

60W-R and 60WP-R Endpoints Installation Guide

Putting knowledge to work.

Identification

60W-R and 60WP-R Endpoints Installation Guide
08/29/2008 PUB-0771-100

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Compliance Statement

This equipment has been tested and found to comply with the limits, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Operation is subject to the following conditions:

- This device may not cause interference.
- This device must accept any interference that may cause undesired operation of the device.

Complies with IC: R.S.S.-210

Transportation Classification

The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, the 60W-R and 60WP-R Endpoints is considered an operating transmitter and receiver and cannot be shipped by air. All product returns must be shipped by ground transportation.

Modification and Repairs

To ensure system performance, this device and antenna shall not be changed or modified without the expressed approval of Itron. Any unauthorized modification will void the user's authority to operate the equipment.



Warning Only authorized Itron personnel should attempt repairs on Itron equipment. Attempts to do so by others might void any maintenance contract with your company.

**Warning**

- Follow these procedures to avoid injury to yourself or others.
- The lithium battery may cause a fire or chemical burn if it is not disposed of properly.
- Do not recharge, disassemble, heat, or incinerate the lithium battery.
- Keep the lithium battery away from children.

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Before You Begin

This document describes the installation of the 60W-R and 60WP-R Endpoints, including pipe mountings, wall mountings, and direct-to-register attachments.

How This Document is Organized

This document is organized as follows:

- **Chapter 1: About the 60W-R and 60WP-R Endpoints** Provides general information about the 60W-R and 60WP-R Endpoints, with an overview of the operating modes and installation options.
- **Chapter 2: Installing the 60W-R and 60WP-R Endpoints** Provides step-by-step instructions for connecting the endpoints to meters and installing the endpoints on walls or on pipes.
- **Chapter 3: Programming and Verifying 60WP-R Operation** Provides instructions for activating and programming the 60WP-R.

Documentation Conventions

This document uses the following conventions.

Convention	Example
Itron product part numbers are noted in parentheses	(Itron Part Number SCR-0010-005)
Hypertext links are blue.	See the Copyright page for copyright information.



Caution This type of note warns the user that failure to heed the information in the note could result in loss of data. Be sure to carefully read Caution notes and heed the advice/instructions.



Warning This type of note is used to warn of potential physical harm to the user or hardware. It is critical that you pay strict attention to Warning notes, read the information carefully, and heed the advice/instructions.



Note This type of note supplies generic information to the user. The information could be ignored and the user could still continue with a task without suffering any adverse consequences

About the 60W-R and 60WP-R Endpoints

The 60W-R and 60WP-R Endpoints are Automatic Meter Reading (AMR) endpoints that collect consumption and tamper information and transmit the data in a bubble-up fashion. Approximately every seven seconds, the endpoint transmits a standard consumption message (SCM) at approximately +10 dBm (10 milliwatts) between 910-920 MHz.

A variety of meter register protocols are supported. Refer to Itron's Water Meter Compatibility List, PUB-0063-002, for a list of approved meters and registers.

The 60W-R and 60WP-R Endpoints feature the following capabilities:

- **Leak Detection** The 60W-R and 60WP-R Endpoints indicate through meter reading software that a potential system leak exists if a zero consumption value does not occur over a seven day period of hourly register reads. Upon detecting a zero consumption value the leak flag will be changed to an off status and the seven day test period will be reset.
- **Tamper Indicators** To minimize the possibility of theft, the 60W-R and 60WP-R Endpoints feature a cut cable and communications error tamper indication as well as a security seal to indicate physical tampering. The cut cable or communications error tamper event increments an interval counter whose value is reported through the meter reading application. For the 60W-R model the tamper event must be maintained for 24 consecutive read periods before it will be reported. The 60WP-R reports a tamper event within 90 seconds of occurrence. The tamper counter value will continue incrementing until the problem is resolved.
- **60W-R Reverse Flow Detection** To detect reverse flow the 60W-R compares the register's current consumption reading to that obtained at the previous hourly update. If the register value is less, the endpoint will signal the meter reading software to report a reverse flow condition for the next 40 days. The 40 day time limit will be continually reset if another reverse flow event occurs before the period has timed out.



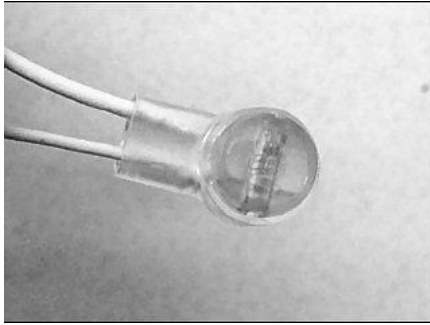
Note When all the digits of the register roll over to zero a reverse flow condition will be reported.

Battery Life

The 60W-R is powered by a non-replaceable long life dual lithium battery pack with an expected battery life of approximately 20 years. The 60WP-R has an expected battery life of 15 years for cable lengths 150 ft or less.

60W-R Startup Sequence

The 60W-R is shipped in a sleep state. Register reads and data transmissions start after initialization of the endpoint. To initialize, place one of the supplied gel connectors on the yellow and brown wires and then crimp. Be sure to use a crimping tool designed for 3M's Y2 gel connectors. See [Appendix A](#) on page 35.



Maintain the connection for at least 3 seconds and then remove the connector by cutting the wires. The endpoint is now ready for attachment to the meter register.

The 60W-R is now in an operating mode referred to as a fast transmit state. In this state, the endpoint is transmitting register data at two seconds intervals. This state provides a quick means of determining if the endpoint and register are successfully communicating. It will remain in this state for 15 minutes assuming no communication errors occur. Following this period the endpoint enters a post install state for an additional three hours. If, during the post install state, the register connection is interrupted or the 60W-R does not acquire three additional hourly register reads, it will revert back to the sleep state.

The 60W-R will enter a normal operating state at the conclusion of the three hour post install state if proper register and endpoint communications were achieved. In the normal operating state, the 60W-R will read the register once every hour while transmitting the data every seven seconds. Once in the normal state the endpoint can never return to the sleep state.

