

## A3 ALPHA® Meters with External Antenna Capability

For Use in the EnergyAxis® System

### General

To function in the EnergyAxis System, the A3 ALPHA meter must be configured at the factory with either of the following option boards:

- The internal LAN node (ILN1) option board for operation as a node within the EnergyAxis System
- The internal LAN controller (ILC1) option board

Typically, the internal antenna used on the ILN1 option board and the ILC1 option board are sufficient for reliable communication with the EnergyAxis network. However, if the A3 ALPHA meter is enclosed in a metal service cabinet or the antenna must be mounted higher to overcome signal obstruction, an external antenna may be used.

This leaflet contains general information for installing the A3 ALPHA meter equipped with connections for an external antenna.

- For information on the operation of the A3 ALPHA meter, see the *A3 ALPHA Meter Technical Manual* (TM42-2190B or later) or the *A3 ALPHA Meter Technical Manual For Use in Canada* (TM42-2195A or later)
- For information on installing the A3 ALPHA meter, see the “ALPHA Meter Installation Instructions” (IL42-4001N or later)

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### ⚠ 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 precautions are not followed. Use circuit closing devices on current transformer secondaries (3S, 4S, 5S, 5A, 6S, 6A, 8S, 9S, 10S, 10A, 26S, 29S, 35S, 35A, 36S, and 36A meters). Equipment damage, personal injury, or death can result if circuit closing secondaries are not used.**

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### Connecting an External Antenna

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.

*Internal antenna:* Elster Electricity P/N: 1B12150H01

*Local external antennas:* Laird/Antenex TRA(B)9023P (3.1 dBi); Laird/Antenex TRA(B)9023NP (3.1 dBi)

*Remote external antennas:* PCTEL/MAXRAD P/N MFB9380 (Tessco P/N 61900) for unity gain (2.15 dBi); PCTEL/MAXRAD P/N MFB 9153 (Tessco P/N 74300) for 3 dB gain (5.15 dBi)

The external antenna connects to either the ILN1 option board or the ILC1 option board using a connector lead as shown in Figure 1. In addition to the standard internal antenna, there are two options available for connecting an external antenna:

- Local external antenna
- Remote external antenna

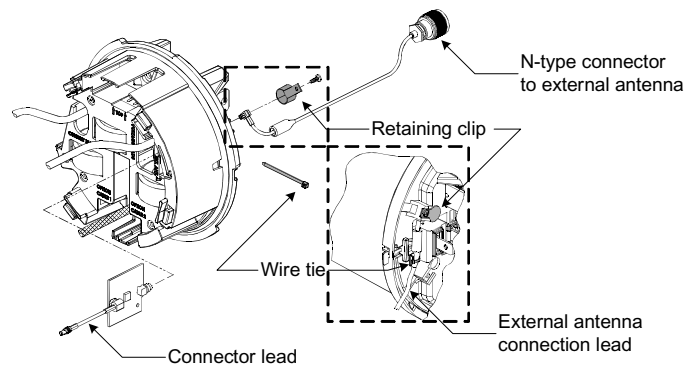


Figure 1. Retaining clip and connector lead

### Local External Antenna

If the A3 ALPHA meter is used in a metal service cabinet, using a local external antenna may be necessary. To obtain better coverage, the local external antenna can be mounted on the top of the metal service cabinet or the meter socket enclosure (see [1] in Figure 2).

Elster recommends Antenex Inc.'s 902-928 MHz Permanent Mount antenna (TRAB9023P).<sup>1</sup> To mount the antenna on the service cabinet or meter socket enclosure, drill a 5/8-inch hole into the cabinet wall with a step drill. Insert the antenna through the hole. After the antenna is mounted, the antenna's Type N female connector can be mated with the meter's Type N male connector.

For installations where the mounting for the local antenna does not provide a conductive metallic ground plane, the Antenex TRAB9023NP (no ground plane required) may be employed. The gain and pattern are virtually identical with the TRAB9023P version and the TRAB9023NP may also be employed on metallic ground planes with good results.

### Remote External Antenna

If the A3 ALPHA meter is used in a metal building, or the meter is installed in a location where the site requires an antenna at a greater height to overcome blocked signals, a remote antenna may be required. If a remote external antenna is used, a lightning/surge arrestor should be installed at the bottom of the socket enclosure (see [2] in Figure 2). Elster recommends a PolyPhaser DSXL IN-LINE EMP surge filter (Tessco P/N 491574).<sup>2</sup>

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## NOTICE

Do not use a standard RG-8/U cable with solid polyethylene dielectric. The losses in solid dielectric RG-8/U cables in short distances make solid dielectric RG-8/U cables unacceptable.

