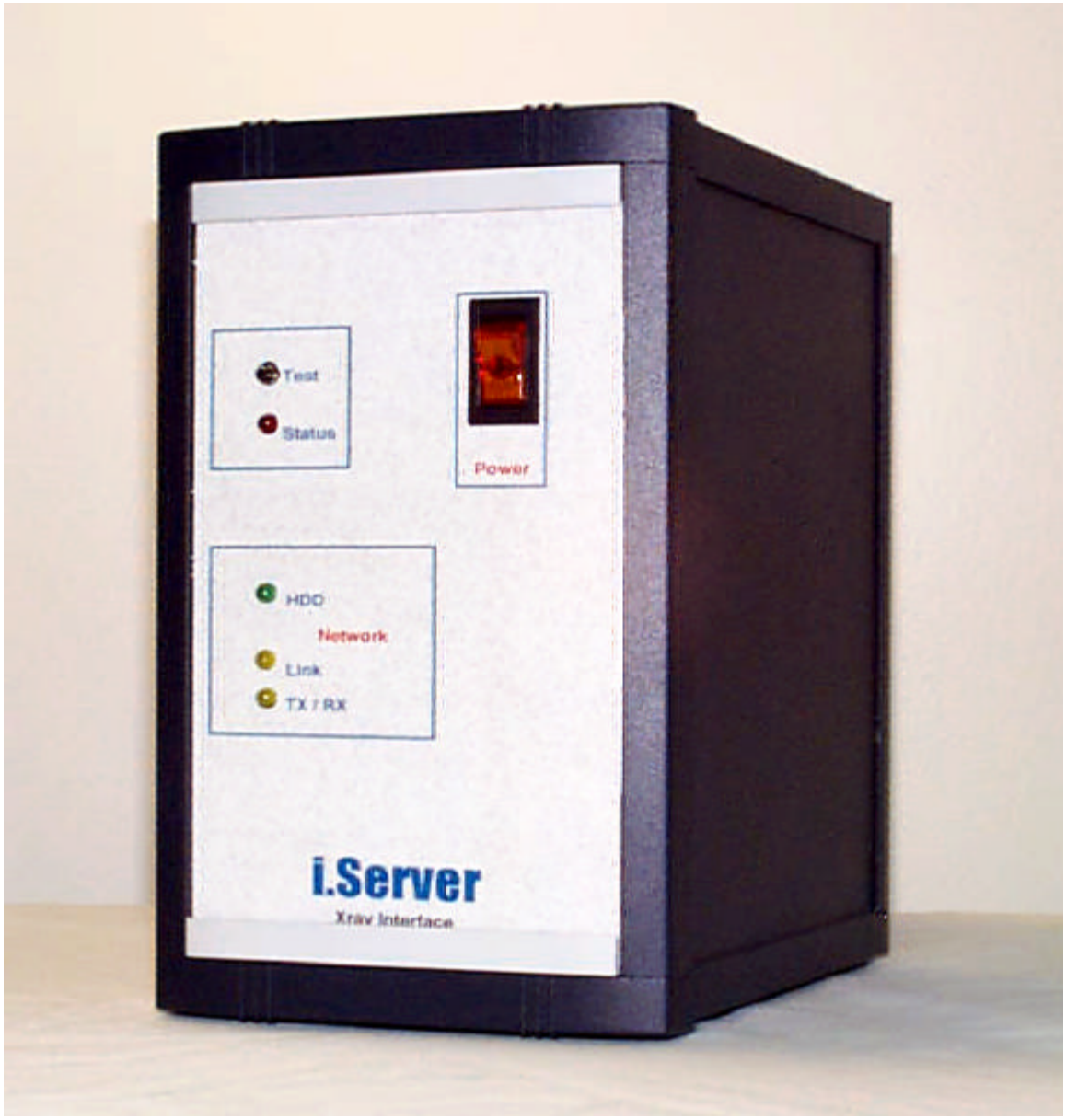
i.Server

X-ray Interface



Operators Manual

Table of Contents

1 General Safety Summary

Injury Precautions

Use Proper Power Cord	To avoid fire hazard, use only the power cord supplied for this product. Place cables to avoid trip or strangulation hazard.
Avoid Electric Overload	To avoid electric shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.
Ground the Product	This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding connector must be connected to earth ground. Before making connections to other units, ensure the product is properly grounded.
Do Not Operate Without Covers	To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.
Do Not Operate in Wet / Damp Conditions	To avoid electric shock, do not operate this product in wet or damp conditions.
Do Not Operate in Explosive Atmosphere	To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Product Damage Precautions

