RICE LAKE 802.11b Ethernet Access Point User Guide

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RICE LAKE WEIGHING SYSTEMS

RICE LAKE 802.11b Ethernet Access Point

OVERVIEW

Introduction

The Ethernet option provides the ability to connect a crane scale directly to a PC, a corporate network or the internet.
The Ethernet option is available as either wired 10/100Base-T or wireless 802.11b network interface.
Communication with the scale is accomplished with Ethernet TCP/IP protocol, bypassing the more complex serial communications of RS-232.
Manuals and additional resources are available from the Rice Lake Weighing Systems website at **www.ricelake.com** Warranty information can be found on the website at **www.ricelake.com/warranties**

Safety Signal Definitions:

- Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.
- Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.
- Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.
- Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

WARNING

- Failure to heed could result in serious injury or death.
- Do not allow minors (children) or inexperienced persons to operate this unit.
- Do not stand near a load being lifted as it is a potential falling hazard. Keep a safe distance.
- Do not use for purposes other then weight taking or dynamic load monitoring.
- Do not use any load-bearing component that is worn beyond 5% of the original dimension.
- Do not use any associated lifting product if any of the load-bearing components are cracked, deformed, or show signs of fatigue. Do not exceed the rated load limit of the associated
- Scale/Dynamometer unit, rigging elements, or the lifting structure.
- Do not allow multi-point contact with the hook, shackle, or lifting eye of the associated Scale/Dynamometer unit.
- Do not allow high torque on the Scale/Dynamometer unless it is specifically designed for high torque.
- Do not make alterations or modifications to the unit or associated load-bearing devices.
- Do not remove or obscure warning labels.
- For guidelines on the safe rigging and loading of overhead scales and dynamometers, see the MSI Crane Scale Safety and Periodic Maintenance Manual (PN 153105).

Quick Start

1. Connect to the network with an unsecured 802.11b access point

Figure 1-1. Quick Start - Connecting to the Network

2. Access the Scale Discovery Utility (Section 2.5 on page 4).
3. Scan the network for the crane scale.
4. Configure the IP settings (see the network administrator if the information is unknown).
5. Open the web interface and configure the network and security settings as necessary.

6. Reboot the Ethernet interface to apply the settings (allow at least one minute for reboot).
7. Scan the network to confirm settings have applied.
8. Open a connection from any TCP/IP client (Windows® Hyper-Terminal or other terminal emulation program, telnet) to confirm communications.

Installation

Ethernet 10/100 Base-T Connection

The Ethernet interface defaults to use Dynamic Host Configuration Protocol (DHCP) for obtaining an IP address. It is not necessary to be running a DCHP server to discover the scale device on network. The Scale Discovery Utility uses multi-cast IP to discover and configure the device. Once the device has an IP address, the further configuration can be done via the web page interface if necessary. The Ethernet connection can be made to the network via a hub or switch, or can go directly to a computer Ethernet port using a crossover Ethernet cable. For details, please reference the networking hardware manual, or contact the network administrator.

Cabling

Rice Lake Weighing Systems provides a field-installable mating connector (PN 144622) that allows customers to interface with their own Ethernet cabling. The connector accepts cables up to 8 mm.

Cable Assembly

1. Slide the pressure nut (item 1) and the housing (item 2) over the cable (Figure 2-1–A).
2. Strip the cable sheath over a length of approximately 1” (28 mm). Trim the braided shield to a length of approximately 1/2” (12 mm) (Figure 2-1–B). See Table 2-1 for the core assignment.
3. Guide the individual cores fully into the marked chambers. Make sure to use the correct chambers and only one core per chamber (Figure 2-1–C).
4. Contact the cores by pressing the termination block (item 3) to the plug insert (item 4) according to views D and E (Figure 2-1–D and E). The termination block engages at the end stop.
5. Pull the housing (item 2) over the plug insert (item 4), hold the plug insert tight and screw the housing onto it (Figure 2-1–F).
6. Push pressure nut (item 1) on the housing. Tighten the pressure nut firmly (Figure 2-1–G).

