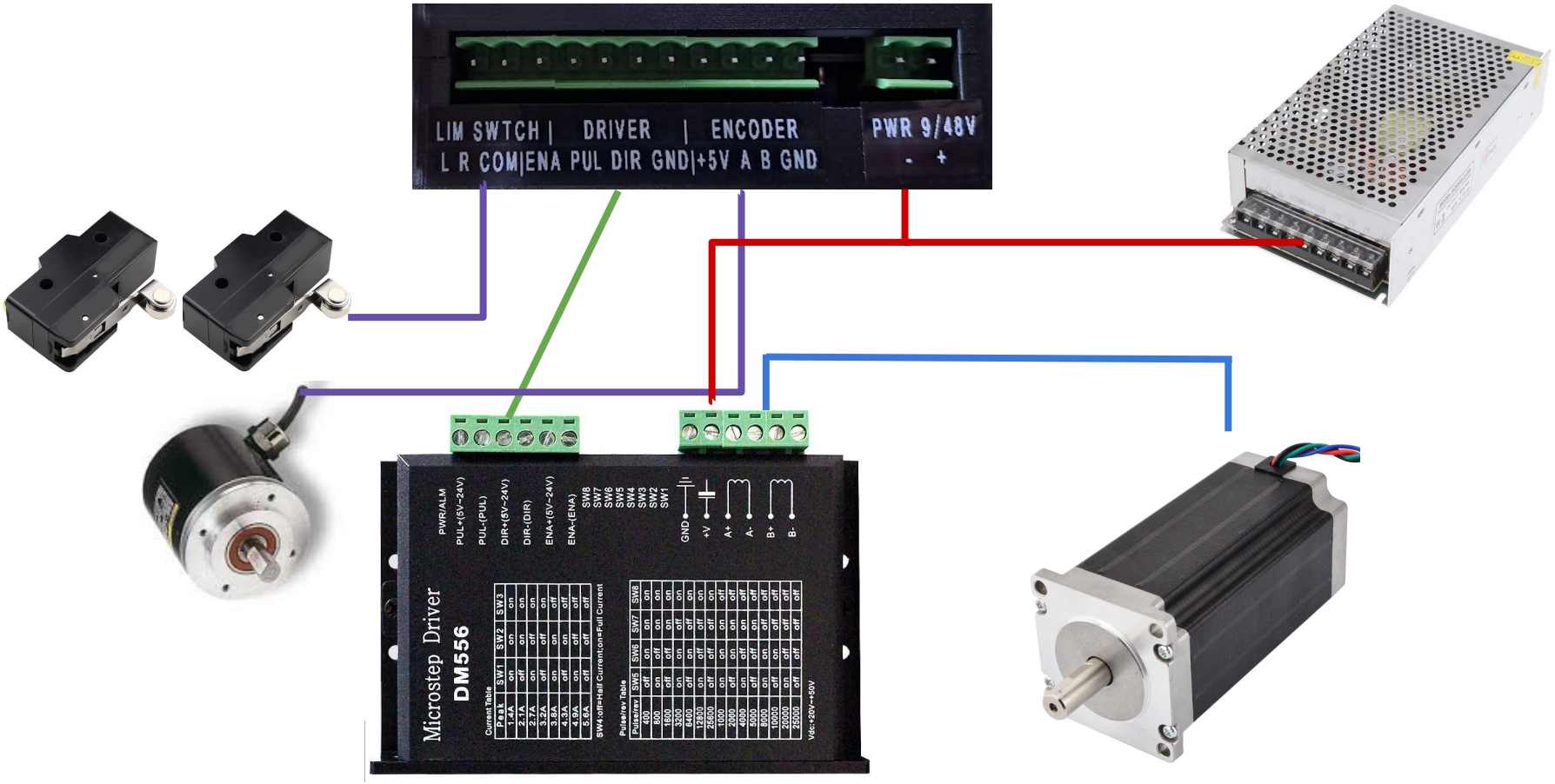
electronicleadscrew.eu

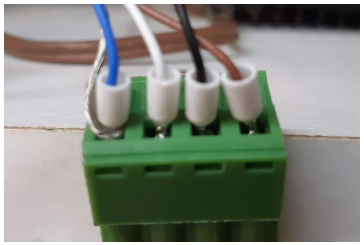
Wiring


LIM SWTCH | DRIVER | ENCODER
L R COM|ENA PUL DIR GND|+5V A B GND
PWR 9/48V
- +
Microstep Driver
DM556
PWR/ALM
PUL+(5V~24V)
PUL-(PUL)
DIR+(5V~24V)
DIR-(DIR)
ENA+(5V~24V)
ENA-(ENA)
SW8
SW7
SW6
SW5
SW4
SW3
SW2
SW1
GND
+V
A+
A-
B+
B-
Current Table
Peak | SW1 | SW2 | SW3
1.4A | on | on | on
2.1A | off | on | on
2.7A | on | off | on
3.2A | off | off | on
3.8A | on | on | off
4.3A | off | on | off
4.9A | on | off | off
5.4A | off | off | off
SW4:off=Half Current;on=Full Current
Pulse/rev Table
Pulse/rev | SW5 | SW6 | SW7 | SW8
400 | off | off | on | on
800 | on | off | on | on
1600 | off | on | on | on
3200 | on | on | on | on
6400 | off | off | off | on
12800 | on | off | off | on
25600 | off | on | off | on
1000 | on | on | off | on
2000 | off | off | on | off
4000 | on | off | on | off
