

Energy Reduction Maintenance Setting (ERMS) System Installation and User Guide

Class 0600

Retain for future use.

Required for Installation

Kit Contents

ERMS Label Kit: 84956

Table 1 – Parts for ERMS Switch (Included in Kit)

Quantity	Description
1	Instruction sheet
1	ERMS hazard label
1	ERMS switch label
1	ERMS light label
1	RSU (Remote Setting Utility) 8.5.1 (on memory stick)

Additional Components Required

Table 2 – Parts for ERMS Switch (Order Separately)

Quantity	Description	Catalog Number
1	Switch with blue indicator light (24 Vdc)	9001K11J35LLL
1	Switch contact block	9001KA1
1	Padlock attachment	9001K7
1	Remote pilot light (blue)	9001KP35L9
1	IO module	LV434063
1	ULP cord (male-to-male RJ45) L = 0.6 m (1.97 ft), 10 cables L = 2 m (6.56 ft), 5 cables L = 3 m (9.84 ft), 5 cables	TRV00806 TRV00820 TRV00830
1	Circuit breaker ULP cord L = 1.3 m (4.27 ft) L = 3 m (9.84 ft)	LV434196 LV434197
1	ULP terminator (bag of 10)	TRV00880
1	IFE module (optional to provide ERMS setting adjustments)	LV434010
1	PowerPact or Masterpact circuit breaker with P or H trip unit with ERMS label (see Figure 1)	—

For additional information see the following user guides available on the Schneider Electric™ website:

- Bulletin HRB28361: *Masterpact™ NW Low-Voltage Power/Insulated Case Circuit Breaker Installation*
- Bulletin 48049-330-03: *Micrologic 5.0H and 6.0H Electronic Trip Units*
- Bulletin 48049-137-05: *Micrologic 5.0P and 6.0P Electronic Trip Unit*
- Bulletin 1040IB1401: *IFE Ethernet Interface for LV Circuit Breakers User Guide (UL)*
- Bulletin 0613IB1317: *IO Module - Input/Output Interface for LV Circuit Breakers - User Guide*

To access the website go to: <http://www.schneider-electric.com>

For application assistance, please call 1-888-778-2733.

Introduction

Square D™ brand PowerPact™ P- and R-Frame and Masterpact™ circuit breakers, manufactured by Schneider Electric, provide arc flash protection characteristics. Additional components can be integrated to increase the options available to reduce the arc flash incident energy (AFIE).

For circuit breakers equipped with P and H Micrologic™ trip units, Schneider Electric has developed a method to temporarily reduce the instantaneous pickup setting of the circuit breaker using an Energy Reduction Maintenance Setting (ERMS) switch.

In order to quantify the AFIE reduction, an arc flash analysis must first be performed. Values must be calculated for the possible maintenance setting to determine if any practical changes to maintenance procedures, such as reduction of PPE levels, is even possible.

NOTE: The ERMS system can only affect the AFIE downstream of the circuit breaker. Multiple source systems that incorporate one or more ERMS system must have each source considered when ERMS is ON to ensure the AFIE reduction can be achieved at the desired location.

Energy Reduction Maintenance Setting (ERMS) Function

The energy reduction maintenance setting (ERMS) function is available on circuit breaker equipped with:

- BCM ULP with firmware version 4.1.0 and above.
- Micrologic P or H trip unit with the **blue ERMS label (A)** as shown below.
- IO Module with application **switch set to position 3.**

Figure 1 – ERMS Label on Trip Unit



See bulletin 0613IB1317: *IO Module - Input/Output Interface for LV Circuit Breakers - User Guide* for more information.

The ERMS function is used to reduce the Ii protection settings in order to trip as fast as possible when a fault occurs. The pre-programmed factory setting for Ii protection in ERMS mode is 2xIn. The ERMS setting can be adjusted using this instruction bulletin (NHA67346).

⚠ DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Do not change the Micrologic P or H trip unit's settings while in ERMS mode.
- Seal the transparent cover of the Micrologic P or H trip unit when using the ERMS mode.

Failure to follow these instructions will result in death or serious injury.

If any of the basic protection settings are changed using the rotary dials on the Micrologic control unit while in ERMS mode, the Micrologic control unit switches to the normal mode and then returns automatically to the ERMS mode after five seconds.

Safety Precautions

⚠ DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified personnel.
- Perform such work only after reading and understanding all of the instructions contained in this bulletin.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off.
- Before performing visual inspections, tests, or maintenance on the equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, grounded, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Practice lock-out / tag-out procedures according to OSHA requirements.
- Handle this equipment carefully and install, operate, and maintain it correctly in order for it to function properly. Neglecting fundamental installation and maintenance requirements may lead to personal injury, as well as damage to electrical equipment or other property.
- Carefully inspect your work area and remove any tools and objects left inside the equipment.
- Replace all devices, doors, and covers before turning on power to this equipment.
- All instructions in this manual are written with the assumption that the customer has taken these measures before performing maintenance or testing.

Failure to follow these instructions will result in death or serious injury.

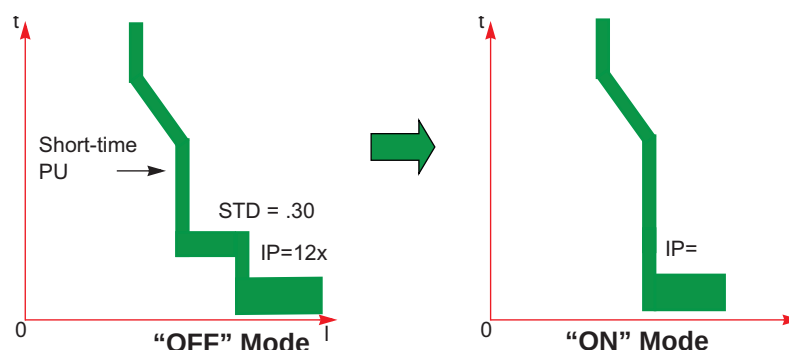
ERMS Switch Application

When the ERMS Switch is Turned “ON”

The ERMS switch can be turned “ON” to reduce circuit breaker tripping time. This sets the instantaneous pickup to a pre-programmed value (See ERMS Setting Adjustment, page 7. Default if not programmed = $2 \times I_n$). If the ERMS instantaneous pickup is adjusted to the same or lower setting than the short-time pickup, the instantaneous function will override the short-time function and trip the circuit breaker with no intentional delay.

In the “OFF” mode, the normal settings of the trip unit are re-established.

Figure 2 – ERMS Switch “OFF” and “ON” Mode



Nuisance Tripping

When the ERMS switch is “ON” (circuit breaker is in maintenance mode), the circuit breaker’s ERMS instantaneous pickup is set to the pre-programmed level (see ERMS Setting Adjustment, page 7 for setting to a value other than the default value of $2 \times I_n$) which is less than the normal instantaneous pickup setting as set by the rotary switch setting (li). As a result, the potential for nuisance tripping increases. Nuisance tripping can be caused by a motor starting, transformer inrush, or some other momentary power disturbance.

Other Considerations

The use of the ERMS switch should be integrated into the overall safety policy. Lock-out / tag-out procedures require the use of personal protective equipment (PPE), so adding the necessary steps to ensure the ERMS switch is turned to the “ON” position when it should be and turned back to the “OFF” position, as well as using appropriate PPE for each of these modes, is critical for proper application of the ERMS switch.

Every ERMS switch user must be trained on the proper use of this equipment and how it impacts their safety policy. Additional considerations are as follows:

- Impact of lost selectivity
- Nuisance trips
- Possibility of using the wrong ERMS switch for the desired upstream circuit breaker
- The ERMS system can only affect the arc flash incident energy (AFIE) downstream of the circuit breaker
- False sense of security
- Increased reliance on procedures
- Equipment planning
- Labeling issues—one reasonable approach is to place arc flash information labels on equipment based on the normal settings mode (which is the ERMS switch turned to the “OFF” position) and when using maintenance settings. The user must develop administrative controls based on the user’s safety practices.

NFPA 70B requires proper maintenance of the electrical system. NFPA 70E recommends updating the arc flash study every five years or whenever system modifications are made, such as adjustment of protective device settings.

