



Excellence in Compliance Testing

Certification Exhibit

**FCC ID: QZC-REXU
IC: 4557A-REXU**

**FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-247**

ACS Project Number: 15-0255

**Manufacturer: Elster Solutions, LLC
Model: REXU**

Manual

REVISED

2:55 pm, Sep 11, 2015



REX[®] meter family

Installation instructions
IL42-4026J

General

This leaflet contains installation instructions for the solid-state, residential electricity meters in the REX family (referred to as "REX" within this IL) with the following form factors:

- self-contained: Forms 1S, 2S, and 12S
- transformer-rated: Forms 3S and 4S

All meters are calibrated and sealed before shipment. For proper installation, accuracy, and maximum life of the meters, use the following procedures.

▲ WARNING

Use authorized utility procedures to install and service metering equipment. Dangerous voltages are present. Equipment damage, personal injury, or death can result if safety procedures are not followed.

▲ WARNING

When using the REX meter with the internal service control switch, follow authorized utility procedures to reconnect electrical service. Property damage, personal injury, or death can result if proper safety precautions are not followed.

Installing the REX meter

- 1 Make sure the meter to be installed matches the service type (that is, form), current, capacity, voltage, and service socket.
- 2 Check the socket and verify that the wiring is correct. See "Internal wiring diagrams" on page 2 and "Installation wiring diagrams" on page 3 for wiring diagrams.
- 3 Make sure that the voltage disconnect or test link on the back of the meter is closed, if installed.
- 4 Position the meter so that all meter blades make contact with all socket jaws and then press the meter firmly into place.
- 5 Make sure the LCD turns on and the energy use indicator flashes if load is present.

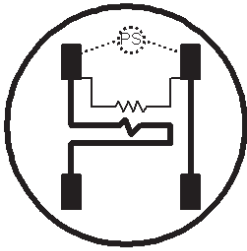
- 6 The LCD has two pulse arrows. The arrow pointing to the left indicates energy received; the arrow pointing to the right indicates energy delivered. For more information, see the technical manual for your meter.
- 7 Apply all seals and record any necessary information.

Internal wiring diagrams

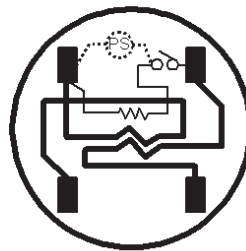
⚠ WARNING

Circuit closing devices must be used on current transformer secondaries. This applies to Form 3S and 4S meters. Dangerous voltages may be present if current transformer secondaries are open-circuited while the transformer is energized. Equipment damage, personal injury, or death can result if circuit-closing devices are not used.