5000 | off | on | on | off
8000 | on | on | off | off
10000 | off | on | off | off
20000 | on | off | off | off
25000 | off | off | off | off
Vdc:+20V~+50V

Wiring details

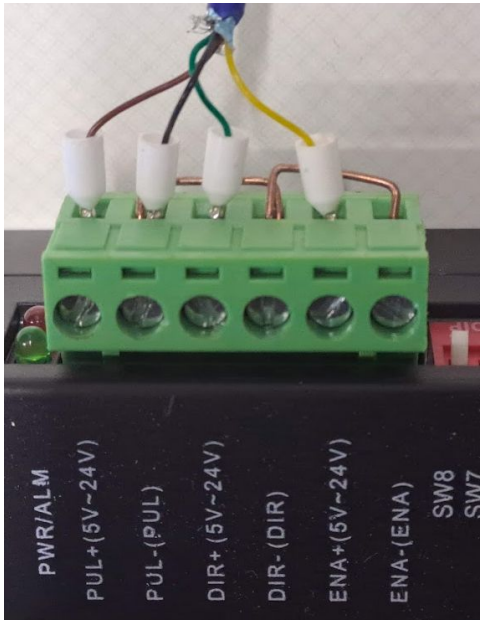
The encoder

It is very important to connect the shield with the ground, or you could lose precision at high speed



The driver

The ground must be bridged on the driver side



The limit switches

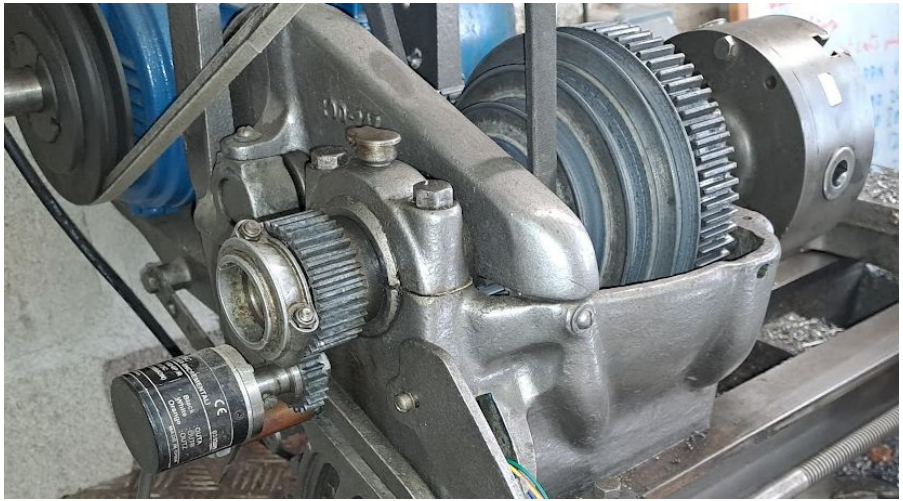
They are simple contact switches. One for left, on the spindle side, one for the right on the tailstock side. When the switches are triggered, it either stop the lead screw or make it turn on the other way.

L COM

R COM

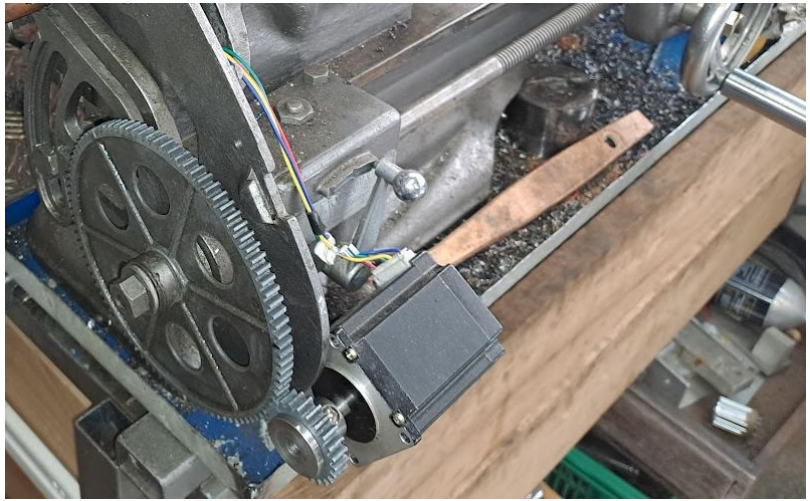
Installation on the lathe

The encoder



The encoder is linked to the shaft with gears or pulleys and belt. Any size of gear is possible but it is better to have a ratio closed to 1.

