SIEMENS

Installation Instructions
Model PSC-12

12 Amp Power Supply for NCCNT WAN

INTRODUCTION

The Model PSC-12 from Siemens Industry, Inc. is a high current power supply that provides the system with primary regulated 24VDC. It is rated at 12A and has a built-in charger that is capable of charging up to 100AH batteries. It also has a microprocessor-controlled transfer circuit that allows the PSC-12 to switch the system power to stand-by batteries during loss or reduction of the AC power.

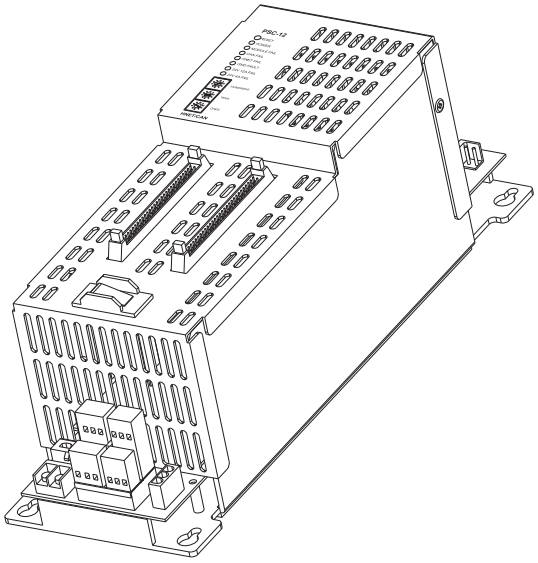


Figure 1
PSC-12 12 Amp Power Supply

The PSC-12 incorporates an 18A circuit breaker on the battery input. It provides terminal tie points for system signals.

The PSC-12 mounts at the back of the enclosure of the COM-1 and occupies one location on the studs in the backbox or on the optional CAB-MP Mounting Plate.

The PSC-12 has four programmable relays. The relays can be configured in the NCC WAN to change state on a global alarm, a global trouble or on a manual request (general output).

Features

The PSC-12 features are as follows:

- Universal AC power input 120VAC-240VAC @60Hz / 50Hz
- Off-line Switch Mode Power Converter
- Power Factor Correction
- Built-in Battery Charger
- Total Output power of 12A@24VDC
- Two separate power output terminals: one power limited terminal with 4A max @ 24VDC capacity and one non-power limited terminal with 12A max @ 24VDC capacity (total not to exceed 12A)
- Both output terminals have current measurement capability
- Auto resettable current protection circuits for overload and short circuit
- Access to CC-5 System bus

P/N 315-099321-7

Siemens Industry, Inc.
Building Technologies Division

- Supplies 6.2VDC @ 2A (power limited) to the system bus
- Supplies 24VDC @ 2A (power limited) to the system bus (subject to a 12A total current limit)
- Communicates via HNET protocol
- Four programmable relays with 2A ratings

OPERATION

The PSC-12 occupies one network address in the HNET network and has four functional components: the Controller, the Charger, the Power Supply and the Interface Board.

The Controller determines the activation of the Charger and monitors the status of the Power Supply (ground fault conditions, loss of network communication, 24VDC terminal overload and the status of the battery).

The Power Supply has an Offline switch mode power converter and power factor correction circuit to improve conductive RF emission at low frequency. It is designed to take voltage inputs of 120VAC-240VAC at 50Hz/60Hz and has one resettable circuit breaker that can also be used as a battery power switch.

The Charger monitors and maintains the battery. This circuitry utilizes three charge modes, depending upon the state of the batteries: Bulk (Full) Charge State, Trickle Charge State and Float (maintenance) State. The Charger monitors the batteries and determines which of the charging modes to activate. It also has the capability to check the state of the battery through diagnostic testing.