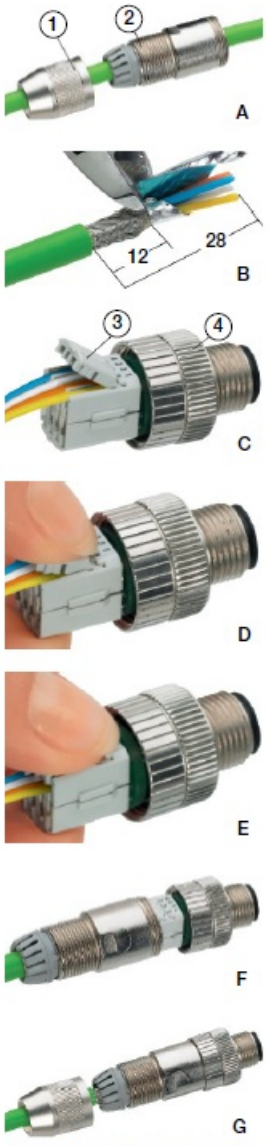

Figure 2-1. Cable Assembly

Pin	TIA 568 B Color	Function
1	White/Orange	TD+
2	Orange	TD-
3	White/Green	RD+
4	Green	RD-

802.11b Connection

The 802.11b interface defaults to an unsecured connection. This allows the device to connect to any unsecured network for configuration. Once connected to an unsecured network, any secure network settings can be applied and the unit will operate on the secure network from that point on.

Information on configuring the wireless security settings can be found in the web interface, wireless settings (Section 2.6.1 on page 7).

Configuring Network Settings

Network settings can be configured from the Scale Discovery Utility, or by opening a web page and pointing it to

the scale device address. The network configuration is specific to every network. Please consult the network administrator for this information.

Scale Discovery Utility

Scale Discovery Utility may need to be added to the security on the computer for the Scale Discovery Utility to run (Section 3.2 on page 9). Download the Scale Discovery Utility at **www.ricelake.com**

The Scale Discovery Utility can be accessed from the Rice Lake website and requires Java 6.0 or greater to run. It uses UDP port 2362 and a multi-cast IP address of 224.0.5.128. These must be enabled on the firewall for the Scale Discovery Utility to work. They are typically enabled by default. The program is loaded from the web page via Java Web Start technology. This ensures that whenever the program is started, the latest version is being used.

1. Open the Scale Discovery Utility.

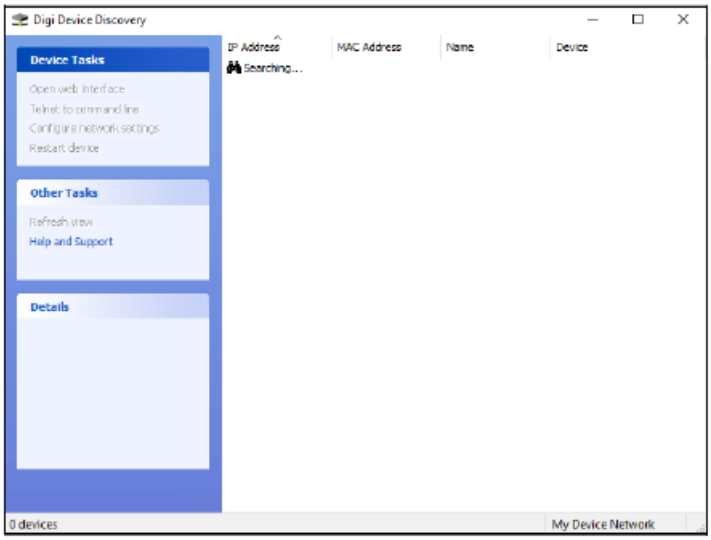

Figure 2-2. Scale Discovery Utility

2. Select Scan Network for the scale. The scan should take about five seconds and when complete, a list of the scales found is displayed.

