

 **RoHS 2 Compliant**

User's Guide

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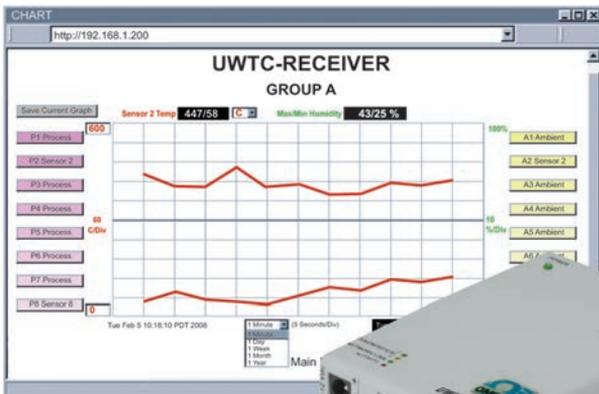
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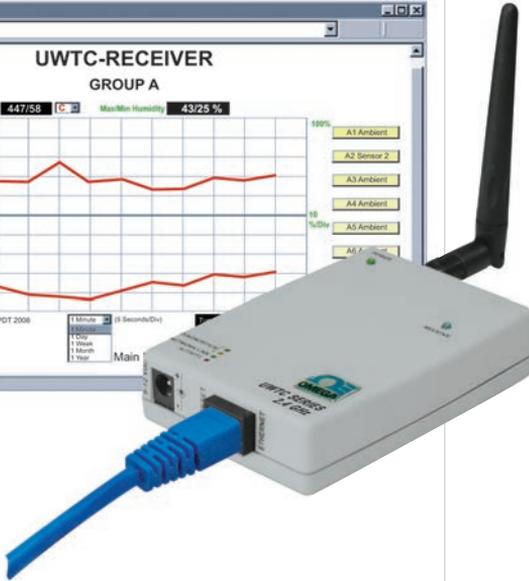
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U.S.A.: OMEGA Engineering, Inc., One Omega Drive, P.O. Box 4047
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FAX: (203) 359-7700 e-mail: info@omega.com

Canada: 976 Berar
Laval (Quebec), H7L 5A1, Canada
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e-mail: info@omegashop.cz

France: Toll-Free: 0805 541 038 TEL: 01 57 32 48 17
FAX: 01 57 32 48 18 e-mail: esales@omega.fr

Germany/ Austria: Daimlerstrasse 26
D-75392 Deckenpfronn, Germany
Toll-Free: 0800 8266342 TEL: +49 (0) 7056 9398-0
FAX: +49 (0) 7056 9398-29 e-mail: info@omega.de

United Kingdom: OMEGA Engineering Ltd.
ISO 9001 Certified One Omega Drive, River Bend Technology Centre, Northbank
Irlam, Manchester M44 5BD United Kingdom
Toll-Free: 0800-488-488 TEL: +44 (0) 161 777-6611
FAX: +44 (0) 161 777-6622 e-mail: sales@omega.co.uk

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The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, human applications.

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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 Wireless System.



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 E31

TIP: Provides you helpful hints.

FEATURES

- ✓ **Temperature**
- ✓ **Humidity**
- ✓ **Email Alarms**
- ✓ **Web Server**
- ✓ **No Special Software Required**

PART 1

INTRODUCTION

1.1 Safety and EMC Considerations



Refer to the Environment/Operating Conditions 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**), data-logging software (**iLog**) and **Mail Notifier** are **available at the website listed on the cover pages of this manual**, or on the CD-ROM enclosed with your shipment.

1.3 Description

The UWTC-REC3 Wireless Receiver provides Web-based monitoring of Temperature and Humidity. Each Receiver can directly support up to thirty-two (32) Thermocouples, RTD, Infrared and Humidity wireless Connectors / Transmitters.

The Receiver allows you to monitor and record Temperature and Relative Humidity over an Ethernet network or the Internet without any special software—just your Web Browser. The Receiver includes AC adapters to operate on any voltage worldwide from 100 to 240 Vac and 50 to 60Hz. The Receiver connects directly to an Ethernet Network or the Internet. Unlike an RS232 or USB device, it does not require a host computer.

The Receiver also provides error detection mechanism for inactive communication and diagnostic information including signal strength and data transmission success rate to help trouble shooting potential wireless system installation issues.

The Receiver is an independent node on the network sending and receiving data in standard TCP/IP packets. It is easily configured from a Web Browser and can be password protected. From within an Ethernet LAN or over the Internet, the user simply types the IP address (such as 192.168.1.200) or an easy to remember name (such as "ServRoom" or "Chicago5") and the Receiver serves a Web Page with the current readings.

The device can trigger an alarm if variables go 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 Internet enabled cell phones and PDA's. The "Mail Notifier" software is free and easy to use program for this application.

1.3 Description (continued)

The Receiver is easy to install, simple to operate, and features award-winning iServer technology with an Embedded Web Server that requires no special software.

The Receiver serves Active Web Pages to display real time readings and charts of Temperature and Humidity. You can also log data in standard data formats for use in a spreadsheet or data acquisition program such as Excel or Visual Basic. iLog is a free and easy to use program for logging data to Excel.

The virtual chart viewed on the web page is a Java™ Applet that records a chart over the LAN or Internet in real time. With the Receiver there is no need to invest time and money learning a proprietary software program to log or chart the data.

Chart scales are fully adjustable on the fly. For example, the chart can display one minute, one hour, one day, one week, one month or one year. Temperature and humidity can be charted across the full span (-40 to 125°C, and 0 to 100% RH) or within any narrow range such as (20 to 30°C).

The OPC Server software makes it easy to integrate the Receiver with many popular Data Acquisition and Automation programs offered by Omega, Wonderware, iConics, Intellution, Rockwell Automation, and National Instruments, among others.

The following example illustrates how you can hookup wireless system to your network:

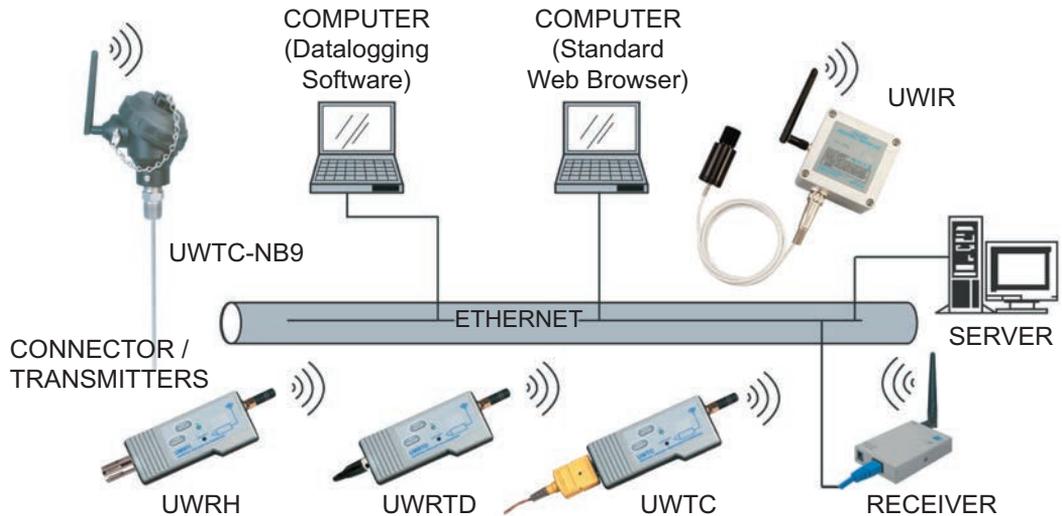


Figure 1.1 Wireless System on the Ethernet Network

The wireless system consists of a single **Receiver** and one or more **Connector / Transmitters**. Transmitter will send data periodically to the Receiver where it serves as a gateway between the users and the Transmitter. The users can access the data through the Receiver's web server and provided data acquisition software.

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 overall configuration parameters.

PART 2 HARDWARE

2.1 Parts of the Receiver

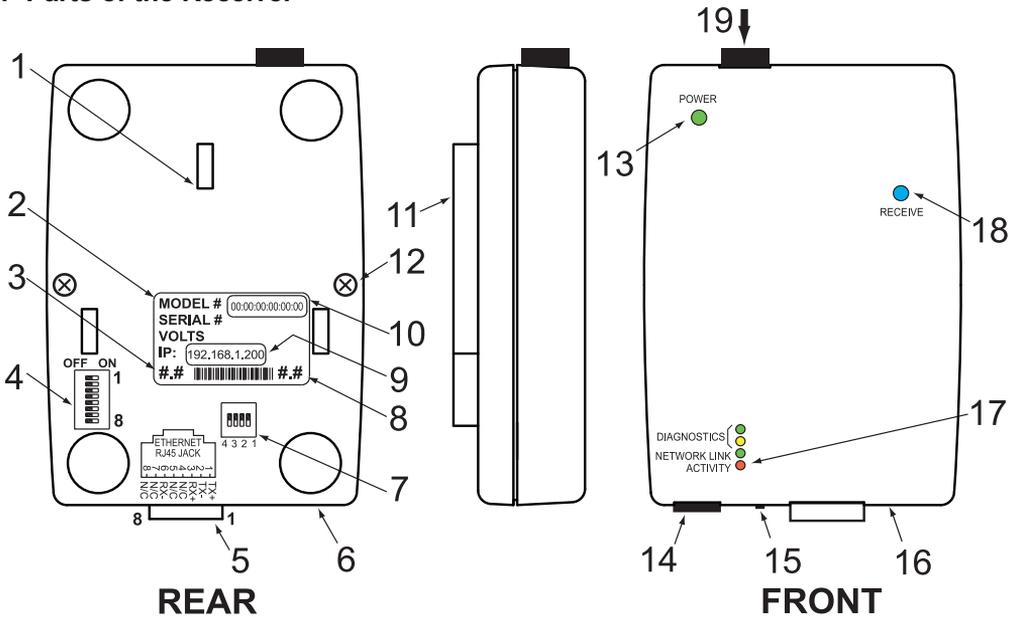


Figure 2.1 Parts of the Receiver

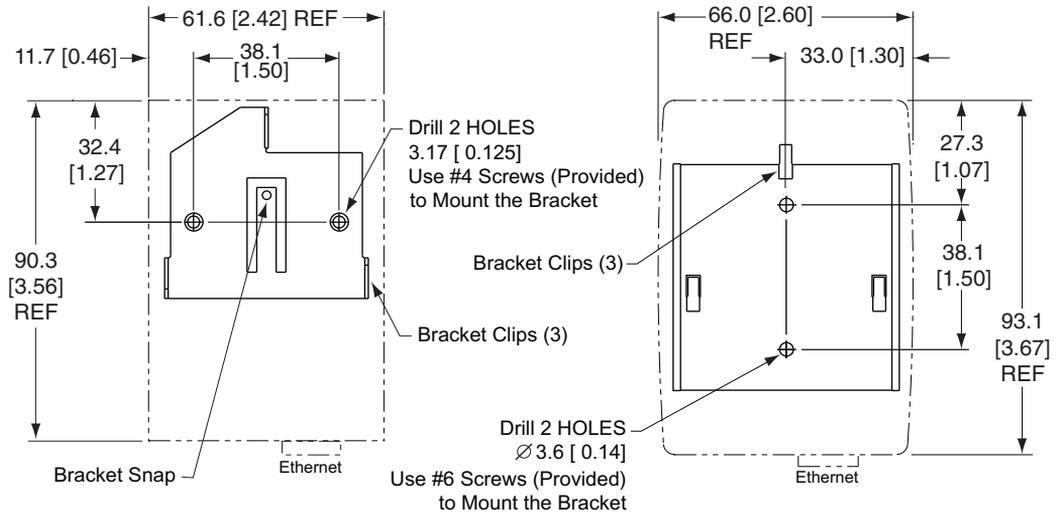
1	Wall mounting bracket clip holes (3 places)
2	Label with model and serial numbers
3	Receiver's firmware revision on label
4	8 position DIP switch, only the 1st position is used (see Section 4.3.1 for details)
5	Ethernet: RJ45 interface for 10BASE-T connection.
6	Case's tray, where the PCB is mounted
7	4 position DIP switch, sets the DHCP and Factory Defaults
8	Receiver's radio module firmware revision on label
9	Label with default IP address, remove and then write your IP address, in the space provided
10	Label with MAC address (in hex code)
11	Wall mounting bracket
12	Case's cover mounting screw (2 places)
13	Power LED: (Green) Solid: Indicates Power-ON
14	Power supply: Plus (+) power supply wire connection inside the plug; Minus (-) power supply wire connection outside the plug
15	Reset button: Used for power resetting the Ethernet board
16	Case's cover

2.1 Parts of the Receiver (continued)

17	Diagnostics LED: (Yellow and Green) Diagnostics: at boot-up they light up for 2 seconds, then turn off; DHCP: if DHCP is enabled, they blink and stay solid periodically Network Link LED: (Green) Solid: Indicates good network link. Activity LED: (Red) Blinking: Indicates network activities (receiving or sending packets).
18	Receive LED (blue): Indicates the Receiver is ready to receive data from the Connector/Transmitter(s).
19	Antenna connector

2.2 Mounting - Receiver

Position unit where required. Mark and drill the two screw holes. Once the bracket is mounted to the wall: align back of unit over the three bracket clips, when engaged, slide downward, the unit will snap in place.



Attach antenna (refer to **Section 5** for Environmental/Operating Conditions) and attach power supply.



Note EN3 If unit is to be mounted on a flat surface, you may take the bottom rubber feet off the unit.

