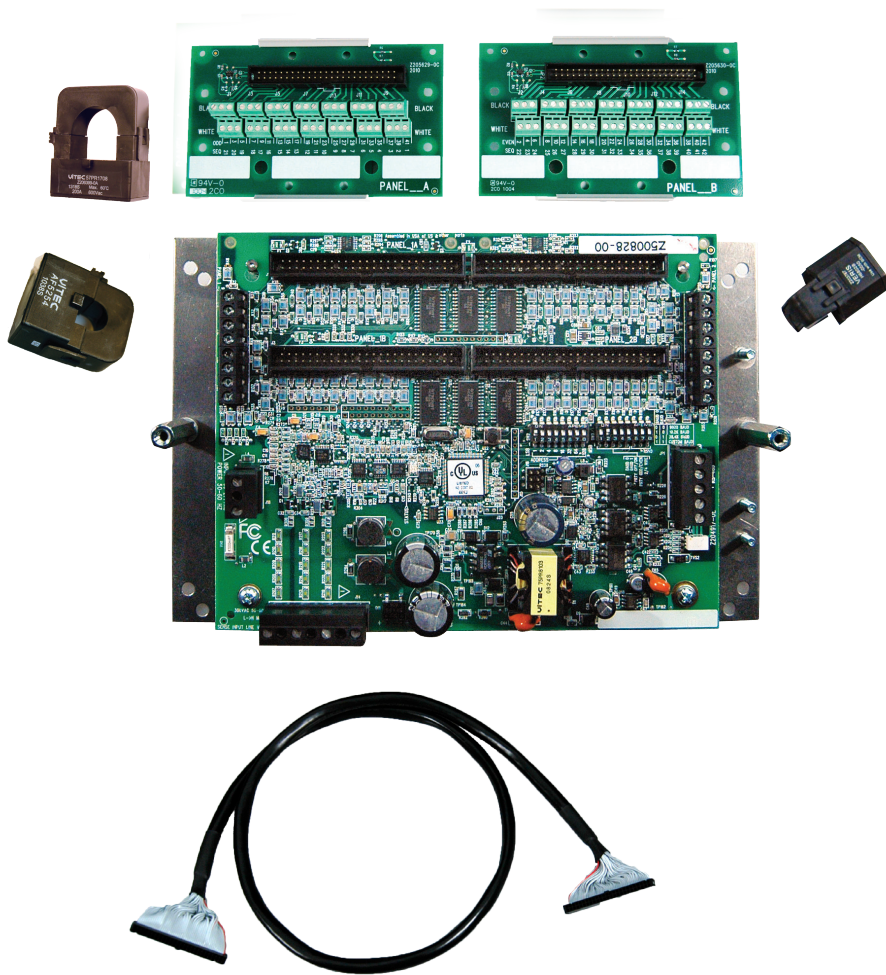


# PowerLogic™ BCPMSC Branch Circuit Power Meter with Split-Core CTs Panelboard Monitoring System Installation Guide

Z205658-0F  
07/2013



## HAZARD CATEGORIES AND SPECIAL SYMBOLS



Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### **DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

### **WARNING**

**WARNING** indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

### **CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

### **CAUTION**

**CAUTION**, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** property damage.

NOTE: Provides additional information to clarify or simplify a procedure.

## PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

## FCC NOTICE

This equipment has been tested by the manufacturer and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Modifications to this product without the express authorization of the manufacturer nullify this statement. This Class B digital apparatus complies with Canadian ICES-003.

## Contents

Safety Precautions.....	1
Installation Overview.....	1
Specifications.....	2
Introduction.....	3
Part Number Information.....	3
Parts of the BCPMSC.....	4
Dimensions.....	5
Data Output.....	6
Blink Codes.....	6
Split Core Accuracy.....	7
Installation.....	7
Wiring.....	11
Configuration.....	15
Default DIP Switch Settings.....	16
Communications Setup.....	17
Commissioning.....	18
Recommended Accessories.....	19
Troubleshooting.....	19
China RoHS Compliance Information (EFUP Table).....	20



## Safety Precautions

### **⚠ DANGER**

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Follow safe electrical work practices. See NFPA 70E in the USA or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand, and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION.
- Only install this product on insulated conductors.
- Install device in an appropriate electrical and fire enclosure per local regulations.
- ESD sensitive equipment. Ground yourself and discharge any static charge before handling this device.

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

## Installation Overview

NOTE: This product is not intended for life or safety applications.

1. Disconnect and lock out power. Use a properly rated voltage sensing device to confirm power is off.
2. Mount the main data acquisition board in the electrical enclosure.
3. Mount the adapter boards to either DIN Rail or SNAPTRACK™.
4. Connect adapter boards to the main board via ribbon cable.
5. Connect current transducers to the adapter boards.
6. Snap split-core CTs onto the conductors to be monitored.  
NOTE: Ensure that each split-core CT is closed and firmly seated.
7. Secure wires using strain relief cable ties.
8. Configure communication and addressing parameters using DIP switches.
9. Wire RS-485 communications.
10. Connect mains monitoring CTs to the auxiliary inputs and connect them onto the main conductors in the enclosure (optional).
11. Wire control power and voltage taps (BCPMSCA and BCPMSCB only).
12. Commission the device for operation.

NOTE: For detailed instructions, please see the "Installation" section later in this guide.

## Specifications

**Table 1: Specifications**

Type	Description
<b>Inputs</b>	
Input Voltage	90-277 Vac
Frequency	50/60 Hz
<b>Accuracy</b>	
Power/Energy	IEC 62053-21 Class 1, ANSI C12.1-2008
Voltage	±0.5% of reading 90-277V line-to-neutral
<b>Operation</b>	
Sampling Frequency	2560 Hz
Update Rate	1.8 seconds (both panels)
Overload Capability	22 kAIC
<b>Outputs</b>	
Type	Modbus™ RTU
Connection	DIP switch-selectable 2-wire or 4-wire, RS-485
Address	DIP switch-selectable address 1 to 247 (in pairs of 2)*
Baud Rate	DIP switch-selectable 9600, 19200, 38400
Parity	DIP switch-selectable NONE, ODD, EVEN
Communication Format	8 data-bits, 1 start-bit, 1 stop-bit
Termination	5-position depluggable connector (TX+ TX- SHIELD TX+/RX+ TX-/RX-)
<b>Mechanical</b>	
Ribbon Cable Support	Up to 20 ft. (6 m) ribbon cables are available
<b>Environmental</b>	
Operating Temperature Range	0° to 60°C (32° to 122°F) (<95% RH, non-condensing)
Storage Temperature Range	-40° to 70°C (-40° to 158°F)
Altitude of Operation	3000 m
Agency Approvals	UL508 open type device, EN61010

\* See Configuration section for details

Installation category: CAT III

The BCPM Series must be installed in an appropriate electrical and fire enclosure per local regulations.

For use in a Pollution Degree 2 or better environment only.

A Pollution Degree 2 environment must control conductive pollution and the possibility of condensation or high humidity. Consideration must be given to the enclosure, the correct use of ventilation, thermal properties of the equipment and the relationship with the environment.

IEC/EN: EN 61010-1 CE

Always use this product in the manner specified or the protection provided by the product may be impaired.



## Introduction

The PowerLogic™ BCPMSC (Branch Circuit Power Meter with Split-Core CTs) is designed to measure the current, voltage, and energy consumption of up to 92 circuits (84 branch circuits, 2 3-phase mains, 2 neutrals) on a single board. The BCPMSC can monitor up to two panels.

The BCPMSC consists of a data acquisition board and up to 84 split-core CTs (50 A or 100 A), with eight auxiliary inputs. Each conductor passes through a CT and terminates at the breaker. Each CT transmits the current data to the data acquisition board.

Data is transmitted over an RS-485 Modbus protocol. Each data acquisition board requires two addresses, one for each set of 42 CTs and four auxiliary inputs. Data is updated roughly every two seconds. As a circuit approaches the user-defined threshold, the BCPMSC activates the alarm indicators.

The BCPMSCA measures both current and power for the mains and branch circuits. The BCPMSCB measures both current and power for the mains and current only in the branch circuits. The BCPMSCC measures current only for the mains and branch circuits.

