

Bluetooth DRO Installation on a Mini Lathe

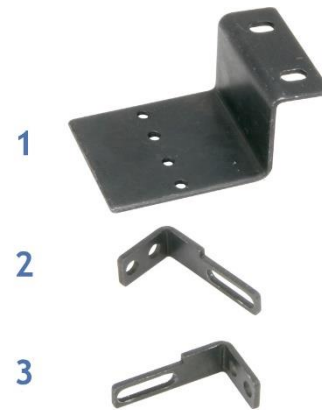
The PN 5495 Digital Position Readout fits all sizes of mini lathes, from 7x10 to 7x16. The short cross slide scale is the correct length for all of them. The longer carriage scale is the correct length for 7x16 mini lathes, including LittleMachineShop.com HiTorque models 5100 and 5200. For smaller lathes, you must cut the carriage scale to the proper length as described in this document. The installation procedure is the same for all mini lathes.

Note: Because the scales are manufactured for use worldwide, they are made to metric dimensions. From this point forward in this document, dimensions shown are in millimeters.

Be Sure You Have Everything

The kit includes the following items:

- Bluetooth transceiver
- Reader with chip scraper (qty 2)
- 5V power adapter
- Magnetic scale for cross slide
- Magnetic scale for carriage
- 1. Reader mounting bracket
- 2. Front cross slide scale bracket
- 3. Rear cross slide scale bracket
- Mounting screws
 - M3x6 pan head screw (qty 6)
 - M3x10 pan head screw (qty 4)
 - M3x14 pan head screw (qty 2)
 - M3x18 pan head screw (qty 2)
 - M3x20 pan head screw (qty 2)
 - M4x14 pan head screw (qty 2)
 - M3x34.5 stud (qty 2)
 - M3 nut (qty 4)



Don't worry if you get a few extra items. They may be for a different version of this kit.

In addition, you'll need the following tools, which are not included with the DRO kit:

- 2.5 mm or #39 drill bit*
- M3x0.5 thread-cutting tap*
- PH 1 Phillips screwdriver

*These tools are available as a kit (PN 5820) from LittleMachineShop.com

Preparing for installation

BEFORE YOU BEGIN: For your safety, be sure the lathe is unplugged from the power source.

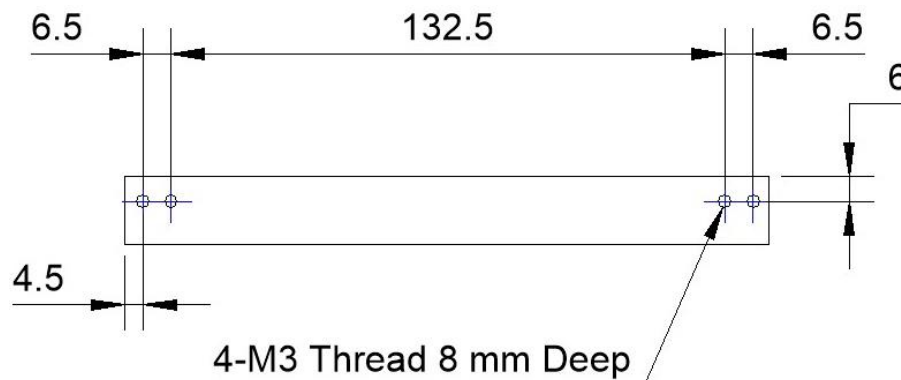
You need to remove a few things before you install the DRO components.

1. Remove the tailstock.
2. Remove the right lead screw mounting bracket (pillow block). There are two socket head cap screws. Slide it off the lead screw.
3. Remove the two socket head cap screws near the front of the carriage that secure the carriage to the apron.
4. Be sure the half nuts are disengaged (handle up) and carefully slide the apron off the right end of the lead screw.
5. Slide the carriage off the right end of the ways. You might need to loosen the adjusting screws to get the carriage off the ends of the ways.
6. Temporarily replace the right lead screw mounting bracket (pillow block). Snug the cap screws.

Installing the cross slide scale

Follow these steps to install the DRO scale on the cross slide.

1. Mark four hole locations on the right (tailstock) side of the cross slide as shown in the drawing below. These dimensions are the same for all mini lathes.



