

MCST3601

Quickstart Manual

EN

Imprint

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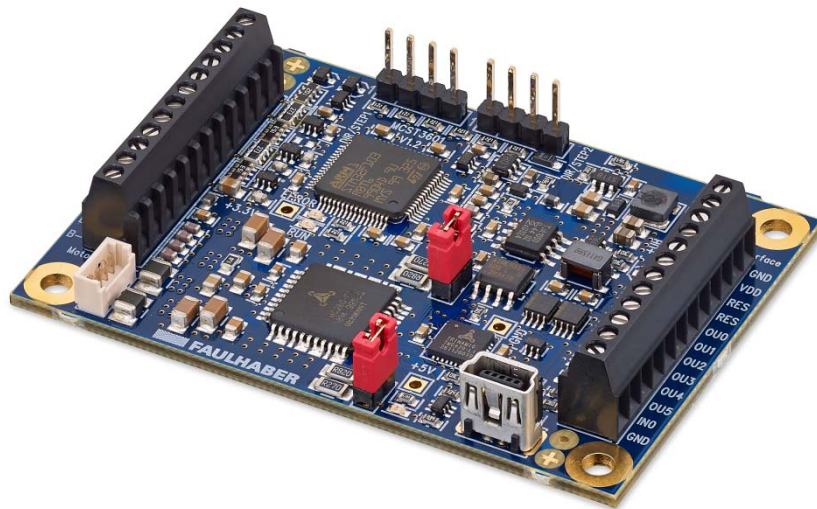
The relevant regulations regarding safety engineering
and interference suppression as well as the requirements
specified in this technical manual are to be noted and
followed when using the software.

Subject to change without notice.

The respective current version of this technical manual
is available on FAULHABER's internet site:
www.faulhaber.com

MCST 3601

Motion Controller for Stepper Motor



QUICK START GUIDE

1 Introduction

Congratulations, you've just acquired the new stepper motor motion controller MCST 3601 from FAULHABER. This electronics based on the Trinamic® chip TMC260 is meant to be used as an evaluation board for stepper motor

The MCST 3601 is fully programmable, features 4 general purpose inputs and 6 outputs, encoder input and offers Microstepping possibility up to 1/256.

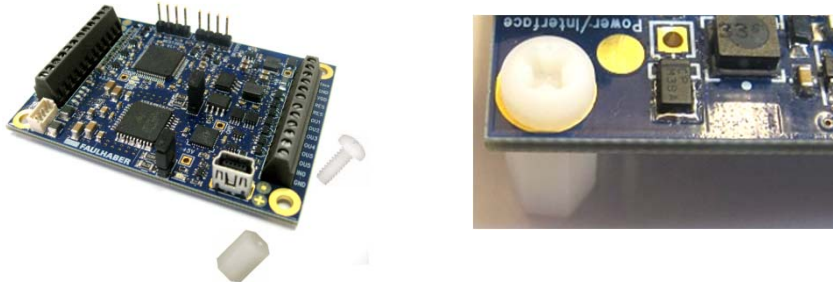
If needed, the electronics can be transformed as a master controller for 2 additional drivers or, alternatively, the controller function can be disabled to turn the same board into a driver with external step and direction input, without the need of specific programming software.

The MCST 3601 is suitable for all the PRECISTEP® technology motor range and can precisely control currents as low as 0.01A and as high as 1.6A.

On the following sections the main features of the board are explained so that the user can start to enjoy the product as quick as possible.

0 Assemble the board with the spacers

It is highly recommended to use the spacer provided with the board to avoid any short circuit during the operation. Please use the four lead screw and hexagonal spacer to stand up the board.



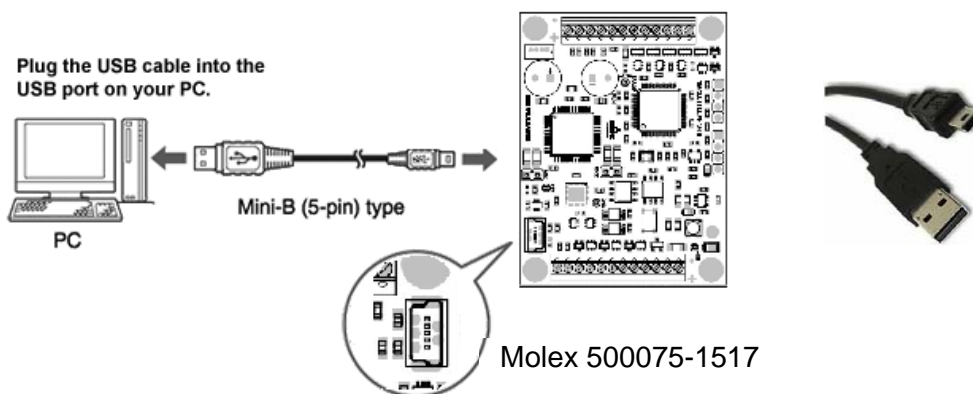
1 Connect board to PC

The board must be link with the appropriate cable to the PC via USB.

The first time this operation is realized, you will be asked to install the driver (.inf file) so that the PC recognizes the board. To do so, look for the USB ports on your computer and upload manually the .inf file under the “MCST3601” USB port.

With Windows: CONTROL PANEL/HARDWARE/DEVICE MANAGER

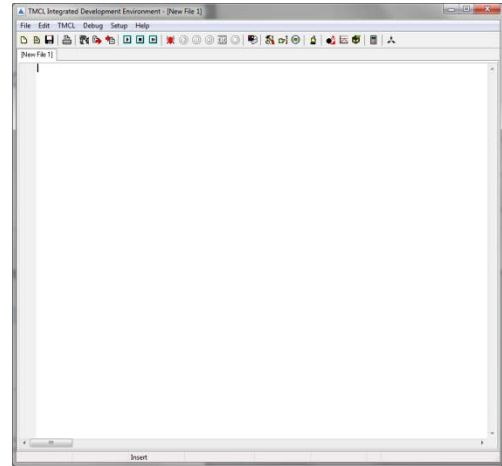
- Select “MCST3601” USB port.
- Mouse right click
- Update driver: search for the .inf file



2 Download and Open TMCL software

If you did not get it together with the board, please download from www.trinamic.com.

Open the TMCL software and the following window will open :



Usually, the board is detected directly from the software and the connection is established. If not, you can verify the COM port under SETUP – OPTION – CONNECTION.

3 Set current range and current

The driver features 4 current ranges that must be selected manually on the board thanks to jumpers and through the software. The motor operates safely if the right current range is selected and the current is set to the nominal current values from the datasheet.

Set the jumpers to the right range (both jumpers must be set at the same position)

Fine tune the current range selection via software and the following command line :

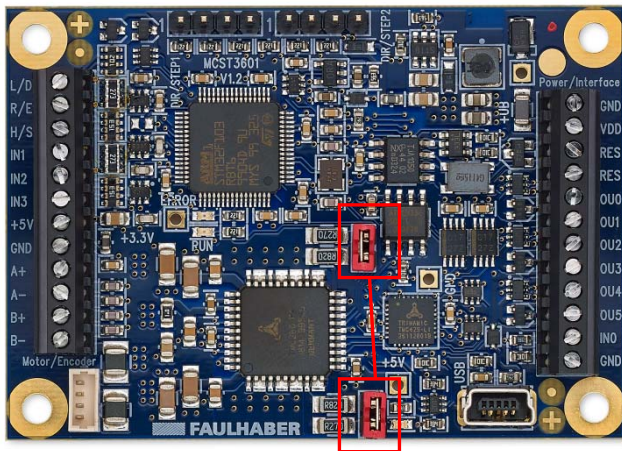
SAP 179, 0, 1 // Set current range via software (Vsense)

Jumpers	Vsense (SAP 179)	Description
Both closed	0	Motor phase current up to 1A
Both closed	1	Motor phase current up to 0.57A
Both open	0	Motor phase current up to 0.26A
Both open	1	Motor phase current up to 0.14A

Set the current values via the software, knowing that 255 is the maximal value of the selected current range. The command to use is:

SAP 6, 0, 135 // Set current, motor #0, 0=0mA, 255= max current from range

In this case if the range is set to the 0.14A range, the current setting is $135/255 * 0.14 \approx 0.07A$. It is recommended to measure the current, this method is only an approximation.



Jumpers

4 Set program

Now the goal is to create a small program to run the motor. The complete Software manual can be downloaded from www.trinamic.com under the TCML-IDE product library.

The following example helps to start a motion quickly using 2 different ways.

Option 1: Write down shortcode directly

The following program let the motor run for a while:

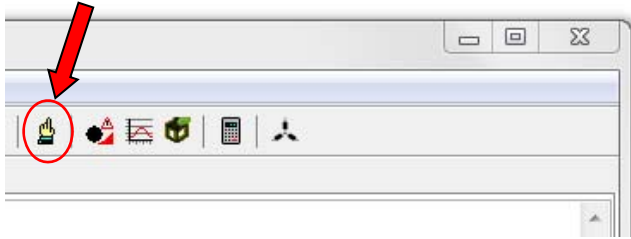
```

SAP 77,0,1// Start application, motor #0, automatically =1
SAP 6, 0, 135 //Set current, motor #0, 0=0mA, 255= max of current range
SAP 5, 0, 100 // Set max acceleration, motor #0, speed
SAP 140, 0, 5 // Set microstepping, motor #0, ,0= 1ustep/s, 1= 2usteps/s, 2= 4usteps/s, 3= 8usteps/s...
SAP 154, 0, 4 // Set Pulse divisor (PD), motor #0,
ROL 0, 983 //Rotate On Left, motor #0, with Speed factor X. Motor Speed (usteps/s)= X *
(16E6/65536) *(1/(2^PD))
WAIT TICKS, 0, 10000 // let the event happen
MST 0 // stop the motion
    
```

Note: Examples of pre-defined programs for PRECInstep[®] motors can be downloaded from Faulhaber.com

Option 2: create program line by line from command library

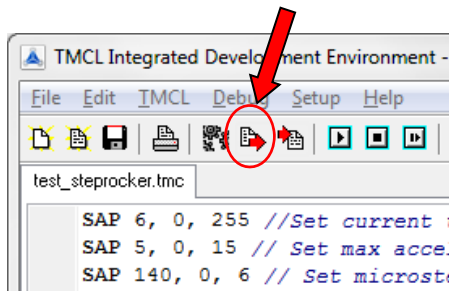
The TMCL software provides a direct mode operation symbolized by a little hand on the tool bar.



If the connection between the board and the computer is established, it is then possible to send direct command to the driver and copy the corresponding command line to the program.

5 Upload program sequence

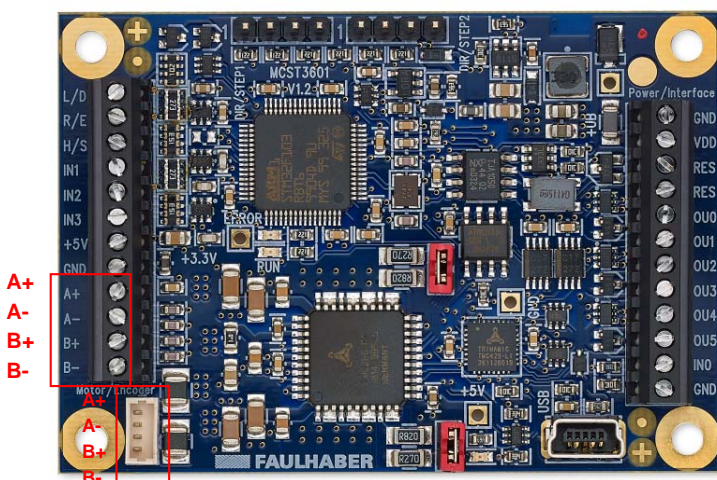
Once the program is ready, you need to upload it on the board.



6 Connect the motor to the board

You can use either the screw terminal (2.54mm pitch) or the white connector (Molex 53047-0410) to plug the motor on the board, as shown below.

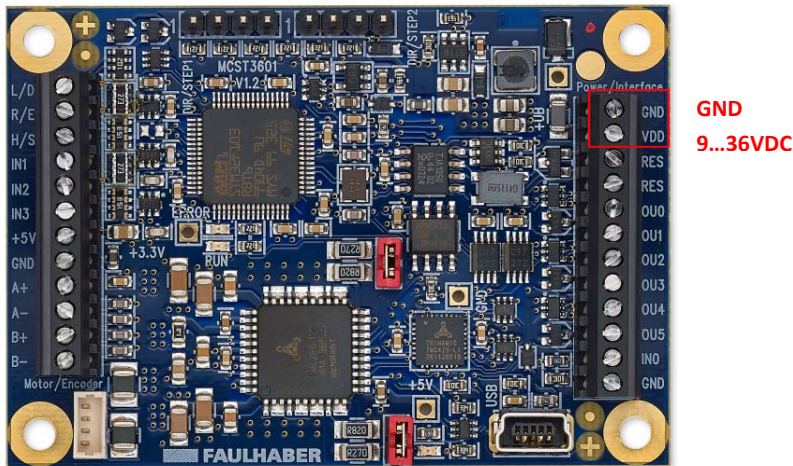
Please respect the connection of phases A and B as mentioned below.



7 Connect power to the board

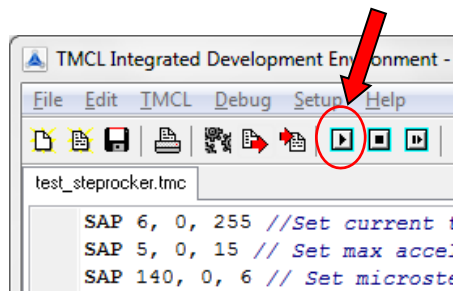
The power supply must be connected to the PIN 1 and 2 of the screw terminal on the right hand of the board, as shown below.

The DC voltage applied must be set between 9V and 36V.



8 Run

If the upload is successful, you can run your program:



or it will run automatically if this function was programmed.

Releases follow-up

Modification	Date	Version
Initial release	10.10.2013	V1.0
Update of images and current values	21.01.2014	V1.1
Various corrections	14.02.2014	V1.2
Update of product pictures	11.09.2014	V1.3

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