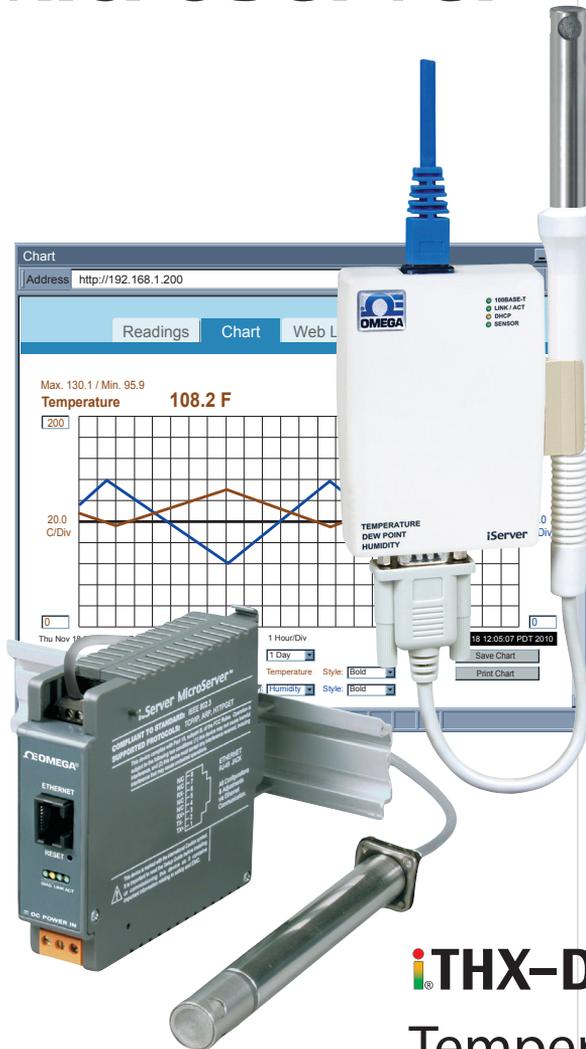


1 YEAR
WARRANTY



iServer MicroServer™



Ω OMEGA™ User's Guide

**Shop online at
*omega.com***

e-mail: *info@omega.com*
**For latest product manuals:
*www.omegamanual.info***

iTHX-D3 and iTHX-W3
Temperature + Humidity



omega.com info@omega.com

Servicing North America:

**U.S.A.
Headquarters:**

Omega Engineering, Inc.
800 Connecticut Ave. Suite 5N01, Norwalk, CT 06854
Toll-Free: 1-800-826-6342 (USA & Canada only)
Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

TABLE OF CONTENTS

Part 1: Introduction

1.1	Safety and EMC Considerations	2
1.2	Before You Begin.....	2
1.3	Description.....	2

Part 2: Hardware

2.1	Mounting	4
2.1.1	Mounting the Wall Mount iServer	4
2.1.2	Mounting the DIN Rail iServer	5
2.1.3	Removal from DIN Rail	5
2.2	Dimensions	6
2.3	Parts of iServer Unit	7
2.4	Network Communication Interfaces	8
2.4.1	10/100 BASE-T RJ-45 Pinout	8
2.4.2	Connecting iServer to PC/Hub/Switch/Router	8
2.5	Industrial Probe	8

Part 3: Network Configuration

3.1	Network Protocols	9
3.2	Ethernet (MAC) Address	9
3.3	DHCP	10
3.4	DNS	10
3.5	IP Address	10
3.6	Port Number	11

Part 4: Operations

4.1	IP Address Assignment.....	11
4.1.1	DHCP (Method 1).....	11
4.1.2	ARP HTTPget Commands (Method 2).....	12
4.1.3	Direct Connection (Method 3).....	12
4.1.4	iConnect Software (Method 4).....	16
4.2	Access and Configuration Using a Web Browser	18
4.3	LOGIN and ADMINISTRATOR Passwords	18
4.4	Setup	19
4.4.1	Overview.....	19
4.4.2	Network.....	20
4.4.2.1	IP Configuration.....	20
4.4.2.2	Ethernet Port.....	22
4.4.3	Configuration	22
4.4.3.1	Data and Time	22
4.4.3.2	Server.....	24
4.4.3.3	Sensors.....	24
4.4.4	Management.....	26
4.4.4.1	Setup.....	26
4.4.4.1.1	Sending Text Messages to a Cell Phone	28
4.4.4.2	Alarms.....	29
4.4.5	Security.....	30

4.4.6	System	31
4.4.6.1	Reboot	31
4.4.6.2	Defaults	32
4.4.6.3	Upgrade	32
4.4.6.4	Download Configuration	33
4.4.6.5	Upload Configuration	33
4.4.7	Diagnostics	34
4.4.8	Log Out	34
4.5	Readings	35
4.5.1	HTML	35
4.5.2	Java	35
4.6	Chart	36
4.7	Web Link	37
4.8	Telnet Setup	38
4.8.1	Telnet Connection	38
4.9	HTTPget Program	39
4.9.1	HTTPget using Port 2000	39
4.10	iLog Software	41
Part 5: Specifications		43
Appendix A	Glossary	45
Appendix B	IP Address	46
Appendix C	ARP Commands	47
Appendix D	IP Netmask	48
Appendix E	ASCII Chart	49
	ASCII Chart Control Codes	50
Appendix F	iLog Error Messages	51
Appendix G	Java Runtime Environment Setup	52
Appendix H	Sensor Information	54
Appendix J	SNMP	56
Part 6: Approvals Information		43
6.1	Electromagnetic Compatibility (EMC)	57
6.2	FCC	57

LIST OF FIGURES:

Figure 1.1	iServer with Probe on the Ethernet Network	3
Figure 2.1	Mounting - Wall Mount iServer	4
Figure 2.2	Mounting - DIN Rail iServer	5
Figure 2.3	Removal - DIN Rail iServer	5
Figure 2.4	Mounting - Dimensions	6
Figure 2.5	DIN Rail iServer Dimensions	6
Figure 2.6	Parts of the iServer Unit	7
Figure 2.7	RJ45 Pinout	8
Figure 2.8	Industrial Probe Wiring Hookup	8
Figure 3.1	Labeling	9
Figure 4.1	ARP and HTTPget Commands on a DOS Window	12
Figure 4.2	Connecting Computer Directly to iServer	13
Figure 4.3	Network Connections	13
Figure 4.4	Local Area Connection	13
Figure 4.5	Changing TCP/IP Properties on Your Computer	14

Figure 4.6	iServer Welcome Page	14
Figure 4.7	Pinging the iServer from MS-DOS Prompt	15
Figure 4.8	Assigning an IP Address using iConnect	16
Figure 4.9	Accessing the iServer's using iConnect	17
Figure 4.10	iServer Welcome Page.....	18
Figure 4.11	LOGIN and ADMINISTRATOR Passwords	18
Figure 4.12	Overview	19
Figure 4.13	Network: IP Configuration	20
Figure 4.14	Network: Ethernet Configuration.....	22
Figure 4.15	Network: Ethernet Configuration.....	23
Figure 4.16	Configuration Menu: Server	24
Figure 4.17	Configuration Menu: Sensors	25
Figure 4.18	Management Menu: Setup.....	27
Figure 4.19	Management Menu: Alarms	29
Figure 4.20	Security Menu.....	30
Figure 4.21	System: Reboot	31
Figure 4.22	System: Defaults	32
Figure 4.23	System: Upgrade	32
Figure 4.24	System: Download Configuration	33
Figure 4.25	System: Upload Configuration	34
Figure 4.26	Diagnostics	34
Figure 4.27	Readings: HTML	34
Figure 4.28	Readings: Java	35
Figure 4.29	Adjustable Chart	36
Figure 4.30	Web Link	37
Figure 4.31	Tera Term Telnet Connection Screen	38
Figure 4.32	Telnet to port 2002 – p command	39
Figure 4.33	Telnet to port 2002 – ? command	39
Figure 4.34	iLog Software Logging Data	41
Figure C.1	ARP Commands and Responses	47
Figure G.1	Java 1.7.x Screen Shot	52
Figure H.1	RH Accuracy Chart	54
Figure H.2	Temperature Accuracy Chart	54
Figure H.3	Normal Range	54

LIST OF TABLES:

Table 2.1	Parts of iServer Unit	7
Table 4.1	iLog Excel Applications	42
Table F-1	iLog Error Messages	51
Table J-1	SNMP MIB-2.....	56
Table J-2	SNMP Trap.....	56

NOTES, WARNINGS and CAUTIONS

Information that is especially important to note is identified by the following labels:

- **NOTE**
- **WARNING or CAUTION**
- **IMPORTANT**
- **TIP**

Note E31

NOTE: Provides you with information that is important to successfully setup and use the iServer.



CAUTION or WARNING: Tells you about the risk of electrical shock.



CAUTION, WARNING or IMPORTANT: Tells you of circumstances or practices that can affect the instrument's functionality and must refer to accompanying documents.

Tip E32

TIP: Provides you helpful hints.

FEATURES

- **Virtual Chart Recorder**
- **Web Server**
- **Temperature**
- **Relative Humidity**
- **Accurate Readings**
- **Password Protection**
- **Email Alarms**
- **Data Logging**
- **Real Time Clock**
- **SNMP Traps**

PART 1

INTRODUCTION

1.1 Safety and EMC Considerations

Refer to the CE Approval Section

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use twisted-pair wires for signal connections.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

Failure to follow all instructions and warnings may result in injury!

1.2 Before You Begin

Inspecting Your Shipment: Remove the packing slip and verify that you have received everything listed. Inspect the container and equipment for signs of damage as soon as you receive the shipment. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent. The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing the contents, save the packing material and carton in the event reshipment is necessary.

Customer Service: If you need assistance, please contact the Customer Service Department nearest you.

Manuals, Software: The latest Operation Manual as well as free configuration software (iConnect), datalogging software (iLog), and Mail Notifier are available at **the website listed on the cover page of this manual.**

1.3 Description

View Temperature + Humidity with a Web Browser. The iServer let's you monitor and record Temperature, Relative Humidity and Dew Point over an Ethernet network or the Internet with no special software -- just a Web browser. The iServer serves Active Web Pages to display real time readings and display charts of temperature, humidity and dew point, or log data in standard data formats for use in a spreadsheet or data acquisition program such as Excel or Visual Basic.

Adjustable Charts. The Java™ Applet chart scales are fully adjustable on the fly. For example, the chart can display one day, one week, one month or one year. Temperature and humidity can be charted across the full span (-40 to 124°C, and 0 to 100% RH) or within any narrow range (such as 20 to 30°C).

Sensor and Calibration. The iServer transmitters come complete with a temperature and humidity probe for measurement of a single location. There is a choice of industrial probes in 2" (with a 3' cable) or 5" length (with a 10' cable) and a wand style probe which is designed for ambient indoor applications.

It is not necessary to take the iServer out of service for routine calibration. The temperature / humidity sensors are interchangeable and can be replaced for about the same cost as a typical calibration. We offer replacement sensors with optional 3-point NIST traceable calibration certificates.

1.3 Description (continued)

Email Alarms. The device can trigger an alarm if temperature or humidity goes above or below a set point that you determine. Your alarm can be sent by email to a single user or to a group distribution list, including text messages to cell phones and PDA's.

Link to Web CAM or IP Camera. The Web page includes a link to a "Web Cam" or "IP camera" (not included). If you get a message about an alarm condition, you can quickly click on the link to view the actual scene over the Internet.

Award-winning Technology. The iServer is simple to install and use. It features award winning technology that requires no special software except a Web browser. The iServer connects to an Ethernet Network with a standard RJ45 connector and sends data in standard TCP/IP packets. It is easily configured with a simple menu using a Web browser and can be password protected. From within an Ethernet LAN or over the Internet, the user simply types its IP address or an easy to remember name such as "CleanRM5" or "ServRoom" in any Web Browser, and the iServer serves a Web Page with the current readings. The iServer comes complete with one temperature/humidity wand probe, universal ac power adapter, and full documentation.

Typical Applications: The iServer is great for monitoring temperature + humidity in applications such as: clean rooms, computer rooms, HVAC systems, pharmaceutical and food processing and storage, hospitals, laboratories, semiconductor fabs, electronic assembly, warehousing, museums, manufacturing, greenhouses, farm animal shelters, and many more.

Example:

A standard web browser can be used to monitor and chart temperature and humidity. The browser can also be used to configure the device's IP address, passwords for access and all configuration parameters. An iLD Big Display can display temperature and humidity received from an iServer over the Ethernet or the Internet.

The following example illustrates how you can hookup an iServer and iLD to your network:

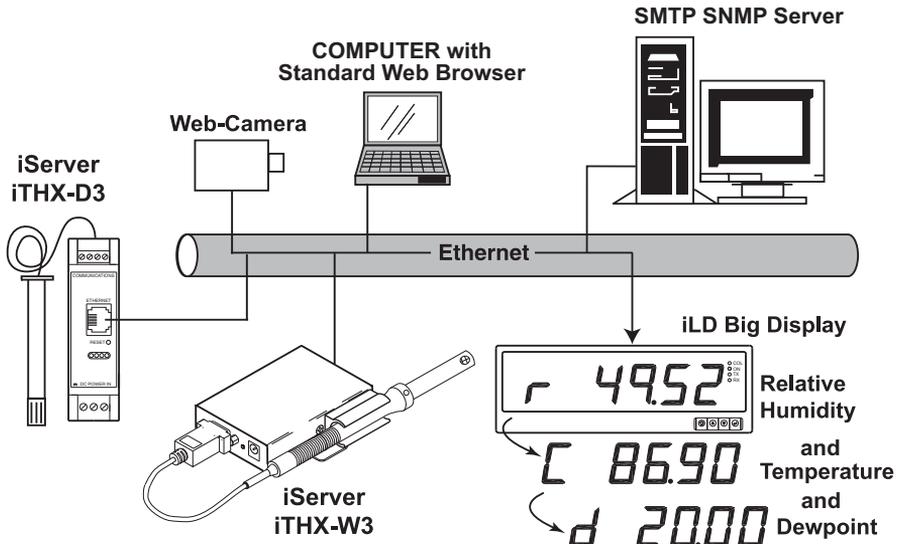


Figure 1.1 iServer with Probe on the Ethernet Network

PART 2 HARDWARE

2.1 Mounting

2.1.1 Mounting the Wall Mount iServer

Position unit where required. Mark and drill the two #6 screw holes.

After bracket is mounted on the wall, align back of unit over the three bracket clips, once engaged, slide downward, the unit will snap in place.

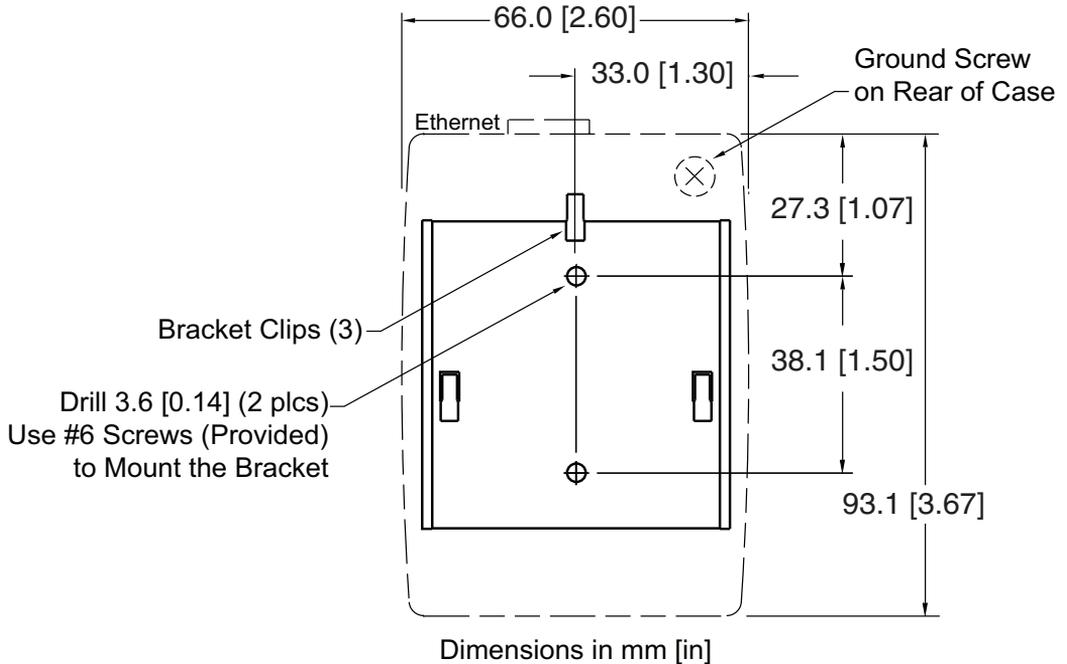


Figure 2.1 Mounting - Wall Mount iServer

Note It is recommended that you ground your unit.

With one end of a wire connected to earth ground, the other side can be wrapped around the ground screw, located on the bottom of the case.

Note If unit is to be mounted on a flat surface, you may take the bottom rubber feet off the unit.

2.1.2 Mounting the DIN Rail iServer

To install unit onto DIN Rail:

- a) Tilt unit, position mounting slot onto DIN Rail, as shown.
- b) Push unit towards DIN Rail and it will snap into place.

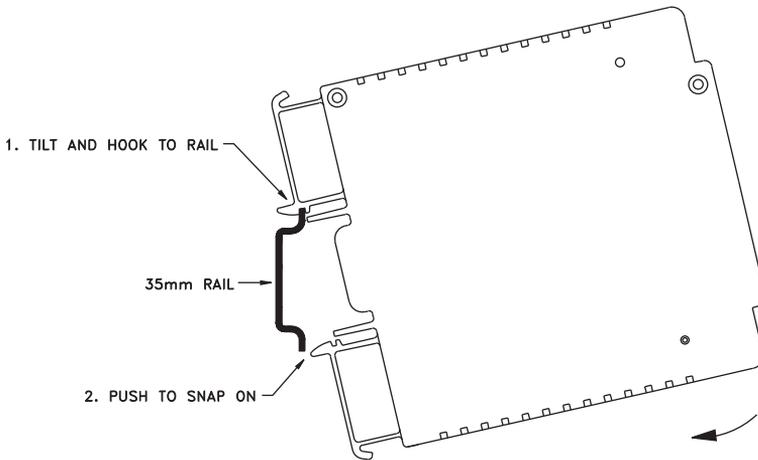


Figure 2.2 Mounting - DIN Rail iServer

2.1.3 Removal from a DIN Rail

- a) Insert flat screw-driver into tab and push downwards.
- b) Unit will detach from DIN Rail.

