

DANGER!



HAZARDOUS VOLTAGES MAY BE PRESENT DURING INSTALLATION.
Electrical shock can cause death or serious injury.



Installation should be done by qualified personnel following all national, state and local electrical codes.

BE SURE POWER IS DISCONNECTED PRIOR TO INSTALLATION!
FOLLOW NATIONAL, STATE AND LOCAL CODES.
READ THESE INSTRUCTIONS ENTIRELY BEFORE INSTALLATION.

The CIO-MLP2-PR Module is a convenient and cost-effective Profibus interface capable of providing discrete control and monitoring of motor starters, drives, and other devices over a Profibus network. The CIO-MLP2-PR is designed to provide the following benefits in both new and existing installations:

- § reduced field wiring
- § greater operator efficiency
- § ease in system startup and commissioning

The CIO-MLP2-PR Profibus module can be DIN rail mounted, or mounted directly to a back panel. The CIO-MLP2-PR's compact size, ease of wiring and Profibus communications capability makes the use of traditional discrete devices on Profibus cost-effective and simple.

The CIO-MLP2-PR Module is compatible with Square D's Model MLP2 overload relay. It simply connects to the side of the MLP2 and permits remote monitoring and control of the MLP2 over a Profibus network.

CONNECTIONS

1. Mount the CIO-MLP2-PR in a convenient location in a properly rated enclosure. The CIO-MLP2-PR can be mounted to a back panel using screws or can be snapped onto DIN rail.
2. Connect the five Profibus wires to the 5-pin connector on the front of the CIO-MLP2-PR Module. 24VDC should be connected to V+ and V-. Connect the other three wires to A, B and Shield.
3. The PBus LED indicates communication is established between the CIO-MLP2-PR and the Profibus master, and OLC indicates communication is established with the MLP2 overload.
4. Connect the Profibus SUB-D connector to the Profibus network.

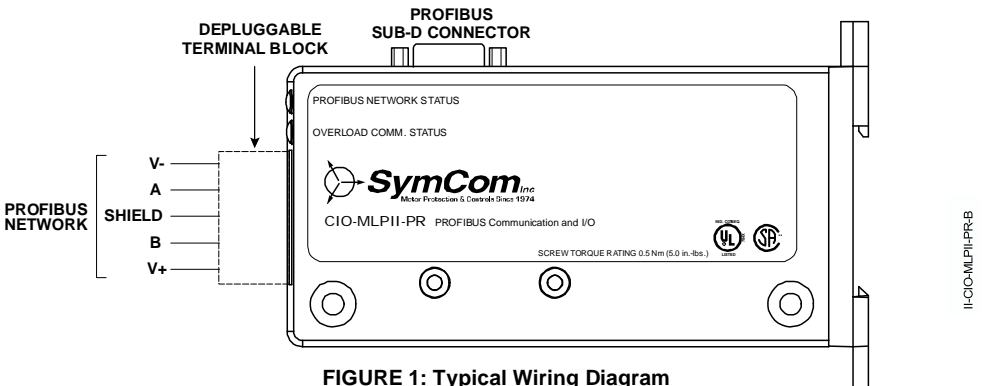


FIGURE 1: Typical Wiring Diagram

DIAGNOSTIC INDICATOR LIGHTS

The unit is energized when power is applied between V+ and V- on the connector. The PBus and OLC lights will flash until communication is established. The PBus communication status indicator light will come on steady when a Profibus master is communicating with the unit. The OLC communications status indicator light will come on steady when it is communicating to an MLPII overload relay.

OPERATION

The CIO-MLPII-PR Module is a DP-V0 device. Cyclical I/O is supported for the transfer of input and output information.

PROFIBUS NETWORK CONFIGURATION

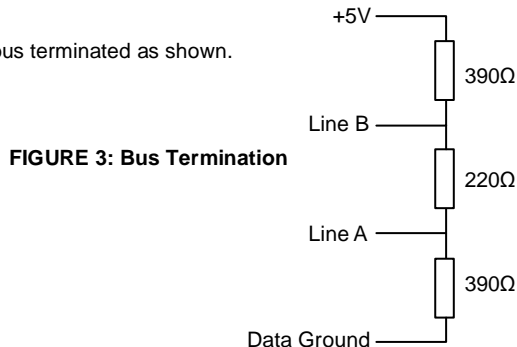
Cable Routing

Follow these general cable-routing guidelines:

- Avoid areas of high temperature, moisture, vibration, or other mechanical stress.
- Secure the cable where necessary to prevent damage.
- Use cable ducts, raceways, or other structures to protect the cable.
- Never route cables over or around sharp edges.
- Avoid sources of electrical interference that can induce noise into the cable. Use the maximum practicable separation from such sources.
- Maintain a minimum separation of 3.3 ft. (1m) from the following equipment:
 - air conditioners and large blowers
 - elevators and escalators
 - radios and televisions
 - intercom and security systems
 - fluorescent, incandescent, and neon lighting fixtures
- Maintain a minimum separation of 10 ft. (3m) from the following equipment:
 - Line and motor power wiring
 - Transformers
 - Generators
 - Alternators

Terminating Resistors

Profibus segments must be bus terminated as shown.



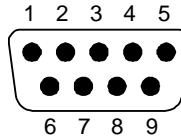
Profibus Cable

The Profibus Cable must be connected as follows:

Pin	Signal	Description		Specification
		Cable	Device	
1	---	---	---	Not used
2	---	---	---	Not used
3	RxD/TxD-P	Receive/Transmit data; line B (red)		Mandatory
4	CNTR-P		Control of repeater direction	Optional ²
5	DGND		Data ground (reference voltage to VP)	Mandatory
7	---	---	---	Not used
6	VP ¹		Power supply +5V (e.g. bus termination)	Mandatory
8	RxD/TxD-N	Receive/Transmit data; line A (green)		Mandatory

¹ Minimum current capability is 10mA
² These signals should be provided by the device if converters from RS-485 to fiber optic transmission are to be supported.

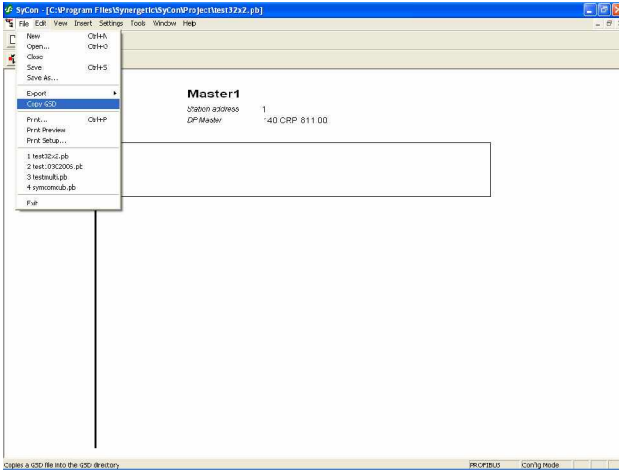
FIGURE 3: 9-Pin Sub-D Connector Pin Assignment



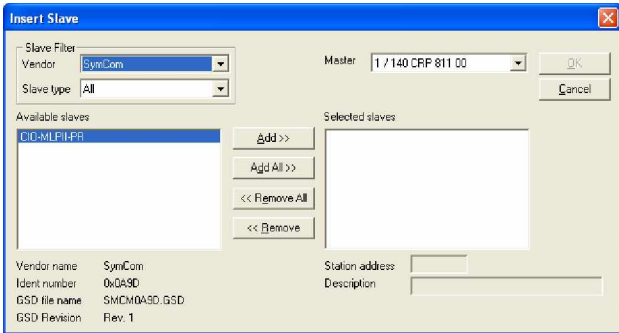
SOFTWARE CONFIGURATION

Import GSD File into the SyCon Software

Open SyCon software and select *File > CopyGSD*. Import the file SMCM0A9D.GSD.



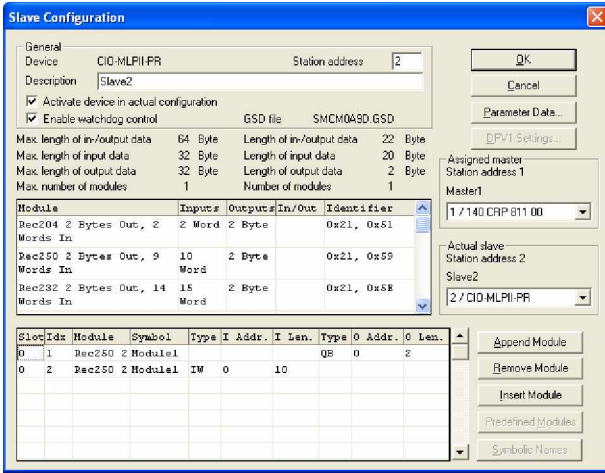
Insert Devices onto the Network



Add devices to the network by selecting *Insert > Master* and/or *Insert > Slave* or click the *Insert Master* or *Insert Slave* buttons. Select the device to add and click the *Add>>* button, then *OK*.