60WP-R Startup Sequence

The 60WP-R is shipped from the factory in a sleep state. To initialize the unit a special magnet pen (Itron part number MLD-0175-001) is placed in the small indentation on the front face of the enclosure. See [Activating 60WP-R Programming Mode](#) on page 33.

After initiating, the endpoint operates in one of the following modes:

- **Programming Mode** - This mode is used to program the endpoint with a starting meter register value and/or unique utility operating parameters.



Caution

- Hold the magnet in position for three seconds to activate programming mode. Do not leave the magnet in place longer than 15 minutes or the endpoint will revert back to a sleep state and the programming sequence will have to be repeated.
- You must activate the programming mode in the 60WP-R to verify operation. For more information see [Verifying Operation of the 60WP-R](#) on page 34.
- **Normal Mode** - Following the 15-minute programming mode, the endpoint enters normal mode and begins to operate as programmed.
- **Quiet Mode** - In quiet mode the endpoint turns off its transmitter and receiver functions but continues to monitor for register pulses. The unit will automatically enter normal mode by adding counts to the attached register or into programming mode using the magnet. You must have a special endpoint configuration file to place the unit in quiet mode.
- **Off Mode** - The 60WP-R is shipped in off mode. In off mode the unit does nothing unless activated by a magnet pen for programming.

You can program the 60WP-R using an FC200SR handheld computer running Endpoint-Link[®] or Endpoint-Link[®] Pro software. For more information about programming the endpoint see [Programming the 60WP-R](#) on page 33.

Installation Options

The 60W-R and 60WP-R Endpoints can be installed in the following ways:

- **Remote Mount:** The endpoint mounts to a flat surface and connects to the meter register with a cable (up to 300 feet). This installation option requires the remote mount kit (CFG-0771-021).
- **Pipe Mount:** Installs the endpoint on a pipe near the meter rather than on a wall surface. Requires the remote mount kit listed above and one of the following pipe mounting kits based on pipe size.
 - Pipes from 3/4 to 1 3/4 inches (CFG-0217-503).
 - Pipes from 1 5/16 to 2 1/4 inches (CFG-0217-504).
- **Meter Register Direct Mounting:** The 60W-R and 60WP-R Endpoints can be direct mounted to meter registers that have specially designed register cases for this purpose.

CHAPTER 2

Installing the 60W-R and 60WP-R Endpoints

There are two tasks involved in the 60W-R and 60WP-R Endpoints installation:

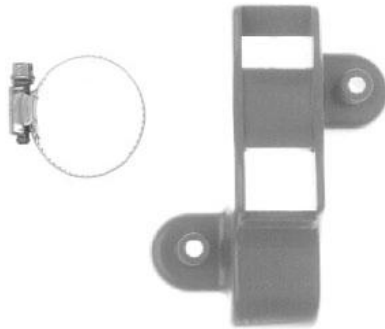
- Mounting the endpoint to a pipe, wall surface, rod, or directly to a meter register
- Wiring the endpoint to the meter

Pipe Mount Installation

The endpoint can be mounted on a pipe either vertically, diagonally, or horizontally using either the CFG-0217-504 or CFG-0217-503 pipe mounting kit in conjunction with the remote mount kit (CFG-0771-021).

To mount the adapter plate on a vertical pipe

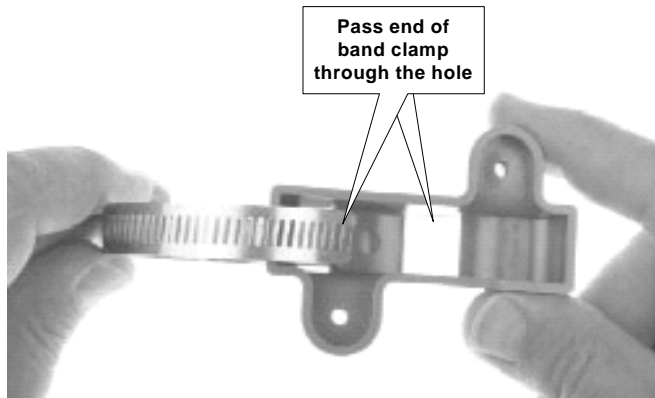
1. Obtain the pipe bracket and the band clamp from the selected pipe mounting kit.



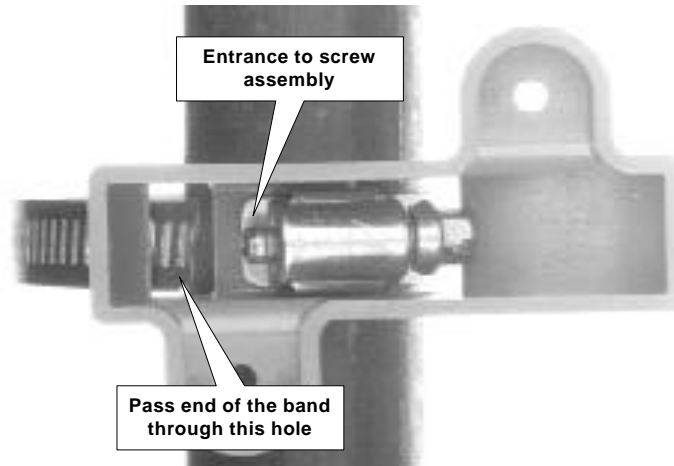
2. Loosen the clamp screw until the end of the band is released.