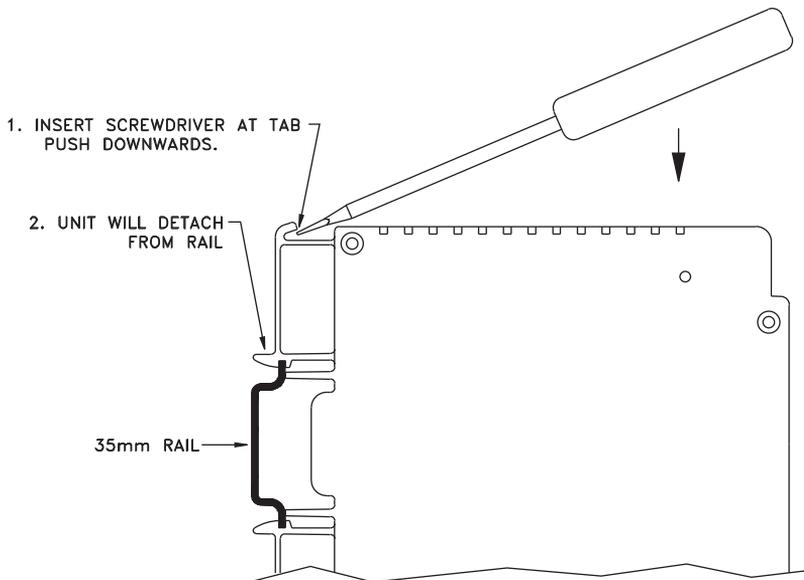


Figure 2.3 Removal - DIN Rail iServer

2.2 Dimensions

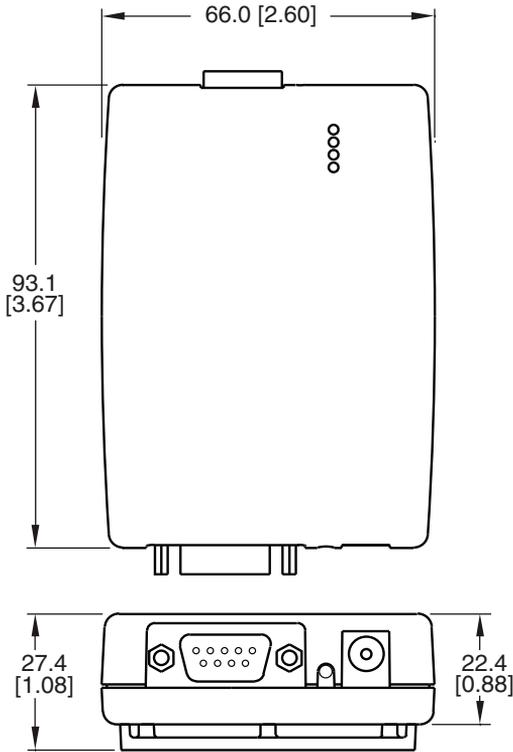


Figure 2.4 Mounting - Dimensions.

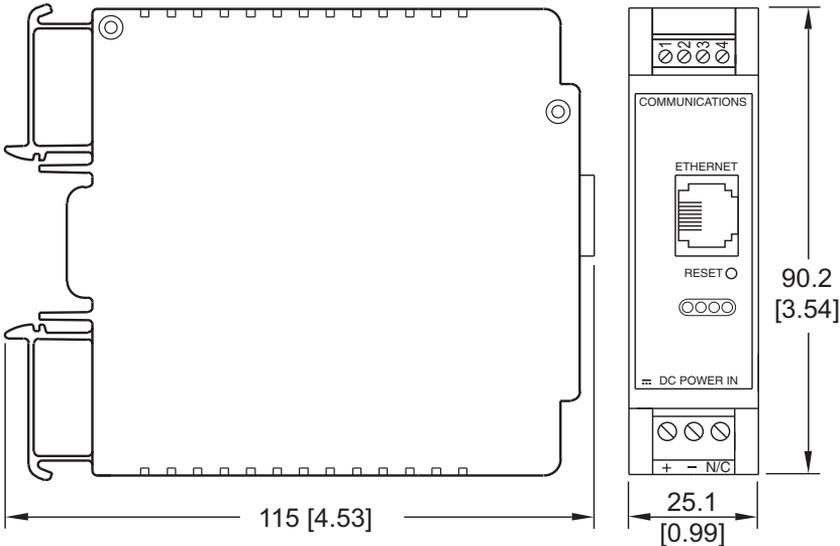
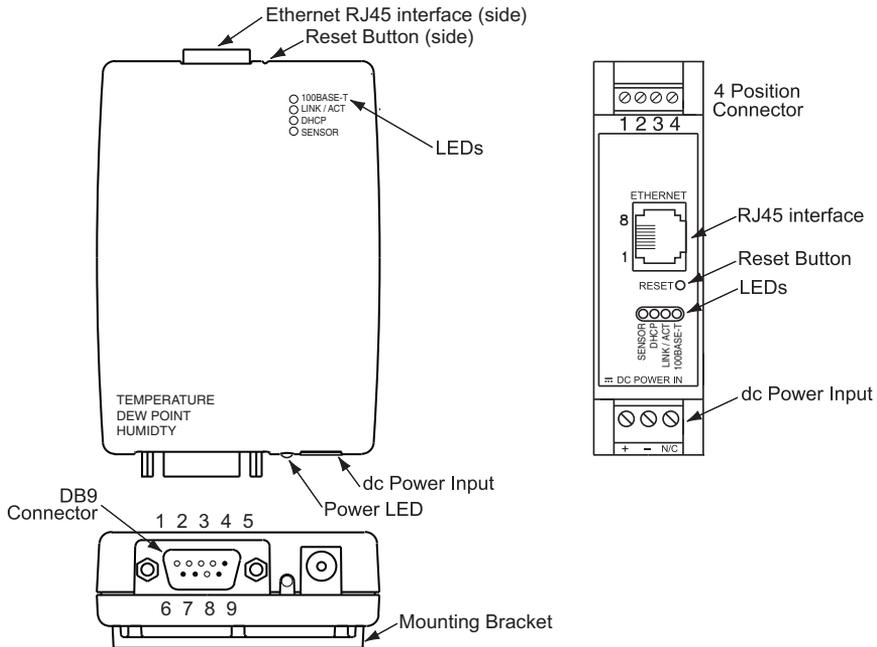


Figure 2.5 DIN Rail iServer Dimensions

2.3 Parts of the iServer Unit



iTHX-W3 DB9			
Pin#	Signal	Pin#	Signal
1	N/A	6	DATA CH1
2	N/A	7	SCK CH1
3	N/A	8	N/A
4	N/A	9	3.3V
5	RTN		

iTHX-D3 Connector		
Pin #	Channel	1
1	3.3V	Red
2	RTN	Black
3	SCK	White
4	DATA	Green

Refer to **Section 2.5** for Probe details

Figure 2.6 Parts of the iServer Unit

Table 2.1 Parts of iServer Unit

ETHERNET	RJ45 interface for 10/100BASE-T connection.
RESET	Button: Momentary (Push and Release) resets power on unit; Push and Hold for 10 seconds to reset unit to factory defaults and reset power.
100BASE-T	LED (Green) On: Indicates 100 Mbps; LED Off: Indicates 10 Mbps.
LINK/ACT	LED (Green) On/Blinking: Indicates good network link and network activities (receiving or sending packets).
DHCP	LED (Yellow): When DHCP is enabled, once the iServer receives the IP parameters from the DHCP server this LED will turn Solid yellow.
SENSOR	LED (Green) On: Indicates sensor is connected and can take readings; LED Off: the sensor is not connected
POWER	LED (Green) Solid: Indicates Power-ON (for -W3 version only).
DC Power Supply Section:	
+	Plus power supply wire connection (inside the plug for -W3 model).
-	Minus power supply wire connection (outside the plug for -W3 model).

2.4 Network Communication Interfaces

2.4.1 10/100 BASE-T RJ-45 Pinout

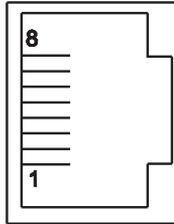
The 10/100BASE-T Ethernet network system is used in the iServer for network connectivity.

The 10 Mbps or 100 Mbps twisted-pair Ethernet system operates over two pairs of wires.

One pair is used for receiving data signals and the other pair is used for transmitting data signals.

This means that four pins of the eight-pin connector are used.

ETHERNET



Pin	Name	Description
1	+Tx	+ Transmit Data
2	-Tx	- Transmit Data
3	+RX	+ Receive Data
4	N/C	Not Connected
5	N/C	Not Connected
6	-Rx	- Receive Data
7	N/C	Not Connected
8	N/C	Not Connected

Figure 2.7 RJ45 Pinout

Note ^{ESD}

For CE compliance at 100 Mbps: use shielded cable, opposite end of cable must be grounded.

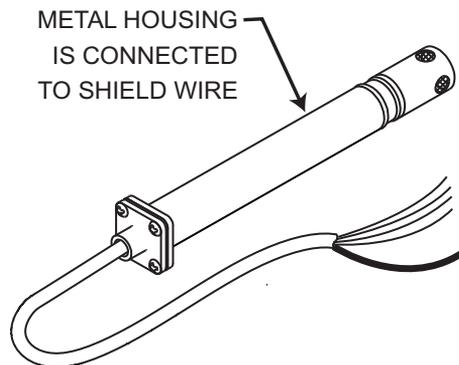
2.4.2 Connecting iServer to PC/Hub/Switch/Router

The iServer's Ethernet interface can automatically detect the Rx and Tx lines on a twisted pair Ethernet cable (MDI/MDIX Auto Cross). Therefore, to connect an iServer to a PC/Hub/Switch/Router, either a straight-through or a cross-over cable can be used.

Note ^{ESD}

On certain devices (like iServer), it is possible for the hardware to automatically correct errors in cable selection, making the distinction between a "straight-through" cable and a "cross-over" cable unimportant. This capability is known as "Auto MDI/MDIX".

2.5 Industrial Probe



Choose one which gives the best signal integrity-

- 1) Connect Probe's Shield to RTN if Probe Housing is not connected to Earth Ground.
OR
- 2) Connect Probe's Shield to Earth Ground if Probe Housing is not connected to Earth Ground.

Refer to **Section 2.3** for connector details.

Figure 2.8 Industrial Probe Wiring Hookup

PART 3 NETWORK CONFIGURATION

3.1 Network Protocols

The iServer can be connected to an Ethernet network communicating through standard IP protocols including TCP, UDP, SNMP, SMTP, ARP, HTTP (WEB access), DNS, DHCP, ICMP, SNTP, and Telnet.

3.2 Ethernet (MAC) Address

MAC (Media Access Control) address is a unique hardware number for Ethernet devices like computers, network switches, print servers, etc. When you're connected to an Ethernet LAN using a computer you can see a table of IP addresses called "ARP table" stored on that computer. The ARP table relates IP addresses of devices on a network to their corresponding MAC addresses. The MAC address can be found on a label attached to your Ethernet device and it contains 6 bytes (12 characters) of hexadecimal numbers XX:XX:XX:XX:XX:XX hex

For example: 0A:0C:3D:0B:0A:0B

Note Remove the small label with the default IP address and there will be room to put your IP address. See **Figure 3.1**

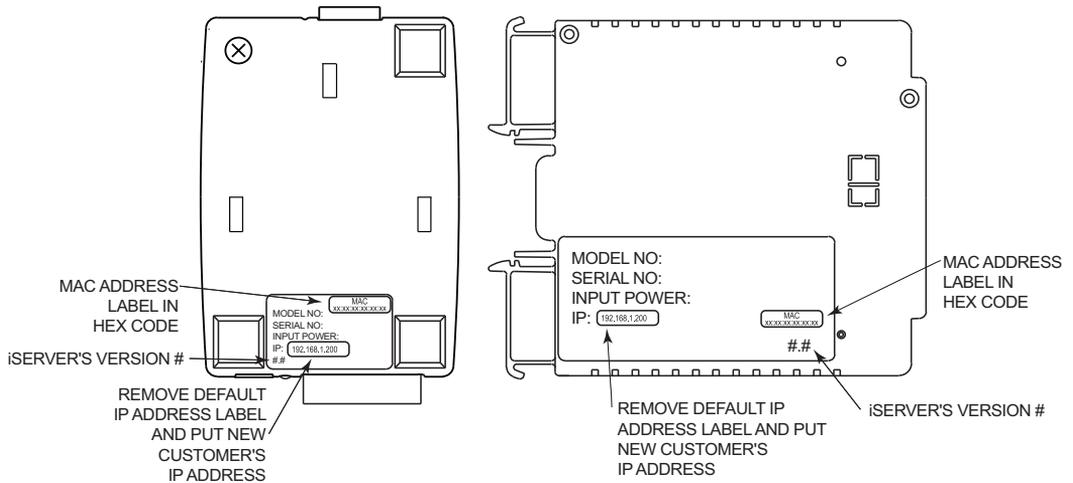


Figure 3.1 Labeling

3.3 DHCP

DHCP, Dynamic Host Configuration Protocol, enables computers and network devices to receive their IP configurations from a DHCP server.

If DHCP is enabled on your iServer, as soon as the iServer that is connected to the network is powered on, there will be an exchange of information between the iServer and the DHCP server. As a result, the DHCP server will assign an IP address, a Gateway address, a Subnet Mask, and a DNS address to the iServer. Note that the DHCP server must be correctly configured to make such assignments.

If fixed or static IP address is desired, the DHCP function must be disabled.

The iServer is shipped with DHCP disabled (factory default).

The DHCP can be enabled by accessing the iServer's web server and selecting Network menu (refer to **Section 4.4.2**).



It's very important to communicate with the network administrator in order to understand DHCP and its existing configurations on the host server before enabling DHCP on the iServer.



The iServer is shipped with a default static IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**.

3.4 DNS

DNS, Domain Name System, enables computers and devices to be recognized over a network based on a specific name instead of IP addresses.

For example, instead of having to use **http://192.168.1.200** (IP address), you would use **http://ithx03ec** or any name up to sixteen alphanumeric characters defined as a Host Name in the iServer's web server.

The default Host Name for an iServer is "**ithx**" followed by the **last four digits** of the MAC address of that iServer unit.



On Windows servers where DHCP and DNS are separate functions it is very important to configure the DHCP server to communicate with DNS in order for the iServer's Host Name to correctly respond. If you cannot access the iServer using its Host Name, please contact your network administrator to make sure DHCP and DNS servers are linked together.

If DNS server address is setup, all Host Names reported during weblink configuration (i.e. SMTP server IP, Sntp server IP, SNMP trap server IP, etc.) will be translated into IP addresses.

3.5 IP Address

Every active device connected to the TCP/IP network must have a unique IP address. This IP address is used to build a connection to the iServer.

All network devices like computers that use TCP/IP protocol to communicate with each other should have a unique 32-bit address called IP address. The IP address is divided into two portions, the network ID and the host ID. For instance, every computer on the same network uses the same network ID. At the same time, all of them have different host IDs. For more details about the IP address see **Appendix B**.

3.6 Port Number

All TCP connections are defined by the IP address and a port number. A port number is an internal address that provides a TCP/IP interface between an application software on a computer and a device on the network or between two devices on the network.

There are two default TCP port (socket) numbers assigned to the iServer:

- 1) **Port 2000:** Once a TCP connection is made to the iServer using port 2000 or any port number that is configured on the iServer for Local Port (see Network menu, **Section 4.4.2**), the iServer can then be polled for variables like temperature, humidity, etc. using commands. For the list of commands see **Section 4.9.1**.
- 2) **Port 2002:** This port is the iServer's network console port for reading or changing the settings within the iServer. For the list of settings refer to **Section 4.8.1**. For both of the above cases, for example, a Telnet application can be used.

PART 4 OPERATIONS

Depending on user's preference and network setup, the iServer can be configured in several ways:

Using the latest versions of Web browsers like Internet Explorer, Firefox, Opera, or Safari (iPhone) the iServer's Web server can be accessed, see **Section 4.2**.

It can also be configured using a TCP connection to port 2002 using a command line interface, see **Section 4.8.1**.

The iCONNECT Configuration Software can also be used to find and configure the iServer over the Ethernet, see **Section 4.1.2**.



Before you configure the iServer, you will need to assign an IP address to the unit. Refer to **Section 4.1.1, 4.1.2 or 4.1.3**.

4.1 IP Address Assignment

4.1.1 DHCP (Method 1)

The DHCP server will assign an IP address, see **Section 3.3**.

4.1.2 ARP HTTPget Commands (Method 2)

You can download the HTTPget program from our web site to use it for this section.

1. From the Command line (DOS prompt) where you keep the HTTPget.exe file, type the following:

```
arp -s 128.100.101.76 00-03-34-00-9c-5c           press the <Enter> key  
128.100.101.76, for example, is the IP address that you want to assign to your iServer  
and 00-03-34-00-9c-5c is the MAC address of your iServer labeled on the bottom of the  
unit.
```

2. From the same prompt, type the following HTTPget command:

```
httpget -r -S "00000000" 128.100.101.76:1     press the <Enter> key  
00000000 is the default ADMINISTRATOR password in your iServer unit and  
128.100.101.76:1 is the IP address that your iServer will accept on TCP port 1. At this  
point, you have successfully assigned 128.100.101.76 IP address to your iServer.
```

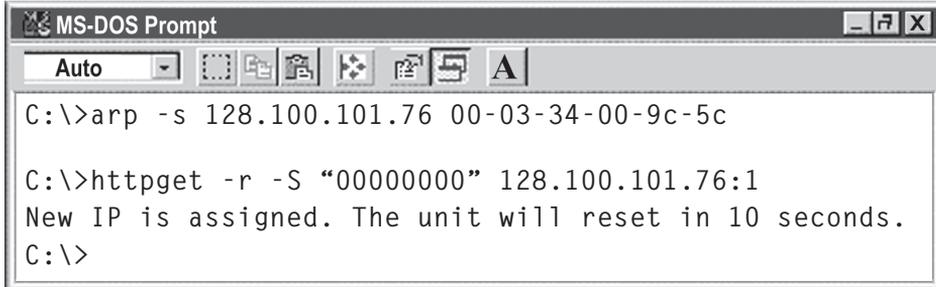
Continued on the following page.

4.1.2 ARP HTTPget Commands (Method 2) (continued)

Note

The above IP address of 128.100.101.76 is an example to show how these commands work. To get a valid IP address on your network you need to consult with your IT department.

