A3 ALPHA® Meters with External Antenna Capability

For use with the ILC/ILN option board

General

Typically, the internal antenna used with the ILC/ILN option board is sufficient for reliable communication with the EnergyAxis network. However, if the A3 ALPHA meter is enclosed in a metal service cabinet or the antenna needs to be mounted higher to increase communication distances, 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" (IL42-4001Q or later)

⚠ 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.

Connecting an External Antenna

The A3 ALPHA meter with the ILC/ILN option board has been certified for operation with the following antennas. Antennas not included in this list are strictly prohibited for use with this device.

- *Internal antenna:* Elster Electricity P/N: 1B12150H01
- *Local external antennas:* Laird/Antenex TRA9023P (3.1 dBi) for use only with metal service cabinets and meter sockets; Laird/Antenex TRA9023NP (3.1 dBi) for use only with non-metal service cabinets[1]
- *Remote external antennas:* PCTEL/MAXRAD P/N MFB9150[2] (2.15 dBi); PCTEL/MAXRAD P/N MFB 9153 (5.15 dBi)

[1] These part numbers specify antennas with a white body. For antennas with a black body, use part numbers TRAB9023P and TRAB9023NP, respectively. The version with an "N" does not require it to be mounted on a ground plane and should only be used in non-metal cabinets. The version without an "N" requires a conductive ground plane under the antenna and should only be used in metal service cabinets and meter sockets.

[2] This part number specifies an antenna with a black body. For antenna with a white body, use part number MFA9150.

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The external antenna connects to the ILC/ILN option board using a connector lead as shown in Figure 1. There are two options available for connecting an external antenna:

- Local external antenna
- Remote external antenna

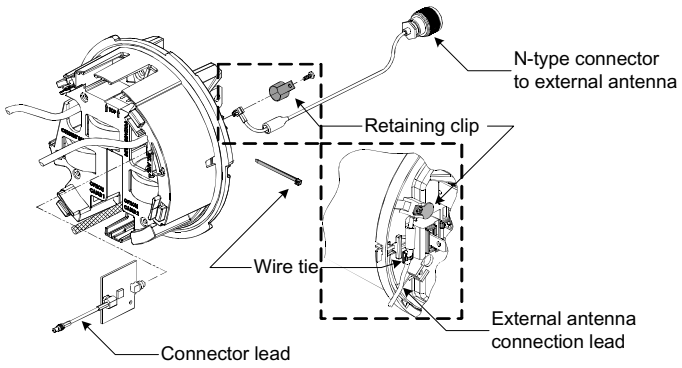

Figure 1. Retaining clip and connector lead

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 the Laird/Antenex 902-928 MHz permanent mount antenna (TRA9023P). 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 of the local antenna does not provide a conductive metallic ground plane, the Antenex TRA9023NP (no ground plane required) may be employed. The gain and pattern are virtually identical with the TRA9023P version. The TRA9023NP antenna 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, a remote antenna may be used. 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).[1]

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.

[1] PolyPhaser Corporation, 2225 Park Place, Minden, NV 89423. Telephone: 800-325-7170. Website: polyphaser.com.

The most economical connection to the remote external antenna is the RG-8/U “foam” or “LMR-400” type cable. This type of cable is 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.

The A3 ALPHA meter with the ILC/ILN option board has been certified for operation with the following remote external antennas. Both antennas are rated to withstand 100 mph winds and are fitted with Type N female connectors:

- PCTEL/MAXRAD MFB9150 Series (Tessco P/N 39493) 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 conductive or metallic obstructions as possible. The connectors should be sealed for waterproofing.

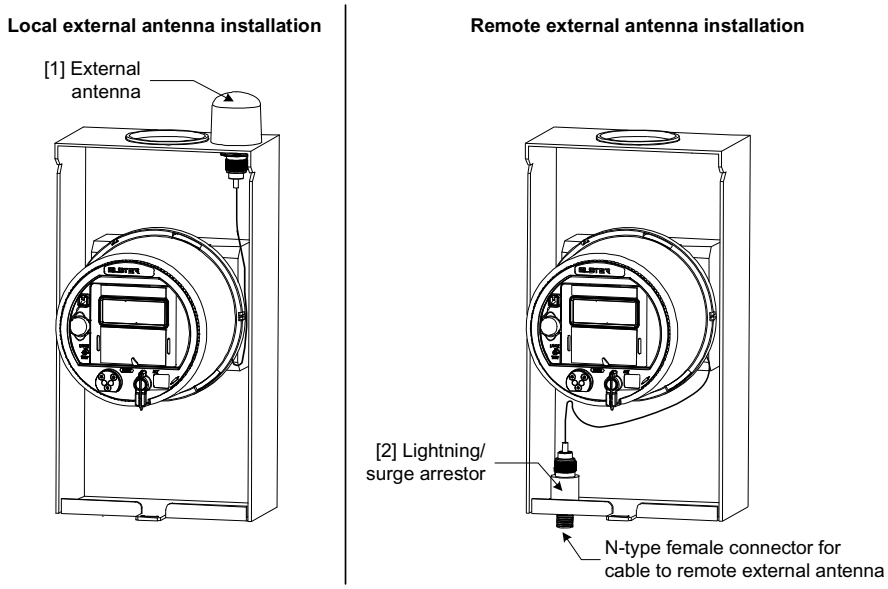

Figure 2. External antenna options

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. Do not attempt to repair this equipment yourself unless you are replacing the entire module.

Compliance Statement (Part 15.19)

The ILC/ILN option board complies 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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