

PD-170



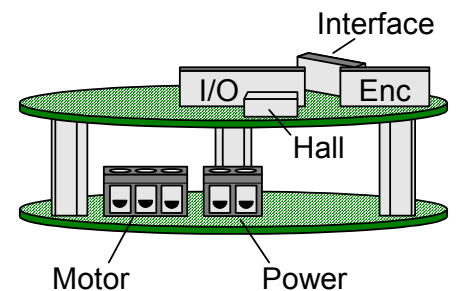
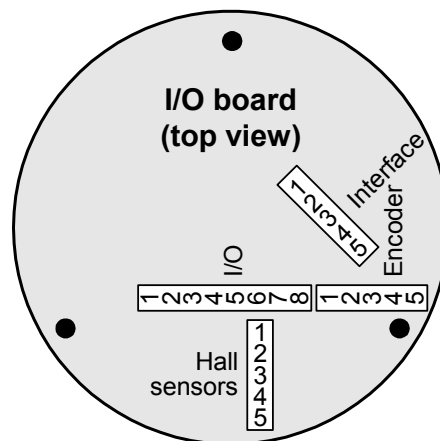
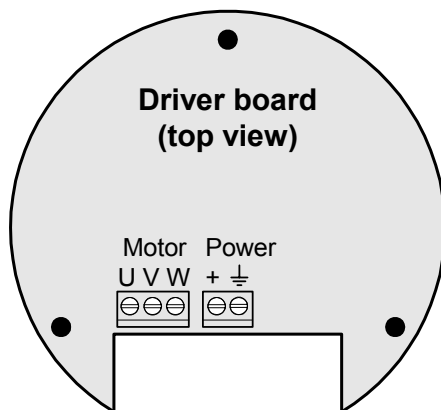
57mm BLDC Motor with Intelligent Electronics and Serial Interface

Features:

The **PD-170-57** is a full mechatronic solution including a 57mm brushless DC motor (NEMA23). It combines a convenient servo controller electronic (TMC170) and an optical encoder with different motor types. The PD-170-57 offers two motor torque options and can be controlled via RS232, RS485 and/or CAN interface. The power supply can be connected via screw connectors and the interface and the multi-purpose I/Os can be connected via high density JST connectors. This PANdrive combines the high resolution commonly known from stepper motors with the high dynamic, high velocity and high reliability of a BLDC drive. It integrates a position regulator and a ramp generator. The ramp generators supports parameterized smooth positioning also with an external switch in order to support an absolute position reference.

Connectors:

At the PANdrive 170 the motor, encoder and hall sensor connections are already done. The I/O-board has to be detached to access the screw connectors for power supply.



Interface	
Pin	Function
1	CANH
2	CANL
3	Ground
4	RS485+ / RxD
5	Rs485- / TxD

Encoder	
Pin	Function
1	+5V supply
2	Ground
3	Channel N / Null channel
4	Channel A
5	Channel B

Hall sensors	
Pin	Function
1	Signal H3
2	Signal H2
3	Signal H1
4	Ground
5	+5V supply

I/O		
Pin	Name	Function
1	AIN	Analog input: 0 - 10V signal.
2	N.C.	Not connected (do not use)
3	/STOP	Reference switch / Emergency stop
4	DIRIN	5V TTL input. Not used in firmware
5	OVT	5V TTL output: OverTemperature warning
6	GND	Ground
7	CUR	On: limited motion due to lack of power
8	+5V	+5V supply

Power supply		Motor	
Screw	Function	Screw	Function
VS	+14..48V DC	U	BLDC motor coil U
GND	Ground	V	BLDC motor coil V
		W	BLDC motor coil W

