

## jmStepper GUI Module

This is a graphical user interface for jmCLIG firmware module jmStepper.c

The firmware module must be compiled and loaded into the chip before using the graphical user interface.

The firmware can be used with a standard communication application, like HyperTerminal, but jmStepper is more user friendly and limit access only to pins on MBED prototyping board (DIP5 to DIP30).

This module can start up to 4 different processes for controlling steppers on MBED DIP pins.

This module automatically sets the selected PINA et PINB as output pins. There is no need to configure output pin directions before using it.



Care should be taken when you turn a microcontroller pin into an output pin. You should make sure that nothing is wired to that pin that can make a short circuit to ground or a short circuit to the supply. Beware of pins previously used as input, because these are potential short circuit hazards if external hardware is still connected to those pins.

Start jmStepper GUI Module from jmSerialCom



### How to

-  Select ID
-  Select PINA and PINB that will be wired to the hardware controller
-  Hit a yellow switch to start the stepper in a direction
-  Hit the red switch to stop the stepper
- Change slider position, wheel mouse, arrow keys or Edit Delay value to change speed
- Edit Steps value to step a fixed amount of steps



The slider changes Delay value more rapidly than edit Delay box. You can use up and down arrow keys to move the slider more precisely. You can use wheel mouse as well to vary the slider.

You first select a stepper process ID. When chosen, a message is sent to the chip and the chip reports back the status for that process. Report format is: GPPST ID PINA PINB status.

The graphical interface is updated by the chip report. If the process is not initialized for that ID, no pin will be selected and no animation will run.

You can start or change the stepper parameters on the fly.

You can change the speed by changing the delay between steps, by using the slider or the edit Delay box. The slider has a coarse action, use arrow up or arrow down keys to do fine adjustments. Each slider movements is sent to the chip, the chip changes the delay between steps and reports back the value. The reported value is used to update the Delay editing box.

If you edit the Delay box, no commands are sent. You have to click one of the direction switches to send the command after editing Delay.

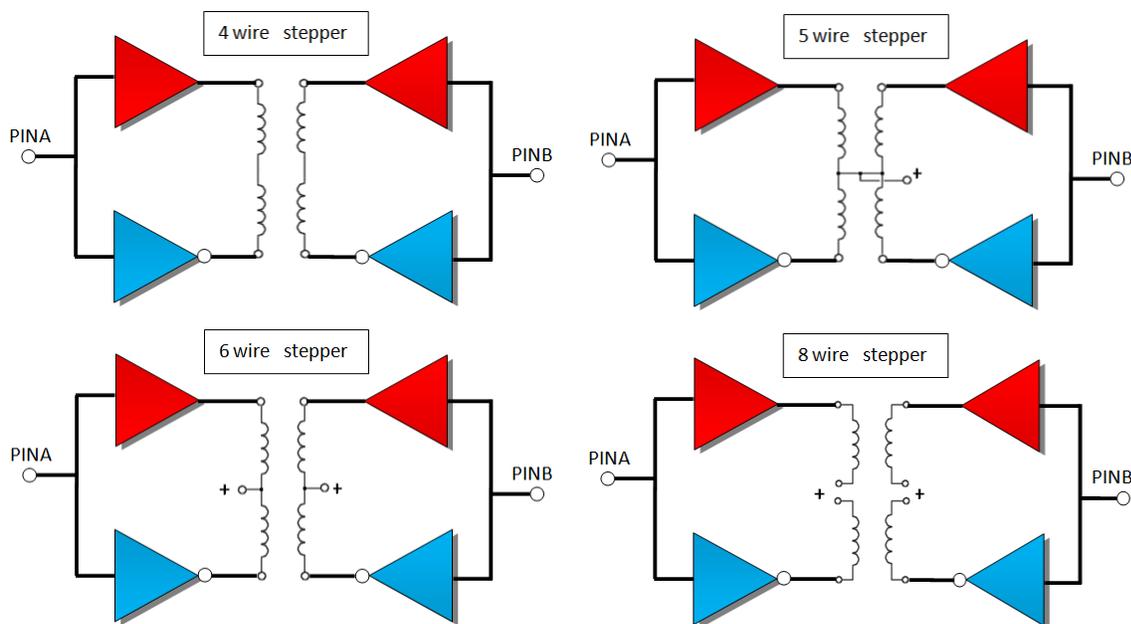
A value of 65535 or an empty value for Steps editing box will set the stepper in continuous mode when a yellow switch or the slider is used. Any other values are used to step the stepper for a fixed number of steps.

### Stepper Controller Software

This software controller is a generic 2 bit controller able to drive any stepper motors of 4, 5,6 and 8 wires with a universal hardware controller. The software provides full step, full torque to the stepper. Because of the hardware controller, there is always current running in the motor even if the rotor does not rotate. To power down the stepper, you have to provide a switch to cut the current to the steppers.

### Universal Stepper Hardware

A universal stepper hardware controller can be built by adding two drivers to each microcontroller output. One driver is non inverting and the other is inverting.



An ohmmeter and colored wires will help you find the center connection for 5,6 and 8 wire steppers. If there is no protection diode inside the drivers, you must provide external diode between the supply and each output driver. The cathode should be wired to the supply.

Reversing the connections between the drivers will reverse rotation of the stepper.