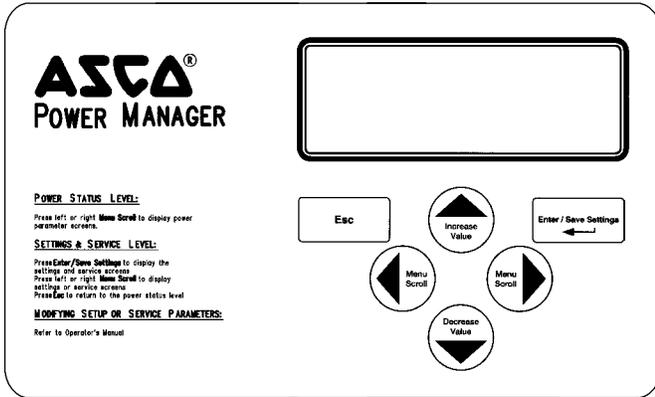


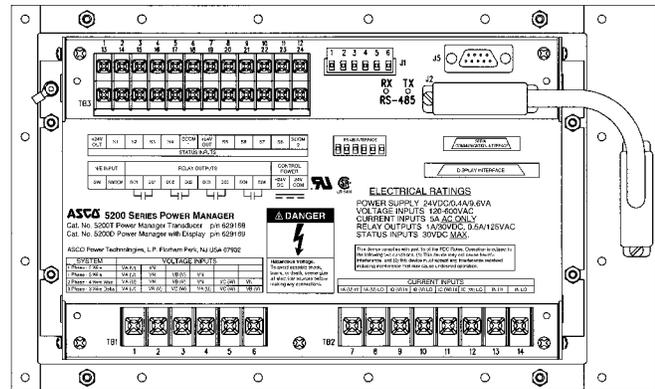
# Operator's Manual

# ASCO® 5200 SERIES POWER MANAGER

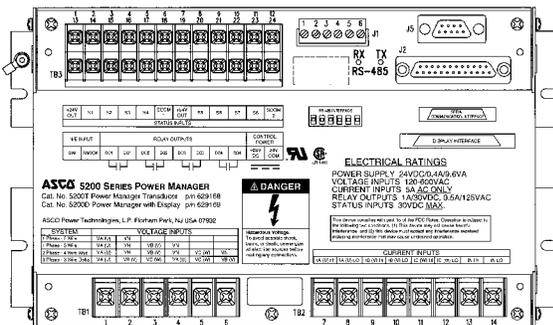


**Note:** When the 5200 Series Power Manager is provided as Accessory 75 or 85 on a 7000 Series ATS product, also refer to the drawings provided with the ATS.

**Catalog 5200D** (Accessory 85 when ordered with an ASCO ATS) Power Manager Display, front view – typical enclosure door mounting.



Rear view – Catalog 5200D Power Manager Transducer attached to the back of the Display.



**Catalog 5200T** (Accessory 75 when ordered with an ASCO ATS) Power Manager Transducer only (without the Display).

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**⚠ DANGER**

To avoid possible shock, burns, or death, deenergize all electrical sources before making any connections to the Power Manager.

**CAUTION**

The protection provided by the equipment may be impaired if the Power Manager is used in a manner not specified by ASCO.

## General Information

The ASCO 5200 Series Power Manager collects real-time power system information from ASCO Power Control Systems and 7000 Series Automatic Transfer Switch products (which utilize the Group 5 Controller). The Power Manager is available in two forms: Catalog 5200D (Accessory 85 on an ATS) Power Manager (Display and Transducer) for local data monitoring and control; or Catalog 5200T (Accessory 75 on an ATS) Power Manager Transducer without the display transmits data serially to a remote network management product for collection and analysis.

The Power Manager includes a backlit 4-line LCD display and membrane controls. All monitoring and control functions can be done from the front of an enclosure for convenience and safety.

The universal potential transformer inputs on the Power Manager can accommodate the following three phase and single phase bus types:

- Three phase – 4 wire WYE system
- Three phase – 3 wire Delta system
- Single phase – 3 wire system
- Single phase – 2 wire system

## Monitored & Calculated Data

Set-up parameters as well as the following computed parameters are available both on the local display and through the serial interface:

- Line-to-neutral voltages ( $V_{AN}$ ,  $V_{BN}$ ,  $V_{CN}$ )
- Line-to-neutral voltage average ( $V_{AVE}$ )
- Line-to-line voltages ( $V_{AB}$ ,  $V_{BC}$ ,  $V_{CA}$ )
- Line-to-line voltage average ( $V_{LAVE}$ )
- Current on each phase ( $I_A$ ,  $I_B$ ,  $I_C$ )
- Current in the neutral conductor ( $I_N$ )
- Average current ( $I_{AVE}$ )
- Active power, KW per phase and total ( $W_A$ ,  $W_B$ ,  $W_C$ ,  $W_T$ )
- Reactive power, KVAR per phase and total ( $VAR_A$ ,  $VAR_B$ ,  $VAR_C$ ,  $VAR_T$ )
- Apparent power, KVA per phase and total ( $VA_A$ ,  $VA_B$ ,  $VA_C$ ,  $VA_T$ )
- Watt demand and maximum Watt demand
- KWHours importing, exporting and net ( $KWH_{IMP}$ ,  $KWH_{EXP}$ ,  $KWH_{NET}$ )
- KVARHours leading, lagging and net ( $KVARH_{LEAD}$ ,  $KVARH_{LAG}$ ,  $KVARH_{NET}$ )
- KVAHours net ( $KVAH_{NET}$ )
- Power factor (PF)
- Signal frequency (Hz)

## Sense Inputs

- 4 current inputs
- 3 voltage inputs
- frequency input

## Control Inputs & Outputs

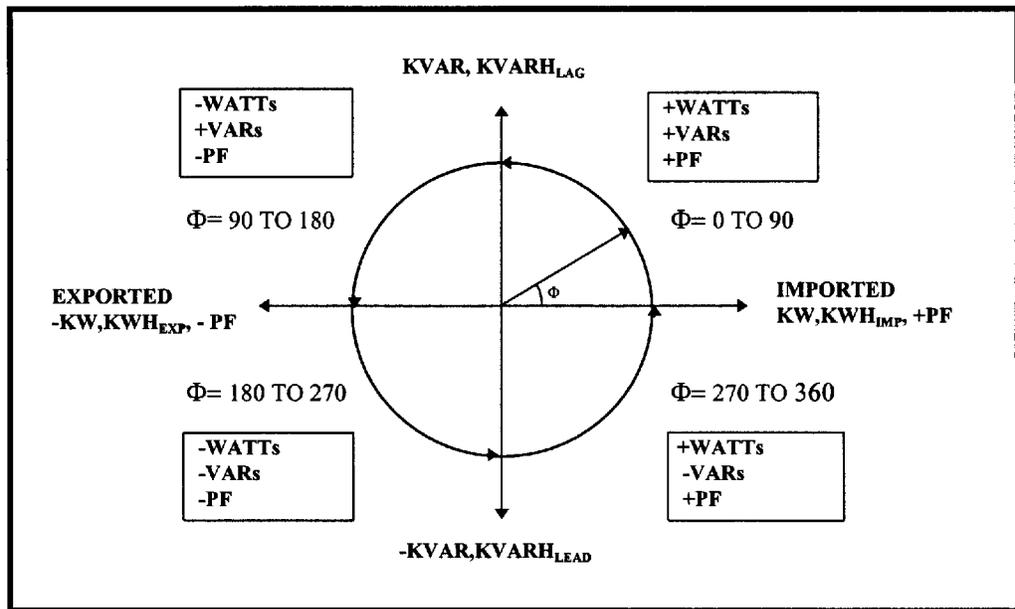
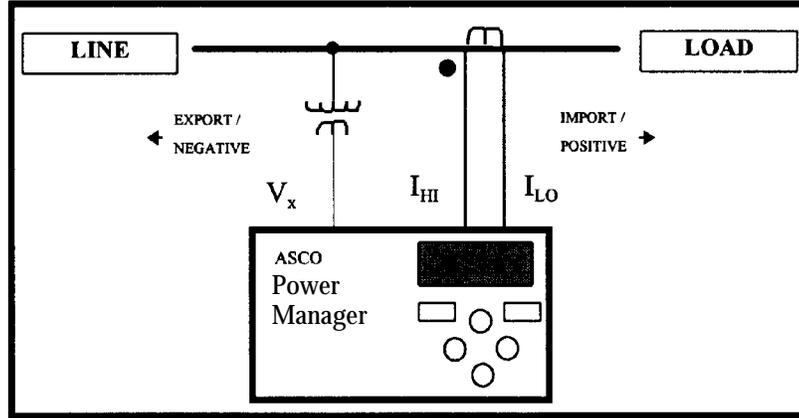
- transfer switch position input
- 8 status inputs
- 4 relay outputs

## Cleaning

The exterior of the 5200 Series Power Manager should be cleaned by wiping the front panel of the display unit with a soft cloth and cleaning agents that are not alcohol based, and are nonflammable, nonexplosive. All other servicing should be performed by authorized factory personnel.

# Measurement Conventions

The following diagrams show how the 5200 Series Power Manager interprets and displays signed (+, -) values for power, power factor and energy parameters. Please note that the polarity of the Watts, VARs, Power Factor, energy import/export, and lag/lead readings can be reversed by reversing the polarity of the CTs connected to the Power Manager.



### DEFINITIONS:

$$\Phi \equiv (\text{phase angle between voltage and current}) = \Phi_V - \Phi_I$$

$$\Phi_V \equiv \text{phase angle of voltage signal}$$

$$\Phi_I \equiv \text{phase angle of current signal}$$

**LAGGING**  $\Phi \equiv (0 < \Phi < 90^\circ)$  for positive power flow. To illustrate this condition, assume  $\Phi_V = 0$  and  $(-90^\circ < \Phi_I < 0)$ . This results in  $(0 < \Phi < 90^\circ)$ , so it would be stated that  $\Phi_I$  LAGS  $\Phi_V$  for positive power flow.

**LEADING**  $\Phi \equiv (-90^\circ < \Phi < 0)$  for positive power flow. To illustrate this condition, assume  $\Phi_V = 0$  and  $(0 < \Phi_I < 90^\circ)$ . This results in  $(-90^\circ < \Phi < 0)$ , so it would be stated that  $\Phi_I$  LEADS  $\Phi_V$  for positive power flow.

## Measurement Specifications

NOTE: The accuracy specifications are subject to change.  
Contact ASCO Power Technologies for more information.

- Temperature : 25 °C / 77 °F
- Frequency : 50.0 Hz or 60.0 Hz
- Current input :  $2 \% < I_{FULL\ SCALE} < 125 \%$
- Sensing type: True RMS up to and including the 21<sup>st</sup> harmonic.

