

RS-232 or RS-485 option board retrofit

For ALPHA Plus® and A3 ALPHA® meters

General

This leaflet contains instructions for installing RS-232 or RS-485 communications option boards on ALPHA electronic meters. Different versions of the electronic assembly may contain 1, 2, or 4 relays.

Read all instructions thoroughly before performing the retrofit.

Unpacking the retrofit kit

Typical style numbers are included below, but these may vary depending on specific styles ordered.

⚠ CAUTION

The ALPHA electronic meter and option boards contain components that are sensitive to electrostatic discharge (ESD). When installing, servicing, or removing the ALPHA meter or any option board, connect to ground with a wrist strap and follow safe ESD procedures. Failure to properly ground both you and the electronic devices or follow safe ESD procedures to avoid ESD can result in equipment damage.

Each kit should include the following:

Style number	Description
5D25375Gxx	1 printed circuit board assembly in an antistatic plastic bag
1B11537H02	3 plastic printed circuit board mounting posts (2 required if installing directly to the main meter board; 3 required if installing on top of another option board)
1B12144H01	1 mylar circuit board shield
4074B15G05	1 communications cable with a 5-pin IDC connector on one end and an un-terminated connector on the other end
3A34309H01	1 RJ-11 connector
1B11708H03	1 label that identifies the communications cable as RS-232 or RS-485, external to the meter
1C11640G01	If required, 1 relay cable and connector assembly (varies depending on whether the cable terminates to the meter blade or exits through the meter base)

Visually inspect all parts for any damage during shipment, contacting Elster as appropriate.

Elster

Raleigh, North Carolina USA
+1 800 338 5251 (US toll free)
+1 905 634 4895 (Canada)
support@us.elster.com
www.elsterelectricity.com



Identifying circuit board assemblies

The RS-232 and RS-485 option board have similar appearance. To determine which option board you have, hold the option board with its component side upwards. If the board is an RS-232 option board, there will be a “232” marked on the board as shown in Figure 1.

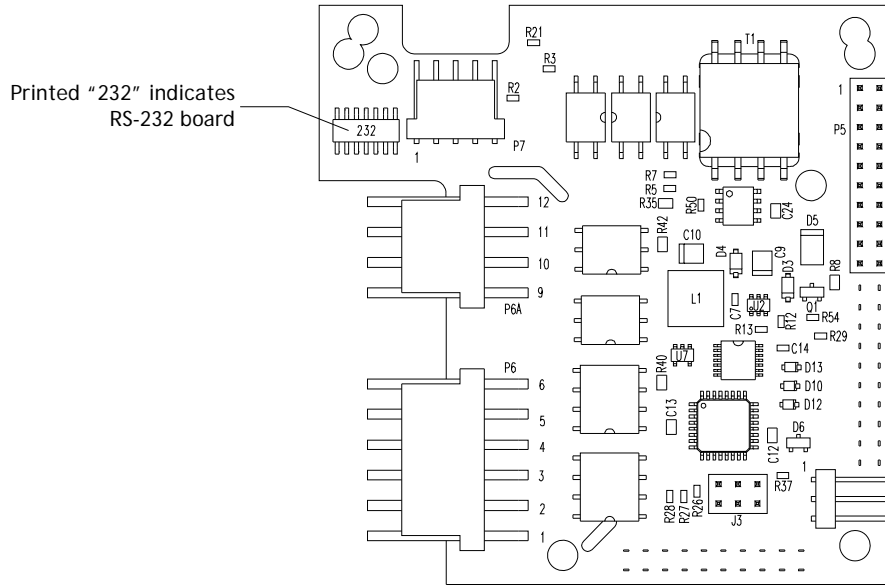


Figure 1. Component side of RS-232 option board

If “232” is not visible, turn the board over. If the board is an RS-485 option board, there will be a “485” marked on the board as shown in Figure 2.