Right side of cross slide

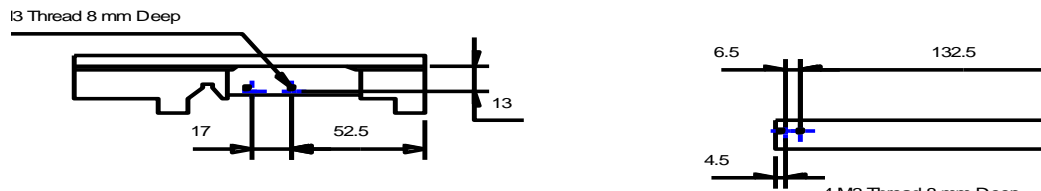
2. Drill and tap the four holes M3. Use a 2.5 mm or #40 tap drill and an M3x0.5 metric tap.
3. Preassemble a bracket on each end of the scale as shown in the photo at right.
4. Attach the scale to the cross slide using four M3x6 Phillips head screws.



Installing the cross slide reader

1. Mark two hole locations on the right (tailstock) side of the saddle slide as shown in the drawing below. Note that the 13 mm dimension is measured from the top sliding surface of the saddle. These dimensions are the same for all mini lathes.

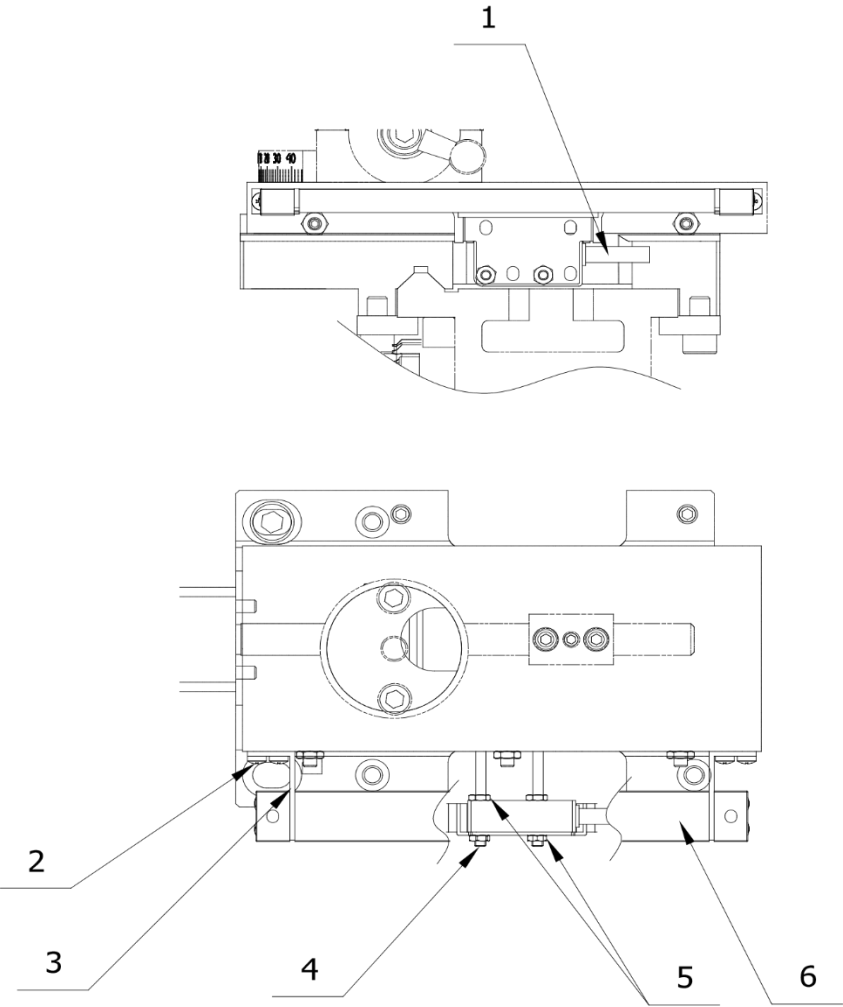
2-M3 Thread 8 m



Right side of saddle

2. Drill and tap the two holes M3. Use a 2.5 mm or #40 tap drill and an M3x0.5 metric tap.
3. Attach the reader to the saddle as shown in the drawing below.

