



This product is designed and manufactured to comply with the following EC Directives for electrical and electronic equipment:

- 1) Restriction of Hazardous Substances (RoHS) Directive: 2011/65/EU
- 2) Electromagnetic Compatibility (EMC) Directive: 2014/30/EU
- 3) Low Voltage (LVD) Directive: 2014/35/EU

A 'Declaration of Conformity' statement to the above Directives, listing the applicable harmonised standards to which the equipment conforms, is available on request.

This product is designed and manufactured to comply with the following UK Regulations for electrical and electronic equipment:



- 1) Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic equipment Regulations 2012 (RoHS)
- 2) Electromagnetic Compatibility Regulations 2016
- 3) Electrical Equipment (Safety) Regulations 2016

A 'Declaration of Conformity' statement to the above Regulations, listing the applicable designated standards to which the equipment conforms, is available on request.

The BMB02 is assessed for safety as suitable for pollution degree 2 environments.

Failure to use the equipment in the manner described in the product literature will invalidate the warranty.



This product must be disposed of in accordance with the WEEE directive.

Additional User Documentation:

Additional reference information is available from the company website: www.zenitel.com.

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Document Change History

Issue	Amendment Summary	Date
01	Draft release for internal use.	27/06/2023
02	Converted to Zenitel template	25/03/2024
03	Product images updated	20/08/2024

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1 Safety and Precautions

Observe all safety information in this section.

ENVIRONMENTAL



The temperature and humidity ranges shown in the specifications for the unit must not be exceeded.



The unit must not be installed in an area that is subject to a corrosive atmosphere, excessive moisture or may allow water or other liquids to come into contact with the unit or its external connections.



Objects containing liquids should not be placed upon the unit.

ESD



The unit contains static-sensitive devices. Observe ESD precautions when handling the unit with the cover removed or handling the front panel.

INSTALLATION



To prevent injury, wall/ceiling/desk-mount units must be securely attached to the wall/ceiling/desk in accordance with the installation instructions.



The BMB02 is designed for professional use only and must be installed in a restricted access location and such that there is no operator access to the internals of the BMB02 or its wiring.

SERVICING



Servicing and installation work should be carried out by qualified personnel only.



Service Access is permitted only to those with the necessary training and expertise and can take responsibility for their own safety when working on the BMB02.



The BMB02 contains wiring that is energised to 60 V DC.

POWER CONNECTIONS



Make sure that power supply cabling is adequately rated for the unit's operating current.

EMC

In the close proximity of some radio frequency transmitters, the signal to noise ratio of this product may be reduced. If this occurs, re-location of the equipment or the signal cables is recommended.

2 Preparation

1. Read and observe the safety instructions and guidelines in Section “1 Safety and Precautions” on page 4.



Failure to follow these instructions and guidelines may cause personal injury and/or damage to the equipment.

2. Gather the following documentation and tools:
 - The system design documentation of the specific location.
 - A small flat-bladed screwdriver.
 - 1 x pair of wire cutters/strippers.
 - Ferrules and crimping tool.
 - Suitable DIN rail for mounting (35mm symmetrical “top-hat” type).
3. Gather the equipment (in its original packing).

