



Badger Meter

GALAXY® Gateway Receiver
Fixed Network Automatic Meter Reading System



IMPORTANT:
This manual contains important information.
READ AND KEEP FOR REFERENCE.

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OVERVIEW

This manual contains inspection, assembly, installation and basic programming instructions for the Badger Meter GALAXY® Gateway Receiver and associated components of the Badger Meter GALAXY® Fixed Network Automatic Meter Reading System (see Figure 1) with Cellular, Wi-Fi, and LAN (Local Area Network) data backhaul options.

Proper performance and reliability of the GALAXY fixed network system depends upon installation in accordance with these instructions.



Figure 1: Gateway GPRS Receiver

UNPACKING AND INSPECTION

Upon receipt of the product, perform the following unpacking and inspection procedures:

Note: If damage to the shipping container is evident upon receipt, request the carrier to be present when the product is unpacked.

1. Carefully open the shipping package, follow any instructions that may be marked on the exterior. Remove all cushioning material surrounding the product and carefully lift the product from the package.
2. Retain the package and all packing material for possible use in reshipment or storage.
3. Visually inspect the product and applicable accessories (Box Contents List) for any physical damage such as scratches, loose or broken parts, or any other sign of damage that may have occurred during shipment.

Note: If damage is found, request an inspection by the carrier's agent within 48 hours of delivery and file a claim with the carrier. A claim for equipment damage in transit is the sole responsibility of the purchaser.

Product Contents

Box 1:

- Gateway Receiver with Receive Antennas

Box 2

- Power / Communications Cable (Bare Wire End / Water-proof Connector end)
- Power Supply
- Mounting Kit (V Clamps / Bolts or BAND-IT® Bands and locking clasps depending on applications)
- LAN Adapter and Adapter Power Supply (LAN Gateway Only)

HARDWARE INSTALLATION

For best performance the antenna / receiver assembly should be mounted as high as practicable and away from any obstructions to radio frequency (RF) signal paths, such as trees, adjacent buildings, metal objects, or other antennas. The minimum recommended mounting height is 30 feet above ground. To avoid interference, the receiver should be mounted at a minimum of 6 feet away from any metal object (excluding the mounting pole).

Standard Pole Installation

V-block clamps are used to attach the antenna / receiver assembly to a mounting mast (see Figure 2):

The clamps supplied accommodate mounting masts of 1-1/2" to 2-1/2" OD. Use suitable mast material. Clamping forces may deform thin-wall masts.

1. Remove two short bolts and nuts that temporarily hold antenna support to mounting plate. (Short bolts used for shipping only and may be discarded.)
2. Install washers on two supplied fully threaded bolts and install through front of antenna support through to mounting bracket where short bolts were previously installed.
3. Install V-block through bolts with flat side facing antenna support.
4. Install two nuts and tighten V-block to antenna support.
5. Install second V-block onto long threaded bolts (V side first).
6. Install lock washers and nuts onto long threaded bolts.
7. Loosen the nuts holding the V-block clamps together enough to provide a space between the clamps that clears the mast diameter.
8. Position the antenna/receiver assembly and V-block clamps on the mast and tighten the nuts.