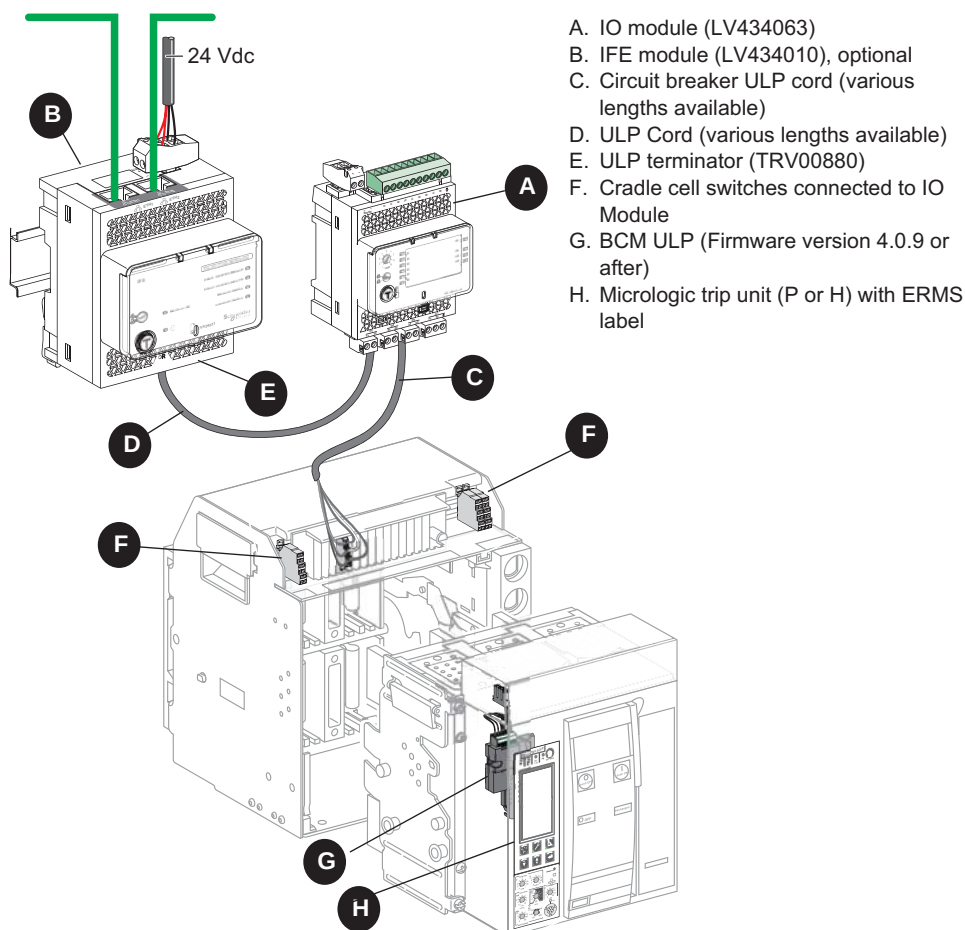
Installing the ERMS Switch

Figure 3 – Local ERMS Switch



1. Observe all safety procedures as described on the page 3 of this bulletin. Make sure the equipment is de-energized in the areas you will be working.
2. Plan the installation of the ERMS system. Determine locations for the ERMS switch/lockout assembly, IO module, and other components as necessary. See page 20 for installation and wiring recommendations.
3. Assemble the ERMS switch, contact block and lockout assembly according to the instructions with the parts. Install the switch assembly in the equipment along with the switch nameplate provided in the kit.
4. Install the IO module (Figure 4, A). Make sure the DIN rail mounting is properly grounded so that the ground shoe of the IO module will be grounded. See Figure 4 below and the instruction bulletin with the IO module to connect the circuit breaker ULP cord (C) between the BCM ULP (G) and the IO module. If equipped, connect the cell switches (F) from the circuit breaker cradle to the IO module.
5. If the optional IFE module (B) is not used, wire the 24 Vdc control power to the top of the IO module (A). If the IFE module is used, wire as shown with the ULP cord (D) between the IO and IFE modules. Also install the ULP terminator (E) into the empty ULP connection at the bottom of the IO or IFE as necessary. Refer to Figure 27 – on page 19 for the wiring diagram.

Figure 4 – Switch Connection



⚠ DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Use only Micrologic P or H trip units with the blue ERMS label for energy reduction maintenance setting systems.

Failure to follow these instructions will result in death or serious injury.

Figure 5 – ERMS Label on Trip Unit

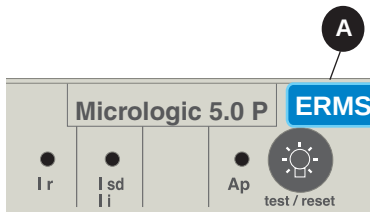
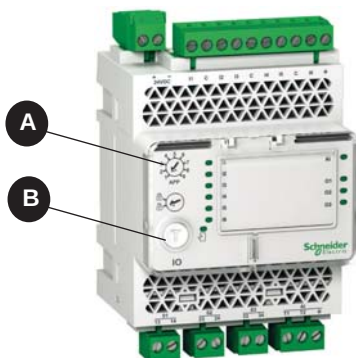


Figure 6 – APP Dial on IO Module



6. All Micrologic P and H trip units with the blue ERMS label are suitable for ERMS applications. Verify that the Micrologic P or H trip unit in the ERMS system has the blue ERMS label (Figure 5, A).
7. Adjust the IO module for the ERMS application by rotating the APP dial (Figure 6, A) to position 3.
8. See the wiring diagram (Figure 27). Use 14 AWG wire to connect the ERMS switch to the input terminals on the IO module. Connect the normally closed contact to terminal I4 and the normally open contact to terminal I5. Connect the common terminal from the IO module to the other side of the normally closed and normally open contacts in the ERMS switch.
9. Also wire the blue LED terminals in the ERMS switch to output 3 on the IO module (terminals 33 and 34) with a 24 Vdc power supply. If necessary, also wire a remote ERMS indicator at the desired location.
10. Make sure the Micrologic P or H trip unit has 24 Vdc control power on terminals F1 (-) and F2 (+).
11. The locking pad of the communication interface module (IFM or IFE) must be in **UNLOCK** position (padlock open) while performing the energy reduction maintenance setting (ERMS). Press and hold the T (Test) button (B) on the face of the IO module for five seconds.
12. The parameter **ACCESS PERMIT** in the COM setup/Remote setting menu on the display of the Micrologic control unit must be **set to YES** for system without IFM/IFE.

NOTE: The ERMS ON and OFF orders are executed only when the access parameter is set to YES and the passcode in the Micrologic control unit is set to 0000.

Selecting Maintenance Mode

Figure 7 – Local ERMS Switch



Locate the ERMS switch for the intended circuit breaker (see Figure 7).

1. Turn the ERMS switch to the “ON” position. After a short delay, the switch will illuminate blue, indicating the circuit breaker is in maintenance mode. See “Testing the ERMS System” on page 16 for more details on trip unit indication.
2. To return to normal operation, turn the ERMS switch to the “OFF” position. The switch should no longer illuminate.

Remote ERMS Switch Maintenance Mode Option

Figure 8 – Local Maintenance Mode Indicator Light

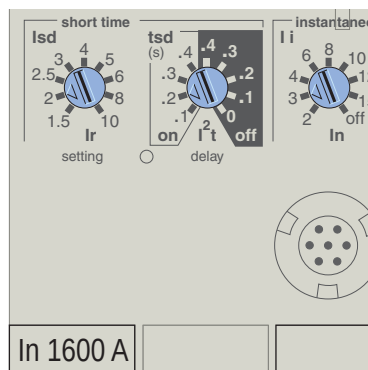


If needed, a local maintenance mode indicator light can be placed in the downstream equipment near the area where the work will be completed (see Figure 8).

1. Locate the local maintenance mode indicator light. Wire the local maintenance mode indicator light into the ERMS ON circuit per the wiring diagram in Figure 27 – on page 19.
2. Turn the ERMS switch to the “ON” position. After a short delay, the remote switch and the local maintenance mode indicator light near the circuit breaker will both illuminate blue, indicating the circuit breaker is in maintenance mode. See “Testing the ERMS System” on page 16 for more details about trip unit indication.
3. To return to normal operation, turn the remote ERMS switch to the “OFF” position. The remote switch and the local maintenance mode indicator light near the circuit breaker will stop illuminating.

ERMS Setting Adjustment

Figure 9 – In Value Location on Trip Unit



The ERMS system is programmed to default to an Instantaneous (li setting) of 2 x In.

NOTE: The In value is shown at the bottom left of the trip unit (Figure 9, A).

The ERMS system can be adjusted above the 2 x In to any other Instantaneous setting (range: 2 x In to li setting) using the following parts:

- Laptop with XP or Windows 7
- Remote setting utility (RSU) software version 8.5.1
- LV434010 IFE Module
- ULP cords lengths, selected below depending on setup:
 - TRV00806 L = 0.6 m (1.97 ft), 10 cables
 - TRV00820 L = 2 m (6.56 ft), 5 cables
 - TRV00830 L = 3 m (9.84 ft), 5 cables
- TRV00880 ULP terminator (bag of 10 terminators).

