F650A Redundant fieldbus power system

Instruction Manual

INM F650A

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Figure1 F650A–LS assembly

1 OVERVIEW

The MTL-Relcom redundant fieldbus power system (FPS-Series) provides redundant power conditioning for fieldbus network segments and facilitates the connection of redundant input power supplies. The system is fully 'hot-swappable' meaning that individual power conditioning modules and input power supplies can be replaced without interrupting power or communication on the fieldbus segment. An alarm circuit provides warning in case of a power conditioning module or input power supply failure. The system is designed so that power for several fieldbus segments can be provided from a single cabinet with minimal wiring.

2 DESCRIPTION

The F650A is designed to provide redundant fieldbus power conditioners for the Honeywell Experion PKS Fieldbus Interface Module (FIM), supporting two H1 fieldbus segments. Each F650A includes two FPS–IPM plug–in power modules for each of the fieldbus segments. These modules function as power conditioners, providing impedance between the input DC power supply and the fieldbus. This impedance is necessary to prevent the input DC power supply from degrading the digital fieldbus signal. One fieldbus segment terminator is permanently connected in each segment.

The Field trunk on each segment, uses a 3-way removable screw terminal. Power for both segments is common and derived from two diode OR'ed sets of connections allowing redundant bulk power supplies to be used. The power inputs are galvanically isolated from the Fieldbus circuitry via the IPM modules. Alarm circuitry is housed in a separate module which plugs onto the backplane. An alarm signal is sent to the Honeywell Control system via the multi-way connectors in the event of failure of the 24VDC inputs, or loss of power to the fieldbus segments.

3 COMPONENTS AND ACCESSORIES

The F650A–LS redundant fieldbus power supply system includes the following component parts: (see component part numbers below):

4 x FPS–IPM
1 x FPS–ALM
1 x F650A–CL–PS

COMPONENTS AND ACCESSORIES

PART No	DESCRIPTION
FPS–IPM	Power Module
FPS–ALM	Alarm Module
F650A–CL–PS	F650A Carrier, Screw Terminals
DMK–HONA	Size A FTA Mounting Plate
FPS–BLK10	Blanking Module (pack of 10)

4 DIMENSIONS

Important dimensions for the F650A–LS assembly are shown in Figure 2.

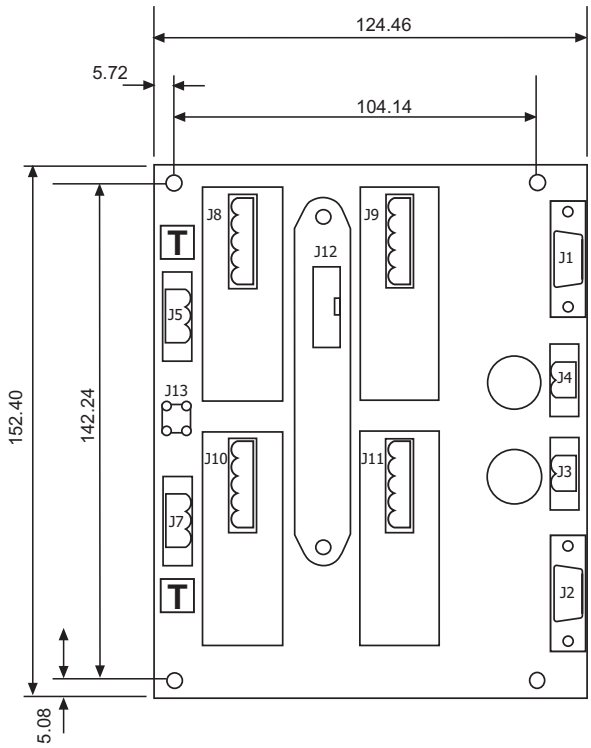

Figure 2 F650A-LS circuit board showing connectors

5 INSTALLATION

5.1 Mounting & enclosure requirements

5.1.1 General

These power supplies may be mounted only in safe areas and wherever they are located, the mounting conditions must:

(a) prevent any form of pollution that could compromise the operation of the unit. For example, an unpolluted location or a suitable enclosure could be chosen.

(b) provide an adequate level of mechanical protection. This can be achieved by selecting a protected location, a suitable enclosure, or a combination of both.

(c) ensure that all cable entries and connections are secure by making provision for the careful routing and securing of all cables.

(d) provide adequate security against unauthorised interference.

(e) ensure that the permitted ambient temperature range of the units (–40°C to + 65°C) is not exceeded. Power dissipation within the enclosure and the use of shading against direct sunlight should be considered.

5.1.2 Outdoor mounting

Where power supplies are to be mounted in outdoor locations, a suitable enclosure with a minimum of IP54 ingress protection is required. However, in some locations, a higher degree of ingress protection rating is recommended since corrosion resistance may be necessary or desirable and the emphasis should be placed on the suitability for the application.

