

Stepping motor clock controller module (Model : AM-MS2) Manual

New Technology Company(N.T.C)

<http://www.NewTC.co.kr>

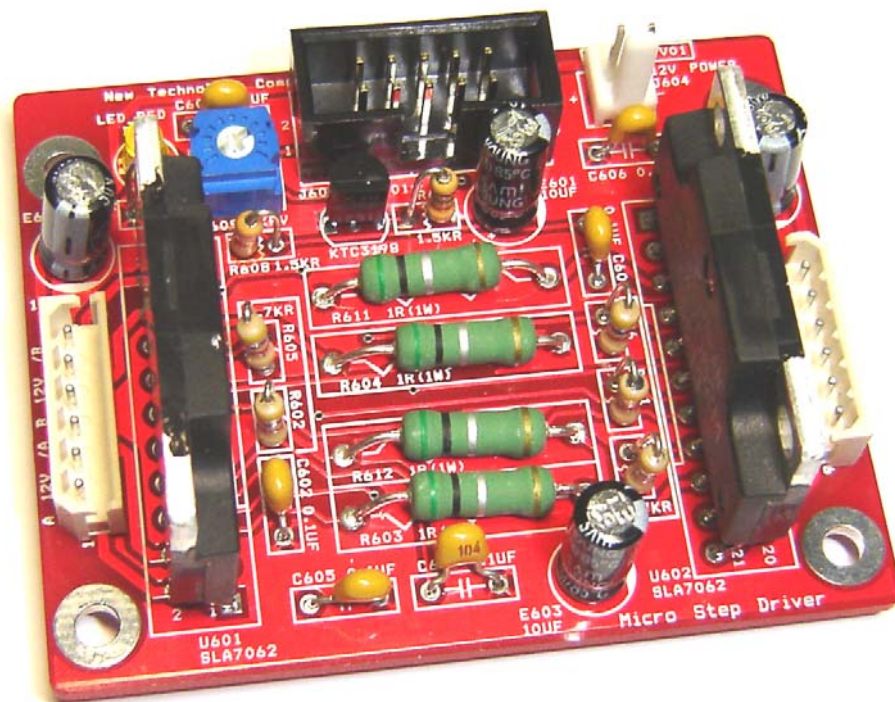
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1 Introduction

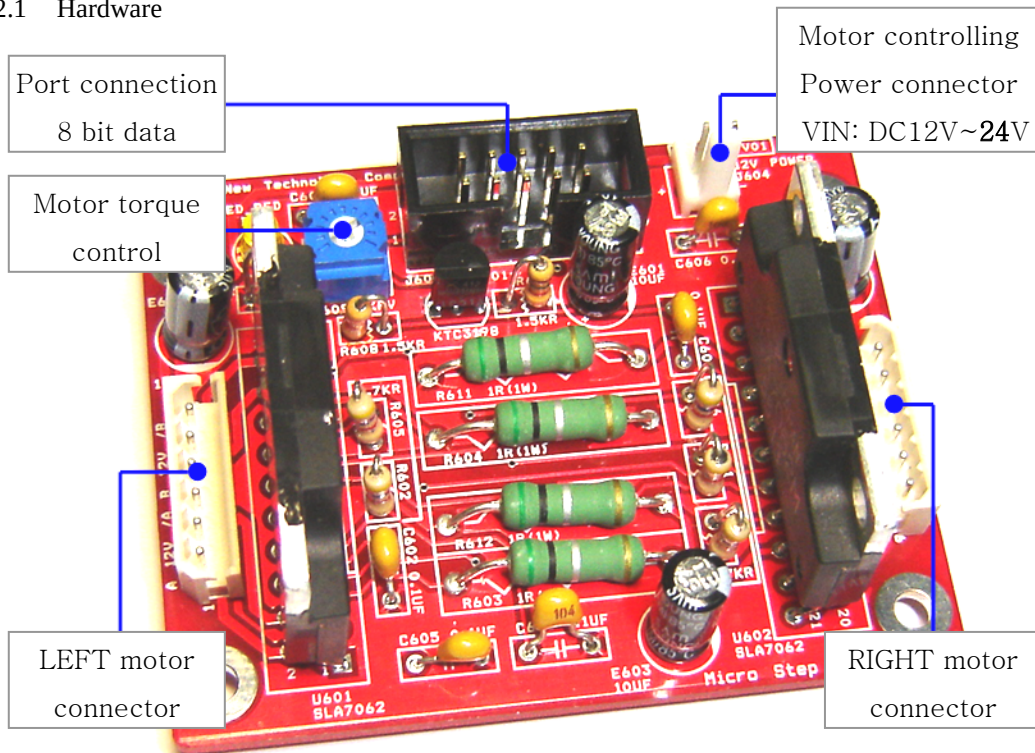
- ◆ The module of Microstep controller (can control stepping motor precisely)
- ◆ Two unipolar stepping motor control
- ◆ Compatible interface with 10Pin box header and 12V power supply connector with molex 5045-2
- ◆ Motor bias current control with variable resistor
- ◆ Can enable and disable module using Enable PIN
- ◆ Module size : 63.3 X 50.6 mm