Connections

1. Confirm that all safety procedures are in place for the equipment. Disconnect the power from the circuit breaker where the ERMS will be adjusted.
2. Open the equipment to get access to the IO module. Check to see if there is an IFE module installed (Figure 10, A).
3. If there is no IFE module installed, install the IFE in a convenient location close to the IO module:
 - a. Move the ULP terminator to the bottom of the IFE module (D) (LV434011).
 - b. Use a ULP cord (E) to connect between the bottom of the IO module (B) to the bottom of the IFE module (A).
 - c. If the 24 Vdc connection (C) is at the top of the IO module (B), move the 24 Vdc connection from the top of the IO module (B) to the top of the IFE module (A).

Figure 10 – IFE Module Connections

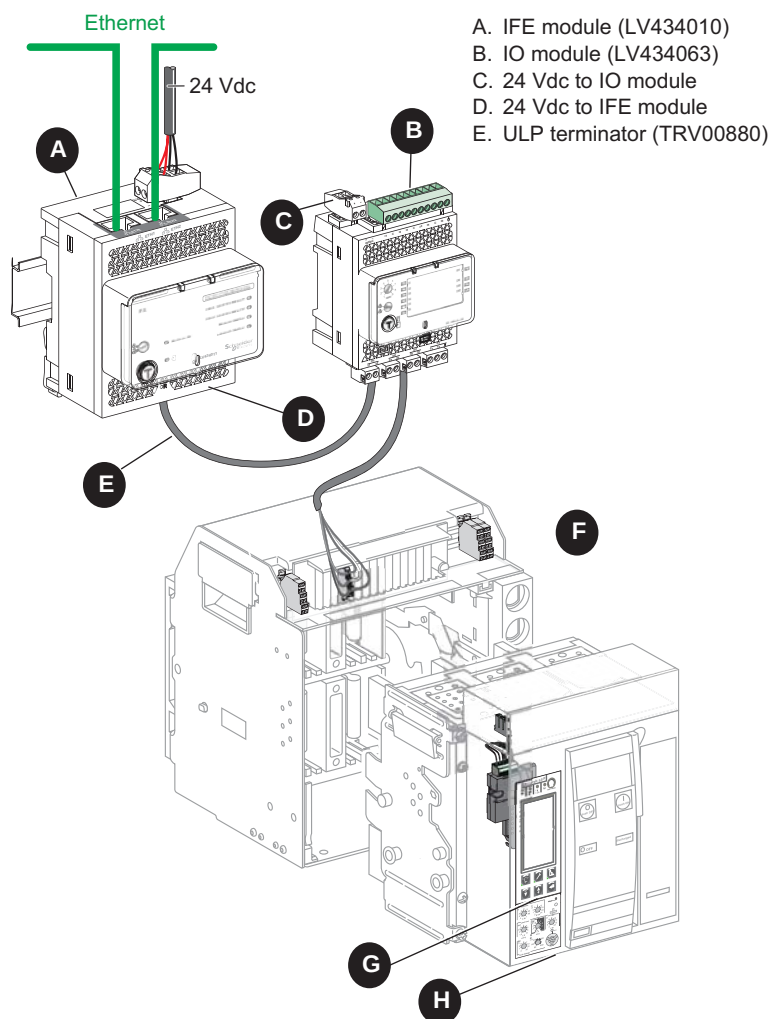
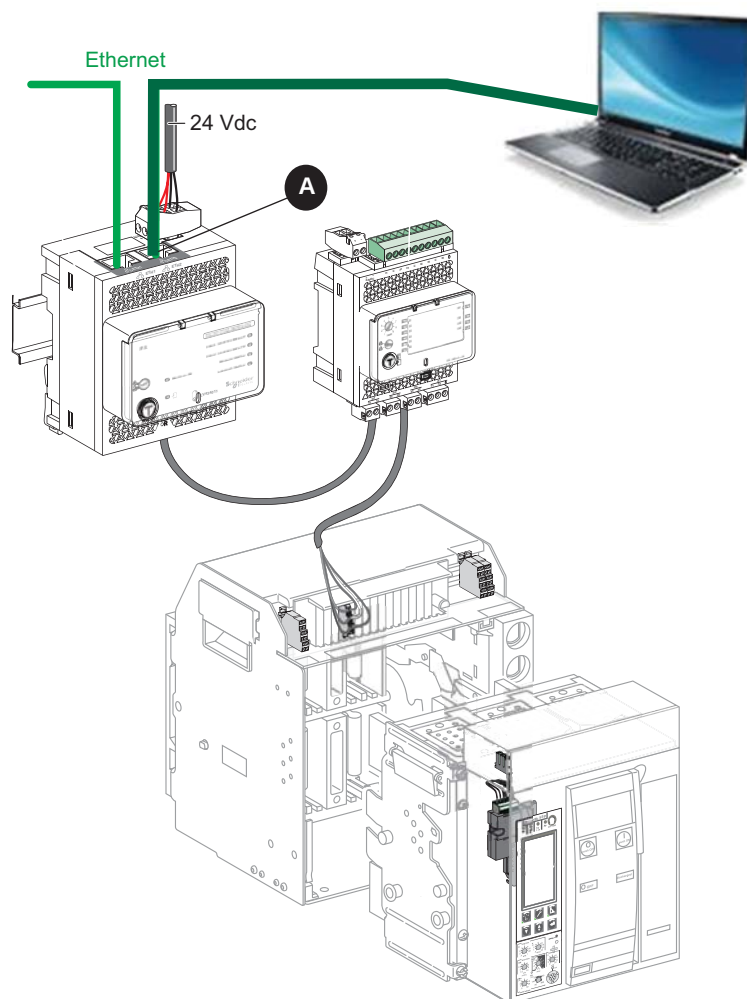


Figure 11 – IFE Module Address

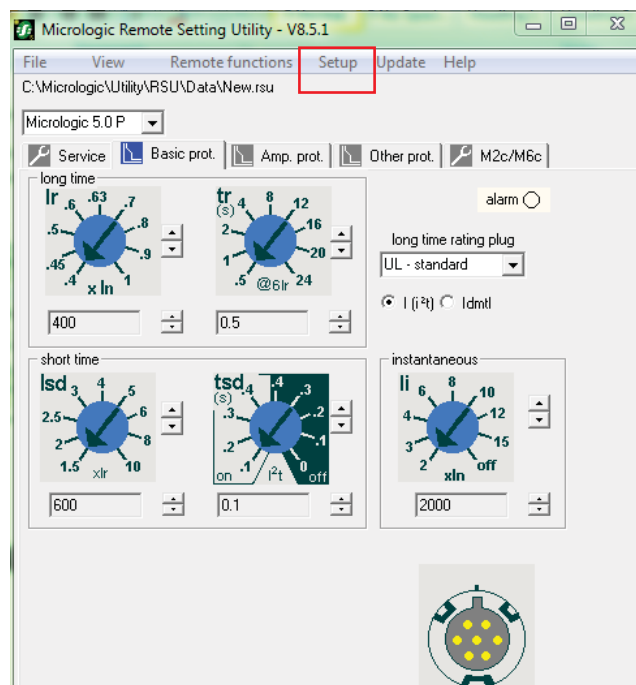
4. Read the IFE address on the front of the IFE module (Figure 11). Example: IFE-E3.13.86. Use the calculator that comes with the laptop (Programmer setting view) to convert the last two characters in the address from hexadecimal to decimal. Add the decimal equivalents to the end of the default IP address: 169.254.xx.xxx. Example: 13 converts to 19 and 86 converts to 134. This gives 169.254.19.134 as the IP address for the IFE module shown in this example. Record the IP address from this step 169.254. __. __.
5. Install the RSU version 8.5.1 software on the laptop. Insert the memory stick that is included in the kit into a USB terminal in the laptop.
6. Download the RSU 8.5.1 folder onto your laptop. There is also an Ecoreach™ folder on the memory stick. You do not need this at this time. Later in this instruction bulletin you will be directed to install the Ecoreach files if needed. Eject the memory stick from the USB port and save the memory stick for later use.
7. Use an appropriate length ULP cable to connect the laptop to the Ethernet port ETH1 (Figure 12, A) on the top of the IFE module. Leave ETH2 open.

