1. smc5d-m4 central unit

1.1. Technical specifications:

- Power: 24V DC, 300mA
- Ethernet 100 Mbit connector **- recommended cat. 6A** or higher cable.
- USB HS connector - **good quality cable, with ferrite choke recommended**.
- CAN bus connector - for connecting additional extension modules.
- 6 axes (X,Y,Z,A,B,C) with differential outputs, up to 300 kHz step frequency.
- 4 relay outputs, galvanically isolated, in two separate groups, one of the groups can be switched to OC or 0/+5V DC mode.
  maximum values for relays: 1A/30V DC, 0.5A/125V AC
  maximum current for OC mode: 300 mA DC
  maximum current for voltage mode 0/5V DC: 100 mA
- Additional output limiting motor current, operating in two modes OC or 0/+5V.
- 8 opto-isolated inputs with led
- Handwheel operator panel connector.
- 2 separate and galvanically isolated connectors from the red switch in the Handwheel operator panel.
- Micro SD card connector.
- Protection against too high supply voltage and reverse power connection.
- Firmware recovery mode – available for controllers shipped after 17.06.2024
- Housing designed for DIN rail mounting, length: 155mm, width: 86mm, thickness: 30mm.

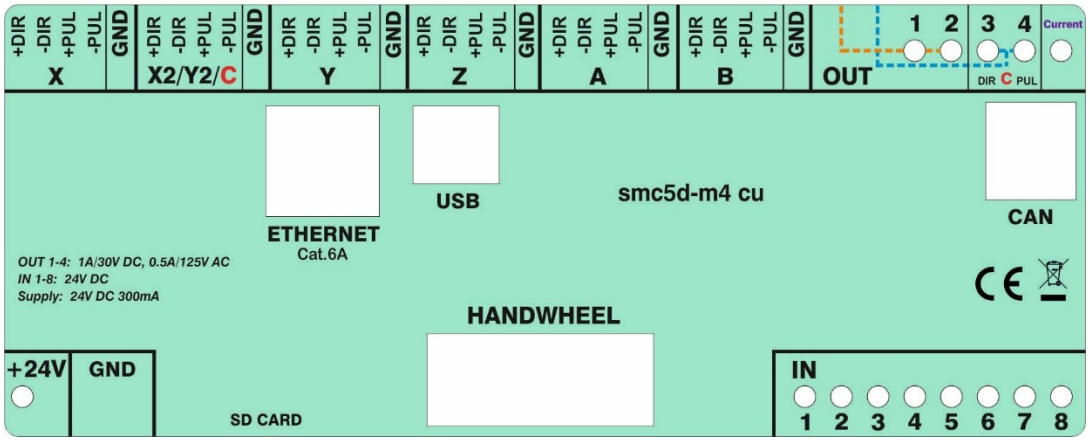
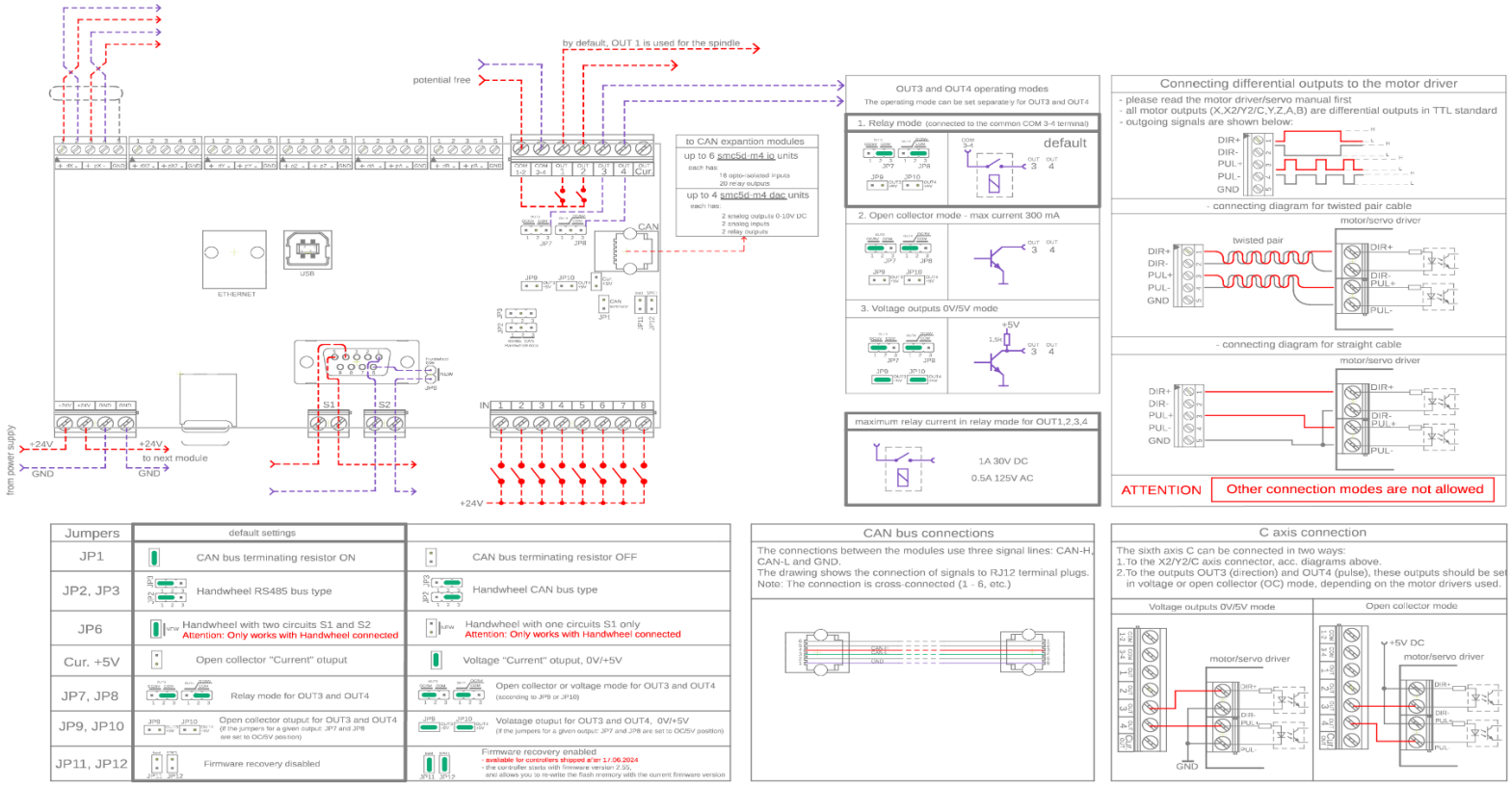


