Badger Meter

ORION® Endpoint Utility

Software Application for Tablet or Laptop

ORI-UM-00019-EN-05 (July 2017)

User Manual

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SCOPE OF MANUAL

This manual is the guide for using the ORION® Endpoint Utility 2.7.x software. Instructions for installing the software are also included.

The ORION Endpoint Utility software is an application designed to read and program these ORION endpoints:

- ORION Cellular LTE water
- ORION Fixed Network (SE) water/gas
- ORION Migratable (ME) water/gas
- ORION Classic (CE) water/gas

Depending on the endpoint technology, the software can also be used to extract endpoint historical profile data using IR or RF technology.

About this Manual

The ORION Endpoint Utility user manual has three main parts:

- **Getting Started**
  This part of the manual covers basic information including the equipment set up, how to start and exit the software program, and how to set the COM ports for the equipment connected to the tablet/laptop. Make sure to review this section before using the software.

- **User Guide**
  The User Guide is the main part of the manual that includes step-by-step instructions for using the ORION Endpoint Utility software application.

- **Appendix**
  Refer to the Appendix to find a glossary of terms used in this manual, and software installation and removal instructions.

NOTE: To provide the best solution for our customers, Badger Meter continually improves software programs and periodically updates this manual to reflect upgrades. Therefore, some discrepancies may be detected between the installed software and this manual.

Typographic Conventions

- Instructions are written for devices with touch screens. If you are using the software with device that does not have a touchscreen, tap = click.
- Items on the software screens that you select or choose are in **bold** text and capitalized in the manual.
  Example: Tap the **View Report** button.
- Names of options, boxes, columns, fields, and sections are *italicized*.
  Example: The value displays in the *Status Information* field.
- Messages and special markings are shown in quotation marks.
  Examples: "Service Stopped" is shown on the display.

Names, addresses and other customer-related information displayed in screen examples were created for demonstration purposes in this manual. No actual customer information is included.

Minimum System Requirements

The software is designed to run on the following devices: Panasonic® FZ-G1 Toughpad® tablet, Panasonic CF-31 or CF-30 Toughbook® laptop, or customer-supplied tablet or laptop with a Windows® operating system meeting the specifications as outlined in the BEACON® AMA Mobile Solution Product Data Sheet, available in the Resource Library at *www.badgermeter.com*. For this manual, the software was used with a Windows 10 operating system.

Microsoft®.NET

Microsoft.NET (.NET) is required to run the software as designed. Most tablet/laptops already have .NET installed. During installation, the ORION Endpoint Utility software prompts you if .NET is not enabled.

To turn on .net, go to the **Control Panel > Programs> Programs and Features > Turn Windows Features On> .NET Framework**.

Windows Updates

Make sure the tablet/laptop on which the software is installed always has all the most recent Windows updates. To check for the most recent updates, go to **Windows Settings> Update & Security**. Then select **Check for Updates**. An update message displays in the window that opens. Follow the instructions to install **all updates** if they are needed. Restart the device after making any updates.

See *"Software Installation" on page 51* for additional software requirements.

GETTING STARTED

EQUIPMENT SETUP

IR Setup

To use the ORION Endpoint Utility software for IR applications, make sure to connect the IR programming cable to the tablet or laptop. A USB IR programming cable (PN: **64436-041**) is available from Badger Meter.

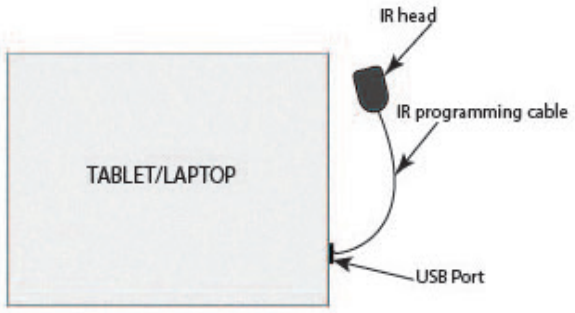

Figure 1: IR programming cable attached at USB port

RF Setup

To use the software for RF applications:

- Connect the magnetic mount antenna to the mobile transceiver and/or receiver.
- Connect the ORION mobile transceiver and/or ORION mobile receiver to a DC power source and to the tablet/laptop.

  NOTE: DC power is not needed if using a USB-powered mobile transceiver.

Vehicle and Tablet/Laptop Setup with Mobile Transceiver and/or Mobile Receiver

Setup with an ORION ME FHSS mobile transceiver and/or ORION CE FHSS mobile receiver and the Panasonic Toughpad (or customer-supplied device) should resemble the diagram below.

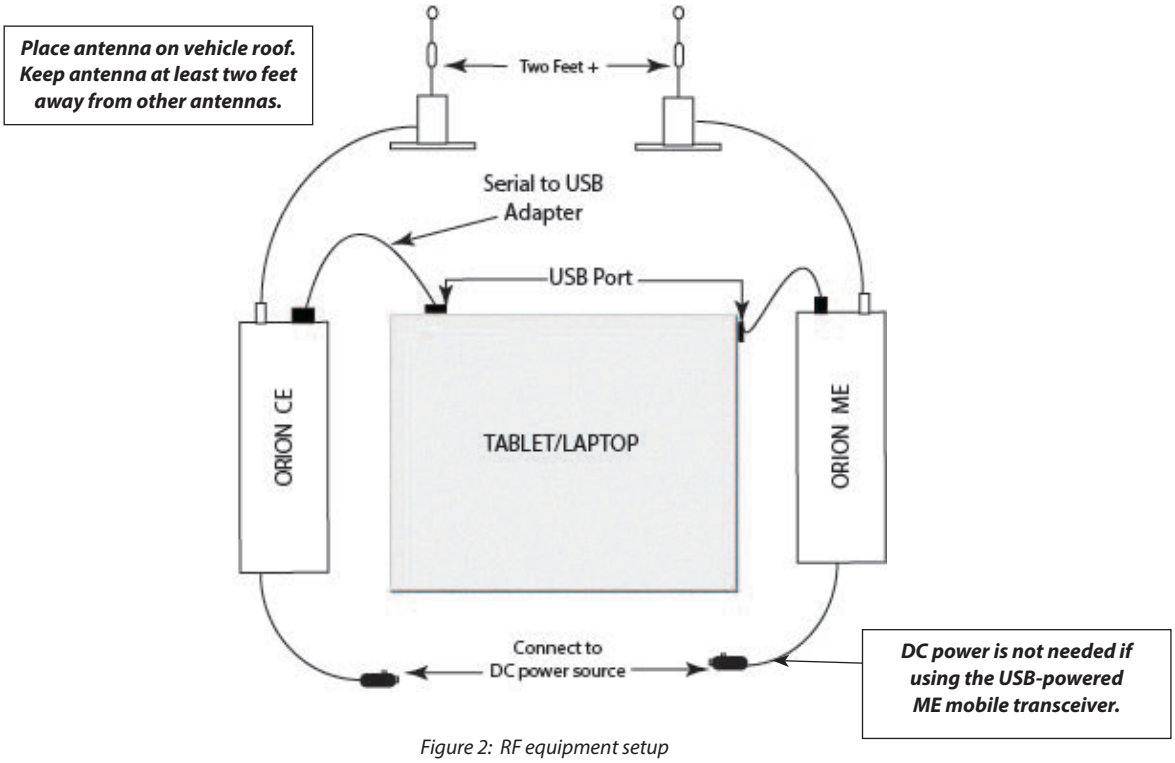

Figure 2: RF equipment setup

NOTE: Make sure to set the COM port(s) for the attached equipment. The ORION Endpoint Utility stores equipment connection information so it is good practice to use the same USB port(s) on the tablet/laptop whenever you connect the equipment to maintain the COM port settings.

If the tablet/laptop has only one USB port, a customer-supplied powered USB hub can be used to accommodate multiple USB connections. Hubs can be purchased wherever tablet/laptop supplies are sold.

COM PORTS

Before using the software application, set the correct COM (communication) ports for the equipment connected to the tablet/laptop to establish communication with the software.

Check the COM Port(s)

Open Device Manager to see the COM ports for any equipment connected to the tablet/laptop. Instructions are for Windows 10. If you have a different operating system, check the Windows website for instructions on accessing Device Manager.

1. Navigate to **This PC**. Tap and hold to display the menu.
2. Tap **Properties**. Then tap **Device Manager**.

   A window similar to the one in *Figure 3* opens.
3. Tap the small arrow next to *Ports (COM & LPT)* to expand the category. In the example, the IR cable ("*Prolific USB-to-Serial Comm Port*") is using COM 10, and the ORION mobile transceiver (USB Serial Device) is using COM 4.

   NOTE: COM ports will vary, depending on the tablet or laptop you are using.

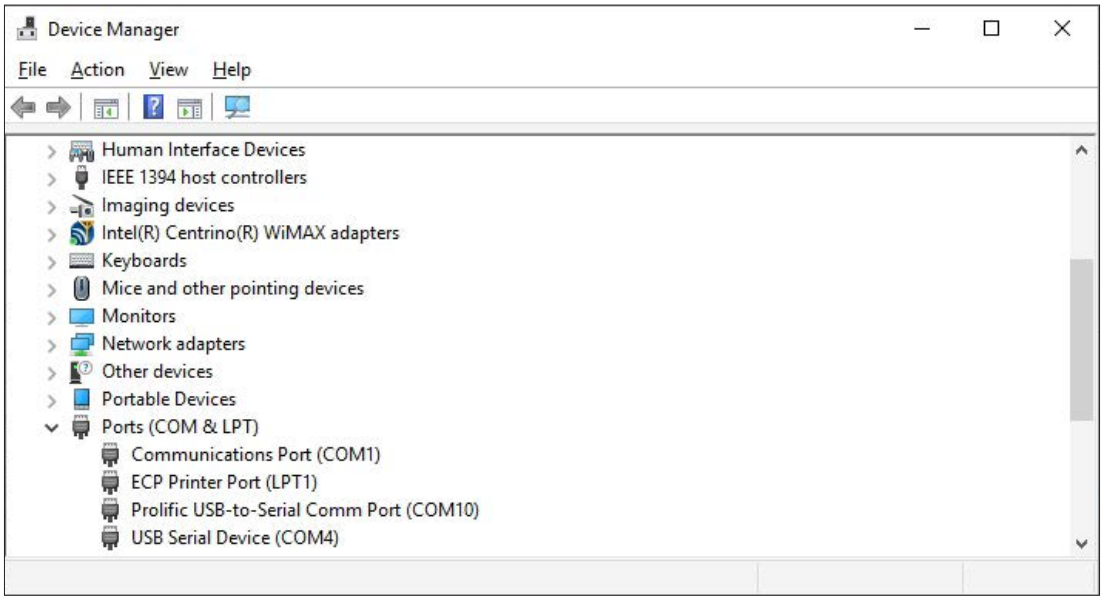

Figure 3: Device Manager showing COM port

IMPORTANT

Make a note of the COM ports to configure the software settings. To set the correct COM port(s) for equipment connected to the tablet/laptop, see "Settings" on page 12.

SOFTWARE STARTUP/EXIT

1. Double-tap the ORION Endpoint Utility shortcut (*Figure 4*) on the desktop to open the software.

Figure 4: Shortcut

The License Agreement screen (*Figure 5*) displays the first time you access the software.

The License Agreement must be accepted by an authorized representative of the customer/licensee.

Tap **I ACCEPT.**
Result: The login screen opens (Figure 6). The login screen has the software version, and access to the license and trademarks.

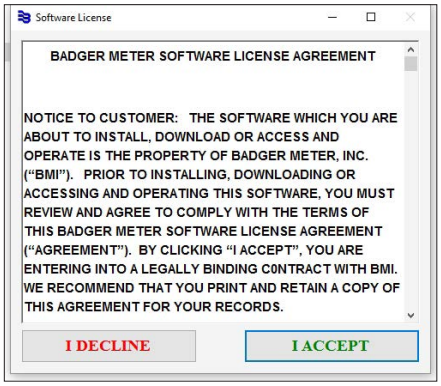

Figure 5: License

2. Use the keypad to enter your ID in the *User ID/Initials* field. The field accepts a maximum of 7 characters, alpha and numeric.

   NOTE: User ID/Initials must be entered by an authorized representative of the customer/licensee.

   *Result: When you enter a valid ID, the **OK** button becomes active.*

3. Tap the **OK** button on the login screen to open the software application.

   NOTE: Tap **Cancel** if you want to exit without opening the software application.

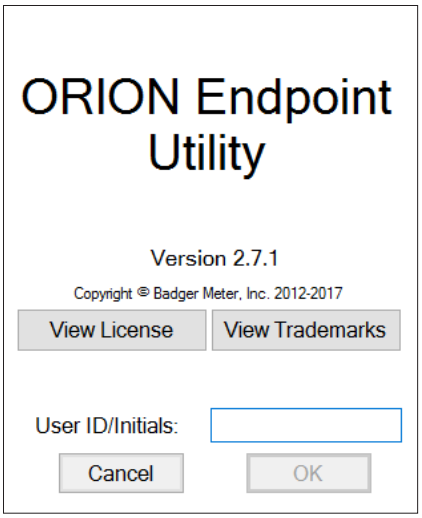

Figure 6: ORION Endpoint Utility login screen

The ORION Endpoint Utility main screen opens, as shown in Figure 7.

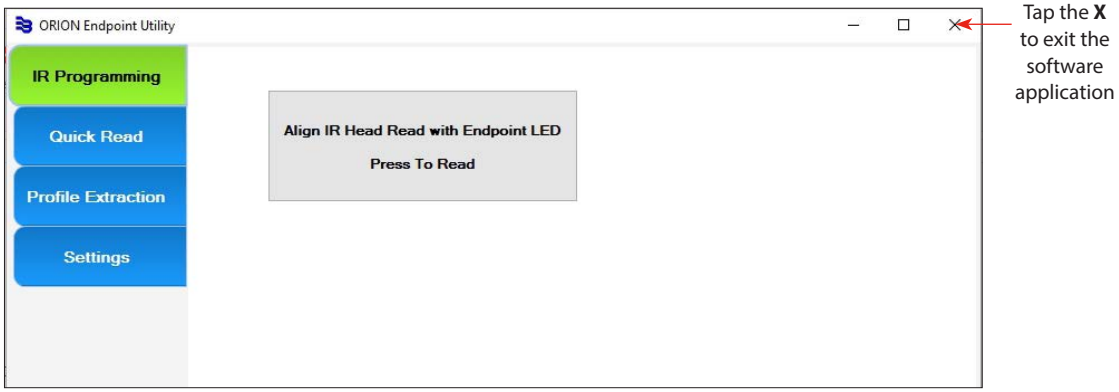

Figure 7: ORION Endpoint Utility main screen

Instructions for using the software begin on *page 16*.

IMPORTANT

Remember to set the COM ports for any equipment attached to the tablet/laptop before using the software for the first time. See "Settings" on page 12 for more information.

Exiting the Software

To close and exit the ORION Endpoint Utility, tap the **X** in the top right corner of any screen.

SETTINGS

The Settings screen is used to set the COM ports for the equipment attached to the tablet/laptop. Settings should be configured prior to using the software.

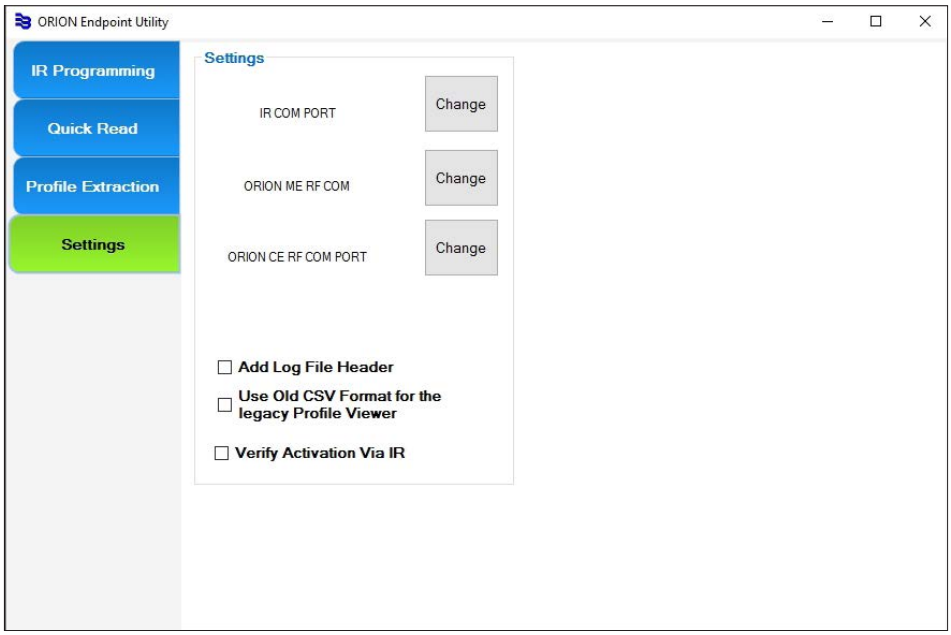

Figure 8: Settings screen options

Settings Screen Options

IR COM PORT	Use to set the COM port for an IR programming cable attached to a communication port on the tablet/laptop.
ORION ME RF COM	Use to set the COM port for an ME transceiver attached to a communication port on the tablet/laptop.
ORION CE RF COM PORT	Use to set the COM port for a CE receiver attached to a communication port on the tablet/laptop.
Add Log File Header	Select to include a header with the IR profile data .csv output file. Tap the box to select the setting.
Use Old CSV Format for the legacy Profile Viewer	Select to save profile data in old .csv (comma separated values) spreadsheet format for Profile Viewer (legacy product). Tap the box to select the setting.
Verify Activation Via IR	*Verify Activation Via IR* is an optional function for ORION Cellular LTE endpoints. Tap the box to select the setting. When selected, this function provides visual confirmation of network communication when you **Start** (activate) an ORION Cellular LTE endpoint that is Stopped or Paused. You must keep the IR communication cable aligned with the endpoint LED throughout the activation process, which takes about 30 seconds. See *"Starting an ORION Cellular LTE Endpoint when Verify Activation Via IR is Selected" on page 25* for step-by-step instructions.

