Motor Speed Controller

2A 24V 50W EMC Improved

Basic Model
TMD 2 DD

Features

- DC-motor speed control
- Tacho or armature feedback
- One quadrant drive
- Easy to adjust. Small size
- Low interference levels

Quick reference data

• Supply voltage	10-30V=
• Max output voltage	2V below supply
• Imax motor cont.	2A
• Imax motor dyn.	4A
• Reference inputs	Potentiometer 10kΩ
• Ambient temp.	0-40°C

The TMD is a speed control board for DC motors. It has an adjustable current limit. Optionally, it can be used as a torque control, with an adjustable speed limit. It is easy to use, normally you will have the motor running at the first attempt. The priorities when creating the drive has been to make a drive that is economical, rugged and easy to use.

TMD is designed for use with most types of PM-DC-motors with a maximum voltage of 24V and continuous current to 1A.

TMD is switched in contradiction to linear mode drives. Special considerations has been made to insure that a minimum of interference is created and released to the environment, thus making the TMD a good choice in devices that must meet the conditions for CE-marking.

The swiched mode gives the drive a high conversion efficiency and thereof small losses. Additional cooling is not necessary.

TMD has the following functions: speed setpoint input, tacho interfacing, armature feedback, RxI compensation, current limit etc.

The TMD has been developed in order to simplify CE-marking of the products in which our drive units are included. It is designed to minimize its own radiated interference, and its output stage is adapted to motors with interference suppression.

Here are some related examples from our product line.

TMD 5 DC, 5A vers.

TMD 1 AE, 1A encaps.

TMD 5 AE, 5A encaps.

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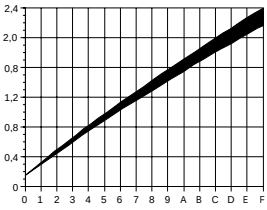
Adjustments



1) Current limit. Read the maximum allowed current for your motor from its marking plate or from the manufacturers catalogue. Set the $\mathbf{I_{max}}$ dial to an appropriate value from the graph. Choose a lower value to protect your motor, or a slightly higher value to get more power (but shorter lifetime).

2) Feedback. There are two basic methodes for feedback resulting in different speed accuracy:

a) If you are using rotor armature, **set** the **ROTOR/ TACHO** switch in position A and turn the **RxI** potentiometer up until the motor becomes unstable i.e. starts hunting or vibrating, and then adjust the potentiometer down about 10%.

b) Or, if you are using tacho feedback, **set** the **ROTOR/ TACHO** switch in position B and adjust the **FB** potentiometer until the motor followes a speed input change correctly.

3) Speed reference. There are three basic ways of controlling the speed:

a) Connect a 10kΩ potentiometer to terminals 10-11-12. Adjust the maximum speed with the $\mathbf{n_{max}}$ potentiometer.

b) Link terminals 10 and 11 and set the desired speed with the $\mathbf{n_{max}}$ potentiometer only.

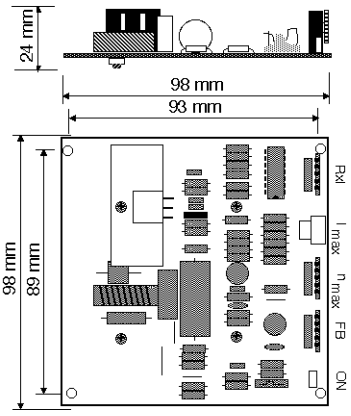
c) Use an external speed control voltage signal connected to terminals 11 and 12.

For a more detailed description of how to connect and adjust the TMD, refer to the users manual.

List of connections:

EC	Abbr.	Function	Comment
	AC	Live	Only on mains versions.
	AC	Neutral	Only on mains versions.
4	+PWR	+Power supply input	Unregulated 24VDC output on mains versions.
5	0VPWR	-Power supply input	Unregulated 24VDC output on mains versions.
6	A+	+Motor output	
7	A-	-Motor output	
8	T+	Tacho feedback input	Use of tacho is optional.
9	T-	Tacho feedback input	0V reference
10	+6V	+6V output	For external potentiometer
11	SPEED	speed input	Connect to EC10 for n_{max}-pot speed control.
12	0VCMD	speed input	0V reference

Note that 0VPWR and the 0V reference are separate and may not be linked.



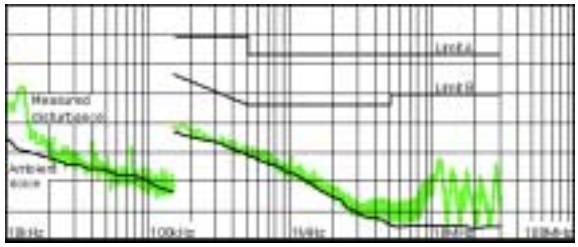
	min	typ	max	unit	comment
DC supply voltage	10		30	VDC	For e.g. 12 and 24 Volt motors.
Current limit max	1,6		2,0	A	
Reference pot	5	10	100	kΩ	
External speed control voltage		6	30	VDC	
Speed accuracy:					
Armature feedback		5		±%rpm	Dependant of load characteristics.
Tacho feedback		0,5		±%rpm	Dependant of tacho, often better.
Motor resistance range	0		2,2	Ω	For RxI compensation
Tacho voltage			100	V	

The stock versions have edge contacts. Terminal blocks and other special executions are available on request.

The graph shows how the mmeqasured interference level from a TMD, in the frequency range of conducted disturbance, is much lower than the requirement in the standard EN50081. The ambient noice in our lab is shown as a thick line in the lower edge of the disturbance graph.

Logarithmic frequency on the X-axis and logarithmic disturbance on the Y-axis. In the higher frequency range of radiated disturbance, the TMD:s disturbance can not be distinguished from the ambient noice.

Limit A is for industrial environment, while Limit B is for light industry and commercial environment.



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