Module carriers - Overview

General

Carriers are the building blocks on which the MTL8000 system is assembled. They distribute the basic power supply services to the modules, and provide the communications route between the Bus Interface Module (BIM) or Controller and the I/O modules.

Most carriers can be mounted on DIN rail or directly to a flat surface and may be joined end-to-end to extend the size of an installation.

Multipin connectors at the end of each carrier carry the system power supply and internal "Railbus" communications across to the next carrier.

All I/O module carriers have their own independent earthing/ grounding strip, with screw terminals, to terminate the screens/shields of field-wiring cables. At each end of the strip there is a separate terminal to enable it to be linked to other carriers, or to the system ground, as required.

Node services carrier-NSM

This node services carrier will accommodate one BIM and a node services module. It is the recommended BIM carrier for all AC powered nodes because it supports "power health" management. This carrier will support Modbus or Profibus-DP BIMs.

It is also recommended for DC powered nodes that are exclusively 2/1, i.e. where no 2/2 I/O modules are required. For these applications, it is commonly used with the power supply carrier (see this page) .

BIM-only carrier

This carrier provides an alternative to a node services carrier - NSM when a node services module is not required. This carrier will support Modbus or Profibus-DP BIMs. It is commonly used with the power supply carrier (see this page).

Node services carrier-BIM

These two node services carriers will accommodate one BIM, a node services module, two system DC power supplies and four 2/2 I/O modules. One carrier (8711) supports the Modbus BIM and the other (8712) supports the Profibus-DP BIM.

These carriers are recommended for DC powered nodes that use 2/2, or a mixture of 2/2 and 2/1 I/O modules.

Controller carrier

The controller carrier provides a mounting platform for up to two controllers or EBIMs (8521-XX-XX). It can also accommodate a Power Supply Monitor module (8410-NS-PS), to monitor up to seven system power supplies in the node and alert the controller to failures.

I/O Module carriers

I/O Module carriers are available in general purpose (2/2) and 2/1 format. As a safeguard, these two types cannot be connected to each other because of the different multipin connectors used. The only way to connect the two types is by placing a Railbus Isolator (on its carrier) between them.

Within these basic formats, 4 and 8 module carriers are available and they may be joined in any combination to suit node requirements.

64 module addressing

The 8521 controller/EBIM is capable of addressing up to 64 modules, unlike the BIM models 8502 and 8505, which will address a maximum of 32.

Two carriers, models 8709-CA-08 (2/2) and 8729-CA-08 (2/1), are available with additional addressing lines to build a node with up to 64 modules. If 64-slot addressing is required for a node, these carrier types must be used *exclusively*, i.e. they cannot be mixed with 32-slot address carriers.

Note: The 8521 controller/eBIM can also be configured to a 32 module limit and may then use 32-slot address carriers.

Power supply carrier

This carrier is used to mount the 8910-PS-DC system power supply module which provides system power for DC power nodes. It is often used to support the node services carrier-NSM or the BIM-only carrier.

IS power supply module carrier

The 8920-PS-DC field power supply module provides power for 2/1 I/O modules and requires its own carrier to mount it. The carrier mounts in-line with 8- and 4-module 2/1 carriers, maintaining the Railbus connections through its edge connectors. This carrier may be used in 32-slot or 64-slot address nodes.

Railbus isolator carrier

When a node has IS field wiring terminating on it, an 8922-RB-IS Railbus isolator must be used between 2/2 and 2/1 carrier types. This is to prevent possible mains-voltage fault conditions from being propagated, via the Railbus, to the IS field wiring. The Railbus isolator has its own carrier – 8723-CA-RB. This carrier may be used in 32-slot or 64-slot address nodes.

Carrier extenders

If the chosen field enclosure will not accommodate a single, end to end line of carriers, extenders can be fitted to enable the carriers to be continued on another line. The extenders are left and right handed and connect to the ends of the I/O module carriers using the multipin connectors. A multicore cable is used to link the data and address bus between the carriers.

General purpose (2/2) and 2/1 extenders have different connectors to prevent accidental cross connection of the two types.

Carrier extenders may be used in 32-slot or 64-slot address nodes.

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Module carriers - Listing

2/2 carriers

8-module carrier (32-slot addressing) 8707-CA-08
8-module carrier (64-slot addressing) 8709-CA-08
4-module carrier (32-slot addressing) 8710-CA-04
Node services carrier (Modbus) 8711-CA-NS
Node services carrier (Profibus) 8712-CA-NS
BIM carrier 8715-CA-BI
Power supply (8910-PS-DC) carrier 8717-CA-PS
Node services carrier (NSM) 8718-CA-NS
Controller/EBIM carrier 8750-CA-NS

Carrier extender (right hand) 8020-CE-RH
Carrier extender (left hand) 8021-CE-LH

Carrier extender cable 0.35m 8001-CC-35
Carrier extender cable 0.85m 8002-CC-85
Carrier extender cable 1.2m 8003-CC-12

2/1 carriers

IS 8-module carrier (32-slot addressing) 8727-CA-08
IS 8-module carrier (64-slot addressing) 8729-CA-08
IS 4-module carrier (32-slot addressing) 8720-CA-04
Railbus isolator carrier 8723-CA-RB
IS module power supply carrier 8724-CA-PS

Carrier extender (right hand) 8030-CE-RH
Carrier extender (left hand) 8031-CE-LH

IS carrier extender cable, 0.35m 8011-CC-35
IS carrier extender cable, 0.85m 8012-CC-85
IS carrier extender cable, 1.2m 8013-CC-12

IS power extension cable, 0.35m 8016-CC-35
IS power extension cable, 0.85m 8017-CC-85
IS power extension cable, 1.2m 8018-CC-12

IS carrier extension cable set, 0.35m 8032-CC-35
IS carrier extension cable set, 0.85m 8033-CC-85
IS carrier extension cable set,,1.2m 8034-CC-12

8-module carrier

8707-CA-08

- *32-slot address bus**
- *accepts up to eight I/O modules and field terminals*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *DIN rail or panel mounting*
- *carries control signals and data on Railbus*
- *distributes DC power to modules*
- *distributes Bussed Field Power to modules*
- *isolated earthing bar for cable screens/shields*

CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or

.....Zone 2, IIC T4 hazardous location

Location of field wiring .....As node

Field terminals accepted.....General purpose, 2/2

I/O modules accepted ..... General purpose, 2/2

ELECTRICAL

Railbus connectors.....female in, male out

Module address range.....1–32

Bussed field power supply (optional)

Two 8-pin connectors are provided at the top rear of the carrier to connect power supplies for 'field power'. Such supplies are routed through certain I/O module to provide power to field circuits.

