		
A. BMC Forced Update Mode	9-10, Normal 10-11, Program	System boots normally. System tries to update BMC firmware.
B. Chassis Intrusion Detection	5-6, Enable 6-7, Disable	Switch installed on chassis indicates when cover has been removed. Chassis intrusion switch is bypassed.
C. FRB Timer Enable	1-2, Enable 2-3, Disable	FRB operation is enabled (system boots from processor 1 if processor 0 fails). FRB is disabled.
D. Boot Block Write Protect	13-14, Protect 14-15Erase/Prog	BIOS boot block is write-protected. BIOS boot block is erasable and programmable.
E. Recovery Boot	9-10, Normal 10-11, Recovery	System attempts to boot using the BIOS stored in flash memory. BIOS attempts a recovery boot, loading BIOS code from a floppy diskette into the flash device. This is typically used when the BIOS code has been corrupted.
F. Password clear	5-6, Protect 6-7, Erase	Maintains the current system password. Clears the password.
G. CMOS clear	1-2, Protect 2-3, Erase	Preserves the contents of NVRAM. Replaces the contents of NVRAM with the manufacturing default settings.
J3 J1		
H. BMC boot block write protect	1-2, Protect 2-3, Erase/Prog	BMC boot block is write protected. BMC boot block is erasable and programmable.
J5B1		
I. WOL Enable	1-2, Disabled 2-3, Enabled	Disables Wake On LAN. If your power supply does not provide 0.8 A of +5 V Standby current, you must move the WOL Enable jumper to this position. Enables Wake On LAN.
J6 J2		
J. Speaker Option	1-4 3-4	External speaker Onboard speaker

CIC BCM Server Motherboard Switch Settings

The following table provides a quick refer for the proper PC motherboard switch settings for the CIC BCM server.

Product Codes:

- 3F = SN _ _**3F**_ _ _ _G
- 4T = SN _ _**4T**_ _ _ _G

Switch – Setting						
S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
S1.1 OFF	S2.1 OFF	S3.1 ON	S4.1 OFF	S5.1 ON	S6.1 On	S7.1 Off
S1.2 OFF	S2.2 ON	S3.2 OFF	S4.2 OFF	S5.2 OFF	S6.2 Off	S7.2 Off
	S2.3 OFF	S3.3 OFF	S4.3 ON	S5.3 ON	S6.3 On	
	S2.4 ON	S3.4 OFF	S4.4 OFF	S5.4 OFF	S6.4 Off	
	S2.5 OFF	S3.5 ON	S4.5 OFF (**3F**) S4.5 ON (**4T**)			
	S2.6 ON	S3.6 ON	S4.6 ON			
	S2.7 OFF	S3.7 ON	S4.7 OFF			
	S2.8 ON	S3.8 OFF	S4.8 OFF			

Watchdog Board (Berkshire)		
Number	**Position**	**Function**
1	OFF	Relay #1 Temperature Mode (RTM)
2	OFF	Relay #1 Mode (R1M)
3	OFF	Relay #2 Mode (R2M)
4	OFF	Temperature Reset Enable (TRE)
5	ON	Power On Delay (POD)
6	OFF	Watchdog Delay Time #1 *
7	ON	Watchdog Delay Time #2 *
8	ON	Watchdog Delay Time #3 *

***** Watchdog allows arming 1 minute after power-up

The following tables specify the proper PC motherboard switch settings and switch control functions. Where necessary, an asterisk (*) indicates the proper switch setting for CIC.

Host Bus Frequency			
Bus Frequency	**S4.1**	**S4.2**	**S4.3**
100 MHz	OFF	OFF	ON
133 MHz	OFF	OFF	ON

CPU Clock Frequency			
CPU Clock	**PCI Clock**	**S4.4**	**S4.5**
100MHz	33MHz	OFF	ON
133MHz	33MHz	OFF	OFF

CPU Type				
Processor	**S5.1**	**S5.2**	**S5.3**	**S5.4**
Pentium III (Coppermine)	ON	OFF	ON	OFF

On Board SCSI Active Terminal Resistor			
Channel	**Switch**	**Auto**	**Always Enable**
Channel A	S7.1	*OFF	ON
Channel B	S7.2	*OFF	ON

