PCBMOTOR ApS
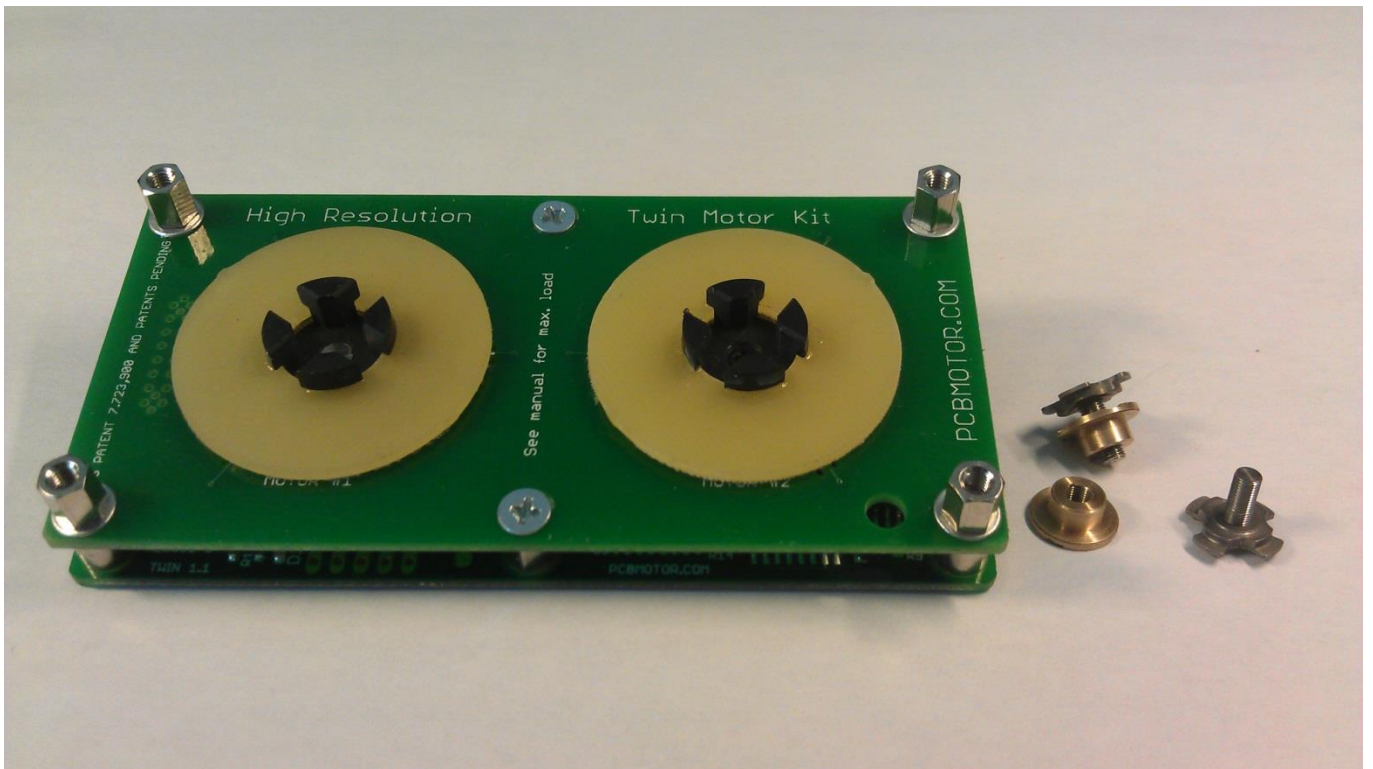
Lead Screw Kit
Version 2013-11-06

By PCBMotor ApS, Denmark
November 6th, 2013

How to modify the standard TwinKit to a lead screw kit:

1. Replace rotors

The screws in the motor print are removed as well as the locking rings on the shafts. Now the motor print including rotors and shaft are loosened from the connector and removed. The shafts are unscrewed from the rotors and shall not be used any more since the lead screw now will center the rotors.

The new upper rotors are Ø35 FR4 rotors with the coupling head for the lead screws. The FR4 rotors are similar to the standard Ø35 rotors but with the Ø12 center hole used for the coupling head in stead of the spring.

Use M2x6mm countersunk screws to mount the rotors on the stator print, making sure the new rotors are placed on the top i.e. on the opposite side of the connector.

Use M2 nuts (1.5mm) as spacers between the rotors and also as replacement for the shafts.