- 1 Reader
- 2 Phillips head screw
- 3 Y-axis bracket
- 4 Stud
- 5 Hex nut
- 6 Y-axis scale



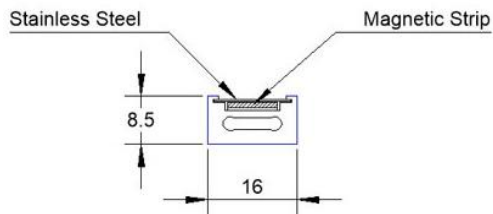
Cutting the carriage scale

If your mini lathe is a LittleMachineShop.com HiTorque 7x16 Mini Lathe (model 5100 or 5200) or a Micro-Mark MicroLux 7x16 Mini Lathe, the carriage scale (the long one) is already cut to the correct length.

For all other mini lathes, you must cut the carriage (long) scale to length as described below.

1. Remove both end caps from the long scale. Use a #2 Phillips screwdriver to remove the two screws in each cap.

The scale consists of an extruded aluminum channel with a magnetic strip in the channel. The magnetic strip is protected by a stainless strip, as shown in this cross-section.

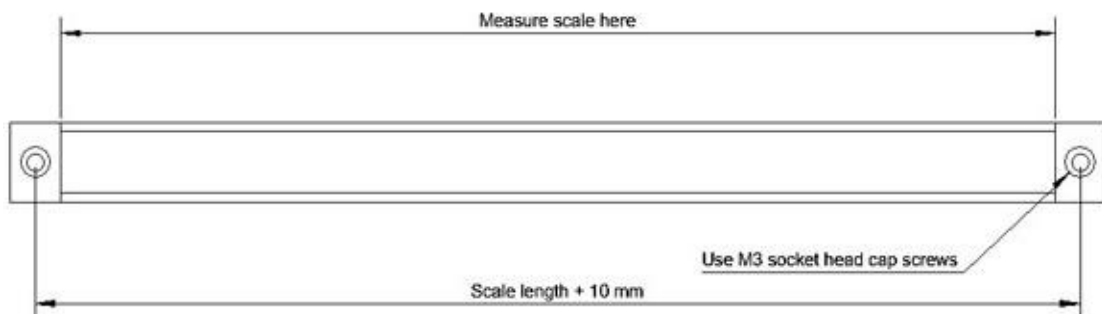


2. Using information from the table below, determine the correct scale length for your lathe.

Dimension table

Lathe	Scale Length	Dimension L	Dimension S	SIEG Model
7x10 Conventional	290 mm	150 mm	300 mm	C2 (200)
7x12 Conventional	390 mm	150 mm	400 mm	C2 (300)
7x14 Conventional	410 mm	180 mm	420 mm	C3
7x12 HiTorque	360 mm	180 mm	370 mm	SC2 (300)
7x16 HiTorque	460 mm	180 mm	470 mm	SC2 (350)

The scale length shown in the table is the length of the aluminum channel without the end caps.



3. Mark the aluminum channel to the scale length indicated in the table.
4. Place the channel in a vise with the "U" facing up and your mark just off the side of the vise. There is a thin strip of stainless steel protecting the

magnetic strip in the channel. Using the finest hacksaw blade (or band saw blade) you have (preferably 32 teeth per inch), carefully saw down through the channel.