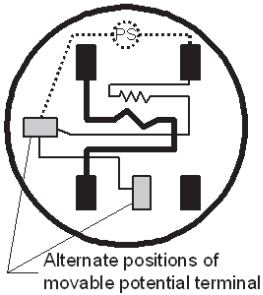
Form 1S



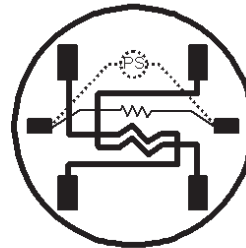
Form 2S



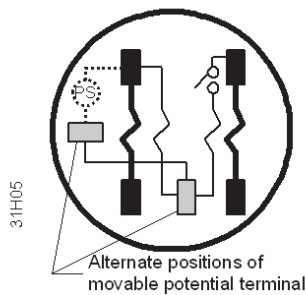
Form 3S



Form 4S



Form 12S

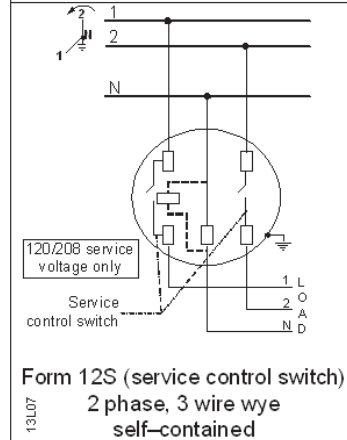
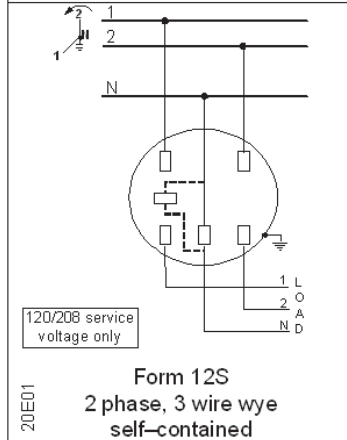
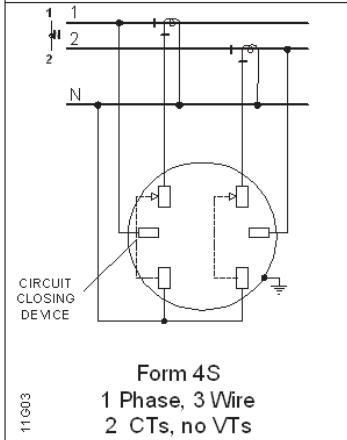
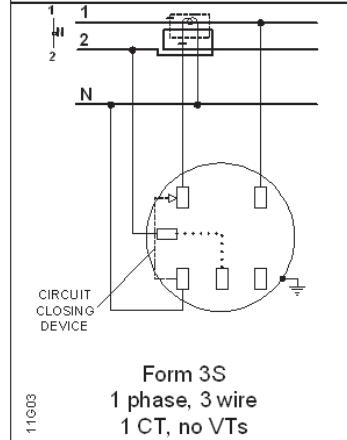
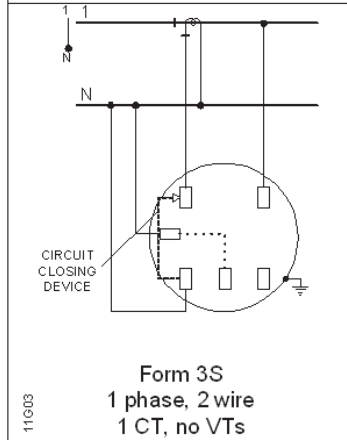
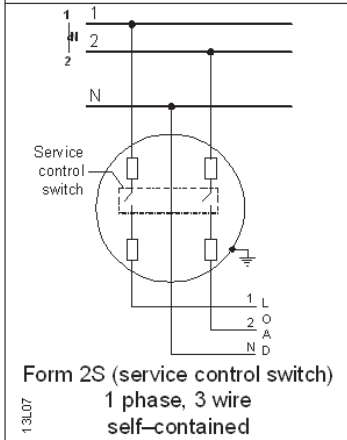
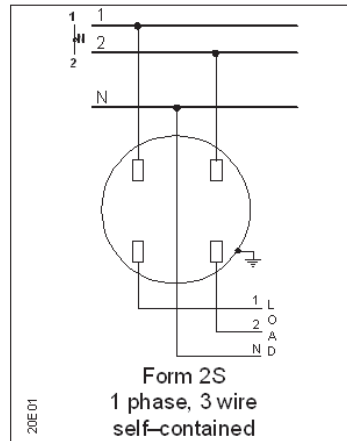
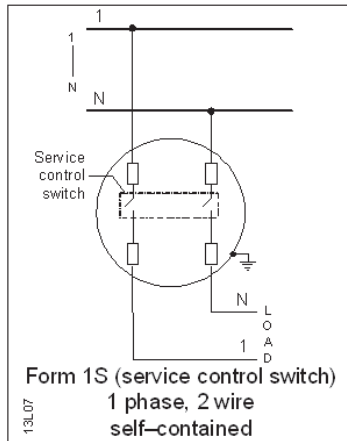
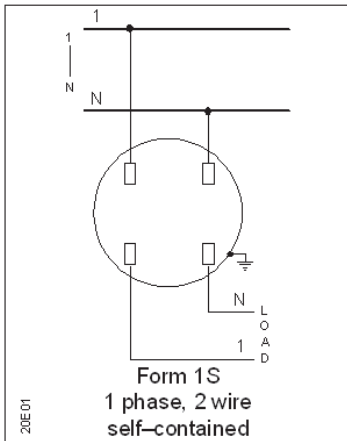


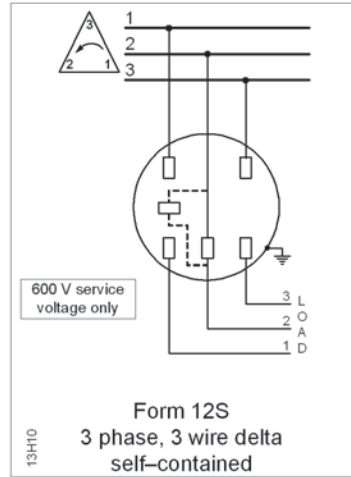
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Installation wiring diagrams

⚠ WARNING

Circuit closing devices must be used on current transformer secondaries. This applies to Forms 3S and 4S meters. Dangerous voltages are present if current transformer secondaries are open-circuited while the transformer is energized. Equipment damage, personal injury, or death can result if circuit-closing devices are not used.





FCC and Industry Canada Compliance

The radio module is manufactured directly onto the meter main circuit board, and the module is inserted into the electronic housing of the meter at manufacture. It has no user serviceable parts. For the most current REXUniversal meter compliance information, see PG42-1060.

User Information (Part 15.105): This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help

If you experience trouble with this equipment, please use the Return Material Authorization (RMA) feature available at the Online Customer Services at www.elstersolutions.com. Do not attempt to repair this equipment yourself unless you are replacing the entire module.

Compliance Statement (FCC Part 15.19 and Industry Canada): This device complies with part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

Énoncé de Conformité: Cet appareil est conforme à la Partie 15 des règles de la FCC et aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'utilisation de cet appareil est soumise aux deux conditions suivantes : (1) Cet appareil ne doit pas provoquer d'interférences nocives et (2) cet appareil doit accepter toutes les interférences reçues notamment celles pouvant provoquer un fonctionnement intempestif de l'appareil.

Antenna Compliance: Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

REX2 meter: This radio transmitter has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

REX2 meter: Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

- PCTEL (MAXRAD) MFB9150 unity gain Fiberglass omnidirectional: 2.15 dBi
- PCTEL (MAXRAD) MFB9153 3dB Fiberglass omnidirectional: 5.15 dBi
- Antenex TRA9023P(NP) (white body) or Antenex TRAB9023P(NP) (black body): 3 dBi

REXUniversal: This radio transmitter has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

REXUniversal: Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

- On Board Printed 900 MHz Slot Antenna: 4.1 dBi
- On Board Printed 2.4 GHz PIFA Antenna: 3.8 dBi

Warning (Part 15.21): Changes or modifications not expressly approved by Elster could void the user's authority to operate the equipment.