Figure 12 – Connect to Laptop

ERMS Adjustments

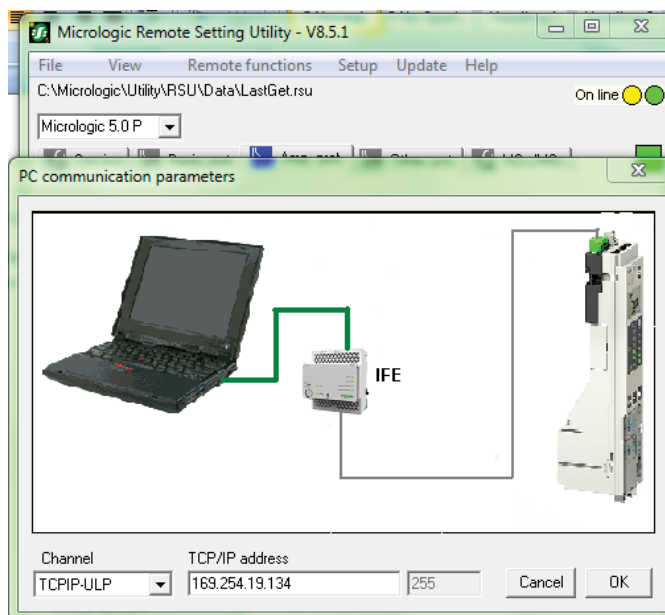
1. Turn off and/or disconnect all network connections to the laptop computer including the wireless radio.
2. Open the RSU 8.5.1 folder, click on the Exe folder and run the Micrologic_RSU.exe to start the RSU program, then open the setup tab.

Figure 13 – Setup Menu



3. Set the communication parameters to channel TCP/IP-ULP and insert the IP address recorded in step 3. Press OK.

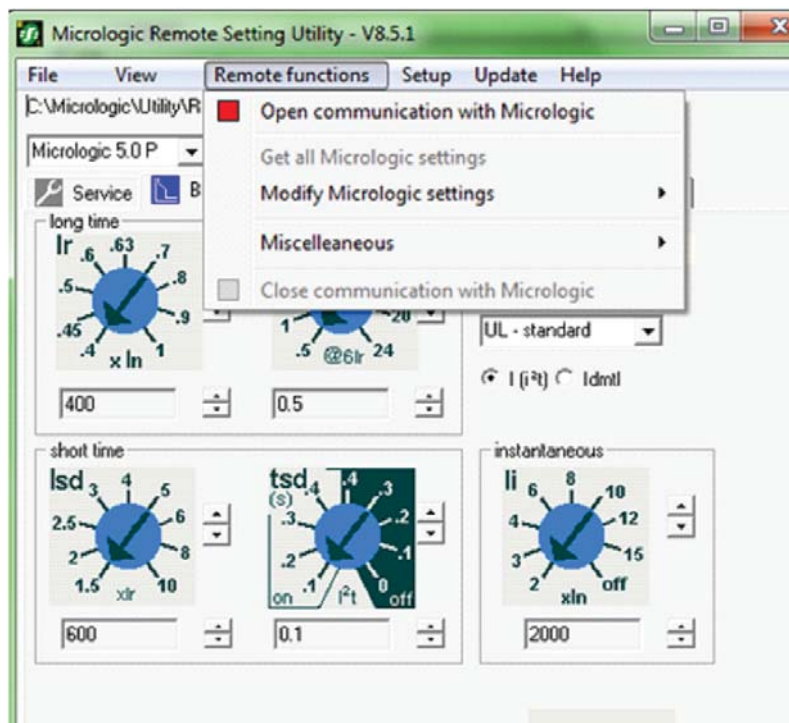
Figure 14 – Insert IP Address



NOTE: Turn on 24 Vdc control power to the IFE and to the trip unit (F1- and F2+).

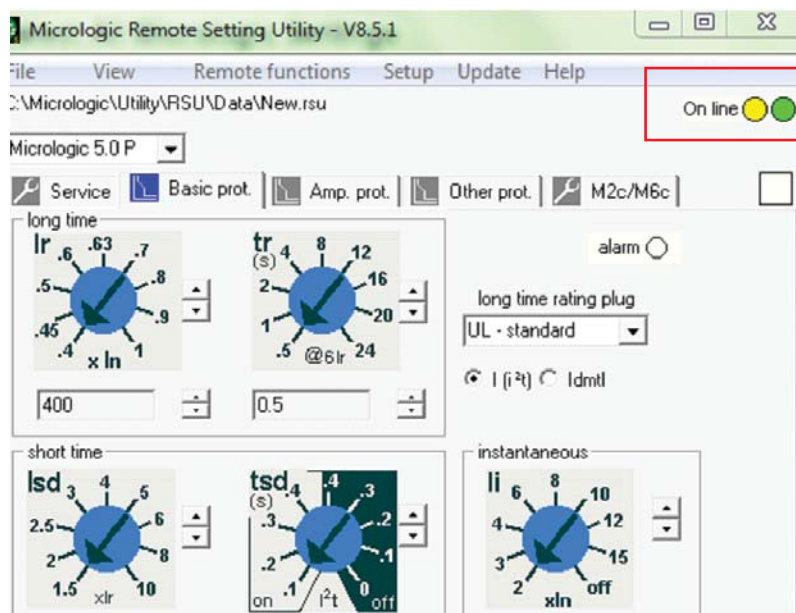
4. Open Remote functions menu and select Open communications with Micrologic. Wait for connection.

Figure 15 – Open Communications



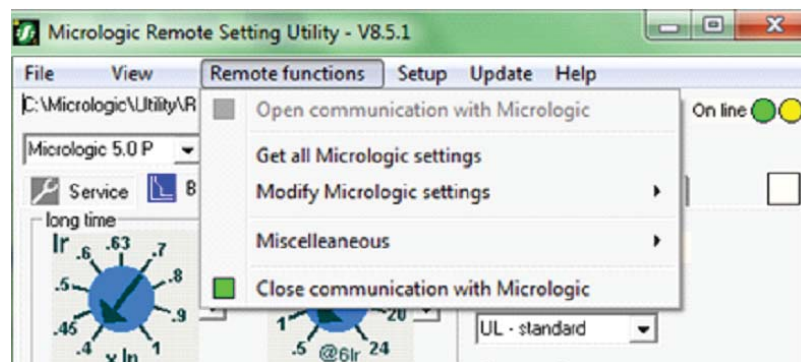
5. When the connection is made, there will be green and yellow lights flashing next to the words On line in the upper right corner of the RSU screen.

Figure 16 – Lights on RSU screen



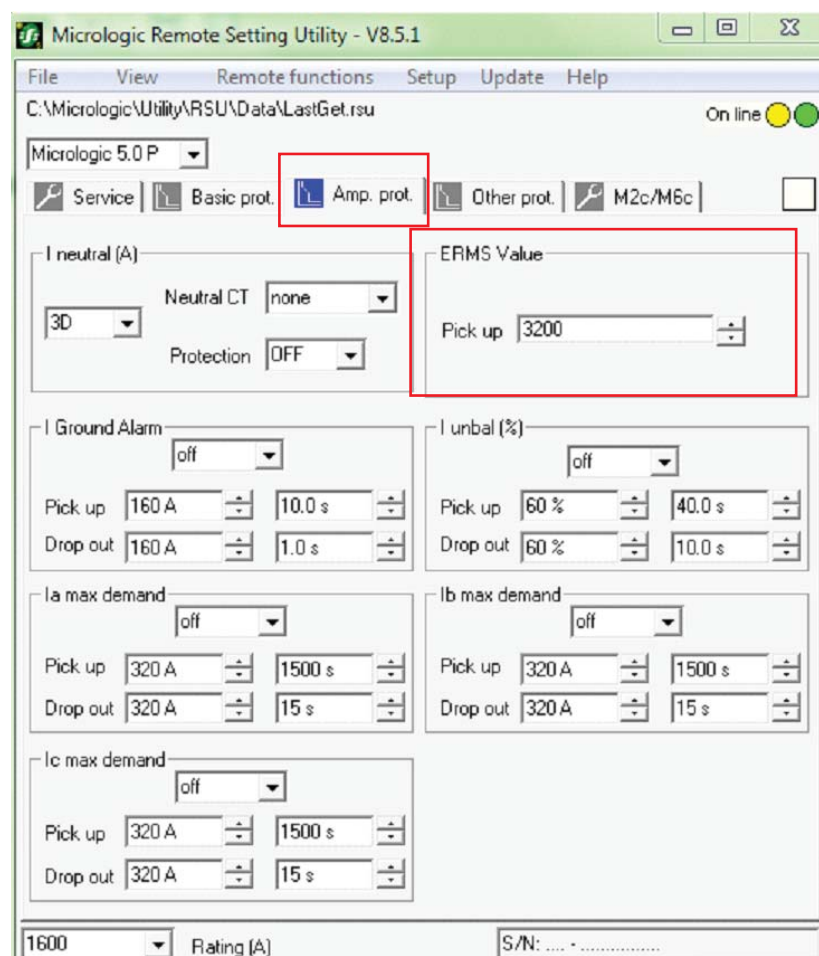
- Click on Remote functions and select Get all Micrologic trip unit settings. Check settings to make sure communications are functioning. Check the coordination study and set the trip unit settings to the correct levels. Please note that ERMS setting range is $2 \times I_n$ to the dial setting of the li adjustment.