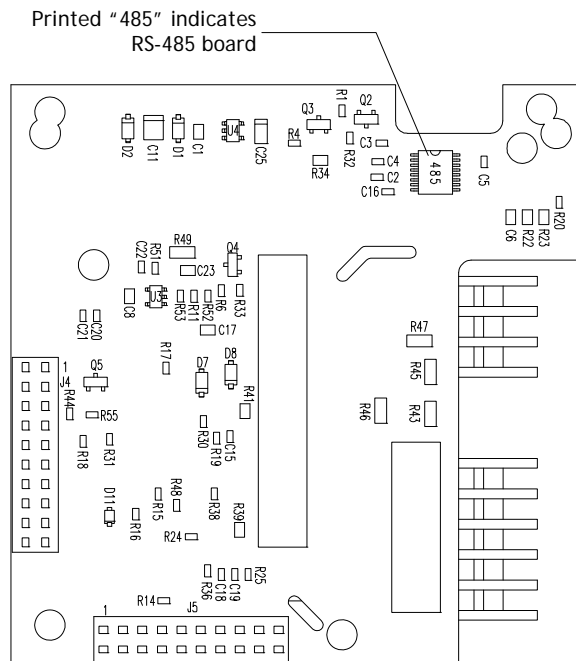


Figure 2. Solder side of RS-485 option board

Exiting the relay cable from the meter base

⚠ WARNING

Do not disassemble the meter chassis or electronic assembly from the meter chassis with power present. Dangerous voltages are present. Failure to remove power may result in equipment damage, personal injury, or death.

If required, the meter base must be prepared so that the relay cable can exit the hole in the meter base.

1. Remove the meter cover.
2. Remove the electronic assembly from the base housing by rotating the electronic assembly counterclockwise while holding the base housing stationary.
3. Locate the cable exit knockout in the meter base. The words “Option cable” or “Option Cable 1” are molded in the housing just above the knockout.
4. Punch out the knockout in the meter base and remove any material remaining in the hole. The knockout is designed to be pushed from inside the meter base and out away from the meter base.
5. Feed the relay option cable through the hole in the base with the connector to the inside.
6. Pull the cable from the outside to force the cable grommet to seal the hole in the base.

Exiting the communications cable from the meter base

⚠ WARNING

Do not disassemble the meter chassis or electronic assembly from the meter chassis with power present. Dangerous voltages are present. Failure to remove power may result in equipment damage, personal injury, or death.

If required, the meter base must be prepared so that the communications cable can exit the hole in the meter base.

1. Remove the meter cover.
2. Remove the electronic assembly from the base housing by rotating the electronic assembly counterclockwise while holding the base housing stationary.
3. Locate the cable exit knockout in the meter base. The words “Option cable,” or “Option Cable 1” and “Option Cable 2” are molded in the housing just above the knockout.
All knockouts have the same dimensions. Typically, only one cable exits the meter base using the “Option Cable 1” knockout. If another relay cable is present, use the “Option Cable 2” knockout.
4. Punch out the knockout in the meter base and remove any material remaining in the hole. The knockout is designed to be pushed from inside the meter base and out away from the meter base.
5. Feed the communication cable through the hole in the base with the connector to the inside.
6. Pull the cable from the outside to force the cable grommet to seal the hole in the base.

Attaching the relay cable to the meter blades

▲ WARNING

Dangerous voltages are present. Before attaching the relay cable to the meter base, make sure there are no voltage sources connected to any relay option leads or to the meter. Failure to remove voltage sources can result in equipment damage, personal injury, or death.

If required, use the following procedure to attach the relay cable to the meter voltage blades.

1. Remove the meter cover.
2. Remove the electronic assembly from the base housing by rotating the electronic assembly counterclockwise while holding the base housing stationary.
3. Disconnect the current and voltage cables from the ALPHA meter board in the electronic assembly. Set the electronic assembly aside.
4. Remove the three screws attaching the base housing to the base and set the housing aside.
5. Connect the relay cable to the KYZ output blades in the base by pushing the appropriate wire's connector onto the tab attached to the blade.

Looking at the base from the front of the meter, the left-most voltage blade is number 1, and the right-most blade is number 7.

