MPWM-2

Technical Documentation
PWM Submodule (Pulse Width Modulation)

Please keep for further use !

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This manual was edited using text formatting software on a DOS personal computer. The text was printed in *Arial*.

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Italics and **bold** type are used for the title of a document or to emphasize text passages.

Passages written in `Courier` show text which is visible on the display as well as software menu selections.

"< >" refers to keys on your computer keyboard (e.g. <RETURN>).

Note

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Revision History

Note:
The cover of this document shows the current revision status and the corresponding date. Since each individual page has its own revision status and date in the footer, there may be different revision statuses within the document.

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Revision	Date

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MPWM 2 PWM Submodule (Pulse Width Modulation)

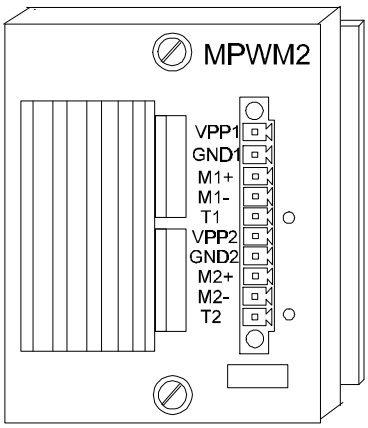
Two Channels (for Direct Control of Two Motors)

1 General

The MPWM-2 module is a submodule for the FOX-20 series. This module can control two motors by means of pulse width modulation. The maximum output voltage is 30 V and the current is a maximum of 3 A.

2 Description of function

2.1 Front panel



Description of the male connector:

VPP1:	Pos. supply voltage of driver chip for motor 1 (max. of 30 V)
GND1:	Neg. supply voltage of driver chip for motor 1
M1+:	Pos. connection of motor 1
M1-:	Neg. connection of motor 1
T1:	Connection not used LED lights up on overtemperature of driver of motor 1.
VPP2:	Pos. supply voltage of driver chip for motor 2 (max. of 30 V)
GND2:	Neg. supply voltage of driver chip for motor 2
M2+:	Pos. connection of motor 2
M2-:	Neg. connection of motor 2
T2:	Connection not used. LED lights up on overtemperature of driver of motor 2.

2.2 Mark to space ratio

You set the mark to space ratio by means of a twos complement representation with a resolution of ±9 bit (±512) + 1 sign bit. These 10 bits are arranged left-justified in the 16-bit word. The bottom six bits are meaningless.

8000H	100%	mark (negative direction of rotation)
0H	0%	mark
7FF0H	100%	mark (positive direction of rotation)

In the fiber optic message, this value is located in DB2 and DB3.

2.3 Space

You can set the space in 16 steps. The shortest space is 25.6 µs and the longest one is 0.84 s.

Bit 0-3: Setting the space

Decimal Value (Bits 0-3)	Space	Clock frequency
0	839 ms	1.19 Hz
1	419 ms	2.38 Hz
2	210 ms	4.77 Hz
3	105 ms	9.54 Hz
4	52.4 ms	19.1 Hz
5	26.2 ms	38.1 Hz
6	13.1 ms	76.3 Hz
7	6.55 ms	152 Hz
8	3.28 ms	304 Hz
9	1.64 ms	610 Hz
10	819.2 µs	1.2 kHz
11	409.6 µs	2.4 kHz
12	204.8 µs	4.9 kHz
13	102.4 µs	9.8 kHz
14	51.2 µs	19.5 kHz
15	25.6 µs	39.1 kHz

2.4 Structure of the command and status bytes

Command byte:

Bit	0:	0: Off Mark 0% (Transistors are short-circuited) 1: On The set mark is output
	1:	0: Brake on (transistors are short-circuited) 1: Brake off
	2:	0: Free-wheeling on (transistors are high-resistance) 1: Free-wheeling off

Free-wheeling, brake and on/off have the following priorities:
Free-wheeling has the highest priority and on/off the lowest. If all the bits are 0, for example, free-wheeling is active, since it has the highest priority.

Status byte:

0:	0: Off Mark 0% 1: On The set mark is output
1:	0: Brake on (transistors are short-circuited) 1: Brake off
2:	0: Free-wheeling on (transistors are high-resistance, PWM bit = 0 and brake bit = 1) 1: Free-wheeling off
3-6:	Not assigned
7:	0: Temperature of motor component is OK 1: Temperature of motor component is too high

3 Processing the module in the fiber optic ring

Example: Submodule MPWM2 is plugged into slot 1

Message Table:

	Output				Input	
Area	DB0 Slot No./ Channel No.	DB1 Constant	DB2 Low Byte	DB3 High Byte	DB2 Low Byte	DB3 High Byte
Space	0001 0001	1000 0000	Space, Motor 1	Space, Motor 2	---- ----	---- ----
Command and Status Bytes	0001 0010	1000 0000	Command Byte, Motor 1	Command Byte, Motor 2	Status Byte, Motor 1	Status Byte, Motor 2
Mark, Motor 1	0001 0011	1000 0000	Low Byte	High Byte	---- ----	---- ----
Mark, Motor 2	0001 0100	1000 0000	Low Byte	High Byte	---- ----	---- ----

Response in the event of a disturbance

Ring interrupted:

In the case of the ring being interrupted, the system stops the motors.