Figure 17 – Select All Micrologic Settings



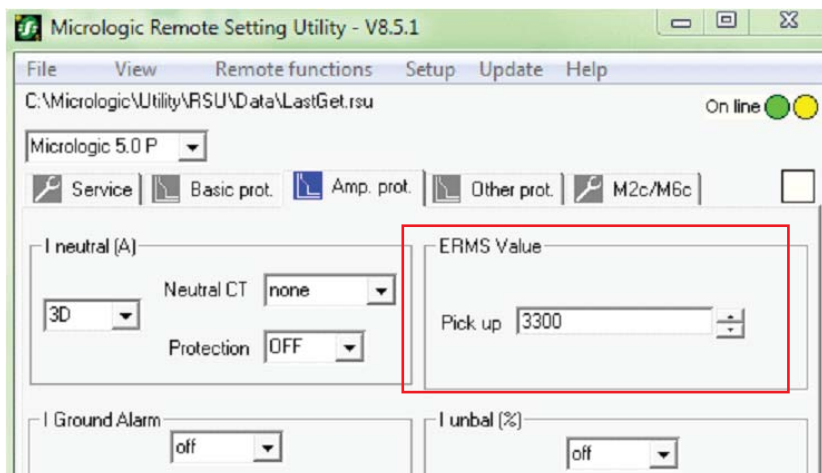
- Click on the Amp. prot. icon. The pick up of the ERMS value is displayed.

Figure 18 – Pick the ERMS Value



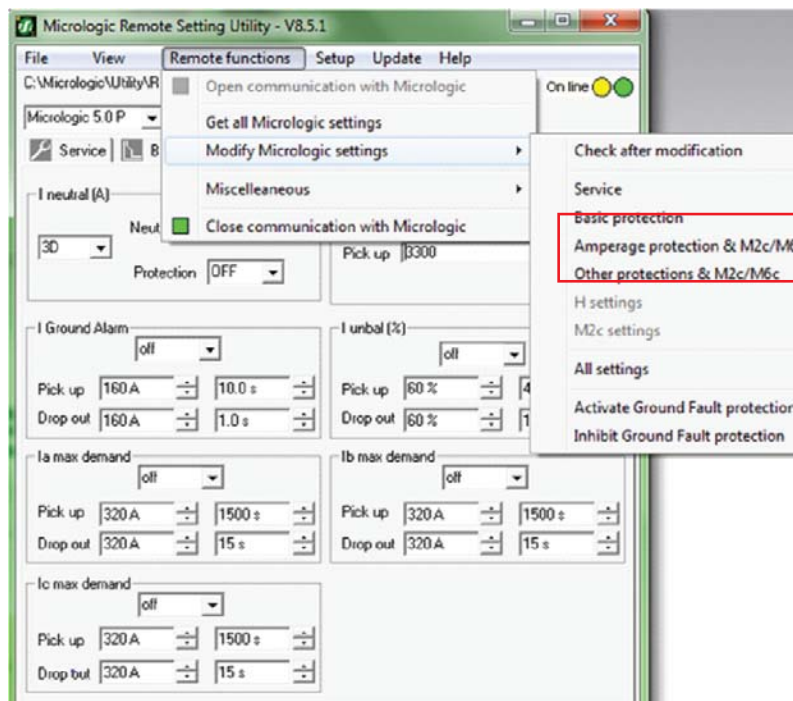
8. Highlight the value and type in the desired ERMS setting above the default level of 2 x In and below the Ii setting on the instantaneous dial on the trip unit. For example: if your arc flash study for maintenance mode indicates that the ERMS level should be set at 3300 amperes, use the up arrows to scroll to 3300 or type in 3300 in the ERMS pickup screen. Then use the up arrow to go up two amperes and then back down to 3300 amperes. The use of the arrow keys fine tunes the setting to the value you need.

Figure 19 – ERMS Value

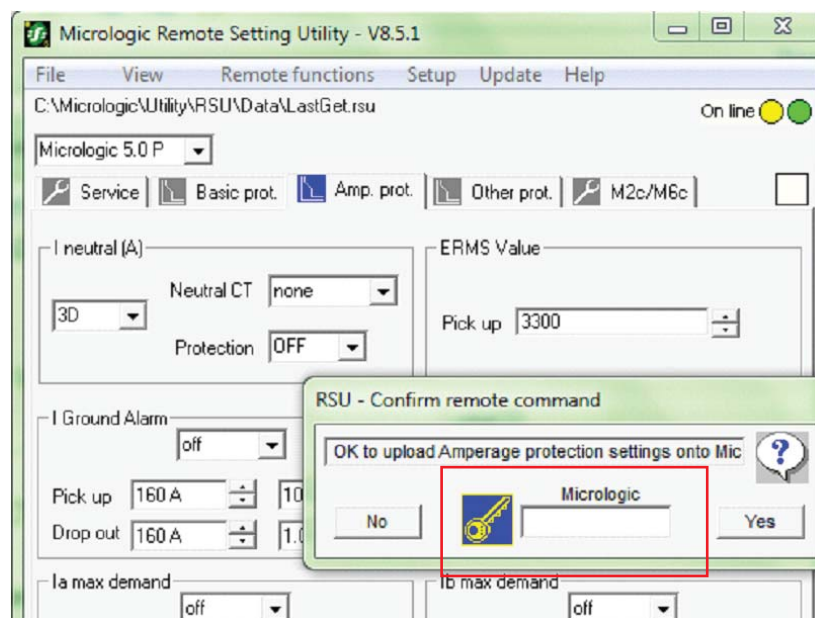


9. Make sure the ERMS switch is in the OFF position. Click on the Remote functions and select Modify Micrologic settings which opens a drop down menu. Click Amperage protection & M2c/M6c to modify the settings of the trip unit.

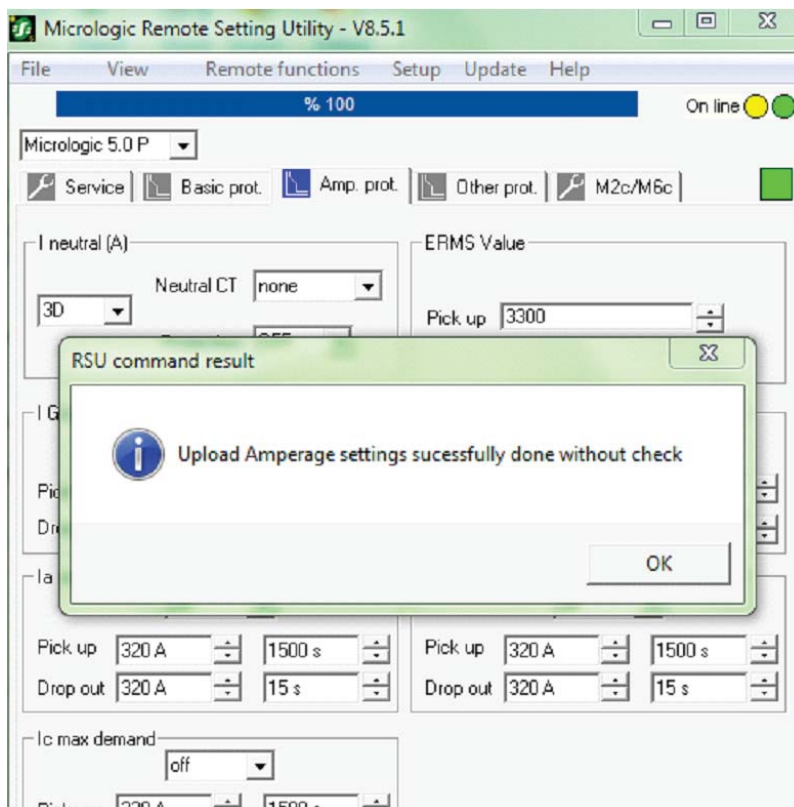
Figure 20 – Modify Micrologic Settings



10. Type the password. Password default is blank.
Press the Yes button.

Figure 21 – Type the Password

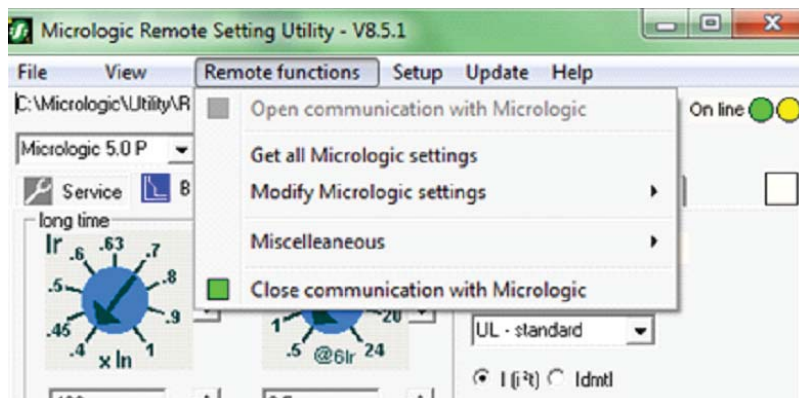
11. After a few seconds, the RSU will send the updated ERMS pickup level to the trip unit.