3 Unpacking and Handling

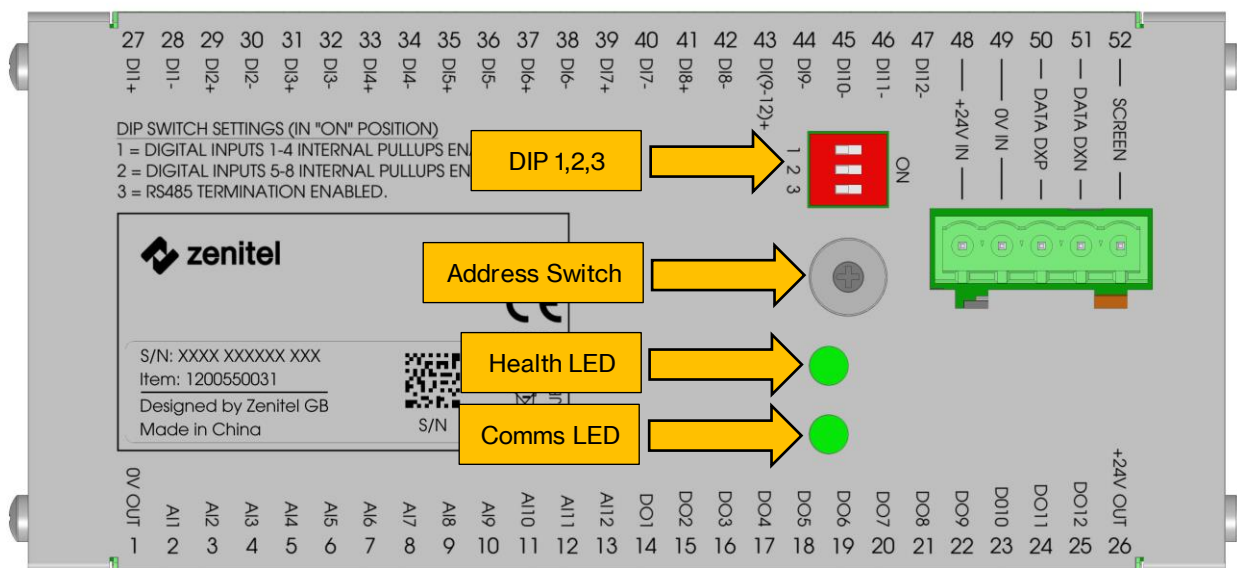
1. Observe any markings or warnings on the package prior to handling and opening.
2. Check the equipment package for signs of damage during transport. Report problems to the carrier or supplier.
3. Unpack the equipment in a dry area, handling the equipment with care.
4. Check the equipment package contents for completeness. Report any missing items immediately.

BMB02 package contents:

- 1 x BMB02
 - 1 x General Product Safety Leaflet = U-0703-0028
 - 4 x 13-way terminal block connector 5.08 mm pitch
 - 1 x 5-way terminal block connector 5.08 mm pitch
5. It is advisable to retain the original equipment packing (containers and materials) in the event that the equipment ever needs returning for service.
 6. If the packing is not to be retained, the packing materials should be either recycled or disposed of according to local regulations.
 7. Ensure that the name and address of the Authorised Distributor from whom you purchased the product is recorded on the “**Service and Warranty**” page of this document for future reference.
 8. Repacking instructions are provided in Section “**9 Packing for Return**” (page 17).

4 Installation

4.1 Protected Controls



BMB02 Controls and Indicators	
Control / Indicator	Description
ADDRESS SWITCH	Enables addresses in the range 1 to 9 to be set.
DIP3 RS485 TERMINATOR LINK	Switch MUST be ON if the BMB02 is the last (or only) device on the RS485 bus in order to correctly terminate the bus. Note: The BDU01 product can also share a multi-drop RS485 connection with the BMB02.
DIP1 INTERNAL PULL-UP ENABLE (1-4)	Switch ON to enable internal pull-ups on the anodes of the opto-isolators for Digital inputs 1 to 4.
DIP2 INTERNAL PULL-UP ENABLE (5-8)	Switch ON to enable internal pull-ups on the anodes of the opto-isolators for Digital inputs 5 to 8.
COMMS LED	Flashes very fast when the unit is transmitting RS485 data.
PROCESSOR HEALTH LED	Flashes slowly (approx once per second) when comms is detected ok. Flashes fast (approx twice per second) when no comms is detected. No LED activity indicates processor fault or loss of power.

4.2 Serial Number Label

The hardware Build Standard (BS) is part of the product’s serial number. The serial number label is located on the front of the unit; see example below.



Where “XXX-XXXXXX-XXX” is the serial number.

