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Chapter 1
Introduction

The Microcor® Wireless Transmitter (MWT) is based on RCS's Microcor technology and will provide corrosion rates and metal loss data in any process media at speeds approaching real time over a wireless network. Each MWT works as a node in a self-organizing network (mesh) to ensure consistent delivery of data. Secure and easily configurable, the self-organizing network ensures an adaptive, flexible approach to wireless data transfer.

Unlike many approaches to in-plant wireless systems which require direct line-of-sight between the instrument and the communications gateway, the RCS approach ensures network integrity by allowing MWT’s to communicate with each other. Because every device serves as a network connector there can be no single point of failure. In the event a temporary obstruction blocks a direct connection, the network automatically reroutes the signal to an adjacent device, ensuring network reliability and data integrity.

A network of MWT’s can operate as an independent system or can integrate into your existing DCS/SCADA. RCS offers the ICMS3™ Corrosion Management Systems for larger scaled systems with Amulet Software. For smaller scale systems RCS offers the Intelligent Interface Unit (see diagrams on next page).

The scope of this manual is to cover all the necessary equipment and settings required to connect your MWT to an Emerson gateway. If this manual is followed completely you will have the necessary instruction to add your MWT to an existing Emerson network, or start your own network. This manual will not cover the connection of any equipment outside of RCS equipment, nor will it cover settings not used by RCS equipment. If you wish to learn more about your 1420 Wireless Gateway and how it can operate with other devices, please reference the Emerson Gateway Manual contained on the CD that was included with the Gateway.
A network of MWT’s as an independent system

A network of MWT’s shown integrated into ICMS3, IIU, or directly to a DCS/SCADA System
Chapter 2
Required Equipment

The following lists the equipment required to correctly setup and run a network of Microcor Wireless Transmitters.

PC must meet the following requirements:

**Operating System Requirements:**
- Windows 2000, service pack 4
- Windows Server 2003 or newer
- Windows XP (Home or Professional), service pack 1 or higher (If the operating system requirement is not met, the setup will display a message and stop).

**Applications:**
- Internet Explorer 6.0 or higher
- Mozilla Firefox 1.5 or higher
- Sun Microsystems™ Java™ Runtime 1.4.1 (or newer)

If the user manual is being installed, the following application is also required:
- Adobe® Acrobat® 5.0 (or newer)

If the Network Assistant or OPC Proxy Setup utilities are being installed, the following application is also required:
- .NET Framework 2.0

If any of the above requirements are not met, the setup disc will install the following:

- Internet Explorer 6.0 service pack 1
- Sun Microsystems™ Java™ Runtime 1.5.0_10
- Adobe® Acrobat Reader® 8.0
- .NET Framework 2.0

**Hard disk space Requirements:**

- Maximum installation (including all upgrades performed by the setup disc): 250 MB

Typical installation (all features, but none of the above installed): 35 MB
Hardware Requirements:

- Ethernet port framework 2.0
- Crossover Cable
- Microcor Wireless Transmitter (MWT)
- MWT Power Module
- R-1420 Gateway
- 24Vdc Power Supply
Chapter 3
Gateway Pre-Configuration

Required Equipment
✓ 24Vdc power supply
✓ R-1420 Gateway
✓ PC with matching requirements
✓ Ethernet Crossover Cable

The first step in setting up a network of MWT’s is to configure the Gateway. This chapter explains how to setup a completely new network of MWT’s and Gateway. If you have an existing network of MWT’s and Gateway and will be adding MWT’s to an existing network, skip to Chapter 4, Programming the MWT.

PC Initialization

To configure the Gateway a local connection between a PC/Laptop and the Gateway need to be established.

1. Connect the 24 VDC supply to the Gateway, and the "crossover" network cable into the Ethernet 1 socket (right hand RJ45 Ethernet port viewed from bottom of 1420), and into the network port on the laptop/PC. Only use the right hand network socket on the Gateway that has been set to a TCP/IP address of 192.168.1.10. Once the crossover cable is connected, the network connection will take a couple of minutes to initialize.

