Contents Page

Hardware design 7–3

Power supply modules 7–3

CPU module 7–5

Switches and indicators 7–5

Binary input module..... 7–7

Connections 7–7

Binary output module 7–8

Connections 7–8

Analog input module..... 7–9

Connections and indications 7–9

Multi-transformer module 7–11

Connections 7–11

Insulating transducer module 7–14

Connections 7–14

Jumpers 7–16

Star coupler module 7–18

Connections and indications 7–18

Switch settings 7–19

Process bus controller..... 7–20

Connectors and indications..... 7–20

1 Power supply modules

Note: Disconnect the mains connector (4) to isolate the power supply module from supply voltage. When switching off (2) primary circuits are still live.

The terminal can be equipped with one of two power supply modules, the 60 W output power 500PSM02 or the 100 W output power 500PSM03. Depending on the unit's backplane selection it is possible to further extend the power capacity by adding a second power supply module at the right end of of the chassi.

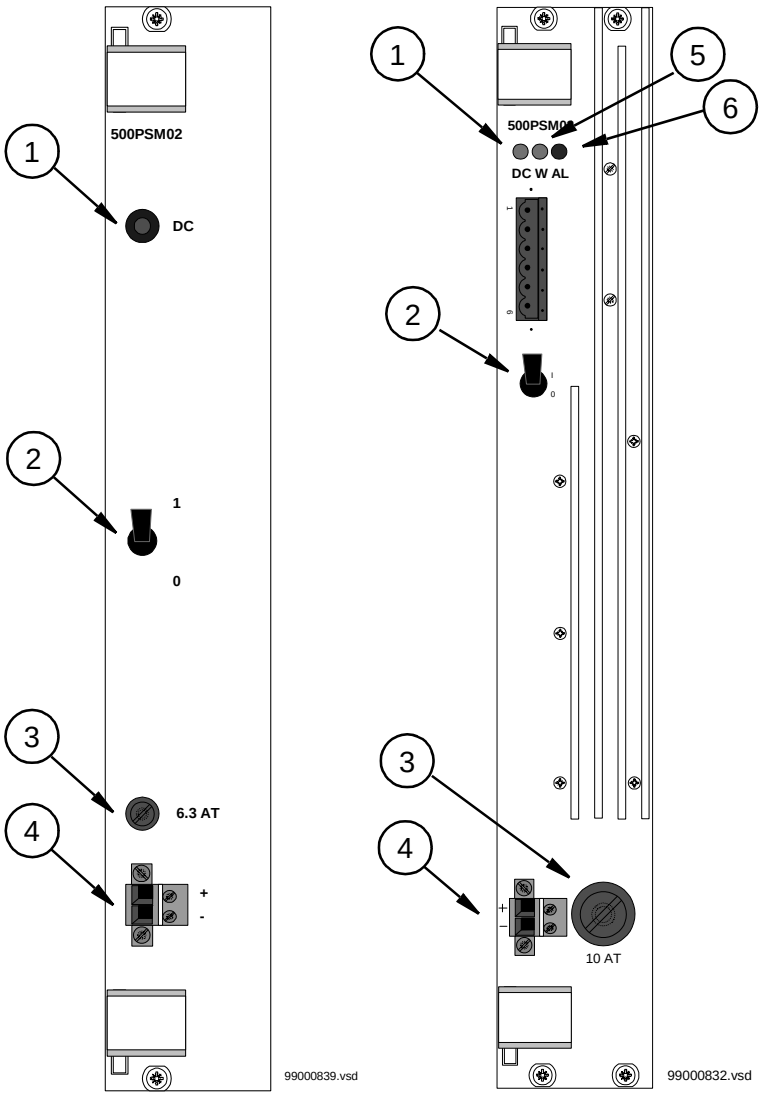

Figure 1: Power supply modules, 500PSM02 (left) and 500PSM03 (right)