5. Use a fine file to debur the end of the aluminum channel.

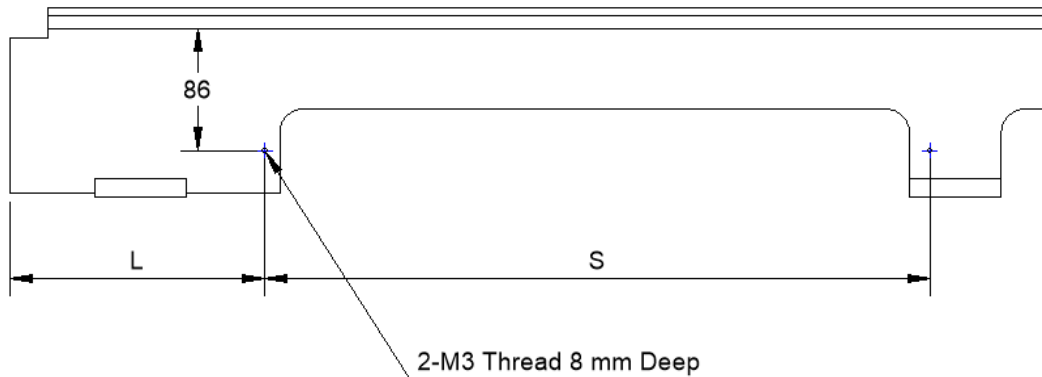


6. Install the two end caps. Note that there is a slot in the end cap that should align with the stainless steel strip. Use a Phillips screwdriver to secure the two screws in each cap.

Installing the carriage scale

Follow these steps to install the carriage scale.

1. Mark two hole locations on the front of the bed way as shown in the drawing below. For L and S, use the values shown in the Dimension Table on the previous page. Note that the 86-mm dimension is measured from the bottom surface of the ways.



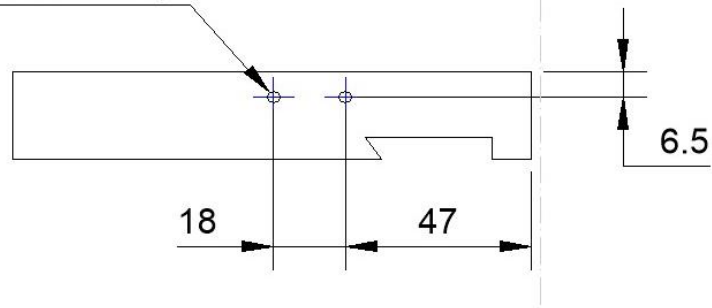
Front of bed ways

2. Drill and tap the two holes M3. Use a 2.5 mm or #40 tap drill and an M3x0.5 metric tap.
3. Install the long scale to the bed way using 2 M3x10 Philips head screws.

Installing the carriage reader

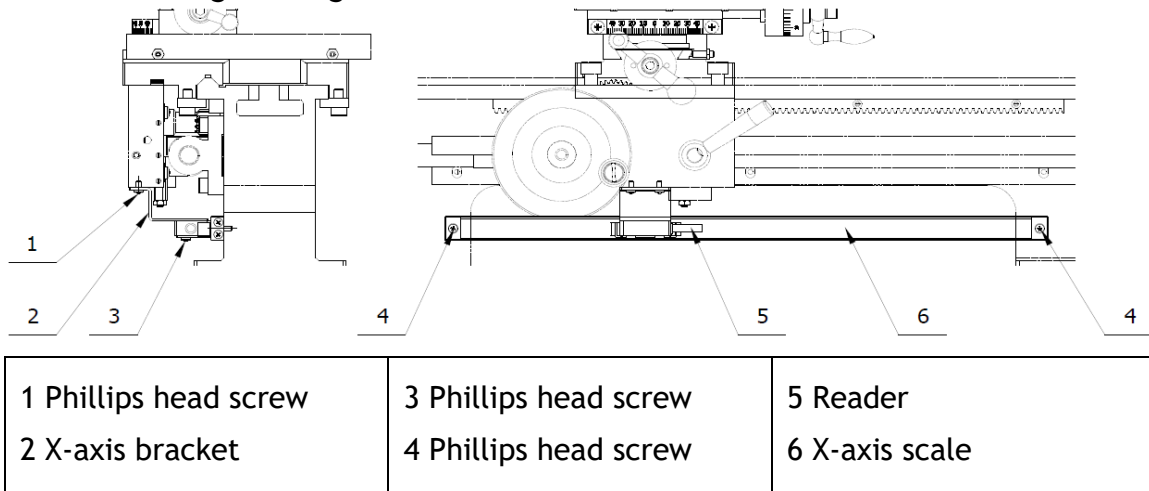
1. Mark two hole locations on the bottom of the apron as shown in the drawing below. These dimensions are the same for all mini lathes.

2-M3 Thread 8 mm Deep



Bottom of apron

2. Drill and tap the two holes M3. Use a 2.5 mm or #40 tap drill and an M3x0.5 metric tap.
3. Install the bracket and reader on the bottom of the apron as shown in the following drawing.