Fig. 1 View of the front panel of the central unit

1.2. ***Central unit - external connections and internal operating mode settings:***
1.3. The figures below shows the connection and jumper settings of central unit.
1.4. Note: **jumpers are available after removing the cover**.



Jumpers	default settings	
JP1	CAN bus terminating resistor ON	CAN bus terminating resistor OFF
JP2, JP3	Handwheel RS485 bus type	Handwheel CAN bus type
JP6	Handwheel with two circuits S1 and S2 Attention: Only works with Handwheel connected	Handwheel with one circuits S1 only Attention: Only works with Handwheel connected
Cur. +5V	Open collector "Current" otuput	Voltage "Current" otuput, 0V/+5V
JP7, JP8	Relay mode for OUT3 and OUT4	Open collector or voltage mode for OUT3 and OUT4 (according to JP9 or JP10)
JP9, JP10	Open collector otuput for OUT3 and OUT4 (if the jumpers for a given output: JP7 and JP8 are set to OC/5V position)	Voltage otuput for OUT3 and OUT4, 0V/+5V (if the jumpers for a given output: JP7 and JP8 are set to OC/5V position)
JP11, JP12	Firmware recovery disabled	Firmware recovery enabled - available for controllers shipped after 17.06.2024 - the controller starts with firmware version 2.55, and allows you to re-write the flash memory with the current firmware version

Fig. 2 Electrical wiring diagram and location of jumpers

2. smc5d-m4 io

2.1. Technical specifications:

- Power: 24V DC, 400mA
- 2 CAN bus connectors
- 20 relay outputs, galvanically isolated, in two separate groups of 10 output each. Maximum values for relays: 1A/30V DC, 0.5A/125V AC
- 16 opto-isolated inputs.
- Protection against too high supply voltage and reverse power connection.
- Housing designed for DIN rail mounting, length: 155mm, width: 86mm, thickness: 30mm.