Figure 4.1 shows the screen shot of an actual DOS window with the above commands executed.



```
MS-DOS Prompt
Auto
C:\>arp -s 128.100.101.76 00-03-34-00-9c-5c
C:\>httpget -r -S "00000000" 128.100.101.76:1
New IP is assigned. The unit will reset in 10 seconds.
C:\>
```

Figure 4.1 ARP and HTTPget Commands on a DOS Window

4.1.3 Direct Connection (Method 3)

The iServer is shipped with a default IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**.

To start, connect your iServer directly to your PC using a straight or cross-over Ethernet cable and power it on.

Make sure that the Network LINK/ACT LED on the iServer and your Ethernet switch is solid ON. Refer to **Figure 4.2**.

If you are going to use a Web browser or Telnet program to access the iServer using its default IP address of 192.168.1.200, you need to make sure that the PC from which you're establishing the connection has an IP address that is in the same range as the iServer's IP address.

For example, you can assign your PC an IP address of **192.168.1.x**, where **x** is any number from **1** to **254**.

Note

Your PC's IP address cannot be the same as the iServer's IP address.

You also need to make sure that your PC's subnet mask is **255.255.255.0**.

This is a good way to access the iServer over the network and make any configuration changes needed.

Changing your PC's IP address is **temporary** and it's only for the purpose of accessing the iServer for initial configurations like assigning a new IP address, subnet mask, etc.

Once the iServer is configured you can **put your PC back to its original IP settings**.

If 192.168.1.200 is already in use on your network, connect the iServer directly to your computer using a CAT5 Ethernet cable (either straight or cross-over cable will be detected by the iServer) and proceed as described below.

4.1.3 Direct Connection (Method 3) (continued)

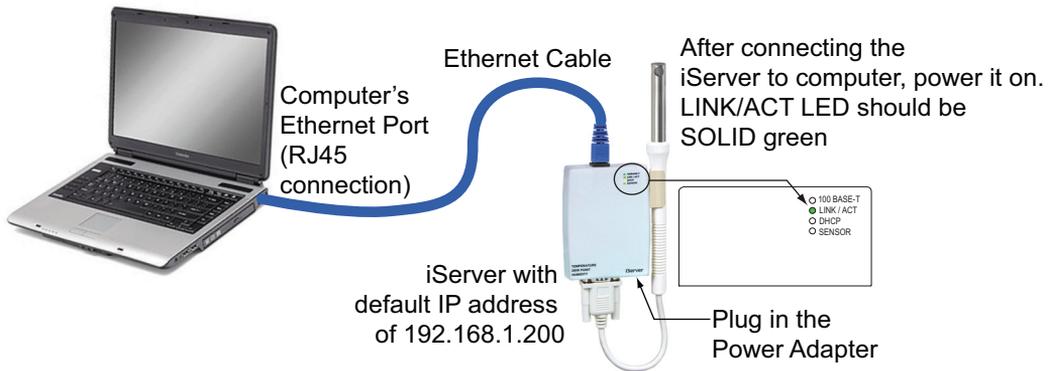


Figure 4.2 Connecting Computer Directly to iServer

1) Click on your Windows “Start” menu and select “Control Panel” from the list options.

Double click on the “Network Connections” icon

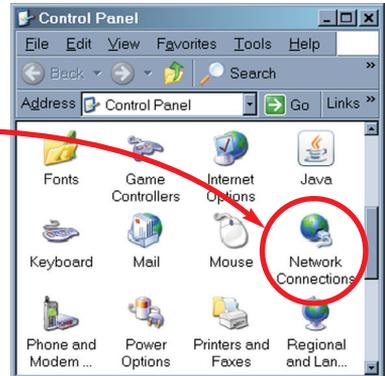


Figure 4.3 Network Connections

2) You now have “Network Connections” window opened.

The “Local Area Connection” icon has all the settings for your ethernet connection.

Double click on this icon.



Figure 4.4 Local Area Connection

4.1.3 Direct Connection (Method 3) (continued)

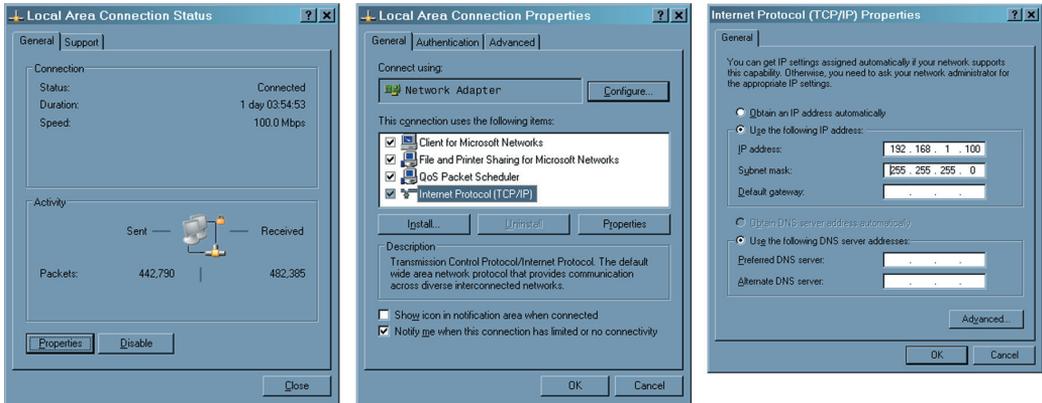


Figure 4.5 Changing TCP/IP Properties on Your Computer

- 4) Now you may need to reboot your computer.
- 5) Once your PC is back up, open your browser and type the iServer's default IP address of **192.168.1.200** in the "Address" window of your browser and press the Enter key.

You will soon be inside the Welcome page (see **Figure 4.6**) of the iServers WEB server and from there you can access all the menus.



Figure 4.6 iServer Welcome Page

4.1.3 Direct Connection (Method 3) (continued)

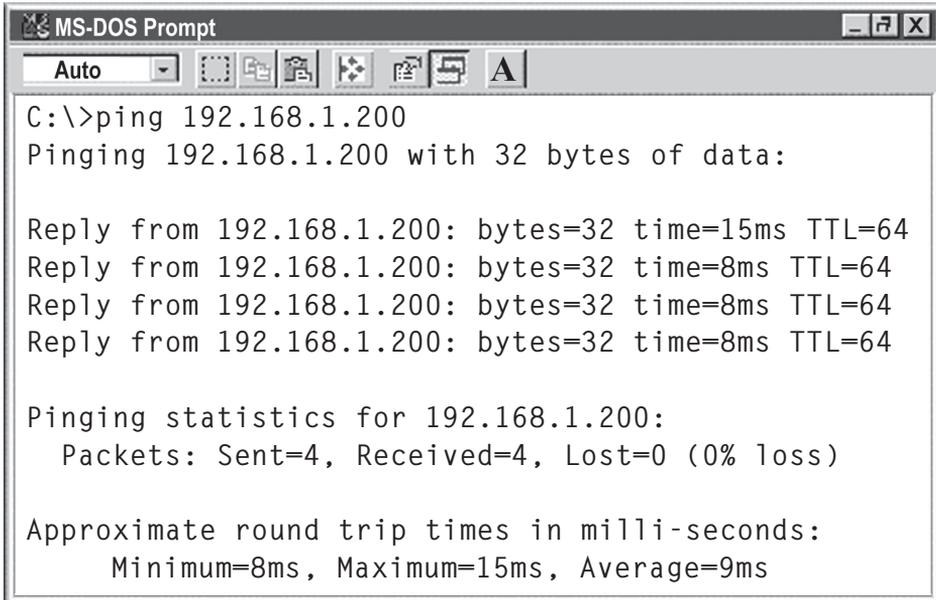
Note

To verify a good connection to the iServer, from a DOS prompt on your computer type "**ping 192.168.1.200**" and press Enter.

You should get a reply as shown in **Figure 4.7**.

If you don't receive a reply it means that you do not have a network connection between your PC and the iServer.

Check your IP address, subnet mask, and gateway address.



```
MS-DOS Prompt
Auto
C:\>ping 192.168.1.200
Pinging 192.168.1.200 with 32 bytes of data:

Reply from 192.168.1.200: bytes=32 time=15ms TTL=64
Reply from 192.168.1.200: bytes=32 time=8ms TTL=64
Reply from 192.168.1.200: bytes=32 time=8ms TTL=64
Reply from 192.168.1.200: bytes=32 time=8ms TTL=64

Pinging statistics for 192.168.1.200:
    Packets: Sent=4, Received=4, Lost=0 (0% loss)

Approximate round trip times in milli-seconds:
    Minimum=8ms, Maximum=15ms, Average=9ms
```

Figure 4.7 Pinging the iServer from MS-DOS Prompt

4.1.4 iConnect Software (Method 4)

The iServer can be assigned an IP Address by using the iConnect software.

- a) Download the iConnect software from the website listed on the cover of this manual (software section).
- b) Install iConnect software on a networked PC. This software is compatible with Windows 95, 98, NT, 2000, and XP.
- c) Use iConnect to assign an IP address to the iServer and access its web pages for configuration.

You can also use any standard web browser to access the iServer's web pages. Consult with your IT department for obtaining an IP address.

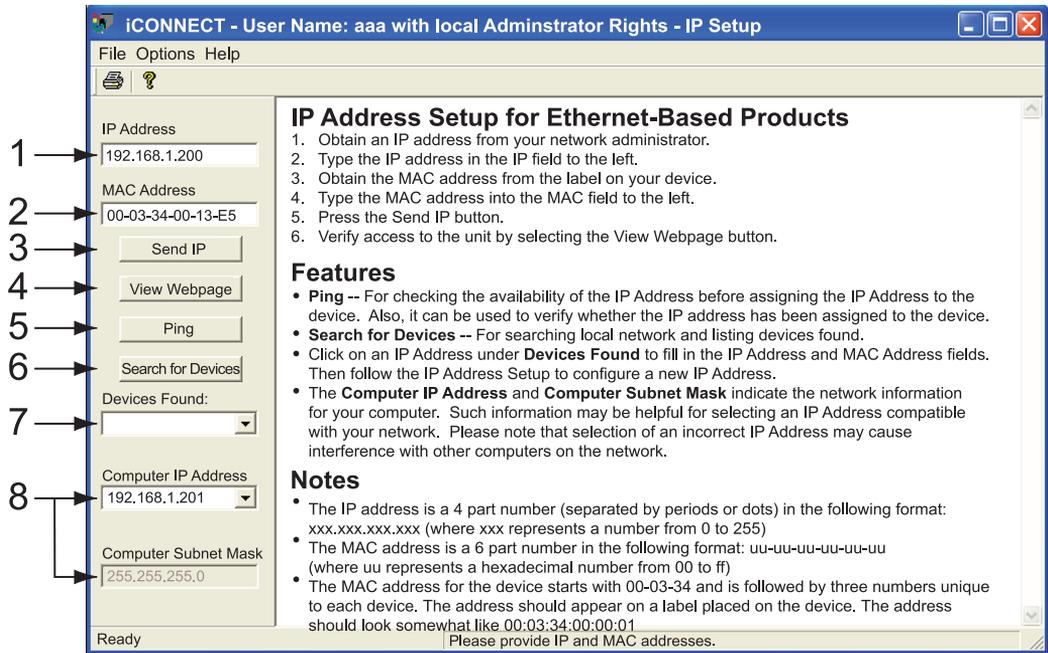


Figure 4.8 Assigning an IP Address using iConnect

- 1) Place the IP address in this box.
- 2) Take the MAC address from the label attached to the bottom of the iServer and place it in this box.
- 3) Click here to send the above IP address to the iServer.
- 4) After the IP address is assigned to the iServer, click here to access it's web pages.
- 5) Click here to Ping the iServer whose IP address is shown in the IP address box.
- 6) Click here to find all the iServer's on your network .
- 7) The IP addresses for the iServer's found by the iConnect will be listed here.
- 8) These fields indicate the IP address and the subnet mask of the PC on which the iConnect is running.

4.1.4 iConnect Software (Method 4) (continued)

d) To access the iServer for Configuration:

Click on the “View Webpage” button, you will access the iServer’s welcome page.

To take advantage of the iServer’s full capability use any standard web browser to access the iServer’s web pages as described in **Section 4.2**.



Figure 4.9 Accessing the iServer’s using iConnect

4.2 Access and Configuration Using a Web Browser

- Start your web browser.
- In the URL field, type **http://192.168.1.200** (iServer's default IP address).
- The Welcome Page, will be displayed.



Figure 4.10 iServer Welcome Page



In order to access the iServer's web pages, users may be prompted for a password, as shown below.

4.3 LOGIN and ADMINISTRATOR Passwords

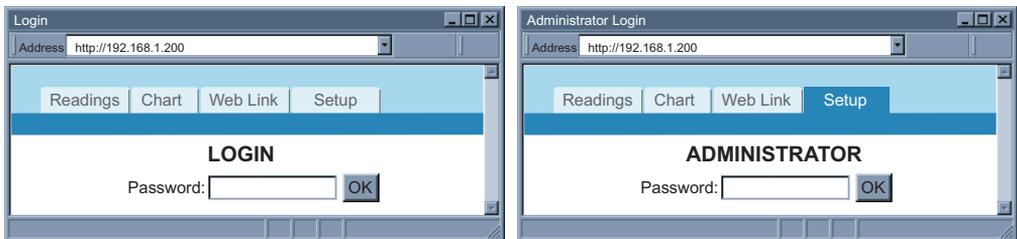


Figure 4.11 LOGIN and ADMINISTRATOR Passwords

There are 2 different access levels:

1. LOGIN Password is required to access the iServer's Readings, Chart, and Web Link pages unless it's disabled. The default password is **12345678**.
2. ADMINISTRATOR Password is required to access the iServer's Setup menu unless it's disabled. The default password is **00000000**.

Refer to **Section 4.4.5** for Password setup.

4.4 Setup

Clicking the Setup button on the Welcome page (see **Figure 4.10**) will provide access to the Menu Panel (see **Figure 4.12**).

Using this Panel you can configure the iServer entirely.

4.4.1 Overview

Once the Administrator password is entered, the Overview page will appear which provides a summary of important parameters within the iServer.

All the fields are read-only.

Overview

Address

Readings Chart Web Link Setup

Menu Bar

Menu Panel

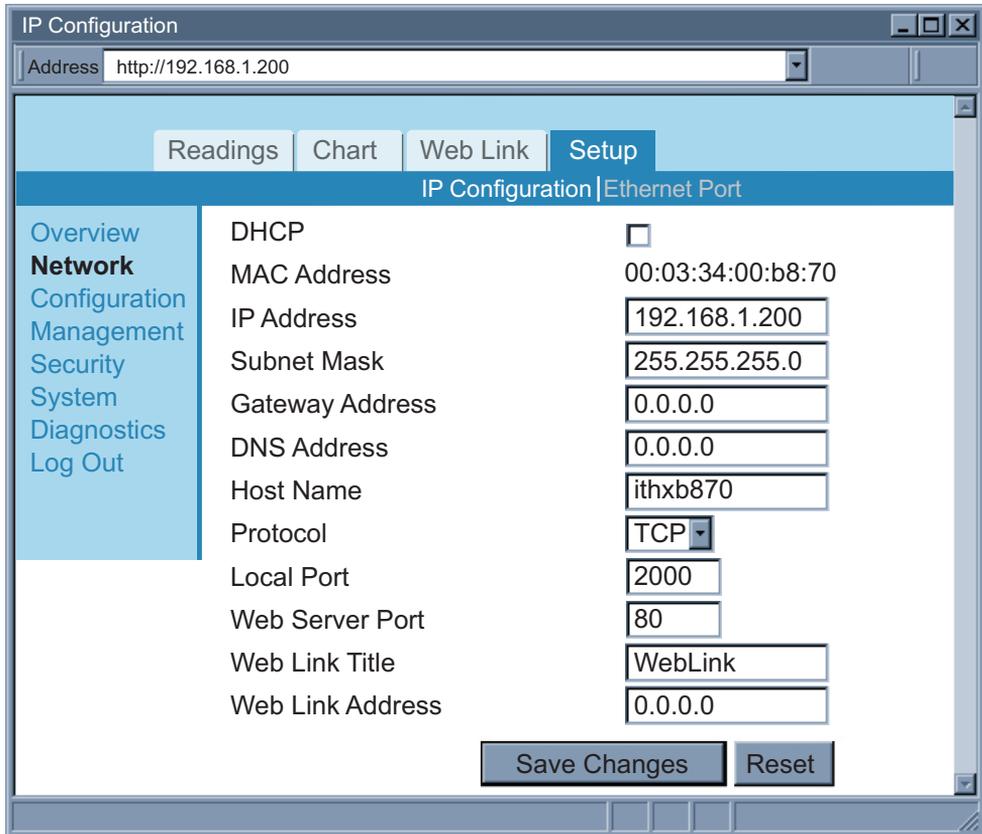
Overview	Model	iTHX
Network	Firmware Version	x.x
Configuration	DHCP	Disabled
Management	MAC Address	00:03:34:00:b8:70
Security	IP Address	192.168.1.200
System	Subnet Mask	255.255.255.0
Diagnostics	Gateway Address	0.0.0.0
Log Out	Hostname	ithxb870
	Ethernet Port	Auto
	Web Server Port	80
	Uptime	1 day, 00:00:00 hh:mm:ss

Figure 4.12 Overview

4.4.2 Network

This menu provides network configurations including IP parameters and Ethernet interface options. Fields are described below.

4.4.2.1 IP Configuration



The screenshot shows a web-based configuration window titled "IP Configuration". At the top, there is a "Address" field with the value "http://192.168.1.200". Below this is a navigation bar with tabs for "Readings", "Chart", "Web Link", and "Setup". The "Setup" tab is active, and the sub-tab "IP Configuration | Ethernet Port" is selected. On the left side, there is a vertical menu with options: "Overview", "Network", "Configuration", "Management", "Security", "System", "Diagnostics", and "Log Out". The "Network" option is highlighted. The main content area displays the following configuration fields:

DHCP	<input type="checkbox"/>
MAC Address	00:03:34:00:b8:70
IP Address	<input type="text" value="192.168.1.200"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway Address	<input type="text" value="0.0.0.0"/>
DNS Address	<input type="text" value="0.0.0.0"/>
Host Name	<input type="text" value="ithxb870"/>
Protocol	<input type="text" value="TCP"/>
Local Port	<input type="text" value="2000"/>
Web Server Port	<input type="text" value="80"/>
Web Link Title	<input type="text" value="WebLink"/>
Web Link Address	<input type="text" value="0.0.0.0"/>

At the bottom of the configuration area, there are two buttons: "Save Changes" and "Reset".