2. Replace spacers

The hex spacers in the corners of the driver are removed, leave the two spacers on the sides of the driver.

Remount the motor print on the driver connector and loosely tighten the screws in the two hex spacers to keep the motor print in place,

Place 6mm smooth bore spacers in the corners and mount the hex spacers on the with a 0.6 washer between the hex spacer and the motor print, resulting in a 6.6mm stand-off for the lead screw lid.

Use M3x12mm countersunk screws to mount the spacers, leaving half of the spacers free for the screws holding the lid.

3. Lead screw lid (optional)

The lead screw nuts are mounted in a lid, normally supplied by the customer or a plexiglass lid for demo purposes. The nut outer diameter is 6mm H7 and the nuts must be pressed in place.

The lead screws are screwed into the nuts leaving a mm or so before hitting the end stop surface of the nut. If necessary clean the thread and check the screws are moving smoothly full stroke.

Align the coupling heads with the wings on the lead screws to make the mating easier when the lid is mounted on the kit.

4. Recommended procedure for setup and calibration of the position of the lead screws:

The bushing is intended to be used as a hard stop when the screws meet the top of the bushing.
In order to be self-cleaning a cross has been milled into the top of bushing and the grooves will
Remove dust and particles from the interface between screw and bushing.

In this way a very high precision (<1u) can be achieved when you repeatedly touch down on the end stop.

If the screw is turned all the way CCW it will eventually stop when it meets the coupling top.
This is not a hard end stop and the screw has a tendency to get stuck in this position unless
you turn CW with a higher voltage setting to get un-stuck (See the Escape-command).
So you should avoid this situation as it could potentially damage the motor.

Here is the suggested way to set the zero position and verify the operation of the lead screw:

1. Mount the motor on the bushings with the lead screw halfway extended to avoid forcing the up into the top of the couplings when you tighten the screws.

2. Connect the USB and wait for the device to be installed by Windows. Then use Termite to power up as described in our documentation.

