

IQ PULSE GP-CEP SETUP AND CONFIGURATION GUIDE



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Change Log:

Date	Author	Change	Version Number
April 2019	Matt Crites	Initial release	1.0
July 2019	Matt Crites	Added Meter Installation, Section 8.0	2.0
September 2019	Matt Crites	Added Change Log	2.5
October 2019	Matt Crites	Added Pit Installation	3.5
November 2019	Matt Crites	Updated App Photos	4.0
October 2020	Matt Crites	Updated App Photos Updated Certified Meters	5.0
March 2021	Matt Crites	Updated Certified Meters	6.0
April 2021	Matt Crites	Updated Pit Install Images	8.0
June 2021	Matt Crites	Added Troubleshooting, SIM Configuration and Device Reset Sections	9.0

Section 1.0: Overview

1.1: THE APP

The LEC/USCC iQ Sense IIoT Web portal is a water usage collection database in which daily water consumption can be collected and calculated as well as alarming notification mechanisms for detecting slow and fast leaks, high consumption, etc. The data accumulated within the portal is received from a cellular endpoint residing in the field.

The cellular endpoints, known as iQ Pulse GP-CEP (General Purpose Cellular Endpoint), are configured by field technicians using a freely available mobile app for Android. The Android device i.e. cell phone, tablet, etc. utilizes built in Bluetooth to connect and communicate with the cellular endpoint.

The iQ Pulse GP-CEP will be delivered with a SIM card already inserted and ready for activation with the cellular network. This guide will walk a field technician through the steps necessary to successfully connect, communicate, and set up iQ Pulse GP-CEP.

1.2: SUPPORT INFORMATION

Setup Support

For initial install, your US Cellular Wireless Solutions Architect and LEC sales rep will provide onsite training to ensure a full understanding of the device install process. Following that, your team will receive webinar training for the iQ Pulse portal.

Post-Purchase Support

Following the install of devices, please utilize your US Cellular sales reps for tier-1 support:

- If you have a device in the field not communicating to the iQ Pulse portal, we will follow troubleshooting steps and advise when the issue appears to be resolved on our end.
 - If device signal does not improve, an external antennae may need to be sent

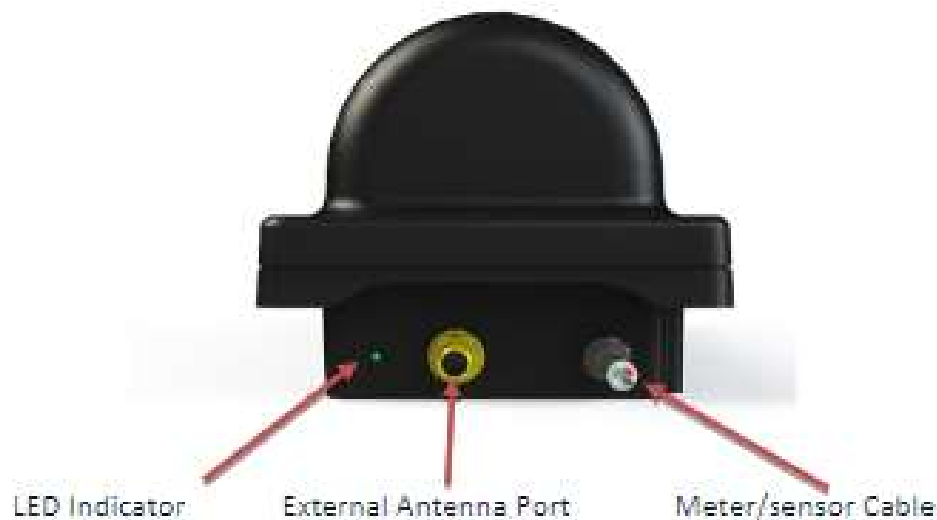
- If you have issues with the iQ Pulse portal, we will engage LEC to troubleshoot as needed and advise when the issue appears to be resolved on our end.

Section 2.0: Connection to iQ Pulse GP-CEP

Before the iQ Pulse GP-CEP can connect to the app, it must first be activated. To activate the Bluetooth connection, a magnet will be utilized to enable Bluetooth communication between GP-CEP and the configuration app.

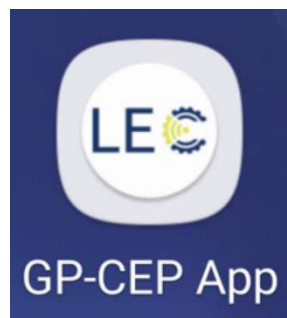
2.1: ACTIVATING TECHNICIAN COMMUNICATION

Place a magnet momentarily around the location shown below to initiate the technician communication mode. Once the technician communication mode is successfully activated, a green LED next to the external antenna port on the cap of the endpoint will illuminate.



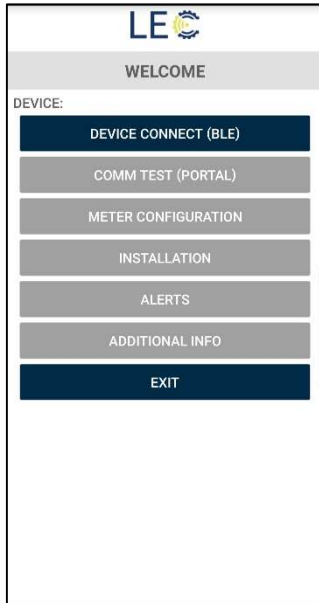
Upon activation of the technician communication mode, the field tech will have approximately 60 seconds to connect iQ Pulse GP-CEP to the app before the endpoint will return to normal operating mode at which time a magnet will need to be applied again to continue with configuration and setup.

With the green LED illuminated, open the iQ Pulse GP-CEP Configuration app on the Android mobile device.



2.2: MAIN MENU

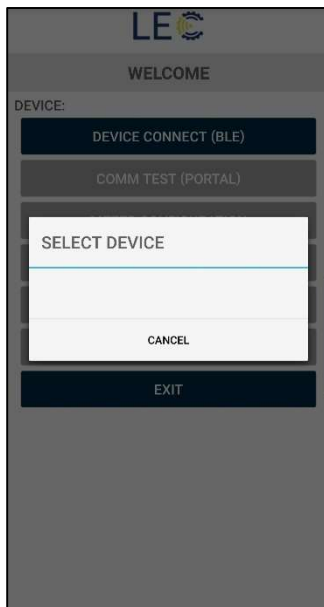
Once the app opens, the field tech will have access to the app's main menu screen. Most of the options will be grayed out until a successful connection is made between the app and iQ Pulse GP-CEP. Once an active connection is achieved, the remaining options will become active. The main menu options are as follows:



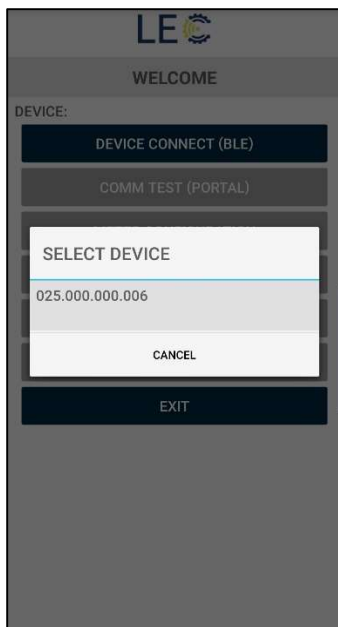
- **Device Connect:** Initiate Bluetooth connectivity
- **Comm Test:** Test iQ Pulse communications with the iQ Sense IIoT Portal
- **Meter Configuration:** Configure iQ Pulse for a specific type of water meter i.e. Badger, Neptune, etc.
- **Installation:** Enter installation parameters
- **Alerts:** Display a list of alerts
- **Additional Info:** Display additional information regarding iQ Pulse and the chosen water meter
- **Web Portal:** Access the iQ Sense IIoT Web Portal
- **Exit:** Exit the Configuration App

2.3: INITIATE CONNECTION FROM APPLICATION

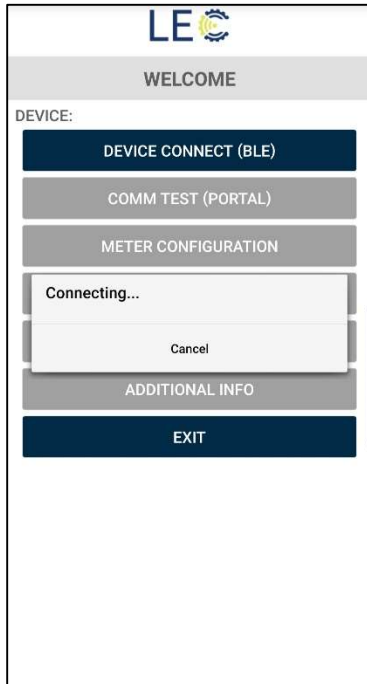
Press the “Device Connect (BLE)” button at the top of the main menu to initiate a scan for any technician communication mode enabled cellular endpoint.



