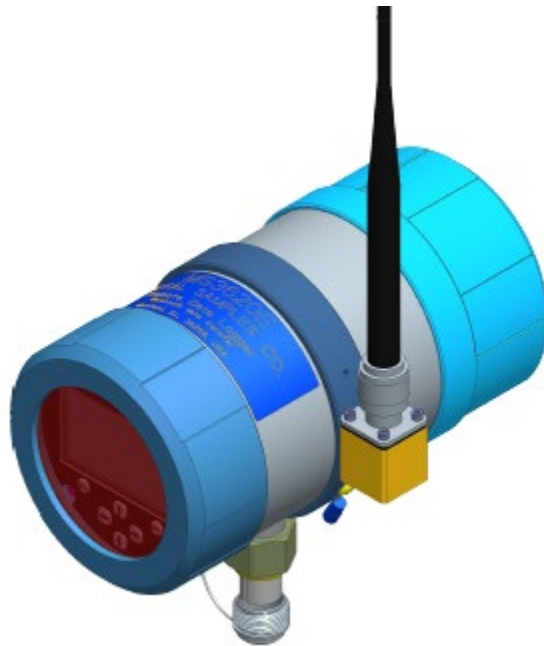


MS5000E-ISA
High Resolution ER ISA Wireless
Transmitter
Operator's Manual



Metal Samples

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I. Introduction

A. General Description

The MS5000E is a battery powered, corrosion meter capable of measuring and storing data from all types of electrical resistance (ER) corrosion probes. The instrument is light weight, microprocessor-based, and features a simple, menu-driven interface using a keypad and a graphical LCD display.

Corrosion rate measurements are made using the electrical resistance method. Essentially, the instrument measures the resistance of the probe element which changes over time, as metal loss occurs. The rate of change is directly proportional to corrosion rate. This method finds a wide variety of applications since it can be used in conductive and nonconductive environments such as petroleum, chemical, water, soil, or even atmosphere. The new high-resolution measurement of the MS5000E detects smaller increments of metal loss, providing faster response than traditional ER instruments.

After taking a reading, the instrument displays metal loss in mils .. All stored readings are automatically time and date stamped. Readings are stored to non-volatile Flash memory which retains data without the need for a battery backup.

The MS5000E High Resolution ER Data Logger can store more than 100000 readings. Stored data can be downloaded directly to a USB Flash (“jump”) drive or WIRELESS compatible devices via WIRELESS. Data can be opened and charted using the provided CDMS software or can be imported into any standard data analysis (spreadsheet) program such as Microsoft Excel. Data can also be reviewed and charted on the instrument’s LCD display for quick reference.

B. Principles of Operation

The MS5000E High Resolution ER Data Logger operates on the Electrical Resistance (ER) technique and is used in conjunction with an ER probe. The ER probe utilizes a resistive sensing element manufactured from the material of interest (or a close approximation) which is exposed to a corroding environment. This is called the Exposed or Corroding Element. The resistance of the Exposed Element is directly related to its thickness, so as the element corrodes the resulting loss of metal causes a proportional increase in the element’s resistance. The probe also contains an internal Reference Element which is used to compensate for the influences of temperature on the Exposed Element.

The MS5000E High Resolution ER Data Logger is designed to work with any standard ER probe, but it is recommended that Cylindrical and Large Flush type probes be used to ensure optimum performance. Their physical design places the Reference Element in closer proximity to the Exposed Element compared to other probe types, providing more effective temperature compensation and thus reducing the effects of thermal noise.

Because they are designed to corrode, ER probes are sacrificial in nature. Each ER probe will have a finite life that is based on the element thickness. ER probes are available in a number of geometries and thicknesses designed to suit a wide variety of applications. Table 1 lists the common ER element options available from Metal Samples and the effective life of each.


Element Type		Compatibility	Thickness	Probe Life (Span)
	Tubular Loop	Compatible	4	2
			8	4
	Wire Loop	Compatible	40	10
			80	20
	Flush (Small)	Compatible	4	2
			8	4
			20	10
	Cylindrical	Preferred	10	5
			20	10
			50	25
	Flush (Large)	Preferred	5	2.5
			10	5
			20	10
			40	20

Table 1. Standard ER Probe Elements

The MS5000E High Resolution ER Data Logger measures an ER probe utilizing a high-resolution, 16-bit measurement. This allows the unit to detect much smaller amounts of metal loss, thus responding faster to corrosion events and upsets. At 16-bit resolution the MS5000E ER Data Logger can measure metal loss amounts as small as 0.004% of the probe life. For highly sensitive probes such as the 5-mil large flush shown above, that results in a detection limit of less than one angstrom.

C. Technical Specifications

Model

MS5000E - Basic Model

Mount Options → Direct Mount / Remote mount

Physical Data

Instrument Weight (w/ boot):	5.75 lbs. (2.61 kg)
Total Weight w/ Case & Accessories:	7.75 lbs. (3.52 kg)
Instrument Dimensions:	12.00"H x 5.55" W x 7.61" D (30.48cm x 14.10cm x 19.33cm)
Case Specifications:	NEMA 4X / IP66 - stainless steel
Mounting Specifications:	Direct probe Mount
Operating Temperature:	-40° to 158°F (-40° to 70°C)
Storage Temperature:	-40° to 185°F (-40° to 85°C)
Operating Humidity Range:	30% - 95%

Performance Data

Measurement Type:	ER measurement using any standard ER Probe Types Preferred Probe Types: Cylindrical, Flush Compatible probe types: Tube Loop, Wire Loop, Flush , Strip, etc..
Range:	0 - 65,535 probe life units (displayed as 0.00 to 1000.00 PLU's in 0.04 increments)
Resolution:	0.0015% of Probe Life
Repeatability:	± 0.2% of Full Scale

Electrical Data

Power Requirements:	7.2V lithium Battery pack
Nominal Probe Cable Distance:	30 ft. (10 m)
Download Method:	To certified WIRELESS enabled devices

Hazardous Location Certifications – Intrinsic Safety

Refer Annexure - A

Included Accessories

Meter Prover, Operation Manual, Corrosion Data Management Software

Optional Accessory Items (Ordered Separately)

Certified Flash Drive (required for transferring data in a hazardous area)

II. Start-up and Operation

A. Receiving the MS5000E High Resolution ER Data Logger

Check the MS5000E High Resolution Data Logger for any shipping damage when it is first received. When the unit is unpacked, verify that the following items are included:

- Wireless Transmitter
- Battery pack (Shipped Separately)
- Meter Prover
- User's Manual

In the event of shipping damage, quantity shortage, or missing items, it is recommended that the event is documented immediately and that digital photographs are taken. Any shortages or missing items should be reported to Metal Samples immediately. In the event of shipping damage, a claim should be opened with the responsible carrier.

B. Start-Up

CAUTION: *Using this product in any way other than that specified within this manual may impair the intrinsic safety protection.*

Start-up of the MS5000E Wireless transmitter involves the following steps:

1. Port Details and Probe Connection
2. Power-Up
3. Setup and Operation

1. Probe Connection

CAUTION: *Using this product in any way other than that specified within this manual may impair the intrinsic safety protection.*

When selecting a location to mount the Wireless Transmitter it is important to consider the surrounding environment. To ensure proper operation:

- Do not mount the transmitter in a location that exceeds its operating temperature.
- Avoid mounting the transmitter near sources of strong electrical noise.
- Ensure that there is sufficient clearance for installation and to open the transmitter cover afterwards.

a. Direct-Probe Mounting

The MS5000E Data Logger is designed for direct-probe mounting which eliminates the need for additional hardware and transmitter-to-probe cabling. This greatly simplifies installation, reduces costs, and minimizes electrical noise that can be coupled onto probe cabling from nearby electrical equipment.

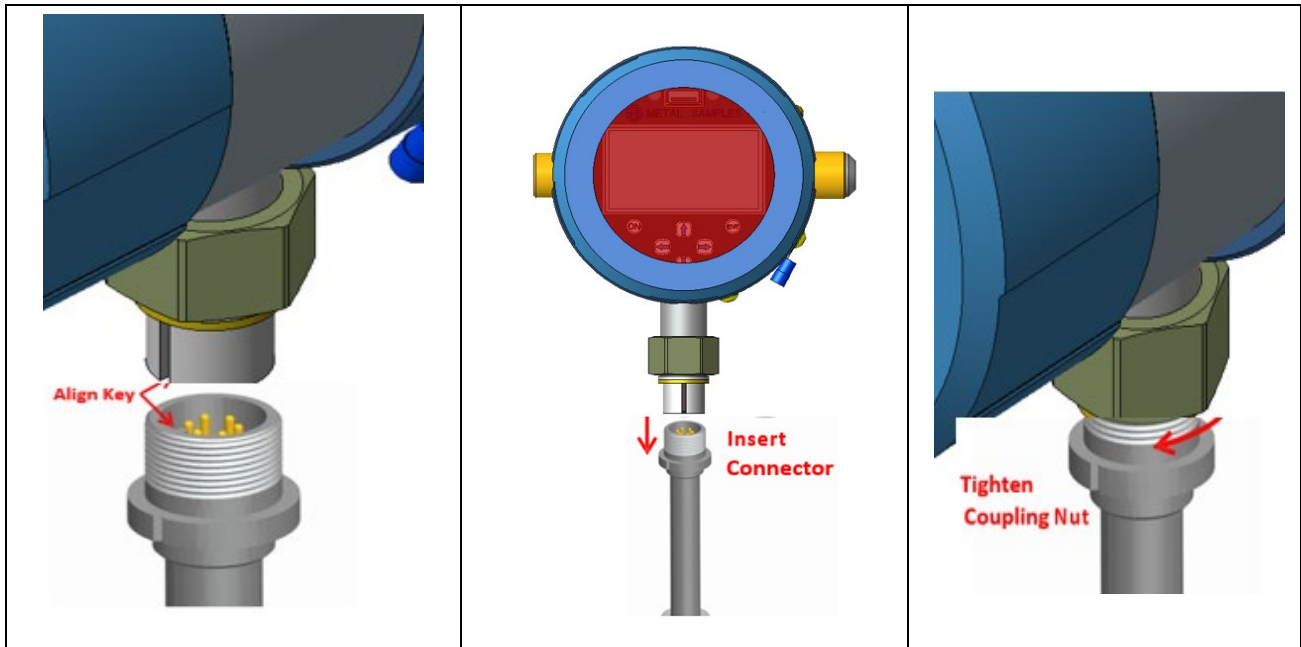
Before mounting the MS5000E Data Logger, first ensure that the probe is installed properly and securely. During installation, it is important that you do not apply excessive force on the probe or seals, as doing so could break the seal and result in system leakage.

To mount the MS5000E Data Logger:

1. Align the keyways of the Wireless Transmitter and probe connectors.
2. Insert the Wireless Transmitter connector plug fully into the probe connector receptacle.
3. Secure the Wireless Transmitter to the top of the probe by tightening the coupling nut.

NOTE: Hand-tight is sufficient. Do not over-tighten the coupling nut.

NOTE: Never force the connectors to mate. If there is resistance, stop and check for bent pins on the probe and for foreign material in the female sockets of the transmitter connector. Gently straighten any bent pins and clear any foreign material that may be found.