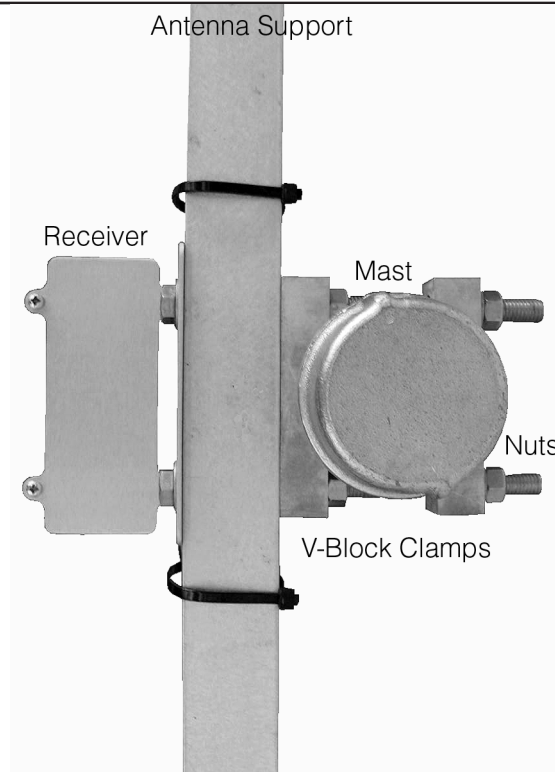


Figure 2: Antenna-Receiver Attached to Mounting Mast (Top View)

Large Pole Installation

To mount on poles greater than 2" in diameter, use the BAND-IT® clasps. Follow all manufacturers' instructions.

1. Screw the BAND-IT® clasp into the bottom and top holes of the Gateway (see Figure 3).

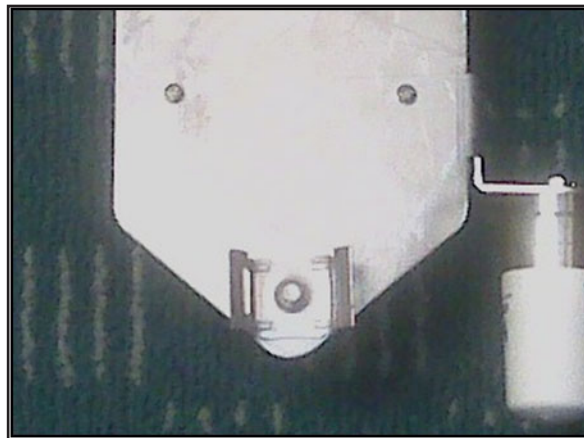


Figure 3: BAND-IT clasp (include in bottom and top holes)

2. Wrap BAND-IT tie around object with the locking ears up (see Figure 4).

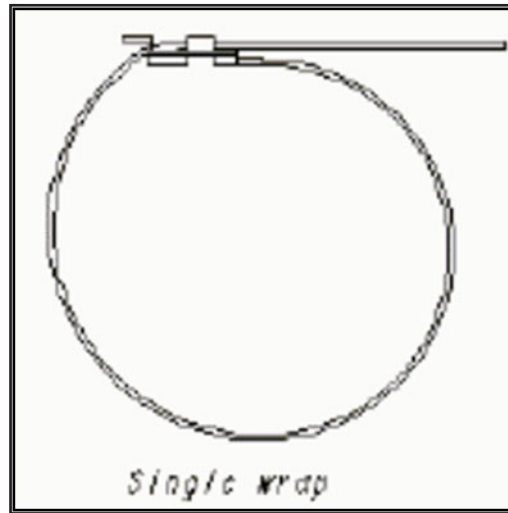


Figure 4: BAND-IT Wrap

3. Tighten BAND-IT ties with one of these (listed in order of increasing tension):
 - a. By hand
 - b. BAND-IT AE201 Tensioning Hook
 - c. BAND-IT AE200 Tensioning Tool
 - d. BAND-IT C075 Bantam Tool

