

Using the RS-485 Option with AIN ALPHA® Meters

General

The RS-485 option board may be provided on AIN ALPHA meters. This option board provides a method for connecting multiple meters using a common set of wires for communication purposes. RS-485 provides for bi-directional data transmission up to 9600 bits per second (bps) between up to 32 devices, one device being the controller. This feature is useful when multiple meters are positioned some distance from each other within a specific electricity user site and one central location is required for communications. The maximum cable length in RS-485 communications paths is 1,200 meters (4,000 feet). RS-485 is also useful in connecting one telephone line to multiple meters that are grouped within a control room or metering closet.

⚠ WARNING

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

Use circuit closing devices on current transformer secondaries. Dangerous currents and voltages are present. Equipment damage, personal injury and death can result if circuit closing devices are not used.

RS-485 Option Board

The RS-485 option board is a single board design providing a terminal connector for the Receive (Rx) and Transmit (Tx) connections. This communication board may also be provided with either two or four relays for pulse output, load control, or end-of-interval indication. These relays are optional and must be specified at the time of order entry.

The RS-485 option board mounts directly to the main circuit board of the AIN ALPHA meter using the 20-pin connector (J8) if no other option boards are used. Reference Figure 1. If the extended memory option board is used, the RS-485 option board mounts on the memory board using the mating J5 and P5 connectors. Reference Figure 2.

Termination Resistors

Most documents referring to the application of RS-485 communication will specify the use of a termination resistor at each end of the cable. This is required for very high speed communications over the RS-485 circuit. Since the AIN ALPHA meter communications is at 9600 bits per second (bps) or less, it does not require termination resistors. However, it will operate with termination resistors in place.

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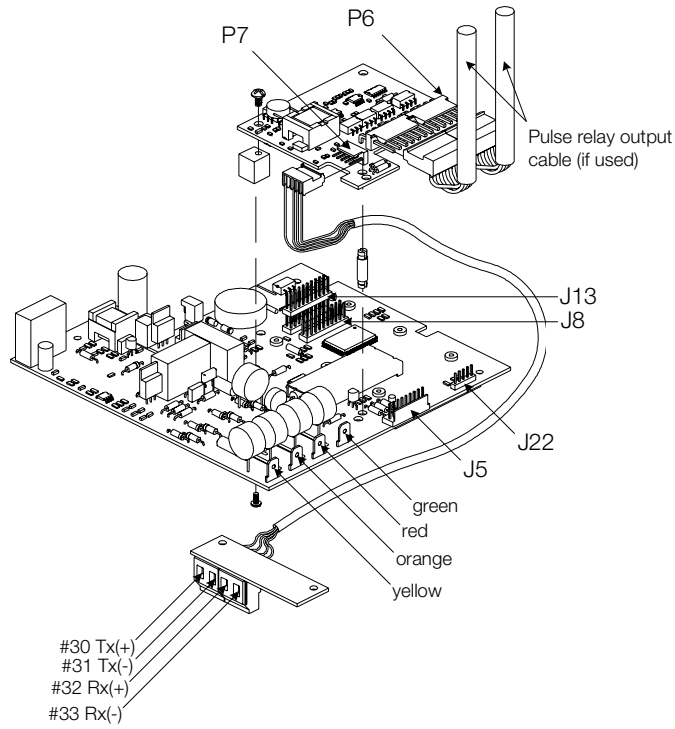


