

PERTRONIC INDUSTRIES LTD

INSTALLATION / OPERATING INSTRUCTIONS

RS485 IO CONTROLLER



Overview:

The **RS485 IO Controller** is one of a range of LED drivers manufactured by Pertronic Industries.

The Pertronic **RS485 IO Controller** has been designed in response to customer requirements to drive larger numbers of LED's than can be accommodated with Pertronic's standard 12-way LED board or RS485 LED Address Controller.

The **RS485 IO Controller** operates in two modes:

- Standard Pertronic 1-to-1 LED mapping mode, and
- Fan Controller Mode.

The **RS485 IO Controller** is designed to connect to the 48-Way O/C Output Board, to the RS485 IO Fan Controller and Indicating boards, as well to standard 8-way LED boards.

Specifications:

Targeted Panel	Pertronic F16e Conventional Panel Pertronic F100A Analogue Addressable Panel Pertronic F120A Analogue Addressable Panel
Board Dimensions	PCB: 395mm x 271.5mm. Mounting: 365.5mm x 243mm.
Electrical	Operating Voltage: 19.2 – 30Vdc, nominal 27.4V Operating Current: 25mA @ 27.4Vdc nominal with no-load
RS485 Operation	Addressed as LED Mimic Display: Select the required Mimic address using the Mimic Address links. Set LED number 'n' on the rotary address switches, and the 1000s links to the desired start LED number of the board.
Test Link	When installed, initiates LED Test sequence. Note: When fitted, the RS485 IO Controller is put into defect.
Configuration Links	Link 1: Not Used. Link 2: Base Address Test. Fit to flash the base address LED. Note: When fitted, the RS485 IO Controller is put into defect. Link 4: Lamp Test Disable. Fitted: Panel Lamp Test Commands are ignored. Not Fitted: Lamp Tests are performed as requested. Link 8: Determines the Controllers mode of operation. Not Fitted: Board operates in Standard Mode. Fitted: Board operates in Fan Block Mode.
Indicators	POLL LED: Flashes when the device is polled via the RS485 connection. RX LED: Turns on when the amplifier is polled via the RS485 connection. TX LED: Turns on when the controller replies via the RS485 connection. Defect LED: Turns on when there is a defect.
Connections	RS485 In/Out: Provides connection to Pertronic RS485 Bus. To TPIC devices: 2mm and 2.54mm IDC Box headers available for connection to associated LED boards. General Inputs: Unused. Local Outputs: 8 Open Collector Outputs, mapped off the LED Base address. Note: Open Collector outputs do not activate during Lamp test.

Installation:

The **RS485 IO Controller** is connected to the fire panel via the panel's RS485 Mimic Port. Four connectors are provided: K13 and K14 using pluggable screw terminals, and K11 and K12 for IDC connection. These allow connection of multiple **RS485 IO Controllers** or other RS485 devices.

The connections are these:

- '+' 12 V to 24 V supply,
- '0' Supply return, and
- A/B RS485 signal lines.

Twisted pair cable is recommended. The maximum length of cable between the last device on the Mimic Port and the Panel is 1.2 Km. The A/B signal lines must be terminated at the remote device with a 470 ohm resistor (placed between A and B).

Limits to the Number of LEDs

Up to 32 RS485 devices (RS485 IO Controllers, LDUs, LCD mimics, Amplifiers, and printer interfaces) can be connected to the RS485 line.

The number of LED outputs that can be connected to the RS485 IO Controller is limited by the maximum mapping capacity of the respective panel.

The **F100A** can control up to 255 LED addresses, and the **F120** can control 2048 LED addresses. The **F16e** can control a maximum of 64 (NZ) or 96 (Aus) LED addresses.

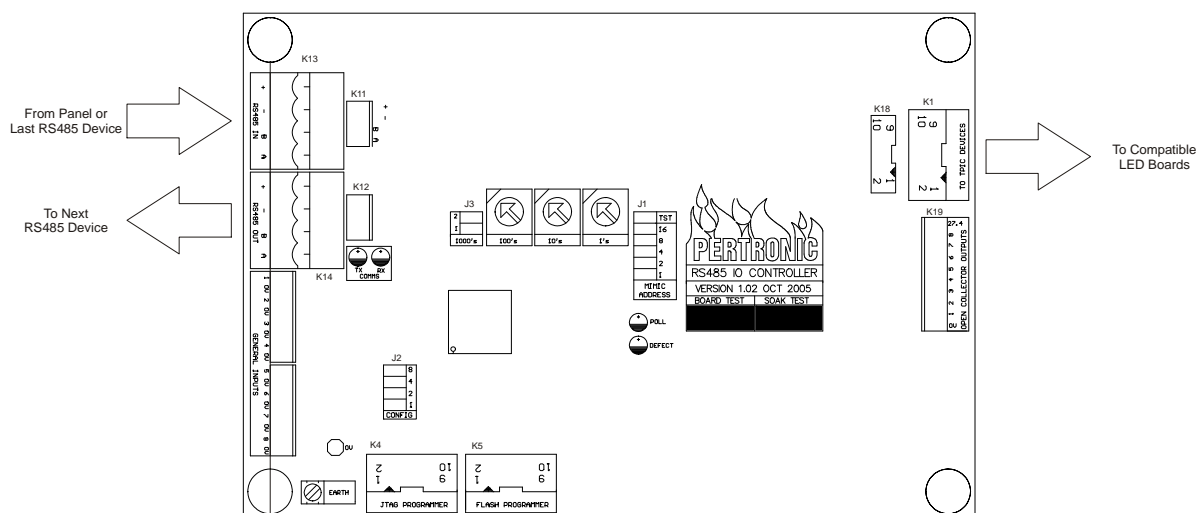


Figure 1: RS485 IO Controller Layout and Terminals

Mimic Addressing

The Mimic address links (1,2,4,8, and 16) are used for selecting the board's address from 1 to 31. The panel must be notified of the exact number of polled devices; otherwise, the panel will report a fault condition.

