ECHELON®

*i.*LON™ 100 *e2* Internet Server User's Guide:

Installing, Connecting, and Configuring the i.LON 100

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Preface

This document describes how to install and configure the
i.LON 100 device in control and data networks.

Welcome

This document describes how to install and configure the *i*.LON 100 device in control and data networks.

Purpose

The *i.LON 100 User's Guide: Installing, Connecting, and Configuring the i.LON 100* describes how to connect the *i*.LON 100 Internet Server hardware and configure it to communicate by TCP/IP, LONWORKS messaging, email, POP, and with Meter Bus devices.

Related Documentation

The i.LON 100 documentation is provided as online Adobe Acrobat PDF files and Windows Help files. The i.LON 100 documentation consists of the following manuals:

- *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* – Describes how to use the *i*.LON 100 Configuration Plug-in to configure the *i*.LON 100 applications.
- *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* — Describes how to configure the *i*.LON 100 application using the *i*.LON 100 Web pages and how to design Web pages that can be used to monitor and control *i*.LON 100 Data Points.
- *i.LON 100 Programmer's Reference* — Describes how to configure the *i*.LON 100 using XML files and SOAP calls. This allows you to configure the *i*.LON 100 without using the *i*.LON 100 Configuration Plug-in

The following additional documentation is useful if you are using the applicable features of the i.LON 100:

- *LNS For Windows Programmer's Guide, xDriver Extension* — Describes how the xDriver software can be used by an LNS application to manage communications with multiple LONWORKS networks that communicate over a TCP/IP network. The xDriver software is used to communicate with the *i*.LON 100 when the *i*.LON 100 is functioning as a Remote Network Interface (RNI).
- *LNS Programmer's Guide* — Describes how to write LNS applications that can take advantage of the communication provided by the *i*.LON 100 Web server.
- *LonMaker User's Guide* — Describes how to use the LonMaker tool, which can be used to install the i.LON 100 in a LONWORKS network.

What's Included with the *i*.LON 100

The *i*.LON 100 includes the following components:

- *i.LON 100 Device* — There are four models of the *i*.LON 100 Internet Server: TP/FT-10 free topology with modem, TP/FT-10 free topology without modem, PL-20 power line with modem, and PL-20 power line without modem. The inputs and outputs of each model are slightly different, as noted in Chapter 2.

- *i.LON 100 Quick Start Guide* — This document describes how to install the *i*.LON 100 Configuration Plug-in, how to connect the *i*.LON 100 hardware, and how to configure the *i*.LON 100's IP information using the Web interface.
- *i.LON 100 CD* — This CD contains the installation software for the *i*.LON 100 Configuration Plug-in, as well as the installation software for LNS 3 Service Pack 7, Update 1, and LonMaker 3.1 Service Pack 2, Update 1.
- *i.LON 100 License Agreement* — The license agreement for the *i*.LON 100 hardware and software.

Hardware Requirements

Hardware requirements and recommendations for the computer on which the *i*.LON 100 Configuration Software will run are given below:

- Pentium II 600 MHz or faster
- 128-MB RAM minimum
- 70 MB free hard disk space
- CD-ROM drive
- Super VGA (800 × 600) or higher-resolution display with 256 colors
- Mouse or compatible pointing device

Software Requirements

Software requirements to run the *i*.LON 100 Configuration Software and *i*.LON 100 configuration Web pages are given below:

- Microsoft Windows XP, Windows 2000, or Windows 98SE; Windows XP or Windows 2000 recommended. It is recommended that you install the latest service pack available from Microsoft for your version of Windows. Screen resolution 1024x768 with large or small fonts; 800x600 with small fonts only.
- LonMaker 3.1, Service Pack 2 or better and/or LNS 3.1, Service Pack 8, Update 1 or better.
- Internet Explorer 6 or higher.
- Terminal emulator, such as Windows HyperTerminal.

What's New in Version 1.1

Version 1.1 of the *i*.LON 100 contains the following new features:

- *M-Bus Data Points* — Version 1.1 of the *i*.LON 100 Configuration Plug-in supports the creation of M-Bus data points used to read and write data on Meter Bus devices. See *Configuring the M-Bus Driver* in Chapter 3 for more information.
- *Web Binding* — The version 1.1 i.LON 100 can connect data points directly to data points on another *i*.LON 100 or to a third party web server such as Apache® or IIS® by a process called Web binding, which uses SOAP messaging as a transport. See *Using Web Binding* in the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.
- *i.LON 100 Configuration Plug-in Support for the Analog Function Block functional block* — Version 1.1 of the *i*.LON 100 Configuration Plug-in includes support for the **Analog Function Block** functional block. See Chapter 9 of the *i.LON 100 User's Guide: Configuring the i.LON 100*

Applications Using the i.LON 100 Configuration Plug-in for more
information.

- *i.LON 100 Configuration Plug-in Support for custom type translator rules* —
  Version 1.1 of the *i*.LON 100 Configuration Plug-in includes support for
  creating, modifying, and deleting rules used by the **Type Translator**
  functional block. See Chapter 7 in the *i.LON 100 User's Guide: Configuring
  the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* for
  more information.

- *i.LON 100 Web Page Configuration Support for the Data Logger, Scheduler,
  Alarm Generator, Alarm Notifier, Data Server, Pulse Counter, Digital Input,
  and Digital Output functional blocks* — See the *i.LON 100 User's Guide:
  Using the i.LON 100 Web Pages to Configure Applications and to Monitor and
  Control Data Points* for more information.

- *Support for Creating SOAP-based Custom Web Pages* — Version 1.1. of the
  i.LON 100 supports the creation of SOAP-based custom Web pages. See
  Chapter 8 of the i.LON 100 User's Guide: Using the i.LON 100 Web Pages to
  Configure Applications and to Monitor and Control Data Points for more
  information.

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1

Introduction

This chapter provides an overview of the capabilities of the *i*.LON 100 server and the terminology used in this document.

Introduction

The *i*.LON 100 Internet Server is a low-cost, high performance interface that connects LONWORKS based everyday devices to the Internet, a LAN, or a WAN. Appliances, meters, load controls, lights, security systems, pumps, valves – virtually any electrical device – can be connected through the *i*.LON 100 Internet Server to an IP network or the Internet. This allows a service center to configure, monitor, and control everyday devices from across the room, or across the globe.

i.LON 100 Internet Server Capabilities

The *i*.LON 100 Internet Server provides the following capabilities:

- Alarming – The *i*.LON 100 Internet Server can trigger alarms based on inputs from LONWORKS devices or its built-in hardware inputs. In response to an alarm condition, the *i*.LON 100 server can be configured to in turn update any network variable in the LONWORKS network, update Web pages, log the conditions to one or more data logs, or send out emails notifying recipients of the alarms and the conditions that triggered them. Alarms can be configured to shut off automatically when certain conditions are met or they can be configured to require manual clearance via a Web page. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Data Logging – The *i*.LON 100 Internet Server can log data points from devices on a LONWORKS network. These logs can be downloaded using the Internet File Transfer Protocol (FTP), retrieved using a SOAP/XML Web service, or displayed on a Web page. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Scheduling – The *i*.LON 100 Internet Server can be used to create daily and weekly schedules, as well as exception schedules and override schedules. These schedules can drive the inputs to any LONWORKS device. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Digital Input/Output – The *i*.LON 100 Internet Server contains 2 built-in digital inputs and 2 built-in digital relay outputs. These can be used to provide LONWORKS functionality to non-LONWORKS devices. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Type Translation – The *i*.LON 100 Internet Server contains Type Translator functional blocks. These functional blocks can be configured to translate data from one data type to another. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and

the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Pulse Metering – The *i*.LON 100 Internet Server contains 2 built-in pulse metering inputs. You can configure the *i*.LON 100 server to count pulses or to measure the pulse frequency. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Analog Function Processing – The *i*.LON 100 Internet Server contains Analog Function Functional Bocks. This functional blocks can be used to perform operations on multiple analog inputs. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Web Hosting – The *i*.LON 100 Internet Server can host Web pages that allow data points on the network to be viewed and modified, as well as providing Web access to the data logging, alarming, and scheduling applications described above. See the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information.

- Remote Network Interface – The *i*.LON 100 Internet Server can function as a Remote Network Interface (RNI), connecting an LNS Server on an IP network to a LONWORKS network. This capability is described in Chapter 7.

- Dial-in/Dial-out Support – The *i*.LON 100 Internet Server can optionally contain a built-in modem. On these models you can configure the *i*.LON 100 server to dial-out and receive calls using the Internet Point-to-Point (PPP) communications protocol.

Using the *i*.LON 100 Internet Server

To take advantage of the capabilities of the *i*.LON 100 server described in the previous section, you will perform the following tasks:

1. *Connect the i.LON 100 Hardware* – This includes connecting the *i*.LON 100 server to a power source, LONWORKS network, and either an Ethernet network or a phone line (or both). Connecting the *i*.LON 100 server to a power source involves handling high-voltage wiring and must be performed by a qualified service person.

2. *Configure the i.LON 100 server's IP information* – This includes configuring the IP address, host name, etc. This is accomplished using the *i*.LON 100 server Web pages as described in Chapter 3 or using the console application described in Appendix A.

3. *Add the i.LON 100 server to a LONWORKS Network* – This is accomplished in an identical manner to adding any other device to a LONWORKS network. Using the LonMaker tool, drag an *i*.LON 100 shape from the *i*.LON 100 stencil to the LonMaker drawing, and then provide the Neuron ID of the *i*.LON 100 server using either the service pin or manual entry. This procedure is described in Chapter 3.

4. *Create Data Points* – The *i*.LON 100 server applications read and write network variable values using data points. All network variables on the

i.LON 100 server automatically have data points created for them (these are called *local data points*, or *NVLs*). When you add dynamic network variables to the *i*.LON 100 device, the *i*.LON 100 application automatically creates new local data points. The *i*.LON 100 server can also read and write the values of network variables on other LONWORKS devices in the network. In order to do this, you must create data points for these network variables (these are called *external data points*, or *NVEs*). You can create external data points using the *i*.LON 100 Configuration Plug-in, as described in the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* or by using the SOAP/XML interface as described in the *i.LON 100 Programmer's Reference*.

5. *Configure the i.LON 100 server Applications* – The *i*.LON 100 server contains functional blocks used for scheduling, alarming, data logging, digital input/output, type translation, and pulse meter reading applications. You can configure these functional blocks using the *i*.LON 100 Configuration Plug-in or the *i*.LON 100 Web pages as described in the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points*. You can also configure the *i*.LON 100 server applications using the SOAP/XML Interface of the *i*.LON 100 server. This interface is described in the *i.LON 100 Programmer's Reference*.

i.LON 100 Usage Scenarios

The *i*.LON 100 can be used in conjunction with the LonMaker tool, with a non-LonMaker LNS application, or simply with a Web Browser. The capabilities of the *i*.LON 100 in each of these situations is outlined below:

- *Using the i.LON 100 with the LonMaker Tool*. When using the *i*.LON 100 with the LonMaker tool, the *i*.LON 100 Configuration Plug-in will be launched when you configure the *i*.LON 100 device shape or any *i*.LON 100 functional block shape. The *i*.LON 100 configuration property is aware of what functional blocks have been dropped in the LonMaker drawing, and will only allow you to configure the applications corresponding to those functional blocks that exist in the drawing.

- *Using the i.LON 100 with a non-LonMaker LNS Tool*. When using the *i*.LON 100 with an LNS tool other than LonMaker, you can launch the *i*.LON 100 Configuration Plug-in by whatever method plug-ins are launched by that tool. The *i*.LON 100 Configuration Plug-in will list all *i*.LON 100 applications; you are responsible for configuring the correct applications.

- *Using the i.LON 100 without LNS*. When using the *i*.LON 100 with no available LNS tool, you can only access the *i*.LON 100 Configuration Web pages. The *i*.LON 100 Configuration Web pages can be used to view and modify (but not create) data points and to configure any of the *i*.LON 100 applications. An LNS tool such as the LonMaker tool must be used to add the *i*.LON 100 to an LNS network and create any necessary network variable connections.

i.LON 100 System Limits

The following sections document the limits of the *i*.LON 100 RNI capabilities and of the applications that run on the *i*.LON 100.

i.LON 100 RNI Limits

The capabilities of the RNI on the i.LON-100 are in largely dependent on the software running on the host computer. When used as an LNS network interface, the i.LON-100 RNI has the following limits (see the *Introduction to LonWorks* document or the *LonMaker User's Guide* for more information about these limits):

- Up to 32768 address table entries.
- Up to 15 simultaneous transactions.
- Up to 1096 aliases.
- Up to 15 groups.
- Up to 4096 dynamic network variables.

i.LON 100 Application Limits

The *i*.LON 100 application has the following limits:

- Up to 4096 address table entries.
- Up to 32 simultaneous transactions.
- Up to 1024 aliases.
- The *i*.LON 100 application theoretically supports up to 3000 dynamic network variables, but the *i*.LON 100 will run out of memory before this limit is reached; the practical limit depends on the sizes of the defined dynamic network variables. You can check the available memory on the **System Info** Web page.

2

Mounting, Cabling and Connections

This chapter describes how to mount the *i*.LON 100 enclosure and how to attach power, data, a LONWORKS channel, an Ethernet network, and I/O to the *i*.LON 100 Internet Server.

Mounting the Enclosure

The *i*.LON 100 Internet Server mounts to a 35mm x 7.5mm or 35mm x 15mm DIN rail located inside of a suitable, safety-agency approved enclosure, and mounted in a restricted access area. All high-voltage wiring must be performed by a qualified service person. The rear of the *i*.LON 100 server enclosure contains a spring-loaded DIN rail lock, which securely grabs the DIN rail onto which the enclosure is snap, mounted. To release the enclosure from the DIN rail, insert a flathead screwdriver into the DIN rail locking tab and gently pull the tab upwards and away from the enclosure.
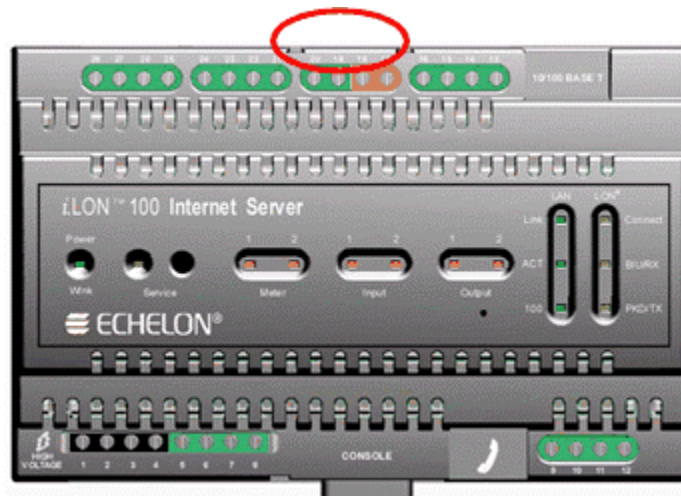
***i*.LON 100 server DIN Rail Locking Tab Location**

The following diagram shows the dimensions of the *i*.LON 100 server and the space required for the various connectors. All units are in millimeters:
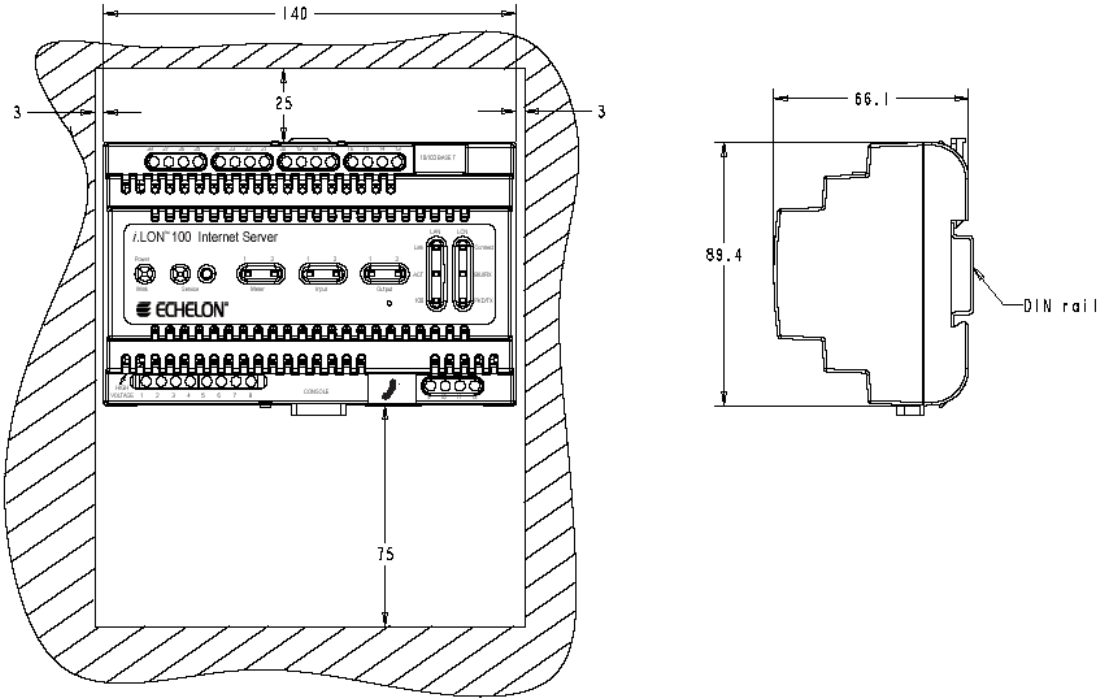
Wiring Connections

The *i*.LON 100 Internet Server is provided with two rows of screw terminal wiring connections, an RJ45 data connection, an RJ11 telephone connection, and a DB-9 D-connector for connection to a configuration console. The screw terminals are located on the top and bottom edges of the chassis, and are numbered 1 to 12 (ascending from left to right) on the bottom, and from 13 to 28 (ascending from right to left) on the top. The following diagram shows the locations of all *i*.LON 100 server connectors:

LonTalk

RJ-45 10/ 100 Base T Ethernet Port

RS-485 Serial

RS-232 Serial

+12V <20 mA

Digital Inputs

28 27 26 25   24 23 22 21   20 19 18 17   16 15 14 13   10/100 BASE T

Service Pin

i.LON™ 100 Internet Server

LAN   LON®

Link   Connect

Power

Wink   Service   Meter   1   2   Input   1   2   Output   1   2   ACT   BIU/RX

100   PKD/TX

ECHELON®

Reset Switch

HIGH VOLTAGE   1 2 3 4   5 6 7 8   CONSOLE   9 10 11 12

Mains (90-240 VAC, 50/60 Hz)

Relay Outputs

DB-9 Console Port

RJ-11 Telephone Line Port

Metering Inputs

i.LON 100 Server Data, Console, and Telephone Connections

The RJ-45 10/100 BaseT Ethernet Port

The RJ-45 connector must be used with an RJ-45 male connector and a suitable Category 5 or Category 6 data cable connected to a 10BaseT or 100BaseT channel. The i.LON 100 server will automatically adjust to the speed of the data port, and if a 100BaseT network connection is established illuminates the "100" LED indicator on the front panel. The i.LON 100 server automatically detects whether it is connected to an Ethernet hub or directly to a computer, so there is no need to use a crossover Ethernet cable.