Use Proper Power Source	Do not operate this product from a power source that applies more than the voltage specified.
Provide Proper Ventilation	To prevent product overheating, provide proper ventilation.
Do Not Operate With Suspected Failures	If you suspect there is damage to this product, have it inspected by qualified service personnel.

2 General Information

2.1 General Description

The i.Server X-ray Interface is a device that exchanges information between the Marquette Medical Systems (MMS) Maclab Cardiac Catheterization System and third party X-ray systems. The supported X-ray systems are General Electric's X-ray system model DLX version C17 and the Philips Integris 5000 X-ray system. On the Philips system, an intermediate computer called the PKI interface handles the data translation from the i.Server X-ray Interface and the actual Philips X-ray system. Data are passed using an Ethernet network running the TCP/IP protocol. The i.Server performs all of the data translations between these devices and provides data in the native formats. On the network, the i.Server X-ray interface appears like any other network device. The network name for the i.Server is always the i.Server Serial Number and can be found on the rear panel of the unit. When connected, the i.Server has the appropriate network shares for the Maclab to log into and can communicate with external X-ray systems.

2.2 Cables and Accessories

The i.Server X-ray Interface comes with the following Cables and Accessories.

i.Server Main Unit
Power Cord
10' COM Cable
10' CAT-5 Network Cable
Operators Manual

2.3 Software Description

The i.Server X-ray Interface communicates with the Maclab using the Marquette Medical Systems Hilltop Protocol. With a patient admitted on the Maclab, Hilltop formatted data are sent to the i.Server X-ray Interface every 15 seconds consisting of Patient Demographics, Test Demographics, Configuration, and Event Log. The i.Server unpacks the data and converts it to the X-ray File Specification. If the selected X-ray system is a Philips Integra system, the file is transferred to the Philips X-ray system using a share on the PKI interface computer. The share name of the PKI system must be configured into the i.Server X-ray Interface. On the GE DLX system, data are passed using the FTP protocol. The IP address of the DLX system must also be configured into the i.Server X-ray Interface. These data are sent only when changes are detected in the fields supported by the particular X-ray system.

On the 15 second cycle, the i.Server queries the X-ray system for a file containing X-ray information. If there is data available, the i.Server X-ray Interface aquires the data file from the X-ray system. The i.Server then reformats the data to the Marquette Hilltop format and places the file in the share used by the Maclab for passing data.

The i.Server X-ray interface includes a Test Mode where predefined X-ray data can be looped back to the Maclab on the 15 second cycle. Test Mode can be entered by pressing the Test Pushbutton for 3 seconds. The Red Status indicator will begin flashing at a 2 Hz rate indicating that the user is in Test Mode. To exit out of Test Mode, the user must cycle power to the i.Server unit.

The i.Server X-ray interface includes a Configuration Mode allowing service personnel the ability to configure the i.Server unit and to display activity logs stored in the i.Server. Access to the Configuration mode is through the COM port located on the back of the i.Server unit. The Configuration Mode allows for configuration of such things as the i.Server's IP address, the type of X-ray system, GE or Philips. If the GE X-ray system is selected, the IP address of that system is also needed, as is the server name of the PKI system if the Philips X-ray system is selected. Daily activity logs are kept on the i.Server to allow service personnel to view and troubleshoot problems.

