



Installation Guide

M-2406 Adapter Chassis

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M-2406 Recloser Control Adapter Chassis

Adapts M-7679 R-PAC to Retrofit Eaton Cooper Form 6 Controls for Use with 14-, 19-, or 26-Pin Eaton Cooper Nova Reclosers



- **Provides easy direct mechanical replacement of the Eaton Cooper Form 6 recloser control in the existing cabinet**
- **Eliminates the need of expensive rewiring of I/O signals by interfacing with the existing electronics**
- **Accepts the existing communications connection plugs for Serial TIA-232, TIA-485 Ethernet and IRIG-B**
- **Includes an on-board Module that interfaces the M-7679 R-PAC with the power supply and battery charger installed in the existing cabinet**

M-2406 Adapter Chassis - Specification

The M-2406 Adapter Chassis combines with the M-7679 R-PAC for convenient replacement of Eaton Cooper Form 6 Type F6-P2A and F6-P2B controls (serial numbers above 10,000 or beginning with CP57) and Triple-Single controls for 26-pin reclosers. Please contact Beckwith Electric for solutions to retrofit controls that are not listed here.

The M-2406 is a direct retrofit chassis designed for a simple, quick exchange in the existing control cabinet. The M-2406 contains all necessary components to provide proper power and control for the Eaton Cooper Nova Recloser. Power and control functions utilize the existing wire harnesses. The M-2406 Adapter Chassis is mounted into the Eaton Cooper Form 6 control location using the existing hardware.

The M-2406 includes an Analog to Digital Interface Module to provide the following, via S-7600 IPScom communications software:

- Battery voltage monitor and power shutdown
- Battery charging mode monitor
- Battery load test (manual and automatic, based on schedule)
- Battery shut down and wake up

The M-2406 is available in two configurations:

- **M-2406** for 14- and 19-pin reclosers,
- **M-2406-26** for 26-pin reclosers.

Optional Intrusion Detection Kit B-1929 (requires extended I/O)

The optional Intrusion Detection Kit can be added to the Cooper Form 6 enclosure to allow a DNP point (**Input 10 Status**) to be monitored via SCADA. The kit is added to the enclosure using the existing mounting studs, and requires no special modifications. The kit consists of two Micro switches for the front and back door, two mounting brackets, four connection wires, and all necessary hardware.

Physical

Size with M-7679 R-PAC: 8.50" high x 10.75" wide x 7.84" deep (21.59 cm x 27.31 cm x 19.91 cm)

Approximate Weight: 1 lb, 10 oz (0.75 kg)

Approximate Weight with M-7679 R-PAC: 6 lbs, 12 oz (3.06 kg)

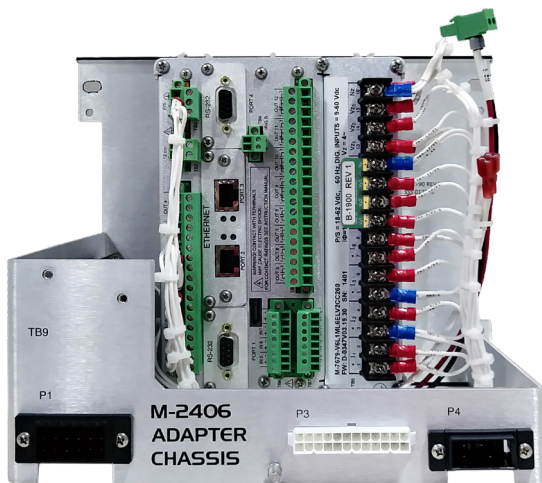


Figure 1 M-2406 14- / 19-pin Adapter Chassis
Rear View

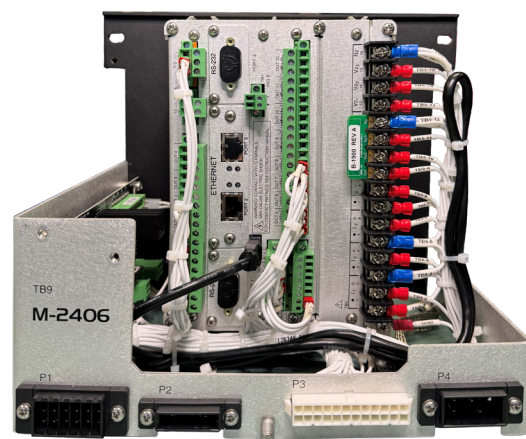


Figure 2 M-2406-26 26-pin Adapter Chassis
Rear View

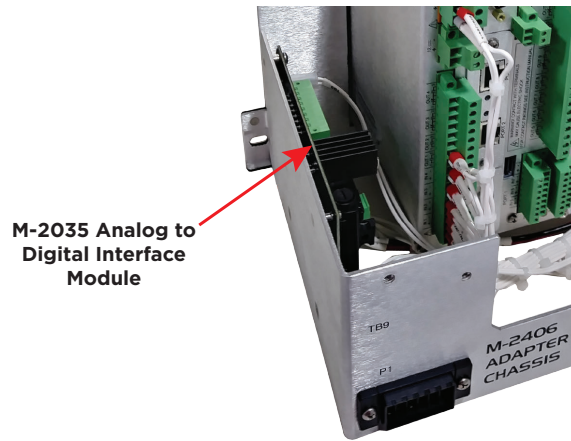


Figure 3 M-2035 External Battery Charger Monitor Module in the M-2406 Adapter Chassis (M-2406 14- / 19-pin Model Shown)



Figure 4 M-2406 Adapter Chassis Retrofit Completed

Warranty

The M-2406 Adapter Chassis is covered by a five year warranty from date of shipment. *Specification is subject to change without notice.*



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WARNING

DANGEROUS VOLTAGES, capable of causing death or serious injury, are present on the external terminals and inside the equipment. Use extreme caution and follow all safety rules when handling, testing or adjusting the equipment. However, these internal voltage levels are no greater than the voltages applied to the external terminals.

DANGER! HIGH VOLTAGE



This sign warns that the area is connected to a dangerous high voltage, and you must never touch it.

PERSONNEL SAFETY PRECAUTIONS

The following general rules and other specific warnings throughout the manual must be followed during application, test or repair of this equipment. Failure to do so will violate standards for safety in the design, manufacture, and intended use of the product. Qualified personnel should be the only ones who operate and maintain this equipment. Beckwith Electric assumes no liability for the customer's failure to comply with these requirements.



This sign means that you should refer to the corresponding section of the operation manual for important information before proceeding.



Always Ground the Equipment

To avoid possible shock hazard, the chassis must be connected to an electrical ground. When servicing equipment in a test area, the Protective Earth Terminal must be attached to a separate ground securely by use of a tool, since it is not grounded by external connectors.

Do NOT operate in an explosive environment

Do not operate this equipment in the presence of flammable or explosive gases or fumes. To do so would risk a possible fire or explosion.

Keep away from live circuits

Operating personnel must not remove the cover or expose the printed circuit board while power is applied. In no case may components be replaced with power applied. In some instances, dangerous voltages may exist even when power is disconnected. To avoid electrical shock, always disconnect power and discharge circuits before working on the unit.

Exercise care during installation, operation, & maintenance procedures

The equipment described in this manual contains voltages high enough to cause serious injury or death. Only qualified personnel should install, operate, test, and maintain this equipment. Be sure that all personnel safety procedures are carefully followed. Exercise due care when operating or servicing alone.

Do not modify equipment

Do not perform any unauthorized modifications on this instrument. Return of the unit to a Beckwith Electric repair facility is preferred. If authorized modifications are to be attempted, be sure to follow replacement procedures carefully to assure that safety features are maintained.

PRODUCT CAUTIONS

Before attempting any test, calibration, or maintenance procedure, personnel must be completely familiar with the particular circuitry of this unit, and have an adequate understanding of field effect devices. If a component is found to be defective, contact Beckwith Electric for approved replacements.

Avoid static charge

This unit's components can be damaged by improper test or rework procedures. Care should be taken to avoid static charge on work surfaces and service personnel.

Use caution when measuring resistances

Any attempt to measure resistances between points on the printed circuit board, unless otherwise noted in the Instruction Book, is likely to cause damage to the unit.

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1.0 Introduction

The M-2406 Adapter Chassis, combined with the M-7679 R-PAC, provides convenient direct replacement of the Eaton Cooper Form 6 Type F6-P2A and F6-P2B controls (serial numbers above 10,000 or beginning with CP57) and Cooper Form 6 Triple-Single controls for 26-pin reclosers. The M-2406 is a direct retrofit chassis designed for a simple, quick exchange in the existing control cabinet. The M-2406 contains all necessary components to provide proper power and control for the Eaton Cooper Type D NovaXX Recloser. Power and control functions utilize the existing wire harnesses that connect the Eaton Cooper Type D NovaXX recloser to the control unit. The voltage sensing is configured for a Nova Recloser with the Internal Voltage Sensor option (IVS).

The M-2406 Adapter Chassis is mounted into the Eaton Cooper Form 6 control location using the existing control mounting locations (front and back), and existing mounting hardware. The M-2406 wire harness interfaces directly with the existing Eaton Cooper Form 6 power harness, and 14-, 19-, or 26-Pin Recloser cable.

This Installation Guide contains the following information:

- Personal Protection Equipment and Tools required for installation
- Initial procedures to ensure power disconnect and safety precautions
- Verification of the control compatibility for replacement
- Removing the Eaton Cooper Form 6 Control
- Installing the M-2406 Adapter Chassis
- Final test procedures and IPScm settings

The M-2406 is available in two configurations:

- **M-2406** for 14- and 19-pin reclosers,
- **M-2406-26** for 26-pin reclosers.

1.1 Description

The M-2406 Adapter Chassis includes the following pre-installed components:

- M-7679 R-PAC
- M-2035 External Battery Charger Monitor Module

M-7679 R-PAC - The M-7679 R-PAC is a digital, Smart Grid ready, advanced Protection, Automation and Control System for Recloser, Switch, Sectionalizer and Power Distribution Applications. It offers a comprehensive protection package with over 30 individual protection functions and up to eight setting groups. The M-7679 R-PAC features a high accuracy metering system with advanced recording and reporting functions as well as continuous data sampling at 128 samples per cycle.