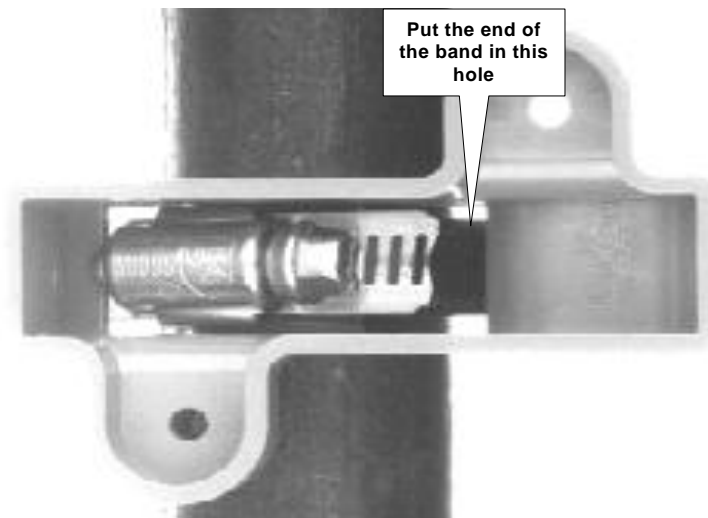
3. Push the end of the band through the hole in the pipe bracket.



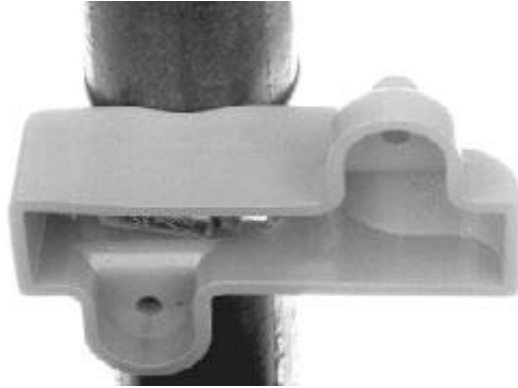
4. Place the band clamp around the pipe.
5. Push the end of the band through the hole in the band clamp and into the entrance to the screw assembly.



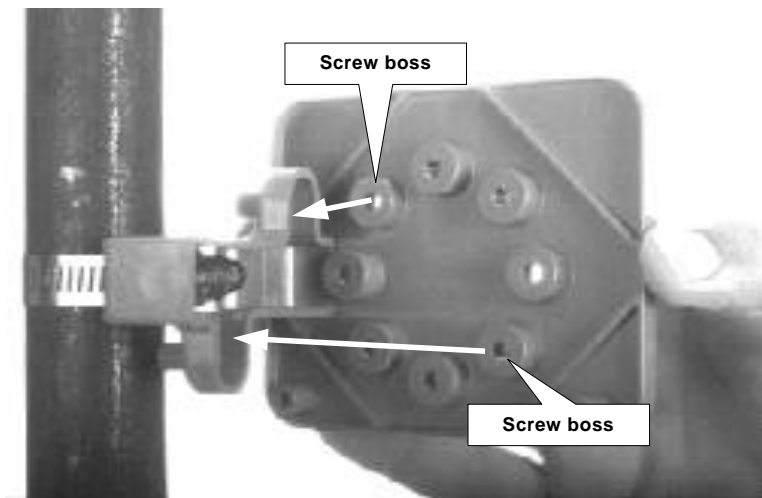
6. Tighten the band clamp until the end of the band can be pushed into the hole in the pipe bracket.



7. Tighten the clamp screw three or four more turns to make sure the end of the band does not pop back out on this side of the pipe bracket.
8. Position the band clamp as shown then fully tighten the band clamp screw.



9. Place the adapter plate on the pipe bracket. The adapter-plate screw boss goes into this pipe-bracket recess.



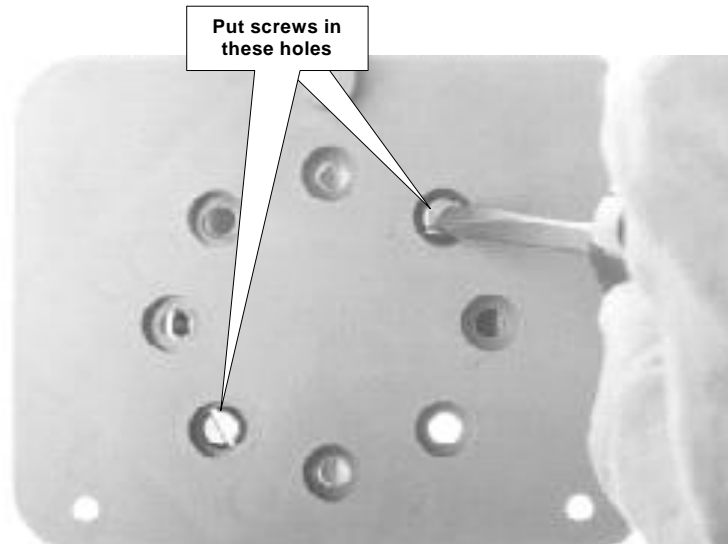
When the adapter plate is properly positioned on the pipe bracket, it looks like this (see below).



- 10.** Obtain two half-inch adapter-plate mounting screws from the installation kit.



- 11.** Connect the adapter plate to the pipe bracket (see below).



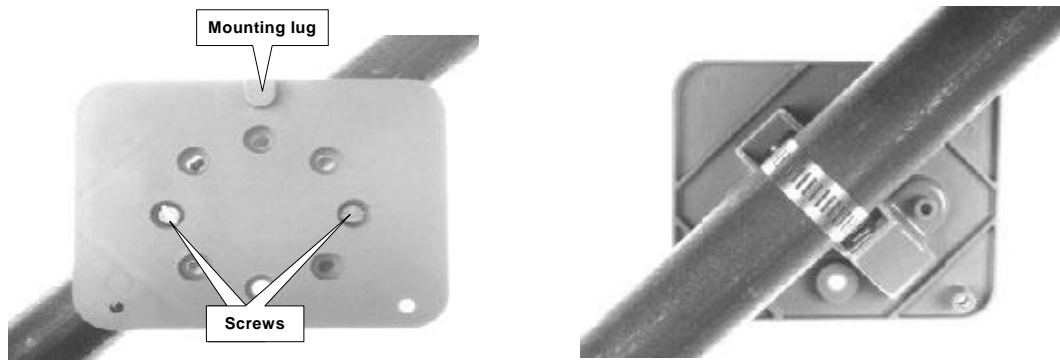
- 12.** Tighten both screws to 9 to 12 inch-pounds of torque.