Setting the COM Ports

IMPORTANT

If using an ORION mobile transceiver, make sure the ME driver is installed and the USB driver is configured according to the instructions. See "ME Driver" on page 52 and "USB Settings" on page 53 for additional information.

Follow these steps to set the COM ports on the Settings screen.

1. Select **Settings** from the main menu.
2. Tap the **Change** button for the hardware attached to the tablet/laptop to open the COM port selection window.

   For this example, we selected the *IR COM Port* **Change** button which is used to set the COM port for the IR programming cable.

3. In the window that opens, choose the COM port for the IR cable.

   In the example, **COM 10** is selected. See *"COM Ports" on page 9* for more information.

   Tap **Select**.

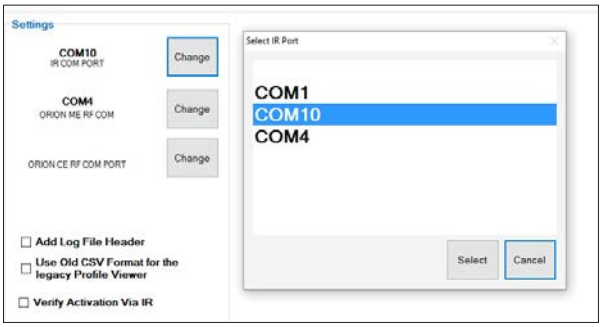

Figure 9: IR COM port

Result: The window closes, and the COM port you set is displayed on the Settings screen (Figure 10).

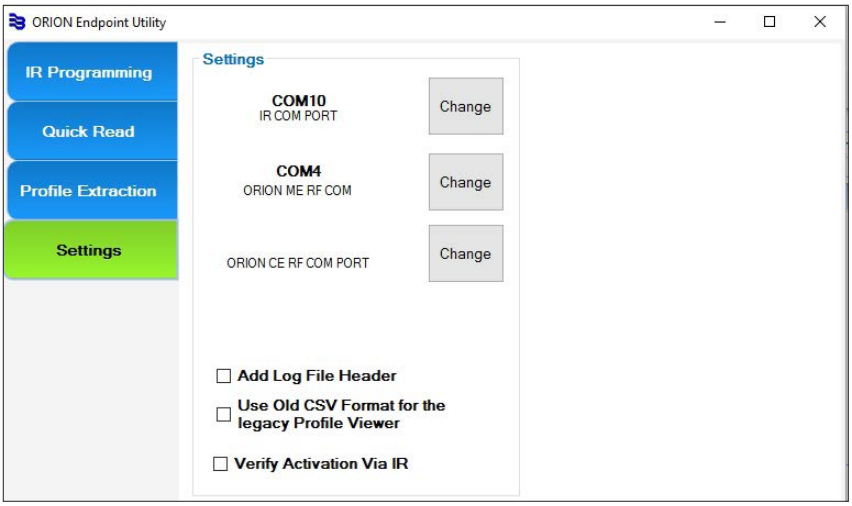

Figure 10: Settings screen - COM port set

4. Repeat steps 2 and 3 to set the COM port for any additional hardware connected to the tablet/laptop.

   When the COM ports are set, the software application is ready to use.

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USER GUIDE

MAIN SCREEN

The software application main functions are listed in a menu along the left side of the software screens as shown in *Figure 11*.

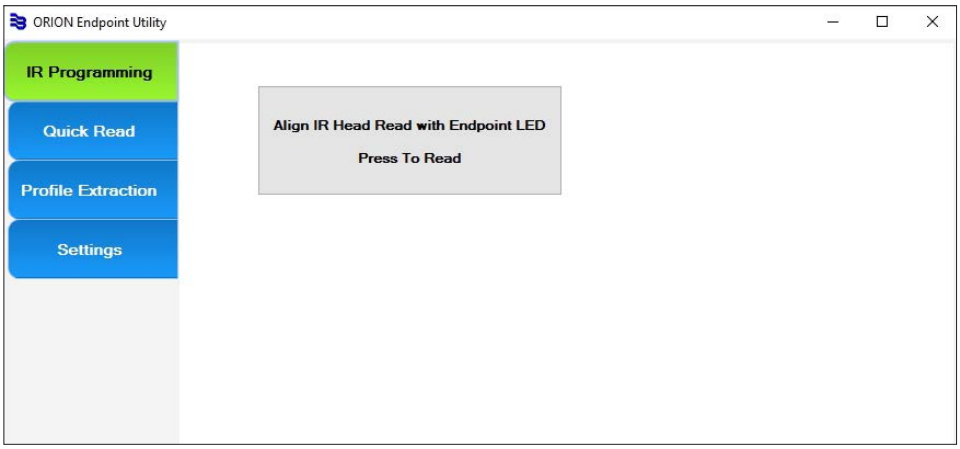


Figure 11: Main screen - IR Programming selected

NOTE: The screen shown in *Figure 11* displays the first time you select the **ORION IR Programming** option on the ORION Endpoint Utility menu. Once you **Read** an endpoint, the IR Programming screen (*Figure 12*) displays instead. The IR Programming screen refreshes each time you read an endpoint using the **Read Endpoint** button.

Main Functions

IR Programming	Used to read and program ORION water and gas endpoints using the IR programming cable, including programming an endpoint following a tamper repair or retrofit installation (RTR water installations only). For additional information, see *"IR Programming" on page 17*.
Quick Read	Used to perform an RF Quick Read on all ORION water and gas endpoints within range of the ORION Endpoint Utility software using the RF mobile transceiver or receiver. Quick Read can also be used to read a specific ORION endpoint serial number. See *"Quick Read" on page 36*.
Profile Extraction	Used to perform an IR or RF extraction of an ORION endpoint's historical interval profile data for viewing in the ORION Profile Viewer software. See *"" on page 40*.
Settings	Used to set or change the COM ports for the devices connected to the tablet/laptop. See *"Settings" on page 12*.

Navigating the ORION Endpoint Utility Software

The main function buttons are always displayed along the left side of the screen as shown above. When selected, the button is green.

Tap the **X** at the top right corner of the screen to close and exit the software application.

IR PROGRAMMING

IR programming screen varies depending on the technology. An example of an IR Programming screen for an ORION Cellular LTE endpoint with an HR-E® LCD encoder on a water meter is shown in *Figure 12*. The fields and buttons on the screen vary depending on the following:

- Endpoint technology: ORION Cellular LTE, ORION Fixed Network (SE), ORION Migratable (ME), ORION Classic (CE)
- Encoder type: HR-E LCD, HR-E, ENC (ADE®), RTR®, Permalog
- Meter type: E-Series®, Recordall® Disc, Compound Series, Turbo Series, Fire Series, Fire Hydrant
- Meter service: Water, Gas

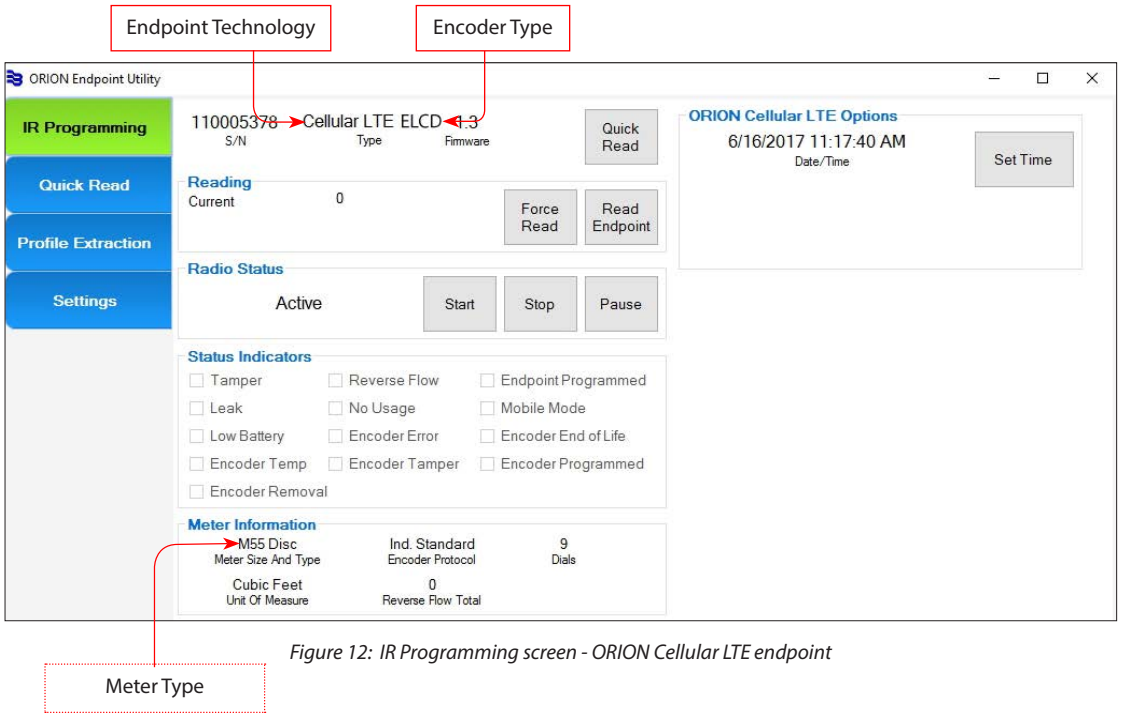


Figure 12: IR Programming screen - ORION Cellular LTE endpoint

The endpoint technology, encoder type and meter type, together, define the information that will be displayed in the *Type* and *Meter Information* fields when performing the IR Programming functions. See *"IR Programming Fields" on page 18 and "IR Programming Buttons" on page 21* for a complete list and description of all the IR programming screen fields and functions.

Optional IR Programming Bracket

An IR Programming Bracket (PN: **65917-001**) is available and can be used to assist in reading ORION endpoints. The bracket facilitates correct alignment between the IR optical read head of the programming cable and the IR port on the endpoint, ensuring a steady read position while leaving your hands free.

IR Programming Fields

All the fields and functions of the IR programming screen are described on the next four pages.

Endpoint/Encoder Information, Reading, Radio Status			
	Displays For		
Field Label	***Endpoint Technology***	***Encoder Type***	***Description***
S/N	LTE, ME, SE, CE	All	Endpoint serial number.
Type	LTE, ME, SE, CE	All	Endpoint and encoder type. ORION Cellular LTE endpoints display endpoint type only. For gas meters, "Gas" displays in the Type field. If "Gas" does not display, the meter is water.
Firmware	LTE, ME, SE	All	Endpoint firmware version.
Current*	LTE, ME, SE, CE	All	Displays the current reading for the selected endpoint.
Daily*	ME, SE	All	Displays the time-synchronized daily endpoint reading value.
Radio Status	LTE, ME, SE, CE	All	Displays the current radio status of the endpoint.

* The reading value is the raw read without reading resolution applied.

ORION Cellular LTE Options			
	Displays For		
Field Label	***Endpoint Technology***	***Encoder Type***	***Description***
Date/Time	LTE	HR-E LCD, HR-E, ENC	Endpoint date and time.
Set Time	LTE	HR-E LCD, HR-E, ENC	Allows you to synchronize the endpoint date and time to the date and time of the tablet/laptop. **NOTE:** The ORION Cellular LTE endpoint automatically synchronizes its date and time with BEACON AMA as part of its standard network communication. If date/time is manually set via the tablet/laptop, you must confirm the tablet/laptop date/time is correct before performing this operation.

Status Indicators			
Box is checked when an alert is reported. The status fields that display depend on the encoder and endpoint type.			
	Displays For		
Field Label	**Endpoint Technology**	**Encoder Type**	**Description**
Cover Removal	ME, SE	Gas	Endpoint is reporting a potential gas meter index cover tamper.
Encoder Empty Pipe	LTE, ME, SE	ELCD	E-Series meter is reporting a no flow condition in the pipe.
Encoder End of Life	LTE, ME, SE	ELCD	Encoder or E-Series meter is reporting to the endpoint that the encoder battery life indicator has been activated.
Encoder Error	LTE, ME, SE	ELCD, HR-E, ENC, Permalog	Encoder is reporting a device error to the endpoint.
Encoder Programmed	LTE, ME, SE	ELCD	Encoder or E-Series meter is reporting to the endpoint that it has been reprogrammed via IR.
Encoder Removal	LTE, ME, SE	ELCD	Encoder is reporting a removal condition to the endpoint.
Encoder Tamper	LTE, ME, SE	ELCD	Encoder is reporting a tamper condition.
Encoder Temp	LTE, ME, SE	ELCD	Encoder or E-Series meter is reporting to the endpoint that it senses temperatures outside the specified range.
Endpoint Programmed	LTE, ME, SE	All	Endpoint was programmed via IR.
Index Changed	ME, SE	RTR and Gas	Endpoint is reporting that the reading (odometer setting) was changed.
Leak	LTE, ME, SE, CE	HR-E, ENC, RTR, Permalog	Endpoint is reporting a potential leak condition.
		ELCD	Encoder or E-Series meter is reporting a potential leak condition to the endpoint.
Low Battery	LTE, ME, SE	All	Endpoint is reporting a low battery.
Mobile Mode	ME, SE, CE	All	Endpoint is communicating in mobile mode.
No Usage	LTE, ME, SE, CE	HR-E, ENC, RTR and Gas	Endpoint is reporting a no usage condition.
		ELCD	Encoder or E-Series meter is reporting a potential no usage condition to the endpoint.
Reverse Flow	LTE, ME, SE, CE	HR-E, ENC and Gas	Endpoint is reporting a reverse flow condition.
		ELCD	Encoder or E-Series meter is reporting a reverse flow condition to the endpoint.
Sensor Error	LTE, ME, SE	ELCD	E-Series only. Meter is reporting a sensor error or meter alarm other than empty pipe or low temp.
Tamper	LTE, ME, SE, CE	ELCD, HR-E, ENC, RTR, Permalog and Gas remotes	Endpoint is reporting a tamper. This condition occurs when the wire between the encoder and the endpoint is cut or shorted, or the encoder is not connected.

NOTE: For more information about status indicators, refer to the following documents, available at *www.badgermeter.com*:

- HR-E, ENC and RTR: Refer to the *ORION Water Endpoint Product Data Sheet* for the endpoint type.
- HR-E LCD: Refer to the *HR-E LCD Encoder User M*anual.
- E-Series: Refer to the *E-Series Ultrasonic Meters User Manuals*.

Meter Information			
	Displays For		
Field Label	Endpoint Technology	Encoder Type	Description
Meter Size and Type	LTE, ME, SE	ELCD, HR-E, ENC, RTR	The size and type of the meter for which the encoder was programmed.
Unit of Measure	LTE, ME, SE	ELCD, HR-E, ENC, RTR	The unit of measure as defined by the encoder: cubic meters, cubic feet, gallons, imperial gallons or liters.
Encoder Type	LTE, ME, SE	ELCD, HR-E, ENC	The encoder protocol.
Dials	LTE, ME, SE	ELCD, HR-E, ENC	The encoder dial resolution as reported from the encoder.
Reverse Flow Total	LTE, ME, SE	ELCD	The total reverse flow units measured by the encoder or the E-Series meter.
Drive Circle	ME, SE, CE	Gas	Displays after initial read for gas endpoints only. Provides access to a read-only screen displaying the possible drive circles for the gas endpoint.
Direction	ME, SE	Gas	The direction for the drive gear.
Pressure Comp	ME, SE, CE	Gas	The gas pressure factor.

Flow Rate Study (ORION ME and SE)			
	Displays For		
Field Label	Endpoint Technology	Encoder Type	Description
Start Date Time	ME, SE	All	Date and time the Flow Rate Study was started. Fills when **Get** button is selected.
Intervals	LTE, ME, SE	All	The number of five-minute Intervals collected during the Flow Rate Study. Fills when **Get** is selected.
Min Max Total	ME, SE	All	The Minimum and Maximum flow, and the Total counts collected. The fields fill when **Get** is selected.

GPS Location (ORION ME and SE)			
	Displays For		
Field Label	Endpoint Technology	Encoder Type	Description
Latitude	ME, SE	All	Geographic coordinate specifying north-south position of the endpoint.
Longitude	ME, SE	All	Geographic coordinate specifying east-west position of the endpoint.

Advanced Endpoint Functions (ORION ME and SE)			
	Displays For		
Field Label	Endpoint Technology	Encoder Type	Description
Battery Status	ME, SE	All	Visual indicator of the endpoint battery status.