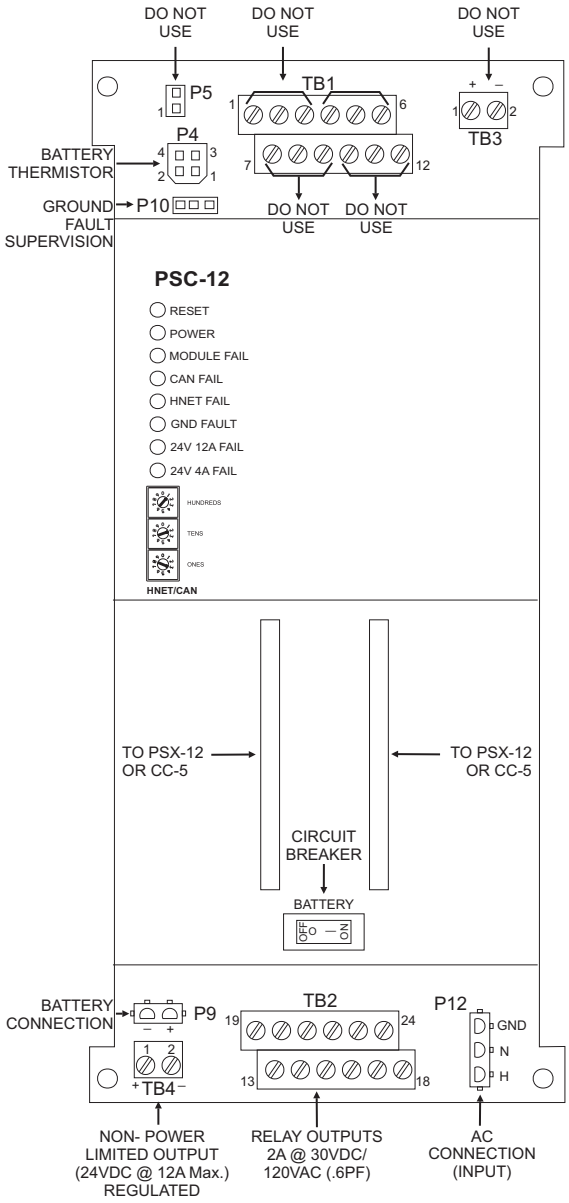
Terminal Blocks, Controls and Indicators

The PSC-12 has one reset switch, seven LEDs, three address switches, one circuit breaker, four terminal blocks, four terminal connections and two 60 pin flat ribbon connections as shown in Figure 2.

A reset switch is located on the top of the front panel. Pushing the reset switch re-initializes the PSC-12 operation.

The LEDs located at the top left of the module are defined as follows:

POWER -	(Green or Blue)	Normally ON. When illuminated, indicates that the PSC-12 is powered from the AC mains. When flashing, indicates that the PSC-12 is powered from the battery.
MODULE FAIL -	(Yellow)	Normally OFF. When illuminated indicates that the module microprocessor has failed.
CAN FAIL -	(Yellow)	Normally OFF. Not used in this application.
HNET FAIL -	(Yellow)	Normally OFF. When illuminated, indicates that the HNET communication with the PSC-12 has terminated and the card goes to degrade mode (applicable only when the card resides in the HNET network).
GND FAULT -	(Yellow)	Normally OFF. When illuminated, indicates that the PSC-12 has detected either a negative or positive ground fault on its outputs.



NOTE:
Positive and negative ground fault datected at: <60K ohms for TB4 terminals 1,2.

Figure 2
Terminal Blocks, Controls and Indicators

24V 12A FAIL-	(Yellow)	Normally OFF. When illuminated, indicates that the 24VDC non-power limited output has a trouble condition or the PSC-12 has disconnected the 24VDC output due to current overload or short circuit.
24V 4A FAIL -	(Yellow)	Normally OFF. When illuminated, indicates that the 24VDC power limited output has a trouble condition or the PSC-12 has disconnected the 24VDC power output due to current overload or short circuit.

Three rotary dial switches located directly below the LEDs are used to set the HNET network address of the PSC-12.

The terminal blocks of the PSC-12 are defined as follows (refer to Figure 2):

TB1 Currently NOT USED.

TB2 Relay Outputs. Four user-programmable relays that are set to NOT USED by default. These outputs are rated 2A @ 30VDC/ 120VAC (.6PF). (Refer to Figure 3 for wiring the relays.)

These relays are controlled by the NCC WAN only. NCC WAN version 6.01.007 or higher is required. The relays can be configured in the NCC WAN as Global Alarm, Global Trouble or General Output.

