PD-110 / TMCM-110

Start into stepper motor motion systems

Italic and green lines can be neglected for the PD-110.

You will need

- Your TMCM-110 stepper motor controller and driver module
- *A stepper motor with 1A RMS coil current*
- Interface (RS232, RS485, CAN or IIC) suitable to your TMCM-110 version, with cables and maybe converter supplied.
- Power supply for 12V to 30V
- TMCL IDE program and PC
- *Equipment to connect motor and TMCM-110, maybe soldering tools.*

Precautions

- Do not connect or disconnect the motors while powered
- Do not mix up connections or short-circuit pins
- Avoid bundling IO wires with motor power wires, as this may cause noise pickup from the motor.
- Do not exceed the maximum power supply of 30V.
- *If attaching the TMCM-110 directly to a motor leave at least a 5mm gap for air cooling.*
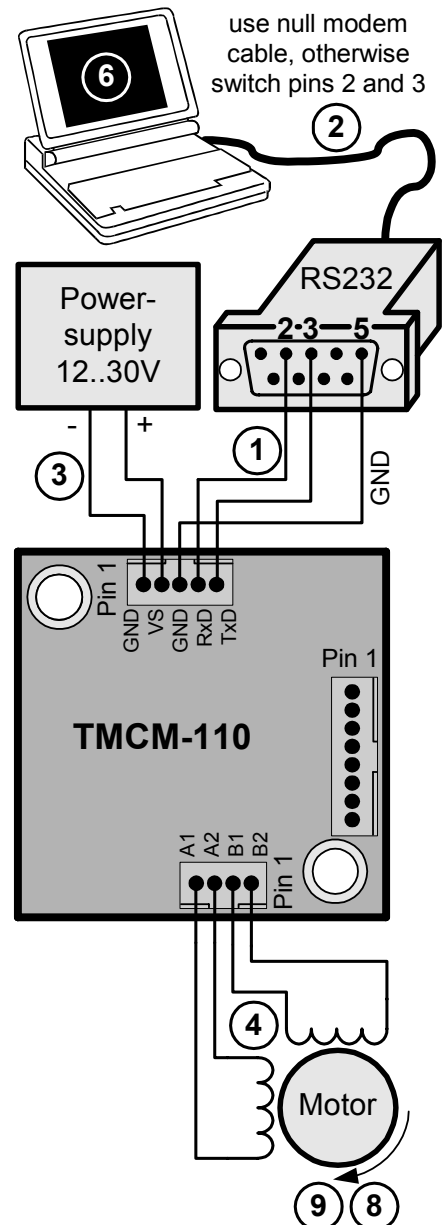
Starting up: Start with power supply OFF.

1. Connect RS232 pin 2 (PC-TxD) to pin 4 (110-RxD) and pin 3 (PC-RxD) to pin 5. Use other interfaces equivalent.
2. Connect RS232 cable to PC.
3. Connect power supply to TMCM-110
   - Power supply (+) to pin 2
   - Ground (GND) to pin 1
4. *Connect stepper motor to 4 pin connector*
5. Turn power ON. The LED of the module flashes and the motor is powered (standby current flows) but in standstill. *If this does not occur switch power OFF and check your connections and power supply.*
6. Start the TMCL IDE program (see other side of the sheet how to configure the connection and use the IDE).
7. Type following into the open window:

```
//A simple example for using TMCL and the TMCL-IDE
      SAP 4, 0, 100       //Set the maximum speed
Loop: MVP ABS, 0, 15000   //Move to position 15000
      WAIT POS, 0, 0
      WAIT TICKS, 0, 200
      MVP ABS, 0, 0        //Move back to position 0
      WAIT POS, 0, 0
      WAIT TICKS, 0, 100
      JA Loop             //Infinite Loop
```

8. Click the "*Assemble*" icon, then click the "*Download*" icon to download the code to the TMCM-110. Click the "*Run*" icon. The downloaded program will now be executed
9. Click stop button and start "TMCL Direct Mode" to issue following commands:
   - ROR rotate right, Motor 0, value 500 → Click Execute The motor is rotating now.
   - MST motor stop, Motor 0 → Click Execute

First steps are made. For other commands of the TMCM-110 refer to next page and the TMCM-110 Manual.