To mount the adapter plate in other positions

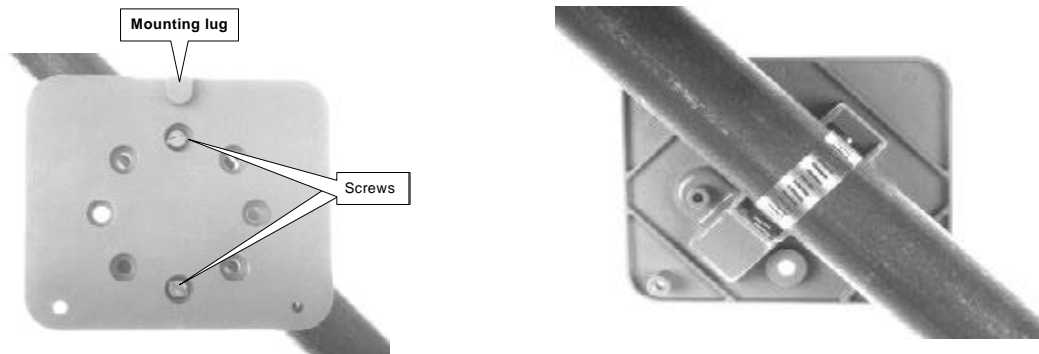
The installation procedure in the previous section shows how to mount the adapter plate on a vertical pipe.

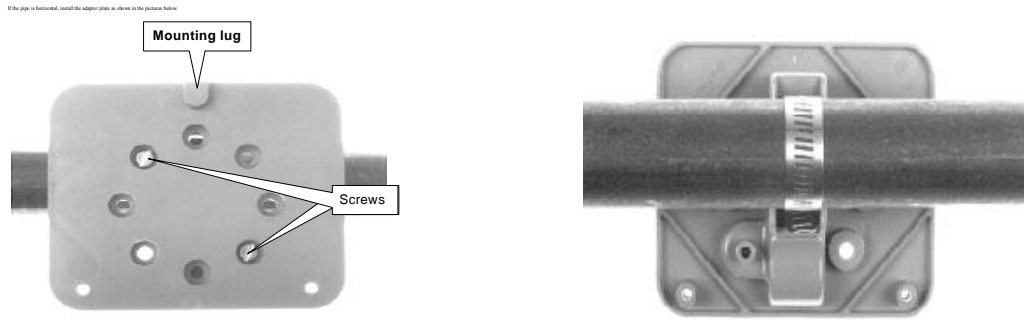
The following pictures show the adapter plate on angled and horizontal pipes. Regardless of the angle of the pipe, the adapter plate mounting lug must always be at the top.

If the pipe is at a 45 degree angle up to the right, install the adapter plate as shown in the pictures below.



If the pipe is at a 45 degrees angle up to the left, install the adapter plate as shown in the pictures below.



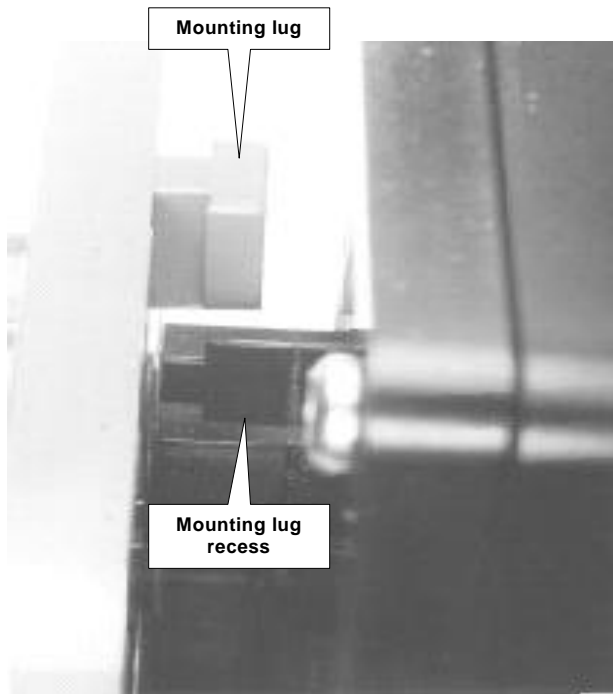


To mount the 60W-R and 60WP-R Endpoints on the adapter plate

1. Obtain two 1-inch mounting screws from the pipe mount installation kit.
2. Place the back of the endpoint against the face of the adapter plate.



The adapter-plate mounting lug should be just above the endpoint mounting lug recess.

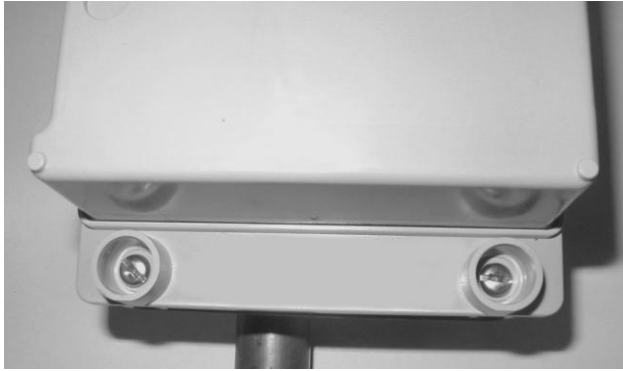


3. Slide the endpoint back cover onto the adapter, pushing up to secure the lug adapter in the lug slot. Ensure that the register cable is routed along the pipe and use a cable tie to secure it to the pipe.



4. Install the two remaining endpoint mounting screws.

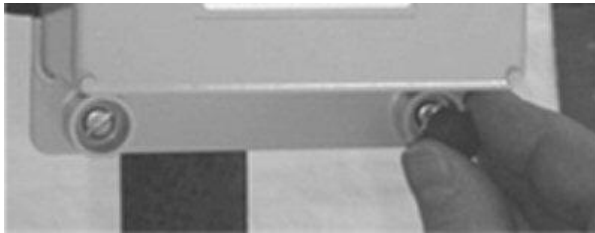
When the endpoint is properly mounted on the adapter plate, it should look like this (see below).