Parameter (full scale)		Accuracy (% full scale)	Display	
			Resolution	Range
Current (I)	5.000 A	0.25 %	0.25 %	0 – 29 999 <sup>1</sup>
Voltage (V)	120 V	1.00 %	1.00 %	0 – 59 999 <sup>2</sup>
	600 V	0.25 %	0.25 %	0 – 59 999 <sup>2</sup>
Active Power (per element)	600 W	1.00 %	0.25 %	0 – 29 999 <sup>3</sup>
	3000 W	0.25 %	0.10 %	0 – 29 999 <sup>3</sup>
Reactive Power (per element)	600 VAR	1.00 %	0.25 %	0 – 29 999 <sup>3</sup>
	3000 VAR	0.25 %	0.10 %	0 – 29 999 <sup>3</sup>
Apparent Power (per element)	600 VA	1.00 %	0.25 %	0 – 29 999 <sup>3</sup>
	3000 VA	0.25 %	0.10 %	0 – 29 999 <sup>3</sup>
Active Energy (KWH)		1.00 % of reading	0.10 %	0 – 1 999 999 999
Reactive Energy (KVARH)		1.00 % of reading	0.10 %	0 – 1 999 999 999
Apparent Energy (KVAH)		1.00 % of reading	0.10 %	0 – 1 999 999 999
Power Factor (PF)		1.00 %	0.01 PF	-0.0 to 1.00 to +0,0
Frequency (Hz)		0.25 %	0.1 Hz	40 to 100 Hz

NOTES:

<sup>1</sup> Reads in KA (i.e., 10.00 KA) for currents over 9,999 A.

<sup>2</sup> Reads in KV (i.e., 10.0 KV) for voltages over 9,999 V.

<sup>3</sup> Reads in MW, MVAR, MVA for readings over 9,999 K.

## FCC Class A Statement

This equipment has been tested and found to comply with the limits for a Class A 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 commercial 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Device Ratings

### Input Signals

- Current (4): 0 to 5 A ac nominal. 4000 V ac isolation, minimum.  
Burden: less than 2mV at 5 A ac input ( 0.01 VA )
- Voltage (3): 0 to 600 V ac nominal, three phase. 3750 V ac isolation minimum.  
Burden: less than 0.1 mA ac at 600 V ac input ( 0.1 VA ).
- Frequency: 40 Hz to 100 Hz fundamental.  
True RMS measurements up to and including the 21<sup>st</sup> harmonic.

Relay outputs (4): Form C dry contact,  
UL/CSA rated 1 A @ 30 V dc, 0.5 A @ 125 V ac resistive load

Status inputs (8): 30 V dc maximum, >10 V dc = active, <1 V dc = inactive

### Transfer Switch

Position input: 30 V dc maximum, >10 V dc = active, <1 V dc = inactive

Power Requirements: 24 V dc / 0.3 A maximum / 7.2 VA  
Power supply should be UL Listed.

Interface (s): External display (J2) – Class 1 DB25 female type  
SCI (J5) – Class 2 DB9 female type  
RS485 (J1) – Isolated RS485 Communications interface

Operating Temp.: –4° F to +140° F (–20° C to +60° C)

Storage Temp.: –67° F to +185° F (–55° C to +85° C)

Installation Category: IC III

Pollution Degree: PD 2

Humidity: Relative humidity 5% to 95%, non–condensing.

### Size:

- Catalog 5200T 6” H x 2 ¾” D x 10” W (152 mm H x 70 mm D x 254 mm W)  
Catalog 5200D 7” H x 5” D x 12” W (178 mm H x 127 mm D x 304 mm W)  
(includes Power Manager Display)

### Weight:

- Catalog 5200T 3 lbs. 5 oz (1.50 kg)  
Catalog 5200D 5 lbs. 11 oz (2.58 kg)  
(includes Power Manager Display)

## Applicable Standards

- UL 3111–1 Electrical Measuring and Test Equipment, Part 1: General Requirements  
CAN/CSA–C22.2 No. 231–M89 CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment

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## Mounting

The 5200 Series Power Manager must be mounted to a flat surface inside a metal enclosure. For Catalog 5200T (Acc. 75) mount the Power Manager Transducer by using the four slotted mounting locations in the base.

For Catalog 5200D (Acc. 85) mount the Display (Transducer with Display) to the inside of an enclosure door which has a 10" x 6" cutout so that the LCD display and membrane controls are accessible through the door (when closed).

Use a standard nutdriver to mount the Power Manager.  
Tighten all mounting hardware to 10 in-lb maximum.

See Outline & Mounting Drawing 627122 (on next page)

8

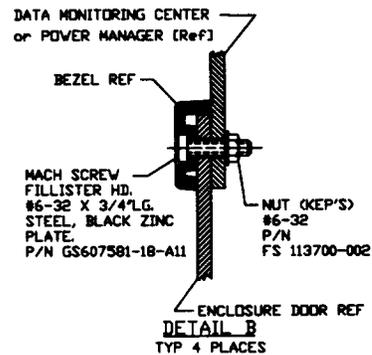
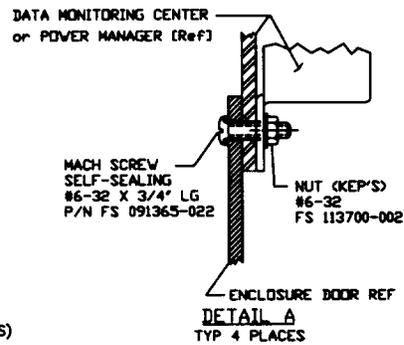
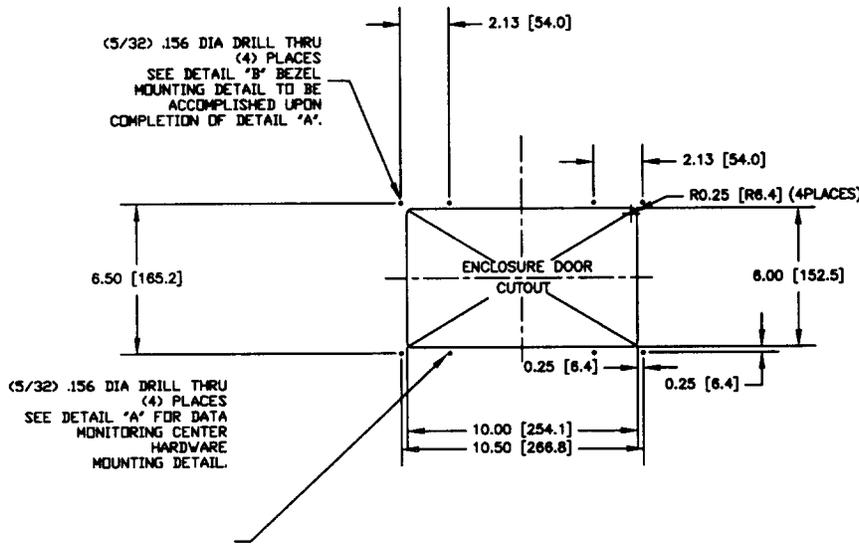
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6

5

DATA MONITOR or POWER MANAGER  
 MONITOR MOUNTING DATA (TYPE 1 ENCLOSURE INSTALLATIONS)  
 (USING THROUGH HOLE MOUNTING METHOD)

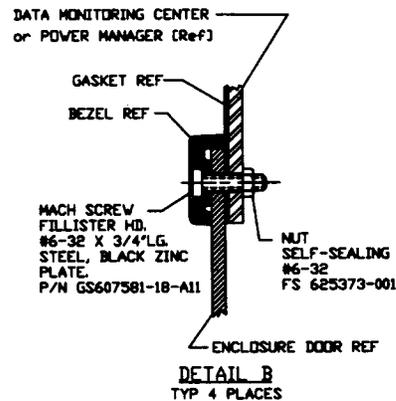
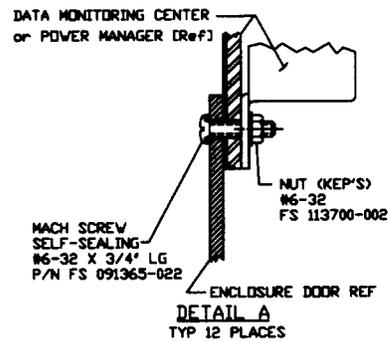
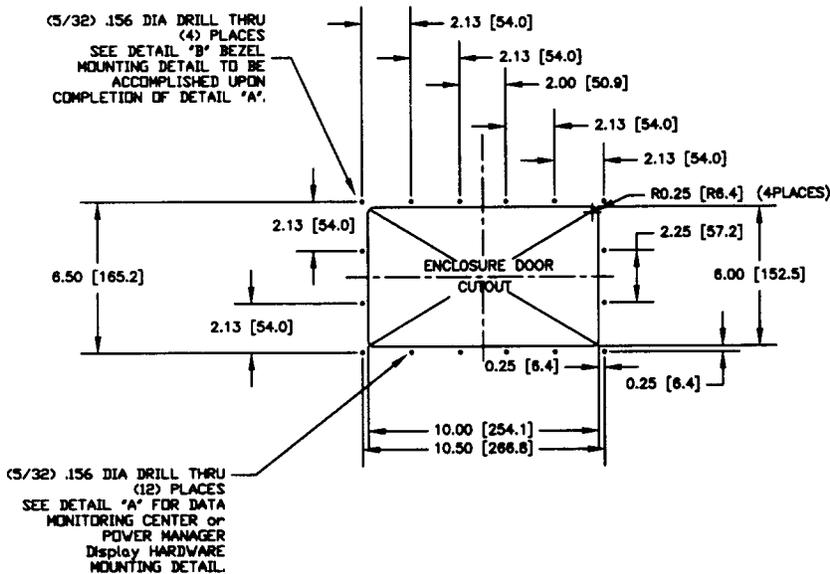
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C

DATA MONITOR or Power Manager  
 MOUNTING DATA (TYPE 3R, 4 & 12 ENCLOSURE INSTALLATIONS)  
 (USING THROUGH HOLE MOUNTING METHOD)

B



A

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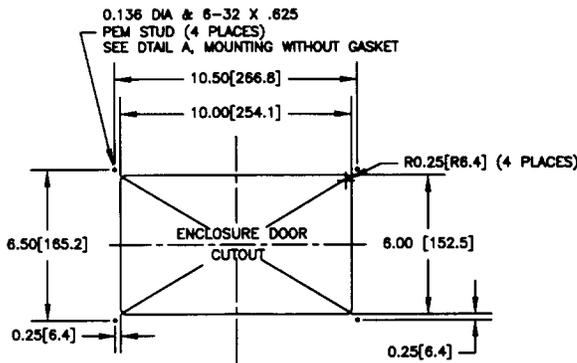
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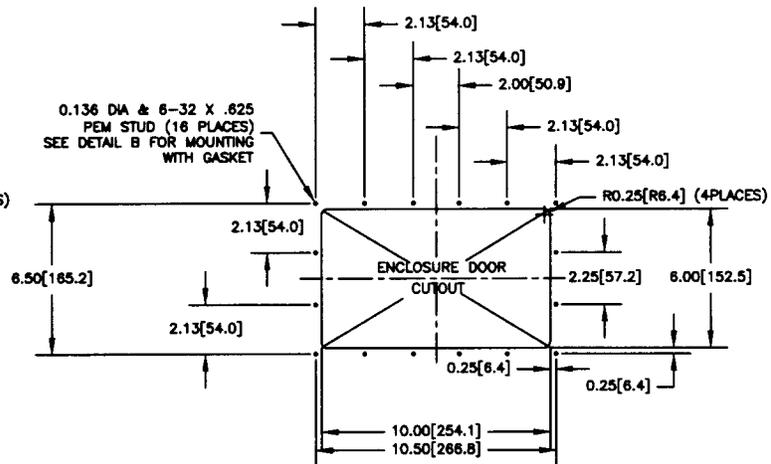
# DATA MONITOR or POWER MANAGER

