INSTALLATION SAFETY REQUIREMENTS

This product has been designed to comply with BS EN615111 installation category II and pollution degree 2. These are defined as follows:

INSTALLATION CATEGORY II

Pollution Degree 2: Normally, only non-conductive pollution occurs. However, there may be occasional conductive pollution caused by condensation; such pollution shall be expected.

PERSONNEL

Installation must be carried out only by qualified personnel.

ENCLOSURE OF LIVE PARTS

To protect hands or exposed body parts that may be electrically live, the unit must be installed in an enclosure.

BLACK TERMINAL UNIT

Base units are supplied to hold 16 modules. In the event that a Base Unit is not fully populated, it should be terminated with a blanking plate to the front of the unit, as required. This is to immediately to the right of the last module in order to maintain IP20 rating.

WARNING: Live sensors may be damaged or destroyed. Please install protective circuitry around the sensor to avoid electrical damage.

CAUTION: Protective earth terminal is to be connected directly to an electrical heating circuit. However, you must ensure that service personnel do not touch any of these circuits while they are live. With a local installation, all cables, connectors and switches for connecting the sensor must be main rated.

WIRING

It is important to connect the unit in accordance with the wiring data given in this section, especially when connecting low voltage signal inputs, sensor inputs or other low level inputs and outputs. Only use copper conductors for connection purposes. DIN rail supports may be used in accordance with all local wiring regulations. For example in the UK use the latest version of the IEE wiring regulations (BS7671). In the USA use NEC Class 1 wiring methods.

POWER ISOLATION

The installation must include a power isolating switch or circuit breaker. This device should be close proximity to the unit when installed and be clearly marked as the disconnecting device for the instrument.

EARTH LEAK CURRENT

Due to RFI Filtering there may be an earth leakage current of up to 3.5mA. This may exceed the rating of an installation of multiple units protected by Neutral Current Device (RCD) or Ground Fault Detector (GFD) type circuit-breakers.

OVERCURRENT PROTECTION

It is recommended that the OC power supply to the system is fused appropriately to protect the relay components andlimit the maximum load. This protection is achieved on the 72550R module to protect the supply from a fault within the unit.

VOLTAGE RATING

The maximum continuous voltage applied between any of the following must not exceed 240V ac rms.:

- I/O input or I/O relay output to logic, dc or sensor connections;
- any connection to ground;
- the unit must not be wired to a three-phase supply with an unbalanced star connection.

Under no circumstances such a supply could rise above 220V ac with respect to ground and the unit would not be safe.

EQUIPMENT & PERSONNEL PROTECTION

1. The designer of any control system must consider the potential failure modes of control equipment, for example, critical control functions, provide a means to achieve a safe state during and after a failure path.

2. Separate or redundant control paths must be provided for critical control functions.

3. System components may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the links.

4. Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

CONDUCTIVE POLLUTION

Electrically conductive pollution is likely to be excluded from the enclosure in which the unit is mounted. To secure a suitable atmosphere in conditions of conductive pollution, fit an air filter to the air intake of the enclosure. Where condensation is likely, include a thermally controlled heater in the enclosure.

INSTALLATION REQUIREMENTS FOR EMC

To ensure compliance with the European EMC directive certain installation precautions are necessary for general duty sites and EMC installations. Part no. HA254446 if using relay outputs it may be necessary to fit suitable filters for suppressing the emissions. For typical applications we recommend Schaffner FN312 or FN612. Do not install more than 8 FI2 modules in a single Base Unit if the channel output load at 24V is more than 5mA per channel. If more loads are required than this restriction permits, an external power supply must be used.

COMPACT FLASH (CF) CARD PRECAUTIONS

The flash card must not be reformatted. Files and System folders must not be loaded. For typical applications we recommend Schaffner FN321 or FN612. Do not install more than 8 FI2 modules in a single Base Unit if the channel output load at 24V is more than 5mA per channel. If more loads are required than this restriction permits, an external power supply must be used.

RESTRICTION OF HAZARDOUS SUBSTANCES

All Modules, including the IOC Modules comply with the 40 Year Environment Friendly Usage Period.

MANUFACTURING ADDRESS

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The Base Unit TO MOUNT THE BASE
This unit is intended to be mounted with an enclosure, or in an environment suitable for IP65. It must be mounted horizontally. DIN RAIL MOUNTING (HORIZONTAL)
1. Mount the DIN rail horizontally, using suitable bolts.
2. Ensure that the DIN rail makes good electrical contact with the metal base of the enclosure.
3. Use screws (1) in the base, and allow, and the associated base retention clip (2) to drop to the bottom of the screw slot.
4. In the back of the base is an extruded slot which locates with the DIN rail (3).
5. Fit the top edges of this onto the top edge of the DIN rail (3). Slide the screw (1) with the associated clips (2) upwards as far as they will go towards the top of the screw slots. The angled edge of the base retaining clip (2) must locate behind the bottom edge of the DIN rail.
6. Tighten the screws (1).
DIN RAIL MOUNTING (VERTICAL)
The base unit must be mounted vertically, but, in such a case, a faith should be fitted in the rear in such a manner as to ensure that the module is supported.
1. Mount the DIN rail vertically, using suitable bolts.
2. Ensure that the DIN rail makes good electrical contact with the metal base of the enclosure.
3. Loosen screws (1) in the base, and move them and the associated base retention clip (2) to the bottom of the screw slot.
4. In the back of the base is an extruded slot which locates with the DIN rail (3).
5. Fit the top edge of this into the top edge of the DIN rail (3). Slide the screws (1) with the associated clips (2) upwards as far as they will go towards the top of the screw slots. The angled edge of the base retaining clip (2) must locate behind the bottom edge of the DIN rail.
6. Tighten the screws (1).
DIRECT PANEL MOUNTING
1. Remove the three base retention clips (2).
2. Hold the base horizontally on the panel and mark the position of the four holes on the panel.
3. Drill two 5.2mm holes in the panel.
4. Using MS bolts supplied, secure the base to the metal panel.

