TPLC-12-1 programmable logic controller installation manual

Introduction

This manual provides instructions for the safe installation, connection and operation of TPLC-12-1 programmable logic controller. It does not cover programming the controller and working with the bundled software. All drawings in this document are only meant to show the placement of connectors and fuses – they do not include and are not scalable to the product's dimensions.

System modules

TPLC-12-1 programmable logic controller consists of the following modules:

1. PLC_MAIN-12-1 – main module, 1x
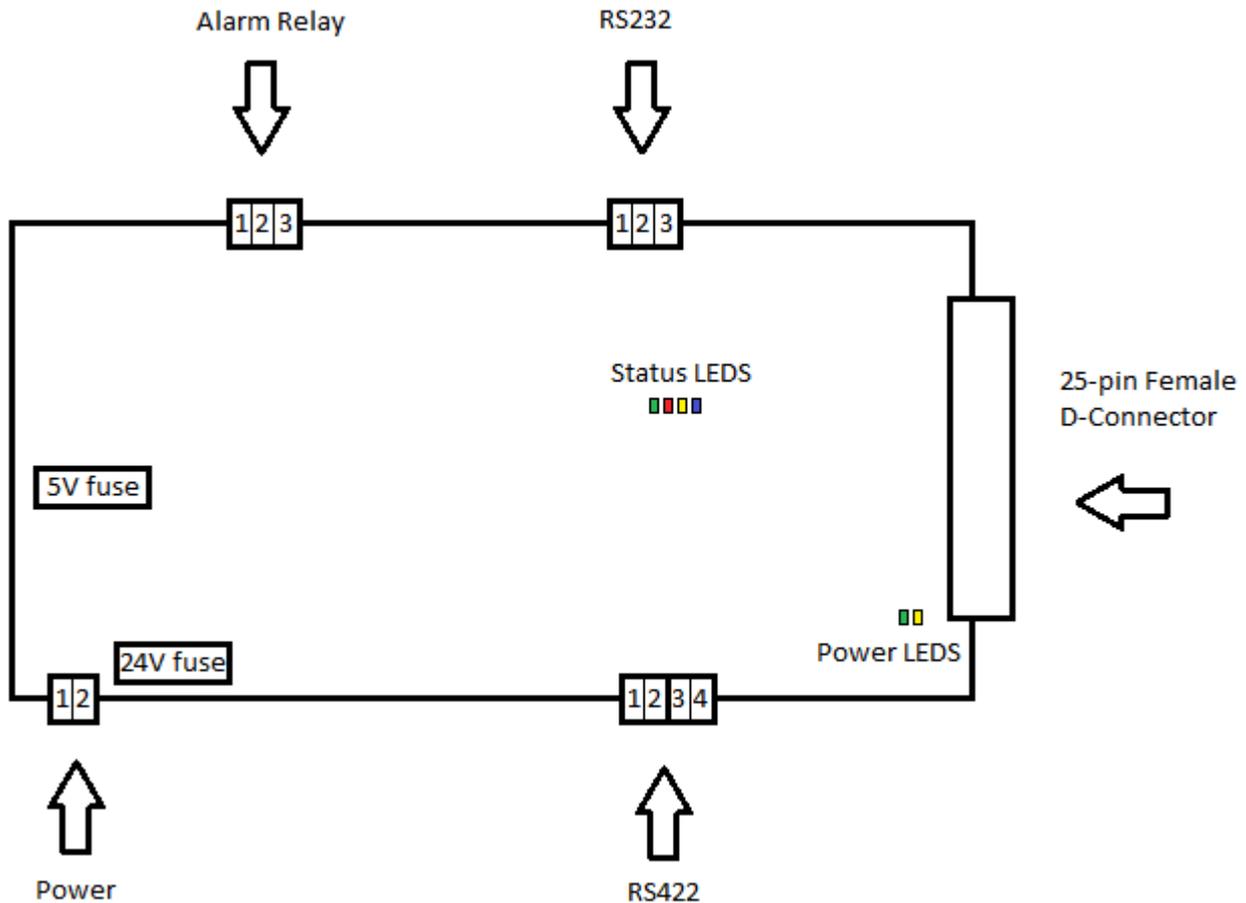
|	POWER	RS422	Alarm relay	RS232
1	GND	RX A	Normally closed	PC_GND
2	24V Input	RX B	Common	RXD
3		TX A	Normally Open	TXD
4		TX B		