RF Radiation Safety Guidelines: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated to provide a separation distance of at least 28 cm from all persons.

Directives de Sécurité de Radiofréquence: Cet équipement est conforme aux limites d'exposition aux radiations définies par la Commission Fédérale des Communications (FCC) pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance d'au moins 28 cm de séparation de toutes personnes

Collocation Statement: This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Déclaration de Co-localisation: Cet émetteur ne doit pas être co-localisé ou opérant en conjonction avec aucune autre antenne ou transmetteur.

Notes:

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Draft 9/25/2015

Gridstream RF Coupling Antenna Installation Guide

Publication: 98-1245 Rev AF

Landis
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LANDIS+GYR CONFIDENTIAL INFORMATION

Draft 9/25/2015

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3/26/2013	AA	Released	Vicky Costello
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Gridstream RF Coupling Antenna Installation Guide

Overview

This publication outlines the procedure for installing the Gridstream RF Coupling Antenna on Gridstream RF Electric Endpoints.

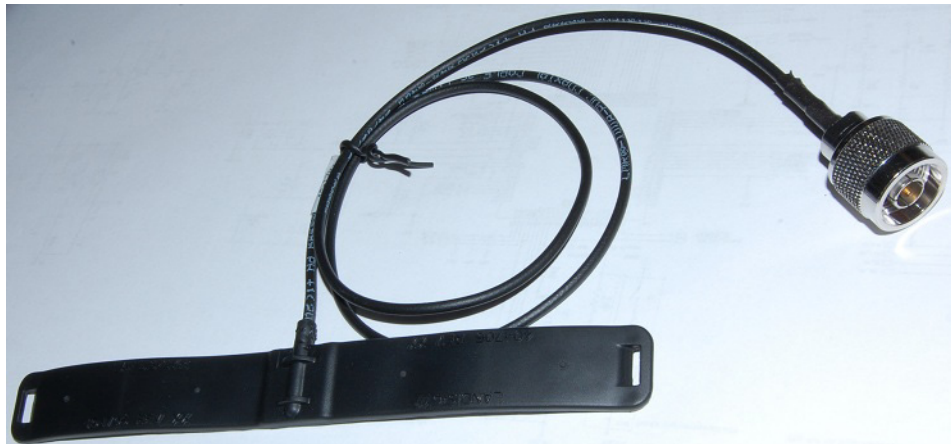


Figure 1. Gridstream RF Coupling Antenna

This antenna couples radio frequency energy to an external antenna. This is useful for meter installations where there is difficulty in obtaining adequate reception. For example, meters located in metal enclosures or in a basement. The coupling antenna utilizes a coaxial cable routed to the remote antenna. Coupling loss (including the 2.5 ft. cable) ranges from 5 to 9 dB, with 5 being a typical value. Environmental performance is rated for: 0 to 95% relative humidity, -40 to +85° C.

Coupler Part Numbers

The same coupler is used for all RF Coupling Antenna installations. The part number and description is as follows:

- 40-1705 flex loop, 2.5 ft. antenna cable, cable tie, adhesive

In the case where the length above is insufficient, Landis+Gyr recommends the extension cable listed below, terminated with a female “N” connector on one end and a male “N” connector on the other:

- 19-1742, extension cable, 20 ft.

Required Materials

The following materials are required to complete a RF Coupling Antenna installation.

- Alcohol wipes
- RTV - Part Number 30-0109, Dow Corning #839
- Cold flow sealing tape
- Hardware, appropriate to installation
- 45-1221, Kit, Antenna (consisting of items listed below)
 - 106119-000 Antenna, 5dBi Whip
 - Antenna Ground Plane
 - 16-0214: Barrel Connector N-Female to N-Female, “Bulkhead”

List of Terms

The following is a list of terms used to identify RF Coupling Antennas and related equipment.

Coupling Antenna

This is the flexible circuit that is at the end of the antenna assembly. It is referred to interchangeably as the flex circuit, flex dipole, patch antenna, coupler, and so on.

Remote Antenna

Refers to the omni whip antenna which will be “remoted” from the RF Coupling Antenna. The remote antenna is ideally mounted “line of sight” to the Gridstream RF Mesh network.

Optional Materials

The following items may be required, depending on the installation.

- 22-1542: Grommet, 1.25” OD, 1.0” ID with 0.25” center hole
- Mounting brackets, Landis+Gyr part numbers:
 - 28-1800: Bracket, antenna, meter box, right
 - 28-1801: Bracket, antenna, meter box, left
 - 28-1802: Bracket, antenna, ceiling mount
 - 28-1804: Bracket, antenna, wall, flat

Tools

The following tools may be required, depending on the installation.

- Flat head screwdriver
- Utility knife
- Battery-operated drill with 5/8- and 1-inch high speed metal bits
- Phillips head screwdriver
- Wire cutters
- Tape measure

Performance

Table 1. Performance

Parameter	Minimum	Typical	Maximum	Units	Condition
Frequency	902		928	MHz	
Coupling Loss		5	9	dB	
Polarization		Linear			
VSWR		1.78:1			Final antenna assembly on FOCUS AX: modular
Impedance		50		ohm	
Input RL		11		dB	Final antenna assembly on FOCUS AX: modular

Qualified Meters

The following table provides a list of qualified module and meters.