2. The PC/laptop address and host settings need to be changed manually using the following procedure for Internet Explorer on Windows. The procedure for other operating systems and web browsers may vary slightly:

   a. On the PC/laptop, install the Java Plug-in found on the Disk 1 CD provided with the Gateway. The Plug-in can also be found at http://java.com/
b. To Establish the PC/Laptop settings navigate to **Start>Control Panel>Network Connections**.

1. Select **Local Area Connection**.
2. Right click to select **Properties**.
3. Select **Internet Protocol (TCP/IP)**; then click the **Properties** button.
4. Select the **Use the following IP address** button and set **IP address** to 192.168.1.13.
5. Set the **Subnet Mask** to 255.255.255.0.
6. Set the **Default Gateway** to 192.168.1.1.
7. Leave **DNS** fields blank.
8. Select **OK** for both the **Internet Protocol (TCI/IP) Properties** window and the **Local Area Connection Properties** window.

PC network settings screens

3. To access the web server page for the Gateway, launch Internet Explorer and enter **192.168.1.10** in the address bar.

Address bar screen
4. Due to default settings on the PC the first page will show a security warning. Click on **Continue to this website** *(not recommended)* to continue.

![Security Warning screen]

5. You will then be prompted by a login screen. The User name and Password have been preset for convenience. However, if the entries get removed or changed the User name is “admin” and the password is “default.” Click **OK** to continue.

![Login screen]
The web server home page will automatically open.

Gateway Configuration

1. Password setup
   a. Click **Setup>Security>User Accounts** to change the Gateway passwords. These passwords allow for varying levels of application access. The administrator can modify any system or field device setting. In contrast, the operator is only able to modify some parameters. Use caution when changing the administrator password. If the administrator password is lost, you will not be able to continue with the Gateway setup.

   *Note: A hard reset is available if the password is lost or an error occurs during programming. Please contact RCS technical support for assistance.*
2. Time and Date setup
   a. On the left hand side menu select SETUP then TIME
   b. Select the option to set with PC time
   c. Then click on Submit

![Time setup Screen](image)

**IP configuration**

*IT/Process Control Network Administrator or Technician can provide the following:*  
Prior to the gateway being installed and connected to a live control network, it should be configured with an IP address as well as other TCP/IP network settings.

**Required information**

- Specify an IP address, or use a DHCP server
- Hostname
- Domain Name
- IP address
- Netmask
- Gateway
1. Configure Gateway Ethernet IP settings
   a. Access the Gateway with Administrator access
   b. Navigate to Setup>Internet Protocol>Address
   c. Enter configuration information determined above
   d. To complete configuration without a firewall, click Submit and proceed with Gateway Restart when prompted.

2. Configure the Gateway for an Ethernet Network with a firewall by performing the following steps:
   a. Navigate to Setup>Security>Protocols
   b. Click to enable Modbus TCP and disable Modbus TCP Secure security protocols
   c. Click Submit and proceed with Gateway Restart when prompted.
3. Configure the Gateway Modbus settings
   a. Access the Gateway Web Interface with Administrator access
   b. Navigate to **Setup>Modbus>Communication**
   c. Configure the Gateway Modbus Communication settings to match below
   d. Click **Submit** and proceed with Gateway Restart when prompted
Network Identification and Join Key Setup

Note: please follow this section step by step to avoid any problems or future complications

1. Configure Gateway Network Name
   a. Access the Gateway with Administrator access
   b. Navigate to Setup>Network>Settings
   c. Enter Network Name only, determined prior to starting setup.
   d. To complete configuration, click Submit.

![Network Settings (highlighting Network name) screen]
2. Configure Gateway Network ID
   a. Access the Gateway with Administrator access
   b. Navigate to Setup>Network>Settings
   c. Enter Network ID only, determined prior to starting setup. Network ID should be unique to any other Gateways that may be currently installed
   d. To complete configuration, click Submit.

![Network Settings (highlighting Network ID) screen]

3. Configure Gateway Network Join Key
   a. Access the Gateway with Administrator access
   b. Navigate to Setup>Network>Settings
   c. Select the Yes indication next to Show join key this will allow you to view the join key as you enter it.
   d. Enter Network Join key only, determined prior to starting setup.
   e. To complete configuration, click Submit

![Join Key screen]

**Note: At this point you will need to complete the MWT setup before you can complete the gateway setup.**
Chapter 4
Programming the MWT-3905 (Microcor®) and MWT-3905-QS (Quicksand™)

Note: All references to the MWT are applicable to the MWT-3905-QS (Quicksand) Wireless Transmitters hereafter unless otherwise noted.

