



INSTALLATION INFORMATION

POWERLINK™

BUILDING AUTOMATION COMPONENTS

SYSTEM NETWORK INTERFACE

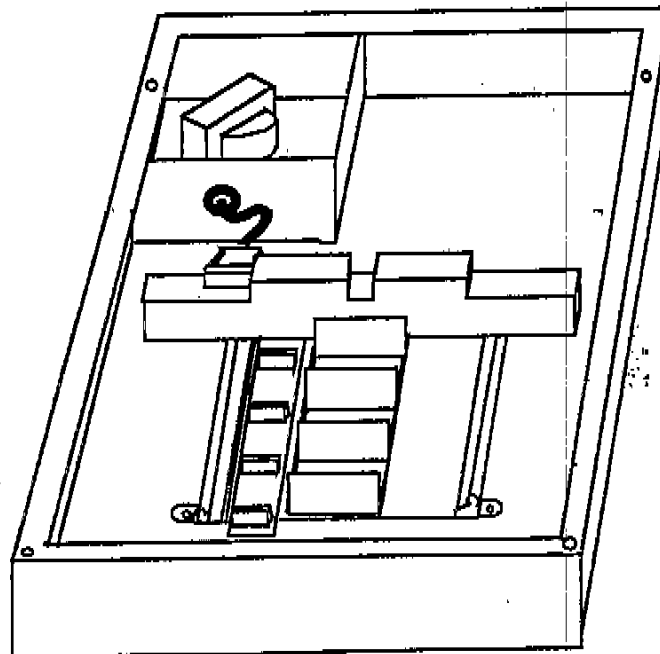
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1. GENERAL:

The POWERLINK System Network Interface, shown on cover, is the link between POWERLINK components and external control devices. The interface consists of a box, step-down transformer, interior, and power supply module. At least one POWERLINK Breaker Interface Module and a POWERLINK Cover, which are ordered separately, are needed to complete a basic system.

1.1 COMPONENT DESCRIPTION:

1.1.1 POWERLINK Transformer (Part No. 4066005001) Replacement only



Fig. 1.1

The power transformer is used for reducing the incoming voltage from the power panel to the low voltage supplying the circuits of the System Network Interface. The transformer is used on a 120Vac supply.

Caution: Use of any other transformer may create fire or shock hazard, will void warranty, and may damage system.

1.2 POWERLINK Interior (Part No. 4066002952) Replacement only



Fig. 1.2

THE INTERIOR mounts in the box and provides connectors and mounting rails for the Power Supply module and up to 4 POWERLINK Breaker Interface Modules. The interior also provides interconnection between the Power Supply Module and the POWERLINK Breaker Interface Modules. The Power Supply Module must always be mounted in position J1 only (see fig. 2.3).

1.1.3 POWERLINK Power Supply Module (Part No. 4066002851) Replacement only



Fig. 1.3

The Power Supply Module converts the incoming AC voltages from the POWERLINK Transformer into regulated DC voltages to power the system electronics, and provides control voltage to the POWERLINK Remote Controlled Circuit Breakers.

1.1.4 POWERLINK Cover (Cat. No's PLC4F and PLC4S)

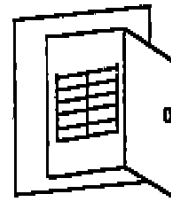


Fig. 1.4

These covers are provided with a door hinged on the right and prepunched twist outs for available module locations. There are two versions of the POWERLINK Cover:

- PLCF4 for flush mounting
- PLCS4 for surface mounting

1.1.5 POWERLINK Breaker Interface Module (Cat. No. PLBIM)



Fig. 1.5

The Breaker Interface Module is an eight channel interface designed to control up to 16 SQUARE D manufactured POWERLINK Remote Controlled Circuit Breakers, with a maximum of up to 2 breakers per channel. The module receives control signals from an external control device or pushbuttons located on the face of the module and provides 24Vdc output signals to the Remote Controlled Circuit Breakers.

