UNLESS OTHERWISE SPECIFIED:

TOLERANCES

.XX   .XXX   ANGLES
± —   ± —   ± —

SURFACE ROUGHNESS
PER ANSI B46.1

FINISH

MATERIAL

DRAWN V. AYALA	DATE 22.SEP.11
CHECK V. AYALA	DATE 22.SEP.11
ENGR D. SINGH	DATE 22.SEP.11
CUSTOMER	
CONTROL DOCUMENTS	

ROHRBACK COSASCO SYSTEMS

SANTA FE SPRINGS, CALIFORNIA USA

TITLE

REFERENCE MANUAL
MICROCOR BLUETOOTH DATA-LOGGER
MWT-3905-MDL-BT

SIZE	DWG. NO.		
A	702199-MANUAL		
SCALE NONE	DO NOT SCALE DRAWING	SHEET 1 OF 17	

Microcor® Bluetooth Data Logger

MWT-3905-MDL-BT

Reference Manual

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Windows® is a registered trademark of Microsoft Corporation.

Table of Contents

Chapter 1
Introduction
Microcor® Bluetooth Data-Logger

The Microcor® Bluetooth Data-Logger (MDL-BT) is based on RCS's latest generation of high-resolution Microcor technology. The MDL-BT operates in conjunction with the high-resolution Microcor probes that RCS offers. The Microcor Bluetooth Data-Logger is an 18 bit high-resolution corrosion measurement device, approximately 256 times higher than previous electrical resistance measurement instruments. This increased resolution greatly improves response to corrosion upsets, and at the same time allows measurements to be made in virtually any environment. The patented technology combines speed of response, similar to linear polarization resistance, with the universal applicability of electrical resistance measurements.

The scope of this manual is to cover all the necessary equipment and settings required to start up and configure your MDL. If this manual is followed completely, you will have the necessary instructions to have your data logger up and running smoothly. This manual will not cover the connection of any equipment outside of RCS equipment, nor will it cover settings not used by RCS equipment.

Chapter 2
Specifications

Mechanical Specifications:

- Weight: 7.5lbs (3.4kg)

- Dimensions: 6.38" x 4.40"

Electrical Specifications:

- Resolution:
    - 18 bit (1 part in 262,144)
- Power Supply:
    - 7.2V Lithium Power Module
- Probe compatibility:
    - All Microcor Probes
- Operating Temperature Range:
    - -40C to +70C
- Maximum Data Storage:
    - 8192 Readings (Circular Buffer)
- Battery Life:
    - 3 years at 10 min measurement interval
- Communications:
    - Wired/RS232 or Bluetooth v2.0
- Data Collection Devices:
    - Checkmate DL (Wired/RS232)
    - Smart Phones/Handheld Computer via Bluetooth v2.0
    - Laptop/Notebook via RS232 or Bluetooth v2.0
- Proprietary Communications Protocol

Bluetooth Specifications:

- Bluetooth v2.0 + EDR

- FHSS/GFSK Modulation

- +2 dBi Integral Antenna

- Frequency Range: 2402-2480 MHz

Chapter 3
Required Equipment

The following lists the equipment required to correctly setup and run a Microcor Data-Logger.

Hardware Requirements:

- Microcor Data-Logger (MDL-BT)
- Power Module
- USB to Serial Adapter
- Limo to Serial cable

Software Requirements:

- Microcor Tools Ver. 5.0 or Greater

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).

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

Hard disk space Requirements:

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

Chapter 4
MDL-BT Bluetooth Communication

The Microcor Bluetooth data-logger requires two steps for downloading data back to the PC. Step one is to download Bluetooth data from the MDL with either a Laptop/Notebook, Smart Phone, or Handheld computer which are Bluetooth v2.0 capable. Furthermore, RCS provides data collection applications for two mobile platforms. The two mobile platforms consist of .net Compact Framework or JAVA (J2ME).

Once data has been successfully collected onto a mobile device, RCS will provide data synchronization software that will download everything automatically into the Corrosion Management Software.
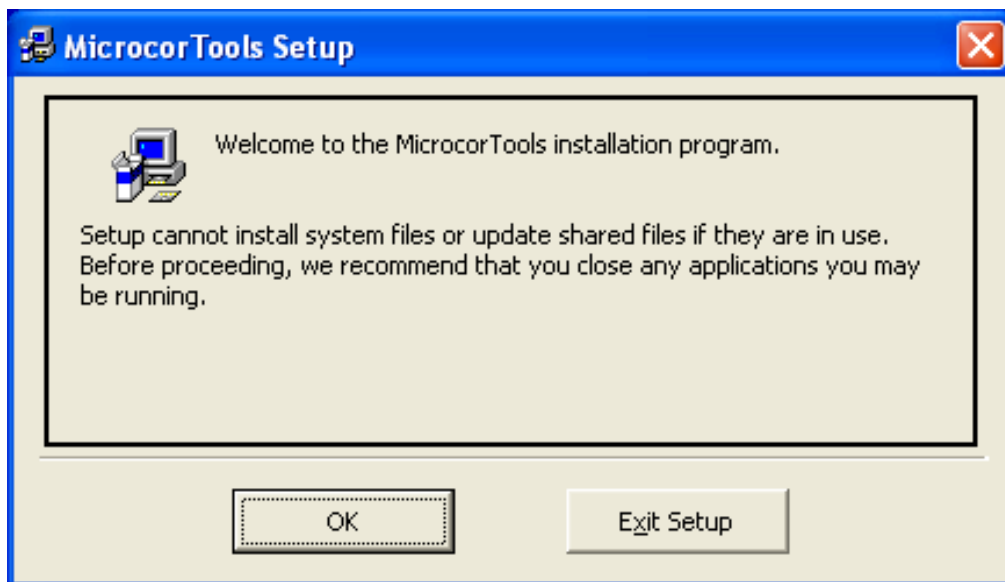
Chapter 5
MDL-BT Wired Communication

This chapter will cover the options available for configuration of the MDL-BT. Option 1 is use of Microcor Tools configuration software in a non-hazardous location. A local connection between a PC/Laptop and the MDL-BT needs to be established. In addition to configuration, Microcor Tools is also used to download and analyze the MDL-BT data. Supplementary data analysis is covered in the Microcor Tools Manual. Option 2 is to use a Windows Mobile or Java Phone. Certain Windows Mobile Phones are approved for use in hazardous locations. Please check with the mobile phone manufacturer's documentation before using in hazardous locations.

Checklist
- ✓ Install Microcor Tools Software (Non-Hazloc area).
- ✓ Be sure the power module is installed in the MDL-BT prior to start of configuration.
- ✓ Connect the communication cable (PN: 748110-9A) to both the computer and the MDL-BT.
- ✓ If using USB to RS232 adapter, be sure to install supplied drivers by the manufacturer.

Installation

1. Install Microcor Tools Software
   a. Insert the Setup and Installation CD that was included with the MDL Installation Kit.
   b. Click **Install/Setup** and follow screens shown below.
   c. Click **OK.**

d. Leave the default directory shown, click on the **icon** to continue.

MicrocorTools Setup

Begin the installation by clicking the button below.