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide

Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

Operating, ...– 40°C to + 70°C

Storage.....– 40°C to + 85°C

Relative Humidity.....5 to 95% RH (non-condensing)

Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm

Weight.....680 g

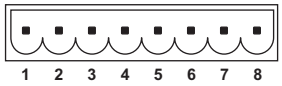
Mounting methods .....Flat panel or DIN rail

DIN-rail types

.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022

.....G-section rail to EN 50035

BUSSED FIELD POWER CONNECTIONS



Terminal		Bussed Field Power
1 2	}	I/O Modules 1 & 2 –ve (or Neutral)
3 4	}	I/O Modules 1 & 2 +ve (or Live)
5 6	}	I/O Modules 3 & 4 +ve (or Live)
7 8	}	I/O Modules 3 & 4 –ve (or Neutral)

Note: A second connector uses the same pin assignments for modules 5 & 6 and 7 & 8.

* *Must not be mixed with 64-slot address carriers*

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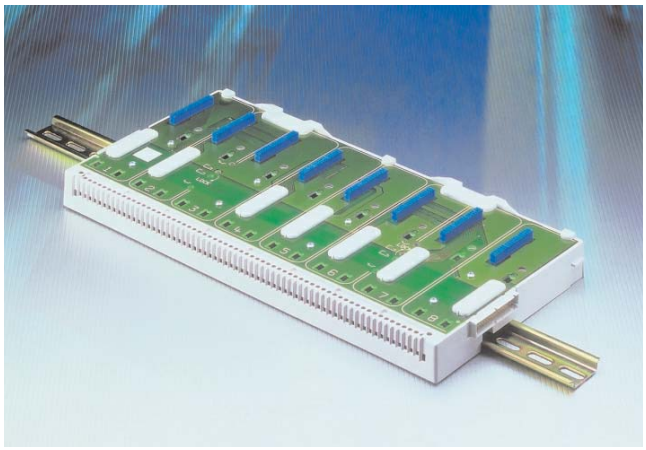
8-module carrier - extended addressing

8709-CA-08

- *64-slot address bus**
- *accepts up to eight I/O modules and field terminals*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *DIN rail or panel mounting*
- *carries control signals and data on Railbus*
- *distributes DC power to modules*
- *distributes Bussed Field Power to modules*
- *isolated earthing bar for cable screens/shields*



CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of carrier

.....Class 1, Div 2, Groups A, B, C, D T6 hazardous location or
.....Zone 2, IIC T6 hazardous location

Location of field wiring .....As carrier
Field terminals accepted.....General purpose, 2/2
I/O modules accepted ..... General purpose, 2/2
Applicable standards:

- Factory Mutual Research Co., Class No. 3611 for Class I, Division 2, Groups A, B, C, D hazardous locations
- CSA Std C22.2 No. 213 for Class I, Division 2, Groups A, B, C, D hazardous locations
- ATEX Category 3 (for Zone 2 installation)to EN50021:1999 protection type 'n'

ELECTRICAL

Railbus connectors.....female in, male out
Module address range.....1–64
Bussed field power supply (optional)
Two 8-pin connectors are provided at the top rear of the carrier to connect power supplies for 'field power'. These supplies are routed through I/O modules that require power for their field circuits.

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

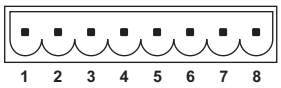
ENVIRONMENTAL

Ambient temp
Operating, ...– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm
Weight.....680 g
Mounting methods .....Flat panel or DIN rail
DIN-rail types
.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022
.....G-section rail to EN 50035

BUSSED FIELD POWER CONNECTIONS



Terminal		Function
1	}	I/O modules 1 & 2
2	}	–ve (or Neutral)
3	}	I/O modules 1 & 2
4	}	+ve (or Live)
5	}	I/O modules 3 & 4
6	}	+ve (or Live)
7	}	I/O modules 3 & 4
8	}	–ve (or Neutral)

Note: A second connector uses the same pin assignments for modules 5 & 6 and 7 & 8.

* *For use only with 8521-XX-XX controller/EBIM, and cannot be mixed with 32-slot address carriers*

4-module carrier

8710-CA-04

- 32-slot address bus*
- accepts up to four I/O modules and field terminals
- printed wiring board
- rugged polycarbonate moulding
- DIN rail or panel mounting
- carries control signals and data on Railbus
- distributes DC power to modules
- distributes Bussed Field Power to modules
- isolated earthing bar for cable screens/shields

CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

Location of field wiring .....As node
Field terminals accepted.....General purpose, 2/2
I/O modules accepted ..... General purpose, 2/2

ELECTRICAL

Railbus connectors.....female in, male out
Module address range.....1–32
Bussed field power supply (optional)

An 8-pin connector is provided at the top rear of the carrier to connect power supplies for 'field power'. Such supplies are routed through certain I/O module to provide power to field circuits.

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

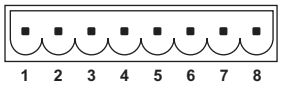
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....178 (w) x 170 (d) x 22 (h) mm
Weight.....350 g
Mounting methods .....Flat panel or DIN rail
DIN-rail types

.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022
.....G-section rail to EN 50035

BUSSED FIELD POWER CONNECTIONS



Terminal		Bussed Field Power
1	}	I/O Modules 1 & 2
2	}	–ve (or Neutral)
3	}	I/O Modules 1 & 2
4	}	+ve (or Live)
5	}	I/O Modules 3 & 4
6	}	+ve (or Live)
7	}	I/O Modules 3 & 4
8	}	–ve (or Neutral)

* *Must not be mixed with 64-slot address bus carriers*

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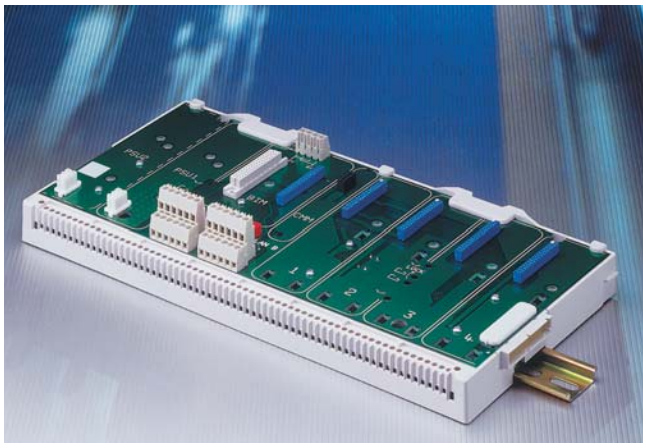
Node services carrier

8711-CA-NS

- *Modbus BIM*
- *accommodates one BIM, two PSUs and four I/O modules*
- *screw terminals for LAN*
- *DIN rail or panel mounting*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *routes Bussed Field Power to I/O modules*
- *isolated earthing bar for cable screen/shield*



CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULES

PSU Modules (main and redundant) 8910-PS-DC
Bus Interface Module .....(Modbus) 8505-BI-MB
Node Services Module.....8510-NS-MO
I/O modules .....general purpose (2/2) various

HAZARDOUS AREA APPROVALS

Location of node
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous area
Location of field wiring.....As per node
Field terminals accepted.....General purpose or Zone 2/Div 2
I/O modules accepted .....General purpose or Zone 2/Div 2

ELECTRICAL

Railbus connector.....male out
External dc power supply (optional)
A 6-pin connector is provided at the top/rear of the carrier to connect a 12.0 V dc (±5%) power supply. This is an alternative to the carrier mounted PSU modules.
Bussed field power supply (optional)
An 8-pin connector is provided at the top rear of the carrier to connect power supplies for 'field power'. Such supplies are routed through certain I/O module to provide power to field circuits.