COM2 Mode (RS232)										
S2.1	**S2.2**	**S2.3**	**S2.4**	**S2.5**	**S2.6**	**S2.7**	**S2.8**	**S3.1**	**S3.2**	**S3.3**
OFF	ON	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF

On Board VGA Enable		
Switch	**Enable**	**Disable**
S3.7	OFF	*ON

LAN1 / LAN2 Enable			
LAN	**Swtich**	**Enable**	**Disable**
LAN1	S1.1	*OFF	ON
LAN2	S1.2	*OFF	ON

KEYBOARD Password On		
Switch	**Enable**	**Disable**
S3.6	OFF	*ON

Clear CMOS Memory		
Switch	**Clear**	**Normal**
S3.4	ON	*OFF

BIOS Flash-able		
Switch	**Enable**	**Disable**
S3.5	*ON	OFF

Reserved		
Switch	**Reserved**	**Reserved**
S3.8	ON	*OFF
S4.6	*ON	OFF
S4.7	ON	*OFF
S4.8	ON	*OFF

Multiplier of CPU Frequency (Only for Intel CPU Engineer Sample)				
Multiplier	**S6.1**	**S6.2**	**S6.3**	**S6.4**
X2	ON	ON	ON	ON
X3	ON	OFF	ON	ON
X4	OFF	ON	ON	ON
X5	OFF	OFF	ON	ON
X2.5	ON	ON	OFF	ON
X3.5	ON	OFF	OFF	ON
X4.5	OFF	ON	OFF	ON
X5.5	OFF	OFF	OFF	ON
X6	ON	ON	ON	OFF
X7	*ON	*OFF	*ON	*OFF
X8	OFF	ON	ON	OFF
Reserved	OFF	OFF	ON	OFF
X6.5	ON	ON	OFF	OFF
X7.5	ON	OFF	OFF	OFF
X1.5	OFF	ON	OFF	OFF
X0.5	OFF	OFF	OFF	OFF

Unity Network IS BCM Server Motherboard Switch Settings

The following table provides a quick refer for the proper PC motherboard switch settings.

Product Codes:

- EY = SN _ _**EY**_ _ _ _G
- EX = SN _ _**EX**_ _ _ _G
- EE = SN _ _**EE**_ _ _ _G

Switch – Setting						
S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
S1.1 OFF	S2.1 OFF	S3.1 ON	S4.1 OFF	S5.1 ON	S6.1 On	S7.1 Off
S1.2 OFF	S2.2 ON	S3.2 OFF	S4.2 OFF	S5.2 OFF	S6.2 Off	S7.2 Off
	S2.3 OFF	S3.3 OFF	S4.3 ON	S5.3 ON	S6.3 On	
	S2.4 ON	S3.4 OFF	S4.4 OFF	S5.4 OFF	S6.4 Off	
	S2.5 OFF	S3.5 ON	S4.5 OFF (**EY**) S4.5 ON (**EX/EE**)			
	S2.6 ON	S3.6 ON	S4.6 ON			
	S2.7 OFF	S3.7 OFF	S4.7 OFF			
	S2.8 ON	S3.8 OFF	S4.8 OFF			

The following tables specify the proper PC motherboard switch settings and switch control functions. Where necessary, an asterisk (*) indicates the proper switch setting for Unity Network IS.

Host Bus Frequency			
Bus Frequency	**S4.1**	**S4.2**	**S4.3**
100 MHz	OFF	OFF	ON
133 MHz	OFF	OFF	ON

CPU Clock Frequency			
CPU Clock	**PCI Clock**	**S4.4**	**S4.5**
100MHz	33MHz	OFF	ON
133MHz	33MHz	OFF	OFF

CPU Type				
Processor	**S5.1**	**S5.2**	**S5.3**	**S5.4**
Pentium III (Coppermine)	ON	OFF	ON	OFF

On Board SCSI Active Terminal Resistor			
Channel	**Switch**	**Auto**	**Always Enable**
Channel A	S7.1	*OFF	ON
Channel B	S7.2	*OFF	ON

COM2 Mode (RS232)										
S2.1	**S2.2**	**S2.3**	**S2.4**	**S2.5**	**S2.6**	**S2.7**	**S2.8**	**S3.1**	**S3.2**	**S3.3**
OFF	ON	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF