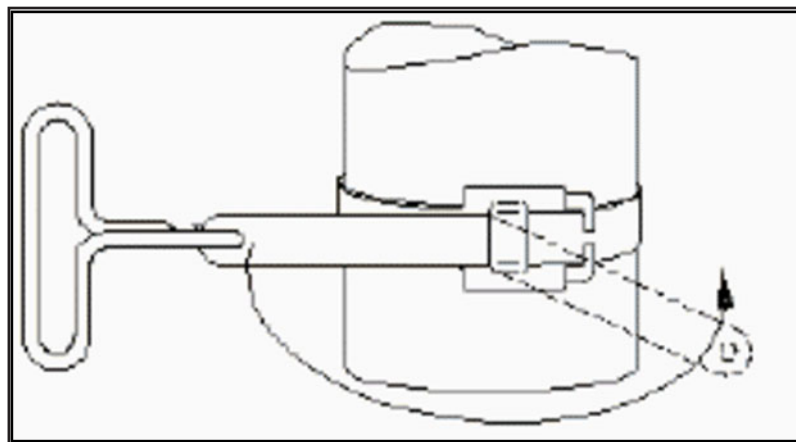


Figure 5: Tightening BAND-IT Ties

4. Bend tail back over raised bridge.
5. Secure tail under ears by slightly pushing the tail sideways and down, first one way then the other (tail may be left on for re-use).

Note: Hammering down the bridge may increase the strength of the lock, but will not allow the clamp to be re-used.

Product Assembly

Note: In the event that you connect the power / communications cable to the receiver on the ground prior to installation, this step would precede mounting the gateway to the pole.

To connect the power / communications cable to the receiver:

1. Unscrew the four captive screws securing the receiver cover (see Figure 6).

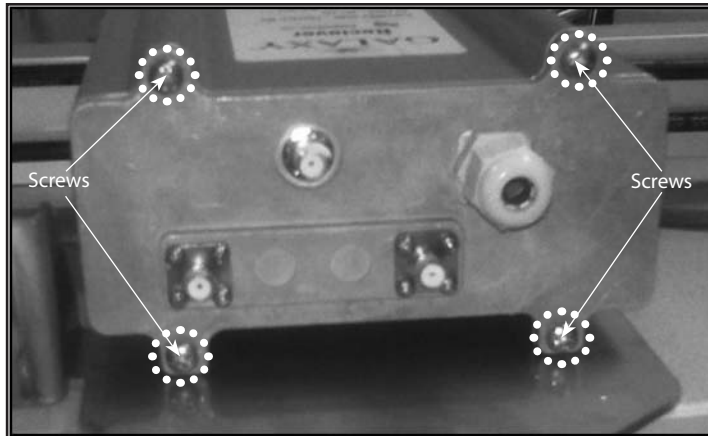


Figure 6: Captive Screws

2. Insert the power / communications cable through the cable gland on the bottom of the receiver housing (see Figure 7).

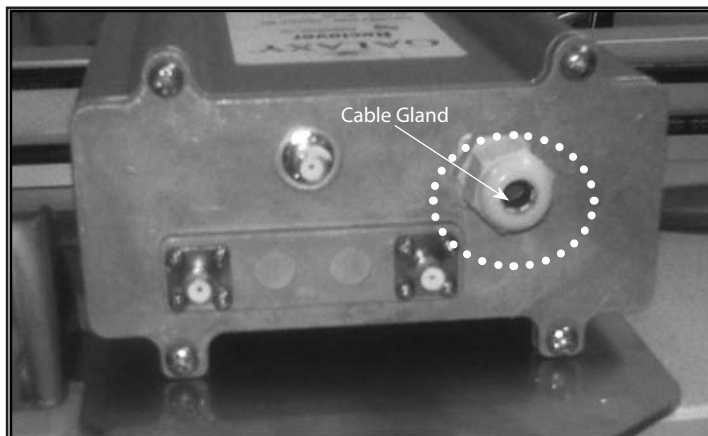


Figure 7: Cable Gland

- Strip the outer cable jacket to a length of two to three inches (see Figure 8).

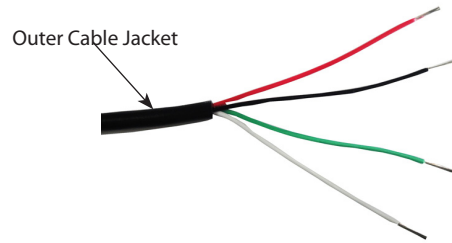


Figure 8: Outer Cable Jacket

- Shorten the foil shield and the uninsulated wire so they are flush with the outer jacket.
- Strip the four (4) insulated wires to a length of 1/4" to 3/8" (see Figure 9).

