

3.6 Pin assignment

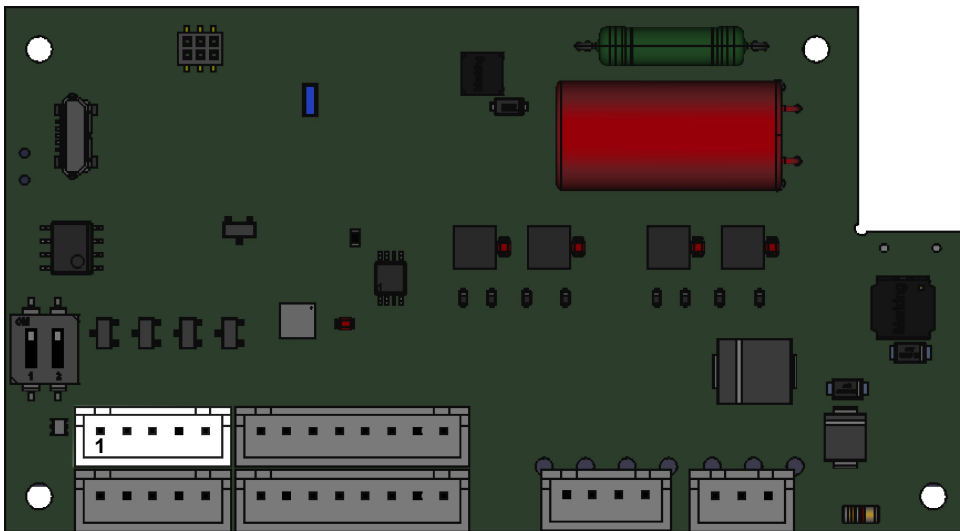
3.6.1 Overview

Connector	Function
X1	CANopen / RS-485 IN
X2	CANopen / RS-485 OUT
X3	Encoder/Hall sensor
X4	Inputs and outputs
X5	Motor
X6	Voltage supply
X7	Micro USB
S1	Switch for 150 ohm termination resistor (RS-485)
S2	Switch for 120 ohm termination resistor (CANopen)
DS	Default switch: switch for resetting the communication settings

3.6.2 X1 – CANopen/RS-485 IN

Connection for CANopen and RS-485 (Modbus RTU). Type: JST B5B-XH-A

In the following figure, pin 1 is marked with a "1".



Pin	Function	Note
1	RS-485-	
2	RS-485+	
3	CAN_L	CAN-Low
4	CAN_H	CAN-High
5	GND	

RS-485 line polarization



Note

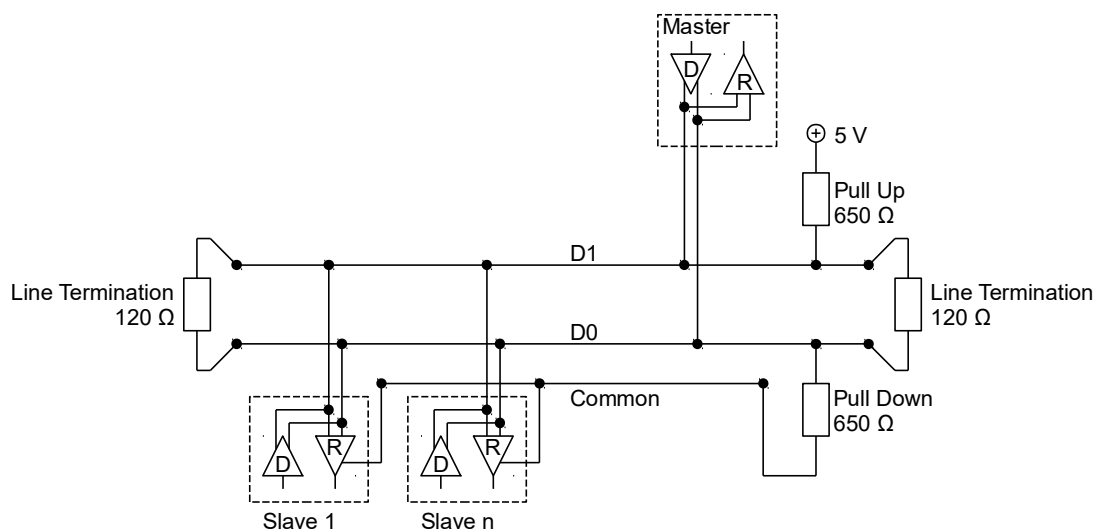
The controller is **not** equipped with line polarization and expects the master device to have one.

