2. Remove the endpoint wire under the breakaway plate.

   - Turn the endpoint/encoder assembly over.

   - Grasp the pull tab located to the right of the encoder seal screw with pliers (*Figure 51*). Then pull and remove the bottom breakaway plate from the housing to expose the wire. The plate is scored to facilitate removal.

   - With your fingers, remove the three feet of endpoint wire from the housing.

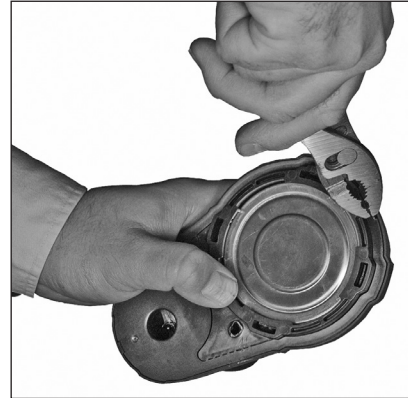   **NOTE:** The wire is attached to the endpoint.

Figure 51: Pull tab to remove the breakaway plate

3. Rotate the endpoint counter-clockwise 1/4 turn and pull the endpoint and endpoint wire out from the assembly base.

Figure 52: Rotate endpoint clockwise

Figure 53: Pull endpoint away from base

4. Mount the endpoint according to recommended installation guidelines within the limits of the endpoint wire.

   NOTE: The encoder cannot be removed from the assembly housing.

5. Remount the encoder (in the assembly housing) onto the meter bayonet.

   - Turn the assembly clockwise 1/4 turn so it locks in place.

   - Replace and tighten the security screw.

ENDPOINT STATUS TOOL FOR ORION CELLULAR ENDPOINTS

BEACON® AMA users can check the activation status of ORION Cellular endpoints with the ORION Endpoint Status tool. Several minutes after installation, the tool displays ORION Cellular endpoints assigned to you. Endpoints do not need to be provisioned in BEACON AMA to display.

The browser-based tool can be viewed on a computer or mobile device. An Internet connection is required. Follow these steps to use the ORION Endpoint Status tool.

1. Go to *https://orionstatus.beaconama.net*.

2. Sign in with your BEACON email address and password (*Figure 54*).

   Result: The ORION Endpoint Status screen (Figure 55) opens showing the list of activated Cellular endpoints.
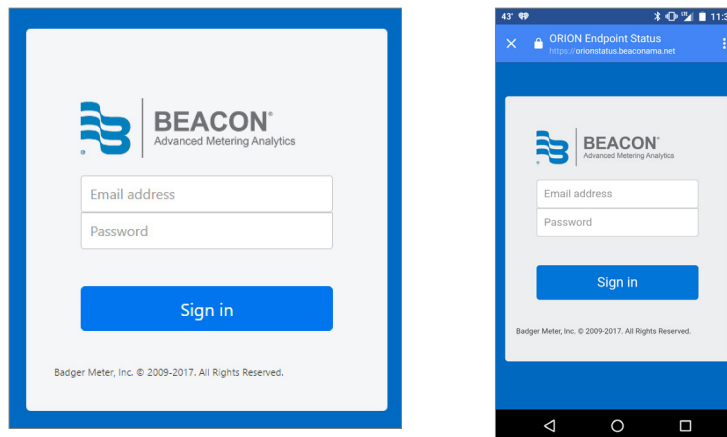

Figure 54: Tool sign in screen - computer and mobile

> **NOTE:** It can take several minutes for a newly installed endpoint to communicate with the cellular network and display on the ORION Endpoint Status screen.