On Board VGA Enable		
Switch	**Enable**	**Disable**
S3.7	*OFF	ON

LAN1 / LAN2 Enable			
LAN	**Swtich**	**Enable**	**Disable**
LAN1	S1.1	*OFF	ON
LAN2	S1.2	*OFF	ON

KEYBOARD Password On		
Switch	**Enable**	**Disable**
S3.6	OFF	*ON

Clear CMOS Memory		
Switch	**Clear**	**Normal**
S3.4	ON	*OFF

BIOS Flash-able		
Switch	**Enable**	**Disable**
S3.5	*ON	OFF

Reserved		
Switch	**Reserved**	**Reserved**
S3.8	ON	*OFF
S4.6	*ON	OFF
S4.7	ON	*OFF
S4.8	ON	*OFF

Multiplier of CPU Frequency (Only for Intel CPU Engineer Sample)				
Multiplier	**S6.1**	**S6.2**	**S6.3**	**S6.4**
X2	ON	ON	ON	ON
X3	ON	OFF	ON	ON
X4	OFF	ON	ON	ON
X5	OFF	OFF	ON	ON
X2.5	ON	ON	OFF	ON
X3.5	ON	OFF	OFF	ON
X4.5	OFF	ON	OFF	ON
X5.5	OFF	OFF	OFF	ON
X6	ON	ON	ON	OFF
X7	*ON	*OFF	*ON	*OFF
X8	OFF	ON	ON	OFF
Reserved	OFF	OFF	ON	OFF
X6.5	ON	ON	OFF	OFF
X7.5	ON	OFF	OFF	OFF
X1.5	OFF	ON	OFF	OFF
X0.5	OFF	OFF	OFF	OFF

A Appendix A – Technical Specifications

For your notes

Technical Specifications–CIC Pro

Due to continual product innovation, GE Medical Systems *Information Technologies* designs and specifications are subject to change without notice.

Performance Specifications (PC)

Table 1. Performance Specifications	
Number of Patients	1 to 16 in standard display format, 1 to 17 in "view patient" format
Display Format	User selectable for up to 16 patients per display
Displayed Wavelengths	3.5 – 11 seconds, dependent on configuration choice
Display Information	Access to complete patient information including arrhythmia histories, graphic trends and tabular vital signs

Controls

- PS/2 keyboard
- PS/2 Mouse

Processing

Table 2. Main Processor		
	Nightshade	**BCM**
CIC Basic	Intel Pentium II, 350 MHz (or faster)	Intel Pentium III, 850 MHz (or faster)
CIC With ApexPro	Dual Intel Pentium II, 350 MHz (or faster)	Dual Intel Pentium III, 850 MHz (or faster)

Alarms

Table 3. Alarms	
Patient Status Alarms	4 Levels: Crisis, Warning, Advisory and Message
System Alarms	2 Levels: Warning and Advisory
Notification	Audible, visual, graph runs, and history storage (dependent on level), alarm display button to view alarming beds
Display of Alarm Information	Alarm information located in waveform window, parameter box and alarm display buttons
Silencing	Current patient alarms silenced for 1 minute
Display of Limits	All parameter limits available

Recorder (optional)

- 2-inch external Direct Digital Writer
- Laser printer

General

Table 4. General Specifications		
	Nightshade Server	**BCM Server**
Storage	128 MB RAM (256 MB RAM with ApexPro); 1.44 MB 3.5-inch floppy disk drive, CD-ROM drive, 9.1 GB hard drive (additional 18 GB drive with Full Disclosure)	128 MB RAM (256 MB RAM with ApexPro); 1.44 MB 3.5-inch floppy disk drive, CD-ROM drive, 36.0 GB hard drive (with or without Full Disclosure)
Software Updates	1.44 MB 3.5-inch floppy disk drive, CD-ROM drive	
Serial Outputs	External asynchronous RS-232 serial ports (two)	
Parallel Output	IEEE 1284 Standard	
Video Output	High resolution video board, 1280 x 1024 @ 75 Hz	High resolution video board, 1280 x 1024 @ 85 Hz
Audio Output	GE Medical Systems *Information Technologies* supplied speakers required	

Environmental Specifications (PC)