1.2 ACCESSORIES

1.2.1 Filler Plate (Cat. No. QOFP)

Filler plates (Cat. no. QOFP) are available for filling openings in covers if twistouts are removed in error.

1.2.2 Filler Plate (Cat. No. QOM1FP)

Filler plate (Cat. no. QOM1FP) is available for filling opening in cover if large top twistout is removed in error.

1.2.3 Lock Kit (Cat. No. PK3FL)

Lock kit (CAT. NO. PK3FL) converts door from spring catch to lock type.

1.2.4 QO Handle Lock (Cat. No. HLO-1)

Handle lock clip (CAT. NO. HLO-1) is used for fixing Square D type QO, either 1, 2, or 3 pole, circuit breaker handles in "ON" or "OFF" position.

1.2.5 EH Handle Lock (Cat. No. HLOEH)

Handle lock clip (CAT. NO. HLOEH) is used for fixing Square D type EH, either 1, 2, or 3 pole, circuit breaker handles in "ON" or "OFF" position.

1.2.6 Partition Kit (Field Installed) (Cat. No. PLPK4)

Partition Kit (CAT. NO. PLPK4) is used for partitioning Class 1 and Class 2 wiring in those installations required to meet the 1987 NEC.

INSTALLATION:

2.1 CHECK & VERIFY ALL ITEMS ARE PRESENT:

- * Box
- * Transformer
- * Interior
- * Power Supply Module

2.2 BOX

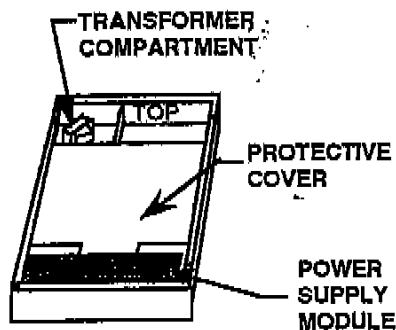


Fig. 2.1

2.2.1 MOUNTING

The box is designed to be flush or surface mounted. Care must be taken not to damage the components mounted within the box. Do not remove protective cover until ready to install and connect modules.

Mount the box so that the transformer compartment is at the top. See fig. 2.1.

2.2.2 WIRING

WARNING

**HAZARD OF ELECTRICAL SHOCK OR BURN.
TURN OFF POWER
TO SYSTEM BEFORE INSTALLING,
REMOVING, CONNECTING, OR SERVICING
MODULES**

Power (120Vac) to the transformer must enter only into the transformer compartment.

CAUTION: Verify the part number of the transformer to be 4066005001 to assure for proper input voltage.

Supply the transformer from a dedicated 15A, 120Vac circuit breaker protected circuit. A handle lockoff may be installed to prevent accidental power loss to the transformer (see Sec. 1.2 - Accessories).

The transformer primary connections are not polarized. Connect one wire of the transformer primary to the neutral and the other wire to the "HOT" conductor of the dedicated 15A circuit using properly sized wire connectors. Connect the ground wire of the dedicated circuit to the green ground wire located in the transformer compartment using a properly sized wire connector. Transformer wire size is #18AWG. Ground wire size is #14AWG.

Note: For proper operation, verify line voltage to be between 110Vac and 132Vac.

2.3 POWER SUPPLY MODULE INSTALLATION

- CAUTION -
ATTEMPTING TO INSTALL THE POWER SUPPLY MODULE IN ANY LOCATION OTHER THAN THE TOP POSITION J1, WILL RESULT IN PHYSICAL DAMAGE TO THE COMPONENTS.

- 2.3.1 Remove the protective fiberboard cover from the POWERLINK Interior.
- 2.3.2 Plug in wiring harness from transformer compartment into connector P1 on the power supply module (see fig. 2.2).
- 2.3.3 Remove the plastic cover from connector J1 See Fig. 2.3.