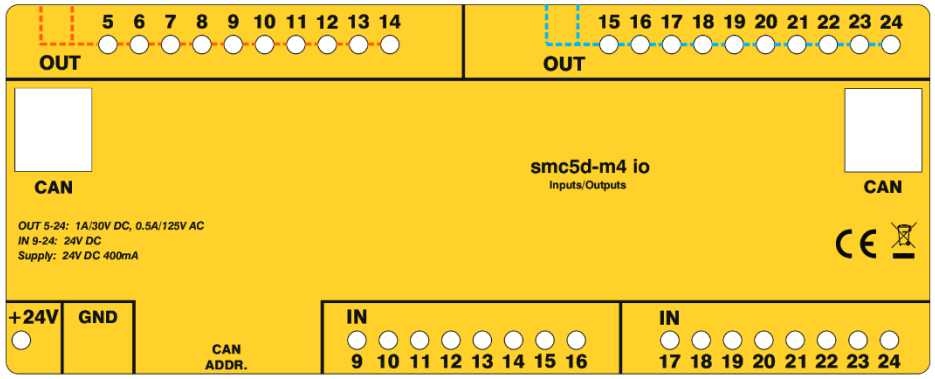


Fig. 3 View of the front panel of the io module

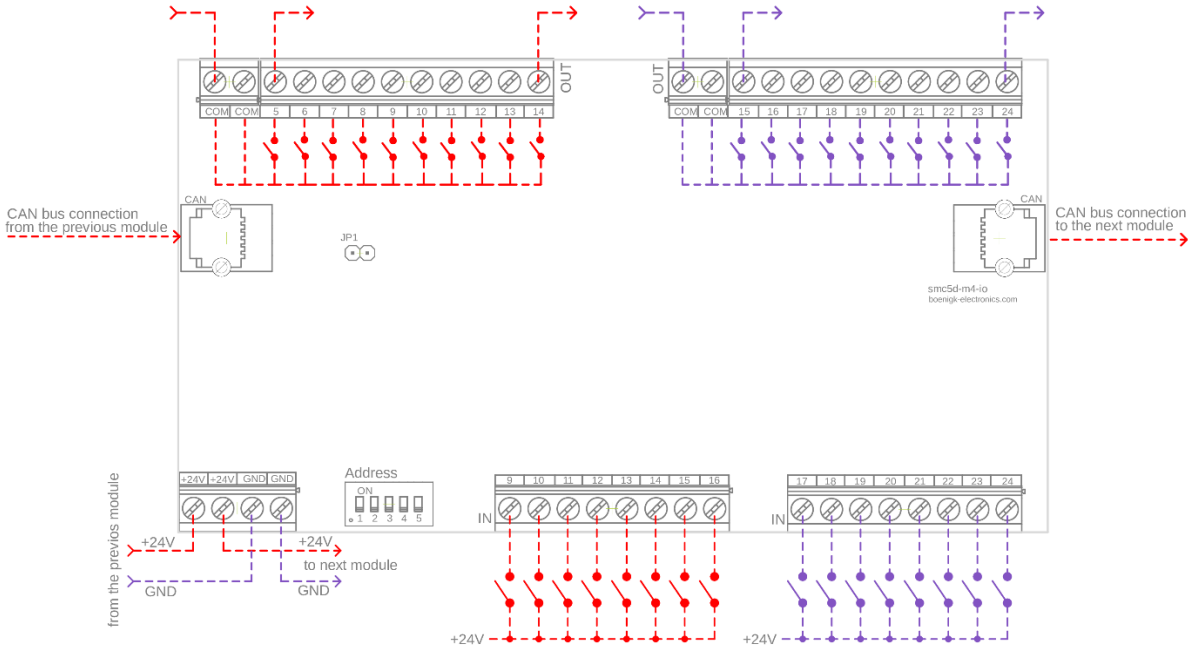


Fig. 4 Electrical wiring diagram and location of jumper

3. smc5d-m4 dac

3.1. Technical specifications:

- Power: 24V DC, 100mA.
- 2 CAN bus connectors.
- 2 Analog outputs 0-10V DC 20mA (0-5V DC or PWM - depending on jumper settings) with fine-tune possibility.
- 2 Analog inputs 0-13V DC – accuracy 0.02V.
- 2 relay outputs, galvanically isolated, maximum values for relays: 1A/30V DC, 0.5A/125V AC.
- Protection against too high supply voltage and reverse power connection.
- Housing designed for DIN rail mounting, length: 86mm, width: 86mm, thickness: 30mm.