## MOUNTING DATA (TYPE 1, 3R, 4 & 12 ENCLOSURE INSTALLATIONS)

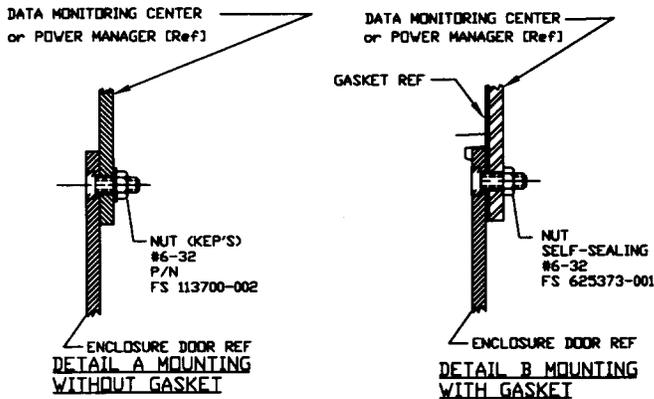
(USING SELF-CLINCHING CAPTIVE STUD MOUNTING METHOD)



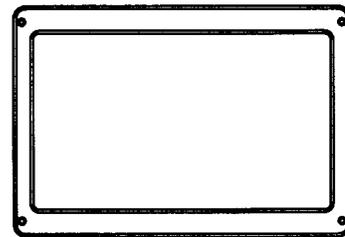
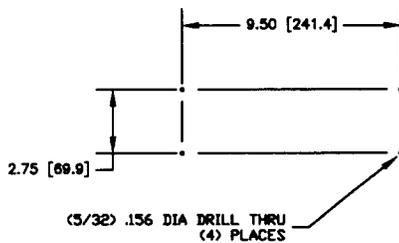
CUTOUT DETAIL FOR TYPE 1 ENCLOSURE (USE PEM STUD)



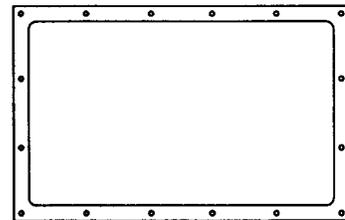
CUTOUT DETAIL FOR TYPE 3R, 12 & 4 ENCLOSURE (USE PEM STUD)



## DATA MONITOR WITHOUT DISPLAY or POWER MANAGER TRANSDUCER MOUNTING DATA



BEZEL PN.607574



GASKET PN.605537

### NOTE:

1. BEZEL IS REQUIRED FOR TYPE 1 ENCLOSURE WHEN USING DRILL THROUGH MOUNTING METHOD.
2. BEZEL AND GASKET ARE REQUIRED FOR TYPE 1, 3R & 4 ENCLOSURE WHEN USING DRILL THROUGH MOUNTING METHOD
3. GASKET IS REQUIRED FOR TYPE 3R, 12 & 4 ENCLOSURE WHEN USING PEM STUD MOUNTING METHOD.

ALL DIMENSIONS: INCH[mm]

PROJECT NAME:		ISSUE NO.	ISSUE DATE
MOUNTING DATA		ISSUE NO.	ISSUE DATE
DATA MONITOR Cat. No. 214A700, 214A701		ISSUE NO.	ISSUE DATE
POWER MANAGER Cat. No. 5200T, 5200D		ISSUE NO.	ISSUE DATE
TYPE 1, 3R, 12 & 4		ISSUE NO.	ISSUE DATE
DESIGNED BY	DATE	ISSUE NO.	ISSUE DATE
CHECKED		ISSUE NO.	ISSUE DATE
APPROVED		ISSUE NO.	ISSUE DATE
DATE		ISSUE NO.	ISSUE DATE
APPROVAL		ISSUE NO.	ISSUE DATE
PROPERTY OF AUTOMATIC SWITCH COMPANY. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.		ISSUE NO.	ISSUE DATE
Automatic Switch Co.		ISSUE NO.	ISSUE DATE
PLANNING PARK, NEW JERSEY OFFICE PRINTED IN U.S.A.		ISSUE NO.	ISSUE DATE
SCALE: 6:1		ISSUE NO.	ISSUE DATE
FILE NO.		ISSUE NO.	ISSUE DATE
DS627122		ISSUE NO.	ISSUE DATE
CHANGE A		ISSUE NO.	ISSUE DATE
REVISION 153736		ISSUE NO.	ISSUE DATE
SHEET 1 OF 1		ISSUE NO.	ISSUE DATE

## Connections

See 4–page Wiring Diagram 617145 (end of this section).

Make the appropriate connections as shown on the label on the Power Manager Transducer and on the wiring diagrams.

### ⚠ CAUTION

To prevent damaging the Power Manager deenergize (turn off) all power to the unit before you connect or disconnect the shielded interconnecting cable and all other wiring to the terminal blocks.

## Tightening Torque

Tighten all connection terminals to 10 in–lb maximum.

## Interconnecting Cable

If a Power Manager Display is provided be sure that its shielded cable is connected to socket J2 on Power Manager Transducer.

## Power Supply Connections Class 1 circuit See CAUTION above!

Use a Class 1 power supply that is UL Listed. Connect the 0.3 amp 24 volt dc power supply to terminal 23 (+) and terminal 24 (com) on terminal block TB3 marked *Control Power* on the Power Manager Transducer. Refer to the labeling below terminal block. Use 18 AWG stranded copper wire.



### ⚠ DANGER

To avoid possible shock, burns, or death, deenergize all electrical sources before making any connections to the Power Manager. Lethal voltages can result if current transformers are open circuited while carrying primary current. To avoid injury turn off primary circuit or short out CT secondary circuit.

## CT Connections

Connect the current transformers (CTs) with 5 amp rated secondaries to the appropriate terminals 7–14 marked *Current Inputs* on the Power Manager Transducer. Refer to the labeling above terminal block TB2. Note the shorting block connections on the Wiring Diagram. See **DANGER** above!

## Voltage Connections

Connect the system voltage (120 to 600 volts ac) to the appropriate terminals 1–6 marked *Voltage Inputs* on the Power Manager Transducer. For system voltages above 600 volts ac use appropriate potential transformers (PTs). Refer to the labeling above terminal block TB1. Note the fusing requirements (1 amp / 600 V) on the Wiring Diagram. See **DANGER** above!

## Transfer Switch Position

If an automatic transfer switch is used, connect an unused auxiliary contact (Feature 14A) on the transfer switch to the appropriate terminals marked *N/E Input* on the Power Manager Transducer terminals 13 & 14. Refer to the labeling below terminal block TB3 (lower row). Refer to the ATS Operator's Manual and ATS wiring diagram for the location of Feature 14A contact. This connection to the Power Manager allows it to monitor and display the position of the transfer switch (page 4–1 step 1).

### ⚠ CAUTION

The transfer switch position indicating auxiliary contact (Feature 14A) must be connected to the Power Manager for proper operation. If not, select *Other* for *Source* to be monitored (page 3–2).

## Status Voltage Input

Connect up to eight status voltage inputs (30 volts dc maximum, two 24 V dc outputs are provided and each can power 4 inputs) to the appropriate terminals 1–12 marked *Status Inputs* on the Power Manager Transducer. Refer to the labeling above terminal block TB3 (upper row). These inputs are independent of the four relay outputs listed on page 2–3. The status of the inputs can then be monitored on the display (see page 4–2 steps 12 & 13). These inputs can then be transmitted serially for display. The default display name of Status Input 1, or input 2, etc. can also be changed serially to a unique 15 character name by using *ASCO* software.

## Relay Output

Connect up to four circuits to the Power Manager's four normally–open relay outputs (each internal contact is rated 1 amp at 30 volts dc, 0.5 amp at 125 volts ac resistive load). Terminals 15–22 are marked *Relay Outputs* on the Power Manager Transducer. Refer to the labeling above terminal block TB3 (lower row). These outputs are independent of the Status Voltage Inputs listed on page 2–2. See page 4–2 step 14 for the display of the outputs. These outputs can then be transmitted serially for display, and remote operation. The default display name of Relay Output 1, or output 2, etc. can also be changed serially to a unique 15 character name by using *ASCO* software.

## Ground Connection

The Power Manager is provided with an earth ground screw and a UL Listed insulated ring terminal. The user should properly crimp the terminal lug to UL listed 16 gauge copper wire with 600 V insulation, color coded green with yellow stripes. Use an *AMP* crimp tool number 47387 or UL approved equivalent crimp tool.

When the Power Manager is mounted on a door, a conductive strap must be used between the enclosure and the door. This connection provides proper grounding which does not rely upon the door hinges.

## Communication Network Connections RS–485 (J1) or SCI (J5) Class 2 circuit

See 4–page Wiring Diagram 629155 (next 4 pages).

**RS–485 (Port J1)** – Use the RS–485 interface to connect the Power Manager directly to an RS–485 based communications network. Baud rates of up to 57.6K baud are supported on this interface.

**SCI (Port J5)** – Use the SCI interface to connect to an *ASCO* Accessory 72A Serial Communications Module which provides a gateway onto a RS–485 communications network. Refer to wiring diagram 629155 (next 4 pages) for connection details. Baud rates of up to 19.2K baud are supported on this SCI/72A interface.

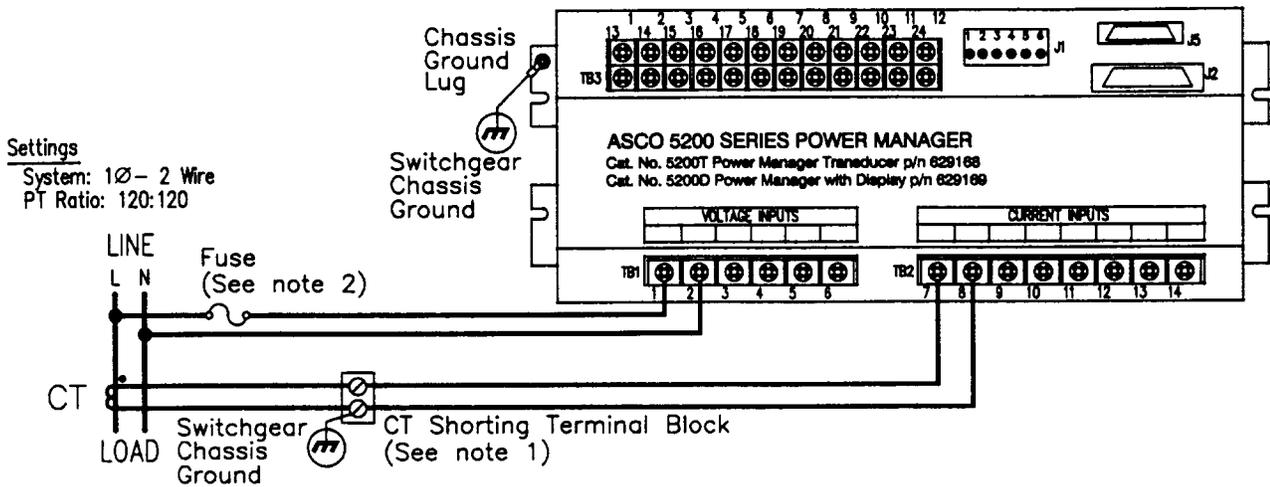
First, use *ASCO* cable 489672 (8 inch) or 489672–001 (4 foot) to connect the unit's serial communications interface connector J5 to the Acc. 72A Serial Communication Module connector J1.