Once you have completed the pre-configuration of the Gateway you can program and add-in MWT's to the network using RCS’s Wireless Tools Software on the CD included with the Installation Kit.

Programming the MWT with Wireless Tools PC Software

Preset check list

☑ Be sure the power module is installed in the MWT prior to start of programming.
☑ Connect the communication cable (748110-9A) to both the computer and the MWT.
☑ If using USB to RS232 adapter, be sure to install supplied drivers by the manufacturer.
☑ Install Wireless Tools Software.

**Important: To preserve battery life, please ensure that the power module is removed from the MWT if it is not in use or connected to a network.**

1. Install Wireless Tools Software
   a. Insert the Setup and Installation CD that was included with the MWT Installation Kit provided with the MWT.
   b. Click Install Wireless Tools Software
c. A security warning window will appear. Click **Run**. Another Security warning window will appear. Click **Run** again.

d. The Wireless Tools Setup Wizard window will appear. Click **Next** to begin installation.

e. Click **Next** after selecting the Install directory (Default directory is recommended).
f. Click **Next** to Confirm Installation.

![Wireless Tools Confirm Installation Window]

- The installer is ready to install Wireless Tools on your computer.
- Click "Next" to start the installation.

![Wireless Tools Installation Complete Window]

- Click "Close" to exit.
- Please use Windows Update to check for any critical updates to the .NET Framework.

---

g. Click **Close** to Complete Installation.
2. Run Wireless Tools
   a. Click the **Wireless Tools** icon on your desktop or in the RCS folder of your Start Menu Programs list.

   ![Wireless Tools icon](image1)

   Or

   ![Windows Start Menu](image2)

   b. Click on **Panel Size** to set your display preference. This Manual will demo the x4 size.

   ![Panel Size](image3)
3. **Communications (Required Step)**
   
a. Click **Search Device** button to auto-detect communications port of connected MWT. The Device Information commands used include: The Hart Revision, Device Type of the Instrument, Manufacturer’s Code, Serial Number, and the Firmware Revision of the Device. The Device Information is Read Only.
b. Click **Wireless Communication** button to configure the Network ID (NW ID) and Join Key of your connected MWT. A special sequence is required for doing this configuration:

1. Click **Disconnect** and wait until the status bar shown on the bottom of the panel indicates the end of the command.
2. Input NW ID and click **Write ID**
3. Input Join Key and click **Write Join Key**
4. Click **Connect** and wait until the status bar shown on the bottom of panel indicates that connect is OK. Click **Refresh** to verify NW ID. Join Key cannot be checked.

To verify MWT/Wireless Gateway communication: Refer to Chapter 5 Section 1 or see Chapter 6 for join verification with Gateway Interface.

---

*Important: If any panel is closed[1] and re-opened[2], the Refresh[3] button must be clicked to ensure the most recent information is displayed.*
1. **Instrument**

   a. Click **Instrument Identification** button to read and write Information to the connected MWT. The Instrument Identification commands used include: The Long Tag, Short Tag, Descriptor, and Date. The Instrument commands can be configured on the Wireless Gateway interface also. A good practice for recognizing connected devices is labeling them properly (Location, Serial Number, etc.).

   1. **Long Tag**: The default value of the Long Tag is MWTxxxx, where xxxx is the Serial Number of the unit. The Long Tag can be modified to 32 characters but must be unique inside the wireless network.
   2. **Short Tag**: The default value of the Short Tag is blank. The Short Tag can be modified to 8 characters.
   3. **Descriptor**: The default value of the descriptor is blank. The Descriptor field can be 16 characters long and used for any type of description a user may need.
   4. **Date**: Manually enter the date (mm/dd/yyyy). This field can store any date the user requires.
b. Click **Configuration** button to configure Burst Interval (Measurement Interval), Probe Range, Primary Variable Units, Corrosion Rate Algorithm, and Corrosion Rate Interval. The Configuration panel is read and write enabled.

