

# Motion Controller

1-Axis controller with microstepping,  
USB interface and GPIO

For combination with:  
Stepper motors

## Series MCST 3601

		MCST 3601	
Power supply	$U_B$	9 ... 36	V DC
PWM switching frequency	$f_{PWM}$	16 000	kHz
Max. continuous output current range <sup>1)</sup>	$I_{dauer}$	0 ... 1,1	A
Max. peak output current	$I_{max}$	1,6	A
Max. current resolution		5	mA
Microstepping		up to 256 <sup>2)</sup>	
Scanning rate (in full step mode)	$N$	30	$\mu$ s
<b>Inputs:</b>			
– Digital, 24 VDC		3	
– Analog, 10 VDC		1	
<b>Outputs:</b>			
– Open drain, 24 VDC		6	
– +5 VDC, 100 mA		1	
Operating temperature range		– 30 ... + 70	°C
Mass		22	g

<sup>1)</sup> at 22°C ambient temperature

<sup>2)</sup>  $\mu$ step/full step

### Connection information

<b>Connections 1-6 :</b>		digital input	
REF_L / DIR_IN	left stop switch input	programmable pull-up to +5V or direction input in S/D <sup>4)</sup> operation mode	
REF_R / EN_IN	right stop switch input	programmable pull-up to +5V or enable input in S/D <sup>4)</sup> operation mode	
HOME / STEP_IN	home switch input	programmable pull-up to +5V or step input in S/D <sup>4)</sup> operation mode	
ENC_A / IN1	incremental encoder	channel A input or digital input 1	
ENC_B / IN2	incremental encoder	channel B input or digital input 2	
ENC_I / IN3	incremental encoder	index / null channel I input or digital input 3	
<b>Connection 7 :</b>		+5V output	
Current range		0 ... 100	mA
<b>Connection 8, 13<sup>3)</sup>, 24 :</b>		GND	
Signal ground			
<b>Connection 9-12 :</b>		motor A+, A-, B+, B-	
Output voltage		= $U_B$	VDC
Coil current range		0 ... 1,1	A
(depends on programming and jumper settings)		0 ... 1,6 (Peak)	A
<b>Connection 14<sup>3)</sup> :</b>		$U_B$	
Supply voltage range		9 ... 36	VDC
<b>Connection 15-16 :</b>		reserved	
Max speed rate transfer		1	Mbits/s
Max number of nodes		110	
Value of the termination resistors (2x)		120	Ohm
<b>Connections 17-22 :</b>		digital output	
Voltage range open drain outputs		= $U_B$	VDC
Current range open drain outputs		0 ... 100	mA
<b>Connection 23 :</b>		analog input	
Voltage range		0 ... 10	VDC

<sup>3)</sup> Crossing the connections 13 and 14 may irreversibly damage the controller.

<sup>4)</sup> S/D = step and direction (direct drive) mode.

## Features

The MCST3601 is a stepper motor controller that is mostly intended to be used as an evaluation board. It has the capability to drive the full range of stepper motors thanks to a selected current range.

This range must be selected manually through jumpers and programmed with the TMCL-IDE software.

The USB communication makes it fully programmable and the many inputs and outputs enable an external interaction.

Full step or microstepping up to 256 can be managed by programming.

Moreover, the MCST3601 comprises screw terminals for quick setup and a Molex connector compatible with the standard cables solutions offered on stepper motors.


When controlling several axis, one driver per axis is required but there is a possibility to coordinate the different axis by using the MCST3601 as „Master“ and up to two other boards as „Slaves“. The slave boards are then addressed as step and direction drivers by the master board. MCST3601 can also be converted in one of those step and direction driver.

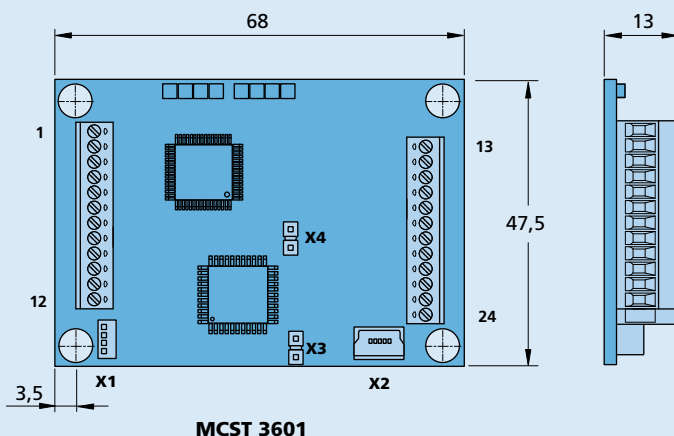
Finally, the MCST3601 has the capability to read and treat an external input signal that may be sent by a sensor or an encoder. This is very useful in the case where a homing function must be made before starting the movement, in other words, when the motor is looking for a reference position before starting. Note that this function is not acting like a closed loop regulator.

## Accessories

The MCST3601 is delivered with one USB cable and four spacer bolt.

## Dimensional drawing and connection information MCST 3601

 Scale reduced



### Motor connection

No.	Function
1	REF_L / DIR_IN
2	REF_R / EN_IN
3	HOME / STEP_IN
4	ENC_A / IN1
5	ENC_B / IN2
6	ENC_I / IN3
7	+5Vout / 100mA
8	GND
9	Motor A+
10	Motor A-
11	Motor B+
12	Motor B-

### X1 Motor connector

Connector housing:  
Molex 51021-0400  
Contacts: Molex 50079-8000  
Wire: AWG 26-28

### Supply connection

No.	Function
13	GND
14	U <sub>B</sub>
15	reserved
16	reserved
17	OUT0
18	OUT1
19	OUT2
20	OUT3
21	OUT4
22	OUT5
23	INO
24	GND

### X2 USB 2.0 (12Mbit/s)

Any standard mini-USB plug compatible with Molex 500075-1517

### X3, X4 Jumpers for current settings