

## Removing the Endpoint from the Assembly Housing

**NOTE:** The endpoint cover connects to the base with three tabs: one in the back and two in the front (closest to the encoder.)

1. Remove the integral assembly from the meter.
  - Remove the security screw at the base of the assembly. Keep the screw for remounting the encoder assembly.
  - Turn the assembly (as one piece) 1/4 turn, counter-clockwise and lift the assembly off the meter.
2. With the endpoint side of the assembly facing toward you, grasp the bottom of the cover with one hand on either side of the endpoint cover base.
3. With your thumbs, push the cover at the center of the base to release the back tab ([Figure 46](#)). Then lift up to release the front tabs and remove the cover from the base.



Figure 46: Push at center of endpoint base to release the cover



Figure 47: Cover tabs released, endpoint wire exposed

4. Twist the endpoint to release it from the housing and uncoil the wire.
5. 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.

6. 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.

## Reattaching the Endpoint

To reattach the endpoint to the assembly housing, follow these steps.

1. Wrap the wire around the endpoint. Make sure the wire is wrapped tightly and neatly around the endpoint or the cover will not fit.
2. Insert the endpoint base into the shroud bracket. Adjust the endpoint so the tabs on the endpoint base align with the openings on the bracket, and the wire at the endpoint base fits into the opening at the back of the bracket. See [Figure 48](#).
3. When the endpoint is correctly inserted into the bracket opening, turn the endpoint clockwise to make sure it is secure.
4. Place the cover over the endpoint, with the single tab at the back.
5. When the cover is almost completely on, align the two front tabs with the openings on the shroud bracket (closest to the encoder) and then push down until all three tabs click into place.



Figure 48: Integral bracket without endpoint

## HR-E Encoder Integral Configuration



Figure 49: HR-E Integral assembly with additional wire

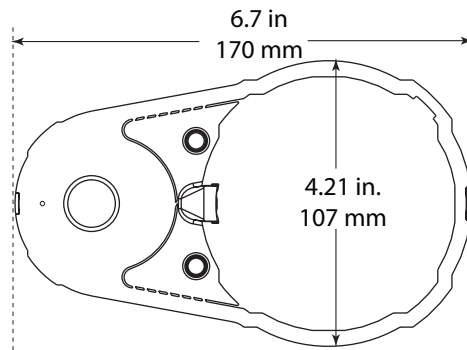


Figure 50: HR-E Integral base dimensions

### Configuration

The ORION HR-E Integral Assembly is shown in [Figure 49](#). The endpoint has a 3-foot length of wire stored inside the bottom of the assembly housing. The endpoint can be removed from the housing, if necessary, and mounted away from the encoder.

**NOTE:** Once removed, the endpoint CANNOT be reassembled into an integral configuration.

### Removing the Endpoint from the Assembly Housing

#### IMPORTANT

Removing the endpoint from the assembly housing can only be done once with this integral configuration.

#### CAUTION

**PRIOR TO DISASSEMBLING AN INTEGRAL ENDPOINT, VERIFY THAT THE ENDPOINT HAS THREE FEET OF WIRE PACKAGED WITH THE ASSEMBLY. CHECK THE SERIAL NUMBER LABEL ON THE SIDE OF THE INTEGRAL BRACKET TO MAKE SURE IT INDICATES "3 FT WIRE." DO NOT CONTINUE WITH THE STEPS LISTED BELOW IF YOUR INTEGRAL ENDPOINT DOES NOT HAVE THIS DESCRIPTION ON THE SERIAL NUMBER LABEL, AS ENDPOINT DAMAGE WILL OCCUR.**

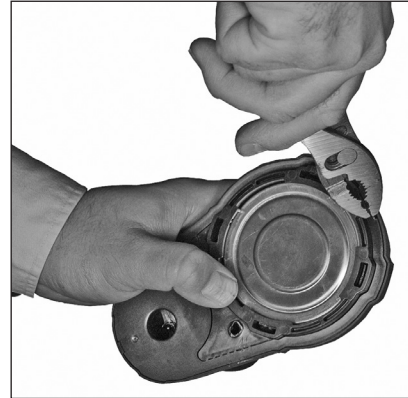
1. Remove the assembly from the meter.
  - Remove the security screw at the base of the assembly. Keep the screw for remounting the encoder assembly.
  - Turn the assembly (as one piece) 1/4 turn, counter-clockwise.
  - Lift the assembly off the meter.



Figure 51: Remove assembly from meter

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 52*). 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 52: 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 53: Rotate endpoint clockwise*



*Figure 54: 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® 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 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 55).

Result: The ORION Endpoint Status screen (Figure 56) opens showing the list of activated Cellular endpoints.

