



**DC MOTOR DRIVER MB002412_X
MANUAL**

DC MOTOR DRIVER MB002412_X

Document Owner [function, process or task]:

Reference documents:

/1/

/2/

Appendices:

/A/

/B/

Version history:

Version	Date / Author	Date / Accepted by	Comment
1.0	12.12.2023/Hannu Siipola		

ABBREVIATIONS:

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1 INTRODUCTION

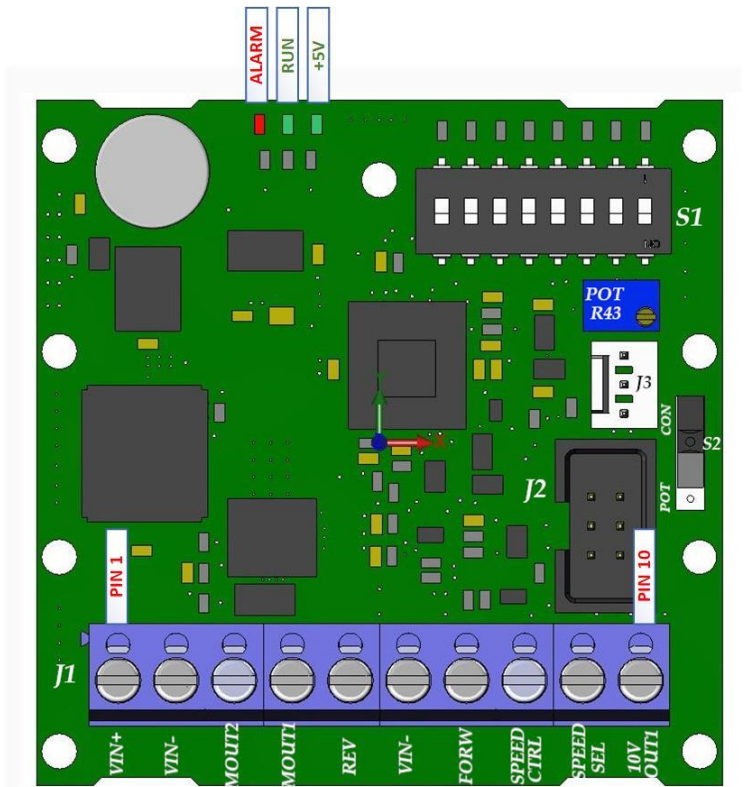
MB002412_X is a 24 VDC-motor controller/driver card made specially for conveyer products of JOT Automation Ltd .

Used with Brushed DC motors up to 45 W power

1.1 FEATURES

- Nominal output current 1.5 A
- Maximum output current 2A. If 2A is exceeded red led blinks and output shuts off. If output current decreases controller retries connecting output voltage on after 1 second.
- Idle current 35mA
- Operating PWM frequency 16kHz
- Operating Voltage Range 20-30V DC
- Current limit setting
0.2, 0.3, 0.4, 0.5, 0.6, 0.7,
0.8, 0.9, 1, 1.1, 1.2, 1.3, 1.4,
1.5, 1.6, 1.7, 1.8, 1.9 A
- Acceleration / deceleration setting
0, 0.1, 0.2, 0.3, 0.5, 0.7,
1.0, 1.5 s
- Stepless / 2-step speed control
- Positive control logic
- Lead-free

J1 PIN	FUNCTION
1	+24 VDC (VIN+)
2	0 VDC (VIN-)
3	MOTORS (-)
4	MOTORS +
5	REVERSE
6	0 VDC
7	RUN FORWARD
8	CONTROL VOLTAGE FROM POT.
9	2-SPEED ON (PULSE IN)
10	10 VDC REF VOLTAGE FOR ADJUST POTENTIOMETER



J2 Molex 6 pin connector for the Atmel/Microchip ICE flasher tool

Slider switch S2 enables the integrated speed adjustment trimmer R43 if the switch's slider is in the POT position

S2 enables connector J3 for external speed control potentiometer if the slider is in the CON position. **Speed 2** adjusting is possible to make either internal potentiometer R43 or external wired potentiometer connected to connector J3. **Speed 1** is adjusted only from Connector J1 pin 8

If speed 1 is not needed to be adjusted J1 pin 8 must be connected to Pin 10 of J1