LAN CONNECTORS

LAN A.....6-way, screw-terminal (x2)
LAN B .....6-way, screw-terminal (x2)

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm
Weight (approx.).....680 g
Mounting methods .....Flat panel (4 fixings) or DIN rail
DIN-rail types
.....'Top hat', 7.5 x 35 mm or 15 x 35 mm to EN 50022
.....G-section, to EN 50035

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8711-CA-NS
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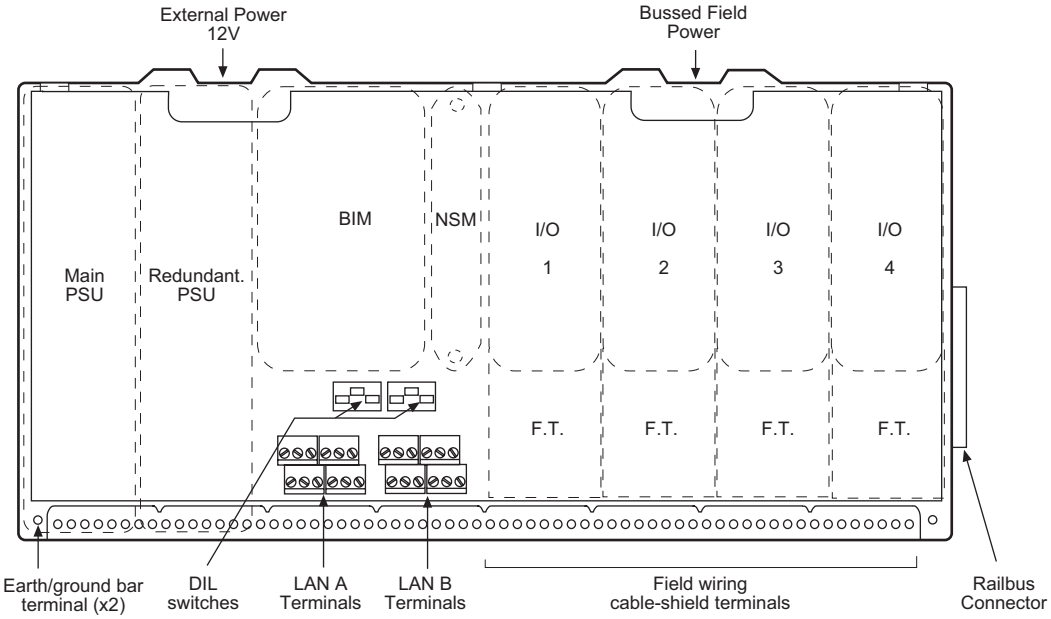
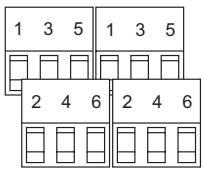


LAN INTERFACE

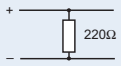
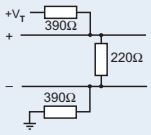
Terminal	Assignment
1	Rx +
2	Tx +
3	Rx –
4	Tx –
5	Gnd
6	Gnd



Each LAN has duplicate connections wired in parallel - pin 1 to pin 1, pin 2 to pin 2, etc.

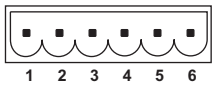
LAN DIL SWITCHES

One switch block per LAN. Operating mode set with switches.

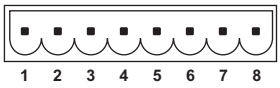
Mode	Switch positions	Termination
Mode 1: RS422		–
Mode 2: RS485 no termination		–
Mode 3: RS485 terminated		
Mode 4: RS485 terminated and biased		

POWER SUPPLY CONNECTIONS

External Power



Bussed Field Power



Terminal	External Power	Bussed Field Power
1	Test Point 1	I/O Modules 1 & 2
2	0 V	–ve (or Neutral)
3	+12 V	I/O Modules 1 & 2
4	+12 V	+ve (or Live)
5	0 V	I/O Modules 3 & 4
6	Test Point 2	+ve (or Live)
7	Not applicable	I/O Modules 3 & 4
8	Not applicable	–ve (or Neutral)

Pins for power supplies are provided in pairs. This enables one pin to be used for the supply input and the second to loop to another connector, when required.

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Node services carrier

8712-CA-NS

- *Profibus BIM*
- *accommodates one BIM, two PSUs and four I/O modules*
- *sub-miniature, 9-pin, D connectors for LAN*
- *DIN rail or panel mounting*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *routes Bussed Field Power to I/O modules*
- *isolated earthing bar for cable screen/shield*

CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULES

PSU Modules (main and redundant) 8910-PS-DC
Bus Interface Module .....(Profibus-DP) 8502-BI-DP
Node Services Module 8510-NS-MO
I/O modules .....general purpose (2/2) various

HAZARDOUS AREA APPROVALS

Location of node
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous area
Location of field wiring.....As per node
Field terminals accepted.....General purpose or Zone 2/Div 2
I/O modules accepted .....General purpose or Zone 2/Div 2

ELECTRICAL

Railbus connector.....male out
External dc power supply (optional)
A 6-pin connector is provided at the top/rear of the carrier to connect a 12.0 V dc (±5%) power supply. This is an alternative to the carrier mounted PSU modules.
Bussed field power supply (optional)
An 8-pin connector is provided at the top rear of the carrier to connect power supplies for 'field power'. Such supplies are routed through certain I/O module to provide power to field circuits.