Terminal Unit (Simplex and Duplex Unit)
The Terminal Units have inputs and switches for configuring the Modbus address and instrument. They also accept a 4-20mA input from a Fieldbus or PROFIBUS network and may be used as a Panel/Network Interface (PNI).

SW1: LIN ADDRESS CONFIGURATIONS
In Duplex mode, the primary is indicated by the red address label (first address) and the secondary, the red address label (second address). If the second address must override, and become the primary, it will also take over the even address.

In Simplex mode, it always adopts the even address. It is strongly recommended that the odd address remains unallocated on this LIN segment to avoid address clashes of a secondary module is subsequently added.

A Simplex Unit always requires a master that it is addressed to, and it is strongly advised that the odd address remains unallocated on this LIN segment.

Connecting the 24Vdc Power Supply

I/O Modules & Terminal Units
TO FIT A TERMINAL UNIT
1. Locate tag (1) on the Terminal Unit PCB with the Terminal Unit (2) and close the retaining lever. The module is fitted in the slot in the Base Unit.

TO FIT A MODULE
The module must be slid into the slot and fixed with the Retaining lever in the open position, as shown, or the module may drop down. On Duplex Module, the Module is removed from the slot in the Base Unit.

1. Open the Retaining lever on the face of the module (4).
2. Insert the module (5), ensuring that it engages with the backplane and terminal unit connectors.
3. Once secure, close the retaining lever.
4. To remove a module, open the retaining clip and pull the module out of the base unit.

I/O MODULE TERMINATION DETAILS
The modules terminate accept wires sizes from 0.20 to 2.5mm² (14 to 24AWG). The screws should be tightened to 0.4Nmm (3.5 in lbf) using a 3mm flat screwdriver.

Simplex Terminal Unit

<table>
<thead>
<tr>
<th>SW1: Function</th>
<th>SW1: Option</th>
<th>Bit 1(7)</th>
<th>Bit 2(6)</th>
<th>Bit 3(5)</th>
<th>Bit 4(4)</th>
<th>Bit 5(3)</th>
<th>Bit 6(2)</th>
<th>Bit 7(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address (MSB)</td>
<td>Yes/No</td>
<td>Yes Yes</td>
<td>Yes/No</td>
<td>Yes</td>
<td>No/Yes</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Address (LSB)</td>
<td>Yes/No</td>
<td>No/Yes</td>
<td>Yes</td>
<td>No/Yes</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Simplex Unit

Pin Colour 3-wire signal 5-wire signal Pin Signal Description
1 Orange/White TX+ | Shield (ground) | Shield (ground) | TxB | 1
2 Orange TX- | Shield (ground) | Cmn | 2
3 Green/Black RX+ | Shield (ground) | Cmn | 4
4 Blue/White N/A | N/A | 5 Cmn | 6 VP | 5V |
5 Blue/White N/A | N/A | 6 Cmn | N/A | N/A |
6 Green Cmn | Cmn | 7 Addr. Bit 6 | N/A | N/A |
7 Addr. Bit 7 | N/A | N/A | N/A | N/A |
8 Addr Bit 3 | N/A | N/A | N/A | N/A |
9 Addr Bit 2 | N/A | N/A | N/A | N/A |
10 Addr Bit 1 | N/A | N/A | N/A | N/A |

Pin 1 and Pin 3 of the twin RJ45 connector are used for communications. Pin 2 and Pin 4 of the twin RJ45 connector are used for chassis earth. This connection also provides a ground for EMC purposes. Batteries must be disposed of according to current local regulations, if batteries are abused, a caustic solution may leak that can result in the corrosion materials.

If batteries are abused, a caustic solution may leak that can result in the corrosion materials. Batteries must be disposed of according to current local regulations.

SERIAL NETWORK CONNECTOR (EIA 485)

The Serial network supports Modbus and PROFIBUS communications protocols. PROFIBUS communications are via the RS-422/485 interface on the Terminal Unit, while PROFIBUS communications are via a dedicated PROFIBUS network. The system permits the use of Profibus master, by detecting the fastest baud rate that all modules use a maximum power of 100mW. The Terminal Unit operates at 12M baud.

COMMUNICATIONS LINE TERMINATOR
The communications line terminator on the last device in the chain uses the local adaptors. To minimise on site wiring and to ensure the correct customer terminology, Adapter is available from your supplier.

RJ45 LINE TERMINATION
The T568B wiring pattern is used and removed from the T568A connector. This connector is plugged into the RJ45 socket in the chain. If the operating interface is a PC or PDA, this should be terminated according to the appropriate baud rates.

LINK CONFIGURATION
Modbus Terminal Unit

Modbus Configuration

Address

Terminal Unit

Address

Link Configuration

RJ45 to Serial Device

RJ45 to Serial Device

Address

Serial Communications (Modbus & PROFIBUS)

The Serial network supports Modbus and PROFIBUS communications. Modbus communications are via the RS-422/485 interface on the Terminal Unit, while PROFIBUS communications are via a dedicated PROFIBUS network.