3. View the endpoint list.
   The list displays endpoint serial number, activation time, and activation signal strength. The current endpoint and meter status are also shown. Endpoints are listed according to their activation time, with the most recent endpoint activation times listed first (top of list).
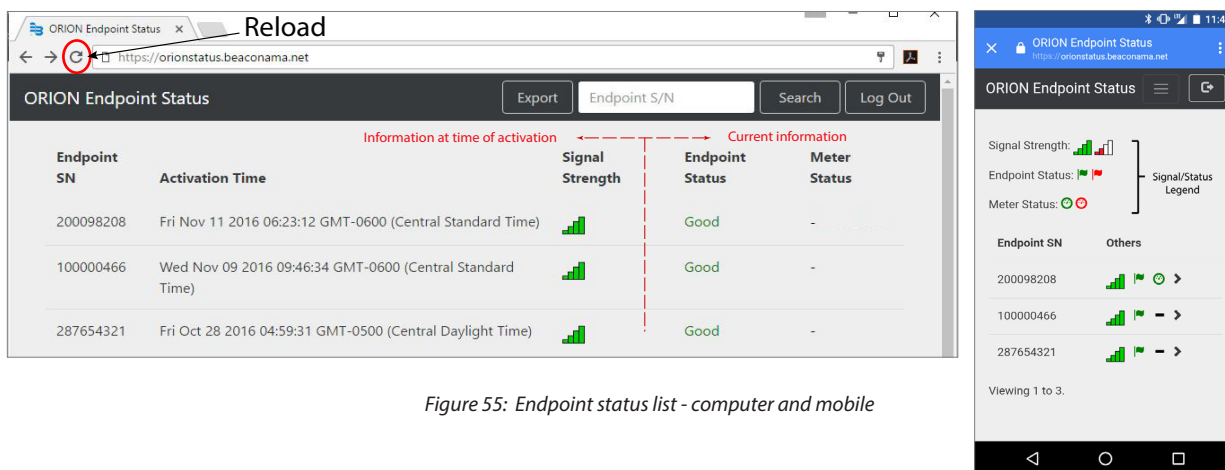

Figure 55: Endpoint status list - computer and mobile

You can also **Export** endpoints into a program such as Excel®, or **Search** to find a specific endpoint.

4. To see any new endpoints that have been added since logging in, reload/refresh the browser window. On a computer, use the reload button ⟳ at the top left of the screen. On a mobile device, swipe down the screen to refresh.

5. Select an endpoint in the list to see the endpoint raw read. A window opens, like the examples shown in *Figure 56*.

   NOTE: Information in the first three fields is captured at the time of activation. Information in the next three fields is current information.
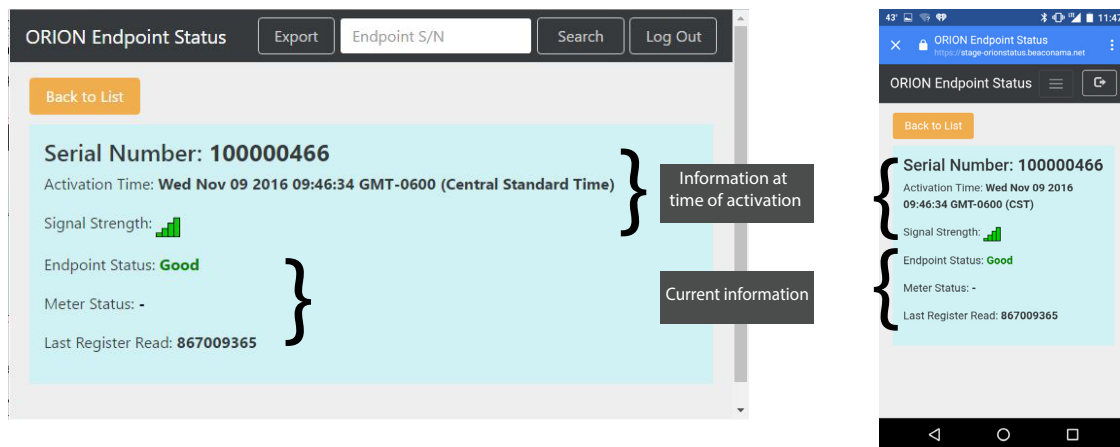

Figure 56: Status detail screen - computer and mobile

The *Endpoint Status* field displays one of the following:

Endpoint Status	Response
Good	No response required.
Endpoint Tamper or Encoder Error	Incomplete information. This message updates at the next scheduled communication.
Endpoint Tamper	Endpoint* requires attention.
Encoder Error	Encoder* requires attention.

*For additional endpoint information, see the ORION Endpoint Utility User Manual for handheld or laptop. For additional encoder information, see the appropriate encoder user manual. All documents are available in the Resource Library at *www.badgermeter.com*.