The last section of the serial number indicates the Build Standard (BS).

4.3 Unit Installation

External Cabling Requirements

Signals	Cable Description	Suggested Type
Data	1 x 2-core twisted, screened	Suitably rated foil screened cable
Power	1 x 2-core	Suitably rated cable
Analogue inputs	Multicore, screened	Suitably rated cable
Digital inputs	Multicore	Suitably rated cable
Digital outputs	Multicore, screened	Suitably rated foil screened cable
<p>i</p> <ol style="list-style-type: none"> 1) Screened cable must be used for the connections where identified in the cable description. 2) The maximum recommended distance for the RS485 data link is 1 km. 3) Refer to BS7671:2018 (Requirements for Electrical Installations) or other appropriate local standards for guidelines on maximum potential cable lengths given the actual installation parameters. 		

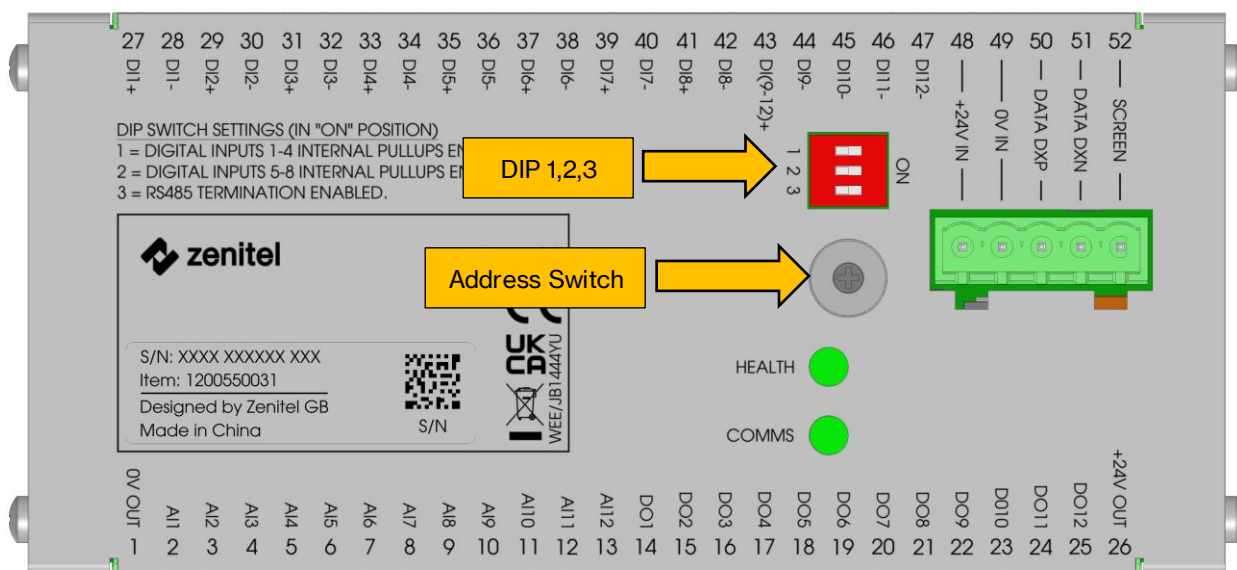
Recommended Installation Procedure



Please read and observe the instructions and guidelines in Section 1 prior to installation. Failure to follow these instructions and guidelines may cause personal injury and/or damage to the equipment.

- Using the hole in the case, set the Address Switch to the correct number between 1 and 9; see Figure 1.