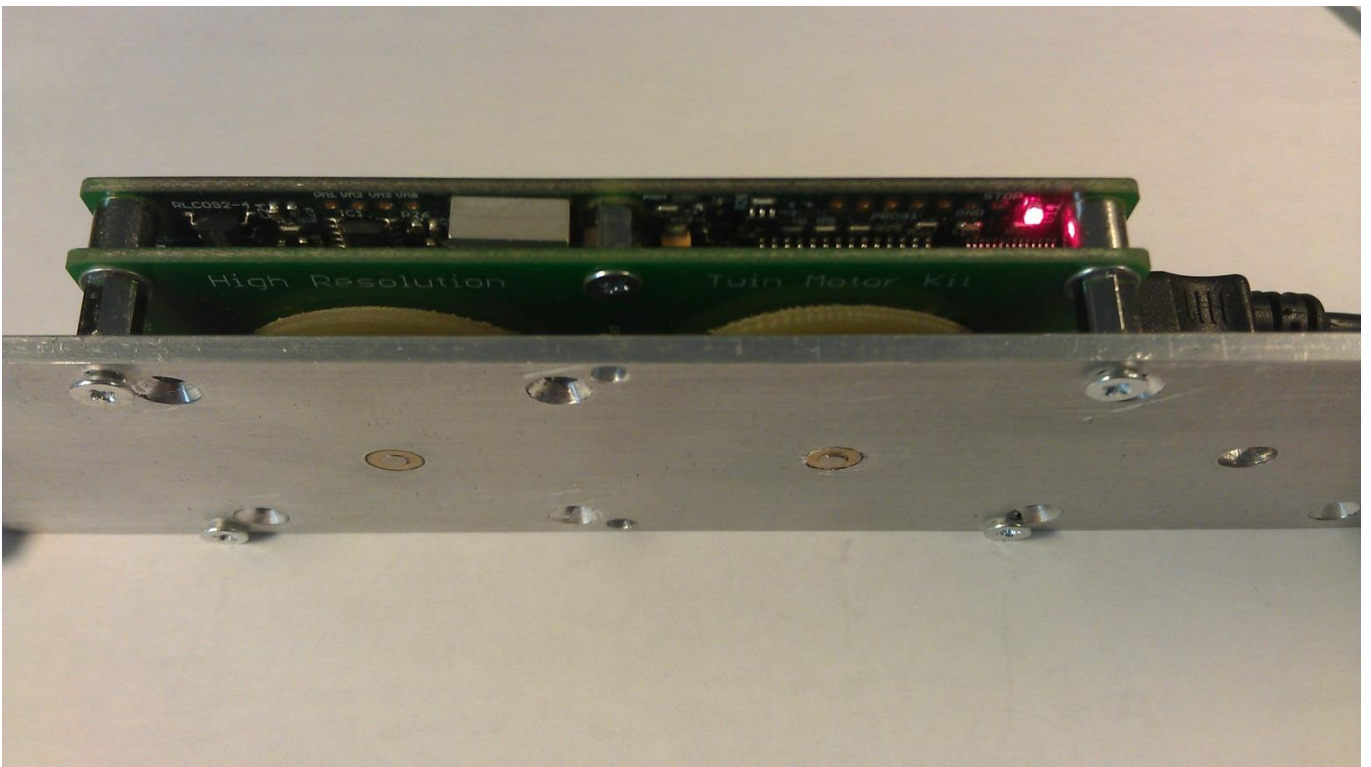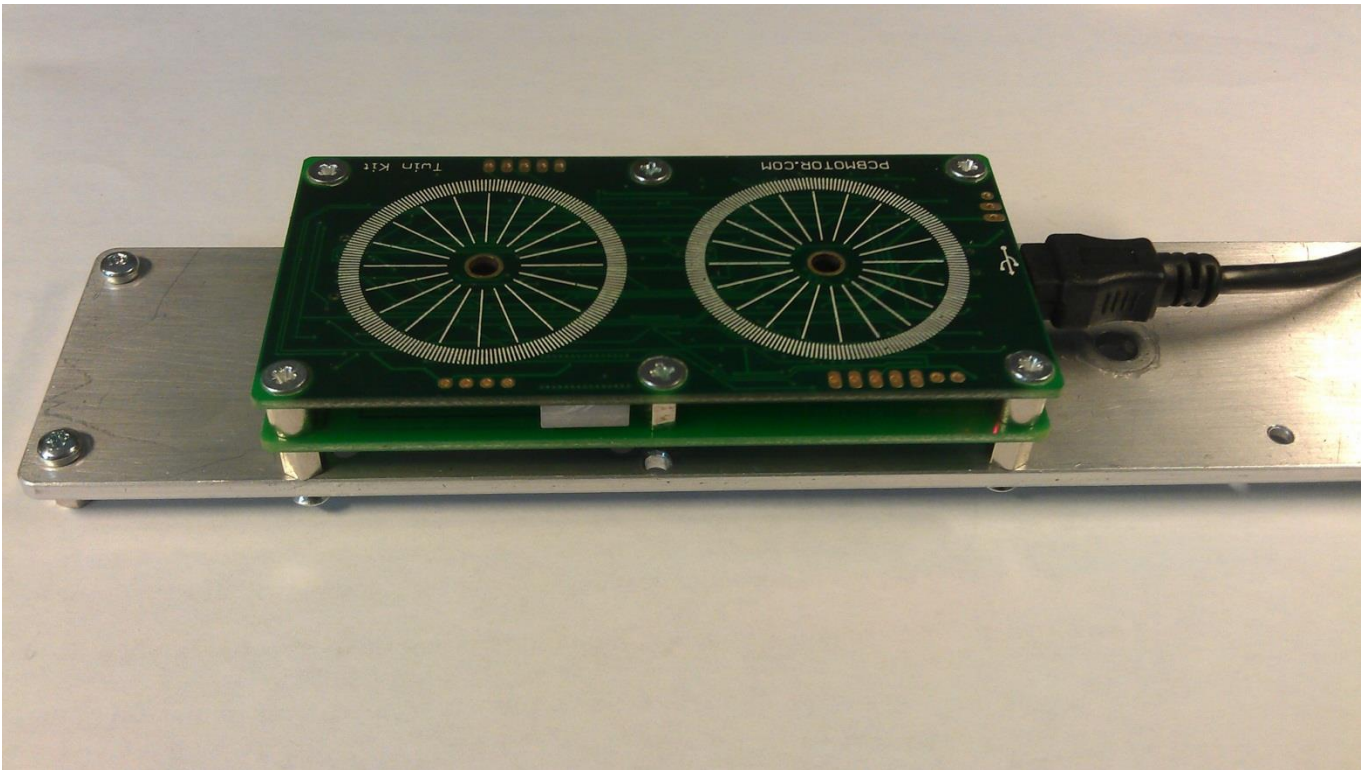3. Use the following commands for both motor1 and motor2:

m1 //Select motor 1. Use m2 to select motor 2.
s-20000 //Run CW until the screw meets the end stop on the bushing - max stroke
z //Set zero here.
//Now start using the G(oto)-command to keep track of the position
g20000 //Find the position of the top of the coupling.
//It should be > 10000 for M3x0.35 leadscrews
//Avoid using postions above 10000
g-10 //Check the timeout occurs at the zero position
//You might run this a few times to clean up the surface
g5,g10000,x5 //Check the current and set the voltage setting until the current is ~400mA
//Éach motor has a CW and a CCW scale factor for aligning speed
//See the Help listing for the EEPROM setting