The *Meter Status* field displays one of the following:

NOTE: *Meter Status* only displays for E-Series Ultrasonic meters. For other meters, the field will have a dash mark (–).

Meter Status	Response
Good	No response required.
Sensor Error	Meter* requires attention.

*For additional information, see the appropriate E-Series Ultrasonic Meter User Manual, available in the Resource Library at *www.badgermeter.com*.

6. Tap/click **Back to List** to return to the previous screen.

7. When finished using the tool, tap the **Log Out** button or [⏻] on a mobile device.

IN-LINE CONNECTORS

In-line connectors are used to allow AMA/AMR/AMI device connectivity without the need for a field splice kit. There are three available in-line connector types: Twist Tight, 308, Nicor.

When ordered separately, the endpoint and encoder (or electronic meter) in-line connectors come with removable caps, which can be removed in the field before joining the connector ends. With the proper orientation, the connector ends go together easily. No tools are necessary.

NOTE: Additional removable caps are available for order. Part numbers are listed in *Figure 58*, *Figure 60*, and *Figure 62*.

⚠️**CAUTION**

BEFORE JOINING, MAKE SURE ALL SURFACES OF THE CONNECTOR ENDS ARE CLEAN, DRY, AND FREE OF ANY DEBRIS OR DIRT. THIS STEP IS ESSENTIAL TO MAKE SURE THE CONNECTOR REMAINS WATER TIGHT AND SUBMERSIBLE.

Twist Tight Connector

To use the Twist Tight connector, follow these steps and refer to *Figure 58*.

1. Remove the protective caps. Twist the rotating collar on each connector counter clockwise (left) to loosen and remove the cap.

2. Align the notches inside each connector and push the ends together until the endpoint-side is fully seated in the encoder-side connector.

Figure 57: Twist Tight in-line connector

Protective cap endpoint-side
68307-007

Protective cap encoder-side
68307-008

Endpoint-side

Encoder-side

Figure 58: Twist Tight connector ends and caps - close up view

3. On the endpoint-side connector, twist the rotating collar clockwise (right) until the ends are tightly connected. When tightly connected, the tabs at the top of the connectors should be aligned and the red O ring on the encoder-side connector should NOT be visible.

IMPORTANT

Do NOT use tools to tighten the connector ends. Hand tighten only.

Twist Tight Extension Harness

An extension harness connects in-line between the meter- and endpoint-side connectors. Extension harnesses are available in the lengths shown, with and without a cable shield. The cable shield offers extra protection for harsh environments such as pit installations.

Part Number Harness only	Extension Harness Length	Part Number Harness with Cable Shield
68307-009	5 ft extension	68883-002
68307-010	10 ft extension	68883-004

NOTE: For more information about the Twist Tight connector, refer to the *Twist Tight In-line Connector Assembly Application Data Sheet*, available in the Resource Library at *www.badgermeter.com*.

308 Connector

To use the 308 connector, follow these steps and refer to *Figure 60*.

1. Squeeze the notched area and pull to remove the cap(s).

2. Align the notches inside each connector and push the ends together. You will hear a "click" when the connector ends are firmly seated and secure.

Figure 59: 308 in-line connector

Protective cap endpoint-side
66233-005

Protective cap encoder-side
66233-006

Endpoint-side

Encoder-side

Figure 60: 308 connector ends and caps - close up view

NOTE: For additional information, refer to the *308 In-line Connector Assembly Application Data Sheet*, available in the Resource Library at *www.badgermeter.com*.

Nicor Connector

To use the Nicor connector, follow these steps and refer to *Figure 62*.

1. Pull the cap(s) straight off to remove.

2. Locate the arrow on each connector.
   With the arrows pointed toward each other, push the ends together until the encoder-side connector is fully seated into the endpoint-side connector. There should be no visible gap.

Figure 61: Nicor in-line connector

Dust cap endpoint-side
66488-014

Dust cap encoder-side
66488-004

Endpoint-side

Encoder-side

Figure 62: Nicor connector ends and caps - close up view

Nicor Extension Harness

An extension harness connects in-line between the meter- and endpoint-side connectors. An extension harness in this lead length is available with the Nicor connector.