IR Programming Buttons

Reading			
	Displays For		
Button Label	***Endpoint Technology***	***Encoder Type***	***Description***
Quick Read	All	All	Initiates an RF Quick Read for the selected endpoint.
High Power	CE	All	Forces a brief high powered signal from the endpoint to a gateway receiver.
Program/ Force Read	All	All	Toggles, based on the encoder type. For ORION water endpoints with an RTR, **Program** is used to set the endpoint odometer value following a tamper repair. With an HR-E LCD or ADE encoder, or with an E-Series meter, **Force Read** is used to view the real-time encoder odometer value.
Read Endpoint	All	All	Initiates IR communication between the software and the endpoint.

Radio Status			
	Displays For		
Button Label	***Endpoint Technology***	***Encoder Type***	***Description***
Start	All	All	Starts endpoint radio. *Radio Status* field displays "Active" for ORION Cellular LTE. *Radio Status* field displays "On-Mobile Mode" for all other endpoints.
Stop	All	All	Stops endpoint radio. "Stopped" is displayed in the *Radio Status* field. Stopped endpoints must be Started via IR to begin transmitting again. With ORION Migratable or Fixed Network endpoints, the endpoint historical interval data (profile data) is cleared when the endpoint is restarted.
Pause	All	All	Pauses endpoint transmission temporarily until a unit of water or gas is registered. "Paused" is displayed in the *Radio Status* field.

Meter Information			
	Displays For		
Button Label	***Endpoint Technology***	***Encoder Type***	***Description***
Change	ME, SE	HR-E, ENC, RTR, Gas	For water meters, used to change the meter size, type and/or units of measure. For gas meters, used to change the drive circle (units, dials and resolution), pressure and direction.
	CE	Gas	

GPS Location (ORION ME and SE)			
	Displays For		
Button Label	***Endpoint Technology***	***Encoder Type***	***Description***
Set GPS Location	ME, SE	All	Window opens in which you can enter the endpoint latitude and longitude.

Flow Rate Study (ORION ME and SE)			
	Displays For		
Button Label	***Endpoint Technology***	***Encoder Type***	***Description***
Start	ME, SE	All	Used to start the flow rate study.
Get	ME, SE	All	Used to get the results of the flow rate study.
Save	ME, SE	All	Saves the flow rate study results. Becomes active when **Get** is selected.

ORION IR PROGRAMMING

IMPORTANT

All IR functions described in this section require the IR programming cable. Connect the IR programming cable to the tablet/laptop and make sure the COM port is correctly set. See "Setting the COM Ports" on page 13 if you need help.

Reading an Endpoint

1. With the **IR Programming** button selected (*Figure 13*), align the optical head of the IR cable with the endpoint IR LED port.

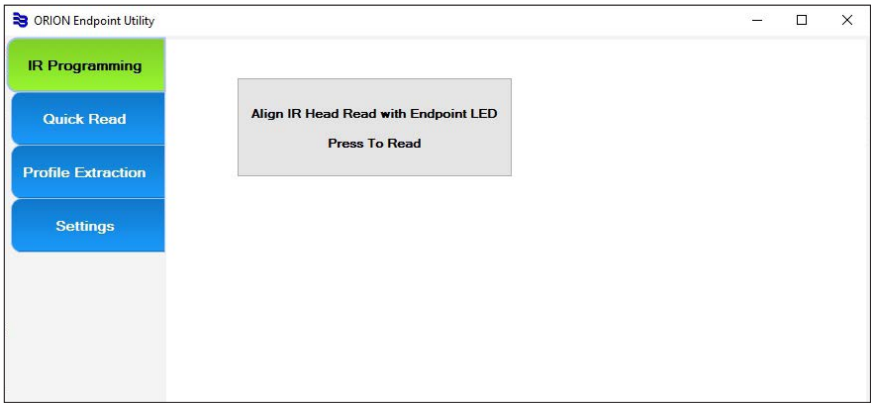


Figure 13: ORION Endpoint Utility main screen with IR Programming selected

2. Tap **Press to Read**.

   Result: The endpoint type, meter details and the current read fill the screen. The example in Figure 14 is an ORION Cellular LTE endpoint. The reading is the raw value without read resolution applied.

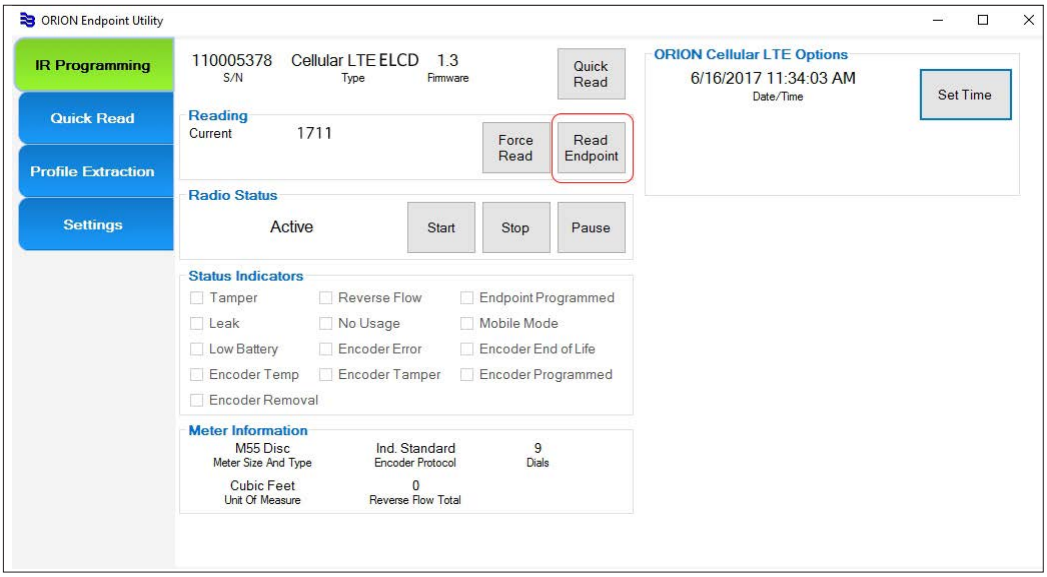


Figure 14: IR Programming screen for ORION Cellular LTE endpoint with HR-E LCD

3. To read another endpoint, align the optical head of the IR cable with the next endpoint IR LED port and tap the **Read Endpoint** button.

4. Repeat **step 3** for each endpoint you want to read.

   The example in Figure 15 is an ORION Migratable endpoint.

   The example in Figure 16 is an ORION Classic endpoint.

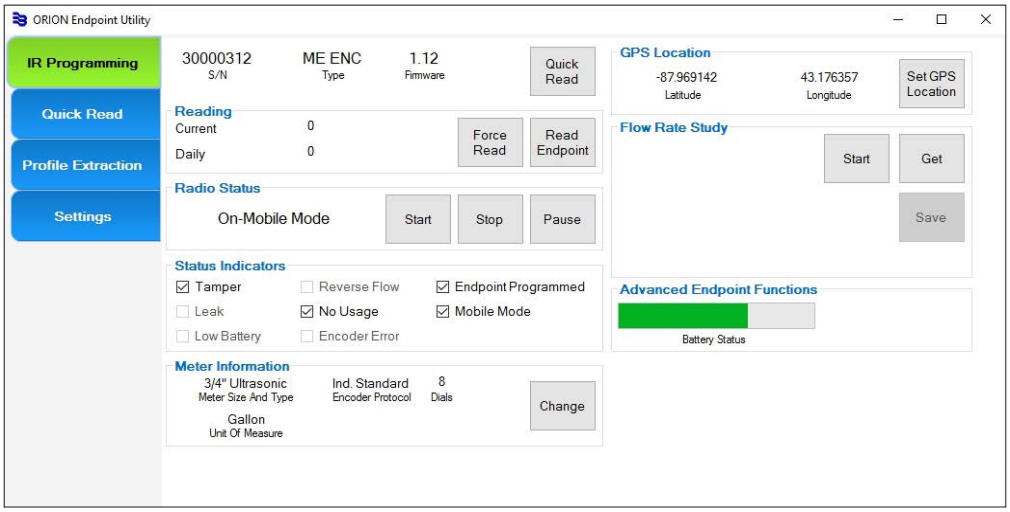


Figure 15: IR Programming screen for ORION Migratable endpoint with HR-E

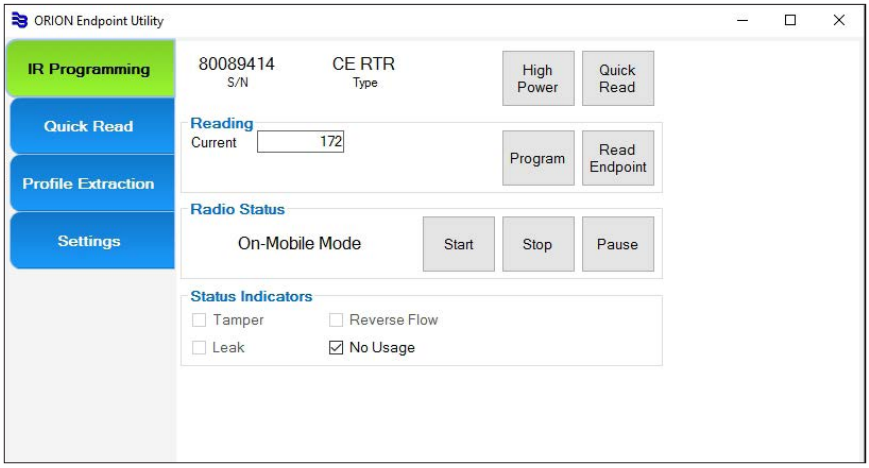


Figure 16: IR Programming screen for ORION Classic endpoint with ENC

For a description of the fields and buttons on the screens, see *"IR Programming Fields" on page 18* and *"IR Programming Buttons" on page 21*.

Force Read

When an ORION endpoint is connected to a device with encoder output, the **Force Read** button displays on the IR Programming screen instead of the **Program** button. Tap **Force Read** to update the endpoint *Reading* from the real-time encoder odometer value. You can also use **Force Read** to verify a successful tamper repair.

The procedure below is a **Force Read** on an ORION Cellular LTE endpoint. Perform the same steps to Force Read any other ORION endpoint connected to a device with encoder output.

1. Align the optical head of the IR cable with the endpoint IR LED port.
2. Tap **Read** on the IR Programming screen to read the endpoint.
3. Tap **Force Read**.

   Result: The Current field updates with the encoder odometer value.

   *If a tamper condition was successfully repaired and no longer exists, the **Tamper** Status Indicator check box should be blank.*

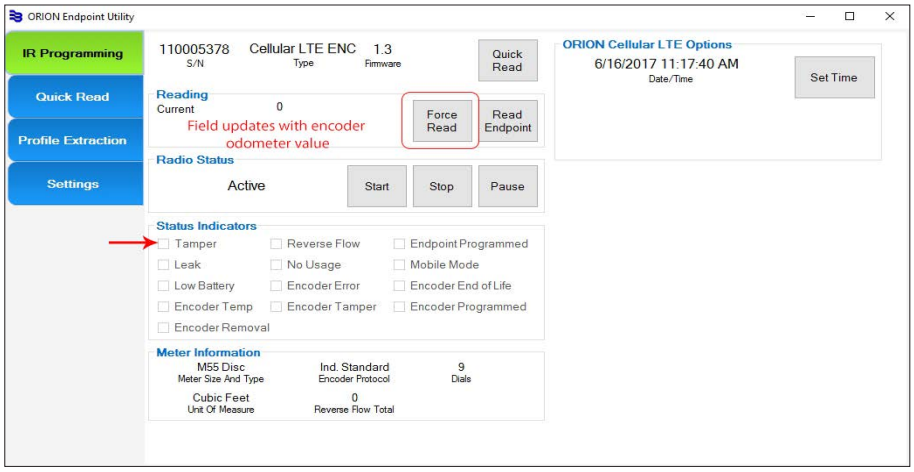


Figure 17: Force Read

Radio Status: Stop, Pause, Start (ORION Cellular LTE)

The *Radio Status* field (*Figure 18*) displays the current radio status of the ORION Cellular LTE endpoint, and includes the **Start**, **Stop**, and **Pause** radio mode buttons.

Figure 18: ORION Cellular LTE - Radio Status

ORION Cellular LTE endpoints display one of the following statuses in the *Radio Status* field.

Radio Status	Description
Stopped	Endpoint is not communicating with the cellular network. The endpoint radio is stopped and must be started via IR to begin communication.
Paused	Endpoint radio communication is temporarily stopped until water flow is registered, or when started via IR.
Active	Endpoint radio is communicating with the cellular network.

Radio Mode Buttons

Stop The **Stop** button stops the endpoint radio from sending a signal, regardless of the usage registered from the meter. Endpoints shipped via air will be in "Stopped" mode and must be manually started via IR.

To place an ORION Cellular LTE endpoint into "Stopped" radio mode, align the optical head on the IR cable with the endpoint IR LED port and tap **Stop**. "Stopped" displays in the *Radio Status* field.

Pause The **Pause** button temporarily stops the endpoint radio signal. Pause is the standard default mode for ORION Cellular LTE endpoints shipped via ground. The endpoint begins transmitting again when water is registered on the meter, or when the endpoint is started via IR. See additional information on activating the ORION Cellular LTE endpoint in the *ORION Water Endpoint Installation Manual*, available in the Resource Library at *www.badgermeter.com*. **Pause** is commonly used for seasonal customer accounts.

To place an ORION Cellular LTE endpoint into "Paused" radio mode, align the optical head on the IR cable with the endpoint IR LED port and tap **Pause**. "Paused" displays in the *Radio Status* field.

Start The **Start** button is used to start (activate) an endpoint when the radio signal is stopped or paused.

Starting an ORION Cellular LTE Endpoint

1. To place a "Stopped" or "Paused" ORION Cellular LTE endpoint into "Active" radio mode, align the optical head on the IR cable with the endpoint IR LED port and tap **Start**.

   In just a few seconds, the screen in *Figure 19* displays to confirm cellular and BEACON network communication with the endpoint.

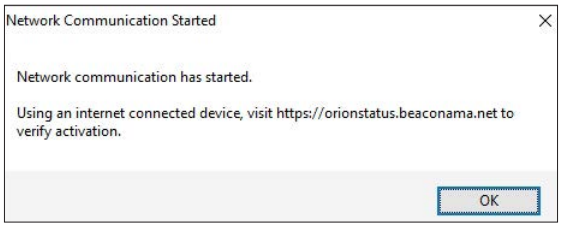


Figure 19: Network communication started. The endpoint is Active

2. Tap **OK** to return to the IR Programming screen. The *Radio* field status is now "Active."

Starting an ORION Cellular LTE Endpoint when *Verify Activation Via IR* is Selected

You can also start a "Stopped" or "Paused" ORION Cellular LTE endpoint with the optional *Verify Activation Via IR* setting selected. The activation process is the same for the endpoint, but you receive visual confirmation of network communication when the setting is selected. You must keep the IR cable aligned with the endpoint throughout the process, which takes about 30 seconds. See *"Verify Activation Via IR" on page 12* to select the setting, then follow these steps.

1. Align the optical head of the IR cable with the ORION Cellular LTE endpoint IR LED port and tap **Read**. In this example, the endpoint Radio Status is "Stopped" as shown in *Figure 20.*

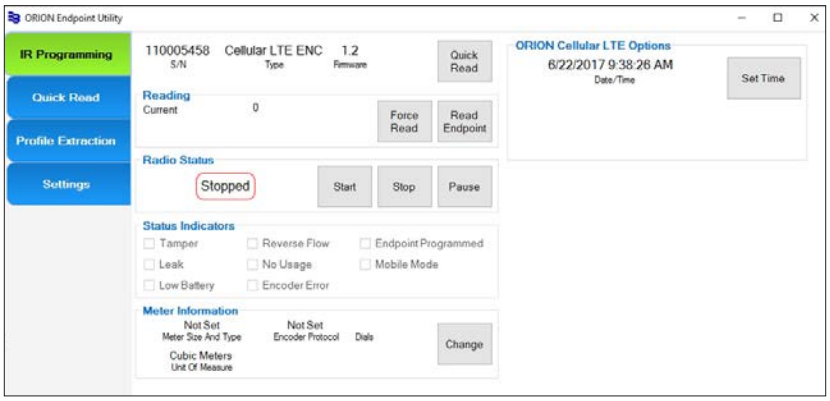


Figure 20: ORION Cellular LTE Endpoint - Stopped

2. Tap **Start**. A screen automatically displays as shown in *Figure 21*, indicating the endpoint activation process has started.

   ! Keep the IR cable aligned with the endpoint throughout activation! This process takes approximately 30 seconds!

   The completed screen is shown in *Figure 22*. The screen confirms the endpoint connection with the encoder and successful communication with the cellular and BEACON network.

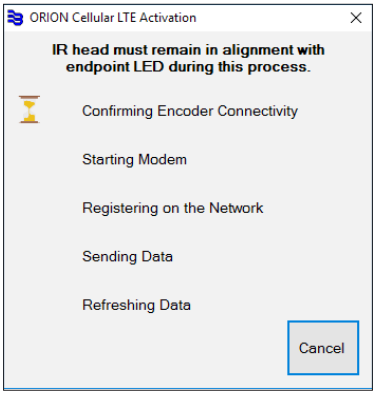


Figure 21: Activation in progress

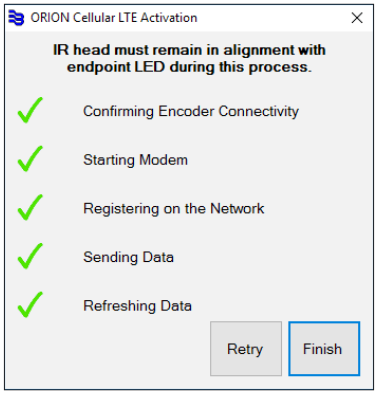


Figure 22: Activation complete

3. If you do not see the **green check marks**, move the endpoint to another location and tap **Retry**. Again, keep the IR cable aligned until the process is complete.
4. Tap **Finish** to return to the IR programming screen. "Active" displays in the Radio Status field, indicating the endpoint radio transmission is started (*Figure 23*).