5.2 Mounting orientation

It is recommended that the F650A assembly is mounted on a vertical surface with the orientation of the IPM modules as shown in figure 2 above.

5.3 Surface mounting

The F650–CL–PS is supplied fitted with four M3.5x 20mm screws and 11mm nylon spacers, on fixing centres shown in figure 2. The F650A has the same dimensions as a size 'A' Honeywell Remote Termination Panel (RTP) and is suitable for mounting in the standard mounting channel.

5.4 DIN–rail mounting

Mounting the assembly on 'Top hat' DIN–rail (35mm x 7.5mm or 35mm x 15mm to EN50022) may be achieved through the use of the DMK-HONA mounting plate. The F650A assembly is first attached to the DMK-HONA mounting plate using the fitted M3.5 screws and spacers provided on the assembly – see Figure 3a. The underside of the DMK-HONA mounting plate (Figure 3b) provides the DIN rail fixings.

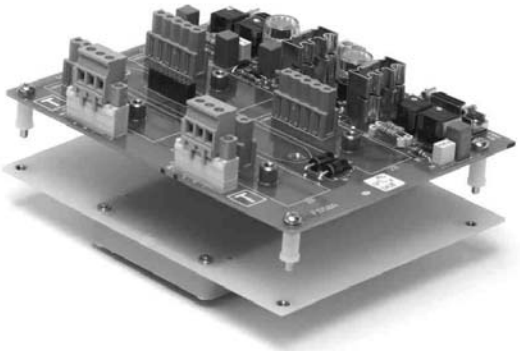

Figure 3a DMK-HON A with F650A assembly - top

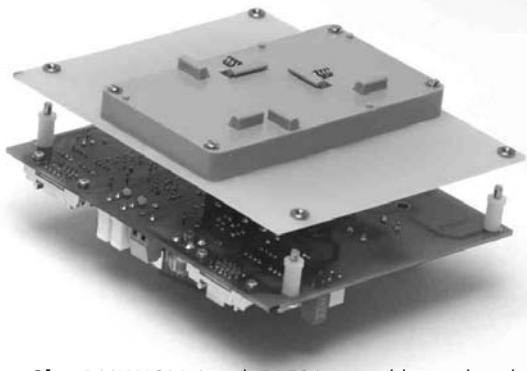

Figure 3b DMK-HON A with F650A assembly - underside

The DMK-HONA has been designed to permit the assembly to be mounted on vertical or horizontal DIN rail – see figure 4. The mountings have spring loaded clips to retain the assembly.

To mount the complete assembly onto a DIN rail:

1) locate the DIN rail against the appropriate (vertical or horizontal) sprung clip,

2) push against the sprung clip until the assembly will sit flat against the rail, then

3) release the pressure against the spring, ensuring that the other sides of the clips are now gripping the DIN rail.

Removal requires pressing the assembly against the spring clip until the other static clips are released from the rail and may be lifted away.

5.5 Power Requirements

Dual power terminals are provided to enable the use of redundant bulk power supplies. Supply voltages shall be in the range of 18-30V dc (nominally 24V dc) and the cable length to any bulk supply shall be limited to a maximum of 30 metres.

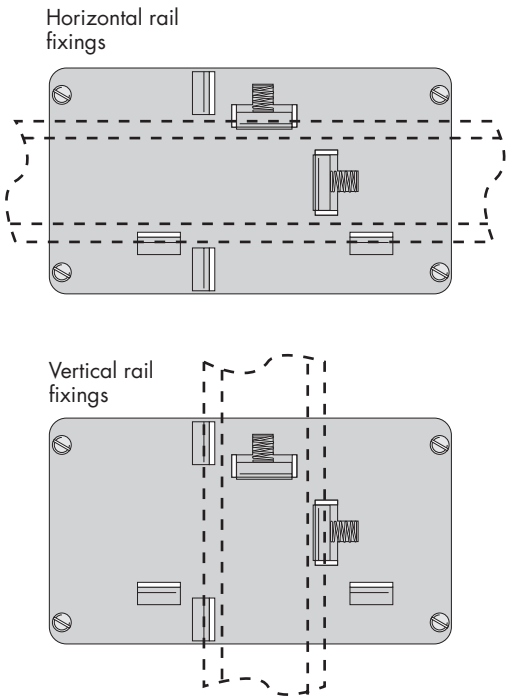

Figure 4 DIN-rail mounting options

5.6 Connections

Various connections are provided on the F650A. Refer to figure 5 for detail and position.

System

Redundant connectors J1 and J2 via TC–FFCOxx cables to Experion PKS Fieldbus Interface Modules. These cables should not exceed 30 metres in length.