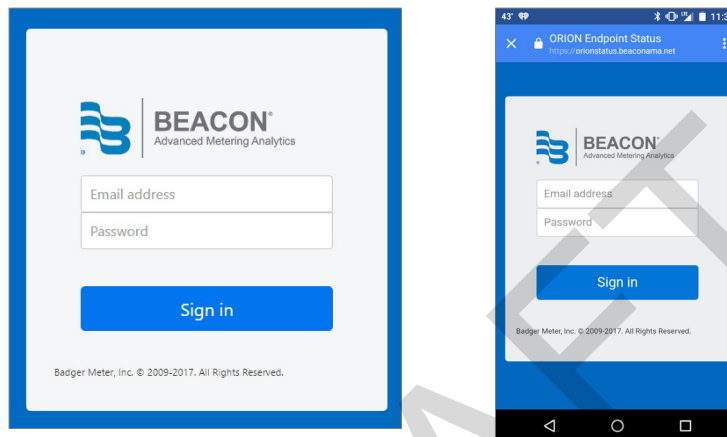


Figure 55: Tool sign in screen - computer and mobile

**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).

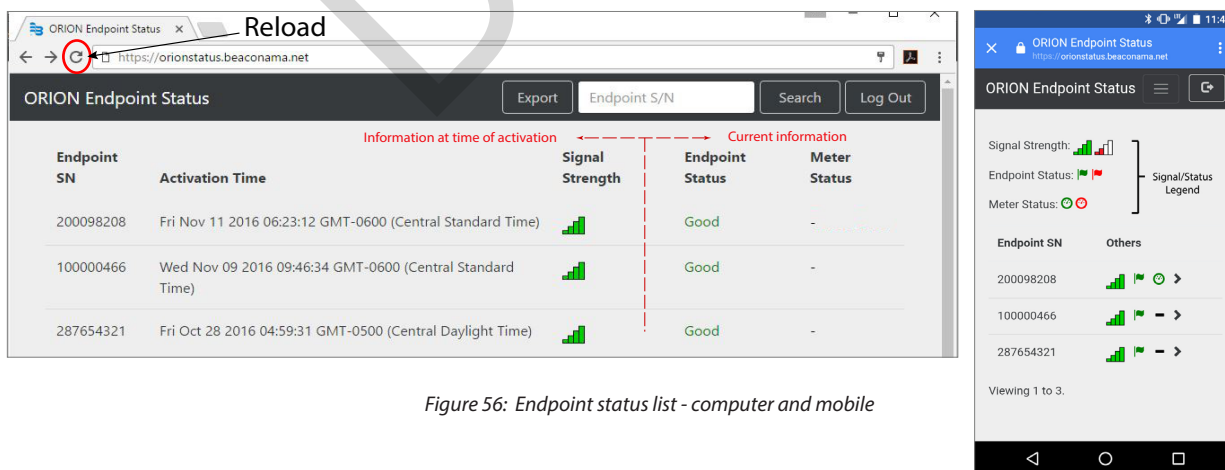



Figure 56: Endpoint status list - computer and mobile

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.

- Select an endpoint in the list to see the endpoint raw read. A window opens, like the examples shown in [Figure 57](#).

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

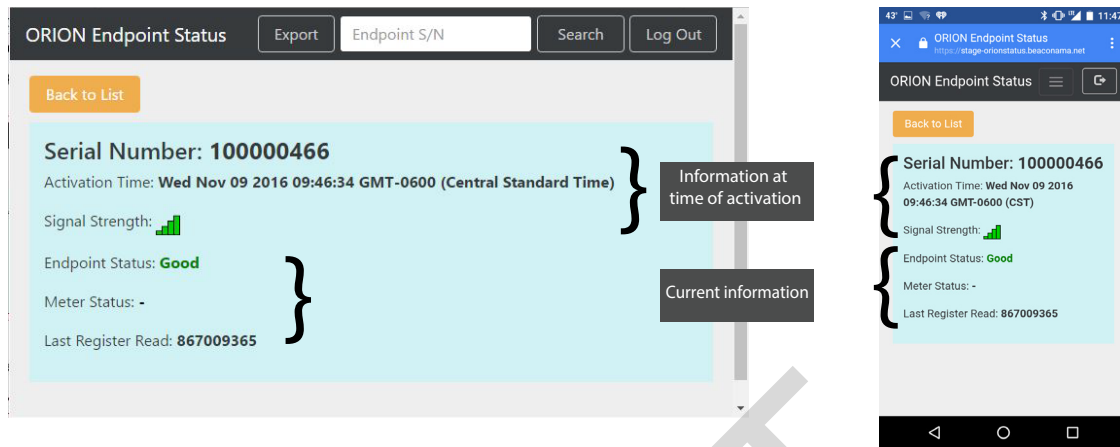


Figure 57: Status detail screen - computer and mobile

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 *Product Configuration Utility for ORION Endpoints* software manual. For additional encoder information, see the appropriate encoder user manual. All documents are available at [www.badgermeter.com](http://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 at [www.badgermeter.com](http://www.badgermeter.com).