M-2035 External Battery Charger Monitor - The M-2035 mounted to the M-2406 Adapter Chassis interfaces the M-7679 R-PAC with external battery chargers and power supplies, to allow monitoring and control of the external charger using IPScm S-7600 Communications Software. IPScm provides the following external battery charger functions:

- Battery voltage monitoring for 12 and 24 Vdc systems
- Battery current monitoring
- AC power loss detection
- Battery disconnect from charger in low voltage condition
- Wake Up pushbutton
- Initiate battery load test

2.0 Required PPE and Tools

Personal Protection Equipment

1. Safety Glasses
2. Safety Gloves
3. Hearing Protection
4. Hard Hat

Tools

1. M-2406 Adapter Chassis with M-7679 R-PAC pre-installed
2. #1 Phillips screwdriver
3. 7/16" and 3/8" nut drivers
4. 3/8" open end wrench
5. [M-7679 R-PAC Instruction Book](#) (recommended; login required)

3.0 Power Disconnect and Safety Precautions

● **WARNING:** Do not attempt to install or replace this equipment until all power has been removed from the recloser equipment, and all Current Transformer secondary windings have been properly shorted. Failure to do so may result in equipment damage, severe personal injury, or death!

● **WARNING:** This equipment is NOT designed to protect operator safety. Always follow all utility procedures and practices when installing, testing, maintaining, or operating these devices. Failure to do so may result in equipment damage, severe personal injury, or death!

● **WARNING:** Do not connect this control to an energized recloser until all control settings have been properly programmed and verified. Failure to do so may result in control and/or recloser mis-operation, equipment damage, personal injury, or death!

■ **NOTE:** Since provisions for shorting CTs may not be provided in the recloser control cabinet, it is necessary to remove power from the recloser, recloser control cabinet, and associated pole VTs, prior to changing out control.

1. Ensure that all of the Utility's applicable safety Lockout/Tagout Procedures are followed during the installation process.
2. Remove power from the control and disconnect the Eaton Cooper battery power harness (Figure 1).

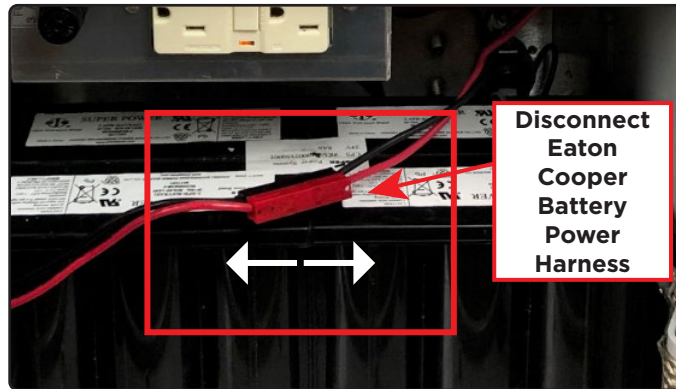


Figure 1 Disconnect the Eaton Cooper Battery Power Harness

3. Disconnect the 14-, 19-, or 26-Pin recloser cable from the cabinet (Figure 2).



Figure 2 Disconnect 14-, 19-, or 26-Pin Recloser Cable

4. Visually verify that the Eaton Cooper Form 6 control is powered **OFF** - e.g., nothing visible in the display, no LEDs illuminated, control pushbuttons are not operable (Figure 3).



Figure 3 Verify that Eaton Cooper Form 6 Control is Powered OFF

4.0 Control Replacement Compatibility Verification

The M-2406 Adapter Chassis is compatible with Eaton Cooper Form 6 Type F6-P2A and F6-P2B controls with serial numbers above 10,000 or beginning with CP57 and Triple-Single controls for 26-pin reclosers. Compatibility can be visually verified by examining the back of the Form 6 control. If the control has **P1**, **P2**, **P3**, and **P4** connectors (Figure 4), then the M-2406 Adapter Chassis is able to be installed in the Eaton Cooper Form 6 control cabinet.

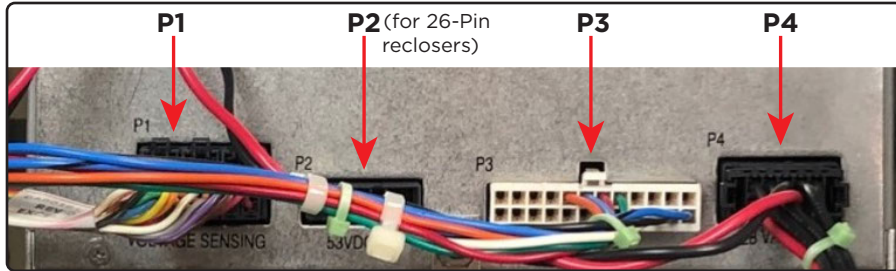


Figure 4 Verification of Control Compatibility with M-2406

Optional Voltage Sensing Terminal Block - Verification of Jumper Positions

1. 14-Pin and 19-Pin reclosers may have an optional voltage sensing input terminal block installed (Figure 5). If the control has this optional terminal block, verify that the jumpers are in the correct locations (Figure 6). The terminal block may have a cover shield which will need to be removed.

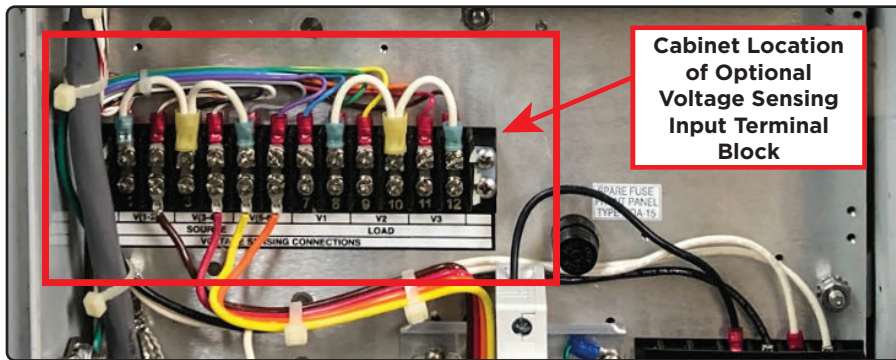


Figure 5 Location of Optional Voltage Sensing Terminal Block

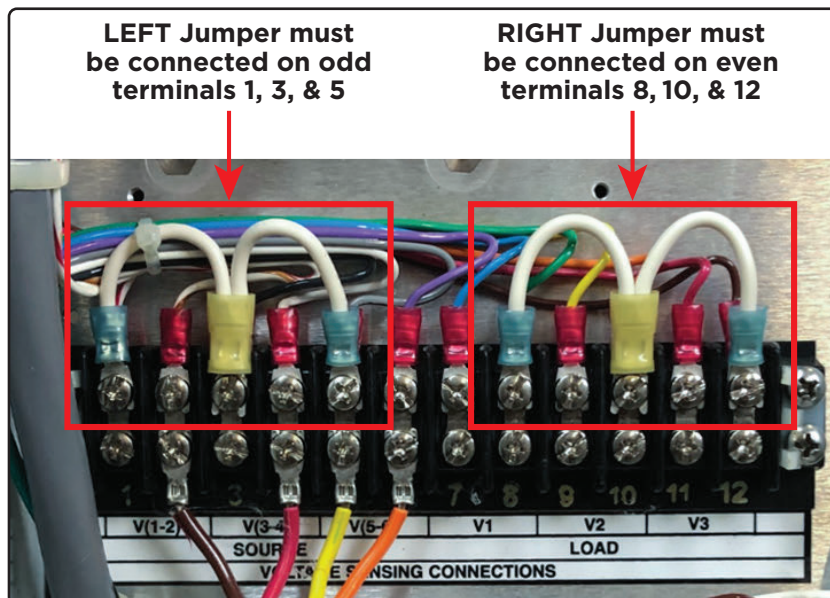
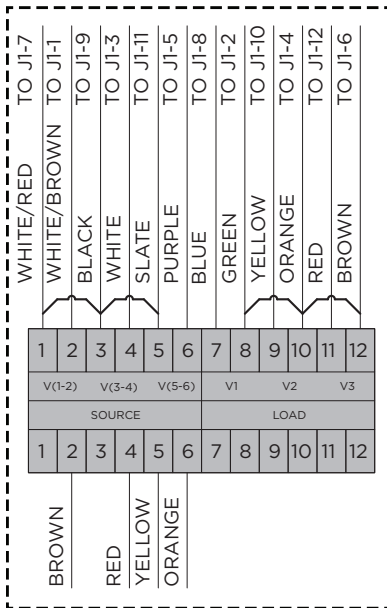


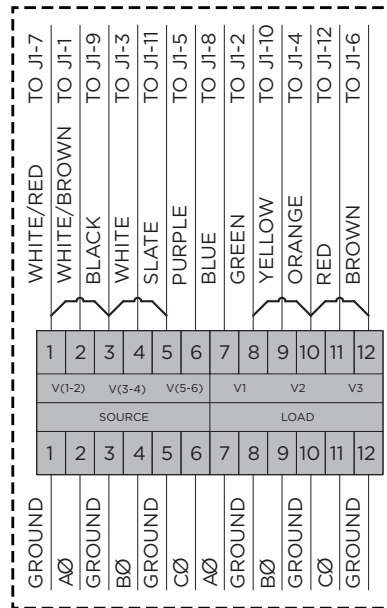
Figure 6 Location of Voltage Sensing Terminal Block Jumpers

- Refer to the illustrations in [Figure 7](#) to determine the jumper locations that are compatible with the M-2406 Adapter Chassis for voltage sensing. Configurations **A** and **B** are automatically compatible with the M-2406, and do not require any rewiring.

