PD-013 / TMCM-013

Start into stepper motor motion systems

Italic and green lines can be neglected for the PD-013

You will need

- Your PD-013 or TMCM-013 stepper motor controller and driver module
- *A stepper motor with 1A RMS coil current*
- RS232 or USB to RS 485 converter with cables
- Step / Direction generator (+5V /0V output)
- DC Power supply in the range 12V to 24V
- Hyperterminal program, PC
- *Equipment to connect motor and TMCM-013, maybe soldering tools.*

Precautions

- Do not reverse the power supply polarity – module could be destroyed!
- Do not connect or disconnect the motor 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 24V.
- *If mechanically attaching the TMCM-013 to a motor leave at least a 5mm gap for air cooling.*

Starting up:

Start with power supply OFF.

1. Connect RS485 Converter to PC via RS232
2. Connect TMCM-013 to RS485 Converter
   - RS485 GND to pin 14 (recommended)
   - RS485 + to pin 15
   - RS485 – to pin 16
3. Connect power supply to TMCM-013
   - Power supply (+) to pin 1
   - Ground (GND) to pin 2
4. *Connect stepper motor to 4 pin connector*
5. Turn power ON. The motor is powered but in standstill. If this does not occur switch power OFF and check your connections and power supply.
6. Start HyperTerminal program (see other side of the sheet for parameters).
7. Issue following commands:
   - AA 400 <ENTER>   -- acceleration
   - AV 50000 <ENTER>   -- move with constant velocity
   - AV 0 <ENTER>   -- stop motor
8. If Step / Direction interface is desired connect
   - +5V power supply (e.g. pin 12) to pin 3 (V_{COM}).
   - Step signal to pin 6 (0V / 5V signal analogical to V_{COM}).
   - Direction signal to pin 5 (0V / 5V signal)
   - GND (e.g. pin 10) to generator GND.
9. For Step / Direction the acceleration has to be set to 0 (default)   → AA 0 <ENTER>.
   Start Step signal (max. 5V, 250kHz). The motor turns. Try out different frequencies and directions.

First steps are made. For other commands see the second page. For full functionality of the TMCM-013 refer to the TMCM-013 Manual.

Wiring note: The TMCM-013 comes with a 16 pin and 4 pin (B4B-PH-SM3-TB series PH-connectors) with about 20cm cables for each pin. If you achieved a PANdrive the TMCM-013 is mounted on a motor with connection already done. Otherwise you have to take care for an appropriate cables.
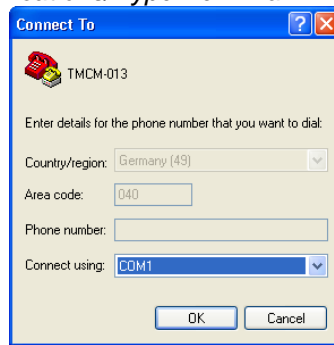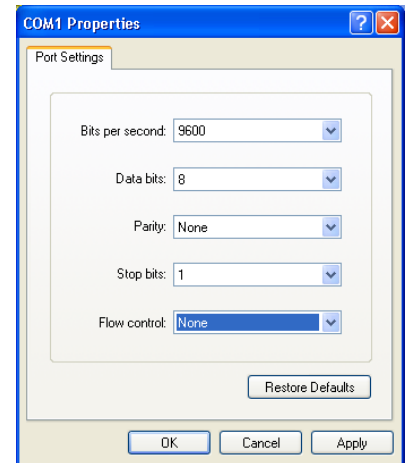

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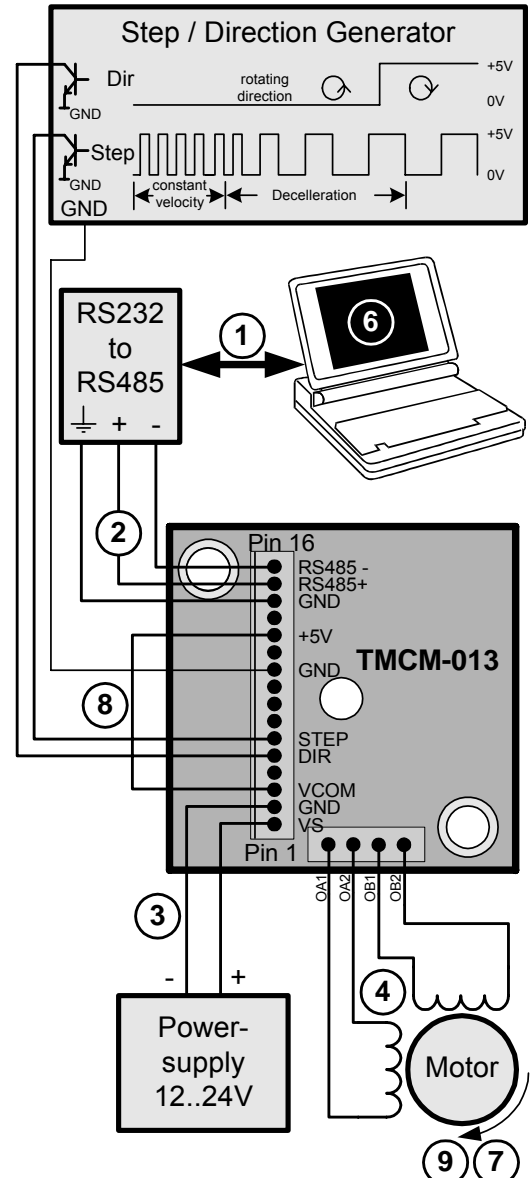
1. Make sure the COM port you intend to use is not blocked by an other program.