Table 5. Environmental Specifications		
	Nightshade	**BCM**
Power Requirements	Autoranging for either: 100-120 VAC or 200-240 VAC ±10%, 50/60 ±3 Hz 4.6 Amps @ 115 VAC, 2.3 Amps @ 220 VAC	Input Range: 90-264 VAC Auto Selecting Frequency: 47-63 Hz Input Current: 10.0 A @ 115 VAC 60 Hz; 5.0A @ 230VAC 50 Hz
Power Consumption	298 watts (max)	300 watts (max)
Low Voltage Shutdown	90 VAC	33 VAC
Cooling	Forced air	Forced air
Operating Temperature	+10°C to +35°C with minimum rate of change not to exceed 10°C/hour	+5°C to +50°C
Non-operating Storage Temperature	–40°C to 70°C (–40°F to 158°F)	-20°C to +65°C
Relative Humidity	95%, non-condensing at 30°C	10% to 90% (Non-condensing)

Physical Specifications

Table 6. Physical Specifications		
	Nightshade Server	**BCM Server**
Height	49.02 cm (19.3 in)	42.5 cm (16.75 inches)
Depth	44.96 cm (17.7 in)	20.0 cm (7.9 inches)
Width	21.08 cm (8.3 in)	47.0 cm (18.5 inches)
Weight	17.1 kg (38 lbs.) minimum 22.9 kg (51 lbs.) maximum	11.3 kg (25 lbs.) minimum 13.1 kg (29 lbs.) maximum

Display Specifications

Table 7. Display Specifications	
Display Size	17 to 21 inch diagonal, color CRT 18 or 20 inch color flatpanel
Dot Pitch	0.28 mm maximum
Resolution	1280 x 1024 @ 75 Hz
Electrical	
Input Voltage Range	Autoranging for either 90 – 135 VAC/60 Hz, or 180 – 270 VAC/50 Hz
Controls	On/Off, Brightness, Contrast
Environmental	
Operating Temperature	10 to 40°C
Humidity	10 to 95% (non-condensing)

Monitor (Display) Connections

Variety of interconnect video cables available.

Certification

UL/CSA/CE certification as required per the original equipment manufacturer (OEM).

Technical Specifications–Unity Network IS

Due to continual product innovation, GE Medical Systems *Information Technologies* designs and specifications are subject to change without notice.

Performance Specifications (PC)

Controls

- PS/2 keyboard
- PS/2 Mouse

Processing

Table 8. Main Processor	
Nightshade	**BCM**
Dual Intel Pentium II, 350 MHz (or faster)	Dual Intel Pentium III, 850 MHz (or faster)

General

Table 9. General Specifications		
	Nightshade Server	**BCM Server**
Storage	128 MB RAM (256 MB RAM with ApexPro); 1.44 MB 3.5-inch floppy disk drive, CD-ROM drive, 9.1 GB hard drive (additional 18 GB drive with Full Disclosure)	128 MB RAM (256 MB RAM with ApexPro); 1.44 MB 3.5-inch floppy disk drive, CD-ROM drive, 36.0 GB hard drive (with or without Full Disclosure)
Software Updates	CD-ROM drive	
Serial Outputs	External asynchronous RS-232 serial ports (two)	
Parallel Output	IEEE 1284 Standard	

Environmental Specifications (PC)

Table 10. Environmental Specifications		
	Nightshade	**BCM**
Power Requirements	Autoranging for either: 100-120 VAC or 200-240 VAC ±10%, 50/60 ±3 Hz 4.6 Amps @ 115 VAC, 2.3 Amps @ 220 VAC	Input Range: 90-264 VAC Auto Selecting Frequency: 47-63 Hz Input Current: 10.0 A @ 115 VAC 60 Hz; 5.0A @ 230VAC 50 Hz
Controls	On/Off, Brightness, Contrast	
Power Consumption	298 watts (max)	300 watts (max)
Low Voltage Shutdown	90 VAC	33 VAC
Cooling	Forced air	Forced air
Operating Temperature	+10°C to +35°C with minimum rate of change not to exceed 10°C/hour	+5°C to +50°C
Non-operating Storage Temperature	–40°C to 70°C (–40°F to 158°F)	-20°C to +65°C
Relative Humidity	95%, non-condensing at 30°C	10% to 90% (Non-condensing)

Physical Specifications

Table 11. Physical Specifications		
	Nightshade Server	**BCM Server**
Height	49.02 cm (19.3 in)	42.5 cm (16.75 inches)
Depth	44.96 cm (17.7 in)	20.0 cm (7.9 inches)
Width	21.08 cm (8.3 in)	47.0 cm (18.5 inches)
Weight	17.1 kg (38 lbs.) minimum 22.9 kg (51 lbs.) maximum	11.3 kg (25 lbs.) minimum 13.1 kg (29 lbs.) maximum

Display Specifications

Table 12. Display Specifications	
Display Size	17 to 21 inch diagonal, color CRT 18 or 20 inch color flatpanel
Dot Pitch	0.28 mm maximum
Resolution	1024 x 768 @ 75 Hz

Monitor (Display) Connections

Variety of interconnect video cables available.