   Note: Allow the network interface a minute or two to boot up and acquire an address once the scale is first turned on.

3. Select Device Information to view information about the Ethernet interface.

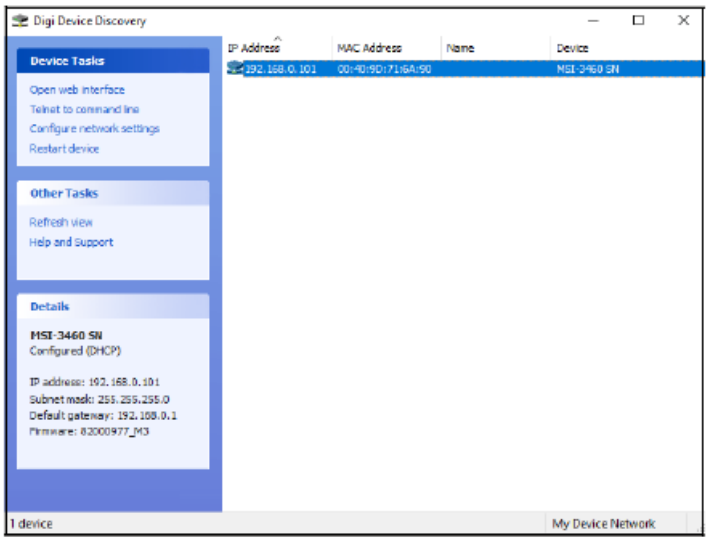

Figure 2-3. Scale Discovery Utility - Device Information

4. Press Configure. A Device Configuration dialog box displays.
5. Select to Automatically adjust the network settings via DHCP or Manually configure network settings.

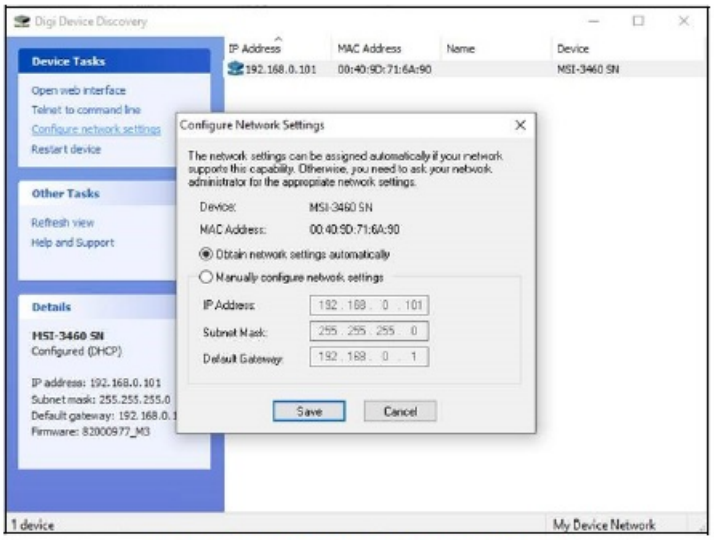

Figure 2-4. Scale Discovery Utility - Configure

6. Press OK to send the configuration to the scale.
7. Press Reboot Device.
8. Rescan the network to find the device with the new settings.

Web Interface

The Scale Discovery Utility provides a quick link to Open Web Interface to the scale. This section details the web interface. The web interface can be accessed after a device has been configured.

1. Navigate the web browser to the URL http://{ipaddress}/. The login screen displays.

Figure 2-5. Web Interface Login

2. Login with:

   Username – msi

   Password – 0199

   After logging in the screen in Figure 2-6 displays.