The stepper motor

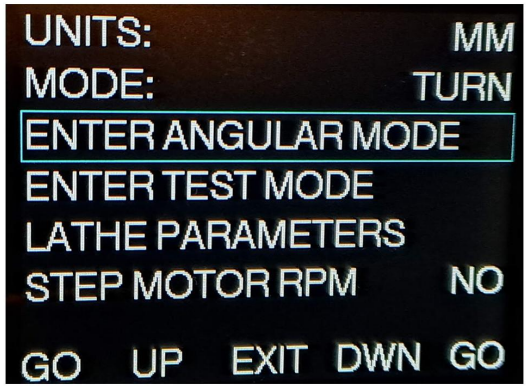


The stepper motor is linked to the lead screw with gears or pulleys and belt. Any ratio can be used but ⅓ or ½ is a good balance between speed and torque.

Checking the parameters

The first time you start the ELS, you need to enter all the parameters, check the section “Lathe Parameters” at the end of this document. You just need to do this once.
Then you can easily check that everything is ok in 2 steps.

Step 1, check the encoder: MENU->ENTER ANGULAR MODE

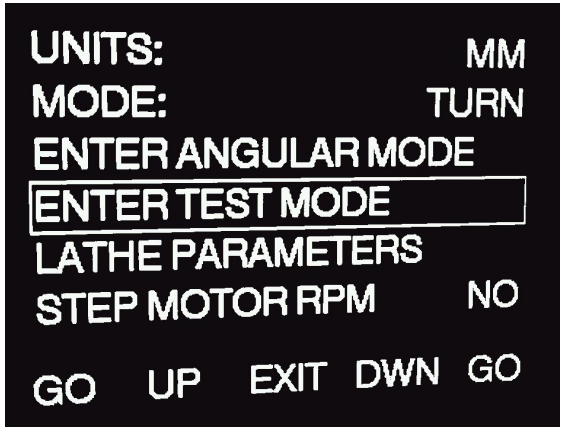


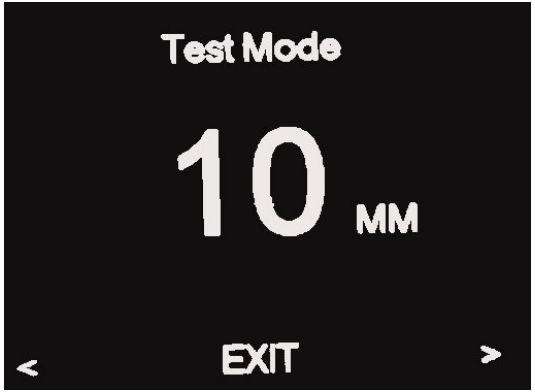
Manually move your chuck for 1 turn. The angle should be 360°.
If not, check:

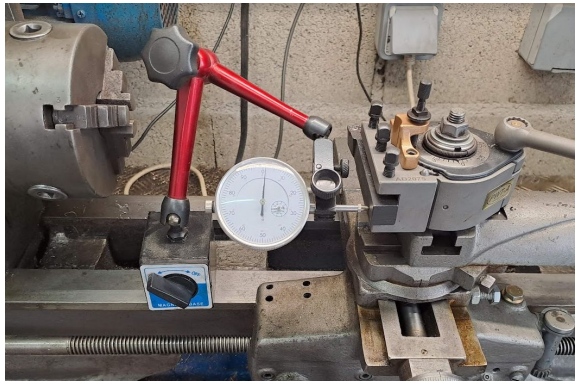
- chuck teeth
- encoder teeth
- encoder steps

Checking the parameters

Step 2, check the motor: MENU->ENTER TEST MODE





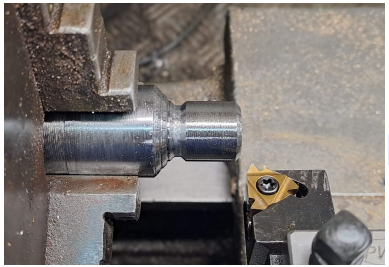


Install a dial indicator, then press on the left or on the right and check the displacement is exactly 10mm or 1” if you use imperial. If not, check:

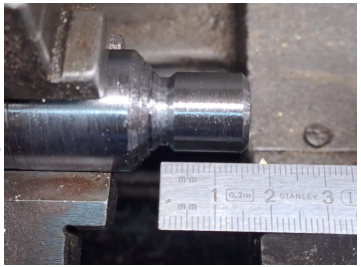
- motor teeth
- lead screw teeth
- lead screw type
- lead screw step
- driver pul/rev

Automatic threading

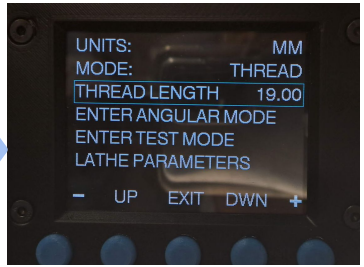
Since version 4 of the ELS, it comes with a new feature that makes thread turning very easy and fast. You do not need to stop your motor or use the thread dial indicator. Just adjust the depth of cut at each pass and press the button, it is as easy as this.



1. Place your tool with the carriage clutch engaged.
Go to the left to avoid backlash.

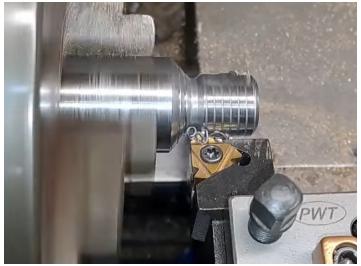


2. Measure the thread length



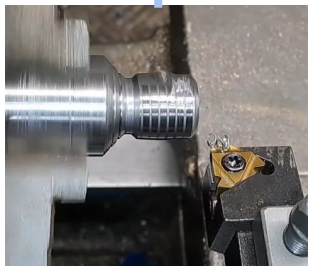
3. In the menu, choose the thread mode and enter the length

4. Press the blinking left button



5. When the cut is done, put the tool backward

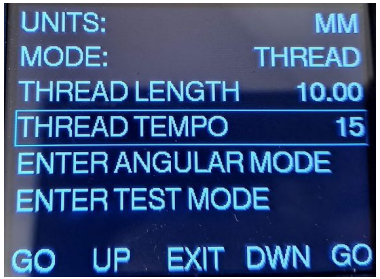
6. Press the blinking right button



7. Increase your depth of cut and repeat from step 4.

Automatic threading temporisation

Since the version 5 of the ELS, you can activate a temporisation when using automatic threading. In that case, except for the first pass for security reason, you do not need to press the buttons. You just need to wait until the counter drops to 0. You need to enter enough time to be able to adjust the cutting depth.
WARNING: You can easily destroy your work or your tool with this mode, use it very carefully.



1. Set up the temporisation time, in seconds

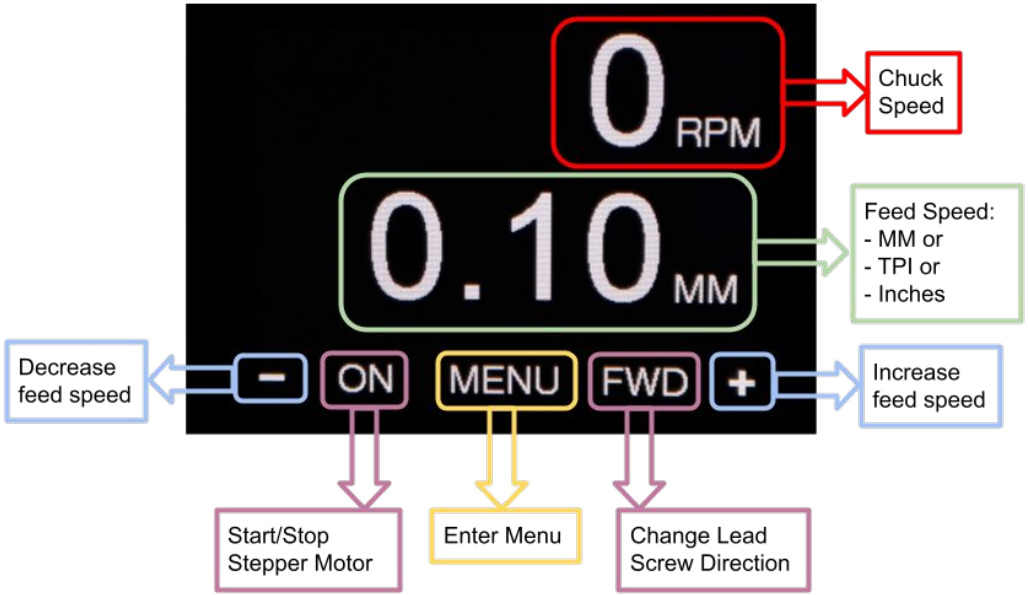
2. For the first time, you still need to press the button.