If the master device on the bus does not have line polarization of its own, a pair of resistors must be attached to the RS-485 balanced cables:

- A pull-up resistor to a 5V voltage on the RS-485+ (D1) cable
- A pull-down resistor to earth (GND) on the RS-485- (D0) cable

The value of these resistors must be between 450 ohm and 650 ohm. A 650 ohm resistor permits a higher number of devices on the bus.

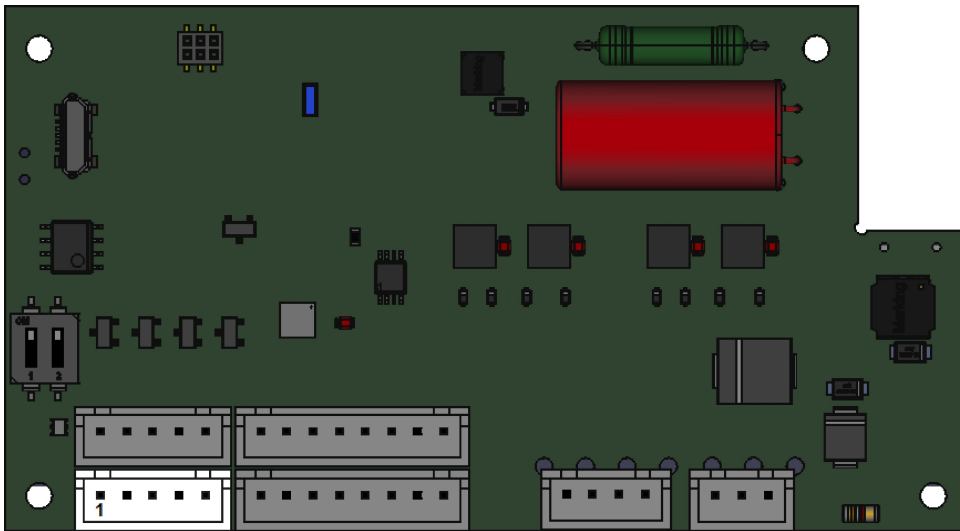
In this case, a line polarization must be attached at a location for the entire serial bus. In general, this location should be on the master device or its connection. All other devices then no longer need to implement line polarization.



3.6.3 X2 – CANopen/RS-485 OUT

Connection for CANopen and RS-485 (Modbus RTU). Type: JST B5B-XH-A

In the following figure, pin 1 is marked with a "1".