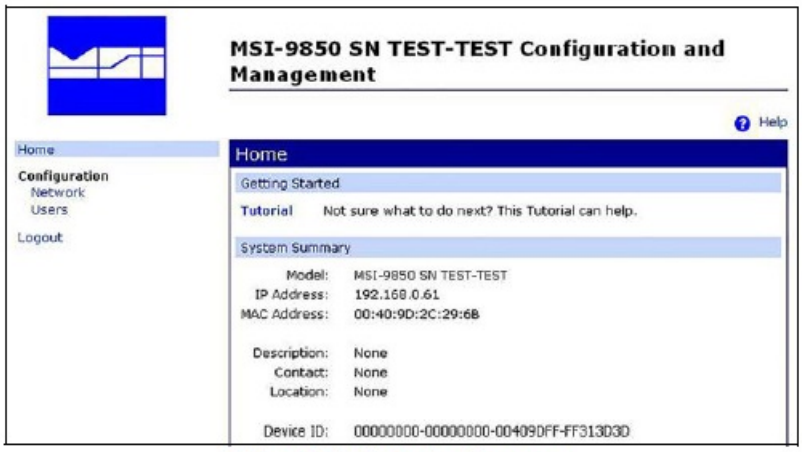

Figure 2-6. Web Interface Homepage

3. Select Network from the menu to configure the network interface. The Network Configuration menu displays.

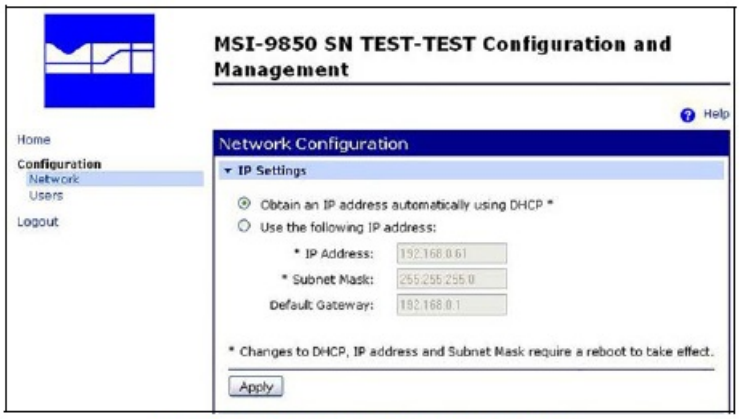

Figure 2-7. Web Interface Network Configuration

4. Enter the network settings and select Apply when complete. The device will prompt to reboot and after rebooting, the new settings take effect.

Wireless Settings

Wireless settings are configured on three pages accessible via the web interface.

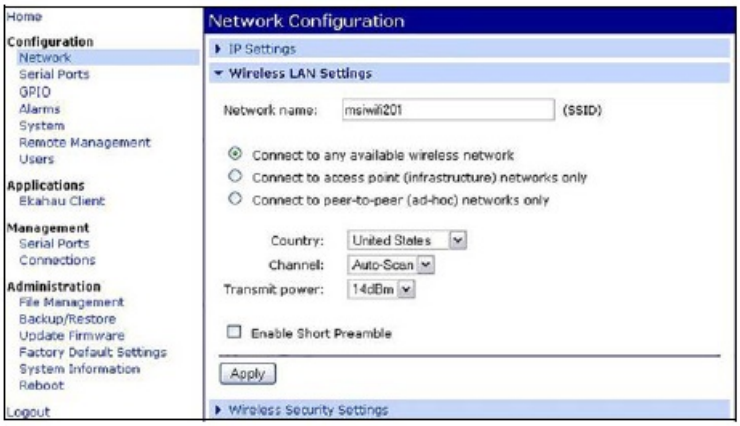

Figure 2-8. Wireless LAN Settings

Enter the Network name and Channel of the network the scale will be connected to. Wireless Security Settings are configured via the web interface. The following is a summary of the supported wireless security capabilities.

