

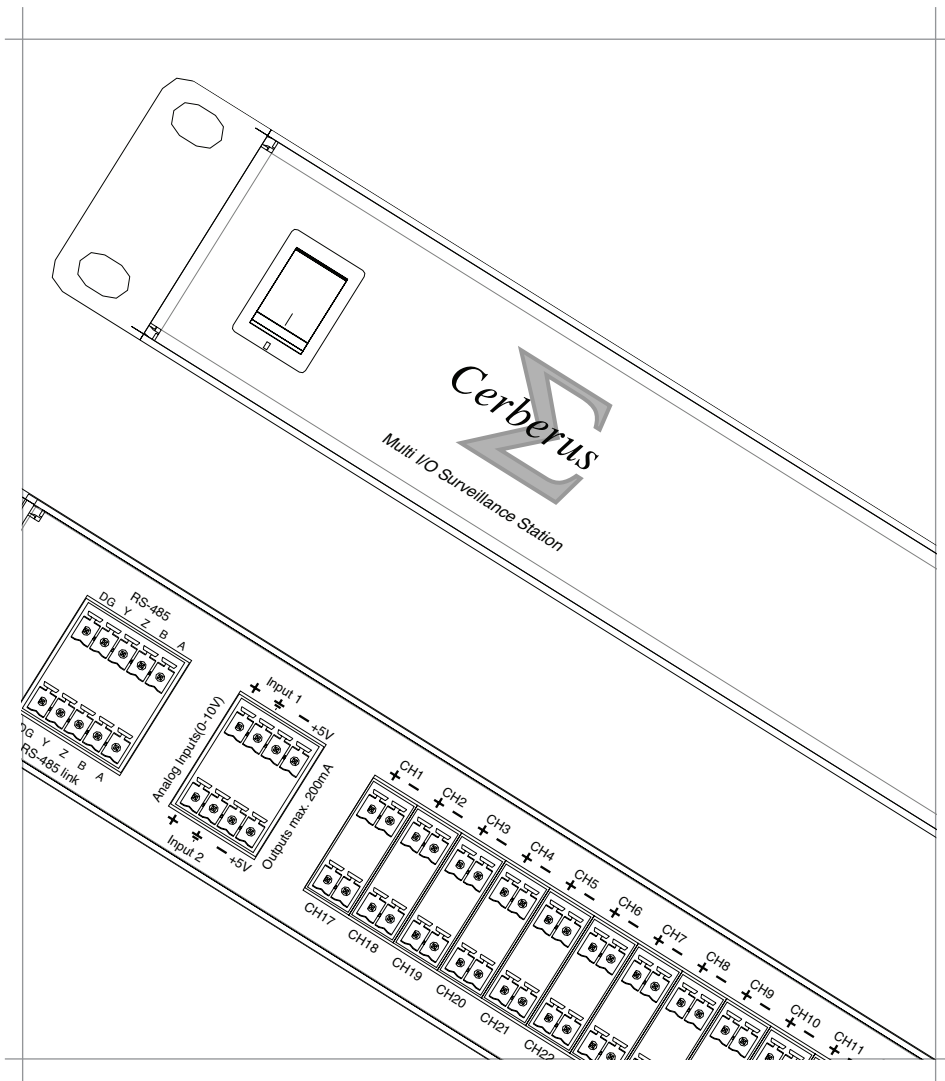
# CERBERUS

## Datasheet

Applies to Part Number:

TUN-391010

## Cerberus multi I/O



Delivering Clear and Intelligible Messages



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# 1. Architectural and Engineering Specifications

The unit shall be constructed as a 1U 19" rack enclosure. The unit shall be primarily designed as a processor controlled multi-channel I/O interface with RS-485 network support and shall be suitable for any of the following applications:

- Redundant amplifier control applications (in conjunction with AXYS® multi-channel amplifiers and redundant amplifier switching kit).
- Monitoring of third party devices (by using an AXYS® WinControl Server).
- Providing a common fault relay for multiple devices (stand-alone mode).

The unit shall be equipped with 32 digital inputs, 2 electronically balanced analogue DC voltage inputs, 8 relay outputs, a common failure relay, a full-duplex RS-485 network input & link interface, status LEDs and a reset switch.