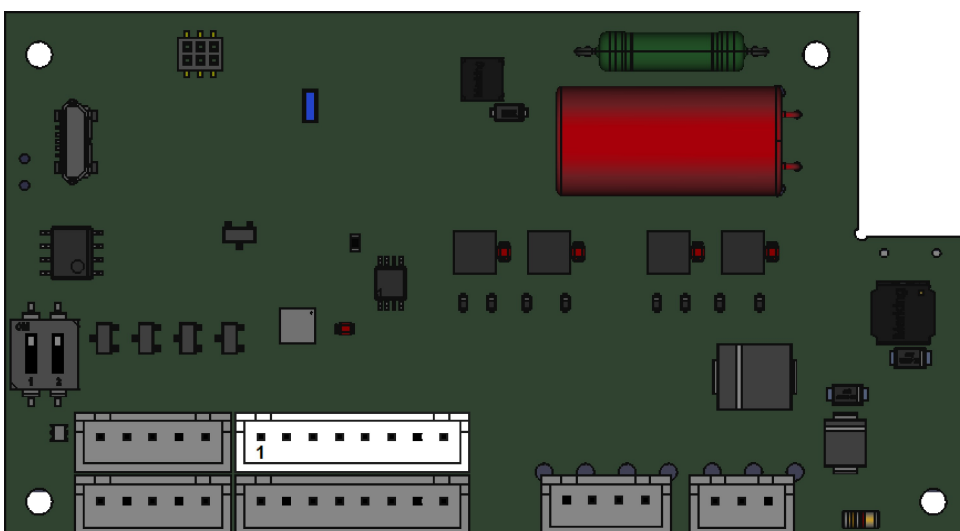


Pin	Function	Note
1	RS-485-	
2	RS-485+	
3	CAN_L	CAN-Low
4	CAN_H	CAN-High
5	GND	

3.6.4 X3 – encoder/Hall sensor

Type: JST B8B-XH-A

In the following figure, pin 1 is marked with a "1".



Pin	Function	Note
1	+5 V DC	Supply voltage for encoder/Hall sensor, max. 200 mA
2	A	5 V signal, max. 1 MHz
3	B	5 V signal, max. 1 MHz
4	Index	5 V signal
5	H1	5 V signal
6	H2	5 V signal
7	H3	5 V signal
8	GND	

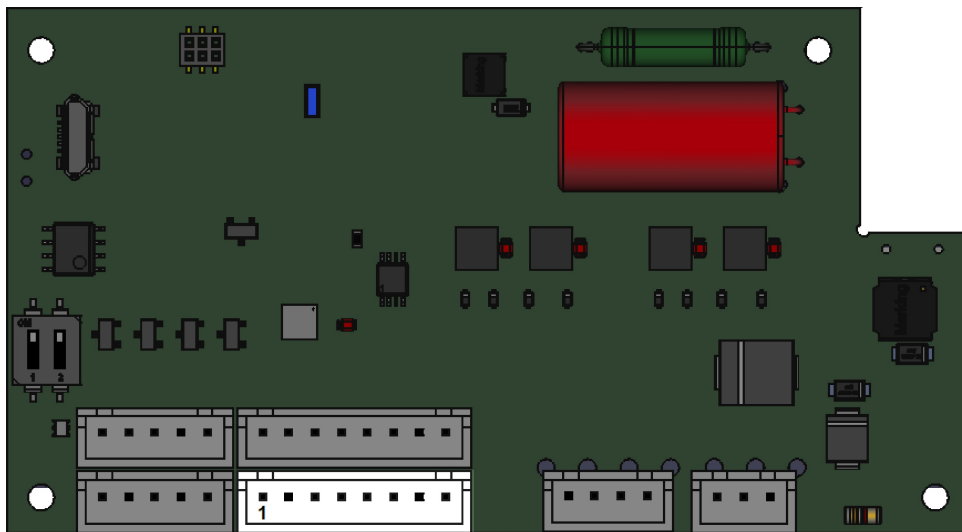
The following switching thresholds apply for the encoder inputs:

Max. Voltage	Switching thresholds	
	On	Off
5 V	> 2 V	< 0.8 V

3.6.5 X4 – inputs and outputs

Type: JST B8B-XH-A

In the following figure, pin 1 is marked with a "1".



Pin	Function	Note
1	Digital input 1	
2	Digital input 2	
3	Digital input 3	Direction input in clock-direction mode, max. 1 MHz
4	Digital input 4	Clock input in clock-direction mode, max. 1 MHz
5	Analog input 1	10 bit, 0-10 V
6	Digital output 1	Positive switching (<i>high-side switch</i>), max. 100 mA
7	Digital output 2	Positive switching (<i>high-side switch</i>), max. 100 mA

Pin	Function	Note
8	GND	



Note

To use the digital outputs, you must connect a voltage (12...30 V DC) to pin 2 of **X6** (logic supply).
 The typical output voltage corresponds to the connected logic supply – 0.6 V. The current should not exceed 100 mA.