2.3 DIP Switch Setup - Receiver

2.3.1 Wireless Settings

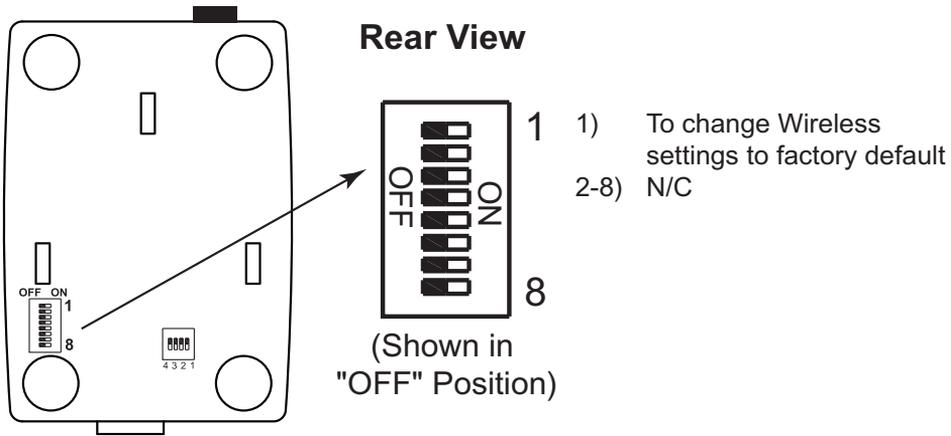


Figure 2.3 8 Position DIP Switch Setup

Once the End Devices and the Receiver start communicating, make sure to push DIP switch #1, located on the back of the Receiver to the **ON** position.

2.3.2 Ethernet Settings

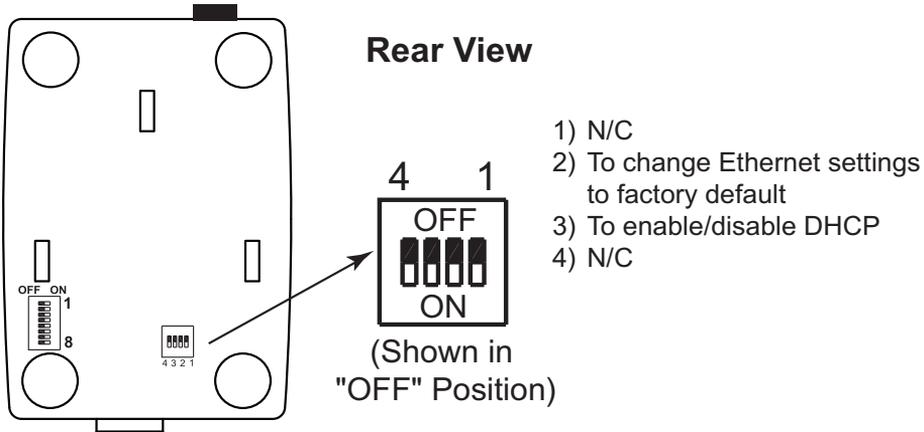


Figure 2.4 Ethernet - 4 Position DIP Switch Setup



To set the Receiver to factory default settings:

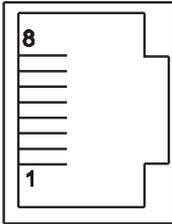
- 1) Slide DIP switch #2 to **ON** position.
- 2) Power the Receiver on and wait about 10 seconds until the Receiver fully boots up.
- 3) Set the DIP switch #2 back to **OFF** position (it does not matter if the Receiver is powered ON or OFF, just make sure that the DIP switch is set to OFF, otherwise, every time the unit is power-cycled the factory settings will take over).

2.4 Network Communication Interfaces

2.4.1 10Base-T RJ-45 Pinout

The 10BASE-T Ethernet network (RJ-45) system is used in the Receiver for network connectivity. The 10 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 2.5 RJ45 Pinout

2.4.2 10Base-T Crossover Wiring

When connecting the Receiver directly to the computer, the transmit data pins of the computer should be wired to the receive data pins of the Receiver, and vice versa. The 10Base-T crossover cable with pin connection assignments are shown below.

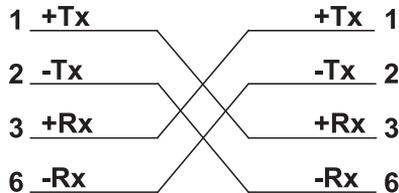


Figure 2.6 10Base-T Crossover Cable Wiring

Note

Use straight through cable for connecting the Receiver to an Ethernet hub. The ports on the hub are already crossed

PART 3

NETWORK CONFIGURATION

3.1 Ethernet (MAC) Address

MAC (Media Access Control) address is your computer's unique hardware number. When you're connected to the LAN from your computer, a correspondence table relates your IP address to your computer's physical (MAC) address. The MAC address can be found on the label of your device and 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 2.5**.

3.2 Network Protocols

The Receiver can be connected to the network using standard TCP/IP protocols. It also supports ARP, HTTP (WEB server), DHCP, DNS and Telnet protocols.

3.3 DHCP

DHCP, Dynamic Host Configuration Protocol enables computers and devices to extract their IP configurations from a server (DHCP server).

If DHCP is enabled on your Receiver, as soon as the Receiver is connected to the network, there is an exchange of information between DHCP server and the Receiver. During this process the IP address, the Gateway address, and the Subnet Mask will be assigned to the Receiver by the DHCP server. Note that the DHCP server must be configured correctly to do such assignment.

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

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

The DHCP can be enabled by setting the DIP switch #3 to the "ON" position

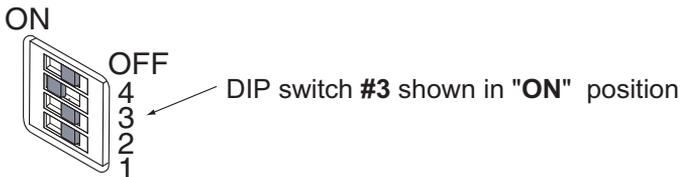


Figure 3.1 4 Position DIP Switch on the Bottom Side of Receiver

Note 

Setting the **Receiver's** IP address to 0.0.0.0 will also enable DHCP.

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 only **http://z03ec** or any sixteen character name stored as Host Name under Access Control menu in the Wireless System Home Page.

The default DNS name for the Receiver is "z" followed by the **last four digits** of the MAC address of that particular Receiver.



Note

1. It is 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 Receiver.
2. The Receivers are shipped with a default static IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**.
3. 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 the DHCP and DNS servers are linked together.

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 establish a connection to the Receiver. Every computer using TCP/IP should have a unique 32-bit address which 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 a different host ID. For more details about the IP address see **Appendix B**.

3.5.1 Default IP Address

The Receiver is shipped with a default IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**. If you are going to use a Web browser or Telnet program to access the Receiver using its default IP address, make sure that the PC from which you're establishing the connection has an IP address that is in the same range as the Receiver's IP address (**192.168.1.x**, where **x** can be any number from 1 to 254). See **Section 3.5.2**.



Note

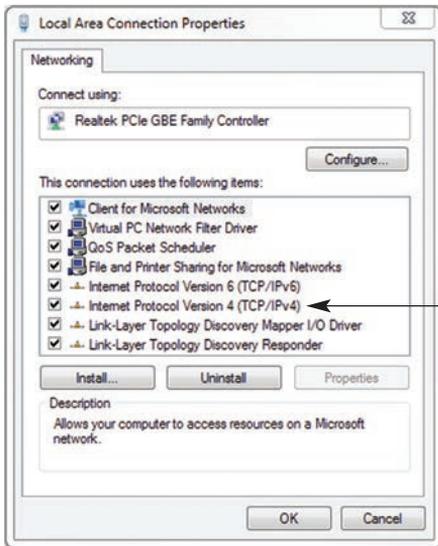
Your PC's IP address cannot be the same as the Receiver's IP address.

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 Receiver over the network and make any configuration changes needed. If **192.168.1.200** is already in use on your network, use an Ethernet crossover cable between your computer and the Receiver to change the IP address or any other settings within the Receiver.

3.5.2 Changing TCP/IP Properties on Your Computer

Go to your computer's **Control Panel** then **Network Connections**.

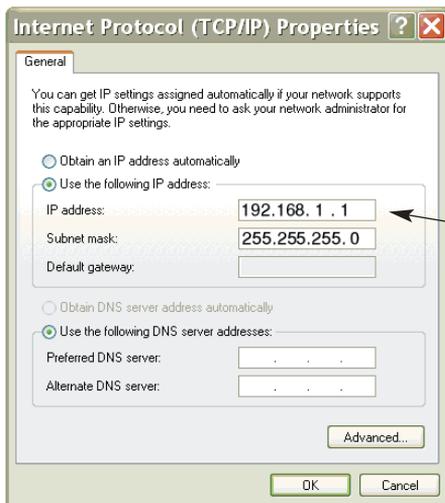
Pick the network with the proper Ethernet card. Right click and choose **Properties**



Look for **Internet Protocol Version 4 (TCP/IPv4)**, click on it and press **Properties**

Figure 3.3 Network Connections

Setup the IP address (in this case, 192.168.1.1) as shown below and press OK



You can access the Coordinator's web server via any internet browser using IP address of **192.168.1.200**.

Once you log into the Coordinator's web server, you will be able to change its IP configuration according to **Section 4.2**.

Note

After you configure the Coordinator's IP configurations, you should go back and set your PC's previous IP settings.

Figure 3.3 Network Connections

PART 4 OPERATIONS

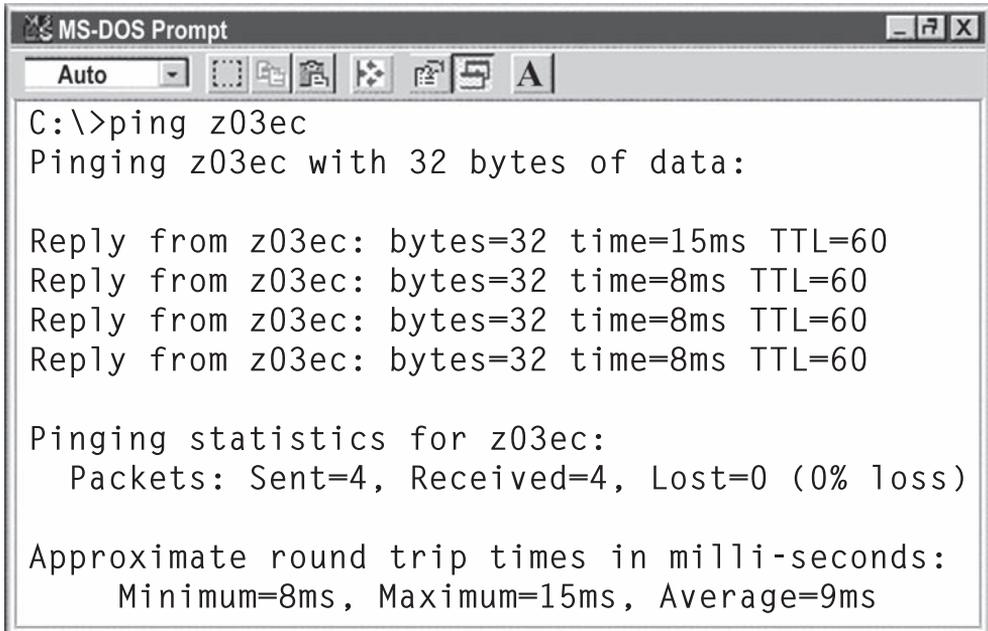
This Receiver can be used and configured in several ways, depending on user's preference and network setup. It can be configured using a Web browser, like Internet Explorer. It can also be configured using the iConnect Configuration Software.

If DHCP and DNS servers are configured to exchange information, the connection will be very simple. All you need to do is to enable DHCP on the Receiver (see **Section 3.3**) and use a straight through network cable to connect the Receiver to an Ethernet hub or switch and power it up. Now, you can use the Receiver's default Host (Domain) Name, which is **zxxxx** (where xxxx are the last four characters of its MAC address) to access the Receiver's Web Server.

If DHCP is not the preferred method, you can configure your PC's network connection with an IP address of **192.168.1.x** that is in the same range as the Receiver's default IP address (**192.168.1.200**) and connect to the Receiver using a cross-over network cable between your PC's network port and the Receiver. After you're done with configuring the Receiver, you can always set your PC back to its original settings. See **Section 3.5.2** for more details.

On your computer, from the MS-DOS Prompt window type "**ping 192.168.1.200**" and press Enter. If DHCP and DNS servers are used type "**ping zxxxx**", where xxxx are the last four digits of the Receiver's MAC address, located on the back of the device. You should get a reply as shown in **Figure 4.1**.

