

Solar EA_Repeater installation instructions

IL42-5020B

General

NOTICE

Areas with less than 2 hours of sunlight per day for significant periods of time (for example: Alaska, northern Canada, etc.) are not suitable locations for the EA_Repeater with the solar power option.

For information regarding solar insolation, visit the following Web sites:

- Within the United States, see the National Renewable Energy Laboratory at <http://www.nrel.gov/gis/solar.html>
- Within Canada, see Natural Resources Canada:
https://glfc.cfsnet.nfis.org/mapserver/pv/index_e.php (English)
https://glfc.cfsnet.nfis.org/mapserver/pv/index_f.php (français)

In less densely populated areas, the range of a gatekeeper's EA_LAN can be extended by deploying a repeating device called the EA_Repeater. EA_Repeaters enhance network performance with two-way communications in rural or remote areas where EnergyAxis-enabled electricity meters are not sufficiently dense to support reliable mesh network communications. The EA_Repeater can also be used to create the EA_LAN for water-only or gas-only utilities or utility service areas.

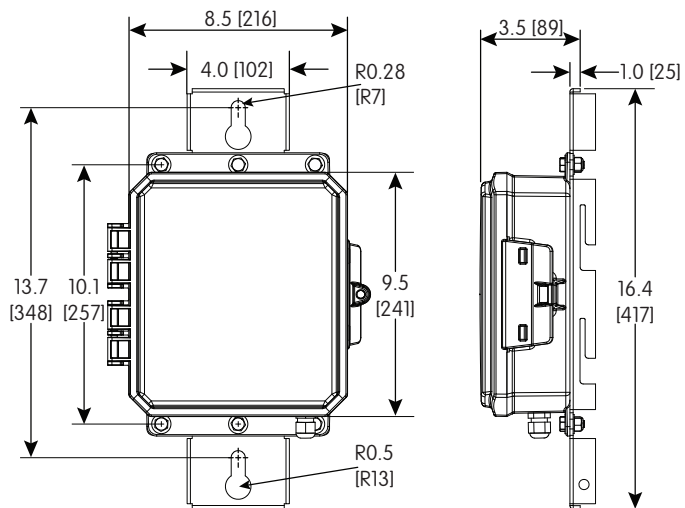
There are two versions of the EA_Repeater. Both versions use a NEMA 4X rated polycarbonate enclosure that provides different installation options. If the antenna needs to be elevated to increase communications distances, version 2 offers the ability to add a remote external antenna.

- Figure 1 shows the approximate dimensions of version 1
- Figure 2 shows the approximate dimensions of version 2
- Figure 3 shows the approximate dimensions of the solar panel

NOTICE

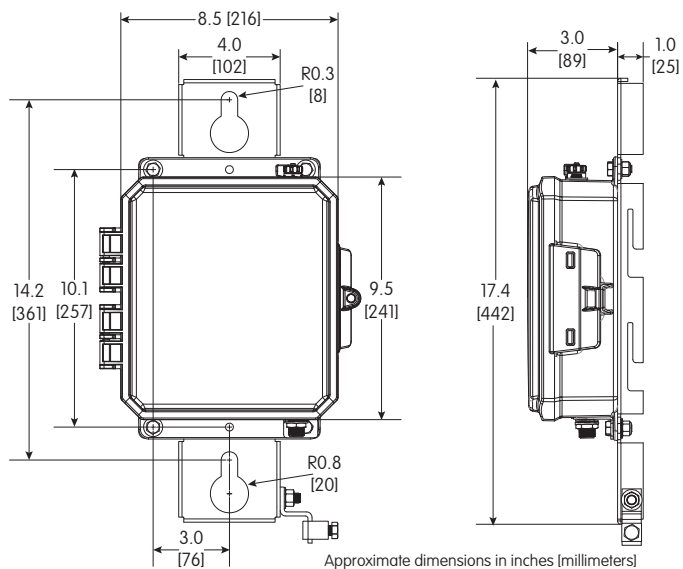
Before installing the EA_Repeater (version 2), you must tear off the foam cubes located inside the surface of the enclosure door. Failure to remove the foam cubes may result in allowing moisture and dust to enter the enclosure. See "Removing the foam cubes" on page 3 for more information.