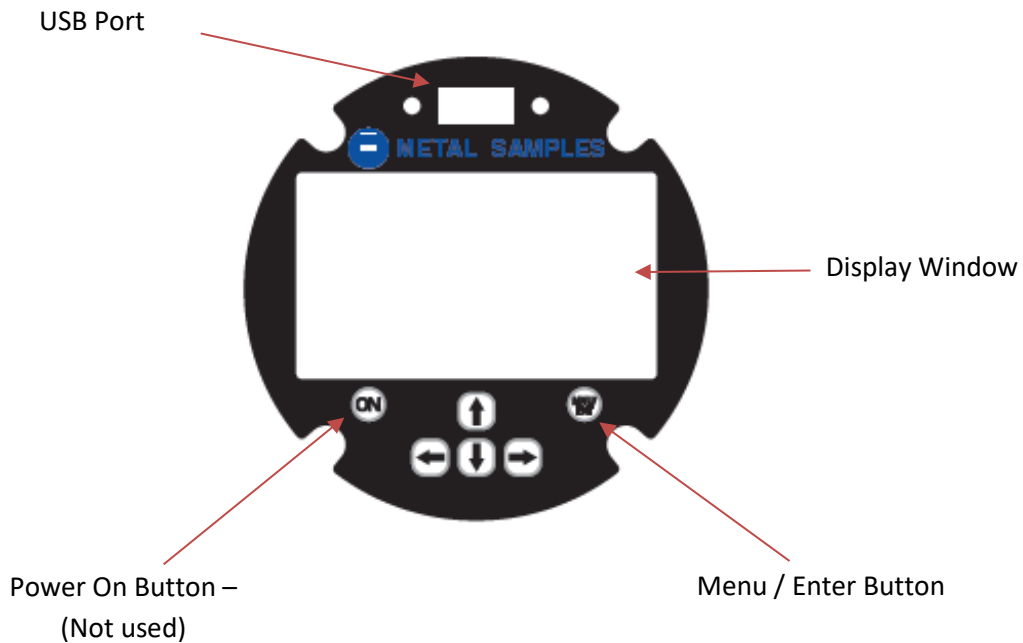


b. Remote Mounting

When it is not practical to direct-probe mount the MS50XX data logger, the unit can be remote mounted instead. In this case, the instrument is mounted to a separate mounting pole using the optional Remote Mounting Hardware Kit. The transmitter is then connected to the ER probe via the optional probe extension cable. When possible, the transmitter should be mounted within 10' (3m) of the probe to keep the probe cabling short and minimize signal degradation.

2. Power-Up

The unit is supplied with Battery pack in a separate package. Install the battery pack before starting the product. The instrument can be powered up by pressing the 'ON' button on the Keypad . The Start-up screen with the Metal Samples logo will appear on the screen; the start-up screen confirms the software version currently running and the SD card status. The keypad switch layout shown below.



a. Safe Area Usage

The MS5000E High Resolution Data Logger is approved for use in hazardous areas but can be used in non-hazardous areas as well.

The Cells in the battery pack must be replaced only in a safe area and it should be replaced with same make and model.

b. Hazardous Area Usage

Refer Appendix-B for details

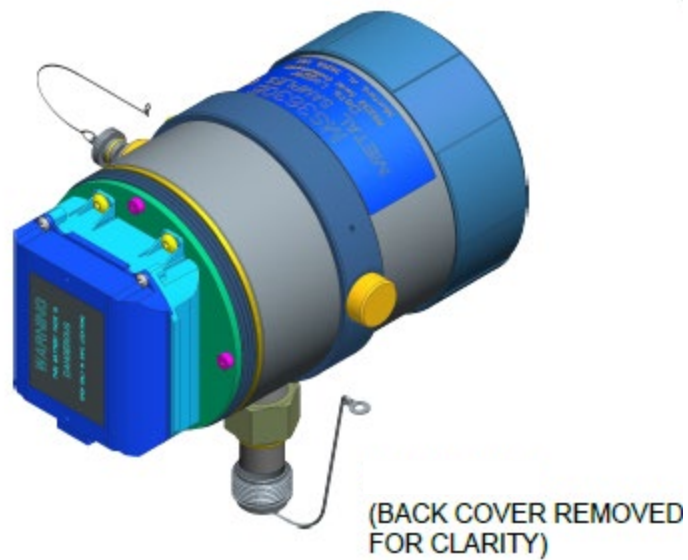
c. Battery Replacement

The battery compartment is located on the back of the instrument. You must first remove it to access the battery compartment.

To replace the batteries, first loosen and remove the cover, then remove the battery cover to expose the batteries. Remove the old batteries and replace them with four new same type of batteries, being sure to follow the polarity (+/-) symbols in the battery compartment. Replace the battery cover and cover screw.

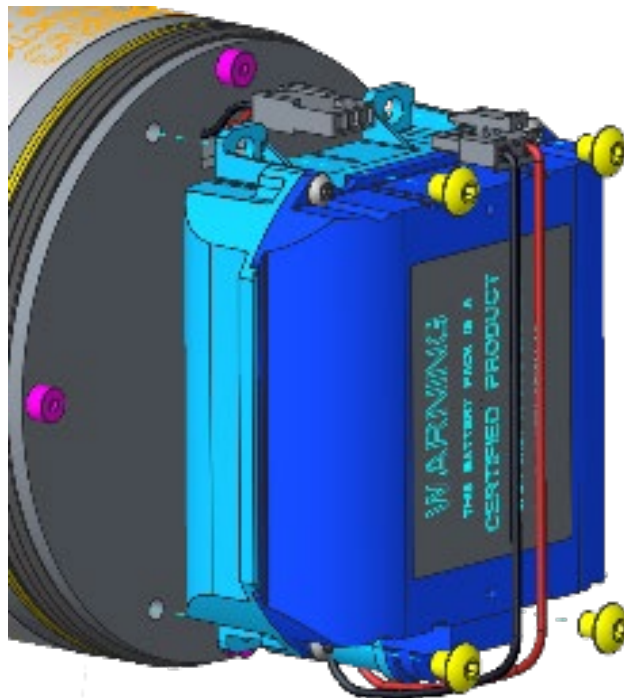
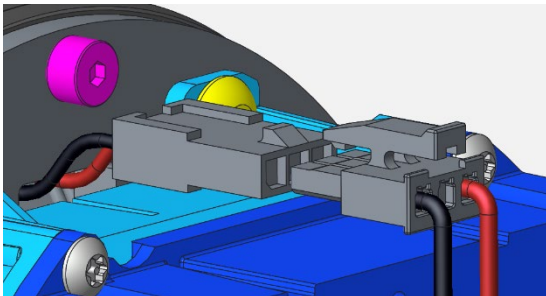
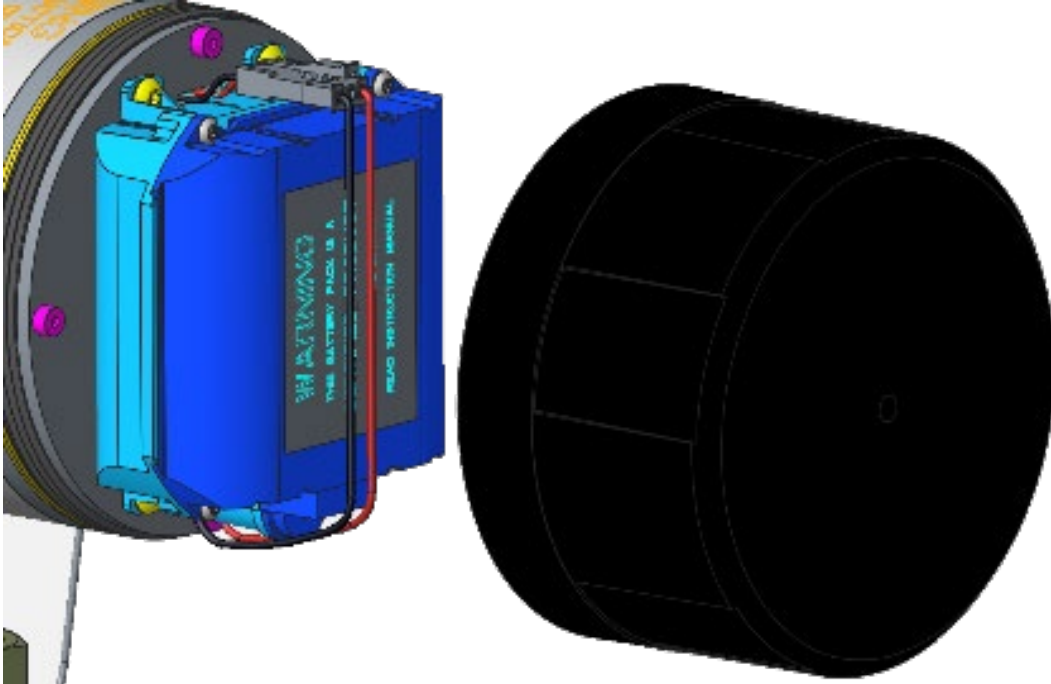
WARNING:

- *Do not mix old and new batteries. Equipment is intended for use only with Xeno Energy model XL-205F and Tadiran model TL-5930 cells. Use of any other battery in this device may impair intrinsic safety.*
- *Do not mix batteries of different types (such as alkaline and lithium.)*
- *The cover screw is used to prevent unauthorized tampering of the batteries and is required to ensure intrinsic safety.*
- *Do not over-tighten the cover screw, as this may damage the instrument case.*



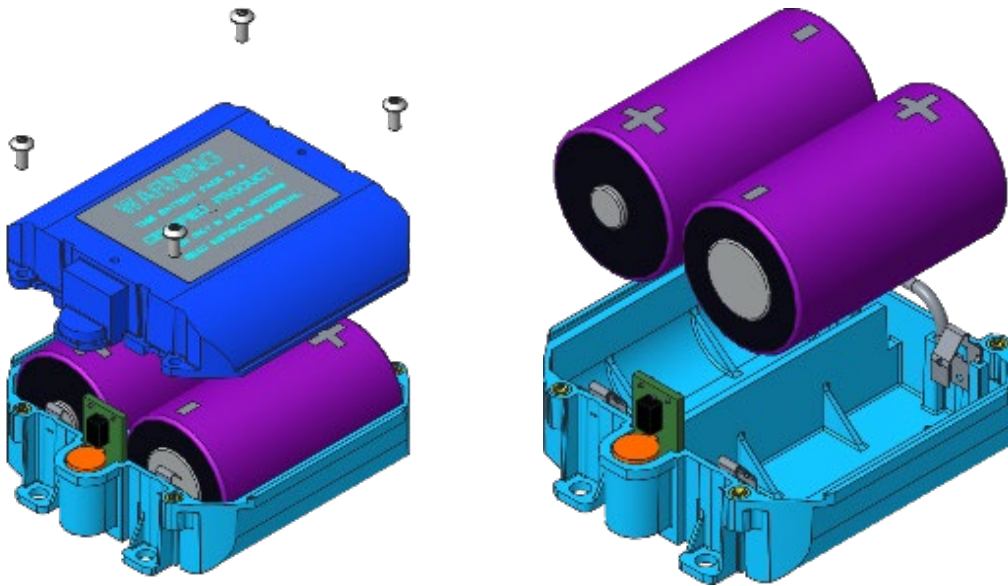
To remove the battery pack:

1. Unscrew the back cover
2. Disconnect the battery cable connection, by pressing down on the locking tab and pulling.
3. Using a 3/32" Allen wrench, remove the 4 screws holding the battery pack in place.



Replace battery cells:

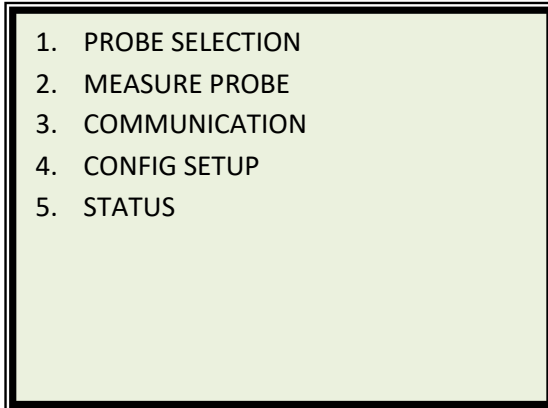
1. Following instructions 'To remove the battery pack' and move battery pack to safe location. **WARNING: ENSURE BATTERY PACK IS MOVED TO SAFE LOCATION BEFORE CONTINUING. FAILING TO DO SO MAY IMPAIR INSTRINSIC SAFETY.**
2. With the battery pack in a SAFE location, remove the 4 Tamper Resistant Torx Screws from the battery pack. Remove the battery pack cover.
3. Remove the battery cells from the pack. Check that new batteries are of the same type as those removed.
4. Insert the new batteries into the pack, ensuring that the direction matches the battery pack
5. Replace the battery pack cover and screw in the 4 Tamper Resistant Torx Screws until snug. **DO NOT OVERTIGHTEN.**



3. Setup and Operation

a. DISPLAY

MENU DISPLAY



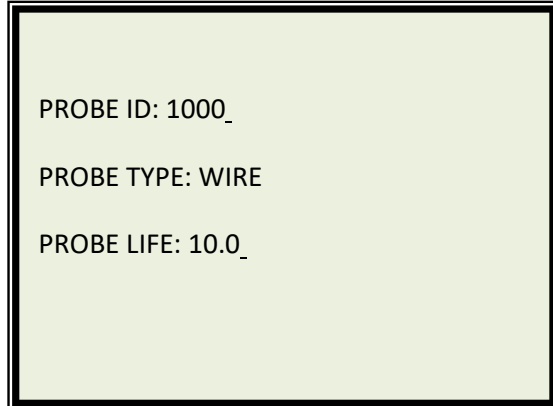
Select the functions by using the up or down arrow and pressing 'MNU/ENT' key. Pressing '<-' will return the selection to the previous screen.