The DB-9 Console Port

The i.LON 100 server contains a console application that is accessed using a terminal emulation program, such as Windows HyperTerminal, via the EIA-232 DB-9 console port. This application allows you to set basic parameters such as the IP address, subnet mask, and FTP user name and password. The DB-9 is designed to be used with a DB-9 null-modem crossover cable with female connectors on both ends that connects the i.LON 100 server and an available COM port on a computer running the terminal emulation program. The connector pins on the DB-9 console are aligned as shown in the following figure:

① ② ③ ④ ⑤
⑥ ⑦ ⑧ ⑨
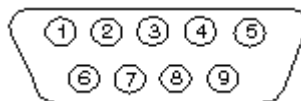
The connector pins are described in the table below.

i.LON 100 Server DB-9 Pin Assignment

i.LON 100 DB-9 (DTE) Pin	Description
1	NC (No connect)
2	RxD (Receive Data)
3	TxD (Transmit Data)
4	NC (No connect)
5	GND (Ground)
6	NC (No connect)
7	NC (No connect)
8	NC (No connect)
9	NC (No connect)
DB-9 Shell	Earth Ground

The RJ-11 Telephone Line Port

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Safety Warning

The i.LON 100 Internet Server telephone modem should be used only with telephone circuits equipped with proper lightning and transient protection circuitry. This minimizes the risk of shock or damage should lightning strike on or near a telephone circuit to which the i.LON 100 Internet Server is connected.

The RJ-11 telephone connector is used with i.LON 100 Internet Server Models 72102 and 72104. This connector must be used with a suitable male RJ-11 connector that is connected to a two-wire POTS connection that is compatible with the V.90 internal analog modem. The i.LON 100 server analog modem is not compatible with ISDN circuits.

CAUTION – To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Screw Terminal Connectors

The screw terminals accept $0.34 – 4.0mm^2$ ($22 – 12AWG$) gauge solid wire. The optimum tightening torque for the screw terminals is 0.75mm (6 lbs. in.) maximum. The ideal flathead screwdriver tip width is 3mm (0.12"). Wires should be stripped to a length of 7mm (0.28"). Although not required, it may be useful to use a soldering iron to tin the stripped lengths of any stranded wires to prevent fraying and inadvertent contact with adjacent terminals.

The screw terminal connections can be divided into seven groups:

- RS-485/Serial ports.

- High voltage mains power;
- Dry contact relay outputs;
- Pulse meter inputs;
- Digital inputs;
- LONWORKS network;
- +12V < 20mA Output;

Each of these groups is described in detail below.

RS-232/RS-485 Serial Ports

The *i*.LON 100 includes one isolated RS-485 multi-drop bus port and one EIA-232 serial port. These ports can be used to connect the i.LON 100 to a GSM modem, to other computers, or to bus systems. To connect the *i*.LON 100 to a GSM modem, the serial connector from the modem must be attached to the ports on the *i*.LON 100 as shown in the following table:

i.LON 100 Server GSM Modem Connections

GSM Modem DB 9 Pin	i.LON 100 Screw Terminal	Enclosure Marking
1	not connected	N/A
2	pin 23	RXD
3	pin 24	TXD
4	not connected	N/A
5	pin 25	GND
6	not connected	N/A
7	pin 21	RTS
8	pin 22	CTS
9	not connected	N/A

If the RS-485 and EIA-232 ports are physically connected to a device other than a GSM modem or an M-Bus device, a special custom software driver must be provided by Echelon to support the intended application and enable communications over the port (check the Echelon website (www.echelon.com) for availability).

The EIA-232 serial connections are implemented on screw terminals 21 through 25. To connect a GSM modem to the i.LON 100 RS-232 port, a cable may be ordered in Europe from EBV. The part number is ECH-RS232/500.

The RS-485 bus connections are implemented on screw terminals 26 though 28. These are polarity sensitive signals and the (+) and (-) connections are noted adjacent to the terminals. Since RS-485 is susceptible to common mode ground differential voltage swings, it is imperative that a suitable shielded cable be used when connecting RS-485 based devices. Reversing the polarity of the RS-485 bus will cause improper bus operation and must be avoided.

In order to connect M-Bus devices to an *i*.LON 100 device, a level converter is needed. This level converter is connected to the RS-232 interface of the *i*.LON 100 and to the M-Bus devices. It not only converts the M-Bus signals to RS-232

signals, it also supplies the M-Bus devices with power. (like the Echelon Link Power Transceivers).

Depending on the number of M-Bus devices you are going to connect to the *i*.LON 100, different classes of level converters are available.

There are converters that can drive only 3 M-Bus devices, and there are converters that can drive 20, 60, or even 250 devices.

Examples and more information on these level converters can be found at:

www.relay.de (Level Converter PW3, PW20, PW60) , www.stv-automation.de (BIALON MPW-20 M-Bus) or www.hydrometer.com (HYDRO-CENTER 25, 60, 250).

For more information on the M-Bus itself, please refer to the M-Bus User Group at www.m-bus.com
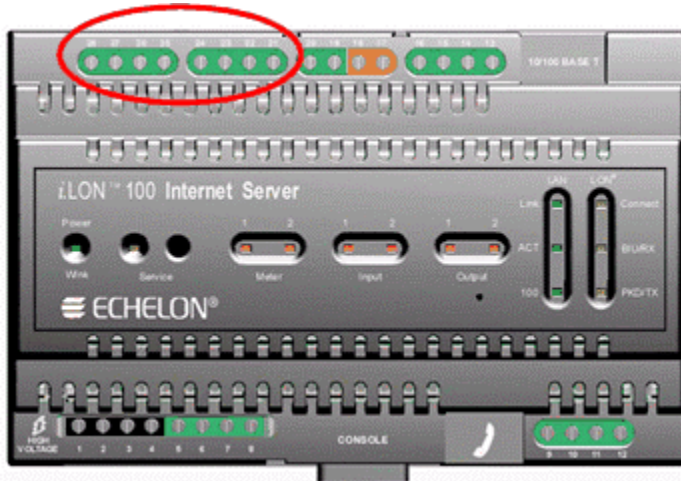
i.LON 100 Server EIA-232 and RS-485 Port Terminals

i.LON 100 Server EIA-232 and RS-485 Port Connections

Screw Terminal	Enclosure Marking	EIA-232/RS-485 connection
21	RTS	EIA-232 RTS
22	CTS	EIA-232 CTS
23	RXD	EIA-232 Receive
24	TXD	EIA-232 Transmit
25	GND	RS-232 ground
26	Shield GND	RS-485 cable shield
27	RT-	RS-485 (-)
28	RT+	RS-485 (+)

High Voltage Mains Power

⚠

Safety Warning

When connecting a unit, always connect earth ground first, then Neutral, then Line. This minimizes the risk of shock or damage should power inadvertently be present on Line.

Safety Warning

Fuse F350 in the *i*.LON 100 server uses a Wickmann rated 250 VAC, .5 A, SLO-BLO.

Safety Warning

The *i*.LON 100 server uses a Poly-carbonmonoflouride Lithium Coin battery.

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

DISPOSE OF UNUSED BATTERIES ACCORDING TO THE INSTRUCTIONS.

Safety Warning

The *i*.LON 100 server is not equipped with a power disconnect device. When the device is installed and mounted, the installer must provide a means to safely remove power, such as a power-switch or a circuit-breaker.

Safety Warning

The high-voltage terminal block has a plastic cover protecting the screw terminals used to connect the high-voltage inputs. This cover **MUST** be replaced after the power wires are connected and before the power is activated.

The 100-240VAC power mains connection is used to both power the *i*.LON 100 Internet Server and, in the case of the power line models (Models 72103 and

72104), for LONWORKS network signaling. The *i*.LON 100 server contains an auto-ranging, auto-setting mains power supply. It is not necessary to adjust any jumpers or other settings when connecting mains voltage.

The high voltage connection is implemented on screw terminals 1 (earth ground), 3 (Neutral), and 4 (Line): screw terminal 2 (NC) is not used and should remain unconnected. A solid earth ground via terminal 1 connection is required for proper ESD and EMC performance of the *i*.LON 100 device. Use the following order for installation.

1. Insert the earth ground;
2. Insert the neutral connection; and then
3. Insert the line connection.

DO NOT apply power to the *i*.LON 100 server until you have checked all wiring connections, and you are instructed to apply power.
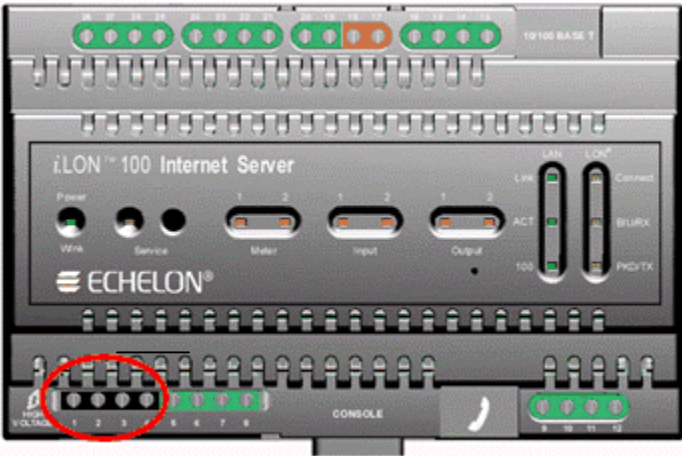
i.LON 100 Server High Voltage Mains Screw Terminals

i.LON 100 Server AC Power Mains Connections

Screw Terminal	Enclosure Marking	Mains Connection
1	E	Earth ground
2	NC	Do not connect
3	N	Neutral
4	L	Line

Safety and High Voltage Warning

Ensure that the AC power mains are turned OFF before removing the cover, handling the mains wiring, or connecting any mains cabling to the *i*.LON 100 server device.

DO NOT under any circumstances operate the *i*.LON 100 server device to mains voltages outside of the range 100/240VAC, -10% to +30%, 50/60Hz ±2.5Hz.

Alerta de Seguridad y Alto Voltaje

Asegúrese que la la red electrica de corriente alterna AC este DESENERGIZADA antes de: quitar la cubierta, manipular los cables de alimentacion o conectar cualquier cableado al dispositivo *i*.LON 100.

Bajo NINGUNA circunstancia conecte el dispositivo *i*.LON 100 a redes electricas con voltajes fuera del rango 100/240VAC, -10% a +30%, 50/60Hz ±2.5Hz.

Sécurité et Avertissement Haute Tension

Assurez vous que l'interrupteur Marche Arrêt est dans la position Arrêt avant d'enlever le capot, manipuler les câbles d'alimentation, ou bien quand vous branchez un cordon secteur au *i*.LON 100.

Il ne faut JAMAIS connecter le *i*.LON 100 à une tension d'alimentation hors de la plage 100/240VAC, -10% à +30%, 50/60Hz ±2.5Hz.

Sicherheitshinweis: Vorsicht Netzspannung!

Stellen Sie sicher, daß die Netzspannung AUSgeschaltet wurde (Schalterstellung OFF), ehe der Gehäusedeckel entfernt, an der Spannungsversorgung hantiert oder irgendeine Netzverbindung mit dem *i*.LON 100 Gerät hergestellt wird.

AUF KEINEN FALL darf das *i*.LON 100 mit Netzspannungen ausserhalb des Bereichs 100/240V, -10% bis +30%, 50/60Hz±2.5Hz betrieben werden.

Avvertenza sulla Sicurezza e sull'Alta Tensione

Assicurarsi che la rete elettrica sia SPENTA prima di rimuovere il coperchio, maneggiare i cavi di alimentazione, o connettere qualsiasi cavo al *i*.LON 100.

NON connettere mai per nessun motivo il *i*.LON 100 a tensioni al di fuori del range 100/240VAC, da -10% a +30%, 50/60Hz +-2.5Hz.

Dry Contact Relay Outputs

The *i*.LON 100 server is provided with two high-voltage, high current, single pole, single throw (SPST), relay outputs rated at 230VAC @ 10 A or 24VDC @ 10A. The operation of the relays is under software control of the *i*.LON 100

Mounting, Cabling and Connections

server, and may be triggered via the local software applications or based on the receipt of remote messages.

The relay connections are implemented on screw terminals 5 through 8. The SPST relay contacts are not polarity sensitive and can be used to switch both AC and DC loads. The relays require a minimum load of 5V at 5mA in order to avoid low voltage contact pitting, and should therefore not be used to switch TTL level signals.
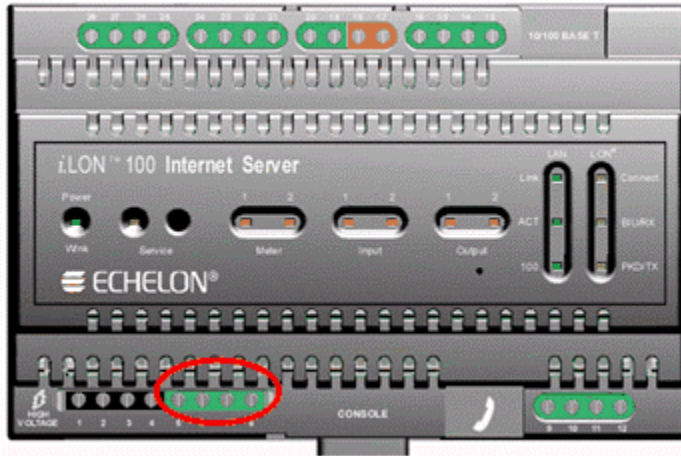
***i*.LON 100 Server Relay Screw Terminals**

***i*.LON 100 Server Relay Connections**

Screw Terminal	Enclosure Marking	Relay Connection
5	Output 1	Relay output 1
6	Output 1	Relay output 1
7	Output 2	Relay output 2
8	Output 2	Relay output 2

The dry contact relay outputs can be connected to a voltage source and a load. When an On value is asserted, the circuit will be closed and the voltage source will drive the load. This is shown in the following diagram:

i.LON 100 Digital
Output Connectors
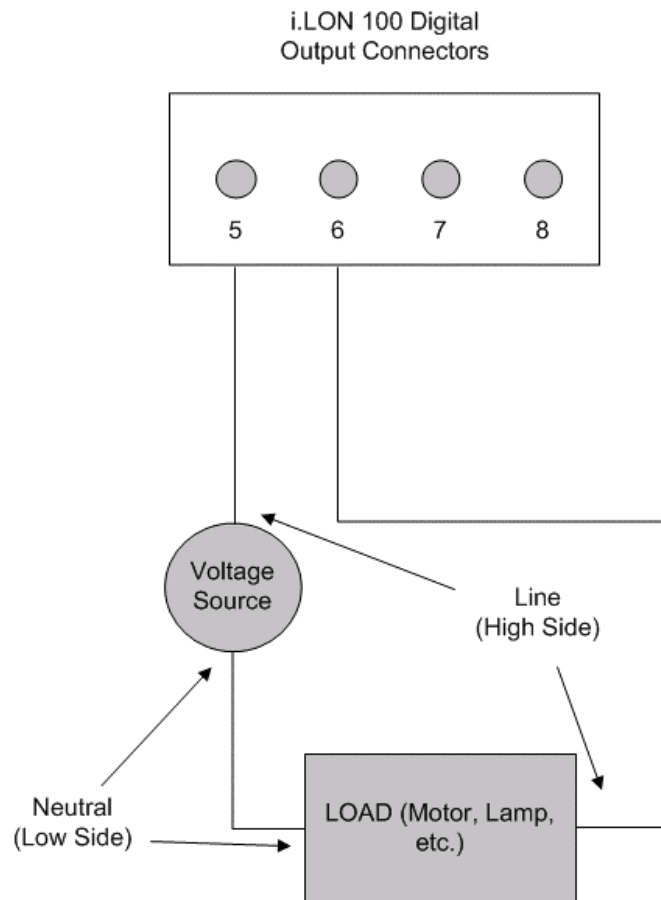
Pulse Meter Inputs

The *i*.LON 100 server is provided with two impulse meter inputs. These pulse meter inputs are in compliance with the DIN 43 864 impulse standard (open terminal voltage <12VDC, maximum current ≤27mA). The supervision of the inputs is under software control of the *i*.LON 100 server and its applications.

The meter input connections are implemented on screw terminals 9 through 12. Meter 2 is connected to terminals 9-10 and Meter 1 is connected to 11-12. The impulse meter inputs are polarity sensitive and the (+) and (-) connections for Meter 1 and Meter 2 are noted adjacent to the terminals. Reversing the polarity of the meter inputs will cause improper operation of the measurement circuits and must be avoided.

A pulse meter registers a pulse when the circuit between its positive and negative connections is closed (i.e. the Voltage is 0) for 30ms or longer; the circuit must be open for a minimum of 30ms between pulses.

Mounting, Cabling and Connections
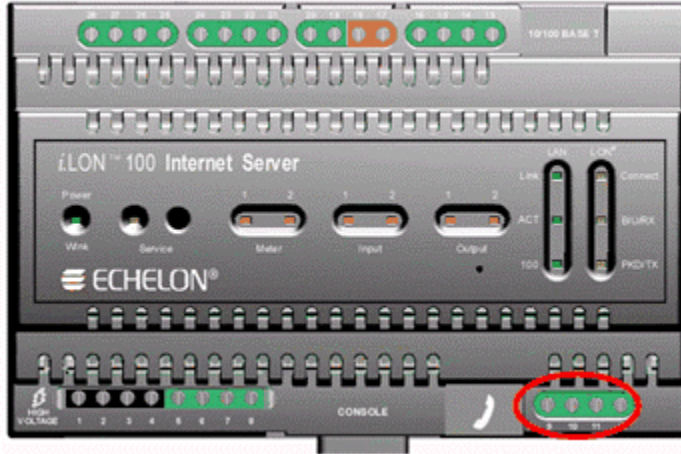
i.LON 100 Server Pulse Meter Screw Terminals

i.LON 100 Server Pulse Meter Connections

Screw Terminal	Enclosure Marking	Pulse Meter Connection
9	Meter2-	- signal from Meter 2
10	Meter 2+	+ signal from Meter 2
11	Meter 1-	- signal from Meter 1
12	Meter 1+	+ signal from Meter 1

The pulse meter inputs can be connected to either a dry contact relay or to an active device output that generates pulses by closing the circuit between the two terminals. Both configurations are shown in the following diagram:
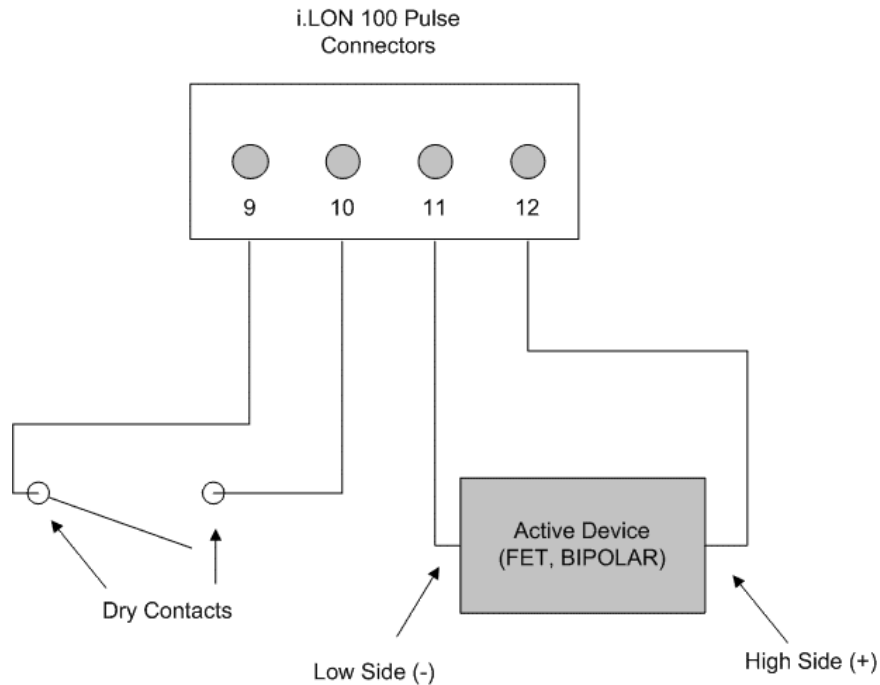
Digital Inputs

The *i*.LON 100 server has two optically isolated, polarity sensitive digital inputs that you can use for monitoring switches and sensors. The supervision of the inputs is under software control of the *i*.LON 100 server and its applications.