A relay configured as Global Alarm changes the respective PSC relay state to off normal when there is any alarm on the NCC. When all alarms are cleared on the NCC, the relay state will restore to normal.

A relay configured as Global Trouble changes the respective PSC relay state to off normal when there is any trouble on the NCC. When all troubles are cleared on the NCC, the relay state will restore to normal.

A relay configured as General Output will change state only through a manual command from the NCC, using either the Device Output Control or using the Disable/Enable (DIS/ENA) and Energize/DeEnergize (ENE/DEE) manual commands.

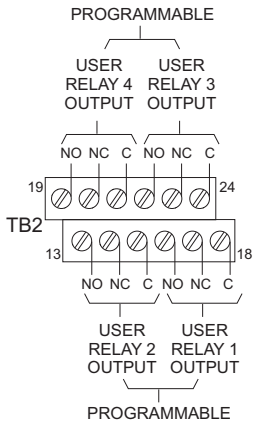


Figure 3
TB2 Wiring Diagram

TB3 Currently NOT USED.

TB4 24VDC Non-Power Limited Output Terminal. This terminal is non-power limited and can supply up to 12A. When the current draw is exceeded, it shuts down, lights its associated LED and sends a fault condition to the NCCNT WAN.

This output is normally connected to the input terminals of the CC-5. This output must remain within the enclosure or within 20 feet in rigid conduit. All wiring must be in accordance with Article 760 of NEC or local building codes. (See Figure 2.)

Output Voltage: 24VDC +10%, -15%
Output Current: 12A max
TB4-1: (+) terminal
TB4-2: (-) terminal

NOTE

The total cumulative sum of the 24VDC output (power limited + non-power limited) must not exceed 12A. Over current draw will initiate a PSC-12 shut down.

The main AC power line must be turned OFF prior to installation.

P4 Currently NOT USED. P4 contains a factory installed plug. Do not remove the plug from P4.

P5 Currently NOT USED.

P9 Connects the back-up battery to the PSC-12. Battery size has to be calculated to ensure that the battery size can support the system load during battery back-up condition. Refer to the Battery Calculation form to determine the required battery size of the system.

P10 Set the jumper on P10 to ENABLE (left hand) position to enable ground fault protection.

Always apply AC power first followed by the battery.

P12 AC input connector from the PTB, terminals P4 or P5.

60-pin Connects the PSC-12 to the system. It is a straight-through connection between the two connectors and provides the 24VDC rated at 2A and 6.2VDC rated at 2A that powers the CC-5 modules. It also contains all the communication signals and system signal bus that is necessary for the proper operation of the system.

These connectors are power limited. If the PSC-12 is located in a different mounting plate in the enclosure, an optional extended ribbon cable, Model BCL (P/N 500-633997) must be used.

Input Voltages: 24VDC, 6.2VDC
Max Current : 2A @ 24VDC
2A @ 6.2VDC

PRE-INSTALLATION

The PSC-12 installation kit has the following components:

INSTALLATION KIT COMPONENTS

PSC-12 / PTB Kit	PSX-12	PTB (Only)
Four #10-32 ½" Phillips Screws (for PSC-12)	Four #10-32 ½" Phillips Screws (for PSX-12)	
Four #10 Hex Nuts (for PTB)		Four #10 Hex Nuts
AC Wire Assembly, P/N 600-134264	AC Wire Assembly, P/N 600-134264	
Battery Wire Assembly, P/N 465-633943	Battery Wire Assembly, P/N 465-633943	
Battery Cable Conversion Kit P/N 545-634222	60-pin Flat Ribbon Cable, P/N 555-133036	

The following part is optional:

- If the PSC-12 is not located in the same row in the backbox (or on the same optional CAB-MP) as the CC-5, an extended 60 pin flat ribbon cable, Model BCL (P/N 500-633997), is required.

The following components must be set prior installing the module in the enclosure:

Verify that the dedicated circuit breaker for the PSC-12 is turned OFF at the mains.