Press Left arrow key to exit and turn off display.

b. SELECT PROBE

ENTER NEW PROBE - To enter the ID of a new probe, select 'ENTER NEW PROBE' menu by using the arrow keys and press MNU/ENT key; the next screen allows you to enter the ID number and the type.

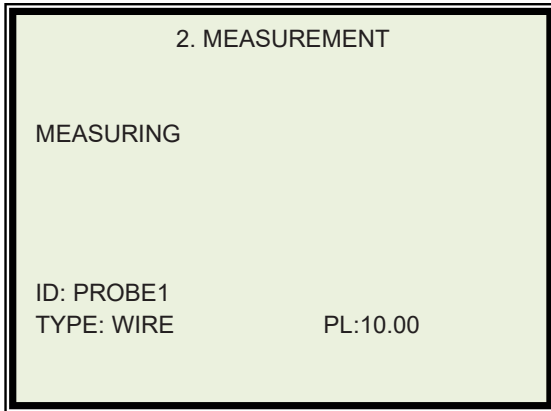
1. Enter the Probe ID using the Up/Down arrow Keys. (Use the Up/Down arrows to scroll between alphanumeric characters. Use the Right/Left arrows to advance to the next character or go back to the previous character.) When a 10-digit Probe ID is entered the cursor automatically advances to the Probe Type field.
2. Use the Up/Down arrows to select the Probe Type. Use the Right arrow to advance to the Probe Life field.
3. Enter the Probe Life using the up/Down arrow keys.
4. Press ENTER.



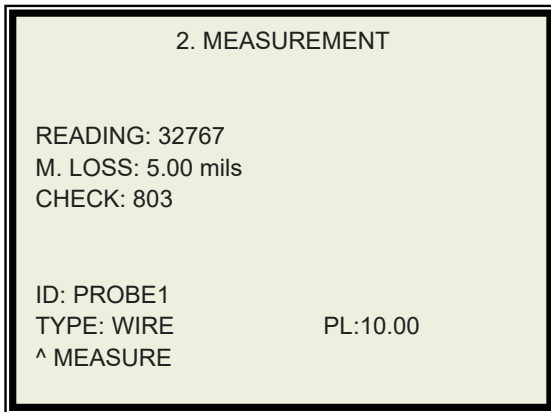
PROBE ID: 1000_
PROBE TYPE: WIRE
PROBE LIFE: 10.0_

c. MEASURE PROBE

To take measurement from probes in memory manually, select 'MEASURE PROBE' menu from the Main Menu. Please ensure the probe is selected as active probe before using this function. The display changes as below and starts measuring the probe. Probe ID, Type and Probe Life of the current measuring probe will be Displayed in the bottom of the screen.



On Completion of the measurement the measured values will be displayed as shown below.



The probe measurement can be repeated by pressing the 'up' arrow key.

To exit and turn off the display press the Left arrow key.

d. COMMUNICATION

Pressing the 'FILE TRANSFER' from main menu screen will display the File transfer screen as below.

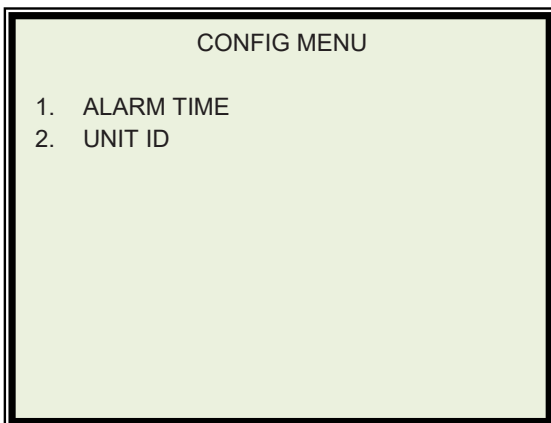


Select 'START PUBLISHING' and press 'MENU/ENTER' button to publish the data. This may be necessary after the power is on and provisioning setup is complete.

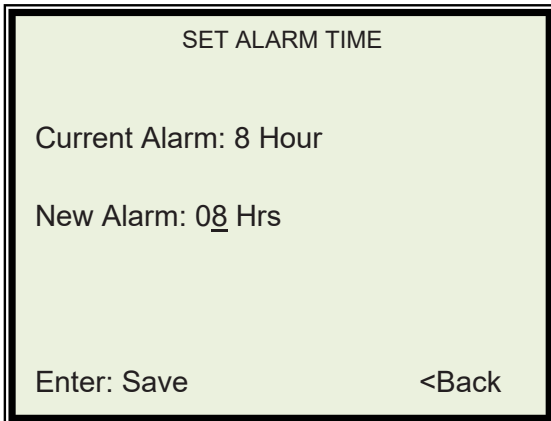
To exit and turn off the display press the Left arrow key.

e. CONFIG & SETUP

Select 'CONFIG & SETUP' from main Menu to set Alarm Time and other settings. The below screen appears with available settings.



f. ALARM TIME



Use Right/Left arrow keys to turn on/off the Alarm Time. Use Up/Down arrow to change Alarm interval. Minimum can be set as 1 Hours and maximum can be set as 99 Days. The unit takes the reading once per the set interval.

To exit and turn off the display press the Left arrow key.

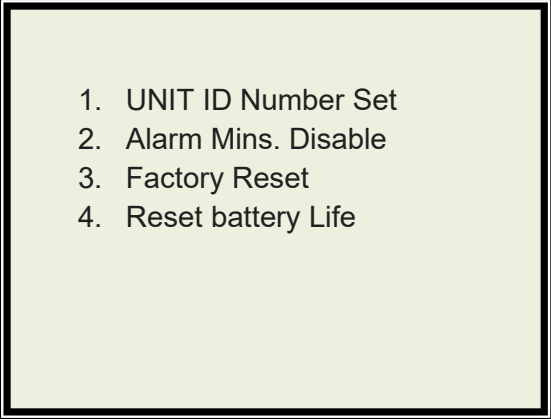
g. UNIT ID



Enter 3333. Use Right arrow keys to move the cursor to the next field. Use Up/Down arrow to change numbers.

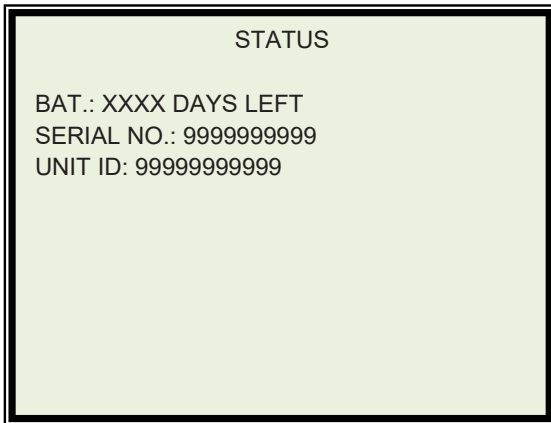
Press 'MENU/ENTER' button

The new screen displays as follows.

- 
1. UNIT ID Number Set
 2. Alarm Mins. Disable
 3. Factory Reset
 4. Reset battery Life

1. **Unit ID number Set** - To enter the unit ID/Tag, select 'UNIT ID Number Set' menu by using the arrow keys and press MNU/ENT key; the next screen allows you to enter the ID number and the type.
 - a. Enter the ID using the Up/Down arrow Keys. (Use the Up/Down arrows to scroll between numeric characters 0-9. Use the Right arrow to advance to the next character .. .
 - b. On completion of entering all digits Press 'MENU/ENTER.
2. **Alarm Mins. Enable / Disable** – To enable /disable Alarm time in minutes, select the manual and use the right arrow key. On completion of selection press '**MENU/ENTER**' key to
3. **Factory Reset** – To Remove provisioning information and set the instrument to default settings, select 'Factory Reset' menu and press 'MENU/ENTER' button.
4. **Reset battery Life** – To reset battery life, select the menu and press 'MENU/ENTER' button. This step becomes necessary after battery replacement

h. STATUS

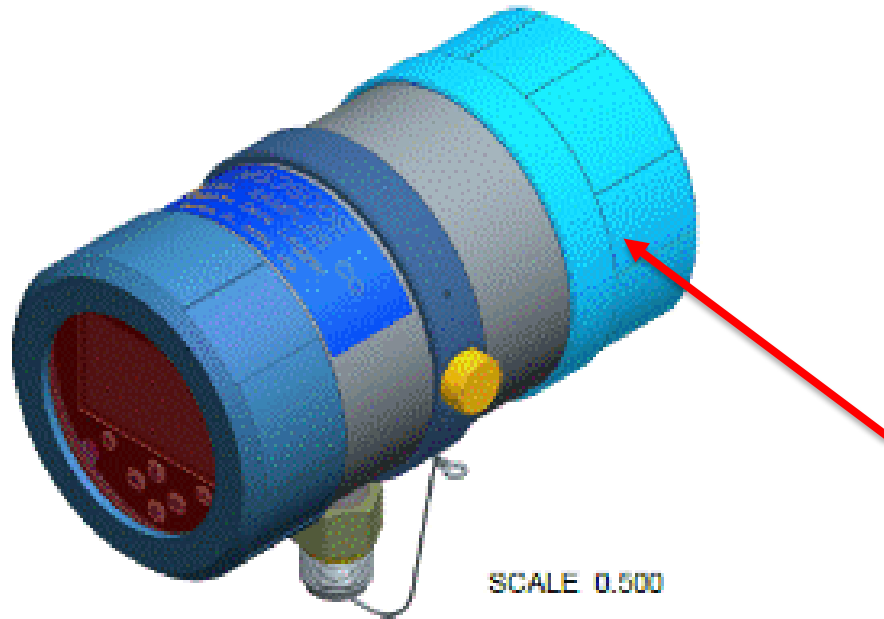


Current battery energy left days displayed on the first line.
Serial number of the instrument is displayed on second line
Unit ID/ tag displayed on third line.

To exit the screen and to display menu screen, press the Left arrow key.

4. Power Up and Initial Setup

- a. Remove the rear cover by turning the cover Counterclockwise.



- b. Connect the battery connector.



- c. The device starts operating once the battery is connected. Instrument scans for any requests from the gateway and responds accordingly. The device polls every 125 mS to serve the request.
- d. Press 'MENU/ENTER' button. The menu Screen displays. And the instrument goes in to maintenance/setup mode. During this time the instrument will not communicate to the requests.
- e. Select '5. CONFIG SETUP' and press Enter button
- f. 'CONFIG MENU' screen appears
- g. Select '1. DATE & TIME' and press Enter
- h. Date and Time Setting screen appears
- i. Set Date and Time and Press Enter
- j. Press Left arrow Key and exit the menu screen. Instrument comes out of setup mode and Green LED starts flashing which indicates the unit is in listening mode for requests.

5. Provisioning Reset / Factory Reset

NOTE: This procedure can be used if provisioning details need to be cleared or the instrument needs to be reset to factory defaults.