The digital input connections are implemented on screw terminals 13 through 16. Input 2 is connected to terminals 13-14 and Input 1 is connected to 15-16. The digital inputs are polarity sensitive and the (+) and (-) connections for Input 1 and Input 2 are noted adjacent to the terminals. Reversing the polarity of the digital inputs will cause improper operation of the monitoring circuits and must be avoided.
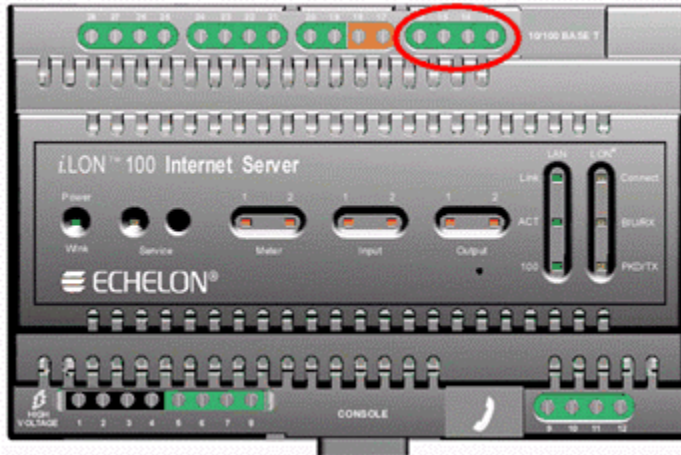
i.LON 100 Server Digital Input Screw Terminals

i.LON 100 Server Digital Input Connections

Screw Terminal	Enclosure Marking	Digital Input Connection
13	Input 2-	- signal from input 2
14	Input 2+	+ signal from input 2
15	Input 1-	- signal from input 1
16	Input 1+	+ signal from input 1

The digital input can be connected to a set of dry contacts or to an active device output. The +12V < 20mA output can be used to as a voltage source for the digital input, as shown in the following figure:

Active Device (FET, BIPOLAR)

High Side (+)

Low Side (-)

| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |

i.LON 100 +12V <
20mA Output

i.LON 100 Digital
Input Connectors
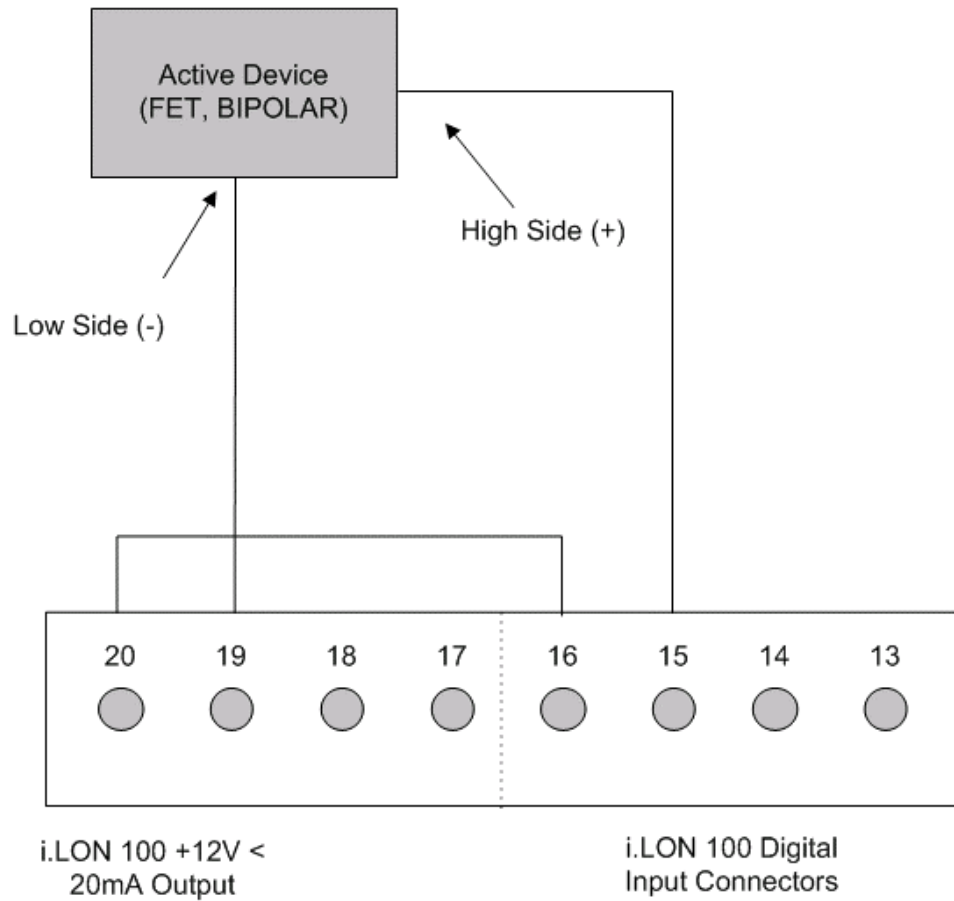
LONWORKS Network

The *i*.LON 100 server is provided with one of two types of LONWORKS channels: TP/FT-10 free topology twisted pair (Models 72101 and 72102) or PL-20 power mains (Models 72103 and 72104). The TP/FT-10 free topology twisted pair interface is polarity-insensitive and requires connecting the twisted pair to terminals 17 and 18.

The PL-20 power mains interface is achieved via the 100-230VAC mains connection (see *High Voltage Mains Power* above). In some cases, on specially modified *i*.LON 100 Internet Servers in which an external power mains coupler is used with twisted pair to connect to a distantly located mains panel, terminals 17-20 will be used – please contact Echelon for details.
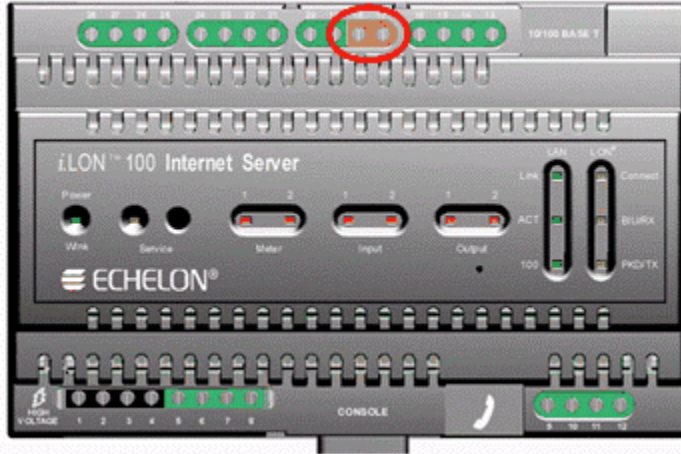
***i*.LON 100 Server LONWORKS TP/FT-10 Free Topology Twisted Pair Terminals**

***i*.LON 100 Server LONWORKS TP/FT-10 Network Connections**

Screw Terminal	Enclosure Marking	LONWORKS Network Connection
17	LON B	TP/FT-10 twisted pair
18	LON A / PLT Tap	TP/FT-10 twisted pair

+12V < 20mA Output

The *i*.LON 100 server is provided with one +12V outlet that can provide up to 20mA. This +12VDC connection may be used by a set of dry contacts to power the optically isolated digital inputs.

The +12V <20mA output is implemented on screw terminals 19 and 20. Screw terminal 20 is the +12 Volt power connector. Screw terminal 19 is the system ground.
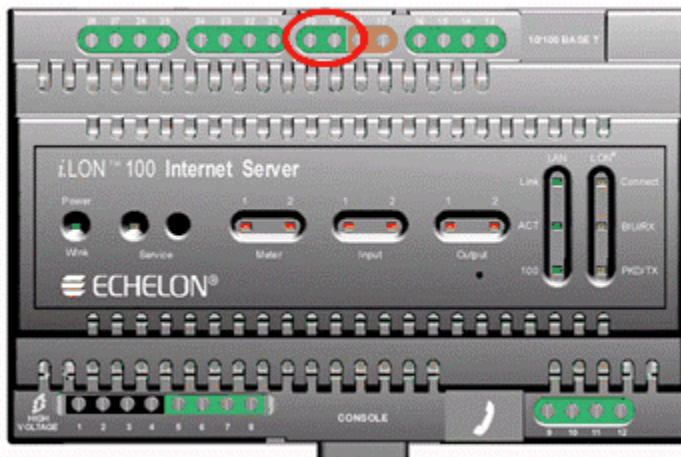
***i*.LON 100 Server LONWORKS +12V < 20mA Output Terminals**

i.LON 100 Server LONWORKS +12V < 20mA Output Terminals Connections

Screw Terminal	Enclosure Marking	+12V < 20mA Connection
19	GND	Ground
20	+12V < 20mA	+12 Volt output.

Applying Power to the i.LON 100 Internet Server

Once you have mounted the *i*.LON 100 Internet Server, connected all wiring, and closed the enclosure, apply AC mains power to the unit. The LEDs on the *i*.LON 100 server will flash for several minutes as the unit boots. Once the unit is powered and operational the green Power/Wink LED will stay solid ON.

i.LON 100 Internet Server LEDs

The following LEDs provide status information for the *i*.LON 100 server.

Power/Wink	This LED is on when the *i*.LON 100 server unit has power. When the *i*.LON 100 server receives a LONWORKS wink command, this light blinks on and off 5 times. When the *i*.LON 100 server applications are not running, this light blinks rapidly.
Service	Indicates the state of the LonTalk application in the *i*.LON 100 server. This LED is normally off. Blinking indicates the application is in the unconfigured state. This LED is solid ON when the *i*.LON 100 server is in Security Access Mode.
Meter	2 LEDs, labeled 1 and 2, which indicate when a pulse is received on the Meter1 and Meter2 inputs, respectively.
Input	2 LEDs, labeled 1 and 2, which indicate when on ON value is received on the Input1 and Input2 digital inputs, respectively. The LEDs are aware of whether the **Invert** option is selected (i.e. if an open circuit is interpreted as ON, then the light will go on when the circuit is open and vice versa). The digital input requires a minimum voltage differential of 3.4V.
Output	2 LEDs, labeled 1 and 2, which indicate when power is applied to the Output1 and Output2 outputs, respectively. The LED is on when the relay contacts are closed, and off when the relay contacts are open.
LAN Link	Lights when an Ethernet connection has been established.
LAN ACT	Lights with there is activity on the Ethernet connection.

LAN 100	Lights when the Ethernet connection is at 100 Mbps (power line models operate at 10 Mbps).
LON Connect	Lights when an xDriver session is open to an LNS Server.
LON BIU/RX	On the power line model, this is the band in use indicator; on the free topology model, this is the receive transmission indicator that lights when LONWORKS data is being received.
LON PKD/TX	On the power line model, this is the packet detect indicator; on the free topology model, this is the transmit data indicator that lights when LONWORKS data is being transmitted.

*i.*LON 100 Internet Server Buttons

The *i.*LON 100 server contains 2 buttons:

Service Pin	The *i.*LON 100 server's service pin is a recessed pushbutton used to send a LONWORKS service pin message on the LONWORKS channel.
Reset Switch	The *i.*LON 100 server's reset switch is a recessed pushbutton used to reset the *i.*LON 100 server. It is located below the **Output** LEDs. To reset the *i.*LON 100 server hardware, press and release the reset switch using a straightened paper clip or similar implement.

FCC Compliance Statement – Class B

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if no installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IC Compliance Statement – Class B

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations of ICES-003.

VCCI Compliance Statement – Class B ITE

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

3

Installing the *i*.LON 100 Software, Hardware, and Firmware

This chapter describes how to install the *i*.LON 100 Configuration Plug-in, how to connect the *i*.LON 100 hardware, and how to upgrade, back-up, and restore the *i*.LON 100 firmware.

Installing the *i*.LON 100 Software

In order to access the *i*.LON 100 Web pages, you must have Internet Explorer 6 or later. To use the *i*.LON 100 Configuration Plug-in, you must install the i.LON 100 software. To install the *i*.LON 100 software, follow these steps:

1. Assure that you have LNS 3 SP 8 Update 1 (or later) and LonMaker 3.1 SP3 (or later). These patches are available on the i.LON 100 CD-ROM, in the following locations:

    LNS 3 SP8   D:\LNS SP8 xDriver\Lns3sp8_5a.exe
    LNS 3 SP8 Update 1   D:\LNS SP8 xDriver\Lns3sp8u1.exe
    LonMaker 3.1 SP3   D:\LMW 3.1 SP3\lmw313.exe

    These patches must be installed in the order they are listed above.

    If you have a version of LonMaker prior to 3.1 you must first update to LonMaker 3.1.

    This will bring your PC up to the latest revisions of LonMaker and LNS software.

    The latest service packs for LNS and the LonMaker tool are available at www.echelon.com.

    You can verify that you have the correct versions of all software installed by clicking on the LonMaker launcher's title bar and selecting "About Echelon LonMaker". This dialog should appear as shown in the following figure
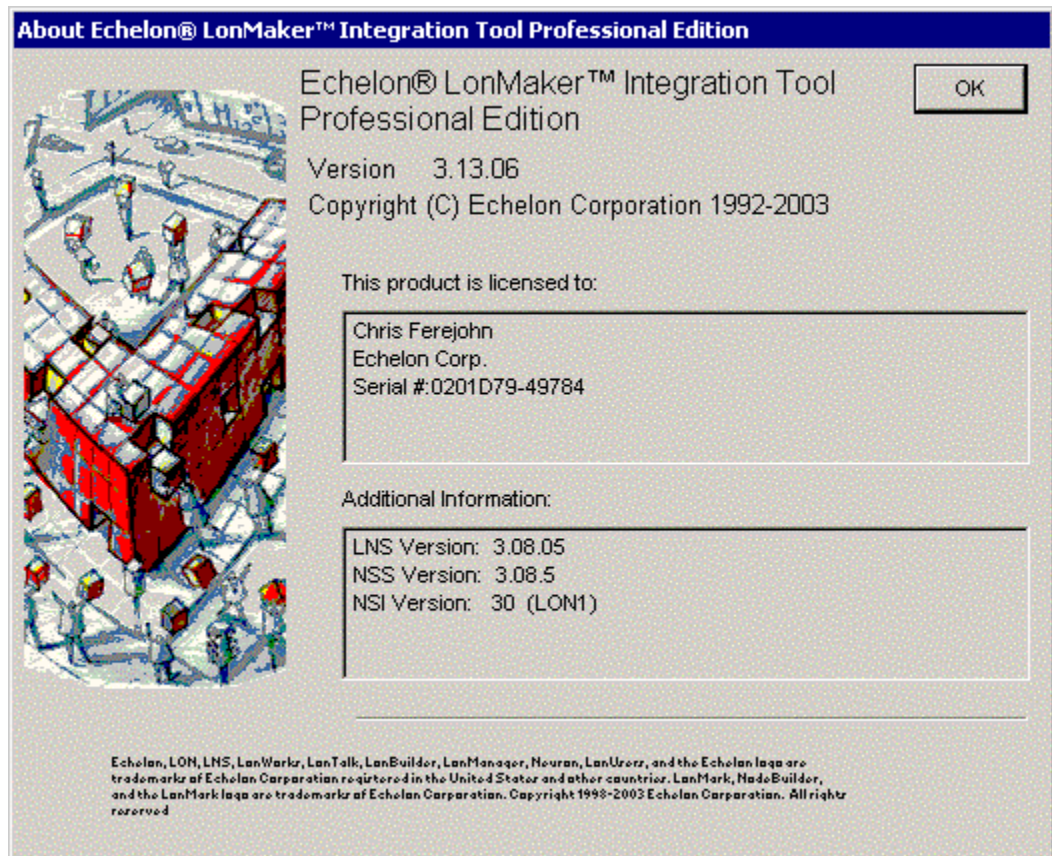
2. Assure that you have Internet Explorer 6, SP 1 (or later) installed on your computer. This is available on the i.LON 100 CD-ROM in the following location:

   D:\IE\ie6setup.exe

3. Once you have assured that the most recent LNS and LonMaker patches have been applied, open the root directory of the *i*.LON 100 CD and double-click Setup.exe. Follow the installation prompts to install the *i*.LON 100 software.

Connecting and Configuring the *i*.LON 100 Internet Server

To connect and configure your *i*.LON 100 Internet Server, follow these steps:

1. Physically install the *i*.LON 100 hardware as described in Chapter 2. High-voltage wiring must be performed only by a qualified service person.

2. If you are using the power line model of the *i*.LON 100 server, skip to step 3. If you are using the free topology model, connect a LONWORKS TP/FT-10 channel to the *i*.LON 100 Internet Server's LonA and LonB screw terminals (screw terminals 17 and 18). The power line model communicates through the power supply.

3. Connect the *i*.LON 100 Internet Server's 10/100Base-T Ethernet port to a Ethernet hub or switch (TCP/IP network) that can communicate with your computer or use an Ethernet cable to connect the *i*.LON 100 server to your computer directly (the *i*.LON 100 Internet Server's Ethernet port is auto-switching, so you can use a straight-thru Ethernet cable, though a crossover cable will still work).

   Alternatively, you can connect a female-to-female DB-9 null modem cable between the *i*.LON 100 server's serial port and one of the serial ports on your computer to configure the *i*.LON using the console application described in *Appendix A*. The Web configuration provides a superior interface and is the preferred configuration method.

4. Open the Windows Command Prompt window and enter the following command (this is the exact text of the command):

   `route add 192.168.1.0 mask 255.255.255.0 %COMPUTERNAME%`

   This command allows your computer to communicate with the *i*.LON 100 server's default IP address (192.168.1.222) even when they are on different subnets. This command will not persist through computer reboots; however, you can add it to your computer's startup script.

5. To confirm that you have successfully connected your i.LON 100, launch Internet Explorer 6 or later and point to `http://192.168.1.222`. The *i*.LON 100 Internet Server Welcome Web page appears. See Chapter 4 for information on how to configure the *i*.LON 100 using these web pages.
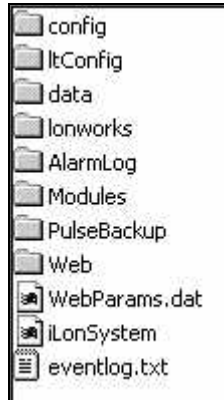
The *i*.LON 100 Firmware

The *i*.LON 100 ships with the latest version of the *i*.LON 100 firmware. When you receive your *i*.LON, you will not need to install any firmware in order to begin using your *i*.LON 100.

This section describes the directory structure of the *i*.LON 100 firmware and how to backup, restore, replace, and upgrade the *i*.LON 100 firmware.