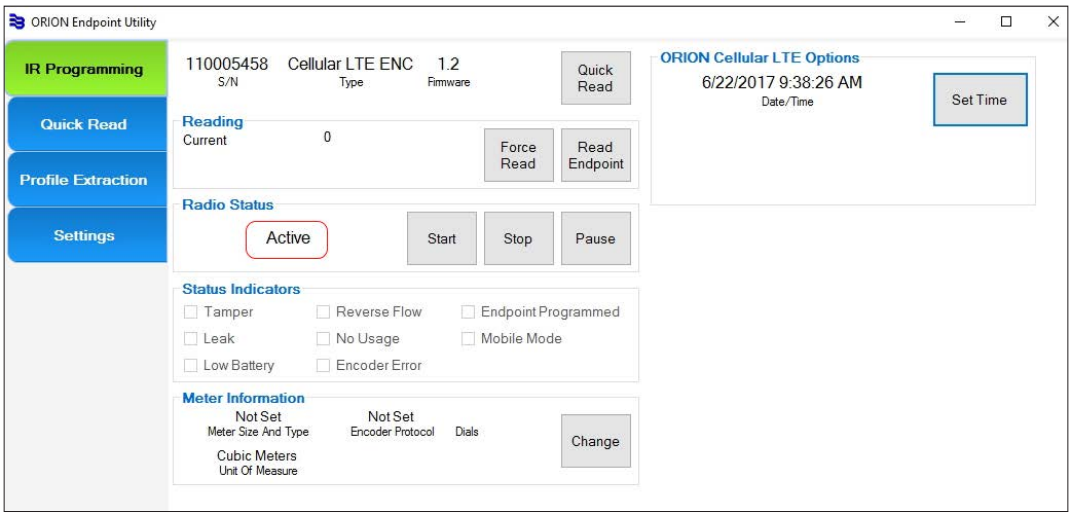


Figure 23: ORION Cellular LTE Endpoint - Active

NOTE: For additional ORION Cellular endpoint information, and to confirm endpoint signal strength, use the ORION Endpoint Status tool at *orionstatus.beacon.net*. BEACON AMA login is required.

Radio Status: Stop, Pause, Start (ORION Migratable, Fixed Network, Classic)

The *Radio Status* field displays the current radio status of the ORION Migratable, Fixed Network, and Classic endpoints endpoint. **Start**, **Stop**, and **Pause** radio mode buttons are also in the field.

Figure 24: Endpoint - Radio Status

The following statuses may display in the *Radio Status* field on the IR Programming screen for ORION Migratable, Fixed Network, and Classic endpoints.

Stopped	Endpoint is not transmitting. The endpoint radio is stopped and must be started to begin transmitting again. For ORION Migratable and Fixed Network endpoints, any stored historical interval data (profile data) will be cleared when the endpoint is restarted. **NOTE:** An ORION endpoint with an RTR must be programmed to restart.
Paused	Endpoint radio transmission is temporarily stopped until water flow is registered.
On Mobile Mode	ORION Migratable and Fixed Network: Endpoint is sending/receiving communications in mobile radio mode until and unless the endpoint establishes communication and is assigned to a network gateway. An endpoint in mobile mode sends a message requesting gateway assignment as frequently as once an hour.* ORION Classic: Endpoint always displays *On Mobile Mode* when transmitting.
Discovery Mode	For troubleshooting only. To be used under the direction of Badger Meter Technical Support.
On-Fixed Mode	An ORION Fixed Network endpoint is assigned to a network gateway for fixed network data collection. Endpoints in network *On-Fixed Mode* can also be received by the mobile transceiver.* An endpoint reverts to *On Mobile Mode* if it fails to receive a response from a gateway for four consecutive days. Once communication is re-established with the gateway, the endpoint automatically transitions to *On-Fixed Mode*.

* Depending on the endpoint firmware version.

Radio Mode Buttons

- The **Start** button is used to start an endpoint radio before usage is registered. Align the optical head of the IR cable with the endpoint IR LED port and tap **Start**. Radio Status changes to "On Mobile Mode."
- The **Pause** button is used to pause the radio signal temporarily. Align the optical head of the IR cable with the endpoint IR LED port and tap **Pause**. The endpoint radio begins transmitting again when a unit of water or gas is registered from the meter.
- The **Stop** button is used to stop an endpoint radio from sending a signal, regardless of the usage registered from the meter. Align the optical head of the IR cable with the endpoint IR LED port and tap **Stop**.

  NOTE: Stopped radios must be restarted using the **Start** function and will not automatically restart when usage is registered by the meter. When ORION ME or SE endpoints are used with an RTR, the odometer value must also be programmed to reflect the current registration reading. When used with E-LCD, HR-E and ADE encoders or E-Series meters, the odometer value is automatically updated within the hour.

⚠WARNING

The historical interval data (profile data) of ORION Migratable and Fixed Network endpoints is cleared when the endpoint is restarted. The message shown in *Figure 25* displays when you tap **Stop**.

Tap **Yes** if you are sure you want to stop the endpoint and clear the endpoint history.

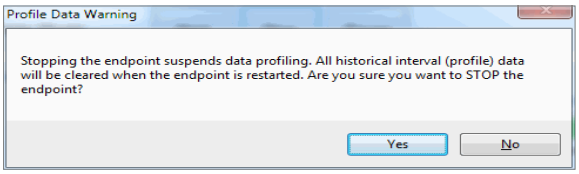


Figure 25: Profile data warning message

Programming an RTR Endpoint to the Odometer Setting (ORION Migratable, Fixed Network, Classic)

To install an ORION endpoint on an active meter with usage on an RTR, use the following information to ensure that the value in the endpoint matches the current odometer value on the RTR once the endpoint is connected to the RTR.

With an RTR, you must also program and set the endpoint to the RTR odometer value following a tamper repair.

NOTE: An ORION endpoint connected to an ADE, E-LCD or approved competitive three-wire encoder or an ADE or High Resolution E-Series Ultrasonic meter does not require programming to clear a tamper. After the wires have been repaired, the endpoint is automatically updated to reflect the register odometer value in the first hour after the wires have been repaired.

IMPORTANT

Stopping an endpoint suspends data profiling. Restarting clears all historical interval data (profile data) and places fixed mode endpoints into mobile mode. Endpoints in mobile mode may not revert to fixed mode for up to 48 hours.

Reading the Odometer

To install an ORION Migratable endpoint on an active meter with usage on the RTR, use the following information to ensure that the value in the endpoint matches the current odometer value on the RTR once the endpoint is connected to the RTR.

When programming ORION endpoints, enter the value of the six moveable odometer wheels plus the sweep hand for all meter types (gallons, cubic feet, etc.) and all meter models.

In the example shown, the odometer value in the moveable dials (both white and black digits) is "000001."

The sweep hand is pointing between the "6" and the "7" but because the sweep hand has not yet hit the "7", use "6" as the value for the last digit of the meter reading. In this example, the value to be entered into the ORION endpoint *Current Reading* field would be "16" or "0000016." (The leading zeros are not required.)

Figure 26: RTR odometer

When programming an ORION endpoint connected to an E-Series meter with an RTR protocol, program the seven most significant (left most) digits shown on the meter display.

Figure 27: E-Series meter display

Follow this procedure for programming an RTR endpoint to the odometer setting.

1. On the IR programming screen, double-tap in the *Current Reading* field to select the current read value.

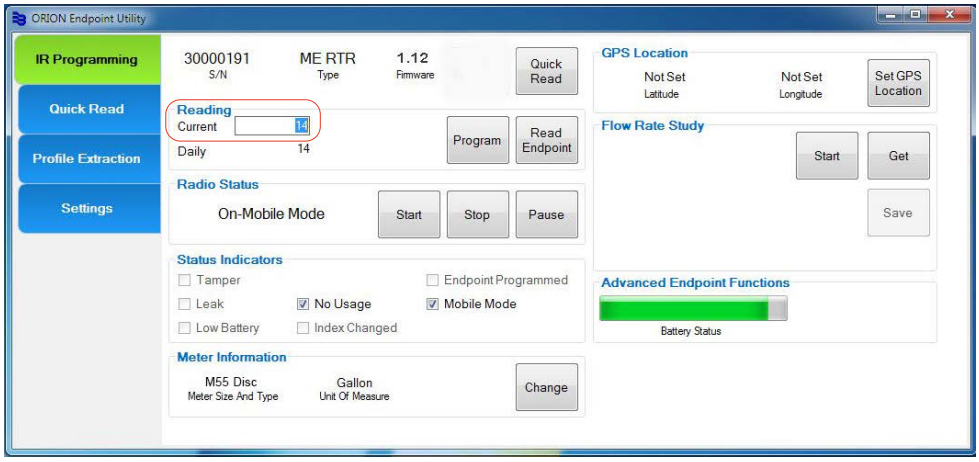


Figure 28: Current Reading field

2. Using the keyboard, enter the RTR odometer value in the *Current Reading* field.

   Result: The field background is highlighted to indicate an unprogrammed value has been entered.

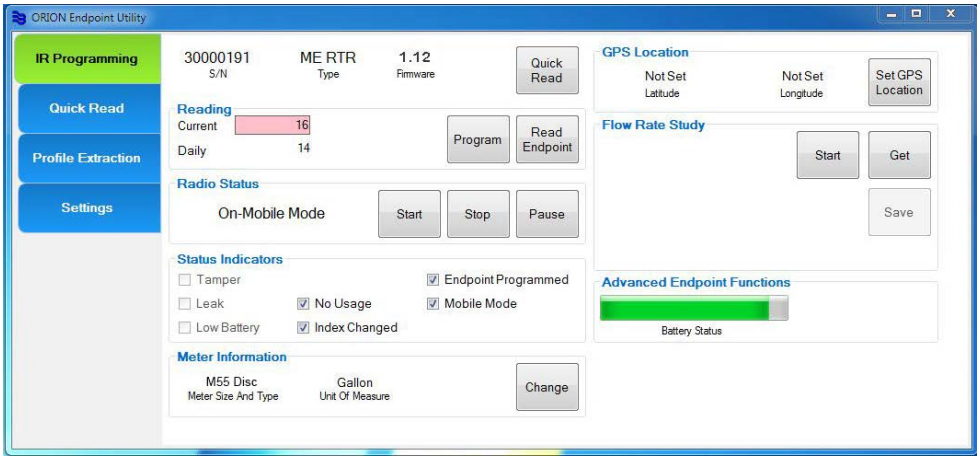


Figure 29: Current Reading field highlighted

3. Align the optical head of the IR cable with the endpoint IR LED port and tap the **Program** button.

   Hold the optical head of the IR cable steady.

   The endpoint is programmed when the *Current Reading* field background clears.

Figure 30: Current Reading field programmed

NOTE: The Status Indicators are also updated to show *Index Changed* and *Endpoint Programmed*.

Programming Water Meter Type, Size and Units of Measure (ORION Migratable, Fixed Network)

To program the water meter type and size for an RTR or ADE, follow these steps.

NOTE: The water meter type, size and units of measure for endpoints connected to an HR-E or ELCD encoder type are obtained from the encoder and are not programmable.

1. Align the optical head of the IR cable with the endpoint IR LED port.
2. Tap **Read Endpoint** if a reading is not already registered.
3. Tap the **Change** button in the *Meter Information* section of the screen.

   Result: The Change Meter Information window opens.

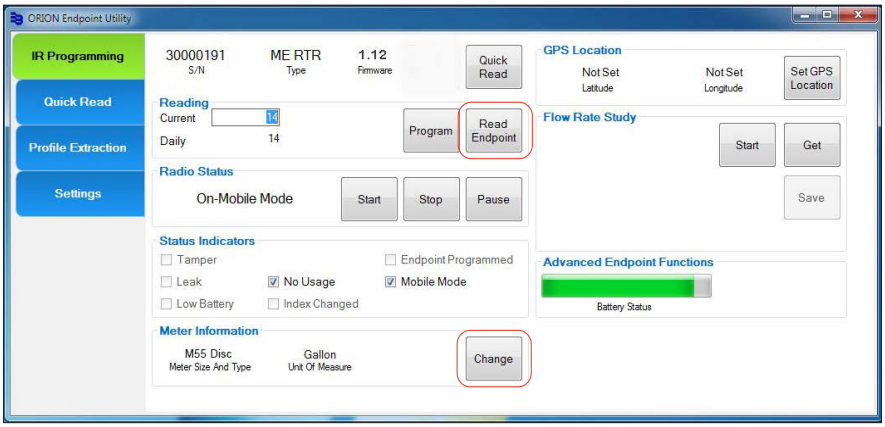


Figure 31: Change button

4. Scroll through the list and tap to select the appropriate Meter Size And Type and Unit Of Measure.
5. Align the optical head of the IR cable with the endpoint IR LED port and tap **Program**.

   *Result: New Meter Information is displayed on the IR Programming screen as shown (Figure 33). The Status Indicators are also updated to show **Endpoint Programmed**.*

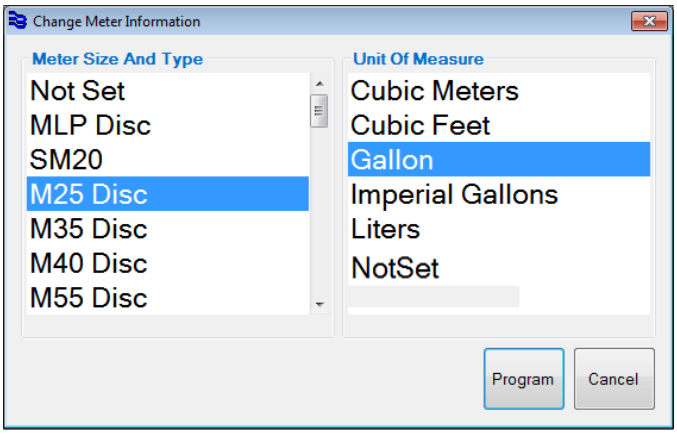


Figure 32: Meter Size, Type, Unit of Measure

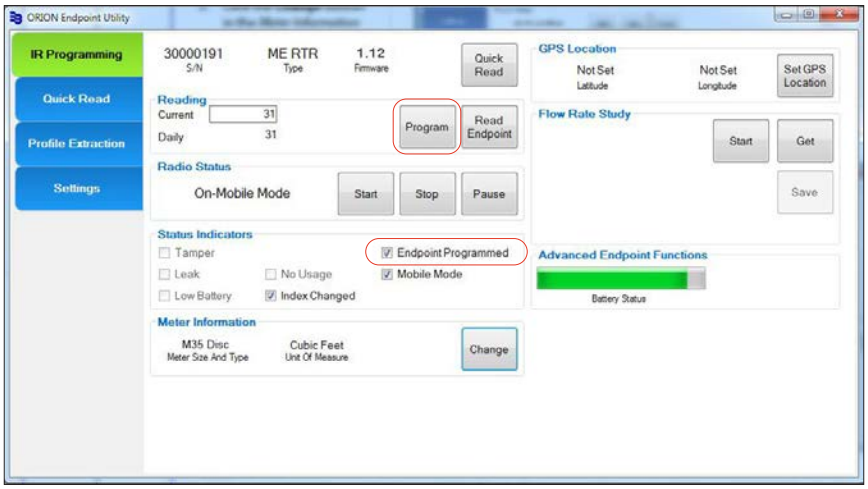


Figure 33: Meter Type, Size, Unit of Measure programmed

NOTE: For gas meters, see *"Programming Gas Endpoints (ORION Migratable, Fixed Network, Classic)" on page 31*.

Programming Gas Endpoints (ORION Migratable, Fixed Network, Classic)

The procedure below is for programming an ORION Migratable/Fixed Network gas endpoint. Perform the same steps for an ORION Classic gas endpoint. For a description of the fields and buttons on the screens, see *"IR Programming Fields" on page 18* and *"IR Programming Buttons" on page 21*.

Program a Read for a Gas Endpoint

1. From the main menu, tap **IR Programming**.
2. Align the optical head of the IR cable with the gas endpoint IR LED port.
3. Tap the **Press to Read** button.

   Result: The IR Programming screen displays for the endpoint.