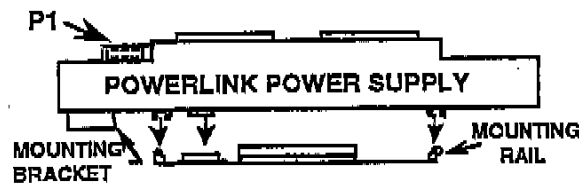


Fig. 2.2

- 2.3.4 The POWERLINK Power Supply Module must be connected to the uppermost position (J1) on the POWERLINK Interior. See Fig. 2.3.

Remove screw from enclosure (just above and to the left of J1)

Align the module in the top position J1. Push the power supply module inward until the module snaps onto both mounting rails. See fig. 2.2.

Align hole in POWERLINK Power Supply Module bracket with hole in enclosure and replace screw.

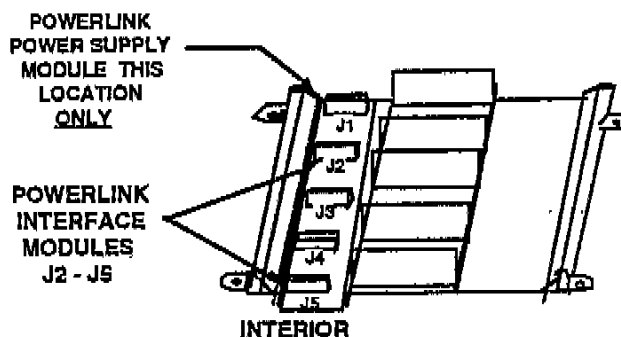


Fig. 2.3

2.4 BREAKER INTERFACE MODULE INSTALLATION

The Breaker Interface Module may be installed only in positions J2 through J5.

- CAUTION -
ATTEMPTING TO INSTALL THE BREAKER INTERFACE MODULE IN THE J1 POSITION WILL RESULT IN PHYSICAL DAMAGE TO THE COMPONENTS.

- 2.4.1 Remove the plastic cover from the next usable position J2 through J5.
- 2.4.2 Align the module in the position where plastic cover was removed. Push the Breaker Interface Module inward until the module snaps onto the mounting rails. See fig. 2.2 & 2.3. DO NOT USE EXCESSIVE FORCE WHEN INSTALLING THE MODULE.

2.4.3 ELECTRICAL CONNECTIONS

Electrical input and output connections to the module are made at the terminal blocks located on the left and right ends of the module's front panel. See fig. 2.4

Input connections from an external controlling means are made to the terminals marked COMMON and 1 through 8 (Channel Numbers) on the right end of the module. This wiring is considered Class 2.

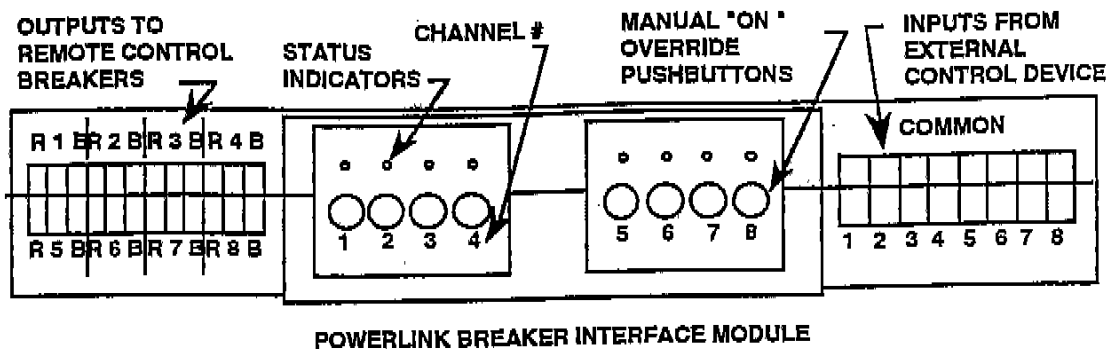
Output connections to the POWERLINK Remote Controlled Circuit Breakers are made to the terminals marked R, B, and 1 through 8 (Channel Numbers) on the left end of the module. This wiring is considered Class 1 and must utilize Class 1 wiring methods in accordance with NEC Article 725.