- a. Press 'MENU /ENTER' button
- b. Menu screen appears.
- c. Select '5. CONFIG SETUP' and press Enter button
- d. 'CONFIG MENU' screen appears
- e. Select 'UNIT ID" menu and press Enter button
- f. Password enter screen appears
- g. Enter 3333 and press Enter button.
- h. Select '3) FACTORY RESET' and press enter button
- i. Instrument turns Off and Turns back on with Menu screen.
- j. Factory Reset completed.
- k. Press Left arrow key
- l. Unit comes out of setup mode and green led starts flashing

6. Publishing Data

- a. Press 'MENU /ENTER' button
- b. Menu screen appears.
- c. Select '4. COMMUNICATION' and press Enter button
- d. On the Communication screen Select 'START PUBLISHING' and press enter.
- e. Data will start publishing.
- f. Press Left arrow Key.
- g. Unit comes out of setup mode and green led starts flashing

7. Alarm Setup

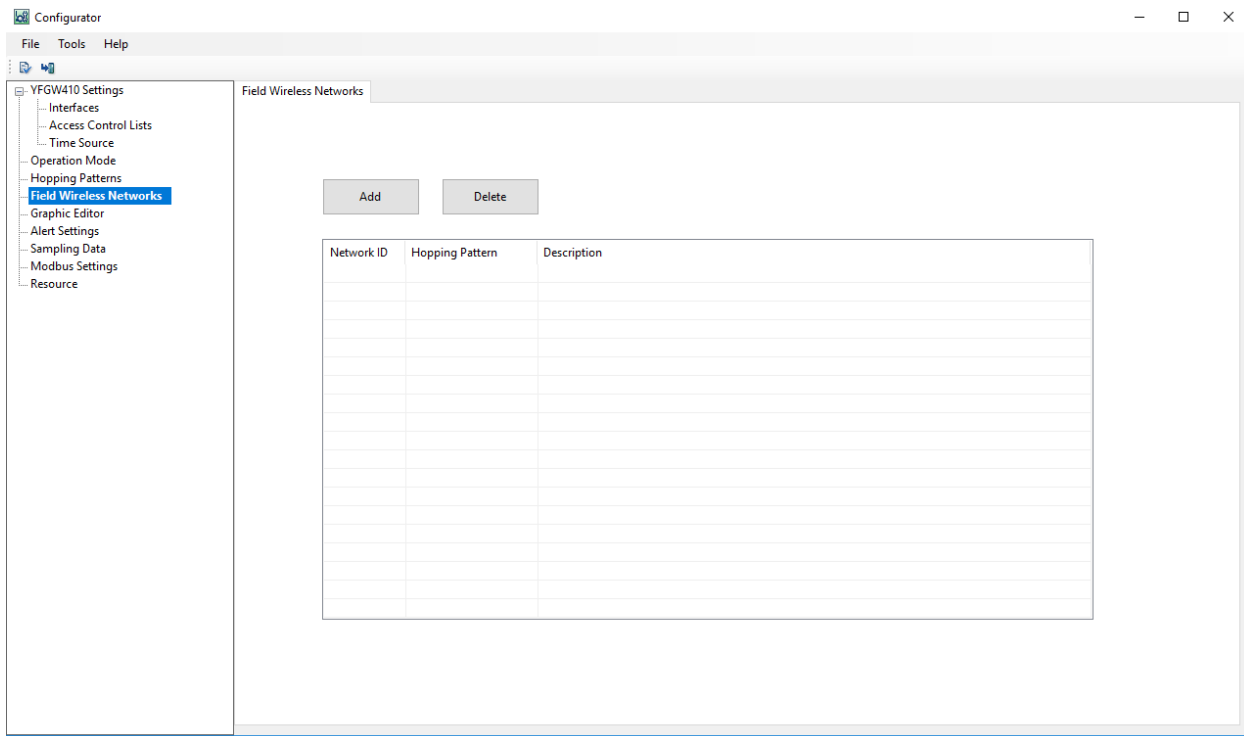
- a. Press 'MENU /ENTER' button
- b. Menu screen appears.
- c. Select '5. CONFIG SETUP' and press Enter button
- d. 'CONFIG MENU' screen appears
- e. Select 'ALARM TIME" menu and press Enter button
- f. Alarm Screen appears
- g. Enter Required Alarm Time in the New Alarm (Min 1 Hour). Move the right arrow key to the 'OFF' field and use up/down arrow to select Hours or Days.
- h. Press Enter to save the new Alarm time.
- i. Press Left arrow Key
- j. Press Left arrow Key
- k. Unit comes out of setup mode and green led starts flashing.
- l. Unit starts Measuring data at set interval time.

8. Configuring the network using the Yokogawa Configurator

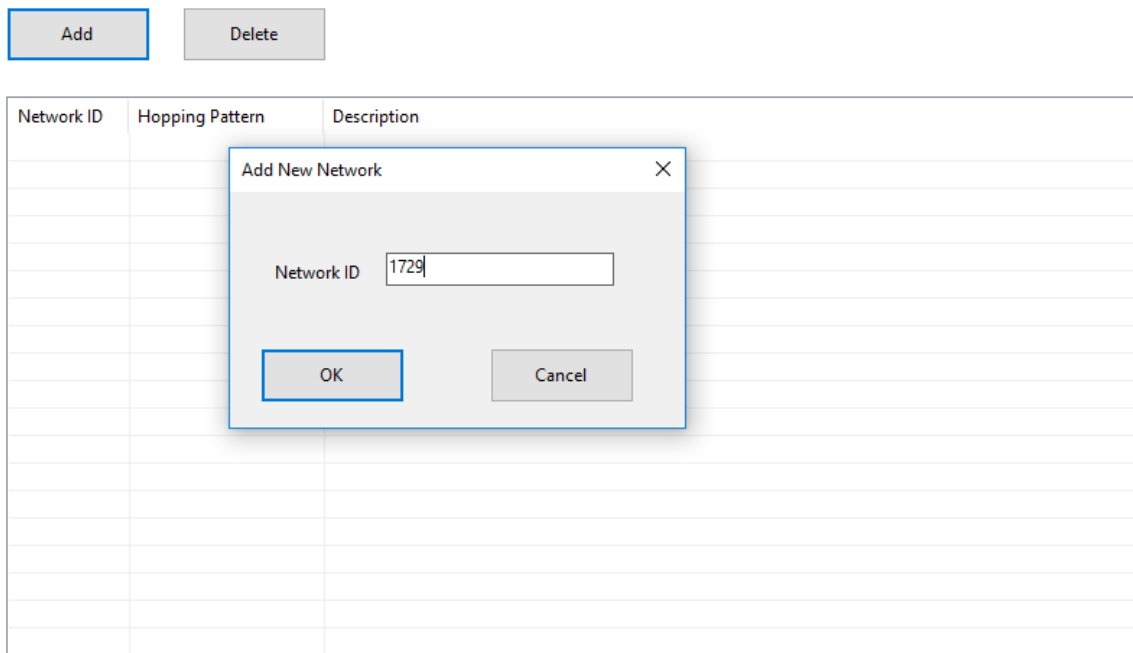
Access the Yokogawa web site (usually <http://192.168.0.101:8080>) and choose the Configurator. Log in using your username and password.



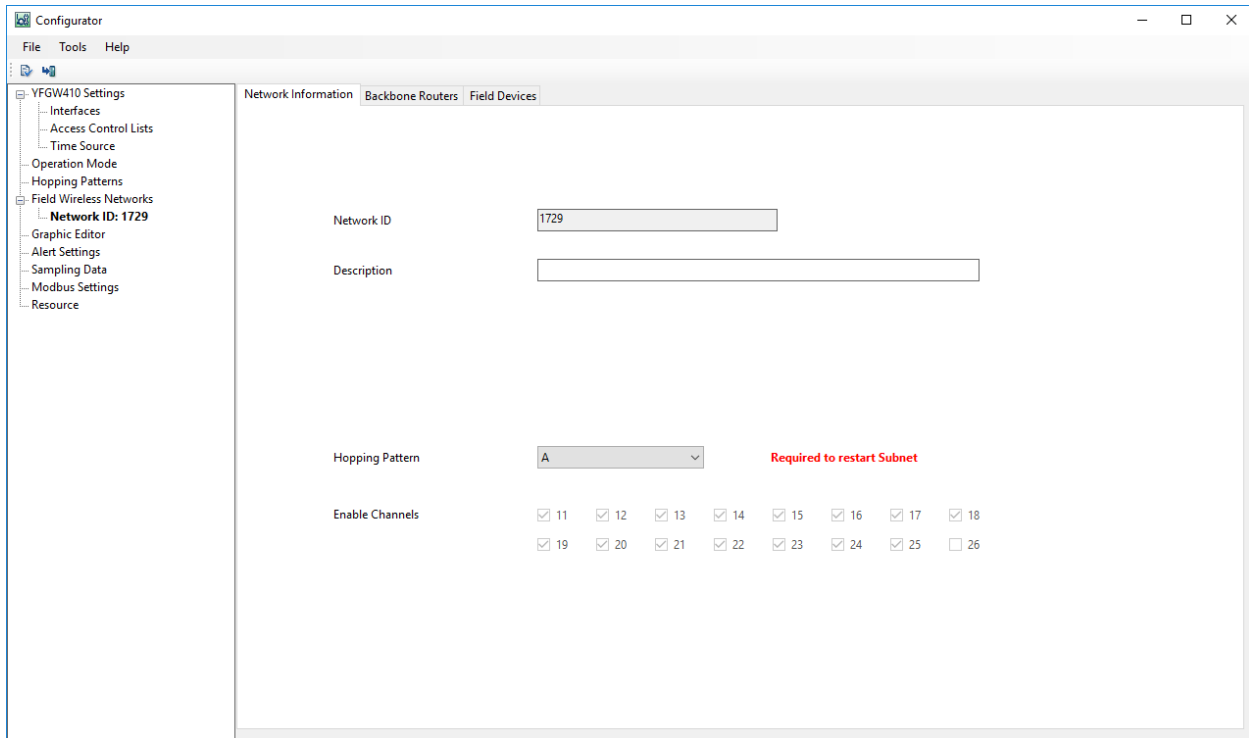
From the left-hand menu, choose "Field Wireless Networks" then click the Add button to create a new network.



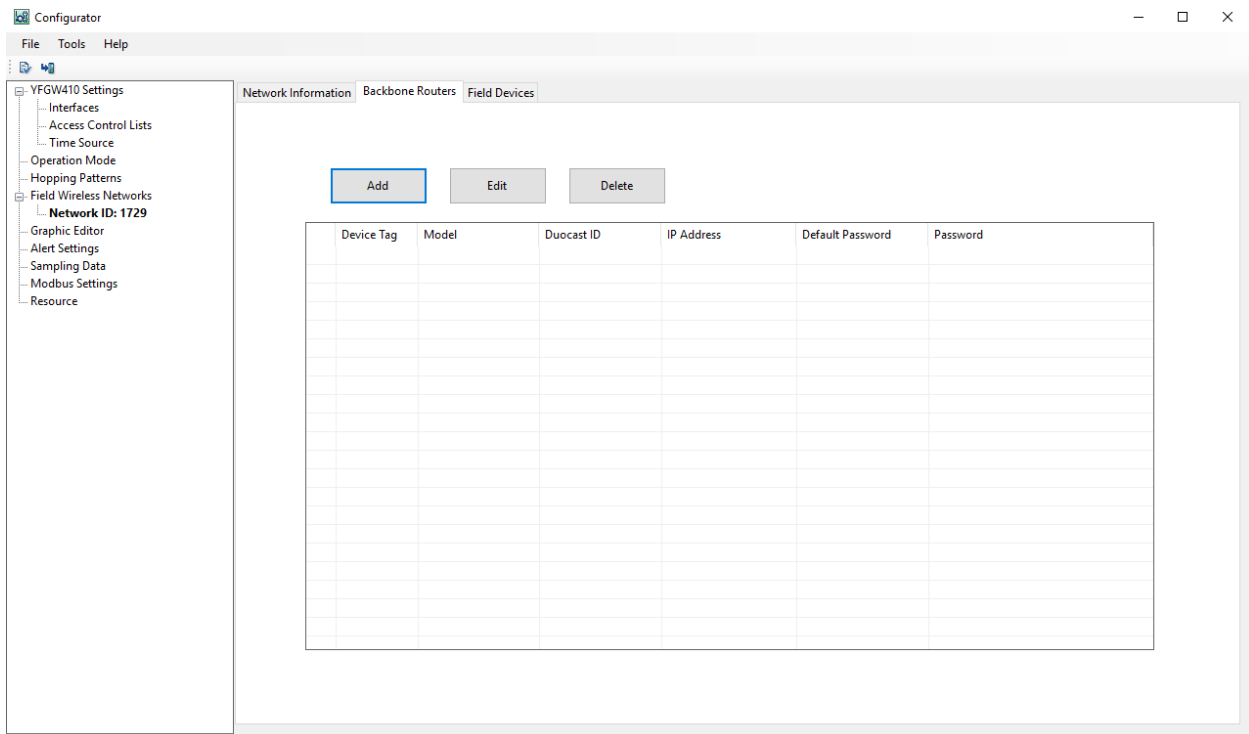
Pick a Network ID and click OK. The Network ID should be unique in the area you plan to use the gateway.