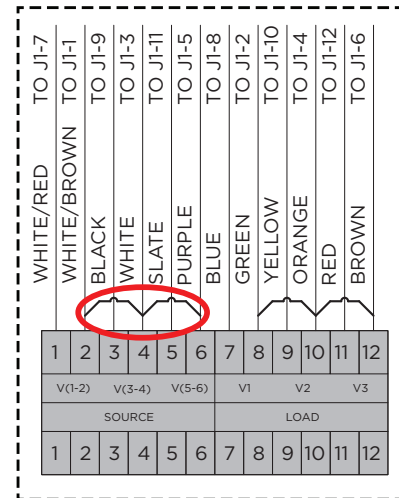
▲ CAUTION: With the default Eaton Cooper configuration, the left jumper must be **MOVED** to positions **1, 3 & 5**. Any additional wiring must match the terminal block references in **Configuration B** for use with the M-2406.



Configuration A
Eaton Cooper Terminal Block Jumper Locations with Internal Source Voltage Sensing Inputs for M-2406
(Reference Only)



Configuration B
Eaton Cooper Terminal Block Jumper Locations with Source and Load Voltage Sensing Inputs for M-2406
(Reference Only)



Default Configuration
Eaton Cooper Terminal Block Jumper Locations

MODIFICATION REQUIRED!
NOTE: Left Jumpers must be MOVED to positions 1, 3 & 5
Additional wiring must match the terminal block references in **Configuration B**
(Reference Only)



Figure 7 Voltage Sensing Terminal Block Jumper Locations Reference

Internal Voltage Sensing Verification

The M-2406 was designed for Eaton Cooper systems that have Internal Voltage Sensing (IVS) in the recloser. The M-2406 ships with the B-1900 IVS Adapter Board pre-installed on the M-7679 R-PAC Control, Terminal Block 5. Visual verification is possible when the recloser nameplate also has an Internal Voltage Sensor label (Figure 8).

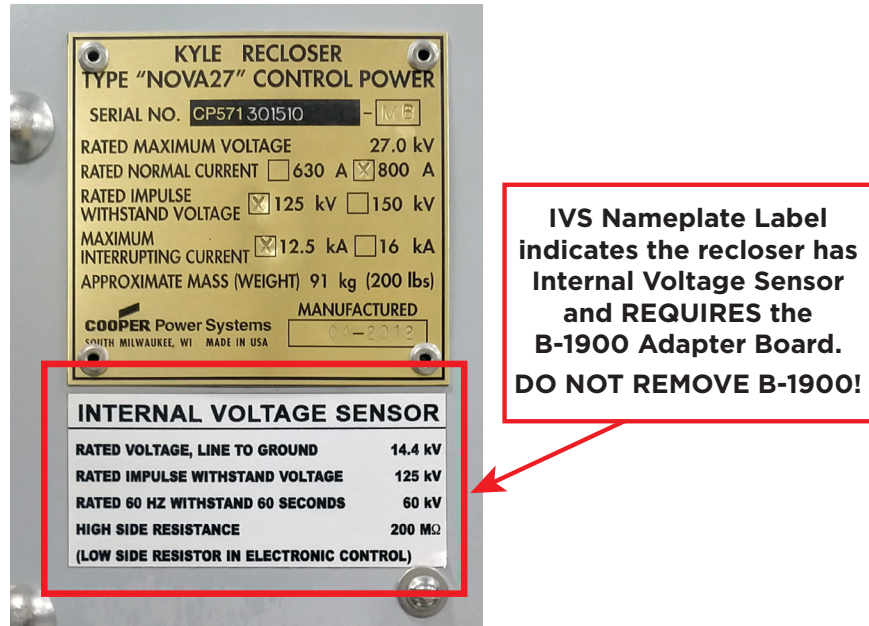


Figure 8 Example of Recloser Nameplate with IVS Label

If the M-2406 is installed in a recloser system that does not have IVS, then the B-1900 IVS Adapter Board must be removed from the control.

Examples of recloser systems that require the B-1900 Adapter Board to be REMOVED:

- When the recloser system has external Potential transformers (PT) in use
- When the recloser does not have the additional IVS label on the nameplate

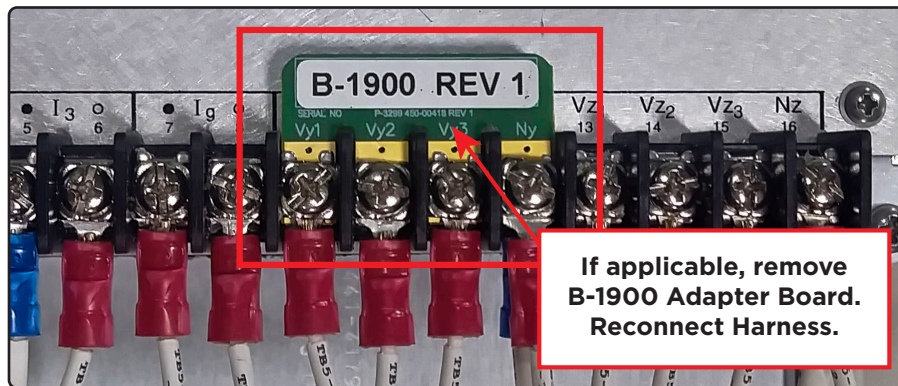


Figure 9 B-1900 IVS Adapter Board

1. Remove the B-1900 Adapter Board (Figure 9) by loosening the retaining screws on TB5 positions 9 (Vy1), 10 (Vy2), 11 (Vy3), and 12 (Ny).
2. Remove the board, and tighten the screws back down making sure to keep the lugs attached to their original positions.

5.0 Removing the Eaton Cooper Form 6 Control

The existing Eaton Cooper Form 6 control is accessible from both the front and back of the cabinet. Open both front and back cabinet doors to perform this procedure.

Disconnect the Electrical Components

1. Disconnect Terminal Block 1 by loosening the two screws on the side of the terminal block and then removing the terminal block from the back of the Eaton Cooper Form 6 control ([Figure 10](#)). This terminal block and corresponding wires are not used in the M-2406 Adapter Chassis.

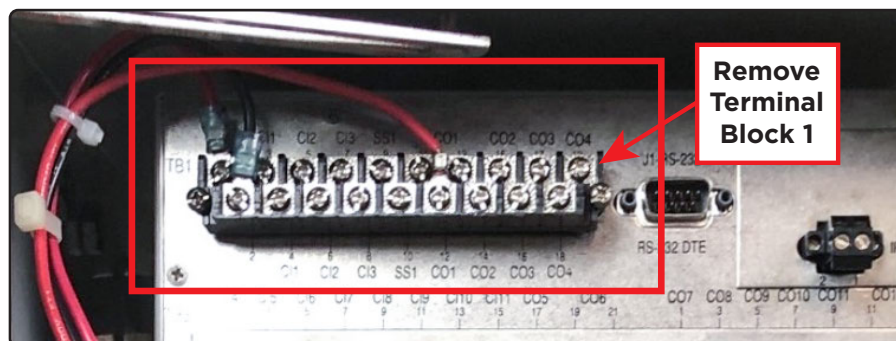


Figure 10 Eaton Cooper Form 6 Terminal Block 1

2. Remove any wires that are connected to this terminal block. These wires can be removed from the wire harness. If the wires cannot be removed, they must be electrically capped, and secured away from the control.
3. Remove Terminal Block 9 from the back of the Eaton Cooper Form 6 Control ([Figure 11](#)), by removing the screws from the corners of the terminal block. Save two of the screws. These will be used to re-install this terminal block onto the M-2406 Adapter Chassis panel.

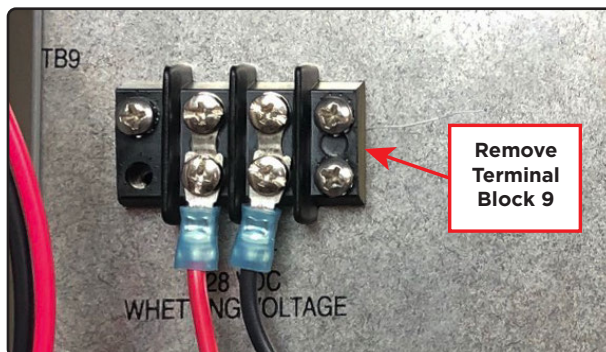


Figure 11 Eaton Cooper Form 6 Terminal Block 9

4. Disconnect **P1**, **P2**, **P3**, and **P4** wire harnesses from the back of the Eaton Cooper Form 6 control panel ([Figure 4](#)). Gently press down on the wire harness connector tabs to remove them from the plugs.

Disconnect the Mechanical Components

1. Remove the 7/16" mounting nut from the back of the Eaton Cooper Form 6 control (Figure 12). Save all hardware, it will be used to install the M-2406 Adapter Chassis.

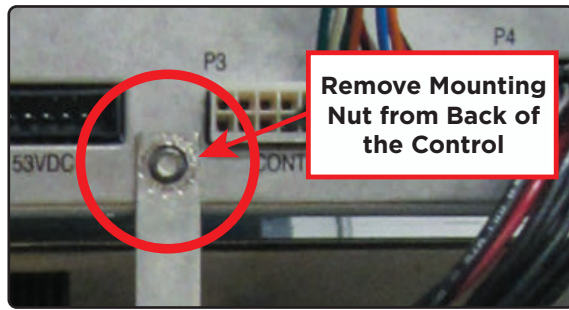


Figure 12 Rear Mounting Nut Location

2. Remove the four 3/8" nuts/hardware from the front side of the Eaton Cooper Form 6 control panel (Figure 13). Save all hardware, it will be used to install the M-2406 Adapter Chassis.