2.4 Specifications

2.4.1 Electrical

Power Requirements:	120 VAC 0.5 Amps 60 Hz

2.4.2 Mechanical

Physical Dimensions:	120mm W x 230mm H x 180mm D
Weight:	Approximately 2.25 Kg
Connectors:	Power Inlet Ethernet Port Communications Port
Switches	Power Switch Test Mode Pushbutton
LED Indicators	Status HDD Link RX/TX

3 i.Server Controls

3.1 i.Server Front Panel Controls

Figure 3.1 illustrates the i.Server X-ray interface front panel controls. These controls are the amber illuminated Power switch, the Red Status indicator, the Test Pushbutton switch, the green HDD (Hard Disk Drive) indicator, and the network indicators, Link and RX/TX.

The Power switch is used to cycle power to the i.Server unit. When illuminated, the i.Server unit is power on.

The Red Status indicator indicates the i.Server Status. When the unit is first powered on, the indicator will be on and not flashing. After the i.Server executes its startup procedure and is ready to operate, the Status indicator will flash at a .5 Hz rate. This will indicate that the i.Server X-ray interface is available and ready to receive data from the Maclab.

The Test pushbutton switch is used to enable the loop back mode. This mode is useful for verification of the Maclab to i.Server interface. Every 15 seconds, the Maclab sends data to the i.Server containing patient information. When the i.Server receives this data, it automatically sends back a set of predefined X-ray data. This mode can also be used for field demos and the like.

The green HDD indicator is used to indicate Hard Disk activity.

The amber network indicators are used to display the network status. The Link indicator must always be on. This indicates that the i.Server is connected to the network hub. Connection to the hub is made using the supplied CAT-5 network cable. The RX/TX indicator is used to display network traffic. This indicator displays all network traffic, not only i.Server traffic. This indicator is useful for troubleshooting network problems.