Figure 4.13 Network: IP Configuration

DHCP – If the box is checked the iServer will dynamically request an IP address, a subnet mask, a gateway address, and a DNS address from the DHCP server. By default the DHCP option is *disabled*. For more information about DHCP, see **Section 3.3**.

MAC Address – This Indicates the hardware address of the iServer and it is non-configurable. For more information about MAC Address, see **Section 3.2**.

IP Address – This indicates the IP address of the iServer. The iServer's default IP address is *192.168.1.200*. When DHCP is enabled this field will be dimmed. Consult with your IT department for obtaining an IP address.

Subnet Mask – It's a 32-bit number that is used to determine which part of the IP address is the network portion and which part is the host portion. When DHCP is enabled this field will be dimmed. The iServer's default Subnet Mask is *255.255.255.0*. Consult with your IT department for obtaining a subnet mask.

4.4.2.1 IP Configuration (continued)

Gateway Address – This points to the router that forwards traffic to a destination address outside of the subnet on which the iServer resides. This is the IP address of the router which functions as a gateway. When DHCP is enabled this field will be dimmed. The iServer's default Gateway address is *0.0.0.0*. Consult with your IT department for obtaining a gateway address.

DNS Address – In order to use the hostname to access the iServer, the DNS server on your network must be configured, refer to **Section 3.4**. iServer plays the role of a DNS client, in the sense that the iServer will actively query the DNS server for the IP address associated with a particular domain name. When DHCP is enabled this field will be dimmed. The iServer's default DNS address is *0.0.0.0*. Consult with your IT department for obtaining a DNS address.

Host Name – If DHCP is enabled, the iServer will send this name to the DHCP server. This name is used so that the iServer can be accessed based on a specific name instead of an IP address. For example, instead of using ***http://192.168.1.200*** (IP address), you would use ***http://ithxA838*** or any name up to sixteen (16) alphanumeric characters. The default Host Name for an iServer is "ithx" followed by the *last four digits* of the MAC address of that particular iServer.

 **Note** On Windows servers where DHCP and DNS are separate functions it's very important to configure the DHCP server to communicate with DNS in order for the iServer's Host Name to correctly respond. If you cannot access the iServer using its Host Name, please contact your network administrator to make sure DHCP and DNS servers are linked together.

Protocol – It's the network protocol the iServer communicates with the Ethernet Network. Options are *TCP* and *UDP*. The default is *TCP*.

Local Port – The default port is *2000*. Refer to **Section 3.6**.

Web Server Port – The default port is *80*. This is the primary port number for the HTTP protocol used for communication between internet browsers and web sites/web servers. Web servers open this port then listen for incoming connections from web browsers. Similarly, when a web browser is given an IP address (like the iServer's IP address), it assumes that the iServer's web server is listening for connections on port 80. If this port is changed to anything but 80 then on the browser the new port number must be indicated with a colon (:) after the IP address. For example, if the Web Server Port is changed to **500**, you will then need to type ***http://192.168.1.200:500*** on the browser to access the iServer's web server.

 **Note** One of the applications where the Web Server Port number may need to change is when users want to access the iServer's web server from outside the local area network (i.e. Internet). By setting up "Port Forwarding" inside a router that is the gateway to that local area network this task can be accomplished. "Port Forwarding" technique uses the Web Server Port number to forward the Internet connection to the iServer on the LAN.

Web Link Title – This is a text field that appears on the button on the iServer's Web Link Page, refer to **Section 4.7**. This can describe the Web Link Address assigned below.

Web Link Address – This provides a network link to any IP device on that network. If your IP device has a web server (just like the iServer) then you can access it directly from the same browser you accessed the iServer. Simply, click on the Web Link button on the iServer's welcome page.

4.4.2.2 Ethernet Port

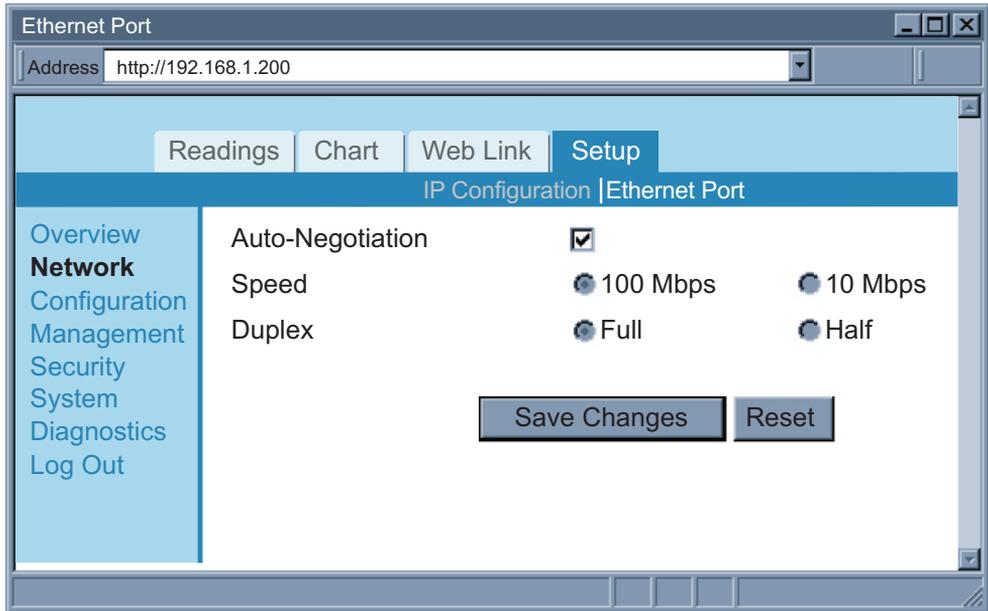


Figure 4.14 Network: Ethernet Configuration

Auto-Negotiation – It is the link, in terms of speed and duplex, between the iServer and another Ethernet device like an Ethernet switch.

If Auto-Negotiation box is checked, the iServer will auto-negotiate the speed and duplex with the attached Ethernet device. If any of the other options are selected, the speed and duplex will be fixed.

It's important to have the same Ethernet port configuration on the iServer and the attached Ethernet device. If iServer cannot auto-negotiate with the attached Ethernet node it will default to *10 Mbps* and *Half-Duplex*. Once Auto-Negotiation is checked, other fields under this category will be dimmed. By default the Auto-Negotiation is *checked*.



If the iServer detects the link to be 100 Mbps the 100 BASE-T LED will be solid green.

4.4.3 Configuration

This menu provides configurations for the real-time clock, server parameters, sensors, and alarm relays settings. Fields are described below.

4.4.3.1 Date and Time

Current Date – This field indicates the iServer's real time clock date. The format is *yyyy/mm/dd*. When there is no date defined, the iServer will be defaulted to *2099/01/01* and be shown in red to alert you that it has not yet been set.

Current Time – This field indicates the iServer's real time clock time. The format is military time (24-hour) and it is entered as *hh:mm:ss*.

Change Date and Time – By clicking on this option the real data and time can be entered.

4.4.3.1 Data and Time (continued)

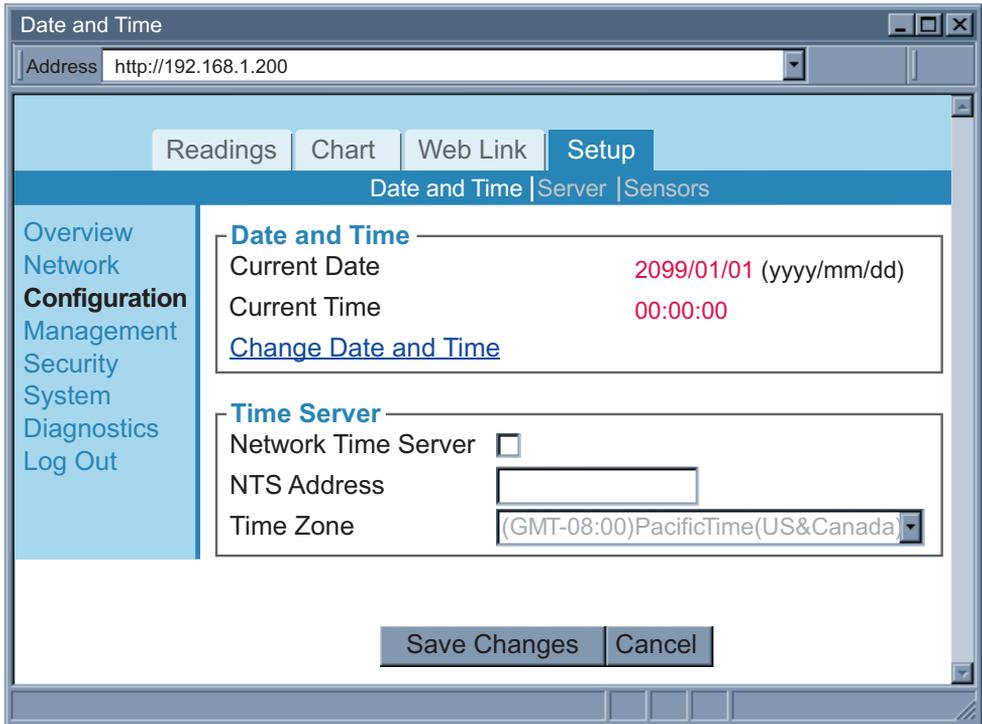


Figure 4.15 Network: Ethernet Configuration



Once the AC adaptor is disconnected from the iServer, the iServer will lose its date and time settings.



Once the iServer is rebooted from any web page, the iServer will lose its date and time settings.



If the iServer is setup to get it's time from a Network Time Server, then the time will be re-assigned after the reboot.

Network Time Server – If there is a time server on the network or the Internet, the iServer will get the real date and time once the Network Time Server's IP address is provided. Default is *unchecked*.

NTS Address – The field to enter the Network Time Server's IP address.

The U.S. National Institute of Standards and Technology (NIST) publishes a list of time servers on the Internet used by the NIST Internet Time Service (ITS). The list includes each server's name, IP address, and location in the United States. As of the publication date of this manual, links to the list can be found at <http://tf.nist.gov>.

Time Zone – If Network Time Server option is checked, the correct time zone must be selected for the correct time display.

4.4.3.2 Server

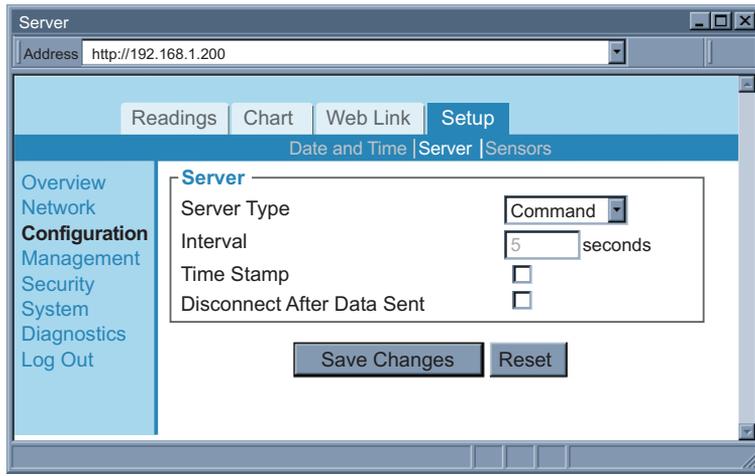


Figure 4.16 Configuration Menu: Server

Server Type – Options are *Command* and *Continuous*.

If *Command* is selected the iServer will respond to commands sent from a network host (for the list of commands refer to **Section 4.9.1**).

If *Continuous* is selected the iServer will send temperature, humidity, dewpoint values and alarm relay status once every time amount selected in the Interval box.

The *Command* and *Continuous* modes operate when a network host opens a TCP connection to the iServer's IP address with port 2000.

In UDP *Command* mode, iServer will respond back with a UDP packet (to the __ address and port) if a host application sends a UDP command to iServer's IP address with port 2000.

In UDP *Continuous* mode, iServer starts sending continuous data if a host application sends a trigger or UDP packet to iServer's IP address with port 2000.

Interval – This is the time interval (in seconds) between each data transmission when the iServer is in *Continuous* mode. The default value is set to *5 seconds* and the minimum is *2 seconds*.

Time Stamp – If checked, the iServer will stamp the data with date and time before sending it out to a network host. This will apply to *Command* and *Continuous* modes. Default is *unchecked*.

Disconnect After Data Sent – If checked, once the iServer responds back with data, the iServer will close the TCP connection that had been made from the network host.

This feature should be used if data acquisition software expects data to be ended by closing TCP connection from the client.

4.4.3.3 Sensors

This is the page where the Sensor Parameters are defined. Reading 1 is for Temperature, Reading 2 is for Humidity, and Reading 3 is for Dewpoint.

Description – This can be a name for the sensor or where the sensor is located. This field is text only and can have up to 16 alphanumeric characters. This description will appear wherever Reading 1, 2 or 3 is displayed on the web server.

4.4.3.3 Sensors (continued)

Unit – This would be the units of measurement for that particular sensor. Examples are % for humidity, *F* and *C* for temperature and dewpoint.



Once the unit of temperature is selected, either *C* or *F*, it will be a global change through out the web server, as well as on the LCD display.

The screenshot shows a web browser window titled "Sensors" with the address "http://192.168.1.200". The "Setup" tab is active. On the left, a navigation menu includes "Overview", "Network", "Configuration", "Management", "Security", "System", "Diagnostics", and "Log Out". The main content area is titled "Date and Time | Server | Sensors". It contains three sensor configuration sections: "Reading 1" (Temperature, Unit C, Data Format 000.0C, Ref. Low 0.0, Ref. High 100.0), "Reading 2" (Humidity, Unit %, Data Format H00.0%, Ref. Low 0.0, Ref. High 100.0), and "Reading 3" (Dewpoint, Unit C, Data Format D000.0C). A "Sampling Rate" section is set to "10 seconds". "Save Changes" and "Reset" buttons are at the bottom.

Figure 4.17 Configuration Menu: Sensors

Display – If checked the variable (i.e. temperature) will be displayed on the Readings and Chart applets as well as data transmission in *Continuous* mode (see Server **Section 4.4.3.2**). The default is *checked*.

End Character – This means that the iServer will send a character (in Hex) after the value for each variable. This will apply to either *Continuous* or *Command* mode. The default is set for *0D* (Hex representation of <CR>).

Data Format – This indicates the format of the variable being displayed on a network host when *Continuous* or *Command* transmission is used. Reading 1: *T000.0C*, *000.0C*, *000.0*; Reading 2: *H00.0%*, *00.0%*, *00.0* (the *C* or *F* will change to the appropriate *unit* once you press Save Changes button).

Adjust by – If it's determined that the reading is slightly off this field can be used to adjust the reading. The options are *Offset* and *Scale & Offset*.

Using the *Offset* method you can manually assign a numerical value to adjust the reading. For example if the actual reading is 55 where it should be 54 you can enter -1 in the *Offset* field.

4.4.3.3 Sensors (continued)

The *Scale & Offset* method uses two points to adjust the reading within the entire temperature range. For example, if at the lower point the actual reading is 10 where it should be 12 and at the higher point the actual reading is 200 where it should be 195, here is how the numbers are entered.

Reading Low	<input type="text" value="10.0"/>	Ref. Low	<input type="text" value="12.0"/>
Reading High	<input type="text" value="200.0"/>	Ref. High	<input type="text" value="195.0"/>

The adjusting numbers can be positive or negative with one decimal point.



The adjusting values must be assigned after the unit of temperature (C or F) is selected. If the unit of temperature is changed, you must readjust the values for a correct result.

Offset – If it's determined that the reading is slightly off, this field can be used to manually assign a numerical value to adjust the reading. The offset can be a positive or a negative number with one decimal point.



The temperature offset value must be assigned after the *Unit (C or F)* is selected. If the unit of temperature is changed, you must reassign the offset value for the correct result.

Sampling Rate – This determines the rate in which the iServer polls the probe for temperature and humidity values. The options are *1, 10, and 60 seconds*.

The default is set for *10 seconds*.

4.4.4 Management

This page provides the iServer's email, SNMP and alarm settings. SNMP (Simple Network Management Protocol) is the protocol used by network management systems to communicate with network devices that respond to SNMP connections for the purpose of problem detections and corrections.

If SNMP and/or SMTP features are desired, please make sure iServer's network setting as well as SNMP trap server and SMTP mail server are setup properly. Failure to do so may cause iServer to be unresponsive while waiting for these servers to reply back.

4.4.4.1 Setup

Simple Network Management Protocol

SNMP Response Enabled – If this option is checked the iServer will respond to network nodes broadcasting SNMP requests. The default is *unchecked*.

Make sure your network is setup properly (gateway, etc) before using SNMP feature

SNMP Community – Every SNMP communication takes place using a community string. The default is *Public*.

Contact – This text field specifies the contact person for this node, together with information on how to contact this person. This field takes up to 16 alphanumeric characters.

Location – This text field specifies the location of the iServer. For example it can be "control station", which is the place where the iServer is located. This field takes up to 16 alphanumeric characters.

SNMP Trap Server – This field contains the IP address of the SNMP trap server located somewhere on the network. The trap server listens for SNMP traps coming from the iServer when there is an alarm condition (refer to Alarms **Section 4.4.4.2** under the Management page).

4.4.4.1 Setup (continued)

Setup

Address http://192.168.1.200

Readings Chart Web Link Setup

Setup | Alarms

Overview
Network
Configuration
Management
Security
System
Diagnostics
Log Out

Simple Network Management Protocol

SNMP Response Enabled

SNMP Community public

Contact None

Location None

SNMP Trap Server 0.0.0.0

Simple Mail Transfer Protocol

SMTP Server 0.0.0.0

SMTP Server Port 25

From:

To:

Subject:

Reminder Interval 60 mins

Transmission Delay 1 mins

Save Changes Reset

Figure 4.18 Management Menu: Setup

Simple Mail Transfer Protocol

SMTP Server – This field specifies the IP Address of the SMTP server.

Note

- 1) You must have an email server (SMTP server) on your network in order to receive emails generated by the iServer.
- 2) iServer does not support SMTP server authentication.

SMTP Server Port – This specifies the TCP port used by the SMTP Server. The default is 25.

From – This field specifies the name of the person who sends the email. It can also be an email address.