Click this button to install MicrocorTools software to the specified destination directory.

Directory:
C:\Program Files\MicrocorTools\

Change Directory

Exit Setup
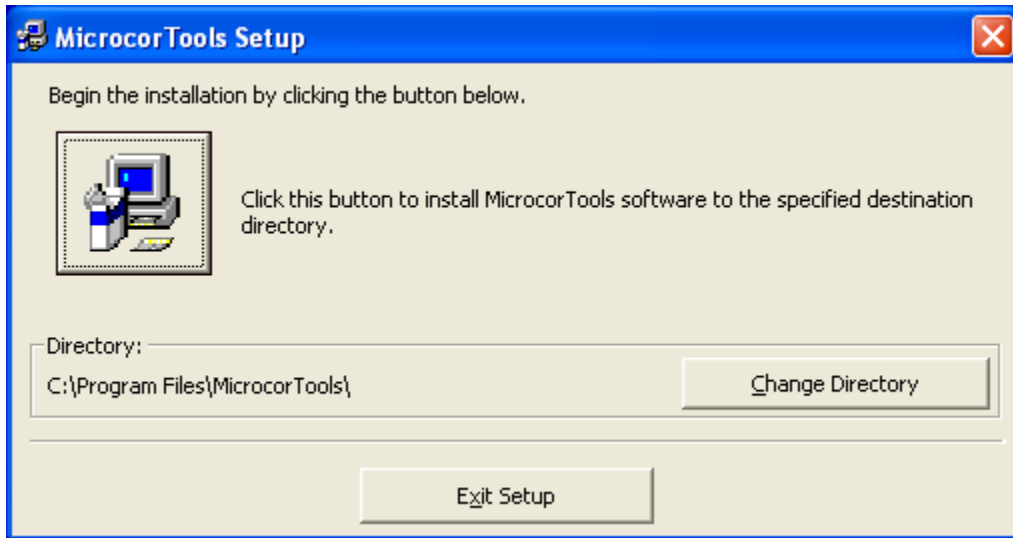
e. Leave the default Program Group, click on **continue** to proceed.
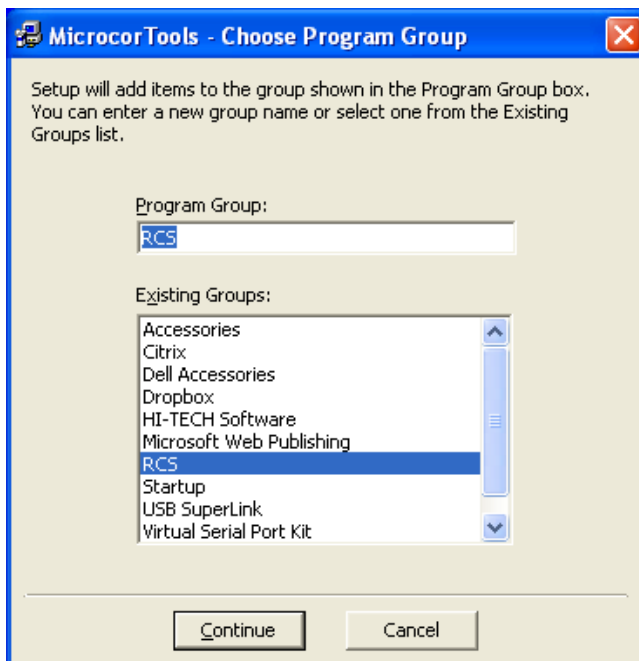
MicrocorTools - Choose Program Group

Setup will add items to the group shown in the Program Group box. You can enter a new group name or select one from the Existing Groups list.

Program Group:
RCS

Existing Groups:
Accessories
Citrix
Dell Accessories
Dropbox
HI-TECH Software
Microsoft Web Publishing
RCS
Startup
USB SuperLink
Virtual Serial Port Kit

Continue   Cancel

*Note: If any Version Conflict is prompted, click **yes** to keep your existing files.

f. Setup is complete, click **OK**.

MicrocorTools Setup

MicrocorTools Setup was completed successfully.

OK
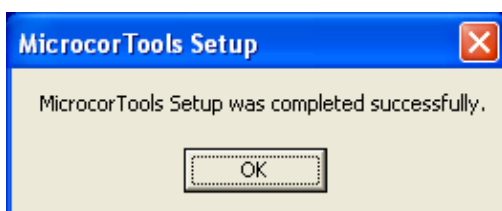
Microcor Tools Configuration Method (Software)

1. Run Microcor Tools
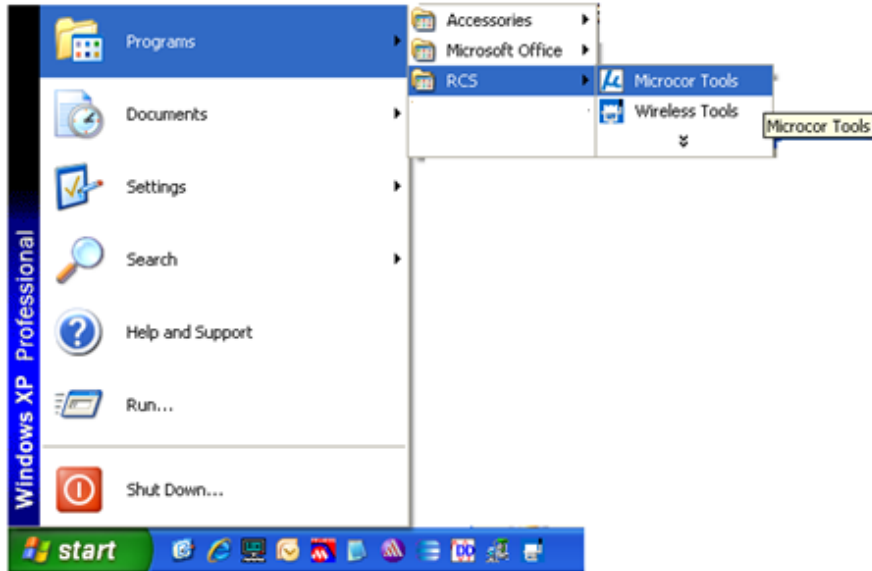
2. Create a "New Site" if one has not been created already.

3. Initialize Data-Logger Communication

    a.   Select Com Port (This can be found in device manager of the PC).
    b.   Save Site Configuration.
    c.   Start Communication.