Click the new sub-item called “Network-ID: xxxx”

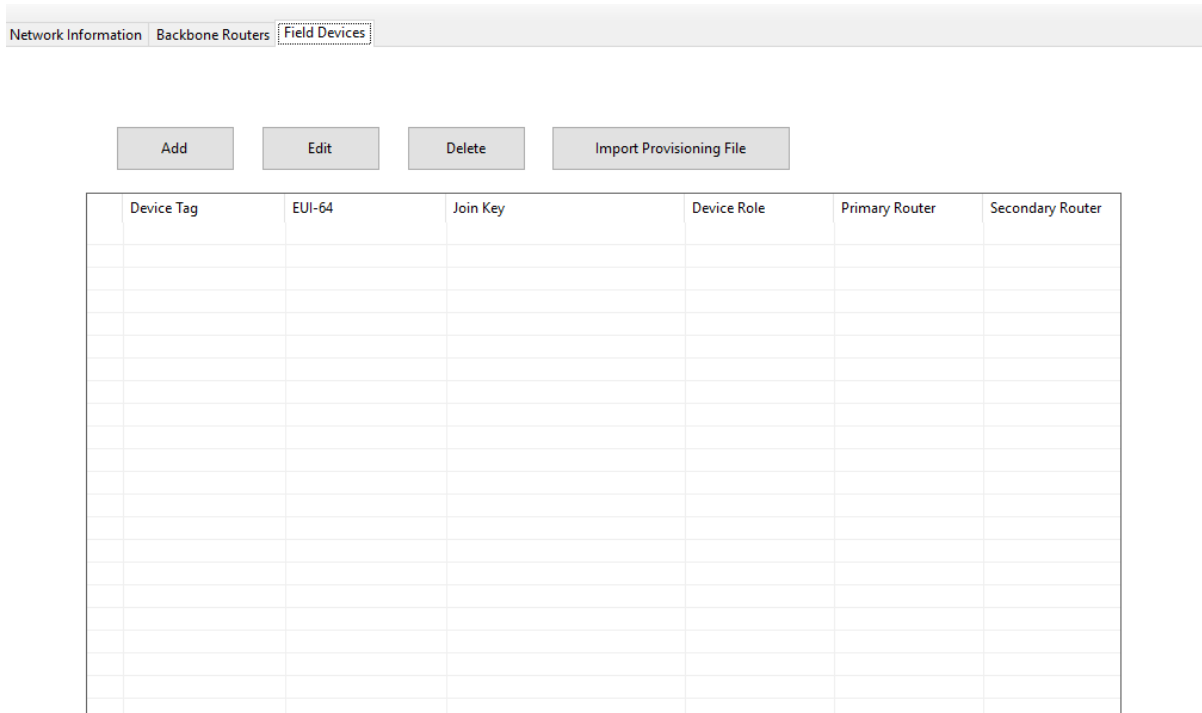


Choose the Backbone Routers and add a Backbone router if one doesn't exist.

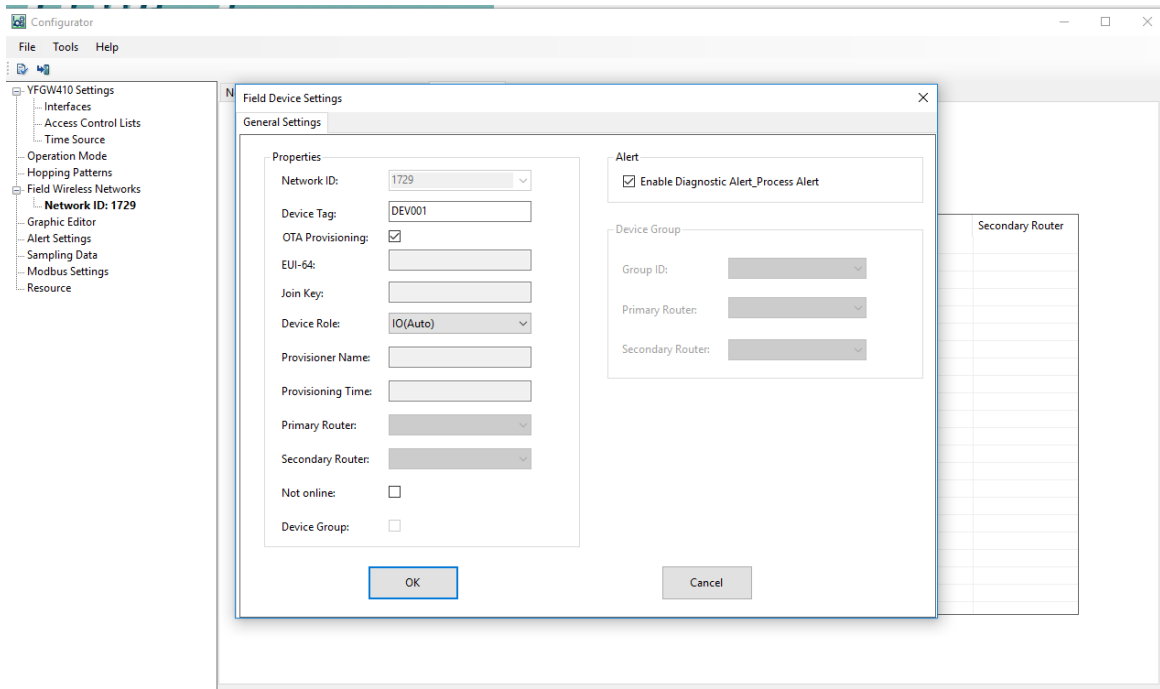


9. Configuring devices to join the network

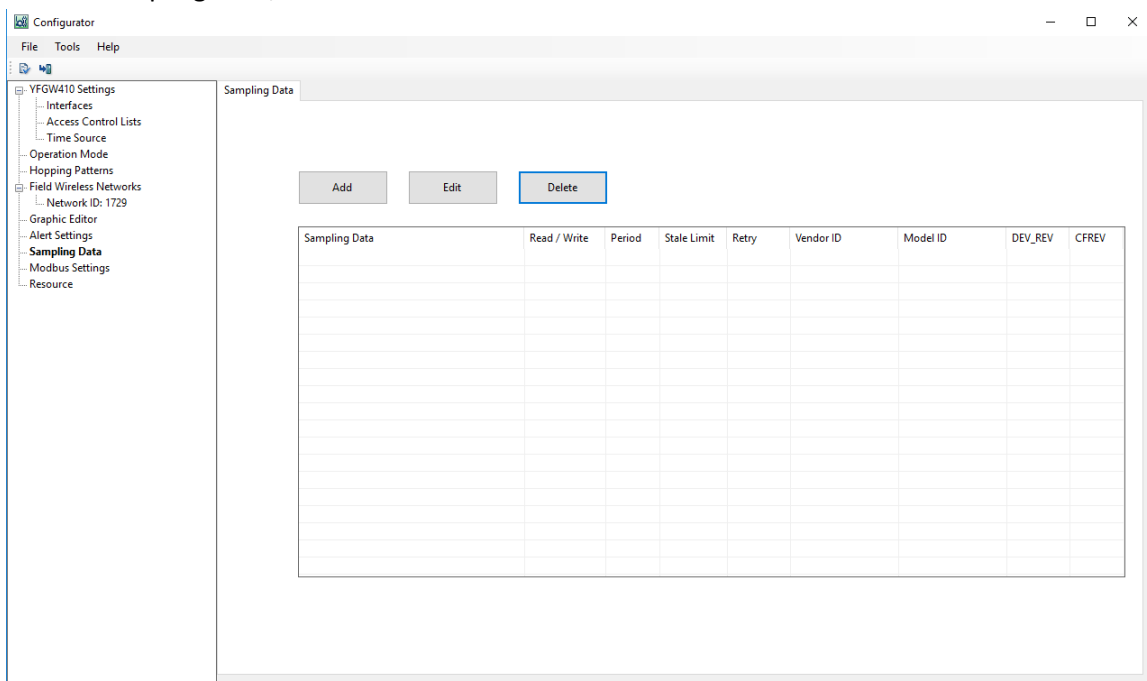
Click on the Field Devices tab, and press Add.



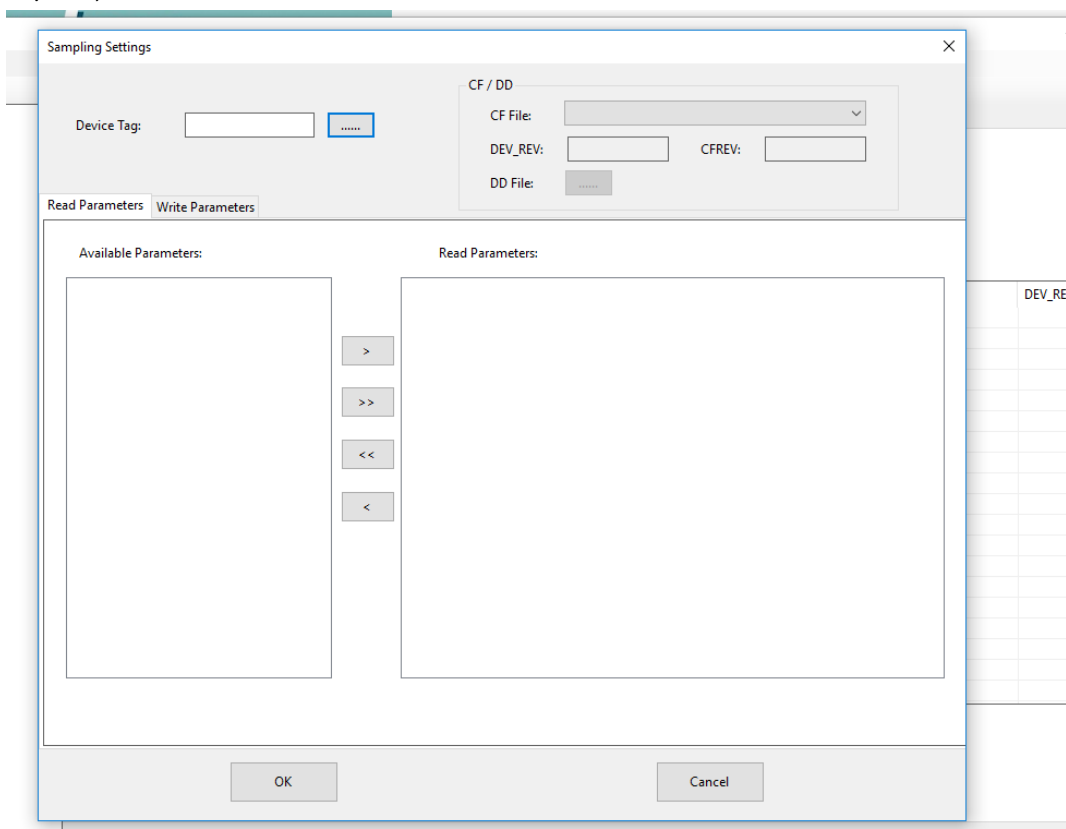
Give the device a unique Device Tag (DEV001 or anything else) and check the OTA Provisioning checkbox, as in the picture below:



Do this for every device you intend to add to the network at this step. Next, from the left-hand side menu, choose Sampling Data, and click the Add button.