The digital inputs shall be suitable for logic high/low level monitoring as well as impedance sensing applications (by means of configurable pull-up current sources).

The analogue inputs shall be suitable for DC voltage monitoring and shall offer a high input impedance and a high common mode voltage range. Supply outputs (+5 V DC) shall be provided to power an external sensor. All related thresholds shall be software configurable.

The internal RISC processor shall be equipped with a watchdog timer and a manual reset switch. Firmware updates shall be supported over the network. Sufficient internal memory shall be provided in order to support at least 8 internal device presets. The processor shall facilitate the monitoring of all I/O states and failure conditions over the network.

The inputs, outputs, network and failure relay shall be connected to Phoenix type MC 1,5/ x-ST-3,81 connectors. The unit shall be equipped with an IEC mains inlet connector.

The enclosure shall be constructed of steel finished with a nickel plating. All connectors shall be grouped together on the rear of the chassis. The front of the enclosure shall accommodate a mains switch and various status LEDs.

Dimensions are 43.5 mm H x 482 mm W x 232 mm D. Weight 3.2 kg.

The multi I/O device shall be the AXYS® Cerberus.

## 2. Specifications

### Electrical:

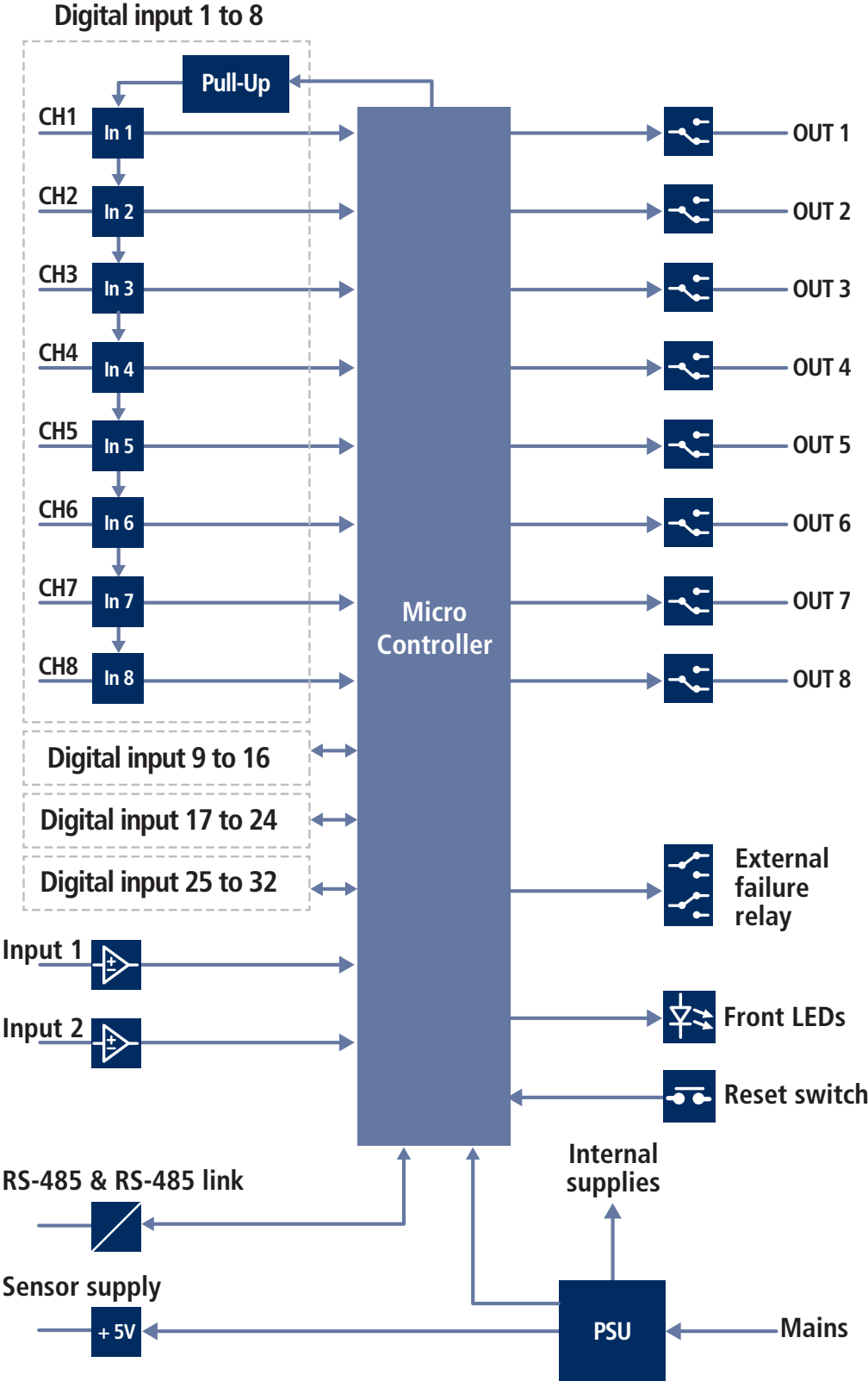
Digital inputs	- Number of digital inputs	: 32
	- Type <sup>1</sup>	: differential
	- Nominal level	: 0 to +5 V DC
	- Maximum level	: +/- 24 V DC
	- External impedance <sup>2</sup>	: 10 k $\Omega$ / 20 k $\Omega$