- For Form 36S meters, connect the K (red), Y (yellow), and Z (black) leads to blades 3, 4, and 5, respectively.
 - For Form 9S meters, connect the K (red), Y (yellow), and Z (black) leads to blades 4, 5, and 6, respectively.
6. Route the relay cable through the voltage opening in the housing and re-assemble the base housing to the base using care to avoid pinching cables between the two parts.
Note. There is indication molded into the base housing of which opening is for the current cable assembly and which opening is for the voltage cable assembly.

Mounting the RS-232 or RS-485 option board to the meter board

▲ WARNING

Dangerous voltages are present. Before mounting the option board, make sure there are no voltage sources connected to any relay option leads or to the meter. Failure to remove voltage sources can result in equipment damage, personal injury, or death.

Use the following procedure to mount the communications option board at position 1 (see Figure 3). Note that the procedure is the same regardless of the meter (ALPHA Plus or A3 ALPHA) or option board (RS-232 or RS-485) at position 1.

1. Position the ALPHA meter so that the electronic assembly faces down.
2. Insert two plastic mounting posts in the proper holes in the ALPHA meter board as shown in Figure 3.
3. Install the mylar option board shield over mounting posts before installing the option board.

Note. The mylar option board shield has three holes but only two are needed. Other option boards may require all three mounting post holes.

4. Plug the communications cable connector (J7) into P7 on the option board. Be sure that the polarizing tabs on the connector align with the notches on the ends of P7 and that the cable exits from the bottom of J7 toward the ALPHA meter board.
5. If required, plug the relay option board cable connector (J6) into P6 on the option board. Be sure that the polarizing tabs on the connector align with the notches on the ends of P6 and that the cable exits from the bottom of J6 toward the ALPHA meter board.
 - A 1 or 2 relay option board has only P6, and the relay cable has only J6 connector.
 - A 4 relay option board has both P6 and P6A, and the relay cable has J6 and J6A connectors. To connect a 4 relay option board, J6 should be connected to P6 and J6A should be connected to P6A.
6. Align the option board for installation on the ALPHA meter board.
 - First align P4 on the option board with J4 on the ALPHA meter board. If properly aligned, the plastic mounting posts will automatically align with the mounting holes in the option board. See Figure 4 for specific holes that the two mounting posts should use.
 - Extra care must be taken with this step because the connectors P4 and J4 are not polarized and are capable of being installed incorrectly. If the unit is powered with a misaligned option board, the meter may not function properly or not function at all.
7. Once aligned, gently press down on the option board until the mounting posts snap into the option board to ensure a lock fit.