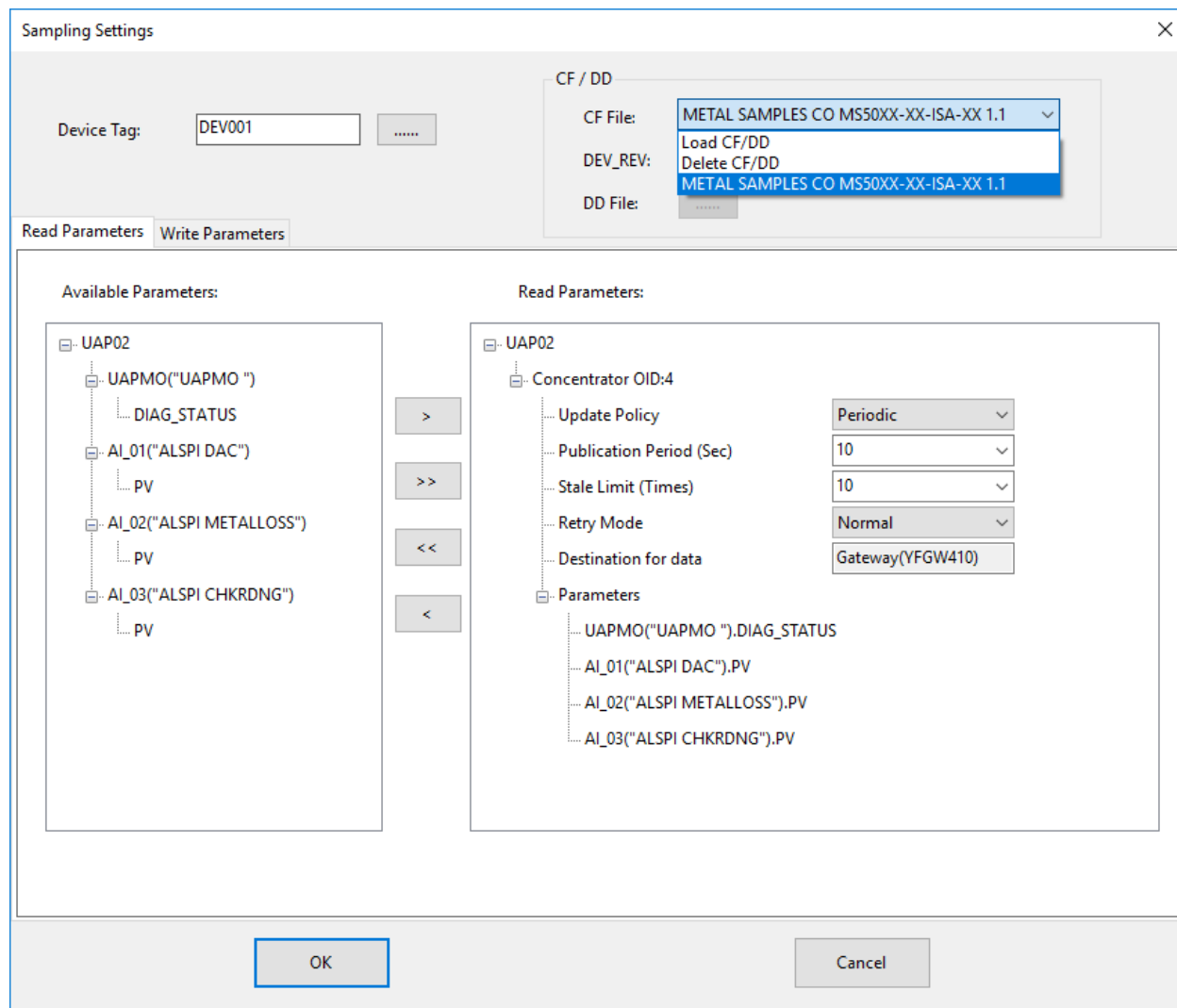


If you haven't uploaded the CF file yet, from the right hand side click on the CF File and choose "Load CF/DD", then click on the DD File "... " button and choose the file.

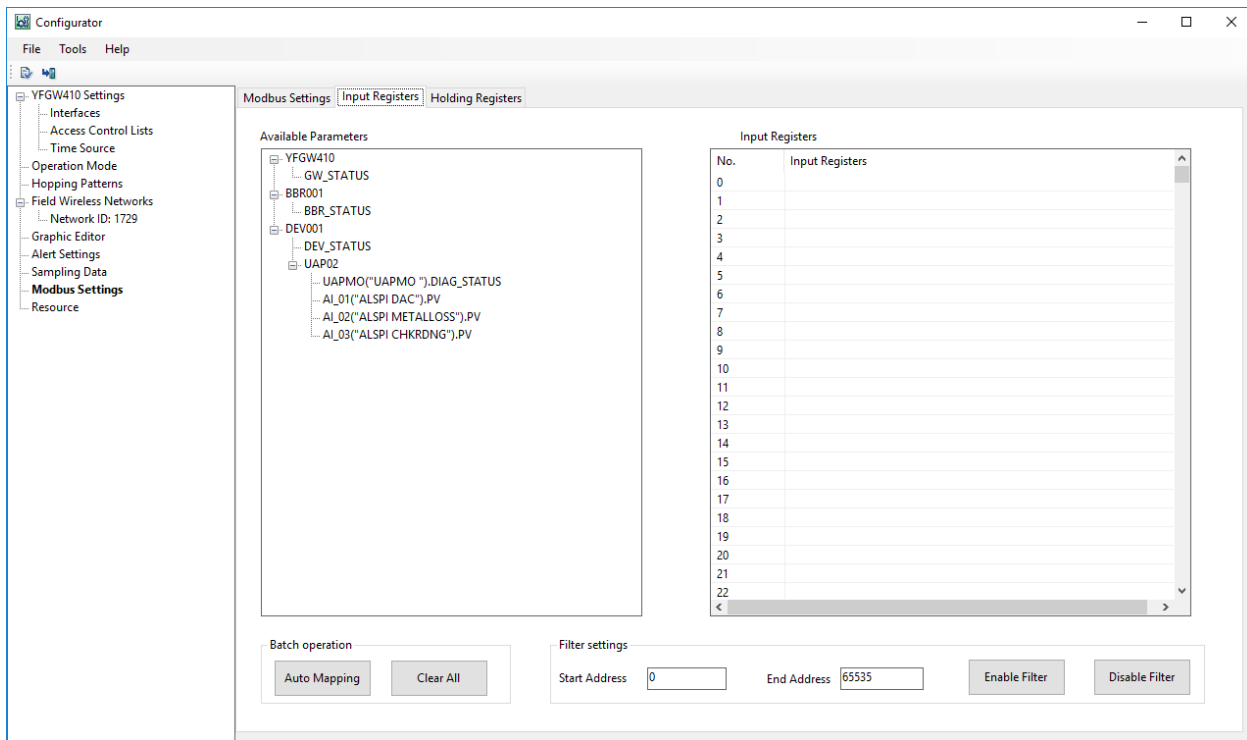


The file will get uploaded to the gateway and the next time you click the CF Files drop-down, you should see something similar to the picture below. Choose each device tag in turn, then choose the Metal Samples CF file, and the 3 values (DAC, METALLOSS, CHKRDNG) PV values should be in the right-hand side. You should choose the Publication Period that suits you. You should set the Stale Limit to the same value of Publication Period. Then click OK.

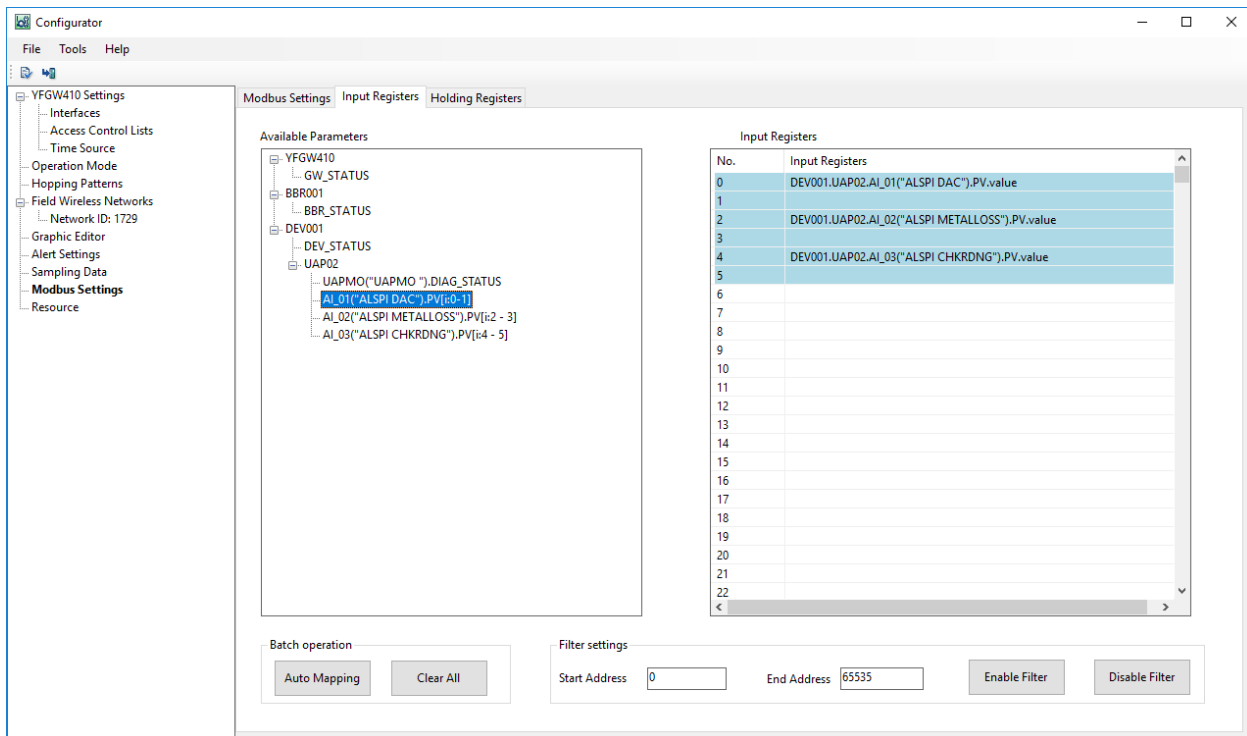
Repeat this step for each device you intend to add to the gateway.



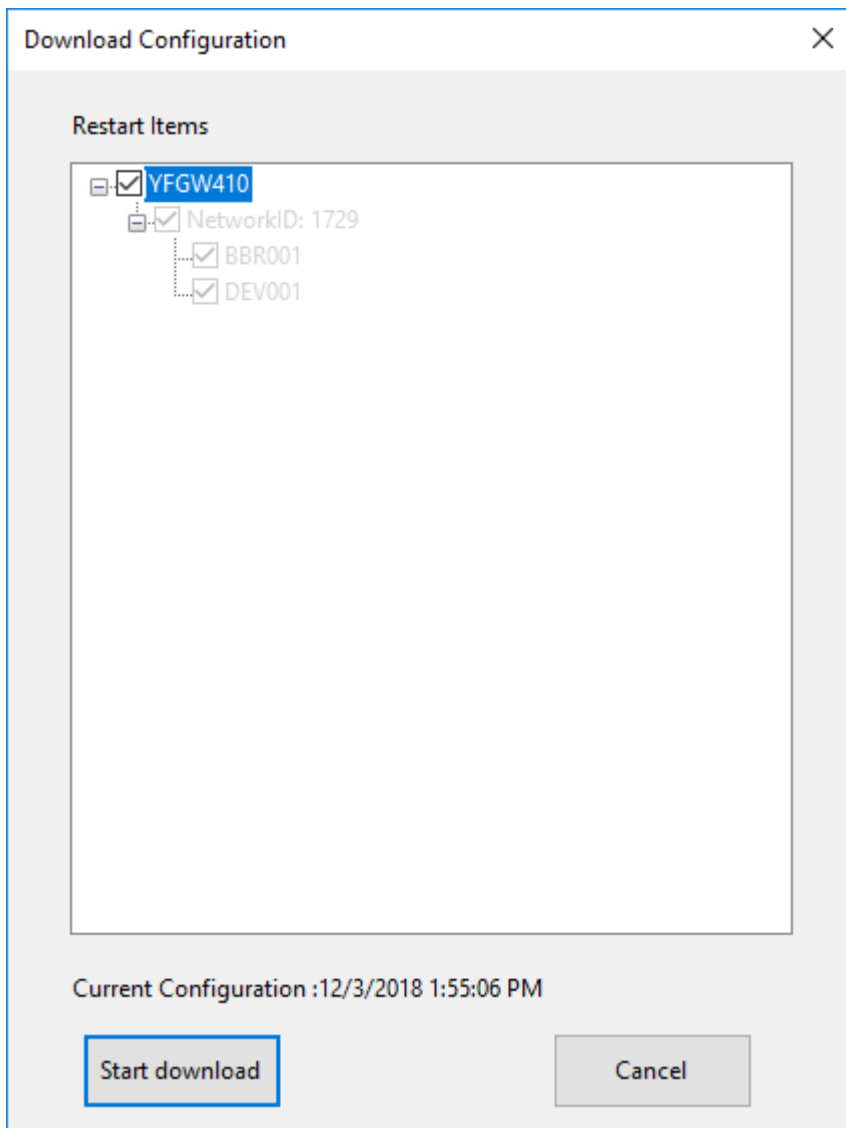
Next, we will map these values to Modbus. From the left-hand side menu, choose Modbus Settings. You should see a tree of available parameters, with each device having the 3 parameters as well as DIAG_STATUS, as in the picture below.



Now drag and drop the 3 PV values and assign them to the intended registers individually.