4. Configure (Configure/DL Transfer Tab)

a. Select an Address to use by clicking the **+** or **–** buttons (**0 to 99**).
b. Check **Data Logger** as Connection type.
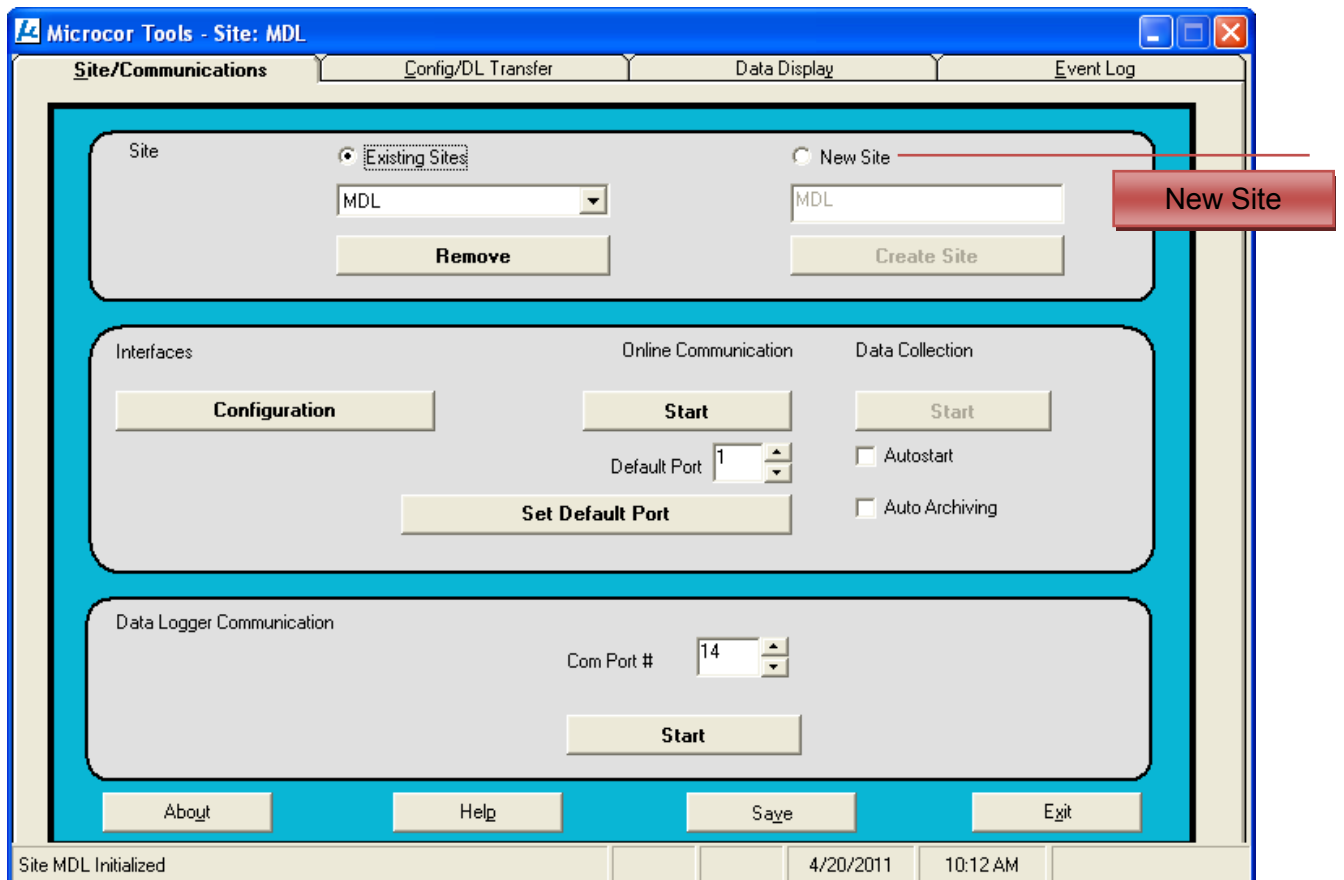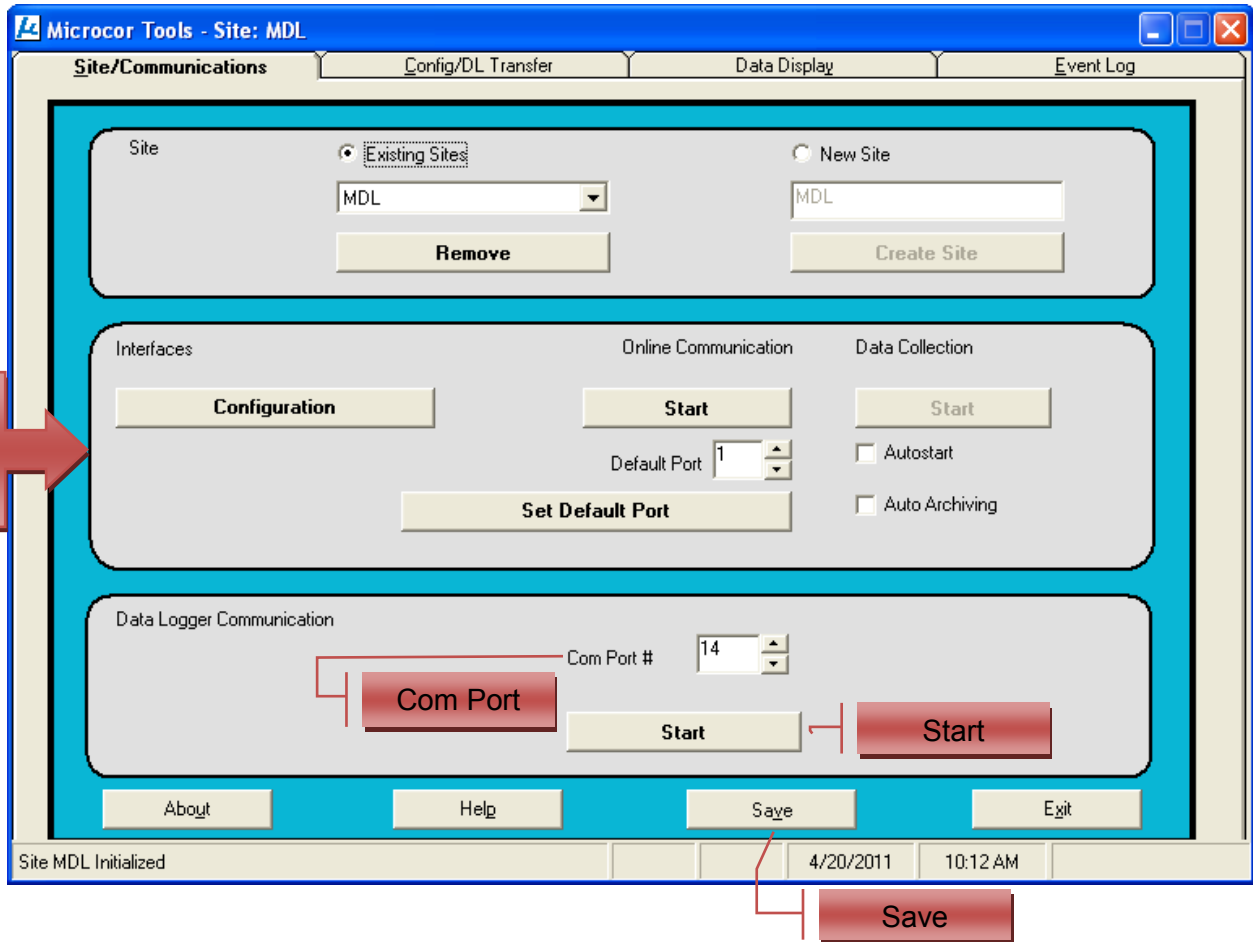c. Select probe and element type from drop down menus.
d. Input the probe span.
e. Input desired sampling interval (**10-60**).
f. Input desired tag name.
g. Click **Store Setup** to initialize configuration.
h. Click **Apply** to save configuration.

i. To modify configuration, edit white text fields and click **Store Setup** followed by **Apply**.