The i.*LON 100 Server's Directory Structure*

The *i*.LON 100 server contains file system with a directory structure as described in this section. This directory structure is replicated on your computer in the LONWORKS\iLON100\Images\iLON100 1.10 directory. You can access the *i*.LON 100 server's file system using an FTP client such as Internet Explorer. The top level of the *i*.LON 100 server's directory structure appears as shown in the following figure:

The folders contain the following information:

AlarmLog	Contains the alarm log data for the *i*.LON 100 server. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information on alarming.
Config	Contains the configuration files for the *i*.LON 100 server. This folder contains a sub-folder called **Software** that contains the configuration XML files. You can modify these files to configure the *i*.LON 100 server without the use of the *i*.LON 100 Configuration Plug-in. See the *i.LON 100 Internet Server Programmer's Reference* for more information.
Data	Contains the **Data Logger** files for the *i*.LON 100 server. See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* and the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information on data logging.
LONWORKS	Contains LONWORKS data. Do not modify the files in this folder. Resource files are located in the LONWORKS/Types folder.

ltConfig	Contains LonTalk configuration data, including NVL driver bindings. Do not modify the files in this folder.
Modules	Contains module data. Do not modify the files in this folder.
PulseBackup	Contains backup data for the **Pulse Counter** functional block. Do not modify the files in this folder.
Web	Contains the data used to create the *i*.LON 100 Web pages. The file named "Index.htm" in this folder will be used as the default web page ("Index.html" will not work). See the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points* for more information on placing your own Web pages in this folder. This folder also contains a sub-folder called **WSDL**. This contains the **WSDL** file for the *i*.LON 100 server used to create Web services. See the *i.LON 100 Internet Server Programmer's Reference* for more information.
Webparams.dat	This file is used to set *i*.LON 100 security as described in the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points*.
iLonSystem	This is the *i*.LON 100 system image. Do not modify or move this file.

Backing Up, Restoring, and Replacing the i.*LON 100 Server*

Because the *i*.LON 100 server has LONWORKS and non-LONWORKS elements, backing up, restoring, and replacing an *i*.LON 100 server is slightly more complex than backing up, restoring, and replacing a typical LONWORKS device. The LONWORKS information is backed up in the LONWORKS database and the LonMaker drawing. These can be backed up and restored as described in the *LonMaker User's Guide*. The non LONWORKS information can be backed up and restored using an FTP application.

Backing Up an i.LON 100 Server Using FTP

You can backup the configuration of an *i*.LON 100 device using FTP or using the i.LON 100 Configuration Plug-in as described in the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* You must separately back-up the LONWORKS and non LONWORKS data. To backup the configuration of an *i*.LON 100 device using FTP, use an FTP application to copy the entire contents of the *i*.LON 100's root directory to a folder on your computer.

If you are using the LonMaker tool, you may want to use the *i*.LON 100 folder within the LonMaker drawing folder on your computer as the backup folder.

This way, when you back up the LonMaker database (see the *LonMaker User's Guide*), you can set **Backup All Files in Drawing Directory** to backup the *i*.LON 100 configuration along with the rest of the LonMaker network.

Restoring or Duplicating an i.LON 100 Server

You can restore the configuration of an *i*.LON 100 device from an *i*.LON 100 backup directory. To restore an *i*.LON 100 backup directory, follow these steps:

1. Determine the location of the directory to which the *i*.LON 100 configuration was backed up.

2. Format the *i*.LON 100 using the **format** command in the console application as described in Appendix A.

3. Copy the contents of the *i*.LON 100 backup folder to the *i*.LON 100's root directory using an FTP application.

4. Reset the *i*.LON 100.

You can follow this procedure with a new *i*.LON 100 to create an *i*.LON 100 with identical configuration to the *i*.LON 100 you used to create the backup folder . You can also FTP files directly from one *i*.LON 100 to another to duplicate the configuration of an *i*.LON 100.

When you install the *i*.LON 100 software, the default *i*.LON 100 server's configuration is stored in the LONWORKS\iLon100\Images\iLON100 1.10 directory on your computer. To restore an *i*.LON 100 server to its factory default condition, use an FTP application to remove all files on the *i*.LON 100 server and then copy the contents of this directory into it.

Replacing an i.LON 100 Server

To replace an *i*.LON 100 device, follow these steps:

1. Close the network containing the *i*.LON 100 device.

2. Reboot the old *i*.LON 100 device as described in *Appendix A*. When the console application displays Press the '!' key to stop auto-boot, press '!'.

3. Backup the entire directory structure of the old *i*.LON 100 server to be replaced onto a folder on a computer using an FTP application, as described in *Backing Up an i.LON 100*.

4. Remove the old *i*.LON 100 device from the LONWORKS network.

5. Attach the new *i*.LON 100 device to the LONWORKS network.

6. Format the new *i*.LON 100 server and restore the directory structure backed up in step 3, as described in *Restoring or Duplicating an i.LON 100*.

7. Reboot the new *i*.LON 100 server.

8. Assure that the new *i*.LON 100 server has the same IP address, subnet mask, and gateway as the old *i*.LON 100 server. If you are using the *i*.LON 100 server's RNI capability, you must also assure that the new *i*.LON 100 server has the same MD5 authentication key as the old *i*.LON 100 server. If the new *i*.LON 100 is initially configured to use the default key (all zeros), this will occur automatically when connecting to the RNI.

9. Re-open the network.

10. Perform a replace operation. Using the LonMaker tool, right-click the *i*.LON 100 device shape and select **Replace** from the shortcut menu.

11. Follow the replace procedure as described in the *LonMaker User's Guide*. Use the configuration property values from the old device. When prompted, press the service pin on the new *i*.LON 100 device. The new *i*.LON 100 device will now function exactly as the old one did.

4

Configuring the *i*.LON 100

This chapter describes how to configure the *i*.LON 100 using the *i*.LON 100 Web pages. For information on configuring the *i*.LON 100 applications using the Web pages, see the *i*.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points.

Configuring the *i*.LON 100

Once you have connected your *i*.LON 100 as described in Chapter 3, configure it as described in the following steps:

1. Launch Internet Explorer 6 or later and point to `http://192.168.1.222`. The *i*.LON 100 Internet Server Welcome Web page appears. Click **Login**.

2. You will be prompted for a user name and password. By default, this is `ilon`/`ilon`. Once you supply this, the main menu Web page opens, as shown in the following figure:
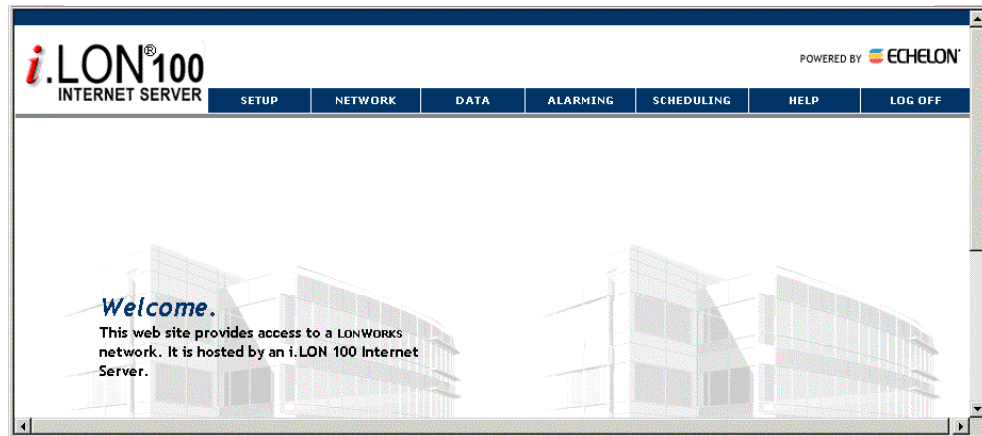
3. Hover your mouse cursor over **Network** and then select **LAN/WAN** from the dropdown menu.

4. On the **LAN/WAN** Web page, set up connections, servers, and services, as described in *Setting Up Connections, Servers, and Services Using the LAN/WAN Web Page*, below.

5. If your *i*.LON 100 server is equipped with a modem, hover your mouse cursor over **Setup**, select **Modem** from the dropdown menu, and then enter the Modem parameters as described in *Verifying i.LON 100* Connections

The *i.LON* 100 Internet Server includes a **Verify** web page that is used to verify communications between the *i.LON* and LNS Servers, SMTP Servers, ISPs, other *i.LON* 100 devices, and third party Web servers. To open this page, hover your mouse cursor over **Setup** in the menu bar and select **Verify** from the dropdown menu. This page appears as shown in the following figure:

This Web page contains a list of all services configured on the **LAN/WAN** Web page (see *Setting Up Connections, Servers, and Services Using the LAN/WAN Web Page).*

You can clear the associated checkbox to prevent verification of any item. To begin testing, click **Start Tests.** Any problems establishing communications with any of the servers will be reported.

When initiating a remote test from this web page, the i.LON will be forced to dial out to each Dial-up connection that contains one or more services. If the i.LON must break communication with this PC during that communication, do not attempt a refresh during the process.

Testing of dial-up connections while dialed in to the **i.LON** 100 will fail, because the Web page will not be able to maintain communication with the *i.LON* 100 after the modem disconnects and dials to another location.

6. At any time during any test you can click **Cancel** to clear all ongoing tests.

7. Configuring Modem Settings, below.

8. If using the *i*.LON 100 server as a remote network interface, hover your mouse cursor over **Network**, select **LONWORKS** from the dropdown menu, and then enter the LNS Server information as described in *Configuring LONWORKS Settings*, below

9. Optionally perform a security access reset on the *i*.LON 100 server as described in *Security Access Reset* in Chapter 6. Set the security options as described in Chapter 6.

10. Click **Reboot** to open the Reset Web page and click the **Reboot** button to reboot the *i*.LON 100 server.

Setting Up Connections, Servers, and Services Using the LAN/WAN Web Page

The **LAN/WAN** Web page of the *i*.LON 100 allows you to manage the *connections*, *servers*, and *services* used by the *i*.LON 100. You can open this web page in one of the following ways:

- Hover your mouse cursor over **Setup** and select **TCP/IP** from the drop-down menu. This will open the **LAN/WAN** Web page with the **LAN** connection selected. See *Configuring LAN Connection Properties*, below, for more information on configuring the **LAN** connection.
- Hover your mouse cursor over **Network** and select **LAN/WAN** from the drop-down menu. This will open the **LAN/WAN** Web page with the top level of the tree (**i.LON 100**) selected. See *Configuring General LAN/WAN Properties*, below, for more information on setting up general *i*.LON 100 LAN/WAN properties.

The **LAN/WAN** Web page appears as shown in the following figure:
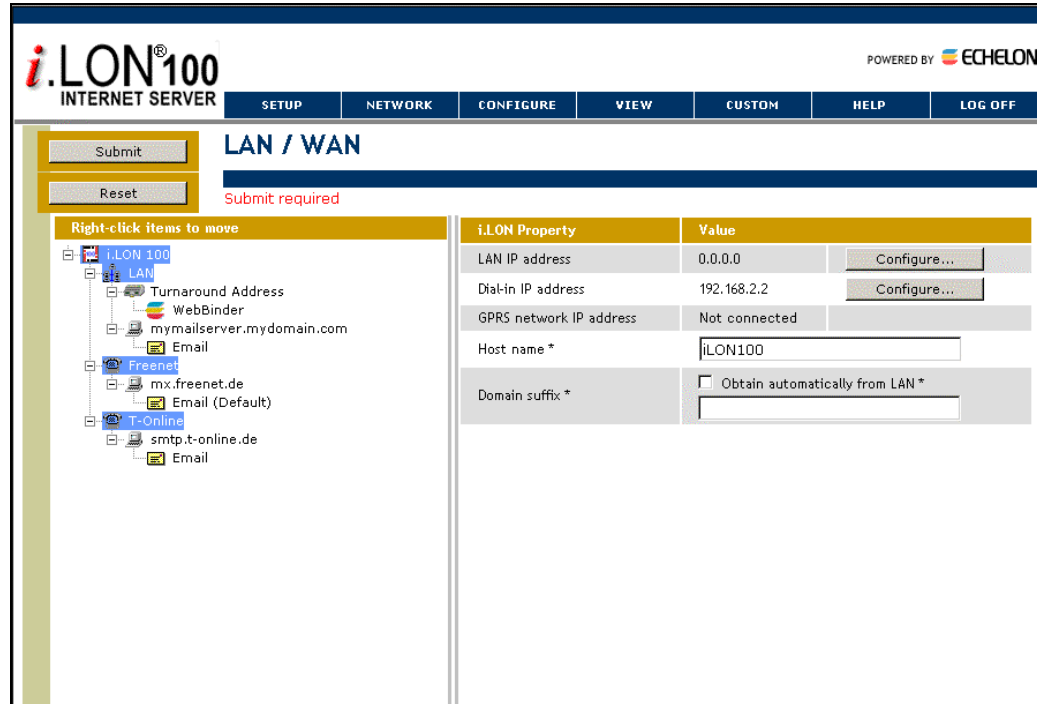
The tree on the left side of this Web page contains three levels:

- *Connections* – The top level of the tree shows *i*.LON 100 *connections*. Connections define how the *i*.LON 100 communicates with other devices. There are two types of connections that are supported by the *i*.LON 100:
  - LAN Connection – The **LAN** connection corresponds to the *i*.LON 100 device's 10-BaseT Ethernet connection. This connection is always the first connection shown in the tree and may not be removed. See *Configuring LAN Connection Properties*, below, for more information on configuring the LAN connection.
  - Dial-up Connections – After the **LAN** connection, the *i*.LON 100 may contain any number of dialup connections. Each dialup connection corresponds to an ISP. By default, the *i*.LON 100 contains two sample dialup connections: Freenet and T-Online. See *Creating and Configuring a Dial-up Connection* below for information about setting up additional dialup connections.
- *Servers* – Each connection can have one or more *servers*. An *i*.LON 100 server is an IP address or host name. By default, the **LAN** connection has a server named **Turnaround Address**. The **Turnaround Address** server refers to the i.LON 100 server itself and supports only the WebBinder service (see the *i.LON 100 User's Guide: Using the i.LON 100 Web Pages to Configure*

Configuring the *i.LON* 100

Applications and to Monitor and Control Data Points in for more information on web binding).

- *Services* – Each server can have one or more *services* that are available from the server. Each server can support one or more of the following services:
  - Email (SMTP) – This service is used to send email from the *i*.LON 100. See *Configuring the Email (SMTP) Service*, below, for more information.
  - WebBinder – This service is used to bind the *i*.LON 100 to another server. See *Configuring the WebBinder Destination Service*, below, for more information.
  - LNS Uplink – This service is used to communicate with an LNS Server. See *Configuring the LNS Uplink Service*, below, for more information.
  - Time (SNTP) – This service is used to synchronize the time and date of the *i*.LON 100 with a time server on the network.. See *Configuring the Time Service*, below, for more information.

Configuring General LAN/WAN Properties

To configure general LAN/WAN properties for the *i*.LON 100, follow these steps:

1. Open the **LAN/WAN** Web page by hovering your mouse cursor over **Network** and selecting **LAN/WAN** from the drop-down menu.

2. Select the top level of the tree (*i*.LON 100). The right side of the LAN/WAN page will appear as shown in the following figure:

3. Configure the following properties (all fields marked with an asterisk require a reboot before the new values take full effect):

LAN IP Address	Displays the IP address of the *i*.LON 100 used by the Ethernet LAN connection. To change this address, click **Configure** to open LAN properties (see *Configuring LAN Connection Properties*, below, for more information).
Dial-in IP Address	Displays the IP address of the *i*.LON 100 used when the *i*.LON 100 receives a phone call via the internal modem. To change this address, click **Configure** to open modem properties (see *Configuring Modem Settings*, below, for more information).
GPRS Network IP Address	Displays the IP address of the *i*.LON 100 used when connected via GPRS modem. If the *i*.LON 100 does not currently have a GPRS

	connection, this property displays **Not Connected**.
Host Name	The TCP/IP host name of the *i*.LON 100 server. When the *i*.LON 100 server establishes a connection with an LNS Server it provides its fully qualified host/domain name so the LNS Server knows which LONWORKS database to open.
	By default, the *i*.LON 100 Internet Server's host name is iLON100. The URL of the *i*.LON 100 server is Hostname.DNS Suffix (*i.e.* if **Hostname** is set to ilon100Alpha and **Domain Suffix** is set to ABCcorp.com, the URL will be ilon100Alpha.ABCcorp.com.
	Set a unique host name if you want to have the DHCP server register the host name with the DNS server or when you want to manually register with the DNS server administrator.
	Valid characters are numbers, letters, and the hyphen ('-') character. By default, this value is set to iLON100. If you change this value, you must reboot the *i*.LON 100 server for the change to take effect. This field has a maximum length of 19 characters.
Domain Suffix	The IP domain name in which the *i*.LON 100 server's Ethernet Adapter is installed. This value is optional. Valid characters are numbers, letters, and the hyphen ('-') and period ('.') characters. This field has a maximum length of 132 characters. If the **Automatically Obtain IP Address** option is selected on the LAN Properties page (see *Configuring LAN Connection Properties*, below), check the **Obtain Automatically From LAN** option to obtain the domain suffix from the DHCP server. By default, this value is empty. If you change this value, you must reboot the *i*.LON 100 server for the change to take effect.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Configuring LAN Connection Properties

If you are connecting your *i*.LON 100 Internet Server directly to a TCP/IP network via the Ethernet port, you must configure the LAN connection properties on the **LAN/WAN** page. To configure LAN properties, follow these steps:

1. Hover your mouse cursor over **Setup** and select **TCP/IP** from the dropdown menu. The **LAN/WAN** Web page opens with **LAN** connection selected from the tree. The right side of this Web page appears as shown in the following figure:

TCP/IP Property	Value
Ethernet MAC address	00-D0-71-00-6C-09
○ Automatically obtain IP address *	
⦿ Manually configure IP settings *	
LAN IP address *	0 . 0 . 0 . 0
Subnet mask *	0 . 0 . 0 . 0
Default gateway *	0 . 0 . 0 . 0
Default DNS server	☐ Obtain automatically * 0 . 0 . 0 . 0
Backup DNS server	0 . 0 . 0 . 0

2. Configure the following properties (all fields marked with an asterisk require a reboot before the new values take full effect):

Automatically Obtain IP Address
Set this option to have the *i*.LON 100 server obtain its IP address, subnet mask, and default gateway from the local network's DHCP server. If this option is set, the user has the option of obtaining the **Domain Suffix** (on the General LAN/WAN properties page – see *Configuring General LAN/WAN Properties*, above) and/or **Default DNS Server** (on this page) automatically by setting the associated **Obtain Automatically** checkboxes. If you change this value, you must reboot the *i*.LON 100 server for the change to take effect.

If the DHCP server cannot be contacted, the IP **Address**, **Subnet Mask**, and **Default Gateway** will be temporarily set to 192.168.1.222, 255.255.255.0, and 192.168.1.222, respectively. As soon as the DHCP server is contacted, the *i*.LON 100 device will reboot itself to take on the new IP address.

Manually Configure IP Settings
Set this option when specifying a static IP address, subnet mask, and gateway for the *i*.LON 100 server in **IP Address**, **Subnet Mask**, and **Gateway**. This is the default setting.

LAN IP Address
Static IP address used by the *i*.LON 100 server if **Manually Configure IP Settings** is set. If you are using a static IP address, be sure that it is not in a range reserved by a

	local DHCP server. By default, this value is set to `192.168.1.222`.
Subnet Mask	Subnet mask used by the *i*.LON 100 server if **Manually Configure IP Settings** is set. By default, this value is `255.255.255.0`.
Default Gateway	Gateway used by the *i*.LON 100 server if **Manually Configure IP Settings** is set. By default, this value is `192.168.1.222`.
Default DNS Server/ Backup DNS Server	The primary and secondary DNS servers used to resolve names (*i.e.* LNS Server name, DNS server name, hostname, etc.). Your IT department typically provides this information. If the **Automatically Obtain IP Address** option, above, is selected, set the **Obtain Automatically** option to obtain **Default DNS Server** from the DHCP server. **Backup DNS Server** may only be entered manually. By default, these values are both `0.0.0.0`.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged. If you changed the IP address of the *i*.LON 100, you will have to change your computer's TCP/IP settings to place it on the same subnet if you want to continue to have Web access. Click **Help** on the Web page for more information about the fields on this screen.