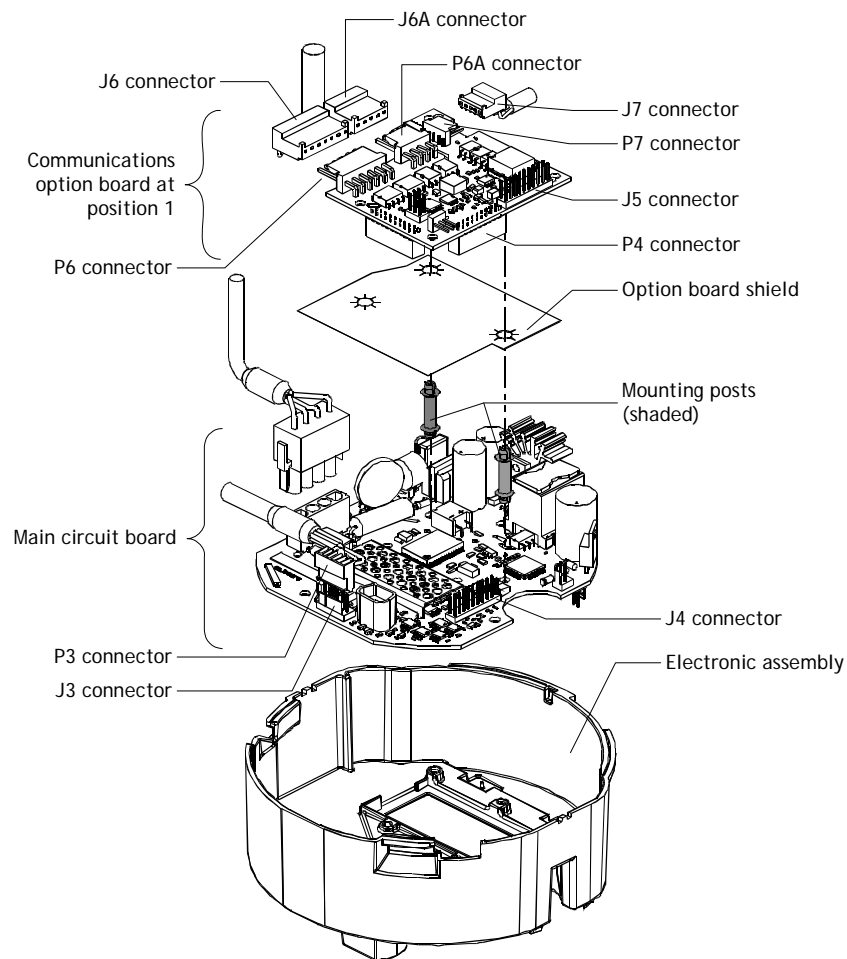


Figure 3. Mounting the RS-232/RS-485 option board on the A3 ALPHA meter

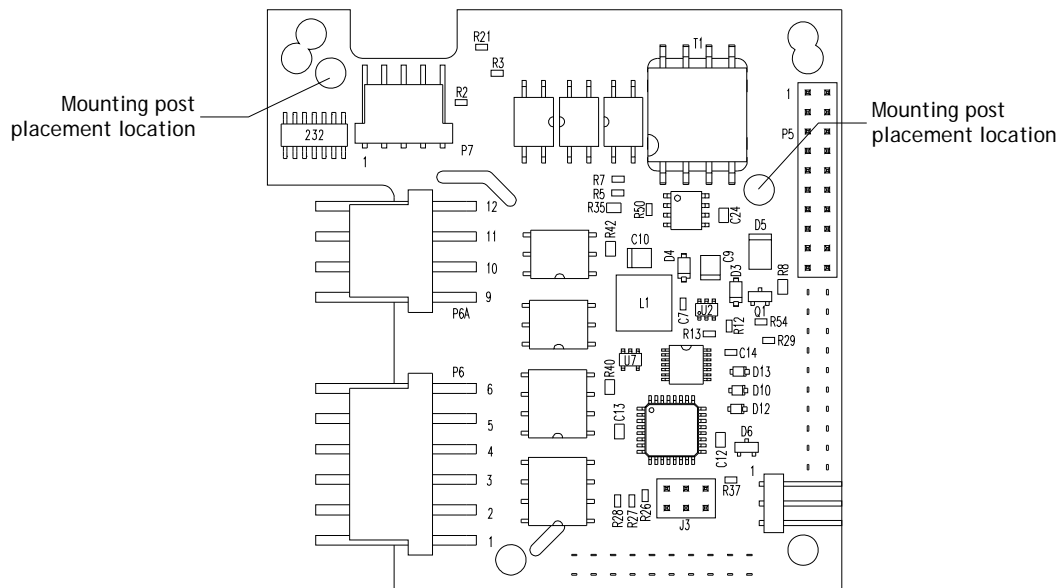


Figure 4. Mounting post placement on RS-232/RS-485 option board

Mounting the RS-232 or RS-485 option board to another option board

⚠ WARNING

Dangerous voltages are present. Make sure there are no voltage sources connected to any relay option leads or to the meter. Failure to remove voltage sources can result in equipment damage, personal injury, or death.

Use the following procedure to mount the communications option board at position 2 (see Figure 5). Note that the procedure is the same regardless of the meter (ALPHA Plus or A3 ALPHA) or the option board (RS-232 or RS-485) at position 2.

1. Position the ALPHA meter so that the electronic assembly faces down.
2. Insert 3 plastic mounting posts in the proper holes in the option board at position 1 (see Figure 5).

Depending on the specific option board located in position 1, there may be multiple mounting holes in the same relative location. It is best to install the communications option board in position 2 without the mounting posts and note which mounting holes align properly. Then, you can remove the communications option board and install the mounting posts in the identified locations. Generally, there are 3 mounting posts; however, some combinations may only require 2 mounting posts.