Stepping motor clock controller module AM-MS2

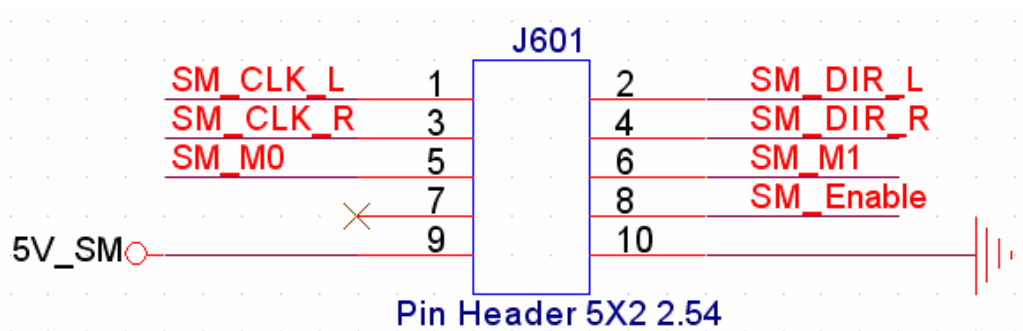
2 AM-MS2 (Stepping motor clock controller module) H/W

2.1 Hardware



2.2 Connector connection

2.2.1 Port connection for J601, box 2x5 header connector



# 1	# 3	# 5	# 7	# 9
Left motor CLK	Right motor CLK	Step Mode 0	N.C.	Power DC 5V
# 2	# 4	# 6	# 8	# 10
Left motor DIR	Right motor DIR	Step Mode 1	Enable	GND

Pin No.	Pin Name	Description
1	LEFT motor CLK	CLOCK for LEFT motor
2	LEFT motor DIR	Direction for for LEFT motor (CW:0 / CCW:1)
3	RIGHT motor CLK	CLOCK for RIGHT motor
4	RIGHT motor DIR	Direction for RIGHT motor (CW:0 / CCW:1)
5	Step Mode 0	Setting step mode 0 (Default : 1)
6	Step Mode 1	Setting step mode 1 (Default : 1)
7	N.C	No connection
8	Enable	Enable / disable stepping motor module
9	VCC	Power Supply Input (DC 5V)
10	GND	Power Supply Ground

The flowing is how to set stepping mode..

Step Modes

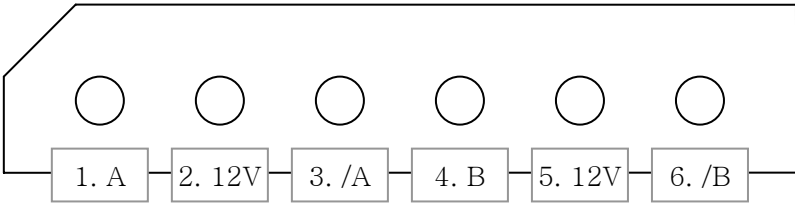
Input M1	Input M2	Step Mode
H	H	Half Step
H	L	Quarter Step
L	H	Eighth Step
L	L	Sixteenth Step

If you use the mode near Sixteenth Step, then you can control more precisely, but you need more clock for one rotation

2.2.2 Power input J604

Power for controlling stepping motor can be supplied from J604. Stepping motor generally needs double voltage of specified proper voltage. Motor driver can take till 40V , but I hope you use 12V for AM-MS2. You can limit controlling current for stepping motor using R609 variable resistor. Turnning variable resistor, you can change and fix to proper current.