3. At the end of the cut, the temporisation will start. At the end of the counter, the motor will go back to the initial position or make the next cut.

Menu Description

Main Screen, turning mode

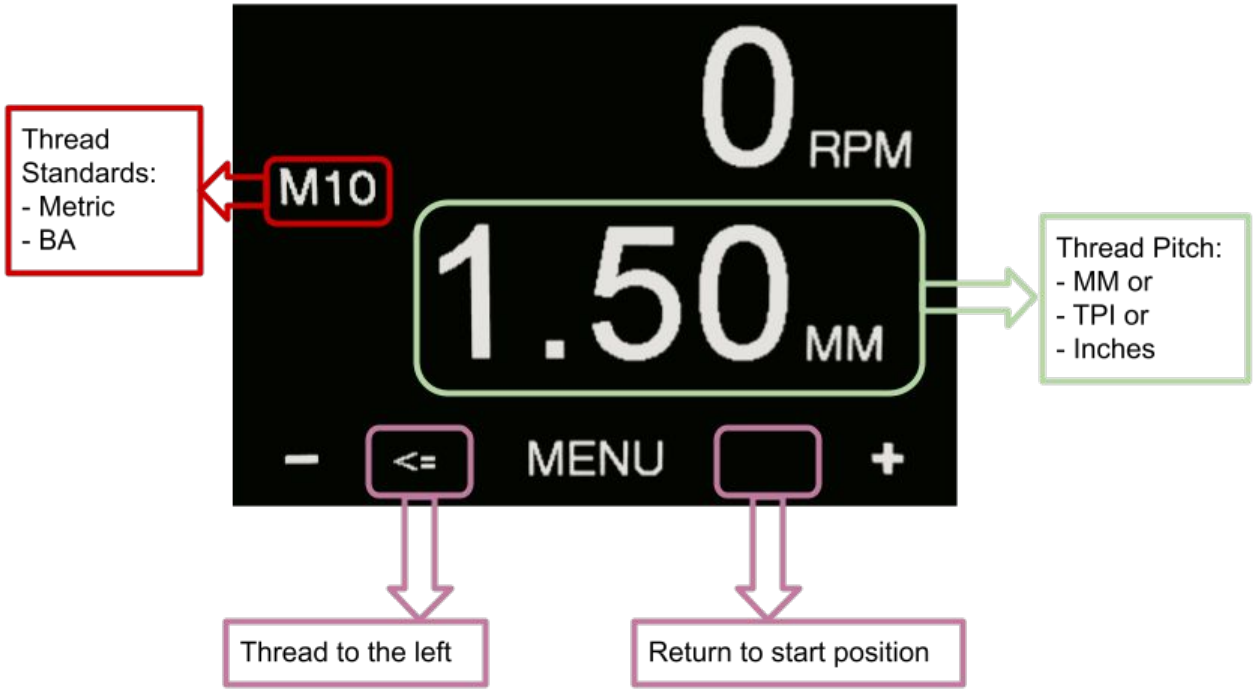
Metric



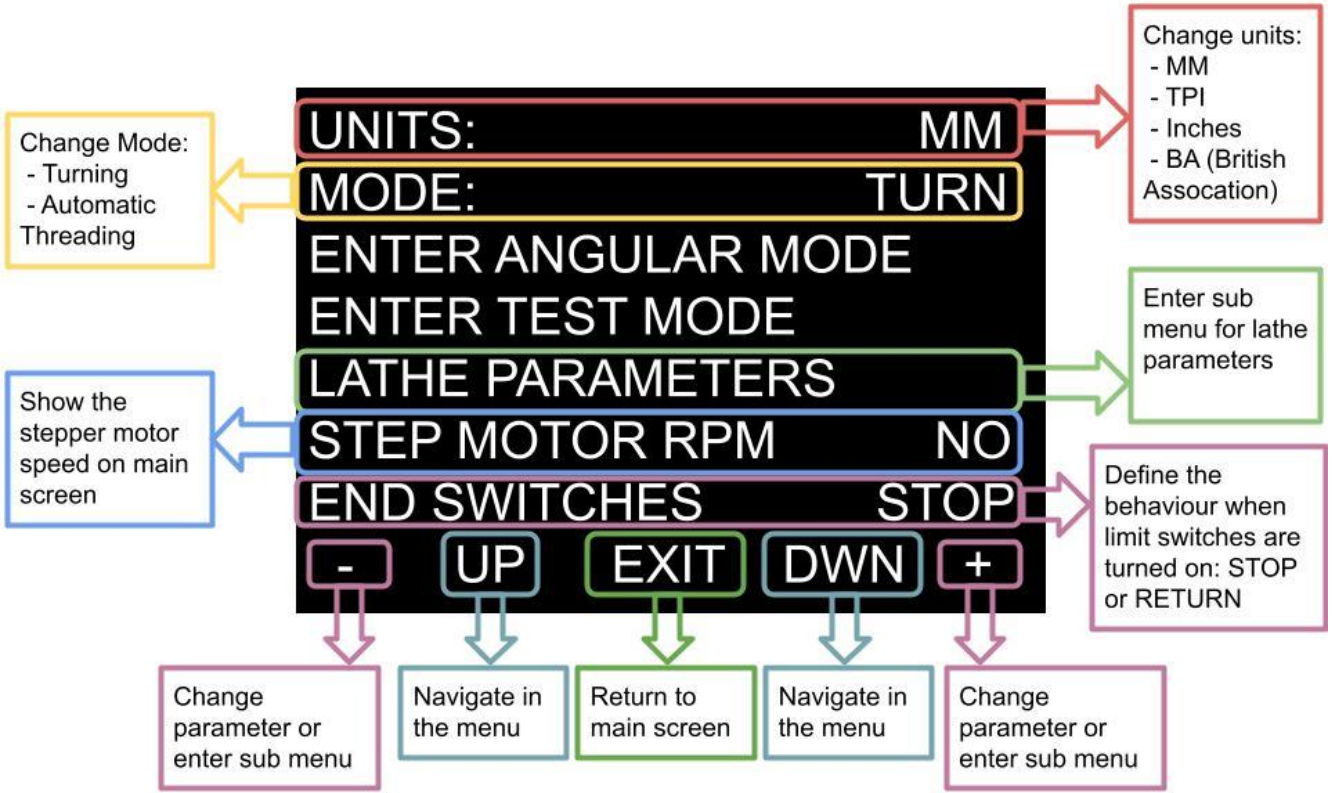
Inches

TPI

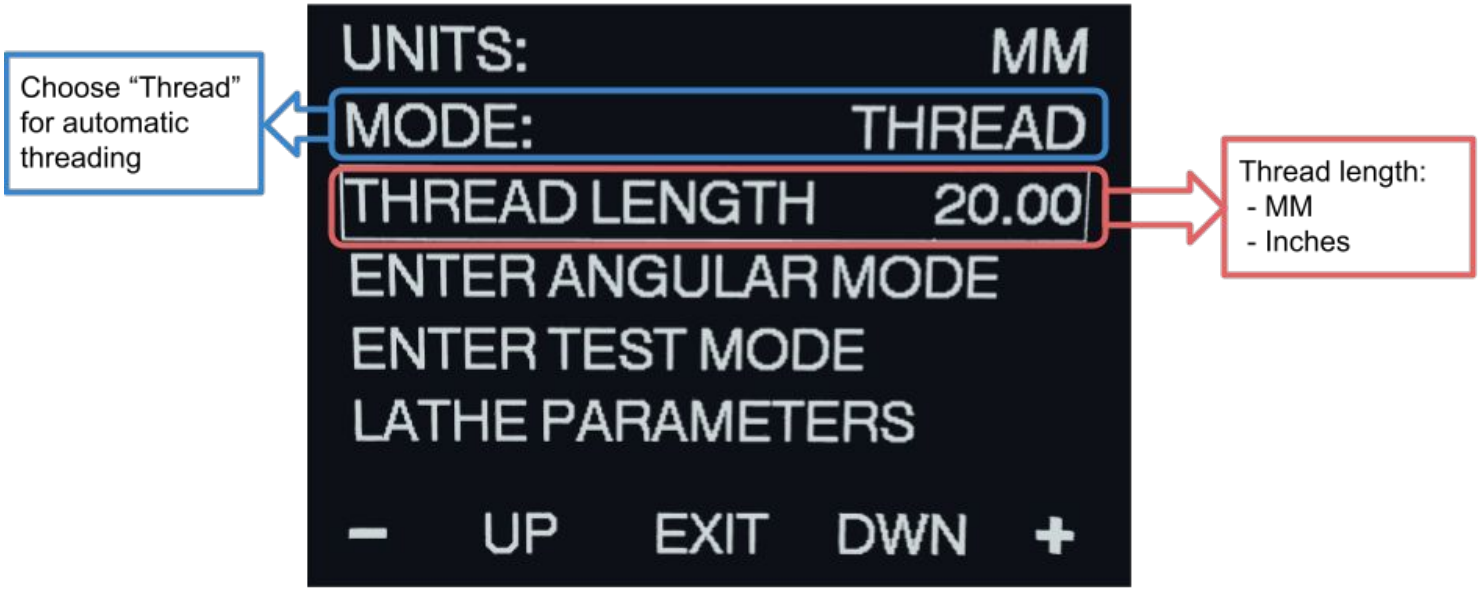
Main Screen, automatic threading



Menu


Change units:
- MM
- TPI
- Inches
- BA (British Assocation)
Change Mode:
- Turning
- Automatic Threading
UNITS: MM
MODE: TURN
ENTER ANGULAR MODE