Figure 22 – Updated Setting Notice

12. Test the ERMS system (see page 16) to make sure the ERMS pickup value is correct.
13. Repeat ERMS setting adjustments as necessary until the correct level of ERMS pickup is obtained.
14. Click Close communications with Micrologic. Close the RSU.

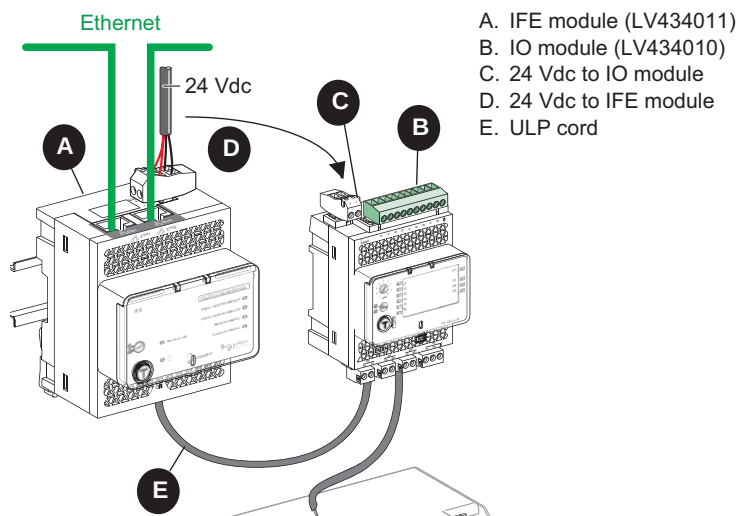
If you cannot set the ERMS to the correct level, complete steps 15–17 and then go to Instruction Bulletin 0602IB1501 *Setting ERMS Level with Ecoeach Customer Engineering Tool*. The instruction bulletin is on the website, go to: <http://www.schneider-electric.com>

Figure 23 –



15. If the IFE module was already installed, disconnect the ULP cord from the laptop and IFE module.
16. If the IFE module was installed for the ERMS setting adjustment:
 - Move the 24 Vdc control power from the IFE module (Figure 24, A) to the IO module (B)
 - Move the ULP terminator from the bottom of the IFE module (A) to the open ULP connections on the bottom of the IO module.
 - Remove the IFE module (A) and the ULP cord (E).
17. Reconnect power to the circuit breaker.

Figure 24 – IFE Module Connections



Testing the ERMS System

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

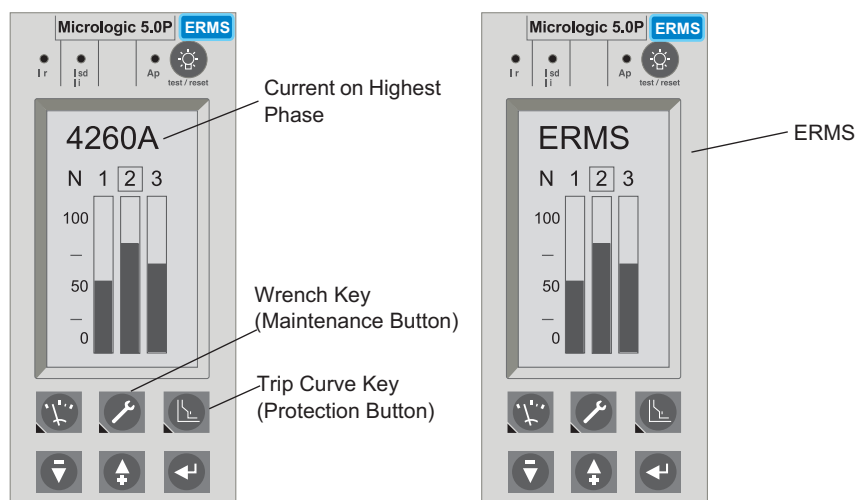
Failure to follow these instructions will result in death or serious injury.

The system should be tested upon initial start-up and at regular intervals afterward. A complete tripping functionality test must be periodically performed using the FFTK as described later in these instructions.

To test the ERMS system, follow the steps listed below.

1. Verify ERMS switch is in the “OFF” position.
2. Locate the Micrologic trip unit associated with the circuit breaker to be tested:
 - a. Observe the load bar graph screen as shown in Figure 25. If another screen is visible, press the wrench key (maintenance button) on the HMI. Make sure that “ERMS” is NOT displayed.
 - b. Go to the I_n setting by pressing the trip curve key (protection button) on the trip unit HMI. Select amperage protections and then I (A). Check that the I (A) value is the Normal setting and not the value for ERMS. (ERMS will be 2xI_n or to the adjusted setting for ERMS, while the normal settings should be higher and would be recorded in the coordination study documents.)
3. Turn the ERMS switch to the “ON” position.
 - a. Press the wrench key (maintenance button) on the HMI to return to the load bar graph screen. After a short delay, check that the letters “ERMS” are displayed and flashing as shown in Figure 25.
 - b. Go to the I_n setting by pressing the trip curve key (protection button) on the trip unit HMI. Select amperage protections and then I (A). Check that the I (A) value is the desired ERMS setting and not the normal setting value.
 - c. The blue ERMS mode indicator light on the ERMS switch must be illuminated.

Figure 25 – Load Bar Graph Screen and ERMS On Screen



4. Turn the ERMS switch to the “OFF” position.
 - a. Check that the blue ERMS mode indicator light on the ERMS switch is Off (not illuminated).
 - b. Observe the HMI on the trip unit and check that the letters “ERMS” are not displayed.
 - c. Go to the Ii setting by pressing the trip curve key (protection button) on the trip unit HMI. Select amperage protections and then I (A). Check the I (A) value is the Normal setting and not the value for ERMS.
5. If the system does not function as described above, check power supplies, LEDs, lamps, wiring, etc.

NOTE: The above test procedure verifies that the circuit breaker trip unit has received the ERMS signal.

ERMS Hazard Label

Install the ERMS switch hazard label near the ERMS switch.