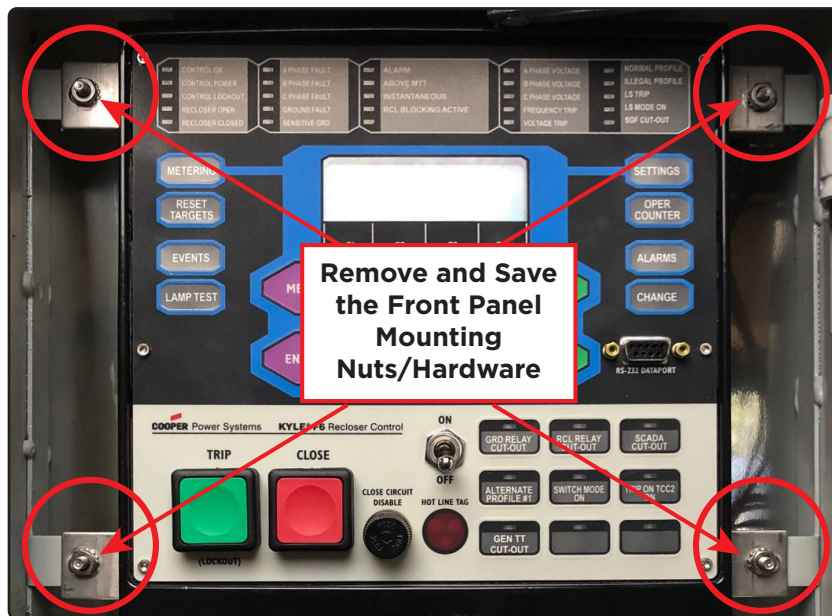


Figure 13 Front Panel Mounting Hardware

3. Remove the Latch nut at the top of the cabinet that attaches the front door bracket, using either a nut driver or 3/8" wrench (Figure 14). This will allow clearance for the control to be removed from the front side of the cabinet. Save the Latch nut.

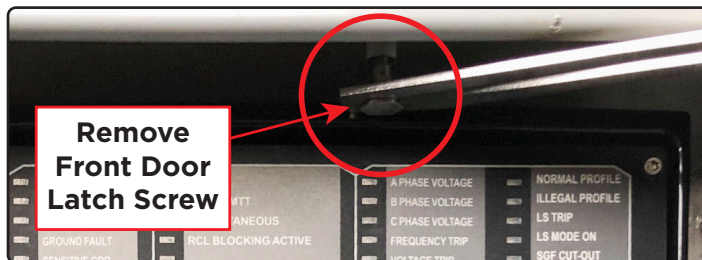


Figure 14 Remove Front Door Latch Screw from Top of Cabinet

4. Once all of the existing mounting hardware is removed and saved, carefully remove the Eaton Cooper Form 6 control from the front of the cabinet ([Figure 15](#)).



Figure 15 Removing the Eaton Cooper Control from the Cabinet

5. Disconnect the Eaton Cooper Battery Power harness from the cabinet board ([Figure 16](#)). Remove the harness from the cabinet and save the harness, which will be used on the M-2406 Adapter Chassis.



Figure 16 Eaton Cooper Battery Power Harness - Cabinet Board Location

6.0 Installing the M-2406 Adapter Chassis

► **REMINDER:** "M-2406" refers to both the 14- / 19-pin (M-2406) and 26-pin (M-2406-26) versions.

Mounting the M-2406 Adapter Chassis in the Control Cabinet

In addition to the saved Eaton Cooper Battery Power harness, the M-2406 Adapter Panel has two additional pre-installed harnesses:

- Battery Charger Interface harness (BECO #B-1853)
 - Battery Wake Up harness (BECO #B-1870)
1. The saved Eaton Cooper Battery Power harness must be installed onto the M-2406 Adapter Chassis prior to installation. Place the M-2406 Adapter Chassis face down to allow access to the M-2035 Module. Connect the 2-pin Phoenix connector to the battery power input plug on the M-2035 Module ([Figure 17](#)).

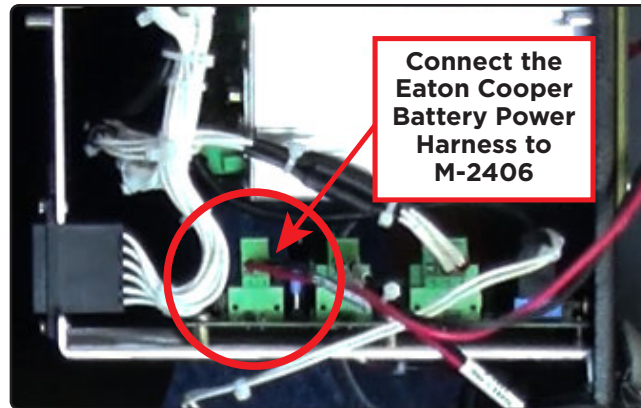


Figure 17 M-2035 Module - Battery Power Input

2. Before inserting the Adapter Chassis into the front of the control cabinet, make sure to feed the three battery harnesses through the cabinet toward the back. Carefully insert the Adapter Chassis into the front of the cabinet. Align the rear mounting screw with the existing vertical mounting bracket at the back of the cabinet. Secure the Adapter Chassis to the front panel mounting locations using the saved hardware.
3. Reinstall the saved Latch nut onto the front door bracket at the top of the control cabinet.
4. Facing the back of the cabinet, place the grounding strap onto the mounting screw at the back of the chassis and use the saved 7/16" nut to secure the strap and the Adapter Chassis to the vertical mounting bracket ([Figure 18](#)).

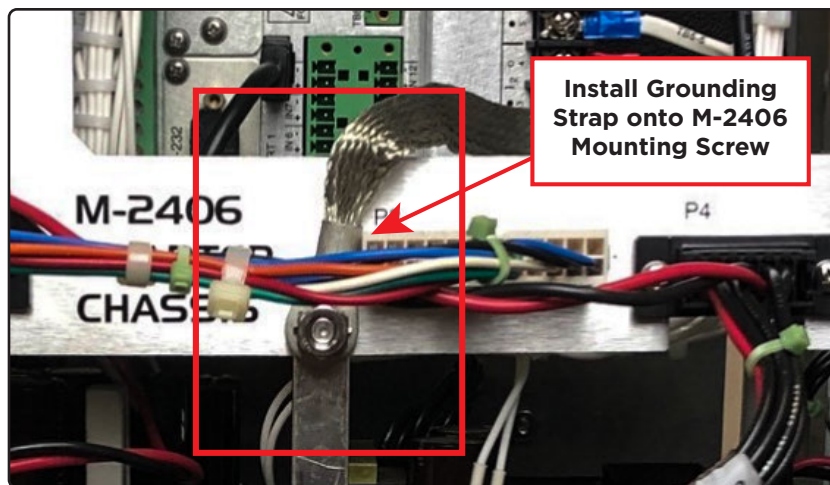


Figure 18 M-2406 Grounding Strap Installed on Rear Mounting Screw
(14- / 19-pin Adapter Chassis Shown)

Electrical Installation

1. For 14- and 19-pin reclosers, connect **P1**, **P3**, and **P4** connectors to the corresponding ports on the back of the 14- / 19-pin Adapter Chassis (Figure 19). For 26-pin reclosers, also connect the **P2** (53 VDC) connector to the corresponding port on the back of the 26-pin Adapter Chassis (Figure 20).



Figure 19 M-2406 Adapter Chassis P1, P3, and P4 Connectors
(14- / 19-pin Adapter Chassis Shown)

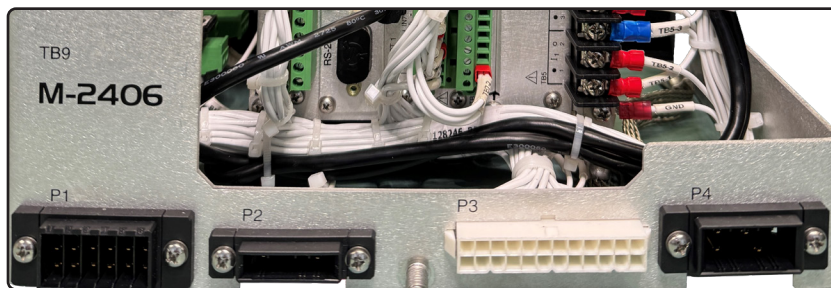


Figure 20 M-2406 Adapter Chassis P1, P2, P3, and P4 Connectors
(26-pin Adapter Chassis Shown - Cable Connections Not Shown)

2. Connect the Battery Wake Up harness (BECO #B-1870) to the Battery Wake Terminals on the board of the existing Eaton Cooper cabinet. These wires are identified as **TM1** and **TM2** and are connected to the **TM1** and **TM2** terminals on the cabinet board (Figure 21).

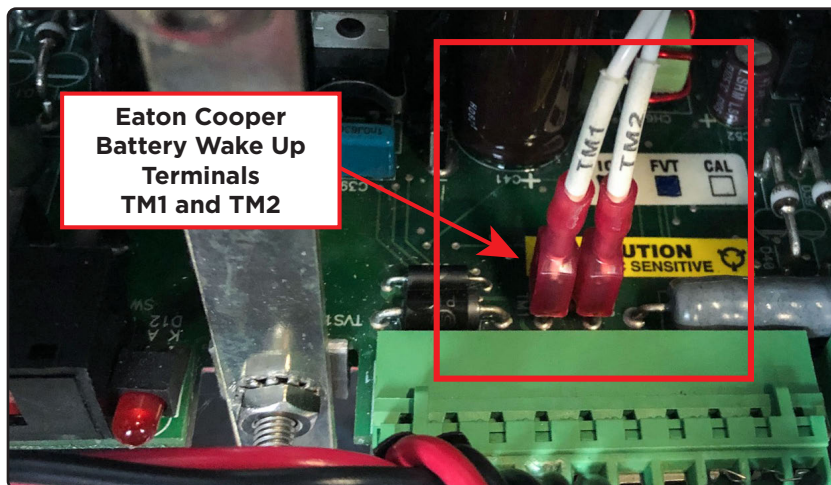


Figure 21 Eaton Cooper Battery Wake Up Terminals TM1 and TM2

3. Reinstall Terminal Block 9 onto the M-2406 Adapter Chassis, lining up with the two pre-drilled holes on the back of the chassis ([Figure 22](#)). Use the screws saved from the removal of TB9 to secure the terminal block.