The MDL is now configured and ready to take Measurements. Go to Data Display section to read instructions on retrieving and viewing data.

CheckMate DL Method (Optional – Hazloc Safe)

The Checkmate DL is designed to configure and gather data from all Microcor Data-Loggers. The following section will explain the data collection procedure from the Microcor Data-Logger.

Note: Checkmate DL is optional if for any reason Bluetooth communication isn't preferred.

1. Read Data-Logger Configuration and Status

Configurations already set into the Data-Logger are easily read with the Checkmate DL. Connect the Checkmate DL to the Data-Logger with the provided adapter cable connector. From the **Standby** screen, press **Read (F1)** to proceed to the following display with the attached Data-Logger information:

```
ID: XX  XXXXXXXXXXXX
MMM DD, YYYY   HH:MM
   Read   Read   Set
Stat    Data  Clock  Exit
```

Press **Read Stat (F1)** to display the Data-Logger time, number of readings and the sample rate as shown below:

```
 MMM DD, YYYY HH:MM
 Readings: XXXXX
 Samp Rate: XXXXX
More              Exit
```

Press **More (F1)** to continue to the next display which shows the battery, memory and transmission information as shown below. Battery status will show **OK** or **LOW**. Memory and Transmission will show **OK** or **BAD** depending on their status.

```
   Batt: OK/LOW
   Mem: OK/BAD
   Trans: OK/BAD
                 Exit
```

2. Reading / Clearing Data from Microcor Data-Loggers

To read a Data-Logger, connect the Checkmate DL to the Data-Logger with the provided adapter cable connector. From the **Standby** screen, press **Read (F1)** to proceed to the following display with the attached Data Logger information:

```
ID: XX  XXXXXXXXXXXX
MMM DD, YYYY   HH:MM
   Read   Read   Set
Stat    Data  Clock  Exit
```

Press **Read Data (F2)**; Checkmate DL will perform a series of internal checks and proceed accordingly. First, Checkmate DL will check whether the ID is properly assigned. If the ID is not

properly assigned, it will prompt the user to set the Data-Logger ID and the Tag information. It will then determine if any readings for this ID are stored in the Checkmate DL. If any data for the ID exists in the Checkmate DL, then the user will be prompted to either **Overwrite (F1)** or **Abort (F4)**. Overwriting will delete the existing data for that ID and replace it with the new data being read. Once these internal checks are performed and any issues resolved, Checkmate DL will proceed to the following screen:

```
       Data Logger ID: XX
       Tag: XXXXXXXXXXXX

    Start              Exit
```

Press **Start (F1)** from the above screen to begin the read process. The Checkmate DL will show the following screen during data transfer.

```
         Getting Data
         Please Wait

       Approx XX.X minutes
```

If "**NO MEMORY SPACE FOR READINGS**" screen appears (shown below), then the Checkmate DL memory will need to be cleared before transferring the data. It is recommended that <u>ALL</u> existing data on the Checkmate DL be transferred to a PC prior to erasing <u>ANY</u> data. Refer to the section on **Clearing the Checkmate DL Memory** on the Checkmate DL reference manual.

```
        NO MEMORY SPACE
         FOR READINGS


    Exit
```

Once the data is successfully read and transferred, it is displayed as shown below. Users can at this time elect to delete the Data-Logger content if desired.

> **Note:** All data stored for the ID on the Checkmate DL will be erased if "**Clear**" button is pressed.

Press **Clear (F1)** to clear Data-Logger readings or **Next (F4)** to return back to the Data-Logger information screen without clearing the readings.

```
       Last Reading xxxxxxx
      MMM DD, YYYY  HH:MM
       Number Reads  XXXXX
    Clear              Next
```

> **WARNING!** It is recommended to clear the data in the Data-Logger after transfer to the Checkmate DL. This reduces the amount and time of data transfer for future downloads. The data is then appended to the previous data when transferring the data from the Checkmate DL to the PC. Refer to the **Transferring Collected Data from Checkmate DL to PC** section.

## 3. Transferring Collected Data from Checkmate DL to PC

Data-Logger data is downloaded to the PC using the provided Microcor Tools Software program. Connect the Checkmate DL instrument to the 9 pin serial port on the PC using the provided cable. If there is no serial port in the computer, use the included serial-to-USB converter cable to complete the connection. Make sure to set the correct COM port number on the Microcor Tools Software program **Data-Logger Communication** area (in most cases this will be COM 1, however verify this in the device manager).

Checkmate DL Data Transfer Procedure

From the **Standby** screen, press **Data (F3)** to advance to the following display:

```
      Transfer Data
      Connect to PC


 Start                  Exit
```
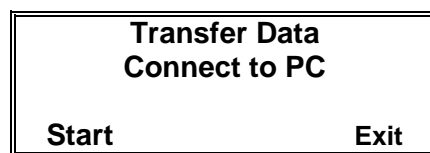
Press the **Start (F1)** to proceed to the next screen. Use **Next (F2)** and **Prev (F3)** to navigate the ID list (0 – 99) and select the desired ID to transfer data (shown below).

```
    Data Logger ID: XX
    Tag: XXXXXXXXXXXX

 Start   Next   Prev   Exit
```
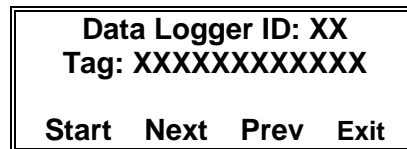
Once the ID is selected, press **Start (F1)**. Following screen will appear:

```
     Ready to Transfer
    Data using Microcor
     Software from RCS

 Exit
```

> **Note:** Make sure that the data (ID of the Data-Logger) set in the Checkmate DL to be transferred corresponds with the **Address** selected in the Microcor Tools Software before transferring the data.

Data is now ready for transfer from the Checkmate DL to the PC. On the Microcor Tools Software program, select the **Site** and navigate to the **Config/DL Transfer** screen, select the **Address** and choose **Data Logger** as the **Connection** type and **Microcor** as the **Instrument** (see image below). Click the **Read Data** command button to begin the transmission. It is also possible to click the **Read Setup** command button to transfer the configuration data of the data-Logger to the **Data Logger** section on the **Config/DL Transfer** screen (shown below).
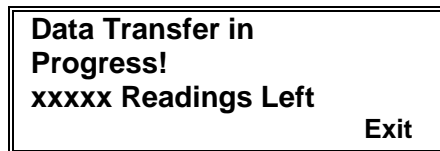
If data already exists for the chosen address, following dialogue box will appear:
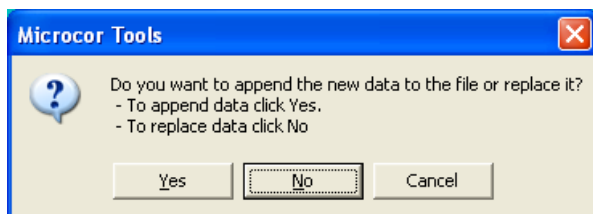
- Press **Yes** to add the new data onto an existing file. This is the normal method if the data in the Data-Logger is deleted after it is collected each time in order to speed data transfer. It also prevents reaching the maximum storage capacity in the data logger at which time the data collection stops.