Class 2 wiring must be separated a minimum of 1/4" from conductors of any electric light, power, or Class 1 conductors in order to meet requirements of the 1990 NEC Article 725. Use wire positioning devices provided to insure conductor separation. For installations required to meet the 1987 NEC requirements for separation of wiring, use partition kit - Cat. No. PLPK4.

Strip 1/4" - 3/8" of insulation from wire for termination to Breaker Interface Module. Tightening torque for all Breaker Interface Module terminals is 3.5 in.-lbs.

2.4.3.1 CIRCUIT BREAKER CONNECTIONS

Class 1 wiring methods must be used between the POWERLINK Remote Controlled Circuit Breakers and the POWERLINK Breaker Interface Module in accordance with NEC article 725. Do not exceed wire lengths as shown in Table 2.1.



POWERLINK BREAKER INTERFACE MODULE

Fig. 2.4

**CONNECTING TYPE QO(B)-PL
POWERLINK REMOTE CONTROLLED
CIRCUIT BREAKERS**

- Step 1. Turn OFF both the power supplying the POWERLINK System Network Interface and the panel in which the QO(B)-PL circuit breaker(s) are being installed. Output connections to the QO(B)-PL circuit breakers are made to the terminals located on the left side of the Breaker Interface Module. Refer to Figures 2.4 and 2.5 while performing steps 2 through 4 below.
- Step 2. Connect the white wire from the QO(B)-PL circuit breaker to the numbered terminal corresponding to the desired control channel.
- Step 3. Connect the red wire from the QO(B)-PL circuit breaker to the terminal labeled "R" adjacent to the numbered terminal selected in step 2 above.
- Step 4. Connect the black wire from the QO(B)-PL circuit breaker to the terminal labeled "B" adjacent to the numbered terminal selected in step 2 above.

**CONNECTING TYPE EHB-PL
POWERLINK REMOTE CONTROLLED
CIRCUIT BREAKERS**

- Step 1. Turn OFF the power supplying both the POWERLINK System Network Interface and the panel in which the EHB-PL circuit breaker(s) are being installed. Output connections to the EHB-PL circuit breaker are made to the terminals located on the left side of the module. Refer to Figures 2.4 and 2.5 while performing steps 2 through 4 below.
- Step 2. Connect the terminal labeled "C" on the EHB-PL circuit breaker to the numbered terminal, corresponding to the desired control channel.
- Step 3. Connect the PLUS (+) terminal on the EHB-PL circuit breaker to the terminal labeled "R" adjacent to the numbered terminal selected in step 2 above.
- Step 4. Connect the MINUS (-) terminal on the EHB-PL circuit breaker to the terminal labeled "B" adjacent to the numbered terminal selected in step 2 above.

Note: Torque all terminal and mounting screws on the EHB-PL circuit breaker to the value shown on the labels.

Circuit Breaker Type	Minimum Wire Size	Maximum Length
QO-PL Single Pole	#18 AWG	275 Ft.
	#16 AWG	400 Ft.
	#14 AWG	650 Ft.
QO-PL Two & Three Pole EHB-PL One, Two, & Three Pole	#18 AWG	400 Ft.
	#16 AWG	625 Ft.
	#14 AWG	1000 Ft.

Table 2.1

2.4.3.2 CONTROLLER INPUT CONNECTIONS

Connections to an external control device are made at the terminals located on the right side of the POWERLINK Breaker Interface Module (See Fig. 2.4). This is a Class 2 circuit and Class 2 wiring methods may be used in accordance with NEC Article 725.

The external control device must be a SPST mechanical or solid state switch or a relay rated for 1 mA continuous at 5Vdc (gold plated contacts or equivalent recommended) and provide isolation between circuitry of the external control device and the power circuitry.

Completing a circuit, on the right side of the POWERLINK Breaker Interface Module, between one of the numbered terminals and a common terminal will signal the remote controlled mechanism of the corresponding remote controlled circuit breaker to close. Opening this circuit will signal the mechanism to open. See fig. 2.4 and 2.5.