2.2.3 Pin number for Stepping motor connector J602, J603

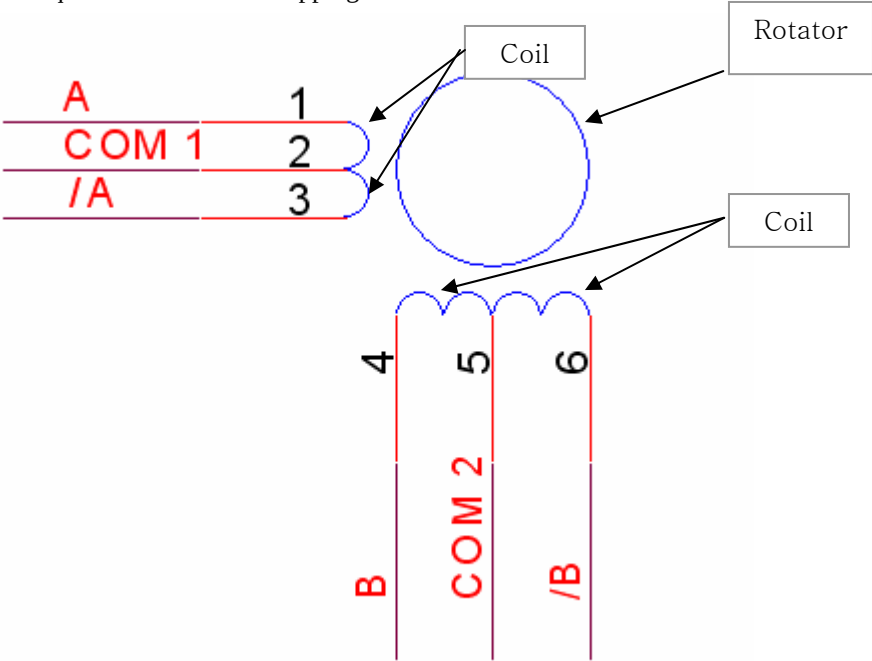


Wiring for motor connection

1	Stepping motor phase A
2	Common (over 12V)
3	Stepping motor phase /A
4	Stepping motor phase B
5	Common (over 12V)
6	Stepping motor phase /B

2.2.4 How to find phase for stepping motor

Equivalent circuit for stepping motor is below



Six pin connection with (Phase A, Phase /A, COM1) and (Phase B, Phase /B, COM2)
There is one coil between phase A and COM1, and there is the other coil between phase /A and COM1. Resistance between A and COM1 is almost 5 ohm, and Resistance between /A and COM1 is almost 5 ohm. You can identify that other 3 pin is not

connected with this 3 pin.. Also, the resistance between phase A and /A is 10 ohm because there are two coils.

If you cannot know the phase because of the absence of datasheet, you could find the phase with this method. At first, find COM1 from connected 3 pins, and select as phase A and /, and find COM2, phase B, /B with the same method from other 3 pins.

3 How to use AM-MS2 (Stepping motor clock controller module)?

3.1 Hardware connection

3.1.1 Enable signal

Enable signal can enable or disable stepping motor controller. Because it is active high , if you want to enable motor driver always, just connect this pin to VCC. If you want to use it as Sleep mode, connect this pin to port output. If you use 0, then torque disappear from motor.

3.1.2 Step Mode [1:0] signal

This pin is for setting step mode of microstep. Default is half step.

Step Modes		
Input M1	Input M2	Step Mode
H	H	Half Step
H	L	Quarter Step
L	H	Eighth Step
L	L	Sixteenth Step

As your needs, if you want to change the modes, you can connect it to port output, or if you want to use at just one mode, you can connect the pin to VCC or GND signal. If you do not connect anything, it works as half step mode.