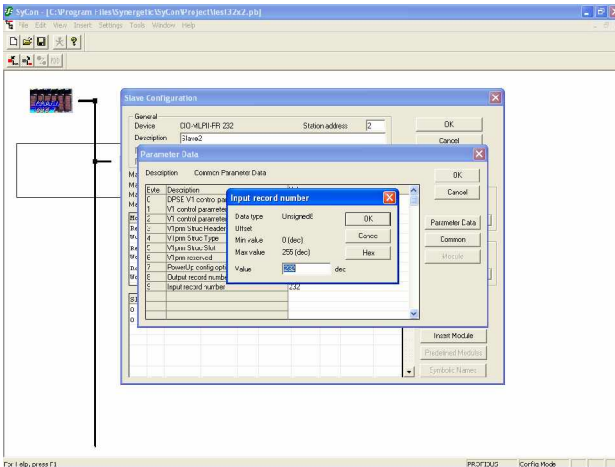
Configure the Slave(s)

Select the slave and choose *Settings > Slave Configuration* or double click on the slave to open the **Slave Configuration** dialog box.

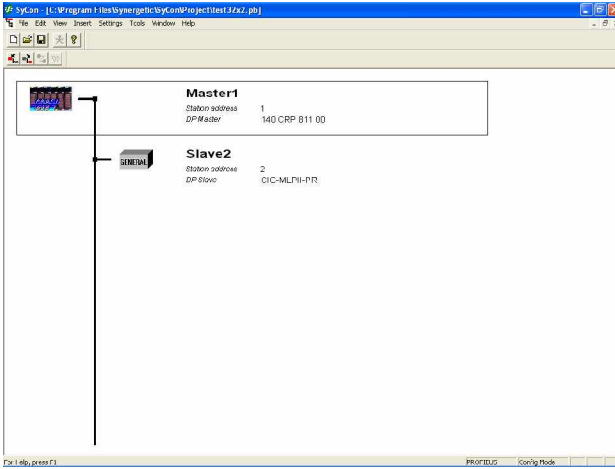


Set the correct **Station address**. Select the correct I/O module in the **Actual slave** menu and set any other options in the **Slave Configuration** window. Append the I/O module from the **Module** list in the middle of the window by double-clicking it or by highlighting it and clicking **Append Module**. It will be added to the lower window which places it into a slot.

Still in the **Slave Configuration** window click the *Parameter Data...* button—all parameter data are displayed in hex. Click *Common*—the common parameter data is displayed. Double-click the **Input record number** and enter the value of the input record, to match the chosen module on the previous screen.



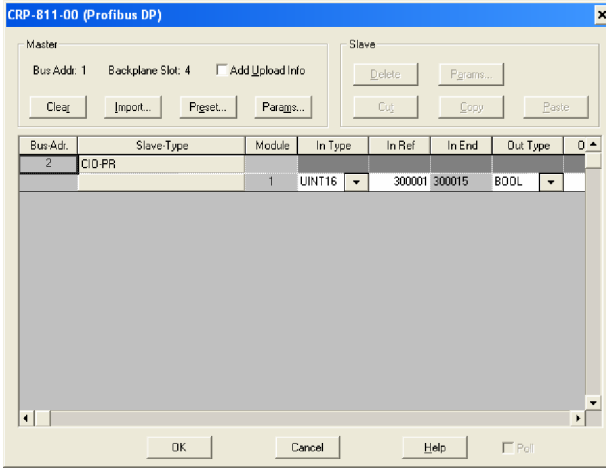
Export



Export the configuration for import into **Concept** or other PLC configuration software:

- 1) Select the Master in the visual network picture.
- 2) Save the network.
- 3) Select *File > Export > ASCII* to save the cnf file.

Import the Network Configuration into the PLC



When **Concept** software is used, follow these steps to import the network configuration:

1. Open a project.
2. Select *Project > Configurator* and double-click **I/O Map**.
3. Click the edit button next to the PLC.
4. Select the Profibus scanner and click the *Params* button.
5. Click the *Import...* button and choose the desired .cnf file.
6. In the scanner configuration window assign registers to all I/O data for all devices.
7. Continue clicking **OK** and **YES** in the I/O Map dialog box to update the changes.