2 CONNECTIONS

2.1 FIXED SPEED USE

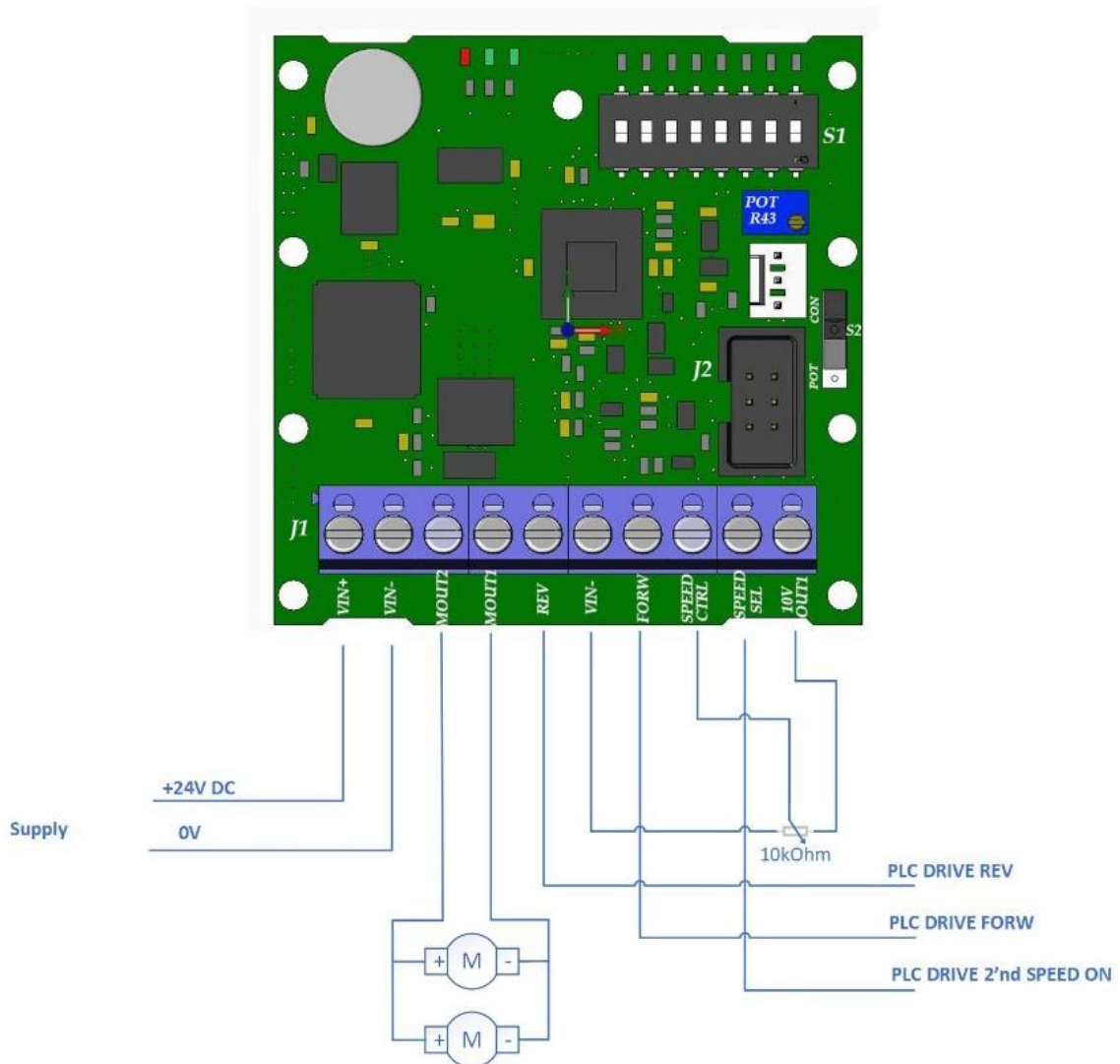
Control signals from PLC: +24VDC.

Run FW-signal pole 7 and Run REV-signal pole 5.