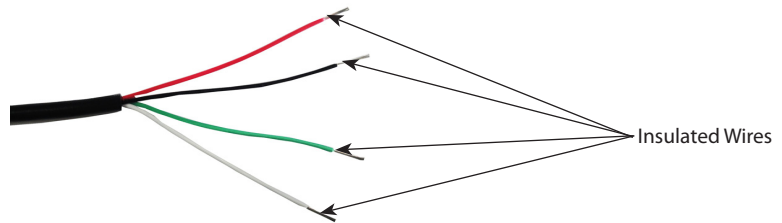


Figure 9: Insulated Wires

- Connect the wires to the compression-style screw terminals on the terminal block according to Table 1.

WIRE COLOR	TERMINAL BLOCK LABEL
RED	RED +
BLACK	BLACK -
UNINSULATED	N.U. OR SHIELD
WHITE	WHITE Tx
GREEN	GREEN Rx

Table 1: Terminal Block Wiring



N.U.

SHIELD

Figure 10: Terminal Block Labels

7. Loop the cable inside the housing as a strain relief (see Figure 11).

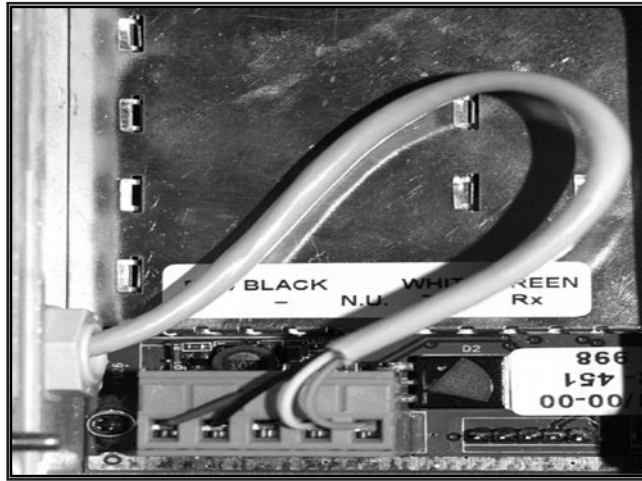


Figure 11: Cable Strain Relief

8. Hand-tighten the cable gland dome nut on the outside of the receiver by turning it clockwise (see Figure 12). The dome nut seal must be in firm contact with the power / communication cable outer jacket.

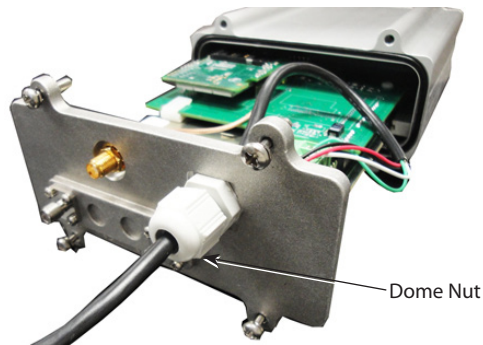


Figure 12: Cable Gland Dome Nut

9. Replace the cover by aligning the receiver board with the guide rails inside the enclosure. Verify proper o-ring seating before tightening the screws (Figure 13).

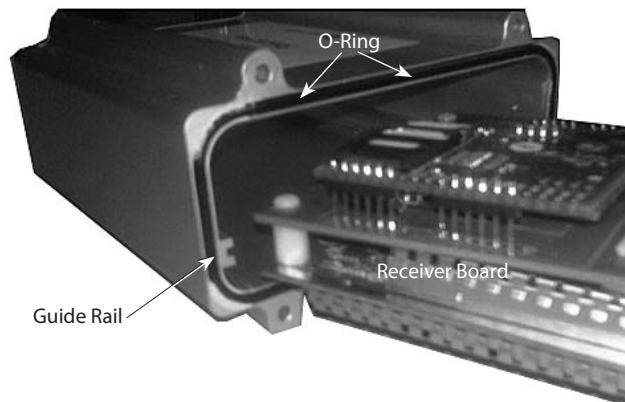


Figure 13: Guide Rails and O-Ring

10. Attach the connectors from each antenna cable to the receiver as shown (see Figure 14). Tighten each connector until firmly seated. Do not overtighten.