Figure 26 – Label for Remote ERMS Switch Option

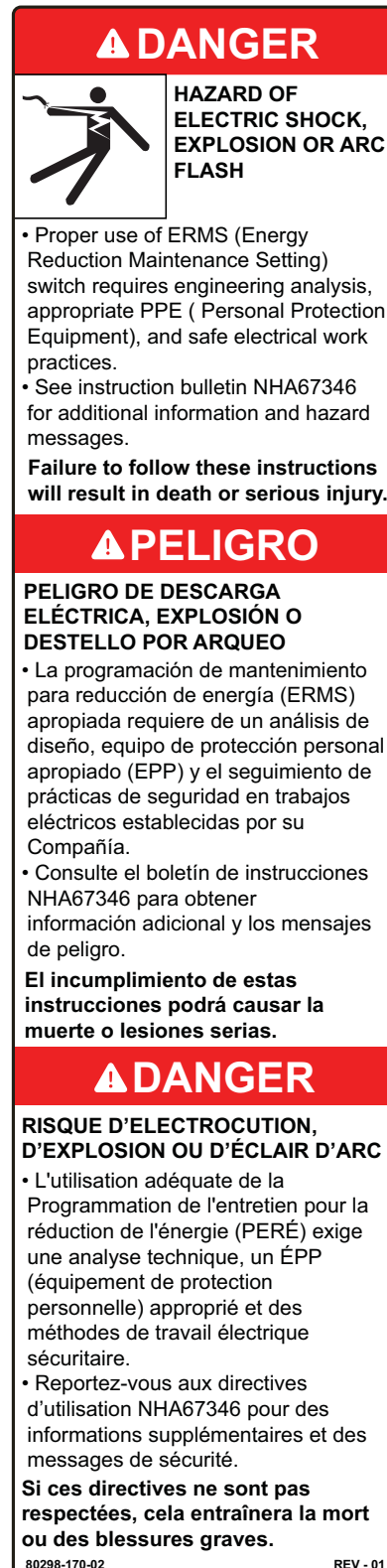
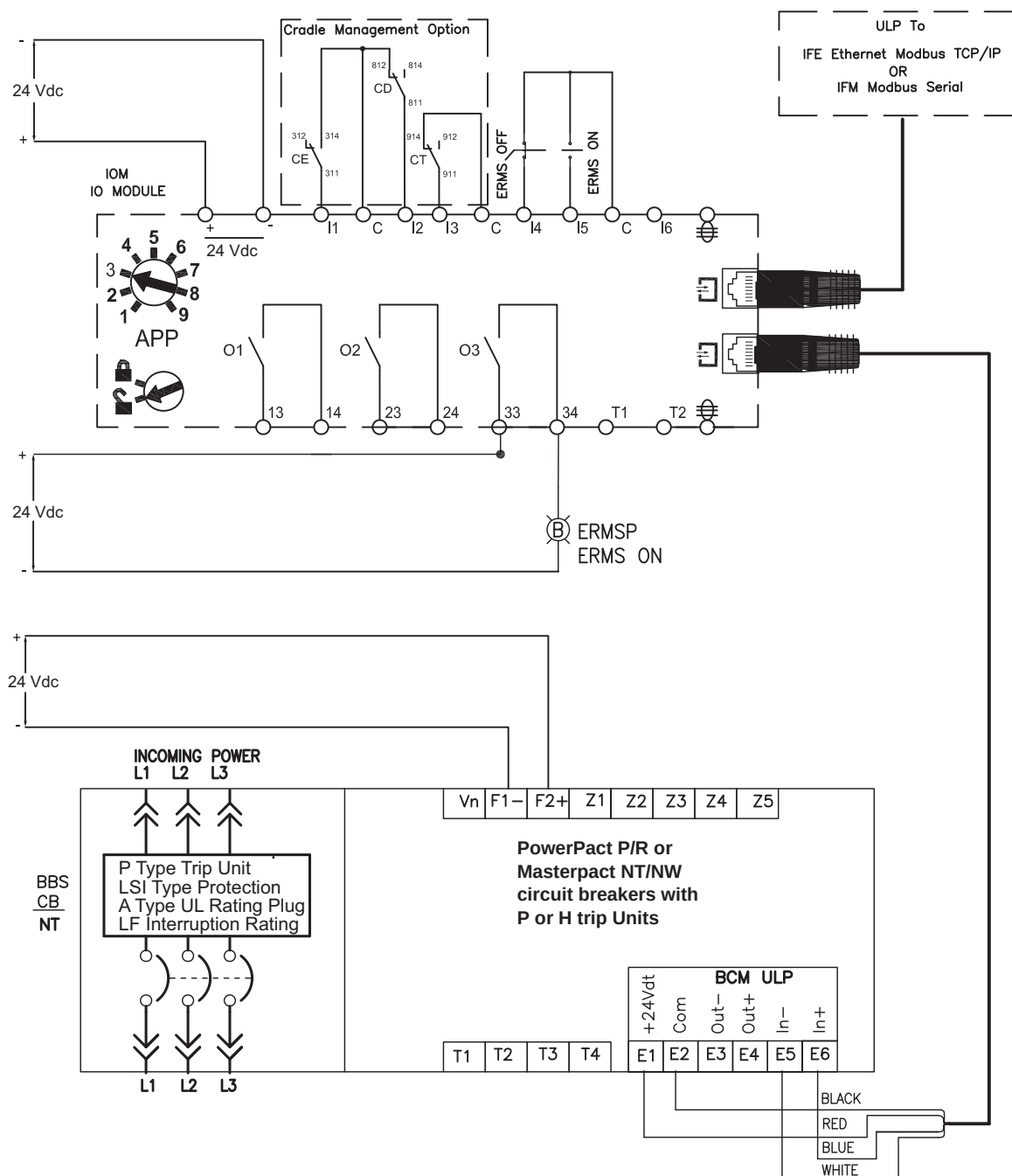


Figure 27 – Wiring Diagram



Installation and Wiring Recommendations

- The IO Module must be solidly grounded to the equipment structure.
 - The IO module contains a grounding clip that connects to the DIN rail. The DIN rail must be attached to the equipment structure to provide a solid ground. The use of galvanized thread cutting hardware every 8 inches (203 mm) along the DIN rail is recommended.
 - It is recommended to use a galvanized steel DIN rail to provide the most consistent ground.
- Proper placement of the IO module includes:
 - Allow at least 3 inches (76 mm) of separation from any type of contactor, relay or starter.
 - Secure all components properly on the DIN rail to prevent any lateral sliding.
- Proper routing of cabling should include:
 - Only use ULP cables shown in this instruction for the connection between the IO Module and circuit breaker.
 - ULP cables must be separated from AC power and control cables with at least 6 inches (152 mm) spacing. The same applies to any DC cables that are used for coil or solenoid control.
 - The 24 Vdc power to the IO module should be delivered using twisted-pair conductors with appropriate current and voltage ratings for the application. DC coils and solenoids should not be powered from this supply

ERMS Pilot Light and Selector Switch cabling should also follow the above guidelines, when possible.

Testing ERMS Tripping Functionality with Full Function Test Kit (FFTK)

Necessary Tools:

S33595 FFTK Full-function Test Kit

Before Testing Tripping Functionality

1. Complete “Testing the ERMS System” on page 16.
2. Verify that the ERMS switch is in the OFF position.

Precautions

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

Connections

NOTICE

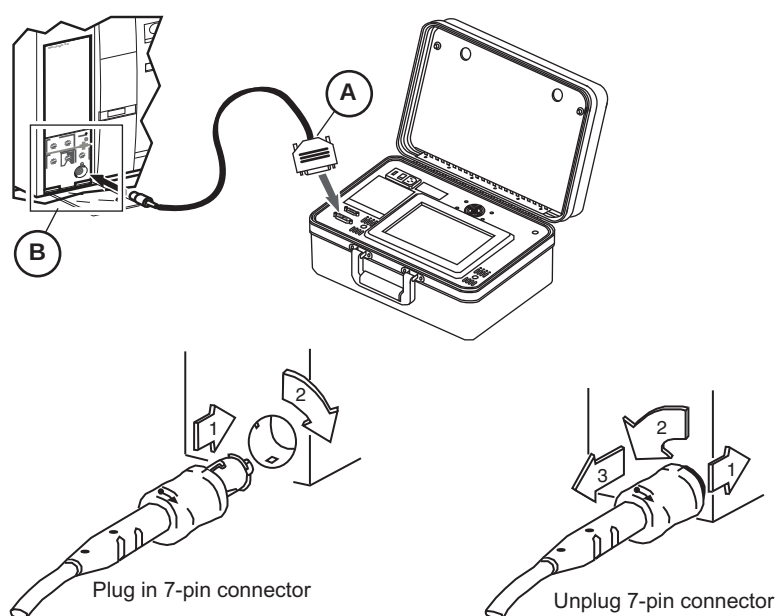
HAZARD OF EQUIPMENT DAMAGE

Pins on a seven-pin test cable connector (see Figure 28, B) can bend or break if forced. Avoid using excess force when connecting to trip unit test port.

Failure to follow these instructions can result in equipment damage.

1. Connect ten-pin test cable connector (A) to ten-pin port on the Full-Function Test Kit (FFTK).
2. Connect seven-pin test cable connector (B) to test port on Micrologic trip units.
 - a. To plug in, push in seven-pin connector and turn clockwise.
 - b. To unplug, push in seven-pin connector and turn counterclockwise.