1. **Burst Interval**: Configures the interval in which the MWT's transmit measurement data to the Gateway. For initial setup, the burst interval should be set to 2 minutes. A burst rate of 2 minutes will allow multiple readings to be taken in a short amount of time for system setup. Burst rate should be changed to an interval of 10 minutes or more (RCS does not recommend a time interval below 10 minutes.) either through the Checkmate DL-W or through the Gateway Web Server. Input value must be an integer between 10 and 60.

2. **Probe Range**: Configures the span of the probe in mils. Span is displayed on actual Probe.

3. **Primary Variable Units**: Metal Loss in mils or microns.

4. **Corrosion Rate Algorithm**: Configuration allows data to be calculated in Linear Regression or 24 Hour filter Algorithm.

5. **Corrosion Rate Interval**: Configures the interval in which the MWT’s will calculate Corrosion Rate Algorithm. Input value must be an integer between 0 and 250.
c. Click **Measurement** button to read all dynamic variables. The variables used include Primary, Secondary, Tertiary, and Quaternary. The variables are read only.

**Note:** Valid readings will appear after 1 measurement interval.

1. **PV (Primary Variable):** Metal Loss in mils or microns.
2. **SV (Secondary Variable):** Corrosion Rate in mils per year or microns per year.
3. **TV (Tertiary Variable):** Instrument Temperature in deg C.
4. **QV (Quaternary Variable):** Battery Voltage in Volts.
Chapter 5
Diagnostics

1. Diagnostics (Optional)

a. Click Radio Communication button to read the join status between the MWT and the Gateway. The initial condition (disconnected) of the status code is “0000” Hex. The completed Join process is indicated by “079F” Hex code. The mode will also confirm device connection by changing status from “Active Search” to “Operational.” Please allow 5 minutes for the MWT to join the Gateway.

See Chapter 6 to view Gateway interface verification of successful join.

*Important: To update the Radio Communication panel, click the Refresh button to ensure the most recent information is displayed*
b. Click **Power Module** button to read battery power information.

1. **Capacity [%]**: This is a calculated estimate of remaining power.
2. **Remaining months at 10 Min. Intervals**: This is a calculated estimate of remaining power with the use of 10 min burst/measurement intervals.
3. **Remaining months at 60 Min. Intervals**: This is a calculated estimate of remaining power with the use of 60 min burst/measurement intervals.
c. Click **Device** button to read Device Status Information. To check proper functionality of the device, you must click on each byte to view individual bit information.

1. **Main**: Bit 7: Device OK, Bit 6: Config. OK. Bit 0-5: Unused

2. **Standard**: Bit 6: Electronics OK, Bit 5: Environmental Condition OK, Bit 4: Voltage OK, Bit 1: NVM OK, Bit 0: Normal Mode. Bits 7, 3, and 2 are Unused.
3. **Additional byte 0**: Bit 6: NVMem OK, Bit 4: NVMem2 OK, Bit 0: ROM CheckSum OK, Bits 7, 5, 3, 2, and 1 are unused.

4. **Additional byte 1**: Bit 6: Supply Voltage Level OK, Bit 4: Supply Voltage Hardware OK, Bit 3: Ambient Temperature Hardware OK, Bit 2: Ambient Temperature Limits OK, Bits 7, 5, 1, 0 are unused.
5. **Additional byte 2**: Bits 7-0 are unused.

6. **Additional byte 3**: Bit 5: Over Range OK, Bit 4: Range Time Out OK, Bit 3: Under Range OK, Bit 2: In Range, Bits 7, 6, 1, and 0 are unused.

   Note: These bits are related to fault probe detection. If values don’t match for Additional byte 3 or 4, likely there is a probe problem. Troubleshoot MWT with a test probe.

7. **Additional byte 4**: Bit 6: Corrosion Rate Calculation OK, Bit 4: Reference Voltage OK, Bit 3: Probe OK, Bit 1: Probe In Range, Bit 0: ADC OK. Bits 7, 5, and 2 are unused.
d. Click **Variables** button to read Device Variable Information. The following are standardized HART commands. Process data should be “Good” and Limit Status should be “Not Limited.”