The main module contains the system MCU and handles calculations and communication with all I/O modules, as well as with the terminal PC. It is powered by 24VDC external power supply. Communication with the terminal PC is based on an opto-isolated RS232 data link. Communication with the remote analog input module is based on an RS422 MODBUS data link, which is also opto-isolated, but on the far end of the line. Communication with the other I/O modules is done through a

system-specific serial interface in the 25-pin D-Connector. Provides one relay output for alarm. The alarm relay is on whenever the on-board alarm buzzer is on. The main module has 6 indication LEDS. Two of them indicate the presence of supply voltage – one for 24V (Yellow) and one for 5V (Green), regulated on-board from the 24V input. The other group of 4 LEDS are status LEDS and indicate the following:

- Green – board-alive, should flash
- Red – indicates IO error if active
- Blue and yellow – indicate a problem with the loaded program

Both fuses should be rated 2A, slow. If the installation requires more than 5 output boards, then the 24V fuse should have greater value, adding an extra 0,25A for each additional output board.

2. PLC_IN-12-1 – input module, 1x ~ 50x
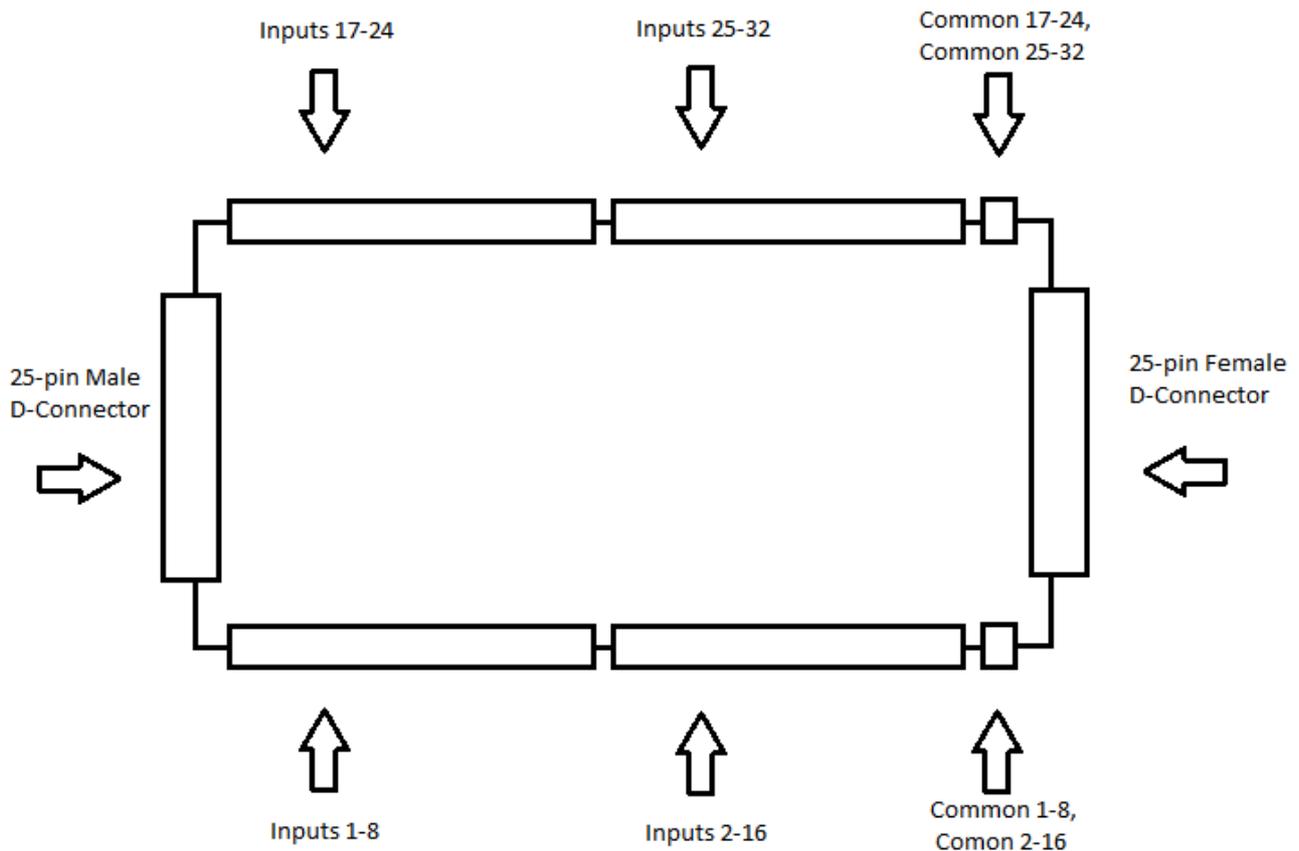
Provides 32 inputs, all of which are opto-isolated. Nominal voltage on all inputs is 24VDC. Although all of them feature a PPTC fuse for protection from higher or reverse voltages, the voltage on any input should be in the range of 0-28V for normal operation. The inputs are divided in groups of 8, where each group shares one common ground terminal. There is an indication LED for each input.