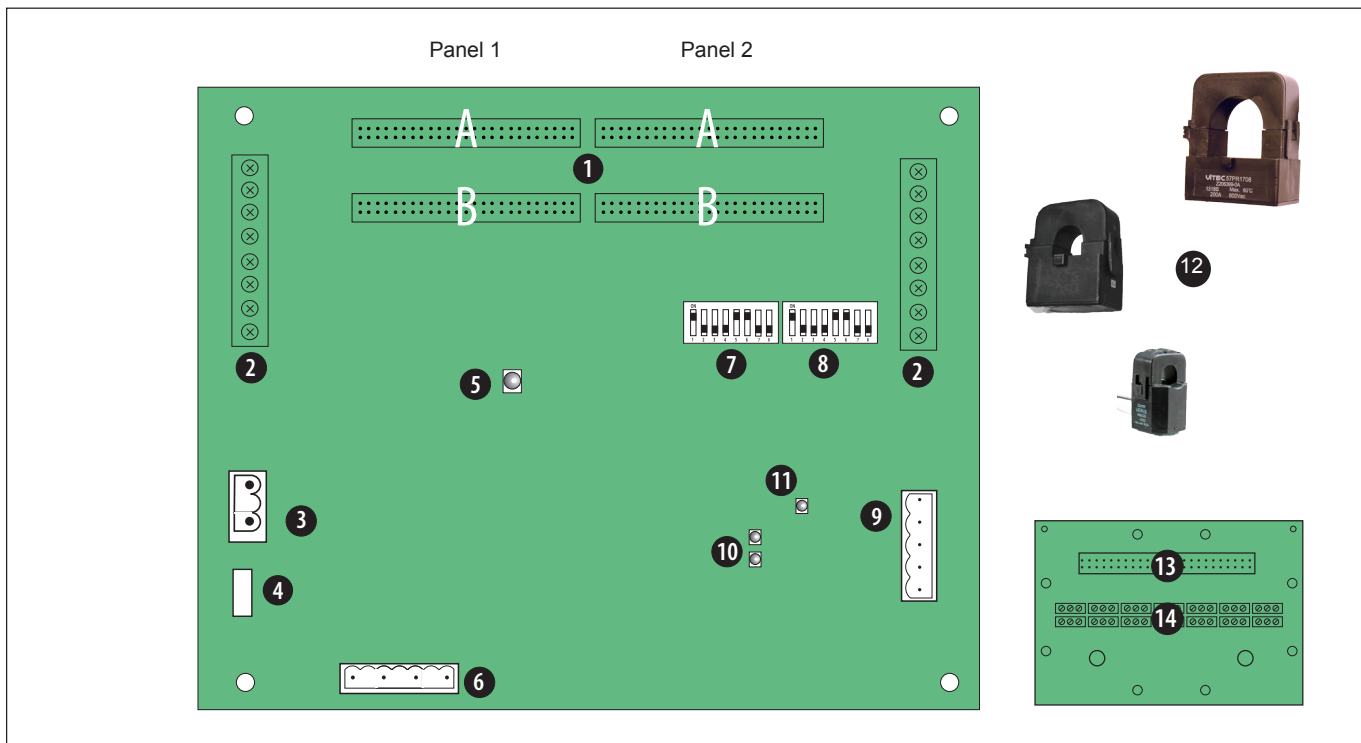
## Part Number Information

Part Number	Description
BCPMSCA1S	BCPMSC feature set A, 42 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCA2S	BCPMSC feature set A, 84 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCA30S	BCPMSC feature set A, 30 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCA42S	BCPMSC feature set A, 42 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCA60S	BCPMSC feature set A, 60 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCAY63S	BCPMSC feature set A, 42 circuit split-core power and energy meter with all boards mounted on backplate, CTs rated to 50 A
BCPMSCA84S	BCPMSC feature set A, 84 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCB1S	BCPMSC feature set B, 42 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCB2S	BCPMSC feature set B, 84 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCB30S	BCPMSC feature set B, 30 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCB42S	BCPMSC feature set B, 42 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCB60S	BCPMSC feature set B, 60 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCBY63S	BCPMSC feature set B, 42 circuit split-core power and energy meter with all boards mounted on backplate, CTs rated to 50 A
BCPMSCB84S	BCPMSC feature set B, 84 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCC1S	BCPMSC feature set C, 42 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCC2S	BCPMSC feature set C, 84 circuit split-core power and energy meter, CTs and cables sold separately
BCPMSCC30S	BCPMSC feature set C, 30 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCC42S	BCPMSC feature set C, 42 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCC60S	BCPMSC feature set C, 60 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCCY63S	BCPMSC feature set C, 42 circuit split-core power and energy meter with all boards mounted on backplate, CTs rated to 50 A
BCPMSCC84S	BCPMSC feature set C, 84 circuit split-core power and energy meter, CTs rated to 50 A
BCPMSCADPBS	BCPMSC adapter boards, quantity 2
BCPMSCCT0	BCPMSC 50 A split-core CTs, quantity 6, 1.8 m lead lengths
BCPMSCCT0R20	BCPMSC 50 A split-core CTs, quantity 6, 6 m lead lengths
BCPMSCCT1	BCPMSC 100 A split-core CTs, quantity 6, 1.8 m lead lengths
BCPMSCCT1R20	BCPMSC 100 A split-core CTs, quantity 6, 6 m lead lengths
BCPMSCCT3	BCPMSC 200 A split-core CTs, quantity 6, 1.8 m lead lengths
BCPMSCCT3R20	BCPMSC 200 A split-core CTs, quantity 6, 6 m lead lengths

## Parts of the BCPMSC

Figure 1 shows the parts of the BCPMSC data acquisition board, while Table 2 describes these parts.