1. **Primary Variable Status:**
   - Process Data Status: Good or Bad.
   - Limit Status: Constant or Not Limited.

2. **Secondary Variable:**
   - Process Data Status: Good or Bad.
   - Limit Status: Constant or Not Limited.

3. **Tertiary Variable:**
   - Process Data Status: Good or Bad.
   - Limit Status: Constant or Not Limited.

4. **Quaternary Variable:**
   - Process Data Status: Good or Bad.
   - Limit Status: Constant or Not Limited.
e. Click **Run Self Test** button to test EPROM, Battery Voltage, and Instrument Temperature Tests.
2. Maintenance (Firmware Updates)
   a. Click **Load Program** once a new Firmware version has been assigned. The current firmware revision is 5. This can be checked on the **Search Device** command displaying Device Information.
Chapter 6
Join Verification with Wireless Gateway

Once you have programmed all the MWT's that you will be joining to the network, you will want to verify that they are joined to the Gateway.

1. Join Verification with 1420 Wireless Gateway
   With the Wireless Gateway on and ready, open the Gateway web server page via your web browser. Click on Explorer from the left hand menu tree and wait for device(s) programmed in chapter 4 to join with green status.

   a. Once in the Explorer area you will need to locate the HART Tag (item number 1.) for the transmitter(s) you are connecting.

   Note: This may take several minutes for the MWT to connect for the first time.
b. Once you have located the **HART Tag** you will need to wait for the **HART Status** (item number 2) to turn green. Once the status goes green you will start receiving data for the PV, TV, and QV sections. The different variables sections are as follows:

**PV (Primary Variable):** Metal Loss in mils or microns.
**SV (Secondary Variable):** Corrosion Rate in mils per year or microns per year.
**TV (Tertiary Variable):** Instrument Temperature in deg C.
**QV (Quaternary Variable):** Battery Voltage in Volts.

Note: The **SV** will vary depending on the amount of time the Corrosion rate interval is setup for. The HART status will turn green after the corrosion rate interval has been reached.

When all the MWT’s show up with a green HART Status, you will now need to change the Burst Rate back to an interval of at least 10 minutes or more as noted in Chapter 4, Section 4b. From the left hand menu tree navigate to HART>Device. Highlight and then enter the new Burst Rate. Click Submit.
c. The following screen will appear. Click **Return to Form**.

![Smart Wireless Gateway](image)

- Click on “Explorer” from the left hand menu tree and wait for device(s) to show green status again. Status time will vary depending on the new Burst Rate applied.
Chapter 7
Physical Installation

Power Module Installation

Ensure that the Power Module is connected to the transmitter. Power Module (RCS P/N 748400) is intrinsically safe and may be connected/disconnected in a hazardous location.

Note:
Wireless devices should be powered up in order of proximity from the Gateway, beginning with the closest device to the Gateway. This will result in a simpler and faster network installation.
Mount the Transmitter

The Microcor® Wireless Transmitter (MWT-3905) and all other wireless devices should be installed only after the Gateway has been installed and is functioning properly. Wireless devices should also be powered up in order of proximity from the Gateway, beginning with the closest. This will result in a simpler and faster network installation.

The Microcor® Wireless Transmitter can be installed on the top, side or bottom of the line according to the probe installation. Choose the best installation configuration that corresponds to the location of the probe.

Grounding
A 8 to 14 AWG grounding wire can be attached to the transmitter at the grounding lug. Connect the ground wire to earth ground per local electrical code.

Note: Wireless devices should be powered up in order of proximity from the Gateway, beginning with the closest device to the Gateway. This will result in a simpler and faster network installation.

Direct Probe Mounting

Top of the Line

a. Attach connector and tighten connector nut to mount the transmitter to the probe adapter.
b. Rotate the antenna to vertical position.

MWT Mounted on a Cosasco Access Fitting With Retrievable Probe

MWT With a Retractable Probe Assembly
**Side of the Line**

a. Attach connector and tighten connector nut to mount the transmitter to the probe adapter.

b. Rotate the antenna to vertical position.