LAN CONNECTORS

LAN A .....9-way 'D' sub-miniature, female (x2)

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm
Weight (approx.).....680 g
Mounting methods .....Flat panel (4 fixings) or DIN rail
DIN-rail types
.....'Top hat', 7.5 x 35 mm or 15 x 35 mm to EN 50022
.....G-section, to EN 50035

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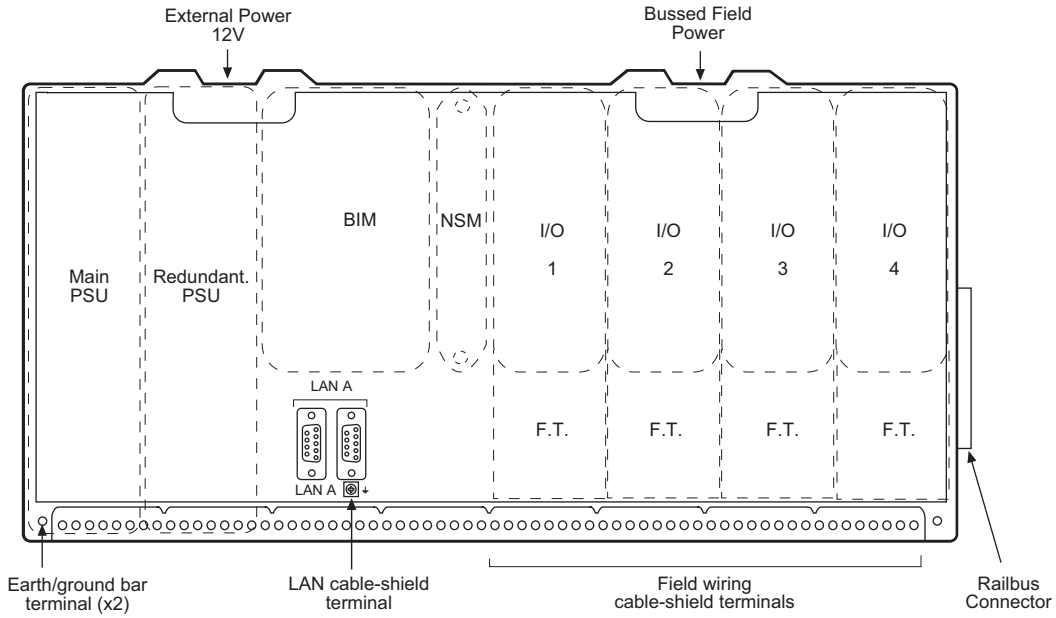
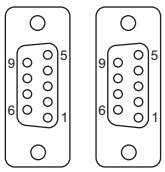
8712-CA-NS continued



LAN INTERFACE

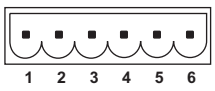


LAN connections RS485 interface (x2)	9-way (female) terminals
Shield/protective ground	Pin 1
RxD /TxD +	**Pin 3**
DGND (0V)	Pin 5
VP (0V)	Pin 6
RxD /TxD -	**Pin 8**

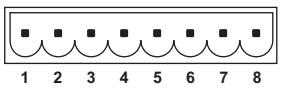
The LAN has duplicate connections wired in parallel - pin 1 to pin 1, pin 2 to pin 2, etc.

POWER SUPPLY CONNECTIONS

External Power



Bussed Field Power



Terminal	External Power	Bussed Field Power
1	Test Point 1	I/O Modules 1 & 2
2	0 V	–ve (or Neutral)
3	+12 V	I/O Modules 1 & 2
4	+12 V	+ve (or Live)
5	0 V	I/O Modules 3 & 4
6	Test Point 2	+ve (or Live)
7	Not applicable	I/O Modules 3 & 4
8	Not applicable	–ve (or Neutral)

Pins for power supplies are provided in pairs. This enables one pin to be used for the supply input and the second to loop to another connector, when required.

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BIM carrier

8715-CA-BI

- *accommodates Bus Interface Module*
- *Modbus or Profibus-DP*
- *dual LAN connections (A & B)*
- *switchable RS485/RS422 termination options*
- *DIN rail or panel mounting*

CARRIER SPECIFICATION

See also System Specification

LAN CONNECTORS

LAN A .....9-pin, D, sub-minature, female
LAN B.....9-pin, D, sub-minature, female
Switchable terminations for Modbus RS485, Modbus RS422 or Profibus-DP

CARRIER MOUNTING MODULES

Bus Interface Modules .....(Profibus-DP) 8502-BI-DP
.....(Modbus) 8505-BI-MB

HAZARDOUS AREA APPROVALS

Location of node..... Zone 2, IIC T4 hazardous area
.....or Class 1, Div 2, Groups A, B, C, D T4 hazardous location

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MATERIALS

Carrier moulding .....Modified Poly-Phenylene Oxide
Printed wiring board .....Epoxy Resin Woven Glass Laminate

DC POWER

External power supply .....12.0 V dc ± 5%
(via 6-pin external power connector at top/rear)

MECHANICAL

Dimensions (overall) .....93 (w) x 170 (d) x 35 (h) mm
Weight (approx.).....680 g
Mounting methods .....Flat panel (2 fixings) or DIN rail
DIN-rail types .....'Top hat', 7.5 x 35 mm to EN 50022
.....or 15 x 35 mm to EN 50022
.....or G-section, to EN 50035

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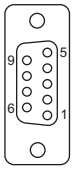
LAN INTERFACE



LAN A

Terminals	Modbus RS422	Modbus RS485	Profibus-DP
Pin 1	FGND/Socket shroud	FGND/Socket shroud	FGND/Socket shroud
Pin 2	RxD+	RxD/TxD+	NC
Pin 3	TxD+	RxD/TxD+	RxD/TxD+
Pin 4	*RxD–*	*RxD/TxD–*	RTS+
Pin 5	GND	GND	GND
Pin 6	V_T	V_T	V_P
Pin 7	RxD–	RxD/TxD–	*RTS+*
Pin 8	TxD–	RxD/TxD–	RxD/TxD–
Pin 9	NC	NC	NC

LAN B

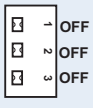
Terminals	Modbus RS422	Modbus RS485
Pin 1	Socket shroud	Socket shroud
Pin 2	RxD+	RxD/TxD+
Pin 3	TxD+	RxD/TxD+
Pin 4	*RxD–*	*RxD/TxD–*
Pin 5	GND	GND
Pin 6	V_T	V_T
Pin 7	RxD–	RxD/TxD–
Pin 8	TxD–	RxD/TxD–
Pin 9	NC	NC

Note: Pins with assignments shown in *italics* are normally not connected; they occur because of the 'universal' nature of the interface.

LAN DIL SWITCHES

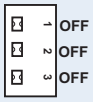
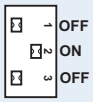
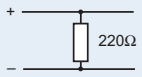
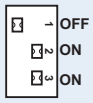
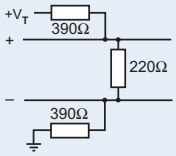
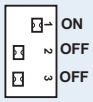
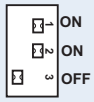
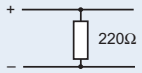
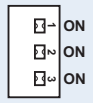
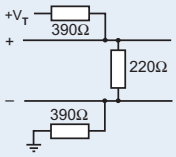
One switch block per LAN to determine termination and/or bias ON = switch to right; OFF = switch to left (with normal orientation) Set operating mode with switches as follows:

Profibus-DP applications

Mode	Switch positions	Termination
RS485 not terminated		None

Note: Any required termination should be implemented in the Profibus D-type plug.

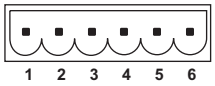
Modbus applications

Mode	Switch positions	Termination
RS422 not terminated		None
RS422 terminated receiver		
RS422 terminated & biased receiver		
RS485 not terminated		None
RS485 terminated		
RS485 terminated & biased		

Note: Switch model may vary but switching directions remain the same.