Table 2. RF Coupling Antenna Qualified Meters

Meter Name	Module Name	FCC ID
L+G FOCUS AX	Enhanced Modular FOCUS AX - 4MB or 8MB	TEB-HUNTSU864
L+G E650 RXRS4X	Enhanced E650 S4x - 4MB or 8MB	TEB-HUNTSU864
L+G AXS4e	Enhanced S4e - 4MB or 8MB	TEB-HUNTSU825
L+G RXS4e	Enhanced S4e - 4MB or 8MB	TEB-HUNTSU825
L+G AXRS4e	Enhanced S4e - 4MB or 8MB	TEB-HUNTSU825
L+G RXRS4e	Enhanced S4e - 4MB or 8MB	TEB-HUNTSU825
L+G FOCUS AX	Enhanced Integrated FOCUS AX	R7PEG1R1S2
L+G FOCUS RXAX	Enhanced Integrated FOCUS AX	R7PEG1R1S2
L+G FOCUS AXR	Enhanced Integrated FOCUS AX	R7PEG1R1S2
L+G FOCUS RXR	Enhanced Integrated FOCUS AX	R7PEG1R1S2
Elster A3RALNQ	Enhanced Elster A3	R7PEC6R1S2
TBD	Enhanced Elster REXU	TBD

General Installation Guidelines

Determine the optimum location for Gridstream Remote antenna installation. This will vary depending on the location of the meter. In general, the antenna should be:

- Installed as close to line of sight with a Gridstream RF network equipment as is possible.
- Mounted so that it is at least four inches from the nearest structure.
- Mounted so that a meter box cover, if the endpoint is enclosed in one, can be removed without interference from the remoted antenna.
- For inside-premise installations, Gridstream Remote antennas may be mounted in the proximity of an available window, or may need to be routed to the outside if the signal strength is insufficient.
- Mounted so that the antenna connector is OUTSIDE the meter box. A 1-inch hole should be drilled in the meter box so that the connector can be fed through the box. Use the appropriate mounting bracket to mount the antenna external to the meter box.
- Mounted so that any length of additional cable is minimized. The best practice for maximum cable length is to not exceed line loss (refer to cable manufactures line loss chart) vs. gain of antenna, the RF link loss by use of passive antenna can be excluded from the line loss calculation.

It is the responsibility of local installation organizations to ensure that local wiring codes and requirements are met, including the application of a safety ground, when required.



NOTE: This device and the supplied installation components are UV-resistant.



CAUTION: You can only use a 5dBi Whip Antenna that is consistent with the characteristics of 106119-00. To avoid violation of the FCC grant for these meters, do not use any other type of antenna.

Gridstream RF Enhanced FOCUS AX/AX-SD Mounting Procedure

This procedure supports the L+G FOCUS AX meter.



NOTE: The RF Coupling Antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover mounting area with an alcohol wipe and let the area dry for one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. **Firmly press the center of the antenna to the bottom (6 o'clock position) of the meter while aligning the upper edge of the antenna 1.2 cm below the inner plastic as shown in Figure 2.**

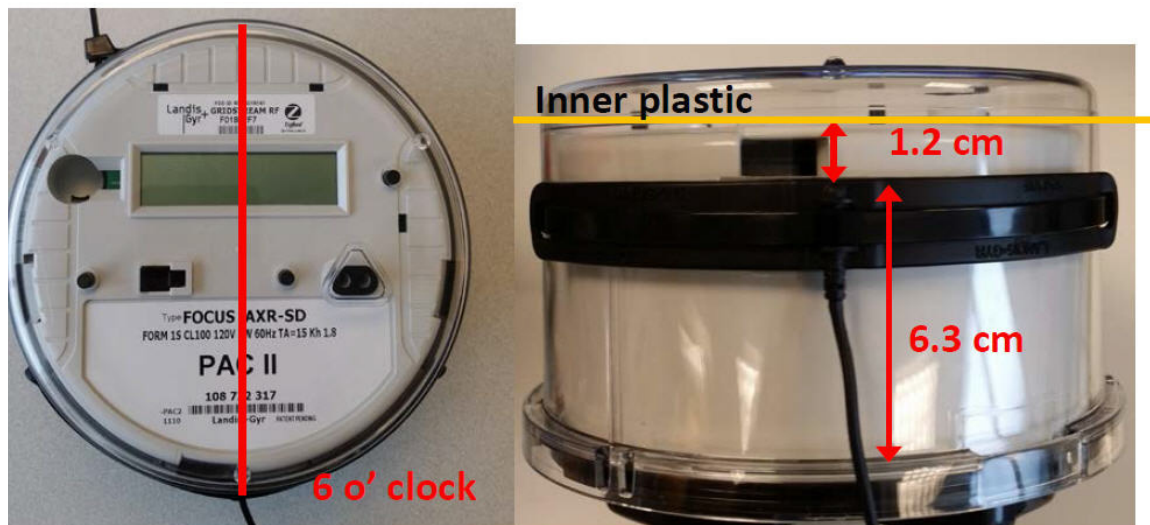


Figure 2. Installation On FOCUS AX/AX-SD Meters

4. Wrap the cable tie through and over antenna guides, and around the meter. Thread the cable tie into the mating end of itself.