Creating and Configuring a Dial-up Connection

If you will be dialing out from your *i*.LON 100 to an ISP, you must create a dial-up connection for each number or GPRS service to which you will connect (you must also configure the modem properties as described under *Configuring Modem Settings*, below). The i.LON 100 ships with two sample dial-up connections to SMTP servers (Freenet and T-Online). To create and configure a dial-up connection, follow these steps:

1. Open the **LAN/WAN** Web page by hovering your mouse cursor over **Network** and selecting **LAN/WAN** from the drop-down menu.

2. On the left hand side of the **LAN/WAN** Web page, Right click **i.LON 100** at the top level of the tree and select **Add Connection** from the drop-down menu. A new connection is added to the tree and is automatically selected. The right half the **LAN/WAN** Web page shows the dial-up connection properties, as shown in the following figure:

Connection Property	Value
Connection name	New Connection
Phone Number	☐ GPRS ☐ Persistent GPRS
User name	
Password	
Re-enter password	
▼ Advanced	
Remote DNS server	☑ Obtain automatically 0 . 0 . 0 . 0
Disconnect if idle for	30.0 seconds

3. Configure the following properties:

Connection Name   **Legal Characters:** All ASCII characters except '&', '<', and '>'.

        Field Length: Up to 30 characters

        Enter a name for this dial-out profile, such as the name of the ISP. When **Submit** is clicked this name will appear in the tree on the left side of the LAN/WAN Web page.

Phone Number   **Legal Characters:** Digits and the hyphen character.

        Field Length: Up to 30 characters

        Enter the phone number to call for dial-out. By default, this field is blank.

GPRS   If a GSM modem is used, set this option to use the GPRS protocol for sending data in lieu of an analog phone call. A connection will be established whenever the *i*.LON 100 attempts to contact a server under the dial-up connection; once the transaction with the server is complete, the connection will be dropped. See the documentation for your GSM modem for more information about the GPRS protocol.

Many GPRS service providers require a phone number which must be dialed when establishing a connection such as ***99**1#**. Consult your ISP for details on configuring the properties of your GPRS connections.

Persistent GPRS	If this option is selected, the GSM modem will request a network connection as soon as the *i*.LON boots, and keep the connection open as long as the service provider allows it.
User Name	**Legal Characters:** All ASCII characters except '&', '<', and '>'.
	Field Length: Up to 30 characters.
	Enter the user name to be used by the *i*.LON 100 server when connecting to an ISP. By default, this field is blank.
Password/Re-enter Password	**Legal Characters:** All ASCII characters except '&', '<', and '>'.
	Field Length: Up to 30 characters.
	Enter and re-enter the password to be used by the *i*.LON 100 server when connecting to an ISP. The password will be displayed as all asterisks. By default, this field is blank.

Set the **Advanced** checkbox to set the following additional options:

Remote DNS Server	Enter the IP address of the DNS server to be used when dialing out using this dial-out profile. Set **Obtain Automatically** to obtain the DNS server address from the PPP server when connecting.
Disconnect if Idle For	**Legal Characters:** Floating point number greater than or equal to 0 and an increment of .1.
	The idle timeout in seconds. If the connection is idle for this length of time, the call will be ended. By default, this value is 30.0 seconds.
	Once a PPP connection is established, it will not be released until it has been idle for this amount of time. This means that if data is being constantly sent over a PPP connection, the connection will never be dropped and any data that needs to use a second PPP connection may never be set.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Creating and Configuring Servers

Each connection in the tree on the left-hand side of the **LAN/WAN** Web page can contain one or more servers. Each server can provide email (SMTP) service, a WebBinder destination, LNS uplink services, or time services. A single server may provide multiple services. By default, the **LAN** connection contains the **Turnaround Address** server with the WebBinder service (to allow the *i*.LON 100 to be bound to itself) and a sample email server called mymailserver.mydomain.com. Each of the sample dial-up connections also contains a sample email server. To create a server, follow these steps:

1. Open the **LAN/WAN** page by hovering your mouse cursor over **Network** and selecting **LAN/WAN** from the drop-down menu.

2. Right-click the connection for which you want to create a server and select **Add Server** from the short-cut menu. The right-hand side of the **LAN/WAN** Web page will appear as shown in the following figure:

Server Property	Value
IP or hostname	0.0.0.0
Configured services	
Email (SMTP)	No
WebBinder destination	No
LNS uplink	No
Time (SNTP)	No

3. Set the **IP Or Hostname** for the server. This is the IP address or the hostname that will be used to contact the server. To access a server via hostname, DNS must be enabled on the *i*.LON 100 (see *Configuring LAN Connection Properties*, above). By default, this value will be 0.0.0.0.

4. Click **Submit** to save the new service. It will appear under the specified connection as the IP address or hostname entered in step 3.

5. Create and configure one or more services for the server. See *Creating and Configuring Services*, below, for more information.

Creating and Configuring Services

Once you have created a server as described in *Creating and Configuring Servers*, above, you must create one or more services for it. To create a service, follow these steps:

1. Open the **LAN/WAN** page by hovering your mouse cursor over **Network** and selecting **LAN/WAN** from the drop-down menu.

2. Right-click the server for which you want to create a service and select **Add Service** from the short-cut menu. The **Add Service** window will appear as shown in the following figure:

3. Select one of the four services and click OK. The new service will appear below the selected server and the right-hand side of the **LAN/WAN** Web page will show the properties for the selected service.

4. Configure the service as described in one of the following sections.

Configuring the Email (SMTP) Service

If you select **Email (SMTP)** in step 3 of the *Creating and Configuring Services* procedure (above), you can send emails through the associated server (note that the server must be an SMTP email server). The right-hand side of the **LAN/WAN** web page will appear as shown in the following figure:

Email Service Property	Value
Email server address	1.2.3.4
Email server port	25 (not configurable)
☐ Use as default	
Source email address	
User name	
Password	
Re-enter password	

This Web page contains the following options:

Email Server Address — The IP Address or hostname of the server to which this service applies. See *Creating and Configuring Servers* for more information.

Email Server Port — The port used by the *i*.LON 100 to send email. This value is always 25 and may not be changed. Contact your IS department to assure that your firewall is configured to allow you to access the email server on this port.

Use as Default — Set this option to make this the default email service for the *i*.LON 100. If this is the first email service created on the *i*.LON 100, this option will be enabled by default. If another email service is currently designated as the default, the designation will be removed from it when you click **Submit**.

Source Email Address — The string that will appear in the **From** field of emails sent through this service (*i.e.* lonfirstfloor@echelon.com). By default, this field is blank.

User Name — The user name used to log in to the SMTP server.

Password — The password used to log in the SMTP server. Re-enter the password in **Re-enter Password**.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Configuring the WebBinder Destination Service

WebBinding is a process by which you can connect data points on your i.LON 100 directly to data points on another *i*.LON 100 or to a third party web server such as Apache® or IIS® (see *Using Web Binding* in the *i.LON 100 User's Guide:*

Using the i.LON 100 Web Pages to Configure Applications and to Monitor and Control Data Points for more information). If you select **WebBinder Destination** in step 3 of the *Creating and Configuring Services* procedure (above), the associated server can be used as a WebBinder destination. The right-hand side of the **LAN/WAN** web page will appear as shown in the following figure:

WebBinder Service Property	Value
WebBinder destination address	1.2.3.4
WebBinder destination port	80
SOAP path	/WSDL/iLON100.WSDL
Retry time	120.0 seconds

This Web page contains the following options:

WebBinder Destination Address	The IP Address or hostname of the server to which this service applies. See *Creating and Configuring Servers* for more information.
WebBinder Destination Port	The port used by the *i*.LON 100 to send WebBinder messages. By default, this value is 80, but it may be changed to any valid port number. Contact your IS department to assure you're your firewall is configured to allow you to access the server on this port.
SOAP Path	Set the path to which SOAP messages should be directed. This is typically the location of the WSDL or ASMX file on the destination server where it receives HTTP requests used in a SOAP message transaction. By default, this is /WSDL/iLON100.WSDL (the default location of this file on an *i*.LON 100).
Retry Time	The i.LON 100 will retry WebBinder connections every 45 seconds. Set the amount of time after which the i.LON 100 will stop retrying to send the message.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Configuring the LNS Uplink Service

If you select **LNS Uplink** in step 3 of the *Creating and Configuring Services* procedure (above), you can establish an uplink LNS connection with associated server (note that the LNS server must be running at the specified location). The right-hand side of the **LAN/WAN** web page will appear as shown in the following figure:

LNS Uplink Service Property	Value
LNS uplink address	1.2.3.4
LNS uplink port	1628
☑ Use as default	

This Web page contains the following options:

LNS Uplink Address The IP Address or hostname of the server to which this service applies. See *Creating and Configuring Servers* for more information.

LNS Uplink Port The port used by the *i*.LON 100 to send LNS messages. By default, this value is 1628, but it may be changed to any valid port number. Contact your IS department to assure that your firewall is configured to allow you to access the LNS server on this port.

Use As Default Set this option to make this the default LNS uplink service for the *i*.LON 100. If this is the first LNS uplink service created on the *i*.LON 100, this option will be enabled by default. If another LNS uplink service is currently designated as the default, the designation will be removed from it when you click **Submit**.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Configuring the Time Service

If you select **Time** in step 3 of the *Creating and Configuring Services* procedure (above), you can use the associated server as a time server (note that a time server must be running at the specified location). The right-hand side of the **LAN/WAN** web page will appear as shown in the following figure:

Time Service Property	Value
Time server address	1.2.3.4
Time server port	123 (not configurable)
☑ Use as default	

This Web page contains the following options:

Time Server Address The IP Address or hostname of the server to which this service applies. See *Creating and Configuring Servers* for more information.

Time Server Port The port used by the *i*.LON 100 to receive time data. This value is always 123 and may not be changed. Contact your IS department to assure that your firewall is configured to allow you to access the time server on this port.

Use as Default Set this option to make this the default time service for the *i*.LON 100. If this is the first time

service created on the *i*.LON 100, this option will be enabled by default. If another time service is currently designated as the default, the designation will be removed from it when you click **Submit**.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to leave all fields unchanged.

Verifying *i*.LON 100 Connections

The *i*.LON 100 Internet Server includes a **Verify** web page that is used to verify communications between the *i*.LON and LNS Servers, SMTP Servers, ISPs, other *i*.LON 100 devices, and third party Web servers. To open this page, hover your mouse cursor over **Setup** in the menu bar and select **Verify** from the dropdown menu. This page appears as shown in the following figure:

This Web page contains a list of all services configured on the **LAN/WAN** Web page (see *Setting Up Connections, Servers, and Services Using the LAN/WAN Web Page*).

You can clear the associated checkbox to prevent verification of any item. To begin testing, click **Start Tests**. Any problems establishing communications with any of the servers will be reported.

When initiating a remote test from this web page, the i.LON will be forced to dial out to each Dial-up connection that contains one or more services. If the i.LON must break communication with this PC during that communication, do not attempt a refresh during the process.

Testing of dial-up connections while dialed in to the *i*.LON 100 will fail, because the Web page will not be able to maintain communication with the *i*.LON 100 after the modem disconnects and dials to another location.

At any time during any test you can click **Cancel** to clear all ongoing tests.

Configuring Modem Settings

Some i.LON 100 models are equipped with an internal modem. In addition, you can connect an external GSM modem to the Serial port. If you plan to dial-out

from the i.LON 100, you must also create one or more dial-up connections, as described in *Creating and Configuring a Dial-up Connection*, earlier in this chapter. To support dial-in connections, you must set the **Enable Dial-in** option on the Security Web page (see Chapter 6).

If your *i*.LON 100 Internet Server is equipped with a modem or attached to an external modem, configure it by hovering your mouse cursor over **Setup** and selecting **Modem** from the dropdown menu. The **Modem** Web page appears as shown in the following figure:

This page contains the following options:

Modem	Select what modem will be used by the *i*.LON 100. Select **Internal Analog** to use the internal modem. Select **External GSM Nokia 30 to 31 Series**, **External GSM Siemens 35 to 45 Series**, or **External GSM Insys GPRS 4.0 to 4.1 Series** to use an external modem connected via the serial port.
	Note that many GSM service provider contracts do not include provisions for establishing data-only connections. Contact your GSM provider to assure that you have data-only connections activated for your GSM contract.
User Name For Incoming Calls	**Field Length**: Up to 30 characters.
	The user name for incoming calls. This user name must be provided by the caller when attempting to connect to the *i*.LON 100 server via modem. By default, the user name is `ilon`.

Password For Incoming Calls/Re-enter Password	**Field Length**: Up to 30 characters.
	The password for incoming calls. This password must be provided by the caller when attempting to connect to the *i*.LON 100 server via modem. The password will appear as asterisks when entered. You must reenter the password to assure that you typed it correctly. By default, the password name is `ilon`.

Set the **Advanced** checkbox to view the following additional properties:

Local IP Address For Incoming Calls	Set the IP address that will be assigned to incoming calls by the *i*.LON 100 server. By default, this is `198.162.2.2`.
PPP Authentication	Specify what sort of PPP authentication will be used. Options are **PAP**, **CHAP**, and **None**.
Modem Country/Region	Select the country in which the *i*.LON 100 server is located. The *i*.LON 100 must be rebooted for changes to this value to take effect. This option is only available if **Modem** is set to **Internal Analog**.
Tone **Pulse**	This option appears only if **Modem** is set to **Internal Analog**.
	Select **Tone** or **Pulse** to determine whether the *i*.LON 100 server Internet Server's modem will dial using touch-tone or pulse dialing. By default, this is **Tone**.
Dialing Prefix	This option appears only if **Modem** is set to **Internal Analog**.
	Legal Characters: Digits only
	Field Length: 30 characters
	If the *i*.LON 100 server is connected to a phone system that requires a code to be dialed to reach an outside line, enter the code here. By default, these fields are blank.
Delay After Prefix	This option appears only if **Modem** is set to **Internal Analog**.
	Legal Characters: Floating point number greater than or equal to 0 and an increment of .1.
	If the **Dialing Prefix** field contains a prefix, enter the delay, in seconds, between the prefix being dialed and the phone number being dialed. The *i*.LON 100 must rebooted for changes to this value to take effect. By default, this value is `0.0`.

Tone/Pulse	This option only appears if you are using the internal analog modem.
	Set **Tone** or **Pulse** to determine whether the *i*.LON 100 internal modem will dial-out using touch-tone or pulse dialing. By default, this option is set to **Tone**.
PIN Number	This option only appears if you are using an external modem.
	Field Length: Up to 30 characters.
	Set the **PIN Number** that must be send to the external modem to send or receive calls.
Access Point Name (APN)	This option only appears if you are using an external modem.
	Field Length: Up to 64 characters.
	Set the APN hostname required by most GPRS service providers. This can be a valid IP address or a valid hostname and domain suffix pair.
Quality of Service (QoS)	This option only appears if you are using an external modem.
	Field Length: Up to 30 characters.
	Set the QoS string required by most GPRS providers.

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to set all fields on this Web page back to the values they had when the page was opened.

Configuring LONWORKS *Settings*

If the *i*.LON 100 Internet Server will be used as a remote network interface to facilitate communications between the local LONWORKS network and the LNS Server, configure it by clicking **Network** on the title bar and selecting **LONWORKS** from the list on the left hand side of the page. The LONWORKS Network Web page opens, as shown in the following figure:

The options on this page are divided into **LonTalk Properties**, **NVE Driver Properties**, **LNS Uplink/Downlink Properties**, and **Initiate LNS Uplink Properties**. These properties are discussed in the following sections:

Configuring LonTalk Properties

The following LonTalk properties are shown:

Neuron ID Range
The range of Neuron IDs used by the *i*.LON 100. This field is read-only.

Channel Type
The LonWorks Channel type supported by the *i*.LON 100. This is **TP/FT-10** for FT model *i*.LON 100s and **PL-20N** (or **PL-20C** if CENELEC is enabled) for PL model *i*.LON 100s.

Domain/Subnet/Node
If the i.LON 100 is configured (i.e. it has been added to an LNS network), this field displays the Domain/Subnet/Node address of the i.LON 100. Otherwise, this field will display **Unconfigured**. By default, this field is read-only; check the **Modify?** option to make this field writable. Note that modifying the Domain/Subnet/Node address of the i.LON 100 may make it inaccessible by the LNS network.

CENELEC Enable
This option only appears if you have a power-line model *i*.LON 100. Set this option to enable CENELEC power-line communication. If you change this value, you will need to close all applications to which the *i*.LON 100 is connected

as an RNI, reboot the *i*.LON 100, and re-establish an RNI connection.

Configuring NVE Driver Properties

The NVE driver properties determine how the *i*.LON 100 communicates with the network variables associated with NVE (external) data points (i.e. network variables on other devices that have *i*.LON 100 data points). See the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* for more information on creating and configuring NVE data points. This section contains the following properties:

NVE Transmit Timer The time, in milliseconds, the *i*.LON 100 will wait between retry attempts when sending an external data point value. The default is 96 milliseconds.

NVE Retry Count The number of times the *i*.LON 100 will attempt to send an external data point value. The default is 3 retries.

NVE Data Point Max Age The amount of time, in seconds, before an NVE data point is considered *stale*. If an NVE point receives no updates in this amount of time, the value will be considered invalid. Setting this value to 0 prevents data from becoming stale. The default for this property is 0.

Configuring LNS Uplink/Downlink Properties

These properties determine how uplink and downlink connections are established with the LNS Server. This section contains the following properties

Default LNS Server/ Backup LNS Server1/ Backup LNS Server2 The default and backup LNS Servers. These fields are read-only. To set these values, you must create a server with the LNS Uplink service on the **LAN/WAN** Web page, as described in *Creating and Configuring Servers* and *Configuring the LNS Uplink Service*, earlier in this chapter. Click **Configure** to open the **LAN/WAN** Web page.

Downlink RNI Port Displays the port on which the *i*.LON 100 listens for LonWorks downlink requests. Click **Configure** to open the **Security** Web page and set this value (see *i.LON 100 Security Web Page* in Chapter 6).

Initiate LNS Uplink When IP Address Changes **This option is not supported for LNS 3, Service Pack 8, Update 1, and earlier.**

Set this option to notify the xDriver when the IP address of the i.LON 100 changes. This may resolve connectivity problems if a non-static IP address is used.

Delay Time Between Two Retries	**This option is not supported for LNS 3, Service Pack 8, Update 1, and earlier.**
	This option is only available if **Initiate LNS Uplink When IP Address Changes** is checked. If the *i*.LON 100 attempts to inform the xDriver of an IP address change and is not successful, this is the amount of time before another attempt is made.
Maximum Retry Time	**This option is not supported for LNS 3, Service Pack 8, Update 1, and earlier.**
	This option is only available if **Initiate LNS Uplink When IP Address Changes** is checked. The amount of time, in minutes, for which the *i*.LON 10 Ethernet Adapter will attempt to inform the server of an IP address change.
Initiate LNS Uplink When Any Explicit Message is Received	Set this option to initiate an uplink connection from the *i*.LON 100 to the LNS Server whenever an explicit message is sent to the host. If this option is cleared, explicit messages for the host will be held until a connection is established. By default, this option is cleared.
Initiate Only When Explicit Message Code is in Range	Set this option to initiate an uplink connection from the *i*.LON 100 to the LNS Server whenever an explicit message with a message code within the specified range is sent to the host. If this option is cleared, explicit messages for the host outside the specified range will be held until a connection is established. By default, this option is cleared.