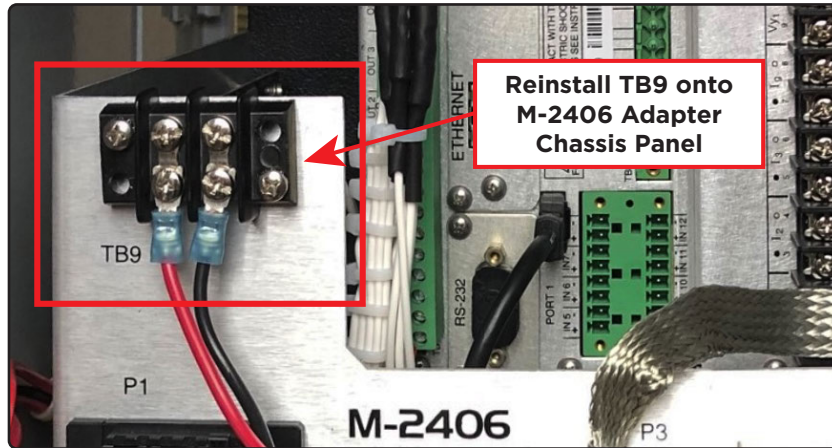


Figure 22 Eaton Cooper Terminal Block 9 Installed onto M-2406 Adapter Chassis (14- / 19-pin Adapter Chassis Shown)

4. Connect the pre-installed Battery Charger harness (BECO #B-1853) from the M-2406 to the existing board in the Eaton Cooper cabinet. This harness connects to the open plug where the Eaton Cooper Battery Power harness was removed ([Figure 23](#)).

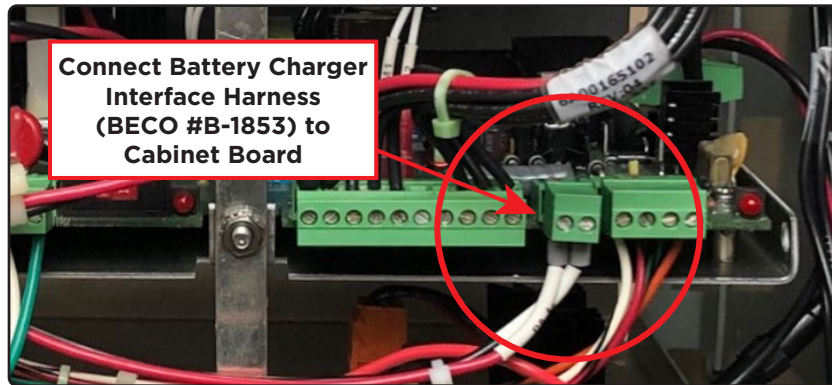


Figure 23 Connect Battery Charger Interface Harness to Eaton Cooper Cabinet Board

5. Feed the Eaton Cooper Battery Power harness (connected to the M-2035 Module) through to the front of the cabinet. This will be reconnected to the battery in the final installation steps.
6. If the cover shield for the optional voltage sensing input terminal block was removed, make sure to reinstall the shield ([Figure 24](#)).

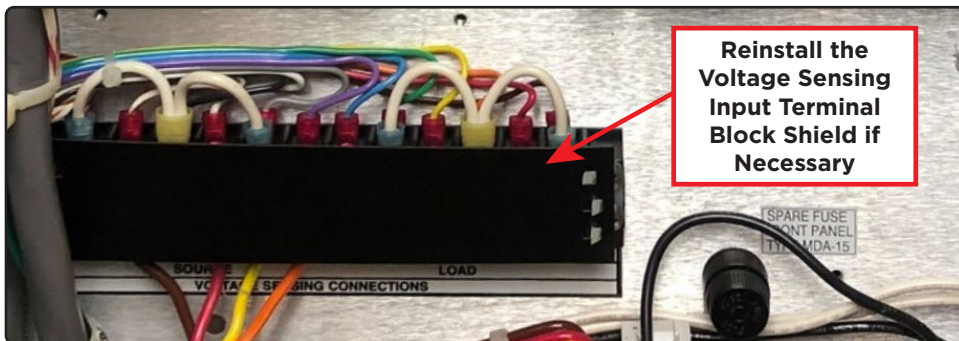


Figure 24 Optional Voltage Sensing Input Terminal Block Cover Shield

7.0 Optional Intrusion Detection Kit (B-1929)

Intrusion Detection Kit Parts Included

The optional Intrusion Detection Kit (B-1929) can be added to Cooper Form 6 enclosures to allow a DNP point (**Input 10 Status**) to be monitored via SCADA. The kit requires the extended I/O option on the M-7679 R-PAC. The kit can be added to a Cooper Form 6 enclosure using the existing mounting studs, and requires no special modifications. The front and back door switches are wired in series, so if either door opens, one Input Status indication is generated.

The Intrusion Detection Kit includes:

- Two bagged MICRO Switches, with two mounting nuts, and two locking nut covers
- One front door switch mounting bracket (see detail [Figure 26](#))
- One back door switch mounting bracket (see detail [Figure 27](#))
- Four connection wires with "To" and "From" wire markers (see detail [Figure 29](#))
- All assembly screws, nuts, and washers

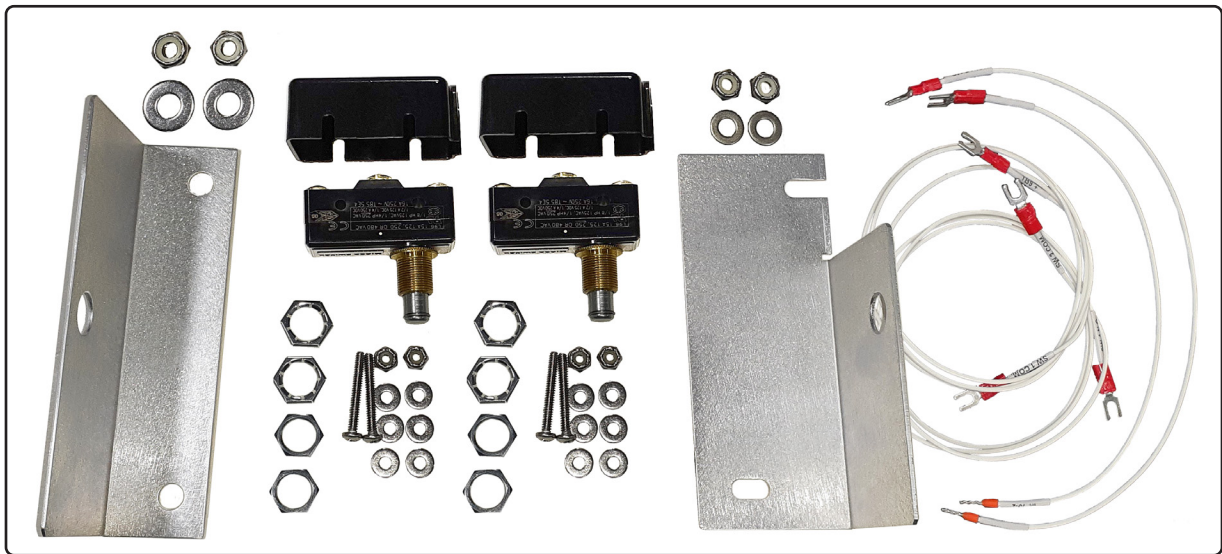


Figure 25 B-1929 Intrusion Detection Kit Parts

Tools Required for Installation

- Phillips head screwdriver
- Three nut drivers: 1/4", 3/8" and 7/16"
- 1/16" flat head screwdriver
- 9/16" deep socket nut driver or open end wrench