	- Internal pull-up <sup>3</sup>	: pull-up current sources
Analogue inputs	- Number of analogue inputs	: 2
	- Type	: electronically balanced
	- Nominal level	: 0 to +10 V DC
	- Maximum level	: +/- 50 V DC
	- Common mode range	: +/- 150 V
	- Impedance <sup>4</sup>	: 2 M $\Omega$
	- Sensor supply output <sup>5</sup>	: +5 V DC / 200 mA per pin
Outputs	- Number of outputs	: 8
	- Type	: one single-pole changeover (SPDT) relay per output
	- Rating	: 100 mA / 24 V
	- Mode <sup>6</sup>	: general purpose or failure controlled
	- Failure controlled features <sup>6</sup>	: - activate or de-activate output on failure <sup>7</sup> - priority for single/multiple output assertion <sup>8</sup> - delayed switching <sup>9</sup> - failure mask for any digital/analogue input and combined failures
Monitoring	- Digital input monitoring <sup>10</sup>	: - open-circuit failure - short-circuit failure - default state failure
	- Analogue input monitoring <sup>11</sup>	: - upper threshold failure - lower threshold failure
	- Output monitoring <sup>12</sup>	: all outputs can be monitored by digital input 25 to 32
	- Failure relay <sup>13</sup>	: double-pole changeover (DPDT) 100 mA / 24 V
Processor	- Type	: 200 ns single cycle RISC
	- Memory	: 2 Mb non-volatile (EEPROM)
	- Self-monitoring	: hardware WDT
	- Reset switch	: access hole on rear panel
Network control unit	- Interface type <sup>14</sup>	: serial full-duplex RS-485, optically isolated
	- Baud rate	: autoswitching 115k2, 57k6, 38k4, 19k2 baud
	- Topology <sup>15</sup>	: parallel connection (multi-drop)
	- Maximum number of units <sup>16</sup>	: 126 per subnet
	- Maximum cable length <sup>17</sup>	: 2 km