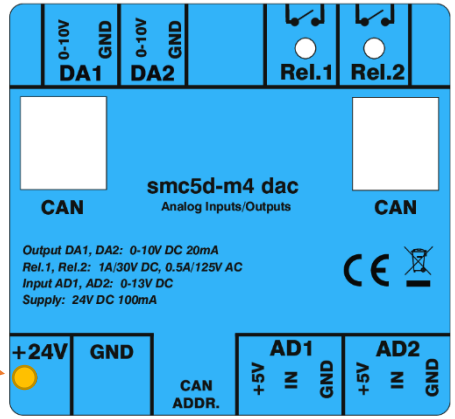


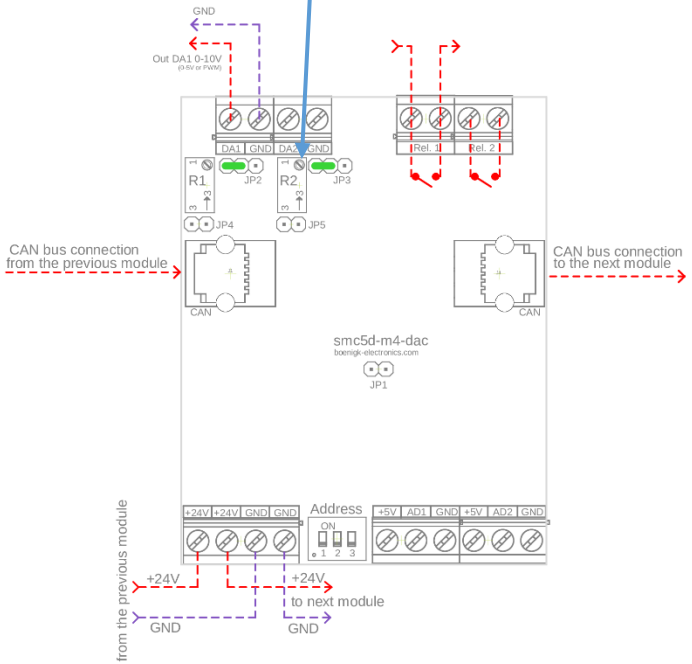
Fig. 5 View of the front panel of the dac

Note 1:

The yellow power LED flashes when the dac module has no communication with the central unit.

Note 2:

R1 and R2 potentiometers are used to precisely set the 10 V voltage - separately for each channel.



Jumpers	default settings	
JP1	CAN bus terminating resistor ON	CAN bus terminating resistor OFF
JP2	DA1 voltage ouput (0-10V or 0-5V according to JP4 settings)	DA1 PWM output
JP3	DA2 voltage output (0-10V or 0-5V according to JP5 settings)	DA2 PWM output
JP4	DA1 0-10V	DA1 0-5V
JP5	DA2 0-10V	DA2 0-5V

Fig. 6 Electrical wiring diagram and jumpers settings

4. Addressing expansion modules in the smc5d-m4 system, connected via CAN bus.

The following modules can be connected to the central unit: 

- up to 6 (six) io  modules each with 16 digital inputs and 20 relay outputs,
- up to 4 (four) dac  modules each with two 0-10V DC analog outputs, two relay outputs, and two 0-13V analog inputs.

The address of each module is set with dip switches   located at the bottom of the device.

Addresses for given type of modules , e.g. io, cannot be the same.

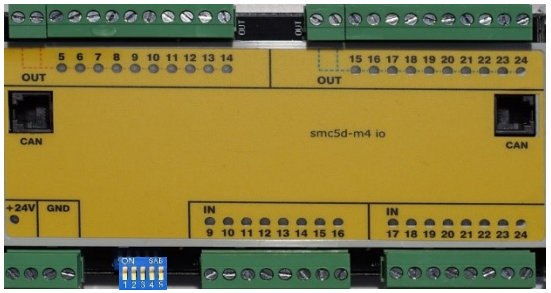


Fig. 7 Smc5d-m4 io address settings

address in the application	dip switch settings
#0	
#1	
#2	
#3	
#4	
#5	

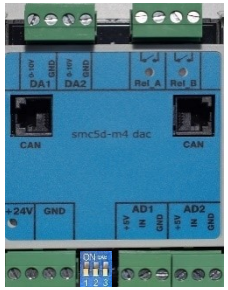
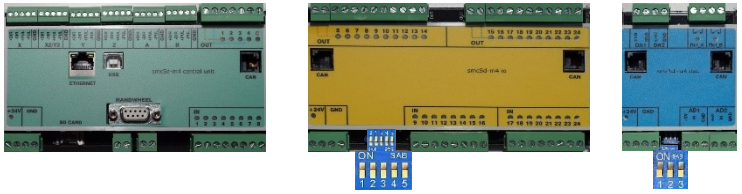
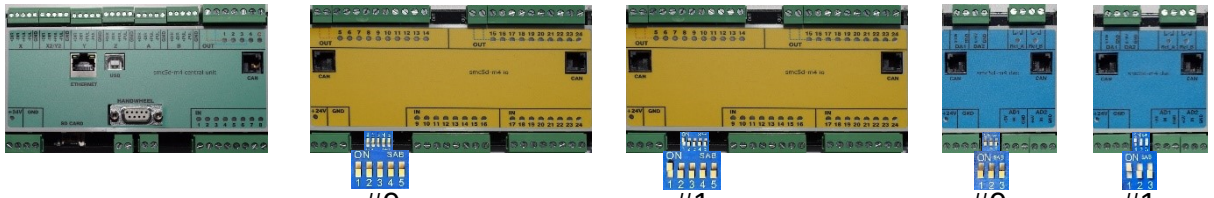