Figure 1 Address Switch and DIP switch locations and settings



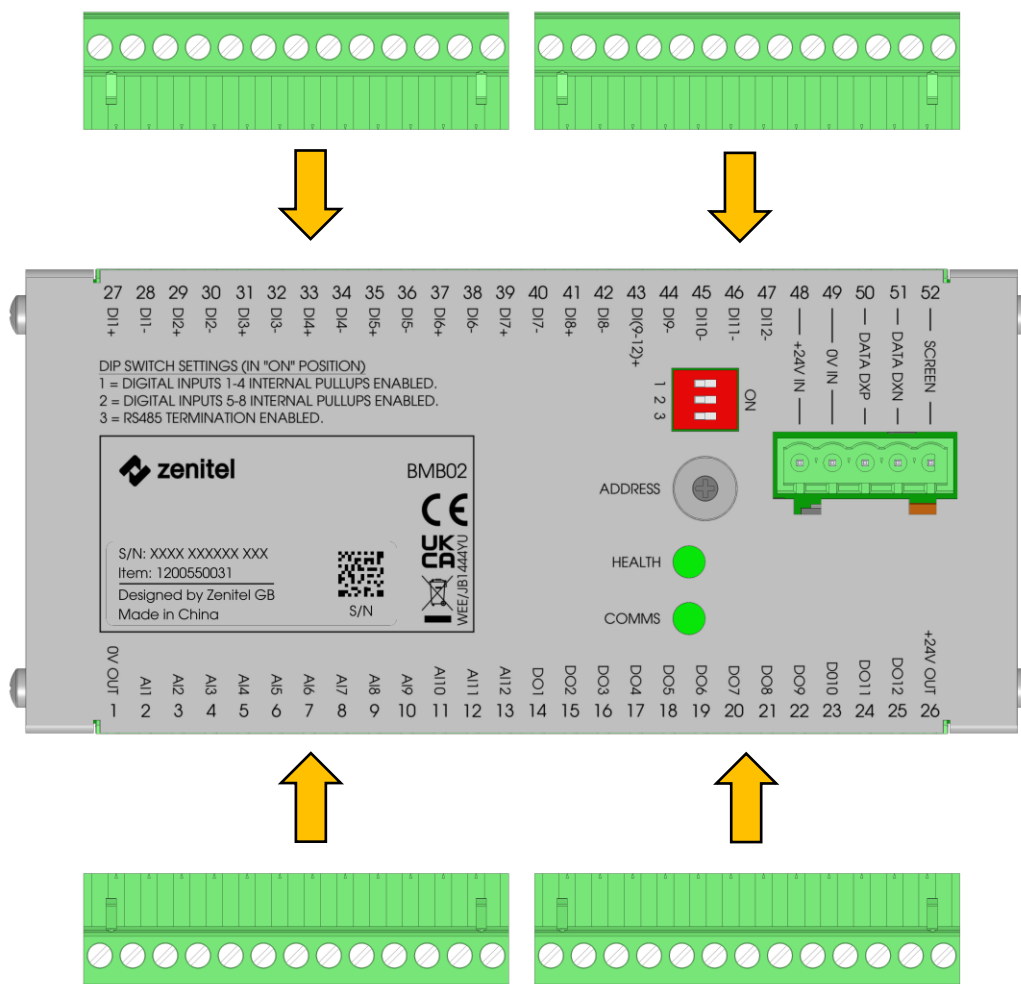
- If the unit is the last (or only) Remote I/O Unit on the RS485 bus, set DIP3 to ON; see Figure 1.
- Set the DIP switches (DIP1, DIP2) as required; see Figure 1.

DIP1: set switch to ON to enable internal pull-ups on the anodes of the opto-isolators for Digital Inputs 1 to 4.

DIP2: set switch to ON to enable internal pull-ups on the anodes of the opto-isolators for Digital Inputs 5 to 8.
- Clip the BMB02 onto the DIN rail by positioning the top of the BMB02's rear DIN rail mount on the DIN rail and then pivoting the unit downwards and backwards until the lower clip has fastened; see Figure 2.

- Connect the field wiring to the connectors, as required by system design. If not already fitted, plug in each connector; see Figure 3. Note: the front 5-way connector allows for “Daisy Chaining” the power and data lines, as an alternative for using double ferrules in the 13-way connector.