To – This field specifies the email address of the recipient. This field can take up to 200 alphanumeric characters; limited to 4 addresses of 50 characters each. Each address should be separated by a comma, without spaces. **Ex: aaa@bbb.com,ccc@ddd.com**

Tip

You can create a “distribution group address” if you need to have more email addresses.

4.4.4.1 Setup (continued)

Subject – This field specifies the subject of the email. Emails for all the alarms will have this common subject line. Example of a subject can be “Alarm from iServer”.

Reminder Interval – This field sets a reminder interval for email and/or trap to be sent again. The allowed minimum value is 1 minute. If it’s set to 0 the iServer will not send a reminder email. The default is *60 minutes*.

Power Reset alarm is only sent once, regardless of reminder interval.

Transmission Delay – Once the iServer alarm condition is met, this is the amount of time the alarm condition is met before iServer sends any email or trap. If it’s set to 0, email and/or trap will be sent immediately. The default is *1 minute*.

4.4.4.1.1 Sending Text Messages to a Cell Phone

In the SMTP **To** field, you can use the following format to have the iServer send a text message to your cell phone. Since most cell phones are capable of receiving text messages you just need to find the correct email format for your cell phone provider.

T-Mobile	phone_number@tmomail.net
Virgin Mobile	phone_number@vmobl.com
AT&T	phone_number@txt.att.net
Sprint	phone_number@messaging.sprintpcs.com
Verizon	phone_number@vtext.com
Nextel	phone_number@messaging.nextel.com

“phone_number” is your 10 digit cell phone number.

4.4.4.2 Alarms

This includes events or conditions. Once a condition is met the iServer will send an email or/and an SNMP trap if either one or both are checked. Fields are described below.

Note Multiple alarm events can be checked and for each event an email and/or a trap will be sent.

Events	Email	SNMP Trap
Temperature <input type="button" value="Low"/> Low <input type="text" value="0.0"/> High <input type="text" value="0.0"/>	<input type="checkbox"/>	<input type="checkbox"/>
Humidity <input type="button" value="Low"/> Low <input type="text" value="0.0"/> High <input type="text" value="0.0"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dewpoint <input type="button" value="Low"/> Low <input type="text" value="0.0"/> High <input type="text" value="0.0"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Reset <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Probe Disconnected <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4.19 Management Menu: Alarms

Note There is text box next to each event. The text content will be the body of the email.

Temperature – The options are *Low*, *High*, and *Low or High*.

If *Low* is selected the Low field must be given a value (lower than that value is an alarm condition).

If *High* is selected the High field must be given a value (higher than that value is an alarm condition).

If *Low or High* is selected the Low and High fields must be given values (outside the band is an alarm condition).

Humidity – The same as Temperature defined above.

Dew Point – The same as Temperature defined above.

Power Reset – This refers to the iServer being powered off and back on (power reset). If the option is checked the iServer will automatically send one email or/and an SNMP trap after rebooting, regardless of reminder interval.

Probe Disconnected – If the probe attached to the iServer is disconnected that is considered as an alarm condition.

4.4.5 Security

This page provides security and access settings for the iServer. Fields are described below.

Security

Address http://192.168.1.200

Readings Chart Web Link Setup

Overview
Network
Configuration Management
Security
System
Diagnostics
Log Out

Login Password 12345678 [Change](#)

Admin Password 00000000 [Change](#)

Local Port Password [Change](#)

Telnet Console Access

Web Server Access

Secured Readings and Charts

IP Exclusivity

Enable

No	IP Address
1	0.0.0.0
2	0.0.0.0
3	0.0.0.0
4	0.0.0.0

Save Changes Reset

Figure 4.20 Security Menu

Login Password – To access Readings, Chart, and Web Link menus this password is required. The password length can be up to 16 alphanumeric case-sensitive characters. To change the password click on *Change*.

Empty box means no password is required. The default Login Password is 12345678.

Administrator Password – To access Setup menu this password is required. The password length can be up to 16 alphanumeric case-sensitive characters. To change the password click on *Change*.

Empty box means no password is required. The default Administrator Password is 00000000.



This password will also be prompted when Telnet connection to port 2002 is made. Port 2002 is the Telnet console port that allows users to configure some of the parameters that can be configured through the web server.

4.4.5 Security (continued)

Local Port Password – To access the iServer via TCP or UDP socket connection to port 2000, this password is required. The maximum length can be up to 16 alphanumeric case-sensitive characters.

Empty box means no password is required. The default is *none*.

Telnet Console Access – If it is unchecked, Telnet console connection to port 2002 will be blocked. The iServer must be rebooted for the change to take place.

The default is *checked*.

Web Server Access – If it is unchecked, the iServer's Web server will not be accessible. The iServer must be rebooted for the change to take place.

The default is *checked*.

Note When the Web Server Access is not enabled, the iServer needs to be configured using Telnet console.

If someone needs to access the Web Server again, use the Telnet console to enable it.

Secured Readings and Charts – If it is checked the Login password will be required to display Readings and Chart applets.

The default is *checked*.

IP Exclusivity – This table contains the IP addresses that are allowed to communicate with the iServer over TCP or UDP connection. This means if the table is empty connections from all IP nodes are allowed to the iServer.

If enabled, all packets from IP addresses not on this list are ignored and thrown away.

4.4.6 System

This menu provides various options to reboot, restore defaults, upgrade firmware and download/upload configuration for the iServer. Fields are described below.

4.4.6.1 Reboot

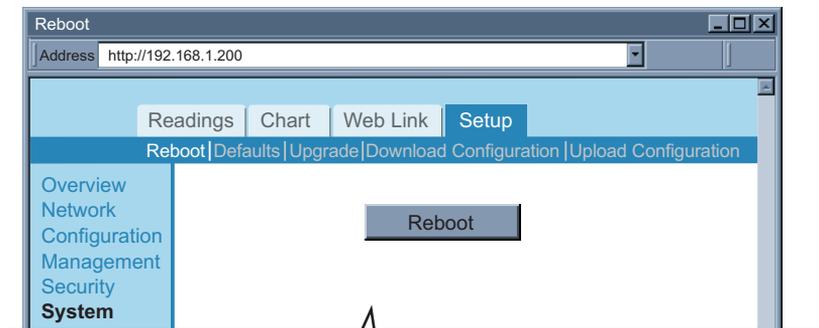


Figure 4.21 System: Reboot

Reboot – This option resets the power on the iServer.

It will set the real date/time back to default unless the Network Time Server option from Configuration page, is enabled.

4.4.6.2 Defaults

Clicking on this button will put the iServer back to its default settings.

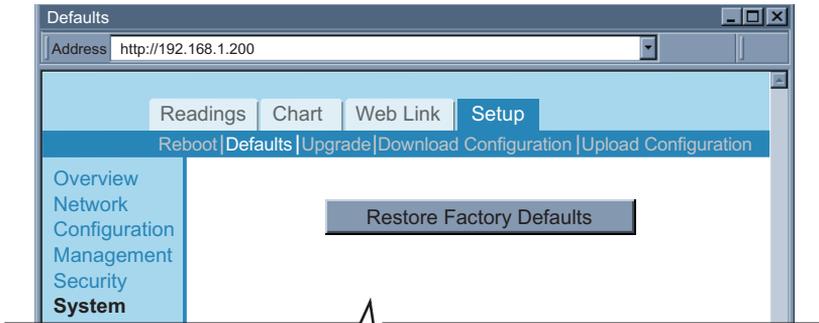


Figure 4.22 System: Defaults

4.4.6.3 Upgrade

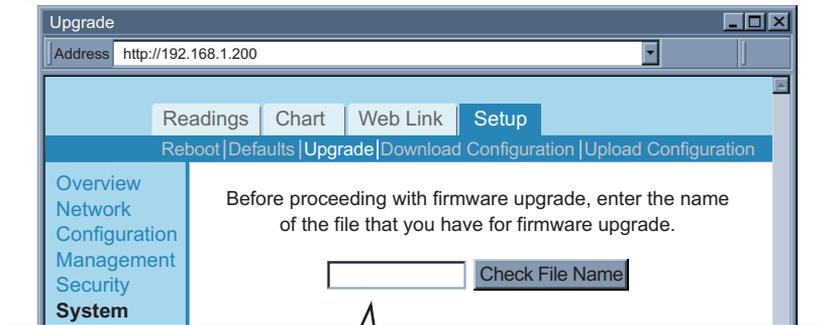


Figure 4.23 System: Upgrade

Upgrade – This option loads a new firmware into the iServer over the network. The firmware is a binary file with **.bin** extension.

Before proceeding with the firmware upgrade, enter the name of the file you plan to use, click on *Check File Name* button.

If OK, a new screen will appear and you can then browse to the actual upgrade firmware file “**iTHX_x.bin**” and click on the *Upload* button.

After the file has upgraded the iServer will automatically reboot and load the new firmware, you will be returned to the Welcome page.



After you have successfully upgraded your device, you can verify the firmware version number on the “Overview” page (see **Section 4.4.1**).

It's recommended to set the iServer to default settings after the firmware is upgraded.

See above **Section 4.4.6.2** on how to set the iServer to default settings.

Applying default settings will change the iServer's settings to factory defaults.

4.4.6.3 Upgrade (continued)

If those settings are important to you and you do not want to reconfigure the iServer, you will need to do the following steps.

From the “System” menu:

- 1) “Download Configuration” the iServer’s configuration settings, **Section 4.4.6.4.**
- 2) “Upgrade” the iServer with the new firmware, **Section 4.4.6.3.**
- 3) Set the iServer to “Default” settings. The iServer’s IP address is now 192.168.1.200.
- 4) “Upload Configuration” the same configuration you obtained from Step 1 onto the iServer, **Section 4.4.6.5.**

4.4.6.4 Download Configuration

Clicking on this button will download the configuration file that contains all the settings stored in the iServer and use it as a reference.

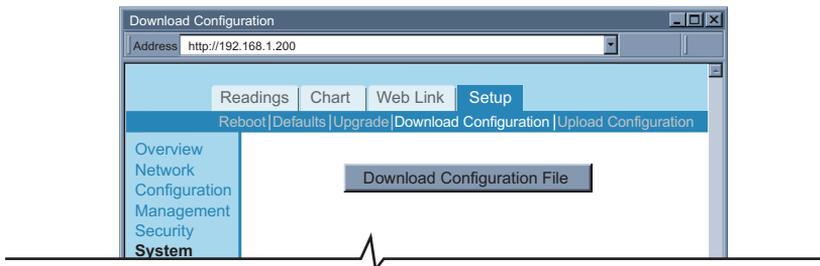


Figure 4.24 System: Download Configuration

4.4.6.5 Upload Configuration

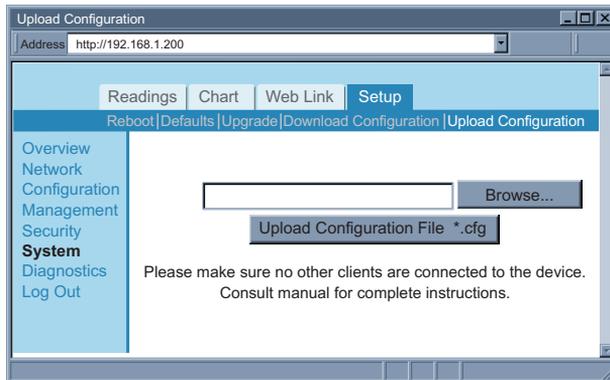


Figure 4.25 System: Upload Configuration

Upload Configuration – Using this option to upload the configuration file into the iServer. It is recommended to *download* and store a working copy of this configuration file in case the device is configured improperly.



You can set the iServer to its *default* settings and *upload* the configuration file back into the iServer.

4.4.7 Diagnostics

This page provides the number of Ethernet packets received or transmitted. Pressing the Reset Counter button will set the counts to zero.

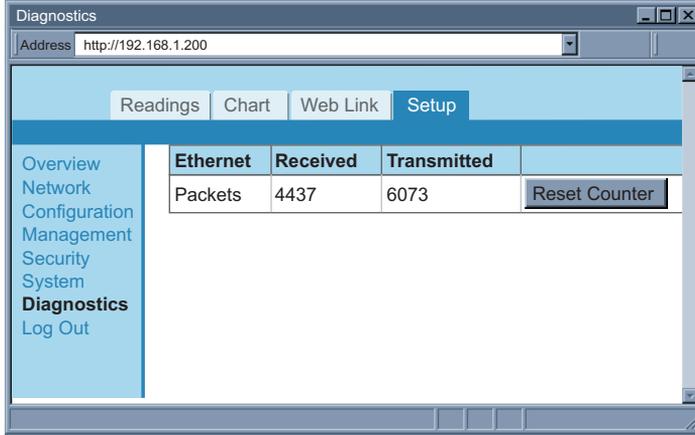


Figure 4.26 Diagnostics

4.4.8 Log Out

Once you click on Log Out, you will be logged out, and taken back to the Welcome page.

4.5 Readings

This page displays temperature, humidity, and dew point.

It can be displayed either as an HTML page or a Java applet.

4.5.1 HTML

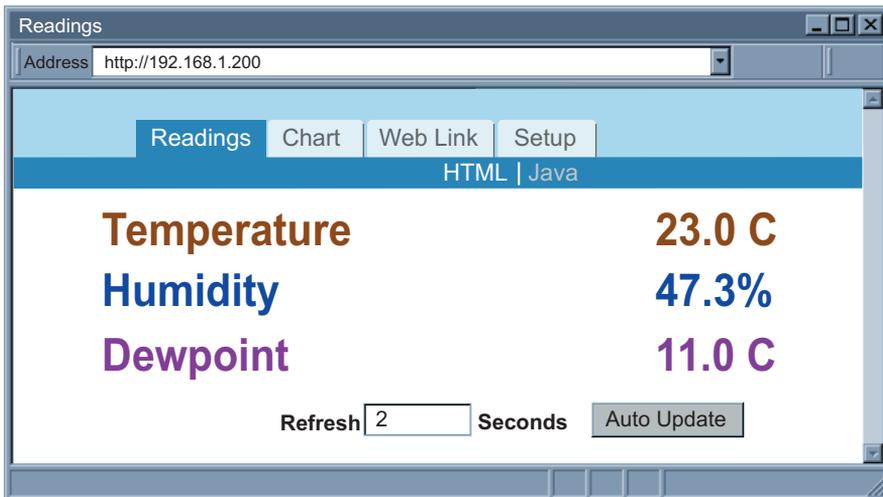


Figure 4.27 Readings: HTML

Refresh – Adding a time value in seconds will automatically update the HTML page with fresh readings.

4.5.2 Java

If Java option is chosen installation of Java Runtime is required (refer to **Appendix G**).

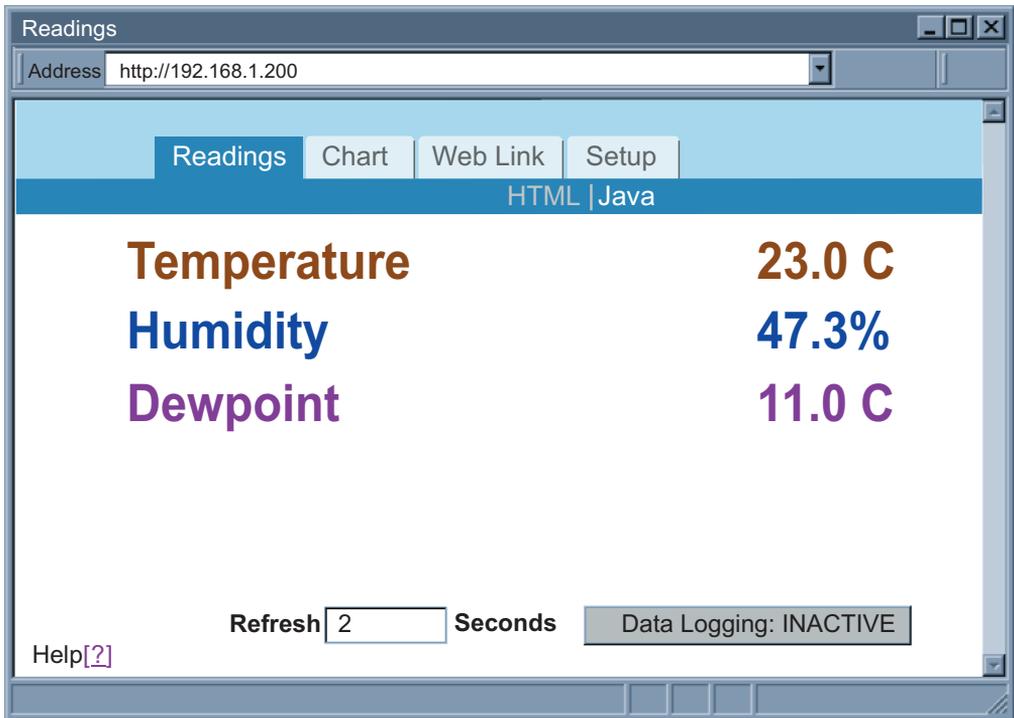


Figure 4.28 Readings: Java

Data Logging – This option will require the Java Policy file to be setup.

Press on **Help[?]** for details.

An alternate way to set up the Java Policy can be found in **Appendix G**.

Once the Java Policy file is completed, click on *Data Logging* button to log the data displayed on this page into a file. The file is in comma separated values (.csv) format, which can be opened in Excel or as ASCII. The fields are separated by a comma (,).

When the button is *ACTIVE* it means that the data is currently being logged into a file. The value in seconds in the Refresh box determines how often the data is being logged. The default is 2 seconds.



If a blank screen appears without any “java application running” or image of a “Java logo”, please verify you have the latest Java Runtime Environment installed and configured according to the instructions (refer to **Appendix G**). If you do not have Java Runtime Environment installed, you may download it from our website (in the software section) or contact the Customer Service Department nearest you.

“Java and the Java Coffee Cup Logo are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.”

4.6 Chart

This page charts the temperature, humidity, and dew point in real-time across the full span (-40 to 124°C, and 0 to 100% RH) or within any narrow range (such as 20 to 30°C).

The time-base can display one minute, one hour, one day, one week, one month or one year.