For the digital inputs of the variants with article numbers *CL4-E-1-12* and *CL4-E-2-12*, the following switching thresholds apply:

Max. Voltage	Switching thresholds	
	On	Off
24 V	> 9 V	< 3.7 V

For the digital inputs of the variants with article numbers *CL4-E-1-12-5VDI* and *CL4-E-2-12-5VDI*, the following switching thresholds apply:

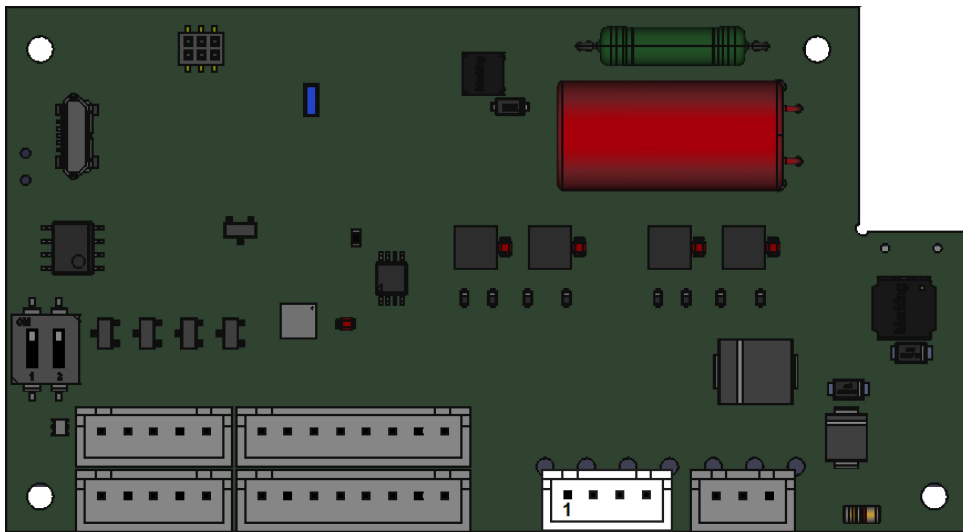
Max. Voltage	Switching thresholds	
	On	Off
5 V	> 2 V	< 0.8 V

3.6.6 X5 – motor connection

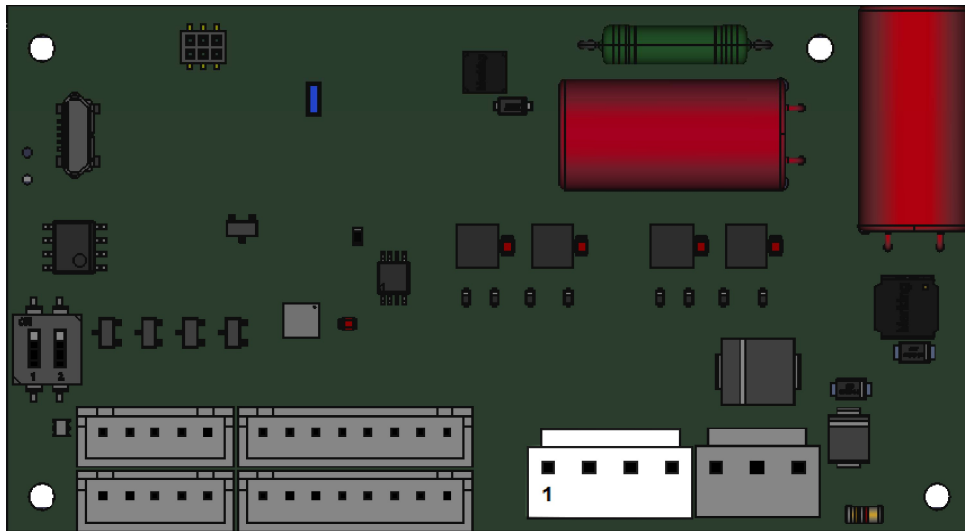
In the following figures, pin 1 is marked with a "1".