POWER SUPPLY CONNECTIONS

External power



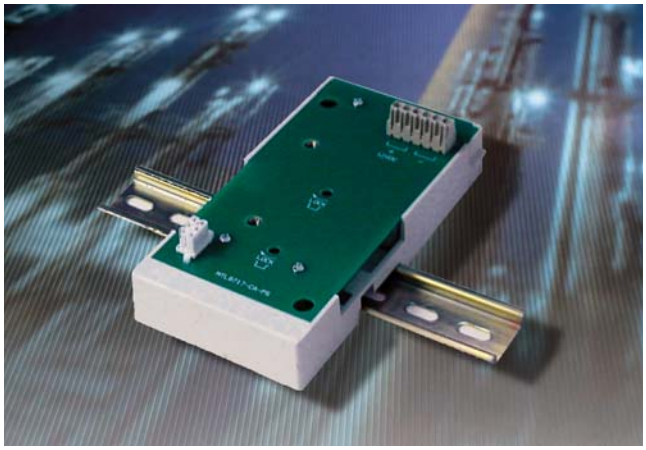
Terminal	External power
1	No connection
2	0 V
3	+12 V
4	+12 V
5	0 V
6	No connection

Power supply pins are provided in pairs. This enables one pin to be used for the supply input and the second to loop to another connector, when required.

Power supply carrier

8717-CA-PS

- *accomodates one 8910-PS-DC power supply*
- *DIN rail or panel mounting*
- *use for 2/1 only nodes with DC power feed*
- *use with 8718-CA-NS or 8715-CA-BI with DC power feed*



CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

ELECTRICAL

12V dc output connector .....6-way screw terminal

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

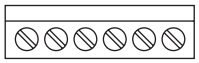
Operating, ...– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....85.5 (w) x 167 (d) x 27.4 (h) mm
Weight.....200 g
Mounting methods .....Flat panel or DIN rail
DIN-rail types

.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022

DC OUTPUT POWER CONNECTIONS



Terminal	Function
1, 2, 3	0 V dc
4, 5, 6	+ 12V dc

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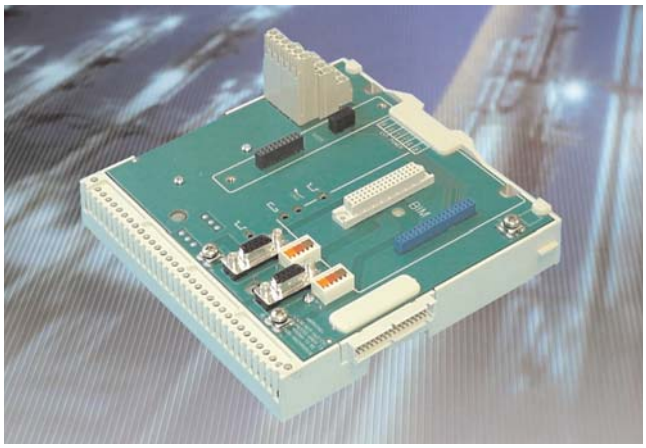
Node services carrier

8718-CA-NS

- *accommodates Bus Interface Module*
- *accommodates Node Services Module*
- *Modbus or Profibus-DP*
- *dual LAN connections (A & B)*
- *switchable RS485/RS422 termination options*
- *eight power fail inputs*
- *DIN rail or panel mounting*



CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULES

Bus Interface Modules .....(Profibus-DP) 8502-BI-DP
.....(Modbus) 8505-BI-MB
Node Services Module 8510-MO-NS

HAZARDOUS AREA APPROVALS

Location of node..... Zone 2, IIC T4 hazardous area
.....or Class 1, Div 2, Groups A, B, C, D T4 hazardous location

ELECTRICAL

Railbus connector.....male out
Power fail connector .....8 pairs (screw terminal)
Carrier ground terminal.....M2 screw terminal

DC POWER

External power .....12.0 V dc (±5%)
A 6-pin connector is provided at the top/rear of the carrier for the connection of the power supply.

LAN CONNECTORS

LAN A .....9-pin, D, sub-minature, female
LAN B.....9-pin, D, sub-minature, female
Switchable terminations for Modbus RS485, Modbus RS422 or Profibus-DP
Note: The screw terminal beside each LAN connector is a termination for the cable screen and should not be used as system ground.

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MATERIALS

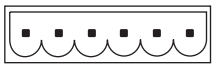
Carrier moulding .....Modified Poly-Phenylene Oxide
Printed wiring board .....Epoxy Resin Woven Glass Laminate

MECHANICAL

Dimensions (overall) .....178 (w) x 170 (d) x 68 (h) mm
Weight (approx.).....450 g
Mounting methods .....Flat panel (2 fixings) or DIN rail
DIN-rail types .....'Top hat', 7.5 x 35 mm to EN 50022
.....or 15 x 35 mm to EN 50022
.....or G-section, to EN 50035

POWER SUPPLY CONNECTIONS

External power



Terminal	External power
1	No connection
2	0 V
3	+12 V
4	+12 V
5	0 V
6	No connection

Power supply pins are provided in pairs. This enables one pin to be used for the supply input and the second to loop to another connector, when required.

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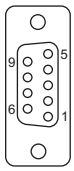
8718-CA-NS continued

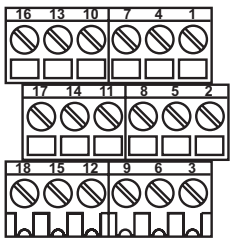
LAN INTERFACE



Terminals	Modbus RS422 LAN A/B	Modbus RS485 LAN A/B	Profibus-DP LAN A only
Pin 1	Socket shroud	Socket shroud	Socket shroud
Pin 2	RxD+	RxD/TxD+	NC
Pin 3	TxD+	RxD/TxD+	RxD/TxD+
Pin 4	*RxD–*	*RxD/TxD–*	RTS+
Pin 5	GND	GND	GND
Pin 6	V_T	V_T	Vp
Pin 7	RxD–	RxD/TxD–	*RTS+*
Pin 8	TxD–	RxD/TxD–	RxD/TxD–
Pin 9	NC	NC	NC

Note: Pins with assignments shown in *italics* are normally not connected; they occur because of the 'universal' nature of the interface.

PSU POWER FAIL CONNECTOR



Connection pairs

	AUX	–ve
Pair 1	1	4
Pair 2	2	5
Pair 3	3	6
Pair 4	7	10
Pair 5	8	11
Pair 6	9	12
Pair 7	13	16
Pair 8	14	17

Eight pairs of terminals are provided for the PSU health signals.

If an 8510-MO-NS module is fitted and power fail signalling is being used:

a) connect the power supply AUX and –ve terminals to a pair as shown in the table (right)

b) put individual wire links across each **unused terminal pairs** to prevent a continual alarm condition being signalled to the BIM.

Note: Terminals 15 and 18 are not used.