**Figure 1** BCPMSC Data Acquisition Board

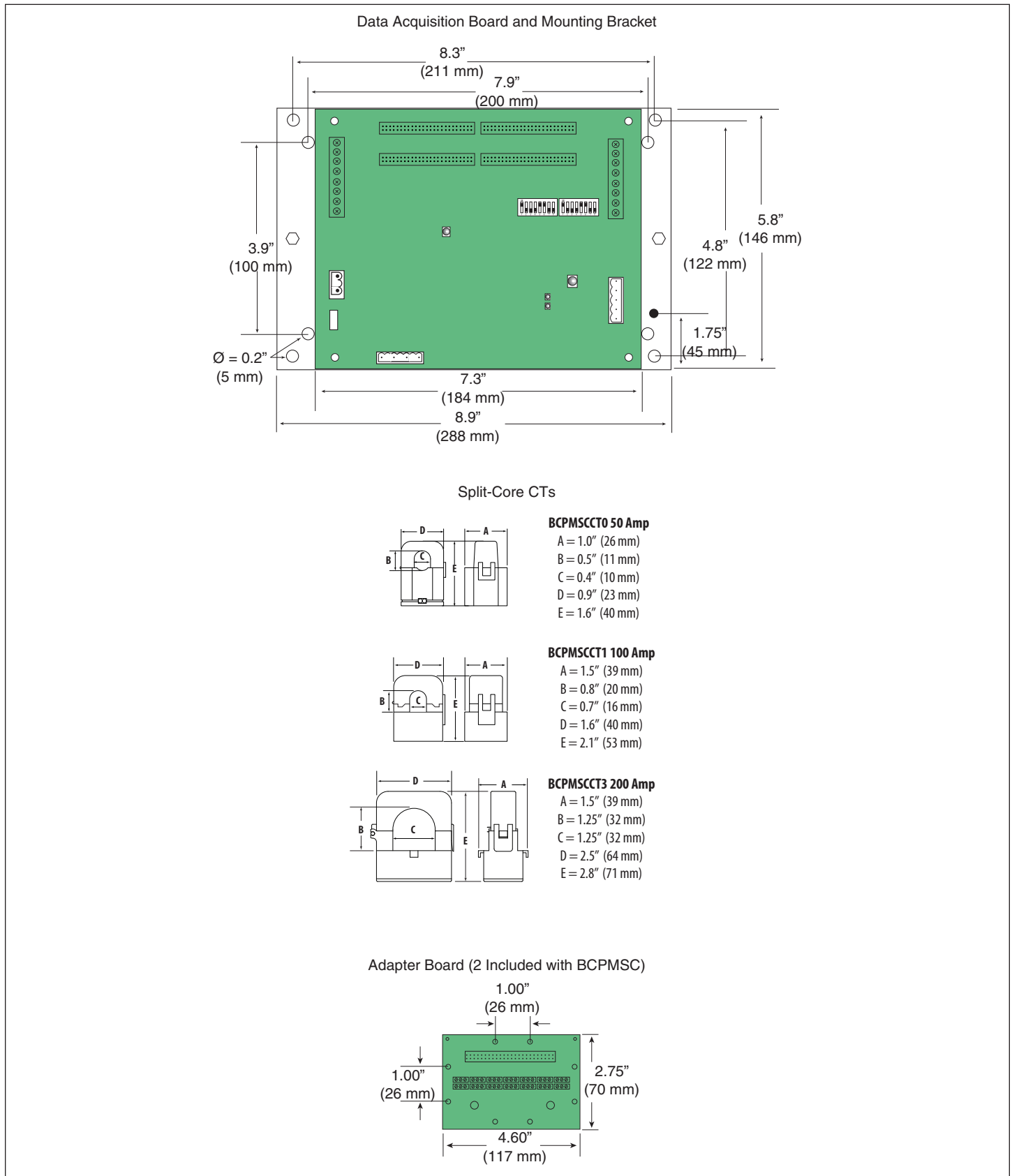


**Table 2:** Parts Description of the BCPMSC Data Acquisition Board

Part	Description
1	50-Pin Ribbon Cable Connectors Ribbon cables attach here for easy connection of adapter boards to the Data Acquisition Board. The two connectors on the left are for Panelboard 1; the two on the right are for Panelboard 2. Note: Connect adapter boards A and B to the correct ribbon cable connectors for each panel. The top connector is for adapter board A, and the bottom connector is for adapter board B.
2	Auxiliary Inputs These 0.333 Vac inputs are used for monitoring the main breaker or other high amperage source. Inputs on the left are for Panelboard 1; inputs on the right are for Panelboard 2.
3	Control (Mains) Power Connection Easy 2-wire 90-277 Vac 50/60 Hz connection.
4	Control Power Fuse 600 Vac, 500 mA time lag, factory-replaceable.
5	Alive LED Red/green/amber LEDs. See Table 4 Blink Codes for LED blink codes.
6	Voltage Taps 1, 2, or 3 phase plus neutral connections. For voltage sensing and power calculations (no voltage taps on the BCPMSC). Voltage taps are shared by both panels.
7	Communications Address DIP Switch Each Modbus device must have a unique address. Switches are binary weighted. Left-most switch has a value of 1; right-most switch has a value of 128. Switches set the address for Panel 1; Panel 2 is automatically set to (Panel 1 address + 1). See Configuration section for details.
8	Communications Settings DIP Switch Configures baud rate, parity, 2- or 4-wire communications.
9	RS-485 Connection Used for Modbus serial communications. The Universal plug accommodates 2- or 4-wire connections.
10	RS-485 LEDs The RX LED (closest to DIP switches) indicates the RS-485 is receiving information; the TX LED indicates transmission of information.
11	Power LED Indicates power to main board
12	Branch Current Sensors Each split-core current sensor is capable of monitoring conductors rated up to a maximum of 50 or 100 Amps. Up to 84 sensors can be purchased with the BCPMSC (see Recommended Accessories table). One of each style is shown here.
13	Ribbon Cable Connection Connection point on adapter board for ribbon cables.
14	CT Terminal Connections Wiring terminals on adapter board for current sensors.

## Dimensions

Figure 2 BCPMSC Dimensions



## Data Output

**Table 3: Data Output**

	BCPMSCA	BCPMSCB	BCPMSCC
<b>Monitoring at Mains</b>			
Current per phase	•	•	•
Max. current per phase	•	•	•
Current demand per phase	•	•	•
Max. current demand per phase	•	•	•
Energy (kWh), total	•	•	
Real power (kW) per phase	•	•	
Apparent power (kVA)	•	•	
Power Factor, total*	•	•	
Power Factor, per phase	•	•	
Voltage, L-L; avg. of 3 phases	•	•	
Voltage, L-N; avg. of 3 phases	•	•	
Voltage, L-N; per phase	•	•	
Frequency (Phase A)	•	•	
<b>Monitoring at Branch Circuit</b>			
Current	•	•	•
Max. current	•	•	•
Current demand	•	•	•
Max. current demand	•	•	•
Real power (kW)	•		
Real power (kW) demand	•		
Real power (kW) demand max.	•		
Energy (kWh) per circuit	•		
Power factor	•		
Apparent power (kVA)	•		
<b>Modbus Alarms</b>			
Voltage over/under	•	•	
Current over/under	•	•	•

\*Based on a 3-phase breaker rotation

## Blink Codes

**Table 4: LED Blink Codes**

Color and Pattern	Status Description
Green, once per second	Normal operation
Amber, once per second	Volts or Amps clipping
Amber, twice per second	Invalid firmware image
Red, solid or blink	Diagnostic event detected

## Split-Core CT Accuracy

**Table 5: CT Accuracy**

	<b>50A Split-Core</b>	<b>100A Split-Core</b>	<b>200A Split-Core</b>
Voltage Rating	300 VAC	300 VAC (CE), 600 VAC (UL)	300 VAC (CE), 600 VAC (UL)
Accuracy	±1%	±0.5%	±1%
Temperature	0° to 60°C	0° to 60°C	0° to 60°C
Agency	UL508 Recognized, EN61010-1	UL508 Recognized, EN61010-1	UL508 Recognized, EN61010-1

## Installation

**⚠ DANGER**

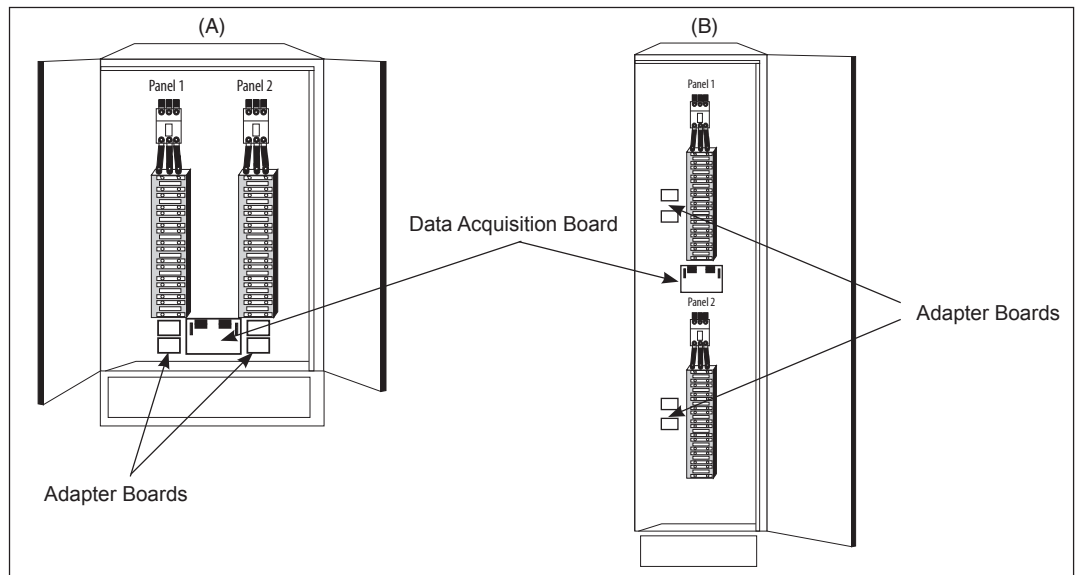
**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Follow safe electrical work practices. See NFPA 70E in the USA or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand, and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Install device in an appropriate electrical and fire enclosure per local regulations.
- ESD sensitive equipment. Ground yourself and discharge any static charge before handling this device.