- **Battery Circuit Breaker**: Set this circuit breaker to the OFF position.
- **Network Address Switch**: Set the three-digit HNET network address for the PSC-12 using the three rotary dial address switches located below the LEDs on the front panel. (Refer to Figure 2 for the location of the switches.) The address for the PSC-12 must be the same as the address selected for it in the Zeus Programming Tool. To set the address, turn the pointers on each of the three dials to the numbers for the selected address. For example, if the address is 123, set the pointer for the HUNDREDS dial to "1," set the pointer for the TENS dial to "2," and set the pointer for the ONES dial to "3." The range of allowable addresses is from 001 to 251 (leading zeros must be used).

INSTALLATION

Remove all system power before installation, first battery then AC. (To power up, connect the AC first, then the battery.)

The PSC-12 mounts on studs in the backbox or on the optional Mounting Plate (CAB-MP). The Mounting Plate may be located either "IN" or "OUT" of the enclosure to perform this installation procedure. If the Mounting Plate is located "IN" the enclosure you will have to gain access to it by opening the enclosure Inner and Outer doors. If the Mounting Plate is located outside of the enclosure, place it in front of you so that the word "TOP" is at the top and away from you.

The PSC-12 can occupy any position in a row in the backbox or on the mounting plate, but it should be installed in the row and position that is located directly above the PTB to which it is connected. (Refer to Figures 4 and 6). When the PSC-12 is mounted correctly on the optional Mounting Plate it will be flush on the top, bottom, and right with the Mounting Plate and the mounting screw holes of the PSC-12 will align with the threaded posts.

1. Install four 10-32 screws in the threaded posts at the mounting position. Screw each of the 10-32 screws into the threaded posts 5-6 turns.
2. Place the PSC-12 over the four screws on the Mounting Plate and slide it down or towards you to rest on the four screws. (Refer to Figure 5.) When the PSC-12 is in the correct position it will be flush with the top, bottom and right side of the Mounting Plate.
3. Tighten the four screws.

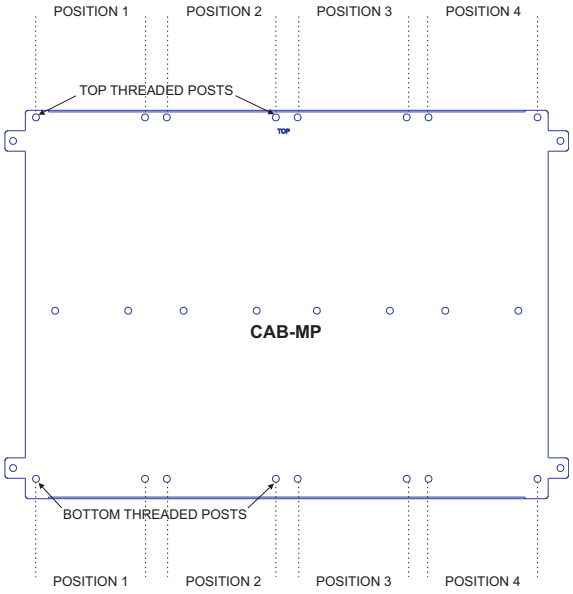


Figure 4
Location Of The PSC-12 On The Optional CAB-MP

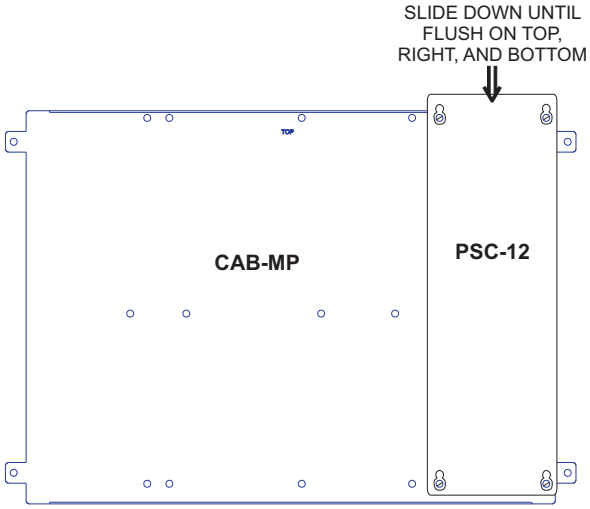


Figure 5
Mounting The PSC-12 On The Optional CAB-MP

WIRING

The PSC-12 has removable terminal blocks and connectors at the top and bottom of the module. The terminals and connectors at the top of the PSC-12 are power limited. The terminals and connectors at the bottom of the PSC-12 are non-power limited. (Refer to Figure 6.)