Figure 1

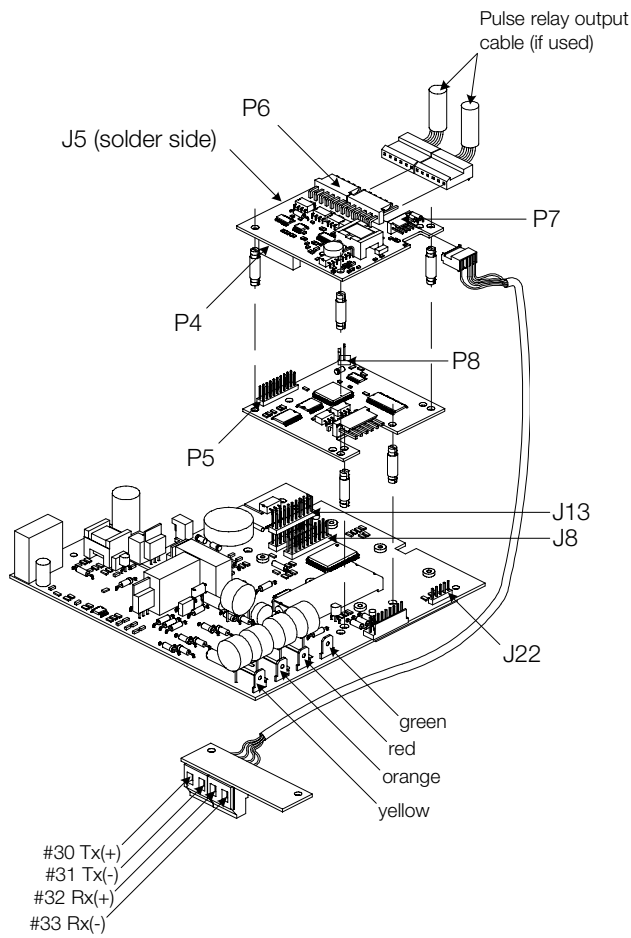


Figure 2

RS-485 Connections

The RS-485 cable exits the meter enclosure through a set of four connectors mounted on the lower front of the AIN ALPHA meter and labeled as terminals 30 - 33. Reference Figures 1, 2 and 4.

Two pairs of wires are used in the RS-485 connection. One pair is for Transmit and the other for Receive. All of the ALPHA meter <Transmit +> wires should be tied together and connected to the <Receive +> of the controller. Likewise, all <Transmit -> wires from the meter should be connected to the <Receive -> of the controller. ALPHA meter <Receive +> connections are made to the controller's <Transmit +> terminal, and the <Receive -> wires tied to the <Transmit -> at the controller. Reference Fig. 3.

It is not recommended to connect any devices other than ALPHA meters and the RS-485 controller to the same circuit.

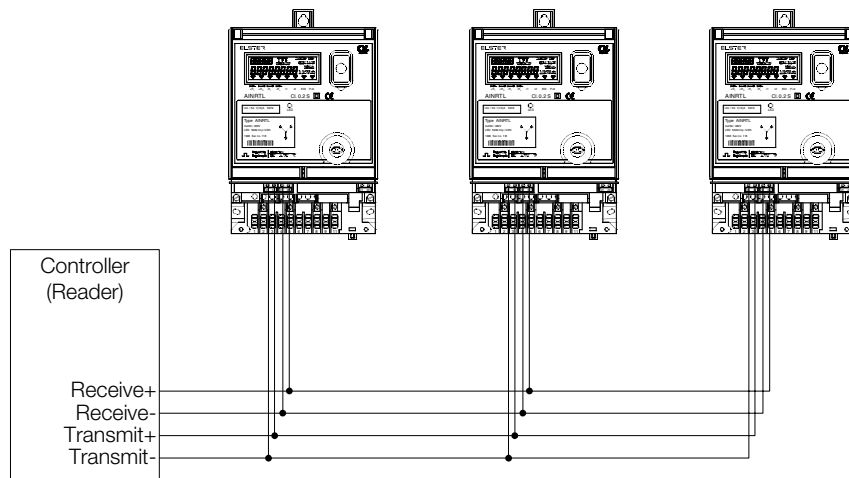


Figure 3

NOTICE

There can be some confusion between equipment suppliers regarding the identification of the “+” and “-” RS-485 connections. Other common nomenclature is “A” and “B”. If problems are encountered during installation, it is suggested that the “+” and “-” wires be reversed at the controller for both the transmit and receive connections.