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

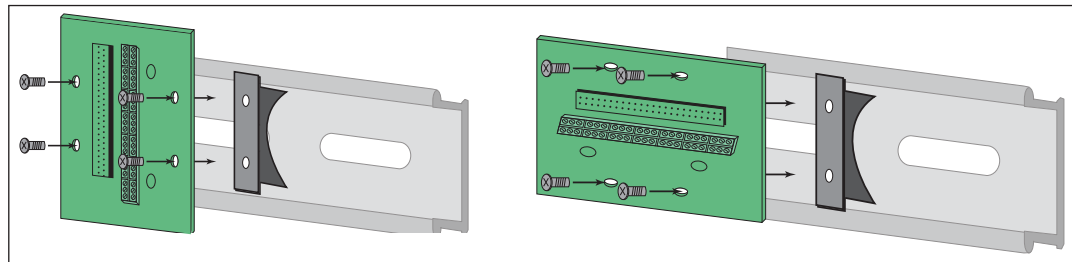
1. Turn off all power to the electrical panel and lock it out. Use a properly rated voltage sensing device to confirm power is off.
2. Install the acquisition board mounting bracket in the panel using screws and bolts provided. Panels can be oriented side-by-side (Figure 3A) or vertically (Figure 3B). A grounding connection is located on the mounting bracket, near the lower right corner. Use this stud to ground the bracket when mounting on a non-conductive surface.

**Figure 3 Install Board in Panel**



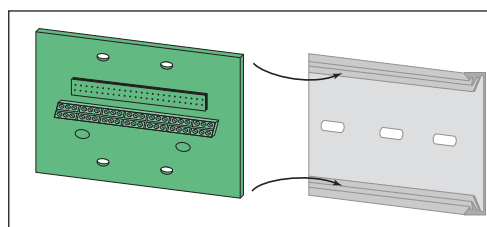
3. Mount the adapter boards to either DIN rail or SNAPTRACK.
- A. DIN Rail: Use the supplied screws to secure the plastic DIN clip to the adapter board. Affix the clip to the DIN rail (Figure 4).

**Figure 4** DIN Mounting, Vertical or Horizontal Mount



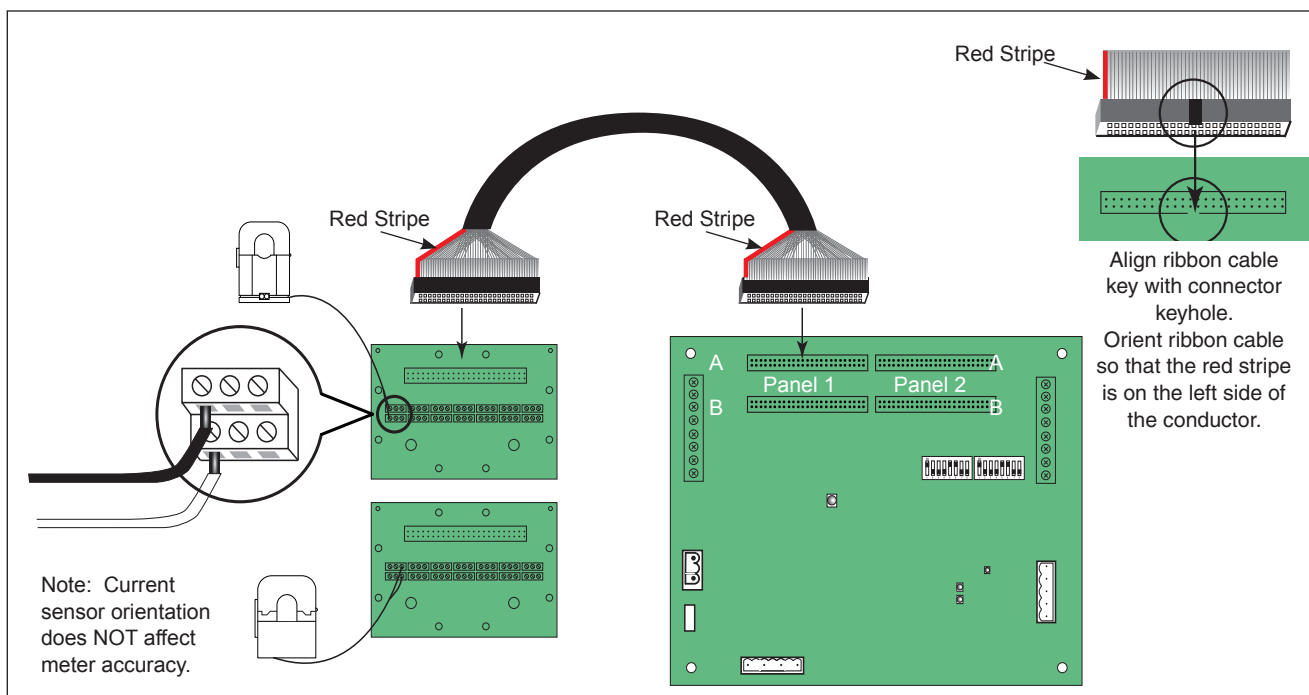
- B. SNAPTRACK: Secure the SNAPTRACK to the mounting surface. Click the adapter board into place (Figure 5).

**Figure 5** SNAPTRACK Mounting



4. Connect adapter boards to the main board using ribbon cable (Figure 6). **Orient the ribbon cable so that the red stripe is on the left.**
5. Connect CTs to terminals on the adapter boards (Figure 6).

**Figure 6** Connect Adapter Boards

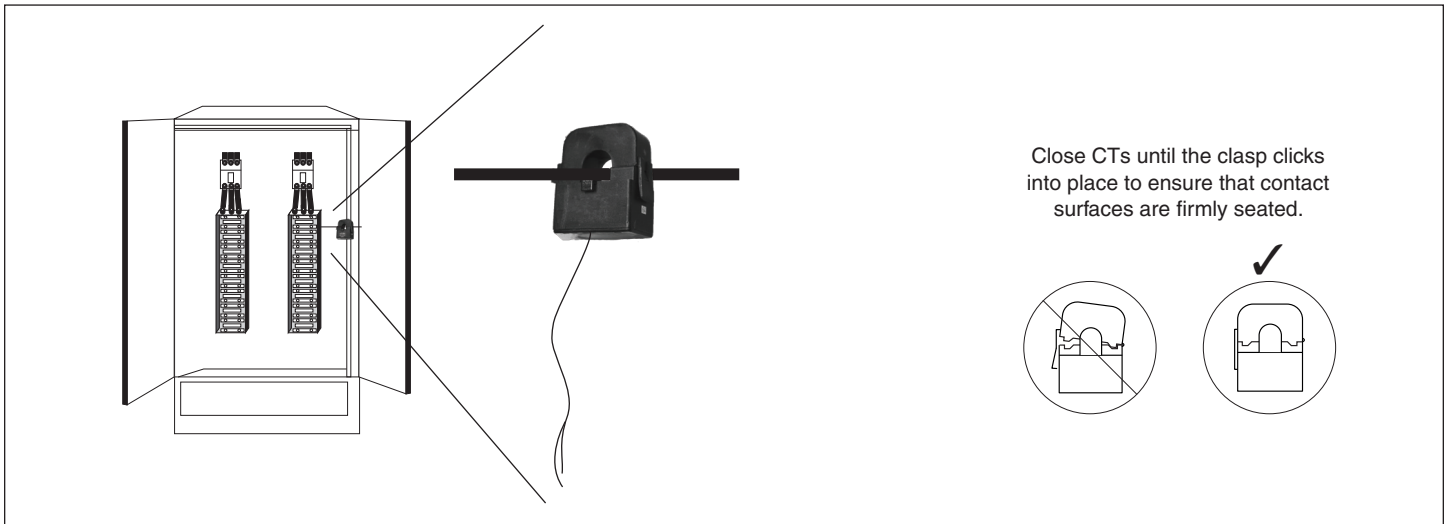


6. Install the split-core CTs onto the conductors to be monitored (Figure 7). CTs can be mounted facing either direction; orientation does not affect meter accuracy. The hinge can detach, allowing the base and the top to separate for easier cleaning and installation.

NOTE: Clean split-core contacts before closing.