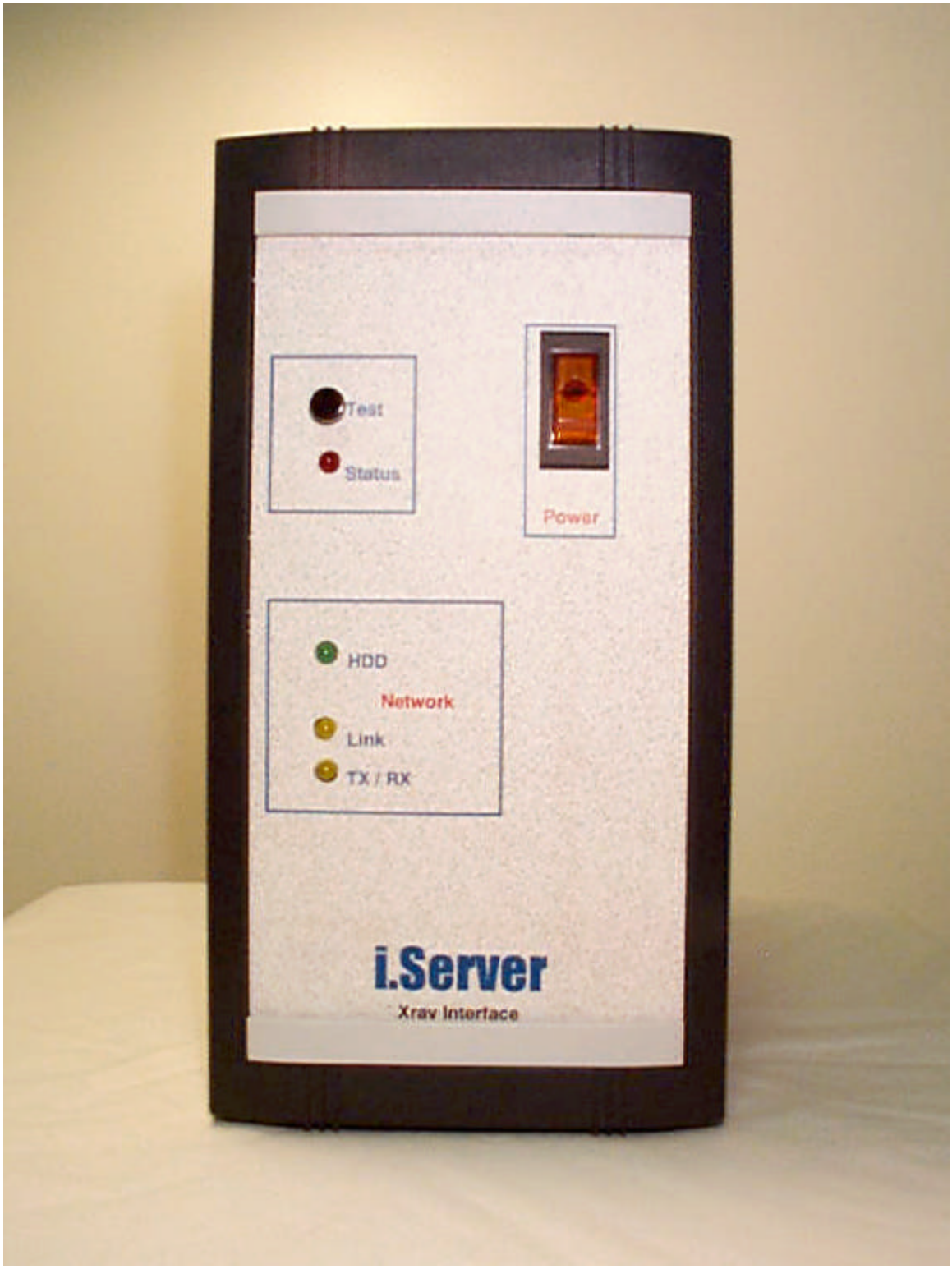


Figure 3.1 Front Panel Controls

3.2 i.Server Rear Panel Controls

Figure 3.2 illustrates the i.Server X-ray interface front panel controls. The rear panel controls consist of a Power inlet, a COM Port (Communications Port) and a 10Base-T Ethernet connection.

The Power inlet is used to supply power to the i.Server X-ray Interface unit. The power rating of the unit is 85 – 265 VAC 10VA and 47 – 440 Hz. This range covers all international power requirements.

The COM port (Communications Port) is used to communicate with the i.Server using the supplied COM cable and any generic PC or notebook computer. When connected, the PC will be able to access the i.Server Configuration program. This program allow the user to review data logs, and configure the i.Server.

The 10Base-T Ethernet connector is used to connect the i.Server X-ray interface to a standard Ethernet hub. Connection is made using the supplied CAT-5 Ethernet cable.