- Press **No** if all of the data in the Checkmate DL is to replace an existing file. This should be used if the data in the Data-logger is NOT cleared each time it is read. In this case the existing file is automatically archived.

- Press **Cancel** to exit the **Read Data** function.

Note: The Microcor Data-Logger will store up to 8000 readings before collection memory is fully allocated, then the collection of data will halt until data is cleared from memory.

After a selection has been made, a counter in the status bar indicates the number of samples to be transferred. Status bar wi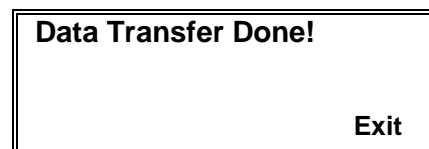ll read **End of Transfer** when the data is successfully transferred from the data logger to the **Microcor Tools** program. During the data transfer, the following screen will be displayed on the Checkmate DL:

```
┌──────────────────────────────┐
│ Data Transfer in             │
│ Progress!                    │
│ xxxxx Readings Left          │
│                       Exit   │
└──────────────────────────────┘
```

The number of readings (xxxxx) counts down as the data is transferred to Microcor Tools. Upon successful transmission, Checkmate DL will show the following screen:

```
┌──────────────────────────────┐
│ Data Transfer Done!          │
│                              │
│                       Exit   │
└──────────────────────────────┘
```

Press **Exit (F4)** to return to the Data Transfer screen to choose another ID for data transfer.

Note: Information from only one Data-Logger can be transferred at a time, when transferring information of more than one Data-Logger, **change the Address on the Microcor Tools Software program for each transfer** so that all data is not transferred only to one ID address.

In case of any error messages displayed on Checkmate DL, check connections between Checkmate DL and the PC, make sure that Microcor Tools Software program is running and that the correct COM port is selected.

If data is still not transferred after checking the connection between the PC and Checkmate DL, please see the Troubleshooting section for further help.

Chapter 6
Retrieving and Plotting Data

Microcor Tools allows retrieving and plotting of corrosion data. **Microcor Tools – History Viewer** can be used to view data collected **Online** or by **Data-Logger** connection methods.

To open the **Microcor Tools – History Viewer** (graph feature), select the site from the **Site/Communications** tab, select the **Address** from the **Config/DL Transfer** tab, and click the **Show Data** command button. Alternate method to enter the **History Viewer** is to navigate to the **Data Display** tab and double-clicking the **Tag** of the desired unit.
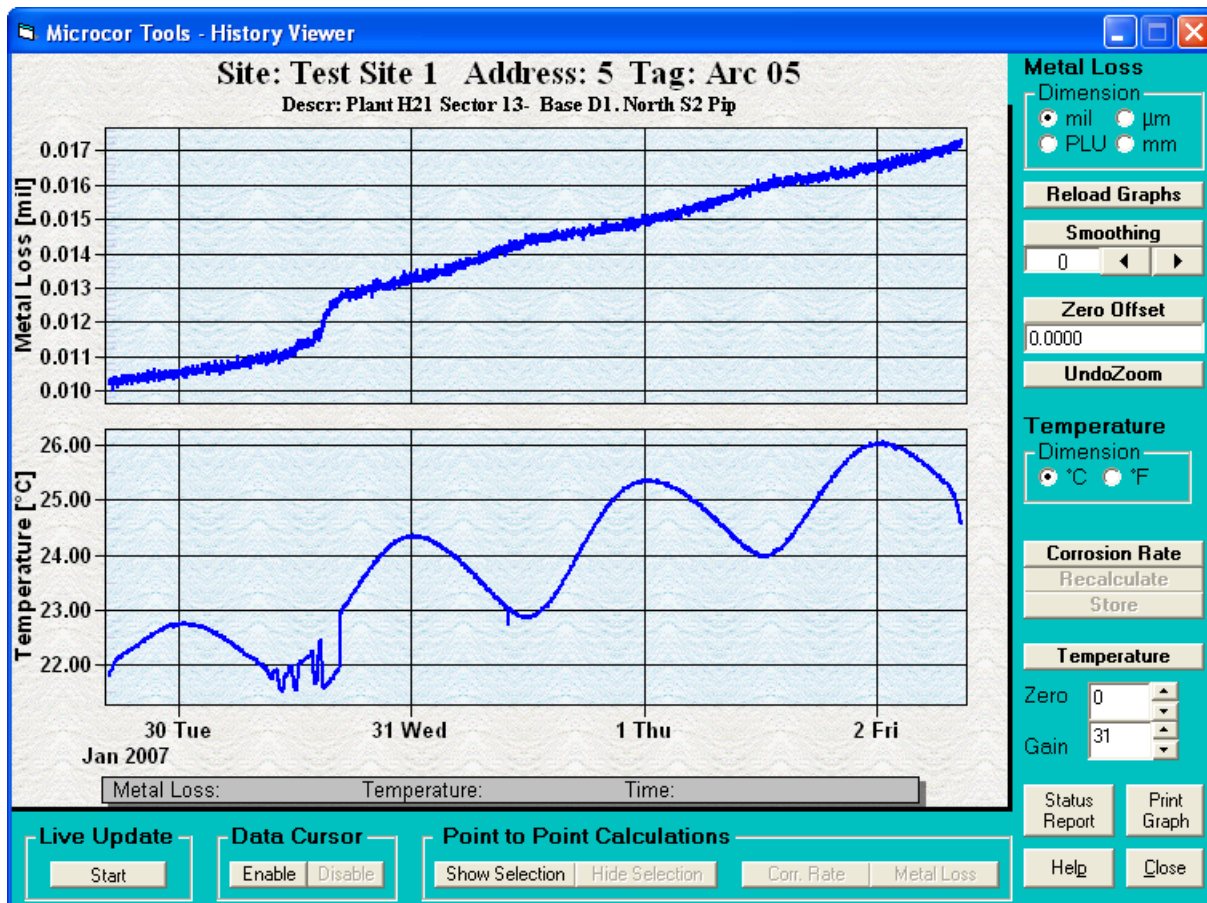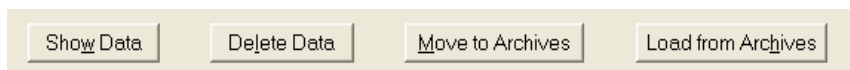
In the above screen, the top graph is the **Metal Loss** and the bottom graph presents the probe