Start Address Selection

The three rotary switches together with the 1000's links are used to select the LED address for display in the first physical LED Position. Subsequent LEDs in the display will then follow the number sequence starting from the number selected for the first LED. For example, if 14 was selected by the rotary switches (100's = 1 and 10's = 4), then the first physical LED on the LED board connected directly to the **RS485 IO Controller** will be LED address 140. Similarly, if 0001 is selected, the first physical LED will be LED address 1. A base address of 0000 will cause an 'Internal mimic' defect/fault.

Board Connection

K1 is used for connecting the **RS485 IO Controller board** to a 8-way or 48-way OC Output Board via a 10-Way 2.54mm Ribbon cable. K8 is used for connecting the **RS485 IO Controller board** to an RS485 'IO Fan Controller and Indicating Boards' via a 10-Way 2mm Ribbon cable.

Display Terminator

A display terminator is required on the last device in the chain. This gives a return monitor signal by connecting pins 5 and 6 of the display bus.

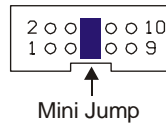


Figure 2: Display Termination

Lamp Test

To perform a lamp test, simply fit a mini jump into the 'test' link located above the Mimic Address links, or use the panel's 'Lamp Test' feature.

The Lamp test indication mode depends on Link 8:

- Without Link 8 fitted (standard mode)—
For each block of 8, the Lamp test turns on every 1st and 5th LED, starting from the base LED, incrementing 3 times at a rate of 400ms, and repeated until the test is terminated.
- With Link 8 fitted (Fan Block Mode)—
The Lamp test turns on every 1st and 5th LED for each block of 8, starting from the base LED, incrementing twice, and then illuminating LEDs 1, 2, 3 and 5, 6, 7 at a rate of 400ms for each block of 8 until the test is terminated.

Optionally, the Lamp Test can be disabled by fitting Config Link 4. This is useful if the I/O controller is used to drive relays or other output devices.

With the test link inserted and provided Link 4 is *not* inserted, the panel signals a mimic defect/fault while the Lamp Test is in progress.

Base Address LED Test

Fitting config LK2 allows identifying the LED (flashing) that corresponds to the selected base address.

The panel signals a mimic defect/fault while config LK2 is inserted.

Fault/Defect Indication

During normal operation, the defect LED is turned OFF. If a problem is detected, the defect LED turns ON.

If the controller is in lamp test or base address test, the defect LED is ON continuously.

If there is a problem with the LED Buss TPIC chain, the first flash is long.

If there is a problem with the RS485 connection to the panel, the second flash is long.

If the LED Base Address is set to 0, the Defect LED is turned ON.

All defects are reported back to the panel.

Mode of Operation

The **RS485 IO Controller** can operate in two modes: Standard Mode and Fan Block Mode.

Standard Mode

Standard Mode is selected by removing Config Link 8. In this mode, the **RS485 IO Controller** controls the output LEDs using direct 1:1 LED mapping. For example, if LED address 101 is turned ON via the panel, then the physical LED at address 101 is turned ON. When activated, each physical LED output flashes at a 400ms rate.

LED Address n	LED Address n+1	LED Address n+2	LED Address n+3	Physical LED
ON	x	X	x	LED 'n' flashes
X	ON	X	x	LED 'n+1' flashes
X	x	ON	x	LED 'n+2' flashes
X	x	X	ON	LED 'n+3' flashes
x = don't care state				

Table2: Standard Mode Truth Table

Fan Block Mode

Fan Block Mode is selected by fitting Config Link 8. In this mode, groups of 4 LED addresses are mapped to 3 consecutive physical LEDs on the LED chain. This is useful when using LED outputs to indicate the state of building equipment such as Fans.

As was the case for Standard Mode, LEDs addresses 'n' to 'n+2' are directly mapped to physical LEDs addresses 'n' to 'n+2'.

LED address 'n+3' is used to change the state of the physical LED address 'n' from steady to flashing. For example, when LED address 'n' is activated and LED address 'n +3' is not activated, then the physical LED located at address 'n' will remain steady. However, if LED address 'n' is activated and LED address 'n+3' is activated, then the physical LED at address 'n' will flash.

LED Address n	LED Address n+1	LED Address n+2	LED Address n+3	Physical LED
ON	x	x	OFF	LED Address 'n' turns on Steady
X	ON	x	X	LED Address 'n+1' turns on Steady
X	x	ON	OFF	LED Address 'n+2' turns on Steady
ON	x	x	ON	LED Address 'n' flashes
x = don't care state				

Table3: Fan Block Mode Truth Table

Local Open Collector Outputs

Eight local Open Collector Outputs are provided; these are mapped off the base address and are active when the relevant LED is active.

The Mapping is shown below:

- Open Collector Output 1 = Base Address LED
- Open Collector Output 2 = Base Address LED + 1
- Open Collector Output 3 = Base Address LED + 2
- Open Collector Output 4 = Base Address LED + 3
- Open Collector Output 5 = Base Address LED + 4
- Open Collector Output 6 = Base Address LED + 5
- Open Collector Output 7 = Base Address LED + 6
- Open Collector Output 8 = Base Address LED + 7

Note: These outputs always correspond to the 1 to 1 mapping off the base address.

The local Open Collector outputs do not activate during LED base address check or Lamp Test.

Ordering Information:

Part No.	Description
PBR54851OCONT PB48WOC-OUT	RS485 IO Controller 48-way display board
Part Number to be assigned for each product requested by a customer.	Fan Controller and Indicating board