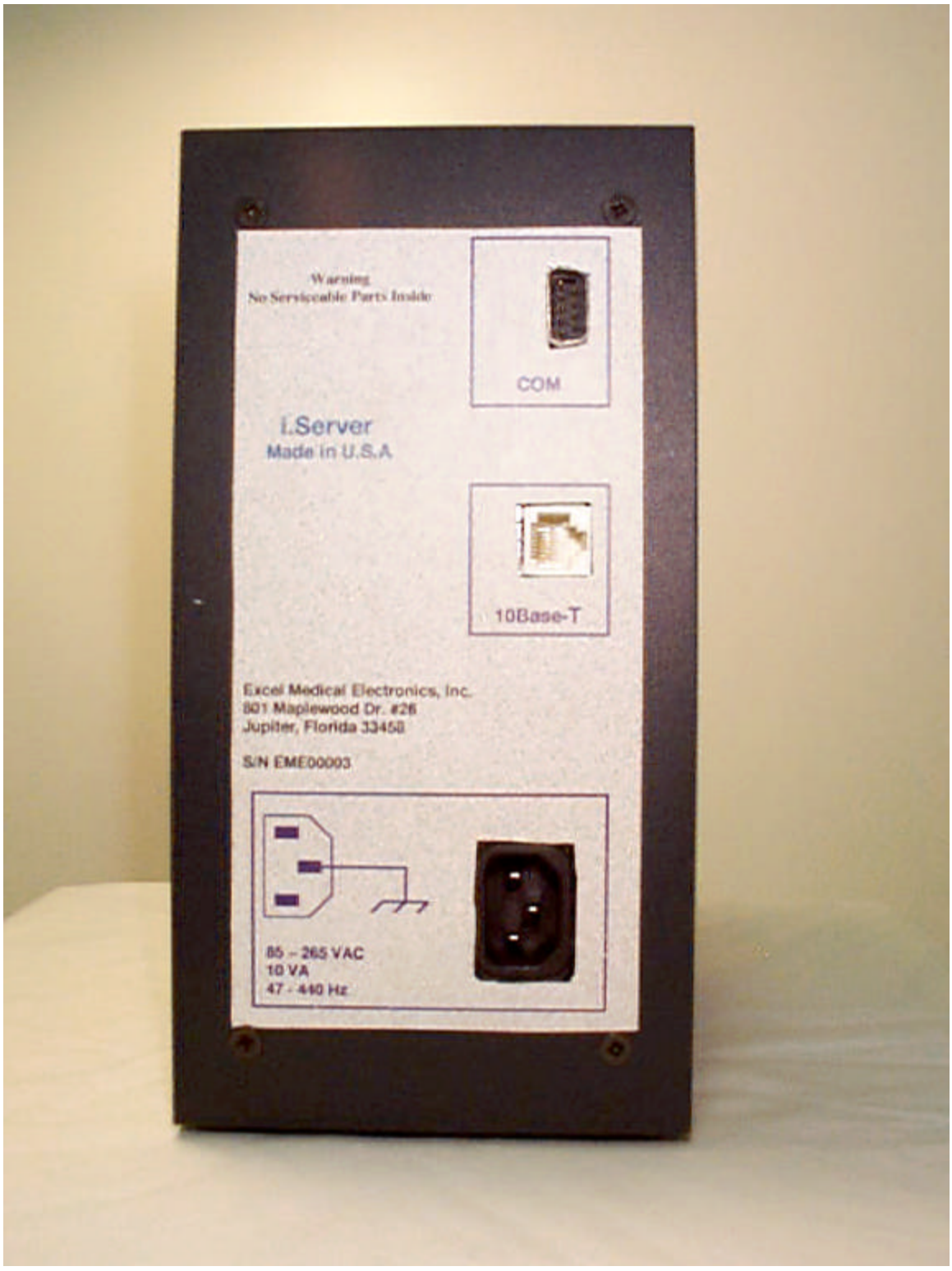


Figure 3.2 Rear Panel Controls

4 Configuration

4.1 i.Server Configuration

In order to operate correctly, the i.Server X-ray Interface needs to be configured for the network IP Address and the X-ray type it will be interfacing to. Configuration is accomplished by connecting a standard PC or Notebook computer to the i.Server using the supplied interface cable. A terminal program such as Procomm or Microsoft's Terminal is needed to communicate with the i.Server. The i.Server communicates with the PC at the following communication settings.

9600 Baud
8 bits
No Parity
1 Stop Bit

To check if the Configuration Monitor is running on the i.Server, the red Status indicator will be flashing at a .5 Hz rate. The Configuration Monitor is always running and will not affect the i.Server's other activities.

4.3 i.Server Configuration Menu

With the terminal program running, press the ENTER key and the i.Server will respond with the prompt "Enter Password: ". At the prompt, type in the password "HELLO". The following screen will appear.

```
        i.Server X-ray Interface Version x.x

1 = Display i.Server Settings
2 = Set Date and Time
3 = View Logs
4 = Change IP Address
5 = Change SubNet Mask
6 = Enable/Disable DHCP
7 = Configure for GE X-ray
8 = Configure for Philips X-ray
9 = Enable/Disable Message Line
Q = Quit
```

4.4 i.Server Settings

Pressing ‘1’, the Configuration program will display the current i.Server X-ray interface settings. Typical settings will appear as follows.

```
i.Server X-ray Interface Settings

         Date: 11/19/1998
         Time: 13:12:17
Serial Number: EME00002
         DHCP: Enabled
   IP Address: 192.168.1.1
  SubNet Mask: 255.255.255.0
   X-ray Type: GE
  GE X-ray IP: 151.168.1.2
 Message Line: Enabled
```

