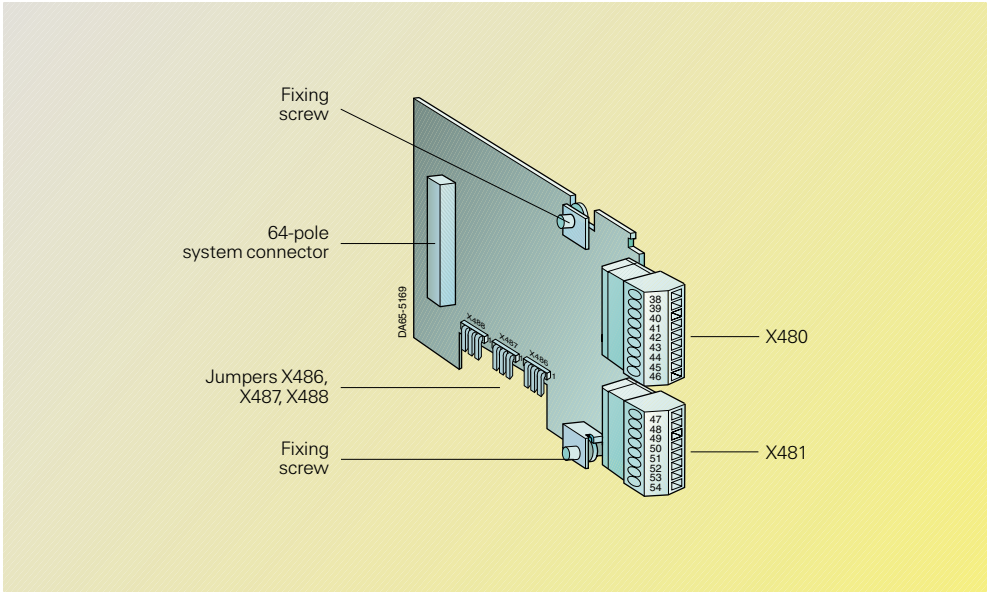
EB1 expansion board

With the EB1 (Expansion Board 1), it is possible to expand the number of digital and analog inputs and outputs.