Certification

UL/CSA/CE certification as required per the original equipment manufacturer (OEM).

For your notes

B Appendix B – Abbreviations and Symbols

For your notes

Abbreviations

Abbreviations and symbols which you may encounter while reading this manual or using the clinical information center are listed below with their meanings.

A

ABG	arterial blood gas
AHA	American Heart Association
AR	arterial
ARRHY	arrhythmia
ART	arterial
AVF	left foot augmented lead
AVL	left arm augmented lead
AVR	right arm augmented lead

B

BCM	Biomedical Computing Machine
BP	blood pressure
Btu	British thermal unit

C

C	Celsius
Card Calc	cardiac calculations
CCU	critical care unit
CD	coherent digital
CD-ROM	compact disk-read only memory
CDT	coherent digital telemetry
CE	Conformité Européene
CIC	clinical information center
CISPR	International Special Committee on Radio Interference
cm	centimeter
COMM	communication
CPP	cerebral perfusion pressure
CRT	cathode ray tube
CSA	Canadian Standards Association
CV	central venous
CVP	central venous pressure

D

DDW	direct digital writer
DIA	diastolic

E

ECG	electrocardiograph
EEC	European Economic Community
EN	European Norm (European standard)
EMC	electromagnetic compatibility

F

F	Fahrenheit
FD	Full Disclosure
FE, FEM	femoral

G

GB	gigabyte
GMT	Greenwich Mean Time

H

HL7	health level 7
HRS	hours
Hz	hertz

I

IABP	intra-aortic balloon pump
ICU	intensive care unit
IDT	incoherent digital telemetry
IEC	International Electrotechnical Commission
ICMMS	Integrated Computer Material Management System
in	inch
IS	Information Suite
ISO	International Organization for Standardization
IX	information exchange

L

LA	left arm

M

MAX	maximum
MB	megabyte
MC	mission critical
MCL	modified chest lead
Mhz	megahertz
mmHg	millimeters of mercury
mm/S	millimeters per second
MMS	Marquette Medical Systems, Inc.
MPIS	Marquette Prism Information Server
MSDS	Material Data Safety Specifications

N

NBP	noninvasive blood pressure

O

OEM	original equipment manufacturer
OR	operating room

P

PA	pulmonary artery
PC	personal computer
PCI	personal computer interface
PDF	portable document format
Pulm Calc	pulmonary calculations
PVC	premature ventricular contraction

Q

QRS	interval of ventricular depolarization

R

RA	right arm
RAM	random access memory
RESP	respiration
RSVP	remote system for viewing patients

S

SP	special
SpO2	arterial oxygen saturation
ST	interval of ventricular repolarization
STD VGA	standard graphics array
SYS	systolic

T

T1	temperature site 1
T2	temperature site 2
Temp, TMP	temperature
TTX	transmitter

U

UA	umbilical artery
UAC	umbilical artery catheter
UL	Underwriters' Laboratories
UPS	uninterruptable power supply
UV	umbilical venous

V

V-Fib, V-FIB	ventricular fibrillation
VAC	voltage alternating current
VENT	ventilator

Symbols

"	inches
°	degrees
±	plus or minus
–	minus
%	percent

For your notes

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: +414.355.5000
800.558.5120 (US only)
Fax: +414.355.3790

European Representative
GE Medical Systems
Information Technologies GmbH
Postfach 60 02 65
D-79032 Freiburg
Germany
Tel: +49 761 45 43 - 0
Fax: +49 761 45 43 - 233

Asia Region
GE Medical Systems Asia
7-127, Asahigaoka 4-chome
Hino-shi, Tokyo 191-8503
Japan
Tel: +81-42-582-6824
Fax: +81-42-582-6830