5. Tighten the screws to 9 to 12 inch-pounds of torque.

To install tamper seals and cable ties

1. Obtain two new tamper seals from the installation kit.
2. Place a new tamper seal over each endpoint mounting screw.



3. Push both tamper seals all the way into place with a 1/4-inch nut driver or similar tool.



Note A tamper seal is fully seated when the top of the tamper seal is approximately 1/16 inch below the top of the screw recess.



The 60W-R and 60WP-R Endpoints should look like this after the tamper seals have been installed (see below).



4. Secure the cable to the meter pipe with a cable tie.



5. Push any excess wire up between the back of the endpoint and the face of the adapter plate.



Remote Mount Installation

Wire the endpoint to the register as described in [Connecting the 60W-R and 60WP-R Endpoints](#) on page 23.

Using a spare backplate, create a drilling template by drilling through a backplate lug slot to mark the position of the screw. Use the drilled backplate as your mounting template.

The arrow on the endpoint must point up when the installation is complete.

Required tools and hardware

Remote mount installation requires the following tools and hardware:

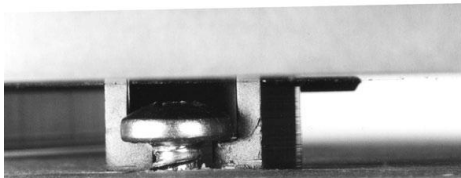
- Remote mount installation kit (CFG-0771-021), which includes the back plate, tamper seals, and mounting screws.
- Nut driver or similar tool
- Phillips screwdriver
- Drill and bits for expected mounting surface and screw size

To install on a flat surface

1. Select an installation location.
2. Using your backplate template, drill three pilot holes into the wall or other surface. The two bottom holes should be level.
3. Screw a mounting screw for the lug slot into the surface, leaving approximately 1/8 inch of the screw protruding. The lug slot should slide over the screw with a tight fit.



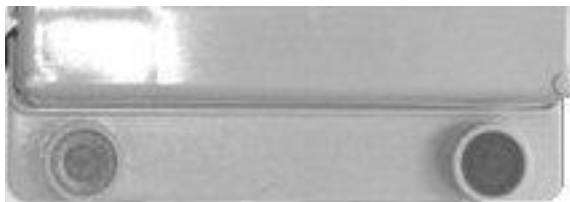
4. Slide the endpoint screw slot onto the mounting screw, pushing the endpoint upward until the screw head is all the way into the slot.



5. Screw the endpoint to the wall using the remaining two mounting screws.



6. Insert a tamper seal over each mounting screw and drive into place with a nut driver or a similar tool.



Note A tamper seal is fully seated when the top of the tamper seal is approximately 1/16 inch below the top of the screw recess.

7. Secure the cable as needed, using the provided cable ties.

Direct-Mount Register Mounting

This section describes how to attach the 60W-R and 60WP-R Endpoints to the following direct mount meter registers

- Badger ADE and RTR
- Elster/AMCO (ABB) Scancoder, InVISION, and Digital



Caution You must perform the steps outlined in [60W-R Start-up Sequence](#) on page 2 before attaching the 60W-R to the meter.

To install the Badger Direct-Mount



Caution

- Ensure you have a Badger meter with a register designed for direct mounting.



- Check the part number on the label to make sure the endpoint matches the meter.
- Always install the endpoint with the arrow on the housing pointing upward.



Note The register may or may not be mounted on the meter when performing the following steps.

1. Obtain a 60W-R endpoint for the Badger ADE register or a 60WP-R for the RTR register. Both endpoints have three wires:



- (1) wire with brown insulation
- (2) wire with yellow insulation
- (3) wire with gray insulation

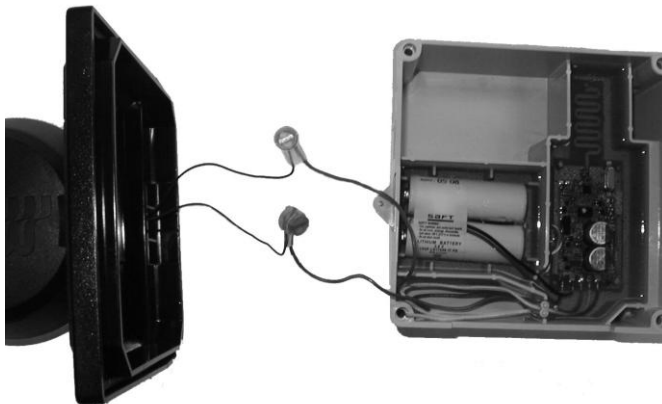


Note Fold the unused yellow wire up into the housing.

2. To attach the 60W-R encoder to the Badger ADE register connect the yellow endpoint wire to the register's black wire, the endpoint's gray wire to the register's red wire, and the endpoint's brown wire to the register's green wire.

To attach the 60WP-R to the RTR register connect the endpoint's gray wire to the register's black and the endpoint's brown to the register's red. The endpoint's yellow wire is not used and should be tucked back into the endpoint housing.

Push the gel connectors and wires into the endpoint housing.



3. Place the endpoint on the register, ensuring the edge of the endpoint housing is seated properly around the perimeter of the register as shown below.



Note A gasket is not required.

4. Install four Torx-head mounting screws (Itron part number SCR-0010-005) as shown below and hand tighten the screws.

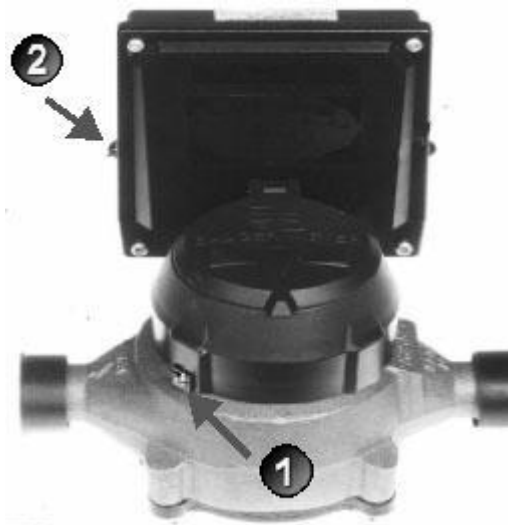


5. If you have not already done so, connect the register to the water meter and fully tighten the mounting screw (1) as directed by Badger Meter.