Connectors	<ul style="list-style-type: none"> <li>- Digital inputs</li> <li>- Analogue inputs</li> <li>- Outputs</li> <li>- RS-485 interface</li> <li>- RS-485 link<sup>18</sup></li> <li>- Failure relay<sup>19</sup></li> <li>- Mains</li> </ul>	<ul style="list-style-type: none"> <li>: Phoenix type MC 1,5/ 2-ST-3,81 (32 x) p1 = +, p2 = -</li> <li>: Phoenix type MC 1,5/ 4-ST-3,81 (2 x) p1 = +, p2 = AGND, p3 = -, p4 = +5 V DC supply</li> <li>: Phoenix type MC 1,5/ 3-ST-3,81 (8 x) p1 = Common (CO), p2 = Active closed (AC), p3 = Active open (AO)</li> <li>: Phoenix type MC 1,5/5-ST-3,81 p1 = DGND, p2 = Y, p3 = Z, p4 = B, p5 = A</li> <li>: Phoenix type MC 1,5/ 5-ST-3,81 p1 = DGND, p2 = Y, p3 = Z, p4 = B, p5 = A</li> <li>: Phoenix type MC 1,5/ 3-ST-3,81 (2 x) p1 = Common (CO), p2 = Normally closed (NC), p3 = Normally open (NO)</li> <li>: 3p IEC connector</li> </ul>
Indicators <sup>20</sup>	<ul style="list-style-type: none"> <li>- Supply monitoring LED<sup>21</sup></li> <li>- Failure relay LED<sup>22</sup></li> <li>- Identification LED<sup>23</sup></li> <li>- RS-485 send<sup>24</sup></li> <li>- RS-485 receive<sup>25</sup></li> </ul>	<ul style="list-style-type: none"> <li>: green</li> <li>: green (OK) / red (failure)</li> <li>: green</li> <li>: orange</li> <li>: orange</li> </ul>
PSU	<ul style="list-style-type: none"> <li>- Type</li> <li>- Mains voltage</li> <li>- Mains fuse(s)</li> <li>- Power consumption</li> <li>- Protection</li> </ul>	<ul style="list-style-type: none"> <li>: switched-mode</li> <li>: 100 V to 240 V, 50 or 60 Hz</li> <li>: 1 x 3.15 A (slow type, integrated in IEC mains connector)</li> <li>: 4 W, 8 VA (typical)</li> <li>: - thermal protection</li> <li style="padding-left: 20px;">- output current limiting</li> <li style="padding-left: 20px;">- under-voltage and over-voltage lock-out</li> </ul>
<b>General:</b>		
Temperature range (ambient)	: 0 to 40 °C (32 to 104 °F)	
Dimensions (H x W x D)	: 43.5 x 482 x 232 mm (1U 19" rack enclosure)	
Weight	: 3.2 kg (7 lbs)	
Finish	: Nickel plated	

Notes:

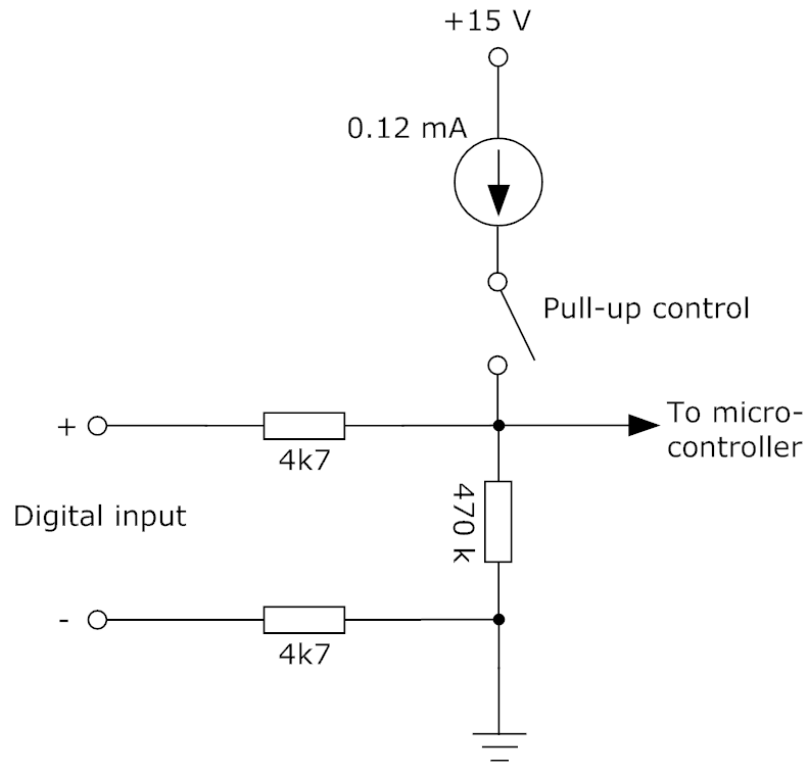
1. The digital inputs can either be used as voltage monitoring inputs (pull-up disabled) or as impedance sensing inputs (pull-up enabled). See section 4 for details.