Then, use only the recommended communication cable (see below) to connect the Acc. 72A Module to the RS–485 network. Connect the transmit and receive communication cable (twisted pairs) as shown on Wiring Diagram 629155 (next 4 pages).

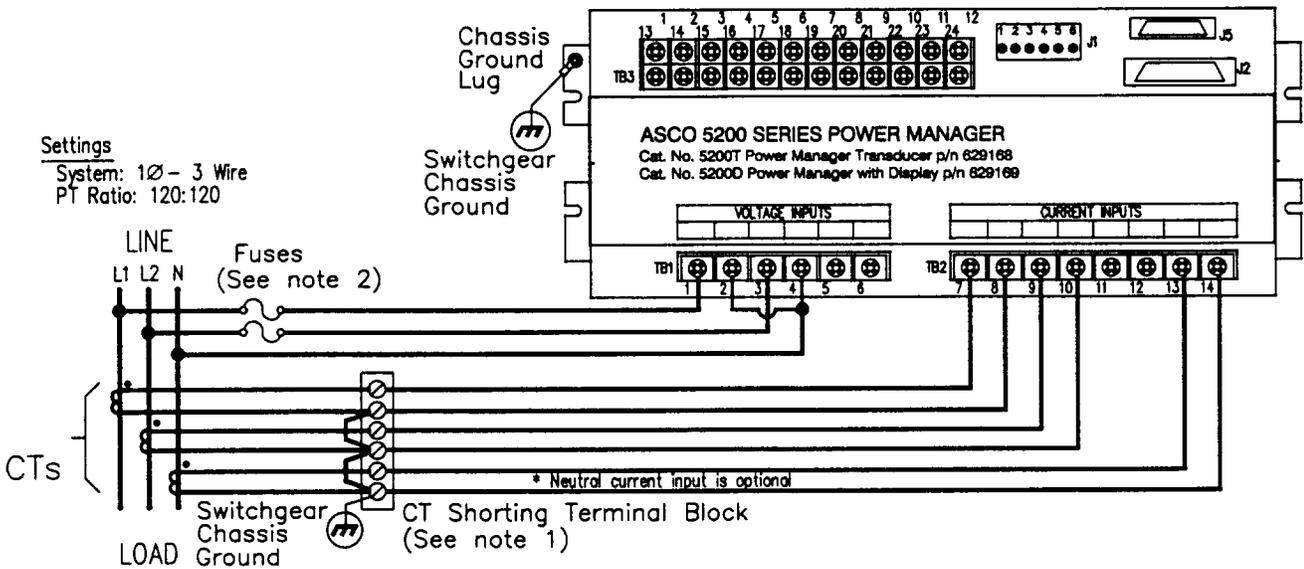
### Acceptable Communication Cable

Type of Cable	Acceptable Manufacturer's Numbers
Standard 80° C	Belden 9842, 9829, Alpha 6202C, 6222C
Plenum Rated	Belden 89729, 82729, Alpha 58902

2 Wire Single Phase Input Voltage < 600Vac(L-L), no external PTs



3 Wire Single Phase Input Voltage < 600Vac(L-L), no external PTs required



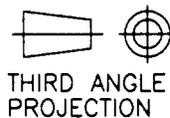
NOTES:

1. A shorting terminal block is recommended at the CT location.
2. Voltage inputs require 1Amp/600V fuses.

A	154387	SRC	WP	5/00
	Delete Data Mon Ref.			
-	153736	SRC	GN	4/00
	NEW ISSUE			

PROJECT NAME:

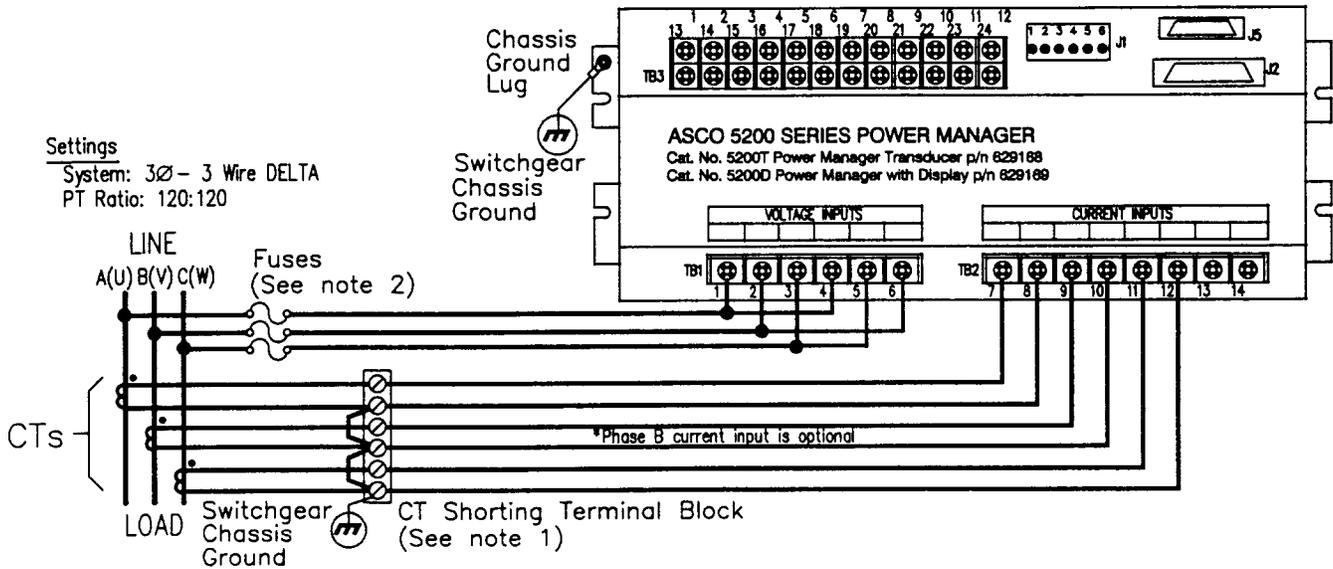
WIRING DIAGRAM  
Power Manager



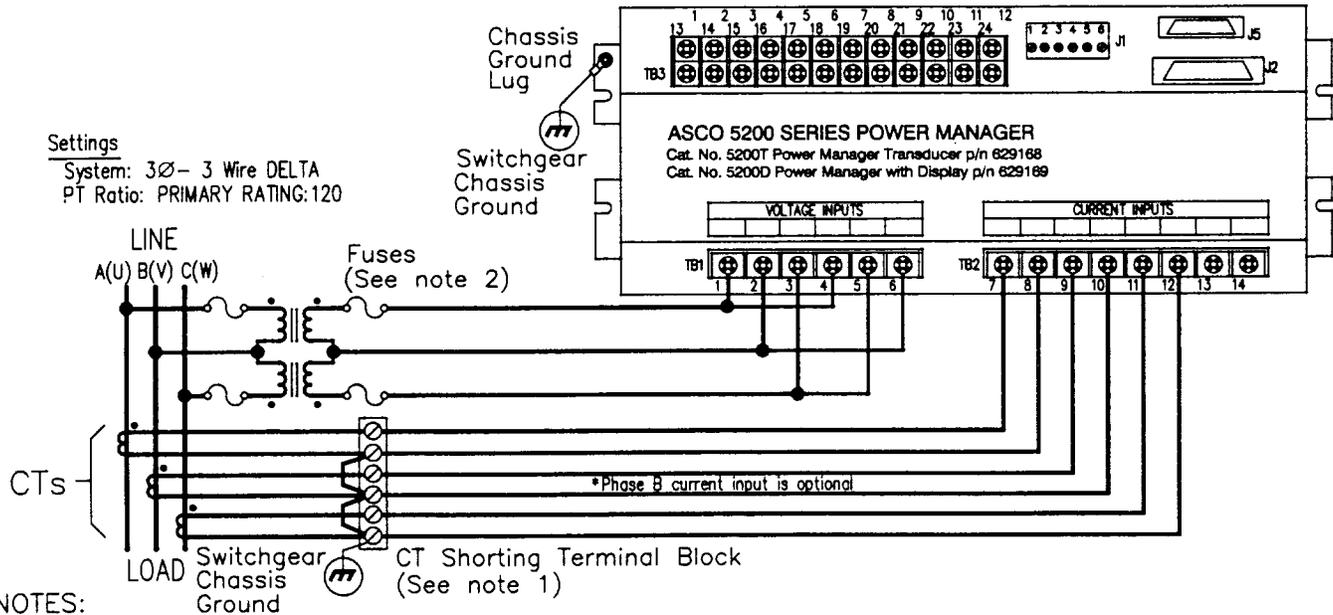
CHANGE LETTER	ECN NO.	BY	APP.	DATE
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CH <input type="checkbox"/>	AV <input type="checkbox"/>	AA <input type="checkbox"/>	PS <input type="checkbox"/>	AR <input type="checkbox"/>
AG <input type="checkbox"/>	AP <input type="checkbox"/>	AC <input type="checkbox"/>	AS <input type="checkbox"/>	<input type="checkbox"/>

BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055	ASSEMB. REF. NO.	COMPUTER GENERATED DRAWING		
DRAWN BY	SRC 4/00			SCALE 1:1	FILE dwg	
CHECKED		PROPERTY OF AUTOMATIC SWITCH COMPANY. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.	AS 629155	SIZE	DWG. NO.	
DRAFTING APPROVAL				CHANGE A	ECN NO. 154387	SHEET 1 of 4
FINAL APPROVAL	GN 4/00			<b>Automatic Switch Co.</b> FLORHAM PARK, NEW JERSEY 07932 PRINTED IN U.S.A.		