Note The register can be installed on the meter in four different positions with respect to the direction of water flow (refer to the directions that come with the meter or register).

6. If the standard Torx screw is used (1), a wire seal is not necessary.
If the optional slotted and drilled RTR screw is used, install a wire seal through the drilled screw from (1) to (2), or as specified by utility policy.



To install the Elster/AMCO (ABB) Scancoder, InVISION, or Digital Direct-Mount



Caution

- Ensure you have an Elster/AMCO meter with a register designed for direct mounting.



- Check the part number on the endpoint label to make sure it corresponds to the meter register.
- Always install the endpoint right side up with the arrow on the housing pointed upward.



Note The register may or may not be mounted on the meter when performing the following steps.

1. Push the hollow pin (1) completely out of its location and separate the endpoint mounting bracket (2) from the meter register collar (3).



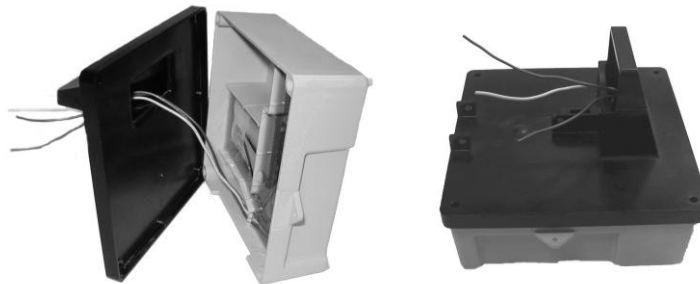
2. Obtain a 60W-R if connecting to an InVISION or Scancode register.
Obtain a 60WP-R if connecting to a Digital register.



3. Strip 1/2-inch of insulation from the end of the brown, gray, and yellow wires.

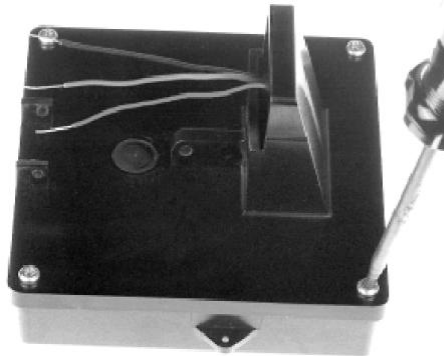


4. Place the endpoint on the mounting bracket and route yellow, gray, and brown wires through the opening as shown below.

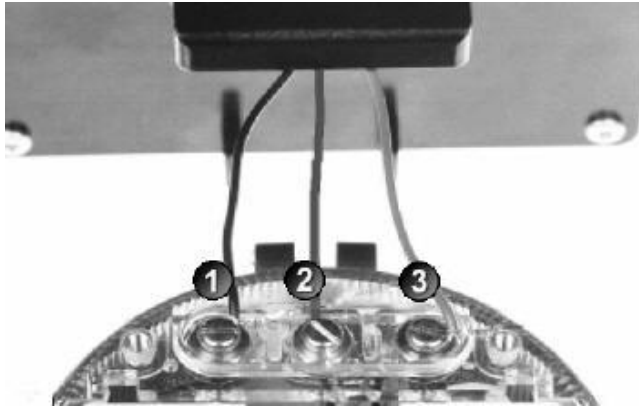


Note A gasket is not required.

5. Install four Torx-head mounting screws (Itron Part Number SCR-0010-005) as shown below. Hand tighten each screw.



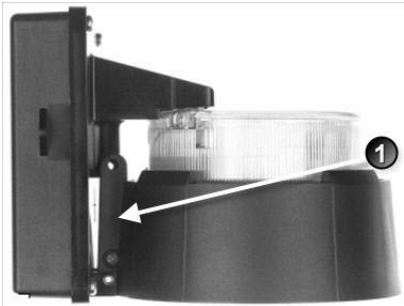
6. For Scancode and InVISION registers connect the gray wire under the left register screw head (1), the brown wire under the center register screw head (2), and the yellow wire under the right register screw head (3). Ensure all screws are tightened securely.
For the Digital Register connect the brown wire under the left register screw head (1), the yellow wire under the center register screw head (2), and the grey wire under the right register screw head (3). Ensure all screws are tightened securely.



Caution Be sure to install the wires around the screws in a clockwise direction, as shown or the wires may come out from under the screw heads as you tighten them. Also, make sure no insulation is compressed under the screw head, or the wire might not make good contact.



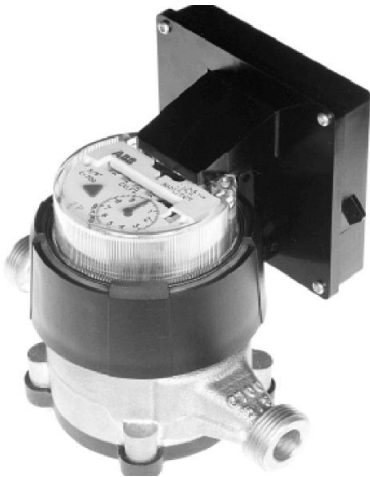
- 7. Install the endpoint and mounting bracket on the meter register adapter collar (1).



- 8. Replace the hollow pin (1) you removed in step 1.



The meter and endpoint assembly should now look like this (see below).



Connecting the 60W-R and 60WP-R Endpoints

This section contains information about wiring the 60W-R and 60WP-R Endpoints to the water meter.

To connect the 60W-R cable to the register

1. Initialize the endpoint by referring to the section titled: [60W-R Startup Sequence](#) (see page 2).



Caution If you simply connect the 60W-R to the meter register, the endpoint might not activate. You must use the shorting plug (provided with inline connector endpoints) or temporarily short the white and red wires together on cable models before attaching to the register. Failure to connect to a register within the allotted time after initialization will cause the endpoint to revert back to a sleep state. If this occurs, step 1 will have to be repeated.