Programming

When more than one ALPHA meter is connected to the RS-485 communication bus, each meter must have a unique number assigned as the “Remote Device Number” when the meter is programmed. The Remote Device Number can range from 0 to 254. Remote Device Number “0” should only be used if the RS-485 controller is connected to a telephone modem. The Remote Device Number “0” meter has the responsibility to initialize the modem. Therefore, if no modem is involved, it is recommended that no meter be identified as Remote Device Number “0”. ALPHA meters must also be programmed with an appropriate Remote Definition, using the latest Elster Electricity meter support software.

Relay Options

One relay is standard on all AIN ALPHA meters and the output terminals are labeled 20 and 21. Additional pulse output relays are brought out of the meter to a set of terminal connections on the lower front of the AIN ALPHA meter. There can be 2 or 4 additional relays provided with the RS-485 option board. These relay outputs are brought to terminals 22 through 29. Relay cable coding, identification and specifications may be found in TM42-2380 for AIN ALPHA meters. Please reference this technical manual for further information.

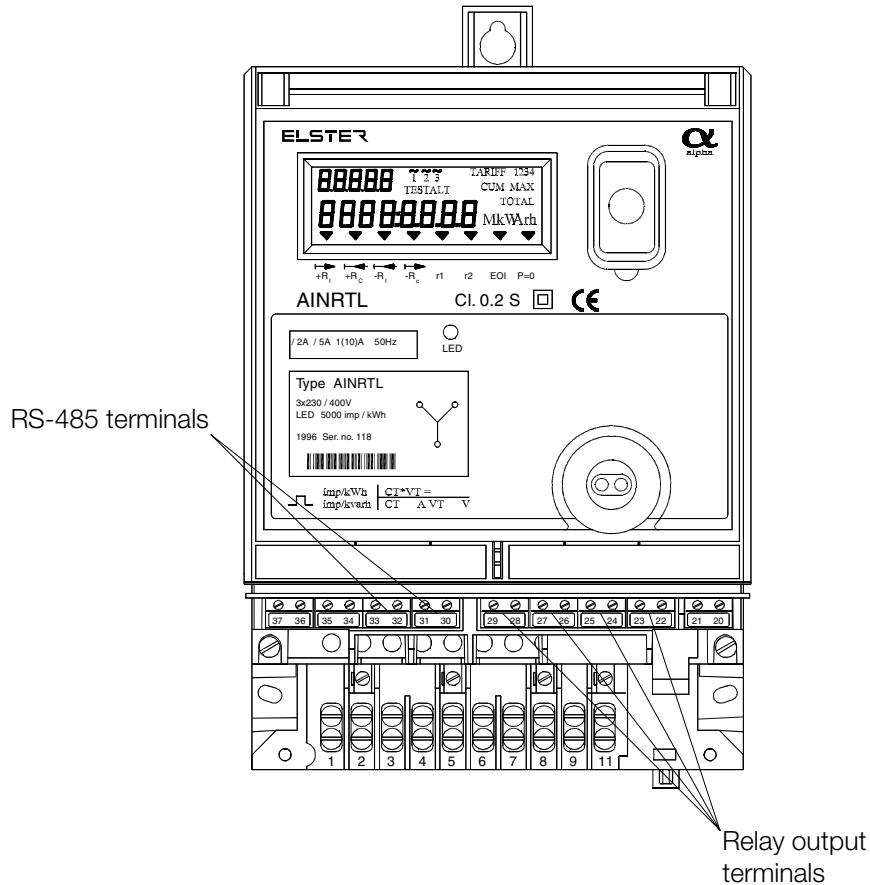


Figure 4

DISCLAIMER OF WARRANTIES AND LIMITATIONS OF LIABILITY

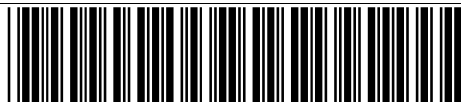
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