ENTER TEST MODE
LATHE PARAMETERS
STEP MOTOR RPM NO
END SWITCHES STOP
Enter sub menu for lathe parameters
Show the stepper motor speed on main screen
Define the behaviour when limit switches are turned on: STOP or RETURN
-
UP
EXIT
DWN
+
Change parameter or enter sub menu
Navigate in the menu
Return to main screen
Navigate in the menu
Change parameter or enter sub menu

Menu automatic threading



Lathe Parameters

Number of teeth on the gear or pulley connected to the shaft

INVERT DIRECTION: YES

CHUCK TEETH: 8

ENCODER TEETH: 5

MOTOR TEETH: 28

LEADSCREW TEETH: 30

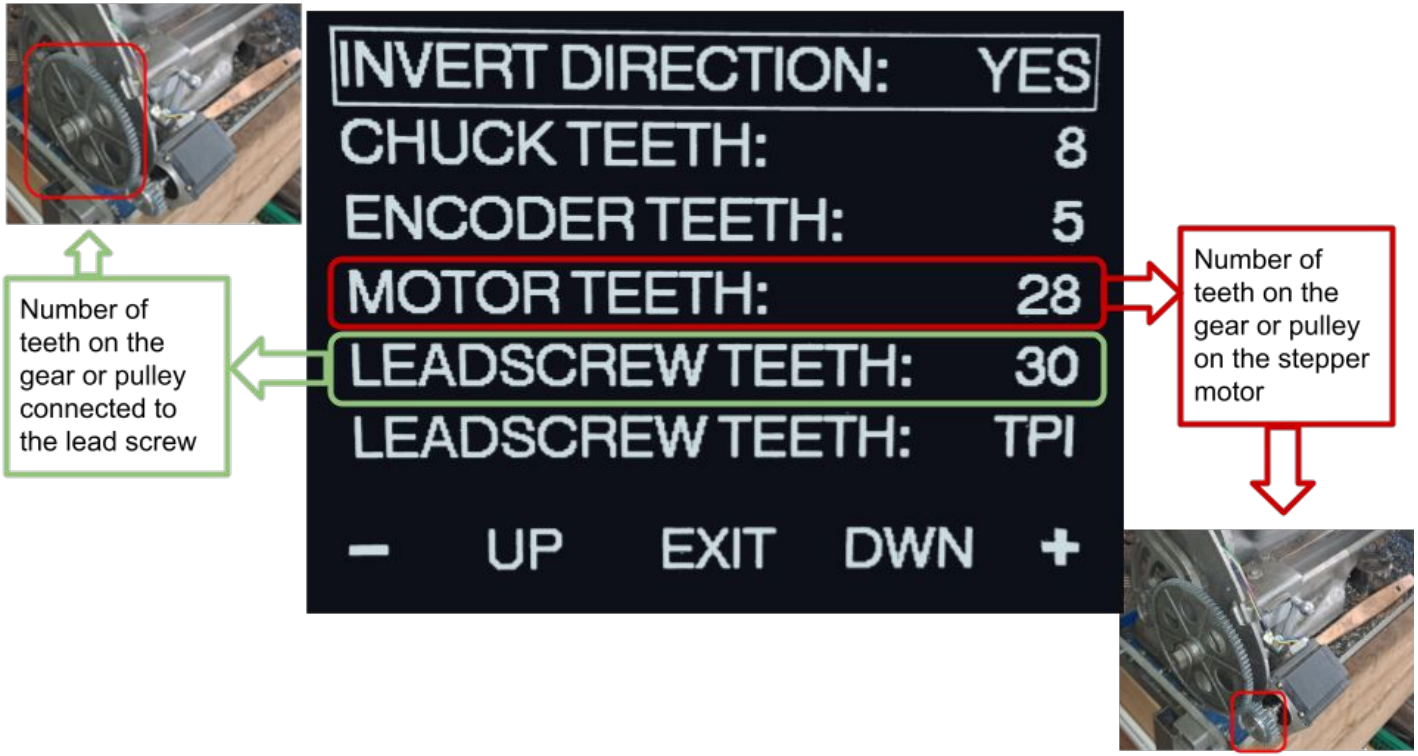
LEADSCREW TEETH: TPI

– UP EXIT DWN +

Change default lead screw direction

Number of teeth on the gear or pulley on the encoder

Lathe Parameters



Lathe Parameters

Step size of the leadscrew in TPI or MM

Driver Microstep Pulse/Rev: 400,800,1000,1600, 2000,3200,4000, 5000,6400*,8000

LEAD SCREW TYPE: TPI
LEAD SCREW STEP: 8
ENCODER STEPS: 1024
DRIVER PUL/REV: 6400
RESET PARAMETERS: NO
VERSION: 4.2
− UP EXIT DWN +