Temperature (when applicable). The bottom graph can be switched to show the **Corrosion** or **Erosion Rate** for the same set of data when the **Corrosion** or **Erosion Rate** button is selected.
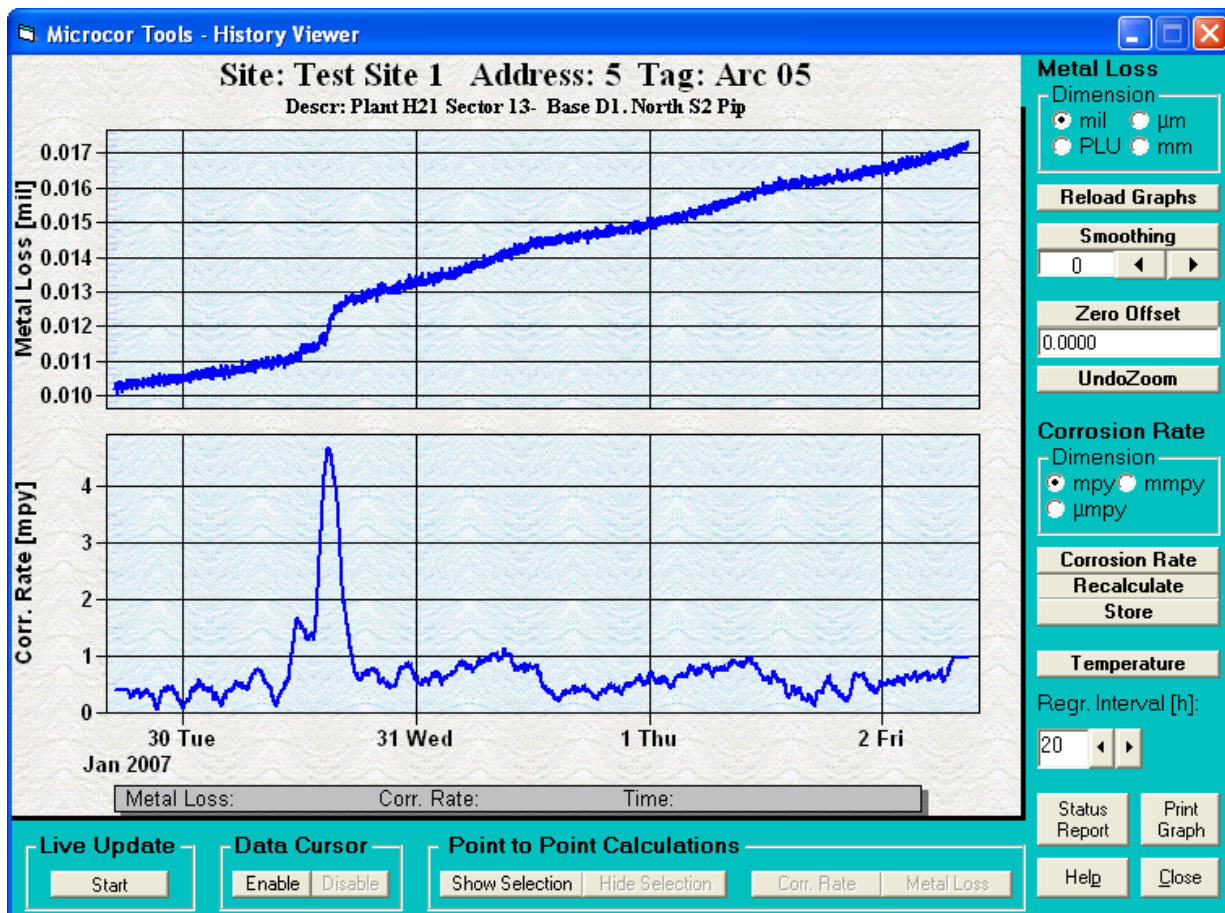
To show the corrosion rate graph, click the **Corrosion** or **Erosion Rate** command button (see section below for more details). Click the **Temperature** command button to display the probe temperature graph.

> **Note:** The **Temperature** graph will open as the default bottom graph if the transmitter supports temperature monitoring capabilities and if the **Probe Temperature** check-box is selected; otherwise the graph area will remain blank (to view the **Corrosion** or **Erosion Rate** graph, **Corrosion** or **Erosion Rate** command button must be pressed. It will not open as a default graph). Data-loggers do not support temperature measurements.

Use the upper **Dimension** box (top right-hand corner of the screen) to select the **Metal Loss** Y-axis units in **mils**, **µm**, **mm** or Probe Life Units (**PLU**). Use the lower **Dimension** box (middle right-hand side of the screen) to select units for the **Temperature** graph in **ºC** or **ºF** or **mpy, mmpy** or **µmpy** units if **Corrosion** or **Erosion Rate** graph is selected.

Corrosion/Erosion Rate is calculated by linear regression. This **Regression Interval** may be re-adjusted and the Corrosion/Erosion Rate recalculated by clicking the **Recalculate** command

button. The default may suit many online systems but can be changed to optimize noise against sensitivity of the computed corrosion or erosion rate. The **24h Filter** can be enabled at the **Rate/Alarms Settings** area (in the **Config/DL Transfer** screen) to reduce the effects of any diurnal (24) thermal noise. The **Alarm Level** units are directly related to the above selected units and can only be changed by the above settings.

Once the settings have been optimized, the rate data may be saved with the **Store** button. When closing the graphical display window (**History Viewer**) a dialog box will prompt to save the settings. Select **Yes** to store these settings for automatic application to all new data.

Select (or type in) values for **Zero** and **Gain** to calibrate the measurement. If calibration parameters are unknown for probes and transmitters, select 0 for **Zero** and 31 for **Gain**.

The **Zero Offset** will allow users to change the y-axis reference point to zero (0) by changing the value. This is a helpful feature when conducting tests to graphically view the data from a convenient starting point. It is recommended that this be returned to original value of zero so determination of probe life can be done accurately.

Chapter 7
Physical Installation

Mounting the Bluetooth Data-Logger

The Bluetooth data-logger 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.
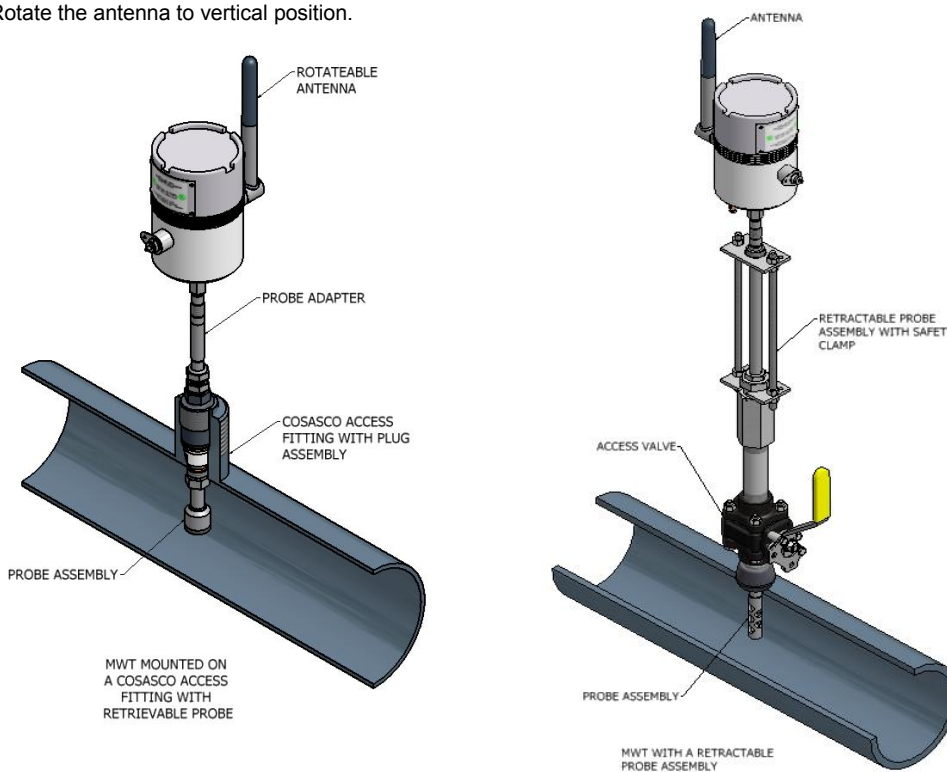
Grounding
A 8 to 14 AWG grounding wire can be attached to the data-logger at the grounding lug. Connect the ground wire to earth ground per local electrical code.