**3 Wire DELTA system Input Voltage < 600Vac(L-L), no external PTs**



**3 Wire DELTA system w/PTs Input Voltage > 600Vac(L-L), external PTs required**

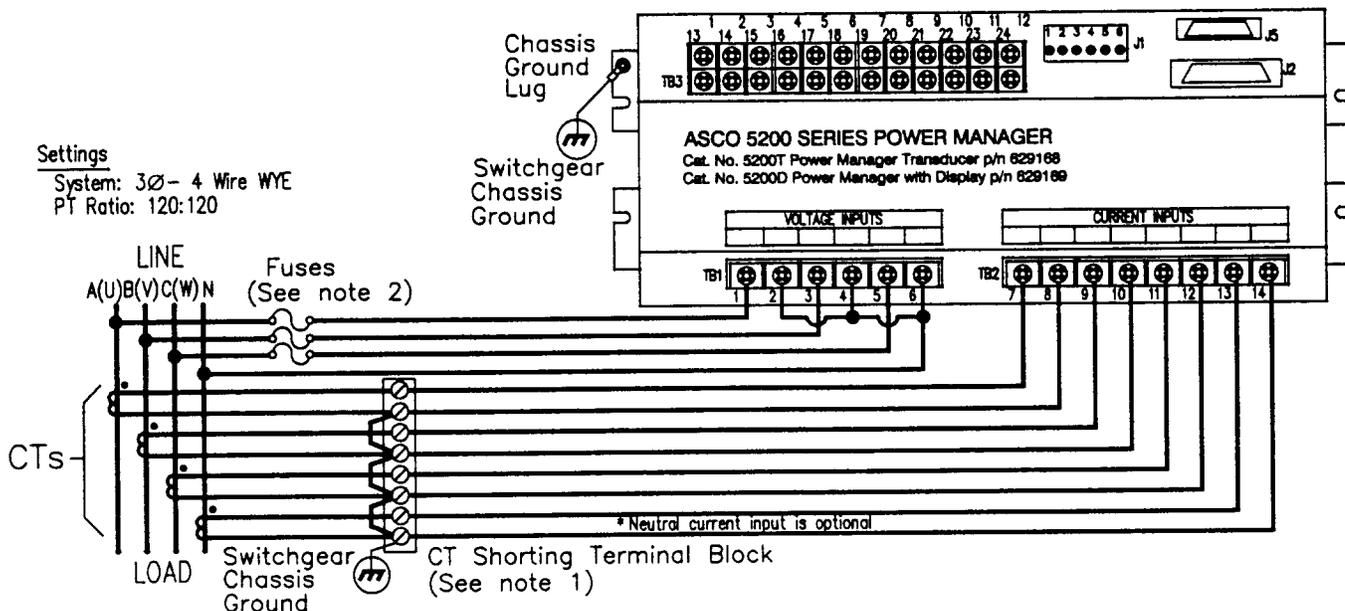


**NOTES:**

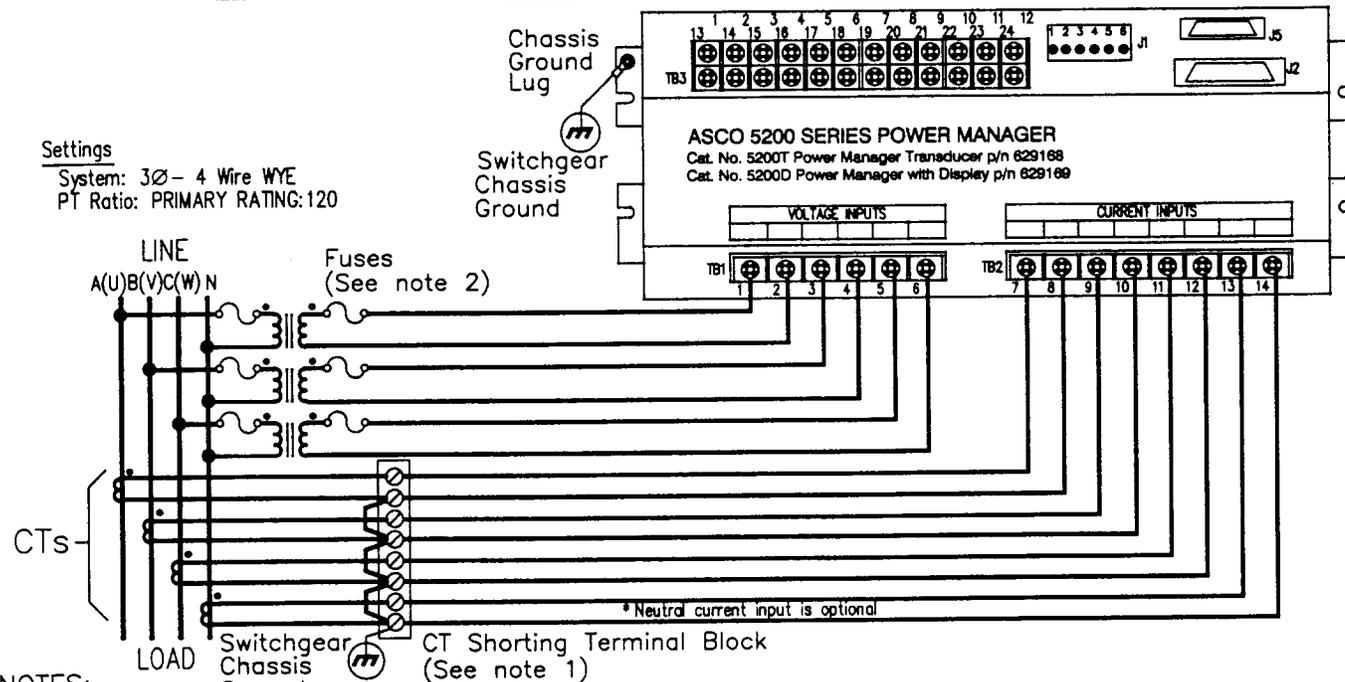
1. A shorting terminal block is recommended at the CT location.
2. Voltage inputs require 1Amp/600V fuses.
3. European convention for phase marking, UVW, shown in parenthesis next to A,B,C markings.

PROJECT NAME:				CHANGE LETTER	ECN NO.	BY	APP.	DATE
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DRAWN BY: SRC    DATE: 4/00				CH <input type="checkbox"/>	AV <input type="checkbox"/>	AA <input type="checkbox"/>	PS <input type="checkbox"/>	AR <input type="checkbox"/>
				AG <input type="checkbox"/>	AP <input type="checkbox"/>	AC <input type="checkbox"/>	AS <input type="checkbox"/>	<input type="checkbox"/>
CHECKED: _____ DRAFTING APPROVAL: _____				COMPUTER GENERATED DRAWING				
				MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055.				ASSEMBLY REF. NO.
FINAL APPROVAL: GN    4/00				PROPERTY OF AUTOMATIC SWITCH COMPANY. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				
				<b>Automatic Switch Co.</b> FLORHAM PARK, NEW JERSEY 07932 PRINTED IN U.S.A.				CHANGE LETTER A

4 Wire WYE system Input Voltage < 600Vac(L-L), no external PTs



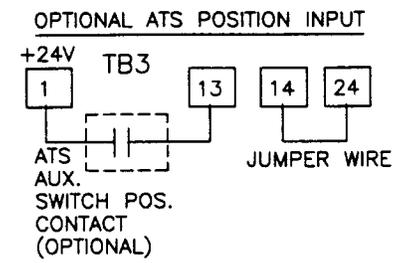
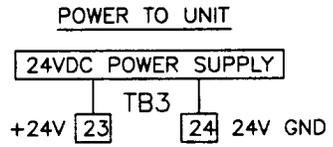
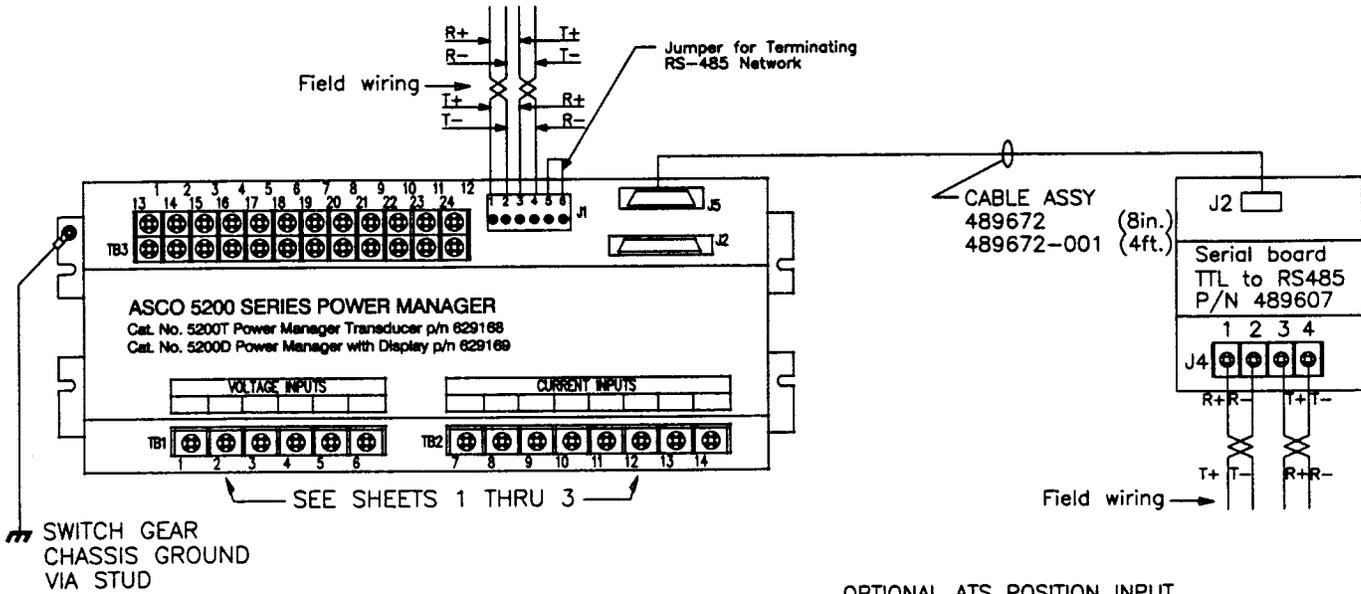
4 Wire WYE system w/PTs Input Voltage > 600Vac(L-L), external PTs required



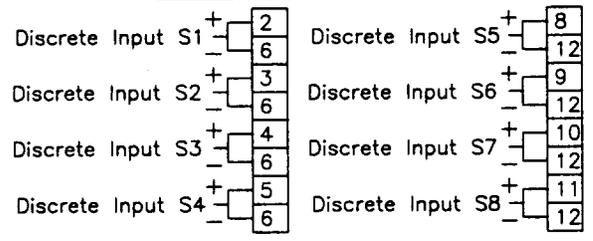
NOTES:

1. A shorting terminal block is recommended at the CT location.
2. Voltage inputs require 1Amp/600V fuses.
3. European convention for phase marking, UVW, shown in parenthesis next to A,B,C markings.