Note. The mylar option board shield should already be installed between the meter board and the option board at position 1. It is not necessary to have another mylar option board shield installed.

3. Plug the communications cable connector (J7) into P7 on the option board. Be sure that the polarizing tabs on the connector align with the notches on the ends of P7 and that the cable exits from the bottom of J7 toward the meter board.
4. If required, plug the relay option cable connector (J6) into P6 on the option board. Be sure that the polarizing tabs on the connector align with the notches on the ends of P6 and that the cable exits from the bottom of J6 toward the meter board.
 - A 1 or 2 relay option board has only P6, and the relay cable has only J6 connector.

- A 4 relay option board has both P6 and P6A, and the relay cable has J6 and J6A connectors. To connect a 4 relay option board, J6 should be connected to P6 and J6A should be connected to P6A.
5. Align the option board for installation on the top of the option board installed at position 1.
 - First align J5 on the communications option board (position 2) with P5 on the option board (position 1) already installed on the meter board. If properly aligned, the mounting posts will automatically align with the mounting posts holes in the option board.
 - Extra care should be taken with this step because the connectors P5 and J5 are not polarized and can be installed incorrectly. If the unit is powered with a misaligned option board, the meter may not function properly or not function at all.
 6. Once aligned, gently press down on the option board until the mounting posts snap into the option board to ensure a lock fit.