**Intrusion Detection
Front Door Switch
Mounting Bracket**

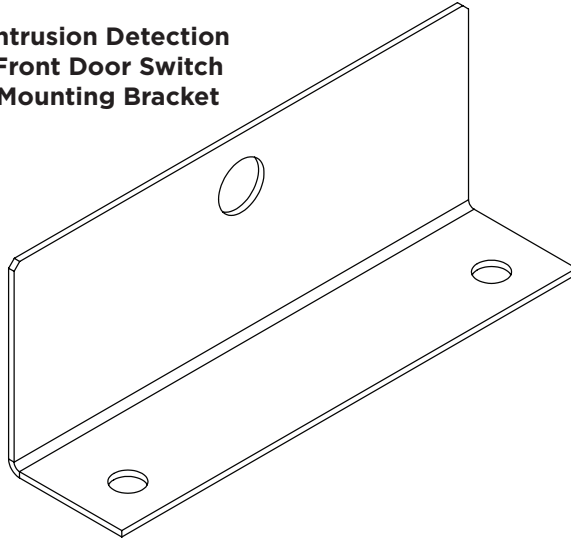


Figure 26 Intrusion Detection Front Door Switch Mounting Bracket

**Intrusion Detection
Back Door Switch
Mounting Bracket**

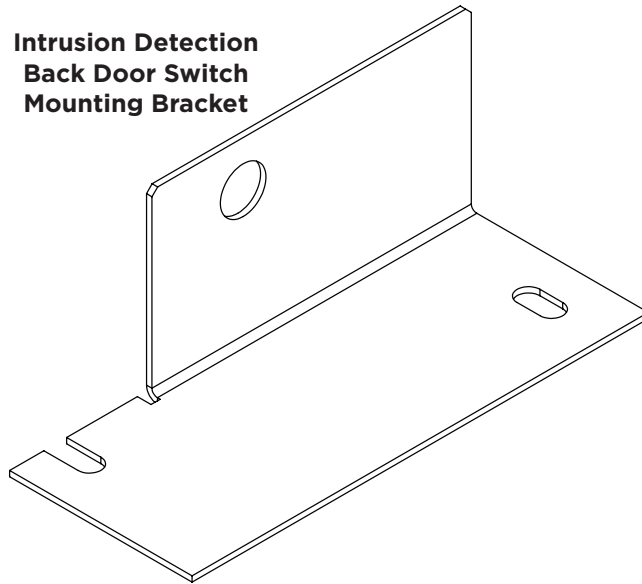


Figure 27 Intrusion Detection Back Door Switch Mounting Bracket

Intrusion Detection Kit Wiring Connections Overview

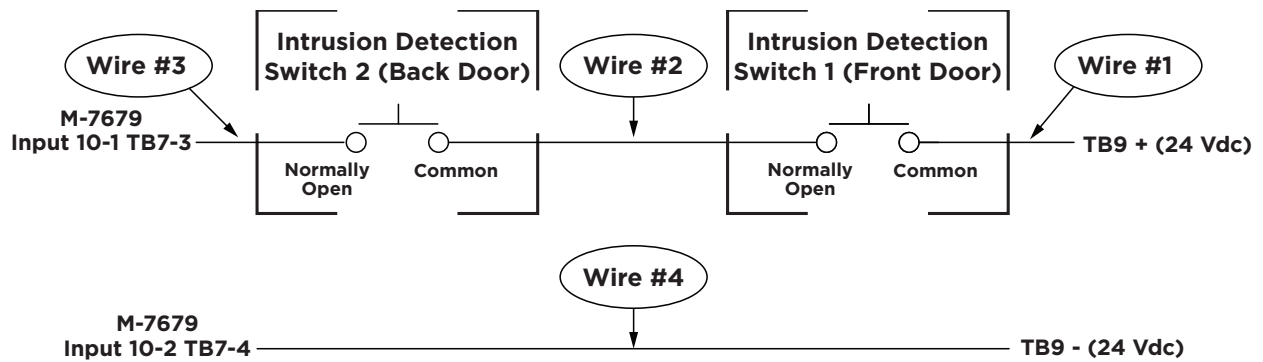


Figure 28 Intrusion Detection Kit Wiring Connections Overview

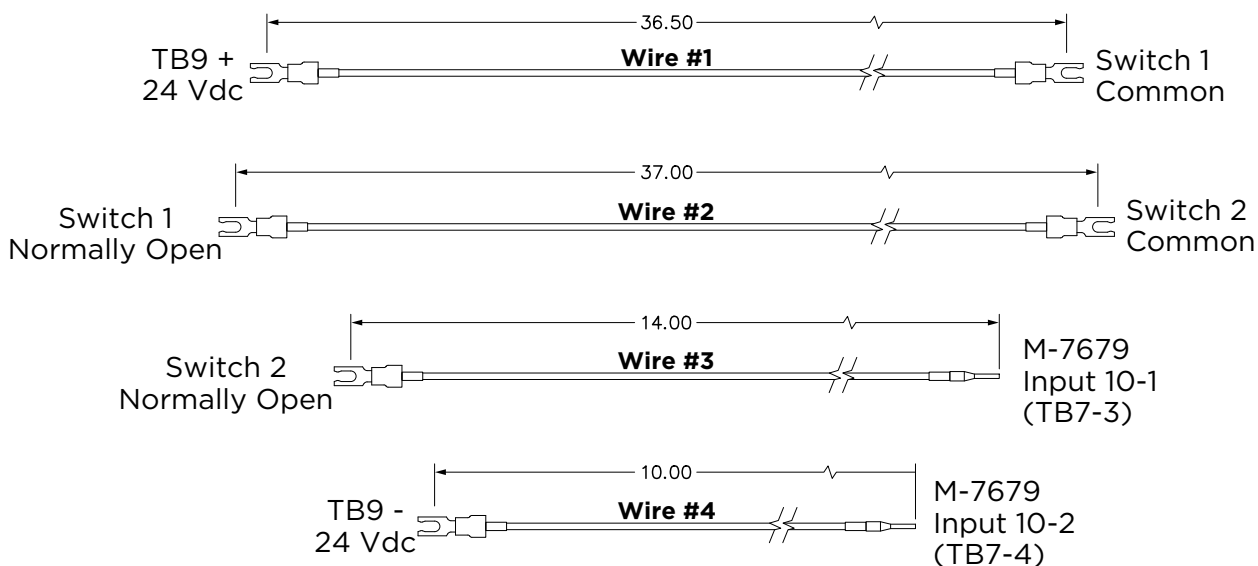
Wire Identification

Figure 29 Intrusion Detection Kit Wire Identification

- **Wire #1** - connects the 24 Vdc wetting terminal block TB9+ to the front door Switch 1. The Positive side is connected to TB9+ and the Common connection is used on the front door Switch 1.
- **Wire #2** - connects the front door Switch 1 to the back door Switch 2. The Normally Open connection is used on the front door Switch 1 and the Common connection is used on the back door Switch 2.
- **Wire #3** - connects the back door Switch 2 to the M-7679 control. The Normally Open connection is used on the back door Switch 2 and Input 10-1 (TB7-3) is used on the M-7679.
- **Wire #4** - connects the 24 Vdc wetting terminal block TB9- to the M-7679 control. The Negative side is connected to TB9- and Input 10-2 (TB7-4) is used on the M-7679.

INSTALLING SWITCH 1 - FRONT DOOR

It is recommended to install the front door switch mounting Bracket and Switch 1 first. The Switch 1 wires are then fed through to the back of the cabinet, and the remaining steps to complete the installation of the kit, are all performed from the back of the cabinet.

Install Front Door Switch Mounting Bracket

The front door switch mounting bracket is installed on the studs used for the battery clamp located on the bottom front of the cabinet (1/4-20 nuts and washers are provided in the kit hardware bag, if needed).

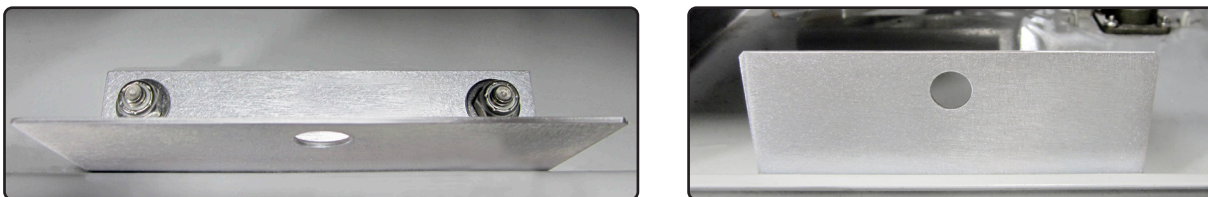


Figure 30 Front Door Intrusion Detection Switch Mounting Bracket Installed

Prepare and Pre-Wire Front Door Switch 1

1. Pre-install the two screws, spacing washers, and nuts which will be used to secure the switch cover (Figure 31). These are provided in the kit hardware bag.

■ **NOTE:** Three washers for each screw are included in the hardware bag, and should be installed on the switch cover screws to act as spacers inside the cover to ensure a tight fit.



Figure 31 Switch Cover Retaining Screws with Spacing Washers

2. Connect **Wire #1** (end marked **SW 1 COM.**) to **Switch 1 "COMMON"** connection terminal by screwing down the fork lug onto the terminal.
3. Connect **Wire #2** (end marked **SW 1 N.O.**) to the **Switch 1 "NORM OPEN"** connection terminal by screwing down the fork lug onto the terminal.

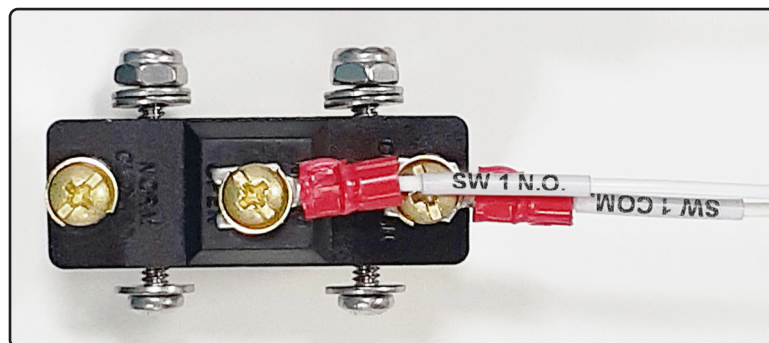


Figure 32 Switch 1 Pre-Wiring Connections (Common and Normally Open)

4. Cover Switch 1 with the provided cover, fitting the spacing washers inside the cover. Tighten the switch cover screws (Figure 33).

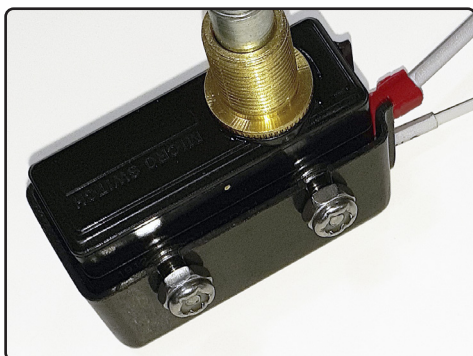


Figure 33 Intrusion Detection Micro Switch with Cover

Mount Switch 1 onto Switch Mounting Bracket

1. Mount **Switch 1** onto the front door switch mounting bracket:
 - a. Install one of the nuts, included in the switch bag, onto the switch post. Thread the nut all the way to the bottom of the post, as far as it will go ([Figure 34](#)).



Figure 34 Switch Mounting Nut #1 Installed

- b. Place the switch into position through the hole on the bracket, with the wires extending from the **right side** of the switch, as you face the front of the bracket. Secure the switch onto the bracket using the other provided nut to lock the switch in place ([Figure 35](#)).
 - c. Optional: after verifying switch operation, install the locking nut covers (included in the switch bag).

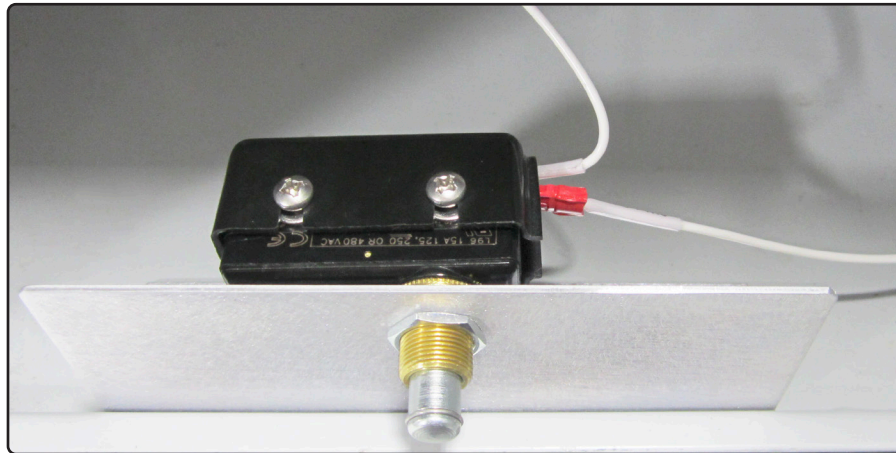


Figure 35 Front Door Switch 1 Mounted on Bracket

2. Feed **Wire 1** (end marked **TB9 +**) to the back of the cabinet, through the space at the bottom right of the cabinet (closest to door panel).
3. Feed **Wire 2** (end marked **SW 2 COM.**) to the back of the cabinet, through the opening at the bottom left of the cabinet.
4. The remainder of the installation is performed from the back of the cabinet.