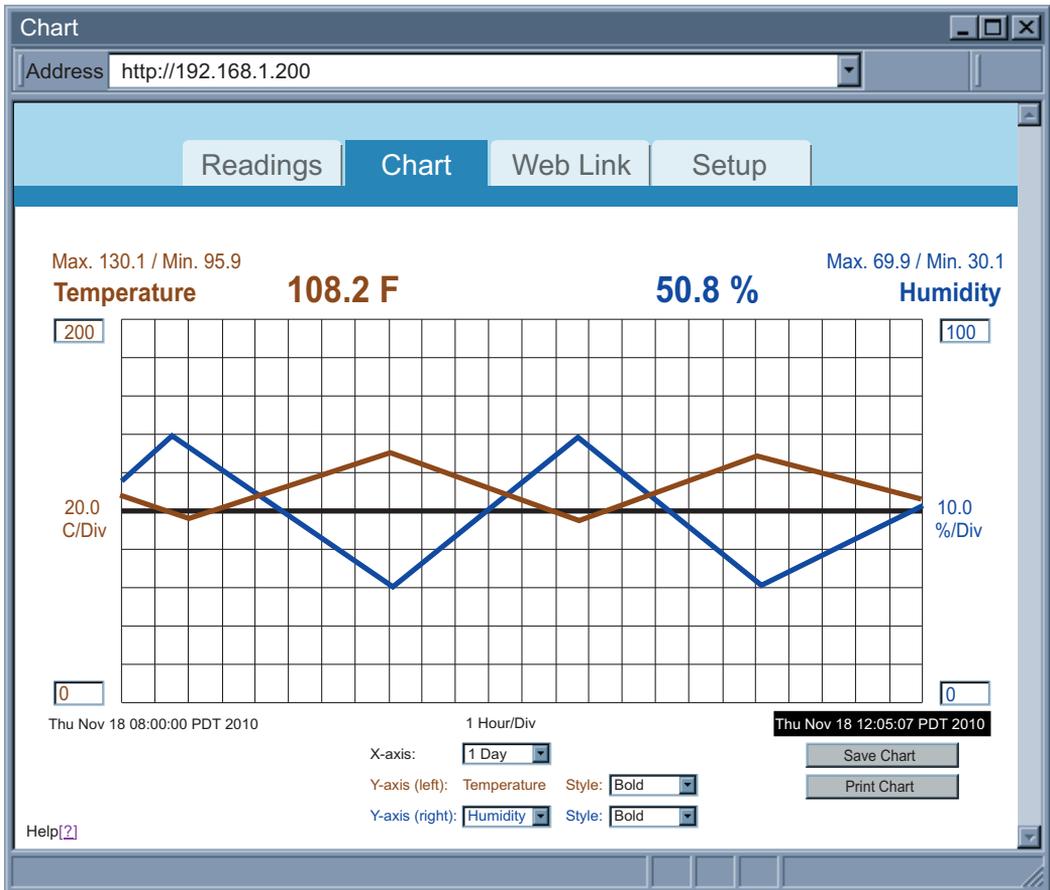


Figure 4.29 Adjustable Chart



If a blank screen appears without any “java application running” or image of a “Java logo”, please verify you have the latest Java Runtime Environment installed and configured according to the instructions (refer to **Appendix G**).

If you do not have Java Runtime Environment, you may download it from our website (in the software section) or contact the Customer Service Department nearest you.

4.6 Chart (continued)

Max. / Min. – This shows the maximum and minimum values for Temperature and Humidity (or Dewpoint) indicated on the Y-axis.

X-axis – This indicates the time, options includes *one minute, one hour, one day, one week, one month or one year*.

Y-axis – The left Y-axis is dedicated to temperature. Either *humidity* or *dewpoint* can be selected for the right Y-axis.

Style – This option will *hide* or *chart (normal)* the graph of the variables (temperature, humidity and dew point). The *bold* option will thicken the displayed graphs.

Save Chart – Save the current graph in PNG (Portable Network Graphics) format. The filename has extension **.png**. This option will require the Java Policy file to be setup.

Press on **Help[?]** for details. An alternate way to set up the Java Policy can be found in **Appendix G**.

Print Chart – The displayed chart will be printed once the button is clicked.

4.7 Web Link

This page is configured from the Network menu under IP configuration.

Refer to **Section 4.4.2.1**.

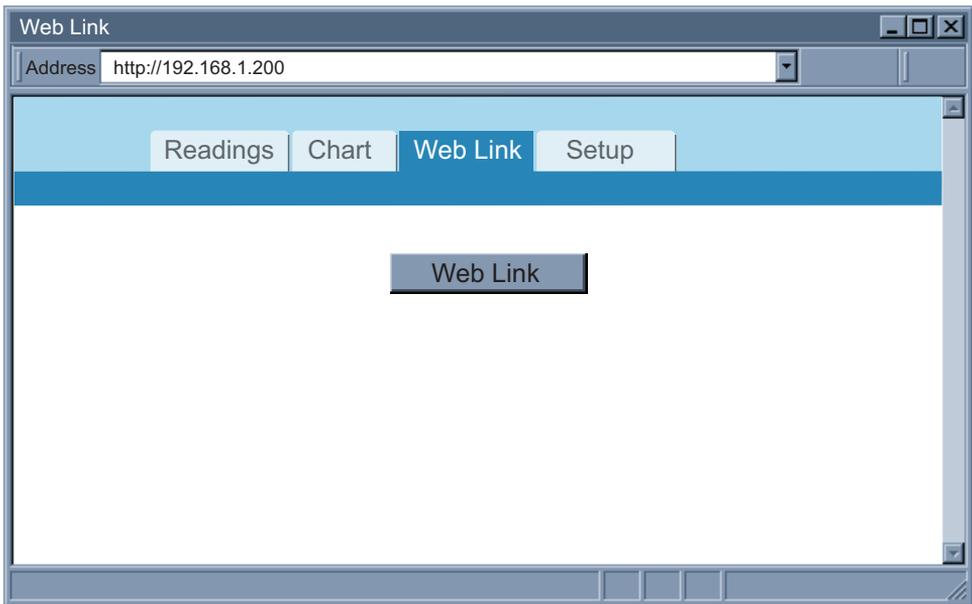


Figure 4.30 Web Link

4.8 Telnet Setup

With a telnet program, you can connect to the iServer using its IP address and TCP Port 2000. In *Continuous* mode (refer to Configuration:Sensors page **Section 4.4.3.2**), the telnet session will receive continuous data (temperature and humidity) from the iServer. In *Command* mode, a command can be sent to query the iServer.

Refer to **Section 4.9.1** for list of commands.

4.8.1 Telnet Connection

Telnet stands for Telecommunications Network, it is a protocol that provides a way for users to connect to a node with a valid IP address anywhere on an Ethernet network or the Internet . You can open a Telnet session using a terminal emulation programs like Tera Term (downloadable from the internet), which is a free software for Windows.

You can initiate a telnet connection by typing the IP address of the iServer, and Port 2002 for logging into the iServer's telnet consol port (see **Figure 4.31**). By telneting to Port 2000, you will be able to access temperature, humidity, and dew point readings.

Note The default password for Telnet Login is **00000000** and can be changed if desired.

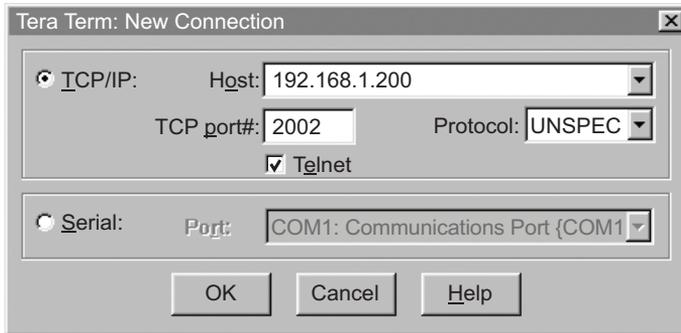


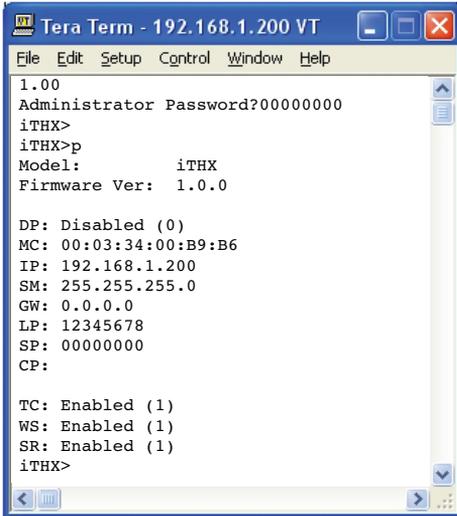
Figure 4.31 Tera Term Telnet Connection Screen

Once the connection is established you will be prompted for an Administrator Password (default is 00000000). Telnet console port (2002) allows users to configure some parameters within the iServer. **Figure 4.33** shows the parameters that can be changed.

After connecting to the iServer, you can use the following commands to read, modify, and get help.

- p** displays the current settings (**Figure 4.32**)
- ?** displays all the available options as well as an example on how to enter a command (**Figure 4.33**)
- s** set a new configuration (see the example in **Figure 4.33**), sending the command **c** is required to permanently store the new settings
- RESET** restart the iServer
- FACTORY** set the iServer to it's factory default, the RESET command is required after the FACTORY command
- c** permanently store the new settings
- q** quit the telnet session

4.8.1 Telnet Connection (continued)



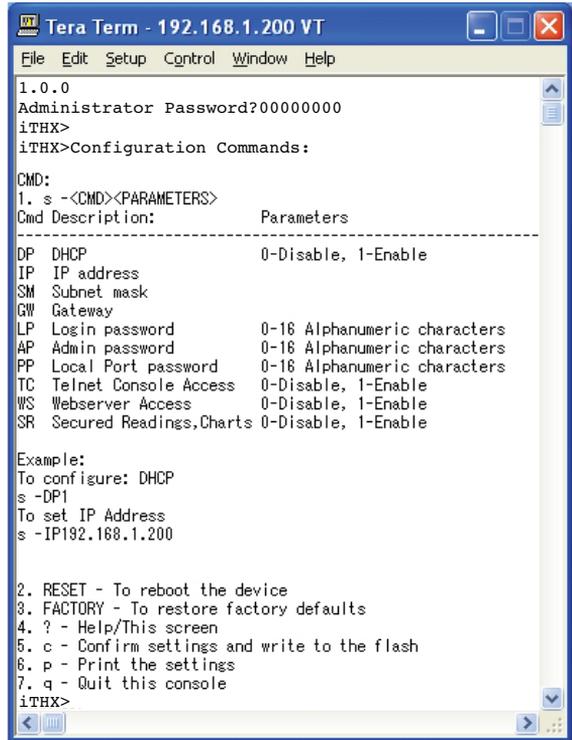
```
Tera Term - 192.168.1.200 VT
File Edit Setup Control Window Help
1.0.0
Administrator Password?00000000
iTHX>
iTHX>p
Model:          iTHX
Firmware Ver:  1.0.0

DP: Disabled (0)
MC: 00:03:34:00:B9:B6
IP: 192.168.1.200
SM: 255.255.255.0
GW: 0.0.0.0
LP: 12345678
SP: 00000000
CP:

TC: Enabled (1)
WS: Enabled (1)
SR: Enabled (1)
iTHX>
```

Figure 4.32

Telnet to port 2002 – p command



```
Tera Term - 192.168.1.200 VT
File Edit Setup Control Window Help
1.0.0
Administrator Password?00000000
iTHX>
iTHX>Configuration Commands:

CMD:
1. s -<CMD><PARAMETERS>
Cmd Description:          Parameters
-----
DP DHCP                    0-Disable, 1-Enable
IP IP address
SM Subnet mask
GW Gateway
LP Login password         0-16 Alphanumeric characters
AP Admin password         0-16 Alphanumeric characters
PP Local Port password    0-16 Alphanumeric characters
TC Telnet Console Access  0-Disable, 1-Enable
WS Webserver Access       0-Disable, 1-Enable
SR Secured Readings,Charts 0-Disable, 1-Enable

Example:
To configure: DHCP
s -DP1
To set IP Address
s -IP192.168.1.200

2. RESET - To reboot the device
3. FACTORY - To restore factory defaults
4. ? - Help/This screen
5. c - Confirm settings and write to the flash
6. p - Print the settings
7. q - Quit this console
iTHX>
```

Figure 4.33

Telnet to port 2002 – ? command

4.9 HTTPget Program

The HTTPget software is used to send a single HTTP or TCP request to an iServer product. In contrast, the telnet or Hyperterminal programs allow a continuous connection with multiple requests to be sent to the iServer product.

Generally HTTPget is used for simply programming an IP address to the iServer or for quickly obtaining a reading of from a device.

The iServer product must be configured from the configuration web page so that the "Server Type" value is set to "Command", refer to **Section 4.4.3.2**.

4.9.1 HTTPget using Port 2000

You can setup and read the information from the iServer by using the HTTPget program. The following program can be used to read data from the iServer by using TCP port **2000**. The command string is sent to this TCP port, then the response can be read back from the same socket.

The HTTPget.exe file is used to setup and read information from the iServer. This file can be downloaded from the website listed on the cover of this manual (software section).

4.9.1 HTTPget using Port 2000 (continued)

Notes on using **HTTPget** :

The HTTPget.exe program should be installed to the windows directory (usually c:\winnt or c:\windows)

1. Open up a command window (or have a DOS window)
 - a) Click on start menu
 - b) Click on "Run"
 - c) In the dialog box that appears, type "cmd" or "command" and click on "OK" button.
 - d) A command window should now appear.
2. If you now type "httpget" and press the "enter" key, the program options should be displayed.
3. Next run HTTPget with the options displayed below

httpget -r -S "*"SRTC\r" 192.168.1.200:2000

where:

-r -S are parameters needed for the command string

***SRTC** is the command as the following:

*SRTC	Read the temperature in C, celcius
*SRTF	Read the temperature in F, fahrenheit
*SRH	Read humidity
*SRD	Read the dew point in C
*SRDF	Read the dew point in F
*SRB	Read the temperature in C and humidity
*SRBF	Read the temperature in F and humidity
*SRYRST	Reset Power on

\r is the carriage return termination character

192.168.1.200 is an IP address

2000 is a socket port number

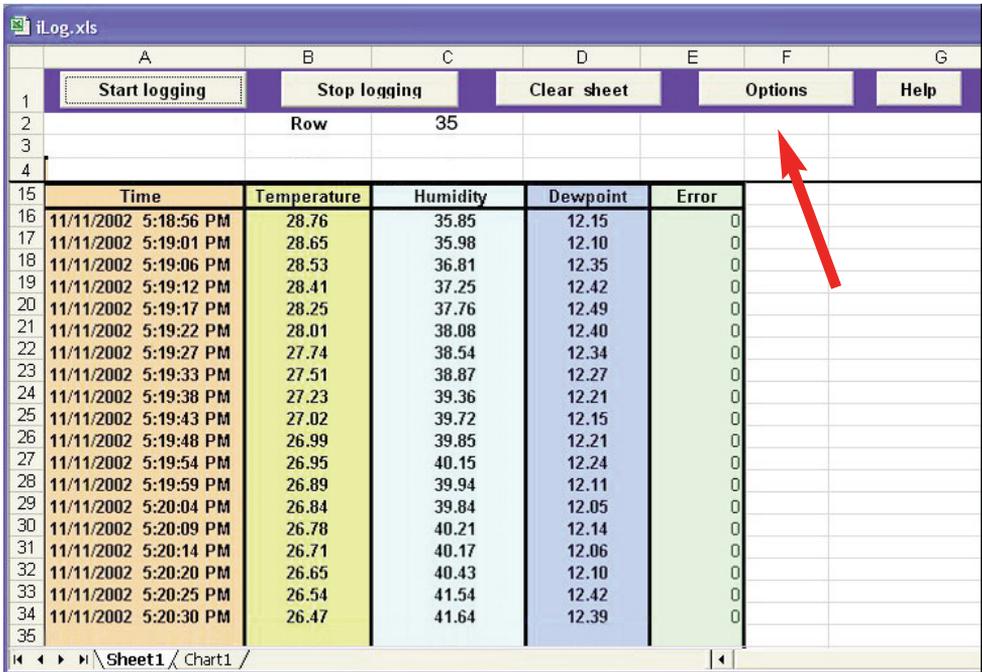
Response:

076.6 (in Deg.F format)

4.10 iLog Software

This is an Excel application software that can log temperature, humidity and dewpoint from the iServer over the local network (Ethernet) or the internet.

- a) Download the iLog software from the website listed in this manual.
- b) Install iLog software on a networked PC. This software is compatible with Windows 95, 98, NT, 2000, XP, Windows Vista and Windows 7 (32 and 64-bit).
- c) If you have Excel 2007 or higher, when installing iLog choose “Custom” installation option and on the next window check the box for “Excel 2007 Apps” and continue the installation to the end.
- d) For complete information of how to use the iLog software, click on the HELP button.
- e) There is a list of Error Messages in **Appendix E**.



	A	B	C	D	E	F	G
1	Start logging	Stop logging	Clear sheet		Options	Help	
2		Row	35				
3							
4							
15	Time	Temperature	Humidity	Dewpoint	Error		
16	11/11/2002 5:18:56 PM	28.76	35.85	12.15	0		
17	11/11/2002 5:19:01 PM	28.65	35.98	12.10	0		
18	11/11/2002 5:19:06 PM	28.53	36.81	12.35	0		
19	11/11/2002 5:19:12 PM	28.41	37.25	12.42	0		
20	11/11/2002 5:19:17 PM	28.25	37.76	12.49	0		
21	11/11/2002 5:19:22 PM	28.01	38.08	12.40	0		
22	11/11/2002 5:19:27 PM	27.74	38.54	12.34	0		
23	11/11/2002 5:19:33 PM	27.51	38.87	12.27	0		
24	11/11/2002 5:19:38 PM	27.23	39.36	12.21	0		
25	11/11/2002 5:19:43 PM	27.02	39.72	12.15	0		
26	11/11/2002 5:19:48 PM	26.99	39.85	12.21	0		
27	11/11/2002 5:19:54 PM	26.95	40.15	12.24	0		
28	11/11/2002 5:19:59 PM	26.89	39.94	12.11	0		
29	11/11/2002 5:20:04 PM	26.84	39.84	12.05	0		
30	11/11/2002 5:20:09 PM	26.78	40.21	12.14	0		
31	11/11/2002 5:20:14 PM	26.71	40.17	12.06	0		
32	11/11/2002 5:20:20 PM	26.65	40.43	12.10	0		
33	11/11/2002 5:20:25 PM	26.54	41.54	12.42	0		
34	11/11/2002 5:20:30 PM	26.47	41.64	12.39	0		
35							

Figure 4.34 iLog Software Logging Data



The Options button will let you select the product model. Choose **iTHX-M** from the Model Selection pull-down menu (from General tab).