Figure 3. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.
7. Once installed to the antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly and in a continuous manner. The tape should cover the cable one inch past the end of the connector.
8. Secure the cable to the side of the structure using appropriate hardware for the building construction.

Gridstream RF Enhanced S4e Mounting Procedure

This procedure supports the L+G AXS4e, L+G RXS4e, L+G AXRS4e, and L+G RXRS4e meters.



NOTE: The RF Coupling Antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover area with an alcohol wipe and let the area dry one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. ***Firmly press the center of the antenna onto the meter housing at the 2:30 o'clock position, 1.5 cm clockwise past the nub on the outer meter cover. Align the top edge of the antenna with the texture line on the S4e meter housing.***
4. Wrap the cable tie over and through the antenna guides, and around the meter. Thread the cable tie into the mating end of itself.

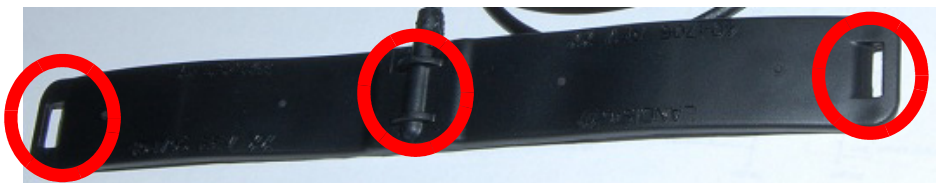
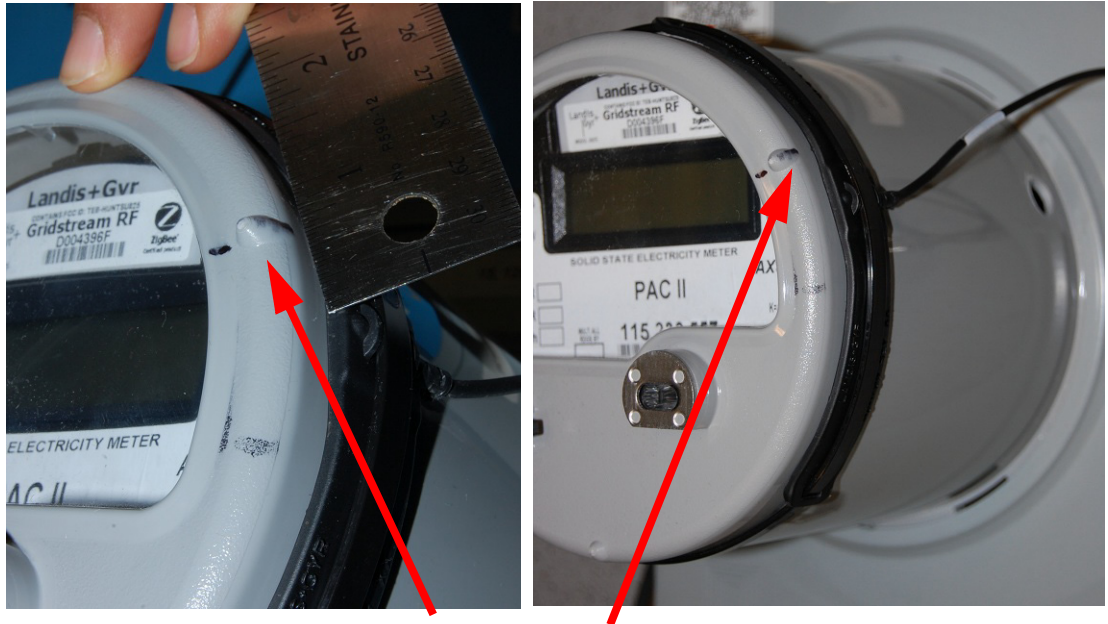


Figure 4. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.
7. Once installed to antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly around the cable and in a continuous manner. The tape should cover the cable one inch past the end of the connector.

- 8 Secure the cable to the side of the structure using appropriate hardware for the building construction. See Figure 5.



Align the antenna center point on the meter housing at the 2:30 o'clock position, 1.5 cm clockwise past the nub on the outer meter cover

Figure 5. Installation On Gridstream RF Enhanced S4e Meters

Gridstream RF Enhanced Integrated FOCUS AX/AX-SD Mounting Procedure

This procedure supports the L+G FOCUS AX, L+G FOCUS RXAX, L+G FOCUS AXR, and L+G FOCUS RXR meters.



NOTE: The RF Coupling Antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover mounting area with an alcohol wipe and let the area dry for one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. **Firmly press the center of the antenna to the 5 o'clock position of the meter while positioning the upper edge of the antenna 0.5 cm below the inner plastic cover as shown in Figure 6.**