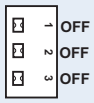
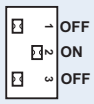
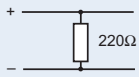
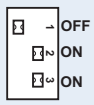
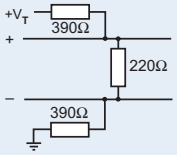
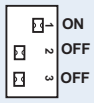
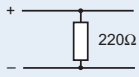
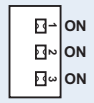
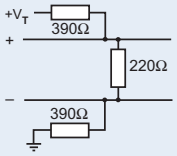
LAN DIL SWITCHES

One per LAN to determine termination and/or bias

ON = switch to right; OFF = switch to left (with normal orientation)

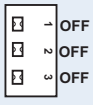
Note: Switch model may vary.

Modbus applications

Mode	Switch positions	Termination
RS422 not terminated		None
RS422 terminated receiver		
RS422 terminated & biased receiver		
RS485 not terminated		None
RS485 terminated		
RS485 terminated & biased		

Note: Switch model may vary but switching directions remain the same.

Profibus-DP applications

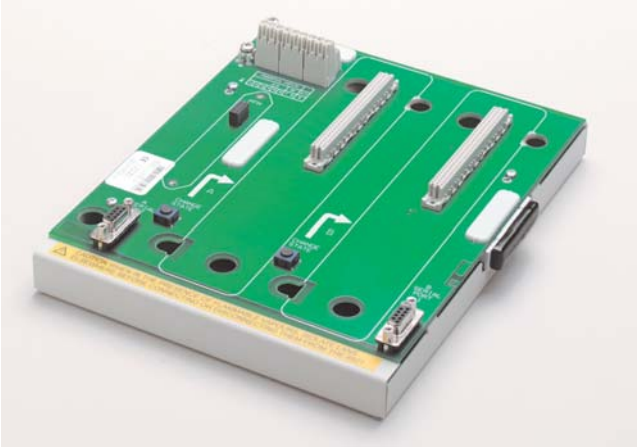
Mode	Switch positions	Termination
RS485 not terminated		None

Note: Any required termination should be implemented in the Profibus D-type plug.

Controller carrier

8750-CA-NS

- *accommodates two controllers/EBIMs*
- *accommodates Power Supply Monitor module*
- *serial port connections for controllers*
- *manual "change state" buttons*
- *seven* power fail inputs*
- *panel mounting*



The controller carrier provides a mounting platform for up to two controllers or EBIMs (8521-XX-XX). It can also accommodate a Power Supply Monitor module (8410-NS-PS) which can monitor up to seven system power supplies in the node and alert the controller to failures. The "powerfail" signals are brought to the module via a screw terminal block at the rear of the carrier. For each controller /EBIM there is a serial port connection on the carrier and a manually operated "change state" (failover) button.

CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULES

Controller/EBIM (x2) 8521-XX-XX
Power Supply Monitor module 8410-NS-PS

HAZARDOUS AREA APPROVALS

Location of carrier ..... Zone 2, IIC T6 hazardous area .....or Class 1, Div 2, Groups A, B, C, D T6 hazardous location

Applicable standards:

- Factory Mutual Research Co., Class No. 3611 for Class I, Division 2, Groups A, B, C, D hazardous locations
- CSA Std C22.2 No. 213 for Class I, Division 2, Groups A, B, C, D hazardous locations
- ATEX Category 3 (for Zone 2 installation) to EN50021:1999 protection type 'n'

ELECTRICAL

Railbus connector.....male out
Serial port connectors.....9-pin, D-type (female) (x2)
Power "health" connections .....screw terminals (x7 pairs)
Ground terminals.....M4 screw terminal (x2)

DC POWER

External power .....12.0 V dc (±5%)

A 6-pin connector (see next page) is provided at the top of the carrier. This connection powers the Power Supply Monitor module and other modules on carriers connected to this one.

Note: This connection does not provide power to the controller/EBIM module(s).

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System Specification

MATERIALS

Carrier body .....Painted 1.6mm ZINTEC to BS EN 10152
Printed wiring board .....Epoxy Resin Woven Glass Laminate

MECHANICAL

Dimensions (footprint).....200 (w) x 253 (d) mm
Height (top of circuit board) .....28 mm
(overall) .....55 mm
Weight (approx.) .....1.43 kg
Mounting methods .....flat panel (4 fixings)

USER CONTROLS

Two "change state" buttons, one for each controller/EBIM, are provided on the carrier to enable the user to change the state of a controller from master to standby, standby to offline or offline to standby. The controller/EBIM affected by each "change state" button is indicated on the circuit board. The state change depends upon the controller state before the button is pressed. See table below for effects.

State	Effect
Master	Change to standby if current standby is healthy
Standby	Change to offline state
Backup	Re-synchronize and return to standby

** up to six 2/2 power supplies plus one 2/1 power supply.*

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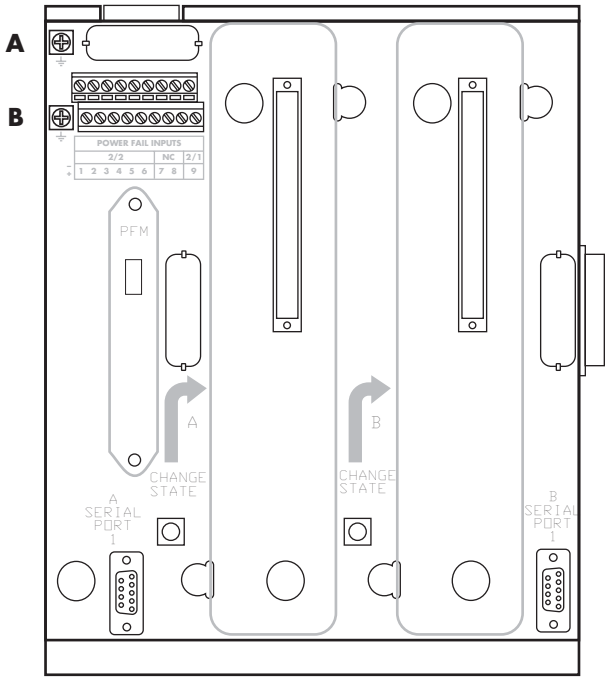
Controller carrier

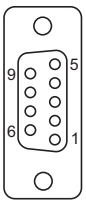
8750-CA-NS continued



Ground terminals (A & B)

A & B provide the same ground connection. B is recommended for terminating any shielding on the power "health" cable(s).

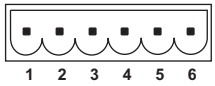
SERIAL PORT CONNECTORS (X2)



Pin #	Function
1	0V
2	NC
3	Tx/Rx (+)
4	Tx/Rx (+)
5	Tx/Rx (–)
6	Tx/Rx (–)
7	NC
8	NC
9	0V

RAILBUS POWER SUPPLY CONNECTIONS

External power

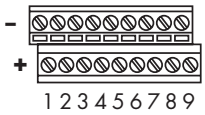


Terminal	External power
1	No connection
2	0 V
3	+12 V
4	+12 V
5	0 V
6	No connection

Power supply pins are provided in pairs. This enables one pin to be used for the supply input and the second to loop to another connector, when required.