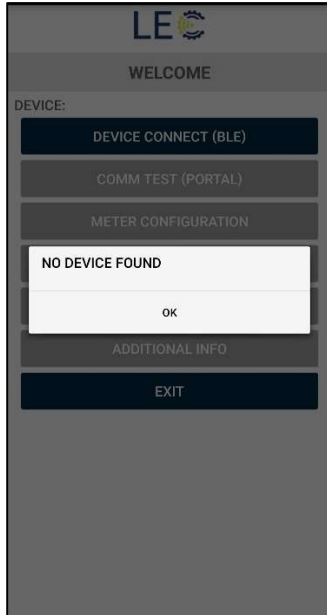
The iQ Pulse GP-CEP's unique identification number will display on the screen. Press the ID number on the screen to begin the connection or cancel to return to the main menu.



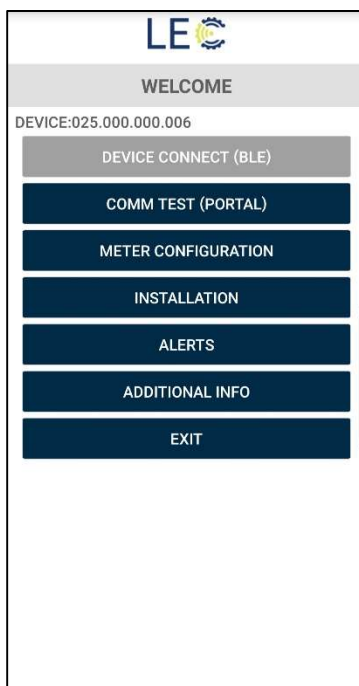
Once the ID number is pressed, the display will indicate a connection is in progress.



If the app displays the message “NO DEVICE FOUND”, check to ensure the green LED on the top of the cellular endpoints cap is still illuminated. If it is not, the GP-CEP has likely returned to normal operating mode and will require reinitializing technician communication mode. See section 2.1.



Upon successful connection, the iQ Pulse GP-CEP’s green LED will begin to flicker to indicate the Bluetooth communication was completed. The iQ Pulse GP-CEP’s unique ID number will be displayed on the app screen above the main menu and the once grayed out menu options should now be active and selectable.

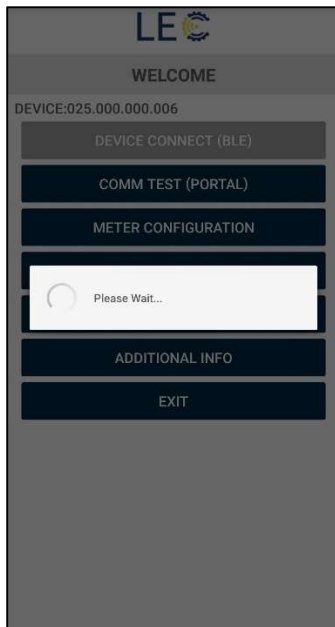


The green LED indicator will remain illuminated as long as there is an active Bluetooth connection. Please note that the iQ Pulse GP-CEP could timeout if the android mobile device goes inactive for an extended period of time which will then require reinitializing a Bluetooth connection.

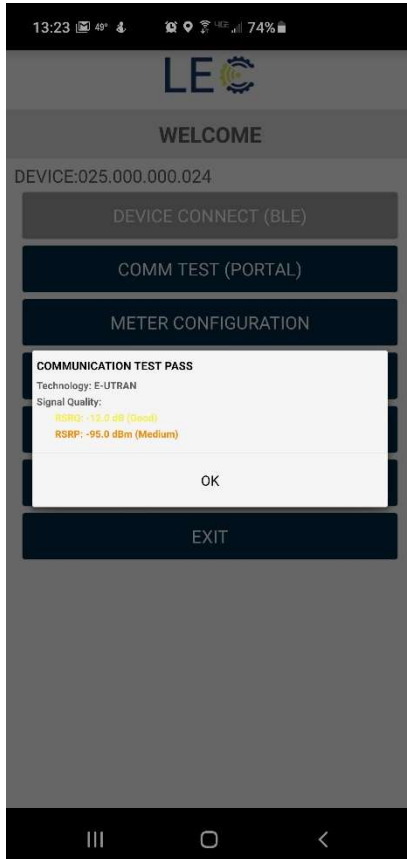
To ensure proper return to normal operating mode, the field technician should deactivate the connection by clicking **Exit** on the main menu screen. Failing to do so could cause the iQ Pulse GP-CEP to not operate normally and could also negatively impact the battery life.

Section 3.0: Comm Test (Portal)

The Comm Test is used during initial installation of the iQ Pulse GP-CEP to perform a communication test with the iQ Sense IIoT Web portal. To begin, press the “Comm Test (Portal)” button on the main menu of the android app.



Once the process has begun, it could take upwards of 5 minutes before completing. Upon successful communication between the iQ Pulse GP-CEP and the iQ Pulse IIoT Web portal, the screen will indicate the test has completed and provide the measured signal strength (RSRP) and signal quality (RSRQ). The metrics of each can be found below:

**RSRP:**

Excellent (Green) ≥ -80 dBm
Good (Yellow) -80 dBm to -90 dBm
Medium (Orange) -90 dBm to -100 dBm
Cell Edge (Red) ≤ -100 dBm

RSRQ:

Excellent (Green) ≥ -10
Good (Yellow) -10 dB to -15 dB
Medium (Orange) -15 dB to -20 dB
Cell Edge (Red) ≤ -20 dB

Press “OK” to return to the Main Menu.

NOTE: There could be times where the Comm Test may fail. This could be due to poor signal that may require the use of an external antenna, which will be covered in the next section or a low battery. It may be necessary to run a Comm Test more than once if the previous test fails.

Section 4.0: Installation

This section will outline the steps necessary to install and activate the iQ Pulse GP-CEP.

SECTION 4.1: INSTALLATION INFORMATION

The Installation menu provides the following information:

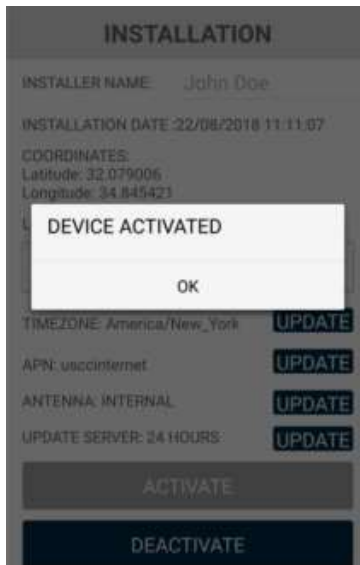
- **Installer Name:**
- **Installation Date**
- **GPS Coordinates** (Latitude and Longitude)
- **Location Description**
- **Time Zone** (Press Update to modify)
- **Cluster**
- **APN** (Press Update to modify)
- **Antenna Type** (Press Update to modify)
- **Update Server Frequency** (Press Update to modify)

SECTION 4.2: ACTIVATION OF IQ PULSE GP-CEP

Press the “ACTIVATE” button near the bottom of the app screen to register the cellular endpoint with the iQ Pulse IIoT Web portal. Activation could take upwards of 5 minutes to complete.