3. PLC_OUT-12-1 - output module, 1x ~ 50x
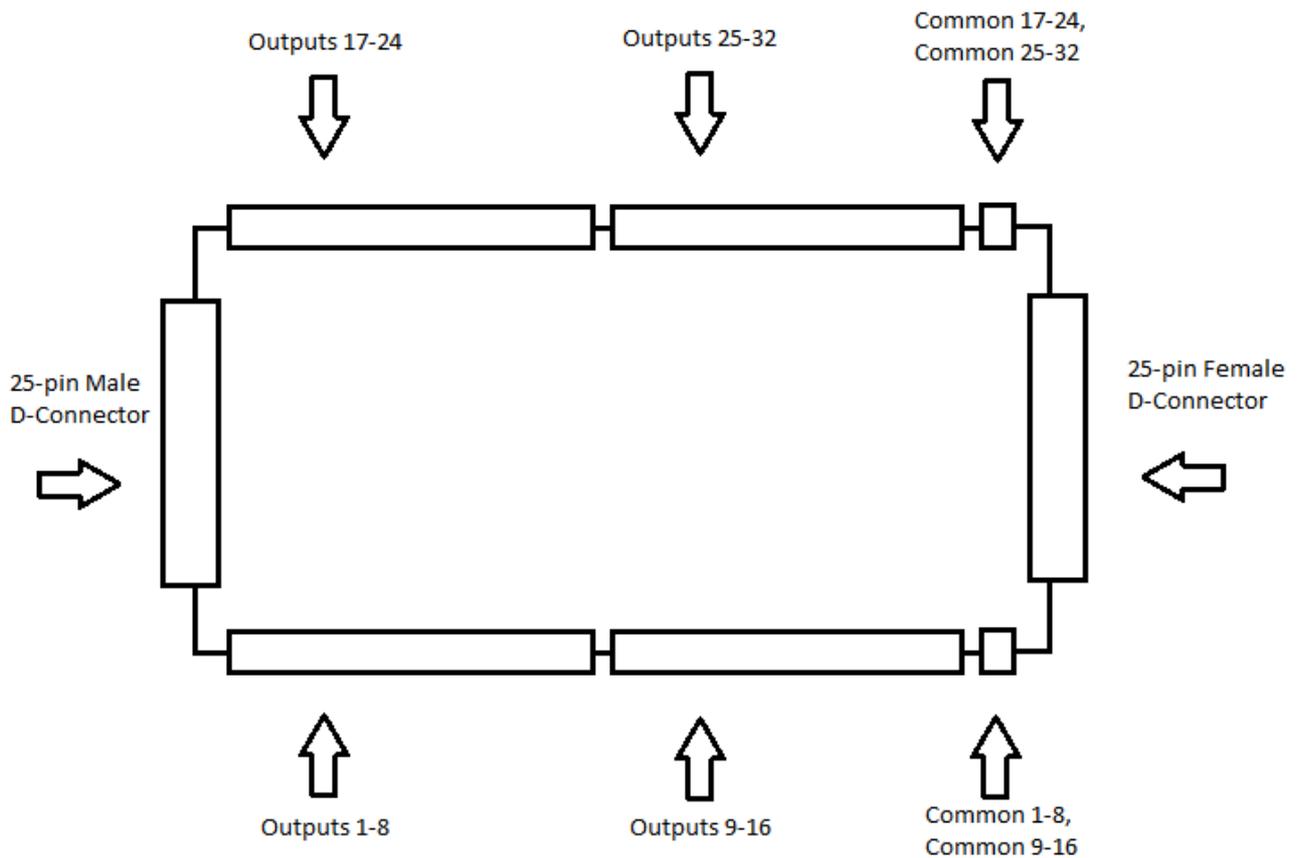
Provides 32 relay outputs, divided into groups of 8, each group sharing one common terminal. Relays are rated 5A/250VAC, 5A/30VDC. There is an indication LED for each output.