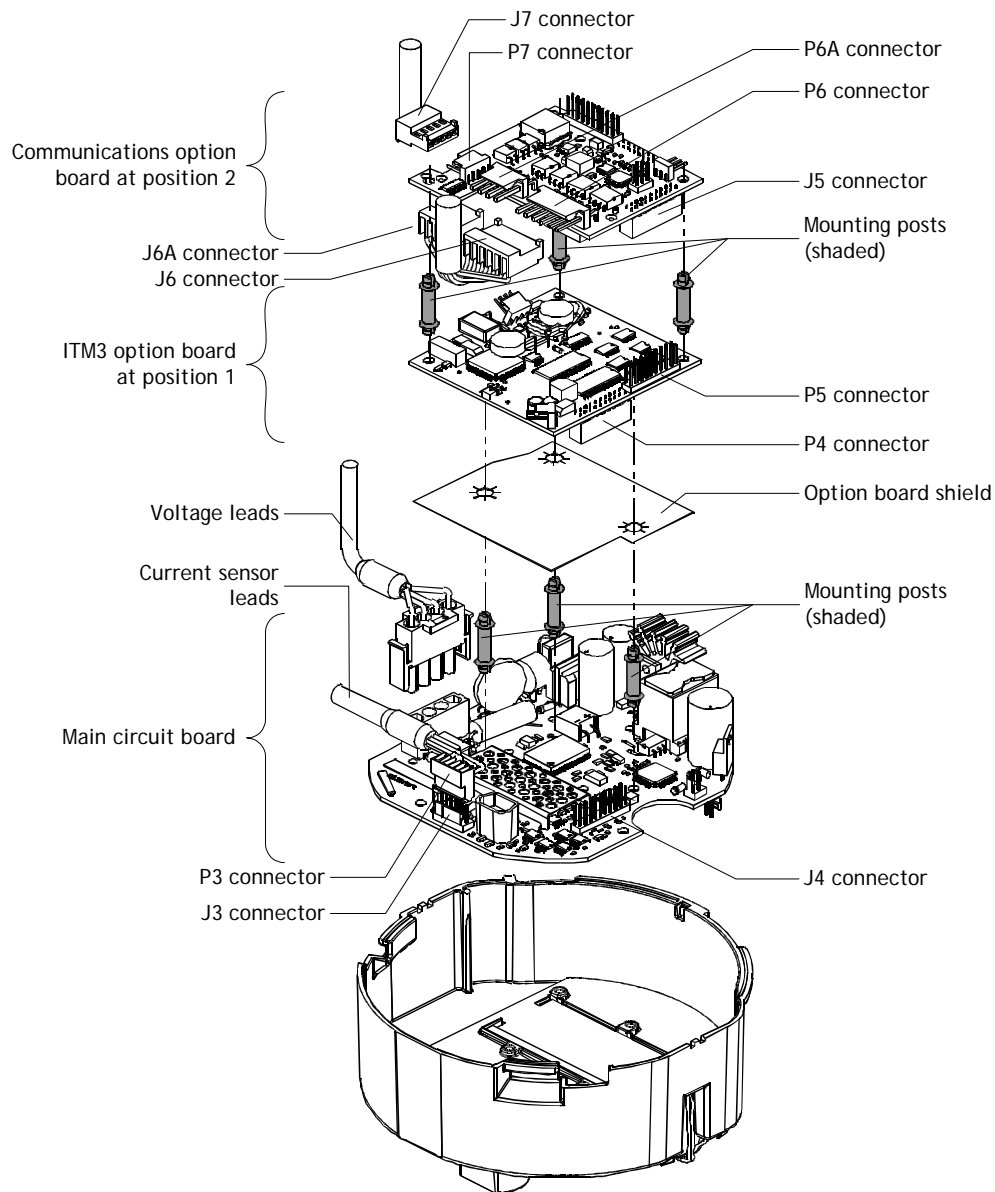


Figure 5. Mounting RS-232/RS-485 option board at position 2

Re-assembling the meter

After mounting the communications option board, use the following procedure to reassemble the meter:

1. Reconnect the current and voltage connectors from the base housing to the electronic assembly. Note that the connectors are keyed for proper orientation. Special care should be given to the 6-pin current sensor connector. The connector is polarized; however, it is still possible that it can be forced into incorrect position. Be sure to align the ears on the bottom of the P3 connector with the slots on the J3 connector as shown in Figure 3 or Figure 5.
2. As the electronic assembly is being brought close to the base for installation, any excess cable for voltage and current harnesses should be pushed back down into the base as much as possible. Just before the electronic assembly touches the base housing, the remainder of the cables should be pressed flat (parallel with the plane of the base) to minimize any interference. This is especially important on a meter with two option boards since the amount of available space is less.
3. Align the top of the electronic assembly with the section of the base housing where the word TOP is molded into the plastic.
4. Reassemble the electronic assembly to the base housing by rotating the electronic assembly clockwise. Use care to avoid pinching the cables or placing a strain on the circuit boards.
5. Replace the meter cover.

Terminating the communications cable

An RJ-11 connector is provided for termination of the communications cable. The communications cable has 4 conductors within the cable and the end of the cable sheathing has been pre-scored for easy removal whenever the RJ-11 connector is to be installed. The following procedure should be followed to install the RJ-11 connector.

1. Remove the last ¼-inch of insulation sheathing over the four wires within the communications cable.
Cables from Elster should be pre-scored, and the insulation sheathing can be removed by hand. If this is a rework, an appropriate tool should be used to strip off the last ¼-inch of outer sheathing without damage to the insulation of the individual wires within the cable.
2. The RJ-11 connector should be oriented with the holes for the wire facing the installer and the locking tabs facing upward.
3. The last 4 wires should be inserted into the RJ-11 connector until they cannot be inserted any further. The color code orientation should match as illustrated in Figure 6.
Although the supplied connector is mechanically the same as a 6-pin connector, only the 4 center pins are used, and only 4 wires may be inserted into the connector.
4. With the wires in the RJ-11 connector, the assembly should be inserted into an appropriate termination tool and crimped.
5. Verify that the crimps have made a solid mechanical connection.
6. Take the appropriate label (RS-232 or RS-485) and apply it to the communications cable, approximately 6 inches from the RJ-11 connector.

