MORLEY-IAS FIRE SYSTEMS	Technical Data Sheet
	EXP038B - Hi485 Interface

Unit Specification

Dimensions:	145mm × 112mm × 22mm
Supply Voltage:	18V - 28V DC
Supply Current:	40mA @ at 24V DC (typical)
	100mA maximum in fault condition
Volt free contact rating:	1A @ 24V DC
Communications:	3 × RS485 balanced transmission ports

Introduction

The Hi485 Interface has three bi-directional RS485 ports, between which unrestricted communication of data is allowed. Several Hi485 Interfaces are typically used to form a loop. This ensures that data is communicated to every device connected to the line, even if a fault exists, and each interface acts as a node access point onto the loop. Adjacent nodes are able to detect and isolate transmission line faults such as short and open circuits that exist on the wiring between. The nodes also act as signal repeaters/boosters, which enables “High Integrity” loops of up to 12km to be constructed.

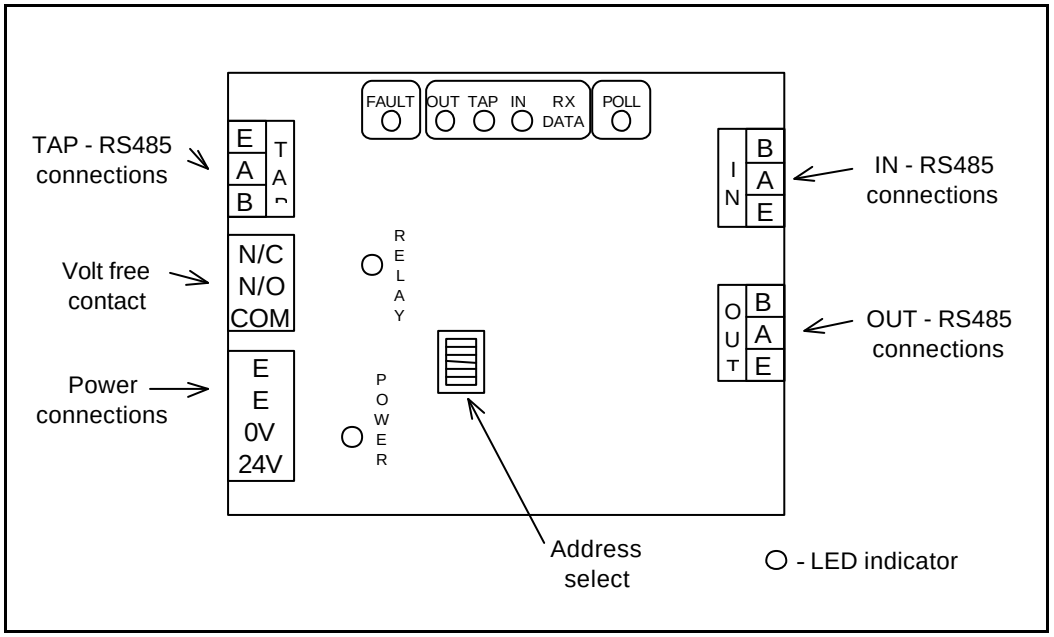

Fig. 1 Hi485 board layout and connections.

The board layout is shown in Figure 1. The board has three RS485 plugs, consisting of two data lines, and an earth connection for cable shielding. A volt free contact, also on the board, is switched during fault conditions and can be monitored or used to trigger external alarms.

Each node has a 6 position DIL switch to set the node address. The settable address range is between 0 and 63. This address is independent of the panel network address. Diagnostic control can be

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exercised and status reports obtained from each node in a system. Each node should be set to a unique address.

Loop Wiring Conventions and Distance Limitations

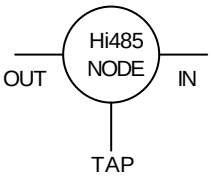

Fig. 2 Representation of a Hi485 Node.

The node, represented in figure 2, has three distinctly labelled ports OUT, IN and TAP. Each port is filtered to restrict noise entering and leaving the node and prevent potentially damaging voltage spikes affecting circuitry. When wiring a loop the node OUT port should be connected directly to the next nodes' IN port, this line can be up to 1.5km long. No other RS485 devices should be connected between the nodes. Wiring should be in the form of a loop, connecting all nodes. Up to 20 nodes can be placed on a loop, the limiting factor is that the loop should not exceed 12km in length. Peripherals, panels, and all other devices communicating by RS485 protocol should be connected to the nodes' TAP connection in a daisy chain fashion. This line can be up to 1km long, and support 31 peripherals. Spurs on the TAP line should not exceed 2m to prevent reflections. Cables should, ideally, be twisted pair type with an outer foil shield (or copper shield for MICC) for maximum immunity from external magnetic fields.