- Tap/click **Back to List** to return to the previous screen.
- When finished using the tool, tap the **Log Out** button or  on a mobile device.

## INLINE CONNECTORS

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

When ordered separately, the endpoint and encoder (or electronic meter) inline 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 59](#), [Figure 61](#), and [Figure 63](#). Select connectors are available for order with a plastic cable shield. The cable shield offers extra protection for harsh environments such as pit installations. Alternatively, a 100 foot spool of the plastic cable shield is available for purchase, part 68878-001, to add on in the field.

⚠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 59](#).

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 58: Twist Tight inline connector



Figure 59: 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 inline between the meter- and endpoint-side connectors. Extension harnesses are available in the lengths shown.

Part Number Harness only	Extension Harness Length
68307-009	5 ft extension
68307-010	10 ft extension

**NOTE:** For more information about the Twist Tight connector, refer to the *Twist Tight Inline Connector Assembly Application Data Sheet*, available at [www.badgermeter.com](http://www.badgermeter.com).



## 308 Connector

To use the 308 connector, follow these steps and refer to [Figure 61](#).

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 60: 308 inline connector

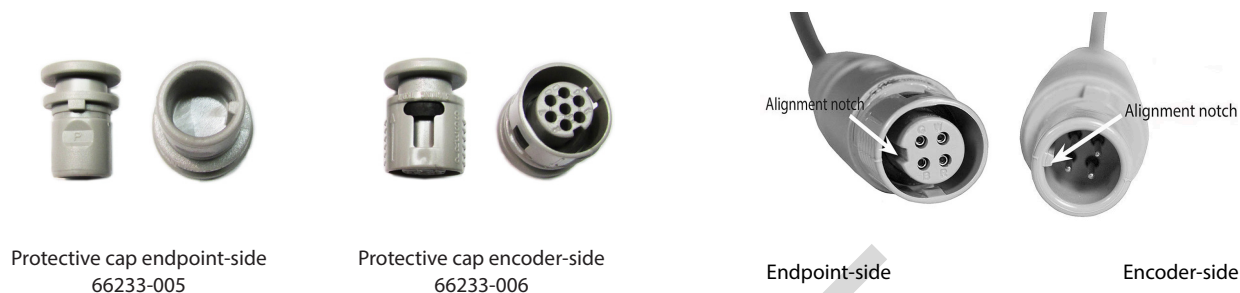


Figure 61: 308 connector ends and caps - close up view

**NOTE:** For additional information, refer to the *308 Inline Connector Assembly Application Data Sheet*, available at [www.badgermeter.com](http://www.badgermeter.com).

## Nicor Connector

To use the Nicor connector, follow these steps and refer to [Figure 63](#).

1. Pull the cap(s) straight off to remove.
2. Locate the arrow on each connector. With the arrows pointed toward each other, **install at a 45 degree angle to prevent air from bubbling in the connection**. Push the ends together until the encoder-side connector is fully seated into the endpoint-side connector. There should be no visible gap.



Figure 62: Nicor inline connector



Figure 63: Nicor connector ends and caps - close up view

### Nicor Extension Harness

An extension harness connects inline 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 inline 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 at [www.badgermeter.com](http://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.

- 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.**

- Unwind the outer foil shield from the endpoint cable and cut it off even with the outer sheath using diagonal cutting pliers.
  - 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 64: Wires in gel cap](#).

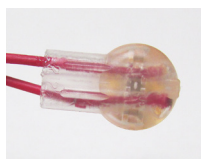


Figure 64: Wires in gel cap



- 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.

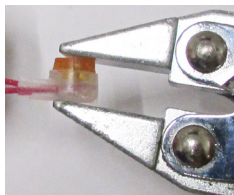


Figure 65: Gel cap in crimping tool

- 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.

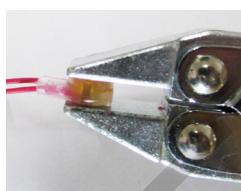


Figure 66: Compress the gel cap

- 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.

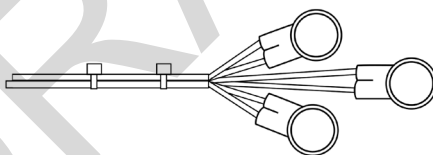


Figure 67: Cable tie attachment locations

**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 at [www.badgermeter.com](http://www.badgermeter.com), for more information.

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