CYCLICAL INPUT RECORDS

Record 204		
Byte.Bit	Name	Description
0-1	Average Current	
2.	MLP2OPRSTAT	
2.0	Out A	
2.1	Out B	
2.2	Running	
2.3	Modbus Comm Loss	
2.4	Fault	
2.5	Overcurrent	
2.6	Ground Fault	
2.7	Warning	
3.0	Trip Relay Closed	
3.1	In 1	
3.2	In 2	
3.3	In 3	
3.4	In 4	
3.5	PTC Warning	
3.6	PTC Trip	
3.7	PTC Short	

Record 208		
Byte.Bit	Name	Description

0-8	Proprietary	
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Record 250		
Byte.Bit	Name	Description
0-1	Current / OC Setpoint	% current of oc setpoint
2-3	Average Current	
4-5	IC	
6-7	IB	
8-9	IA	
10-11	CUB	
12-13	Thermal Capacity	
14-15	IGF	
16-17	MLP2OPRSTAT	
16.0	Out A	
16.1	Out B	
16.2	Running	
16.2	Modbus Comm Loss	
16.4	Fault	
16.5	Overcurrent	
16.6	Ground Fault	
16.7	Warning	
17.0	Trip Relay Closed	
17.1	In 1	
17.2	In 2	
17.3	In 3	
17.4	In 4	
17.5	PTC Warning	
17.6	PTC Trip	
17.7	PTC Short	
18-19	Fault Status	same as Modbus 40408
18.0	Reverse Phase	
18.1	PTC Overtemp	
18.2	Reserved	
18.3	Undercurrent	
18.4	Overcurrent	
18.5	Ground Fault	
18.6	Current Unbalance	
18.7	Single Phase	
19.0	Reserved	
19.1	PTC Shorted	
19.2	Internal Error	
19.3	No AC Power	
19.4	Reserved	
19.5	Reserved	
19.6	Reserved	
19.7	Reserved	