Use a separate or dedicated circuit breaker and run the earth ground from a suitable source to the PSC-12. Check local requirements.

NOTE

Conduit is not an acceptable Earth Ground Conductor.

Wire in accordance with local codes and Article 760 of the NEC, NFPA latest edition. In compliance with NEC, all power limited fire protective signaling conductors must be separated a minimum of a 1/4" from all of the following wiring located within a control panel:

- Electric light
- Power
- Class 1 or non-power limited fire protective signaling conductor

Refer to the CAB2-BB Installation Instructions, P/N 315-033009-1 for wiring requirements to comply with NEC codes.

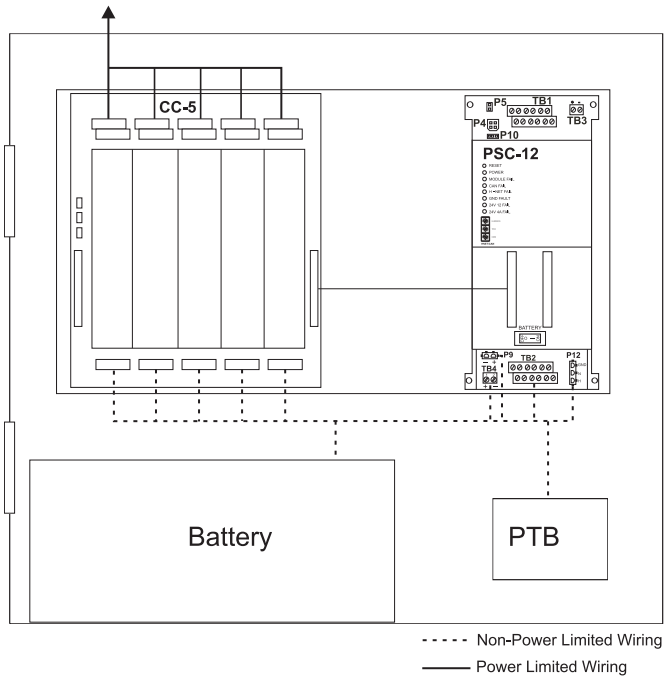


Figure 6
PSC-12 Wiring In The CAB Enclosures

Battery Connections

When BTX-1, BTX-2 or BTX-3 batteries are required, connect them to the system with the Battery Cable Conversion Kit, P/N 545-634222, following the steps listed below. (Refer to Figure 7.)

1. Using the 12 in. long wire assembly, connect the two batteries together, as shown in Figure 6. Secure each end of the assembly to the battery with a 10-32 x 3/4" screw and lock nut.
2. Attach the quick disconnects to the positive and negative battery terminals with the 10-32 x 3/4" screws and lock nuts supplied.
3. Attach the red battery wire to the quick disconnect on the positive terminal and the black battery wire to the quick disconnect on the negative terminal.