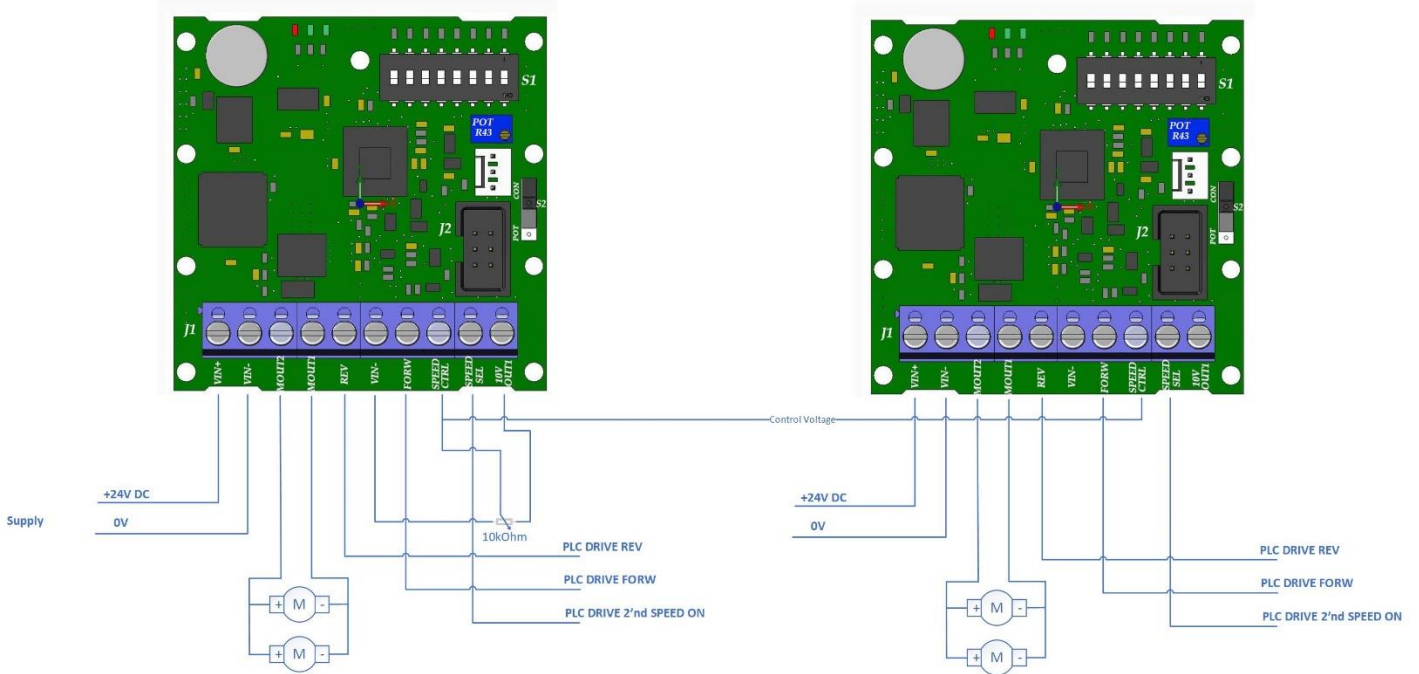
Motor-: pole 3, motor+: pole 4

2.2 SPEED CONTROL

2.2.1 One segment speed control



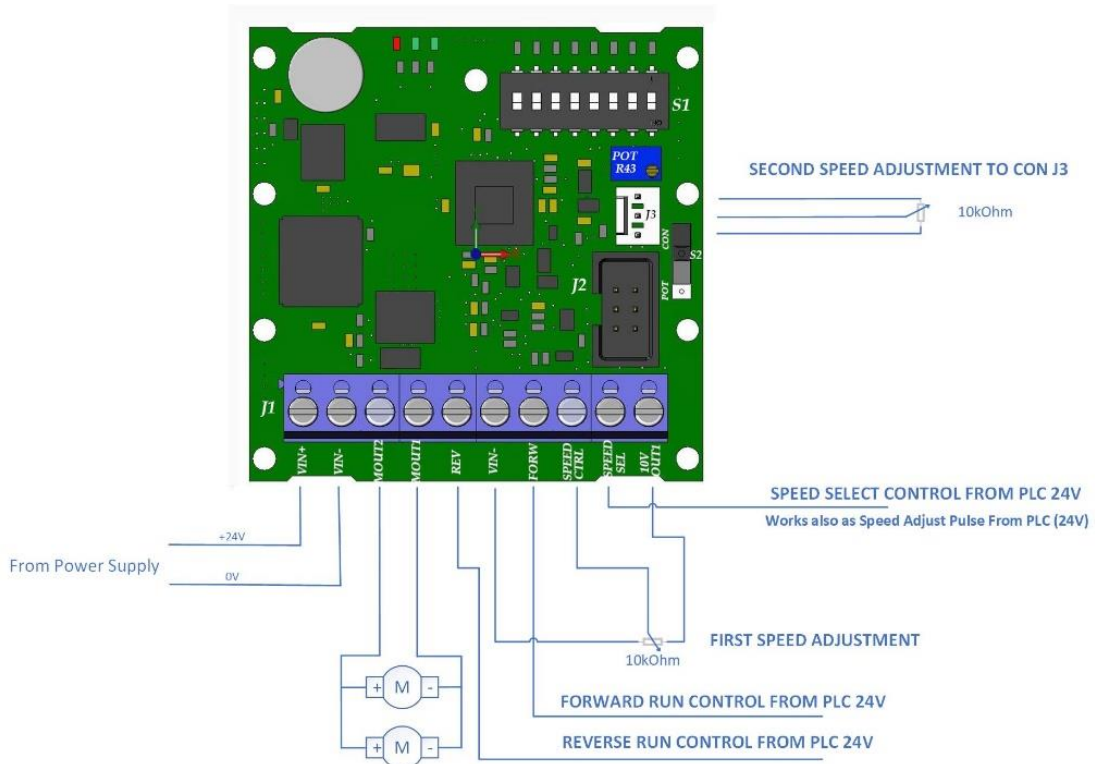
2.2.2 Master / slave speed control



2.3 DUAL SPEED

+24 VDC signal to the pole 9 enables the potentiometer connected to the J3.