Configuring Initiate LNS Uplink Properties

Set these options to determine when the *i*.LON 100 will attempt to initiate an uplink connection to the LNS Server based on a network variable message for the host. If an update is received that is not configured to establish an uplink connection, the update will be held until a connection is established. By default, all of these options are cleared (i.e. the *i*.LON 100 will never attempt to establish an uplink connection as a result of a network variable message).

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to set all fields on this Web page back to the values they had when you opened the page.

Configuring Time Settings

The *i*.LON 100 has a real-time clock. The time for this clock can be set manually using the **Time** Web page or synchronized to an SNTP time server as described in *Configuring the Time Service*, earlier in this chapter.

To view and set the time, hover your mouse cursor over **Setup** and select **Time** from the dropdown menu. The **Time** Web page opens, as shown in the following figure:

Property	Value
⊕ Default time server	0.0.0.0:123 Configure...
⊕ Backup time server	0.0.0.0:123
Time of last SNTP sync	Unknown
Time zone	(GMT-08:00) Pacific Time (US & Canada); Tijuana
Date and local time	TUE 2004 JUN ▾ 8 ▾ 13 : 21 : 23

This Web page contains the following options:

Default/Backup Time Server

These read-only fields display the IP address/hostname and port of the default and backup SNTP time servers. Click **Configure** to open a popup window that allows you to create a new time server (see *Creating and Configuring Servers* for more information about servers)

Time of Last SNTP Sync

This read only field shows when the i.LON 100 last synchronized its clock with the **Default Time Server**. How often the i.LON 100 synchronizes with the SNTP server varies between 1 to 15 minutes depending on how far off its time is from the server. As the difference approaches 75 ms or less, the interval will keep increasing until it reaches the maximum of 15 minutes.

Time Zone

Choose the time zone in which the i.LON 100 resides from this drop-down list.

Date and Local Time

These fields display the time and date currently kept by the i.LON 100's real time clock. This Web page is not updated automatically; refresh the Web page to see the current time. You can modify the time and date manually (you must click **Submit** for the changes to be saved), but if you have configured an SNTP time server, these changes will be overwritten the next time the i.LON 100 synchronizes with the time server.

Configuring the M-Bus Driver

The *i*.LON 100 Internet Server includes an M-Bus driver that is used to communicate with Meter Bus (M-Bus) devices using the M-Bus protocol (EN 1434-3). The i.LON 100 will act as the master for the M-Bus.

1. Install the Meter Bus devices using a Meter Bus specific installation tool. See the documentation provided with the Meter Bus devices for more information.

2. Map the Meter Bus devices to data points on the *i*.LON 100 Internet Server. This is done using the M-Bus Driver Web page. To open this Web page, hover your mouse cursor over **Network** on the title bar and then select **M-Bus**

Driver from the drop-down menu. The **M-Bus Driver** Web page opens, as shown in the following figure:

3. Click the **Add** button. A new M-Bus device is added to the page, as shown in the following figure:

	Index	Name	Address	Primary	Secondary	Baud rate	Poll rate	Status	Man. ID	Medium	Version
☑	new	MBS_	Sec ▼			2400 ▼	0.0	new	---	---	---

4. Enter the following information:

Name	The name of the data point to be associated with the M-Bus device. Once a name has been assigned (i.e. the **Submit** button has been clicked), it cannot be changed. This name can be up to 30 characters long and must begin with "MBS_". The "<", ">", and "&" characters may not be used in this name.
Address	Choose primary (**Pri**) or secondary (**Sec**) addressing mode. An M-Bus device contains both a *primary address* and a *secondary address*. The primary address is assigned by the network management tool used to install the M-Bus device (analogous to a LONWORKS subnet/node address); the secondary address is burned into the device at the factory (analogous to a LONWORKS Neuron ID).
Primary	This field is only active if **Address** is set to **Pri**. Enter the primary address of the M-Bus device. Valid range is 0 to 255.
Secondary	This field is only active if **Address** is set to **Sec**. Enter the secondary address of the M-Bus device. Valid range is 0 to 99,999,999.
Baud Rate	Select the baud rate at which the M-Bus device communicates on the serial port. The default is 2400 bps. See the documentation for your M-Bus device for more information on supported baud rates.
Poll Rate	The poll rate for the device, in seconds. The M-

Bus device will update the data point on the *i.*LON 100 at the specified interval. M-Bus devices cannot send event-driven updates, so they must be polled. This value can be set from 0.0 to 6553.4 seconds, with a resolution of .1 seconds. Setting this value to 0.0 will turn off polling. By default, this value is 30 seconds.

Click **Help** for more information on using this web page.

See Chapter 7 of the *i.LON 100 User's Guide: Configuring the i.LON 100 Applications Using the i.LON 100 Configuration Plug-in* for an example of using the M-Bus driver with the Type Translator functional block to read and write M-Bus data.

5

Managing the *i*.LON 100

This chapter describes how to reboot the *i*.LON 100, how to clean the *i*.LON 100 (i.e. restore manufacturer settings), and how to view *i*.LON 100 system information.

Rebooting the *i*.LON 100 Server

You can reboot the *i*.LON 100 server using the Reboot Web page. Click the **Reboot** button to begin the reboot. A Web page will be displayed telling you that the *i*.LON 100 server is rebooting. A reboot takes approximately 2 minutes. While the reboot is happening, the LEDs on the *i*.LON 100 server will flash; once the reboot is complete, the green Power/Wink LED will stay on solidly. Once the reboot is completed, the Welcome Web page will open.

If DHCP is enabled, this page may not redirect the Web browser to the **Welcome** page properly, because the new address from the DHCP server is unknown. If this is the case, issue the **show all** command from the console application (see *Appendix A*) or ask your network administrator to determine the new IP address of the *i*.LON 100 server. If your DHCP server has the capability to dynamically propagate newly assigned device IP address and target name to the DNS server (as is the case with the WIN2K DHCP server), you should be able to connect to the *i*.LON 100 server after reset using its fully qualified hostname.

When the *i*.LON 100 server is rebooted, it executes its shutdown and startup scripts. Modifying these scripts is not supported.

Cleaning the *i*.LON 100 (Restoring Factory Defaults)

You can use the **Clean Up** Web page to restore the *i*.LON 100 to its manufacturer defaults. This will remove all configuration to the *i*.LON 100 and its applications.

To clean up the, follow these steps:

1. Perform a security access reset as described in *Security Access Reset* in Chapter 6.

2. Hover your mouse curse over the **Setup** button and select **Clean Up** from the drop-down menu to open the **Clean Up** Web page.

3. Click **Clean Up** (this button will only be active if the *i*.LON 100 is in security access mode).

This will restore the following *i*.LON 100 server configuration:

FTP user name:	`ilon`
FTP password:	`ilon`
Automatically obtain IP address:	`false`
IP address:	`192.168.1.222`
Subnet mask:	`255.255.255.0`
Gateway:	`192.168.1.222`
Web server port:	`80`
Hostname:	`iLON100`
Domain suffix:	`[blank]`
DNS servers:	`0.0.0.0`

SNTP servers:	`0.0.0.0`
Time zone:	`(GMT-08:00) Pacific Time (US & Canada); Tijuana`
LNS Servers:	`0.0.0.0:1628`
Incoming RNI port:	`1628`
LonTalk address:	`unconfigured`
Email server:	`0.0.0.0`
Source email address:	`[blank]`
CENELEC enabled:	`false (Power line model only)`

All XML configuration files, as well as the contents of the `/root/PulseBackup` (pulse count data), `/root/AlarmLog` (alarm log data), and `/root/data` (data log data) directories will be backed up to a `/root/config/software.bak`.

This will restore the IP address back to `192.168.1.222`, so you will need to place your computer on that subnet or use the route command as described in *Connecting and Configuring the i.LON 100 Internet Server* in Chapter 4, in order to communicate with the *i*.LON 100 server after the reboot is complete.

Viewing *i*.LON 100 System Information

To view *i*.LON 100 system information, over your mouse cursor over **Setup** and select **System Info** from the drop-down menu. The following Web page appears:

Click **Reset** to reload the entire page. Click **Refresh** to refresh the data on the page.

This web page is divided up into model information and flash information. The two sections are described below:

i.LON 100 Model Information

This section of the **System Info** Web page displays *i*.LON 100 model information. This information may be requested by Echelon support when diagnosing a problem with the i.LON 100. This part of the web page shows the following information:

Model Number	The model number of the i.LON 100.
Channel Type	The channel type of the i.LON 100. Either TP/FT-10 or PL-22.
Modem Installed	Indicates whether the i.LON 100 has an internal modem.
CPU Speed	The CPU speed of the i.LON 100, in MHz.
Firmware Version	The firmware version of the i.LON 100.
Bootrom Version	The bootrom version of the i.LON 100

i.LON 100 Flash Information

This section of the Web page shows information on flash memory usage. The i.LON 100 uses flash memory to store data associated with its applications, such as the log files generated by the Data Loggers and Alarm Notifiers that you have created. This non-volatile memory appears to the i.LON 100 applications as a logical 32 MB disk drive (also called a "flash disk"). The flash disk is extremely reliable and should last a long time, but it has some limitations that may affect the lifetime and runtime configuration of the i.LON 100.

The flash memory is physically composed of 2048 blocks of 16 KB each (these are not the same as disk blocks/sectors, which are much smaller). 2000 of these blocks are mapped to the logical disk drive, 2 are required for overhead, and the remaining ones (up to 46) are spares.

Once a flash block has been written to, it must be completely erased before it can be written to again. As the i.LON 100 applications write data to the logical flash disk, physical flash blocks are erased as needed to allow data to be stored. Each flash block can be erased a limited number of times before it fails, and flash manufacturers specify a minimum expected value for this limit. When a flash block fails, it is permanently marked as failed and no longer used by the i.LON 100. The spare flash blocks allow for a limited number of block failures to occur without affecting the reliability of the flash disk.

The amount of time it takes for the flash blocks on the i.LON 100 to reach their erase limit depends on how much and how often data is written to the flash disk. Writes to the logical flash disk cause erases of physical flash blocks, but there is no simple formula to precisely describe this relationship. The flash erase rates reported by the i.LON 100 apply to the entire flash memory, not to individual flash blocks. The i.LON 100 contains a sophisticated flash file system that distributes flash erases across all available blocks, in order to optimize the flash life. Over time, the actual number of erases of each block will remain approximately equal, thus maximizing the lifespan of all flash blocks. According to the flash manufacturers' rated limits, all flash blocks should last at least 10 years if the total block erase rate averages no more than 39 erases per minute for that entire time. Exceeding this limit may cause the flash disk to wear out sooner.

It should be noted that the block erase limit specified by the flash manufacturers is very conservative. Empirical testing of at least some flash parts indicates that a typical limit under normal conditions may be at least 10 times longer, which translates to a much longer life for the i.LON 100 flash disk, and/or erase rates much greater than 39 erases per minute. Informally, flash manufacturers will confirm these findings, but they cannot be guaranteed. Use this information with caution, depending on how conservative you wish to be. You may also trade off expected lifespan for increased erase rates.

The configuration of your i.LON 100 may have a significant impact on the number of flash erases per minute. Because of this, it is important that you monitor both the rate at which you are erasing the flash blocks on your i.LON 100, and how many spare disk blocks are available. You can do so using the information on this Web page. If the number of spare block falls below the recommended minimum, you should consider replacing the i.LON 100.

The rate of flash block erases is a difficult number to report. Short-term increases or decreases in this value are not meaningful to the lifespan of the flash. Only long-term, sustained rates are truly significant. However, if you are trying to adjust your data logging to see what affect this has on the erase rate, a long-term number is not very helpful. To accommodate these different needs, this Web page reports four different values for the flash block erase rate.

The most important one is computed using a two-day moving average, which will reflect only sustained erase rates. However, this average is slow to respond to changes in the rate, and it may take up to five days before the value fully reflects a sustained change in the erase rate. The three minute and one hour values provide more immediate feedback by using shorter time windows, but they may show jumps in their values due to short-term activity (for example, transferring a file via FTP to the i.LON 100). The final value is the rate since the last reboot, which may respond to rate changes even slower than the two-day average, but provides a very long-term view.

The following parameters are displayed on this Web page:

Flash Disk Activity: Moving Average	The long term moving average of the number of flash block erases/minute (using a two day sliding window). When this value exceeds the recommended limit of 39 erases/minute, the value will be shown in red and a warning message will be displayed at the top of the web page.
Flash Disk Activity: Last 3 Minutes	The number of flash disk erases/minute over the last 3 minutes.
Flash Disk Activity: Last 1 Hour	The number of flash disk erases/minute over the last 1 hour.
Flash Disk Activity: Since Startup (<Time Since Startup>)	The number of flash disk erases/minute since the i.LON 100 was last rebooted.
Spare Flash Blocks	The number of available spare flash blocks remaining out of the 46 total. Initially, the i.LON 100 contains up to 46 spare flash blocks that are used to accommodate block failures. However, it is normal for a small number of flash blocks to initially be marked as failed by the flash manufacturer, and additional blocks may fail after extended use, so the

number of available spare blocks on your i.LON 100 may vary. This does not adversely affect the normal operation of the flash disk, as long as some spares are available. When the number of spare flash blocks falls below the recommended limit of eight blocks, this value will be shown in red and a warning message will be displayed at the top of the web page. If a flash block on the i.LON 100 fails and there are no spare blocks remaining, the flash disk may become unreliable. The i.LON 100 should be replaced before this happens.

Free Disk Space / Total Disk Space   The current available disk space and the total possible disk space in the i.LON 100, in kilobytes. If you go below the recommended limit of 1024KB of free disk space, this value will appear in red and a warning message will appear at the top of the web page.

Free Memory (RAM)   The current available RAM on the *i*.LON 100. The *i*.LON 100 has 32 MB of RAM. If the *i*.LON 100 runs out of available RAM, it will reboot. If this value is getting close to 0, you should close some *i*.LON 100 applications.

Data Point Message Failures: Last 2 minutes   The number of data point message failures/minute over the last 2 minutes. Data point message failures occur when the i.LON 100 cannot handle all updates to its data points. This problem can be caused by high network traffic, misconfigured applications, or overactive remote applications attempting read or write to i.LON 100 data points.

Data Point Message Failures: Last 10 Minutes   The number of data point message failures/minute over the last 10 minutes.

Data Point Message Failures: Last 1 Day   The number of data point message failures/minute over the last day.

6

i.LON 100 Security

This chapter explains how to configure *i*.LON 100 security and describes how to perform a security access reset.

i.LON 100 Server Security

The *i*.LON 100 Internet Server institutes a number of security measures:

- *MD5 Authentication.* When functioning as an RNI, the *i*.LON 100 Internet Server uses MD5 authentication with all communications between it and the LNS Server, requiring a 16-byte authentication key.
- *Security Web Page.* The *i*.LON 100 Security Web page allows you to password protect or disable entirely FTP, Web server, dial-in, and RNI access to the *i*.LON 100 server.
- *Security Access Reset.* A security access reset is required to access the security Web page. A security access reset requires physical access to the *i*.LON 100 server hardware.

Security Access Reset

The Security Web page of the *i*.LON 100 Internet Server is only available after performing a security access reset. This Web page allows you to set the user name and password used for FTP access to the *i*.LON 100 server, the MD5 Authentication Key, and allows you to determine what methods may be used to access the *i*.LON 100 server. To ensure maximum security, Echelon recommends disconnecting the computer and *i*.LON 100 server from the local area network before performing a security access reset.

A security access reset of the *i*.LON 100 Internet Server requires physical access to the *i*.LON 100 server hardware. To perform a security access reset, follow these steps:

1. Remove the *i*.LON 100 server from the TCP/IP network and attach it to the computer using an Ethernet cable or a local server hub. This step is optional, but is likely to be necessary since performing a security access reset will temporarily reset the *i*.LON 100 server's IP address to 192.168.1.222.

2. Press and hold the service pin on the *i*.LON 100 server using a ballpoint pen or similar device.

3. Reboot the *i*.LON 100 server while still holding down in the service pin. This can be done from the **Reboot** Web page (see *Rebooting the i.LON 100 Server* in Chapter 5 for more information), by using the **Reboot** command in the console application (see *Appendix A*), or by pressing the Reset button (just below the **Output** LEDs as described in Chapter 2).

4. Continue holding the service pin. In approximately 10 seconds, all the LEDs on the *i*.LON 100 server will flash, continue holding the service pin.

5. Approximately 30 seconds from when the reboot began, the service LED will illuminate solid orange; at this point you can release the service pin.

The *i*.LON 100 Internet Server will now be in security access mode. When the *i*.LON 100 server is in security access mode, its IP address, subnet mask, and gateway are temporarily changed to 192.168.1.222, 255.255.255.0, and 192.168.1.222, respectively, they are changed back to the values specified on the Setup and Security Web pages once the *i*.LON 100 server exits security access mode (*i.e.* when the *i*.LON 100 server is rebooted). This IP address change may place the *i*.LON 100 server on a subnet that your computer cannot communicate with. In order to communicate with the *i*.LON 100 server after a Security Access Reset, you can either modify your computer's IP configuration to

place it on the 192.168.1.* subnet or enter the following command in the Windows Command Prompt window:

```
route add 192.168.1.0 mask 255.255.255.0 %COMPUTERNAME%
```

This command allows your computer to communicate with the *i*.LON 100 server even when they are not on the same subnet. This command does not persist through computer reboots, but you can add it to the startup script for your computer.

When in security access mode you can access the Security and Restore Factory Defaults Web pages. The *i*.LON 100 Web server is always enabled in security access mode regardless of the Enable Web Server property described in the following section.

i.LON 100 Security Web Page

To access the Security Web page, perform a security access reset as described above, point your browser to `192.168.1.222`, and click **Security**. The following Web page opens:

This Web page allows you to set the following properties (all fields marked with an asterisk require a reboot before the new values take full effect):

Enable This Page Without Security Access Reset	Set this option to allow the properties on this page to be modified without a security access reset. Note that this will significantly effect the security of the *i*.LON 100.
FTP User name	The FTP user name for the *i*.LON 100 server. This defaults to **ilon**. The user name can be up to 20 characters long and may contain letters, numerals, and the underscore character.
FTP Password/Re-enter Password	The FTP password for the *i*.LON 100 server. This defaults to **ilon**. The password will appear as asterisks. The password can be up to 20 characters long and may contain letters, numerals, and the underscore character. Reenter the password in the **Re-enter Password** field.