Part Number	Extension Harness Length
66488-024	10 ft extension

USING GEL CAPS TO CONNECT AN ENCODER

For those connections that are not factory wired or equipped with in-line connectors, follow these guidelines for using gel caps when splicing is required, either for installation or to fix a connection after a tamper. Refer to the wiring charts for each ORION endpoint, starting on *page 6*.

NOTE:

- For pit environments, splice connections require a field splice kit (**62084-001**), which can be ordered separately. Refer to *Field Splice Kit for Badger Meter AMR/AMI Products,* available in the Resource Library at *www.badgermeter.com*.

- For all installations, excess wire should be coiled and cable tied to avoid any damage.

Required Tools

Splicing Tools (Customer Supplied)	**Badger Meter Part Number**
• Parallel Pliers	59983-001
• Coax Wire Stripper	59989-001
• Diagonal Cutting Pliers	n/a

Connecting an Encoder Using Gel Caps

Follow these steps when using Badger Meter supplied gel caps.

1. To connect an encoder with existing wires to an ORION endpoint, strip approximately 1-1/2 inches (38 mm) of outer insulation sheath from the encoder and endpoint cables using a coax wire stripping tool. We recommend using the Badger Meter Coax Wire Stripper (**59989-001**).

   ⚠CAUTION

   USE CAUTION WHEN REMOVING THE OUTER SHEATH SO THAT THE INNER SIGNAL WIRE INSULATION IS NOT NICKED OR DAMAGED.

2. Unwind the outer foil shield from the endpoint cable and cut it off even with the outer sheath using diagonal cutting pliers.

3. Connect the ORION endpoint to an approved encoder. Verify the endpoint serial number prior to completing the wiring setup.

   - Connect the encoder cable wires to the ORION endpoint wires using the insulation gel caps provided in the installation kit. Refer to the wiring charts for the endpoint type starting on *page 6* and determine which wires need to be connected to complete an installation.

     NOTE: The terminal posts and wire colors may not match.

   ⚠CAUTION

   DO NOT STRIP ANY INSULATION FROM THE ENDS OF THE WIRES BEFORE YOU PUSH THEM INTO THE GEL CAP.

   - Insert the wires from each cable end as far as possible into the gel cap. See *Figure 63: Wires in gel cap*.
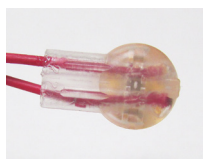

Figure 63: Wires in gel cap

- Using a crimping tool such as the Badger Meter Parallel Pliers (**59983-001**), place the gel cap with the wires into the jaws of the crimping tool.
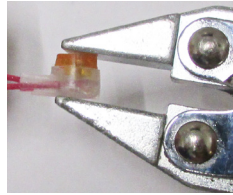

Figure 64: Gel cap in crimping tool

- Crimp the gel cap by squeezing the crimping tool handles until the gel cap is completely compressed. The Badger Meter Parallel Pliers is designed to apply just enough pressure to crimp the gel cap. Apply pressure for three seconds.
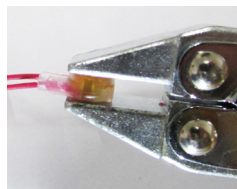

Figure 65: Compress the gel cap

- Repeat the crimping procedure for the remaining gel caps and wires.

4. Attach the two plastic cable ties and tighten securely for strain relief. Snip off the excess cable tie with the wire cutter.

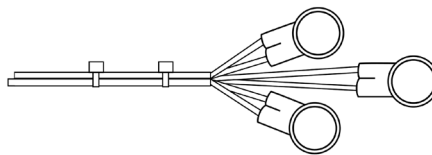5. For remote installations, the connection is complete.

Figure 66: Cable tie attachment locations

NOTE: For pit installations, an appropriate field splice kit should be used. If using the Badger Meter Field Splice Kit, refer to the *Field Splice Kit Application Data Sheet* provided with the kit.

Testing Wire Connections

Test all wiring connections to confirm connectivity, and to verify the ORION endpoint reading and the encoder reading are the same. The connections can be tested using the Quick Read function with either an ORION handheld or mobile data collector. See the appropriate software manual, available in the Resource Library at *www.badgermeter.com*, for more information.

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