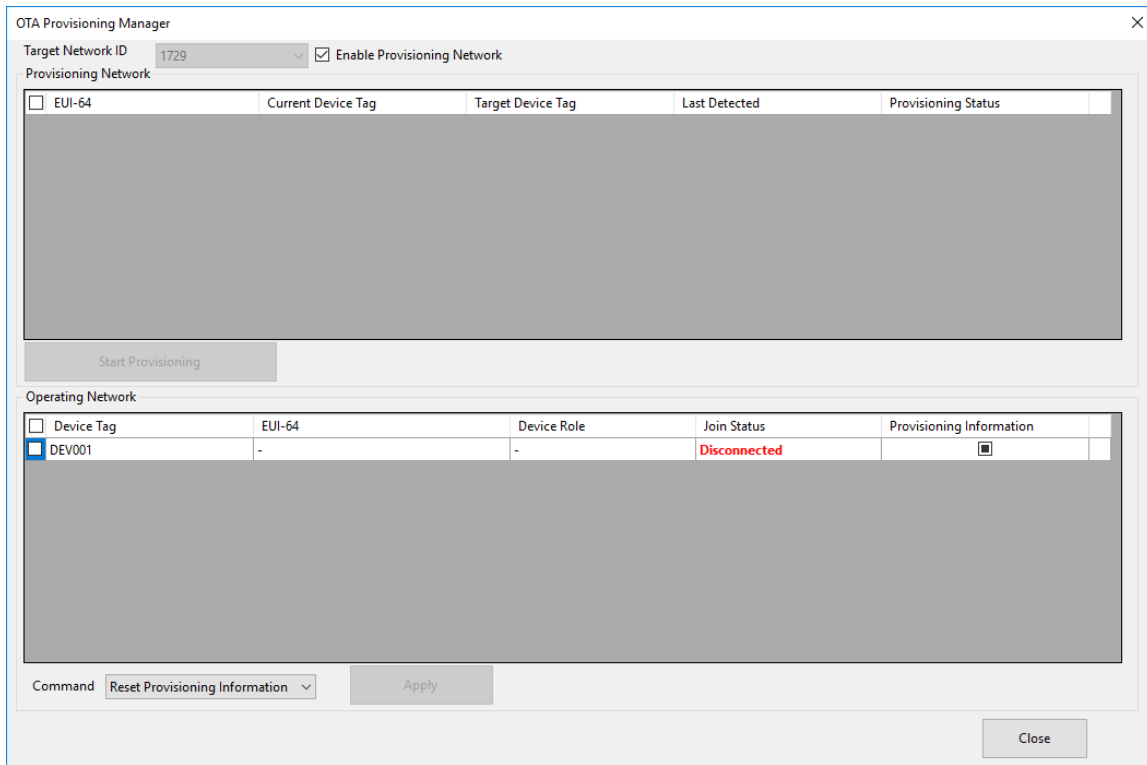


When you are done, from the Tools menu choose the Download Configuration button. A dialog will appear as shown in the next picture.

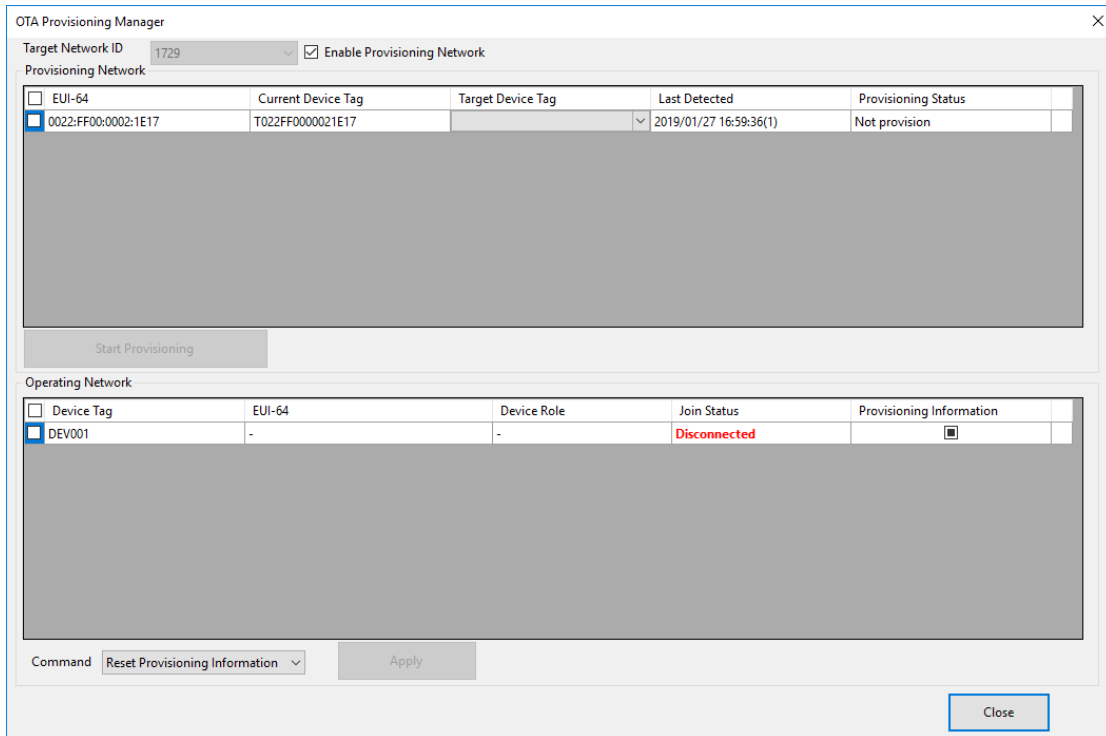


Click on Start Download and wait for the process to finish. Once it's completed, you can close the Configurator tool, and start the Monitor tool.

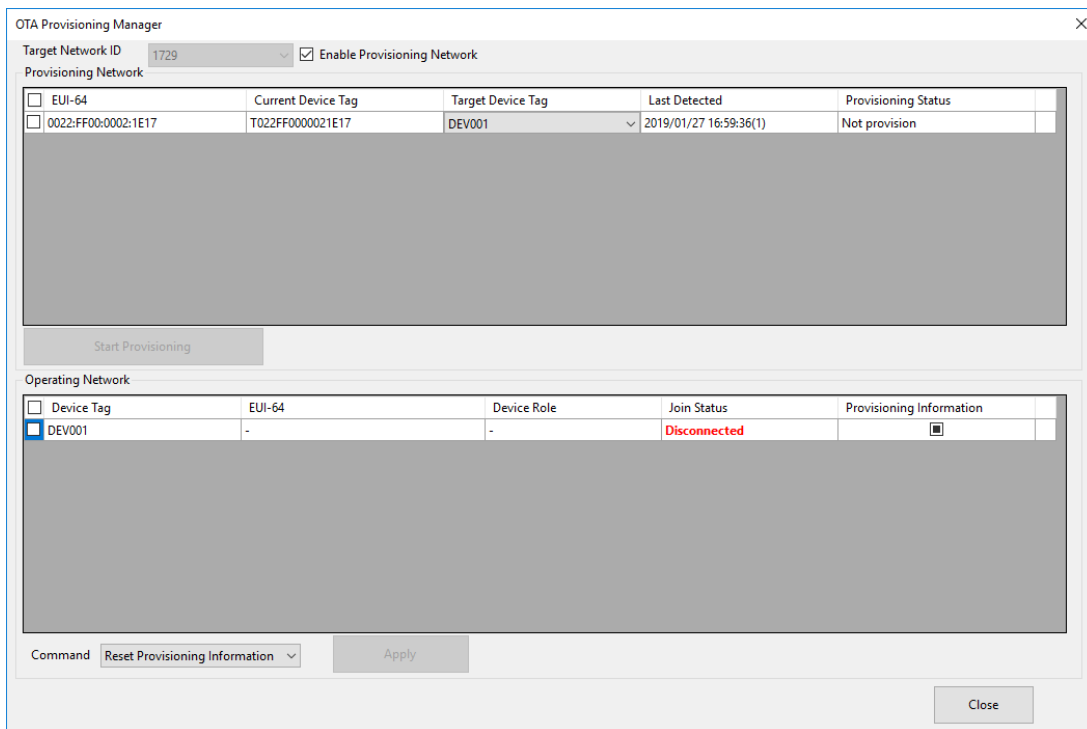
Once logged in to the Monitor tool, from the Tools menu choose OTA Provisioning Manager. It will appear as in the picture below.



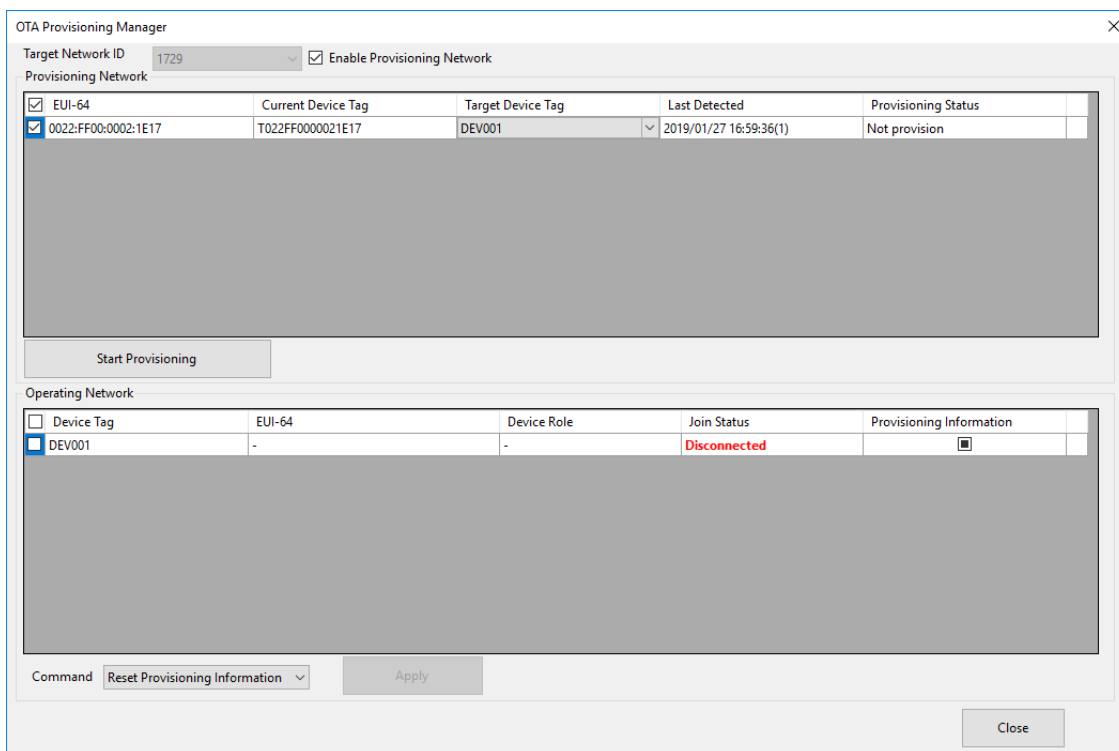
Click on the “Enable Provisioning Network” checkbox, and wait for your device(s) to appear.