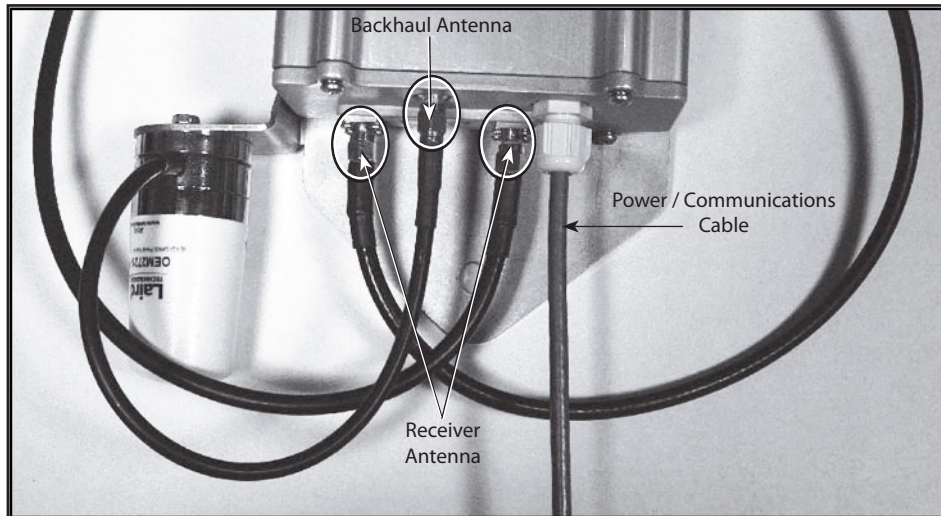


Figure 14: Antenna Connections to Receiver

11. Ensure the coax connector attached to the bottom of each antenna is firmly seated and connected. Torque connector finger tight, then tighten an additional 1/8 turn (see Figure 15).