Type:

- *CL4-E-1-xx low current*: JST B4B-XH-A



- *CL4-E-2-xx high current*: JST B4P-VH



Pin	Stepper motor function	BLDC function	Note
1	A	U	
2	A\	V	
3	B	W	
4	B\	n.c.	

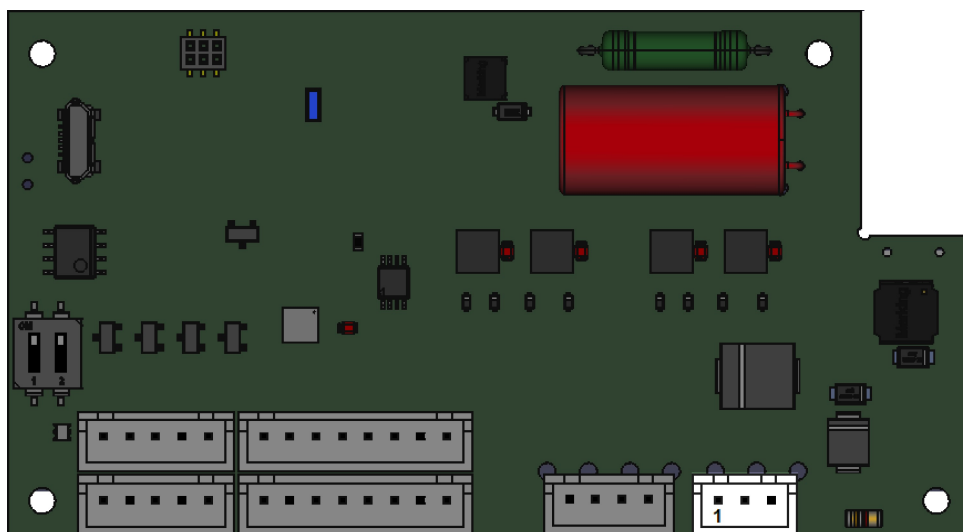
3.6.7 X6 – voltage supply

Connection for the main supply and logic supply.

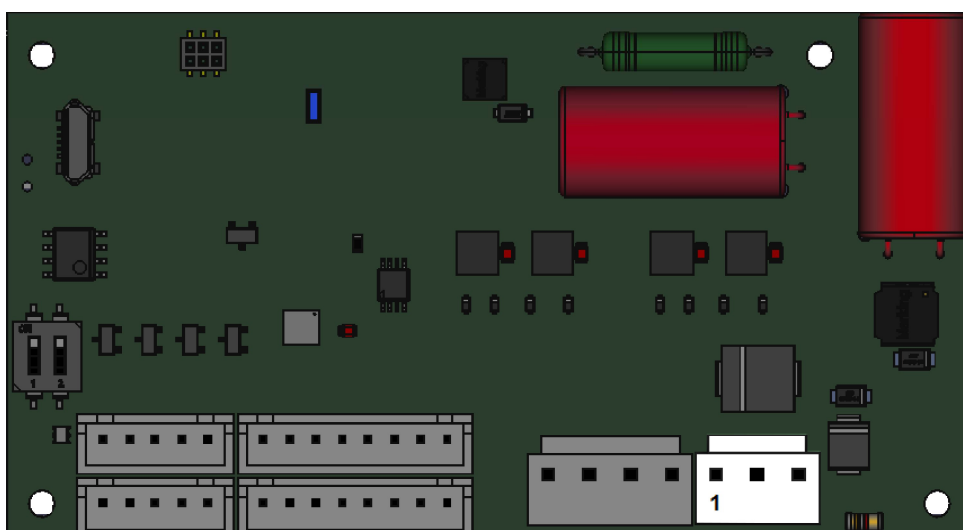
In the following figures, pin 1 is marked with a "1".

Type:

- CL4-E-1-xx *low current*: JST B3B-XH-A



- CL4-E-2-xx *high current*: JST B3P-VH



Voltage source

The operating or supply voltage supplies a battery, a transformer with rectification and filtering, or a switching power supply.