Note: The controllers/EBIMs do not draw main power from this supply. See previous page.

PSU POWER "HEALTH" CONNECTOR



This power "health" facility is operational only when a Power Supply Monitor module (8410-NS-PS) is fitted on the carrier.

Terminal pairs 1 – 6

These terminal pairs (+ and –) are provided for external 2/2 power supplies, e.g. 8913-PS-AC or 8914-PS-AC. For each pair:

+ Power health signal from PSU

– negative (–ve) connection from PSU

Note: On the 8913-PS-AC, it is the 12V output that provides the power health signal, therefore connect the –ve terminal from the **12V output** to the –ve terminal on the power health connector.

Each unused terminal pair must be fitted with a shorting link to prevent an alarm condition being signalled to the controller.

Terminal pairs 7 & 8

These terminal pairs are disconnected and should not be used.

Terminal pair 9

If a Railbus Isolator (8922-RB-IS) is **not** used in the node, this terminal pair **must** be fitted with a shorting link to prevent an alarm condition being signalled to the controller/EBIM.

Carrier extender

Left-hand/right-hand

802x-CE-xH

- *General purpose and non-IS field wiring installations*
- *ensures Railbus and power supply continuity*
- *pairs (LH & RH) link separate carrier runs*
- *sub-D connectors linked via multiway cable*
- *screw terminals link power supply connections*
- *rugged polycarbonate base with DIN rail fixings*
- *multipin connector to carrier*
- *maximum of 3 extender pairs per node*
- *32- and 64-slot address capable*

SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node .....
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

ELECTRICAL

Railbus carrier connector .....
8020-CE-RH .....female in
8021-CE-LH.....male out
Usable with 32-slot or 64-slot address nodes
Extender cable connector.....Sub-D, 37-pin female
DC power cable connector.....Screw terminal
DC power cable conductor size.....2.5 mm^2 (max.)

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating, ...– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions (overall) .....42 (w) x 168 (d) x 37 (h) mm
Weight.....135 g
Mounting method .....Integral DIN-rail fixings
DIN rail types
.....'Top hat', 35 x 7.5 mm or 35 x 15 mm to EN 50022
.....G-section, to EN 50035

PART NUMBERS

Carrier Extender, Right-hand	8020-CE-RH
Carrier Extender, Left-hand	8021-CE-LH

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June 2004

Carrier extender cables

0.35m, 0.85m and 1.2m

800x-CC-xx

- *Railbus data extender cables*
- *general purpose and non-IS field wiring installations*
- *three lengths - 0.35, 0.85 and 1.2 m*
- *sub-D cable connectors*
- *32- and 64-slot address capable*

SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

ELECTRICAL

Extender cable connectors.....Sub-D, 37-pin male

ENVIRONMENTAL

Ambient temp

Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

PART NUMBERS

Carrier Extension Cable, 0.35m	8001-CC-35
Carrier Extension Cable, 0.85m	8002-CC-85
Carrier Extension Cable, 1.2m	8003-CC-12

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Module carriers

IS 8-module carrier

8727-CA-08

- *32-slot address bus**
- *accepts up to eight 2/1 I/O modules and field terminals*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *DIN rail or panel mounting*
- *carries control signals and data on Railbus*
- *distributes DC power to modules*
- *isolated earthing bar for cable screens/shields*

CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or

.....Zone 2, IIC T4 hazardous location

Location of field wiring

.....Class 1, Div 1, Groups A, B, C, D T4 hazardous location or

.....Zone 1 /Zone 0, IIC T4 hazardous location

Field terminals accepted.....IS only

I/O modules accepted..... 2/1 only

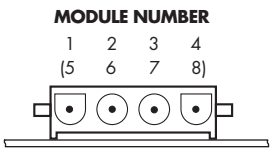
ELECTRICAL

Railbus connectors.....male in, female out

Module address range.....1–32

Earth leakage detection

4-pin connectors are provided at the top/rear of the carrier for wiring the individual modules to earth leakage detectors, e.g. MTL2220. (*Refer to MTL for earth leakage detection support within I/O modules)*



Connector is repeated for modules 5 to 8

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide

Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

Operating, ...– 40°C to + 70°C

Storage.....– 40°C to + 85°C

Relative Humidity.....5 to 95% RH (non-condensing)

Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm

Weight.....680 g

Mounting methods .....Flat panel or DIN rail

DIN-rail types

.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022

.....G-section rail to EN 50035

* *Must not be mixed with 64-slot address bus carriers*

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June 2004

IS 8-module carrier - extended addressing

8729-CA-08

- *64-slot address bus**
- *accepts up to eight 2/1 I/O modules and field terminals*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *DIN rail or panel mounting*
- *carries control signals and data on Railbus*
- *distributes DC power to modules*
- *isolated earthing bar for cable screens/shields*

CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of carrier

.....Class 1, Div 2, Groups A, B, C, D T6 hazardous location or

.....Zone 2, IIC T6 hazardous location

Field terminals accepted .....IS only

I/O modules accepted ..... 2/1 only

Applicable standards:

- Factory Mutual Research Co., Class No. 3611 for Class I, Division 2, Groups A, B, C, D hazardous locations
- CSA Std C22.2 No. 213 for Class I, Division 2, Groups A, B, C, D hazardous locations
- ATEX Category 3 (for Zone 2 installation) to EN50021:1999 protection type 'n'

ELECTRICAL

Railbus connectors.....male in, female out

Module address range.....1–64

Earth leakage detection

4-pin connectors (see right) are provided at the top/rear of the carrier for wiring the individual modules to earth leakage detectors, e.g. MTL2220*

**Refer to MTL for earth leakage detection support within I/O modules*

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide

Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

Operating .....– 40°C to + 70°C

Storage.....– 40°C to + 85°C

Relative Humidity.....5 to 95% RH (non-condensing)

Vibration and Shock .....See System specification

MECHANICAL

Dimensions.....342 (w) x 170 (d) x 22 (h) mm

Weight.....680 g

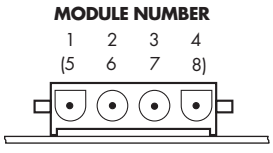
Mounting methods .....Flat panel or DIN rail

DIN-rail types

.....'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022

.....G-section rail to EN 50035

* *For use only with 8521-XX-XX controller/EBIM, and cannot be mixed with 32-slot address carriers*



Connector is repeated for modules 5 to 8

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Module carriers

IS 4-module carrier

8720-CA-04

- *32-slot address bus**
- *accepts up to four 2/1 I/O modules and field terminals*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *DIN rail or panel mounting*
- *carries control signals and data on Railbus*
- *distributes DC power to modules*
- *isolated earthing bar for cable screens/shields*