Direct Probe Mounting

Top of the Line

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

2. Rotate the antenna to vertical position.

Side of the Line

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

2. Rotate the antenna to vertical position.

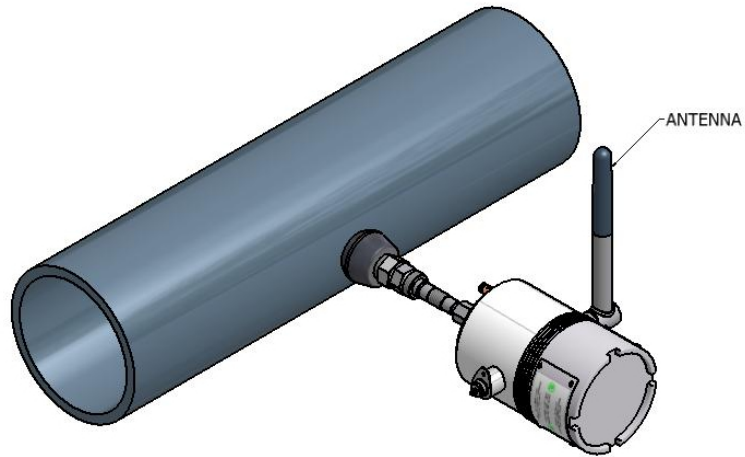MWT WITH FIXED PROBE
MOUNTED ON THE SIDE OF
THE PIPE

Bottom of the Line

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

2. Rotate the antenna to vertical position.

PROBE ASSEMBLY

ANTENNA

MWT MOUNTED ON
UNDERSIDE OF PIPE

PROBE ASSEMBLY

ANTENNA
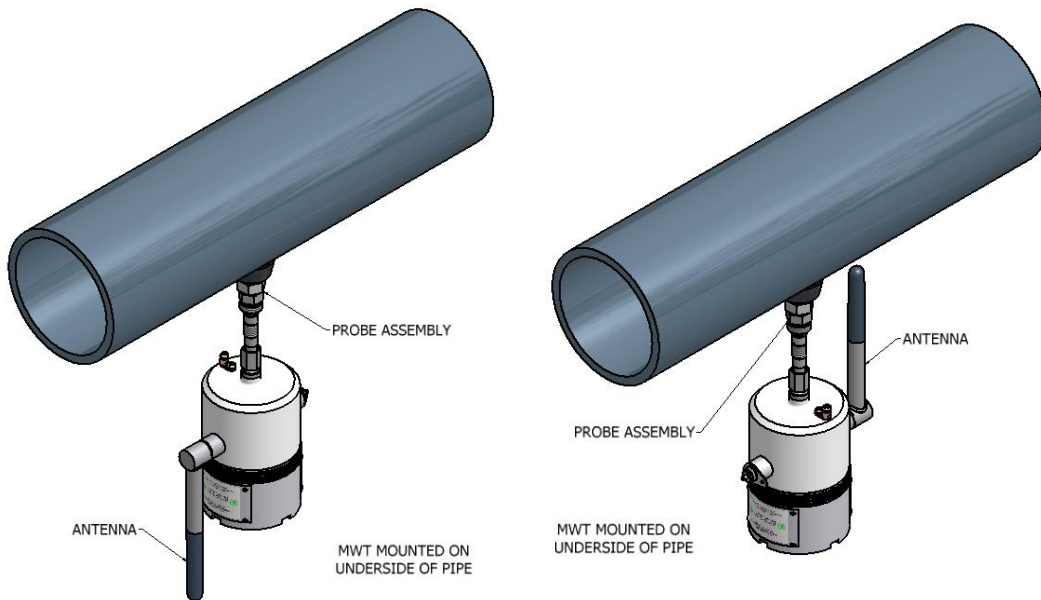
MWT MOUNTED ON
UNDERSIDE OF PIPE

Optional Remote Mounting
(Bottom of the Line shown)

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

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

3. Rotate the antenna to vertical position.

WMT MOUNTED IN A REMOTE LOCATION
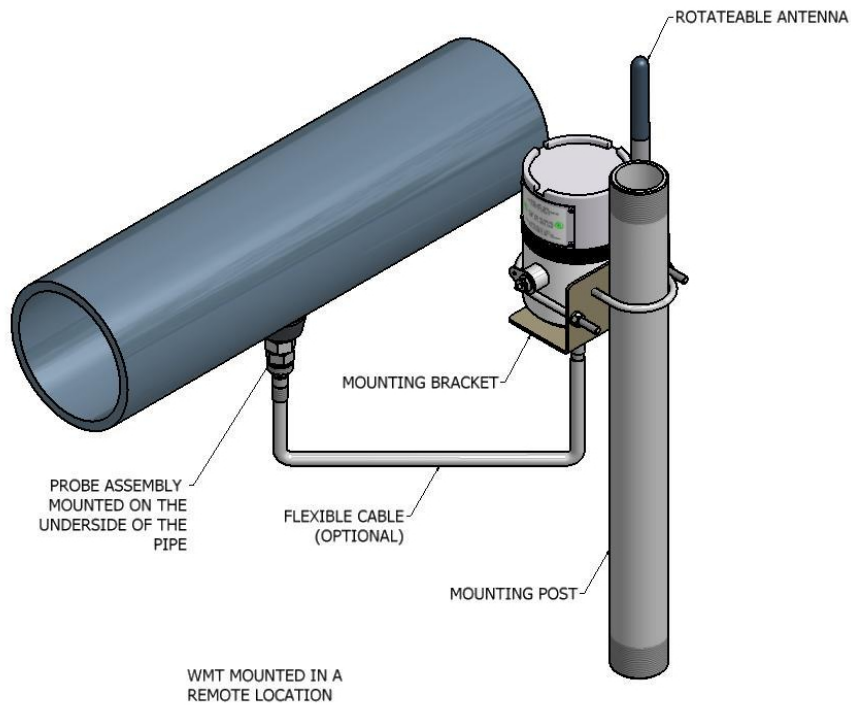
RCS Mounting Accessories
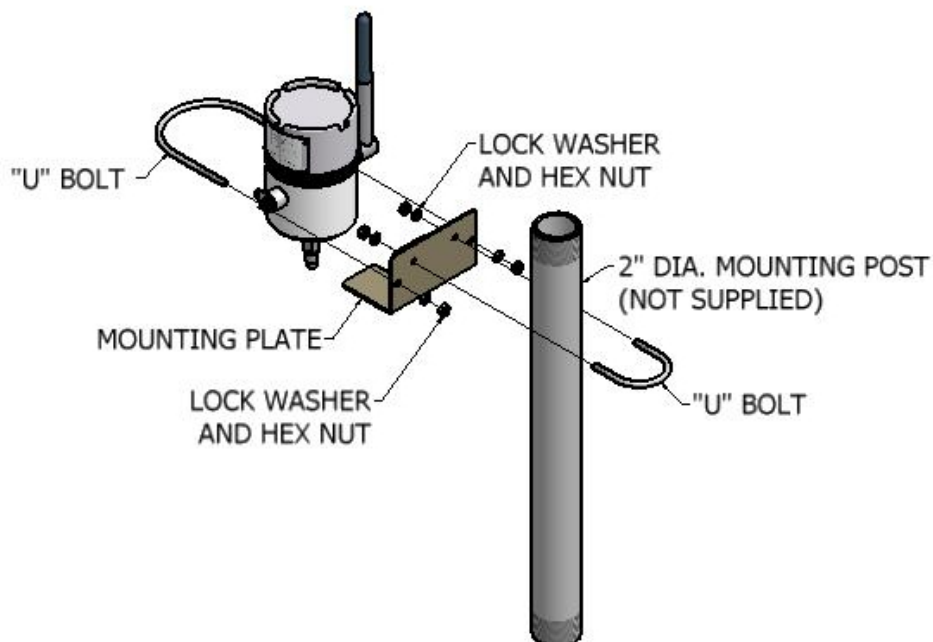
STEP 2: CONNECT THE POWER MODULE