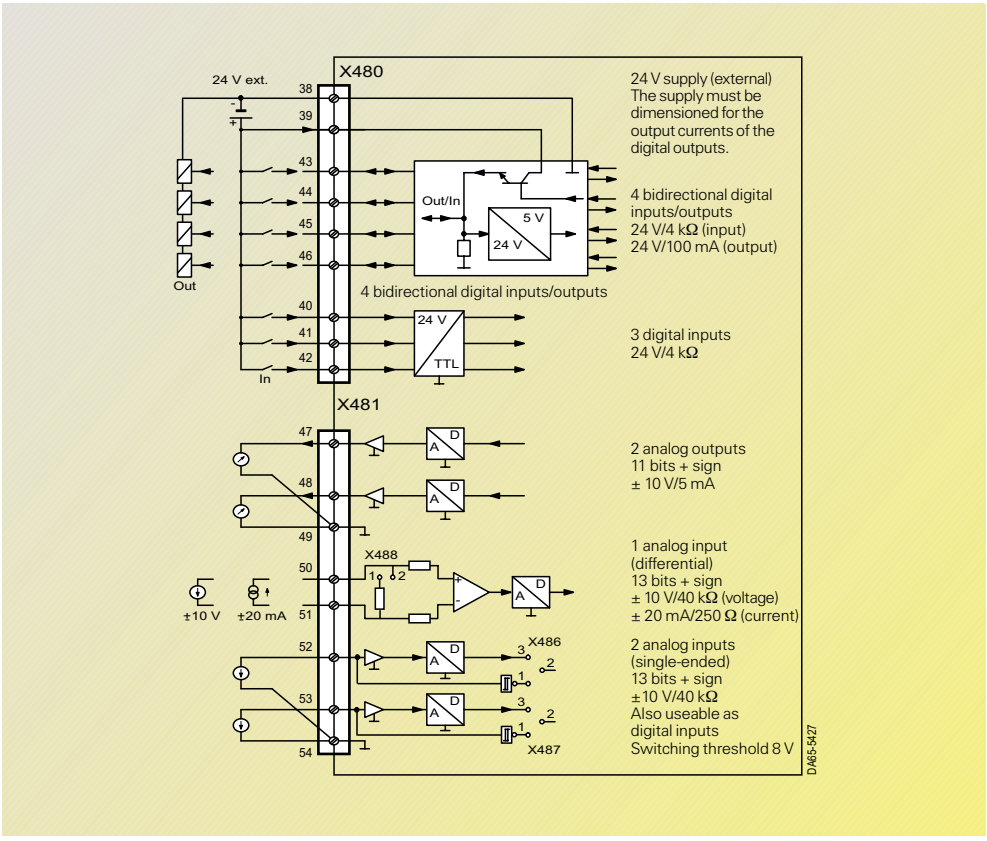
The EB1 expansion board has

- 3 digital inputs
- 4 bidirectional digital inputs/outputs
- 1 differential analog input signal which can be used as a current/voltage input
- 2 analog inputs (single-ended) which can also be used as digital inputs
- 2 analog outputs
- 1 input for the external 24 V power supply for the digital outputs

The EB1 expansion board can be integrated into the electronics box via slot.



EB1 expansion board



Circuit diagram of the EB1 expansion board

Connection X480

The following connections are provided on the terminal strip:

- 3 digital inputs
- 4 bidirectional digital inputs/outputs

The ground cables are protected by a reactor. Terminal 46 is at the top when fitted.

Note

An external 24 V supply is necessary and must be dimensioned for the currents of the digital outputs.

Terminal	Designation	Description	Range
38	M	Ground digital	0 V
39	P24 ext.	Ext. 24 V supply	20 V to 33 V
40	DI1	Digital input 1	24 V, R_i = 4 kΩ
41	DI2	Digital input 2	24 V, R_i = 4 kΩ
42	DI3	Digital input 3	24 V, R_i = 4 kΩ
43	DIO1	Digital input/output 1	As input: 24 V, 4 kΩ As output: Output voltage P24 ext. 100 mA
44	DIO2	Digital input/output 2	
45	DIO3	Digital input/output 3	
46	DIO4	Digital input/output 4	

Max. connectable cross-section: 0.14 – 1.5 mm² (AWG 16)

Connection X481

The following connections are provided on the terminal strip:

- 1 differential analog input, which can be used as a current and voltage input
- 2 analog inputs (single-ended) which can also be used as digital inputs
- 2 analog inputs

The ground cables are protected by a reactor. Terminal 47 is at the top when fitted.

Terminal	Designation	Description	Range
47	AO1	Analog output 1	±10 V, 5 mA
48	AO2	Analog output 2	±10 V, 5 mA
49	AOM	Ground analog output	0 V
50	AI1P	Analog input 1 +	Voltage: ± 10 V, 40 kΩ
51	AI1N	Analog input 1 –	Current: ± 20 mA, 250 Ω
52	AI2	Analog input 2	±10 V, 40 kΩ
53	AI3	Analog input 3	±10 V, 40 kΩ
54	AIM	Ground analog input	0 V

Max. connectable cross-section: 0.14 – 1.5 mm² (AWG 16)

Technical Data

Designation	Value
Digital inputs	DI1, DI2, DI3
• Voltage range LOW	0 V (–33 V to +5 V)
• Voltage range HIGH	+24 V (13 V to 33 V)
• Input resistance	4 kΩ
• Smoothing	250 µs
• Electrical isolation	None
Bidirectional digital inputs/outputs	DIO1, DIO2, DIO3, DIO4
As input	
• Voltage range LOW	0 V (–33 V to +5 V)
• Voltage range HIGH	+24 V (13 V to 33 V)
• Input resistance	4 kΩ
As output	
• Voltage range LOW	< 2 V
• Voltage range HIGH	> P24 ext. –2.5 V
Analog input (differential input)	AI1P, AI1N
• Input range	
Voltage	±11 V
Current	±20 mA
• Input resistance	
Voltage	40 kΩ to ground
Current	250 Ω to ground
• Hardware smoothing	220 µs
• Resolution	13 bits + sign
Analog input (single-ended)	AI2, AI3, AIM
• Input range	±11 V
• Input resistance	40 kΩ to ground
• Hardware smoothing	220 µs
• Resolution	13 bits + sign
Analog output	AO1, AO2, AOM
• Voltage range	±10 V
• Input resistance	40 kΩ to ground
• Hardware smoothing	10 µs
• Resolution	11 bits + sign