Figure 1. Solar EA_Repeater (version 1) dimensions



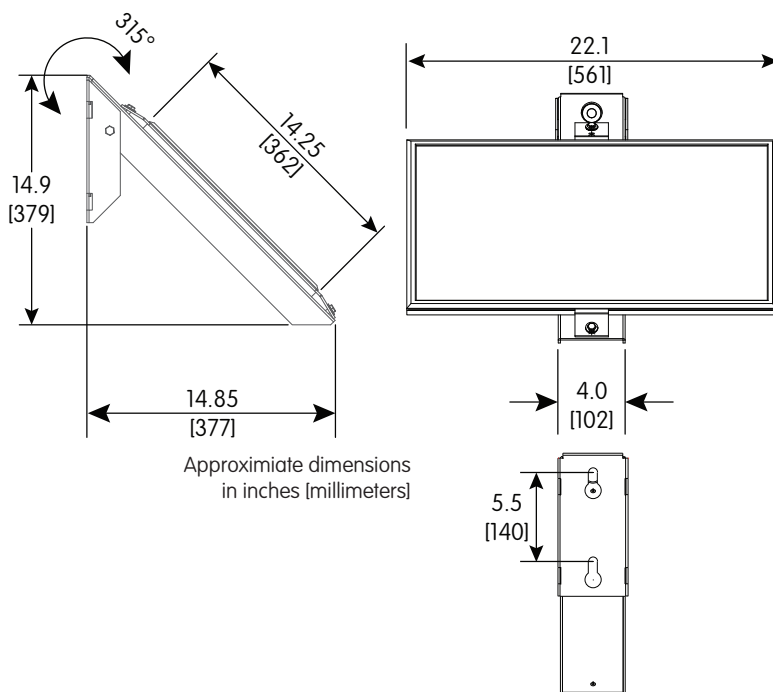
Approximate dimensions in inches [millimeters]

Figure 2. Solar EA_Repeater (version 2) dimensions



Approximate dimensions in inches [millimeters]

Figure 3. Solar panel dimensions



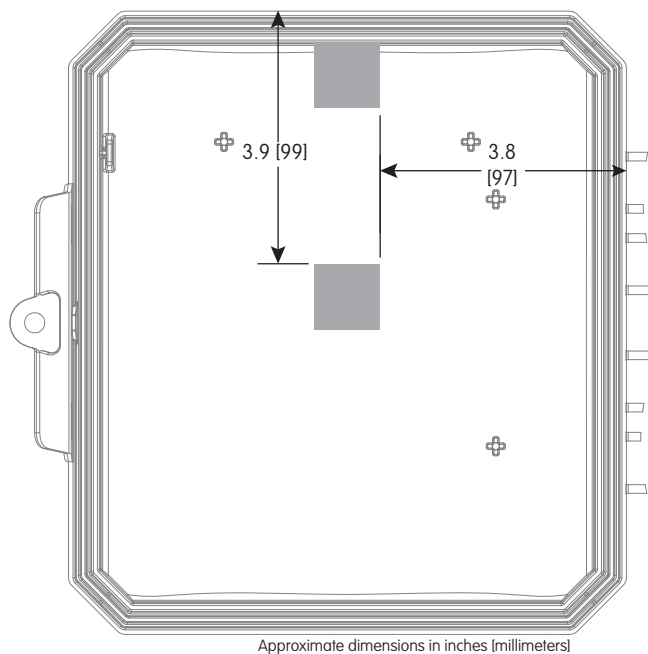
Removing the foam cubes

⚠ WARNING

Use authorized utility procedures when handling the EA_Repeater. Dangerous voltages are present. Equipment damage, personal injury, or death can result if authorized utility procedures are not followed when handling the EA_Repeater.

The EA_Repeater version 2 is shipped with foam cubes attached to the inside surface of the enclosure door (see Figure 4). Before placing the repeater into service, tear off the two 1-inch by 1-inch foam cubes. Failure to remove the foam cubes may result in allowing moisture and dust to enter the enclosure.