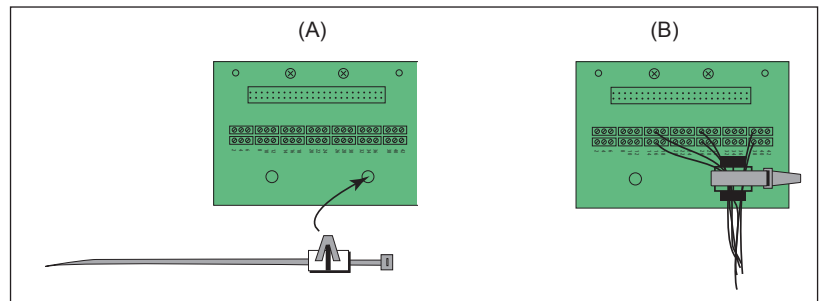
NOTE: The 50A CT accepts maximum #2 AWG (0.384" O.D.) wire with THHN insulation. The 100A CT accepts maximum 3/0 AWG (0.584" O.D.) wire with THHN insulation. The 200A CT accepts a maximum of 350 MCM wire with THHN insulation. Use this gauge wire or smaller for each circuit.

**Figure 7** Installing the split-core CTs in the panel



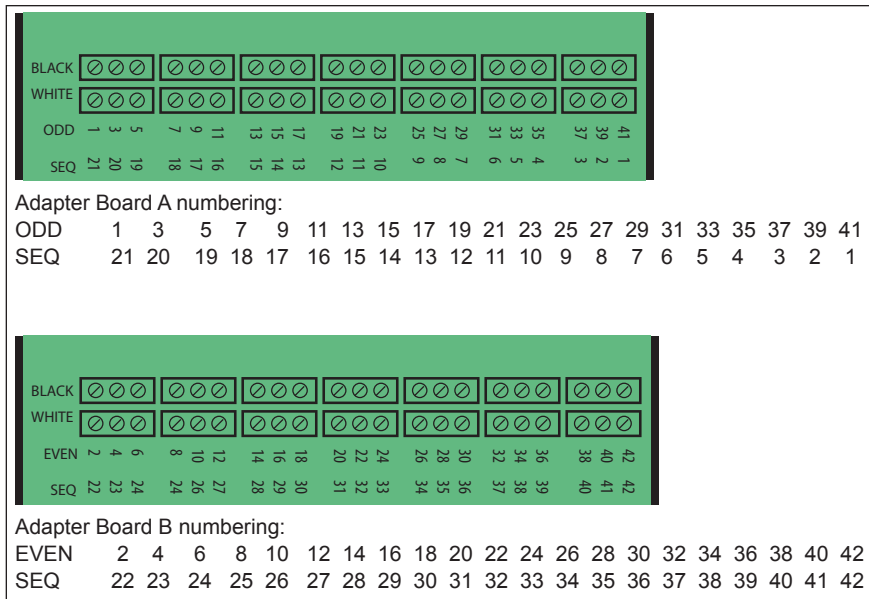
7. Plastic cable ties are included with the product for strain relief. Insert the strain relief device into one of the available holes on the adapter board (Figure 8A). Gather all CT wires connected to that adapter board and secure the cable tie around them (Figure 8B).

**Figure 8** Strain Relief



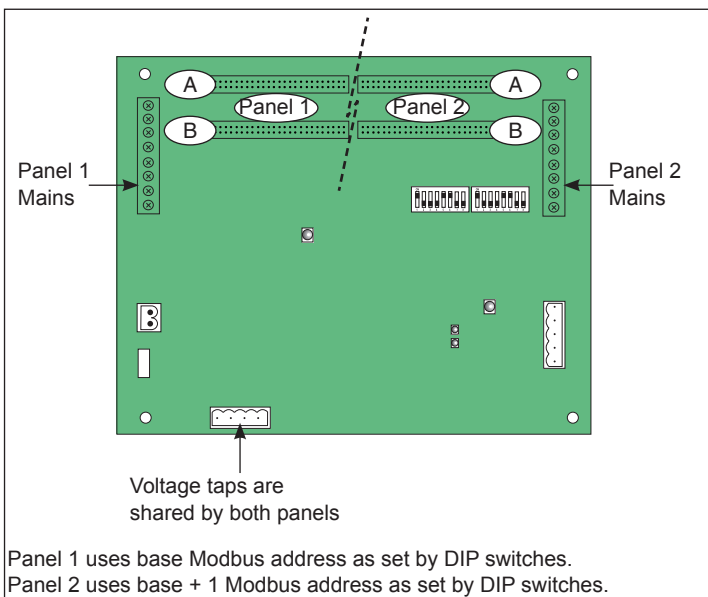
- The adapter boards are labeled with two rows of numbers. For applications that require odd/even branch circuit numbering, use the row designated ODD or EVEN. For applications that require sequential numbering, use the number row marked SEQ (Figure 9).

**Figure 9 Branch Circuit Numbering**



- Configure communication and addressing parameters using DIP switches. The BCPMSC requires two addresses, one for each set of 42 CTs and four auxiliary inputs. See the Configuration section for more information.

**Figure 10 Connectors**



- Wire RS-485 communications. See the diagrams in the “Wiring” section.

## Wiring

### **⚠ DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Read, understand, and follow the instructions before installing this product.

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

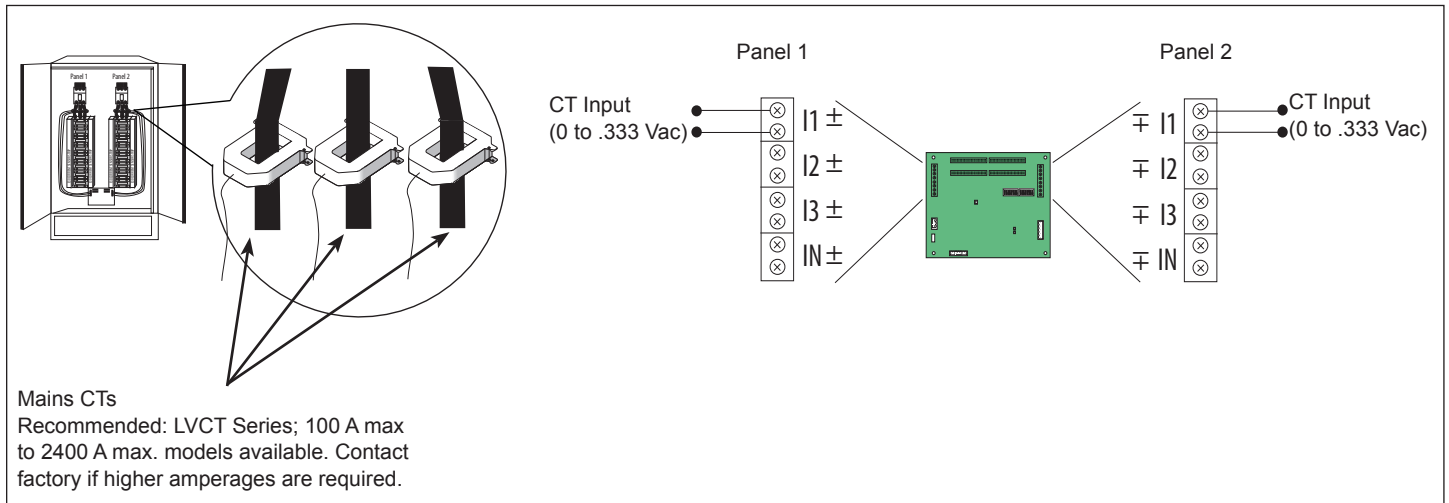
NOTE: If BCPMSC products are installed in circuits with higher voltage ratings, keep the circuits segregated per UL508A Sec. 17.5.

NOTE: 480Y/277 Vac connected (center grounded) power systems operate within the 300 Vac line-to-neutral voltage rating of the BCPMSC Series, and the operational voltage limit (single-phase connection) as the line-to-neutral voltage is 277 Vac in such power systems. Corner-grounded delta 480 Vac systems would not qualify, as the actual line-to-earth voltage is 480 Vac on each leg, exceeding the BCPMSC ratings.

NOTE: BCPMSC internal circuitry (cables and CTs) are not circuits as defined by UL508A, as they do not extend beyond the BCPMSC itself without further fire isolation.