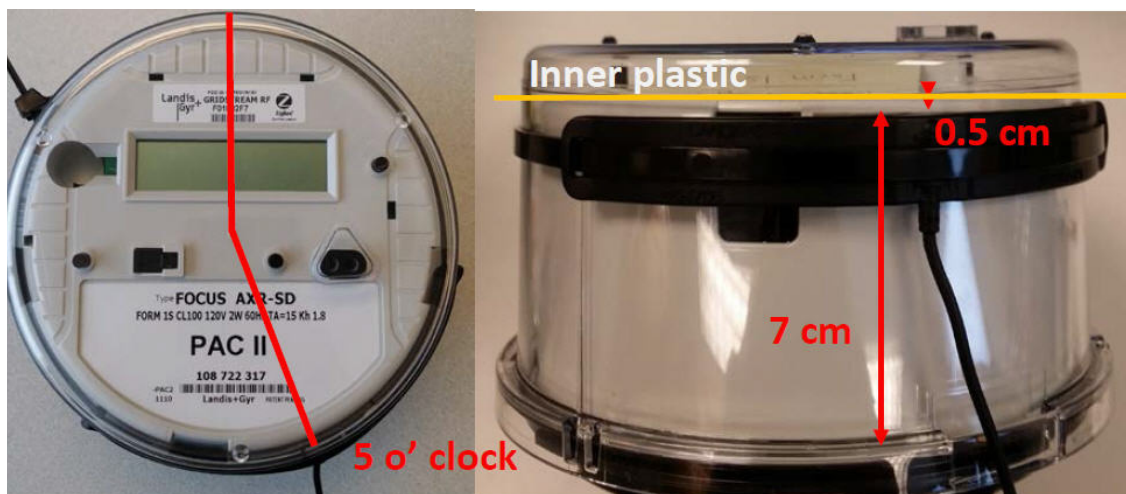


Figure 6. Installation On FOCUS Integrated AX/AX-SD Meters

4. Wrap the cable tie through and over antenna guides, and around the meter. Thread the cable tie into the mating end of itself.

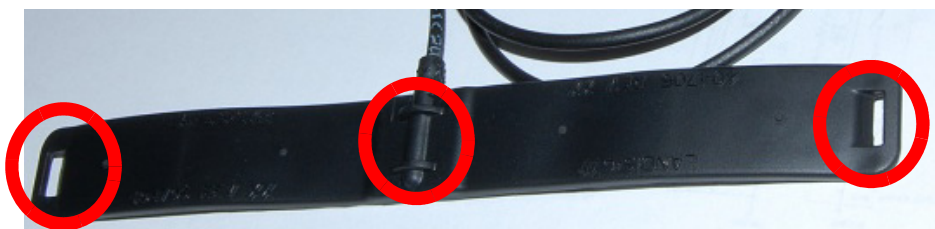


Figure 7. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.

7. Once installed to the antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly and in a continuous manner. The tape should cover the cable one inch past the end of the connector.
8. Secure the cable to the side of the structure using appropriate hardware for the building construction.

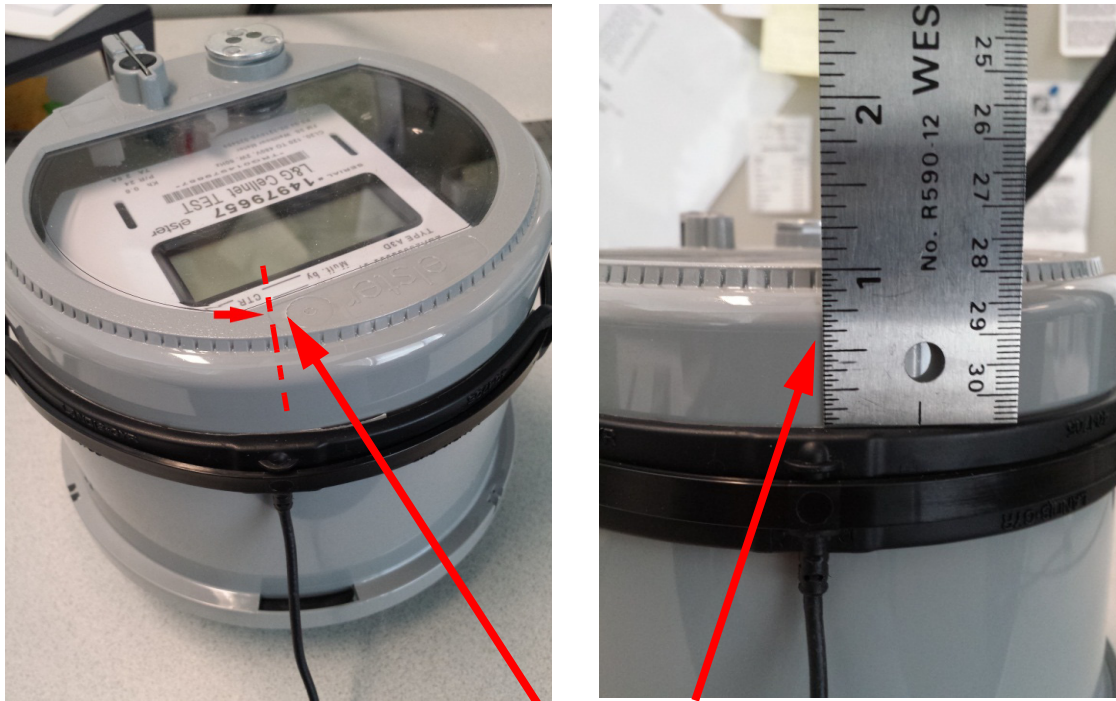
Gridstream RF Enhanced Elster A3 Mounting Procedure

This procedure supports the L+G Elster A3RALNQ meter.