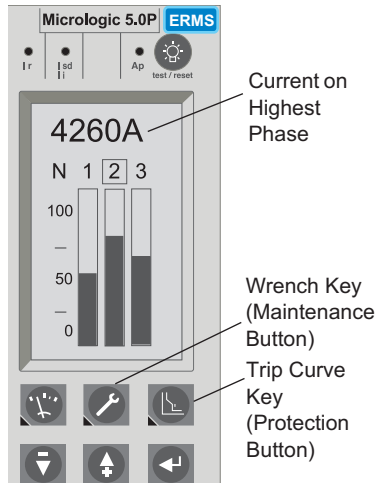
Figure 28 – Connection to Micrologic Trip Units



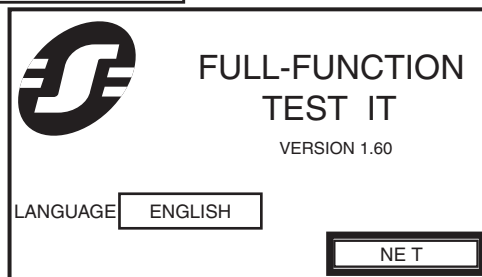
Test Setup

NOTE: The circuit breaker ERMS instantaneous tripping can be tested with the circuit breaker Open or Closed. If the circuit breaker is closed, make sure all downstream loads are off. The circuit breaker cannot be carrying current for this test to be accurate.

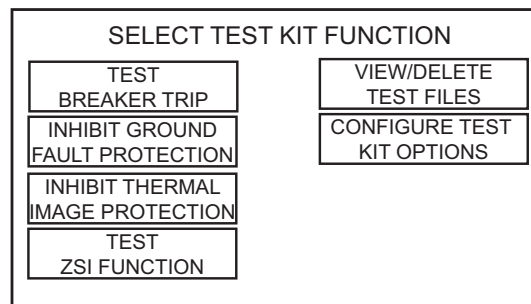
1. Turn on all control power to the trip unit, IO module and IFE, if equipped.
2. See “Testing the ERMS System” on page 16. Make sure the ERMS switch is in the OFF position.

Figure 29 – Load Bar Graph Screen

3. Observe the load bar graph screen as shown in Figure 29. If another screen is visible, press the wrench key (maintenance button) on the trip unit. Make sure that the “ERMS” is NOT displayed.
4. Go to the Ii setting by pressing the trip curve key (protection button) on the trip unit. Select amperage protections and then I (A). Check that the I (A) value is the Normal setting and not the value for ERMS. (ERMS will be 2xIn or to the adjusted setting for ERMS, while the normal settings should be higher and would be recorded in the coordination study documents.)
5. Turn the FFTK on and wait for the Power On test and for the Full-function Test Kit Title screen to come up. Select language as required.



6. Click Next to go to the Select Test Kit Function screen. Wait for the Test Breaker Trip box to load on the screen.
7. Press Test Circuit Breaker Trip box.



8. The FFTK will communicate with the Micrologic P or H trip unit and populate most of the fields in the parameters screen.

CONFIGURE CIRCUIT BREAKER PARAMETERS			
TRIP UNIT FAMILY	MICRO-LOGIC	STANDARD	UL
TRIP UNIT TYPE	6.0 H	INTERRUPT RATING	G
BREAKER FAMILY	POWERPAC	In	1600 A
BREAKER TYPE	P1200		
HOME		NEXT	

9. Press the Next key to go to the Select Circuit Breaker Test. Press Automatically Test Trip Curve.

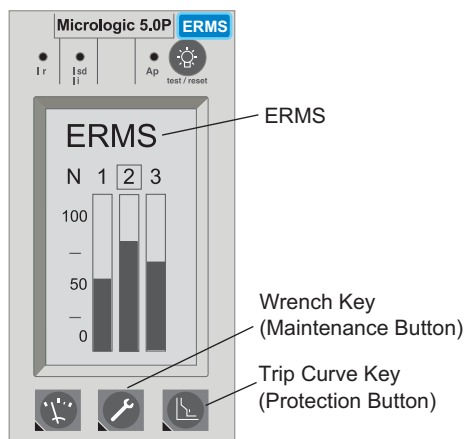
SELECT CIRCUIT BREAKER TEST	
AUTOMATICALLY TEST TRIP CURVE	
MANUALLY TEST TRIP CURVE	
TEST MECHANICAL OPERATION	
HOME	BACK

10. The Configure Protection Parameters screen appears with the trip unit settings programmed on the trip unit.

CONFIGURE PROTECTION PARAMETERS			
Ir	1 (1600 A)	tsd	0.3 s ON
tr	16	li	10 (16000 A)
IDMTL	OFF	Ig	0.65 (1040 A)
I _{sd}	5 (8000 A)	tg	0.1 s OFF
HOME	BACK	NEXT	

11. Check the li setting. Make sure the li setting shown on this screen is the Normal setting and not the value for ERMS. (ERMS will be 2xI_n or to the adjusted setting for ERMS, while the normal settings should be higher and would be recorded in the coordination study documents.)
12. Press the Home button to return to the Select Test Kit Function.
13. See "Testing the ERMS System" on page 16. Turn the ERMS switch to the ON position.

14. Press the wrench key (maintenance button) on the trip unit to return to the load bar graph screen. After a short delay, check that the letters “ERMS” are displayed and flashing as shown.



15. Go to the Ii setting by pressing the trip curve key (protection button) on the trip unit. Select amperage protections and then I (A).
16. Check that the I (A) value is the desired ERMS setting and not the Normal setting value.
17. If the ERMS value is not correct, refer to “ERMS Setting Adjustment” on page 7 and make adjustments as necessary.
18. Press Test Breaker Trip box.

SELECT TEST KIT FUNCTION	
TEST BREAKER TRIP	VIEW/DELETE TEST FILES
INHIBIT GROUND FAULT PROTECTION	CONFIGURE TEST KIT OPTIONS
INHIBIT THERMAL IMAGE PROTECTION	
TEST ZSI FUNCTION	

19. The FFTK will communicate with the P or H trip unit and populate most of the fields in the parameters screen

CONFIGURE CIRCUIT BREAKER PARAMETERS			
TRIP UNIT FAMILY	MICRO- LOGIC	STANDARD	UL
TRIP UNIT TYPE	6.0 H	INTERRUPT RATING	G
BREAKER FAMILY	POWERPAC	In	1600 A
BREAKER TYPE	P1200		
HOME		NEXT	

20. Press the Next key to go to the Select Circuit Breaker Test. Press Automatically Test Trip Curve.

SELECT CIRCUIT BREAKER TEST	
AUTOMATICALLY TEST TRIP CURVE	
MANUALLY TEST TRIP CURVE	
TEST MECHANICAL OPERATION	
HOME	BACK

21. The Configure Protection Parameters screen appears with the trip unit settings programmed on the trip unit.

CONFIGURE PROTECTION PARAMETERS			
Ir	1 (1600 A)	tsd	0.0 s OFF
tr	16	li	2.2 (3500 A)
IDMTL	OFF	lg	0.65 (1040 A)
Isd	5 (8000 A)	tg	0.1 s ON
HOME	BACK	NEXT	

22. Check the li setting. Make sure the li setting shown on this screen is the ERMS setting and not the Normal setting.
23. Press Next to advance to Configure Automatic Curve Test screen.
24. Select the Instantaneous time-current curve segments to be tested by toggling the touch key to ENABLED. Toggle all other segments to Disabled.
25. Press NEXT to proceed to the Automatic Trip Curve Test Alert screen.

CONFIGURE AUTOMATIC TRIP CURVE TEST		
LONG TIME	DISABLED	
SHORT TIME	DISABLED	
INSTANT- ANEOUS	ENABLED	
GROUND FAULT	DISABLED	
HOME	BACK	NEXT

26. The Instantaneous setting can be tested with the circuit breaker Open or Closed. If the circuit breaker is closed, this test will open the circuit breaker. Please note that if the circuit breaker is closed, downstream loads must be Off. The circuit breaker cannot be carrying any current or this test will not be accurate. If the circuit breaker is open, leave the circuit breaker open and press Yes to continue the test.

AUTOMATIC TRIP CURVE TEST ALERT

THIS TEST WILL TRIP THE CIRCUIT BREAKER. THE CIRCUIT BREAKER SHOULD BE CLOSED BEFORE STARTING THIS TEST.

PROCEED WITH AUTOMATIC TRIP TEST

27. The FFTK begins the injection of the current. The FFTK selects the current just above the pickup tolerance based on the ERMS setting.

AUTOMATIC TRIP CURVE TEST

	INJECTION CURRENT	TRIP TIME	STATUS
INSTANT- ANEOUS	4375 A	0.000 s	INITIAL- LING

28. The FFTK records trip time and evaluates the trip time to the trip curve to determine Pass or Fail.
29. This test shows that the lowered ERMS current is sensed and trips the circuit breaker in less than 0.050s (50ms).
30. Test file can be saved if desired. See the FFTK instruction bulletin for information.

AUTOMATIC TRIP CURVE TEST

	INJECTION CURRENT	TRIP TIME	STATUS
INSTANT- ANEOUS	4375 A	0.037 s	PASSED