4.0 Testing the Connection



```
MS-DOS Prompt
Auto
C:\>ping z03ec
Pinging z03ec with 32 bytes of data:

Reply from z03ec: bytes=32 time=15ms TTL=60
Reply from z03ec: bytes=32 time=8ms TTL=60
Reply from z03ec: bytes=32 time=8ms TTL=60
Reply from z03ec: bytes=32 time=8ms TTL=60

Pinging statistics for z03ec:
    Packets: Sent=4, Received=4, Lost=0 (0% loss)

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

Figure 4.1 Pinging the Receiver from MS-DOS Prompt

This proves that the connection is proper and you can get into configuration or run mode using the Telnet or Web browser.

4.1 iConnect Software

The Receiver may also be assigned an IP Address by using the iConnect software.

- a) Download the iConnect software from the website listed in this manual.
- 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 Receiver and access its web pages for configuration. You can also use any standard web browser to access the Wireless System' web pages. Consult with your IT department for obtaining an IP address.

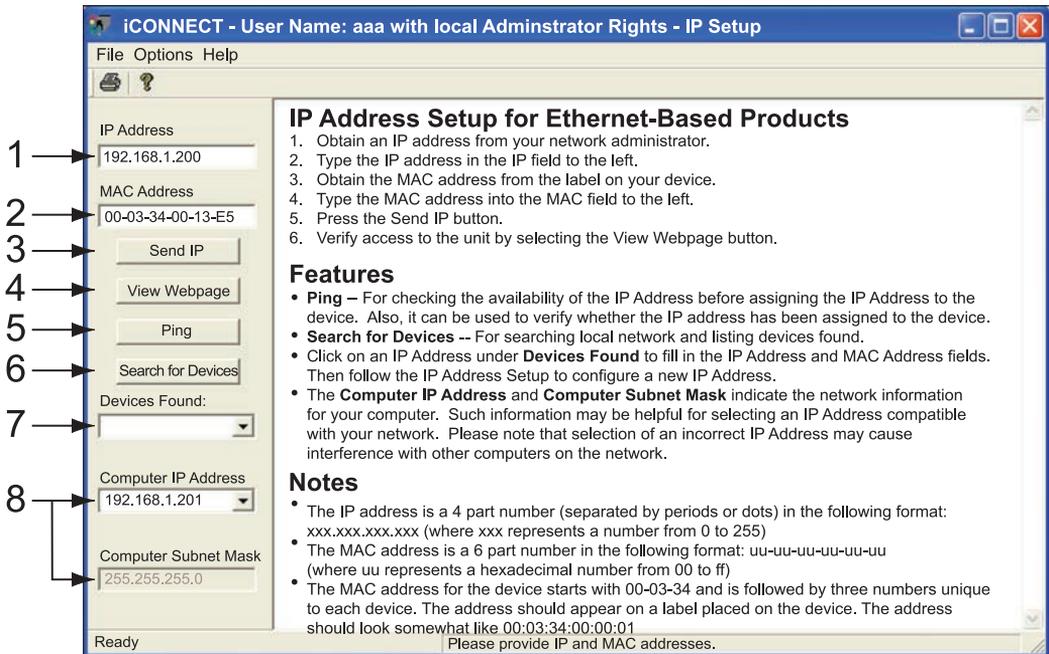


Figure 4.2 Assigning an IP Address using iConnect

- 1) Place the IP address in this box
- 2) Take the MAC address from the label attached to the bottom of the Receiver and place it in this box
- 3) Click here to send the above IP address to the Receiver
- 4) After the IP address is assigned to the Receiver, click here to access it's web pages
- 5) Click here to Ping the Receiver whose IP address is shown in the IP address box
- 6) Click here to find all the Receivers on your network
- 7) The IP addresses for the Receivers 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 iConnect Software (continued)

- d) To access the Wireless System for Configuration:
Click on the "View Webpage" button, you will access the Wireless System' home page, refer to **Section 4.3** for details.

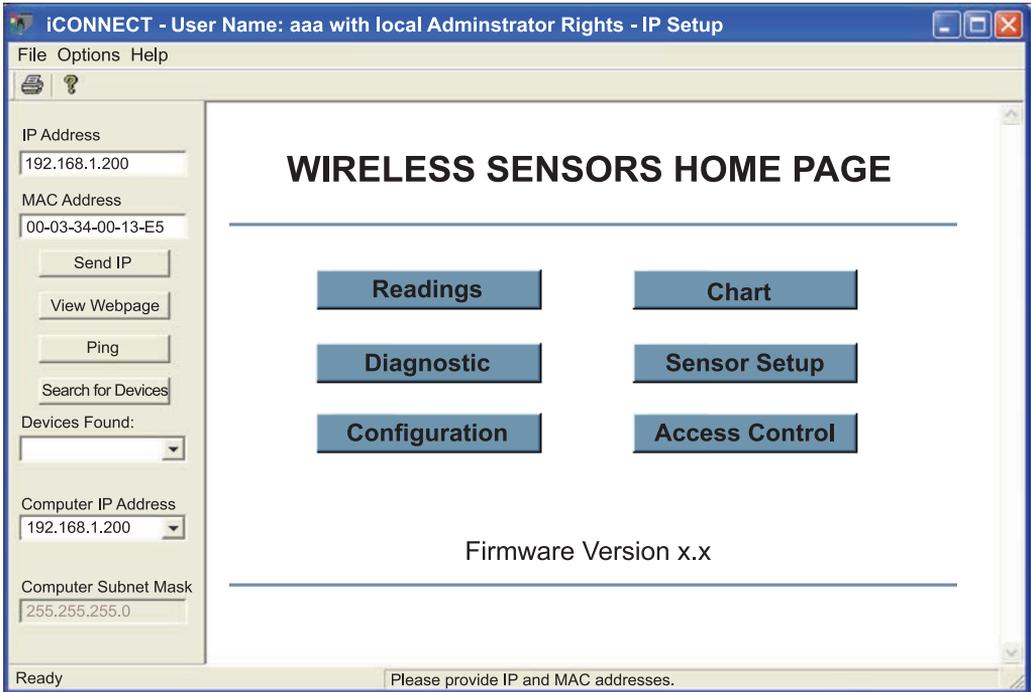


Figure 4.3 Accessing the Wireless System for Configuration

4.2 Setting a New IP Address over the Network

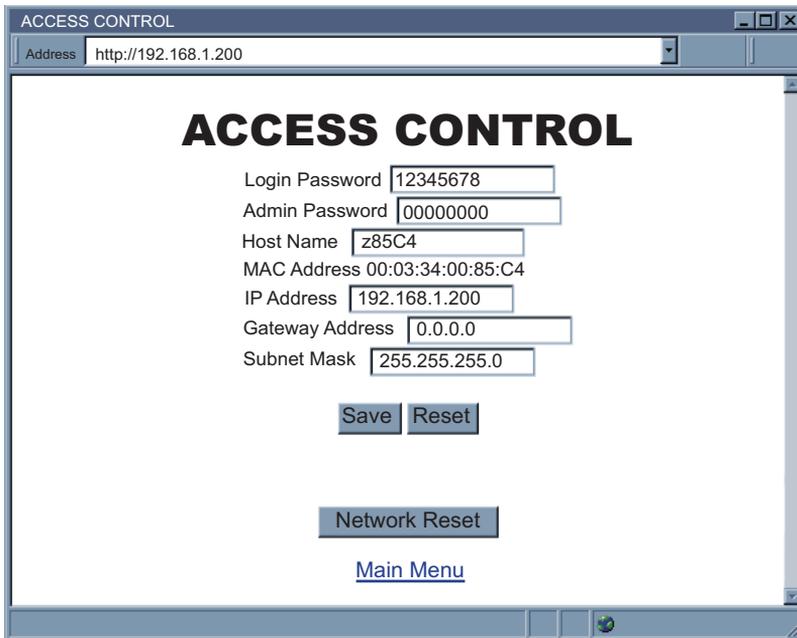
Besides using the iConnect software, you may use the Receiver's default IP address to access it and assign a new IP address to it.

The Receiver is shipped with a default IP address of **192.168.1.200** and Subnet Mask of **255.255.255.0**. You can configure your PC's Network connection with an IP address that is in the same range as the Receiver's IP address (**192.168.1.x**) and connect to the Receiver using a crossover network cable between your PC and the Receiver.

With this completed, you can go to the DOS-Prompt and ping **192.168.1.200**. If you receive responses back (**Figure 4.1**), you can go to the Web browser and type in **http://192.168.1.200** and it will take you to the Wireless System' Home Page.

Select **Access Control**, button, you'll be asked for the password. You should be on the Access Control page where you can simply type in the desired Static IP address, and click Save.

For more details about the "Access Control" page refer to **Section 4.3.9**.



ACCESS CONTROL

Address http://192.168.1.200

ACCESS CONTROL

Login Password

Admin Password

Host Name

MAC Address

IP Address

Gateway Address

Subnet Mask

[Main Menu](#)

Figure 4.4 Access Control

For the IP address to take effect, the Receiver needs to be turned OFF and ON using the "Network Reset" button. Pressing the physical button marked "RESET" on the Receiver does the same thing.

You can now connect the Receiver to an Ethernet hub using a straight through cable, power it up, and follow the ping routine mentioned in the previous section.

4.3 Receiver's Configurations and Operations

Using a web browser, you should be able to view the Receiver's homepage.

- Start your web browser.
- From the browser you type **http://zxxxx** using the last four-digits from the MAC address label located on the device if DHCP and DNS are used. If a static IP address is used, then simply type **http://x.x.x.x**, where **x.x.x.x** is the Receiver's IP address.
- The Home Page, will be displayed.

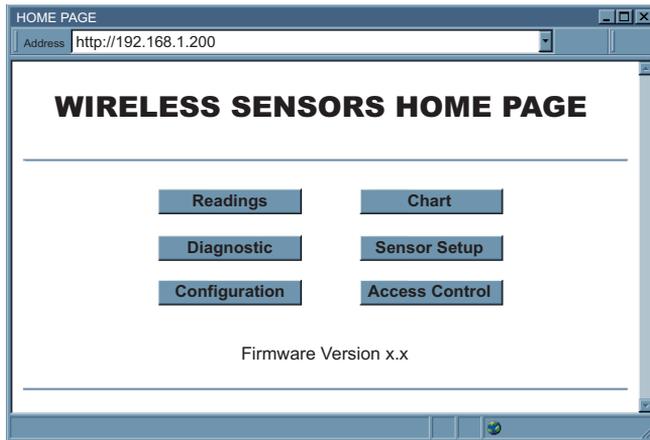


Figure 4.5 Wireless System Home Page Menu

Note

In order to access certain menu items of the Home Page, users may be prompted for a password, as shown in the two figures below.



Figure 4.6 LOGIN and ADMINISTRATOR Passwords

There are 2 different access levels:

1. **ADMINISTRATOR Password** (administrator) allows certain groups and individual users to access and modify "entire" parameters without any restrictions.
The default password is **0000000**. This password can be up to 16 alphanumeric case-sensitive characters.
2. **LOGIN Password** (operator) allows users to access and modify all of the parameters, except "Access Control" which requires an Administrator password.
The default password is **12345678**. This password can be up to 16 alphanumeric case-sensitive characters.

4.3.1 Power Up Device

To verify that a Connector/Transmitter is working before deploying remotely, install the battery and power it on right next to the Receiver. When the Connector/Transmitter is powered on, the green LED (TX) will blink continuously. This indicates the Connector/Transmitter is broadcasting its data to the Receiver on selected RF channel.

The LED will blink only when the Connector/Transmitter sends data to the Receiver. If the Receiver is not powered on, or it's out of reach, the Connector/Transmitter will not receive the acknowledgment packet from the Receiver and therefore to save battery power it will go to sleep.

The sleeping period can be defined by the users via the USB port (PC Configuration software) on the Connector/Transmitter. The Connector/Transmitter sends new data for a short period of time after every sleep period is over, until it can establish the connection back with the Receiver. For a list of battery life versus the transmit time, please refer to the **UWTC Connector/Transmitter manual Section 6.11**.

Note

Once the Connector/Transmitter and the Receiver start communicating, make sure to push DIP switch # 1 located on the back of the Receiver to ON position if success calculation and lost detection features are enabled. This will lock the wireless settings (eg. update, transmission power) on the Receiver in case of a power outage.

Note

When there are two Connector/Transmitters with the same Device ID/address, both will be transmitting data every sampling period with their LEDs blinking. The Receiver will receive data from both Connector/Transmitters and will display their data alternately. To avoid this please turn the Connector/Transmitter one by one and verify that the Receiver is displaying the correct data.

Note

Make sure the Connector/Transmitter is configured to use the same Network ID and RF channel as the Receiver. Also, make sure receiver address for the Connector/Transmitter is set to 0.

4.3.2 Get Readings from the Connector/Transmitter

Once you see the Connector/Transmitter's LED blinking periodically, it means it is sending data which will appear on the "Readings" page. To view the data in a chart format, you can use the "Chart" page.

Click on [Readings](#) from the Home Page, the following page will appear. Select the proper Group to view the readings.

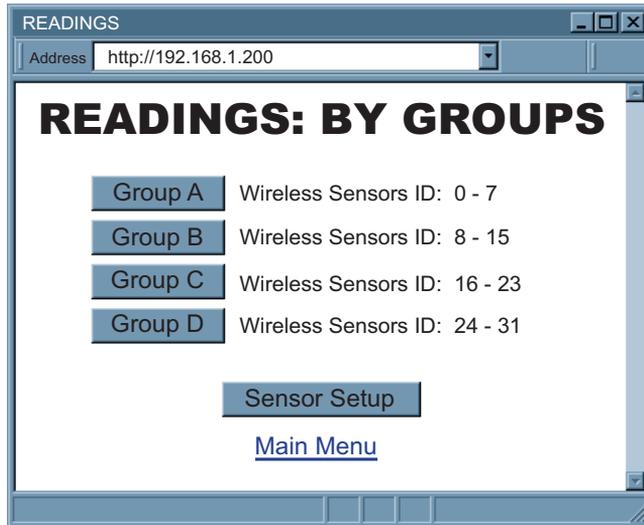


Figure 4.7 Select Readings by Groups

In a few seconds the following page will appear, showing updates of the Process and Ambient Temperature.

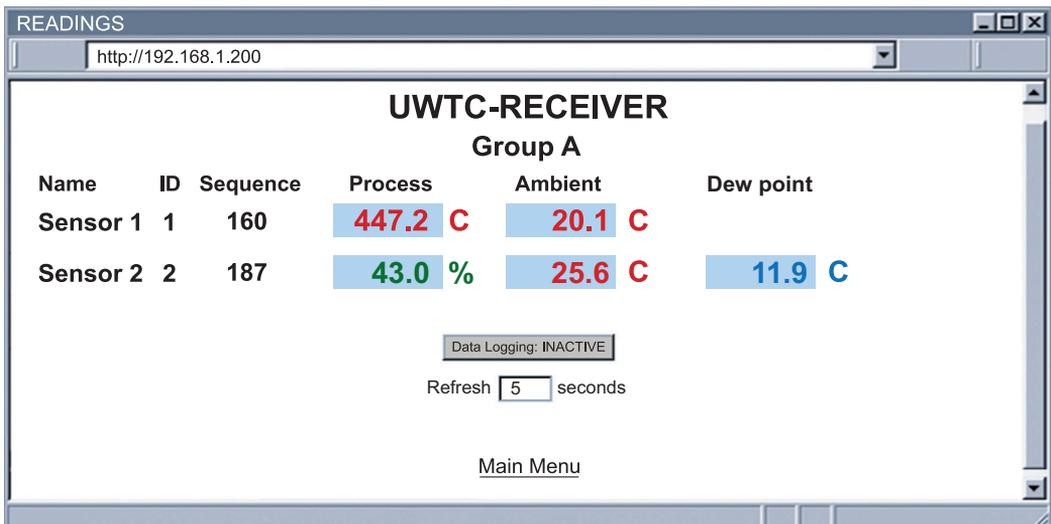


Figure 4.8 Readings

4.3.2 Get Readings from the Connector/Transmitter (continued)

Note While accessing the "Readings" page, 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 **Section 4.3.3.1**. If you do not have Java Runtime Environment, you may download it from our website or contact the Customer Service Department nearest you.

The "Readings" fields are defined as follows:

Title: Receiver's name, assigned in "Configuration" page.

Name: Connector/Transmitter's name, assigned in "Sensor Parameters" page.

ID: Device ID/address

Sequence: Sequence number [0-255, Lost].

The Sequence number is incremented for each newly received data. Therefore, it indicates if the sensor is transmitting data successfully.

This area also will display error messages:

Lost Receiver has not received data from the Connector/Transmitter.

Reading Values: The order from left to right is: Process, Ambient, then Dewpoint.

First Reading Process - reading with temperature or humidity unit.

Second Reading Ambient - ambient temperature reading with temperature unit.

Third Reading Dewpoint - dewpoint calculated only if humidity sensor is present.

Note Reading "Open" indicates that no sensing device is detected.

Data Logging: Press to activate/deactivate data logging. When it is pressed to activate data logging, a file browser pops up to ask for which file data will be saved.