4. PLC_TERM-12-1 – I/O termination module, 1x

Provides error checking on the I/O modules connection. Has one 25-pin Male D-Connector which connects to the last I/O board.

5. PLC_ANALOG_IN-12-1 – remote analog input module, 0x ~ 8x
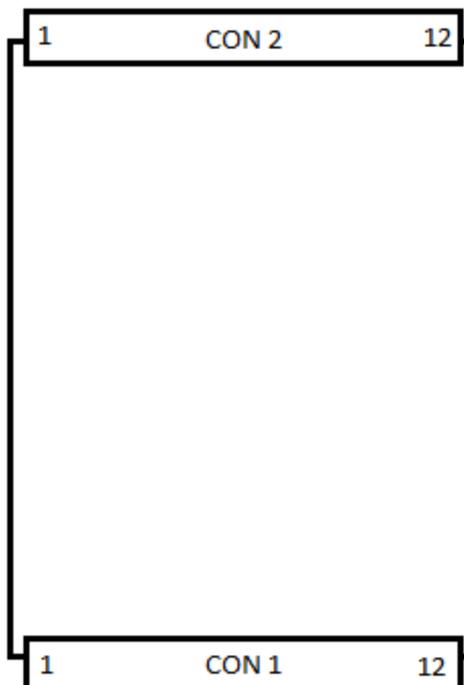
	CON 1	CON 2
1	NC	NC
2	NC	NC
3	Input 1	RX B
4	Input 2	RX A
5	Input 3	TX B
6	Input 4	TX A
7	Input 5	GND_ISO
8	Input 6	GND
9	Input 7	GND
10	Input 8	VIN
11	NC	NC
12	NC	NC

Features 8 analog inputs and an opto-isolated RS422 data link. Powered by an external 9-12 VDC supply. All inputs are measured with respect to GND. GND_ISO is the GND reference for the RS422 pins and is left unconnected for normal operation.

Installation and operation

The controller consists of one main module, at least one input module, at least one output module and one I/O termination module. Optional remote analog input modules could also be added if required. The first I/O module should be connected to the main module by its 25-pin D-Connector. Every next I/O module should be connected to the previous I/O module by its D-Connector. When all the modules are installed, the last remaining 25-pin Female D-Connector should be terminated using the termination module. I/O modules could be installed in any order. For example, if 3 input and 2 output modules should be installed, they could be installed as IIIOO, OOIII, IOIOI, etc. The system provides full I/O isolation. Hence, the use of a dedicated, isolated 24VDC power supply is strongly recommended.

The TPLC-12-1 programmable logic controller is designed for installation on a DIN rail and indoor use only. Connection of modules, as well as input/output cables should only be done when the system power is off. Unwanted effects, including system malfunction or damage, might appear if those conditions are not met.