To Activate, select the correct Cluster ID associated with the installation. Please contact an LEC Support or Sales Engineer, if Cluster is unknown.

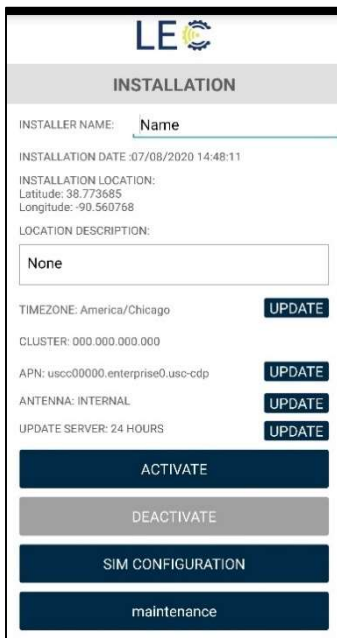
After successful completion, the app screen will display confirmation. Press “OK” to return to the Installation Menu.



To Deactivate an iQ Pulse GP-CEP, press the “Deactivate” button on the android app. Deactivation will cause the cellular endpoint to cease sending meter data including consumption and alarms to the iQ Pulse IIoT Web portal.

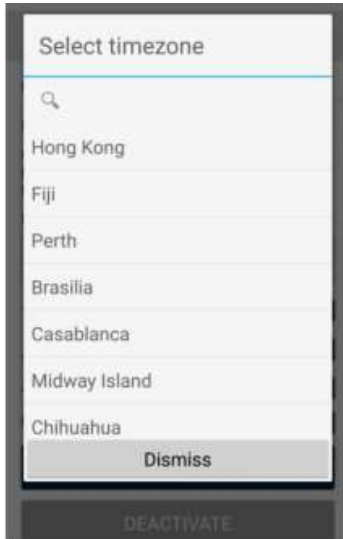
SECTION 4.3: INSTALLER NAME AND LOCATION ENTRY

During installation of iQ Pulse GP-CEP, if a field technician chooses, they may enter their names into the Installer name field as well as a description of the location where the meter will be installed such as an address or any other desired location information. These fields are not requirements for installation.



SECTION 4.4: UPDATING TIME ZONE

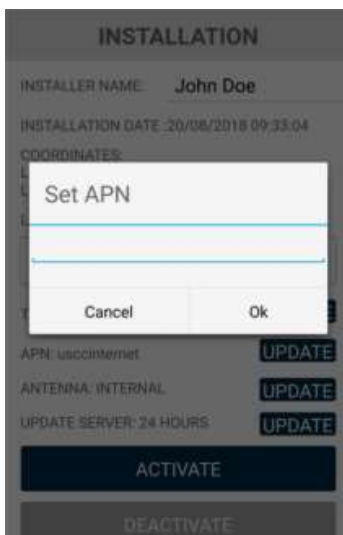
Press the “Update” button next to the current Time Zone on the android app screen to display the list of available time zones. Scroll through the list and select the desired time zone or click the “Search” icon to search for desired time zone. Press “Dismiss” to return to the Installation Information screen without changing the current time zone.



SECTION 4.5: UPDATING GP-CEP APN

There may be times when the APN that the iQ Pulse GP-CEP’s SIM card uses to connect to the cellular network will need to be changed/updated. These occasions are very rare. Please DO NOT change and/or modify the APN without explicit direction from an LEC support engineer. Doing so could render the smart meter from communicating with the cell network.

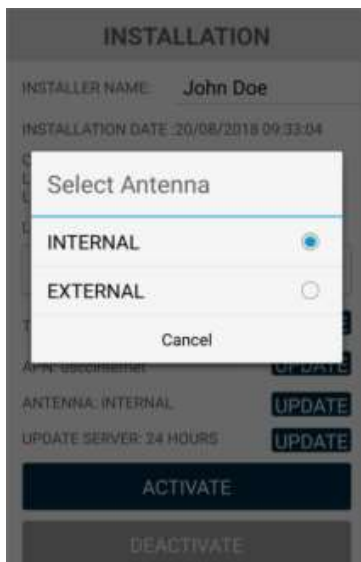
To update and/or modify the APN, press the “Update” button next to the current APN. Enter the provided APN and press “OK” to complete or “Cancel” to return to Installation Information screen without making any changes.



SECTION 4.6: ANTENNA SELECTION

Each iQ Pulse Smart Meter comes with an internal antenna for connection to the network. Depending on where it is installed, it might be necessary during installation or at any point during operation, to change the antenna type being used from its internal antenna to an external one.

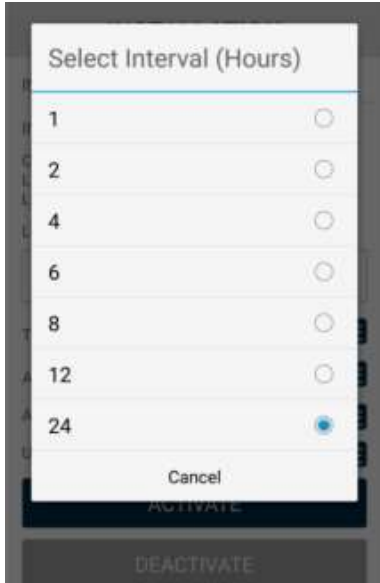
Should an external antenna be required, unscrew the EMI cap from the SMA connector on top of the iQ Pulse Smart Meter's case and attach the external antenna. On the android app, press the "Update" button next to the current selected antenna choice on the Installation Information screen. Choose the desired antenna type or press Cancel to return to the Installation Information screen without making any changes.



SECTION 4.7: SERVER UPDATE FREQUENCY

The Server Update Frequency is the frequency at which the iQ Pulse GP-CEP provides usage updates to the portal. Default is 24 hrs. Please note that changing the frequency will negatively affect the overall battery lifespan and will void the device hardware warranty and thus should not be changed from the default selection

To change the server update frequency, press the "Update" button next to the current Update Server selection on the Installation Information screen. From the menu, choose the desired frequency (in hours). Press Cancel to return to the Installation Information menu screen without making changes.

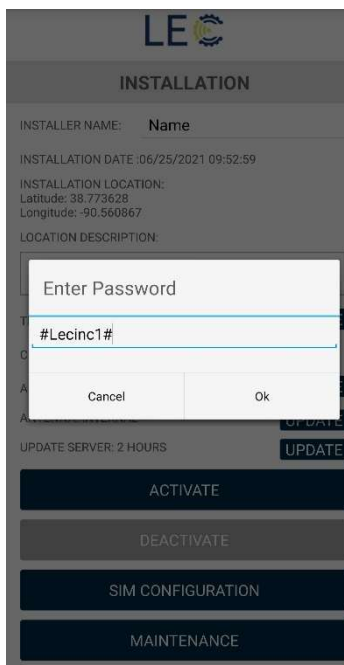


NOTE: For information on SIM Configuration, please refer to the iQ Pulse Smart Water Meter Installation Guide.

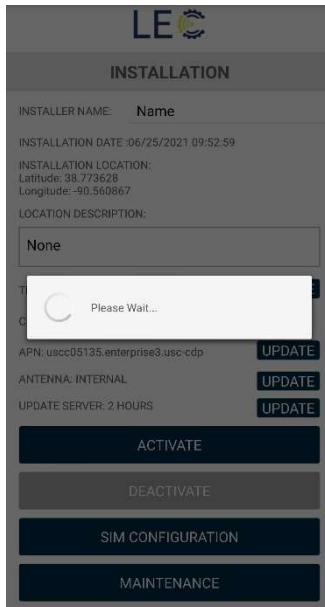
SECTION 4.8: SIM CONFIGURATION

This section will outline performing a SIM configuration. This process is necessary to activate a SIM to the cellular network. If this step is not completed, the GP-CEP will not be able to communicate with the network nor activate to the iQ Pulse portal.