Figure 3 Connecting the field wiring



i The connectors are pluggable so the BMB02 can be replaced without having to disconnect individual wires.

- Secure the BMB02 unit on the DIN rail using end-stop or wiring terminals on both sides of the unit.
- Ensure that the unit is powered on.

The PROCESSOR HEALTH LED flashes to indicate that the unit is powered on and the processor is fault free; see Figure 3.

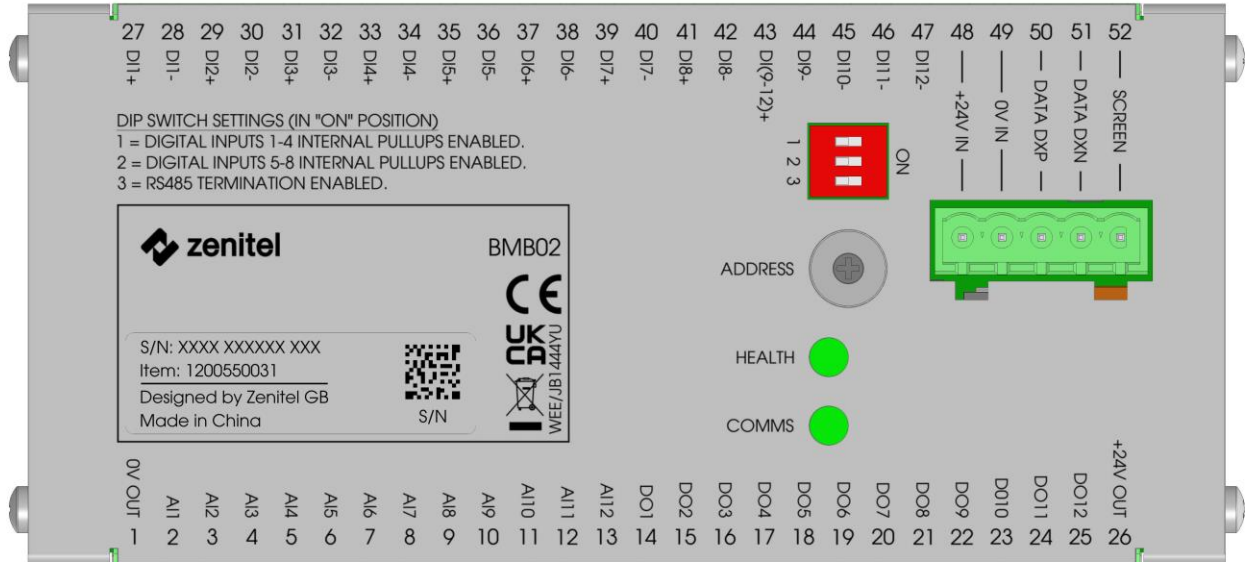
- The installation is now complete and ready for system commissioning.

When the BMB02 is correctly configured and commissioned the LEDs (see Figure 3) flash as follows:

- PROCESSOR HEALTH LED: flashes approximately once per second
- COMMS LED: flashes very fast