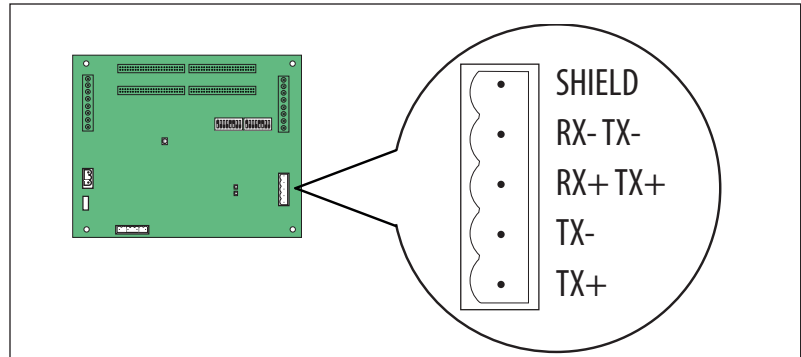
1. Turn off all power to this equipment and the equipment it is installed in before installing wires. Use a properly rated voltage sensing device to confirm power is off.
2. Connect the 0.333 Vac mains CTs to the main conductors by snapping CTs around lines, observing local codes regarding bending radius (optional; Figure 11).

**Figure 11** Connect CTs to main conductors

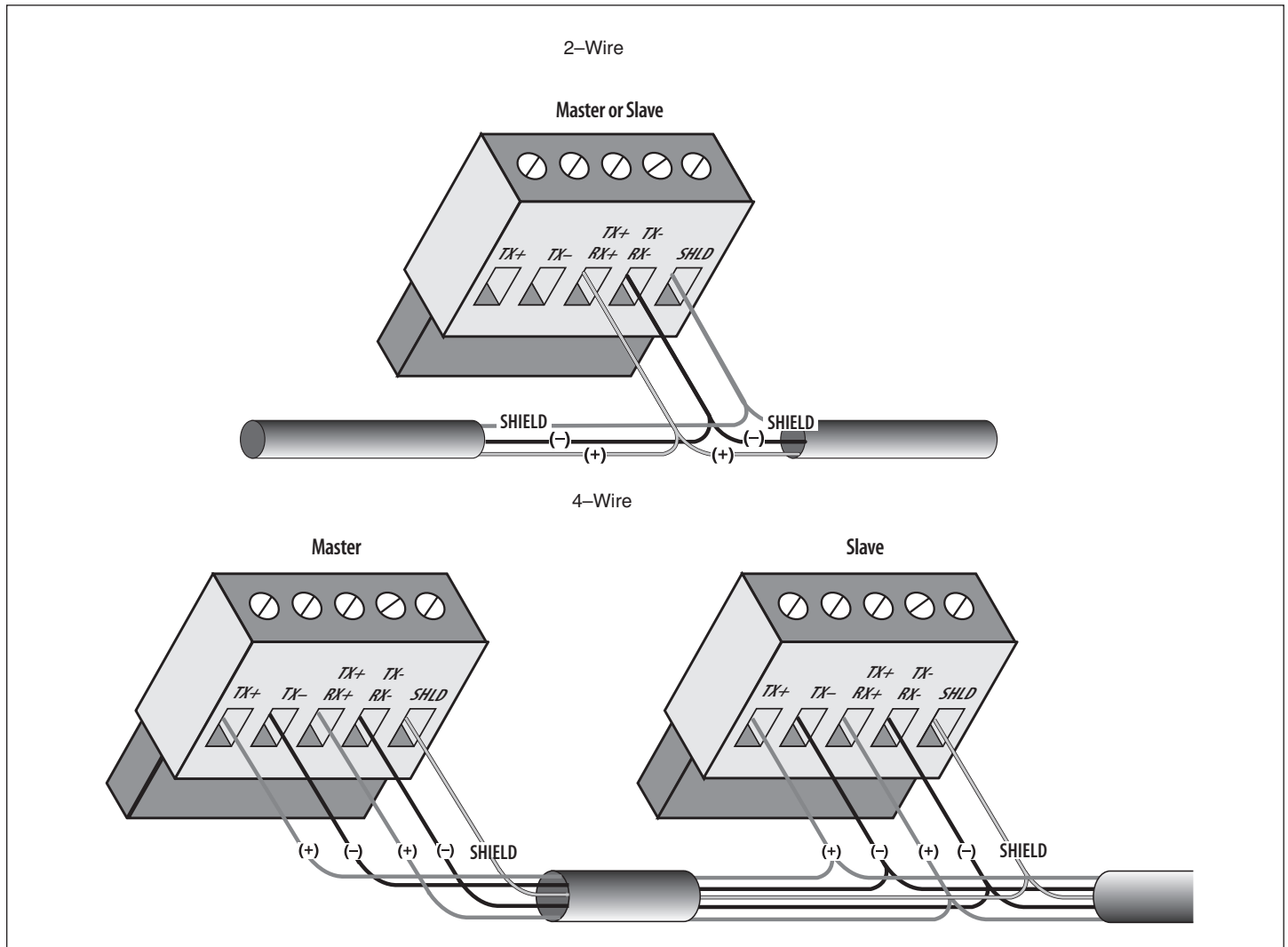


3. Connect 2-wire or 4-wire Modbus® RS-485 daisy chain network. See Figures 12 and 13.

**Figure 12 Communications Connector**

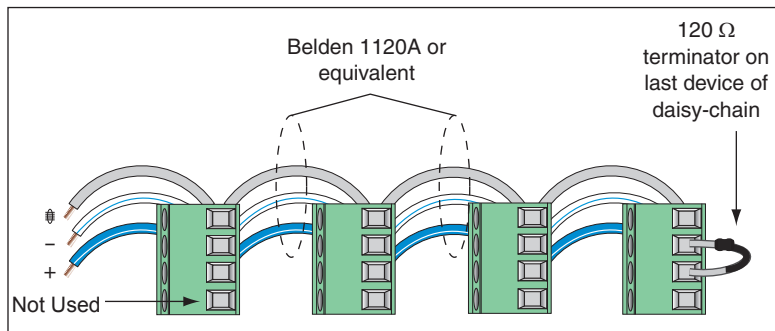


**Figure 13 2-wire and 4-wire communications wiring**



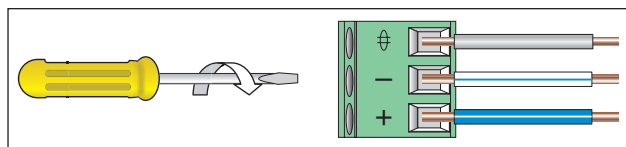
4. Mechanically secure the RS-485 cable where it enters the electrical panel.
5. Connect all RS-485 devices together in a daisy-chain fashion, and properly terminate the chain (Figure 14).

**Figure 14 Properly terminated daisy-chain network**



6. Shield the RS-485 cable using twisted pair wire such as Belden 1120A. Use cable that is voltage rated for the installation.
7. When tightening terminals, apply the correct torque: 0.5 to 0.6 N·m (0.37 to 0.44 ft·lb ) for connectors on main board, 0.22 to 0.26 N·m (0.16 to 0.19 ft·lb) for connectors on adapter boards (Figure 15).

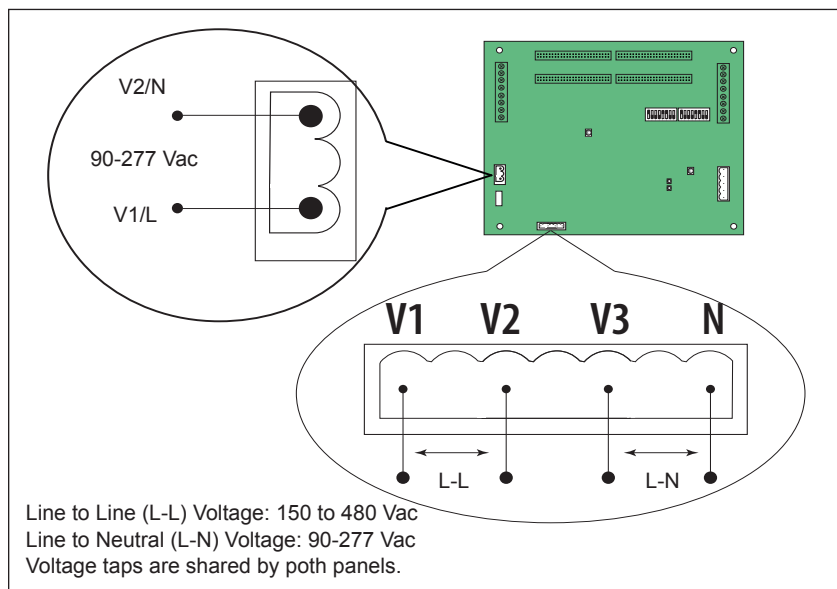
**Figure 15 Torque requirements**



NOTE: After wiring the RS-485 cable, remove all scraps of wire or foil shield from the electrical panel before closing the enclosure.