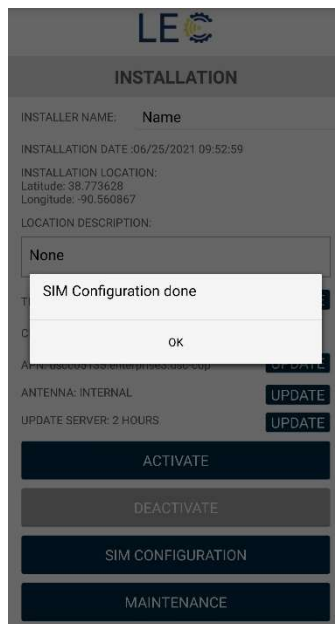
To perform a SIM Configuration, click “SIM Configuration”. The process will require a password to complete. Enter the following password into the field: **#Lecinc1#**



The configuration will then begin. The process could take upwards of 5 min to complete.



Once complete, the SIM is now activated with the cellular network. Click OK to return to the Installation page



SECTION 4.9: DEVICE RESET

There may be times where a reboot of an endpoint is necessary to clear any communications issues. The only way to reboot an endpoint is through the technician's app.

To perform a reboot, scroll to the bottom of the Installation page. Click the “Device Reset” button. To reboot an endpoint, a password will be required. Enter the following into the password field: **#Lecinc1#**

LE

INSTALLATION

INSTALLATION DATE :06/25/2021 09:52:59

INSTALLATION LOCATION:
Latitude: 38.773628
Longitude: -90.560867

LOCATION DESCRIPTION:
None

TIMEZONE: America/Chicago **UPDATE**

CLUSTER: 003.000.001.002

APN: uscc05135.enterprise3.usc-cdp **UPDATE**

ANTENNA: INTERNAL **UPDATE**

UPDATE SERVER: 2 HOURS **UPDATE**

ACTIVATE

DEACTIVATE

SIM CONFIGURATION

MAINTENANCE

DEVICE RESET

LE

INSTALLATION

INSTALLER NAME: Name

INSTALLATION DATE :06/25/2021 09:52:59

INSTALLATION LOCATION:
Latitude: 38.773628
Longitude: -90.560867

LOCATION DESCRIPTION:

Enter Password

#Lecinc1#

Cancel Ok

ACTIVATE

DEACTIVATE

SIM CONFIGURATION

MAINTENANCE

The endpoint will now reboot and connection to the app will be lost. To get reconnected to the app, Bluetooth communication will need to be reactivated.

Section 5.0: Meter Configuration

This section is a walkthrough of how to select the supported water meter. For instructions on how to wire the iQ Pulse GP-CEP to a supported water meter, please see section 9.0.

SECTION 5.1: CURRENT METER INFORMATION

The Meter Configuration screen will display the following information:

METER CONFIGURATION

METER MODEL: MASTER METER (Pulse)

METER ID: 81

FLOW TO PULSE RATIO: 1:10 US Gallons

READING: 50 **UPDATE** **REFRESH**

UPDATE METER

UPDATE SERVER NOW

REPLACE METER

TAKE A PICTURE

- Meter Model
- Meter ID
- Flow to Pulse Ratio/Decimal Location (depending on meter chosen)
- Reading

NOTE: For Pulse Output meters, Update will be active. Press on “Update” to manually enter the current meter reading. This button will be grayed out for all other meters. After pressing “Update”, enter the current meter reading into the field and press “OK” or “Cancel” to return to the Meter Configuration screen without making any changes.



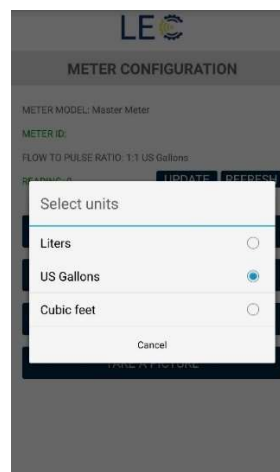
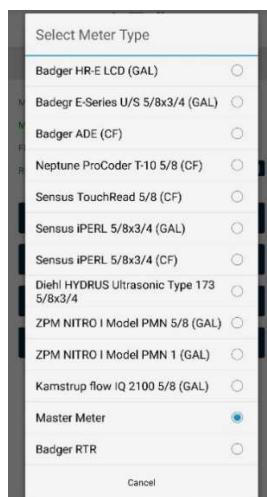
Press “REFRESH” to refresh the currently known meter information.

SECTION 5.2: UPDATE METER

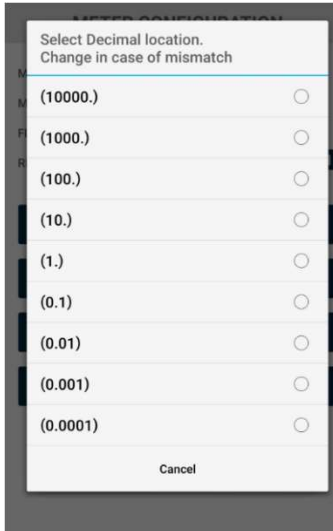
To update the currently selected water meter, press the “Update Meter” button. A list of the currently supported meters will be listed. Select the desired Meter from the list or press “Cancel” to return to the Meter Configuration Screen without making changes.

After choosing the desired meter, the recommended choices for Units and decimal placement will be shown. It is recommended to not alter these settings however, if it is necessary, the below menus will be displayed for choosing the desired units of measurement after pressing Edit on the Confirmation screen.

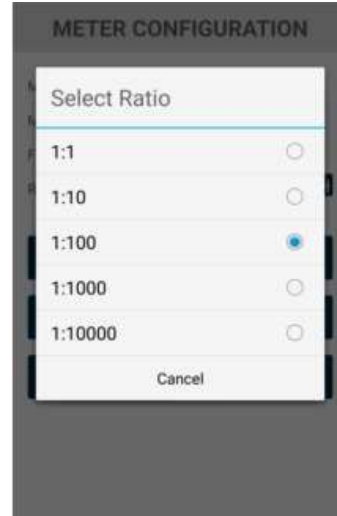
Select the units of measurement or press “Cancel” to return to the Meter Configuration Screen without making changes.



Depending on which meter was selected, encoder or pulse, the next screen will be different based on that selection. For encoder, select the decimal location and for pulse meters, select the appropriate ratio. Or press “Cancel” to return to the Meter Configuration Screen without making changes.

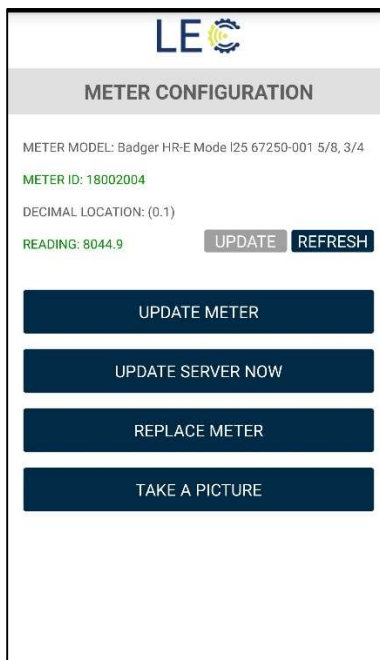
The screen is titled "Select Decimal location. Change in case of mismatch". It features a vertical list of radio button options: (10000.), (1000.), (100.), (10.), (1.), (0.1), (0.01), (0.001), and (0.0001). A "Cancel" button is located at the bottom.

Encoder Meter Screen

The screen is titled "Select Ratio". It features a vertical list of radio button options: 1:1, 1:10, 1:100, 1:1000, and 1:10000. The 1:100 option is selected, indicated by a blue dot. A "Cancel" button is located at the bottom.