Figure 4. Location of the foam cubes to be removed



EA_Repeater components

Visually inspect all parts for any damage that may have occurred during shipment. Contact Elster if you discover any components broken or missing.

NOTICE

The EA_Repeater contains components that are sensitive to electrostatic discharge (ESD). When installing, servicing, or removing components, connect to ground with a wrist strap and follow safe ESD procedures. Failing to properly ground both you and the electronic devices or failure to follow safe ESD procedures to avoid ESD can result in equipment damage.

Item	Manufacturer	Version 1 part number	Version 2 part number
MPPT solar controller	GenaSun	1B11886H01	1B11886H01
PV panel subassembly	Elster	5D25978G01	5D25978G02
Electronic assembly	Elster	5D26170G54	5D26170G54
Enclosure mounting bracket	Elster	5D25872H02	5D25872H02

Figure 5. EA_Repeater (version 1) components

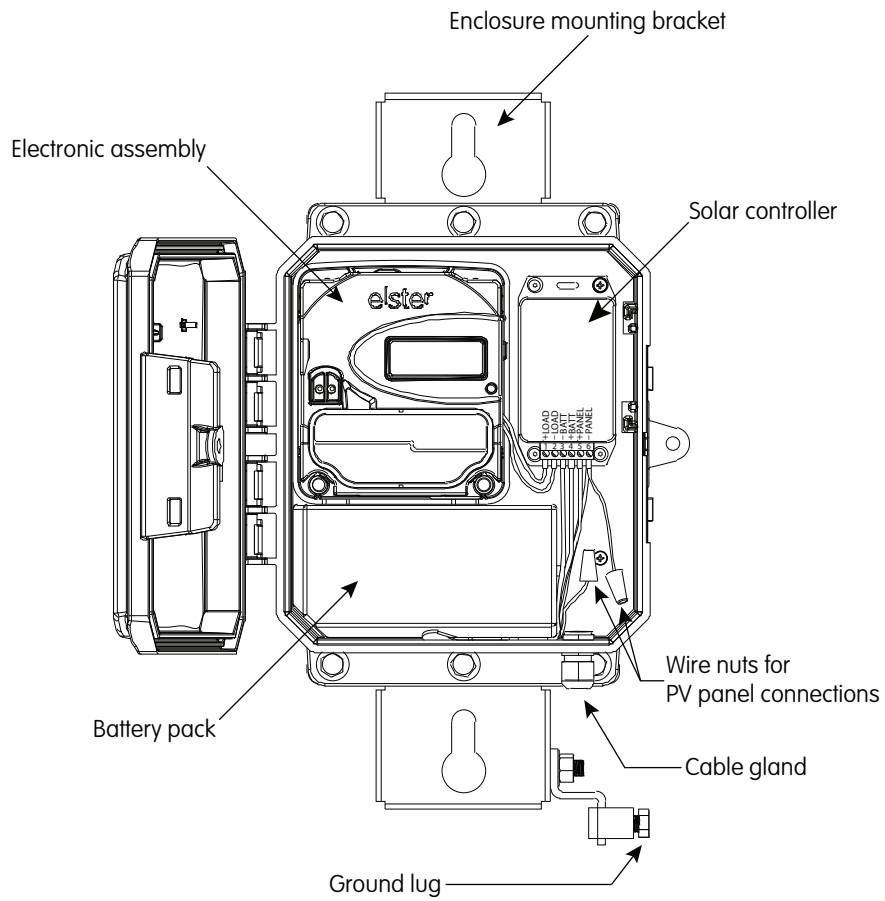
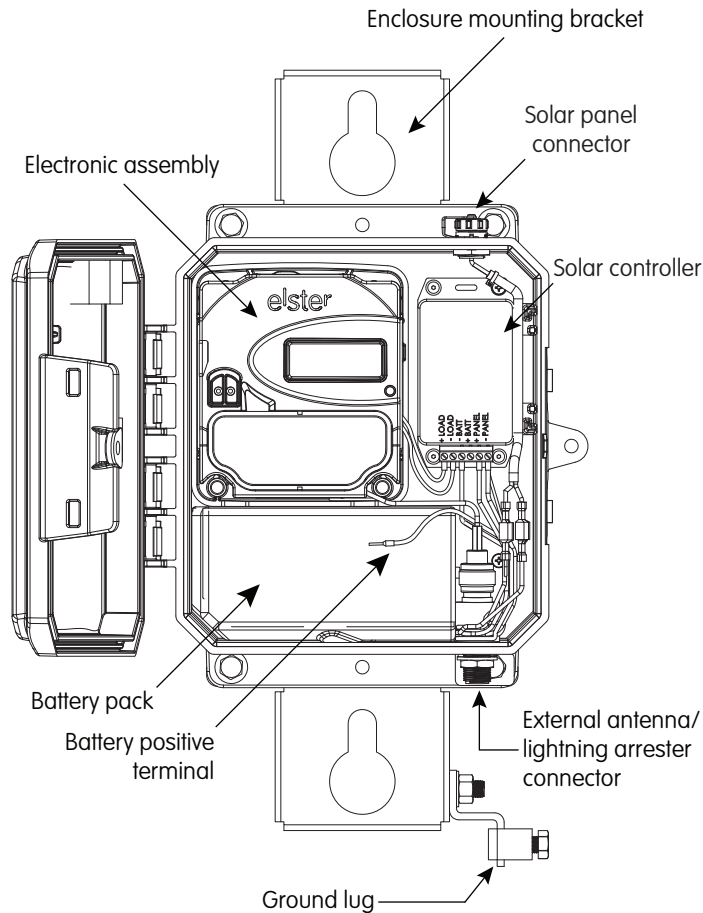