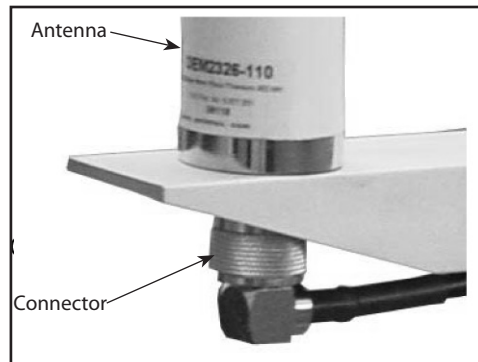


Figure 15: Coaxial Cable Attachment to Antenna Base

ELECTRICAL / NETWORK INSTALLATIONS

GPRS / Wi-Fi Installation

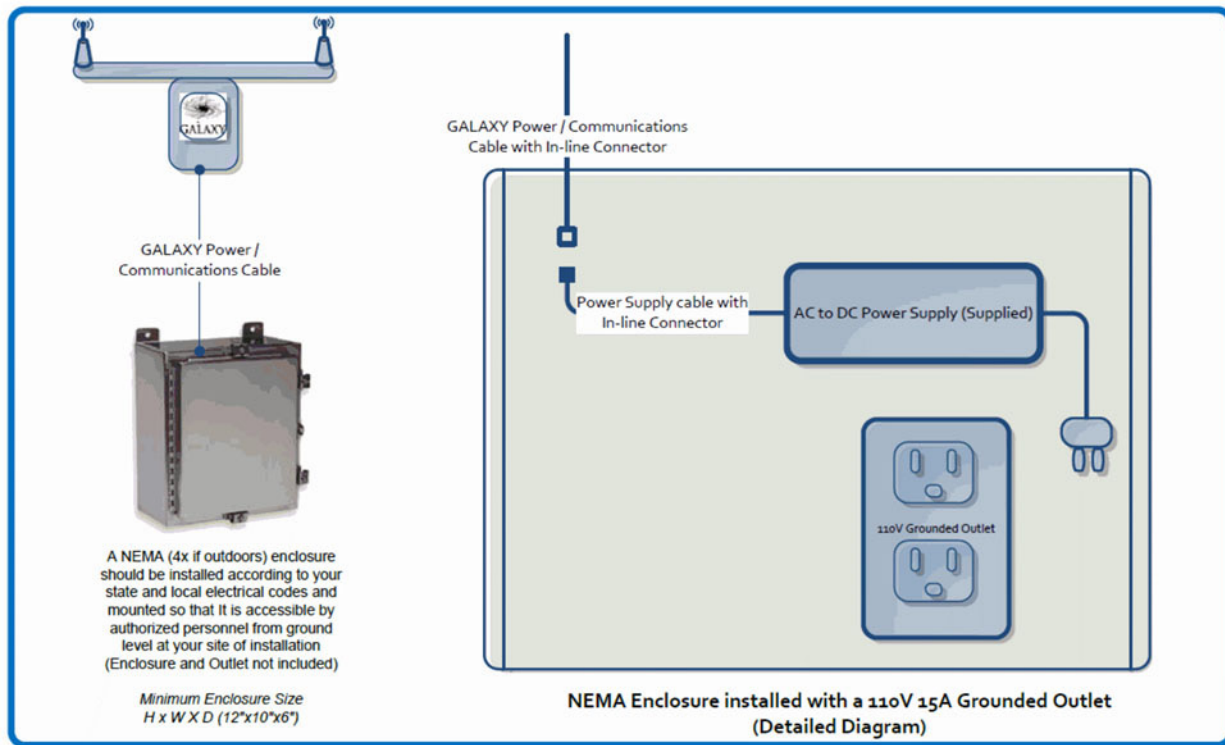


Figure 16: GPRS / Wi-Fi Connections

Install a NEMA (4x if outdoors) enclosure according to state and local electrical codes, installed to be accessible by authorized personnel from ground level.

Minimum Enclosure size: 12" x 10" x 6".

Your NEMA enclosure should contain a hole large enough to pass the GALAXY power / communication cable through. The hole must be sealed with the appropriate NEMA 4x approved cord or conduit sealing device.

Outlets and enclosure not included.