2. Connect the wires to the register screw terminals according to the following table.

Register	60W-R wires		
	Brown (data)	Gray (power/clock)	Yellow (ground)
AMCO Invision	R	G	B
AMCO Scancode	R	G	B
Hersey Translator	G	R	B
Badger ADE	G	R	B
Sensus ECR	G	R	B
Sensus ICE	G	R	B
Metron Famier	G	R	B
Actaris Coder	G	R	B
ProRead	R	B	G
ARBV	R	B	G
Performance ETR	G	R	B



Caution If the screws are not sufficiently tightened or if wire insulation is under the head of the screw, intermittent electrical connection may occur. In addition, a moisture proof sealant must be used if the meter will be used outdoors or in any environment where moisture could collect on the screw terminals.

To connect the 60W-R to the Neptune ARB V or ProRead register-mount



Caution

- Ensure you have a Neptune ARB V or ProRead meter.



- Check the part number on the endpoint to make sure it corresponds to the meter register

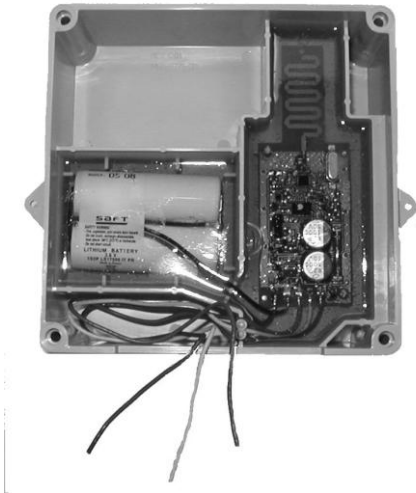


Note Neptune's ProRead register must be programmed with a Neptune ProRead Programmer as 3-wire to work properly with the 60W-R. Neptune ARB V registers are not programmable.

1. Pull the bottom edge of the wire terminal enclosure cover out and down as shown below.



2. Obtain a 60W-R Neptune ARB V endpoint if connecting to an ARB V register or a 60W-R endpoint if connecting to a ProRead register.



3. Strip 1/2-inch of insulation from the end of the endpoint's gray, yellow, and brown wires.

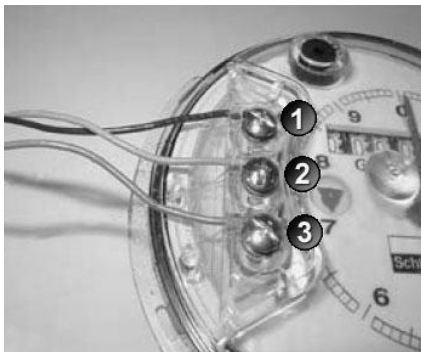


4. Connect the cable wires from the endpoint to the register screw terminals as shown below.

Connect the gray cable wire to the top (1) screw.

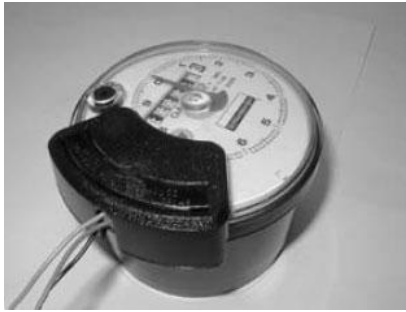
Connect the yellow cable wire to the middle (2) screw.

Connect the brown cable wire to the bottom (3) screw.

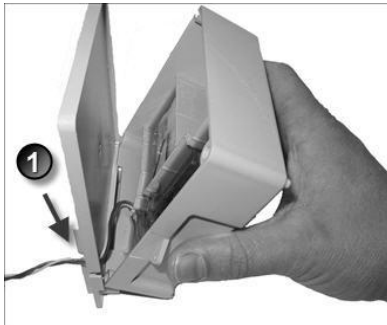


Caution Be sure to install the wires around the screws in a clockwise direction, as shown or the wires may come out from under the screw heads as you tighten them. Also, make sure no insulation is compressed under the screw head, or the wire might not make good contact.

5. Put the wire terminal enclosure cover back on the register (see below).



6. Place the endpoint on the mounting bracket as shown below, with the wires exiting from the notch in the bracket (1).



7. Attach the endpoint mounting cover using four Torx-head mounting screws (Itron Part Number SCR-0010-005) as shown below. Hand tighten each screw. Ensure the wires are not pinched between the cover and the endpoint housing.



To connect the Sensus ECR or ICE register



Caution

- Ensure you have a Sensus ECR or ICE with accessible screw terminals.
- Check the part number on the endpoint to make sure it matches the meter.



Note The register may or may not be mounted on the meter when performing the following steps.

1. To remove the cable entrance cover from the meter register, turn it counterclockwise approximately 1/4 turn.



2. Obtain a 60W-R for the Sensus ECR or ICE registers.



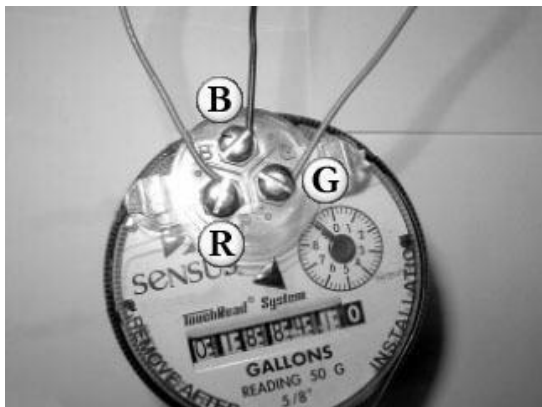
3. Strip 1/2-inch of insulation from the end of the brown, gray, and yellow wires.



4. Install the yellow wire from the endpoint under the register screw head marked "B" on the top of the register. Tighten the screw fully.

Install the gray wire under the register screw head marked "R" on the top of the register. Tighten the screw fully.

