# PERTRONIC INDUSTRIES LTD
# F4-RMAX Installation Note

## Product Overview:

The Pertronic **F4 Remote LED Mimic / Aux Relay Module F4-RMAX** is an optional extra for the Pertronic F4 conventional 4-zone fire alarm panel. This board enables the fire alarm panel to drive a remote LED mimic display over an RS485 communication circuit.

Installing an F4-RMAX adds three extra features to the F4 fire alarm panel:

- Serial port for a monitored remote LED Mimic
- Additional two-pole changeover **Auxiliary Fire** relay
- Additional two-pole changeover **Auxiliary Defect** relay

The F4-RMAX is compatible with F4 fire alarm panels fitted with version 5.02 or later firmware, and version 5.05 or later F4 master boards.

The **Auxiliary Fire** relay is normally de-energised and operates when any circuit activates into a **Brigade Calling Alarm. (**Except Circuit 4, if configured as **Direct Brigade Alarm – DBA.)**

The **Auxiliary Defect** relay is normally de-energised and operates when any fault occurs.

The F4-RMAX board may be fitted in an F4 panel that also has an F4 Type 5 Sound Control Board, provided the panel master board is version 5.05 or later.

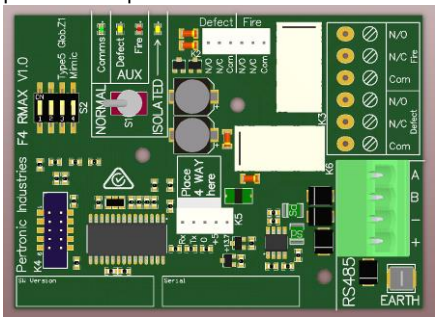


**Figure 1: F4-RMAX board.**

Note: Pertronic Industries recommend that the RMAX board should be used with the standard (flashing) mimic **F100PDB12**, in preference to the steady indication (F100PDB12S).

## Features*:*

- Interfaces an F4 fire alarm panel with a Pertronic 12-way LED mimic F100PDB12
- RS485 serial port
- 13.7 VDC (“12 Volt nominal”) power supply output for LED mimic
- Two-pole change-over (form C) **Auxiliary Fire** and **Auxiliary Defect** relays
- **Auxiliary Relay Isolate** switch

## Specification:

| | | |
|---|---|---|
| • Power Supply | 5 VDC | |
| • Current Consumption (Standby & Alarm) | 3 mA to 5 mA, excluding current drawn by mimic | |
| • RS 485 Data Rate | 9.6 kB/s | |
| • Relays, Two-Pole (Fire, Defect) | 2 A @ 30 VDC Form C (Changeover)* | |
| • Connections | | |
| ◦ F4 Masterboard | Ribbon Cable | |
| ◦ Earth | 2.5 mm² | |
| ◦ Mimic port (13.7Vdc & RS485) | 2.5 mm² | |
| ◦ Relays (Pole 1) | Ribbon Cable* | |
| ◦ Relays (Pole 2) | 2.5 mm² | |
| • Dimensions | 94 x 67 x 26 | H x W x D mm |
| • Weight | 50 g | |
| • Operating Temperature | -10 °C to +55 °C | |
| • Humidity | 10 % to 95 % RH, non-condensing | |

* We recommend 0.5 mm² cable if pole 1 is required to switch more than 1.5 Amps (continuous).

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## Installation:

**1. IMPORTANT: If installing the F4-RMAX into an existing F4 fire alarm system, MAKE SURE that all appropriate precautions have been taken to ensure that:**

- **The brigade will be called if a fire occurs, and**
- **The brigade will not be called accidentally during installation, and**
- **The fire alarm system is properly reinstated to working order when the installation work is finished.**

2. Check that the F4 fire alarm panel is suitable for the F4-RMAX board. The master board **must** be version 5.05 or later. It may be necessary to upgrade the firmware, which must be version 5.02 or later.

3. Check that all necessary parts are available:

- F4-RMAX board
- Five-way ribbon lead, (Note: If the F4-RMAX board will be used only for the additional **Auxiliary Fire** and/or **Auxiliary Defect** relay, a four-way ribbon lead may be used. The ribbon lead's fifth conductor supplies 12 Volt (nominal) power, which is used only for the remote mimic.)
- Earth lead with 3.5 mm or 4 mm ring terminal at one end
- Three nylon dome-end 6.3 mm PCB standoffs (PSR06X)