2.3.1 Fixed speed –adjusted speed 2



2.3.2 Two pre adjusted speeds

Two speed can be selected if two potentiometers are applied. One for the J3 and second for the SPEED CTRL screw terminal J1 (Pin 8)

Then the SPEED SELECT input (Pin 9 of J1) selects between the two pre selected speeds

2.3.3 Pulse adjusted speed

Applying square formed signal with duty cycle 50% to the pin 9 of the J1 can be used for speed control purposes. Frequency of this control pulse should be between 4Hz up to 50Hz. (250ms – 20ms).

Controller reads this pulse controlling mode automatically. Normal logical states works still if pulse adjustment is not used

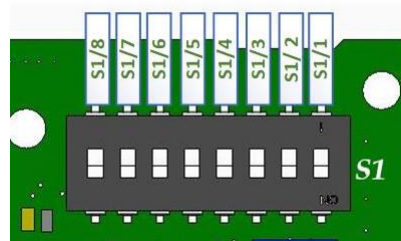
Zero voltage on pin 9 selects SPEED1 and 24V (Logical 1) selects SPEED 2.

3 SETTINGS

3.1 OUTPUT CURRENT SETTINGS

DIP-switch S1 / 1-4 are used for setting the maximum output current.

Setting with DIP-switches as follows:



Current limit:

	4	3	2	1		4	3	2	1		4	3	2	1		4	3	2	1		
OFF					0,2A		x			0,6A		x			1,0A		x	x			1,4A
ON	x	x	x	x		x		x	x		x	x	x					x	x		
	4	3	2	1		4	3	2	1		4	3	2	1		4	3	2	1		
OFF				x	0,3A		x		x	0,7A		x		x	1,1A		x	x		x	1,5A
ON	x	x	x			x		x			x	x						x			
	4	3	2	1		4	3	2	1		4	3	2	1		4	3	2	1		
OFF			x		0,4A		x	x		0,8A		x		x	1,2A		x	x	x		1,7A
ON	x	x		x		x			x		x	x							x		
	4	3	2	1		4	3	2	1		4	3	2	1		4	3	2	1		
OFF			x	x	0,5A		x	x	x	0,9A		x		x	1,3A		x	x	x	x	1,9A
ON	x	x				x					x										

3.2 ACCELERATION/DECELERATION RAMPS

DIP-switch S1 / 5-7 are used for setting Acceleration/deceleration ramps.

Setting with DIP-switches as follows:

Ramps:

	7	6	5	
OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0 s
ON	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

	7	6	5	
OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0,2 s
ON	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

	7	6	5	
OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0,5 s
ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

	7	6	5	
OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1,0 s
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

	7	6	5	
OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.1 s
ON	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

	7	6	5	
OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0,3 s
ON	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	7	6	5	
OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0,7 s
ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

	7	6	5	
OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1,5 s
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

DIP-switch S1 / 8 is used for setting short circuit braking; no ramp.

	8	
OFF	<input type="checkbox"/>	deceleration ramp ON
ON	<input checked="" type="checkbox"/>	

	8	
OFF	<input checked="" type="checkbox"/>	deceleration ramp OFF;
ON	<input type="checkbox"/>	short circuit brake

4 INDICATOR LEDS

JOT Motor Controller has several functions indicated by three SMD LED's

4.1 FIRST LED FROM LEFT

The first LED is the HW Alarm. It is RED Colour and it indicates short circuit or motor over current

4.2 MIDDLE LED

Normal mode (Led On Time/ LED Off time)	Pulse driven speed mode (Led On Time/ LED Off time)
Idle: 700ms on / 700ms off	Idle: 50ms on / 1000ms off
Motor running: 150ms on / 150ms off	Motor running: 50ms on / 250ms off
SW Current limit exceeded 10ms on / 10ms off	SW Current limit exceeded 10ms on / 10ms off

4.3 MOST RIGHT LED

The 3rd Led calculated from left (picture) indicates that the card Internal +5V regulator provides voltage