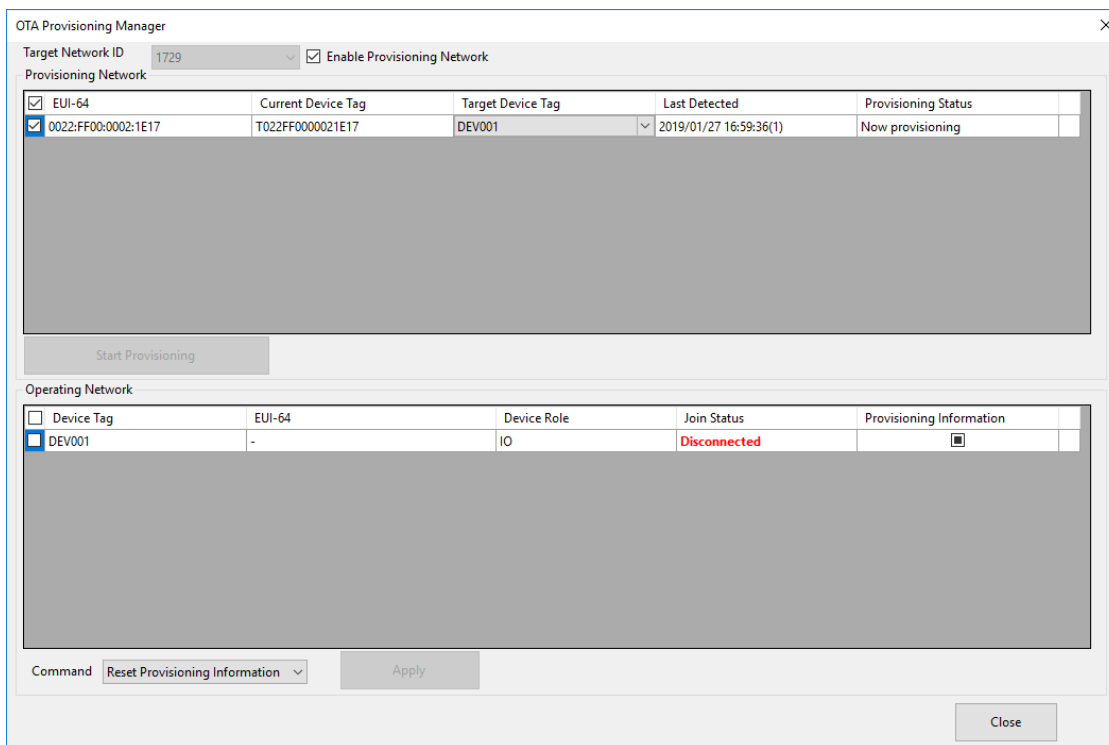
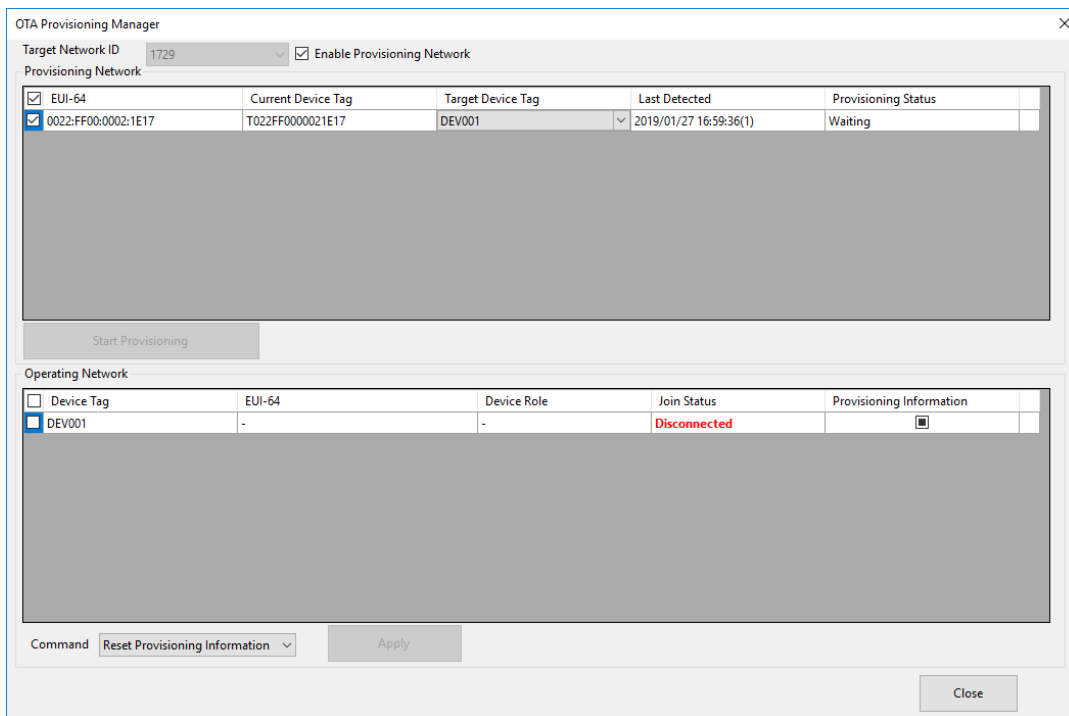
Once the device(s) appear, as in the picture below, choose the Target Device Tag of the device you intend to use.



Then check the device you want to provision (as in the picture below), and click the "Start Provisioning" button.



The device will now go through the following states: “Not Provision”, “Waiting”, “Now Provisioning” and “Provisioned”.



Once the device is provisioned, uncheck the “Enable Provisioning Network” and wait for a few minutes before the data from the device reaches the gateway and Modbus registers.

C. Maintenance

Once installed, the MS5000E High Resolution ER Data Logger requires no maintenance. However, it is important to verify the following items periodically to ensure continued safe operation.

CAUTION: Before performing any tests or maintenance on the MS5000E High Resolution ER Data Logger, ensure that all hazardous area requirements are met.

Inspection Item	Frequency
Inspect the enclosure for any signs of damage. Return if necessary.	Annually
Inspect the probe cable / connector for any signs of damage. Replace as necessary.	Annually
Replace the Battery pack	As needed

Contact Metal Samples for replacement parts or if instrument repair is necessary.

Testing the MS5000E High Resolution ER Data Logger with the Meter Prover

A Meter Prover is provided to allow routine checks of the MS5000E High Resolution ER Data Logger. The Meter Prover simulates a Wire Loop type probe at a fixed value. To test the unit with the Meter Prover:

- 1) Connect the Meter Prover to the probe connector .
- 2) Turn on the MS5000 data logger by pressing the 'ON' button
- 3) Select probe type as Wire Loop.
- 4) Select MAKE MEASUREMENT From main menu .
- 5) Press 'ENT' button to start measuring the probe value. During measurement 'MEASURING. ' message displays on the screen. On completion of measurement the display shows the Meter Prover reading. The output should closely match the value printed on the Meter Prover label.

If the Data Logger output matches the Meter Prover value, the instrument can be used for probe measurement by selecting the appropriate PROBE ID and connecting to the respective probe. If the Data Logger output shows a significant difference compared to the Meter Prover value, further troubleshooting may be required. Refer to page 19 for troubleshooting or contact the factory for further assistance.

D. Troubleshooting

If the MS5000E High Resolution ER Data Logger does not seem to perform as expected, check the following items:

CAUTION: *Before performing any tests or maintenance on the MS5000E High Resolution ER Data Logger, ensure that all hazardous area requirements are met.*

1. Ensure that the probe is operational and is not completely corroded. This can be done in two ways.
 - a. Test the probe with another portable ER meter if available.
 - b. Test the probe with a portable resistance or continuity meter as follows:
 - i. Connect one test lead to pin 'A' of the probe's 6-pin connector.
 - ii. Measure continuity to each of the other pins. There should be continuity (low resistance) to each pin.

NOTE: Continuity on each pin does not ensure that the probe is good. However, if you find an open circuit on any pins then it is almost certain that the probe is bad and should be replaced.
2. Ensure the battery voltage.
3. Test the MS5000E High Resolution ER Data Logger transmitter using the supplied Meter Prover (see page 23.)

These basic checks should indicate the source of any problem (probe, power supply, wiring, etc.). If it is determined that the MS5000E High Resolution ER Data Logger is malfunctioning, or if you need further assistance in troubleshooting, contact Metal Samples Technical Support.

CAUTION: *If the MS5000E High Resolution ER Data Logger transmitter shows any signs of damage, remove it from service immediately and consult the factory.*

III. Service and Warranty Information

A. Warranty

Metal Samples warrants that any part of the model **MS5000E High Resolution ER Data Logger** and accessories which proves to be defective in material or workmanship within one year of the date of original shipment to Purchaser will be repaired or replaced, at Metal Samples option, free of charge. This warranty does not cover (1) probe assemblies, (2) items expendable in nature, or (3) items subject to damage from normal wear, misuse or abuse, or failure to follow use and care instructions.

All damaged items are to be shipped at Purchaser's expense to and from Metal Samples which shall have the right to final determination as to the existence and cause of a defect.

The foregoing shall constitute the sole and exclusive remedy of any purchaser of Metal Samples products for breach of warranty and IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL METAL SAMPLES BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES, OR FOR ANY DELAY IN THE PERFORMANCE OF THIS WARRANTY DUE TO CAUSES BEYOND ITS CONTROL.

The technical information and suggestions contained herein are believed to be reliable, but they are not to be construed as warranties since conditions of use are beyond our control.

B. Obtaining Service and Returning the Instrument for Repair

If you experience problems with your instrument please contact the factory at 256-358-4202 and ask for customer support for instrumentation. Our customer support department will assist you in troubleshooting your instrument.

Most issues can be resolved over the phone, but in some cases it may be necessary to return your instrument for further evaluation and repair. In this case, please obtain a Return Materials Authorization (RMA) number from the sales person or support technician. This RMA number will ensure that your instrument is routed to the correct department when it is received at the factory.

After receipt of an RMA number you may pack your instrument for return. Be sure to pack your instrument in a sturdy box and to pad it sufficiently to avoid damage during transit. Also be sure to complete the "Instrument Repair Form" on the next page and include a copy with your repair. This will ensure that the repair department has sufficient information regarding the problems you are experiencing with your instrument, as well as the billing, contact, and return shipping details for the repair.

Once you have obtained an RMA number, completed the "Instrument Repair Form", and packed your instrument securely, please ship it prepaid to the following address:

Metal Samples
152 Metal Samples Road
Munford, AL 36268
ATTN: RMA# _ _ _ _ _

NOTE: Be sure to list your RMA number in the attention line (shown as blanks in the example above.)

C. Instrument Repair Form

This form may be photocopied for use when returning an instrument to Metal Samples for repair. Please fill in all known information and enclose a copy of the completed form with the instrument.

General Information

Model Number		Serial Number	
RMA Number		Date of Purchase*	

**If known.*

Contact Information for Repair

Contact Name		Company	
Phone Number		E-mail Address	

Return Shipping Information

Recipient Name*		Company*	
Return Address			

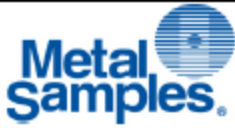
**If different than above.*

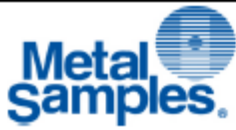
Reason for Return. (Provide as much detail as possible. Attach additional pages if required.)

Invoice Instructions (For non-warranty repairs)

<input type="checkbox"/>	Invoice me for the repair <i>(Requires an open account with Metal samples.)</i>	→	Reference PO#
<input type="checkbox"/>	Contact me for credit card information <i>(For security purposes, do not list credit card information on this form..)</i>		

Appendix B : CERTIFICATION DETAILS

	MS50XX HAZARDOUS AREA CERTIFICATION - INTRINSIC SAFETY DETAILS	Doc.Number	EXDOC-000013
		Revision	0
		Date	6/28/2017
		Page	1 of 2
Worldwide and Europe	Ex ia [ia] IIC T4 Ga -40°C ≤ Ta ≤ +70°C (When used with Tadiran TL-5930 Cells) -40°C ≤ Ta ≤ +50°C When used with Xeno Energy XL-205F Cells ATEX Cert. No: ITS17ATEX201833X IECEX Cert. No: IECEX ETL 17.0020X X – See special Conditions below		
Special Conditions			
1. Potential Electro charging Hazard.			
2. Only Battery packs allowed to replace in Hazardous areas.			
<u>Hazardous Area Installation</u>			
CAUTION: This section provides general guidelines for hazardous area wiring. However, regardless of anything stated here, the MS50XXE transmitter must be installed in full compliance with the control drawing provided Annexure-C and all of the local area requirements.			
<u>Entity Parameters</u>			
<u>at Probe (common for all models)</u>			
Uo:	4.94V		
Io:	0.85A		
Po:	1.05W		
Ci:	44.55μF		
Li:	0μH		
Co:	1.9μF		
Lo:	10μH		



MS50XX HAZARDOUS AREA
CERTIFICATION - INTRINSIC SAFETY DETAILS

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CAUTION:

1. When replacing the battery packs in Hazardous area, discharge the static charge from the body using ground strips or other methods.
2. Use gas analyzers or other type of equipment to ensure the area is non-hazardous before changing the batteries. Cells in the batteries not allowed to replace in hazardous areas.
3. Use only with battery pack part # ET1664 or ET1857.
4. Equipment is intended for use only with Xeno Energy model XL-205F and Tadiran model TL-5930 cells. Use of any other battery in this device may impair intrinsic safety.
5. Do not replace cells in the pack unless area is known to be Non-Hazardous.