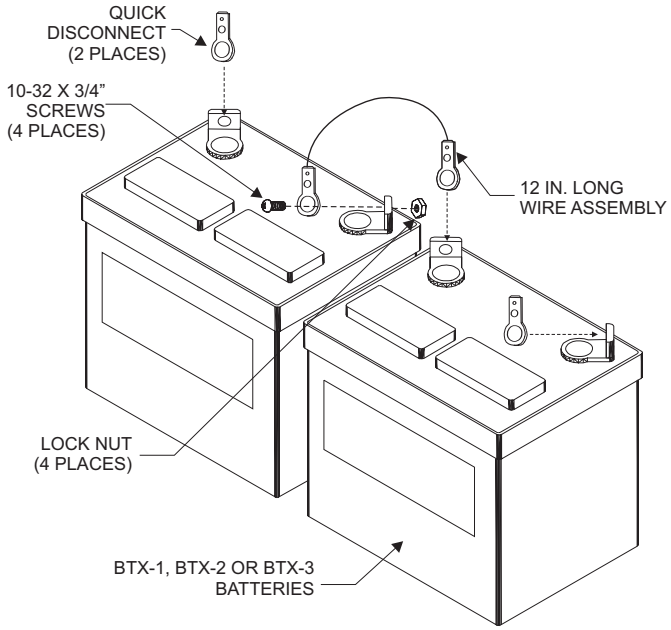


Figure 7
Wiring BTX-1/-2/-3 Batteries To The PSC-12

Power Supply Load Calculations

POWER SUPPLY LOAD CALCULATION FORM

Card / Module	Quantity	Card/Module 24 VDC Current					Card/Module 6.2 VDC Current	
		Back Plane Current		Screw Terminal 24V Current		Total 24 VDC Current (Total 1 + Total 2)		
		Per Card/Module	Total 1	Per Card/Module	Total 2		Per Card/Module	Total
HUB-4		0		400mA			30mA	
NIC-C		120mA		0	0		0	
		TOTAL	(Must not exceed 2 Amps)		**TOTAL**	(Must not exceed 5 Amps in standby, 12 Amps in Alarm)	**TOTAL**	(Must not exceed 2 Amps)

To ensure that the PSC-12 power supply is not overloaded, use the form and follow the procedure listed below.

1. Enter the quantity of each card/module in the enclosure.
2. Calculate both the 24VDC and 6.2VDC loads for each row.
3. Total the Active 24VDC and Active 6.2VDC columns.
4. Ensure that both totals are within the power supply output ratings.

Battery Power

Make sure that the battery circuit breaker is in the OFF position.

Use either 14 or 12 AWG for battery connection.

Battery backup is required for compliance to UL864. The PSC-12 can charge a battery up to 100 amp hours. (15 amp hours is the minimum size for the PSC-12.) To determine the battery size, use the form and follow the procedure listed below.

To determine the battery size, add current supplied to all devices connected to PSX-12 Power Supply Extenders.

BATTERY SIZE CALCULATION FORM

Module	Quantity	Standby 24 VDC (Module/Card Current)	Load Current Per Circuit		
			End of Line Device	Device Current	Total Standby 24 VDC Module Current
HUB-4		400mA	0	0	
NIC-C		120mA	0	0	
				Total System Current	
				Engine Driven Generator - - Total AH x 4 =	
				NFPA Proprietary (72D), UL 1076 - - Total AH x 24 =	
				Battery Size (Reserve Battery Current) x 1.3 =	

1. Record quantities of all required cards and modules.
2. Calculate each row across and place the total in the last column: Total Standby 24VDC Module Current.
3. Total the last column and record it at the bottom of the form in the space labeled **Total System Current.**
4. For **NFPA 72 Proprietary and UL 1076 systems**, multiply the total system current by 24 and record it at that **Total AH location**.
5. Multiply the AH Total by 1.3 to obtain the final battery amp hour capacity and record it opposite **Battery Size.**

These battery models are UL listed for use with the system:

- BP-61—24V, 15 AH
- BTX-1—a set of 12V, 31 AH
- BTX-2—a set of 12V, 75 AH
- BTX-3—a set of 12V, 100AH

Select the battery that meets or exceeds the final calculated battery amp hour rating. Use an external battery box, Model CAB-BATT from Siemens Industry, Inc. (P/N 500-633917) with the BTX-2 and BTX-3 models.

Battery System Electrical Rating:
Input Voltage: 24VDC +10%, -15%
Input Current: 15A max.
Minimum Battery size: 15AH
Maximum Battery size : 100AH
Battery Max Charge Current: 5A (full charge mode)

SPARE EQUIPMENT

A minimum of one spare PSC-12 per NCCNT WAN system is recommended.

ELECTRICAL RATINGS

Input Voltage	120VAC @ 60Hz 220VAC @ 50Hz 240VAC @ 50Hz +10%, -15%
Input Current	3.5A Max. @ 120VAC 2.5A Max. @ 220VAC 2.0A Max. @ 240VAC
24V Back Plane Current	2A Max.
Screw Terminal 24V Current	Power Limited: 4A Max.
	Non-Power Limited: 12A Max.
6.2V Back Plane Current	2A Max.
24V Standby Current	150mA + 20mA per active relay

Siemens Industry, Inc.
Building Technologies Division
Florham Park, NJ

Siemens Canada, Ltd.
1577 North Service Road East
Oakville, Ontario
L6H 0H6 Canada

P/N 315-099321-7
Document ID A6V10239285