Table 1: Power supply module switches and indicators

Pos	Description
1	Power on indication
2	Power on switch
3	Fuse
4	Input terminal
5	Warning indication[a]
6	Alarm indication[a]

a. 500PSM03 only

2 CPU module

2.1 Switches and indicators

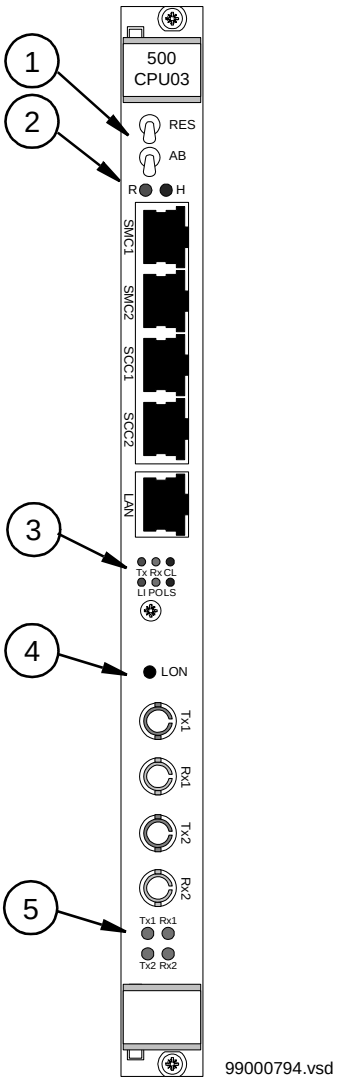

Figure 2: The CPU module front panel

Table 2: Front panel switches and indicators

Pos	Description
1	Reset and Abort switches. Toggle RES to restart the CPU and the entire system if the CPU board is configured as system controller. The operation of the AB switch depends on the installed software.
2	System activity indicators. R indicates bus activity. H indicates that execution is stopped.
3	LAN activity indicators. LS indicates that a LON communication error has occured.

Table 2: Front panel switches and indicators

Pos	Description
4	Press the LON services button to activate LON services.
5	Optical network activity indicators.

3 Binary input module

Note: Do not connect AC signals to any input.

The 500BIM01 binary input module has 24 binary opto-coupled inputs. The module is designed as a standard VME bus I/O board.

3.1 Connections

Signals are connected using COMBICON (Phoenix technology) plug-in screw connectors.

Connect signals to the COMBICON plug. Then plug the connector into the corresponding board mounted receptable. Lock the plug to the receplable by fastening the lock screws.

Use a solid or stranded conductor with a cross section area between 0.2-2.5 mm^2 (AWG24-12). Use a ferrule with plastic collar to connect two conductors, cross section area between 0.5-1.5 mm^2 (AWG20-18).

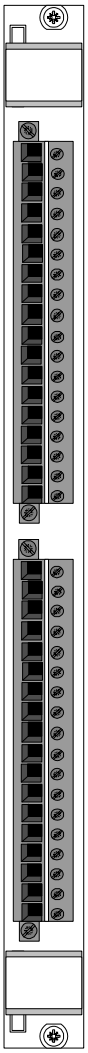

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Figure 3: Binary input module, front plate

4 Binary output module

The 500BOM01 binary output module has 22 relay outpus. The module is designed as a standard VME bus I/O board. Both normal relay outputs (S1-S9) as well as trip outputs with trip coil supervision (T1-T3) are available.

4.1 Connections

Signals are connected using COMBICON (Phoenix technology) plug-in screw connectors.

Connect signals to the COMBICON plug. Then plug the connector into the corresponding board mounted receptable. Lock the plug to the receplable by fastening the lock screws.

Use a solid or stranded conductor with a cross section area between 0.2-2.5 mm^2 (AWG24-12). Use a ferrule with plastic collar to connect two conductors, cross section area between 0.5-1.5 mm^2 (AWG20-18).

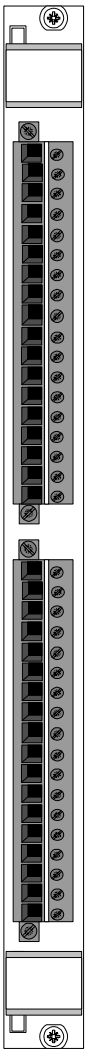

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Figure 4: Binary output module, front plate

5 Analog input module

The 500AIM02 analog input module uses the MVB process bus to collect analog data from switch devices but can also process analog signals from the unit's I/O bus. The module is designed as a standard VME bus I/O board.

5.1 Connections and indications

Connect the MVB bus fibers to the corresponding Tx and Rx connectors.