- WEP (Wired Equivalent Privacy)
- 64/128-bit encryption (RC4)
- WPA/WPA2/802.11i

- Strong SSL 3.0/TLS 1.0 based encryption

DES (56-bit), 3DES (168-bit), AES (128/256-bit)

- 128-bit TKIP/CCMP encryption
- 802.1x
- EAP authentication

LEAP (WEP only), PEAP, TTLS, TLS
GTC, MD5, OTP, PAP, CHAP, MSCHAP, MSCHAPv2, TTLS-MSCHAPv2

- Enterprise and Pre-Shared Key (PSK) mode

Wireless 802.1x Authentication Settings – After the wireless interface is configured, IP settings can be reconfigured with the Scale Discovery Utility (Section 2.5 on page 4).

Installation without Supporting Network Infrastructure
n some situations a network infrastructure may not be available. For example, a scale needs to communicate to a computer running Microsoft Windows Operating System, and the access point (or switch) is configured to bridge mode and does not provide DHCP services. This configuration may require additional support software to configure the scale network interfaces. The following procedure helps with this type of system.

1. Configure MS Windows as DHCP server

   Install the program Open DHCP Server (http://dhcpserver.sourceforge.net/)

   Edit the configuration file as necessary; The following is a basic configuration:

   [LISTEN_ON]

   192.168.0.1

   [RANGE_SET]

   DHCPRange=192.168.0.10-192.168.0.254 [GLOBAL_OPTIONS]

   SubNetMask=255.255.255.0
2. Cycle power on the scale device.
3. Run the Scale Discovery Utility (Section 2.5 on page 4).

Note:
Running the Open DHCP Server on a computer while attached to a network with supporting services can cause errors. Be sure to disable (or uninstall) the program when not needed. For details consult the site-specific IT department.

Figure 2-9 is an example session running Open DHCP Server, local computer network interface configuration and the Scale Discovery Utility.

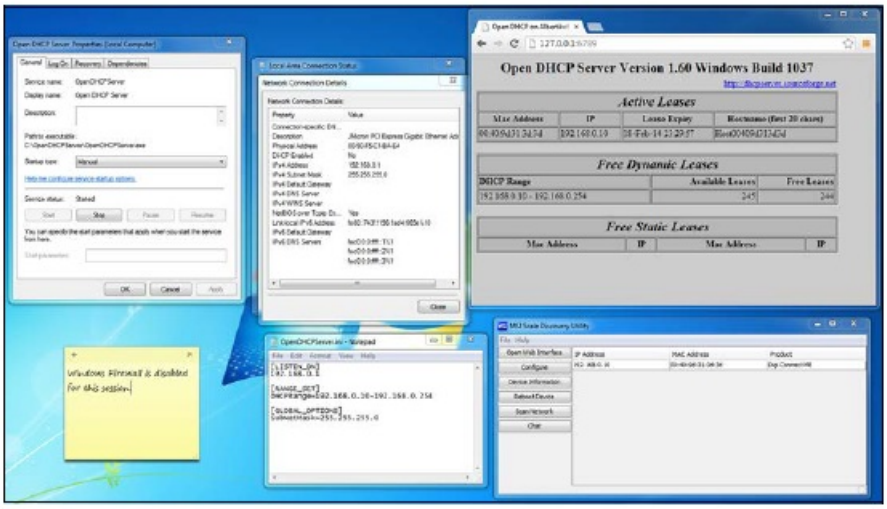

Figure 2-9. Open DHCP Server

Now that the scale is configured on the network, there is access to the scale for host communications via port 2101. The host commands provide the ability to read all aspects of weight data: Current, Gross, Net, Tare weight, Total weight, and statistics. In addition, the host command language provides the ability to configure settings in the crane scale.

Note: Complete details about host communications can be found in the specific crane scale manual.

Appendix

Using a Terminal Program
Hyper Terminal and similar utilities are communications programs that can be used to connect to an Ethernet interface for communications and testing.