A typical RS485 loop containing five Hi485 interface boards is shown in Figure 3. Two of the nodes have daisy chain connections on their TAP connections for multi-drop communications, another two nodes are connected to only one device. The remaining node is arranged with nothing connected to its TAP terminal, and acts as a booster, increasing the distance between panels up to 3km.

The Hi485 Interface board can be conveniently mounted in a fire panel enclosure as shown in Figure 4. A 485 interface card on the fire panel is used to connect to the node TAP port, and so provide a data path on to the loop. Power connections are taken from the panel auxiliary supply.

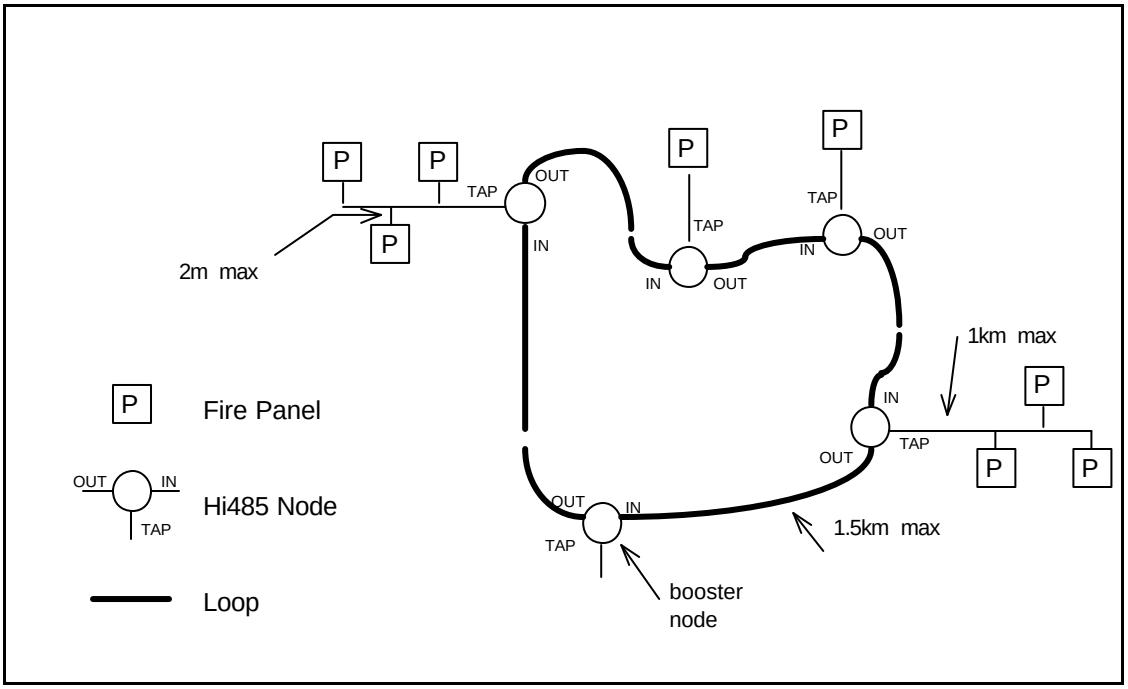

Fig. 3 Typical configuration of a Hi485 loop.

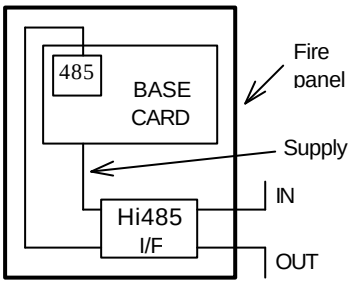

Fig. 4 Hi485 Interface installed in a fire panel enclosure.

LED Indicators

The node has 7 LED indicators that assist in commissioning and allow node operation to be verified.

LED	Colour	Function
1	YELLOW	FLASHING - Indicates data transmission received on OUT port
2	GREEN	ON - Indicates presence of a DC source, assuming the fuse is not blown
3	YELLOW	FLASHING - Indicates data transmission received on TAP port
4	YELLOW	FLASHING - Indicates data transmission received on IN port
5	RED	ON - Indicates relay has been activated
6	RED	ON - Indicates a fault condition exists – can be used to determine between which nodes a fault exists
7	YELLOW	FLASHING - Indicates node is being polled with diagnostic commands

Installing the Board

Mounting in an Enclosure

The module can be conveniently located in a suitable enclosure.

The board fixing points are shown in the diagram opposite.

The board should be installed in the enclosure using the M3 spacers and screws supplied.

The enclosure should be provided with a suitable earth point for cable screen connection.

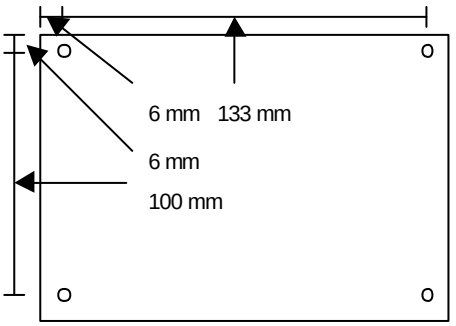

Figure 5 - Board Fixing Points

Installation Wiring

Installation wiring will be required for the RS485 Communications links and the DC Power Supply Input.