4. Make sure the installation work will not trigger a false alarm. Then, disconnect the power and unplug the battery.

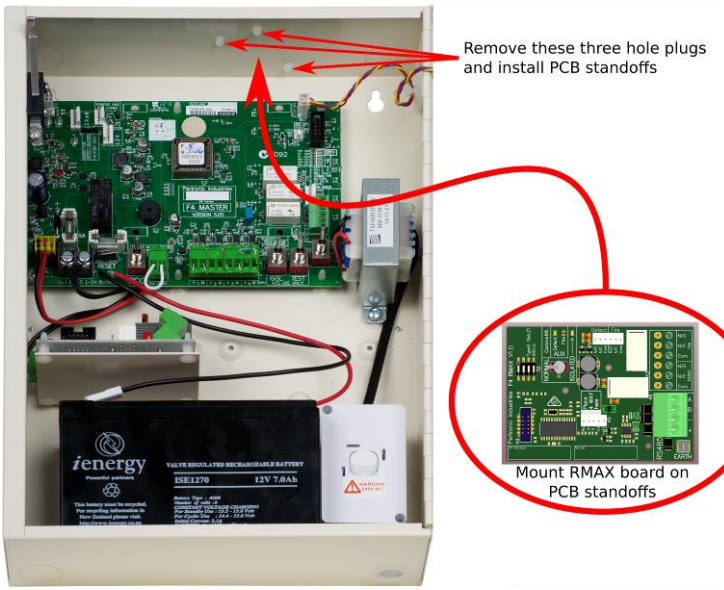


**Figure 2: Installing the RMAX board in the F4 cabinet.**

5. Remove the three hole plugs from the three 4.8 millimetre holes in the cabinet's top panel.
6. Insert PCB standoffs in the three holes on the top panel.
7. Connect the earth lead to the **EARTH** screw terminal on the F4-RMAX board.
8. Connect the ribbon lead to K18 on the F4 master board. Observe correct polarity, see Figure 4.
9. Connect the ribbon lead to K5 on the F4-RMAX board. Observe correct polarity.

10. Clip the F4-RMAX board in place on the standoffs.
11. Fit the earth lead ring terminal under the mounting screw at the lower left corner of the F4 master board.
12. Remove jumper MJ5 from the F4master board to enable serial communication between the F4 master board and the F4-RMAX board.

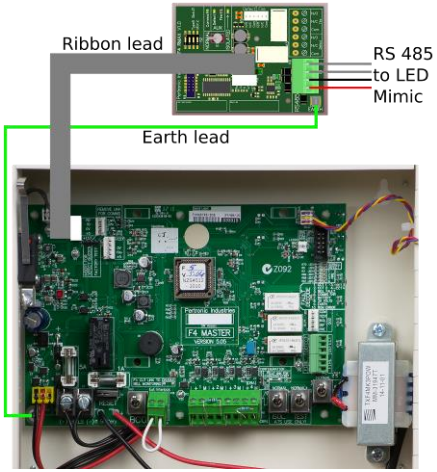


**Figure 3: F4-RMAX internal wiring.**


**Figure 4: F4 panel with RMAX and Type 5 boards.**

13. Set the DIP Switches to the desired configuration.

***DIP Switch Settings***

| | |
|---|---|
| SW1 | Not used |
| SW2 | Not used |
| SW3 | Type 5 Global Z1 |
| SW4 | LED Mimic Enable |

If the panel is fitted with an **F4 Type 5 Sound Control Board**, then, with RMAX connected and SW3 OFF, zones 1, 2, 3 and 4 function as standard zones.

If the panel is fitted with an **F4 Type 5 Sound Control Board,** with RMAX connected and SW2 ON, zone 1 operates in global zone mode and zones 2, 3, and 4 (if non-DBA) operate in standard zone mode.

Note that when the RMAX board is fitted, link MJ5 on the master board must be removed to enable communications. In this case, SW3 on the RMAX board takes control of the global zone mode. For more details, please refer to the F4 Technical Manual, Section 9.8.7

14. Connect the RS485 cable (K6), Auxiliary Fire and/or Auxiliary Defect cables (K2, K3), as required. **Pertronic Industries recommend twisted pair cable for all RS485 connections.**

***RS 485 Connection to Mimic (K6)***

| | |
|---|---|
| + | 13.7 VDC (12 Volt nominal) supply |
| 0 | Supply return |
| A, B | RS485 Data |

The maximum length of cable between the panel and the mimic is 1.2km. The signal lines must be terminated at the mimic with a 470 Ω resistor placed between A and B.

15. Check that the address jumpers on the **RS485 LED Display Unit F100PDB12** are set to address 1, as described in the RS485 LED Display Unit Installation Note.
16. If all is correct, reinstate and verify the system.

## Operation:

***F4-RMAX Board***

The processor on the F4-RMAX board communicates with the fire alarm panel over an internal serial communication bus. The F4-RMAX processor drives the RS 485 transceiver for communication with the Remote LED/ Mimic Display. The F4-RMAX processor also drives the **Auxiliary Fire** and **Auxiliary Defect** relays.