Data is in Comma Separated Value (csv) format, which can also be opened in Excel.

Please name file with .csv extension.

	A	B	C	D	E	F	G	H
1	Wed May 06 14:19:24 PDT 2009	3	26	230	25	C	23.7	C
2	Wed May 06 14:19:30 PDT 2009	3	27	230	25	C	23.7	C
3	Wed May 06 14:19:36 PDT 2009	3	28	230	25	C	23.7	C
4	Wed May 06 14:19:42 PDT 2009	3	30	230	25	C	23.7	C
5	Wed May 06 14:19:48 PDT 2009	3	31	230	25	C	23.7	C
6	Wed May 06 14:19:54 PDT 2009	3	32	230	25	C	23.7	C
7	Wed May 06 14:20:00 PDT 2009	3	33	230	25	C	23.7	C
8	Wed May 06 14:20:06 PDT 2009	3	35	230	25	C	23.7	C
9	Wed May 06 14:20:12 PDT 2009	3	36	230	25	C	23.7	C
10	Wed May 06 14:20:18 PDT 2009	3	37	230	25	C	23.7	C

Figure 4.9 Comma Separated Value Format

4.3.2 Get Readings from the Connector/Transmitter (continued)

Columns from left to right: Date and time, Device ID, Sequence number, Device type, Reading 1, Unit 1, Reading 2, Unit 2, (up to 3 readings and units), next Device ID, next Sequence number, ... (up to 8 Connector/Transmitter's).

ACTIVE data is currently being logged in the specified file.

INACTIVE data logging is not executed.

Refresh: How often the current applet asks for data from embedded server.

Note Ensure Java Runtime Environment is setup. Refer to **Section 4.3.3** before activating data logging

4.3.3 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.

4.3.3.1 Java Runtime Environment 1.7 Setup instructions

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

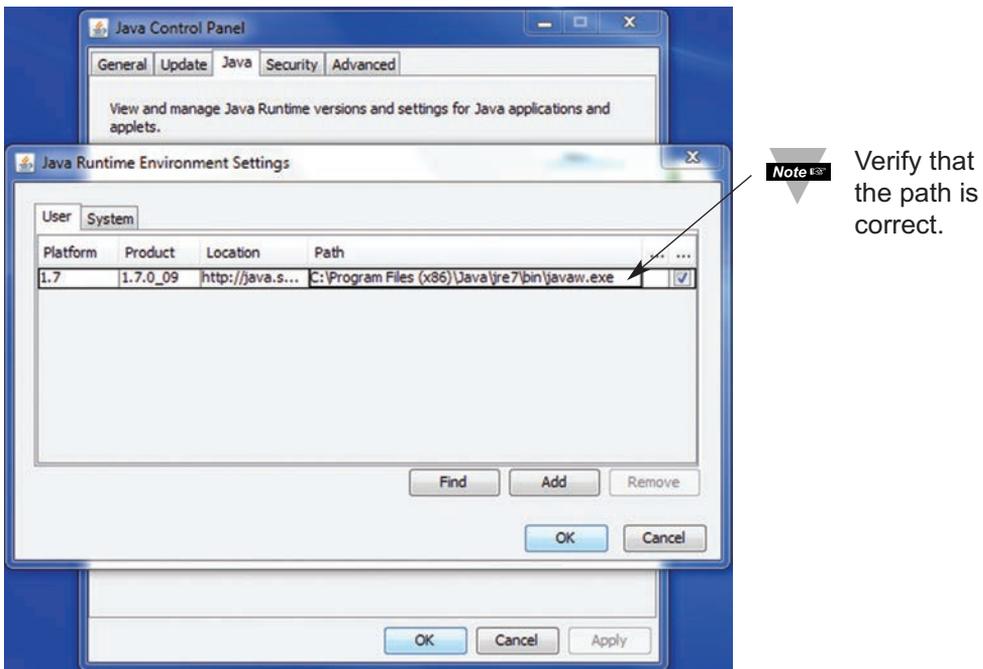


Figure 4.10 Java 1.7 Screen Shot

4.3.3.2 Browser Proxy Selection

Accessing Receiver units within your internal network

- Usually when the computer and Receivers 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 Receiver 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 Wireless System appears, then the HTTP Proxy is working fine.

If the data isn't updated on the Wireless System upon selecting the "Readings" 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. (The TCP ports Receiver uses for Java applets are 1000 and 1001).

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 Receiver 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 Receiver) and then connecting the Receiver 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 Wireless System's charts after connecting the Receiver 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 Wireless System's 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.

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

4.3.4 Chart

Click on [Chart](#), from the Home Page, the following page will appear. Select the proper Group to view the Chart.

In a few seconds the following page will appear. The Java™ Applet graph displays Process Readings and Ambient Temperature. It 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).

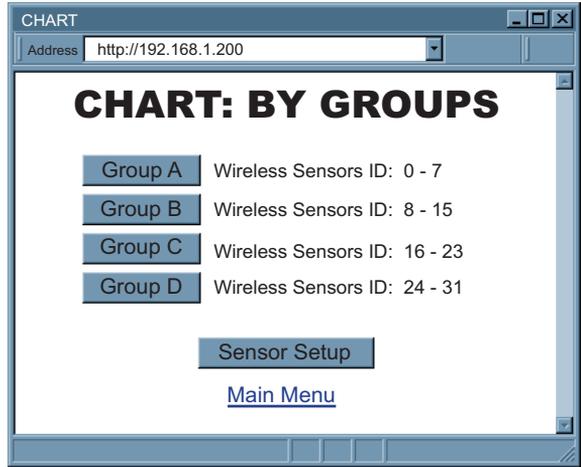


Figure 4.11 Select Chart by Groups



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 **Section 4.3.3.1**). If you do not have Java Runtime Environment, you may download it from our website or contact the Customer Service Department nearest you.

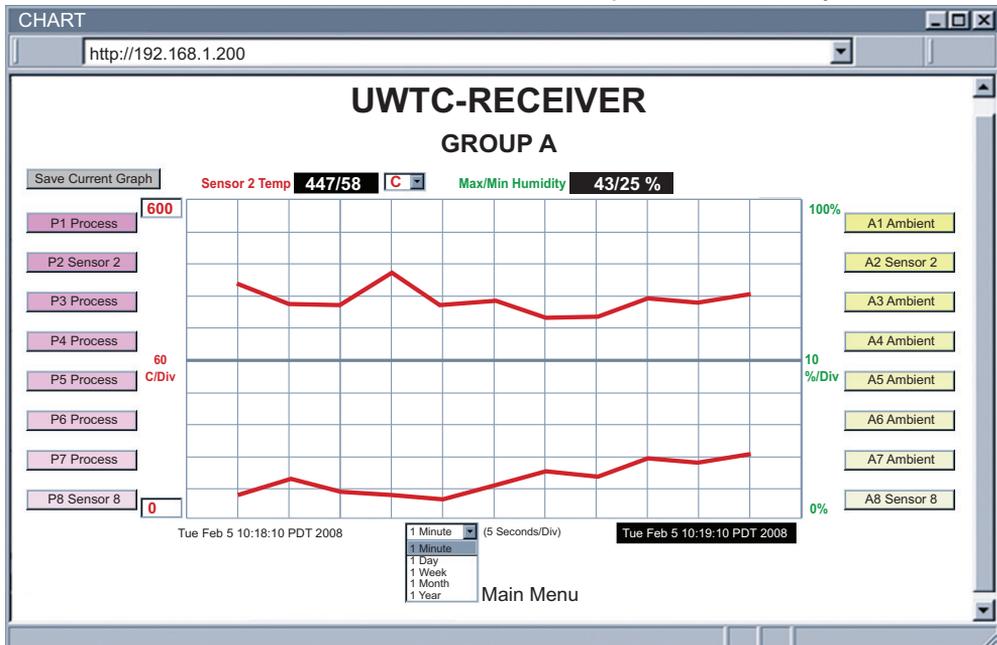


Figure 4.12 Chart

4.3.4 Chart (continued)

Title: Receiver's name, assigned in "Configuration" page.

Save Current Graph: Save the current graph in PNG (Portable Network Graphics) format. The filename has the extension **.png**.

Max/Min Temperature: Maximum and minimum temperature of the current graph. If a sensor is selected (trend line and sensor name turns bold), its most current temperature reading is shown here.

Temperature Unit Drop-down List: Temperature unit to be used, either °C or °F.

Max/Min Humidity: Maximum and minimum humidity of the current graph.

If a sensor is selected (trend line and sensor name turns bold), its most current humidity reading is shown here.

Note

Reading "Open" indicates that no sensing device is detected.

P# button (Process): P# shows the sensor name and controls the process readings. When clicked once, it turns bold, highlights the process sensor trend line and displays current sensor readings.

When clicked twice, it turns white and the trend line will disappear.

When clicked again, it comes back to normal operation.

Chart Area: Display the trend lines of the sensors.

Range of temperature can be controlled by the upper and lower boxes on the left.

A# button (Ambient): A# shows the sensor name, displays error messages [Lost] and controls the ambient sensor readings.

When clicked once, it turns bold, highlights ambient sensor trend line and displays current sensor readings.

When clicked twice, it turns white and the trend line will disappear.

When clicked again, it comes back to normal operation.

Applet Start Date and Time: Activates when the "Chart" page opens up.

X-axis Drop-down List: Time scale for the chart.

The chart area can be shown based on 1 min, 1 hour, 1 day, 1 week, 1 month, or 1 year time intervals.

Last Update Date and Time: The last date and time when data arrived.

4.3.5 Diagnostic

Click on [Diagnostic](#), the following page will appear.

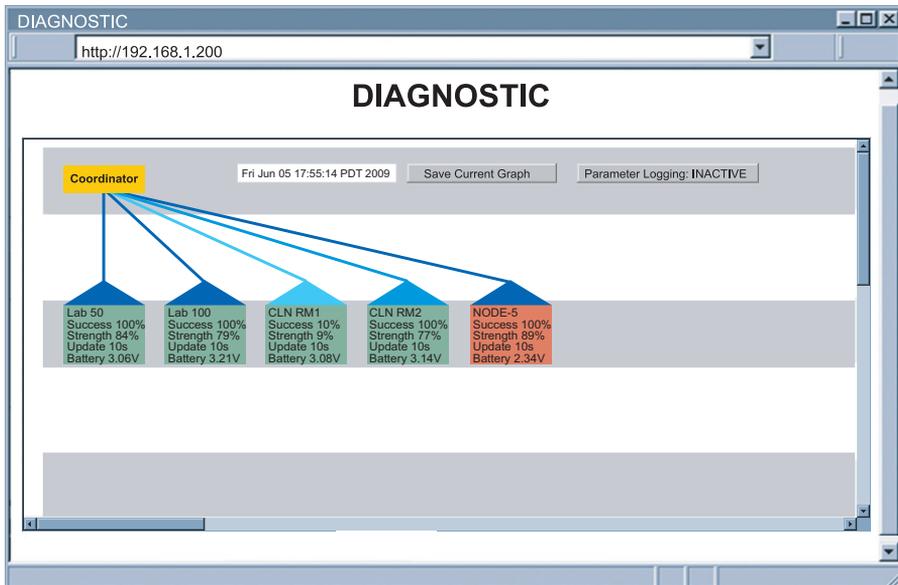


Figure 4.13 Diagnostic

Date and Time: Most recent time when data is received.

Save Current Graph: Save the current graph in PNG format. The filename has extension **.png**.

Parameters Logging: Click to activate/deactivate parameters logging. When it is activated, a file browser screen will allow you to name and save the logging file.

The file is in Comma Separated Value (**.csv**) format.

ACTIVE – parameters are currently being logged in the specified file.

INACTIVE – parameters logging is not activated.

Receiver (yellow box): Receiver is always at the top of the wireless network hierarchy (star topology).

Sensor: Name of the sensor.

Success Rate: (0-100%), a low success rate indicates a longer data delay, shorter battery lifetime and high network traffic. Any error message (LOST, OPEN) will be shown here as well.

Radio Signal Strength: (0-100%), the higher the better.

The **blue line and blue triangle (roof)** connecting to the Receiver indicates the radio signal strength. Darker blue means a stronger radio signal.

Dark Blue: between 100% and 79%; *Medium Blue;* 78% to 11%; *Light Blue:* 10% to 0%

Update Rate: The time interval the Receiver received data from the Connector / Transmitter.

Battery Voltage: The total voltage of the battery in the Connector/Transmitter. Once the voltage gets to 3.0V, it's recommended to change the battery (full battery is 3.6V).

The **box (house) color** indicates battery voltage. *Green:* >3.0V; *Red:* <3.0V

4.3.6 Configuration

Click on [Configuration](#) from the Home Page, the following page will appear.

CONFIGURATION

Address <http://192.168.1.200>

CONFIGURATION

Name

Temperature

TCP Connections Port

Network ID Channel

Transmission Power Range

Please refer to your local regulations for the allowed maximum transmission power

Radio Version x.x

[Main Menu](#)

Name: Receiver name [maximum of 16 alphanumeric characters]

Temperature: Unit of temperature readings, [°C or °F].

TCP Connections: Number of TCP connections available for data query. If "0" is selected no TCP connection can be made to the indicated port number [0 through 5].

Port: Port number for TCP connections. [invalid ports: <500, >65536, 1000, 1001].

Save: Saves any changes for above settings.

Figure 4.14 Configuration

Network ID: The Personal Network ID (0 to 65535).

Note The Receiver always has an address of 0.

Channel: Choose the operation channel defined in IEEE 802.15.4 for the sensor network.

Transmission Power: This determines the signal power transmitted by the Receiver. The options are 10 dBm and 20 dBm.

Note Refer to your local regulations for the allowed maximum transmission power.

Save: Saves changes for Transmission Power.

Radio Reset: Power resets the radio module in the Receiver.

Radio Version: Firmware version of the radio module, also shown on model/serial label.

4.3.7 Sensor Setup

Click on [Sensor Setup](#) from the Home Page, the following page will appear. Select the proper Group.

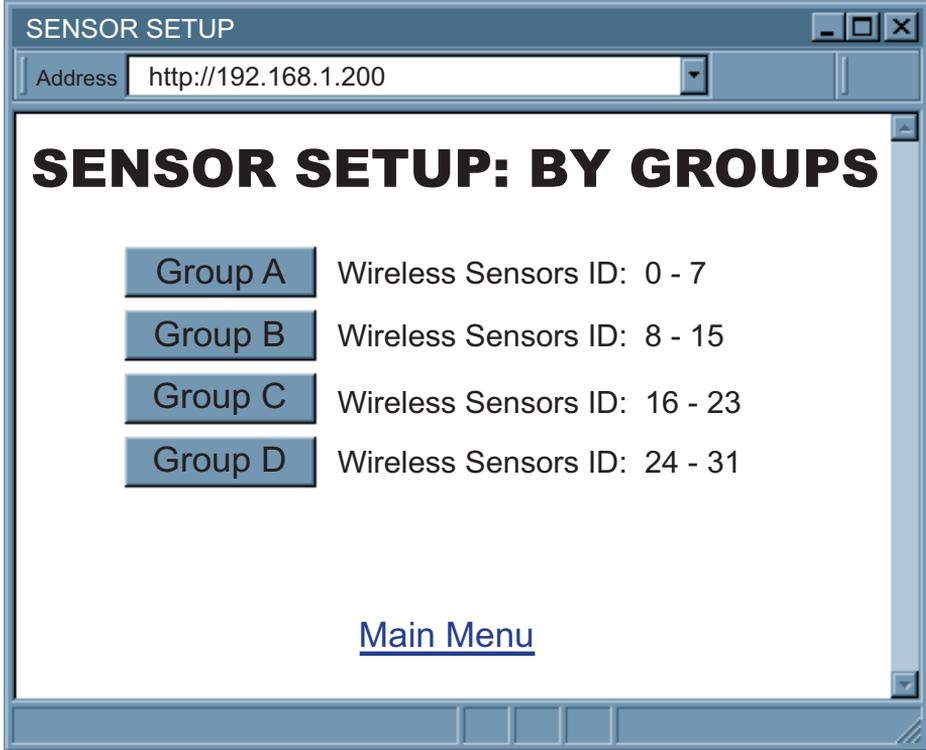


Figure 4.15 Sensor Setup by Groups

The Sensor Setup Page is for configuring the Connector/Transmitter parameters such as Name and Update Rate.

4.3.7 Sensor Setup (continued)

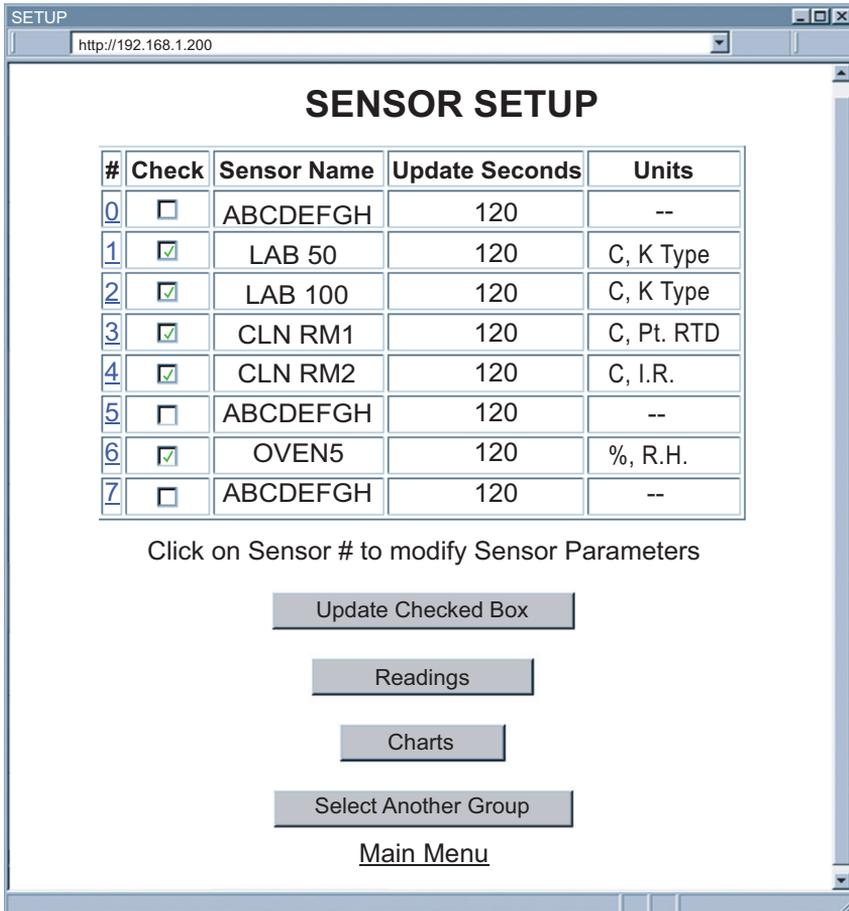


Figure 4.16 Sensor Setup

#: Sensor ID/address configured on the Connector/Transmitter. Click on the number to view and modify Sensor Parameters. See **Figure 4.17**.

Check: Each check box controls whether or not readings from the Connector / Transmitter will be outputted. If unchecked, the readings from the Connector/Transmitter will not be displayed on the "Readings", "Chart" and "Diagnostic" pages nor it will be reported through Telnet.