For suitable cables, refer to the Panel Installation Manual. The use of screened cables for both the communications and power supply wiring is recommended. The EXP038B - Hi485 Interface must be connected to a suitable earth point through the power supply cable.

Power Supply Input

The module is to be powered from a regulated, 24VDC Power Supply. The PANEL Auxiliary Power Output is a suitable power source.

The power input terminal block connections are shown in the diagram opposite.

The board and the chassis must be connected to earth. Use the earth core in the incoming power cable.

The EXP038B - Hi485 Interface provides electrical isolation between the 24V supply and the earth-referenced RS-485 communication terminals. A 0.4A poly fuse provides supply current surge and reverse polarity protection.

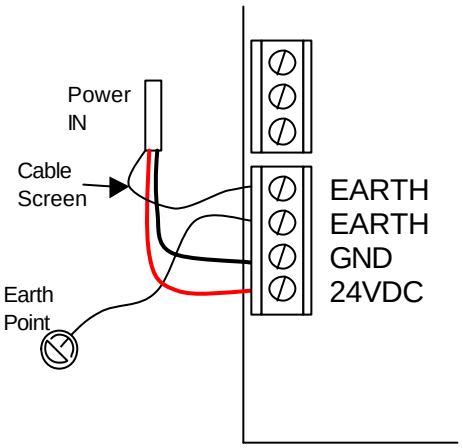

Figure 6 - Power Supply Input Terminations

RS485 Wiring to the PANEL

The EXP038B - Hi485 Interface card 'TAP' interface is connected to the RS485 Interface Module located in Ports 'B', 'C' or 'D' of the Panel.

Connect the drain wire for shielded cable to the 'Earth' terminal of the Data Terminal Block.

Connect signal 'A' on the EXP038B - Hi485 Interface to signal 'A' on the PANEL or other unit. Connect signal 'B' on the EXP038B - Hi485 Interface to signal 'B' on the PANEL or other unit.

An improperly grounded shielded cable may aggravate rather than eliminate noise problems. Reconnect the shielded cable drain each time the cable is cut to install a device.

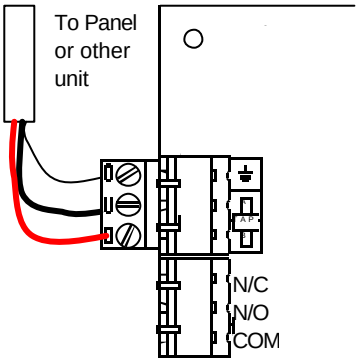

Figure 7 - RS485 'TAP' Connections

RS485 High Integrity Loop Wiring

The High Integrity Loop is created when multiple EXP038B - Hi485 Interface modules are connected directly to each other's High Integrity Circuit Input / Output Terminal Blocks.

To ensure loop integrity, there must be no other RS485 devices connected to the wiring between the High Integrity Output Circuit Blocks.

Each block has connections for two data lines and an earth connection for cable shielding. Connect the drain wire for shielded cable to the 'Earth' terminal of the Data Terminal Block.

Connect signal 'A' on the EXP038B - Hi485 Interface (OUT) to signal 'A' on the next EXP038B - Hi485 Interface (IN). Connect signal 'B' on the EXP038B - Hi485 Interface (OUT) to signal 'B' on the next EXP038B - Hi485 Interface (IN).

An improperly grounded shielded cable may aggravate rather than eliminate noise problems. Reconnect the shielded cable drain each time the cable is cut to install a device.

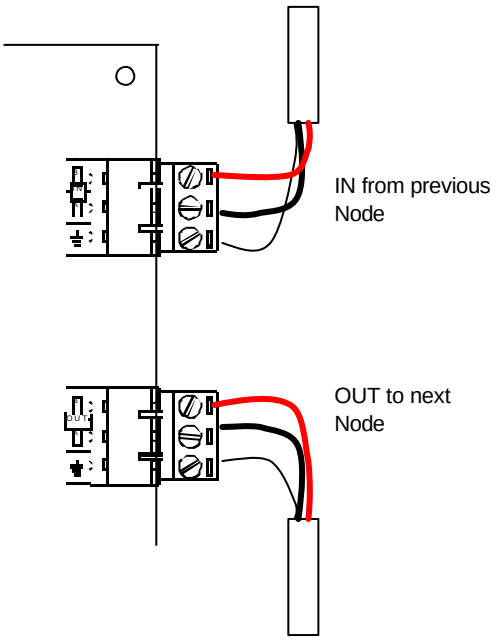

Figure 8 - High Integrity Loop Terminations