Note

- EMC: For a DC power supply line longer than 30 m or when using the motor on a DC bus, additional interference-suppression and protection measures are necessary.
- An EMI filter is to be inserted in the DC supply line as close as possible to the controller/motor.
- Long data or supply lines are to be routed through ferrites.
- A capacitor of at least 4700 μF is to be connected to the supply voltage (in parallel), as close to the controller as possible.

Pin assignment

Pin	Function	Note
1	+Ub	12 ...58 V DC
2	+UB Logic	12 ...30 V, input voltage for the optional logic supply and the digital outputs Current consumption without the outputs: approx. 27 mA
3	GND	

Permissible operating voltage

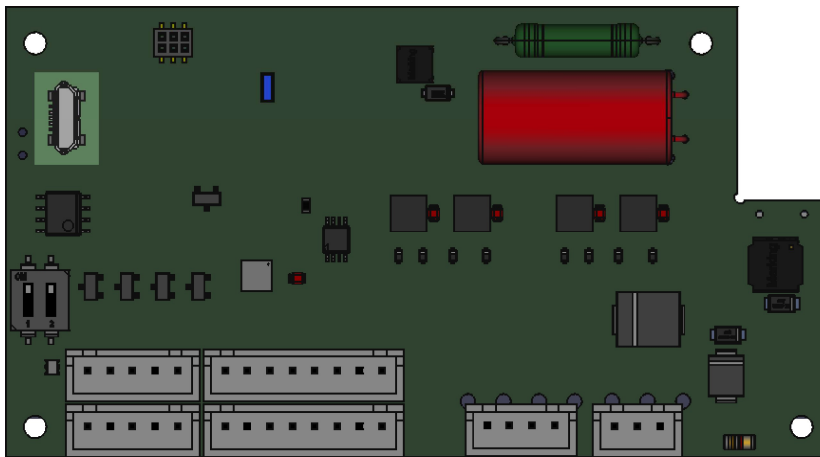
The maximum operating voltage is 59 V DC. If the input voltage of the controller exceeds this threshold value, the motor is switched off and an error triggered. Above 60 V, the integrated ballast circuit (3 W power) is activated.

The minimum operating voltage is 10 V DC. If the input voltage of the controller falls below this threshold value, the motor is switched off and an error triggered.

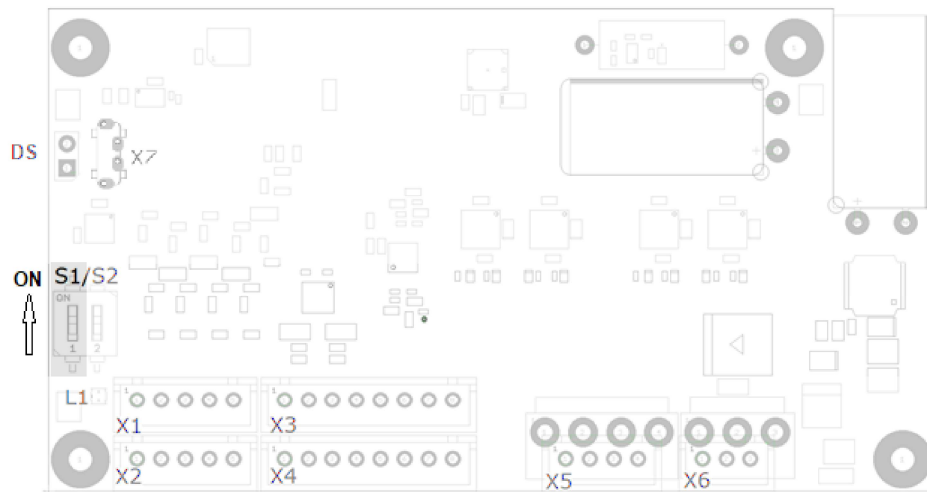
A charging capacitor of at least 4700 μF (approx. 1000 μF per ampere rated current) must be connected to the supply voltage to avoid exceeding the permissible operating voltage (e.g., during braking).