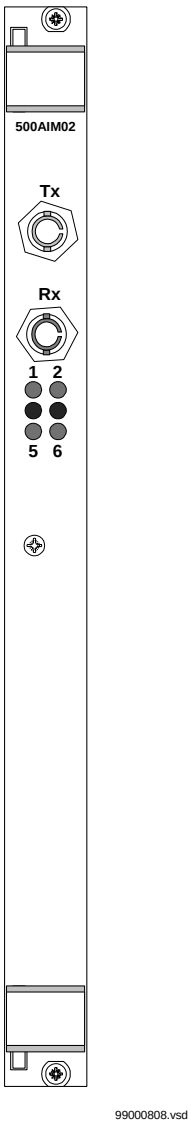

Figure 5: The analog input module front plate

Table 3: Indicators

LED	Function
1	Indicates transmission (Tx) activity
2	Indicates recieve (Rx) activity

Table 3: Indicators

LED	Function
3	Reset. Lit when system reset is asserted
4	Halt. Lit when the CPU is in halt state
5	CFB. Lit when the module has control of the configuration bus
6	LAO. Lit when the optical interface used the main RS-485 line only

6 Multi-transformer module

Use the 500MTM02 multi-transformer module to connect CT:s, MCT:s and VT:s. The multi-transformer module serves as a buffering and signal conditioning unit. Analog to digital conversion is performed by the analog input module (500AIM02) internally connected via the unit backplane. The module is designed as a standard VME bus I/O board.

6.1 Connections

CTs are connected using board mounted screw connectors.

Use a solid conductor with a cross section area between 0.5-6 mm^2 (AWG20-10) or a stranded conductor with a cross section area between 0.5-4 mm^2. Use a ferrule with plastic collar to connect two conductors, cross section area between 0.5-1.5 mm^2 (AWG20-18).

VTs, and in some module configurations also CTs, are connected using COMBICON (Phoenix technology) plug-in screw connectors.

Connect signals to the COMBICON plug. Then plug the connector into the corresponding board mounted receptable. Lock the plug to the receplable by fastening the lock screws.

Warning!
Do not unplug the COMBICON connector when live CT circuits are connected. The following routine must under all circumstances be followed:

1. Short-circuit the CT circuit at the terminal block of the CT.

2. Unplug the COMBICON connector.

Use a solid or stranded conductor with a cross section area between 0.2-2.5 mm^2 (AWG24-12). Use a ferrule with plastic collar to connect two conductors, cross section area between 0.5-1.5 mm^2 (AWG20-18).

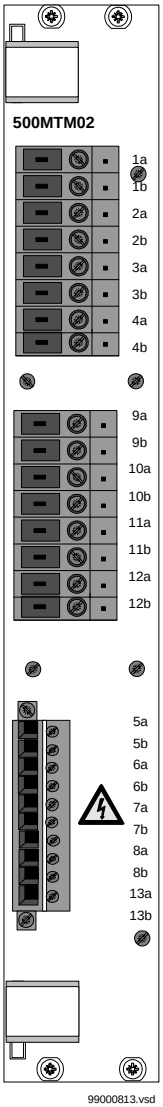

Figure 6: Multi-transformer module

Connect a potential transformer (PT), measuring transformer (MCT) or protection current transformer (PCT) to a corresponding input according to the following table. It is not necessary to short-circuit any unused channel.

Table 4: Transformer types

Channel	Connection	PT	MCT	PCT
1	1a-b	✓	✓	✓
2	2a-b	✓	✓	✓
3	3a-b	✓	✓	✓
4	4a-b	✓	✓	✓
5	9a-b	✓		
6	10a-b	✓		
7	11a-b	✓		
8	12a-b	✓		
9	5a-b	✓	✓	✓
10	6a-b	✓	✓	✓
11	7a-b	✓	✓	✓
12	8a-b	✓	✓	✓
13	13a-b	✓		

7 Insulating transducer module

Use the 500ITM02 to connect DC currents or voltages, for example current loop (0-5/0-20/4-20 mA) signals and low voltages up to ±10 V. The insulating transducer module buffers and conditions the input signals. The analog input module (500AIM02) internally connected via the unit backplane is used for analog to digital conversion. The module is designed as a standard VME bus I/O board.

Up to 16 input channels are available. If the terminal is equipped with an multi-transformer module only half the channels can be used. This must be defined when ordering, since the insulating transducer moduler will be delivered in different versions depending on the ordered terminal configuration. Please see the buyer's guide for details.

7.1 Connections

Signals are connected using COMBICON (Phoenix technology) plug-in screw connectors.

Connect signals to the COMBICON plug. Then plug the connector into the corresponding board mounted receptable. Lock the plug to the receplable by fastening the lock screws.