A two-position **Aux Relays Isolate** switch on the F4-RMAX board isolates the **Auxiliary Fire** and **Auxiliary Defect** relays **on F4-RMAX board only**. If this switch is left in the **Isolated** position when the panel door is closed, the panel reports a **Door Interlock** fault.

Internal monitoring firmware in the F4-RMAX board drives four indicator LEDs mounted alongside the **Aux Relays Isolate** switch. These LEDs indicate the following conditions:

- **Fire** Red **Auxiliary Fire** relay active
- **Defect** Yellow **Auxiliary Defect** relay active
- **Isolated** Yellow **Aux Relays Isolated**
- **Comms** Green Communications OK. This LED turns off for any communications fault.

If the F4-RMAX board has power, but the internal serial communication bus is unresponsive, the on-board **Fault**, **Fire** and **Isolate** LEDs flash at 1Hz, 50% duty cycle

***F4 Fault Decode Indication (LED 1)***

The introduction of the F4-RMAX board required an update to the F4's firmware. Notably, the upgraded firmware (≥ version 5.02) needs to be able to report two additional Fault codes: **Remote Mimic Aux Fault**, and **Remote Mimic Missing**.

This update changed the operation of the internal **Fault Decode** indicator (LED 1). If the panel firmware detects a fault, LED 1 starts repeating a sequence of short and long flashes. The sequence consists of twelve flashes, numbered 1 to 12. Each flash corresponds to one of the twelve defined fault codes. At any position in the sequence, a short flash indicates normal operation, whereas a long flash shows that the corresponding fault has been detected. On a panel with firmware older than version 5.02, LED 1 would flash only ten times during each **Fault Decode** sequence.

Note that the firmware upgrade did not change the **Fault Decode** protocol. The fault indication latches to show current as well as historical defects. LED 1 continues flashing the **Fault Decode** until the panel is reset, even if the fault is cleared. The **Fault Decode** sequence may indicate up to seven fault codes. If the fire alarm panel has detected more than seven faults, the **Fault Decode** sequence indicates the seven most recently-detected faults.

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**NOTE**: LED 1 flashes while the F4 panel is starting up. This start-up sequence is normal. It has nothing to do with the **Fault Decode Indication**.

***RS485 LED Display Unit***

The **RS485 LED Display Unit F100PDB12** is a versatile Remote LED / Mimic Display that communicates with the F4 fire alarm panel through the F4-RMAX board's RS 485 transceiver.
The LED display board displays three global indicators (**Fire**, **Defect** and **Normal**) plus four LED zone indicators.

***LED Display Unit Functions***

- The LED display board's **Fire** LED lights up if there is an alarm on any of the F4's four zones
- Alarms on zones 1 to 4 on the F4 fire alarm panel operate the corresponding zone LEDs (1 to 4) on the LED display board
- The F4-RMAX board supports only address 1 on the F100PDB12
- The **Sprinkler** LED on the F100PDB12 is not used
- F4-RMAX board does not support the F100PDB12's **Acknowledge** input

## Backward Compatibility:

1. The **F4-RMAX** may be used in place of the **F4 Auxiliary Relay Board F4AUXRLY** and **F4AUXRLYV2**.
   When installed in F4 fire alarm panels with firmware prior to version 5.02, the F4-RMAX will provide only the **Auxiliary Fire** and **Auxiliary Defect** relays. It will not be able to drive the RS485 circuit for a remote mimic.
   **NOTE**: The F4 Auxiliary Relay Board connects to the F4 master board with a 4-way ribbon lead. If the F4 Auxiliary Relay Board is replaced with an F4-RMAX board, make sure the 4-way ribbon lead is plugged on to the correct pins. The 4-way ribbon lead must connect to Rx, Tx, 0, and 5V. A 4-way ribbon lead will not supply 13.7 Volt power to a remote mimic. If a remote mimic is required, it will be necessary to add an additional wire for the 13.7 VDC supply, or use a 5-way ribbon lead.
   When installed in F4 fire alarm panels with firmware prior to version 5.02, the F4-RMAX will provide only the **Auxiliary Fire** and **Auxiliary Defect** relays. It will not be able to drive the RS485 circuit for a remote mimic.
2. The F4 master board, from version 5.05 and firmware version 5.02 onward, retains the ability to drive the **F4 Auxiliary Relay Board F4AUXRLY,** and **F4AUXRLYV2**

| **Ordering Information:** | |
|---|---|
| **Code** | **Description** |
| **F4-RMAX** | F4 Remote LED Mimic / Aux Relay Module |
| **F100PDB12** | 12-Way SMD Smart (Flashing) LED Display Board |
| **F100PDB12-S** | 12-Way SMD Smart (Steady) LED Display Board |
| **F4T5SCNT** | F4 Type 5 Sound Control Board with Hush |