Install the brown wire under the register screw head marked "G" on the top of the register. Tighten the screw fully.





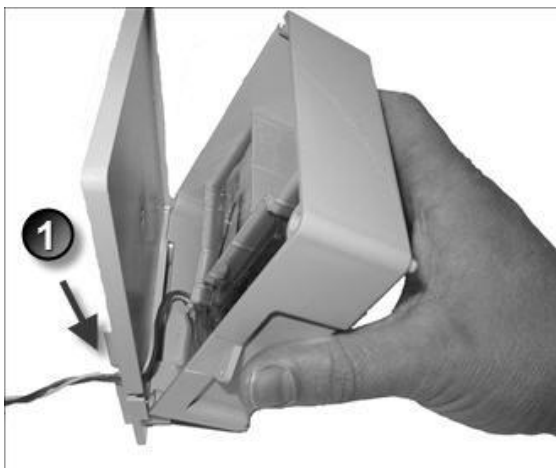
Caution Be sure to install the wires around the screws in a clockwise direction, as shown or the wires may come out from under the screw heads as you tighten them. Also, make sure no insulation is compressed under the screw head, or the wire might not make good contact.



5. To reinstall the cable bracket on the meter register, place it over the wires, push down and turn clockwise until it lines up as shown below.



6. Place the endpoint on the mounting bracket as shown below, with the wires exiting from the notch in the bracket (1).



7. Attach the endpoint mounting cover using four Torx-head mounting screws (Itron Part Number SCR-0010-005) as shown below. Hand tighten each screw. Ensure the wires are not pinched between the cover and the endpoint housing.



Programming and Verifying 60WP-R Operation

To program the endpoint, you must first activate the programming mode and then program the endpoint using an FC200SR handheld radio.

Activating 60WP-R Programming Mode

Use the programming magnet pen (Itron part number MLD-0175-001) to place the endpoint into programming mode.

Place the magnet pen in the small indentation on the front of the endpoint housing (see below) and hold it for approximately three seconds.



Notes

- The 60WP-R will remain in programming mode for 15 minutes.
- If the magnet pen is held in place longer than 15 minutes, the endpoint will revert back to an off state and the above activation step must be repeated..
- Endpoints that have been factory programmed will still require activation with the magnet pen before they will detect register pulses. The one exception to this rule is an endpoint that has been placed in the quiet mode. For more information see [60WP-R Operating Modes](#) on page 2.

Programming the 60WP-R

To program a 60WP-R, use an FC200SR handheld running Endpoint-Link or Endpoint-Link Pro software and your utility's programming configuration file.

Using the handheld, enter the endpoint ID, select the endpoint type (60WP-R), select the correct meter configuration, select the length of the cable, and then enter in the initial reading from the register. After programming, the endpoint enters normal mode and begins bubbling-up the SCM data at a seven second rate.



Caution

- The FC200SR is the only handheld that supports programming for the 60WP-R endpoint.
- The endpoint and programmer should be a minimum of 12 inches apart while programming.

Verifying Operation of the 60WP-R

After you have programmed the 60WP-R verify that it is correctly reporting consumption data. Use one of the following handheld computers to verify consumption:

- G5R (must be configured to read 60 series endpoints)
- FC200R
- FC200SR



Caution

- Each handheld radio requires special setup and configuration parameters to successfully read and program 60-series products. Refer to the respective meter reading application for specific instructions.
- To verify operation using the check endpoint function, you must activate the programming mode in the 60WP-R. For more information see [Activating 60WP-R Programming Mode](#) on page 33.
- ReadOne Pro, FS2PN and FS3PN readers should not be used to read the 60W-R and 60WP-R Endpoints. These readers do not keep their receivers on long enough to reliably capture the 60W-R and 60WP-R Endpoints transmission.

APPENDIX A

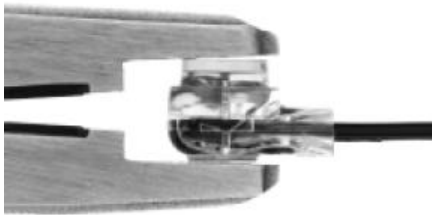
Appendix A

1. Push the wires that are to be connected together as far as possible into the connector.

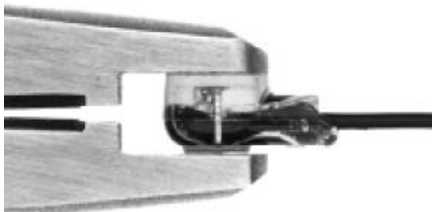


Caution Do not strip any insulation from the ends of the wires before you push them into the connector.

2. Placed the connector (with wires) into the jaws of the crimping tool.

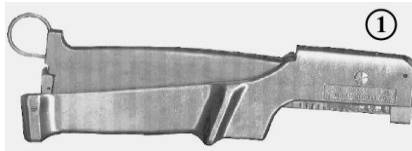


3. Crimp the connector by squeezing the handles until the connector looks like this (see below). Continue to apply pressure for three seconds.

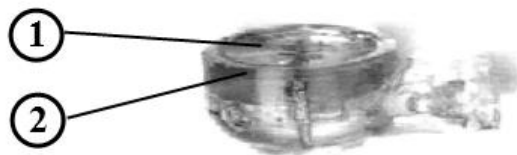


4. If using a 3M Scotchlok Model E9C Cartridge Tool (See 1 below), push the ends of the wires to be connected into the connector at the end of the crimping tool, as shown in (2) below.

Then squeeze the crimping tool handle until it pushes the connector (now crimped out of the tool) when you release the handle.



A connector is crimped properly if the top of the movable, yellow center part (1) is flush with the top of the connector body (2) (see below).



Warning Crimping the connectors sometimes squeezes some sealant (see below) out of them. The sealant protects the inside of the connector against insects, moisture, and other contaminants.

The sealant may cause minimal eye and skin irritation. Avoid eye contact. Avoid prolonged or repeated skin contact. Material Safety Data Sheets (MSDS) are available upon request.