**Bottom of the Line**

a. Attach connector and tighten connector nut to mount the transmitter to the probe adapter.

b. Rotate the antenna to vertical position.
Optional Remote Mounting
(Bottom of the Line shown)

a. Secure the transmitter to the remote mounting post using appropriate accessories.

b. Attach connector and tighten connector nut of the optional flexible cable to the probe adapter and attach the other end to the transmitter.

c. Rotate the antenna to vertical position.

RCS Mounting Accessories
Chapter 8
Microcor® Wireless Extender

Introduction

The Microcor Wireless Extender MWT-3905-WE is used to expand the network when Microcor Wireless Transmitters (MWT) are located distances that are out of the wireless range direct to the gateway. The Wireless Extender is identical to the MWT, with the exception of the electronics measuring corrosion. The Wireless Extender integrates seamlessly with other MWT’s and Emerson Wireless devices using WirelessHART 7 protocol. The Wireless Extender can be setup and configured using RCS’s Wireless Tools Software or the convenient Checkmate DL-W Wireless Configurator for Zone 1, hazardous areas.

The setup and installation of the Wireless Extender is similar to the MWT. The following will take you through the necessary steps to easily setup and install Wireless Extenders.

1. If you have not done so already for existing or new MWT’s, you will need to pre-configure the Gateway. Please refer to Chapter 3, Gateway pre-configuration.

2. Once you have pre-configured the Gateway you will now need to program the Wireless Extenders.

Programming the Wireless Extender with Wireless Tools PC Software

Preset Check List

✓ Be sure the power module is installed in the Wireless Extender prior to start of programming.
✓ Connect the communication cable (748110-9A) to both the computer and the MWT.
✓ If using USB to RS232 adapter, be sure to install supplied drivers by the manufacturer.
✓ Install Wireless Tools Software.

**Important: To preserve battery life, please ensure that the power module is removed from the Wireless Extender if it is not in use or connected to a network.**
1. **Install Wireless Tools Software**
   a. Insert the Setup and Installation CD that was included with the MWT Installation Kit.
   b. Click **Install** Wireless Tools Software
   
   ![Image](image1.png)

   c. A security warning window will appear. Click **Run**. Another Security warning window will appear. Click **Run** again.

   ![Image](image2.png)

   d. The Wireless Tools Setup Wizard window will appear. Click **Next** to begin installation.

   ![Image](image3.png)

   e. Click **Next** after selecting the Install directory (Default directory is recommended).
f. Click **Next** to Confirm Installation.

![Image](image1)

![Image](image2)

g. Click **Close** to Complete Installation.

![Image](image3)
2. Run Wireless Tools

a. Click the **Wireless Tools** icon on your desktop or in the RCS folder of your Start Menu Programs list.

b. Click on **Panel Size** to set your display preference. This Manual will demo the x4 size.
3. Communications (Required Step)
   a. Click **Search Device** button to auto-detect communications port of connected Wireless Extender. The Device Information commands used include: The Hart Revision, Device Type of the Instrument, Manufacturer’s Code, Serial Number, and the Firmware Revision of the Device. The Device Information is Read Only.
b. Click **Wireless Communication** button to configure the Network ID (NW ID) and Join Key of your connected Wireless Extender. A special sequence is required for doing this configuration:

1) Click **Disconnect** and wait until the status bar shown on the bottom of the panel indicates the end of the command.
2) Input NW ID and click **Write ID**
3) Input Join Key and click **Write Join Key**
4) Click **Connect** and wait until the status bar shown on the bottom of panel indicates that connect is OK. Click **Refresh** to verify NW ID. Join Key cannot be checked.

Wireless Extender/Wireless Gateway communication: Refer to Chapter 5 Section 1 or see Chapter 6 for join verification with Gateway Interface.

*Important: If any panel is closed[1] and re-opened[2], the Refresh[3] button must be clicked to ensure the most recent information is displayed.*
4. Instrument
   a. Click **Instrument Identification** button to read and write Information to the connected Wireless Extender. The Instrument Identification commands used include: The Long Tag, Short Tag, Descriptor, and Date. The Instrument commands can be configured on the Wireless Gateway interface also. A good practice for recognizing connected devices is labeling them properly (Location, Serial Number, etc.).