NOTE: The passive antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover area with an alcohol wipe and let the area dry one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. **Firmly press the center of the antenna onto the meter housing at the 1:00 o'clock position of the meter while positioning the upper edge of the antenna 2.5 cm below the top surface of the meter cover.**



Align the antenna center point at the 1:00 position (Texture change in plastic) with the upper edge of the antenna 2.5 cm (1 inch) below the top surface of the meter cover

Figure 8. Installation On Elster A3 Meters

4. Wrap the cable tie over and through the antenna guides, and around the meter. Thread the cable tie into the mating end of itself.



Figure 9. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.
7. Once installed to antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly around the cable and in a continuous manner. The tape should cover the cable one inch past the end of the connector.
8. Secure the cable to the side of the structure using appropriate hardware for the building.

Gridstream RF Enhanced Elster REXU Mounting Procedure

This procedure supports the TBD meter.



NOTE: The passive antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover area with an alcohol wipe and let the area dry one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. **Firmly press the center of the antenna onto the meter housing at the 7:00 o'clock position of the meter while positioning the lower edge of the antenna 2.5 cm below the surface of the meter cover.**

7:00 o'clock will be 240 degrees if you use 3 o'clock as a reference, as shown in Figure 10.



Align the antenna center point at the 7:00 position with the lower edge of the antenna 2.5 cm (1 inch) below the top surface of the meter cover

Figure 10. Installation On Elster REXU Meters

4. Wrap the cable tie over and through the antenna guides, and around the meter. Thread the cable tie into the mating end of itself.

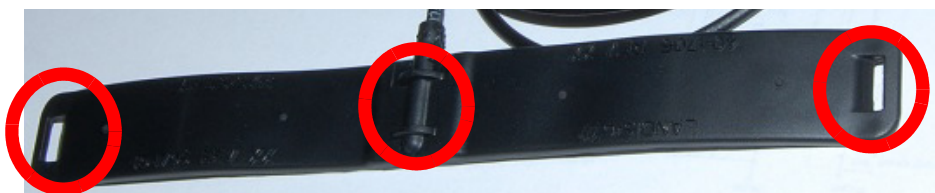


Figure 11. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.

7. Once installed to antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly around the cable and in a continuous manner. The tape should cover the cable one inch past the end of the connector.
8. Secure the cable to the side of the structure using appropriate hardware for the building.

Gridstream RF Enhanced S4x Mounting Procedure

This procedure supports the L+G E650 RXRS4X meter.



NOTE: The RF Coupling Antenna should be mounted within 5 mm (0.25") of the indicated location to achieve specified performance.

1. Clean the meter cover where the flex antenna will be installed. Wipe the cover area with an alcohol wipe and let the area dry one minute before proceeding with the installation.
2. Peel the paper backing off of the adhesive tape (bottom of coupling antenna).
3. ***Firmly press the center of the antenna onto the meter housing at the 5:00 o'clock 30 minutes position of the meter (~1.5 cm past the nub on the meter cover) while positioning the upper edge of the antenna 6.5 cm below the to surface of the meter cover.***
4. Wrap the cable tie over and through the antenna guides, and around the meter. Thread the cable tie into the mating end of itself.



Figure 12. Antenna Guides

5. Ensure that the cable tie is evenly placed over the antenna and cinch tight.
6. Install the remote antenna at the location indicated by the link assessment performed. If a link assessment tool is not available, select a location that provides the best line of sight to the nearest collector.
7. Once installed to antenna, wrap the connector using cold flow tape. Tape should be wrapped tightly around the cable and in a continuous manner. The tape should cover the cable one inch past the end of the connector.

8. Secure the cable to the side of the structure using appropriate hardware for the building.



Align the antenna center point on the meter housing at the 5:30 o'clock position, 6.5 cm clockwise below the top surface of the meter cover