Use a solid or stranded conductor with a cross section area between 0.2-2.5 mm^2 (AWG24-12). Use a ferrule with plastic collar to connect two conductors, cross section area between 0.5-1.5 mm^2 (AWG20-18).

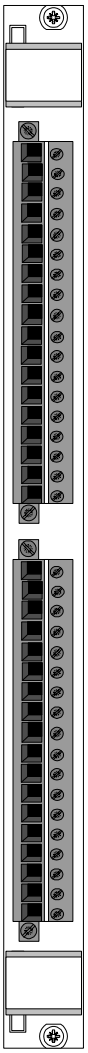

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Figure 7: The insulating transducer module front plate

7.2 Jumpers

Select input signal type (voltage or current) by setting the jumpers accordingly. If current input is selected, set the channels input range to ±5 mA or ±20 mA.

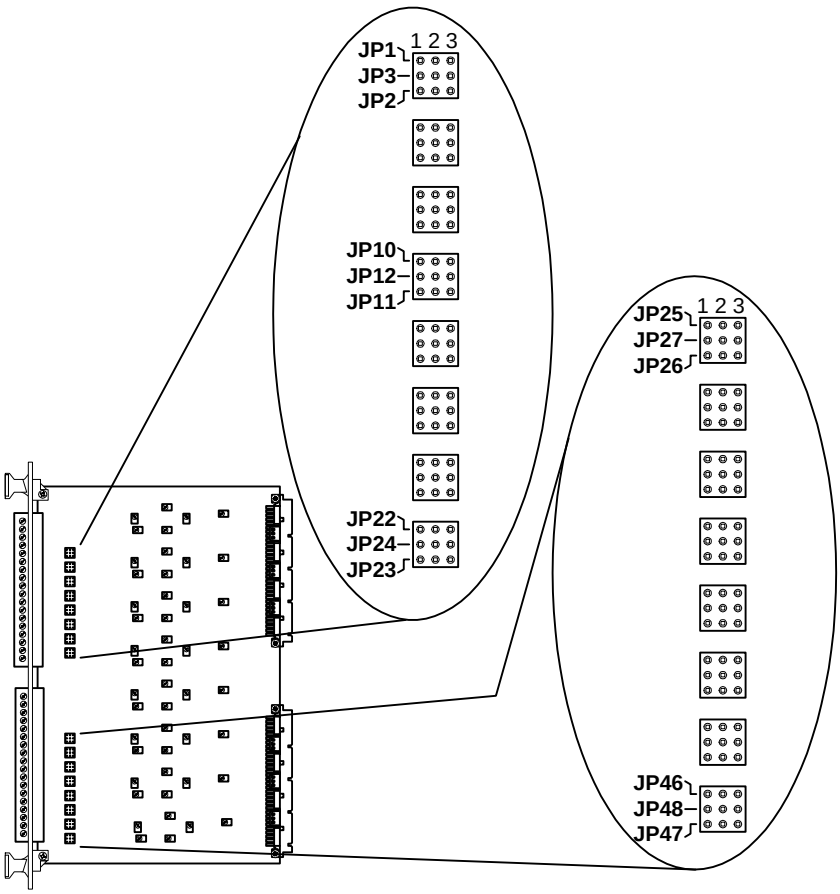

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Figure 8: Isolating transduce module jumpers

Note: The jumpers are not sequential, see the illustration!

Connect pin 2 and 3 of the U/I selection jumpers to configure the channel for voltage signals.

Connect pin 1 and 2 of the U/I selection jumpers to configure the channel for current signals. Connect pin 1 and 2 of the current level selection jumper to select ±20 mA input range. Connect pin 2 and 3 to select ±5 mA input range.

Table 5: Jumper operation

Channel	U/I selection	Current level selection
1	JP1 and JP2	JP3
2	JP4 and JP6	JP5
3	JP7 and JP9	JP8

Table 5: Jumper operation

Channel	U/I selection	Current level selection
4	JP10 and JP12	JP11
5	JP13 and JP15	JP14
6	JP16 and JP18	JP17
7	JP19 and JP21	JP20
8	JP22 and JP24	JP23
9	JP25 and JP27	JP26
10	JP28 and JP30	JP29
11	JP31 and JP33	JP32
12	JP34 and JP36	JP35
13	JP37 and JP39	JP38
14	JP40 and JP42	JP41
15	JP43 and JP45	JP44
16	JP46 and JP48	JP47

8 Star coupler module

Use the 500SCM01 star coupler module to connect up to five MVB bus units to the terminal. The module is designed as a standard VME bus I/O board.