Pulse Meter Screen

Upon successful connection, the iQ Pulse GP-CEP will display the meter ID and current meter reading from the encoder/pulse connection.

The screen is titled "METER CONFIGURATION" and features the LE logo at the top. It displays the following information: "METER MODEL: Badger HR-E Mode I25 67250-001 5/8, 3/4", "METER ID: 18002004", "DECIMAL LOCATION: (0.1)", and "READING: 8044.9". There are "UPDATE" and "REFRESH" buttons next to the reading. Below this, there are four large blue buttons: "UPDATE METER", "UPDATE SERVER NOW", "REPLACE METER", and "TAKE A PICTURE".

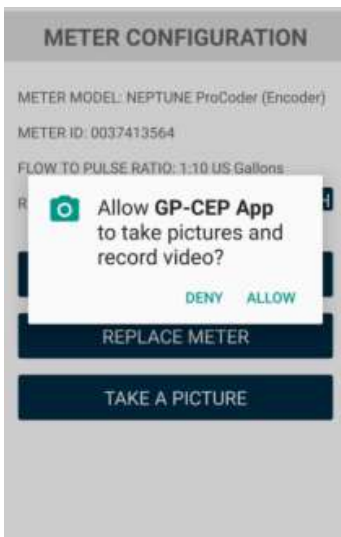
SECTION 5.3: REPLACE METER

To replace a water meter, press the “Replace Meter” button. Enter the old meter ID number and the old meter reading at time of replacement. The new meter ID and meter reading are automatically populated by the iQ Pulse GP-CEP from the new meter. Once done, press “OK” to save the Replace Meter information or press Cancel to discard entries and return to the Meter Configuration screen.



The android app allows for taking a picture of the meter at time of installation. In order for the app to be able to take a picture, it will require Allow permissions for the mobile device’s camera. This step is not a requirement for operation and maybe skipped, if desired.

To take a picture of the meter, press the “Take a Picture” button on the Meter Configuration Screen. The first time the Take a Picture function is selected, permission will be requested to allow the App to take pictures. Press on Allow to grant permission or press “Deny” to deny permission.



The camera function on the mobile device will activate. Snap a picture of the meter. Once the picture is taken, the image can be approved by pressing “OK” or rejected by pressing “Retry”. Once approved, the picture will be saved to the mobile device’s storage and the app will return to the Meter Configuration screen.

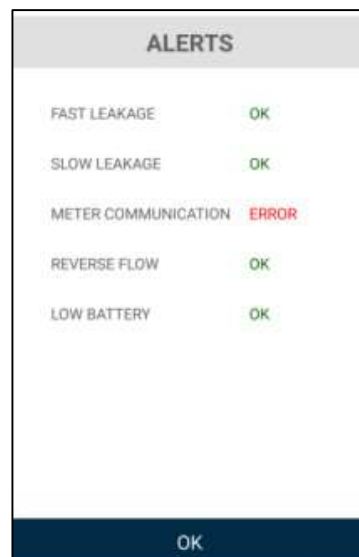
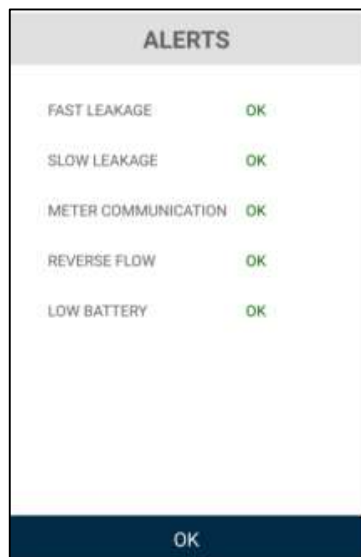


SECTION 5.5: UPDATE SERVER NOW

The Update Server Now function will update the iQ Sense IIoT portal immediately. To update the iQ Sense IIoT Web Portal, press the “Update Server Now” button on the Meter Configuration screen.

Section 6.0: Alerts

To display any currently open alerts, press the “Alerts” button on the Main Menu screen. All alerts will be labeled with a green OK, indicating no alarms detected, or a red Error, indicating an alarm is active. Press “OK” to return to the Main Menu screen.



Section 7.0: Additional Information

SECTION 7.1: ADDITIONAL INFORMATION

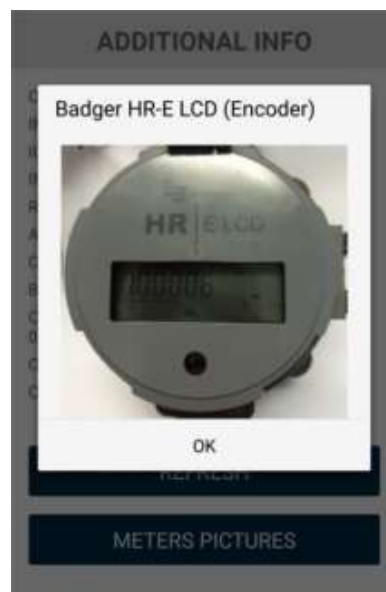
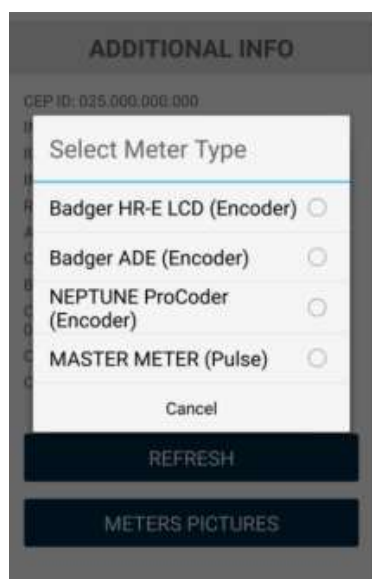
The additional information function provides specific information relating to iQ Pulse GP-CEP. From this menu, information such as current software and hardware versions, RSSI, SIM ID, and battery status, etc. After pressing the “Additional Information” button, the following information is displayed:



- **CEP ID:** Unique Identification number of iQ Pulse Smart Meter
- **IMEI:** Cellular Modem ID
- **ICCID:** SIM ID
- **IMSI:** Operator information
- **RSRQ:** LTE Signal Quality
- **RSRP:** LTE Signal Strength
- **Network Status:** Registered or not, Roaming or Home network
- **Access Technology:** Type of access (e.g. 4G)
- **Cell Information:** MCC, MNC
- **Battery:** Battery status
- **CEP Manufacturing Date:** Date device was manufactured
- **CEP SW Version:** Software version number
- **CEP HW Version:** GP-CEP hardware version number
- **CEP TIME:** Detected time and date of endpoint

SECTION 7.2: METER PICTURES

This function will display pictures of various meters that the smart meter device supports. The pictures displayed are not those that were taken during meter installation in Section 6.4. The pictures provided are stock photos of supported water meters. To view the pictures, press the “Meter Pictures” button on the Additional Info screen. Choose meter from the list by pressing on the name of meter.



Section 8.0: Meter Connection

This section will outline how to physically wire a supported water meter to the iQ Pulse GP-CEP. A GP-CEP field installation kit is available from LEC.

The GP-CEP Field Installation Kit will provide the following:

Quantity	Description
1	Gel Enclosure
2	Zip Ties, if needed
3	Two Wire Gel Connectors

Additional Recommended Tools:

- Crimping Pliers for gel connectors
- Wire Stripper
- Wire Cutters



NOTE: The recommended crimping tool is Jonard Tools Connector Crimping Pliers (p/n JIC-891). Customer supplied tools may also be used. Please ensure the proper crimping pliers are used to avoid damage to the gel connectors.

The currently list of supported meters can be found in Appendix A. The below procedures will walkthrough how to connect using either a supported meter with 2 wires or 3 wires.

SECTION 8.1: SPlicing THE WIRES

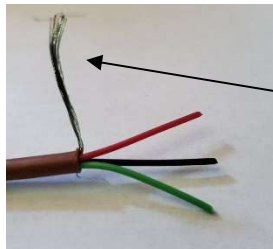
1. Using the wire stripper tool, strip off approximately 1 ½ inches of the outer insulation of the wire on the water meter. Use caution when removing as to not damage the internal signal wires within.