Sensor Name: Name of a Connector/Transmitter shows on the "Readings" and "Chart" pages, this is a text field and can take up to 8 alphanumeric characters.

Updates Seconds: How often a Connector/Transmitter sends its data to the Receiver.

Units: Type of data and the corresponding units. Units of measurement from sensors inside a Connector/Transmitter that has joined the network will be displayed. [°C, °F or %].

Update Checked Box: After checking/unchecking the boxes, make sure this is clicked to save the changes.

4.3.7 Sensor Setup (continued)

SENSOR PARAMETERS

Address

SENSOR PARAMETERS

Sensor #2, Group A

Sensor Name

Update (seconds)

Offset1 (xxxx.x) (C)

Offset2 (xxxx.x) (C)

[Main Menu](#)

Update (seconds)

Offset1 (xxxx.x) (%)

Offset2 (xxxx.x) (C)

Offset3 (xxxx.x) (C)

Note If there is an RH sensor, this section is slightly different.

Figure 4.17 Sensor Parameters

Sensor Name: Name of this Connector/Transmitter.

Update (Seconds): How often this sensor is sending its data to the Receiver. This update corresponds to the sampling rate configured by using the Configuration Wizard. For detailed steps on how to configure the sampling rate, please refer to **Section 4.1 of the UWTC Manual**. Non zero update rate will enable success calculation and lost detection features. Update rate should reflect the actual blinking interval in order to enhance the accuracy of success calculation and lost detection.

Note

Update on the webpage means how often the Receiver expects a reading coming from a Connector/Transmitter. The Receiver uses this Update to detect lost condition and calculate success rate. It is purely used by the Receiver only, and the Connector/Transmitter does not recognize the Update on the webpage. Therefore, changing Update will not change the actual sample rate stored on the Connector/Transmitter.

Note

For a more accurate success rate and lost packet information, it is necessary to change the default "update second" to the actual sampling rate of the Connector/Transmitter. If you desire to lock this information in your Receiver, DIP switch #1 should be turned **ON**. Otherwise, in the case of a power outage the default "update second" will go back to default.

Offset: If it is determined that the readings are slightly off, the user can manually assign numerical values to adjust the readings for temperature (in °C), humidity (in percentage), and dewpoint (in °C). The offset value can either be a positive or a negative number with one decimal point

Update: Saves changes.

Reset Value: Ignores changes and puts previous values back in the fields.

Cancel: Ignores all the changes and goes back to the "Sensor Setup" page.

Reset Sensor: Reset the Connector/Transmitter readings and status. Its data will be cleared immediately.

Select Another Group: Go back to the group selection page to setup sensors.

4.3.8 Access Control

This section describes the "Access Control" page of the Wireless System Web interface. This page allows the users to set up the network and security parameters of the Wireless System.

At the initial entrance to the "Access Control" page you may be prompted for the LOGIN Password (see **Figure 4.6**) prior to an ADMINISTRATOR Password.

The screenshot shows a web browser window titled "ACCESS CONTROL" with the address bar displaying "http://192.168.1.200". The main content area features the heading "ACCESS CONTROL" in large, bold, black letters. Below the heading are several input fields with their current values: Login Password (12345678), Admin Password (00000000), Host Name (z85C4), MAC Address (00:03:34:00:85:C4), IP Address (192.168.1.200), Gateway Address (0.0.0.0), and Subnet Mask (255.255.255.0). Below these fields are three buttons: "Save", "Reset", and "Network Reset". At the bottom of the form area is a blue link labeled "Main Menu".

Figure 4.18 Access Control

Login Password: This allows users to access and modify all of the Wireless System Home Page menu items, except "Access Control", which requires an Administrator password. The default Login password is **12345678**. This password can be up to 16 alpha-numeric case-sensitive characters.

If there is no Login Password assigned (blank box) the Wireless System will not require a password to access and modify the Wireless System Home page menu items.

Admin (administrator) Password: This allows users to access and modify the "Access Control" page. The default password is **00000000**. This password can be up to 16 alpha-numeric case-sensitive characters.

If there is no Administrator Password assigned (blank box) the Wireless System will not require password to access and modify "Access Control" page.

Host Name: Name of the server (DNS) max 16 characters, default is "z" and the last 4 digits of the MAC address. Refer to **Section 3.4**, DNS.

4.3.8 Access Control (continued)

MAC Address: This is also called Hardware address or Ethernet address, which is assigned to the Receiver at production. The MAC (Media Access Control) address is the Receiver's unique hardware number and is not changeable.

IP Address: The IP (Internet Protocol) address is a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Ethernet or the Internet. The Receiver's default IP address is **192.168.1.200**. The Receiver's IP address should be changed to fit user's networking environment. Consult with your IT department for obtaining an IP address.

 **Note** The DHCP will be enabled in the Receiver if its IP address is set to **0.0.0.0**. The DHCP can also be enabled by setting the DIP switch **#3** to **ON** position.

Gateway Address: A gateway is a network point that acts as an entrance to another network. A gateway is often associated with a router, which knows where to direct a given packet of data that arrives at the gateway. If the Receiver is sending packets to another network node that is not on the same network on which the Receiver is connected, a gateway address needs to be given to the Receiver. The gateway address should be the IP address of the router connected to the same LAN to which the Receiver is connected. The Receiver default gateway address is **0.0.0.0**. Consult with your IT department for obtaining a gateway 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. The Receiver default subnet mask is **255.255.255.0**. Consult with your IT department for obtaining a subnet mask.

Save: Saves any changes for above settings.

Reset: Pressing the Reset button will set all the fields back to their original values.

Network Reset: Reboots the embedded server. Note that all updated network parameters take effect after reboot.

 **Note** Changes made in the "Access Control" page can be saved permanently by pressing the **Save** button and power recycling the Receiver (press **Network Reset** button).

4.4 Telnet Setup

In the Configuration page, set the TCP Connections to 1 - 5 other than 0, and use a telnet simulation program to connect to the Receiver (using Port 2000). The command can be sent to query the Receiver and you will get a response back.

For a list of commands refer to ASCII/TELNET commands Table in **Appendix F**.

4.5 HTTPget Program

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

Generally HTTPget is used for simply programming an IP address to the Receiver or for quickly obtaining a reading from a Connector/Transmitter.

The Receiver must be configured from the configuration web page so that the "TCP Connections" indicates any number between 1 and 5. Make sure that the Port Field number indicates 2000.

4.5 HTTPget Program (continued)

Whenever Terminal Server service (using Port 2000 by default) is required, the # of connections must be set to a value from 1 to 5. The Terminal Server mode is the recommended mode for the most reliable connection when operating with NEWPORT software or with other programs supporting TCP/IP communications. The Port 2000 access can be used with NEWPORT software and may be needed with some Receivers when you need to view readings from the web page while simultaneously collecting data through TCP/IP communications.

4.5.1 HTTPget using Port 2000

You can setup and read the information from the Receiver by using the HTTPget program. The following program can be used to read data from the embedded server firmware 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 Receiver. This file will be automatically installed when you install the MailNotifier software available on our website and CD.

Notes on using **HTTPget** :

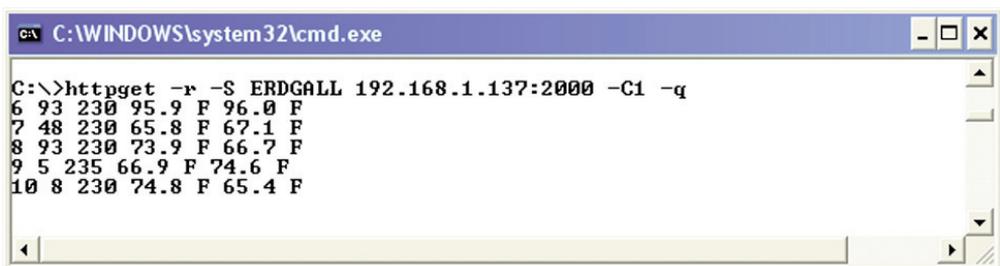
The Httpget.exe program is installed to the windows directory (usually c:\winnt or c:\windows) when installing the Mail Notifier software.

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", the program options should be displayed.
3. Next run HTTPget with the options displayed below