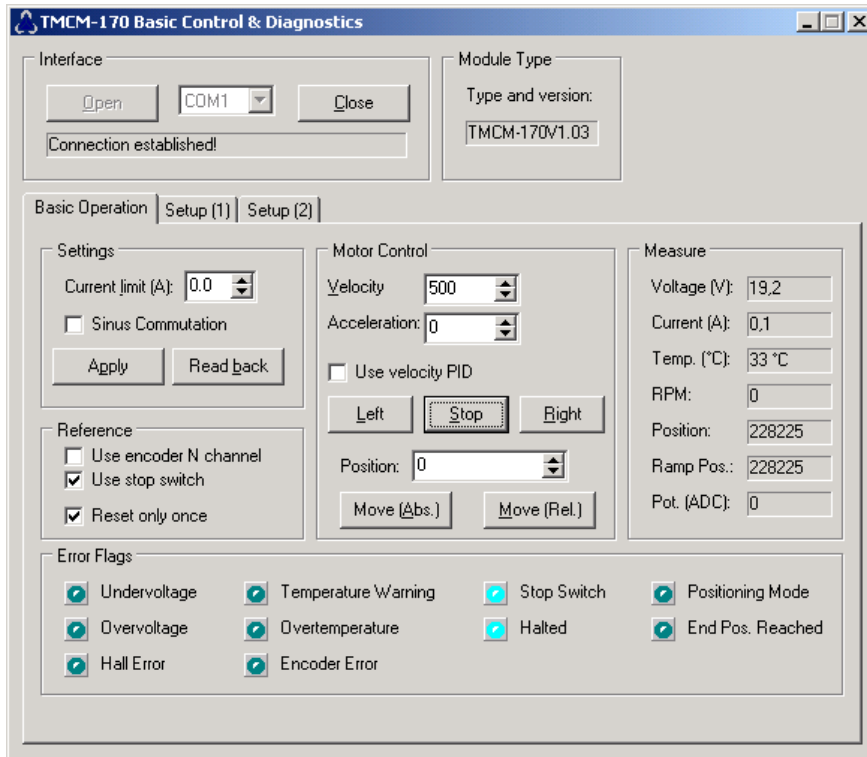
Do not connect or disconnect a motor while the board is powered, as this could damage the driver chips!

TMCM-170 Software:

www.trinamic.com

1. Open basic TMCM-170 software (available at TechLibCD and www.trinamic.com in TMCM-170 folder) by clicking TMCM170.exe.

2. Choose a COM port and click "Open". With established connection the module's type and version as well as parameters like supply voltage, current and module temperature are displayed.
3. The preconfigured values (for setup (1) and (2) also) stored in the EEPROM of the TMCM-170 can be displayed by clicking button "Read Back" in Settings section. Do not exceed a current of maximum 10 A.
4. At Section Motor Control type in a velocity like "1000" and click "Left" or "Right". Stop the motor by clicking "Stop".
5. Type in a position and let the motor move to the absolute position or relative to actual position (see position counter on the right).
6. For more functions and explanations read the TMCM-170 hardware and programming manual. For full functionality use the TMCL-IDE at TechLibCD.



TMCL-IDE:

For full functionality of the TMCM-170 use the TMCL-IDE. All commands can be included into a program or used in "Direct Mode". There are e.g. motion (ROR, ROL, MST, MVP) and SAP (Set Axis Parameter) commands to set motion and control parameters. GAP delivers their actual value.

CAUTION: For short moves do not exceed a max. current (SAP 6) of 14A (value 180). 10A (value 138) is recommended as maximum for constant rotations.

Troubleshooting:

If communication is not established:

Instr.	Type	Value	Description
SAP	<i>Sets motion and control parameters</i>		
	SAP <type no.>, <motor no.>, <Value>		
	128	0, 1, 2	0: normal op. 1: Enable TMCL
	1	32 bit	Actual pos.
	4	16 bit	Max pos. vel.
	5	0..255	PWM limit
6	0..250	Max current	
GAP	GAP <type no.>, <motor no.>		
	<i>Gives actual values of SAP parameters</i>		
ROR	(don't care)	0..2047	Rotate right
	ROR <motor no.>, <Value>		
ROL	(don't care)	0..2047	Rotate left
	ROL <motor no.>, <Value>		
MST	(don't care)		Motor stop
	MST <motor no.>, <Value>		
MVP	ABS REL COORD	23 bit	Move to pos.
	MVP <type>, <motor no.>, <Value>		

For full instruction set and further description refer to TMCM-170 Programming manual at TechLibCD or www.trinamic.com.

- Check if the power LED (green) of the TMCM-170 lights. If not check your power supply.
- Check if you are using the right COM port and it is not blocked by another program.
- Check your interface connection. Are you really using a null modem cable?
- Refer to TMCM-170 manual or Trinamic support forum for further information and help.

If the motors do not respond:

- Usually it is a problem with the communication described above.
- If the current limit LED (center) is flashing or on (red) the voltage or current are too low.
- Set a value for current limit, e.g. 6.0A and apply this value.
- Read back and check the values of the module by pressing button read back.
- Is the temperature limit exceeded? Indicated by red LED. Blink: pre-warning, On: motor stopped.
- Switch power off, wait a few seconds and switch on again, to reset all unstored parameters to factory defaults.