Record 232

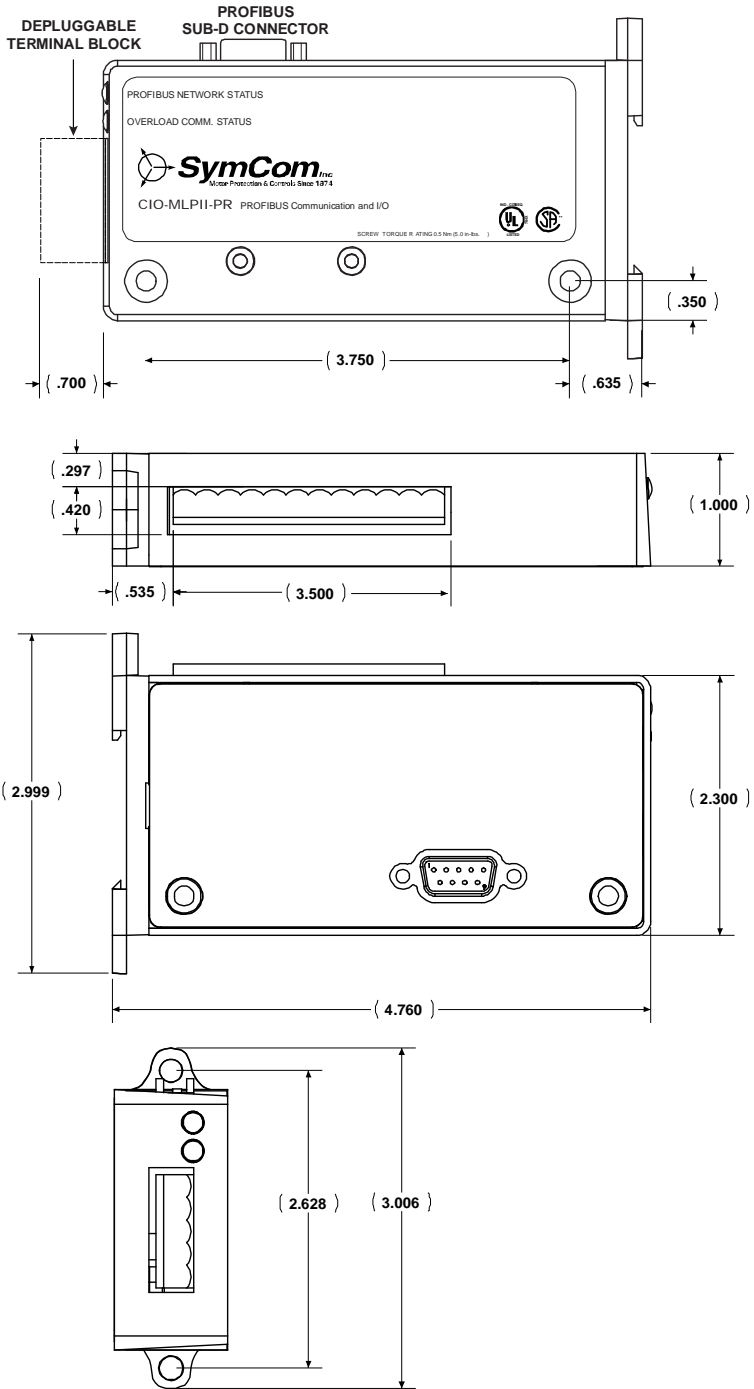
Byte.Bit	Name	Description
0-1	Current / OC Setpoint	% current of OC setpoint
2-3	Average Current	
4-5	IC	
6-7	IB	
8-9	IA	
10-11	CUB	
12-13	Thermal Capacity	
14-15	I GF	
16-17	RD1	
18-19	RD2	
20-21	RD3	
22-23	MLP2OPRSTAT	
22.0	Out A	
22.1	Out B	
22.2	Running	
22.3	Modbus Comm Loss	
22.4	Fault	
22.5	Overcurrent	
22.6	Ground Fault	
22.7	Warning	
23.0	Trip Relay Closed	
23.1	In 1	
23.2	In 2	
23.3	In 3	
23.4	In 4	
23.5	PTC Warning	
23.6	PTC Trip	
23.7	PTC Short	
24-25	Last 4 faults	same as Modbus 40425
24.0–24.3	Last Fault	
24.4–24.7	2nd last fault	
25.0–25.3	3rd last fault	
25.4–25.7	4th last fault	
26-27	Fault Status	same as Modbus 40408
26.0	Reverse Phase	
26.1	PTC Overtemp	
26.2	Reserved	
26.3	Undercurrent	
26.4	Overcurrent	
26.5	Ground Fault	
26.6	Current Unbalance	
26.7	Single Phase	
27.0	Reserved	
27.1	PTC Shorted	
27.2	Internal Error	
27.3	No AC Power	
27.4	Reserved	
27.5	Reserved	
27.6	Reserved	
27.7	Reserved	
28-29	Holdoff Status	same as Modbus 40410
28.0	Reverse Phase	
28.1	Thermal Capacity	Not enough thermal capacity available
28.2	PTC Overtemp	
28.3	PTC Shorted	
28.4	Test Trip (Local)	Local reset button
28.5	Test Trip (Remote)	remote reset button
28.6	Reserved	
28.7	Reserved	
29.0	Reserved	
29.1	Reserved	
29.2	Internal Error	
29.3	No AC Power	

29.4	Reserved	
29.5	Reserved	
29.6	Internal Error	
29.7	Internal Error	EEPROM checksum

CYCLICAL OUTPUT

Cyclical Messages, Output / Control		
Byte.Bit	Name	Description
0.0	Out B / Run Reverse	0=Off, 1=On
0.1	Off	1=turn Out A & B Off
0.2	Out A / Run Forward	0=Off, 1=On
0.3	unused	
0.4	Overload Test	1=Force Trip
0.5	unused	
0.6	Reset	1=Reset fault relay
0.7	unused	

DIMENSIONS



CIO-MLPII-PR SPECIFICATIONS

Power Requirements	
Voltage	12–24VDC
Current	150mA (max.)
Power	3.6 Watts (max.)
Weight	14 oz.
Enclosure	Polycarbonate
Terminal (depluggable terminal block)	
Torque	4.5 in.-lbs. (max.)
Wire AWG	12–20 AWG
Safety Marks	
UL	UL508 (File #E68520)
CSA	C 22.2
Standards Passed	
Electrostatic Discharge (ESD)	IEC 1000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity, Radiated	159 MHz, 10V/m
Fast Transient Burst	IEC 1000-4-4, Level 3, 4 kV input power
Hi-Potential Test	Meets UL508 (2 x rated V +1000V for 1 minute)
Environmental	
Temperature Range	Ambient Operating: -20° to 70°C (-4° to 158°F) Ambient Storage: -40° to 80°C (-40° to 176°F)
Class of Protection	IP20, NEMA 1 (Finger Safe)
Relative Humidity	10-95%, non-condensing per IEC 68-2-3



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