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

Configuration for hazardous/non-hazardous locations (computer software may only be used in a non-hazardous location).

Appendix A
Product Certifications

PRODUCT CERTIFICATIONS

Product Name: Microcor Wireless Transmitter
Model: MWT-3905

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

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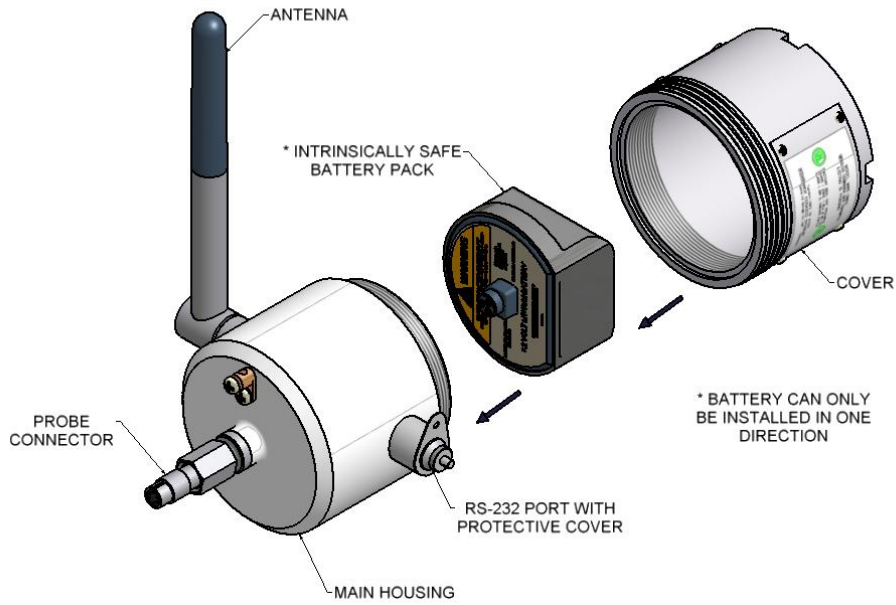 and fire protection requirements by FM Approvals, a Nationally Recognized Testing Laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

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

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"
EN 60079-11:2007, Electrical Apparatus for Explosive Gas Atmospheres – Intrinsic Safety " i
   "

Electromagnetic Compatibility Directive (EMC) 89/336/EEC, Amended 91/263/EEC, 92/31/EEC and 93/97/EEC

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

EN 61326-1:2006, Electrical Equipment for Measurement and Control
EN 61000-4-2:1995, A1:1998, A2:2001, EMC: Electrostatic Discharge Immunity
EN 61000-4-3:2006, A1:2008, EMC: Radiated Radio Frequency Immunity
EN 61000-6-4:2007, EMC Radiated Emissions

Radio and Telecommunications Terminal Equipment Directive (R&TTE) 1999/5/EC

The MWT-3905-MDL-BT complies with the European R&TTE Directive.

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

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
For use only with Power Module P/N 748400

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 "

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

The MWT-3905 complies with the following IEC standards:

IEC 60079-0:2007, Electrical Apparatus for Explosive Gas Atmospheres – General
    Requirements
IEC 60079-1:2007, Electrical Apparatus for Explosive Gas Atmospheres – Flameproof
    Enclosures "d"
IEC 60079-11:2006, Electrical Apparatus for Explosive Gas Atmospheres – Intrinsic Safety " i
    "

Federal Communications Commission (FCC) and Industry Canada (IC)

Changes or modifications not expressly approved by Rohrback Cosasco Systems could void the user's authority to operate the equipment.

"This device complies with Part 15 of the FFC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmfull interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

This device complies with Industry Canada license-exempt RSS standard(s).Operations is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de license. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: **781 762 4300** F: 781-762-9375 www.fmapprovals.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT
PER CANADIAN REQUIREMENTS

This certificate is issued for the following equipment:

MWT-3905 Microcor Wireless Transmitter.
I/1/Ex d [ib] IIC/T4 Ta = -40°C to +70°C; IP66

Equipment Ratings:

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

FM Approved for:

Rohrback Cosasco Systems
11841 East Smith Ave
Santa Fe Springs, CA 90670

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FM Approvals®

Member of the FM Global Group

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
ANSI/ISA 60079-0	2005
ANSI/ISA 60079-1	2005
ANSI/IEC 60529	2004
ANSI/ISA 60079-11	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

J. E. Marquedant
Group Manager, Electrical

1 October 2009
Date

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"
EN 60079-11:2007, Electrical Apparatus for Explosive Gas Atmospheres – Intrinsic Safety " i "

Electromagnetic Compatibility Directive (EMC) 89/336/EEC, Amended 91/263/EEC, 92/31/EEC and 93/97/EEC

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

EN 61326-1:2006, Electrical Equipment for Measurement and Control
EN 61000-4-2:1995, A1:1998, A2:2001, EMC: Electrostatic Discharge Immunity
EN 61000-4-3:2006, A1:2008, EMC: Radiated Radio Frequency Immunity
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

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
IEC 60079-1:2007, Electrical Apparatus for Explosive Gas Atmospheres – Flameproof
Enclosures "d"
IEC 60079-11:2006, Electrical Apparatus for Explosive Gas Atmospheres – Intrinsic Safety " i "

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
For use only with Power Module P/N 748400
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 "

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.

Place and Date of Issue:

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

Authorized Signature:
Steven L. Stricklin   **Quality Assurance Manage**r