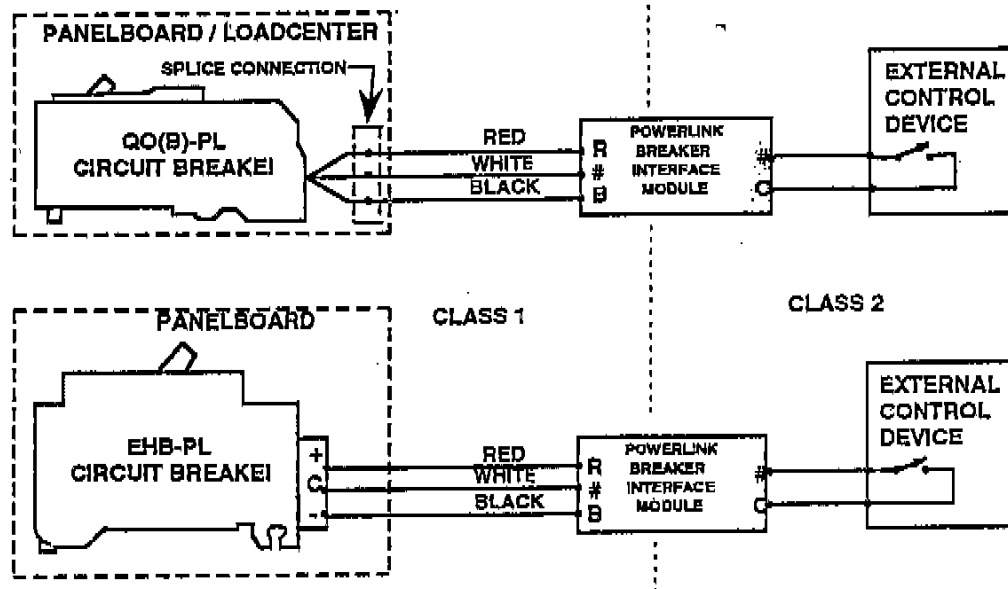


Fig. 2.5

2.5 COVER

Remove the twistouts in the cover for the modules installed.
DO NOT REMOVE MORE TWISTOUTS THAN REQUIRED. DO NOT REMOVE THE LARGE TWISTOUT AT THE TOP OF THE COVER OR THE BOTTOM TWISTOUTS NUMBERED 21,22,23,AND 24.

Each module will require 4 twistouts to be removed, 2 on each side of the cover (see fig. 2.6). Note: the first twistout on each side has been factory removed.

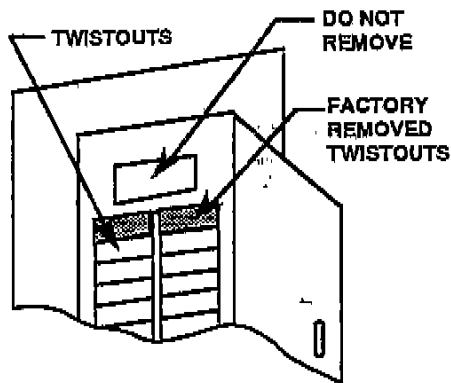


Fig. 2.6

6 OPERATION

See Section 3.1 for troubleshooting hints. Assure that the plug from the transformer is fully seated in P1. See Fig. 2.3.

NOTE: The Remote Control Circuit Breaker handle must be in the ON position before power is supplied to the circuit. The remote mechanism will operate when signaled.

2.6.1 Turn ON power supplying transformer.

2.6.2 Power Supply Module

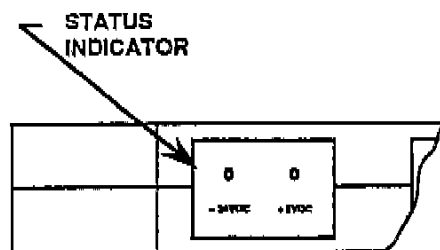


Fig. 2.7

There are two indicators located on the face of the Power Supply Module (see fig. 2.7.) indicating the status of the +24Vdc and the +5Vdc internal power supplies. The indicators show:

Indicator ON = POWER SUPPLY FUNCTIONING

Indicator OFF = POWER OFF or SYSTEM MALFUNCTIONED

If either LED Indicator is off a short circuit may be present, therefore the Remote Controlled Circuit Breaker can not be operated by the Breaker Interface Module.