Enable FTP	Set this option to allow FTP access to the *i*.LON 100 server. Set the port the *i*.LON 100 will use for FTP communication in the **Port** column. By default, this option is enabled and the port is set to 21.
Enable Web Server	Set this option to allow HTTP access to the *i*.LON 100 server. Set the port the *i*.LON 100 will use for FTP communication in the **Port** column. **Note: If you disable this option, you will not be able to access the *i*.LON 100 Web pages after a reset.** If you need to reenable HTTP access, you can reset this option by performing a security access reset, as described above. If you change this option, you must reboot the *i*.LON 100 server for this change to take effect. By default, this option is enabled and the port is set to 80.
Enable Downlink RNI Connections	Set this option to allow the *i*.LON 100 server to be used as a remote network interface (RNI, see Chapter 7, *Configuring the i.LON 100 Internet Server as* an RNI, for more information).
	Set the port the *i*.LON 100 will use for RNI communication in the **Port** column. Legal port values are 1–65535, but it is not recommended that the port number be set below 1025, as ports 0 through 1024 are normally reserved. This value must match the port value set in the xDriver. See Chapter 7 for more information.
	By default, this option is enabled and the port is set to 1628.
Enable Telnet	Set this option to allow Telnet access to the i.LON 100 console application (see *Appendix A*). The port for Telnet communication is always 23 and may not be changed. This option is disabled by default.
Enable Remote Dial-in	Set this option to allow an LNS Server to dial-in to the *i*.LON 100 server. See *Creating and Configuring a Dial-up Connection* in Chapter 4 for more information. This option is enabled by default.
Raw MD5 Authentication Key/Text Secret Phrase	You can enter either an MD5 authentication key or a text secret phase to be used for authentication when using the *i*.LON 100 server as an RNI (see Chapter 7). This value must match the value specified in the LONWORKS Interfaces control panel. Changing the key here is generally not necessary, as changing the key in the LONWORKS Interfaces control panel will normally automatically update the key on the *i*.LON 100, as long as the previous key was known by the control panel, or was the default key (all zeros).

Click **Submit** to save the changes you have made to this Web page. Click **Reset** to set all fields on this Web page back to the values they had when you opened the page.

7

Configuring the *i*.LON 100 Internet Server as an RNI

This chapter describes how to use the *i*.LON 100 server as a remote network interface (RNI) and how to configure the xDriver settings. For more information on the xDriver, see the *LNS Programmer's Guide – xDriver Extension*.

Using the *i*.LON 100 Server as a Remote Network Interface

The *i*.LON 100 server can be used as a remote network interface (RNI). This allows the *i*.LON 100 server to take the place of a standard LONWORKS interface (*i.e.* PCLTA-20, PCC-10, etc.). The LNS Server sends LONWORKS messages over IP to the *i*.LON 100 server, which is connected to the rest of the LONWORKS network (either TP/FT-10 or PL-20 power line). This function can be performed simultaneously with the application and Web server abilities of the *i*.LON 100 server. To use the *i*.LON 100 server as a remote network interface, you must configure the xDriver software on your computer with the IP address or fully qualified domain name of the *i*.LON 100 server. Once you have done this, the *i*.LON 100 device will appear in the list of available network interfaces. The following diagram shows an *i*.LON 100 server functioning as an RNI:
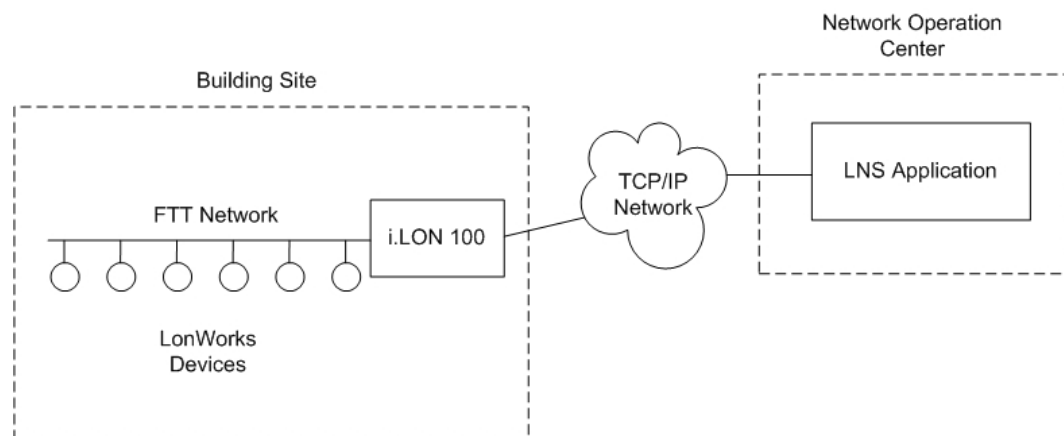
Installing and Configuring the xDriver Software

You can use the *i*.LON 100 Internet Server to communicate with an LNS Server, Release 3.08, Update 1 or later. The LNS Server contains a software component called the xDriver. If you are an LNS 3.0 user you may upgrade to version 3.08 by installing LNS Service Pack 8 and Update 1, which are available on the *i*.LON 100 CD and also as free downloads from www.echelon.com/downloads.

NOTE: If you are using Windows 98, the xDriver can only be used to initiate downlink connections. Uplink connections can only be established using Windows 2000 and Windows XP. See the *LNS for Windows Programmer's Guide, xDriver Extension* for more information.

Using The LONWORKS Interfaces Control Panel Applet

Use the LONWORKS Interfaces Control Panel applet to create LONWORKS interface names for each of your *i*.LON 100 Internet Servers. A separate entry is required for each *i*.LON 100 server you plan to connect to the LNS Server

If you are managing a large application on a single LNS Server computer, and will be using many *i*.LON 100 servers (*i.e.* more than 50), you should consider creating an external lookup extension to keep track of each *i*.LON 100 server See the *LNS for Windows Programmer's Guide, xDriver Extension* for more information on this.

To use the LONWORKS Interfaces Control Panel applet, follow these steps:

1. Open the Windows Control Panel and double-click the LONWORKS Interfaces
    icon ( ). This opens the LONWORKS Interfaces Control Panel applet.

    NOTE: This is not the same as the LONWORKS/IP Channels Control Panel
    applet used with the *i*.LON 1000 Internet Server.
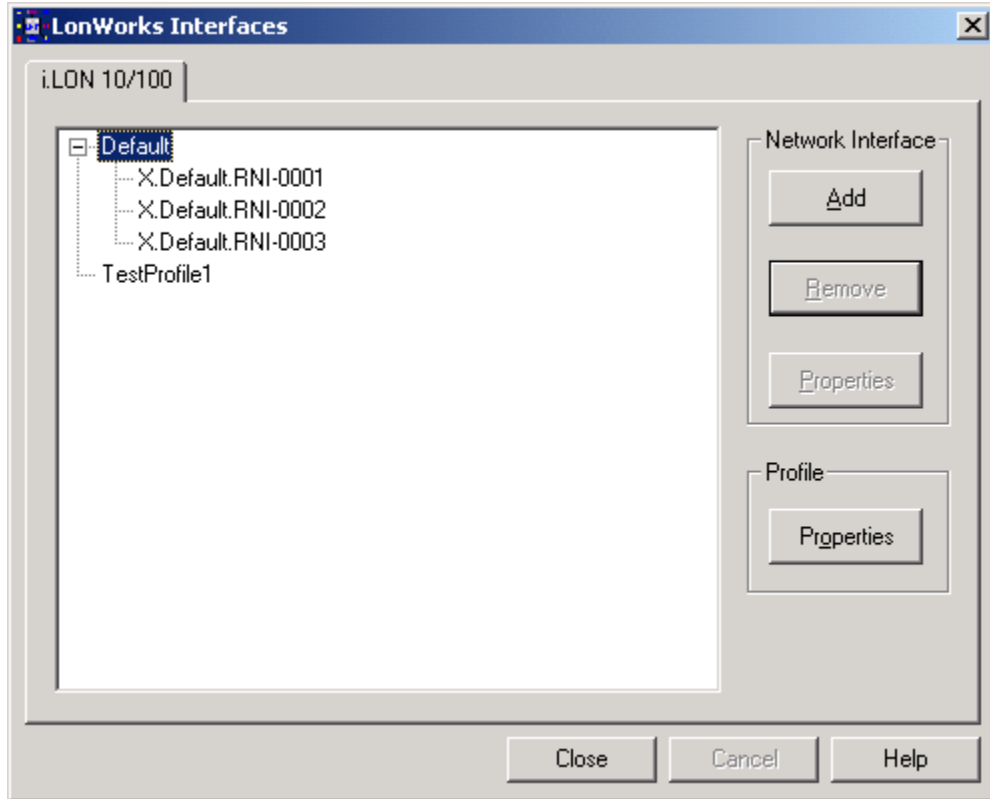
2. The applet lists the LNS network interface names of all the network
    interfaces that have been added to the Windows registry below the **Default**
    item. In the figure above three RNIs have been added to the Windows
    registry.

    Default represents the default xDriver profile. This is the set of
    configuration parameters that determines how the default xDriver will
    manage connections to your RNIs. You can review and edit the configuration
    of the default xDriver profile by clicking **Default**, and then clicking the
    Profile **Properties** button (see the *LNS Programmer's Guide, xDriver
    Extension* for more information).

    Click **Add** to create a registry entry for a new *i*.LON 100 server under the
    selected profile. This opens the window shown the following figure:
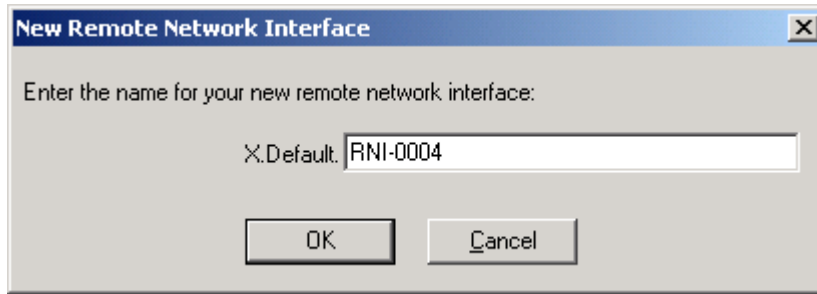
NOTE: You must be logged in as a user with administrative rights to create a registry entry for an *i*.LON 100 server if you are using the Windows 2000 or Windows XP platforms.

3. Enter the name for the new RN*I*. This will be used as a lookup key to access the proper registry entry each time xDriver initiates a connection to this RN*I*. **Each RNI must have a unique name.**

4. Click **OK**. This opens the tab shown in the following figure:
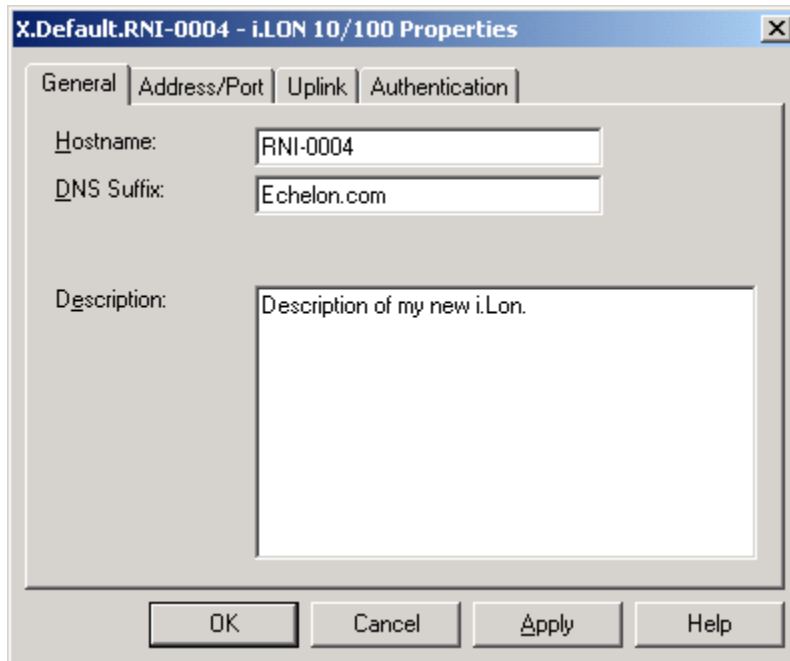
5. Configure the fields on the General tab. The following table describes these fields.

Field	Description
Hostname	**Maximum Length:** 19 chars **Legal Chars:** A-Z, a-z, "-", 0-9 **Comments:** Enter the TCP/IP hostname of the *i*.LON 100 server. xDriver will use this hostname to connect to the *i*.LON 100 server.
DNS Suffix	**Maximum Length:** 63 chars **Legal Chars:** A-Z, a-z, "-", 0-9,"." **Comments:** Enter the name of the IP domain on which the *i*.LON 100 server is installed.

Description	**Comments:** Optional field. Generally used to describe the site.

6. When you have configured the fields on the General tab, click the **Address/Port** tab. This opens the tab shown in the following figure:
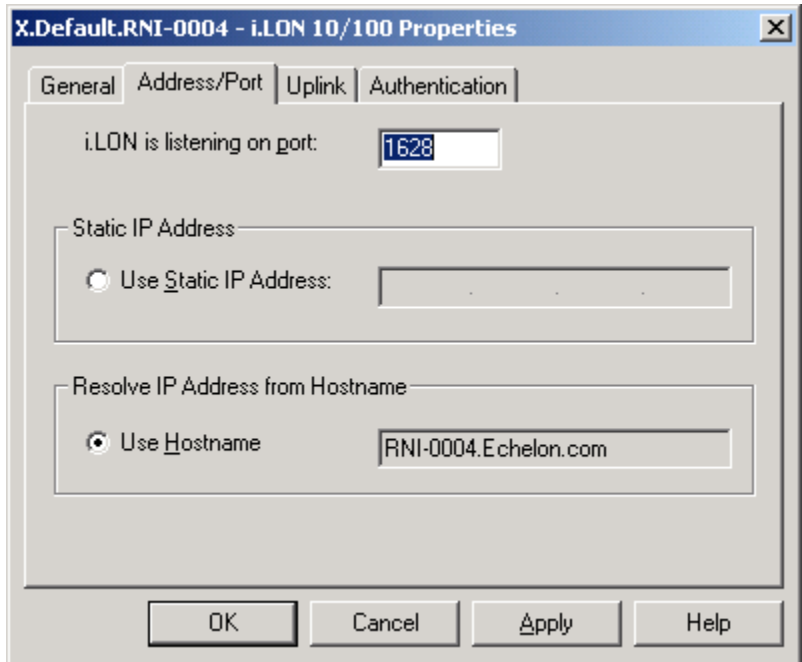
7. Configure the fields on the Address/Port tab. The following table describes these fields.

Field	Description
i.Lon is listening on port:	**Default Value:** 1628 **Range:** 1-65,535 **Comments:** Enter the TCP port number the *i*.LON 100 server is using to listen for incoming connections from the LNS Server. This should be set to the same value as the **Incoming RNI Port** field in the LONWORKS configuration Web page (see *Configuring LONWORKS Settings* in Chapter 4).
Use Static IP Address	**Comments:** Click the **Use Static IP Address** button to manually enter the IP address of the *i*.LON 100 server. You must enter an IP address in the form x.x.x.x, where x is an integer in the range 0-255. You should use this option if your *i*.LON 100 server's hostname is not configured in any name servers (*e.g.* DNS servers, HOSTS file).
Use Hostname	**Comments:** Click the **Use Hostname** button to have xDriver resolve the *i*.LON 100 server's IP address from the hostname and DNS suffix entered in the **General** tab.

When you have configured the fields on the Address/Port tab, click the **Authentication** tab. This opens the tab shown in the following figure:
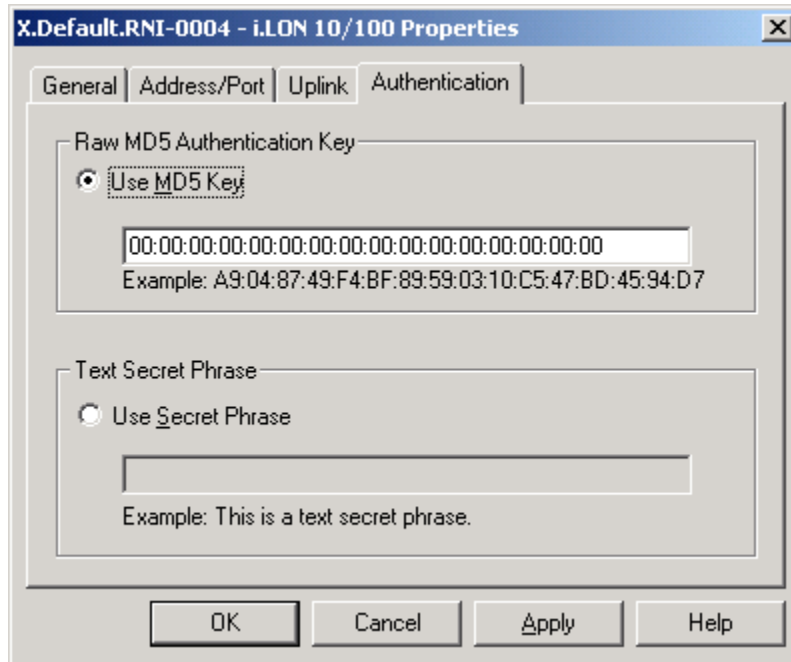
8. You can choose to authenticate connections to this *i*.LON 100 using a specified MD5 authentication key or an MD5 authentication key that is derived from a specified text secret phrase using an algorithm configured into the *i*.LON 100. Using an MD5 authentication key or text secret phrase prevents the LNS Server and the *i*.LON 100 from responding to unauthorized messages during an xDriver session.

    NOTE: This authentication key is not the same as the authentication key used within the LONWORKS network.

    To set an MD5 authentication key, click the **Use MD5 Key** button., and enter the authentication key as a 32-character hexadecimal string representing a 128-bit MD5 key. Enter the 32 characters in colon-separated pairs. For example:

    A9:04:87:49:F4:BF:89:59:03:10:C5:47:BD:45:94:D7

    This must match the MD5 authentication key configured into the *i*.LON 100 server. Setting the authentication key to all zeros here will cause xDriver to use the pre-defined, default factory authentication key for the *i*.LON 100 server. For security reasons, it is not recommended that you use the default authentication key for the *i*.LON 100 server.

    To use the text secret phrase, click the **Use Secret Phrase** button and enter a text secret phrase. This phrase is a string 16-63 characters long, and must exactly match the text secret phrase used by the *i*.LON 100 server.

    When you have finished, click **OK** to save the settings for the *i*.LON 100 server into the Windows registry and return to the LONWORKS Interfaces window. The new *i*.LON 100 server will appear in the list of network interfaces below the **Default** Profile. Or, click **Apply** to save all changes and continue editing the *i*.LON 100 server's settings.

You can modify an *i*.LON 100 server's settings later by selecting it from the list of network interfaces, and clicking the Network Interface **Properties** button. You can remove an *i*.LON 100 server from the Windows registry by selecting it from the list, and clicking the Network Interface **Remove** button.

Switching Between *i*.LON 100 RNI and a Standard LONWORKS Network Interface

If you are using the *i*.LON 100 server as an RNI and wish to switch to a different LONWORKS network interface (*e.g.* a PCLTA-20, PCLTA-10, or PCC-10), but you want to leave the *i*.LON 100 server attached to the network, you must disable the RNI application on the *i*.LON 100 server before opening the network with the new network interface. You can disable RNI in either of the following ways:

- Perform a security access reset, open the **Security** Web page, clear the **Enable RNI** option, and reboot the *i*.LON 100 server. See

i.LON 100 Server Security in Chapter 6 for more information about the **Security** Web page and security access reset.

- Enter the following command using the console application:

```
deactivate 4
```

4 is the index of the RNI application. Confirm that you want to disable the RNI application. Disabling the RNI application may cause the *i*.LON 100 server to reboot. See *Appendix A* for more information about the console application.

If you want to use the RNI capability of the *i*.LON 100 server at a later time, you must remember to re-enable RNI, either by setting the **Enable RNI** option on the **Security** Web page or by entering `activate 4` in the console application.