   1) **Long Tag**: The default value of the Long Tag is MWTxxxx, where xxxx is the Serial Number of the unit. The Long Tag can be modified to 32 characters but must be unique inside the wireless network.

   2) **Short Tag**: The default value of the Short Tag is blank. The Short Tag can be modified to 8 characters.

   3) **Descriptor**: The default value of the descriptor is blank. The Descriptor field can be 16 characters long and used for any type of description a user may need.

   4) **Date**: Manually enter the date (mm/dd/yyyy). This field can store any date the user requires.

   ![Instrument Identification](image)

   b. Please refer to section b1 of Chapter 4 to configure initial burst rate (Page 22).

   c. Configuration of the Wireless Extender is now complete and should be joined to the Gateway and other Wireless devices in the network.
Join Verification with Wireless Gateway

Once you have programmed all the Wireless Extender(s) that you will be joining to the network, you will want to verify that they are joined to the Gateway.

1. Join Verification with 1420 Wireless Gateway
   a. With the Wireless Gateway on and ready, open the Gateway web server page via your web browser. Click on Explorer from the left hand menu tree and wait for Wireless Extenders that you programmed to join with green status.

   b. Once in the Explorer area you will need to locate the HART Tag (item number 1.) for the transmitter(s) you are connecting.

   Note: This may take several minutes for the Wireless Extender to connect for the first time.
c. Once you have located the HART Tag you will need to wait for the HART Status (item number 2) to turn green. Since the Wireless Extender does not have any data associated with it the PV, SV, and TV variables as well as the Burst Rate will show as null values. The QV (Quaternary Variable) is battery voltage in volts.

**Diagnostics**

For diagnostics, refer to Chapter 5, Sections 1a, 1b, 1c, and 1e only.
Appendix A
Product Certifications

Product Name: Microcor® Wireless Transmitter
Model: MWT-3905

Approved Manufacturing Location
Rohrback Cosasco Systems, Inc. — Santa Fe Springs, California USA

European Union (EU) Directives

ATEX certification

FM 09 ATEX 0018X
Ex d [ib] Class I, Zone 1, IIC, T4, Ta = -40C to +70C
Enclosure: IP66
For use only with Power Module P/N 748400
See Installation Drawing 702408 for instructions

ATEX Directive 94/9/EC

The MWT-3905 complies with the European ATEX Directive and the following standards:

EN 60079-0:2006, Electrical Apparatus for Explosive Gas Atmospheres – General Requirements
EN 60079-1:2007, Electrical Apparatus for Explosive Gas Atmospheres – Flameproof Enclosures “d”


The MWT-3905 complies with the European EMC Directive and the following standards:

EN 61326-1:2006, Electrical Equipment for Measurement and Control
EN 61000-6-4:2007, EMC Radiated Emissions
CISPR 11:2004, Industrial, Scientific, and Medical (ISM) Radio Frequency Equipment

Radio and Telecommunications Terminal Equipment Directive (R&TTE) 1999/S/EC

The MWT-3905 complies with the European R&TTE Directive and the following standards:

EN 300 328 V1.7.1:2006, ERM and EMC, Equipment Operating in the 2.4 GHz ISM Band
EN 301 489-1 V1.6:2005, ERM and EMC, Radio Equipment Common Technical Requirements
EN 301 489-17 V1.2.1:2002, ERM and EMC, Specific Conditions for 2.4 GHz Systems
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**IEC Ex Certification**

FM IEC Ex FMG 09-2004  
IEC Ex d [ib], Class I, Zone 1, IIC, T4, Ta = -40C to +70C  
Enclosure: IP66  
For use only with Power Module P/N 748400  
See Installation Drawing 702408 for instructions

The MWT-3905 complies with the following IEC standards:

- IEC 60079-0:2007, Electrical Apparatus for Explosive Gas Atmospheres – General Requirements

**Factory Mutual Approvals (FM Approvals) Certification**

The Microcor Wireless Transmitter (MWT-3905) has been examined and tested to determine that the design meets basic electrical, mechanical and fire protection requirements by FM Approvals, a Nationally Recognized Testing Laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