If either indicator is off, **TURN OFF POWER** supplying transformer. See section 3.1 for troubleshooting hints.

2.6.3 Breaker Interface Module

2.6.3.1 Power-up

Remote Control Circuit Breakers are shipped from factory with the remote control mechanism in the "closed" position.

2.6.3.2 Status Indication

Eight red indicators are present on the front panel and are associated physically with each channel number and are visible when ON (see fig. 2.4). The table below explains the indicator operation.

RED INDICATOR INDICATES

INDICATOR OFF = OFF signaled to Remote Control Circuit Breaker

INDICATOR ON = ON signaled to Remote Control Circuit Breaker

INDICATOR FLASHING = ON OVERRIDE signaled to Remote Control Circuit Breaker

Note: LED indicator indicates output status of Breaker Interface Module only. It does not verify Remote Control Circuit Breaker has operated and circuit is energized. If Remote Controlled Circuit Breaker is manually off or tripped it can not be remotely controlled.

2.6.3.3 Manual ON Override

Eight pushbuttons are present on the front panel of each Breaker Interface Module and are associated physically with each channel number (See Fig. 2.4). The override pushbuttons provide a means for manually overriding the channels ON, regardless of the input signal from the external controlling means.

A channel that is in the ON override condition may be allowed to resume normal operation by pushing the associated pushbutton. This will give control of this channel back to the controller.

Note: If power is lost to the System Network Interface for any reason, Remote Controlled Circuit Breakers can not be turned "ON" if remotely switched "OFF" prior to power loss.

2.6.3.4 External Control Device

Insure that all channels are not in the override ON condition (indicator flashing) From the external control device, signal the breakers to turn ON. This will turn ON the Remote Controlled Circuit Breaker which is connected to the corresponding numbered terminal located on the left side of the Breaker Interface Module. Also the corresponding channel indicator will light (see fig. 2.4).

In the case where more than one Remote Controlled Circuit Breaker is requested to change state (i.e. ON or OFF) at the same time, the Breaker Interface Module will sequence the commands to the Remote Controlled Circuit Breakers.

Due to sequencing, a delay of up to one second for each Breaker Interface Module is possible (a maximum of four seconds if four Breaker Interface Modules are used.), however the red indicators within the Breaker Interface Module have no delay.

SERVICE HELP

.1 TROUBLESHOOTING HINTS

CONDITION	POSSIBLE CAUSE	ACTION
Cover will not fit	1. Twistouts not removed. 2. Cover or box up-side down.	See Section 2.5
Indicator(s) on Power Supply Module are OFF	1. Power to unit is off. 2. Power Supply malfunction. 3. Field installed wires shorted	See Section 2.6.1 See Section 2.6.2 Remove power and check wiring - See Section 2.4.3
24 Volt indicator off when powering more than 32 EHB-PL Circuit Breakers	4. Mounting screw for Power Supply Module not in place.	See Section 2.3.4
Load is not activated when indicated	1. POWERLINK Remote Controlled Circuit Breaker handle is turned OFF. 2. POWERLINK Remote Controlled Circuit Breaker is tripped. 3. Power to POWERLINK system is turned OFF. 4. External control device or POWERLINK Circuit Breaker not properly connected.	Turn ON POWERLINK Circuit Breaker handle. Reset POWERLINK Circuit Breaker Turn ON Circuit Breaker supplying POWERLINK system See Section 2.4.3
External control device will not turn OFF load	1. Manual override is active. 2. Power to POWERLINK system is turned OFF. 3. External control device or POWERLINK Remote Control Circuit Breaker not properly connected.	See Section 2.6.3.3 Turn ON Circuit Breaker supplying POWERLINK system See Section 2.4.3

If you have problems or questions with this system call

**Square D Company
Technical Service Division**

1 - 800 - 634 - 2003

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