4.10 iLog Software (continued)

Table 4.1 iLog Excel Applications

The iLog application actually consists of several Excel files, though most supported devices can be accessed by the main iLog program. The main program is listed as "iLog", plus a version number, under the Start Menu program links (those links available by clicking the Start button on the Windows taskbar).

In the following table, the iLog File column shows how many sensors are logged by the main iLog file. If more than 3 sensors are available, then the Alternate column shows how many sensors the device can support. Devices with more than 3 sensors will have their own Excel file. For these files, click on the model device found in the Start Menu.

Networked Product	iLog File	Alternate
iTHX-W3, iTHX-D3, iTHX-W, -2	3 column	
iTHX-M, iTHX-SD	3 column	
iTHX-W, -2 (dual probe)	1st probe / 3 column	6 column
iSE-TC, iSD-TC	3 column	5 column
iSE-TH, iSD-TH	3 column	5 column
iBTHX-W, iBTHX-D	3 column	4 column
iBTX-W-D, iBTX-M, iBTX-SD	2 column	
iPTX-W	2 column	
iTCX	3 column	
iTH Controller	3 column	
iVI	3 column	4 column
iSeries	1 column	
iDRX/iDRN	1 column	
INF-B	1 column	

Wireless Devices

The "Auto" column shows number of columns per remote device that are possibly displayed.

The Full column shows number of columns allocated per device for the "Full" spreadsheet, which will be able to display all data for all active devices.

Networked Product	Auto	Full
zSeries Receiver and Remotes	1 to 4 column / device	4 column / 32 device
wiSeries with zED Remotes	1 to 2 column / device	2 column / 32 device
UWTC REC-3 and Remotes	1 or 2 column / device	2 column / 32 device
wiSeries with UWTC Remotes	1 to 2 column / device	2 column / 32 device

The active wireless devices, when shown in the Excel application, will be shown with the device number and the units returned.

PART 5 SPECIFICATIONS

SENSOR SPECIFICATIONS

Relative Humidity (RH)

Accuracy/Range at 25°C

- Non-Condensing:

±2.75% for 10 to 90%;
±3% for 5 to 10% and 90 to 95%
±4% for 0 to 5% and 95 to 100%

Refer to chart in **Appendix H**

Hysteresis:

±1% RH

Non-linearity:

±3%

Response Time:

8 seconds, tau 63% (time for reaching 63% of a step function, valid at 25C and 1m/s airflow)

Repeatability:

±0.1%

Resolution:

0.1%, 12bit

NOTE: Reconditioning of the probe may be necessary if the probe is stored for a period of time in a harsh environment (temperatures below 0°C or above 70°C or exposure to chemical vapors, condensation, etc). To recondition the probe refer to **Appendix H.4**

Temperature (T)

Accuracy/Range*:

Wand Probe:

±0.5°C for 5° to 45°C (±1°F for 41° to 113°F);
up to ±1°C for 0° to 5°C and 45° to 70°C
(up to ±2°F for 32° to 41°F and 113° to 158°F)

Refer to chart in **Appendix H**

Industrial Probe:

±0.5°C for 5° to 45°C (±1°F for 41 to 113°F);
up to ±1.5°C for -40° to 5°C and 45° to 124°C
(up to ±2.7°F for -40° to 41°F and 113° to 255°F)

Refer to chart in **Appendix H**

*Extended temperature range is for industrial probe only, the iServer's operating temp is 0 to 70°C (32 to 158°F) for iTHX-W3 with wand; -40 to 85°C (-40 to 185°F) for iTHX-D3, iTHX-W3-2 or iTHX-W3-5

Response Time:

5 to 30 seconds, tau 63% (response time depends on heat capacity of and thermal resistance to sensor substrate)

Repeatability:

±0.1°C

Resolution:

0.1°C, 14 bit

PROBE SPECIFICATIONS

Wand Probe:

198 mm long x 19 mm diameter (7.8" x 0.75")

Cable with DB9 connector: 152 mm long (6")

Cable operating temperature: 0 to 80°C (32 to 176°F)

Industrial Probe:

137mm *or* 51mm long x 16mm diameter (5" *or* 2" x 0.63")

Cable with DB9 connector: 3m *or* 0.9m long (10' *or* 3')

Cable operating temperature: -40 to 125°C (-40 to 257°F)

iSERVER SPECIFICATIONS

Interfaces

Ethernet (RJ45):	Fixed or auto-negotiating 10/100Base-T; Auto MDI/MDIX
Sensor:	Digital 4-wire (DB-9) iTHX-W3; Removable 4 position screw terminal: iTHX-D3
Supported Protocols:	TCP, UDP, SNMP, SMTP, SNTP, ARP, ICMP, DNS, DHCP, HTTP, and Telnet
LED Indicators:	100BASE-T, Network Link and Activity, DHCP, Recording
Management:	Device configuration and monitoring through embedded WEB server
Embedded WEB Server:	Serves WEB pages containing real-time data and live updated charts within definable time intervals.

POWER

Power Input:	5 Vdc @ 200 mA max: iTHX-W3 10 to 32 Vdc: iTHX-D3
Safety Qualified (included) ac power adapter:	Nominal Output: 5Vdc @ 600 mA Input: 100 to 240 Vac, 50/60Hz included: iTHX-W3
Switching Power Supply Consumption:	Sold separately for the iTHX-D3 2 W max for iTHX-W3; 2.5 W max for iTHX-D3

ENVIRONMENTAL

Operating Temperatures

iServer Unit:	0 to 70°C (32 to 158°F) for iTHX-W3 with wand; -40 to 85°C (-40 to 185°F) for iTHX-D3, iTHX-W3-2 or iTHX-W3-5
ac Power Adapter:	0 to 40°C (32 to 104°F)
Wand Cable:	0 to 80°C (32 to 176°F)
Industrial Cable:	-40 to 125°C (-40 to 257°F)
Storage Temperature:	-40 to 85°C (-40 to 185°F)
Material:	Valox 364 PBT case with wall mount bracket: iTHX-W3; Polycarbonate case with DIN Rail mount: iTHX-D3
Weight (with probe):	0.31 kg (0.68 lbs) iTHX-W3; 0.31 kg (0.68 lbs) iTHX-D3

GENERAL

Agency Approvals:	FCC-B, CE
Software:	Compatible with Windows operating systems Firmware upgrade from Ethernet

OPC Server

iConnect: Configuration software for the Ethernet interface
iLog: Macro for automatic data logging in MS Excel

User of this manual should be familiar with following definitions:

ARP (Address Resolution Protocol) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address that is recognized in the local network. For example, the IP address in use today is an address that is 32-bits long. In an Ethernet local area network, however, addresses for attached devices are 48-bits long. (The physical machine address is also known as a Media Access Control or MAC address.) A table, usually called the ARP cache, is used to maintain a correlation between each MAC address and its corresponding IP address. ARP provides the protocol rules for making this correlation and providing address conversion in both directions.

Ethernet is a network protocol defined by the IEEE 802.3 standard. Ethernet-based networks use MAC Address rather than IP Address to exchange data between computers. By using ARP and adding TCP/IP support, Ethernet devices may be connected as part of the Internet. An Ethernet LAN typically uses coaxial cable or special grades of twisted pair wires. The most commonly installed Ethernet systems are called 10BASE-T and provide transmission speeds up to 10 Mbps. Devices are connected to the cable and compete for access using a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) protocol.

IP (Internet Protocol) is the method or protocol by which data is sent from one computer to another on the Internet.

IP address (Internet Protocol address) is a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Internet.

IP Netmask is a 32-bit pattern of bits used to determine which part of the IP address is the network portion and which part is the host portion.

MAC (Media Access Control) Address is your computer's unique hardware number. When you're connected to the Internet from your computer, a correspondence table relates your IP address to your computer's physical (MAC) address on the LAN.

Ping is a utility that tests the network connectivity. It is used to determine if the host is capable of exchanging information with another host.

Port number/Socket number is a way to identify a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. It is a predefined address that serves as a route from the application to the Transport layer or from the Transport layer to the application of the TCP/IP system.

Sockets are a method for communication between a client program and a server program in a network and defined as "the endpoint in a connection." Information transferred across the Internet primarily occurs between sockets.

TCP/IP (Transmission Control Protocol/Internet Protocol) is the basic communication language or protocol of the Internet. When you are set up with direct access to the Internet, your computer is provided with a copy of the TCP/IP program just as every other computer that you may send messages to or get information from also has a copy of TCP/IP. TCP/IP often is used as a general term to indicate generic access to the Internet.

UDP/IP (User Datagram Protocol/Internet Protocol) is the TCP/IP standard protocol that allows an application program on one machine to send a datagram to an application program on another. The UDP can be either in Broadcast or Directed form. The Broadcast UDP transmits data to every node on the same network. The Directed UDP transmits data to one node only.

Appendix B

IP Address

An IP address is a unique 32-bit address assigned to a computer and includes:

- A network ID number identifying a network.
- A host ID number identifying a computer on the network.

All IP addresses have been divided into three smaller groups (classes) A, B and C

- **Class A** addresses have 8-bits of network ID and 24-bits of host ID. They can support a large number of hosts, approximately $2^{24} = 16,777,216$ computers per network.

The IP addresses range in binary from 00000001.xxxxxxxx.xxxxxxxx.xxxxxxxx
to 01111111.xxxxxxxx.xxxxxxxx.xxxxxxxx

The IP addresses range in decimal from 1.x.x.x to 127.x.x.x

Class A network ID's support a very large number of hosts.

- **Class B** addresses have 16-bits of network ID and 16-bits of host ID. They can support approximately $2^{16} = 65,536$ computers per network.

The IP addresses range in binary from 10000000 00000000.xxxxxxxx.xxxxxxxx
to 10111111 11111111.xxxxxxxx.xxxxxxxx

The IP addresses range in decimal from 128.0.x.x TO 191.255.xxx.xxx

Class B network ID's support a medium number of hosts.

- **Class C** addresses have 24-bits of network ID and 8-bits of host ID. They can support approximately $2^8 = 256$ computers per network.

The IP addresses range in binary from 11000000.00000000.00000000.xxxxxxxx
to 11011111.11111111.11111111.xxxxxxxx

The IP addresses range in decimal from 192.0.0.xxx to 223.255.255.xxx

Class C network ID's support a small number of hosts.



The rest of the addresses are divided into two classes, D and E.

Class D networks are not assigned to the host. They are used for multicasting.
The address range from 224.x.x.x to 239.x.x.x

Class E networks are experimental or reserved addresses.
The address range from 240.x.x.x to 247.x.x.x

Appendix C

ARP Commands

ARP is the Internet layer protocol responsible for matching or obtaining the MAC (hardware) address that corresponds to a particular IP address. The ARP command allows the user to view the current contents of the ARP cache of the local computer (residing on the same network). Microsoft includes the ARP.EXE utility for viewing and modifying the ARP cache with its Windows products. The following ARP commands can be used to view cache entries:

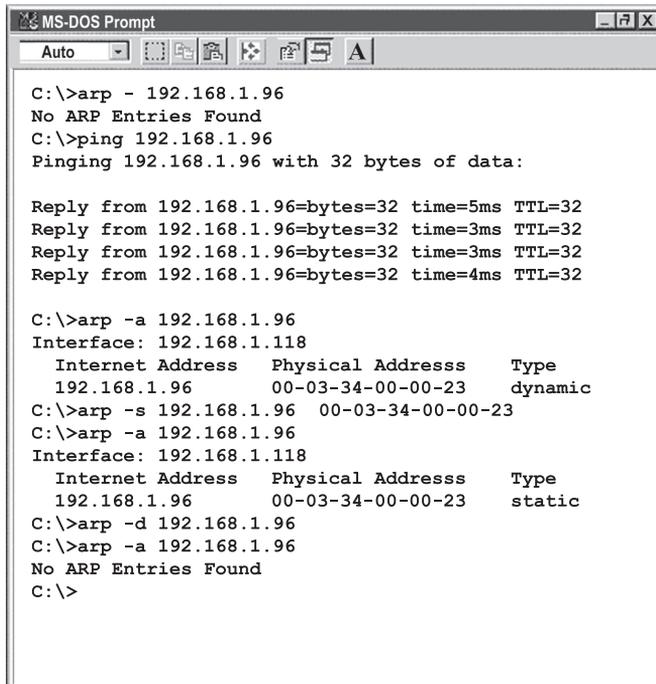
- **arp -a** → Use this command to view all ARP cache entries.
- **arp -a** plus **IP address** → Use this command to view ARP cache entries associated with one particular interface on a network with multiple adapters.
- **arp -g** → Same as arp -a.
- **arp -N** → Use this command to display ARP entries for specific network interface.
- **arp -s** plus **IP address** plus **Physical address** → Use this command to manually add a permanent static entry to the ARP cache.
- **arp -d** → Use this command to manually delete a static entry.

Note

Ping the destination computer using IP address first before using the arp -a command.

The following window shows [examples](#) of arp commands and responses.

- Your computer has an IP address of **192.168.1.118**
- The destination computer has an IP address of **192.168.1.96**



```
MS-DOS Prompt
Auto
C:\>arp - 192.168.1.96
No ARP Entries Found
C:\>ping 192.168.1.96
Pinging 192.168.1.96 with 32 bytes of data:

Reply from 192.168.1.96=bytes=32 time=5ms TTL=32
Reply from 192.168.1.96=bytes=32 time=3ms TTL=32
Reply from 192.168.1.96=bytes=32 time=3ms TTL=32
Reply from 192.168.1.96=bytes=32 time=4ms TTL=32

C:\>arp -a 192.168.1.96
Interface: 192.168.1.118
Internet Address  Physical Address  Type
192.168.1.96      00-03-34-00-00-23  dynamic
C:\>arp -s 192.168.1.96 00-03-34-00-00-23
C:\>arp -a 192.168.1.96
Interface: 192.168.1.118
Internet Address  Physical Address  Type
192.168.1.96      00-03-34-00-00-23  static
C:\>arp -d 192.168.1.96
C:\>arp -a 192.168.1.96
No ARP Entries Found
C:\>
```

Figure C.1 ARP Commands and Responses

Appendix D

IP Netmask

IP Netmask or Subnet Mask is a 32-bit pattern of ones and zeros used to determine network portion of an IP address from the host portion of the IP address. Subnet mask is a network ID that is created by borrowing bits from host portion of IP address and using them as part of a network ID. The table below shows a default subnet mask for address Classes A, B, and C. Each bit that is set to "1" in the subnet mask corresponds to the bit in the IP address that is to be used as the network ID. Each bit that is set to "0" in the subnet mask corresponds to a bit in the IP address that is to be used as the host ID.

Address Class	Mask Binary Value	Mask Decimal Value or Dotted Notation
Class A	11111111 00000000 00000000 00000000	255.0.0.0
Class B	11111111 11111111 00000000 00000000	255.255.0.0
Class C	11111111 11111111 11111111 00000000	255.255.255.0

If your network requires more network ID's, you can extend the default subnet mask to include additional bits from the host ID. This allows for additional network ID's within the network. The table below shows some examples of subnet masks and bits moved from the hosts ID to create a new subnet.

Mask Dotted Notation	Mask Binary	Mask Bits
Class A		
255.0.0.0 (Default)	11111111 00000000 00000000 00000000	0
255.192.0.0	11111111 11000000 00000000 00000000	2
255.224.0.0	11111111 11100000 00000000 00000000	3
255.240.0.0	11111111 11110000 00000000 00000000	4
255.248.0.0	11111111 11111000 00000000 00000000	5
255.252.0.0	11111111 11111100 00000000 00000000	6
255.254.0.0	11111111 11111110 00000000 00000000	7
255.255.0.0	11111111 11111111 00000000 00000000	8
255.255.128.0	11111111 11111111 10000000 00000000	9
255.255.192.0.0	11111111 11111111 11000000 00000000	10
.....
255.255.255.252	11111111 11111111 11111111 11111100	22
Class B		
255.255.0.0 (Default)	11111111 11111111 00000000 00000000	0
255.255.192.0	11111111 11111111 11000000 00000000	2
.....
255.255.255.252	11111111 11111111 11111111 11111100	14
Class C		
255.255.255.0 (Default)	11111111 11111111 11111111 00000000	0
255.255.255.192	11111111 11111111 11111111 11000000	2
.....
255.255.255.254	11111111 11111111 11111111 11111100	6

To determine the number of valid hosts ID's remaining after subnetting, use the following equation: $2^n - 2$, where n is the number of octet digits left after the subnet mask.