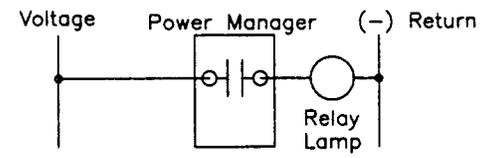
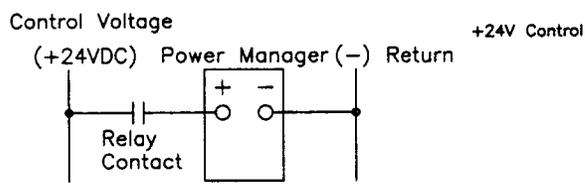
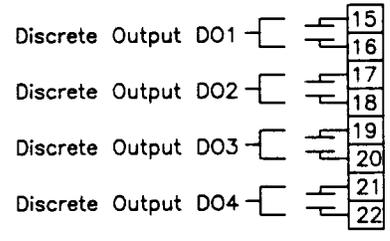
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WIRING DIAGRAM		SUBSIDIARY DISTRIBUTION				
Power Manager		AE <input type="checkbox"/>	AN <input type="checkbox"/>	AM <input type="checkbox"/>	AJ <input type="checkbox"/>	AL <input type="checkbox"/>
		CH <input type="checkbox"/>	AV <input type="checkbox"/>	AA <input type="checkbox"/>	PS <input type="checkbox"/>	AR <input type="checkbox"/>
		AG <input type="checkbox"/>	AP <input type="checkbox"/>	AC <input type="checkbox"/>	AS <input type="checkbox"/>	<input type="checkbox"/>
DRAWN BY SRC 4/00		MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055		ASSEM. REF. NO.		
CHECKED		PROPERTY OF AUTOMATIC SWITCH COMPANY. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.				COMPUTER GENERATED DRAWING
DRAFTING APPROVAL		SCALE 1:1		FILE.dwg		
FINAL APPROVAL GN 4/00		SIZE DWG. NO.		AS 629155		
		CHANGE LETTER A		ECN NO. 154386		SHEET 30F4
<b>Automatic Switch Co.</b> FLORHAM PARK, NEW JERSEY 07932 PRINTED IN U.S.A.						



TYPICAL DISCRETE INPUT WIRING



TYPICAL DISCRETE OUTPUT WIRING



153736	SC	GN	4/00
NEW ISSUE			

PROJECT NAME: **WIRING DIAGRAM**  
**Power Manager**

THIRD ANGLE PROJECTION

CHANGE LETTER	ECN NO.	BY	APP.	DATE
AE	AN	AM	AJ	AL
CH	AV	AA	PS	AR
AG	AP	AC	AS	

DRAWN BY	BY	DATE	MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-1-003. FOR PLASTIC PARTS SEE MP-1-055	ASSEM. REF. NO.
CHECKED	SRC	4/00		
DRAFTING APPROVAL				
FINAL APPROVAL	GN	4/00		

PROPERTY OF AUTOMATIC SWITCH COMPANY. USE PERMITTED FOR OUR WORK ONLY. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.

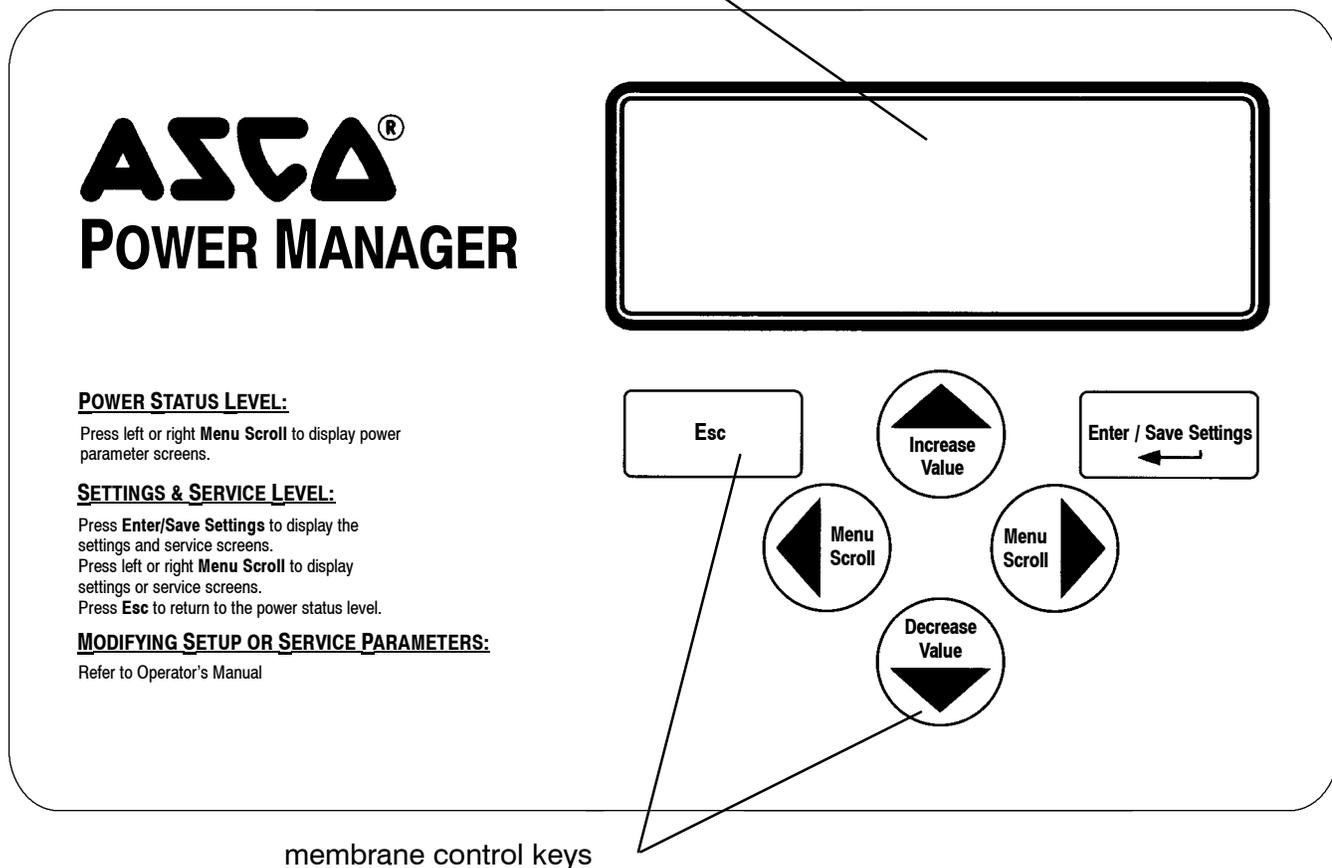
**Automatic Switch Co.**  
FLORHAM PARK, NEW JERSEY 07932 PRINTED IN U.S.A.

COMPUTER GENERATED DRAWING		
SCALE	1:1	FILE dwg
SIZE	DWG. NO. AS 629155	
CHANGE LETTER	ECN NO. 154386	SHEET 4 of 4

## Control Overview

On the Catalog 5200D Power Manager, which includes the Display, six control buttons perform all monitoring and setting functions. Two levels of screens are used. The top level is the *monitoring level* and provides information about the the power system. The lower level is the *settings level*. It may be necessary to enter a password to change a setting (see page 3-1).

4-line LCD display



Power Manager Display.

### Left-Right Arrows

The left arrow ◀ and right arrow ▶ keys (*Menu Scroll*) navigate through both levels of screens.

### Enter/Save Settings

The **Enter / Save Settings** ↵ key drops from the top level to the lower level settings screens. It also is used to save a new settings.

### Up-Down Arrows

The up arrow ▲ and down ▼ arrow keys (*Increase Value* and *Decrease Value*) modifies a setting (setup parameter) while in the lower level screens.

### Esc key

The Esc key ignores a change and returns to the top level.

## Initial Setup

After installing the 5200 Series Power Manager you must set these parameters:

- password (required to change any setting)
- type of electric system (3Ø or 1Ø, 3 or 4 Wire, Wye or Delta)
- source to be monitored (normal, emergency, load, other)
- potential transformer (PT) and current transformer (CT) ratios
- communication parameters (if connected to a PC)
- clear energy parameters (resets base energy level to zero)
- watt demand window size
- setpoint parameters

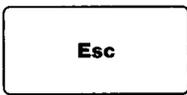
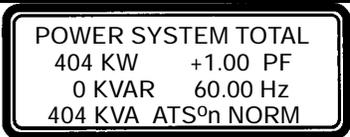
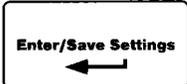
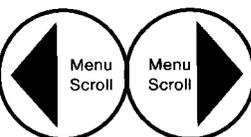
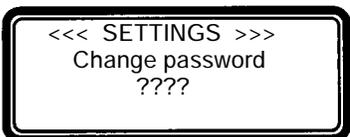
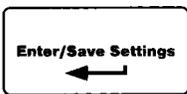
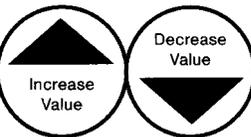
If the Power Manager is preinstalled as an ATS accessory, initial setup has already been done. You should set your password and clear the energy settings, however. Then go to *Operating the Power Manager* on page 4-1.

### Password Selection

Select a four digit or letter password and record it here \_\_\_\_\_.  
Now change the Power Manager password as follows:

Don't forget the password;  
write it down!

The initial password  
from the factory is 0000  
which is the disabled  
password state.

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until password setup location appears.
4			The <b>first</b> digit is blinking.
5			Press up & down arrow keys until correct <b>first</b> digit is displayed.
6			Repeat steps 5 and 6 for the 2nd, 3rd, & 4th digits.
7			Saves the new password.

Now press the **Esc** key to return to the top level display.

## Type of Electrical System and Source to Monitor

Select one electrical system type and one source to monitor as follows:

### Electrical System Type

- 3Ø – 4 Wire WYE
- 3Ø – 3 Wire Delta
- 1Ø – 3 Wire
- 1Ø – 2 Wire

### Source to be Monitored

- Normal
- Emergency
- Load
- Other

### ⚠ CAUTION

The transfer switch position indicating auxiliary contact (Feature 14A) **must** be connected to the Power Manager for proper operation (page 2-2). If not, select *Other* for Source to be monitored.