Reassembling the lathe

1. Slide the carriage onto the ways. Adjust the retainers as described in the *Mini Lathe Users Guide*.
2. Remove the right lead screw mounting bracket (pillow block). There are two socket head cap screws. Slide it off the lead screw.
3. Be sure the half nuts are disengaged (handle up) and carefully slide the apron onto right end of the lead screw.
4. Replace the two socket head cap screws near the front of the carriage that secure the apron. Close the half-nuts to position the apron before tightening the cap screws.
5. Replace the right lead screw mounting bracket (pillow block). Move the carriage as far to the right as you can and close the half nuts. Tighten the cap screws.
6. Replace the tailstock.

Adjusting the read heads

Adjust the DRO read heads so that the chip plows touch the stainless strip, but the reader head is clear of it.

Connecting the Bluetooth transceiver



1. Use a small straight screwdriver to open the Bluetooth transceiver. Use both corner slots to open it.



2. Identify the connector for each axis. Remove the green plug from each one.

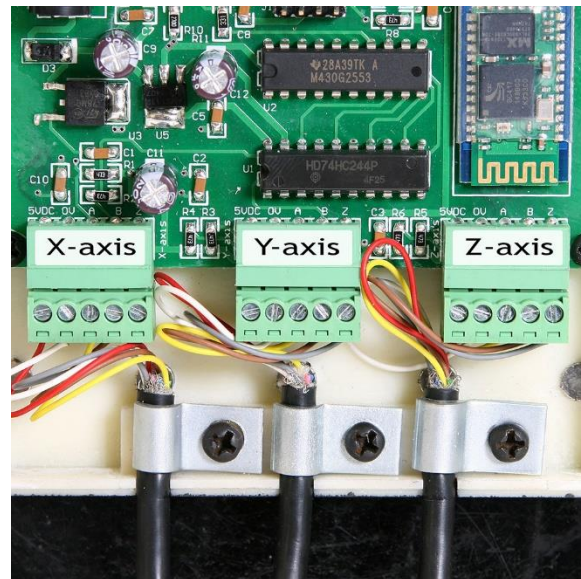


3. Install a green plug on the wire from each read head. With the screw heads up, the colors, from left to right are:
Red White Yellow Brown Gray

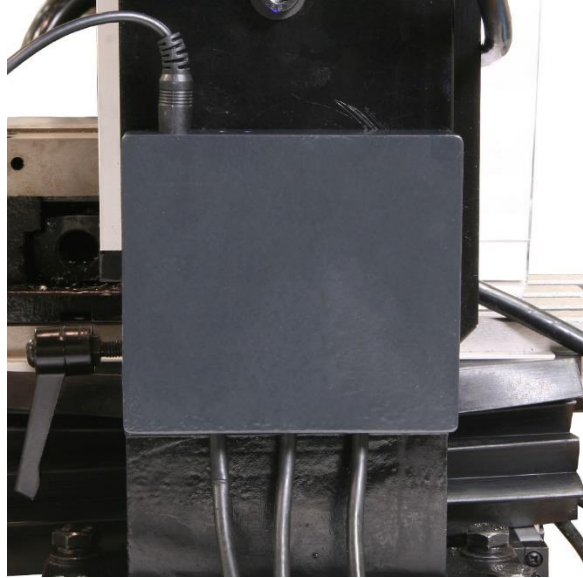
Double check each wire to ensure that the wires are in the correct order and that the screw terminals are secure.

Chris' Tip: You can shorten the wires if that makes sense for your installation. It's good practice to tin (apply a bit of solder to) the bare wire ends. Be sure to leave enough length for full travel of your machine.

4. Insert each axis plug into the appropriate socket. Clamp the black-jacketed wire in the corresponding strain relief.
5. Snap the cover onto the Bluetooth transceiver.



6. The Bluetooth transceiver mounts magnetically. Place it at a convenient location on your machine.
7. Plug in the power supply and you are ready to go to work.



Done!

That's it, the DRO is ready to go. Fire up the Android tablet and go to work.

If you have our Android tablet (PN 5513), the software is already installed. If you have another Android tablet go to the Apps store at Google Play to find and install Yuriy's Toys TouchDRO.