LAN Installation

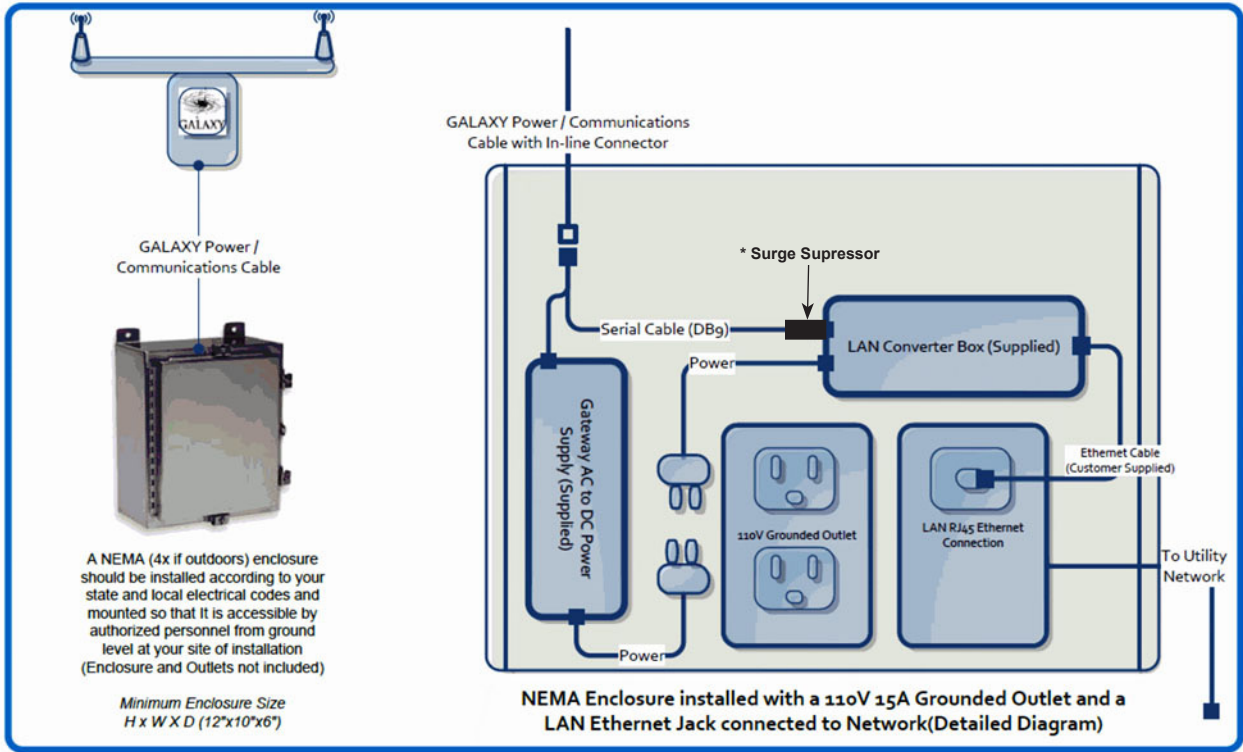


Figure 17: LAN Connections

Install a NEMA (4x if outdoors) enclosure according to state and local electrical codes, installed so as to be accessible by authorized personnel from ground level.

Minimum Enclosure size: 12" x 10" x 6".

Your NEMA enclosure should contain a hole large enough to pass the GALAXY power / communication cable through. The hole must be sealed with the appropriate NEMA 4x approved cord or conduit sealing device.

Outlets and enclosure not included.

* The surge suppressor connects in-line between the serial cable and the LAN converter box. The ground wire connects to an earth ground.

POWER REQUIREMENTS

AC Power

Badger Meter provides a DC to AC power supply which plugs into a standard three-prong 110V AC outlet. If you are powering the Gateway directly via DC power, please refer to the DC power information.

Customer-supplied DC Power

The Badger Meter GALAXY Gateway GPRS receiver requires 12 – 18V DC power source capable of delivering 200 mA continuously and up to 500 mA peak at 12V DC. If connecting to a voltage supply of less than 15V DC the power / communication cable length is limited to 100 feet.

The Badger Meter GALAXY Gateway Wi-Fi receiver requires 12 – 18V DC power source capable of delivering 200 mA continuously and up to 360 mA peak at 12V DC. If connecting to a voltage supply of less than 15V DC the power / communication cable length is limited to 100 feet.

External Power Source Connections

Wire Color	External DC Power Source
Drain (no insulation)	Negative (-)
Black	Negative (-)
Brown	Not Used/Cut off at outer Jacket
Red	Positive (+)
Light Blue	Not Used/Cut off a outer Jacket

Note: Unused wires should be cut off at the outer jacket.

MAINTENANCE

Please visually inspected the Gateway Receiver unit, its cabling and mounting hardware along with any additional installation hardware on an annual basis to be sure that the unit remains in the condition of its original installation.

FCC REQUIREMENTS

The Badger Meter GALAXY Receiver complies with Part 90 of the Federal Communications Commission Rules. An FCC license is required for operation of the GALAXY system.