2. Remove the outer foil that surrounds the inner signal wires and discard. Be sure to inspect the inner signal wires to ensure there is not any damage to the insulation which could result in a short.

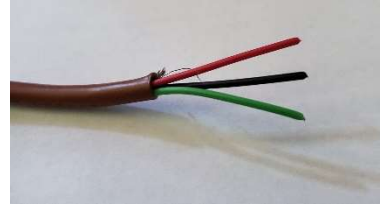


3. Remove the shield drain wire using wire cutters from the water meter as it will not be used. If using a two-wire meter, the green signal wire can be cut flush with the outer insulation sleeve as it is also not needed.



Exposed Drain Wire

Shield Drain Wire



Drain Wire Removed

NOTE: Do not strip any insulation from the inner signal wires.

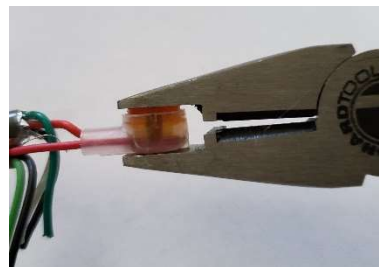
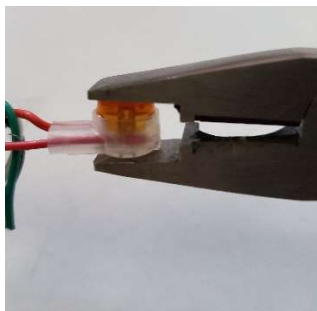
SECTION 8.2: CRIMPING WIRES TO CONNECTORS

1. Connect each wire from the smart meter and the water meter using the three (3) gel connectors included, one for each pair of wires. Please refer to appendix B for appropriate wiring.

Make certain each wire is fully inserted into the gel connector and both wires can be seen through the crimp bar to the tip of the connector.



2. With the signal wires properly inserted into the gel connectors, using a crimping tool, crimp the wires, plunging the amber connector head into the wires. Be sure not to over-crimp the gel connector.



3. Inspect the wires inside the gel connector to ensure they are properly seated inside.



4. Repeat the previous steps for the remaining wires.

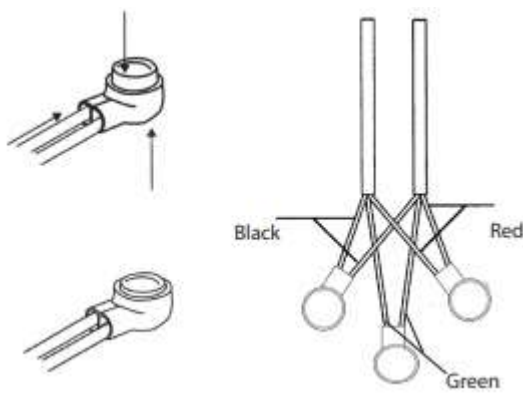


Figure 1: Three wire connection

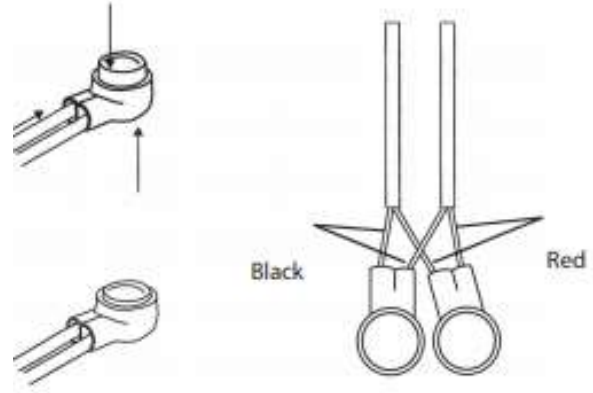
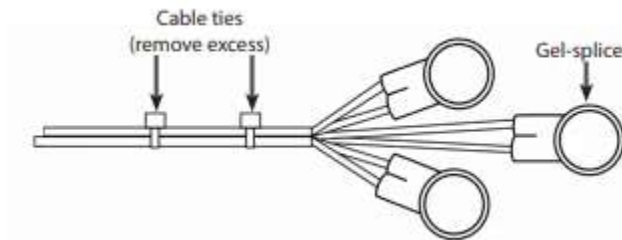


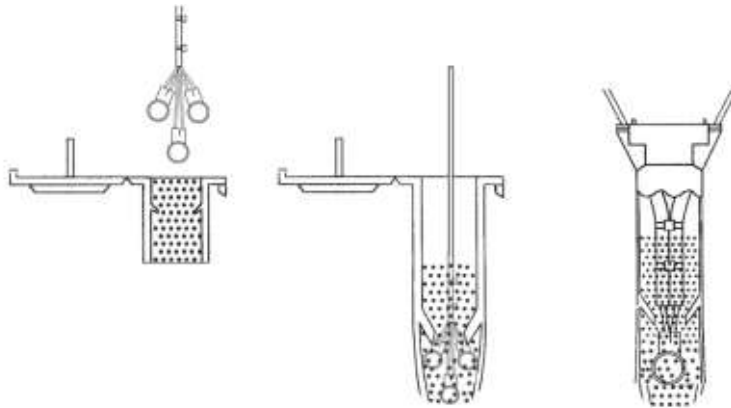
Figure 2: Two Wire Connection

SECTION 8.3: USING GEL ENCLOSURE

1. Using the two (2) zip ties, secure the wire from the smart meter and the water together. Trim excess cable from the zip tie with wire cutters.

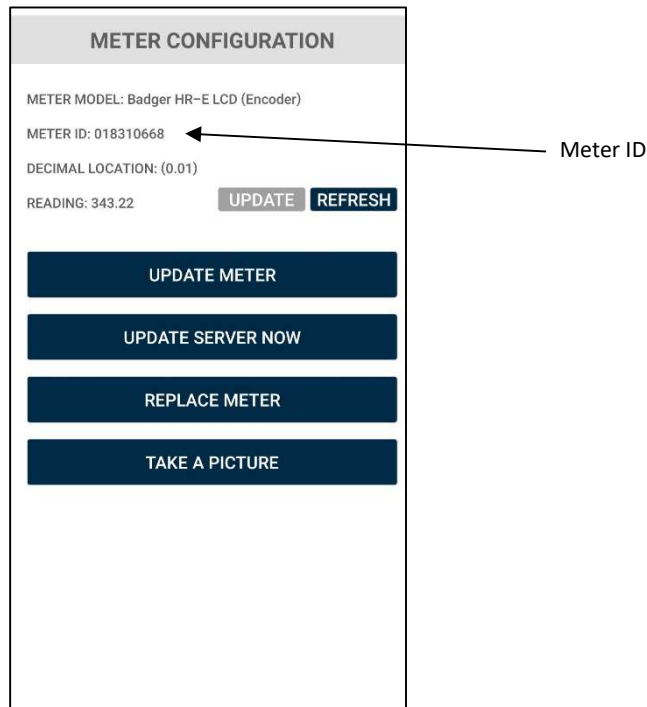


2. Open the lid of the gel enclosure and insert the wire assembly inside.



3. Close the lid of the gel enclosure securely, ensuring each set of signal cables are exiting their own point of the enclosure.

- After all the connections are complete, test the connection using the smart meter app. Refer to section 5.2. If the connections are successful, the meter ID will display on the screen.



METER CONFIGURATION

METER MODEL: Badger HR-E LCD (Encoder)

METER ID: 018310668

DECIMAL LOCATION: (0.01)

READING: 343.22 **UPDATE** **REFRESH**

UPDATE METER

UPDATE SERVER NOW

REPLACE METER

TAKE A PICTURE

If the meter reads, Meter ERROR, check the wire connections.

- Ensure the Meter ID and Reading both match what the connected register is displaying.