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The most economical connection to the remote external antenna is the RG-8/U "foam" or "LMR-400" type cable. This type of cable should be suitable for distances of up to 100 feet. The foam dielectric cable will incur a loss of approximately 3.9 dB in 100 feet (or approximately 2 dB in 50 feet). The coaxial cable should be mounted at the bottom of the meter socket in "drip loop" fashion. A "drip loop" is formed by bringing the coaxial cable to a point below the meter socket and then bending it back up to the connector. This forms a U-shape, which allows water to run down the cable exterior. Antenna cables should be ordered with N-type male connectors on each end.

<sup>1</sup> Antenex, 2000-205 Bloomingdale Road, Glendale Heights IL 60131. Telephone: 630-351-9007. Website: antenex.com

<sup>2</sup> PolyPhaser Corporation, 2225 Park Place, Minden, NV 89423. Telephone: 800-325-7170. Website: polyphaser.com.

The collectors and nodes in the EnergyAxis System operate under Part 15.247 of the FCC Rules. Suitable antennas are omni-directional antennas of unity gain or 3 dB gain (2.15 and 5.15 dBi, respectively). Elster recommends the following, which are rated to withstand 100 mph winds and are fitted with Type N female connectors:

- PCTEL/MAXRAD MFB9300 Series (Tessco P/N 61900) for unity gain (2.15 dBi)
- PCTEL/MAXRAD MFB9153 Series (Tessco P/N 74330) for 3 dB gain (5.15 dBi)

Regardless of the antenna selected, the antenna should be mounted with at least two MMK1 pipe clamps (Tessco SKU 68869). The antenna should be mounted in the clear, as free from the conductive or metallic obstructions as possible. The connectors should be sealed for waterproofing.

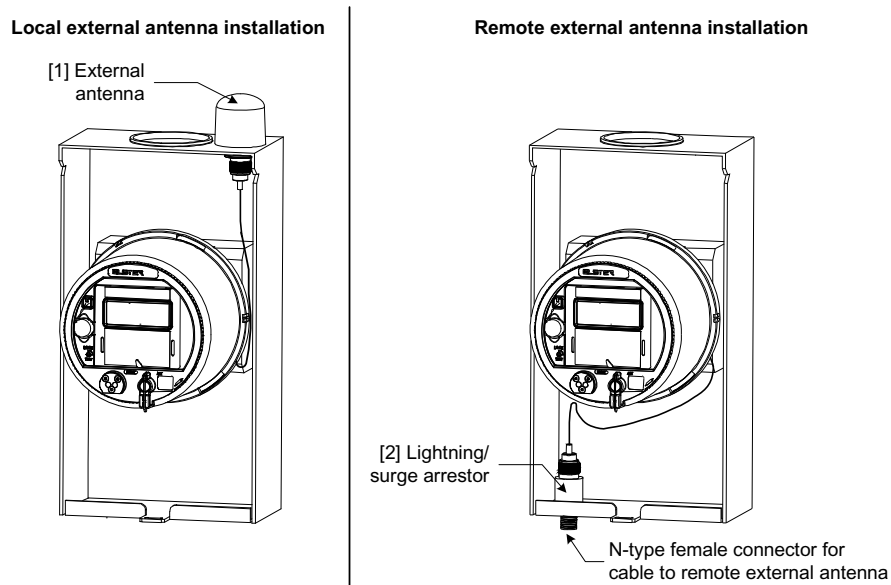


Figure 2. External antenna options

Remote antenna materials described in this IL can be obtained from the following:

Tessco Technologies, Inc.  
 11126 McCormick Road  
 Hunt Valley, MD 21031-1494  
 +1 800 508 5444  
 tessco.com

Laird/Antenex antennas can be obtained from the following:

OEM Sales M6  
 Laird Technologies  
 1751 Wilkening Court  
 Schaumburg, IL 60173  
 +1 847 839 6916 (telephone) or +1 847 839 6063 (fax)  
 www.lairdtech.com

**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 Request (RMR) feature available at the Online Customer Services at [www.elsterelectricity.com](http://www.elsterelectricity.com). Do not attempt to repair this equipment yourself unless you are replacing the entire module.

*Compliance Statement (Part 15.19)*

The ILN1 and ILC1 option boards comply with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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

*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.

*Warning (Part 15.21)*

Changes or modifications not expressly approved by Elster Electricity 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.

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**Elster Electricity, LLC**  
Raleigh, North Carolina USA



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