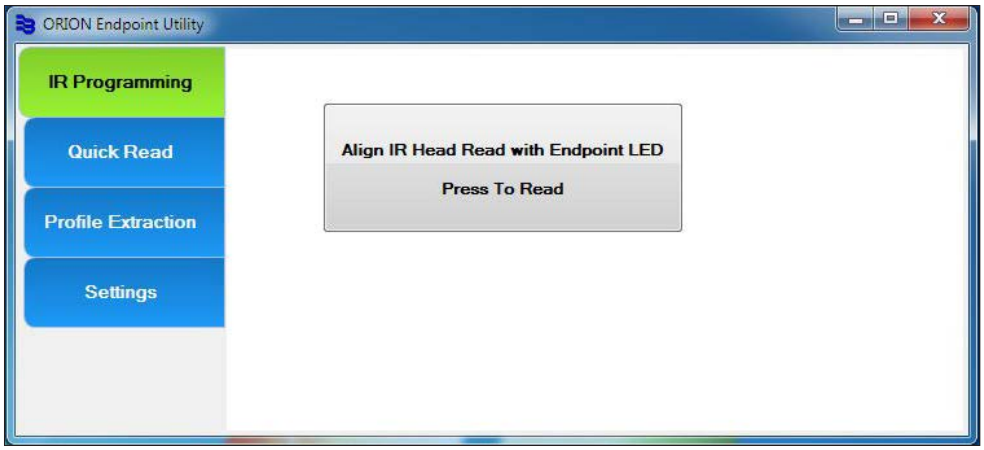


Figure 34: Main menu

4. On the IR programming screen, double-tap in the *Current Reading* field to select the current read value.

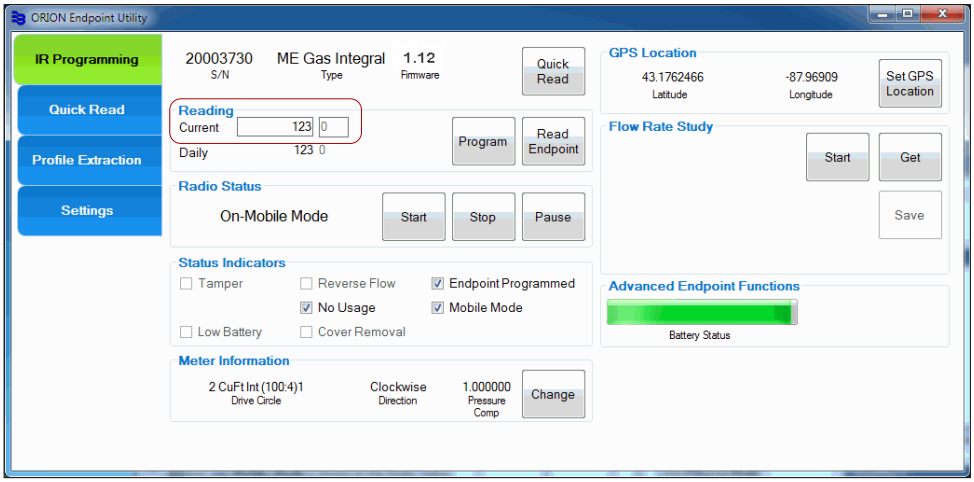


Figure 35: IR Programming screen for gas endpoint

5. Using the keyboard, enter the new value in the *Current Reading* field.

   Result: The field background is highlighted to indicate an unprogrammed value has been entered.

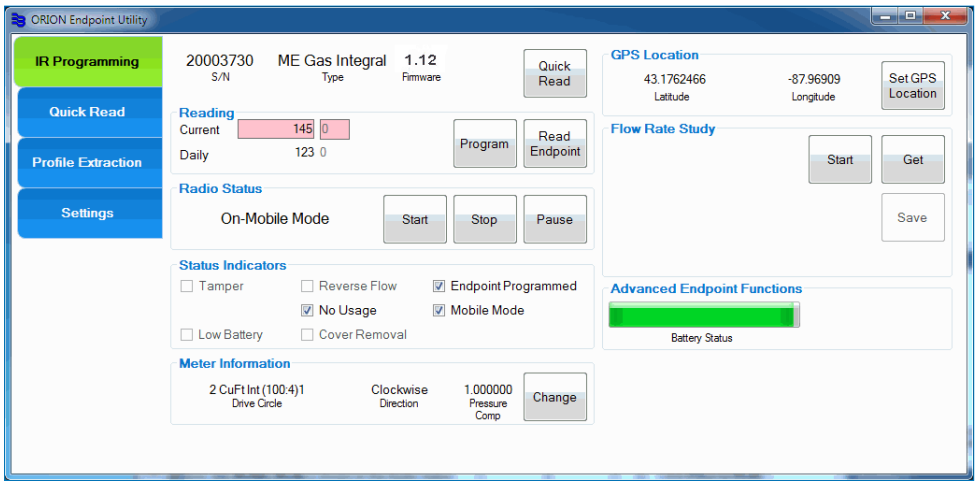


Figure 36: Current Reading field highlighted

6. Align the optical head of the IR cable with the endpoint IR LED port and tap the **Program** button.

   Hold the optical head of the IR cable steady.

   The highlighted background in the *Current Reading* field is cleared when the endpoint read is programmed.

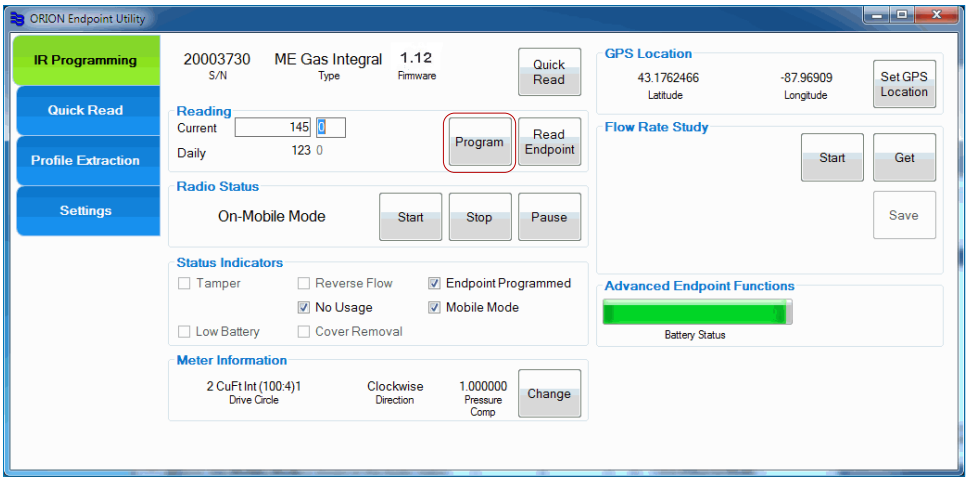


Figure 37: Current Reading field clears when programmed

7. Visually verify that the anticipated index reading is reflected in the *Current Reading* field. If it is not, repeat steps 4…6.

Change and Program the Gas Drive Circle

1. Tap the **Change** button in the *Meter Information* section of the IR Programming screen.
   Result: The Change Drive Circle window opens.
2. Locate the Drive Circle.
   - Use the selections in the top half of the screen to filter the list on the bottom by choosing **Integral** or **Remote**, and choosing the Units, Dials and Res (resolution).
   - Or just scroll through the list in the bottom half of the window to find the drive circle for the endpoint.
3. Tap to select the drive circle.
4. Tap in the **Pressure** field. Use the keyboard to enter the pressure factor, if applicable.

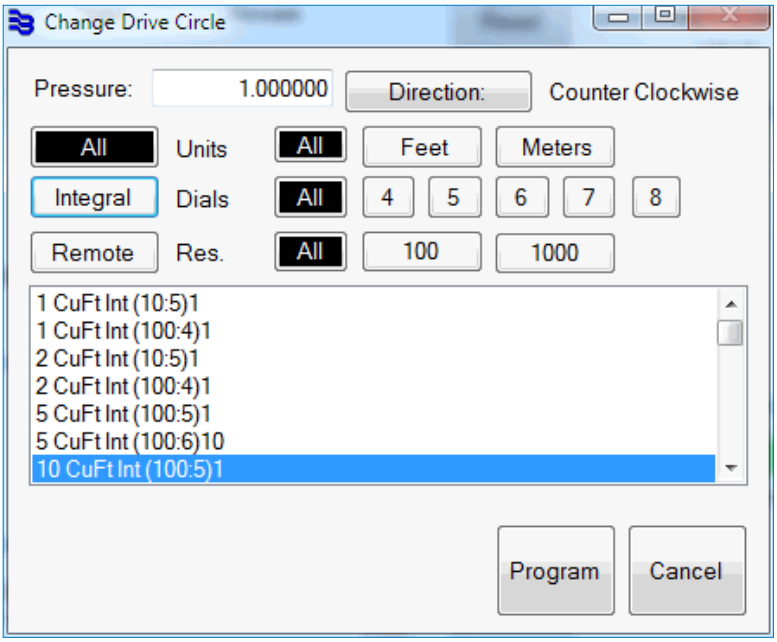


Figure 38: Change Drive Circle

5. Tap **Direction**. Then select the direction for the drive gear, if applicable.
6. Align the optical head of the IR cable with gas endpoint IR LED port and tap **Program**.

Result: The new Meter Information is displayed on the IR Programming screen and the Endpoint Programmed Status Indicator is selected.

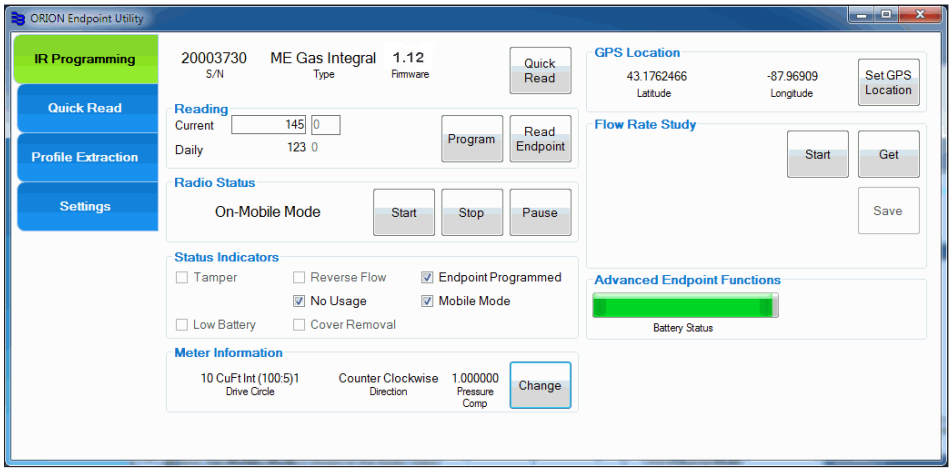


Figure 39: Meter programmed

7. Visually verify that the anticipated drive circle, direction and pressure compensation values are reflected in the Meter Information section of the screen. If they are not, repeat steps 1…6.

GPS Location (ORION Migratable, Fixed Network)

If the latitude and longitude are not set or need to be changed, you can set them manually for any ORION Migratable or Fixed Network (in mobile mode) endpoint.

1. Tap the **Set GPS Location** button in the *GPS Location* section of the IR Programming screen.
   Result: The GPS Input window opens.
2. Enter the Latitude and Longitude in each field, respectively.
   NOTE: The field will only accept numeric characters, decimal point (period) and minus sign (–).

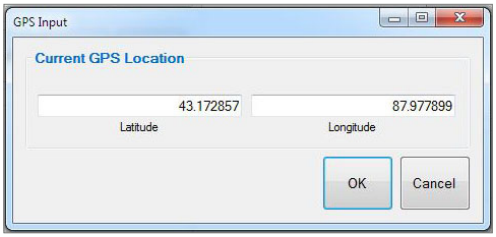


Figure 40: GPS Location

3. Align the optical head of the IR cable with the endpoint IR LED port and tap **OK**.
   Result: The GPS Input window closes and the Latitude and Longitude you entered display on the IR Programming screen.

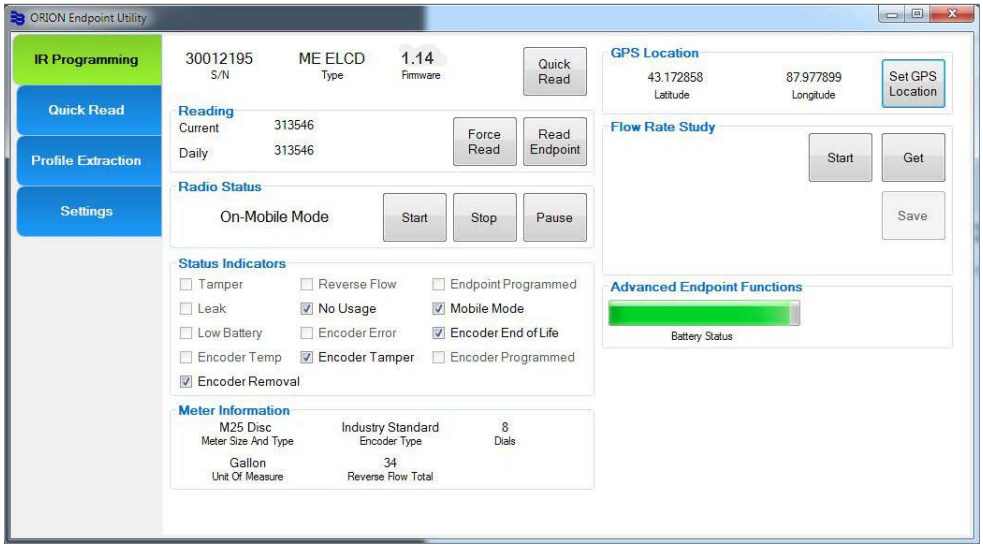


Figure 41: GPS Location set

Flow Rate Study (ORION Migratable, Fixed Network)

A flow rate study is a week-long study that can be performed on an ORION Migratable or Fixed Network (in mobile mode) endpoint to report high, low and average flow rates.

A flow rate study can also be requested on the Advanced Endpoint Details screen available via the Quick Read screen.

Starting a Flow Rate Study

1. Align the optical head of the IR cable with the endpoint IR LED port and tap the **Start** button in the *Flow Rate Study* section of the IR Programming screen.

   Result: A message window opens (Figure 43) to confirm the successful start of the flow rate study. The study continues for one week from the start time and date.

2. Tap **OK** to close the window.

Figure 42: Start Flow Rate Study

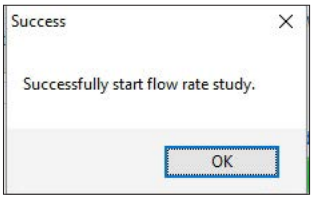


Figure 43: Flow Rate Study started

Getting Flow Rate Study Results

1. At the end of a week-long flow rate study, align the optical head of the IR cable with the endpoint IR LED port and tap **Get** in the *Flow Rate Study* section of the IR Programming screen.

   *Result: The data from the study fills in the field next to the **Start**, **Get** and **Save** buttons as shown. The flow study data includes the minimum, maximum and total usage for the week.*

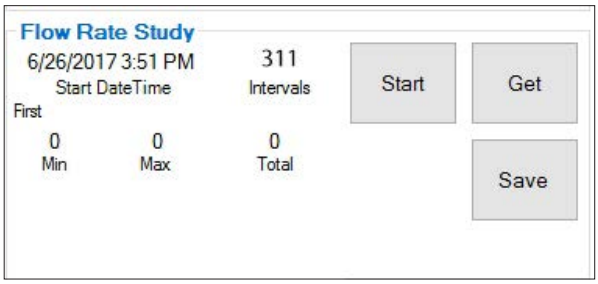


Figure 44: Flow Rate Study results

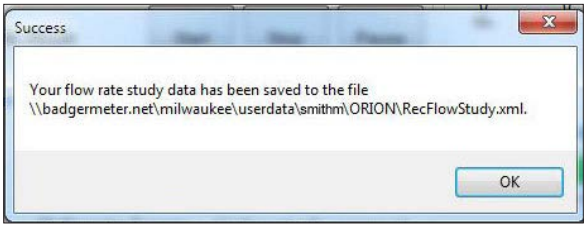


Figure 45: Flow Rate Study results saved

2. Tap the **Save** button to create a file of the flow rate study data.

   Result: A screen displays (Figure 45) showing the location of the saved file.

3. Tap **OK** to close the window.

QUICK READ

Quick Read is performed on the ORION endpoints using RF (radio frequency). The Quick Read screen can be used to display readings for all ORION Cellular LTE, Migratable, Fixed Network (in mobile mode) and Classic endpoints in range. One endpoint can display several readings during a Quick Read.

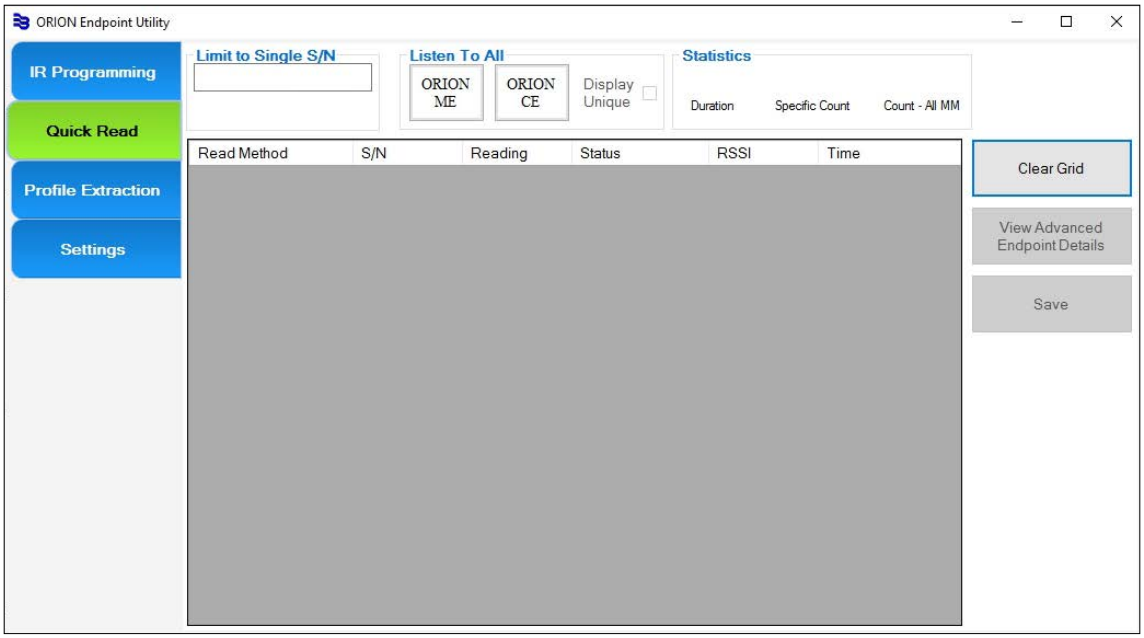


Figure 46: Quick Read screen

RF Quick Read Fields

Limit to Single S/N When an endpoint serial number is entered, performs a Quick Read on the endpoint entered via RF. Tap in the field and type the serial number for the endpoint you want to read.