Section 9.0: iQ Pulse GP-CEP Pit Installation

Each iQ Pulse GP-CEP meter will come with a bracket for ease of installation in outdoor water pits or indoors along a wall. In addition to the mounting bracket, an $\frac{3}{4}$ " schedule 40 PVC stem cut to the necessary depth is needed for the desired pit depth will also be needed for installation.

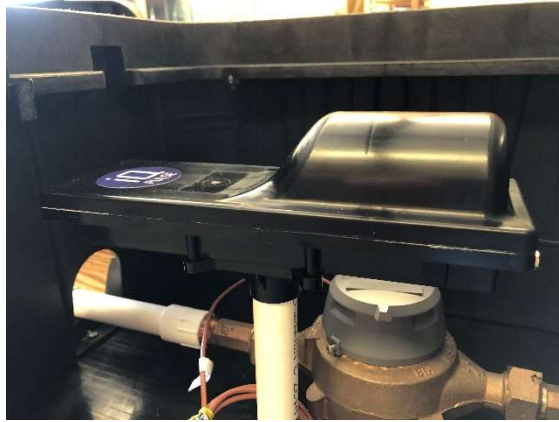
Endpoint installation will require the following:

- Rubber mallet, for pit installations
- PVC Pipe 15-18" long (x 3) that is $\frac{3}{4}$ " wide, for pit installation
- PVC Cutters
- Screwdrivers
- 1 $\frac{3}{4}$ in drill bit, for external antenna pit installs

NOTE: The Mounting bracket is provided in the field installation kit or can be ordered separately. Please contact your WSA or BASE for ordering.

- Using the rubber mallet, secure the PVC saddle stem in the ground either inside or outside of the water pit.

2. Screw the mounting bracket to the underside of the iQ Pulse GP-CEP device.
3. Once secured, place mounting bracket on top of stem.



4. Connect the wires to the water meter if that has not yet been done during a previous step.
5. If needed, drill a hole into the pit lid using a 1 3/4 in bit.



6. Insert the external antenna into the pit lid and secure with provided nut





7. Remove the metal cap from the antenna port on the iQ Pulse endpoing and secure connect the antenna wire to the port. DO NOT OVERTIGHTEN.








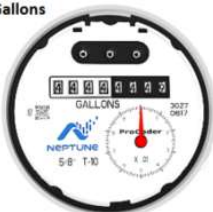
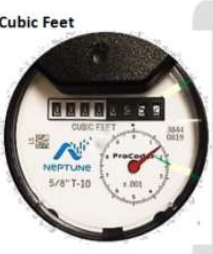
8. Once all steps have been completed, secure the pit lid back into place.







Appendix A: Supported Water Meters and Endpoint Wiring




Pulse Meters:							
Make	Model	Register Picture	Meter Size	Measurement Units	Pulse Resolution	Wiring Color Code	
						G	W
Master Meter	BL FAM with Reed Switch		5/8"	Gallons	1:10	BLK	RED
Badger	RTR Model 25		5/8" x 3/4 "	Gallons	1:1	BLK	RED

Encoder Meters:								
Make	Model	Register Picture	Meter Size	Measurement Units	AMR Factor	Wiring Color Code		
						G	C	D
Badger	HR-E High Res. (mechanical register)		5/8 – 1"	Gallons Cubic Feet	0.1 0.01	BLK	RED	GRN
			1 ½ - 4"	Gallons Cubic Feet	1 0.1			
			6 – 10"	Gallons Cubic Feet	10 1			
Badger	HR-E LCD		5/8 – 1"	Gallons Cubic Feet	9 Digit Resolution (6 Digit resolution) 0.01 (10) 0.001 (1)	BLK	RED	GRN
					0.1 (100) 0.01 (10)			
			1 ½ - 4"	Gallons Cubic Feet	1 (1000) 0.1 (100)			
			6 – 10"	Gallons Cubic Feet				

Encoder Meters Cont:												
Make	Model	Register Picture	Meter Size	Measurement Units	Pulse Resolution	Wiring Color Code						
Badger	HR E-Series	 HR Mark	5/8 – 1" 1 ½ - 4"		9 Digit Resolution	<table><tr><td>G</td><td>C</td><td>D</td></tr><tr><td>BLK</td><td>RED</td><td>GRN</td></tr></table>	G	C	D	BLK	RED	GRN
				G	C	D						
				BLK	RED	GRN						
				Gallons Cubic Feet	0.01 0.001							
Gallons Cubic Feet	0.1 0.01											
Badger	ADE	<p>Gallons</p>  <p>Cubic Feet</p> 	5/8 – 1" 1 ½ - 4" 6 – 10"		6 dial Resolution (5 dial resolution)	<table><tr><td>G</td><td>C</td><td>D</td></tr><tr><td>BLK</td><td>RED</td><td>GRN</td></tr></table>	G	C	D	BLK	RED	GRN
				G	C	D						
				BLK	RED	GRN						
				Gallons Cubic Feet	10 (100) 1 (10)							
Gallons Cubic Feet	100 (1000) 10 (100)											
Neptune	ProCoder T-10	<p>Gallons</p>  <p>Cubic Feet</p> 	5/8 x 1	Gallons Cubic Feet	6-digit resolution 10 1	<table><tr><td>GRN</td><td>BLK</td><td>RED</td></tr></table>	GRN	BLK	RED			
				GRN	BLK	RED						

Encoder Meters Cont:								
Make	Model	Register Picture	Meter Size	Measurement Units	Pulse Resolution	Wiring Color Code		
Neptune	E-Coder T-10	 	5/8 – 1"	Gallons Cubic Feet	6 Digit Resolution	G	C	D
					10 TBD	GRN	BLK	RED
Sensus	ICE-PMM		5/8 -1"	Cubic Feet	100	BLK	RED	GRN
Sensus	TouchRead		5/8 x 1"	Cubic Feet	100	BLK	RED	GRN
Sensus	iPerl		5/8 x 1"	Gallons Cubic Feet	8-digit resolution	BLK	RED	GRN
					0.1 0.01			
			1 ½ x 4"	Gallons Cubic Feet	1 0.1			
			6 – 10"	Gallons Cubic Feet	10 1			

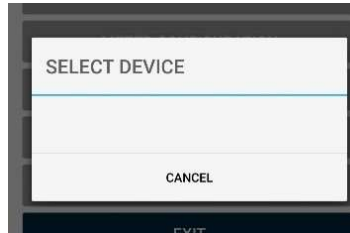
Encoder Meters Cont:								
Make	Model	Register Picture	Meter Size	Measurement Units	Pulse Resolution	Wiring Color Code		
Sensus	SRII/aS accuSTREAM		5/8 – 1"	Gallons Cubic Feet	TBD TBD	G	C	D
						BLK	RED	GRN
Sensus	OMNI C2 [T2, R2, F2]		C2: 1½ - 2" R2: 1½ - 2" T2: 1½ - 10" F2: 4" - 10"	Gallons Cubic Feet	1000 100	BLK	RED	GRN
Zenner	ZPM NITRO I Model PMN		5/8 x 1"	Gallons	10	BLK	RED	GRN
Kamstrup	flowIQ2100 (new – 2021)		5/8" x 3/4 "	Gallons	9 Digit Resolution 0.01	BLK	RED	GRN

Encoder Meters Cont:						
Make	Model	Register Picture	Meter Size	Measurement Units	Pulse Resolution	Wiring Color Code
Kamstrup	flowIQ2100 (old – 2019)		5/8" x 3/4"	Gallons	4 Digit Resolution 1000	G C D
						WHT BLK RED
DIEHL	HYDRUS Ultrasonic Type 173		5/8" x 3/4"	Gallons	8-digit resolution 0.1	BLK RED GRN
Master Meter	Octave		2" – 12"	Gallons	TBD	BLK RED GRN

Appendix B: Troubleshooting

This section will walk through some common issues that can be found when setting up and/or using the iQ Pulse GP-CEP endpoint.