The Date and time fields represent the date and time of the i.Server x-ray Interface. The i.Server contains an internal real-time clock. The serial number is the serial number of the unit. It matches the serial number located on the rear of the unit. The rest of the items have to do with network configuration. If the network has a DCHP Server, IP address can be allocated dynamically. Typically DHCP is not used since Maclab is isolated from the hospital network. IP Address is the IP address given to the i.Server X-ray interface. The IP address and the SubNet Mask are needed to allow the i.Server to communicate on the network. The X-ray type is the selected X-ray type, currently GE and Philips. If the X-ray type is GE, then the GE X-ray IP address must also be entered. If the X-ray type is Philips, then the Philips PKI server name must also be entered.

4.5 Setting Date and Time

Pressing ‘2’ on the Configuration Menu, the Configuration program will enter the Set Date & Time program. The program runs as follows.

```
Set Date & Time

Date: 11/19/1998
Time: 13:12:21

Enter Day [range 1-31]: 19
Enter Month [range 1-12]: 11
Enter Year [range 1998-2050]: 1998
Enter Hour [range 0-23]: 13
Enter Minute [range 0-59]: 12

Date: 11/19/1998
Time: 13:12:00
```

4.6 Activity Logs

Pressing ‘3’ on the Configuration Menu, the Configuration program will enter the View Logs program. The program displays another set of menus as follows.

```
i.Server X-ray Interface Activity Logs

1 = Display Monday's Log
2 = Display Tuesday's Log
3 = Display Wednesday's Log
4 = Display Thursday's Log
5 = Display Friday's Log
6 = Display Saturday's Log
7 = Display Sunday's Log
Q = Quit

Enter Command:
```

The i.Server X-ray Interface logs all transactions between the Maclab and the X-ray devices. The i.Server keeps the data in log files by day of the week. All logs remain for one week and are then overwritten. If the user wants to display the log data for Friday, they would press ‘5’. The following is an example of the data displayed.

```
          Opening Log: C:\I-DRIVE\LOGS\Xray.Fri

                  Site Name: Test Hospital
              Serial Number: EME00002
           iServer Password:
          Log Creation Date: Fri Oct 23 14:16:58 1998
                             DHCP Disabled
                 IP Address: 192 168 1 1
                SubNet Mask: 255 255 255 0
          ------------------------------------

Fri Oct 23 14:16:58 1998 i.Server Cold Start
Fri Oct 23 14:19:24 1998 Posted PID file for PID 005003342
Fri Oct 23 14:30:41 1998 Transfered PID [005003342] from
Xray to Maclab
```

4.7 Changing IP Address

Pressing ‘4’ on the Configuration Menu, the Configuration program allows changes to the IP Address. The program displays as follows.

```
==============================

DHCP Disabled


Enter IP Address [x.x.x.x]:

==============================
```

At the prompt, enter the IP Address in standard notation. E.g. 192.168.1.1 The IP Address and SubNet mask must coincide with the IP Address and SubNet Masks that are entered on the Maclab and X-ray System. Press enter and the following will appear.

```
==============================

DHCP Disabled
IP Address: 192.168.1.1
SubNet Mask: 255.255.255.0

==============================
```

4.8 Changing SubNet Mask

Pressing ‘5’ on the Configuration Menu, the Configuration program allows changes to the SubNet Mask. The program displays as follows.

```
==============================

DHCP Disabled
IP Address: 192.168.1.1
SubNet Mask: 255.255.255.0

==============================

Enter SubNet Mask [x.x.x.x]:
```

At the prompt, enter the SubNet Mask in standard notation. E.g. 255.255.255.0 The IP Address and SubNet mask must coincide with the IP Address and SubNet Masks that are entered on the Maclab and X-ray System. Press enter and the following will appear.

```
==============================

DHCP Disabled
IP Address: 192.168.1.1
SubNet Mask: 255.255.255.0

==============================
```