Appendix E

ASCII Chart

ASCII Char	Dec	Hex	Binary No Parity	ASCII Char	Dec	Hex	Binary No parity
NUL	00	00	00000000	@	64	40	01000000
SOH	01	01	00000001	A	65	41	01000000
STX	02	02	00000010	B	66	42	01000010
ETX	03	03	00000011	C	67	43	01000011
EOT	04	04	00000100	D	68	44	01000100
ENQ	05	05	00000101	E	69	45	01000101
ACK	06	06	00000110	F	70	46	01000110
BEL	07	07	00000111	G	71	47	01000111
BS	08	08	00001000	H	72	48	01001000
HT	09	09	00001001	I	73	49	01001001
LF	10	0A	00001010	J	74	4A	01001010
VT	11	0B	00001011	K	75	4B	01001011
FF	12	0C	00001100	L	76	4C	01001100
CR	13	0D	00001101	M	77	4D	01001101
SO	14	0E	00001110	N	78	4E	01001110
SI	15	0F	00001111	O	79	4F	01001111
DLE	16	10	00010000	P	80	50	01010000
DC1	17	11	00010001	Q	81	51	01010001
DC2	18	12	00010010	R	82	52	01010010
DC3	19	13	00010011	S	83	53	01010011
DC4	20	14	00010100	T	84	54	01010100
NAK	21	15	00010101	U	85	55	01010101
SYN	22	16	00010110	V	86	56	01010110
ETB	23	17	00010111	W	87	57	01010111
CAN	24	18	00011000	X	88	58	01011000
EM	25	19	00011001	Y	89	59	01011001
SUB	26	1A	00011010	Z	90	5A	01011010
ESC	27	1B	00011011	[	91	5B	01011011
FS	28	1C	00011100	\	92	5C	01011100
GS	29	1D	00011101	]	93	5D	01011101
RS	30	1E	00011110	^	94	5E	01011110
US	31	1F	00011111	_	95	5F	01011111
SP	32	20	00100000	`	96	60	01100000
!	33	21	00100001	a	97	61	01100001
"	34	22	00100010	b	98	62	01100010
#	35	23	00100011	c	99	63	01100011
\$	36	24	00100100	d	100	64	01100100
%	37	25	00100101	e	101	65	01100101
&	38	26	00100110	f	102	66	01100110
'	39	27	00100111	g	103	67	01100111
(	40	28	00101000	h	104	68	01101000
)	41	29	00101001	i	105	69	01101001
*	42	2A	00101010	j	106	6A	01101010
+	43	2B	00101011	k	107	6B	01101011
,	44	2C	00101100	l	108	6C	01101100
-	45	2D	00101101	m	109	6D	01101101
.	46	2E	00101110	n	110	6E	01101110

Appendix E**ASCII Chart Continuation**

/	47	2F	00101111	o	111	6F	01101111
0	48	30	00110000	p	112	70	01110000
1	49	31	00110001	q	113	71	01110001
2	50	32	00110010	r	114	72	01110010
3	51	33	00110011	s	115	73	01110011
4	52	34	00110100	t	116	74	01110100
5	53	35	00110101	u	117	75	01110101
6	54	36	00110110	v	118	76	01110110
7	55	37	00110111	w	119	77	01110111
8	56	38	00111000	x	120	78	01111000
9	57	39	00111001	y	121	79	01111001
:	58	3A	00111010	z	122	7A	01111010
;	59	3B	00111011	{	123	7B	01111011
<	60	3C	00111100	|	124	7C	01111100
=	61	3D	00111101	}	125	7D	01111101
>	62	3E	00111110	~	126	7E	01111110
?	63	3F	00111111	DEL	127	7F	01111111

ASCII Control Codes

ASCII Char	Dec	Hex	Ctrl Key Equiv.	Definition	ASCII Char	Dec	Hex	Ctrl Key Equiv.	Definition
NUL	00	00	Ctrl @	Null Character	DC1	17	11	Ctrl Q	Data Control 1 - XON
SOH	01	01	Ctrl A	Start of Header	DC2	18	12	Ctrl R	Data Control 2
STX	02	02	Ctrl B	Start of Text	DC3	19	13	Ctrl S	Data Control 3 - XOFF
ETX	03	03	Ctrl C	End of Text	DC4	20	14	Ctrl T	Data Control 4
EOT	04	04	Ctrl D	End of Transmission	NAK	21	15	Ctrl U	Negative Acknowledge
ENQ	05	05	Ctrl E	Inquiry	SYN	22	16	Ctrl V	Synchronous Idle
ACK	06	06	Ctrl F	Acknowledge	ETB	23	17	Ctrl W	End of Trans Block
BEL	07	07	Ctrl G	Bell	CAN	24	18	Ctrl X	Cancel
BS	08	08	Ctrl H	Back Space	EM	25	19	Ctrl Y	End of Medium
HT	09	09	Ctrl I	Horizontal Tabulation	SUB	26	1A	Ctrl Z	Substitute
LF	10	0A	Ctrl J	Line Feed	ESC	27	1B	Ctrl [	Escape
VT	11	0B	Ctrl K	Vertical Tabulation	FS	28	1C	Ctrl \	File Separator
FF	12	0C	Ctrl L	Form Feed	GS	29	1D	Ctrl]	Group Separator
CR	13	0D	Ctrl M	Carriage Return	RS	30	1E	Ctrl |	Record Separator
SO	14	0E	Ctrl N	Shift Out	US	31	1F	Ctrl _	Unit Separator
SI	15	0F	Ctrl O	Shift In	SP	32	20		Space
DLE	16	10	Ctrl P	Data Link Escape					

Appendix F

iLog Error Messages

Table F-1 iLog Error Messages

Error #	Description	Note
-8003	User stopped logging readings.	
-10005	Failed to find the iServer.	Ethernet cable is disconnected, iServer is powered off, connections across the firewall require longer "connection to socket time out" setting.
-10006	Windows socket was closed.	
-10007	Windows socket error.	Wrong IP or wrong Port number was used.
-10008	The iServer failed to respond to a request.	Wrong IP or wrong Port number was used.
-10011	Response came empty.	No data was sent.
-10012	Device responded with "Serial Time Out" string.	Possibly the iLog is configured for wrong product model.
-10014	Terminal Server Mode when the Port is 1000.	Try Port 2000 in iLog configuration.
-15100	Error on obtaining the temperature reading.	Possibly the iLog is configured for wrong product model.
-15105	Error on obtaining the humidity reading.	Possibly the iLog is configured for wrong product model.
-15110	Error on obtaining the dew point reading.	Possibly the iLog is configured for wrong product model.

Appendix G

Java Runtime Environment Setup

G.1 Java Runtime Environment Setup

If your computer does not have Java installed, please download from java.sun.com. You can change the Java setting by clicking its icon in Control Panel. To load the applet, you have to enable the web browser and disable cache.

G.1.1 Java Runtime Environment 1.7 Setup instructions

1. Go to your computer's Control Panel. Open the Java Plug-in.

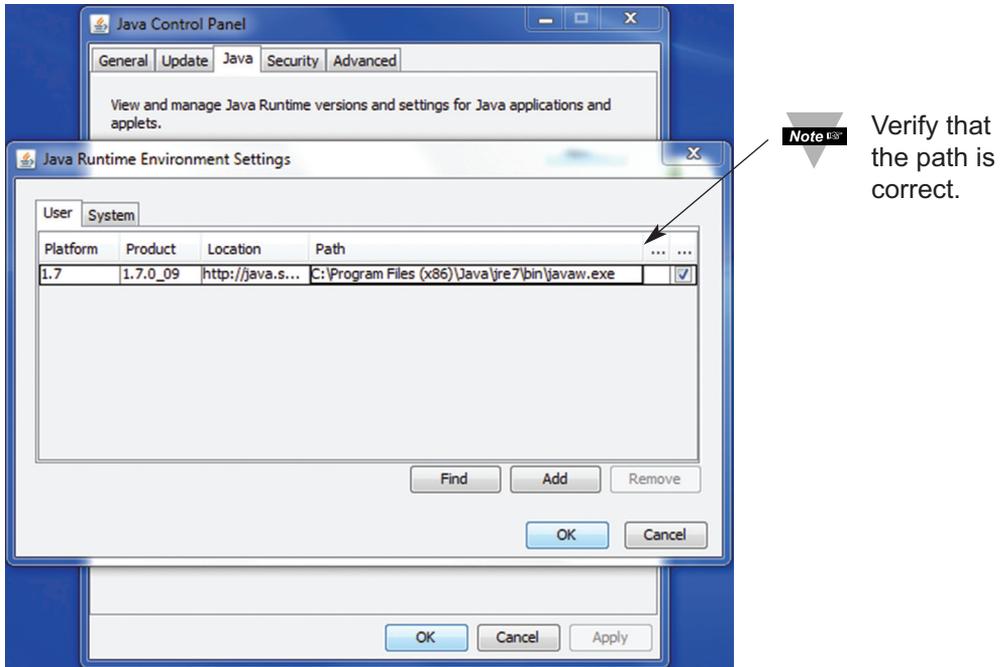


Figure G.1 Java 1.7 Screen Shot



The "Data Logging" button on the "Readings" page, "Save Chart" button on the "Chart" page, and the "Retrieve" button on the "Recording Data Retrieval" page will not be active if the instructions explained in the above are not followed.

G.2 Browser Proxy Selection

Accessing iServer within your internal network

- Usually when the computer and iServers are on an internal network, you will not use Proxy server access.
- You should un-check the "Use Browser Settings" option on the "Proxy" tab.

Accessing iServers units using the internet

- Often the web browser will use Proxy server access to the internet. In such cases, the default Java runtime settings on the "Proxy" tab should suffice. The default setting is the "Use Browser Settings" option.
- If the default proxy setting doesn't work, then you may have a situation where the proxy settings of the web browser are incorrect.

Diagnostics:

If the web page of the iServer appears, then the HTTP Proxy is working fine.

If the data isn't updated on the iServer upon selecting the "Readings" or "Chart" web page, there may be a problem with access through a winsock proxy server. In such cases your network administrator will need to provide the winsock proxy server and port #s. .

These values should be entered into the Socks line on the "Proxy" tab (of the Java Plugin control panel) or into the "connections" tab on the View,Internet Options dialog and make sure that the Proxy tab shows that the "Use Browser Settings" option is not selected (i.e. when you specify proxy connections in the Java Plugin control panel).

Accessing iServer units over Peer-to-Peer network

A simple peer-to-peer network is setup by disconnecting from the main network (as users will often do when trying to do initial setup of the iServer) and then connecting the iServer to another computer using an ethernet hub, an ethernet switch, or a Cross-over cable connection.

Often when using a peer-to-peer network, the Java plugin and the web browser (such as Internet Explorer) have internet connections configured to connect through proxy servers. In such case, you will need to simply assign the final IP address on this peer to peer network and then view the iServer charts after connecting the iServer into the regular network. Otherwise you can disable the Java plug-in's "Use Browser Settings" temporarily and then reconfigure the Java plug-in settings for regular network access after testing the iServer chart access on your peer-to-peer network.

The "Use Browser Settings" should not be selected. And the HTTP and Socks proxy entries should be blank. Also, setup the internet browser so that proxy servers are disabled.

Appendix H

Sensor Information

H.1 Accuracy

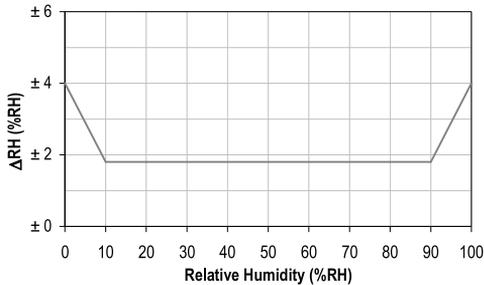


Figure H.1
RH Accuracy Chart

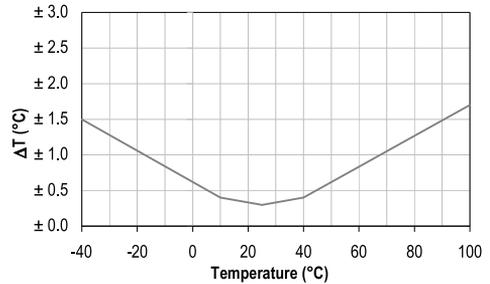


Figure H.2
Temperature Accuracy Chart

Accuracies are tested at Manufacturer's Outgoing Quality Control at 25°C (77°F) and 3.3V. Values exclude hysteresis and non-linearity, and is only applicable to noncondensing environments.

H.2 Operating Conditions

Sensor works stable within recommended normal range – see Figure. Long term exposures to conditions outside normal range, especially at humidity >80%RH, may temporarily offset the RH signal (+3 %RH after 60h). After return to normal range it will slowly return towards calibration state by itself. See **Section H.4**

“Reconditioning Procedure” to accelerate eliminating the offset. Prolonged exposure to extreme conditions may accelerate ageing.

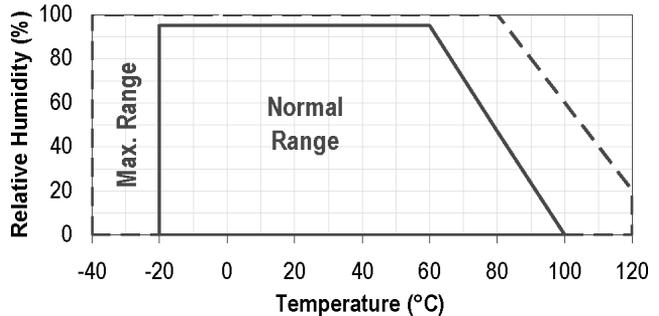


Figure H.3 Normal Range

H.3 Storage Conditions and Handling Instructions

It is of great importance to understand that a humidity sensor is not a normal electronic component and needs to be handled with care.

Chemical vapors at high concentration in combination with long exposure times may offset the sensor reading. For these reasons it is recommended to store the sensors in original packaging including the sealed ESD bag at following conditions: Temperature shall be in the range of 10°C – 50°C (0 – 80°C for limited time) and humidity at 20 – 60%RH (sensors that are not stored in ESD bags). For sensors that have been removed from the original packaging we recommend to store them in ESD bags made of PE-HD8.

In manufacturing and transport the sensors shall be prevented of high concentration of chemical solvents and long exposure times. Out-gassing of glues, adhesive tapes and stickers or out-gassing packaging material such as bubble foils, foams, etc. shall be avoided. Manufacturing area shall be well ventilated.

Appendix H Sensor Information (continued)

H.4 Reconditioning Procedure

As stated above extreme conditions or exposure to solvent vapors may offset the sensor. The following reconditioning procedure may bring the sensor back to calibration state:

Baking: 100 – 105°C at < 5%RH for 10h

Re-Hydration: 20 – 30°C at ~ 75%RH for 12h.

(75%RH can conveniently be generated with saturated NaCl solution. 100 – 105°C correspond to 212 – 221°F, 20 – 30°C correspond to 68 – 86°F)

H.5 Temperature Effects

Relative humidity reading strongly depends on temperature. Therefore, it is essential to keep humidity sensors at the same temperature as the air of which the relative humidity is to be measured. In case of testing or qualification the reference sensor and test sensor must show equal temperature to allow for comparing humidity readings.

The packaging of sensor is designed for minimal heat transfer from the pins to the sensor. Still, if the sensor shares a PCB with electronic components that produce heat it should be mounted in a way that prevents heat transfer or keeps it as low as possible. Furthermore, there are self-heating effects in case the measurement frequency is too high.

H.6 Light

The sensor is not light sensitive. Prolonged direct exposure to sunshine or strong UV radiation may age the housing.

H.7 Materials Used for Sealing / Mounting

Many materials absorb humidity and will act as a buffer increasing response times and hysteresis. Materials in the vicinity of the sensor must therefore be carefully chosen.

Recommended materials are: Any metals, LCP, POM (Delrin), PTFE (Teflon), PE, PEEK, PP, PB, PPS, PSU, PVDF, PVF. For sealing and gluing (use sparingly): Use high filled epoxy for electronic packaging (e.g. glob top, underfill), and Silicone.

Out-gassing of these materials may also contaminate the sensor (see **Section H.3**).

Therefore try to add the sensor as a last manufacturing step to the assembly, store the assembly well ventilated after manufacturing or bake at 50°C for 24h to outgas contaminants before packing.

Appendix J

SNMP

Table J-1 SNMP MIB-2

Version: SNMPv1 Private Enterprise Number: .1.3.6.1.4.1.34089
MIB-2 (RFC 1213) supported: System Group

Object Identifier (OID)	Object	Description	Access	Default
.1.3.6.1.2.1.1.1	sysDescr	The name and version identification of the product	Read-only	iTHX/ X.XX X.XX is the firmware version
.1.3.6.1.2.1.1.2	sysObjectID	The authoritative identification of the network management subsystem contained in the product. This value is allocated within the SMI enterprises subtree (1.3.6.1.4.1).	Read-only	.1.3.6.1.4.1.34089.XX X.X is the product system object ID
.1.3.6.1.2.1.1.3	sysUpTime	The time since the system was last re-initialized.	Read-only	
.1.3.6.1.2.1.1.4	sysContact	The contact person for this node, together with information on how to contact this person.	Read-write	None
.1.3.6.1.2.1.1.5	sysName	The hostname of this node.	Read-write	ithXXXXX XXXX are the last 4 characters of the MAC address
.1.3.6.1.2.1.1.6	sysLocation	The physical location of this node.	Read-write	None
.1.3.6.1.2.1.1.7	sysServices	The set of services that this product primarily offers. The value is a sum of network layer services implemented.	Read-only	76 Services include application, end-to-end and internet

Table J-2 SNMP Trap

SNMP Trap (RFC 1157) version: SNMPv1
Generic trap type: enterpriseSpecific(6)

Specific Trap	Alarm Description	Specific Trap	Alarm Description
0	Reading 1	7	Reserved
1	Reading 2	8	Reserved
2	Reading 3	9	Reserved
3	Reserved	10	Reserved
4	Power reset	11	Reserved
5	Sensor disconnected	12	Reserved
6	Reserved		

PART 6

APPROVALS INFORMATION

6.1 CE APPROVAL

 This product conforms to the EMC directive 89/336/EEC amended by 93/68/EEC, and with the European Low Voltage Directive 72/23/EEC.

Electrical Safety EN61010-1:2001

Safety requirements for electrical equipment for measurement, control and laboratory.

Basic Insulation

Pollution Degree 2

Dielectric withstand Test per 1 min

- Input Power to Sensor Metal Body: 1500Vac
- Input Power to Ethernet Output: 1500Vac
- Ethernet to Sensor Metal Body: 1500Vac

Measurement Category I

Category I are measurements performed on circuits not directly connected to the Mains Supply (power). Unit measures Air Temperature and Humidity.

Transients Overvoltage Surge (1.2/50uS Pulse)

- Input Power: 500V Transients Overvoltage
- Sensor : 500V Transients Overvoltage
- Ethernet: 1500V Transients Overvoltage

Note: *The ac power adapter must have Safety Qualified Agency Approvals for CE with Double Insulation rating.*

The ac/dc power adapter is 5Vdc @ 200 mA max (iTHX-W3)

The power input rating is 10-32Vdc (iTHX-D3)

The minimum output current rating is 600mA.

EMC EN61000-6-1:2001 (Immunity) and EN61000-6-3:2001 (Emissions)

Immunity requirements for residential, commercial and light-industrial environments

- EMC Emissions Table 1, Class B
- EMC Immunity Table 1: Enclosure
Table 2: Signal Lines Ports
Table 3: Dc input/Dc output Ports

EMC EN61326:1997 + and A1:1998 + A2:2001

Immunity and Emissions requirements for electrical equipment for measurement, control and laboratory.

- EMC Emissions Table 4, Class B of EN61326
- EMC Immunity Table 1 of EN61326

Note: *I/O lines / sensor cables require shielded cables and these cables must be located on conductive cable trays or in conduits.*



Refer to the EMC and Safety installation considerations (Guidelines) of this manual for additional information.

6.2 FCC

This device complies with Part 15, Subpart B, Class B of the FCC rules.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a trademark of OMEGA ENGINEERING, INC.

© Copyright 2019 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop online at omega.com*

TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- ☑ Transducers & Strain Gages
- ☑ Load Cells & Pressure Gages
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ☑ Communications-Based Acquisition Systems
- ☑ Data Logging Systems
- ☑ Wireless Sensors, Transmitters, & Receivers
- ☑ Signal Conditioners
- ☑ Data Acquisition Software

HEATERS

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments