



TMCM-310



3-Axis Stepper Motor Motion Control Module

Features:

The TMCM-310 is a triple axis 2-phase stepper motor controller and driver module. It provides a complete single board motion control solution at low cost. Using the integrated additional I/Os it even can do complete system control applications. The motors and switches can be connected easily with screw terminals. The connection of the multi purpose I/Os can be done via a dual-in-line pin connector. The TMCM-310 comes with the PC based software developer environment TMCL-IDE for the TRINAMIC Motion Control Language (TMCL). Using predefined TMCL high level commands like "move to position" or "constant rotation" rapid and fast development of motion control applications guaranteed. The TMCM-310 can be controlled via the RS-232 or the CAN interface. Communication traffic is very low since all time critical operations, e.g. ramp calculation are performed on board. A user TMCL program can be stored in the onboard EEPROM for stand-alone operation. The firmware of the module can be updated via the serial interface. With the optional StallGuard feature it is possible to detect overload and stall of the motor.

Connectors:

Power, interface, motor, stop switch and I/O connectors:

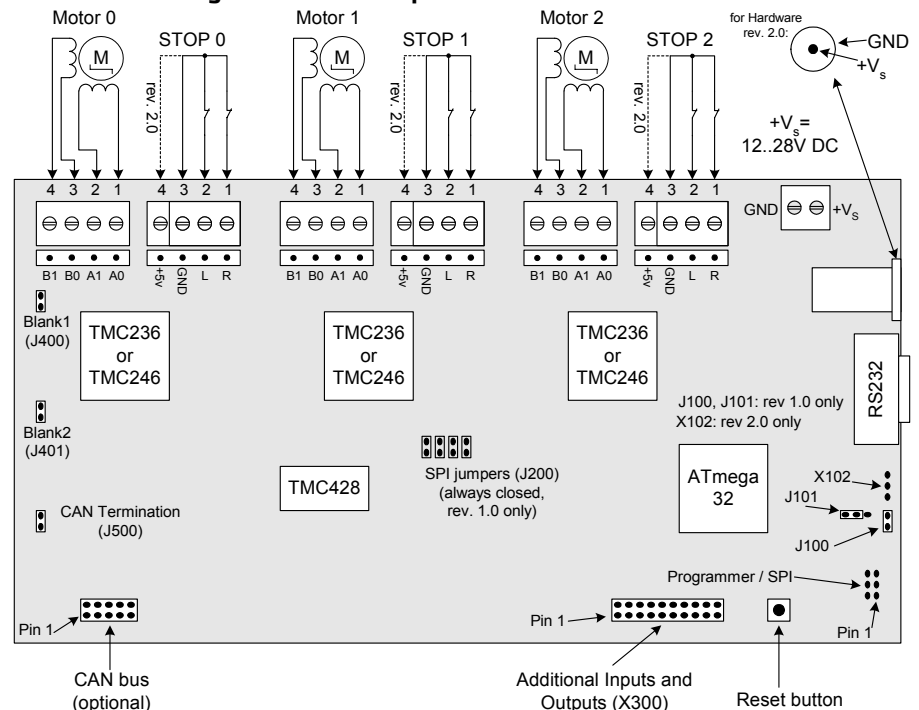
Screw	Socket	Function
VS	Pin	+7..34V DC
GND	Ring	Ground

Pin	RS232	CAN (optional)
2	RxD	CAN_L
3	TxD	GND
5	GND	
6		GND (optional)
7		CAN_H

	Pin	Function
Motor X	1	Motor coil Ao
	2	Motor coil A1
	3	Motor coil Bo
	4	Motor coil B1
STOP X	1	Right limit switch
	2	Left limit switch
	3	Ground
	4	+5V power supply

Power supply, motors and stop switches are accessible by screw connectors. The RS232 interface has a DSUB, the optional CAN interface a 2x5 pin and the I/O connector a 2x10 pin industry standard connector.

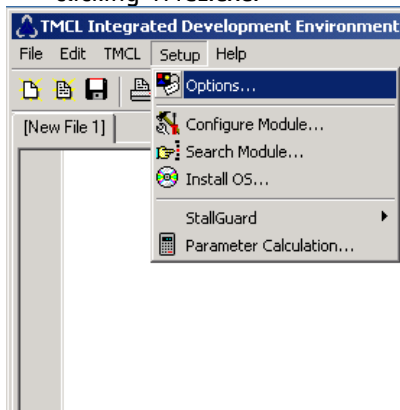
Do not connect or disconnect a motor while the board is powered, as this could damage the driver chips!



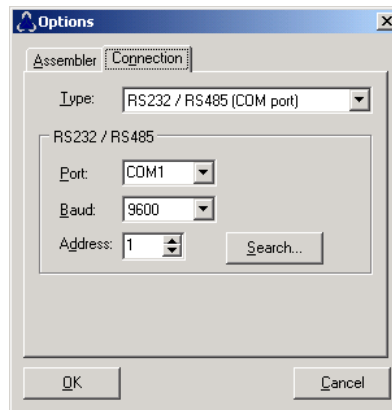
I/O connector (X300)							
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	Output 0	2	Output 1	11	Input 0	12	Input 1
3	Output 2	4	Output 3	13	Input 2	14	Input 3
5	Output 4	6	Output 5	15	Input 4	16	Input 5
7	Output 6	8	Output 7	17	Input 6	18	Input 7
9	rev. 2.0: Alarm Input rev 1.1: +5V (Output)	10	GND	19	+5V (Output)	20	GND

TMCL-IDE:

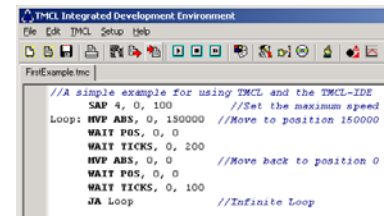
1. Make sure the COM port you intend to use is not blocked by an other program.
2. Open TMCL IDE (available at TechLibCD and www.trinamic.com) by clicking TMCL.exe.



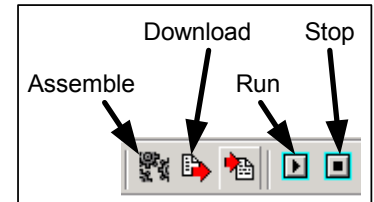
3. Choose Setup and Options... and then the connection tab.



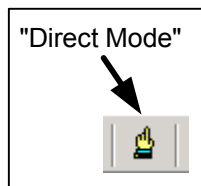
4. Choose COM port and type in parameters shown above (baudrate 9600). Click OK.



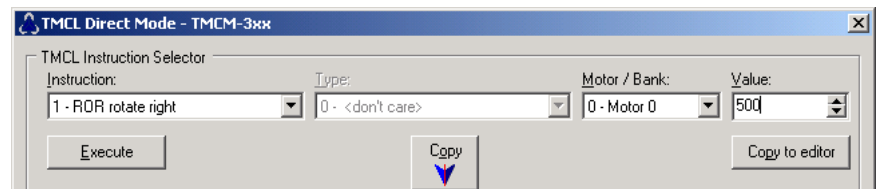
5. Write a program code into the white field and save it with File/Save.



6. Click "Assemble" first, then "Download" and "Run" button to start the program.



7. Stop all running programs by clicking "Stop button" and start "Direct Mode".



8. If communication is established the TMCM-310 is automatically detected. Issue a command by choosing Instruction, Type, Motor, Value and press Execute to send it to the TMCM-310.

Commands:

Following commands can be included into a program or used in "Direct Mode". There are motion (ROR, ROL, MST, MVP) and SAP (Set Axis Parameter) commands to set motion and control parameters. GAP delivers their actual value.

Instr.	Type	Value	Description
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>		
SAP	2	23 bit	Actual pos.
	4	0..2047	Max speed
	5	0..2047	Max accell.
	6	0..1500	Max current
	7	0..1500	Standby curr.
	140	0..6	Microstep res.
	SAP <type no.>, <motor no.>, <Value>		
<i>Sets motion and control parameters</i>			
GAP	GAP <type no.>, <motor no.>		
	<i>Gives actual values of SAP parameters</i>		

For full instruction set and further description refer to TMCL-Reference at TechLibCD or www.trinamic.com.

Troubleshooting:

If communication is not established:

- Check if the power LED (D503) of the TMCM-310 lights. If not check your power supply.
- Try to start "Direct Mode" and see if the TMCM-310 is detected automatically. If not close window.
- Check if you are using the right COM port and it is not used by another program.
- Check your connection settings, default: 9600 baud and address 1.
- Check your interface connection. Are you really using a null modem cable?
- Termination and telegram pause time OK ?
- Refer to TMCM-310 manual or Trinamic discussion group for further information and help.

If motor does not respond:

- Usually it is a problem with the communication described above.
- If you are using a TMCL program try a movement command in "Direct Mode" to see if there is a problem with your program.
- If the activity LED (D100) is flashing the module should run normally, check the motor connection.
- Restore factory settings to cancel all settings modified by user by issuing instruction 137.