INSTALLING SWITCH 2 - BACK DOOR

Install Back Door Switch Mounting Bracket

The back door switch mounting bracket is installed on the existing mounting studs located on the top right side of the back of the cabinet (#10-32 nuts and washers are provided in the kit hardware bag, if needed). The bracket is designed so that it can only be installed in the correct position.

■ **NOTE:** Unplug Connector P4, if clearance is needed to install the bracket hardware. Disconnecting P4 will power down the unit.

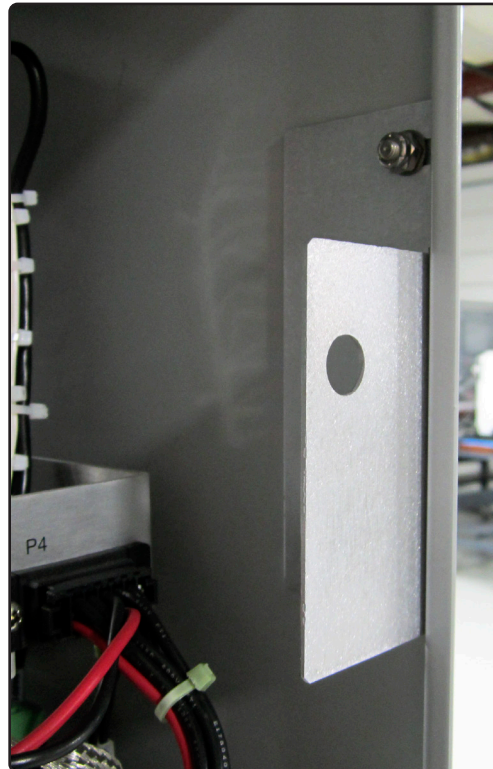


Figure 36 Back Door Intrusion Detection Switch Mounting Bracket Installed

Prepare and Pre-Wire Back Door Switch 2

1. Pre-install the two screws, spacing washers, and nuts which will be used to secure the switch cover, in the same manner as Switch 1 ([Figure 33](#)). These are provided in the kit hardware bag.

■ **NOTE:** Three washers for each screw are included in the hardware bag, and should be installed on the switch cover screws to act as spacers inside the cover to ensure a tight fit.

2. Locate **Wire #2** from Switch 1 that was fed through the cabinet (should be the wire that is coming through the bottom right opening, as you face the back of the cabinet). Connect **Wire #2** (end marked **SW 2 COM.**) to the back door **Switch 2 "COMMON"** connection terminal by screwing down the fork lug onto the terminal.
3. Connect **Wire #3** (end marked **SW 2 N.O.**) to the **Switch 2 "NORM OPEN"** connection terminal by screwing down the fork lug onto the terminal.
4. Cover Switch 2 with the provided cover. Tighten the switch cover screws ([Figure 33](#)).

Mount Switch 2 onto Switch Mounting Bracket

1. Mount **Switch 2** onto the back door switch mounting bracket:
 - a. Install one of the nuts, included in the switch bag, onto the switch post. Thread the nut all the way to the bottom of the post, as far as it will go ([Figure 34](#)).
 - b. Place the switch into position through the hole on the bracket, with the wires extending from the **top** of the switch. Secure the switch onto the bracket using the other provided nut to lock the switch in place.
 - c. Optional: after verifying switch operation, install the locking nut covers (included in the switch bag).
 - d. Secure Wire #2 inside the cabinet, if desired.



Figure 37 Back Door Switch 2 Mounted on Bracket

2. Connect **Wire #3** to the M-7679 **Input 10-1** (TB7-3).
3. Locate **Wire #1** from Switch 1 that was fed through the cabinet (should be the wire that is coming through the bottom left opening, as you face the back of the cabinet). Connect **Wire #1** (end marked **TB9 +**) to the 24 Vdc wetting terminal block **TB9 +** (positive).

■ **NOTE:** The positive and negative connections must be determined by the installer, and are based on the existing wiring on TB9.

4. Locate the short **Wire #4** that has not been used so far. Connect **Wire #4** from **Input 10-2** (TB7-4) on the M-7679 control to the 24 Vdc wetting terminal block **TB9 -** (negative). This last connection provides power to the switches.
5. Reconnect Connector P4, if it was previously disconnected.

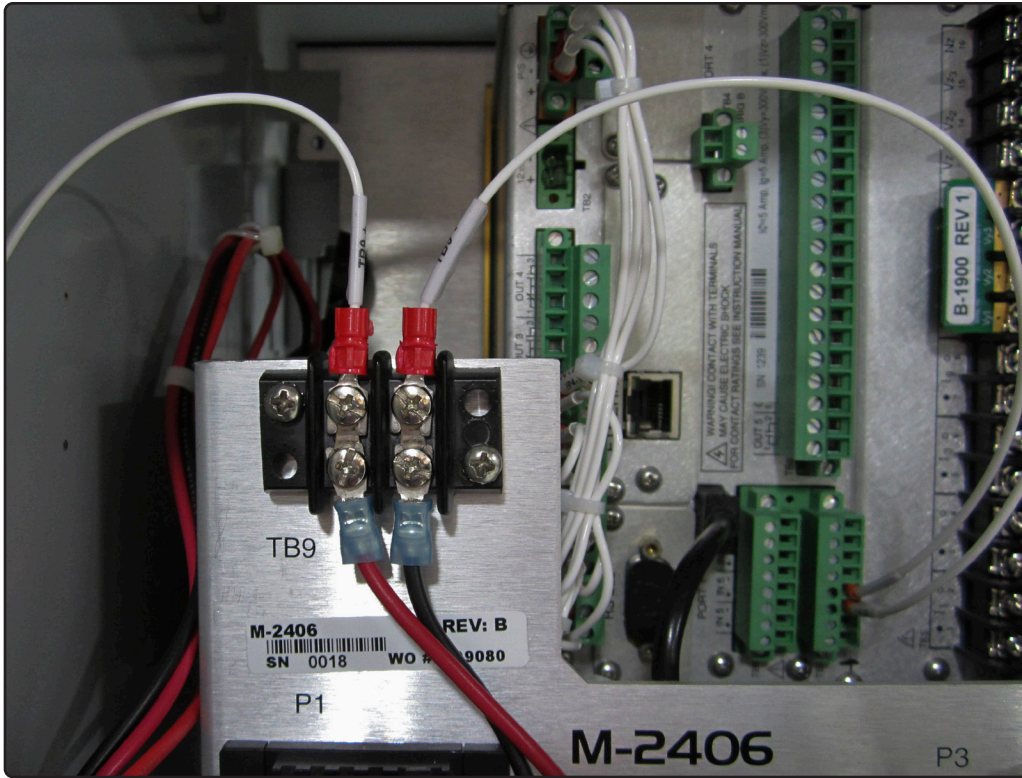


Figure 38 Back Door Switch 2 Final Connections
(14- / 19-pin Adapter Chassis Shown)

VERIFY INTRUSION DETECTION OPERATION

- Using S-7600 IPScam **Setup/Configuration/Relay/Input**, assign **Input 10** as General ([Figure 39](#)).

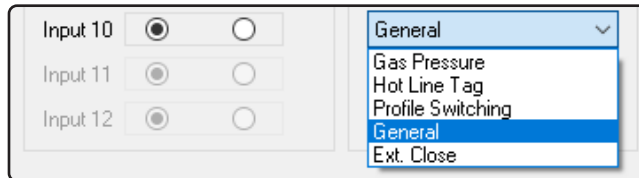


Figure 39 Intrusion Detection Input 10 Setting Screen

- Close both doors of the cabinet. With both doors closed, Input 10 should be active.
- If the doors are closed and Input 10 is not active, then adjust the switch positions so they activate the input when the doors are closed. The switch may be adjusted forward and backward by moving the nuts installed on the switch post to different positions on the post. Listen for the switch to "click" when the door is very close to being completely closed.

NOTE: The two switches are wired in series, so if either door opens, one Input Status indication is generated.

- Verify the Input 10 status displays as expected during the following conditions: all doors closed, only the front door open, only the back door open, all doors open.