3.6.8 X7 – Micro USB

A cable of type "micro USB" is needed for this USB connection.

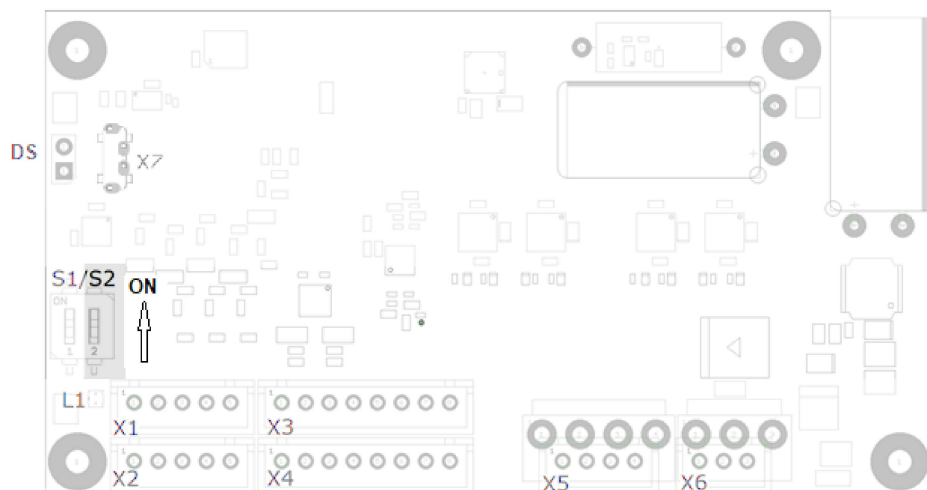


3.6.9 Switch S1 – Termination resistor RS-485



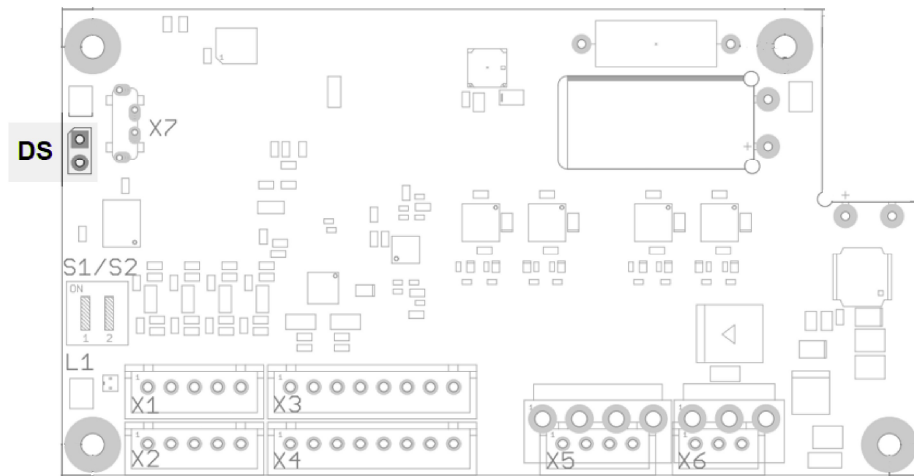
With this DIP switch, termination can be switched on (switch to ON) or off with 150 ohm between RS-485- and RS-485+.

3.6.10 Switch S2 – Termination resistor CANopen



With this DIP switch, termination can be switched on (switch to ON) or off with 120 ohm between CAN-L and CAN_H.

3.6.11 Switch DS – Default switch



By short circuiting (e.g., with a wire bridge) the two copper openings, the address and baud rate are reset. The controller restarts automatically after approx. 3 seconds.

The following objects are affected:

Object	Function	Factory settings
2009 _h	CANopen node-ID	127
2005 _h	CANopen baud rate	136 (1 MBaud)
2028 _h	Modbus slave address	5
202A _h	Modbus baud rate	19200
202D _h	Modbus parity	04 _h (Even)