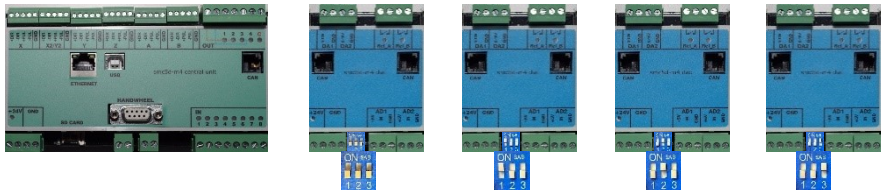
Fig. 8 Smc5d-m4 dac address settings

address in the application	dip switch settings
#0	
#1	
#2	
#3	

Examples of correct address setting







Maximum configuration

5. CAN bus termination rules

A CAN bus termination resistor must be present at the two end points of the network – see the figure below:

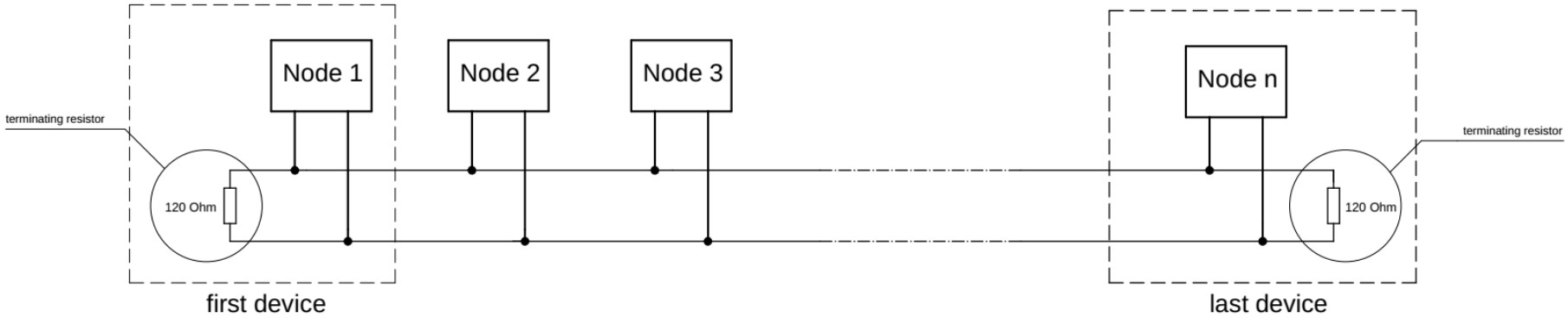
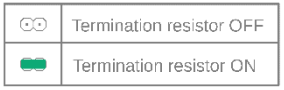


Fig. 9 Termination resistors

Each module of the smc5d-m4 system has a terminating resistor – switched with a J1 jumper.



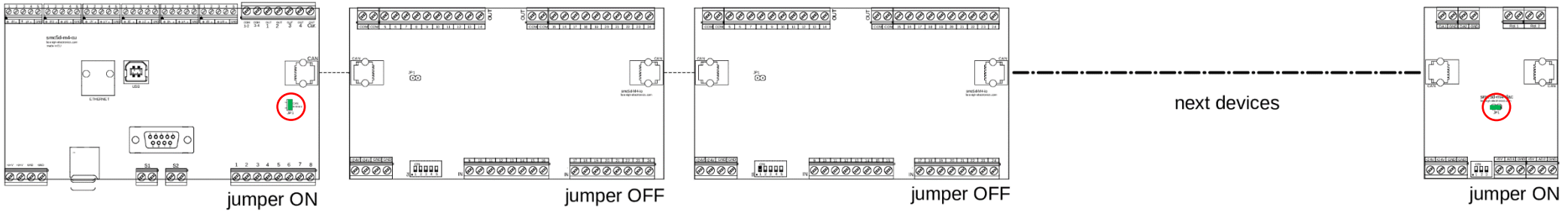


Fig. 10 Example of the correct setting of the terminating resistors