8.1 Connections and indications

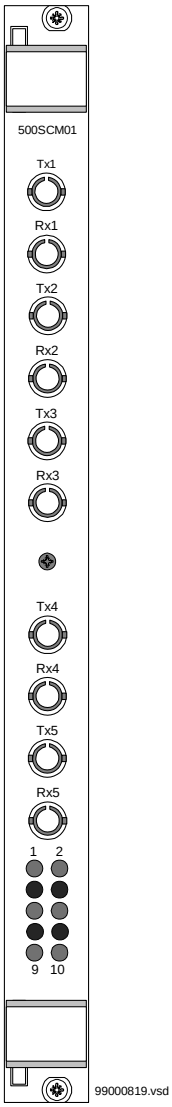

Figure 9: The star coupler module front plate

Connect the MVB bus fibers to the corresponding Tx and Rx connectors. The LEDs indicate bus traffic, the left column Tx traffic, the right Rx traffic.

8.2 Switch settings

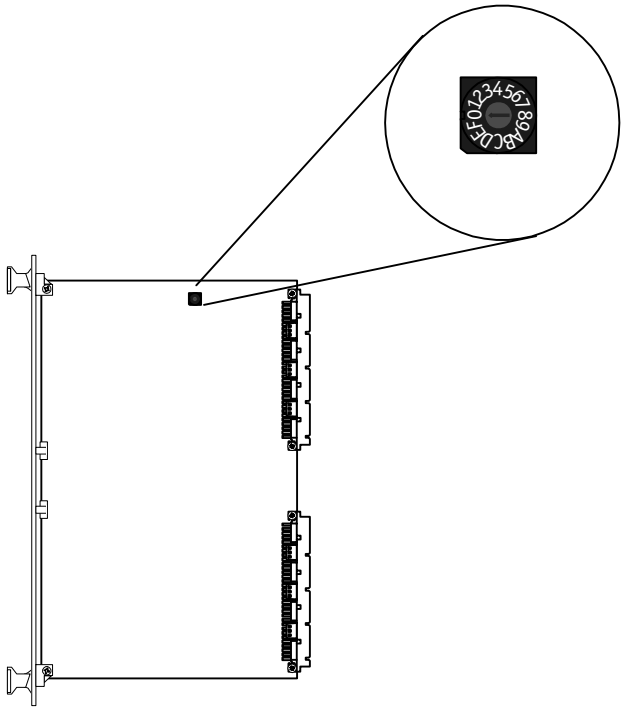

Figure 10: Rotary switch

Table 6: Rotary switch positions

Position	Function
0	The assignment of optical inputs and outputs to the electrical lines of the backplane is effected from the connected CPU module.
1	All optical connections are connected to line 1A
2	All optical connections are connected to line 2A
3	All optical connections are connected to line 3A
4	All optical connections are connected to line 4A
5	All optical connections are connected to line 5A
6	Not used
7	Not used
8	Not used
9	All optical connections are connected to line 1B
A	All optical connections are connected to line 2B
B	All optical connections are connected to line 3B
C	All optical connections are connected to line 4B
D	All optical connections are connected to line 5B
E	Not allowed
F	Not allowed

9 Process bus controller

Use the 500MBA02 process bus controller for process bus administration when the main CPU module is equipped for MVB bus communication. The module is designed as a standard VME bus I/O board with a fixed connection to I/O bus lines 1A (Rx) and 1B (Tx).

9.1 Connectors and indications

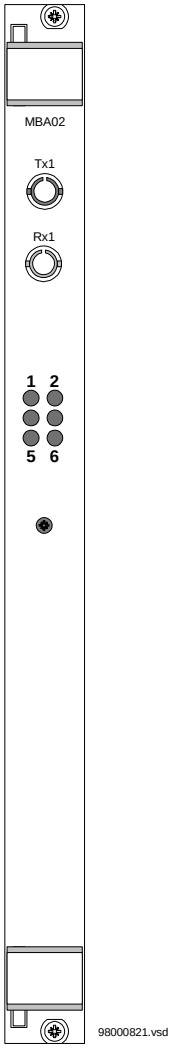

Figure 11: The process bus controller front plate

Connect the MVB bus fibers to the corresponding Tx and Rx connectors. LEDs 1 and 2 indicate bus traffic. LED 3 indicates module initialization. LEDs 4-6 are not used.