3.1.3 LEFT/RIGHT motor DIR

DIR pin is for changing the direction of rotation. If DIR pin is connected to GND, motor is to clockwise(CW), and if it is connected to VCC, it rotates counter clockwise(CCW). If you want to move robot with two motor, to the forward, then LEFT motor should rotate to CCW, and RIGHT motor to CW. Connect this pin to VCC or GND signal. Connect this pin to VCC or GND signal, otherwise to port output..

3.1.4 LEFT/RIGHT motor CLK

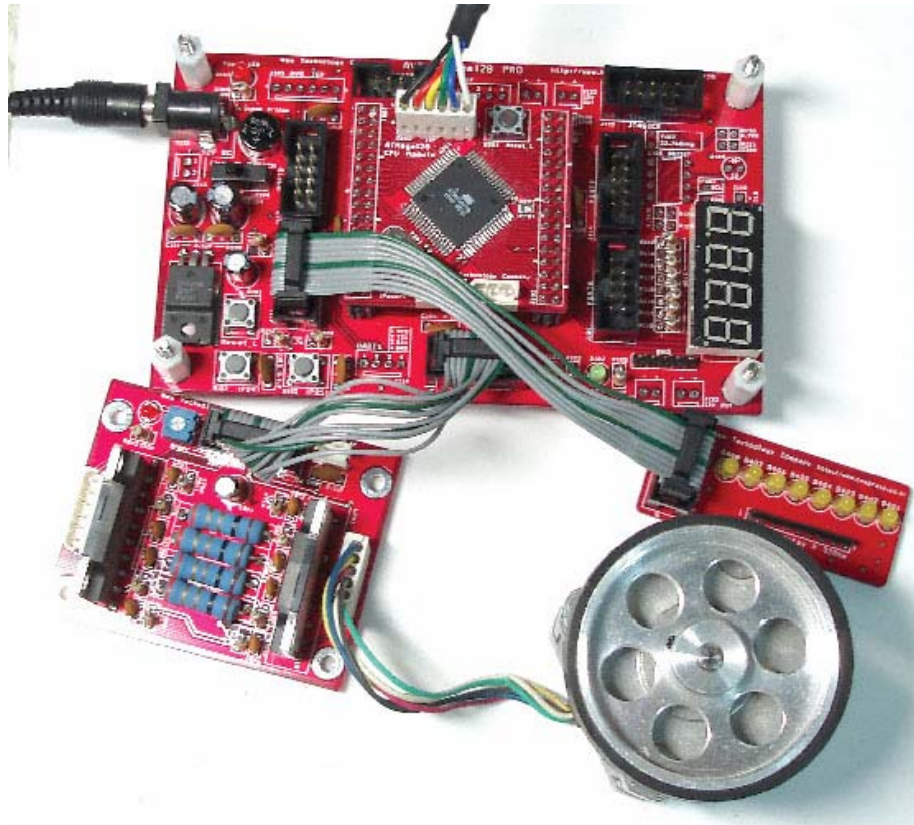
CLK pin can control the speed of rotation in LEFT motor and right motor. If you make CLK faster, motor rotates faster, and if you make CLK slower, it rotates slower. This pin can be connected to the port output of microprocessor, and you can control the speed of motor from microprocessor.

The angle of rotation per clock is different from microstep modes.

3.1.5 How to use AM-CS2P (stepping motor control module) (Software)

3.1.5.1 How to control stepping motor

To control stepping motor, you should understand basic structure and controlling method, and you should make the phase with hardware or software. Refer to “robot lecture” in “Linetracer lecture – 2. Motor controlling” in homepage (<http://www.newtc.co.kr>).



Controlling stepping motor using “KD-128PRO”

4 Epilog

4.1 Contact point and appreciation letter

I appreciate you for buying the product of my company. We are always trying to make it convenience for AVR user to use easily. If you want to use this module, you need to control microprocessor or PC. To study this, you can ask the example by Q&A of website or email, and also you can refer the lectures from website of our company.

4.2 Technical support

<http://www.NewTC.co.kr>

In website, there is so many lectures and library, and over there you can download AVR lectures, electronic lectures, robot making lectures, and in the library, we are updating and uploading many example files, application programs, and datasheets, so refer it, please.

If you have any A/S or inquiry, then do not hesitate to contact with me, and you can use Q&A of website. If you want to develop something, you can email me(E-mail (davidryu@newtc.co.kr)). Thank you.