Wiring note: The TMCM-110 comes with a 4pin, a 5pin and an 8 pin JST PHR-connector with about 20cm cables for each pin. If you have a PANdrive the TMCM-110 is mounted to a motor and no extra motor connection is needed.
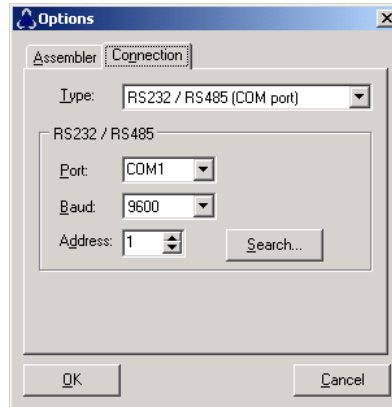

use null modem cable, otherwise switch pins 2 and 3

Power-supply 12..30V

RS232   2·3 — 5

GND VS GND RxD TxD

Pin 1

TMCM-110

A1 A2 B1 B2   Pin 1

Motor

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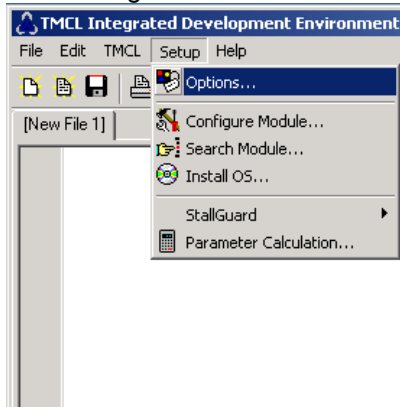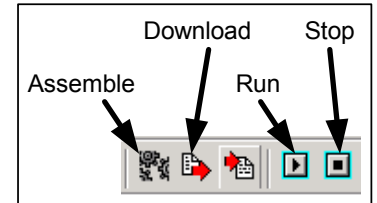
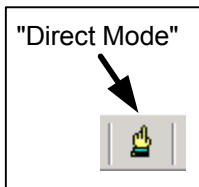**3.** Choose Setup and Options… and then the connection tab.

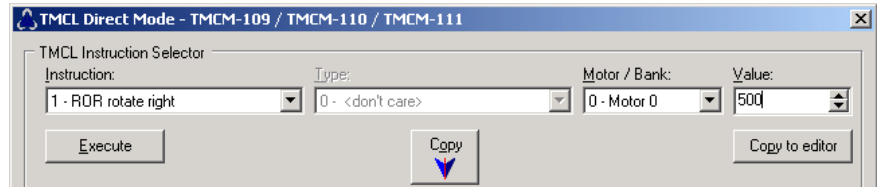**4.** Choose COM port and type in parameters shown above (baudrate 9600). Click OK.
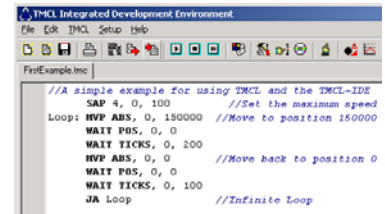
5. Write a program code into the white field and save it with File/Save.

Download — Stop

Assemble — Run

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".

"Direct Mode"

8. If communication is established the TMCM-110 is automatically detected. Issue a command by choosing Instruction, Type, Motor, Value and press Execute to send it to the TMCM-110.

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>		
	Sets motion and control parameters		
GAP	GAP <type no.>, <motor no.>		
	Gives actual values of SAP parameters		

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

Troubleshooting:

If communication is not established:
- Check if the LED of the TMCM-110 is flashing. If not check your power supply.
- Try to start "Direct Mode" and see if the TMCM-110 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 to TMCM-110.
- Refer to TMCM-110 manual.

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.
- Check the motor connection. And power LED of the module.
- Restore factory settings to cancel all settings modified by user by issuing instruction 137.