CARRIER SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node

.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or

.....Zone 2, IIC T4 hazardous location

Location of field wiring

.....Class 1, Div 1, Groups A, B, C, D T4 hazardous location or

.....Zone 1 /Zone 0, IIC T4 hazardous location

Field terminals accepted.....IS only

I/O modules accepted..... 2/1 only

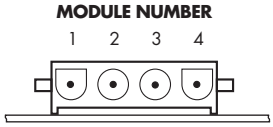
ELECTRICAL

Railbus connectors.....male in, female out

Module address range.....1–32

Earth leakage detection

A 4-pin connector is provided at the top/rear of the carrier for wiring the individual modules to earth leakage detectors, e.g. MTL2220. (*Refer to MTL for earth leakage detection support within I/O modules.)*



MATERIALS

Carrier moulding.....Modified poly-phenylene oxide

Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp

Operating .....– 40°C to + 70°C

Storage.....– 40°C to + 85°C

Relative Humidity.....5 to 95% RH (non-condensing)

Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions.....178 (w) x 170 (d) x 22 (h) mm

Weight.....350 g

Mounting methods .....Flat panel or DIN rail

DIN-rail types

..... 'Top hat' 35 x 7.5 mm rail or 35 x 15 mm rail to EN 50022

.....G-section rail to EN 50035

* *Must not be mixed with 64-slot address bus carriers*

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Railbus isolator carrier

8723-CA-RB

- *accommodates one Railbus Isolator*
- *DIN rail or panel mounting*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *32- and 64-slot address capable*

CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULE

Railbus Isolator.....8922-RB-IS

HAZARDOUS AREA APPROVALS

Location of node .....
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous area

ELECTRICAL

Railbus connectors .....male in, female out
Usable with 32-slot or 64-slot address nodes

DC power

DC power for the Railbus Isolator is obtained from the system through the multipin Railbus connectors.

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions (overall) .....93 (w) x 168 (d) x 35 (h) mm
Weight (approx.).....195 g
Mounting methods .....Flat panel (3 fixings) or DIN-rail
DIN-rail types
.....'Top hat', 7.5 x 35 mm or 15 x 35 mm to EN 50022
.....G-section, to EN 50035

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Module carriers

IS module power supply carrier

8724-CA-PS

- *accommodates one 8920 PSU module*
- *DIN rail or panel mounting*
- *printed wiring board*
- *rugged polycarbonate moulding*
- *32- and 64-slot address capable*

CARRIER SPECIFICATION

See also System Specification

CARRIER MOUNTING MODULE

System Power Supply module 8920-PS-DC

HAZARDOUS AREA APPROVALS

Location of node .....
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous area

ELECTRICAL

Railbus connectors .....male in, female out
(Usable with 32-slot or 64-slot address nodes)

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions (overall) .....93 (w) x 168 (d) x 35 (h) mm
Weight (approx.).....195 g
Mounting methods .....Flat panel (4 fixings) or DIN-rail
DIN-rail types
.....'Top hat', 7.5 x 35 mm or 15 x 35 mm to EN 50022
.....G-section, to EN 50035

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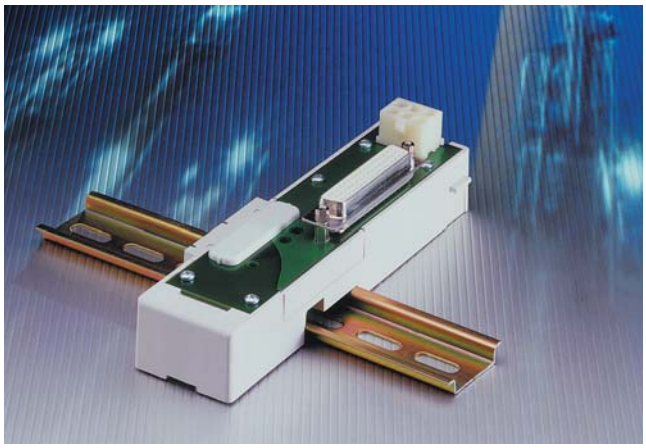
Carrier extender

Left-hand/right-hand

803x-CE-xH

- *for IS field wiring installations*
- *ensures Railbus and power supply continuity*
- *pairs (LH & RH) link separate carrier runs*
- *sub-D connectors linked via multiway cable*
- *screw terminals link power supply connections*
- *rugged polycarbonate base with DIN rail fixings*
- *multipin connector to carrier*
- *maximum of 3 extender pairs per node*
- *32- and 64-slot address capable*



SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node .....
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

ELECTRICAL

Railbus carrier connector .....
8030-CE-RH.....male in
8031-CE-LH.....female out
Usable with 32-slot or 64-slot address nodes
Extender cable connector.....Sub-D, 50-pin female
DC power cable connector.....6-pin

MATERIALS

Carrier moulding.....Modified poly-phenylene oxide
Printed wiring board.....Epoxy resin woven glass laminate

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

MECHANICAL

Dimensions (overall) .....48 (w) x 168 (d) x 42 (h) mm
Weight.....140 g
Mounting method .....Integral DIN-rail fixings
DIN rail types
.....'Top hat', 35 x 7.5 mm or 35 x 15 mm to EN 50022
.....G-section, to EN 50035

PART NUMBERS

Carrier Extender, Right-hand	8030-CE-RH
Carrier Extender, Left-hand	8031-CE-LH

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June 2004

Carrier extender cables

IS carrier extender cables

80xx-CC-xx

- *Railbus data & power extender cables*
- *for IS field wiring installations*
- *three lengths - 0.35, 0.85 and 1.2 m*
- *sub-D cable connectors*
- *32- and 64-slot address capable*

SPECIFICATION

See also System Specification

HAZARDOUS AREA APPROVALS

Location of node .....
.....Class 1, Div 2, Groups A, B, C, D T4 hazardous location or
.....Zone 2, IIC T4 hazardous location

ELECTRICAL

Data extender cable connectors.....Sub-D, 50 pin male
Power extender cable connectors.....6-pin

ENVIRONMENTAL

Ambient temp
Operating .....– 40°C to + 70°C
Storage.....– 40°C to + 85°C
Relative Humidity.....5 to 95% RH (non-condensing)
Vibration and Shock.....See System specification sheet

PART NUMBERS - DATA CABLES

IS Carrier Extension Cable, 0.35m	8011-CC-35
IS Carrier Extension Cable, 0.85m	8012-CC-85
IS Carrier Extension Cable, 1.2m	8013-CC-12

PART NUMBERS - POWER CABLES

IS Power Extension Cable, 0.35m	8016-CC-35
IS Power Extension Cable, 0.85m	8017-CC-85
IS Power Extension Cable, 1.2m	8018-CC-12

PART NUMBERS - CABLE SETS

IS Carrier Extension Cable set, 0.35m	8032-CC-35
IS Carrier Extension Cable set, 0.85m	8033-CC-85
IS Carrier Extension Cable set, 1.2m	8034-CC-12