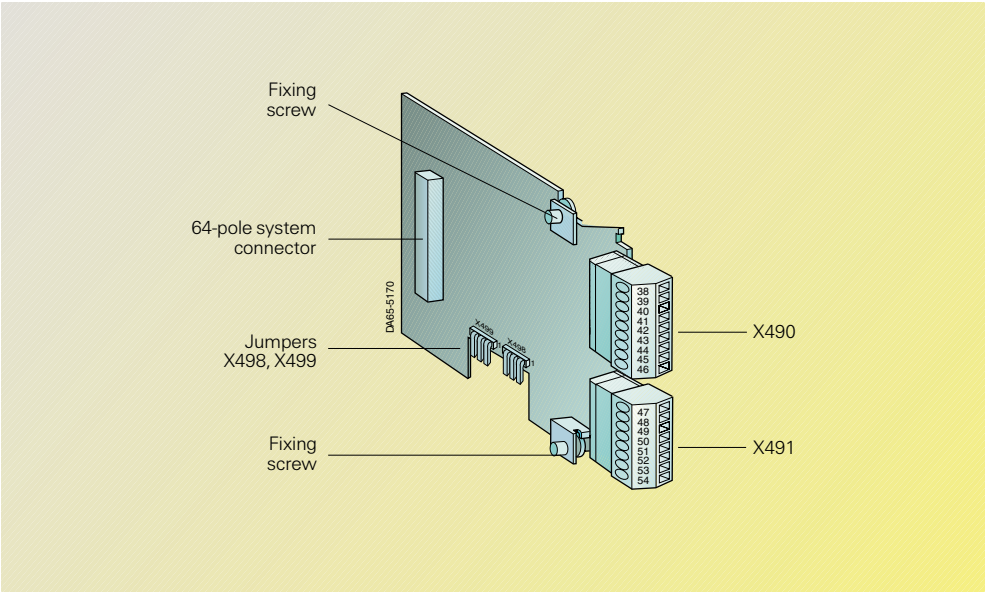
EB2 expansion board

With the EB2 expansion board (Expansion Board 2), the number of digital and analog inputs and outputs can be expanded.