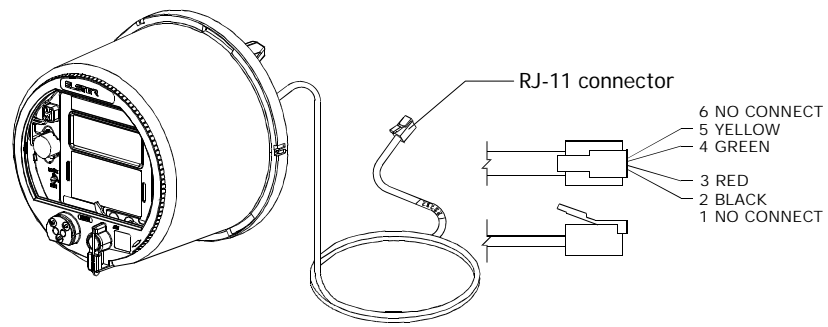


Figure 6. RJ-11 connector wiring

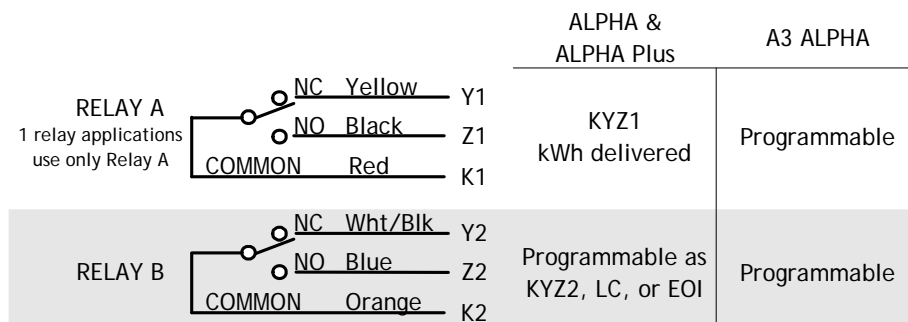


Figure 7. Color coding for 1 or 2 relays with 6 output leads

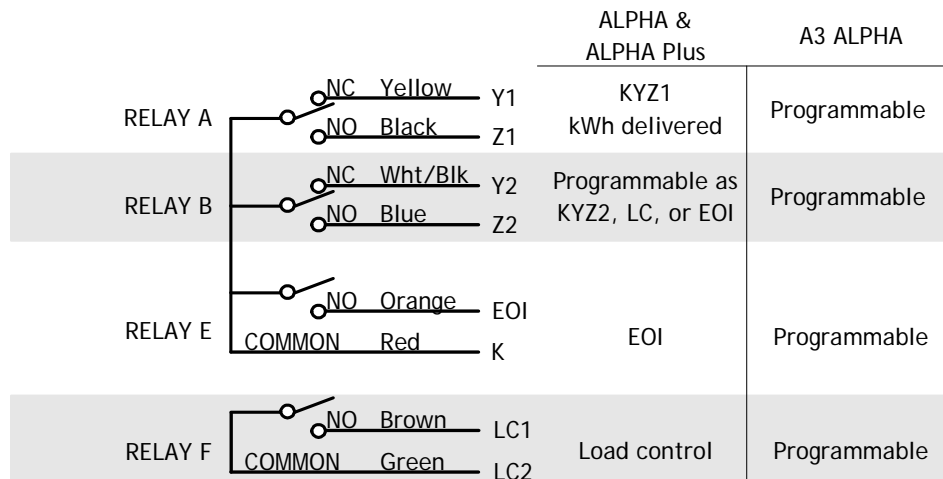


Figure 8. Color coding for 4 relays with 8 output leads

Notes:

Notes:

Notes:**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.

The information, recommendations, descriptions, and safety notices in this document are based on Elster experience and judgment with respect to operation and maintenance of the described product. This information should not be considered as all-inclusive or covering all contingencies. If further information is required, Elster should be consulted.

No warranties, either expressed or implied, including warranties of fitness for a particular purpose or merchantability, or warranties arising from the course of dealing or usage of trade, are made regarding the information, recommendations, descriptions, warnings, and cautions contained herein.

In no event will Elster be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental, or consequential damage or loss whatsoever, including but not limited to: damage or loss of use of equipment, cost of capital, loss of profits or revenues, or claims against the user by its customers resulting from the use of the information, recommendations, descriptions, and safety notices contained herein.

Elster
Raleigh, North Carolina USA



IL42-4035A

© 2009 by Elster
All rights reserved.
Printed in the United States.