Display Unique Check the box to display each unique endpoint serial number once only.

Read Method Displays endpoint and encoder type. "Gas" is also displayed for gas meters.

S/N The endpoint serial number.

Reading Current reading for the corresponding endpoint serial number. The reading is the raw value without reading resolution applied.

Status Displays potential exception issues such as a tamper or no usage. If no exceptions are noted, the *Status* field is blank.

RSSI Bar showing the relative signal strength of endpoint communication to mobile transceiver or receiver.

Time The date and time of the Quick Read.

Statistics

Duration The elapsed time in seconds since the Quick Read started. This field continues to update during the Quick Read.

Unique Count The number of unique endpoint serial numbers heard. This field continues to update during the Quick Read.

Count - All MM The number of endpoint messages heard by the mobile transceiver or receiver. This field continues to update during the Quick Read.

RF Quick Read Buttons

ORION ME	Tap **ORION ME** to Quick Read ORION Cellular LTE, ORION Migratable and ORION Fixed Network (in mobile mode) endpoints within range. Tap again to stop reading.
ORION CE	Tap **ORION CE** to Quick Read all ORION Classic endpoints within range. Tap again to stop reading.
Clear Grid	Removes the current grid display and refreshes the screen so you can change selections. The *Statistics* field clears and restarts with the next Quick Read.
View Advanced Endpoint Details	Provides additional information available for ORION Cellular LTE, Migratable and Fixed Network endpoints. Select an endpoint in the grid before tapping the button.
Save	Saves the Quick Read in the grid as a .csv file. Window opens to show where and when the file is saved.

NOTE: When performing the procedures described in this section, make sure the appropriate equipment is connected to the tablet/laptop, and the COM ports are set correctly. See *"Equipment Setup" on page 8* and *"COM Ports" on page 9* if you need help.

RF Quick Read

With Quick Read, you can read all endpoints. With **ORION ME** selected, you can read ORION Cellular LTE, ORION Migratable and ORION Fixed Network (in mobile mode) endpoints within range. With **ORION CE** selected, you can read ORION Classic endpoints within range.

NOTE: Make sure the ME transceiver and/or CE receiver is connected to the tablet/laptop and the correct COM port is set. For help, see *"Vehicle and Tablet/Laptop Setup with Mobile Transceiver and/or Mobile Receiver" on page 8*.

NOTE: To read all endpoint types simultaneously, see *"Changing Quick Read Technology" on page 39*.

The procedure below is a Quick Read with the **ORION ME** transceiver selected. To read ORION Classic endpoints, perform the same steps with the **ORION CE** receiver selected.

1. Tap **Quick Read** on the main menu.
2. Tap the **ORION ME** button to start.

   *Result: The **ORION ME** button becomes green to indicate the ME transceiver is active and communicating with ORION Cellular LTE, ORION Migratable and ORION Fixed Network (in mobile mode) endpoints in range. The fields on the screen begin to fill with readings, and the Statistics section changes to reflect the elapsed time and number of readings.*

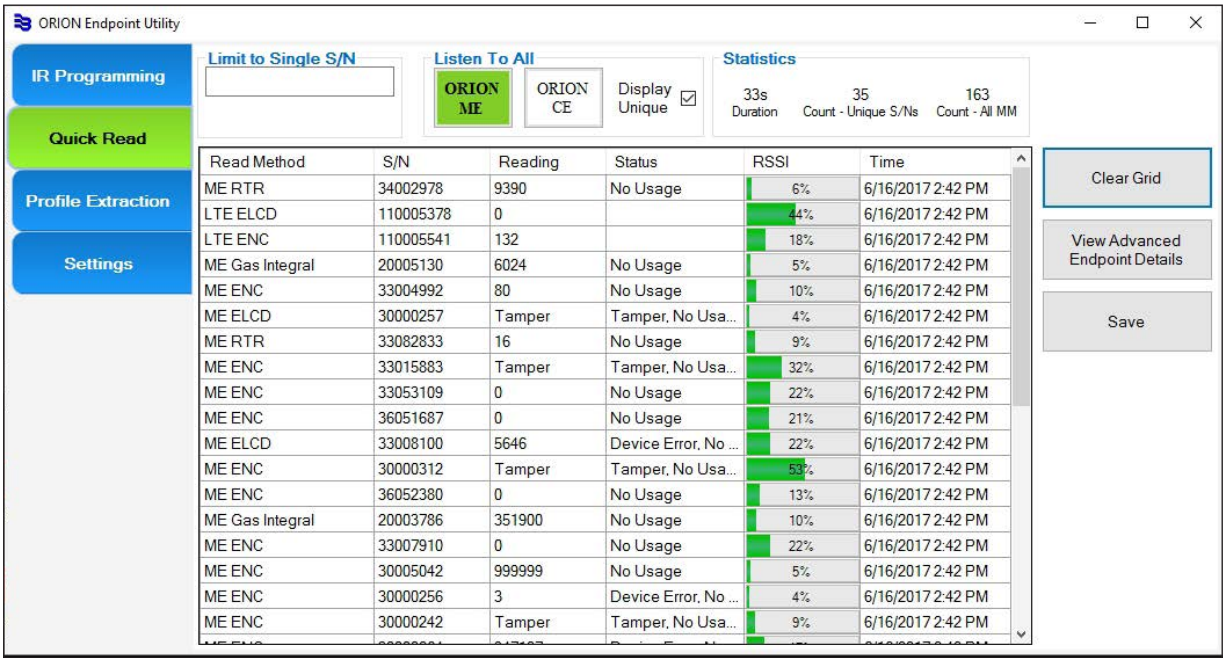


Figure 47: Quick Read

3. Tap the **ORION ME** button again to pause or stop the Quick Read.

For a single endpoint:

4. To view readings for a single endpoint serial number, tap the row of the endpoint you want to read.

   Result: The endpoint serial number fills in the Limit to Single S/N field.
5. Tap the **ORION ME** button again.

   Result: The button becomes green and readings display for the endpoint serial number you selected.
6. Tap the **ORION ME** button again to end the Quick Read.

Changing Quick Read Technology

When reading both ORION ME and ORION CE endpoints, you can quickly change from one technology to the other and back again, or listen simultaneously.

NOTE: Make sure the ORION ME mobile transceiver* and CE mobile receiver are connected. For help, see *"Vehicle and Tablet/ Laptop Setup with Mobile Transceiver and/or Mobile Receiver" on page 8*.

Steps 1...4 of the following procedure describe changing from an ORION ME Quick Read to an ORION CE Quick Read. The same steps can be performed to change from an ORION CE Quick Read to an ORION ME Quick Read by selecting the opposite buttons.

1. After performing a Quick Read, tap the **ORION ME** button to stop the read.

   Result: The button becomes clear and the readings stop.
2. Tap **Clear Grid** to clear the Quick Read screen.
3. Tap the **ORION CE** button to start a Quick Read of all ORION Classic endpoints.
4. Tap the **ORION CE** button again to stop the Quick Read.

To read ORION Cellular LTE, Orion Migratable and ORION Classic endpoints simultaneously:

5. Tap **Clear Grid** to clear the Quick Read screen.
6. Tap both the **ORION ME** button and the **ORION CE** button. Both buttons should turn green.

   Result: Readings for all endpoints are displayed in the grid.
7. Tap the **ORION ME** and **ORION CE** buttons again to stop the Quick Read.

* With an ORION ME transceiver, you can read ORION Cellular LTE, ORION Migratable and ORION Fixed Network (in mobile mode) endpoints within range.

RF Quick Read - Single Endpoint

1. Tap the **Quick Read** button on the main menu.
2. Tap in the *Limit to Single S/N* field and use the keyboard to enter the serial number of the endpoint you want to read.

Figure 48: RF Quick Read screen

3. Tap the button for the endpoint type. In the example above, an **ORION Cellular LTE** endpoint serial number is entered so you would tap the **ORION ME** button to start reading.

   *Result: Readings from the endpoint fill in the fields of the screen and the **View Advanced Endpoint Details** button becomes active.*
4. Tap the endpoint button again to stop the reading.

Advanced Endpoint Details (ORION Cellular LTE)

For an ORION Cellular LTE endpoint, the Advanced Endpoint Details screen gives you access to the endpoint extended status. Tap **Get Extended Status Data** to access the full endpoint status (*Figure 50*), also available via IR from the IR Programming screen.

Figure 49: Advanced Endpoint Details screen - ORION Cellular LTE

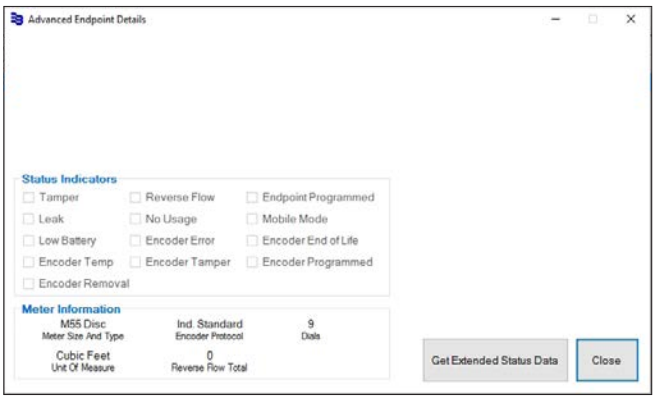


Figure 50: Extended Status - ORION Cellular LTE

Advanced Endpoint Details (ORION Migratable, Fixed Network)

For an ORION Migratable or Fixed Network endpoint, the Advanced Endpoint Details screen gives you access to the options described below.

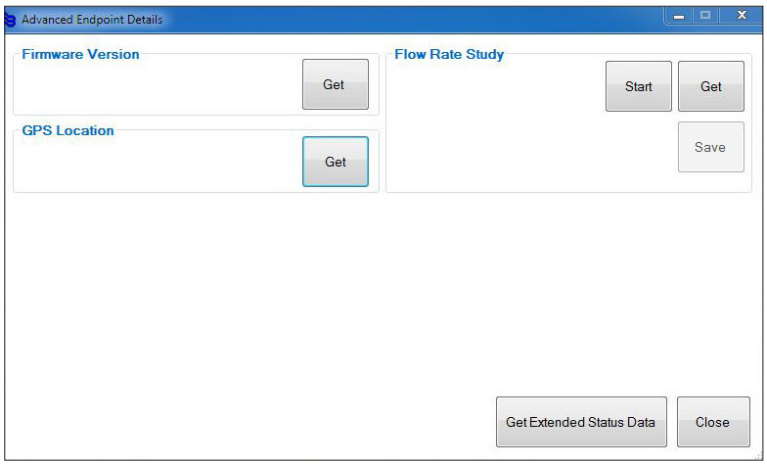


Figure 51: Advanced Endpoint Details screen - ORION ME/SE

NOTE: All options described here are available via IR from the IR Programming screen.

Firmware Version	Tap **Get** to display the endpoint firmware version.
GPS Location	Tap **Get** to display the latitude/longitude for the endpoint if the location has been programmed.
Flow Rate Study	Field displays any flow study results.
• **Start**	Tap **Start** to begin a 7-day flow rate study.
• **Get**	Tap **Get** to see the flow rate study results.
• **Save**	Tap **Save** to save the flow rate study results.
Get Extended Status Data	Tap to receive and display the full endpoint status, including meter size, model type and units, as well as any status alerts.
Close	Tap **Close** to close the Advanced Endpoint Details screen and return to the Quick Read screen.

PROFILE EXTRACTION (ORION MIGRATABLE, FIXED NETWORK, CLASSIC)

The Profile Extraction option on the main menu is used to extract, save and view historical interval profile data from ORION Migratable (or Fixed Network in mobile mode) and ORION Classic water and gas endpoints. The profile extraction section does not apply to ORION Cellular LTE endpoints.

NOTE: Extracting historical interval profile data from an ORION Migratable endpoint can be performed via IR or RF. Extracting historical interval profile data from an ORION Classic endpoint can only be performed via IR.

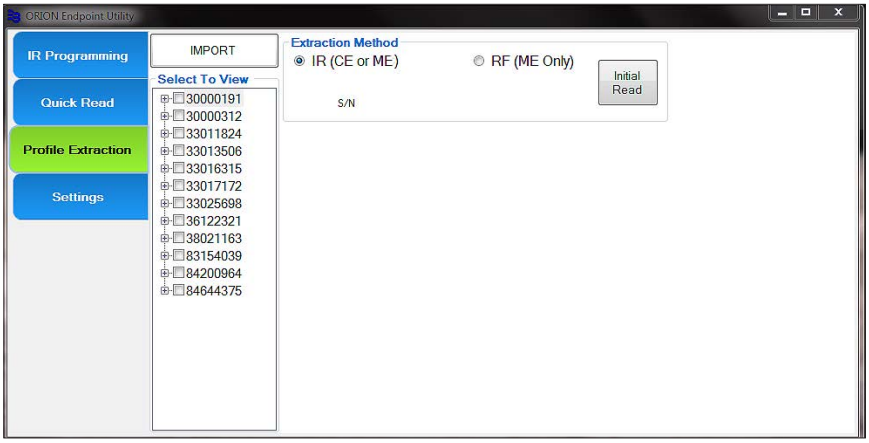


Figure 52: Profile Extraction screen

Profile Extraction Screen

IMPORT — The **IMPORT** button opens Windows File Explorer for access to saved profile data .csv files. Files can be added to the C:\Program Data\Badger Meter\ORION folder and will display in the Select To View list. For additional information, see *"Adding Profile Data Files" on page 48*.

Select To View — Profile data files that are saved to the C:\Program Data\Badger Meter\ORION folder will display in the Select To View list by endpoint number. If there are no profile data files to view, "No Data Available" displays in the field.

IR (CE or ME) — Select the IR radio button to extract profile data from an ORION CE or ME endpoint using the IR cable. An IR programming cable must be attached to the laptop. See *"IR Setup" on page 8*.

RF (ME Only) — Select the RF radio button to extract profile data from an ORION ME endpoint using radio frequency (RF). An ORION ME transceiver and antenna must be attached to the laptop. See *"RF Setup" on page 8* for more information.

Initial Read — Select the **Initial Read** button to read the endpoint and start the profile extraction process.

Interval Readings

An ORION ME water endpoint stores 90 days of hourly readings or 22 days of readings taken at 15 minute intervals. The chart below shows the number of readings collected for meters set at 60 minute (hourly) intervals and at 15 minute (quarter hourly) intervals:

Available Profile Data Extraction Intervals	Hourly Reads: 1 Read per Hour 24 Reads per Day	15 Minute Reads: 4 Reads per Hour 96 Reads per Day
1 day	24 (24 x 1)	96 (96 x 1)
7 days	168 reads (24 x 7)	672 (96 x 7)
14 days	336 reads (24 x 14)	1344 (96 x 14)
21 days	504 reads (24 x 21)	2016 (96 x 21)
30 days	720 reads (24 x 30)	2160 (96 x 22.5)
60 days	1440 reads (24 x 60)	2160 (96 x 22.5)
All/90 days	2160 reads (24 x 90)	2160 reads (96 x 22.5)

IR Profile Extraction (ORION Migratable, Fixed Network, Classic)

To access profile data from an ORION endpoint using IR, follow these steps.

1. On the Profile Extraction screen, tap to select the **IR (CE or ME)** radio button.

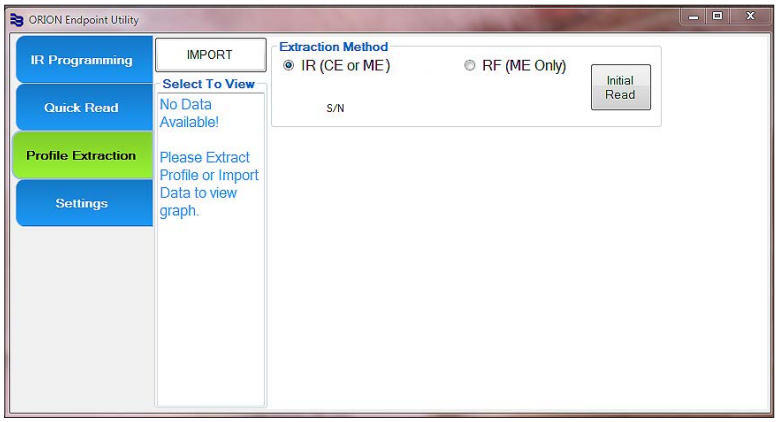


Figure 53: IR profile extraction

2. With the IR cable connected to the laptop, align the optical head of the IR cable with the endpoint IR LED port.
3. Tap **Initial Read**. Hold the IR cable steady while the data is being read.
4. On the window that displays, select the appropriate meter size and unit of measure. For water endpoints, the Test Circle window will display. For gas endpoints, the Drive Circle window will display. An example of both windows is shown (*Figure 54*, *Figure 55*).