```
httpget -r -S ERDGALL 192.168.1.135:2000 -C1 -q
```

where:

- r -S are parameters needed for the the command string
- ERDGALL is the Telnet command (refer to **Appendix F**)
- 192.168.1.135 is an IP address
- 2000 is a socket port number
- C1 closes the TCP connection after 1 second
- q displays no error messages once the connection is closed



```
C:\WINDOWS\system32\cmd.exe
C:\>httpget -r -S ERDGALL 192.168.1.137:2000 -C1 -q
6 93 230 95.9 F 96.0 F
7 48 230 65.8 F 67.1 F
8 93 230 73.9 F 66.7 F
9 5 235 66.9 F 74.6 F
10 8 230 74.8 F 65.4 F
```

Figure 4.19 HTTPget Example of Polling Connector/Transmitter #6,7,8,9,10

4.5.2 HTTPget and ARP to Setup Device IP Address



Use the iConnect software, which may be downloaded from our website, to do these IP changes whenever possible.

Use ARP first to assign the mac address to a static IP address in computer arp table by this command:

```
arp -s 192.168.1.200 00-03-34-00-06-b6
```

Then use the following command to assign new IP to the device:

```
Httpget -r -S "00000000" 192.168.1.200:1
```

where:

"00000000" is admin. password. If the password is wrong, the unit will ignore the new IP. If the new IP is taken, you will get the message "New IP is Assigned" after the HTTPget command. The device will reset automatically.

"192.168.1.200" is an example of an IP address. It is replaced with IP address suitable for your network.

"00-03-34-00-06-b6" is replaced with your Receiver's MAC address.

4.6 ARP Protocol

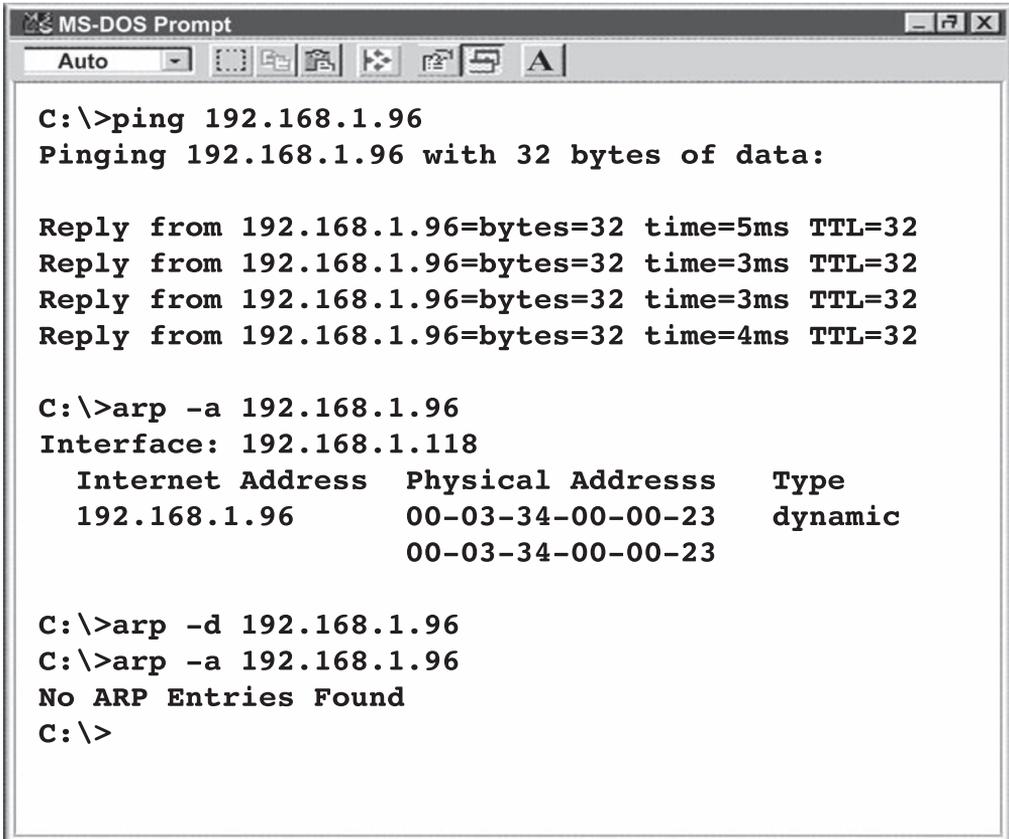
ARP is the Internet layer protocol responsible for matching or obtaining the MAC (hardware) address that corresponds to a particular IP address. The ARP command allows the user to view the current contents of the ARP cache of the local computer (residing on the same network). Microsoft includes the ARP.EXE 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** plus **IP address** → Use this command to manually delete a static entry.

4.6 ARP Protocol (continued)

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:\>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
                        00-03-34-00-00-23

C:\>arp -d 192.168.1.96
C:\>arp -a 192.168.1.96
No ARP Entries Found
C:\>
```

Figure 4.20 ARP Commands and Responses

4.7 iLog Software

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

- Download the iLog software from the website listed in this manual.
- 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).
- 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.
- For complete information of how to use the iLog software, click on the HELP button.
- There is a list of Error Messages in **Appendix E**.

Time	Dev6/F	Dev7/F	Dev8/F	Error
2/27/2008 12:24:03 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:08 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:14 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:21 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:27 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:33 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:40 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:46 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:53 PM	95.90	96.00	65.80	67.10
2/27/2008 12:24:59 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:06 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:12 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:19 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:25 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:32 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:38 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:44 PM	95.90	96.00	65.80	67.10
2/27/2008 12:25:51 PM	95.90	96.00	65.80	67.10
2/27/2008 12:26:00 PM	95.90	96.00	65.80	67.10
2/27/2008 12:26:07 PM	95.90	96.00	65.80	67.10
2/27/2008 12:26:13 PM	95.90	96.00	65.80	67.10
2/27/2008 12:26:20 PM	95.90	96.00	65.80	67.10
2/27/2008 12:26:26 PM	95.90	96.00	65.80	67.10

Figure 4.21 iLog Software Logging Data for Connector/Transmitter #6,7,8

To log dewpoint from a RH sensor, use Wireless zSeries AutoDetect/Full Device Access.

Note

4.7 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-W, iTHX-2	3 column	
iTHX-M, iTHX-SD	3 column	
iTHX-W 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-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.

4.8 Mail Notifier Software

For complete information of how to use the Mail Notifier software, click on the Help menu of the main window.

The Mail Notifier software generates email notifications for alarm conditions. Users can be notified automatically of alarm conditions monitored via internet connections throughout the world. By use of the email forwarding of alarm conditions, alarm conditions can be monitored on a network isolated from the internet and forwarded to connections on the Internet.

The Mail Notifier utility operates under Windows 98, NT 4.0, 2000, and XP in conjunction with existing email that supports the MAPI messaging interface. If MS Outlook™ has been loaded, the MAPI support should be available.

4.8.1 Installation

The Mail Notifier must be loaded on a computer running Microsoft™ Windows (versions specified earlier) using an email program that provides MAPI access. Network access must be available between this computer and the Receiver. Network access must also be available from this computer to the appropriate email server and from the email server to the recipient's email server.

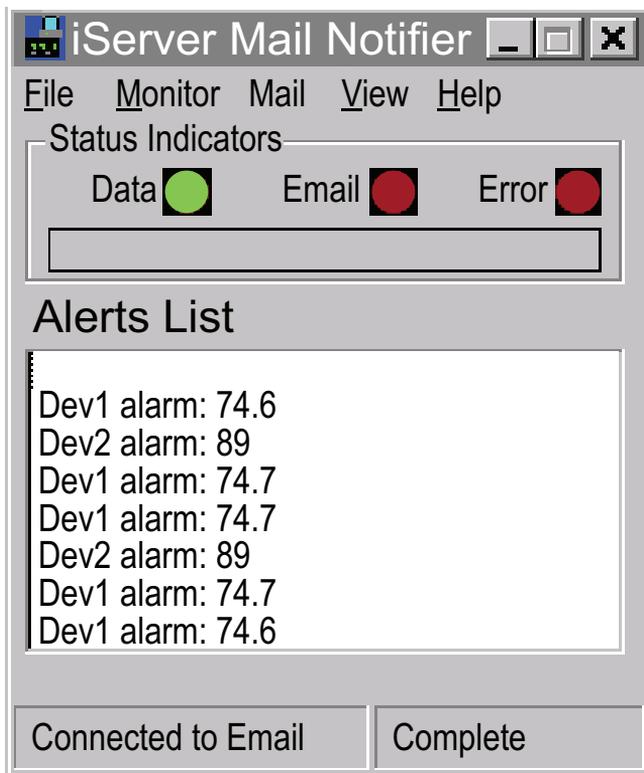


Figure 4.22 Mail Notifier Main Window

4.8.2 Program Options Setup and Configuration

Complete program setup requires:

- Entering a recipient for the email
- Specifying connection details to MAPI services.
- Defining alarms for devices, and selecting how and when the email will be active.

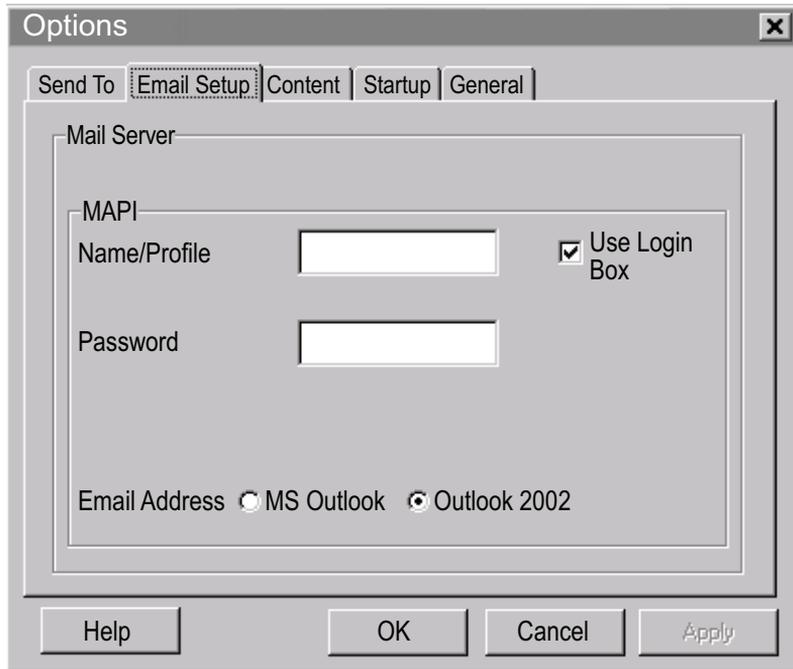


Figure 4.23 Mail Notifier Profile Setup

Email Address Setup

The email addresses must be entered using individual addresses or alias. Select "Options" from the "View" menu and enter the email addresses on the "Send To" screen. This will be the list of email addresses to which alarm notifications will be sent.

Email Setup

The Mail Notifier is compatible with original MS Outlook™ and Outlook™ 2002 to 2005.

The Mail Notifier will attempt to automatically identify whether the Outlook is a newer version. A red bar appears under the Mail Notifier splash window to confirm that the detection of the 2002 or newer version is acceptable. With the newer versions, no additional steps should be taken to enable the connection between the Mail Notifier and the Email server.

Note

MS Outlook tends to require that the users respond to a "login box" in order for email access to be activated for Mail Notifier. Some other email clients may allow for Mail Notifier to gain access without user login, as may be desired for a system recovering from a power outage. See the Help files for more information.

4.8.3 Device Setting and Configuration

Make sure that the Receiver is configured (using web access, see **Figure 4.17**) to the settings below.

TCP Connection = any value from 1 to 5

Port number = 2000 (other values may be acceptable as long as Mail Notifier is setup with the same Port number).

Then on the Mail Notifier Alarm Editor:

- 1) Set the "IP address" (for example **192.168.1.200**).
- 2) Specify "Socket Number" **2000**.
- 3) Set the "Address/RS485 Unit" to the Device ID number for a Connector/Transmitter.
- 4) Set the "Reading Cmd" using general commands in the Table below.
- 5) Define the Alarm Configuration (High/Low, High value, or Low value).

Specify Email Interval. This determines how many seconds each subsequent alarm notification will be sent.

Determine Monitor interval. This establishes the interval or time resolution in seconds for which readings will be obtained from the device.

Table 4.2 Mail Notifier Commands

Desired Value to Monitor	Reading Cmd string	Actual Command String (see Note 2)
Reading A	zRdgA	ERDB003
Reading B	zRdgB	ERDB003
Reading C	zRdgC	ERDB003
Battery voltage (mV)	zBatt	EQPE003
Signal Level	zSignal	EQPE003



1. The devices are configured in Mail Notifier with symbolic commands rather than actual device commands.
2. zRdgA with RS485 Device Unit # as 3, for example, is sent as ERDB003.
3. "Reading A" will be the first value returned for a device in response to a command such as ERDB003.

4.8.3 Device Setting and Configuration (continued)

The screenshot shows a dialog box titled "Alarm Editor" with a close button (X) in the top right corner. The dialog is divided into two main sections: "Device Info (1 of 2)" and "Alarm Configuration".

Device Info (1 of 2)

Server IP Address	192.168.1.200
Socket Number	2000
Bus Address/Device ID	3
Description	
Src ID	Dev1
Reading Cmd	zRdgA

On the right side of the Device Info section, there are four buttons: "OK", "Cancel", "Help", and "Add". Below these buttons is a checkbox labeled "Only Monitor Access to iServer device" which is currently unchecked.

Alarm Configuration

Alarm Type	Alarm High	Info Message	
Alarm High	73	Email Interval	0.05 hrs.
Alarm Low	0	Monitor Interval	0.5 min.
		Alarm Hold Time	0.0 min.

Figure 4.24 Mail Notifier Device Setting

4.8.4 Sending Text Messages to a Cell Phone

Once you install the Mail Notifier Software and configure it to work with any of our networking products, you can use the following format to have Mail Notifier 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 and use it within the Mail Notifier environment.

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.

PART 5

ENVIRONMENT / OPERATING CONDITIONS

The Connector/Transmitter/Receiver are designed to be fixed mounted and operated in a clean and dry environment. Care should be taken to prevent the components of your wireless system from being exposed to moisture, toxic chemicals, extreme cold or hot temperature that are outside the specification listed in this manual.

The following is a list of basic good practice you should apply when operating this Wireless System.

1. Do not operate the wireless device in flammable or explosive environments.
2. Do not use the wireless device in medical, nuclear or other critical application where failure can cause damage or harm.
3. Always operate the wireless device within the recommended environmental limits specified in the manual.
4. Do not operate the wireless device with a battery or AC adapter other than what's supplied or specified in this manual or on the battery compartment label.
5. Keep each wireless device at least 8 inches (20 cm) from other radio transmitters, antennas, and people.
6. The FCC approval for this device specifies the specific antenna supplied with this device.

5.1 General Deployment Guidelines

1. Position Receiver in a central location. When multiple Connector/Transmitters are in operation, position your Receiver in a central space if possible in equal distance to each Connector/Transmitter.
2. Test your system before permanent mounting. Try to move the devices to different location around and mounting angles to determine what installation achieves the best signal strength before permanently mounting the Connector/Transmitter.
3. Move your system components higher off the floor and away from exterior walls. The closer the Connector/Transmitter/Receiver are, the greater the interference and lose of signal strength will be.
4. Maintain a line-of-sight between antennas and keep Fresnel zone free of obstruction. See **Figure 5.2**.
5. Maintain a constant ambient temperature environment. Exposing your system components to extreme cold or hot temperatures, or sudden changes in ambient conditions will have an effect on the performance of your system.
6. As a general rule in buildings, head height or above is preferred. On the other hand, Connector/Transmitter which stays close to the floor may have their range reduced by 50% to 90%.

5.1 General Deployment Guidelines (continued)

7. Where possible, try to ensure an uninterrupted line-of-sight between nodes. Avoid obscuring objects (e.g. metal pillars, posts, sign) near the antenna. A close object obscures a wider range of solid angle.
8. It is important to understand that the environment may change over time due to new equipment or machinery being installed, building construction, etc. If new obstacles exist between the Connector/Transmitter and Receiver, antenna angle may need to be re-adjusted and/or the unit has to be relocated.
9. An IEEE 802.15.4 wireless network will not work under water. Wet condition (e.g. in heavy rainfall) may exhibit some degradation. In most cases, water droplets on or close to the antenna are more serious than the rain itself. Humidity can affect radio performance as well.
10. Reduced performance scenario:
 - a. A large building may have few obstructions between nodes but large amount of metallic paneling that cause reflections.
 - b. A small domestic installation may have numerous brick walls between nodes in individual rooms.
 - c. An office building may have metalized dry-wall partitions together with mezzanine ceilings.

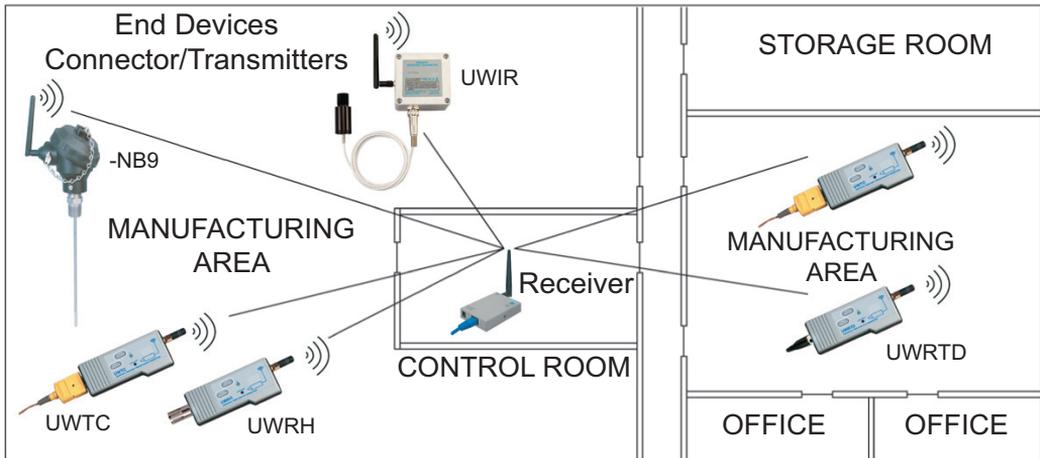


Figure 5.1 Operation in Buildings

Note E-3

Data is sent through radio signal at 2.4 GHz. Radio signals are electromagnetic waves, hence the signal becomes weaker the further it travels.

While radio waves can penetrate some solid materials like a wall, they can diminish more than when a direct line-of-sight between the transmitting and receiving antenna exist.

Therefore, it is generally a good idea to place Receiver at the center while Connector/Transmitters are located about the same distance away from it. If possible, keeping clearance around the line of site will improve performance as well.

5.2 With Line-of-Sight

When installing the Receiver it is important to position your device in such a way to optimize the antenna location within what's known as the "Fresnel Zone".

The Fresnel Zone can be thought of as a football-shaped invisible tunnel between two locations that provides a path for RF signals between the Connector/Transmitter and the Receiver.

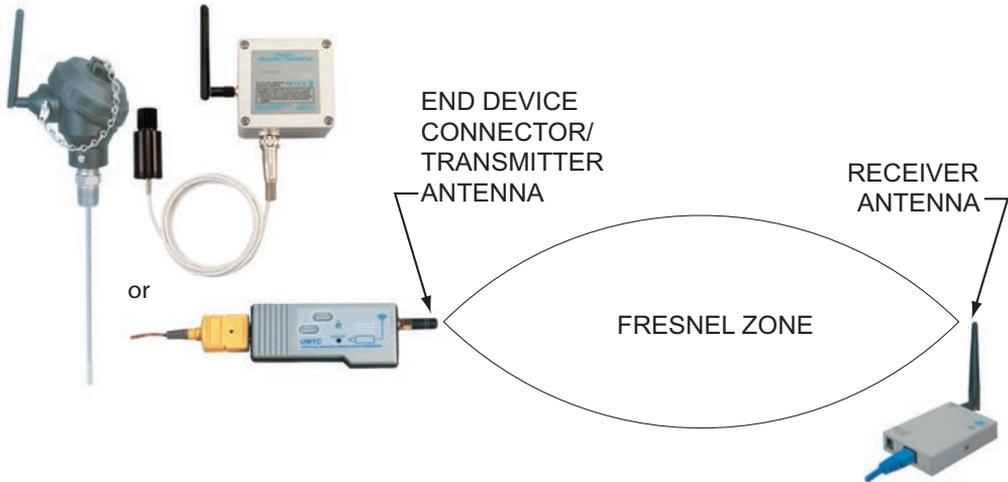


Figure 5.2 Fresnel Zone

In order to achieve maximum range, the football-shaped path in which radio waves travel must be free of obstructions.

Obstacles in the path (especially metal) will decrease the communication range between the Connector/Transmitter and Receiver.

Also, if the antennas are mounted just barely off the ground or below the ceiling, over half of the Fresnel zone ends up being obstructed resulting in significant reduction in range.

Below is the calculated radius of the football-shaped tunnel for different distance range:

Distance (feet)	Radius (feet)
100	3.2
200	4.5
300	5.5

It is recommended that within the tunnel of the above radius, at least 60% of space is free of obstruction.

Since signal reaches destination directly in a line-of-sight situation, it is important to adjust antenna properly to achieve maximum performance.

Antenna for the Receiver and Connector/Transmitter should be perpendicular to the plane where Receiver and Connector/Transmitter is located.

5.3 Without Line-of-Sight

When line-of-sight is not possible, signal penetrates and is reflected by different objects to reach the destination. Therefore, it is important to learn about how these materials would affect signal propagation.

Depending on the thickness, moisture content and angle of incidence, a wall may allow between 1% and 25% of the radio power to pass through.

Metal panel or metalized glass window will not allow much radio power to pass through. Signal will be reflected if the panel is a mirror.

Some radio power may propagate through small holes in the panel or around metal edges through the process of diffraction.

Material Type	Possible Signal Reduction
Wood, Plaster, Sheetrock, Fiberglass Uncoated Glass w/out Metal	0 to 10%
Brick, Pressboard	5 to 35%
Reinforced Concrete	10 to 90%
Metal Walls, Metal Doors, Elevators, Metal Piping, Metal Stair Cases, Metal Mesh, Metal Screening	90 to 100%

Figure 5.3 Materials in Buildings

In a non-line-of-sight situation at 2.45 GHz, it is possible to move the receive antenna only 1 to 1 1/2" (3 to 4 cm) and see signal strength varies from 6 dB to -20 dB due to multiple signal reflection path. Therefore, there should be about 20 dB path loss margin to take signal fading into account.

5.4 Casing and Closure Around the Antenna

1. Metallic structure should be kept at least 0.8" (2 cm), although 2.4" (6 cm) is recommended away from the antenna.
2. Any casing that encloses the antenna should be plastic. In addition, it is also wise to avoid plastic case with dark fillers or colorants.

PART 6 SPECIFICATIONS

INTERFACE SPECIFICATIONS

Ethernet:	Standards Compliance IEEE 802.3 10Base-T (RJ45)
Supported Protocols:	TCP/IP, ARP, ICMP, DHCP, DNS, HTTP, and Telnet
LED Indicators:	Network Activity, Network Link, Diagnostics, Receive and Power
Management:	Device configuration and monitoring through embedded WEB server
Embedded WEB Server:	Serves WEB pages (Java™ Applets) containing real-time data and live updated charts within definable time intervals.

WIRELESS COMMUNICATION

Standard:	IEEE 802.15.4, DSSS
Frequency:	2.4 GHz (2410 MHz), 12 Channels
Network Topology:	Star Topology
Radio Power Output:	100 mW (20 dBm), 10 mW (10 dBm)



Limitations on Equivalent Isotropic Radiated Power (EIRP) levels in the European Community and other countries applies. An improper combination of power level can result in an EIRP above the allowed amount per regulations. See **Appendix H**.

Data Rate:	Bit rate 250 Kp/s; Symbol rate 62.5 Symbol/s; Chip rate 2000 kchip/s
Modulation:	Orthogonal Quaternary Phase Shift Keying (O-QPSK)
Receiver Sensitivity:	-100 dBm
Range:	The range depends on the specific Connector/Transmitter used. Refer to the UWTC Manual for more specifications.



The range assume a Line-of-Sight (LOS) between the Receiver and Connector/Transmitter without obstructions or interference at which the diagnostic signal strength web interface registers approximately 25%.

Antenna Frequency:	2400 to 2500 Mhz
Impedance:	50 ohm
Connector:	Reverse Polarity SMA Plug

POWER

Power Input:	9 to 12 Vdc
Consumption:	2.5 W max.
Safety Qualified ac Power Adapter (included)	
Nominal Output:	9 Vdc @ 0.5 A
Input:	100 to 240 Vac, 50/60 Hz

ENVIRONMENT

Operating Temperature:	0° to 70°C (32° to 158°F) 90% RH, non-condensing
AC Power Adapter:	0° to 40°C (32° to 104°F)
Storage Temperature:	-40° to 125°C (-40° to 257°F)
Antenna, AC Adapter:	-20° to 70°C (-4° to 158°F)

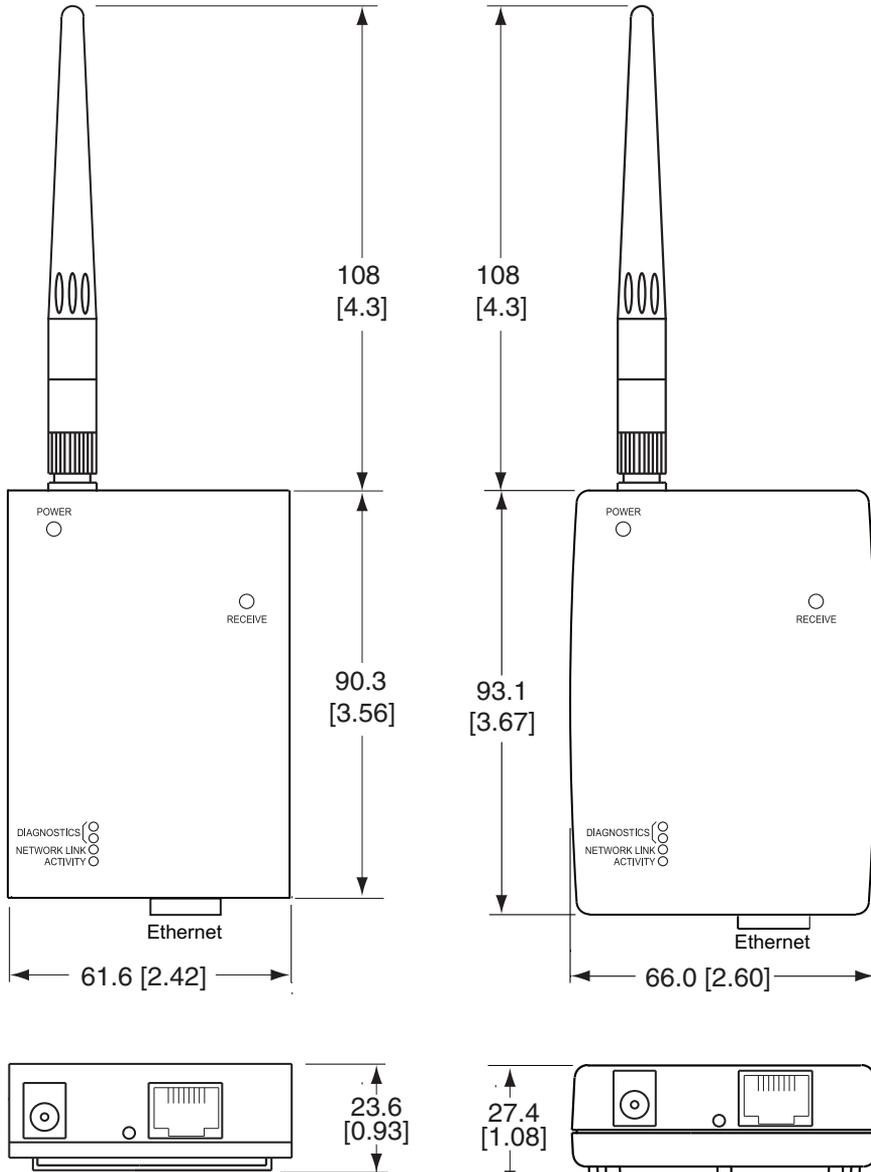
SAFETY & REGULATORY COMPLIANCE

Safety:	EN 60950-1:2006 (IEC 60950-1: 2005) Safety requirements under article 3.1a of the R&TTE
EMC:	EN 301 489-1 V1.6.1:2005-09 Electromagnetic compatibility article 3.1.b of the R&TTE; EN 301 489-17 V1.2.1:2002-08 Electromagnetic compatibility article 3.1.b of the R&TTE EN 55022:2006 + A1:2007, Class B, (CISPR 22 +A1:2005)
Radio:	EN 300 328 V1.7.1:2006-10 Spectrum article 3(2) of the R&TTE
FCC:	Part 15C, Class DTS Intentional radiator tested for 15.205, 15.209, 15.247(d), 15.215(c), 15.247(a)(2), 15.247(b), 15.247(e). See Appendix H . This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The product herewith complies with the essential requirements and other relevant provisions of the R&TTE Directive 1999/5/EC, the EMC Directive 2004/108/EC, and the Low Voltage Directive 2006/95/EC, and carries the CE- marking accordingly. The following Mark  is affixed to this equipment. See Appendix H . The declaration is available at the website listed on the cover page of this manual.

GENERAL

Software: The software packages available for the Wireless System products are **iConnect** (configuration software for the Ethernet interface), **iLog** (Excel-based software for automatic data logging), and **Mail Notifier** (email alarm notification software).

PACKAGING



Version A: Metal Enclosure

Version B: New Plastic Enclosure

Figure 6.1 Dimensions of the Receiver

PART 7
FACTORY PRESET VALUES

PRESET PARAMETERS	FACTORY DEFAULTS
IP Address	192.168.1.200
Gateway Address	0.0.0.0
Subnet Mask	255.255.255.0
Device Host Name	z and last 4 digits from the MAC address
Login Password	12345678
Admin Password	00000000
DHCP	Disabled
Web Server	Enabled
TCP Connections	1
Port #	2000
Network ID	13106 (0x3332)
Channel	12
Name	UWTC-REC3
Connector/Transmitter Name	ABCDEFGH
Check Box	Checked
Update readings (seconds)	120 seconds
Temperature Unit	C
Offset1, Offset2, Offset3	0

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.

SMTP Simple Mail Transfer Protocol is an Internet standard for electronic mail (email) transfer across the Internet. SMTP clients usually use SMTP to send email messages by specifying the SMTP server. The email server uses SMTP to both send and receive email messages.

SNMP Simple Network Management Protocol is a network monitoring protocol to monitor devices connected to an Ethernet Network.

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

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 D

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 D**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 E**iLog Error Messages**

Error #	Description	Note
-8003	User stopped logging readings.	
-10005	Failed to find the Receiver.	Ethernet cable is disconnected, Receiver 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 Receiver 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.

Appendix F ASCII / TELNET COMMANDS TABLE

Command	Device / Group ID	Description (see notes below if *)	Example
ERDB	Device ID: 000 – 031	Get sensor readings of Connector/ Transmitter	Get reading for sensor 15, ERDB015
ERDR	Device ID: 000 – 031 Reading/parameter: a-s *4	Get individual reading or parameter	Get the first temp. reading for sensor 1, ERDR001c
ERDG	Group ID: 00A-00D, ALL *5	Get sensor readings of a group / groups of sensors	Get readings for all group B, ERDG00B
EQNF	Device ID: 000 – 031	Get name, *3 status of Connector / Transmitter	Get name, for sensor 15, EQNF015
EQNG	Group ID00A-00D, ALL	Get name, *3 status of a group / all groups of sensors	Get name, for all sensors, EQNGALL
EQPE	Device ID: 000 – 031	Get sleep period, battery voltage, signal strength, success, network address and parent address of Connector/Transmitter	Get sleep period, for sensor 15, EQPE015
EQPG	Group ID: 00A-00D	Get sleep period, battery voltage, signal strength, success, network address and parent address of a group / all groups of sensors	Get sleep period, of group B, EQPG00B
ESPD	Device ID: 000-031, ALL	Set the sleep period for Connector/ Transmitter / all sensors *1	Set sensor 15's sleep period to 30 seconds, ESPD015 30
ESNM	Device ID: 000 – 031	Set the name of Connector/Transmitter *2	Set the name of sensor 15, ESNM015 z15
ERST	Device ID: 000 – 031, ALL	Reset Connector/Transmitter/all sensors	Reset all sensors, ERSTALL
CRST		Reset wireless network	Reset network, CRST
CSTS		Get personal network ID, channel, and the state of network stack	Get network information, CSTS
FACTORY AdminPassword		Sets the Receivers Ethernet configur- ations to Factory Defaults	FACTORY xxxxxxxx xxxxxxx is the Admin Password

*1 Argument: 1 – 32767 (1 seconds to about 9 hours)

*2 Argument: xxxxxxxx (8 characters)

*3 and *4 See the following page

*5 Refer to **Section 4.5.1** HTTPget using Port 2000

Appendix F ASCII / TELNET COMMANDS TABLE (continued)

* An example of the status of a Connector/Transmitter

Command: **EQNG00A**

Response: **7 EngrLAB 01000000 2.0**

7 is the Device ID (DID) of the Connector/Transmitter.

EngrLAB is the name for the Connector/Transmitter.

“01000010” is the bitmap representation of the internal state. The meaning for each bit is described below (bit 7 starts from the left).

Bit 7 shows if the sensor is plugged into the Connector/Transmitter. ‘1’ means there is no sensing device detected.

Bit 6 shows if the communication to the Connector/Transmitter is lost. ‘1’ means there has not been any data received from that particular Connector/Transmitter for 1 minute or 4 times the update rate, whichever is a longer time interval.

Based on the above information, Connector/Transmitter # 7 has not been communicating with the Receiver.

Reading/parameter for ERDR commands

Options (lower case)	Reading/parameter
a	Sequence number
b	Device type
c	First reading
d	Second reading
e	Third reading
i	Update rate
j	Battery voltage
k	Signal strength
l	Success rate
q	Name
r	Status

Connector/Transmitter Types

UWTC B Type TC	221	UWTC K Type TC	230
UWTC C Type TC	222	UWTC N Type TC	233
UWTC E Type TC	224	UWRTD	235
UWRH	227	UWTC R Type TC	237
UWIR	228	UWTC S Type TC	238
UWTC J Type TC	229	UWTC T Type TC	2

Appendix G Frequently Asked Questions (FAQ)

Q: Java applet is not loaded?

A: Check Java Setting (icon in Control Panel). Make sure cache is disabled and your web browser is enabled for Java.

Q: I do not see any readings even if the applet is loaded, what could be wrong?

A:

- 1) Check if the battery is still good. You should be able to see the LED when you power the Connector/Transmitter on.
- 2) Make sure that there is no Connector/Transmitter with the same Device ID.

Q: What are the error messages that appear on the “Reading”, “Chart”, and “Diagnostic” pages?

Open

A: It means that the Connector/Transmitter cannot detect any process sensors.

Check the connections for the process sensor.

Lost

A: It means that the Connector/Transmitter found the Receiver when it was powered on, but it cannot communicate with it currently.

Make sure the Receiver is powered on, DIP switch **#1** (of the 8-DIP switch) on the Receiver is ON, and there is no obstructive objects blocking the communications path (see **Section 5** for more details). If the obstructive object is only temporary, you will get the sensor readings once the path is open.

Q: Nothing happens when I click on the Data Logging button, what could be wrong?

A: The Java policy file is not setup properly. Make sure you get a Java policy file and copy it to a folder in the host computer. Then input the java runtime argument in Java Setup (Control Panel) with the appropriate path to the policy file. Close all web browser and re-open the applet again. See Java Setup **Section**.

Q: The Chart trend line for all the variables are broken, what could be wrong?

A: It indicates that a TCP connection to the Receiver was timed-out and no data was obtained. Make sure the Receiver is still on in the network and powered up. If there are too many broken lines, it may indicate that the network load is too heavy.

Q: The trend line for one of my sensors inside one Connector/Transmitter is broken, what could be wrong?

A: It indicates that TCP connection to the Receiver is good but the Receiver did not have any readings from the corresponding Connector/Transmitter. Make sure Connector/Transmitter is still blinking according to the update rate. It could be caused by a reset/power cycling of the Receiver as well.

Appendix G Frequently Asked Questions (FAQ) (continued)

Q: Nothing happens when I click on the Save Current Graph button, what could be wrong?

A: The Java policy file is not setup properly. Make sure you get a Java policy file and copy it to a folder in the host computer. Then input the java runtime argument in Java Setup (Control Panel) with the appropriate path to the policy file. Close all web browser and re-open the applet again. See Java Setup **Section**.

Q: Nothing is shown inside the Diagnostic page/applet, what could be wrong?

A: The first thing you want to try is to click your mouse right inside the box. Then minimize and restore the web browser. Try to move the scrollbar as well. If nothing works after about a minute, check the TCP connection to the Receiver.

Appendix H Warnings and Regulatory Information



In order to comply with FCC radio frequencies (RF) exposure limits, dipole antennas should be located at a minimum 7.9" (200mm) or more from the body of all persons.

This device complies with part 15 rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation.

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

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



The following alert sign indicates that there are restrictions on usage of the equipment in regards to power limitations on Equivalent Isotropic Radiated Power (EIRP) levels in the European Community.

The following are user restrictions:

- Wideband Data Transmission Systems on the band 2400 to 2483.5 MHz in Europe is limited to a Maximum of 10 mW (10 dBm) for Direct Sequence Spread Spectrum (DSSS). See Annex 3 of ERC/REC 70-03, decision ERC/DEC/ (01)07.
- Combinations of power levels and antennas resulting in a radiated power level above 10 mW - EIRP for Direct Sequence Spread Spectrum (DSSS) devices are considered as not compliant, and are not allowed for use within the European Community and other countries that have adopted the European R&TTE directive 1995/5/EC or the CEPT recommendation ERC/REC 70-03 or both.
- The users in Europe are instructed to change the default 20 dBm level to 10 dBm via the Web Interface of the Meter/Receiver.

UNIT'S MAXIMUM POWER LEVELS AND ANTENNA GAINS

	Antenna Gain	SMA Connector Output, Max	Maximum Radiated
U.S.A (Regulatory 1000mW (30dBm))	2.0 - 2.2 dBi	18.0 dBm	20 dBm
EUROPE (Regulatory 10mW (10dBm)) (DSSS)	2.0 - 2.2 dBi	7.0 - 7.5 dBm	10 dBm



The default 20 dBm must be changed to 10 dBm to comply with power level regulations. The 0.5 dBm variation depends on the internal DC power used (3V, 3.3V, 3.7V max) of the different models.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **one (1) year** from the date of purchase. In addition to OMEGA's standard warranty period, OMEGA Engineering will extend the warranty period for **one (1) additional year** if the warranty card enclosed with each instrument is returned to OMEGA.

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 which wear are not warranted, including but 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 it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS 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.

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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 product, and
3. Repair instructions and/or specific problems relative to the product.

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