1. Start the terminal program.
2. Enter a name for the connection.
3. Configure the connection to use TCP/IP.
4. Enter the device address and port number 2101.
5. The connection is now established. Use the host commands to talk to the scale or observe the continuous print string if the crane scale is configured so.
6. z To end the session save the connection and close the terminal program.

Security Settings
Java security settings may need to be modified on the computer in order for the scale discovery utility to run.

1. Open the Control Panel panel on the computer.
2. Select Programs (for category view).
3. Select Java to open the Java Control Panel.
4. Select the Security tab.
5. Click the Edit Site List… button.
6. Add the Scale Discovery Utility (Figure 3-1)

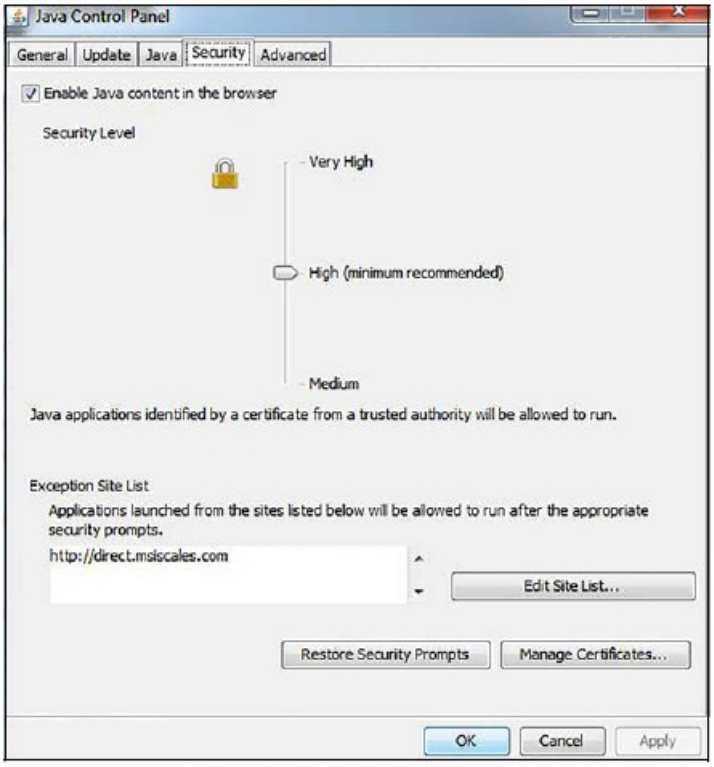

Figure 3-1. Add MSI Site to Security

FAQ

- **Question Can a program be written to talk to the scale and record weight information?**
  Answer Yes, the crane scale provides a host communication language to access all aspects of weight data and scale configuration. For full details see the specific crane scale manual.
- **Question** Can multiple computers be connected to the scale at once via the Ethernet interface?
  Answer No, the crane scale supports a single TCP/IP connection at a time.
- **Question** Can a web page be accessed to view the scale weight?
  Answer No, crane scale web page interface provides a secondary means of configuring the network settings only.
- **Question** What if Scale Discovery Utility does not find the crane scale even though it is connected to the network.
  Answer There may be some network firewall settings between the Scale Discovery Utility and the crane scale that are preventing communications. Have the network administrator check the network firewall settings to ensure UDP port 2362 and multicast IP address 224.0.5.128 are not being blocked.
- **Question** What if an error dialog message displays in the Scale Discovery Utility when Chat is pressed
  Answer Only one active connection to the scale Chat or host interface can be active at a time.
  Likely there is another program running (perhaps on another computer) that is already talking to the scale.
- **Question** Can the MSI-9750 hand-held or MSI-9850 meter be used with an 802.11b equipped crane scale?”
  Answer No, the 802.11b interface of the crane scale replaces the standard 2.4GHz radio in the CellScale product family. These radios are not compatible with each other.