**North American Certifications**

FM AEx d [ib] Class I, Zone 1, IIC, T4, Ta = -40C to +70C  
FMc Ex d [ib] Class I, Zone 1, IIC, T4, Ta = -40C to +70C  
Enclosure: IP66  
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See Installation Drawing 702408 for instructions

The MWT-3905 complies with the following North American standards:

- ANSI/ISA 60079-0:2005, Electrical Apparatus for use in Class I, Zones 0, 1, and 2 Hazardous Locations: General Requirements
- ANSI/ISA 60079-1:2005, Electrical Apparatus for use in Class I, Zones 0, 1, and 2 Hazardous Location: Type of Protection Flameproof “d”
- ANSI/ISA 60079-11:2005, Electrical Apparatus for use in Class I, Zones 0, 1, and 2 Hazardous Locations: Intrinsic Safety “i”
Federal Communications Commission (FCC) and Industry Canada (IC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation of 20 cm from all persons.

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the radio frequency (RF) spectrum. Nearly every country requires this type of product certification. RCS is working with governmental agencies around the world to supply fully compliant products and to remove the risk of violating country directives or laws governing wireless device usage.
Appendix B
Certificates of Compliance

CERTIFICATE OF COMPLIANCE
HAZARDOUS LOCATION ELECTRICAL EQUIPMENT
PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

*MWT-3808 Microcor Wireless Transmitter*

T1Ex e IIC/T4 Ta = -40°C to +70°C; IP66

Equipment Ratings:

Flamereproof with Intrinsically Safe outputs for use in Class 1, Zone 1 Hazardous (Classified) Locations

FM Approved for:

Rohmtrax Calseno Systems
11841 East Smith Ave
Santa Fe Springs, CA 90670

3032790C
Page 1 of 2
This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3000 1996
ANSI/ISA 50079-0 2005
ANSI/ISA 50079-1 2005
ANSI/IEC 60079-11 2004
ANSI/ISA 50079-11 2006

Original Project ID: 3032790 Approval Granted: October 1, 2009

Subsequent Revision Reports / Date Approval Amended

Report Number Date Report Number Date

FM Approvals LLC

[Signature]

E. Marcuedant / Group Manager, Electrical

1 October 2009
Appendix C
Manufacturer’s Declaration of Conformity

Product Name: Microcor Wireless Transmitter
Model: MWT-3905

Approved Manufacturing Location
Rohrback Cosasco Systems, Inc. — Santa Fe Springs, California USA

European Union (EU) Directives

ATEX certification
FM 09 ATEX 0018X
Ex d [ib] Class I, Zone 1, IIC, T4, Ta = -40C to +70C
Enclosure: IP66
For use only with Power Module P/N 748400
See Installation Drawing 702408 for instructions

ATEX Directive 94/9/EC
The MWT-3905 complies with the European ATEX Directive and the following standards:
EN 60079-0:2006, Electrical Apparatus for Explosive Gas Atmospheres – General Requirements
EN 60079-1:2007, Electrical Apparatus for Explosive Gas Atmospheres – Flameproof Enclosures “d”

The MWT-3905 complies with the European EMC Directive and the following standards:
EN 61326-1:2006, Electrical Equipment for Measurement and Control
EN 61000-6-4:2007, EMC Radiated Emissions
CISPR 11:2004, Industrial, Scientific, and Medical (ISM) Radio Frequency Equipment

Radio and Telecommunications Terminal Equipment Directive (R&TTE) 1999/S/EC
The MWT-3905 complies with the European R&TTE Directive and the following standards:
EN 300 328 V1.7.1:2006, ERM and EMC, Equipment Operating in the 2.4 GHz ISM Band
EN 301 489-1 V1.6:2005, ERM and EMC, Radio Equipment Common Technical Requirements
EN 301 489-17 V1.2.1:2002, ERM and EMC, Specific Conditions for 2.4 GHz Systems
EN 60950-1:2001, General Requirements

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Place and Date of Issue:

January 29, 2010
Rohrback Cosasco Systems, Inc.
Santa Fe Springs, CA 90670

Authorized Signature:
Steven L. Stricklin       Quality Assurance Manager
Appendix D
Drawing 702408