5 Connections

BMB02 Terminal Allocation



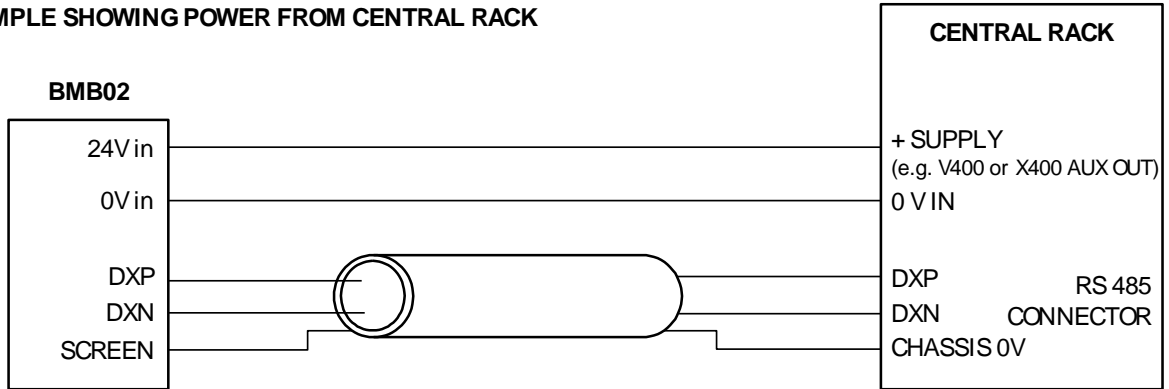
Note: Pin numbers 48-52 are also present at the 5-pin front-facing connector. This allows multiple units' power and data connections to be “daisy chained” together.

BMB02 Terminal Description

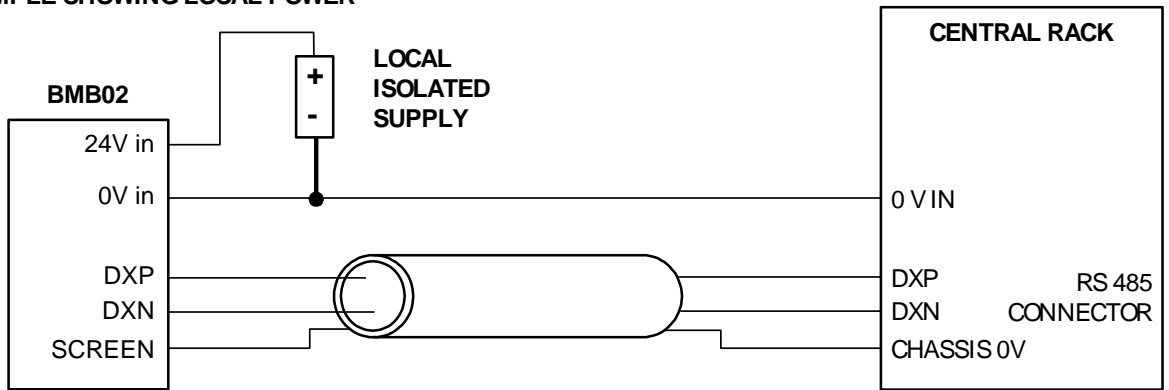
Pin No	Signal	Description / Operation
1	0V OUT	0 V connection for Analogue Inputs
2-13	AI1-AI12	Analogue Inputs (internal 4.7 kΩ pull-up to +5 V)
14-25	DO1-DO12	Digital Outputs (open-collector)
26	+24V OUT	+ve supply (as 24 V in) for open-collector outputs. Resettable internal 1.6 A fused.
27-42	DI1-DI8	Digital Inputs 1 to 8 + = Opto-anode (with internal 10 kΩ pull-up to positive supply voltage enabled/disabled via link settings) - = Opto-cathode
43	DI(9-12)+	Common connection to external pull-ups on the anode of the opto-isolators of Digital Inputs 9 to 12
44-47	DI9-DI12-	Digital Inputs 9-12 (opto-cathode)
48	+24V IN	18-60 V Supply In
49	0V IN	0 V Supply In
50	DATA DXP	RS485 DATA +
51	DATA DXN	RS485 DATA -
52	SCREEN	Screen connection for RS485 data

BMB02 Power Connection Options

EXAMPLE SHOWING POWER FROM CENTRAL RACK



EXAMPLE SHOWING LOCAL POWER



Power to the BMB02 can either be local or from the central rack equipment.