Alarm

On each RTP connector, a single pair of contacts (inside the alarm module) links pins 6 and 16 to signal 0V (pins 5, 7, 8, 11, 13, 15, 17, 18). Pins 10, 19 and 20 are not connected. Pin 9 is connected to signal 0V.

Fieldbus

Two-part pluggable connector with rising cage clamp screw terminals

Conductor size: 0.14 to 2.5mm^2

Power input

Two-part pluggable connector with rising cage clamp screw terminal.

Conductor size: 0.14 to 2.5mm^2

Screen (J13)

To connect fieldbus and host cable screens to a common point (cabinet earth). This connector is common to each of the four mounting feet.

Terminators

One per channel included.

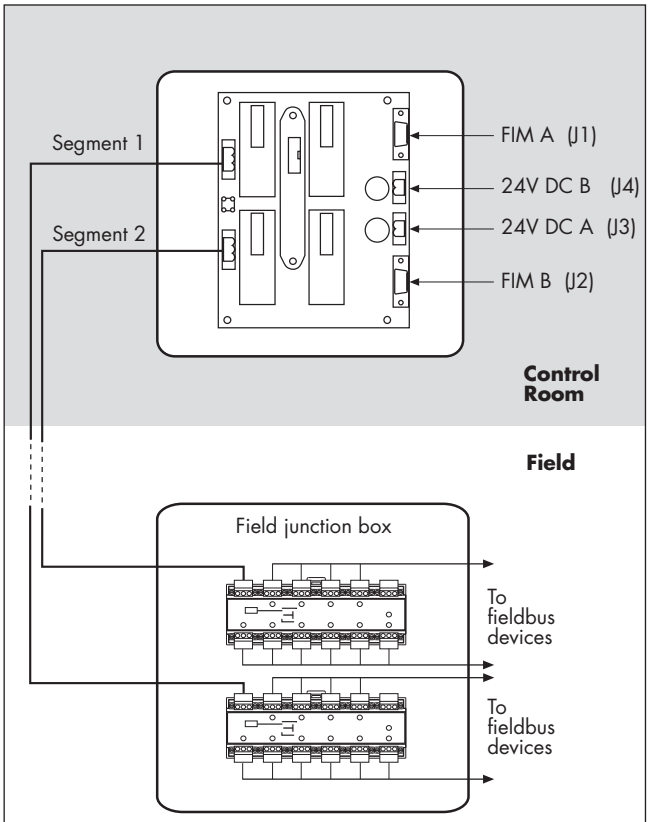

Figure 5 Typical system connection details

5.7 Fitting and removal of modules

5.7.1 Alarm module

The FPS–ALM module locates onto the 16–way multipin connector and is secured by two captive screws in the module body. To remove the module, first fully release the securing screws and pull the module away from the board.

5.7.2. Power modules

The four FPS–IPM power modules locate onto connectors J8 to J11. To secure each module, tighten the screw in the top of the FPS–IPM module.

IMPORTANT: Do not overtighten; maximum torque 1.2 Nm.

To remove a power module, first release the securing screw.

6 TECHNICAL SPECIFICATION

6.1 Input

Input voltage
18 - 30V dc
Current consumption (2 segments each with 350mA output load)
1.7A (typical) at 18V
1.2A (typical) at 24V
1.1A (typical) at 28V
Power dissipation (2 segments each with 350mA output load)
10.7W (typical)

6.2 Alarm thresholds

Either dc input voltage	<18V dc
Either IPM output	<22V dc

6.3 Output

Number of channels
Two
Voltage
Minimum 25.0V dc
Current
0 to 350mA
Output ripple
Complies with clause 22.6.2 of the fieldbus standard IEC 61158—2
Minimum load
No load
Isolation

Fieldbus to power supply:	250V ac rms withstand
Segment to segment:	50V ac

6.4 Environmental

Location of equipment
Safe area
Ambient temp
Operating, optimum orientation*
–40°C to +65°C
Storage
–40°C to +85°C
Ingress Protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)

**Optimum orientation is when the carrier is mounted on a vertical surface as shown in figure 2.*

7 TESTING

Remove each power module (and replace in turn) and check that the alarm led illuminates and that the alarm chain is broken. Disconnecting each power input in turn should also cause the alarm condition, and extinguish the associated green power LED on the alarm module. Check all power module green LEDs are lit.

8 ROUTINE MAINTENANCE

Check the general condition of the installation occasionally to make sure that no deterioration has occurred. At least every two years (and more frequently for particularly harsh environments) check:

- *the condition of wire connection/terminations/screens.*
- *that the dc output voltage on each of the two fieldbus segments is >25V. This can be performed using a multimeter or a Relcom FBT-3 fieldbus tester.*
- *that the Power A and Power B LEDs on the FPS-ALM module are on.*
- *that the LEDs on all 4 FPS-IPM modules are on.*
- *that all of the retaining screws are tight.*
- *that there are no signs of damage or corrosion.*

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