If incorrect password is entered you will see;  
Invalid Password

Step	Press	Display Shows	Comment
1	Esc	POWER SYSTEM TOTAL 404 KW +1.00 PF 0 KVAR 60.00 Hz 404 KVA ATS <sup>0n</sup> NORM	Brings you to top level if not already there.
2	Enter/Save Settings ←	<<< SETTINGS >>> System: 3φ-4W WYE Source: LOAD	This is the system type and source setup location.
3	Enter/Save Settings ←	<<< SETTINGS >>> Enter password 0000	Enter password as explained in steps 5 & 6 on page 3-1.
4	Enter/Save Settings ←	<<< SETTINGS >>> System: 3φ-4W WYE Source: LOAD	System type is blinking.
5	 Increase Value     Decrease Value 	<<< SETTINGS >>> System: 3φ-3W Delta Source: LOAD	Press up & down arrow keys until correct system type is selected.
6	Enter/Save Settings ←	<<< SETTINGS >>> System: 3φ-3W Delta Source: LOAD	Source is blinking.
7	 Increase Value     Decrease Value 	<<< SETTINGS >>> System: 3φ-3W Delta Source: NORMAL	Press up & down arrow keys until correct source is selected.
8	Enter/Save Settings ←	<<< SETTINGS >>> System: 3φ-3W Delta Source: NORMAL	Saves the new settings. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## PT and CT Ratios

Select the appropriate ratios for the potential transformers (PTs) and current transformers (CTs) connected to the Power Manager as follows:

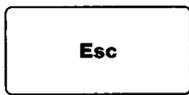
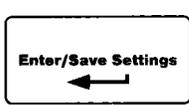
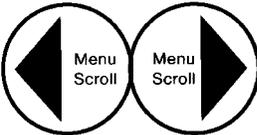
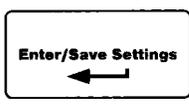
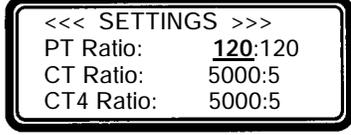
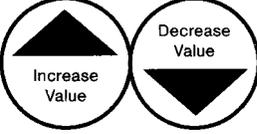
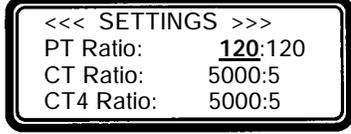
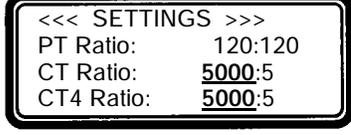
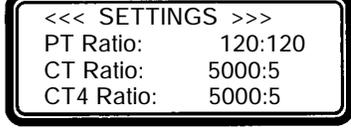
**PT Ratios** ( based upon system voltage, ratio is \_\_\_\_ : 120 )

- up to 600 V direct input use 120:120 (maximum is 28200:120)

**CT Ratios** ( based on typical ASCO ATS amp size, ratio is \_\_\_\_ : 5 )

- 30 amp 50:5
- 70 amp 100:5
- 100 amp 150:5
- 150 amp 200:5
- 260 amp 300:5
- 400 amp 600:5
- 600 amp 800:5
- 800 amp 1000:5
- 1000 amp 1200:5
- 1200 amp 1500:5
- 1600 amp 2000:5
- 2000 amp 3000:5
- 3000 amp 4000:5
- 4000 amp 5000:5
- maximum is 24000:5

**CT4 Ratio** ( auxiliary CT for neutral connection, if used )

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until PT & CT setup location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The PT ratio is blinking.
6			Press up & down arrow keys until correct number is displayed.
7			Repeat steps 5 and 6 for the CT and CT4 ratios.
8			Saves the new settings. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## Serial Communication Interface (SCI) port J5

If the Power Manager is connected to a communications network via the SCI (J5) port, select the appropriate protocol, baud rate, and address for the port as follows:

### Protocol

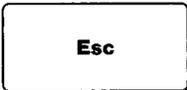
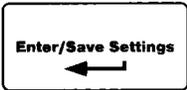
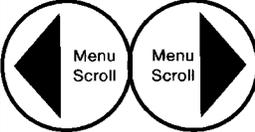
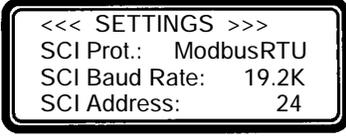
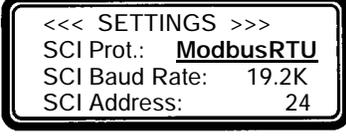
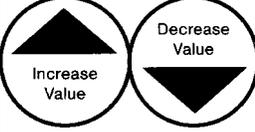
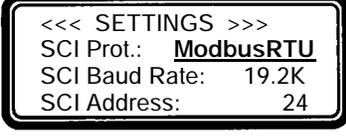
- *ASCOBus I* – Enters the Power Manager in an *ASCO* I/O Module emulation mode when used on ATs with Group 7A Controllers, I/O Modules, and *ASCO VPi*.  
*Note: The Power Manager must be connected and configured as a 3Ø – 3 Wire Delta System for this protocol.*
- *ASCOBus II* – New *ASCO* serial communications protocol used on all latest devices and software packages such as *VPi-SYNCHROPOWER*®.
- *Modbus RTU* – Choose this selection when the Power Manager is to be used on a network that communicates via the Modbus RTU protocol. Contact *ASCO Power Technologies* to obtain a document detailing the corresponding Modbus protocol Register map definitions.

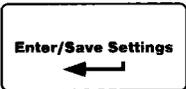
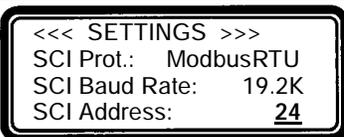
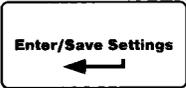
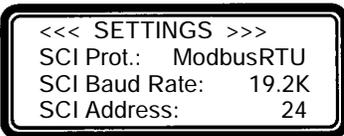
### Baud Rate

- off, 9600, or 19.2K

### Address

- 1–239 (unique for each Power Manager)  
*Note: ASCOBusI address 0–31 only*

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until baud & address setup appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The protocol is blinking.
6			Press up & down arrow keys until correct number is displayed.

7			Repeat steps 5 and 6 for the baud rate.
8			Repeat steps 5 and 6 for the address.
9			Saves the new settings. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## RS-485 Serial Communication Interface (J1)

If the Power Manager is connected to a communications network via the RS-485 (J1) port, select the appropriate protocol, baud rate, and address for the port as follows:

### Protocol

- **ASCOBus I** – Enters the Power Manager in an ASCO I/O Module emulation mode when used on ATs with Group 7A Controllers, I/O Modules, and *ASCO VPi*.  
*Note: The Power Manager must be connected and configured as a 3Ø – 3 Wire Delta System for this protocol.*
- **ASCOBus II** – New ASCO serial communications protocol used on all latest devices and software packages such as *VPi-SYNCHROPOWER*®.
- **Modbus RTU** – Choose this selection when the Power Manager is to be used on a network that communicates via the Modbus RTU protocol. Contact ASCO Power Technologies to obtain a document detailing the corresponding Modbus protocol Register map definitions.

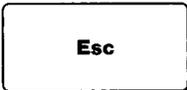
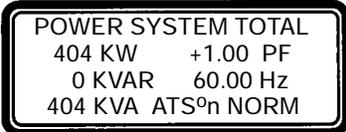
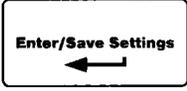
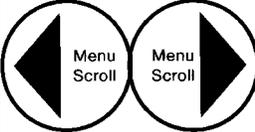
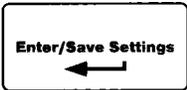
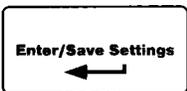
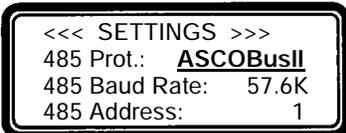
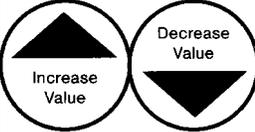
### Baud Rate

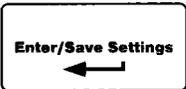
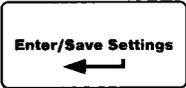
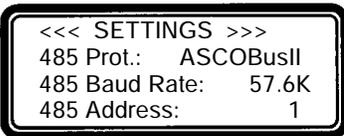
- off, 9600, 19.2K, 38.4K, 57.6K

### Address

- 1–239 (unique for each Power Manager)

*Note: ASCOBusI address 0–31 only*

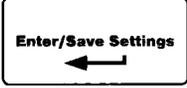
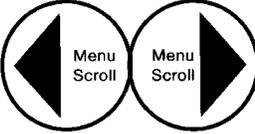
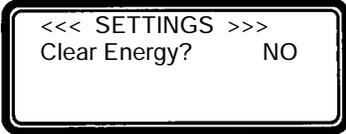
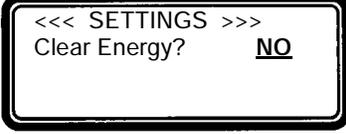
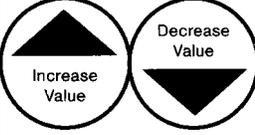
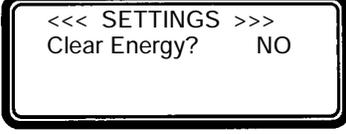
Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until baud & address setup appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The protocol is blinking.
6			Press up & down arrow keys until correct number is displayed.

7			Repeat steps 5 and 6 for the baud rate.
8			Repeat steps 5 and 6 for the address.
9			Saves the new settings. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## Reset Energy Level

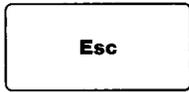
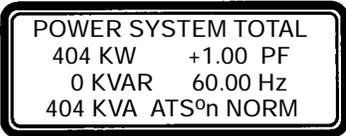
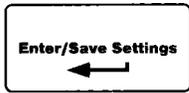
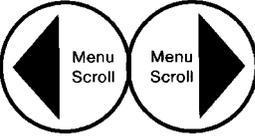
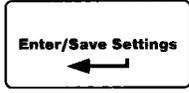
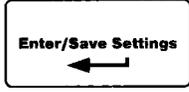
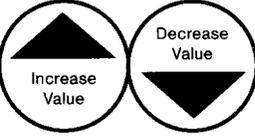
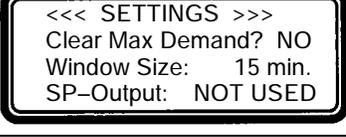
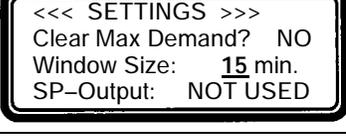
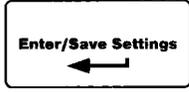
Energy registers are updated approximately once per second and stored into non-volatile (EEPROM) storage once every 15 minutes. Clear the Power Manager's non-volatile memory for base energy level as follows:

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until the clear energy location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The word <u>NO</u> is blinking.
6			Press up & down arrow keys until the word <u>YES</u> appears.
7			Clears energy register to 0. Changes back to NO.

Now press the **Esc** key to return to the top level display.