2. Open HyperTerminal. Typical path (Windows XP):
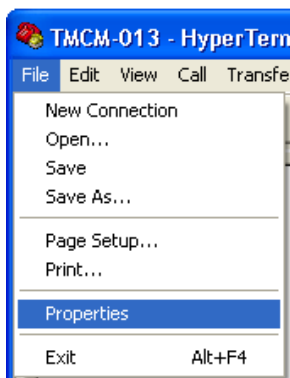*Start/Programs/Accessories/Communications/HyperTerminal*
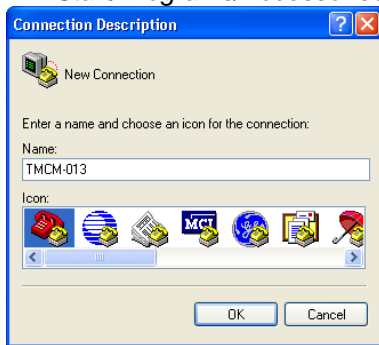
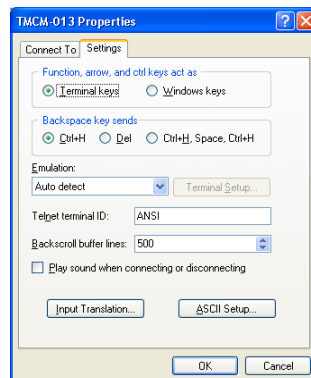**3.** New connection, choose new name and icon. Click OK.

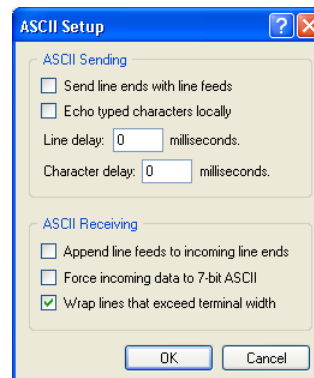**4.** Choose connection (RS232 is normally COM1). Click OK.

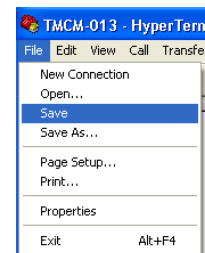**5.** Make the settings shown above. Click OK

6. Choose Properties in HyperTerminal.

7. Click ASCII setup button on the Settings tab.

8. Make settings shown above. Click OK and click OK again.

9. Click File/Save to store this connection. You are ready to send commands now.

To connect or disconnect use this buttons

RS485 Commands:

For RS485 commands write the address byte (default is "A") first, then a command. A small command letter provides the actual setting.

Command	Function	Range	Factory Default
A, a	Acceleration	0..2500000	0
C, c	Set Motor Current	0..100	50
G, g	StallGuard	-7..0..+7	0
M, m	Select Mode	0, 1, 2, 3, 4	0
P	Set Position	32 bit	0
R	Read Current Position	32 bit	
V, v	Velocity for Rotation	+/- 2500000 0 or 1	0
W	Store actual parameters		
X	Get version number		
Y, y	Standby curr.	0..100	20
Z, z	Microstep Resolution	0..6	0

For further commands and description refer to TMCM-013 Manual at TechLibCD or www.trinamic.com.

Troubleshooting

If the typed command is not echoed:

- Check if the LED at the TMCM-013 is flashing. If not check your power supply.
- Check if you are using the right COM port and it is not used by another program.
- Switch RS485 + and – connection.
- Try to change ASCII settings.
- Download Monopack LT software from www.trinamic.com, "discontinued products" or an other terminal software and use this instead of HyperTerminal.

If motor does not respond:

- Usually it is a problem with the communication described above.
- Check your acceleration and current settings. They have to differ from 0 to get a rotation with the command AV. Set the current to a value of at least 50 for failure search.
- Set back the TMCM-013 to factory default settings. Refer to TMCM-013 Manual for details.
- Do a failure readout with command AE. Please refer to the TMCM-013 Manual for details of the failure readout and further information about the module.