8. Connect 2-wire 90-277 Vac power to main power terminals. Observe polarity. For the BCPMSCA and BCPMSCB, connect voltage lines to the voltage taps (Figure 16). Equip voltage lines with fuses.

**Figure 16 Connecting power to power terminals**



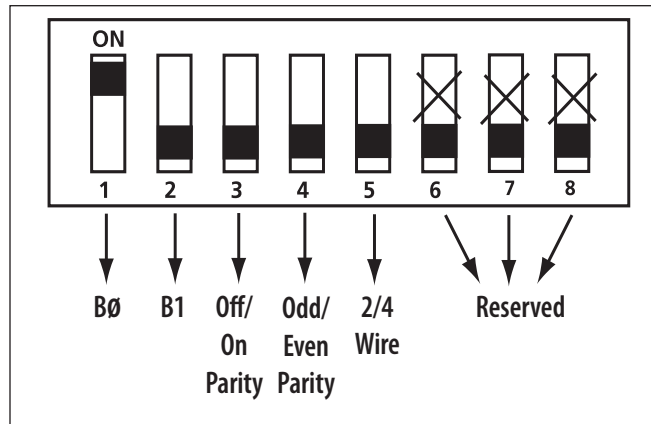
## Configuration

NOTE: Use ION Setup to set up breaker size, demand interval, and alarm levels. See the Commissioning section later in this document for more information. ION Setup is available online at <http://www.powerlogic.com>.

1. Communications Configuration: Communications parameters for the BCPMSC are field selectable for your convenience. Please see Figure 1 for selector location. The following parameters are configurable:

- Baud Rate: 9600, 19200, 38400
- Parity On or Off
- Parity: Odd or Even
- Wiring: 2 or 4 wire RS-485

**Figure 17 Example: 2-wire 19200 Baud No Parity**



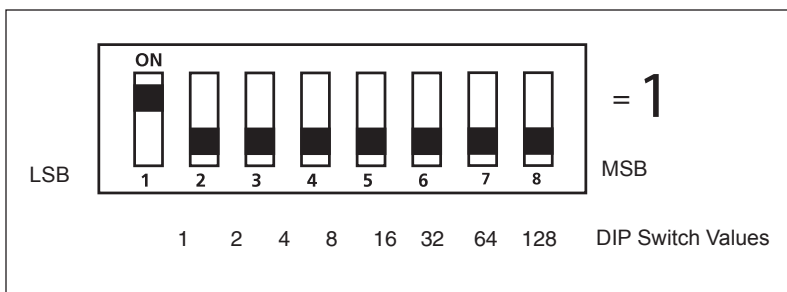
**Table 6: Switch Settings**

1	2	3	4	5	6	7	8	
off	off				X	X	X	9600
on	off				X	X	X	19200
off	on				X	X	X	38400
on	on				X	X	X	Reserved
		off	off		X	X	X	No Parity
		on	off		X	X	X	Odd Parity
		off	on		X	X	X	No Parity
		on	on		X	X	X	Even Parity
				on	X	X	X	4-wire RS-485
				off	X	X	X	2-wire RS-485

2. Each Modbus device on a single network must have a unique address. Set the switch block to assign a unique address before the device is connected to the Modbus® RS-485 network. If an address is selected that conflicts with another device, neither device will be able to communicate.

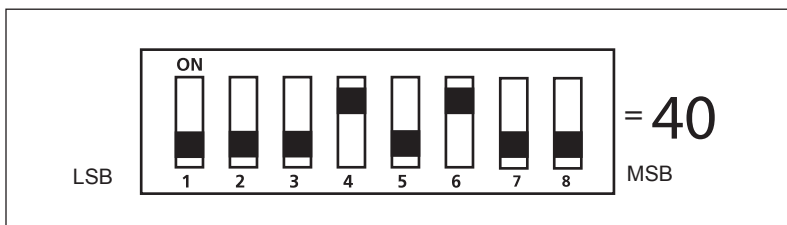
- The BCPMSC uses two logical addresses. Panel 1 uses the base address as set on the DIP switches, and Panel 2 uses this base address + 1. Address the BCPMSC as any whole number between and including 1-247. Each unit is equipped with a set of eight DIP switches for addressing (Figure 18).

**Figure 18 Default Modbus address DIP switch settings**



To determine an address, add the values of any switch that is on (Figure 19).

**Figure 19 Modbus® address DIP switch values**

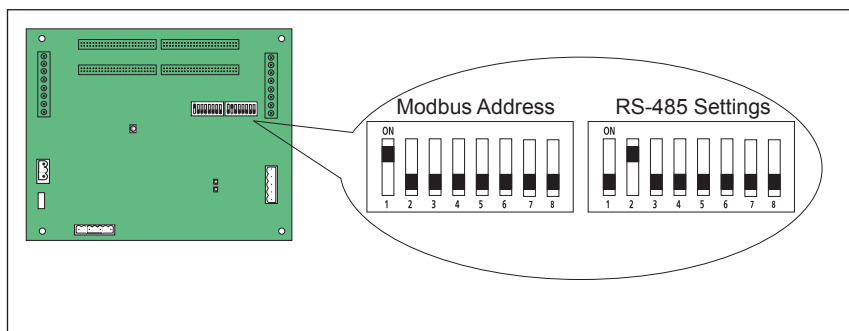


Switch number 4 has an ON Value of 8 and switch number 6 has an ON Value of 32. (8 + 32 = 40). Therefore, the address for Panel 1 is 40, and the address for Panel 2 is 41.

See the Communications Setup section on page 17 for a pictorial listing of the first 63 switch positions.