Figure 6. EA_Repeater (version 2) components



Remote LAN antenna supporting hardware

These additional antenna hardware components are required to place the EA_Repeater (version 2) into service: antenna, antenna mounting hardware, and an RF cable to route between the enclosure and antenna. The following table identifies the approved antennas. You can obtain the components using your preferred provider or order it through your local Elster representative.

Note: This device has been designed to operate with the antennas listed below and having a maximum gain of 5.15 dBi. Antennas not included in this list or having a gain greater than 5.15 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Antenna	Mount	Gain
PCTEL (MAXRAD) MFB9150 unity gain Fiberglass omnidirectional	Remote	2.15 dBi
PCTEL (MAXRAD) MFB9153 3 dB Fiberglass omnidirectional	Remote	5.15 dBi

The following hardware is available for purchase from Elster. Your local Elster representative can assist you with purchasing these components as needed.

Item	Part number
MAXRAD MBF9153 antenna and mounting hardware	7S1812G001
Stock cable lengths	
N-male to N-male LMR-400 RF cable, 10-foot	7S1816H001
N-male to N-male LMR-400 RF cable, 15-foot	7S1816H002
N-male to N-male LMR-400 RF cable, 25-foot	7S1816H003
N-male to N-male LMR-400 RF cable, 35-foot	7S1816H004
N-male to N-male LMR-400 RF cable, 50-foot	7S1816H005
N-male to N-male LMR-400 RF cable, 100-foot	7S1816H006

Placing the solar EA_Repeater into service

Determine your mounting location and use the appropriate features on the universal mounting bracket to secure the device:

- **Keyhole features:** The keyhole features are intended to ease installation of the EA_Repeater by allowing the device to hang from the fastener. The bolts can be partially installed in the mounting location leaving a few inches of fastener exposed. The head of the fastener can then pass through the large portion of the opening and rest in the narrower portion. The fasteners can then be fully secured without having to hold the device in place.
- **Open aperture banding slots:** The banding features are used to accommodate up to a 3/4-inch stainless steel strap. These features include an open aperture to allow the bands to be partially installed such that the EA_Repeater can hang on the straps. The straps can then be fully secured without having to hold the device in place.

Installing the EA_Repeater remote antenna hardware (version 2 only)

⚠ WARNING

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Placing the EA_Repeater into service will require mounting the remote external antenna in a suitable location. The antenna should be mounted in the clear, as free from conductive or metallic obstructions as possible. The connectors should be sealed for waterproofing.