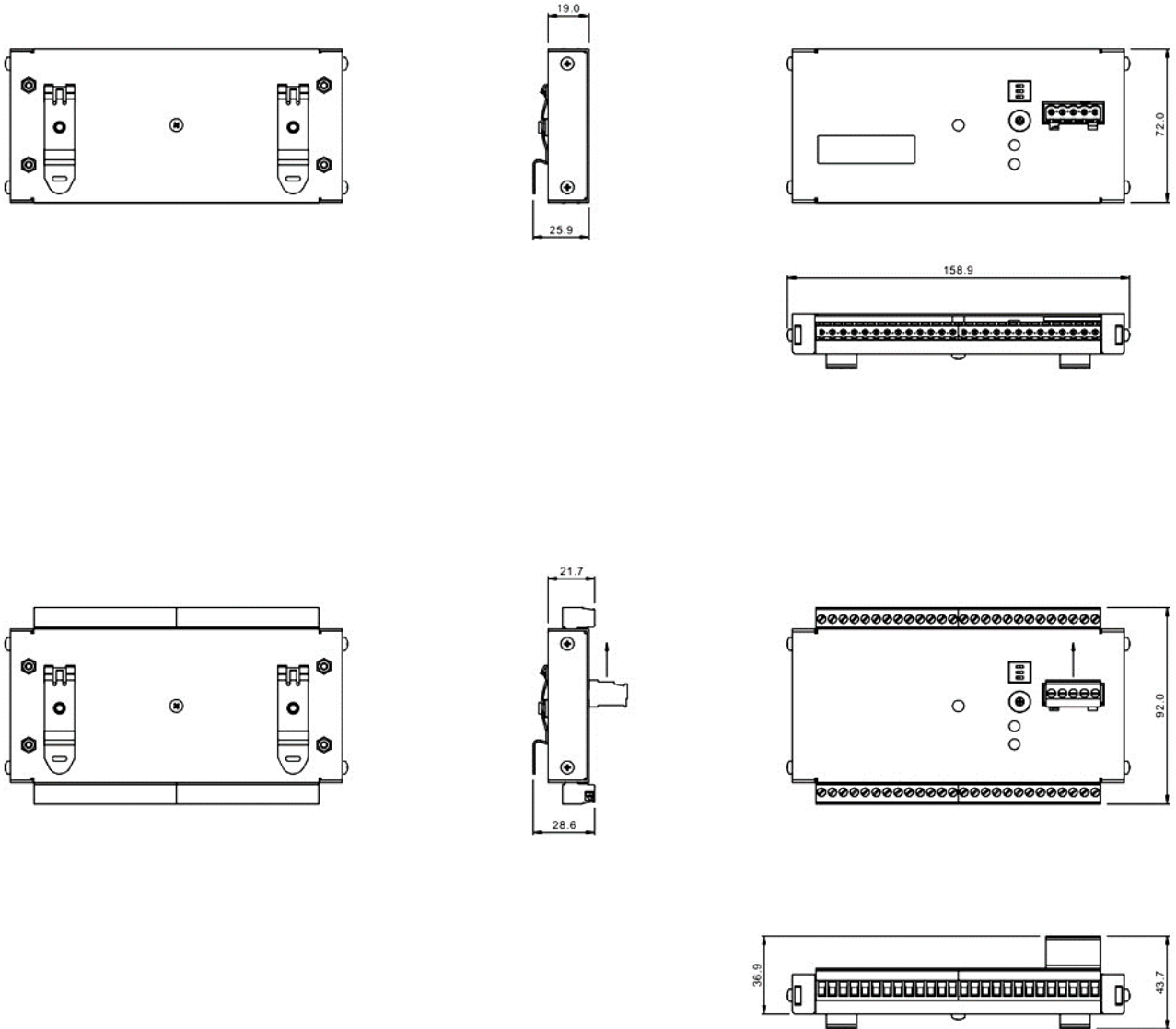
If a local power supply is used, a 0 V connection must be made between the central rack and the BMB02 for correct operation of the data-link. The local power supply must be isolated from ground to avoid potentially large ground currents flowing in the 0 V interconnection if the BMB and central rack are an appreciable distance apart.