GATEWAY RECEIVER PROGRAMMING

Note: Programming the receiver is not required for installation. The unit is shipped with customer-specified network parameters.

GRPS Gateway

The GPRS Gateway Receiver is a device that receives the transmissions from the Galaxy endpoints. The received transmissions are in turn delivered via the cellular (GPRS) data network the Galaxy Reading Data Management software application.

In order to set up the GPRS Gateway Receiver for operation, two key parameters are programmed into the GPRS Gateway Receiver:

1. The IP address of the Destination Server (Utility computer where data will reside).
 - A publicly accessible static IP address. This should be available from the utility’s Internet Service Provider. (The IP address may not be free of charge.)

- For the static IP address in Item 1, the firewall must allow bi-directional data on Port 5003.
- The data being sent/received on the above mentioned IP address and Port, must be routed to the PC (or server) running the Badger Meter READCENTER® software.

2. The Access Point Name (or "APN") of the cellular provider (usually provided by Badger Meter).

Note: These parameters will be pre-programmed into the GALAXY Gateway prior to delivery. As such, they are not necessary for installation but must be ascertained prior to shipment. If you are utilizing the standard Badger Meter cellular backhaul, the APN of your cellular provider is already known.

After these two parameters have been set, the GPRS Gateway Receiver will be ready for use. No further programming should be required, unless the server is changed. In such a circumstance, the IP address of the server will need to be reprogrammed for the GPRS Gateway Receiver.

LAN Gateway

The LAN Gateway Receiver receives the transmissions from the Badger Meter GALAXY endpoints. These transmissions are in turn delivered via a LAN connection to the Badger Meter GALAXY control center software application.

In order to prepare the LAN Gateway Receiver for operation, two key parameters are programmed into the LAN Gateway Receiver:

1. The IP address of the LAN adapter including:
 - IP Address
 - Subnet Mask
 - Default Gateway
2. The IP address of the Destination server (Static IP Address)
 - A publicly accessible static IP address. This should be available from the utility's Internet Service Provider. (The IP address may not be free of charge.)
 - For the static IP address in Item 1, the firewall must allow bi-directional data on Port 5003.
 - The data being sent/received on the above mentioned IP address and Port, must be routed to the PC (or server) running the Badger Meter READCENTER® software.

Note: These parameters will be pre-programmed into the GALAXY Gateway prior to delivery. As such, they are not necessary for installation but must be ascertained prior to shipment.

Once these parameters have been programmed, the LAN Gateway Receiver is ready for use, and no further programming is required, unless the server is changed. In such a circumstance, the IP address of the server will need to be reprogrammed for the LAN Gateway Receiver.

Wi-Fi Gateway

The LAN Gateway Receiver receives the transmissions from the Badger Meter GALAXY endpoints. These transmissions are in turn delivered via a LAN connection to the Badger Meter GALAXY control center software application.

In order to prepare the LAN Gateway Receiver for operation, two key parameters are programmed into the LAN Gateway Receiver:

1. Wi-Fi settings such as SSID, security mode and password.
2. The IP address of the Destination server (Static IP Address).
 - A publicly accessible static IP address. This should be available from the utility's Internet Service Provider (the IP address may not be free of charge).
 - For the static IP address in Item 1, the firewall must allow bi-directional data on Port 5003.
 - The data being sent/received on the above mentioned IP address and Port, must be routed to the PC (or server) running the Badger Meter READCENTER software.

Note: These parameters will be pre-programmed into the GALAXY Gateway prior to delivery. As such, they are not necessary for installation but must be ascertained prior to shipment.

Once these parameters have been entered, the Wi-Fi Gateway Receiver is ready for use, and no further programming should be required, unless the server is changed. In such a circumstance, the IP address of the server will need to be reprogrammed for the Wi-Fi Gateway Receiver.

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