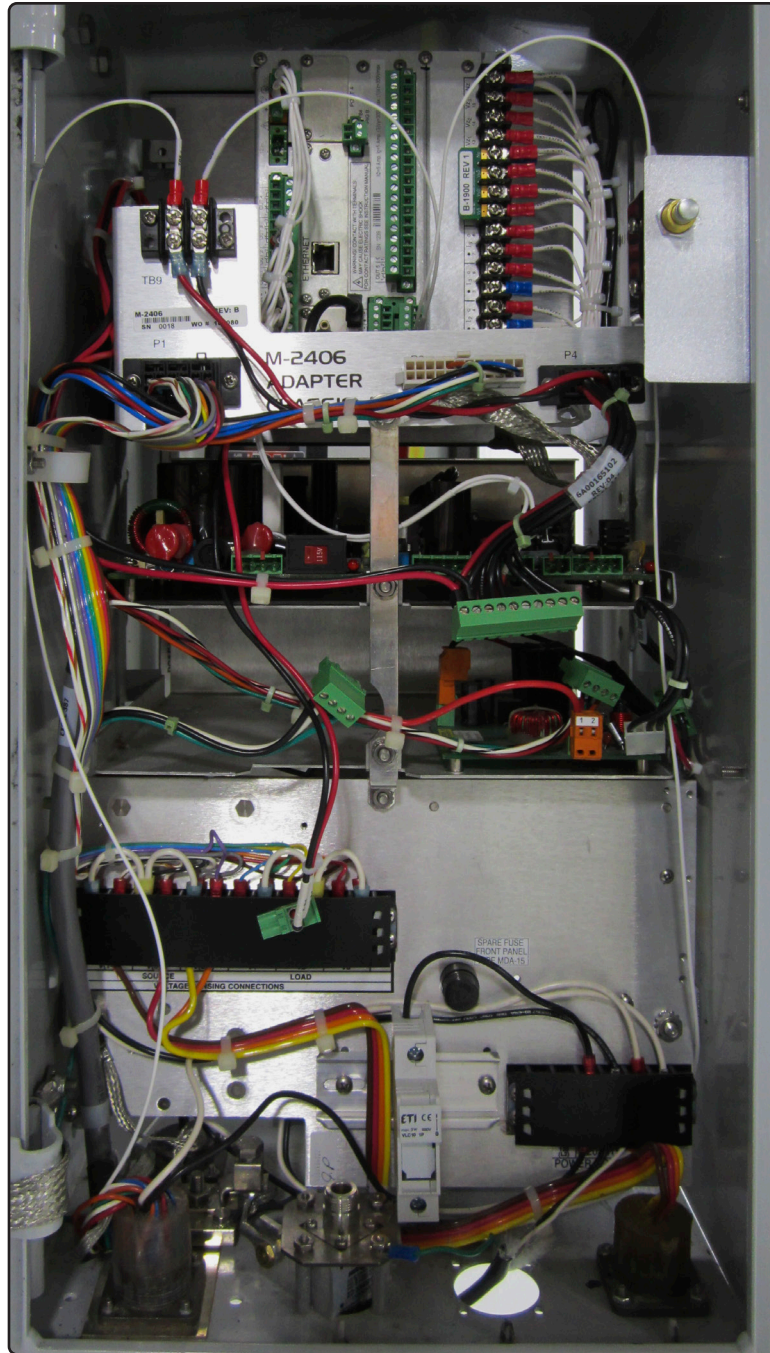


Figure 40 Intrusion Detection Kit Installed - Back Door View
(14- / 19-pin Adapter Chassis Shown)

8.0 Final Installation Steps and Trip/Close Test

► **REMINDER:** "M-2406" refers to both the 14- / 19-pin (M-2406) and 26-pin (M-2406-26) versions.

1. Connect the 14-, 19-, or 26-Pin Recloser cable to the bottom of the cabinet.
2. Re-connect the Eaton Cooper Battery Power harness ([Figure 41](#)).

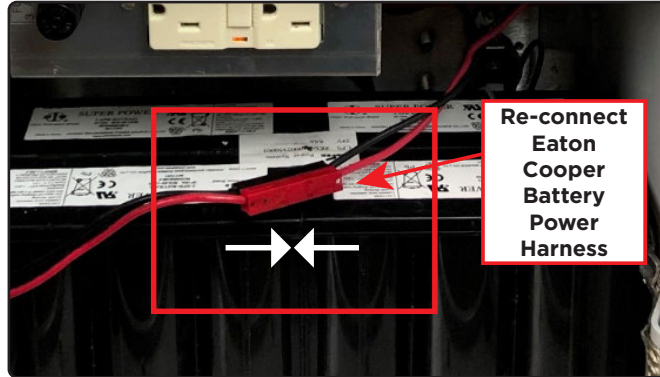


Figure 41 Re-connect Eaton Cooper Battery Power Harness

3. Apply power to the cabinet.
4. The M-7679 R-PAC will perform the bootup process, and will then indicate the status of the recloser. It is recommended to **perform at least one Trip/Close sequence** from the M-7679 R-PAC to verify proper operation of the control in the cabinet.



Figure 42 M-2406 Chassis Fully Installed

9.0 Required IPScom Settings

Set System Setup Settings

1. Connect to the M-7679 through IPScom. Refer to Chapter 4 in the [M-7679 R-PAC Instruction Book](#) for details.
2. Access the **System Setup** screen (Setup/Configuration/Relay) and click **Interface Configurator**.

For the 14- / 19-pin Adapter Chassis (M-2406): Set and confirm the Interface Type as **M-2406 Cooper Form 6** (Figure 43). Proceed to step 3.

For the 26-pin Adapter Chassis (M-2406-26): Set and confirm the Interface Type as **Custom** (Figure 44). Then, see [Table 1](#) for all required values to set in the corresponding **Input** and **Output** tabs of this screen.

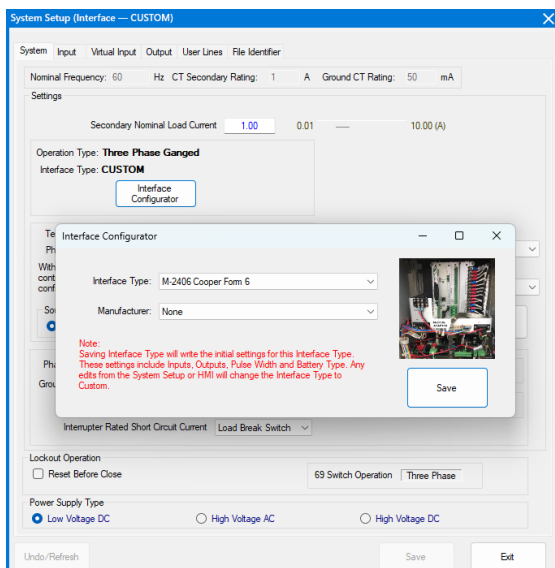


Figure 43 System Setup Interface Configurator Screen - 14- / 19-pin Adapter Chassis

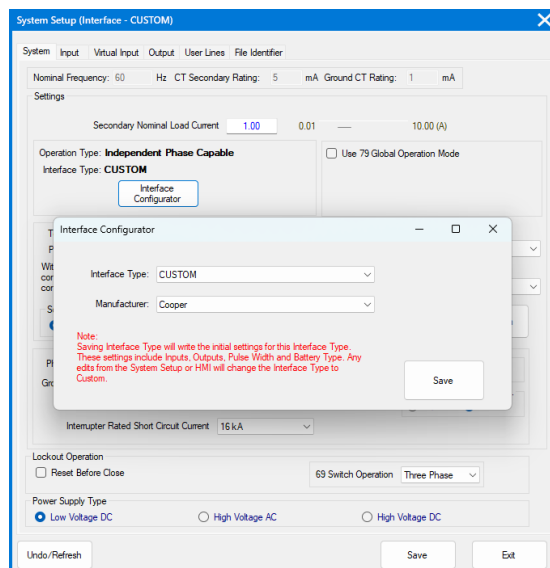


Figure 44 System Setup Interface Configurator Screen - 26-pin Adapter Chassis

Set Values for Inputs and Outputs (26-pin Adapter Chassis)

Use the table below to set the following values in the **System Setup** screen's **Input** and **Output** tabs. When finished, proceed to step 3.

Input / Output #	Input - Active State	Input - Function	Input - Debounce	Output - Operation	Output - Pulse Width/ Seal-in Time	Output - Function
1	Close	52a Phase A	50	Pulsed	0.04	Trip Phase A
2	Close	52b Phase A	50	Pulsed	0.10	Close Phase A
3	Open	69 Lockout Phase A	500	Direct	0.20	General
4	Open	69 Lockout Phase B	500	Direct	0.07	General
5	Open	69 Lockout Phase C	500	Pulsed	0.04	Trip Phase B
6	Close	52a Phase B	50	Pulsed	0.10	Close Phase B
7	Close	52b Phase B	50	Pulsed	0.04	Trip Phase C
8	Close	52a Phase C	50	Pulsed	0.10	Close Phase C
9	Close	52a Phase C	50	Pulsed	0.07	General
10	Close	General	50	Direct	0.07	General
11	Close	General	50	Direct	0.07	General
12	Close	General	50	Direct	0.07	General

Table 1 Required Settings for Input and Output Tabs of System Setup Screen for 26-pin Adapter Chassis

Prepare for Service

3. It is recommended to **perform at least one Trip/Close sequence** from IPScom (Monitor/BECO vHMI) to verify proper configuration. Follow your company's validation procedure.

— Installation Procedure Complete —

Legal Information

Patent

The units described in this manual are covered by U.S. Patents, with other patents pending.

Buyer shall hold harmless and indemnify the Seller, its directors, officers, agents, and employees from any and all costs and expense, damage or loss, resulting from any alleged infringement of United States Letters Patent or rights accruing therefrom or trademarks, whether federal, state, or common law, arising from the Seller's compliance with Buyer's designs, specifications, or instructions.

Warranty

Seller hereby warrants that the goods which are the subject matter of this contract will be manufactured in a good workmanlike manner and all materials used herein will be new and reasonably suitable for the equipment. Seller warrants that if, during a period of five years from date of shipment of the equipment, the equipment rendered shall be found by the Buyer to be faulty or shall fail to perform in accordance with Seller's specifications of the product, Seller shall at his expense correct the same, provided, however, that Buyers shall ship the equipment prepaid to Seller's facility. The Seller's responsibility hereunder shall be limited to replacement value of the equipment furnished under this contract.

Seller makes no warranties expressed or implied other than those set out above. Seller specifically excludes the implied warranties of merchantability and fitness for a particular purpose. There are no warranties which extend beyond the description contained herein. In no event shall Seller be liable for consequential, exemplary, or punitive damages of whatever nature.

Any equipment returned for repair must be sent with transportation charges prepaid. The equipment must remain the property of the Buyer. The aforementioned warranties are void if the value of the unit is invoiced to the Seller at the time of return.

Indemnification

The Seller shall not be liable for any property damages whatsoever or for any loss or damage arising out of, connected with, or resulting from this contract, or from the performance or breach thereof, or from all services covered by or furnished under this contract.

In no event shall the Seller be liable for special, incidental, exemplary, or consequential damages, including but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of purchased power, cost of substitute equipment, facilities or services, downtime costs, or claims or damages of customers or employees of the Buyer for such damages, regardless of whether said claim or damages is based on contract, warranty, tort including negligence, or otherwise.

Under no circumstances shall the Seller be liable for any personal injury whatsoever.

It is agreed that when the equipment furnished hereunder are to be used or performed in connection with any nuclear installation, facility, or activity, Seller shall have no liability for any nuclear damage, personal injury, property damage, or nuclear contamination to any property located at or near the site of the nuclear facility. Buyer agrees to indemnify and hold harmless the Seller against any and all liability associated therewith whatsoever whether based on contract, tort, or otherwise. Nuclear installation or facility means any nuclear reactor and includes the site on which any of the foregoing is located, all operations conducted on such site, and all premises used for such operations.

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