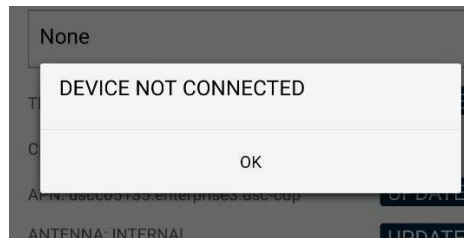
PROBLEM: Can't connect endpoint to technician's app



SOLUTIONS:

- The Bluetooth connection may not be active. Check the top of the endpoint to ensure the green LED is on. If not, please refer to section 2.1 Activating Technician Communication for more information.
- If the Bluetooth connection still will not connect, the battery may be dead, or Bluetooth sensor may be malfunctioning. Contact Support for RMA

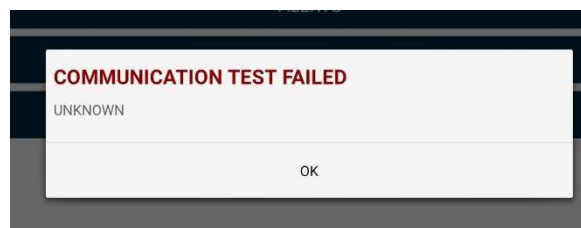
PROBLEM: Device Not Connected: App navigation works but cannot make any changes.



SOLUTION:

- The app is no longer connected to the endpoint. Reactivate the Bluetooth communication to regain connection. Refer to section 2.1: Activating Technician Communication for more information.

PROBLEM: Communication Test Failed: Running a Comm Test displays “unknown” message



SOLUTIONS:

- Endpoint may be in a poor coverage area. Move endpoint to a known good coverage area.
- Connect an external antenna, if available. Refer to section 4.6 Antenna Selection for more information.
- SIM card may not be active. Run a SIM configuration to ensure the SIM card is active with the cellular network. Refer to section 4.8: SIM Configuration for more information.

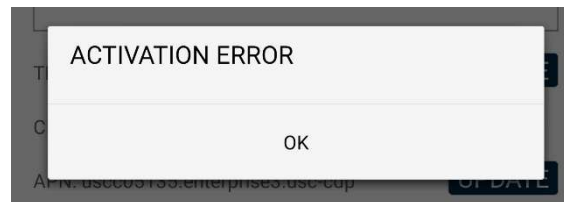
- SIM card may not be read by the endpoint. Check the Additional Info tab of the technician's app. Refer to the ICCID field. If CCID is present, the SIM is being read however, if the field says, "sim not inserted", the SIM card is not being recognized. Contact Support for RMA.

LE

ADDITIONAL INFO

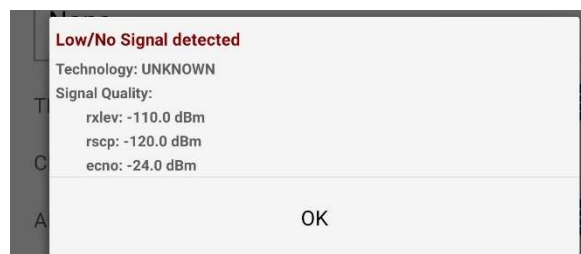
CEP ID: 025.000.000.102
IMEI: 353535099408815
ICCID: sim not inserted
IMSI:
rxlev: -110.0 dBm
rscp: -120.0 dBm
ecno: -24.0 dB
rsrp:
NETWORK STATUS: UNKNOWN
ACCESS TECHNOLOGY: UNKNOWN
CELL INFORMATION:MCC 0, MNC 0,
MODEM CNUM:

PROBLEM: Activation Error: Activating an endpoint to the iQ Pulse portal is unsuccessful.



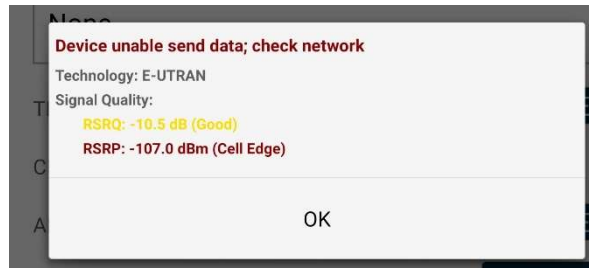
SOLUTIONS:

- Low or no Signal detected:
 - Move endpoint to another location that has known good cellular coverage
 - Add a known good external antenna, if using the internal. Refer to section 4.6 Antenna Selection for more information.
 - Run SIM Configuration, if not already done. Refer to section 4.8: SIM Configuration for more information.

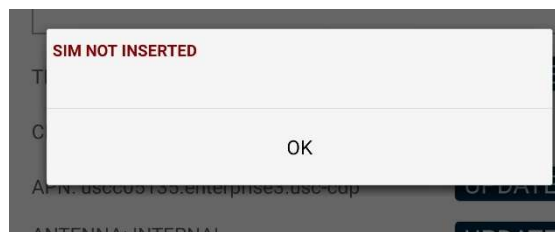


- Device unable to send data; check network:
 - Move endpoint to another location that has known good cellular coverage
 - Add a known good external antenna, if using the internal. Refer to section 4.6 Antenna Selection for more information.

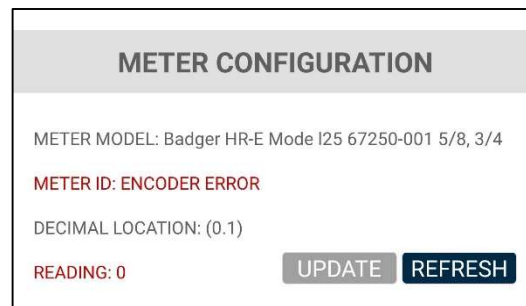
- Run SIM Configuration, if not already done. Refer to section 4.8: SIM Configuration for more information.



- Sim not inserted
 - Reboot the endpoint. Refer to section 4.9: Device Reset for more information
 - SIM is not being recognized. Contact Support for RMA

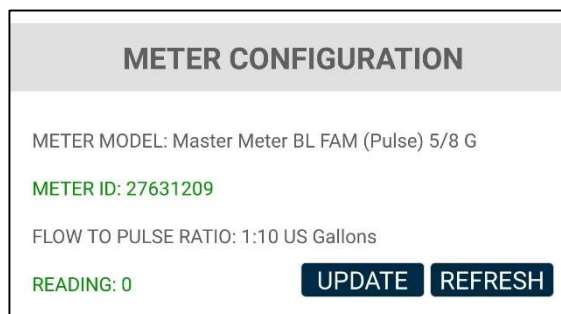


PROBLEM: Encoder Error: Meter selection displays encoder error message.



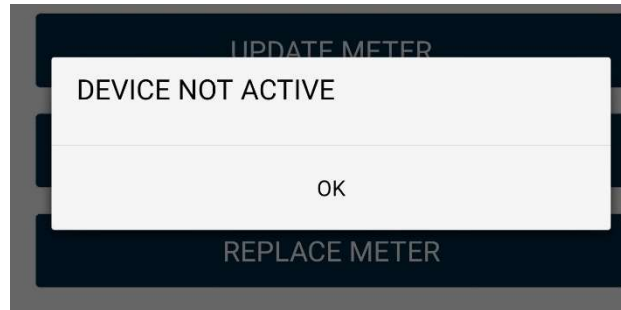
SOLUTIONS:

- Meter Selection:
 - Verify the meter highlighted under “Meter Model” is the correct meter in service. Refer to section 5.2: Update Meter for more information



- Wiring:
 - Verify the correct wires are connected securely together within the crimp connector. Refer to Appendix A for the appropriate wiring for chosen meter.

- Update Server Error: Manual upload of data to iQ Pulse portal is unsuccessful.
 - Device Not Active
 - The endpoint is not activated to the iQ Pulse portal. Refer to section 4.2: ACTIVATION OF IQ PULSE GP-CEP.



If none of the above fixes the problem, please refer to section 1.2 Support Information of this document to contact support for additional assistance.