Wireless Troubleshooting

The main challenge is getting the 802.11b equipped crane scale to associate with a Wireless Access Point (WAP). Once this is accomplished, the crane scale can be further configured by using the Scale Discovery Utility. The

settings below are the default settings that the crane scale will attempt to look for in an access point. Once the device has associated these settings, they can be changed, provided they are changed on the crane scale and the access point. At this point, encryption and authentication can be set up.

Access Point Settings (Case Sensitive):

- SSID: Connect
- Authentication: none (i.e. open) Encryption: none
- Channel: Auto (1, 6, 11 preferred)
- Mode: Infrastructure (as opposed to Ad Hoc) DHCP server: enabled

The device looks for an access point with an SSID of Connect. If it can not find Connect, it will then look for an Ad Hoc network with an SSID of Connect. If that fails it will then associate with the strongest unencrypted access point signal regardless of SSID. If there are more than one access point, the MSI-8000 RF Remote Display will attempt to associate with the SSID of Connect, regardless of signal strength. The device needs an access point without authentication or encryption. It will not be able to associate if either of them are enabled. It can associate with any channel, but 1, 6, or 11 are preferred (assuming North America). The device will look for an access point in Infrastructure mode. It will come up in BSS_Join mode.

Once the device has successfully associated with the access point, assuming that the module has not been assigned a static IP address, it will attempt to acquire a dynamic IP address from any available DHCP server on the network.

Other Troubleshooting Tips

- Make sure the access point is running in mixed or B mode (802.11b). If it is running in G Mode (802.11G) the device is not be able to associate with it as it can only do B mode (11 Mbps).
- If problems continue, then try to force the device to associate with the desired access point. Remove the antenna from the device and move it within a few inches of the desired access point. Check the above settings on the access point. If have any other access points in the area might want to power them off.
- Make sure the access point is not blocking multi-cast IP traffic. The Scale Discovery Utility uses multi-cast IP to find and configure scale network settings.
- Make sure the access point being used has the newest firmware loaded onto it. In rare circumstances, errors in the access point’s firmware can impede communications.

Glossary

802.3
The IEEE standard for wired Ethernet.

802.11
The IEEE standard for wireless Local Area Networks, including wireless Ethernet.

DHCP
See Dynamic Host Configuration Protocol.

Dynamic Host Configuration Protocol (DHCP)
An Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and

default router, and to provide other configuration information.

MAC address
A unique network identifier. All network devices are required to have their own unique MAC address. The MAC address is on a sticker on the Digi device server. The number is displayed as 12 hexadecimal digits, usually starting with 00:40:9D.

Multi-cast IP
A method of forwarding IP datagrams to a group of interested receivers.

TCP
See Transmission Control Protocol.

Transmission Control Protocol (TCP)
A set of rules (protocol) used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet. While IP handles the actual delivery of the data, TCP handles keeping track of the individual units of data (called packets) that a message is divided into for efficient routing through the Internet.

For example, when an HTML file is sent to from a Web server, the Transmission Control Protocol (TCP) program layer in that server divides the file into one or more packets, numbers the packets, and then forwards them individually to the IP program layer. Although each packet has the same destination IP address, it may get routed differently through the network.

At the other end (the client program in the computer), TCP reassembles the individual packets and waits until they have arrived to forward them as a single file. TCP is known as a connection-oriented protocol, which means that a connection is established and maintained until such time as the message or messages to be exchanged by the application programs at each end have been exchanged. TCP is responsible for ensuring that a message is divided into the packets that IP manages and for reassembling the packets back into the complete message at the other end. In the Open Systems Interconnection (OSI) communication model, TCP is in layer 4, the Transport Layer.

Documents / Resources

	RICE LAKE 802.11b Ethernet Access Point [pdf] User Guide 802.11b Ethernet Access Point, 802.11b, Ethernet Access Point

References

- Open DHCP Server
- Products | Rice Lake Weighing Systems
- java.com/
- Rice Lake Weighing Systems
- Training | Rice Lake Weighing Systems
- Warranties
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