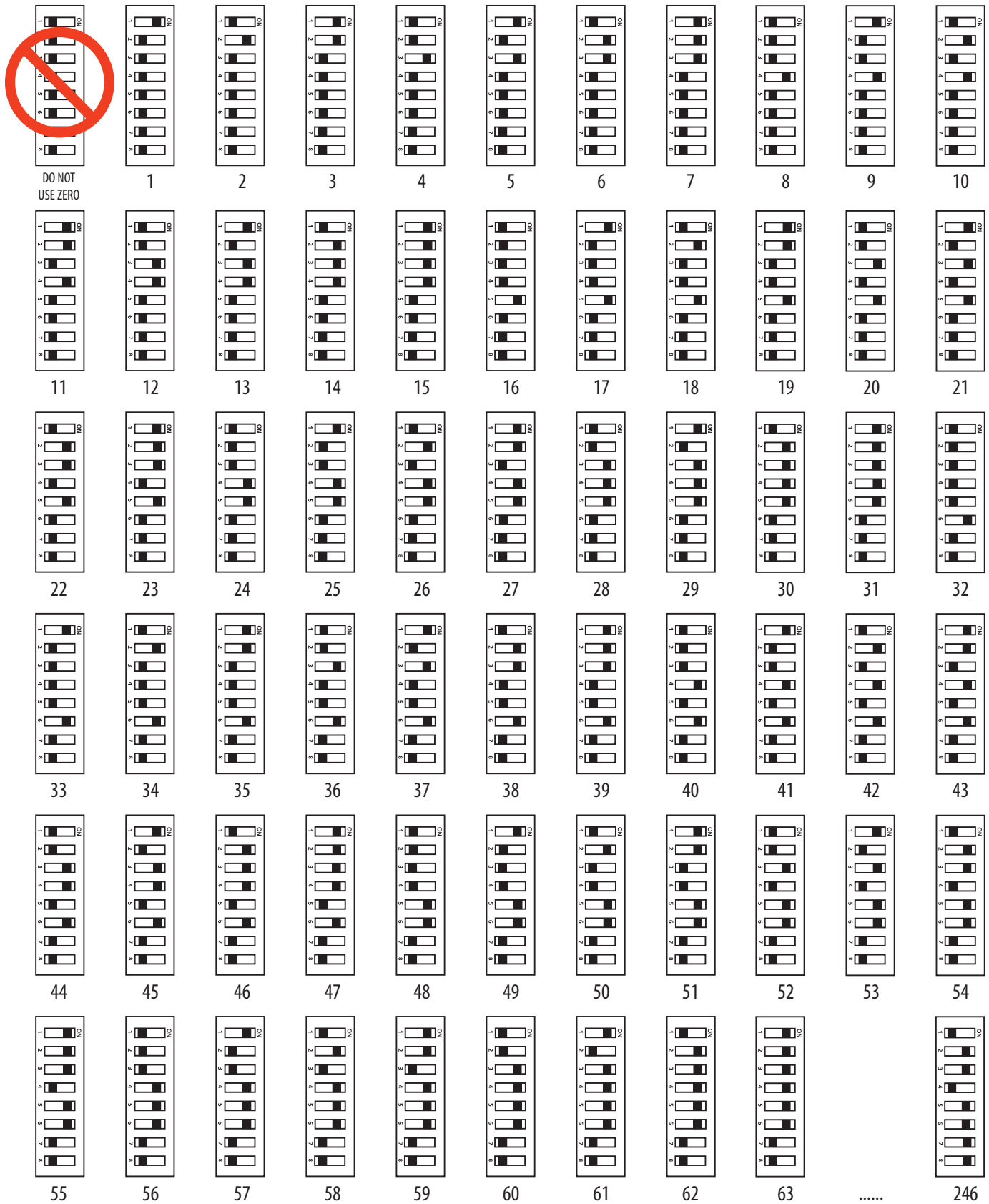
## Default DIP Switch Settings

The BCPMSC includes two DIP switches, as shown below. Switches are shown in their default positions.



## Communications Setup

Figure 20 Address selection switches from 1 to 63

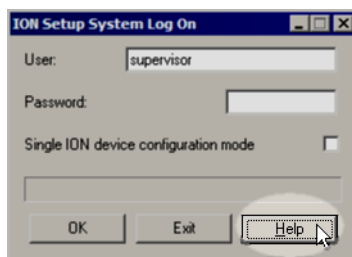


## Commissioning

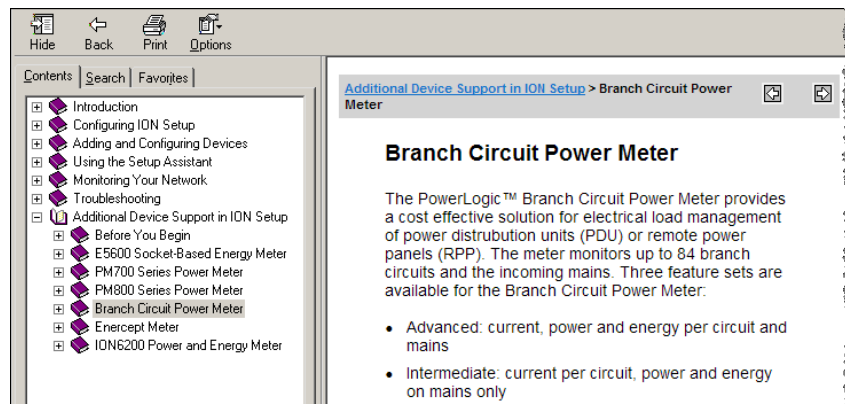
Use ION Setup to configure the BCPMSC. ION Setup is a meter configuration software you can download from [www.powerlogic.com](http://www.powerlogic.com)

NOTE: Install the latest build in order to get the most up-to-date information, feature and device support for ION Setup.

To learn how to add and configure sites and meters, refer to the ION Setup online help by clicking the Help button or pressing F1 on your keyboard.



Click the Branch Circuit Power Meter topic for details on configuring the device.



## Recommended Accessories

**Table 7: Recommended Accessories**

Part Number	Description
CBL008	Flat ribbon cable, 50 x 28 AWG, 1.5 ft. (0.45 m)
CBL016	Flat ribbon cable, 50 x 28 AWG, 4 ft. (1.2 m)
CBL017	Flat ribbon cable, 50 x 28 AWG, 5 ft. (1.5 m)
CBL018	Flat ribbon cable, 50 x 28 AWG, 6 ft. (1.8 m)
CBL019	Flat ribbon cable, 50 x 28 AWG, 8 ft. (2.4 m)
CBL020	Flat ribbon cable, 50 x 28 AWG, 10 ft. (3.0 m)
CBL021	Flat ribbon cable, 50 x 28 AWG, 20 ft. (6.1 m)
CBL022	Round ribbon cable, 50 x 28 AWG, 4 ft. (1.2 m)
CBL023	Round ribbon cable, 50 x 28 AWG, 10 ft. (3 m)
CBL024	Round ribbon cable, 50 x 28 AWG, 20 ft. (6 m)
CBL025	Flat ribbon cable, 50 x 28 AWG, 2 m
CBL026	Flat ribbon cable, 50 x 28 AWG, 4 m
CBL027	Flat ribbon cable, 50 x 28 AWG, 6 m
CBL031	Round ribbon cable, 50 x 28 AWG, 1.5 ft. (0.45 m)
CBL032	Round ribbon cable, 50 x 28 AWG, 2.5 ft. (0.76 m)
BCPMSCCT0	Six-pack 50 A CT, 6 ft. (1.8 m) lead
BCPMSCCT0R20	Six-pack 50 A CT, 20 ft. (6 m) lead
BCPMSCCT1	Six-pack 100 A CT, 6 ft. (1.8 m) lead
BCPMSCCT1R20	Six-pack 100 A CT, 20 ft. (6 m) lead
BCPMSCCT3	Single 200A CT, 6ft (1.8m) lead
BCPMSCCT3R20	Single 200A CT, 20ft (6m) lead
BCPMSCADPBS	2 BCPMSC Adapter boards
BCPMCOVERS	BCPM MCB Cover

## Troubleshooting

**Table 8: Troubleshooting**

Problem	Solution
Product is not communicating over Modbus daisy chain	<ul style="list-style-type: none"> <li>• Check the unit Modbus address to ensure that each device on the daisy chain has a unique address.</li> <li>• Check Parity.</li> <li>• Check the communications wiring.</li> <li>• Check that the daisy chain is properly terminated.</li> </ul>
RX LED is solid	<ul style="list-style-type: none"> <li>• Check for reversed polarity on Modbus comms.</li> <li>• Check for sufficient biasing on the Modbus bus. Modbus physical specification calls for 450-650 Ω biasing. This is usually provided by the master.</li> </ul>
The main board has a fast flashing amber light	<ul style="list-style-type: none"> <li>• Verify ribbon cable connectors are inserted in the correct orientation.</li> <li>• If cables are correct, reset main board to re-initialize product.</li> </ul>
The main board has a slow flashing amber light	<ul style="list-style-type: none"> <li>• One or more channels is clipping. This can be caused by a signal greater than the split-core CT size or 277 V L-N, or by a signal with high THD near the gain stage switching points (1.5 A and 10 A).</li> </ul>
The main board has a flashing green light	<ul style="list-style-type: none"> <li>• Everything is wired properly and the main board has power.</li> </ul>
The main board is a flashing or solid red light	<ul style="list-style-type: none"> <li>• Light may be red briefly while device powers up.</li> <li>• If light is red for more the 60 sec. device has encountered a diagnostic event. Contact technical support.</li> </ul>
Split-core product is reading zero for some values	<ul style="list-style-type: none"> <li>• Device was unable to read split-core adapter boards on power up. Verify adapter boards are connected.</li> <li>• Verify ribbon cable connectors are inserted in the correct orientation.</li> <li>• Reset main board to re-initialize product.</li> </ul>
Power factor reading is not as expected	<ul style="list-style-type: none"> <li>• Verify voltage taps are connected in appropriate phase rotation.</li> <li>• Verify phase rotation of breakers (firmware rev. 1.012 or higher allows for custom rotation if needed).</li> </ul>
Current reading is not as expected, or reading is on different CT number than expected	<ul style="list-style-type: none"> <li>• Verify ribbon cable is fully seated and in the correct orientation.</li> </ul>
Current is reading zero, even when small currents are still flowing through circuit	<ul style="list-style-type: none"> <li>• The product cuts off at 50 mA, and will set the reporting register to 0 mA for currents near or below this range.</li> </ul>

## China RoHS Compliance Information

**Table 9: EFUP Table**

部件名称	产品中有毒有害物质或元素的名称及含量Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电子线路板	X	0	0	0	0	0
0 = 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X = 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。						
Z000057-0A						

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