   Result: The endpoint serial number displays on the screen along with the encoder type, meter type and size.

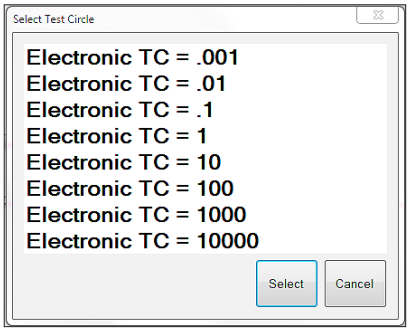


Figure 54: Water - Test Circle selection

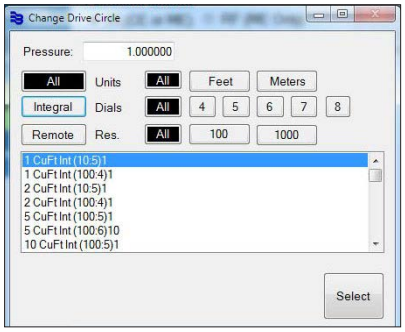


Figure 55: Gas - Drive Circle selection

5. Choose the number of days of historical interval data to extract using the drop-down menu.

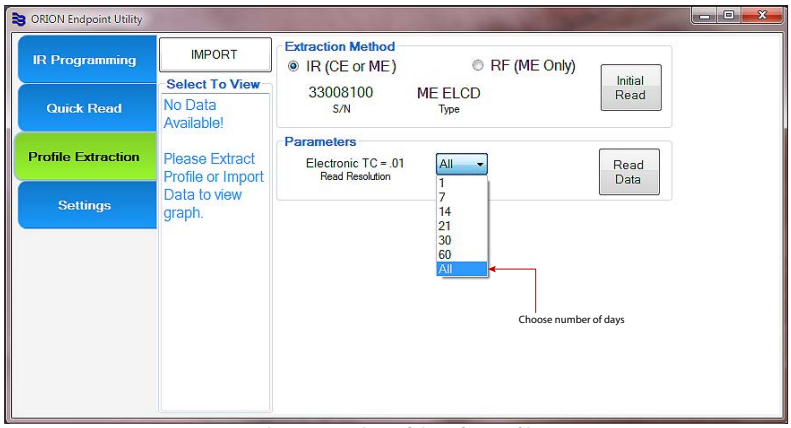


Figure 56: Choose number of days for profile extraction

6. Tap the **Read Data** button. Hold the IR cable steady while the data is being read.

Result: A progress bar displays while data is being extracted. The screen fills as shown below when the data has been retrieved.

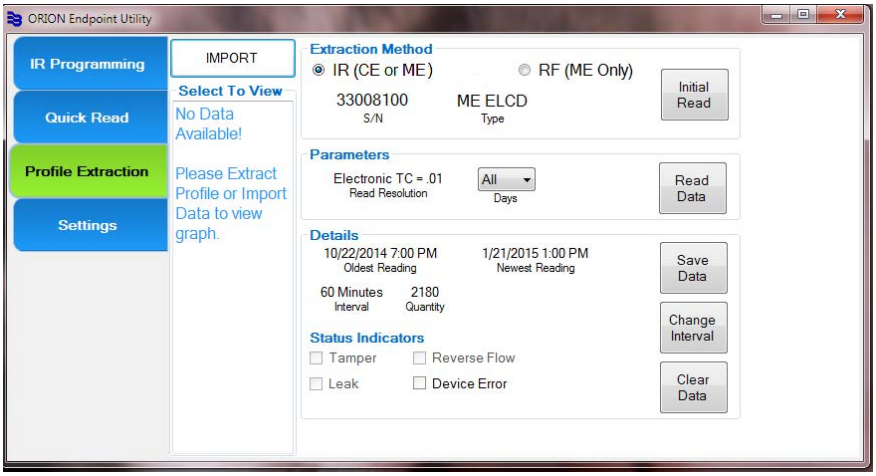


Figure 57: IR profile extraction complete

IR Profile Extraction Details

Oldest Reading The date and time of the oldest reading in the data extracted.

Newest Reading The date and time of the newest reading in the data extracted.

Interval The reading interval at which the endpoint is set: 60 Minutes or 15 Minutes

Quantity The number of interval reads retrieved.

Status Indicators Potential exception issues such as a tamper or no usage. If no exceptions are noted, none of the boxes are checked.

7. Use the buttons to **Save Data** or **Clear Data**. You can also select **Change Interval** to change the time between historical interval meter readings.

   Save Data Select to save the profile data. A window displays with a message that confirms the save and the location of the file as shown in *Figure 58*. Tap **OK** to close the window.

   NOTE: The endpoint number of the saved file now displays in the *Select To View* field on the screen.

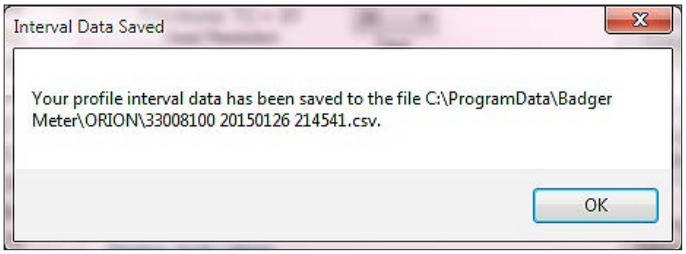


Figure 58: Save file confirmation

   Change Interval Select to change the interval (60 minutes or 15 minutes) for meter readings. Changing the interval clears any stored interval data. A window opens, asking you to confirm the change.

   Clear Data Select to clear all historical interval profile data from the endpoint. A window opens, asking you to confirm the change.

8. IR data profile extraction is complete. To access profile data for another endpoint, repeat steps 2…7.

RF Profile Extraction (ORION Migratable, Fixed Network)

To access profile data for an ORION Migratable (or Fixed Network in mobile mode) endpoint using RF, follow these steps.

1. Tap to select the **RF (ME only)** radio button.
2. Tap in the *S/N* field and use the keyboard to enter the serial number of the endpoint.

   Result: As the radio connection is made, you will see two status messages: "Waiting For Mobile Message" and then "Waiting for Extended Status."

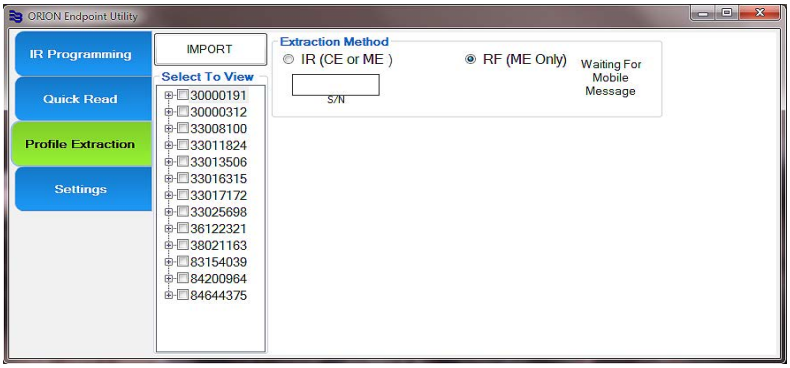


Figure 59: RF profile extraction

3. On the window that displays, select the appropriate meter size and unit of measure. For water endpoints, the Test Circle window will display. For gas endpoints, the Drive Circle window will display. An example of both windows is shown (*Figure 60*, *Figure 61*).

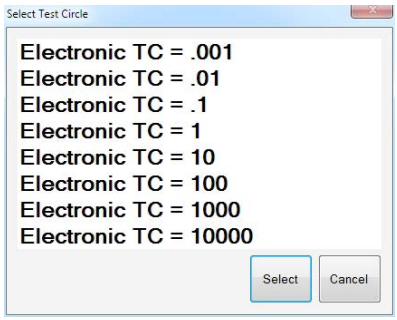


Figure 60: Water - Test Circle selection

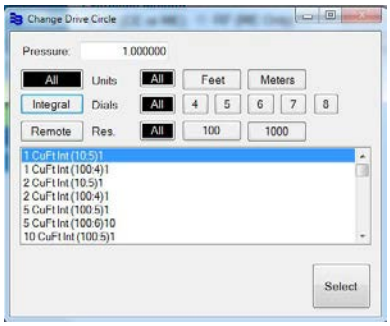


Figure 61: Gas - Drive Circle selection

4. Choose the number of days of historical interval data to extract using the drop-down menu.

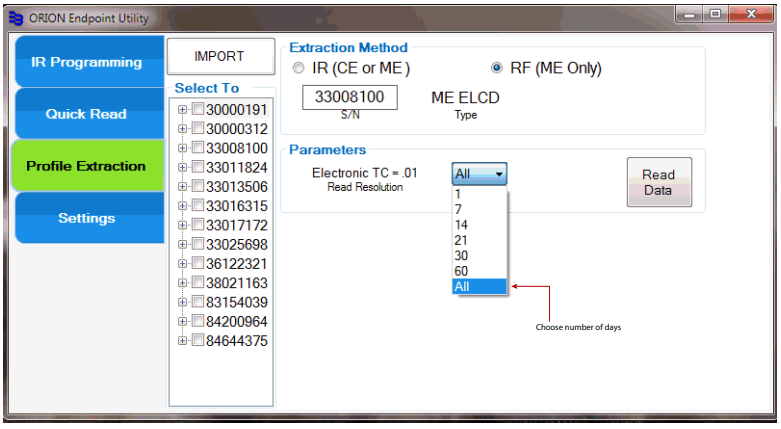


Figure 62: Choose number of days for profile extraction

5. Then tap **Read Data**.

Result: Two status messages display: "Waiting for Mobile Configuration" and then "Reading Data." A bar displays to show progress. Profile data for the endpoint is extracted and the screen fills as shown below to confirm that the data has been retrieved.

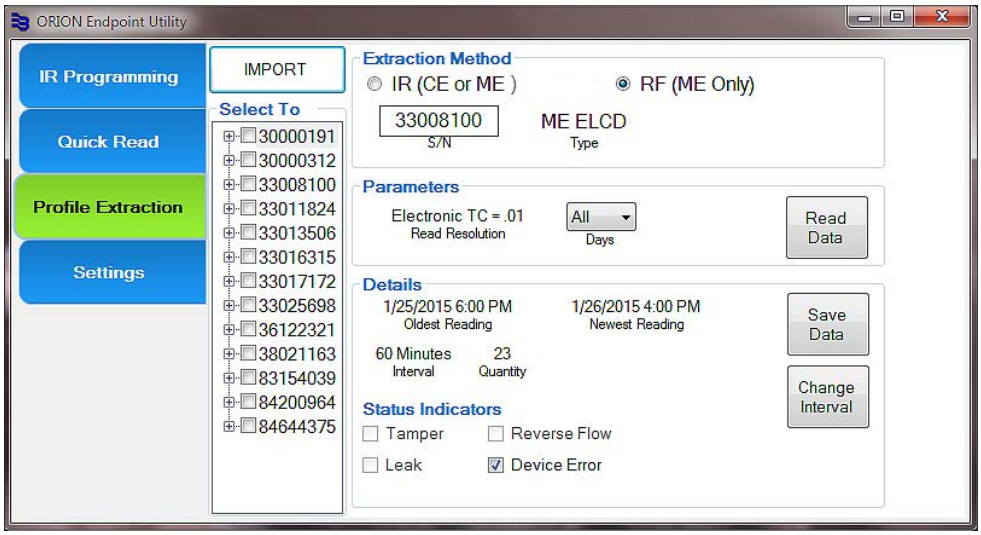


Figure 63: RF profile extraction complete

RF Profile Extraction Details

Oldest Reading The date and time of the oldest reading in the data extracted.

Newest Reading The date and time of the newest reading in the data extracted.

Interval The reading interval at which the endpoint is set: 60 Minutes or 15 Minutes.

Quantity Displays the number of interval reads retrieved.

Status Indicators Displays potential exception issues such as a tamper or no usage. If no exceptions are noted, none of the boxes are checked.

6. Tap the button to **Save Data**. You can also tap **Change Interval** to change the time between historical interval meter readings.

Save Data Tap to save the profile data. A window displays with a message that confirms the save and the location of the file (*Figure 64*). Tap **OK** to close the window.

NOTE: You must tap **Save Data** to save the file and make it accessible in the *Select To View* list.

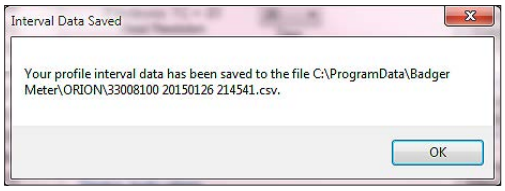


Figure 64: Save file confirmation

Change Interval Tap to change the interval (60 minutes or 15 minutes) for meter readings. Changing the interval clears any stored interval data. A window opens, asking you to confirm the change.

7. RF Profile Extraction is complete. To read another endpoint, repeat steps 2…6.

Viewing Profile Data

Saved profile data can be viewed in a bar graph format in the ORION Endpoint Utility. An example of a profile data graph is shown below.

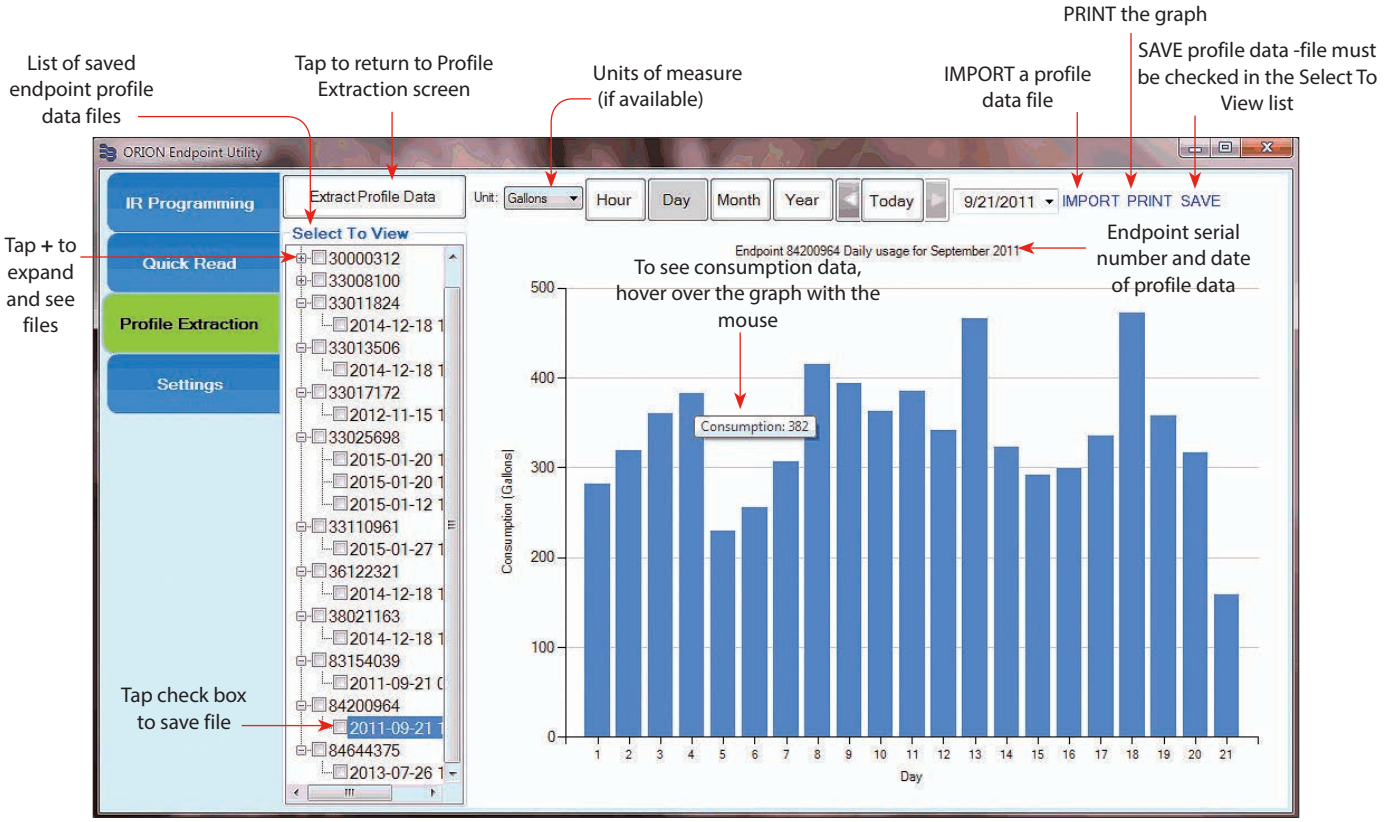


Figure 65: Profile data graph

Graph Details

Extract Profile Data — Tap to return to the Profile Extraction screen.