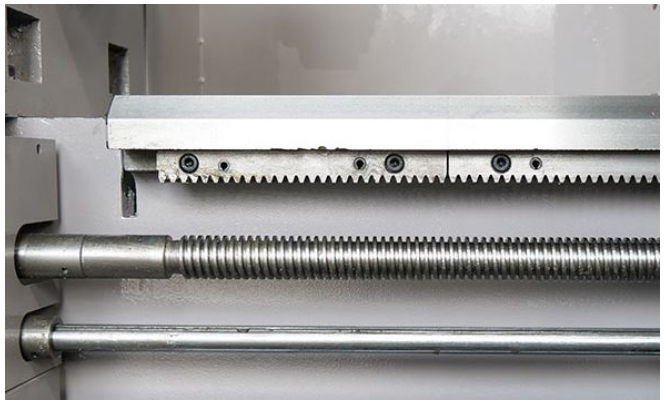
Type of leadscrew:
- MM
- TPI

Encoder Resolution Pulse/Rev: 360,400,500,600*, 720,1000,1024,1200,1250,1800,2000,2500

* Recommended

Z Ratio (from release 5.8s)

The Z ratio can be used as an option for lathe equipped with a feed rod:

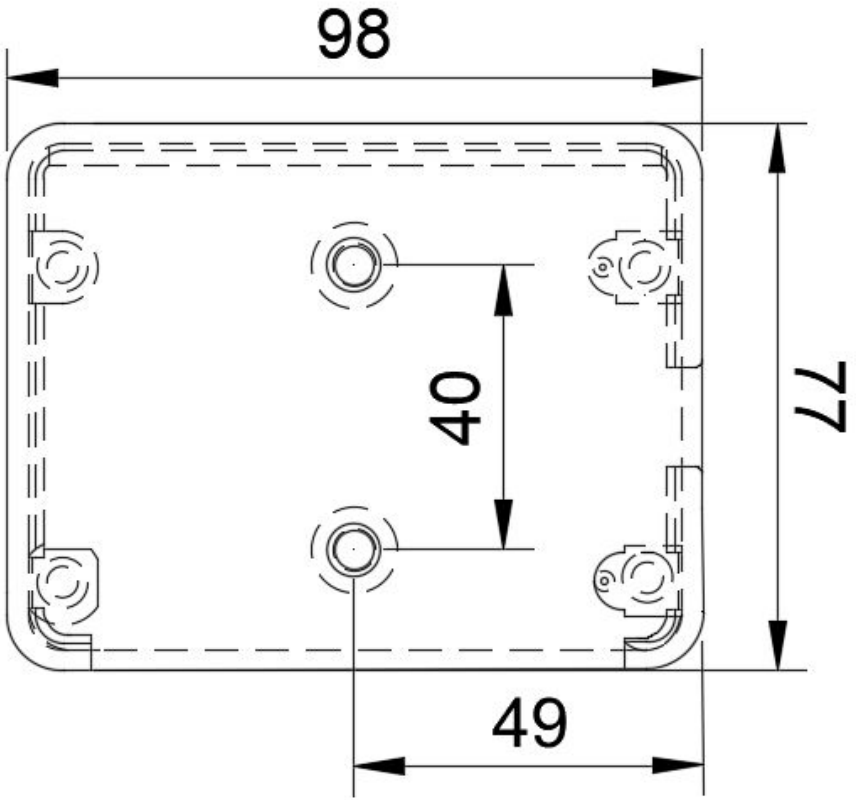


By default ZRatio is set to 1, that means it is not enabled. If set to more than 1, it will change the behaviour of the ON/OFF button and the speed of the stepper motor:

ON -> [ZRatio] -> OFF

When [Zratio] is selected the stepper motor will turn [zratio] times slower than the regular speed.

Fixing dimensions



Troubleshooting

1. Everything looks fine but the motor does not move, I have a 5v/24v switch on my driver

   On some drivers, like the DM556T, input signals can be 5v or 24v. You need to toggle the switch to 5v.