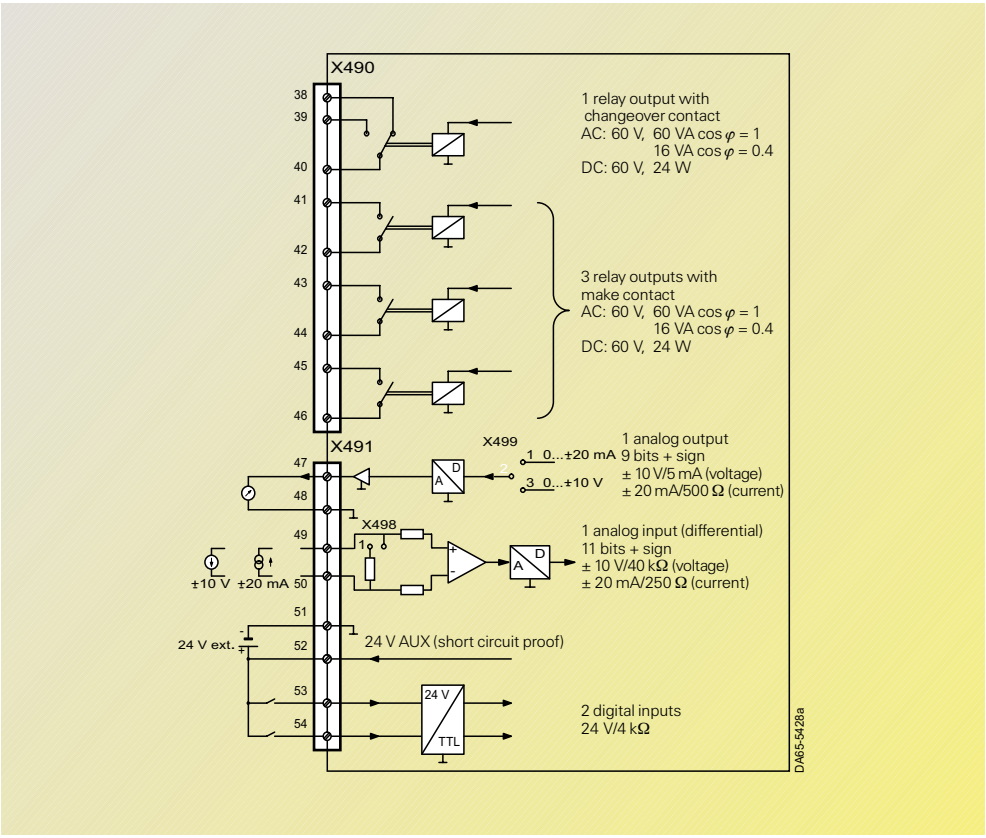
The EB2 expansion board has

- 2 digital inputs
- 1 relay output with change-over contacts
- 3 relay outputs with make contact
- 1 differential analog input signal which can be used as current input or voltage input
- 1 analog output
- 24 V power supply for the digital inputs

The EB2 expansion board can be integrated into the electronics box via slot.



EB2 expansion board



Circuit diagram of the EB2 expansion board

Connection X490

Load capability of the relay contacts

Type of contact	Changeover contact
Maximum switching voltage	60 V AC, 60 V DC
Maximum switching output	16 VA at 60 V AC ($\cos\varphi = 0.4$) 60 VA at 60 V AC ($\cos\varphi = 1.0$) 3 W at 60 V DC 24 W at 60 V DC

Terminal	Designation	Significance
38	DO13	Relay output 1, break contact
39	DO12	Relay output 1, make contact
40	DO11	Relay output 1, reference contact
41	DO22	Relay output 2, make contact
42	DO21	Relay output 2, reference contact
43	DO32	Relay output 3, make contact
44	DO31	Relay output 3, reference contact
45	DO42	Relay output 4, make contact
46	DO41	Relay output 4, reference contact

Connectable cross-section: 0.14 – 1.5 mm² (AWG 16)

Connection X491

The ground cables are protected by a reactor.

Note

The analog input can be used as a voltage or current input. A jumper is used for switching over.

Terminal	Designation	Significance	Range
47	AO	Analog output	±10 V, 5 mA ±20 mA, 500 Ω
48	AOM	Ground analog output	
49	AI1P	Analog input +	±10 V, 40 kΩ ±20 mA, 250 Ω
50	AI1N	Analog input –	
51	DIM	Ground digital input	0 V
52	P24AUX	24 V supply	24 V
53	DI1	Digital input 1	24 V, R_i = 4 kΩ
54	DI2	Digital input 2	24 V, R_i = 4 kΩ

Connectable cross-section: 0.14 – 1.5 mm² (AWG 16)

Technical Data

Designation	Value
Digital inputs	DI1, DI2, DIM
• Voltage range LOW	0 V (–33 V to +5 V)
• Voltage range HIGH	+24 V (13 V to 33 V)
• Input resistance	4 kΩ
• Smoothing	250 µs
• Electrical isolation	None
Digital outputs (relays)	DO1., DO2., DO3., DO4.
• Type of contact	Changeover contact
• Max. switching voltage	60 V AC, 60 V DC
• Max. switching capacity	
– at 60 V AC:	16 VA ($\cos\varphi = 0.4$) 60 VA ($\cos\varphi = 1.0$)
– at 60 V DC:	3 W 24 W
• Min. permissible load	1 mA, 1 V
Analog input (differential input)	AI1P, AI1N
• Input range	
Voltage	±11 V
Current	±20 mA
• Input resistance	
Voltage	40 kΩ to ground
Current	250 Ω to ground
• Hardware smoothing	220 µs
• Resolution	11 bits + sign
Analog output	AO, AOM
• Voltage range	±10 V, ±0 – 20 mA
• Input resistance	40 kΩ to ground
• Hardware smoothing	10 µs
• Resolution	9 bits + sign