4.9 Enable / Disable DHCP

Pressing ‘6’ on the Configuration Menu, the Configuration program allows enabling or disabling DHCP. When enabled, the i.Server X-ray Interface tries to dynamically configure the IP address from a DHCP Server. Caution, if there is no DHCP Server available, the i.Server X-ray interface will not work properly. Only select this option if you are sure there is always a DHCP server available. The program displays as follows.

```
Enable DHCP? [Y/N]:

Disable DHCP? [Y/N]:
```

4.10 Configuring for GE X-ray

Pressing ‘7’ on the Configuration Menu, the Configuration program allows configuring for a GE X-ray System. If this is selected, the program prompts as follows.

```
Current X-ray Type: GE
GE X-ray IP: 151.168.1.1

Configure for GE X-ray? [Y/N]: y

Enter GE X-ray IP Address [x.x.x.x]:
```

As shown, the i.Server is configured for a GE X-ray system. Since all communication with the GE X-ray system is done using the FTP protocol, the i.Server needs to know the IP address of the GE X-ray system.

4.11 Configuring for Philips X-ray

Pressing ‘8’ on the Configuration Menu, the Configuration program allows configuring for a Philips X-ray System. If this is selected, the program prompts as follows.

```
Current X-ray Type: GE
GE X-ray IP:


Configure for Philips X-ray? [Y/N]: Y
Enter Philips PKI Server Name [\\PKIxxxx\\H-Drive]:
```

As shown, the i.Server is configured for a GE X-ray system. Selecting Yes to the prompt will enable the Philips interface. Since all communication with the Philips X-ray system is done using the standard file passing protocol, the i.Server needs to know the PKI Server name. The PKI Server name is usually the PKI box serial number and the H-Drive.

4.12 Enable / Disable Message Line

Pressing ‘9’ on the Configuration Menu program allows enabling or disabling of the Message Line. When enabled, the i.Server X-ray Interface sends a

Message to the Maclab informing the user that X-ray data is available. Disabling this function disables the i.Server from sending this information.

```
Enable Message Line? [Y/N]:

Disable Message Line? [Y/N]:
```

5 Names and Directories

5.1 i.Server Network Name

The i.Server Network Name is the unit's Serial Number. On the Maclab configuration screen, there is a field for entering the Network Name.

For example, a unit with "S/N EME00013", enter EME00013 in the X-ray Network Field.

5.2 i.Server Shares and Directories

The i.Server has two Network Shares, "I-Drive" and "C-Drive". The Maclab uses the I-Drive share as the means for connecting to the i.Server. A sub-directory named COM is the primary location for exchanging Marquette Hilltop files. Another sub-directory called LOGS is where the activity logs are kept. The "C-Drive" share encompasses the whole i.Server Hard Drive. Some files of interest are the files in the directory ISERVER. The Master.ini file contains the Settings for the i.Server X-ray Interface. The file REPORT1.TXT contains the data for the Test Mode loop back. The network dependent files such as PROTOCOL.INI and TCPUTILS.INI are located in the directory called NET. All of theses files should not be modified as they can cause unpredictable or malfunctioning behavior of the i.Server X-ray Interface.

6 Spare Parts

6.1 i.Server X-ray Interface Spare Parts

SA-01000-001	i.Server X-ray Interface Main Unit
SA-01001-001	i.Server X-ray Interface Operators Manual (USA)
173-63101	i.Server Power Cord (USA)
DCA1605	i.Server CAT-5 Network Cable 10’

7 Product Servicing

7.1 i.Server X-ray Interface Product Servicing

The following are the safety precautions for service personnel when servicing the i.Server X-ray Interface.

The i.Server X-ray Interface uses a fuse on the neutral power conductor.

Replace fuses F3 or F4 with 1 AMP fuses, EME P/N: 224001

CAUTION: Double pole/neutral fusing.

The i.Server X-ray Interface uses a lithium battery to power circuitry to maintain the date and time.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.