Figure 13. Installation On S4x Meters

Antenna Brackets and Antenna Mounting

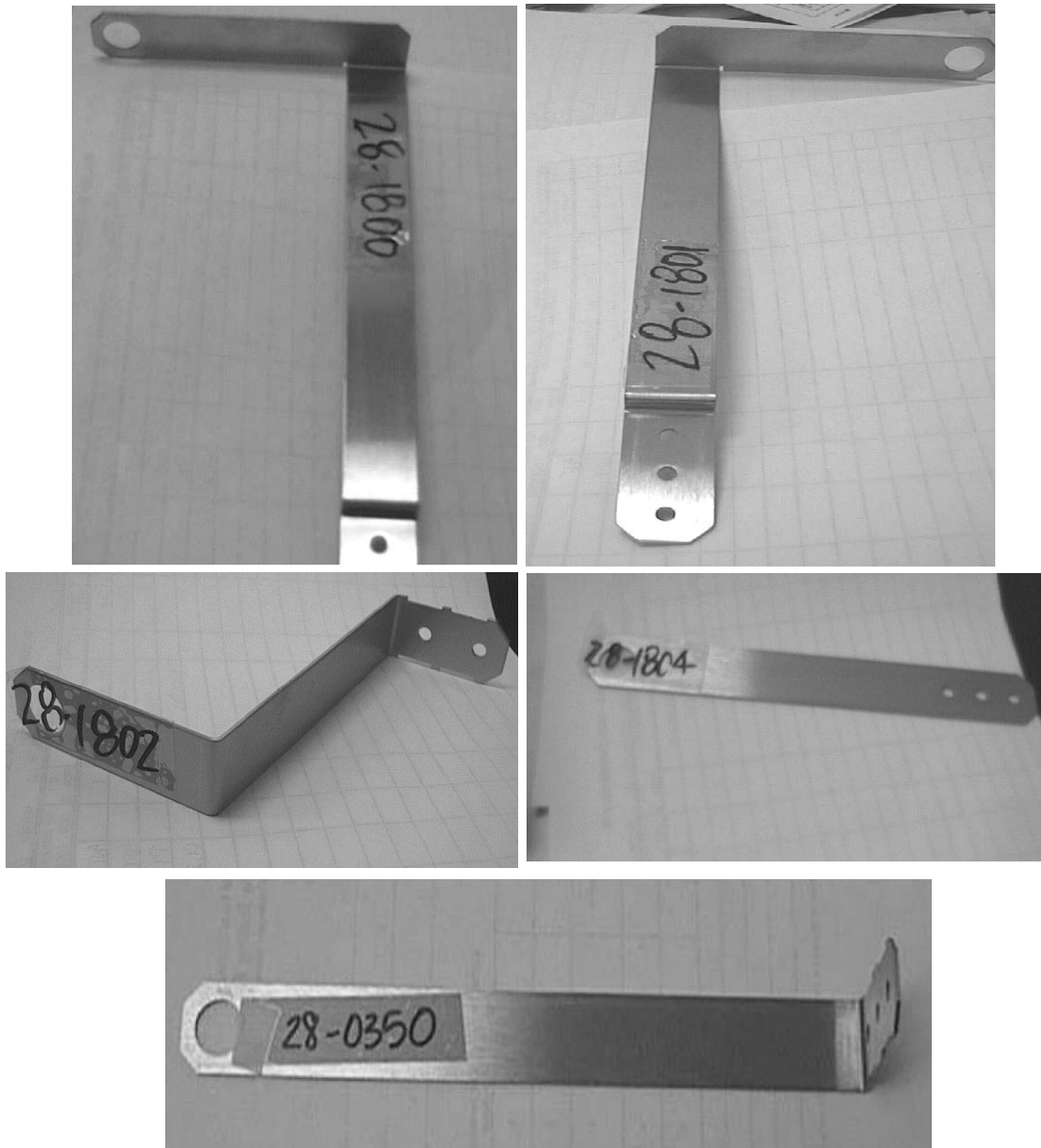


Figure 14. Typical Remote Antenna Brackets



NOTE: To mount these brackets, use screw and bolt hardware that is approved by the local utility.

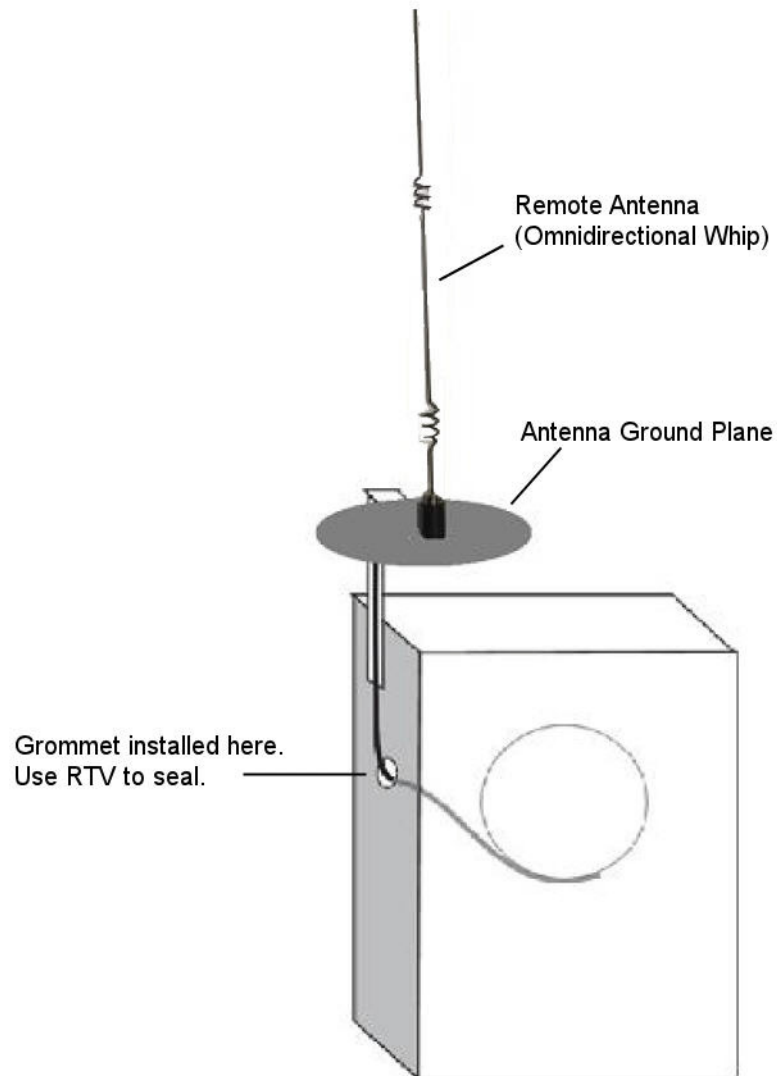


Figure 15. Example Remote Antenna Illustration