Select To View — Endpoint numbers with saved profile data are displayed in ascending numerical order. Tap **+** to display saved files for the endpoint. Then tap a file to display a bar graph of the profile data.

Units (Y-axis) — When unit of measure is available, a drop-down menu will display. Select from the drop-down menu to change the Y-axis value.

Time Period (X-axis) — **Hour**: Displays a day of data, divided into hours.

Day: Displays a month of data, divided into days.

Month: Displays a year of data, divided into months.

Year: Displays a year of data.

<Today> — Tap **Today** to see a graph of the profile data for the current day. Use the arrows to view a graph of the previous or next day.

Date Drop-Down — Tap the drop-down arrow to display a calendar and select a date.

IMPORT, PRINT, SAVE — Use **IMPORT** to access and import a profile data file. Use **PRINT** to print the current graph. Use **SAVE** to save the profile data. The file in the *Select To View* list must have a check mark to save.

Procedure for Viewing a Graph

1. On the Profile Extraction screen, tap the **+** next to the endpoint number in the *Select To View* list to see the profile data file(s).
2. Tap a file to select it.

   Result: A graph of the file automatically opens to the right of the Select To View list.

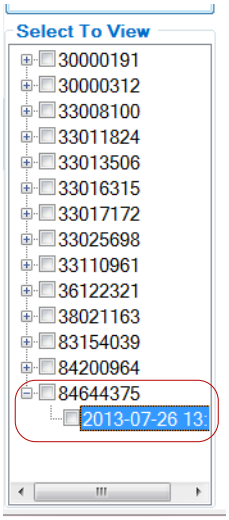


Figure 66: Select To View list with file selected

3. If available, select a unit of measure using the drop-down menu to change the Y-axis value.
4. Use the buttons at the top of the screen to change the time period for a different graph display. The X-axis will update accordingly.

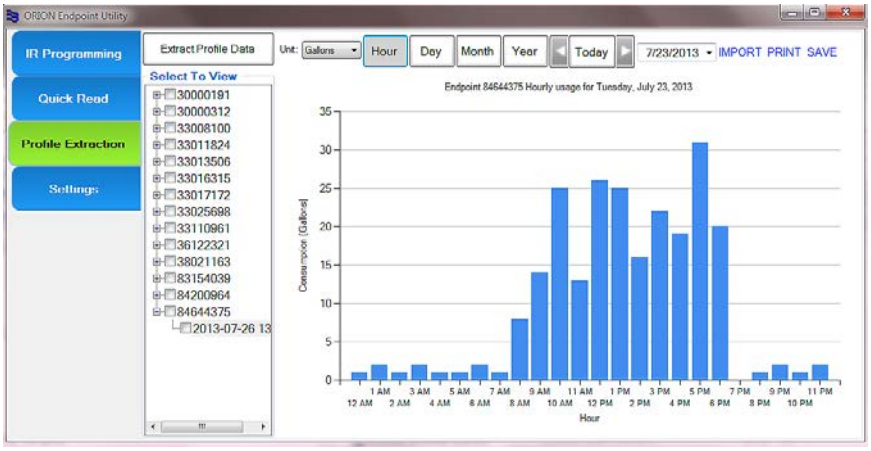


Figure 67: Profile data by hour

5. Tap **PRINT** to print the graph.

   To **SAVE** the profile data, place a check mark in the box next to the file in the *Select To View* list (*Figure 68*). Then tap the **SAVE** button.
6. Tap **Extract Profile Data** to return to the Profile Extraction screen.

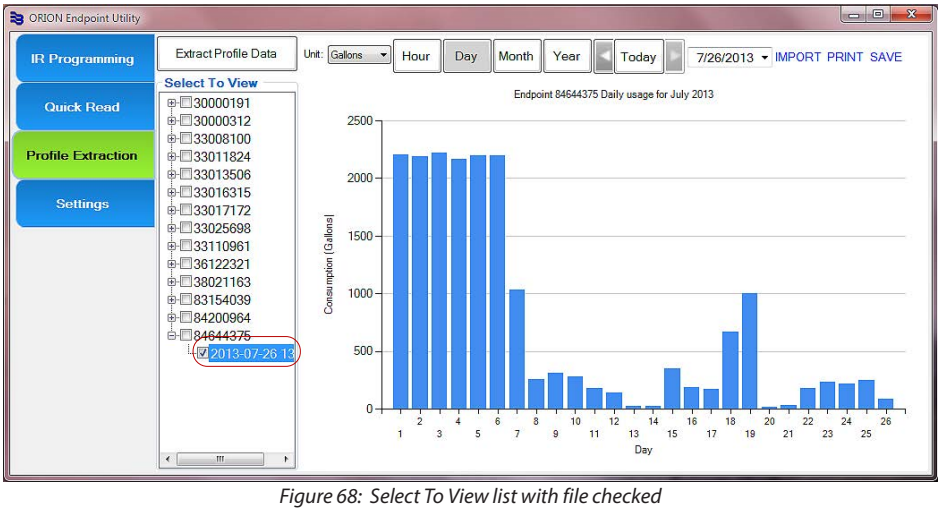


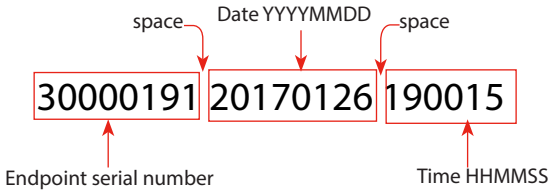
Figure 68: Select To View list with file checked

NOTE: A graph displays when there is data. If there is no data for the time period selected, a graph will not display. An empty graph displays when there is no consumption for the time period selected.

Adding Profile Data Files

You can add profile data files to the **ORION** folder on the tablet/laptop at **C:\Program Data\Badger Meter** for viewing in the ORION Endpoint Utility. Use the **IMPORT** button on the Profile Extraction screen to import files, or copy and paste files directly into the **ORION** folder.

NOTE: Profile data files must be .csv files, the format created when files are extracted/saved using Badger Meter software. File names must have the same numerical format. An example of the format is shown here:



Once a file is saved, go to the **ORION Endpoint Utility**> **Profile Extraction** and select the file in the S*elect To View* list to display the graph. See *"Viewing Profile Data" on page 46* for details.

Deleting Profile Data Files

1. On the tablet/laptop, go to **C:\Program Data\Badger Meter\ORION** and open the folder with the saved profile data files.
2. Select a file (or multiple files).
3. Press the **Delete** key on the keyboard.

   Result: A confirmation window opens.
4. Tap **Yes**.

   Result: Files are deleted and will be removed from the Select To View list the next time you access the ORION Endpoint Utility.

Changing the Registration for an Existing Endpoint Assembly – Best Practice

If you need to connect an endpoint with previously logged historical profile data to different registration (encoder), best practice recommends following this process:

1. Extract and save the historical profile data from the endpoint.
2. Clear the profile data from the endpoint.
3. Connect the new registration. Follow the instructions in the *Field Splice Kit Application Brief* and the *Installation Manual* for the encoder type, available at *www.badgermeter.com*.

APPENDIX

GLOSSARY

ADE	The Absolute Digital Encoder is a position-based encoder that senses the position of each number wheel to determine the reading for touch and AMR/AMI systems. The ADE encoder displays as "ENC" on the software screens.
AMI	Advanced metering infrastructure (AMI).
AMR	An automated meter reading (AMR) system that uses radio frequency technology to transmit meter readings between an endpoint and a data collection device.
C700D	Endpoint type exclusively used for connectivity with Elster/AMCo C700 digital encoders.
ELCD	Field display representing either an HR-E LCD encoder or High Resolution E-Series Ultrasonic meter.
ENC	Used in the software to refer to a three-wire encoder, including the Absolute Digital Encoder.
endpoint	The term used to describe a transmitter which is an electronic device that produces radio waves.
HR-E	High resolution absolute encoder with eight-wheel mechanical display. The HR-E encoder displays as "HRE" on the software screens.
HR-E LCD	High resolution (HR) electronic encoder with digital display and no moving parts. The HR-E LCD encoder displays as "ELCD" on the software screens.
IR	Infrared. Wireless transmission that requires a clear line of sight between the transmitter and receiver. An IR programming cable connected to a collection device (laptop or handheld tablet/ laptop) is used to read and program ORION endpoints.
lat/long	Abbreviation for latitude/longitude.
MM	Mobile message. An endpoint radio transmission heard by the laptop.
ORION CE	The ORION Classic (CE) endpoint is a one-way local automated meter reading (AMR) system which communicates with a mobile receiver designed to read ORION Classic water and gas endpoints. The receiver has Frequency Hopping Spread Spectrum (FHSS) technology to minimize interference and eliminate FCC licensing.
ORION ME and ORION SE	The ORION Migratable (ME) endpoint and ORION Fixed Network (SE) are two-way utility management solutions. ORION Migratable and Fixed Network (in mobile mode) endpoints communicate with a mobile transceiver designed to receive signals from and send signals *to* ORION Migratable and Fixed Network water and gas endpoints. The transceiver has Frequency Hopping Spread Spectrum (FHSS) technology to minimize interference and eliminate FCC licensing.
raw reading	The numerical value from the encoder without reading resolution applied.
reading data management software	Refers to Badger Meter reading data management software which acts as an interface between the Utility's billing software and the meter reading devices.
RF	Radio frequency.
RSSI	Received Signal Strength Indicator.
RTR	The Recordall Transmitter Register (RTR) is used in conjunction with Recordall disc, turbo, compound and fire series water meters to measure totalized flow through the meter and output a signal to Badger Meter meter reading products.
transceiver	A device that has the ability to both transmit and receive.

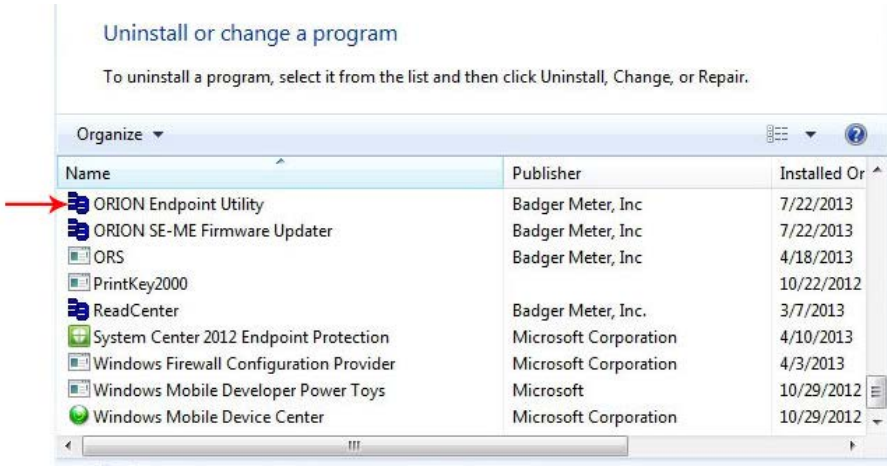
SOFTWARE INSTALLATION

Remove older software versions prior to installing a new version.

Removing Previous Software Version

NOTE: If you are installing the ORION Endpoint Utility software for the first time (no previous versions installed), skip this section and install the software.

1. Access the Windows Control Panel on the tablet/laptop and select **Programs> Programs and Features**.
2. Locate and select **ORION Endpoint Utility** in the Programs list.



Programs and Features detail view

3. Tap **Uninstall**.

   Result: The selected program uninstalls and any desktop icon is removed.

4. Close the **Programs and Features** window.
5. Restart the tablet/laptop to complete the uninstall process.

Installing the Software

The ORION Endpoint Utility software is available as a download for ORION Mobile Read users. The software is also available on a DVD disk.

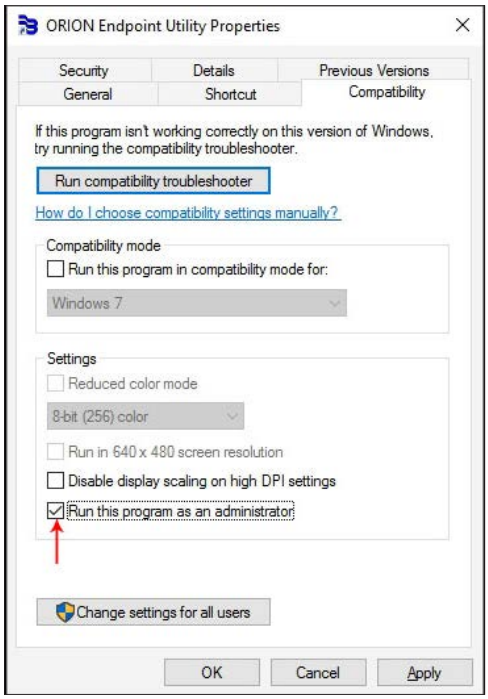
1. Load the ORION Endpoint Utility software provided by Badger Meter to a tablet or laptop.
2. Double tap the **.exe** file to launch the software.
3. Follow the prompts to complete the installation.

   When installation is complete, a shortcut to the software displays on the tablet/laptop desktop.

Windows 7 Users Only - Additional Setting

For Windows 7 users only, this process is required to complete installation.

1. After installing the software, tap and hold (or right click) the ORION Endpoint Utility desktop icon and select **Properties**.
2. In the Properties window, select the **Compatibility** tab and check the box next to "Run this program as an administrator" as shown.
3. Tap **OK**.



Compatibility tab

Software installation is complete.

ME Driver

The ME driver is required for communication between the ORION Endpoint Utility software and an ORION mobile transceiver. You will receive an error message on your tablet/laptop when you connect the ORION mobile transceiver if you *do not* have the ME driver.

Windows 10 automatically detects and installs the driver. For other operating systems, the ME driver will be added during Training if you do not already have it installed.

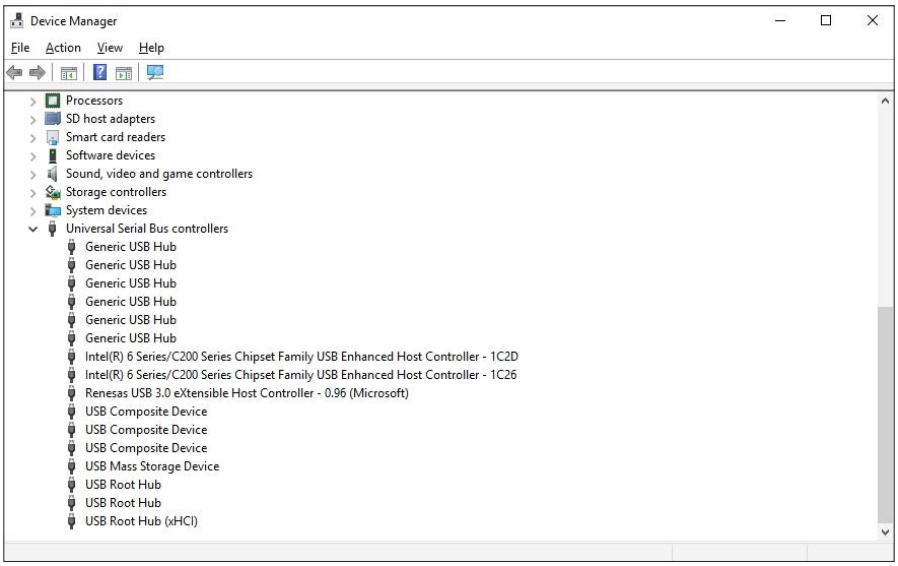
USB Settings

USB settings need to be configured on your tablet/laptop for using the ORION Endpoint Utility software. Once configured, this process does not need to be repeated. USB settings will be configured during Training, or follow the steps below.

Instructions are for Windows 10. If you have a different operating system, check the Windows website for instructions on accessing Device Manager.

1. Navigate to **This PC**. Tap and hold to display the menu.
2. Tap **Properties**. Then tap **Device Manager**.

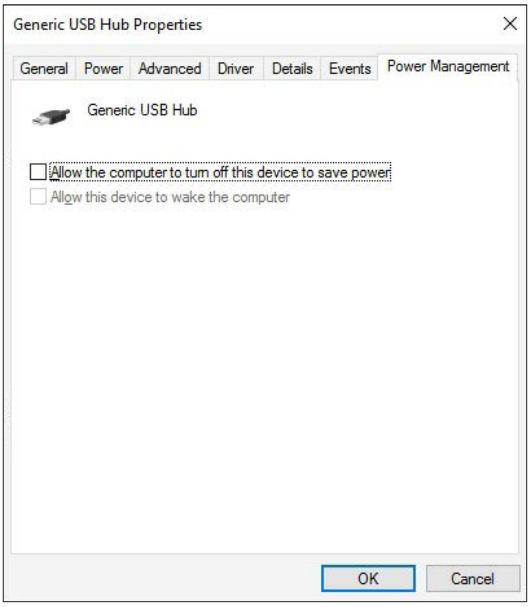
   The Device Manager window opens, similar to the one shown here.



3. Tap the small arrow next to *Universal Serial Bus controllers* to expand the category.

Do this for each USB root hub:

4. Tap to select. Then tap and hold to display the menu.
5. Select **Properties** on the menu.
6. In the Properties window that opens, select the **Power Management** tab and uncheck the box for "Allow the tablet/laptop to turn off the device to save power."
7. Tap **OK**.
8. Repeat steps 4…7 for each root hub.
9. When finished, close **Device Manager**.



Configuration for the ORION Endpoint Utility software is complete.

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