If powered from the central rack, the cabling should be selected so that the total load does not cause an excessive voltage drop (>4 V) in the 0 V connection otherwise incorrect operation of the data-link may occur

6 Technical Specification

Supply Voltage Range	18 – 60 V DC
Current Consumption (max, all LED's on)	35 mA @ 24 V DC supply
Digital Outputs	12 x active-low open-collector outputs
Open-collector Maximum Rated Current	350 mA
Open-collector Maximum Voltage.....	60 V
Analogue Inputs	12 x non-isolated analogue interfaces internally pulled up to 12 V by 4.7 k Ω
Digital Inputs.....	12 x opto-isolated interfaces with built-in resistor to suit voltages of +12 to +60 V
Data Connection.....	EIA RS485 19200 baud
Temperature Range (Storage and Operating)	-5 °C to +55 °C
Humidity Range.....	0 % to 93 % non-condensing
Dimensions (H x W x D).....	92 mm x 159 mm x 44 mm
Weight	370 g

7 Mechanical Dimensions



- 1) Zenitel recommend a rear clearance depth of at least 110 mm for cabling.

A 19-inch standard rack with 800 mm depth provides the required room for installation including the rear cabling.

- 2) In order for customers to produce their own site documentation drawings of the front and rear panel are available from Zenitel.

8 Storage and Preservation

This product should be packed for storage in the original packing as described in the Section 9 “Packing for Return” below and stored in the following environmental conditions:

- Away from harsh environmental conditions, such as areas that are subject to corrosive atmosphere, excessive moisture or may allow water or other liquids to come into contact with the unit or its external connections.
- In a heated and humidity-controlled storage areas where the temperature and humidity are within the equipment specification.

9 Packing for Return



This product contains static-sensitive devices. Observe ESD precautions when handling this product with the cover removed.

If a product is being returned for servicing, try to use the containers and materials of the original packaging. Attach a tag indicating the type of service required, return address, equipment type and full serial number.

If the original packing can no longer be used, the following general instructions should be used for repacking with commercially available materials:

- All electronics assemblies must be properly packed in ESD protective packing for transport, to prevent physical and ESD damage.
- The filler material used for packing must be antistatic or static dissipative, as this may come into contact with exposed connectors, wiring, or PCB assemblies. The use of non-conductive filler material may cause damage to the electronic assemblies reducing their operational life, or even destroying them.
- Use a sturdy cardboard box that will support the weight and size of the equipment.
- Attach a tag indicating the type of service required, return address, equipment type and full serial number.
- Completely wrap the equipment in bubble wrap (all sides must be protected) and secure the wrap in place with tape.
- Place the wrapped equipment inside the box surrounded by filler material, ensuring that there is no room for movement.
- Seal the box securely with packing tape.

Service and Warranty

Name and Address of Authorised Distributor:

This product carries a full warranty. For full details of warranty and service agreements, please contact the Authorised Distributor who supplied the product to you.

Exclusions

The warranty does NOT cover:

1. Customer misuse, including incorrect installation.
2. Damage other than manufacturing defects.
3. Transit / Courier damage.
4. Incorrect voltage or power supply used.
5. Incorrect input signal.
6. Abnormal environmental operating conditions.
7. Damage incurred by accident, fire, lightning or other hazard.
8. Modification to the unit or inexpert / attempted repair.
9. No fault found – where no fault can be found after extensive testing, indicating user error or failure in ancillary equipment.
10. Electronic assemblies which are improperly packed when returned for repair or service. All electronics assemblies must be properly packed in ESD protective packing for transport to prevent physical and ESD damage.

Should any of the above apply, Zenitel reserves the right to raise any relevant charges to the customer.

Zenitel shall not be liable for any indirect, special or consequential loss or damage (including without limitation any loss of profits) arising from the use of this product or for any breach of this warranty.

In the interest of continual product development, Zenitel reserves the right to make changes to product specification without notice or liability.