If you are using a different LONWORKS network interface and you wish to switch to using the *i*.LON 100 server's RNI capability, you must physically remove the old network interface from the network.

Appendix A

The *i*.LON 100 Console
Application

This appendix describes how to use the *i*.LON 100
Server's console application through the serial port.

The *i*.LON 100 Server's Console Application

You can use the *i*.LON 100 server's console application to configure and troubleshoot the *i*.LON 100. To access the console application, you must connect a female-to-female DB-9 null modem crossover cable from the **Console** hardware output to a COM port on your computer; then use a terminal emulator, such as Windows HyperTerminal, to communicate on the specified serial port. Set the communications parameters on the terminal emulator to 9600-8-N-1 and turn flow control off.

Console Command List

Once you have accessed the *i*.LON 100 console application, you can issue commands. You must reboot the *i*.LON 100 (either through the console application or the Web page) for any changes to take effect. You can use the following commands with the *i*.LON 100 console application:

activateapp *index|name*	The *i*.LON 100 server uses a multitasking operating system that can simultaneously run multiple processes. This command allows you to selectively activate or deactivate processes. Version 1.00 of the *i*.LON 100 server firmware supports 2 processes, LtaHost (index 3) and RNI (index 4).
authkey *key*	Sets the 16 byte MD5 authentication key.
cd [*directory*]	Changes to the specified directory. If no argument is provided, displays current directory.
copy *file1 file2*	Copies *file1* to *file2*.
createapp *name*	Creates an application instance, specified by name, and returns the index assigned to the application. The application is automatically activated upon creation. The user does generally not use this command.
cenelec *on |off*	Power line model only. Puts the *i*.LON 100 server in CENELEC mode (for communicating on European C-band power line networks). If you change this value, you will need to close all applications to which the *i*.LON 100 is connected as an RNI, reboot the *i*.LON 100, and re-establish an RNI connection.
date *mm/dd/yyyy*	Sets the date. This is not allowed if the *i*.LON 100 server is synched to an SNTP server.
deactivateapp *index|name*	Deactivates an application instance, specified by index or name. See **activateapp** for supported names. This command does not delete the instance of the application; it deactivates the application. Primarily used for troubleshooting.
delete *file*	Deletes *file*.

demo *A|B*	Reserved for future use.
dhcp *on|off*	Turns DHCP on and off. If DHCP is on, the *i*.LON 100 DHCP client gets its IP address, gateway, subnet mask, primary DNS server (if used), and DNS domain from a DHCP server.

diag *Module subcommand [params]*	Performs diagnostic commands on the *i*.LON 100 server. You may be asked to perform these commands by Echelon support personnel to assist them in diagnosing problems with your *i*.LON 100 server. The *module* argument must be set to **ConMan** (connection manager). Valid *subcommands* are:
	
	 trace [value] – This subcommand sets and views the debug trace level. To view the current trace level, provide no argument (*i.e.* `diag ConMan trace`). To turn on tracing, enter one of the following parameters:
	
	 0x01 – enable MAJOR_EVENT
	 0x02 – enable MINOR_EVENT
	 0x04 – enable STATE_TRANSITION
	 0x08 – enable MODEM_RESPONSE
	 0x10 – enable PPP_DEBUG
	 0x20 – enable AUTHENTICATION
	
	 You can enable multiple traces by adding the values of the traces to be enabled. For example, the following command enables MAJOR_EVENT and STATE_TRANSITION tracing:
	
	 `diag ConMan trace 0x5`
	
	 ping IpAddress [count] – Pings the *IpAddress count* times. For example, the following command pings `10.6.8.100` 5 times:
	
	 `diag ConMan ping 10.6.8.100 5`
	
	 If all pings get a response, the console will display:
	
	 IpAddress `is alive`
	
	 If the pings get no response, the console will display:
	
	 `No answer from` *IpAddress*
	
	 Show [route] – The `diag ConMan show` command displays connection manager configuration information. If the optional *route* parameter is entered (*i.e.* `diag ConMan show route`), connection manager configuration and IP routing information is shown.

dialuptrace [*level*]	Sets the dialup trace level. This command is a simpler version of the **diag ConMan trace** command described above. You may be asked to perform a dialup trace by Echelon support personnel to assist them in diagnosing problems with your *i*.LON 100 server. The higher the trace level, the more information will be displayed by the console application. Available dialup trace levels are: *0 or OFF* – Turns off dialup tracing. *1 or LOW* – Turns on dialup tracing for MAJOR_EVENT, MINOR_EVENT, and STATE_TRANSITION. *2 or MEDIUM* – Turns on dialup tracing for the above plus MODEM_RESPONSE. *3 or HIGH* - Turns on dialup tracing for the above plus PPP_DEBUG. Use the dialup trace command with no arguments to see the current dialup trace level.
dir [*directory*]	Lists directory contents. If no directory is specified, lists the contents of the current directory.
disable *service*	Disables a service. Available services are: **Ftp** – FTP access **Web** – HTTP access **Dial-in** – Dial-in access **DnsServerViaDhcp** – Obtaining DNS server from DHCP. **DnsDomainViaDhcp** – Obtaining DNS suffix via DHCP.
dnsdomain *domain*	Sets the DNS domain name. This command is valid only when DHCP is turned off or **Obtaining DNS Suffix From DHCP** is disabled while DHCP is enabled (see the **enable** and **disable** commands for more information).
dnsprimary *address*	Sets the IP address of the primary DNS server. This command is valid only when DHCP is turned off or **Obtaining DNS Suffix From DHCP** is disabled while DHCP is enabled (see the **enable** and **disable** commands for more information).
dnssecondary *address*	Sets the IP address of the secondary DNS server. This will only be used if the primary DNS server can not be contacted.
enable *service*	Enables a service. Available services are: **Ftp** – FTP access **Web** – HTTP access **Dial-in** – Dial-in access

	DnsServerViaDhcp – Obtaining DNS Server from DHCP. **DnsDomainViaDhcp** – Obtaining DNS suffix via DHCP.
eventlog *on|off*	Turns the console event log on and off. The event log is kept in eventlog.txt in the root directory of the *i*.LON 100 server.
factorydefault	Resets the *i*.LON 100 server to its factory defaults. Files added by the user outside of the /root/software directory (*i.e.* Web pages) are not affected. **Echelon highly recommends that user run this command from the *i*.LON 100 bootrom console. See *Interrupting the Boot Process*, later in this Appendix, for more information.**
ftppassword *password*	Sets the FTP password to *password*; anonymous FTP is not allowed. By default, the FTP password is *ilon*. If the **Global password** on the Security Web page is changed, the FTP password will be changed to the same value.
ftpuser *name*	Sets the FTP username to *name*. By default, the FTP username is *ilon*. If the **Global username** on the Security Web page is changed, the FTP username will be changed to the same value.
format	Formats the *i*.LON 100 server's flash disk. **Caution!** This command deletes all files, including the *i*.LON 100 server's system image file. After using this command, you must upload a new software image to the *i*.LON 100 server. **Echelon highly recommends that user run this command from the *i*.LON 100 bootrom console. See *Interrupting the Boot Process*, later in this Appendix, for more information.**
gateway *address*	Modifies the gateway address. Enter 0.0.0.0 to specify no gateway. For example, gateway 10.1.10.1. This command is valid only if DHCP is turned off.
help	Displays a listing of the typically used commands. Help all displays a complete command list.
history [*size*]	If you do not specify the *size* parameter, this command displays a history of console commands issued since the last reboot. You can specify a size from 10 to 100 to determine how far back the command history is kept.
hostname *name*	Modifies the host name. For example, hostname ilon100.
install *idx|name*	Installs a LONWORKS domain/subnet/node address for

[*dmn*]*sn nd*	the application specified by *idx*. **Caution!** This command is provided for backward compatibility to add an *i*.LON 100 server to a pre-installed network. **Echelon does not recommend or support using this command**. The *i*.LON 100 server should be installed using a standard network installation tool such as the LonMaker tool.
ipaddress *address*	Modifies the IP address. For example, `ipaddress 101.253.100`. This command is valid only when DHCP is turned off.
listapp	Lists the current application instances.
ltipport	Reserved for future use.
mkdir *directory*	Makes a directory.
ping *hostaddr*	Tests communications to another IP host.
reboot	Reboots the *i*.LON 100 server. If the *i*.LON 100 server is currently being used as an RNI, the networks for which it is acting as an interface must be closed and opened.
removeapp *index*|*name*	Deletes an existing application instance, specified by index or name. The user does generally not use this command.
rename *file1 file2*	Renames *file1* to *file2*.
servicepin *index*	Sends a service pin message for the application specified by *index*. See **activateapp** for supported indexes.

show [*all*| *hwInfo*]	This displays configuration information about the *i*.LON 100 server. For example, show might display:
	
	```Software Version: 2.00-0024```
	```IP Address: 10.1.253.201```
	```Subnet Mask: 255.0.0.0```
	```Host Name: echeloni100```
	```Gateway: 0.0.0.0```
	```SNTP Server: 0.0.0.0```
	```DHCP: off```
	```MAC Address: 00-D0-71-00-4A-04```
	```Time: MON SEP 13```
	```08:30:02 2001```
	```UTC Time: MON SEP 13```
	```06:30:02 2001```
	```Startup script:```
	``` /root/config/startup.scr```
	```Timezone:```
	``` MET:60:1.5.1.3.2:5.1.10.4```
	
	Show all displays all parameters. Show hwinfo displays hardware properties.

shutdown	Properly quits all applications on the *i*.LON 100 device. A reboot is required to restore operation of all

The *i.LON* 100 Console Application

	modules.
sntpaddress *address*	Modifies the address of the SNTP server. If you have a backup SNTP server, you can enter **sntpaddress address1 address2**.
sntplog *on |off*	Enables or disables SNTP logging. The SNTP log file is named sntp.log and is located in the root directory of the *i*.LON 100 server. The time logged in the SNTP log file is in universal coordinated time (UTC). The maximum size of the SNTP log file is 50 Kbytes. When the file exceeds 50 Kbytes, logging is automatically disabled. Use this command to diagnose time synchronization problems.
subnetmask *address*	Modifies the subnet mask. For example, subnetmask 255.255.255.0. This command is valid only when DHCP is turned off.
time *hh:mm:ss*	Sets the time. This is not allowed if the *i*.LON 100 server is synched to an SNTP server.
timezone *zone*	Sets the time zone with the following format: *nameOfZone*:*timeInMinutes*FromUTC:*dstUsed*:*daylightStart*:*daylightEnd* where *dstUsed* is 0 or 1, and daylight savings start/end times are in the form *rank*.*day*.*month*.*hour*. For example, 1.1.4.2 is the first Sunday in April at 02:00. Rank is a number from 1 to 5 with 5 meaning the last instance in the month. Days are numbered 1 to 7 starting with Sunday. Months are numbered 1 to 12, starting with January.
trace *level* [*stamp*]	Sets the tracing level; 0 = None; 1 = Urgent tracing only (default); 2 = Verbose tracing (for debugging only, not recommended). Set the optional *stamp* parameter to **TRUE** to enable time stamping.
type *file*	Types the contents of *file*.
update *bootrom* [*file*]	Updates the bootrom of the *i*.LON 100 server. By default, this command will look for the bootrom.upd file in the /root directory of the *i*.LON 100 server. **Echelon highly recommends that user run this command from the *i*.LON 100 bootrom console. See *Interrupting the Boot Process*, later in this Appendix, for more information.**

Interrupting the Boot Process

The *i*.LON 100 server undergoes an extensive boot process upon power-up and when reset by the reset button or a reboot command issued in the Configuration Server or console application. During the boot process, the *i*.LON 100 server's disk structure is automatically checked to ensure that any structural errors on the disk are repaired (similar to running a check-disk command in DOS), and a message is displayed on the screen if any corrections are made to the disk.

(Additional information about the corrections is written to the event log file.) The boot process then loads the *i*.LON 100 server's system image. Successful completion is indicated when the *i*.LON 100 server displays its normal command-line prompt.

If the *i*.LON 100 server repeatedly fails to boot up, you are unable to FTP files to it, or you suspect the image is corrupted, you may interrupt the boot process to troubleshoot the *i*.LON 100 server. To interrupt and bypass the boot process, press the exclamation point (!) key when the "Press the '!' key to stop auto-boot…" message appears on the console. This message displays for approximately 4 seconds at the beginning of the boot process (following self-test and memory initialization). If the auto-boot is interrupted, the boot image is then loaded from ROM, and the *i*.LON 100 server enters the bootrom state.

The Bootrom State

When the boot process is interrupted or fails (*e.g.*, if the iLonSystem image is corrupt or not available, perhaps due to a power cycle during image download), the *i*.LON 100 server loads its system image from ROM and starts a console application similar to that run by the normal iLonSystem image. This state, called the bootrom state, is indicated by a command-line prompt prefixed with [Bootrom]. If caused by a boot failure, you may need to reload or upgrade the *i*.LON 100 server software to restore proper operation.

While in the bootrom state, only a subset of the normal console commands are available. The *i*.LON 100 server provides the minimal functionality required to troubleshoot and recover its system image. The FTP server runs, and the console provides commands needed to recover the image; however, application commands, such as listapp and createapp, are not available and certain attributes are not displayed.

Updating the Bootrom

Echelon may provide updates to the *i*.LON 100 server bootrom. The bootrom can be updated using the console application. The bootrom that ships in the *i*.LON 100 will be installed to `<LonWorks>\iLON100\Images\BootROM\iLON100 1.10\bootrom.upd`. To update the bootrom, follow these steps:

1. Obtain the updated bootrom file from Echelon. The default name for this file is `bootrom.upd`.

2. Reboot the *i*.LON 100 server using the console. When the console reads "`Press the '!' key to stop auto-boot`", press '!'. The *i*.LON 100 server will reboot to the bootrom state, halting all applications.

3. FTP the `bootrom.upd` file into your *i*.LON100 /root directory.

4. Update the bootrom by executing the **update bootrom** command. If the bootrom file name is different than the default (`bootrom.upd`), specify the actual file name as an additional parameter. When the update completes, it will automatically reboot your *i*.LON100 system.

See *Backing Up, Restoring, and Replacing the i.LON 100* in Chapter 5 for information on updating other *i*.LON firmware.

> **WARNING:** Do not interrupt the bootrom update process. Doing so will render the *i*.LON 100 server unable to boot. If this happens, you will need to ship your *i*.LON 100 server back to Echelon to be repaired.

Appendix B

Troubleshooting *i*.LON 100 Configuration

This appendix can be used to diagnose common problems that occur during *i*.LON 100 configuration.

Anytime I reboot or power down and up when using RNI loose connection in LonMaker and have to un-attach and reattach.

- This is a known bug that will be addressed in a future release. The current work around is to close and then re-open the system.

I can access my *i*.LON 100 Web pages but some content seems to be missing.

- The *i*.LON 100 has been designed to work with Microsoft Internet Explorer 6.0 or later. Some pages will not display correctly on other browsers or prior versions of IE.

I can't make my *i*.LON 100 send an email message. What am I doing wrong?

- The *i*.LON 100 is designed to send messages using SMTP. Be sure that the email server you defined in the *i*.LON 100's email page is in-fact an SMTP server. (Many companies use Microsoft Exchange servers that may have SMTP disabled.) Check with your ISP or your network administrator.
- Emails are sent as a result of alarm conditions. Verify that the alarm condition actually triggers and that the email *should* be sent.
- Some ISPs delay sending emails by a few minutes. Check with your ISP (or network administrator) to understand the operation of your SMTP server.
- Verify that the destination address you specified for you r email address is correct.

My Service LED is blinking, what does this mean?

- The Service LED blinks when the *i*.LON 100 device is uncommissioned. When the *i*.LON 100 is added to a network and commissioned, the Service LED will turn off.

When updating the *i*.LON 100, I get an error that the update completed successfully, but the device has not been updated successfully yet. What is wrong?

- This error occurs when you attempt to update the *i*.LON 100 device while monitoring many of its network variables with a very short poll time. Try turning off monitoring or increasing the poll time.

I can't open the network using a non-*i*.LON 100 network interface. What is wrong?

- If you were using the *i*.LON 100 as an RNI, then you switched to another network interface, you need to disable RNI on the *i*.LON 100 in order to open the network. This can be done using the console application or the Security Web page.

I can't open the network using the *i*.LON 100 as an RNI. What is wrong?

- Can you access the *i*.LON 100 via HTTP (*i.e.* the *i*.LON 100 Web pages)? If not, then you may not be in TCP/IP communication with the *i*.LON 100. Check the connection. If using static IP addresses, make sure that your computer is on the same subnet as the *i*.LON 100. If using DHCP, consult your network administrator.
- If you are can see the *i*.LON 100 Web pages, but still cannot open the network via RNI, check the following:
  - Ensure that RNI is enabled on the *i*.LON 100. This can be done on the Security Web page or using the console application.
  - Ensure that you have an xDriver entry for the *i*.LON that has the correct IP address/hostname, port and MD5 Authentication Key

The *i*.LON 100 gets a duplicate IP address assigned from a DHCP server, and either boots using its default IP address (*i.e.* 192.168.1.222), or boots using the duplicate IP address.

- If the *i*.LON 100 device boots using its default IP address when it has obtained an address via DHCP, it is probably because the DHCP server assigned an address already in use by another machine on the network. This may happen if the other machine is disconnected from the network long enough for its DHCP lease to expire, yet continues using that address after reconnecting to the network. Make sure all other machines on the network using DHCP have valid leases. If the *i*.LON 100 detects this condition, it will boot using its default IP address (typically 192.168.1.222), and will continue attempting to contact a DHCP server. Once it can contact a DHCP server, the *i*.LON 100 will reboot to obtain a new IP address.

- The *i*.LON 100 may not initially detect the above condition, in which case it will boot using the duplicate IP address. At some point the *i*.LON 100 may discover that the address is a duplicate, but will continue using it. Make sure all machines on the network using DHCP have valid leases. Reboot the *i*.LON to obtain another address, if necessary, or use a statically configured address.

The *i*.LON 100 exhibits problems due to a low-memory condition. This could be indicated by one or more of the following: "out-of-memory" messages, slow network access, application performance problems, or even an unexpected reboot.

- Reduce the number of Alarm Notifiers and/or the size limit of the alarm Summary Logs (which are kept in RAM).

- Reduce the number of Web clients that are simultaneously accessing the *i*.LON 100.

- If you are making calls to the SOAP interface on the *i*.LON 100, refer to the *i*.LON 100 Programmer's Guide for specific recommendations on limiting SOAP messages.

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DECLARATION OF CONFORMITY

i.LON 100 Internet Server

Application of Council Directive:	89/336/EEC, Electromagnetic Compatibility Directive (EMC), 73/23/EEC, Low Voltage Directive (LVD)
Manufacturer's Name:	Echelon Corporation
Manufacturer's Address:	550 Meridian Avenue San Jose, CA 95126 USA
Manufacturer's Address: in Europe	Echelon BV Printerweg 3 3821 AP Amersfoort The Netherlands
Product Model Number:	72101, 72102, 72103, 72104
Type of Equipment:	Information Technology Equipment

Standards to which: Conformity is Declared	EN 60950:2000	EN 50065-1:1999
	EN 55022:1998	EN 61000-4-2
	EN 55024:1998	EN 61000-4-4
	EN 61000-4-3	EN 61000-4-6
	EN 61000-4-5	EN 61000-4-11
	EN 61000-4-8	

I, Wim Meijer, hereby declare that the equipment specified above conforms to the above Directives and Standards.

Place: Amersfoort, The Netherlands   Date: December 2002   Position: Controller Echelon Europe