2. Typical external resistance values for impedance sensing line monitoring applications (pull-up enabled).
3. Individual 0.12 mA current sources per digital input. Can be enabled/disabled per group of 8 digital inputs.
4. Typical differential input impedance at DC.
5. The sensor supply output pins are hardwired linked and connected via a Polyfuse self-resettable PTC to the internal +5 V supply.
6. Software configurable for each output individually, requires firmware v4.80 or higher to be installed.
7. For supporting additional failure relay outputs (de-activate) or redundant amplifier control (activate).
8. 8 priority levels are available for mutually exclusive output assertion, as required for redundant amplifier control. Additionally priority level 0 corresponds to 'no priority' which allows multiple outputs to be asserted simultaneously.
9. Delayed switching can be set for each output individually however a common delay parameter is shared with the general failure relay.
10. All related thresholds are software configurable per group of 8 digital inputs.
11. All related thresholds are software configurable for each analogue input individually.
12. Hardware configurable (internal jumpers) for each output individually. This allows self-monitoring of the output relay status.
13. Software configurable failure conditions.
14. Individual balanced connections for transmit and receive.
15. 'Star' configuration allowed, depending on cable properties. Closed loop not allowed.
16. Maximum number that can be connected to one subnet, multiple subnets can be controlled by one host PC.
17. Approximate maximum length that can be obtained with good quality data cable.
18. Hardwired link.
19. CO is connected to NC if the device is switched-on and has no failure.
20. All indicators on the front side of the unit.
21. This LED indicates if the device is switched-on and the internal +5 V power supply is OK.
22. This LED indicates the status of the Failure relay.
23. This LED is used for device identification on the RS-485 network.
24. This LED indicates if the device transmits data over the RS-485 network.
25. This LED indicates if data is received over the RS-485 network.