There are several options for remote antenna cabling. The most economical connection to the external remote antenna is the LMR-400 type cable. This type of cable is suitable for distances up to 100 feet (approximately 30 meters). Antenna cables should be ordered with the N-type male connectors on each end. One end attaches to the EA_Repeater housing, and the other end attaches to the antenna. You may perform on-site assembly, order stock lengths from Elster, or order pre-assembled cables (for example, from Laird Technologies).

The RF cable should be mounted at the bottom of the enclosure in a drip loop fashion. A drip loop is formed by bringing the RF cable to a point below the enclosure and then bending it back up to the lightning arrestor bulkhead. This forms a U-shape which allows water to run down the cable exterior.

Connecting power to the EA_Repeater (version 1)

WARNING

Use authorized utility procedures when installing the EA_Repeater into service. Dangerous voltages are present. Equipment damage, personal injury, or death can result if authorized utility procedures are not followed when installing the EA_Repeater.

CAUTION

Do not short-circuit the red battery cable to the controller. Shorting the red battery cable can permanently damage the battery assembly or solar controller and cause faulty operation to the device.

Be sure to follow your utility's procedures for installing the solar panel that will be used for the EA_Repeater. Be sure to follow your utility's procedures for installing or mounting the EA_Repeater on the pole or surface.

The EA_Repeater is shipped with most of the wiring connections already made. To complete the wiring and place the EA_Repeater into service (see Figure 5):

- 1 Remove the vinyl cap from the battery positive terminal. The vinyl cap is no longer needed and may be disposed.
- 2 Attach the red battery cable to the positive battery terminal on the solar controller.
- 3 Feed the solar supply cable through the PV panel gland.
- 4 Attach the red PV panel cable to the solar controller white flying lead.
- 5 Attach the black PV panel cable to the solar controller black flying lead.
- 6 Torque the PV panel gland to 22 inch-pounds (2.5 Newton-meters).

Connecting power to the EA_Repeater (version 2)

WARNING

Use authorized utility procedures when installing the EA_Repeater into service. Dangerous voltages are present. Equipment damage, personal injury, or death can result if authorized utility procedures are not followed when installing the EA_Repeater.

CAUTION

Do not short-circuit the red battery cable to the controller. Shorting the red battery cable can permanently damage the battery assembly or solar controller and cause faulty operation to the device.

Be sure to follow your utility's procedures for installing the solar panel that will be used for the EA_Repeater. Be sure to follow your utility's procedures for installing or mounting the EA_Repeater on the pole or surface.

The EA_Repeater is shipped with most of the wiring connections already made. To complete the wiring and place the EA_Repeater into service (see Figure 6):

- 1 Remove the vinyl cap from the battery positive terminal. The vinyl cap is no longer needed and may be disposed.
- 2 Attach the red battery cable to the positive battery terminal on the solar controller.
- 3 Unscrew the cap to the solar panel connector.
- 4 Attach the solar panel cable to the solar panel connector. The cable is keyed. Once the cable is correctly aligned, it will slide into place.
- 5 Securely hand-tighten the solar panel cable.

FCC and Industry Canada Compliance 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 (Part 15.19)

This device complies with Part 15 of the FCC Rules and Class B digital apparatus requirements for ICES-003. 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.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, 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 exigences relatives aux appareils numériques de classe B conformément à l'avis sur la compatibilité électromagnétique ACEM-3. 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

To reduce potential 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 permitted for successful communication. 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.

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.

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

The device should be installed in a location where there will be a separation greater than 20 cm (8 inches) from locations occupied by humans.

Collocation Statement

Collocation of simultaneously-transmitting (co-transmitting) antennas located within 20 cm of each other within a final product is not allowed.

DISCLAIMER OF WARRANTIES AND LIMITATIONS OF LIABILITY

There are no understandings, agreements, representations, or warranties either express or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out by any existing contract between the parties. Any such contract states the entire obligation of the seller. The contents of this document shall not become part of or modify any prior existing agreement, commitment, or relationship.

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