## Reset Maximum Demand Level

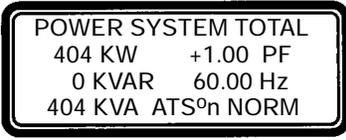
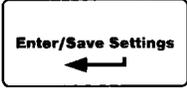
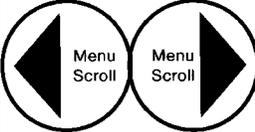
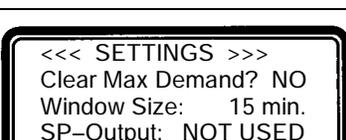
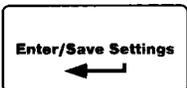
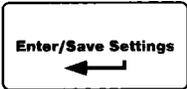
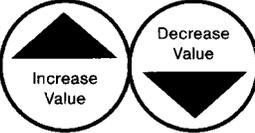
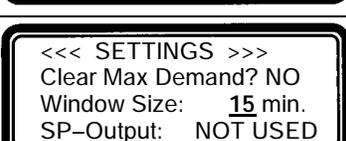
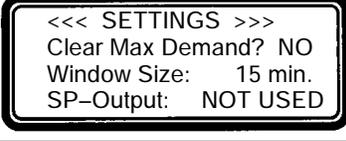
The maximum watt demand register stores the largest instantaneous watt demand value since last power-up or manual reset. Manual reset is accomplished by the following procedure:

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until the <i>Clear Max Demand</i> location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The word <u>NO</u> is blinking.
6			Press up & down arrow keys until the word <u>YES</u> appears.
7			Clears max demand to 0. Changes back to NO.
8			Window Size is blinking.
9			SP-Output is blinking.
10			Saves the new setting. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## Watt Demand Window Size

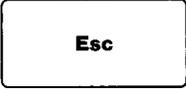
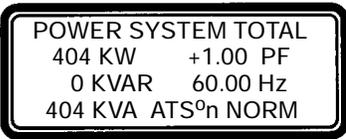
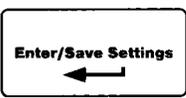
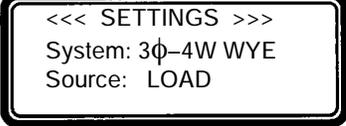
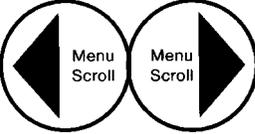
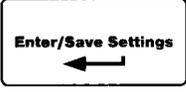
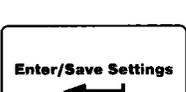
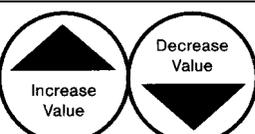
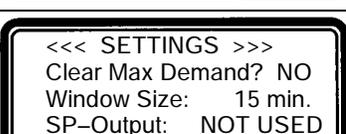
The integration time period for the watt demand calculation is user selectable from one to fifteen minutes in one minute increments. It is recommended that the user selects this option to be one-third of the billing interval. Set this option as follows:

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until the <i>Clear Max Demand</i> location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The word <u>NO</u> is blinking.
6			Window Size is blinking.
7			Press up & down arrow keys until correct number is displayed.
8			SP-Output is blinking.
9			Saves the new setting. Nothing is blinking.

Now press the Esc key to return to the top level display.

## Setpoint Output Relay

The Power Manager provides the user with one programmable setpoint based on Watt Demand. With the setpoint function, the user can program the Power Manager to control one of the four built-in relays. When the watt demand register exceeds the SP-KWDemand Hi setting, the selected relay closes, and stays closed until the Watt Demand register falls below the SP-KWDemand Lo setting for a preset amount of time determined by the SP-Reset TD setting, upon which the relay opens (or releases). Select the output relay to be used for the setpoint function (choices include, DO1, DO2, DO3, DO4, or NOT USED) as follows:

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until the <i>Clear Max Demand</i> location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The word <u>NO</u> is blinking.
6			Window Size is blinking.
7			SP-Output is blinking.
8			Press up & down arrow keys until correct output relay is displayed.
9			Saves the new setting. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

## KW Demand High/Low Setpoints and Reset Time Delay

Selects the limits at which the SP-Output relay closes and opens. Refer to page 3-10. Set the Power Manager's KW demand setpoints and reset time delay as follows (software prevents the *Hi* point from being set below the *Lo* point and it prevents the *Lo* point from being set above the *Hi* point):

**High Setpoint** ( *SP-KWDemand Hi* ) relay closes

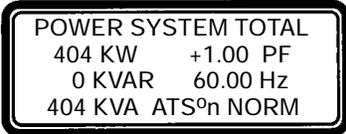
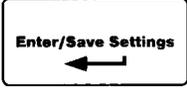
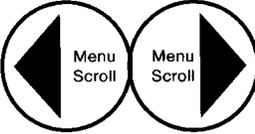
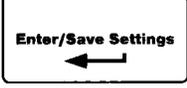
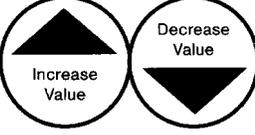
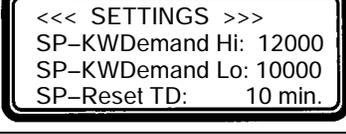
- Range maximum: 32,000 Kilowatts  
minimum: SP-KWDemand Lo setpoint + 1 Kilowatt

**Low Setpoint** ( *SP-KWDemand Lo* ) relay opens

- Range maximum: SP-KWDemand Hi setpoint - 1 Kilowatt  
minimum: 1 Kilowatt

**Reset Time Delay** ( *SP-Reset TD* ) delay on relay opening after a low

- 0 to 99 minutes (in 1 minute increments) condition is met.

Step	Press	Display Shows	Comment
1			Brings you to top level if not already there.
2			
3			Press left & right arrow keys until <i>SP-KW Demand</i> location appears.
4			Enter password as explained in steps 5 & 6 on page 3-1.
5			The Hi setpoint is blinking.
6			Press up & down arrow keys until correct number is displayed.
7			Repeat steps 5 & 6 for the Lo setpoint and reset time delay value.
8			Saves the new settings. Nothing is blinking.

Now press the **Esc** key to return to the top level display.

# Operation

From the top level display the 5200 Series Power Manager can show the following information about the electrical power system:

- system totals (kW, kVAR, kVA, PF, Hz, position of ATS)
- current & voltage (line-to-neutral & line-to-line) – all phases
- power (kW), kVARs, kVA, & PF (power factor) – all phases
- Watt demand and maximum Watt demand
- average current & voltage (line-to-neutral & line-to-line)
- unbalance % amps & voltage (line-to-neutral & line-to-line)
- neutral current (if neutral is connected to Power Manager)
- kW hours (imp, exp, net) for Normal & Emergency sources
- kVAR hours (lag, lead, net) for Normal & Emergency sources
- 8 inputs and 4 relay outputs

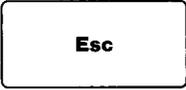
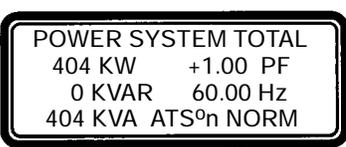
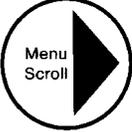
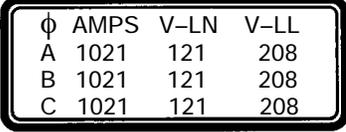
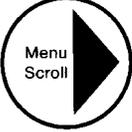
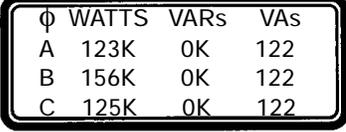
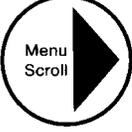
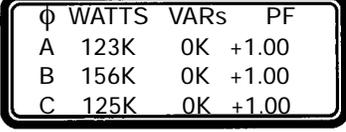
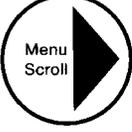
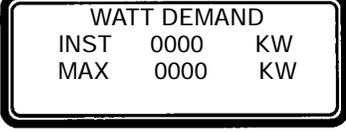
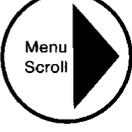
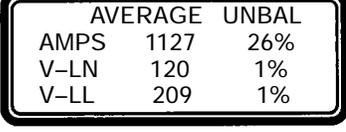
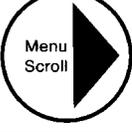
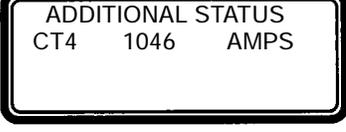
Data is updated approximately every half second.

These are the screens for a 3 Ø, 4-wire wye system and monitored source is Load. Screens may be different for other electrical systems or other monitored sources.

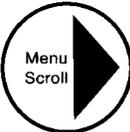
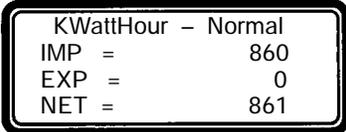
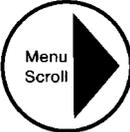
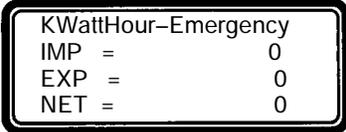
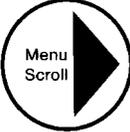
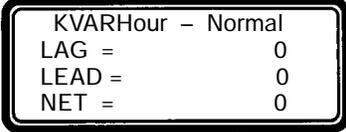
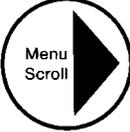
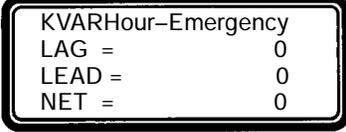
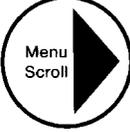
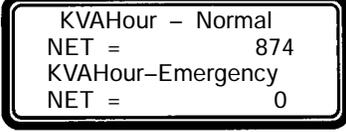
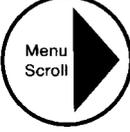
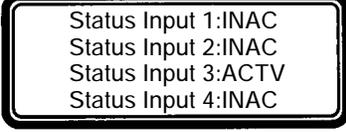
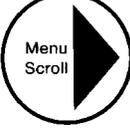
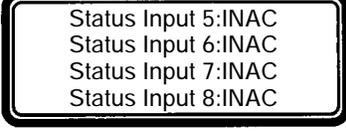
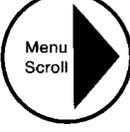
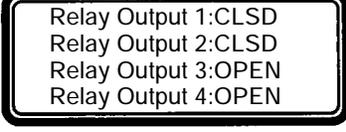
These screens vary depending on the type of system selected.

Not used for 1 Ø systems.

Not used for 3 Ø, 3-wire or 1 Ø, 2-wire systems.

Step	Press	Display Shows	Comment
1			Shows totals for kW, kVARs, kVA, PF, frequency, and position of the ATS.
2			Shows current & voltage (line-to-neutral, line-to-line) all phases.
3			Shows power (kW), kVAR, & VA on all phases.
4			Shows power (kW), kVAR, & power factor on all phases.
5			Shows Watt demand (instantaneous and maximum).
6			Shows average current & voltage (line-to-neutral & line-to-line).
7			Shows neutral current if neutral is connected to Data Monitor.

(continued on next page)

Shown only if monitored source is Normal.	8			Shows normal power usage (kWH) imported, exported, & total.
Shown only if monitored source is Emergency.	9			Shows emergency power usage (kWH) imported, exported, & total.
Shown only if monitored source is Normal.	10			Shows normal VAR usage (kVARHours) lag, lead, & total.
Shown only if monitored source is Emergency.	11			Shows emergency VAR usage (kVARHours) lag, lead, & total.
Only used if monitored source is Load.	12			Shows normal & emergency kVA usage (kVA-Hours) totals.
	13			Shows the status of inputs 1-4 (INAC=off, ACTV=on).*
	14			Shows the status of inputs 5-8 (INAC=off, ACTV=on).*
	15			Shows status of relay outputs 1-4 (OPEN=off, CLSD=on).*

Now press the **Esc** key to return to the top level display.

\* Power Managers that are connected to PC devices display user-definable status input and relay labels (15 characters) and status (4 characters).

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