### 3. Functional Diagram





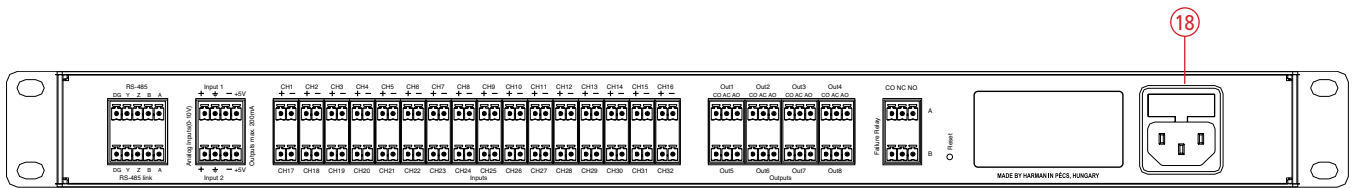
## 4. Digital Input Diagram



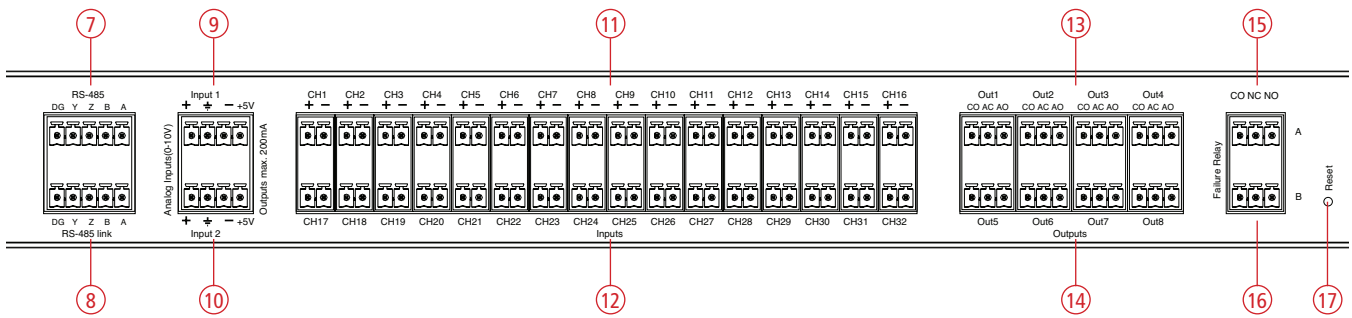
# 5. Mechanical Details



Front Panel

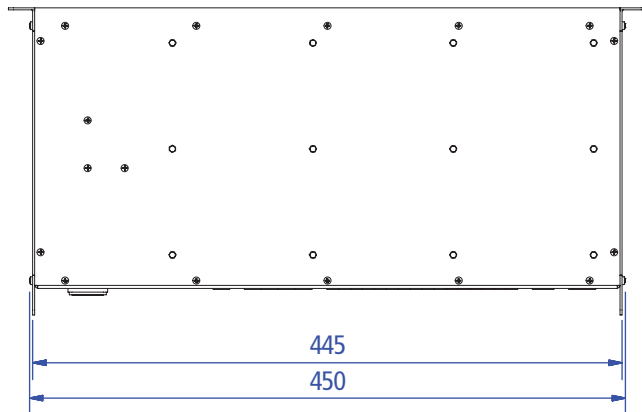
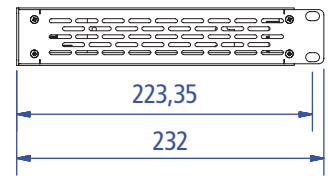
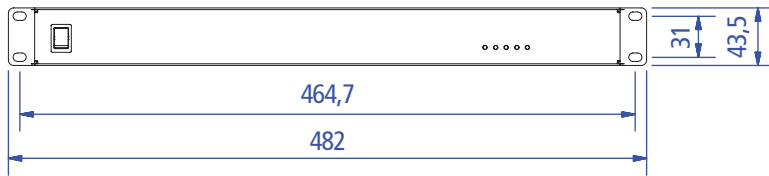
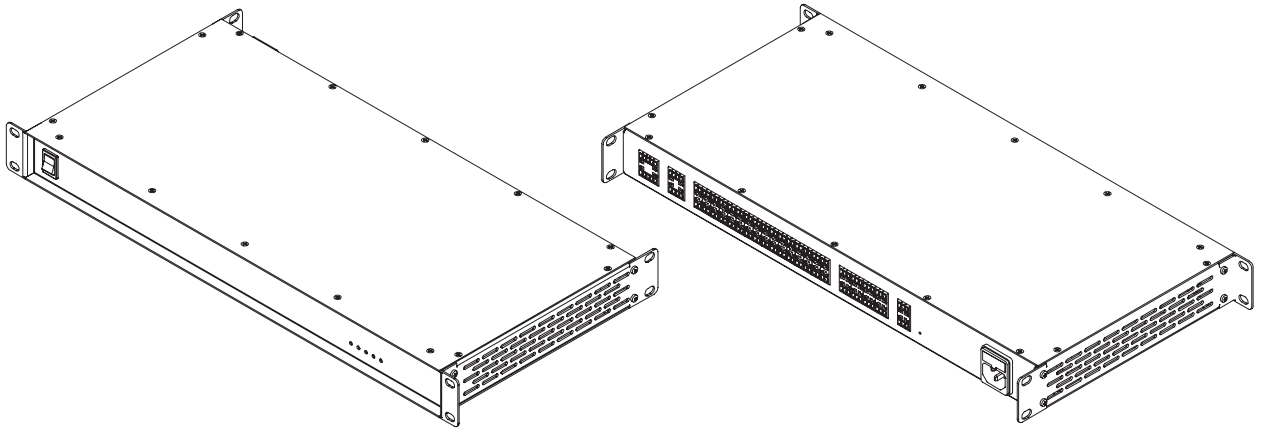


Rear Panel



Detailed view of rear connections

1.	Mains switch	7.	RS-485 interface	13.	Relay outputs 1 to 4
2.	Power supply LED	8.	RS-485 link	14.	Relay outputs 5 to 8
3.	Status LED	9.	Analogue DC input 1	15.	Failure relay contacts A
4.	ID LED	10.	Analogue DC input 2	16.	Failure relay contacts B
5.	RS-485 send	11.	Digital inputs 1 to 16	17.	Reset switch
6.	RS-485 receive	12.	Digital inputs 17 to 32	18.	IEC mains inlet



Note: All dimensions in mm



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