4. The motors can have a rhythmic sound matching each turn. This is caused by a slight sideways movement of the coupling and is OK. If you have positions on the screw with slow movement you should check for damage/contamination of the threading.

The kit including screws and bushings has been fully tested before shipping, so please contact us if you have problems getting this to work.
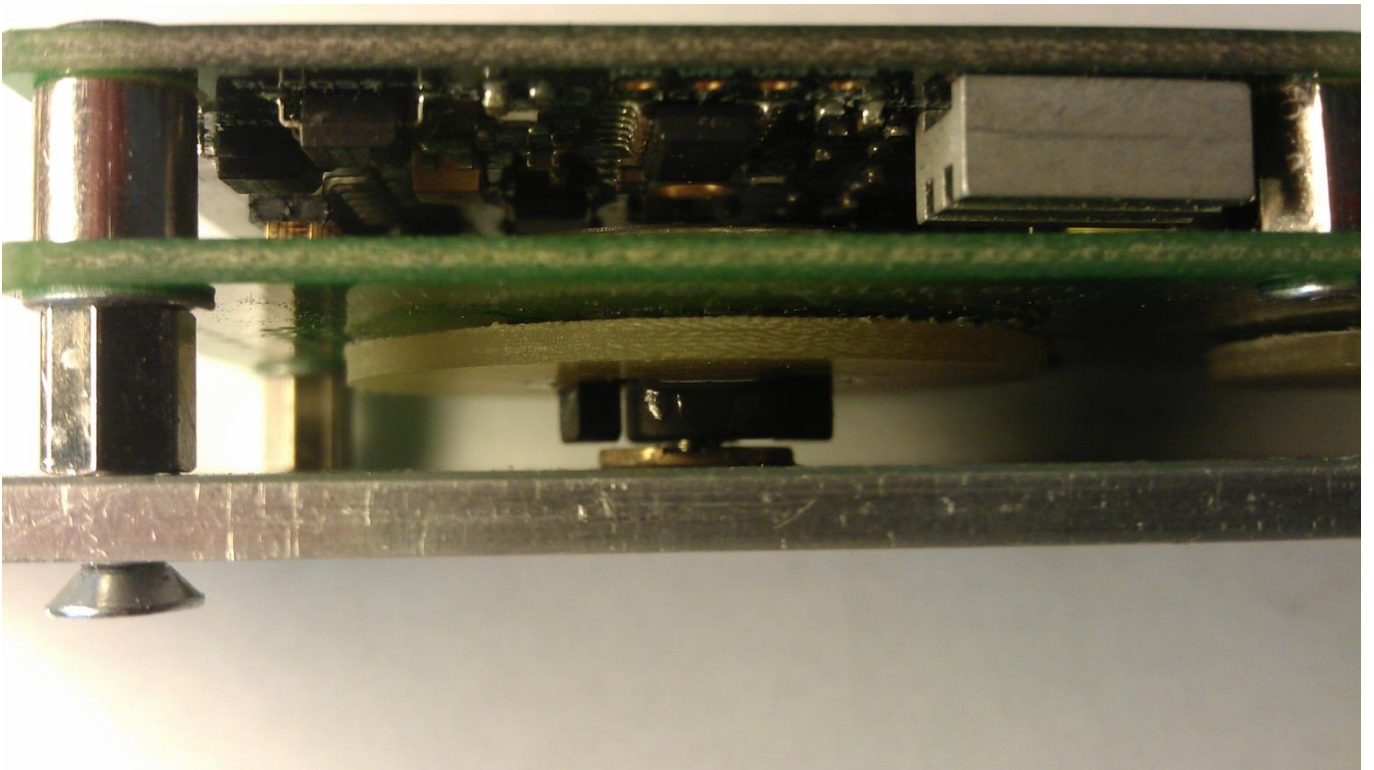
Please contact our Technical Support at support@pcbmotor.com if you experience any issues.