LittleMachineShop.com
The premier source of tooling, parts,
and accessories for bench top machinists.

Bluetooth DRO Installation for Bench Mills

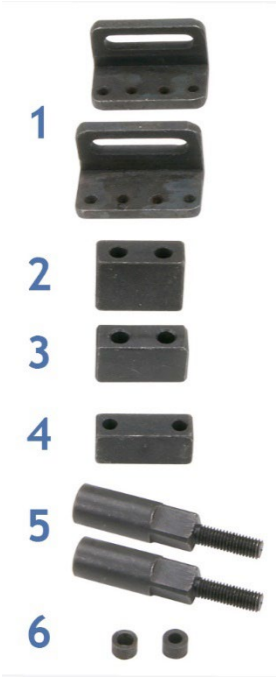
These instructions describe how to install the following products:

- 5494: Digital Position Readout, 3-Axis Bluetooth for LittleMachineShop.com Model 5500 HiTorque Bench Mill

The installation procedure is the same for all mills. You'll need to partially disassemble your mill, drill and tap 15 holes, attach the hardware to your mill, connect all the pieces, and then pair the DRO to your Bluetooth display device.

Be Sure You Have Everything

The kit includes the following items:



Bluetooth transceiver
Reader with chip scraper (qty 3)
5V power adapter
Magnetic scale for X axis
Magnetic scale for Z axis
Magnetic scale for Y axis

1. Reader mounting bracket (qty 2)
2. 17 mm reader mounting spacer
3. 13 mm reader mounting spacer
4. 10 mm reader mounting spacer
5. Scale mounting standoff post (qty 2)
6. 4 mm round scale mounting spacer (qty 2)

Mounting fasteners

- M3x10 pan head machine screw (qty 6)
- M3x14 pan head machine screw (qty 4)
- M3x25 pan head machine screw (qty 2)
- M4x20 socket head cap screw (qty 2)
- M4x25 socket head cap screw (qty 2)
- M5 nut (qty 2)

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*
- 3.3 mm or #30 drill bit*
- 4.2 mm or #19 drill bit
- 10 mm or 0.375" drill bit

- M3x0.5 thread-cutting tap*
- M4x0.7 thread-cutting tap*
- M5x0.8 thread-cutting tap
- 2.5 mm hex key wrench
- PH 1 Phillips screwdriver

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

Install the X-Axis Scale and Reader

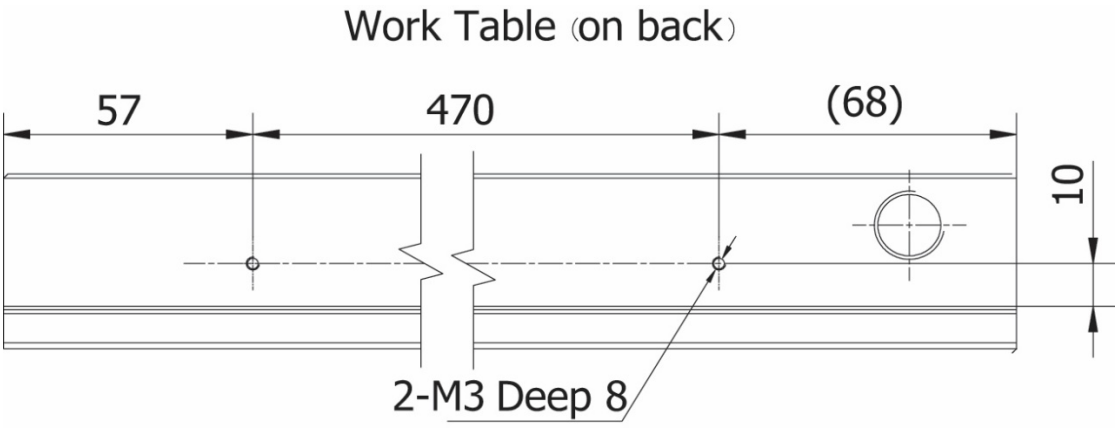
Scales come in different lengths for different models of bench mills.

X-Axis Dimension Table

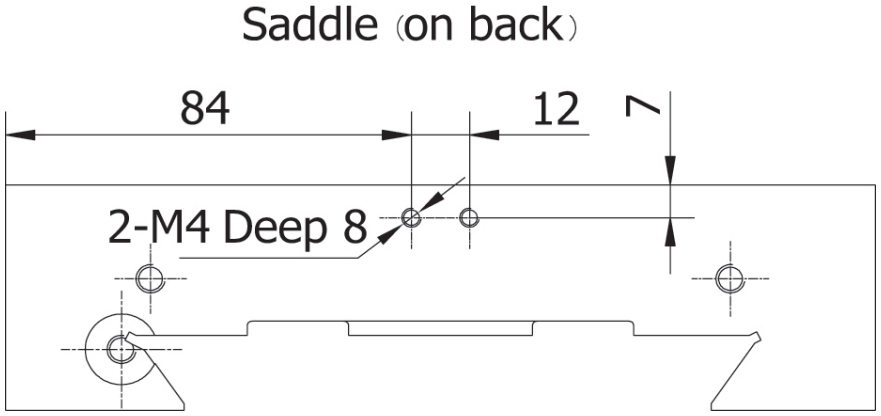
Machine	X Scale Length	Dimension E	Dimension L	SIEG Model
LMS 5500 Bench Mill	460 mm	57 mm	470 mm	X2.7/SX2.7

Follow these steps to install the scale and reader for the X-axis.

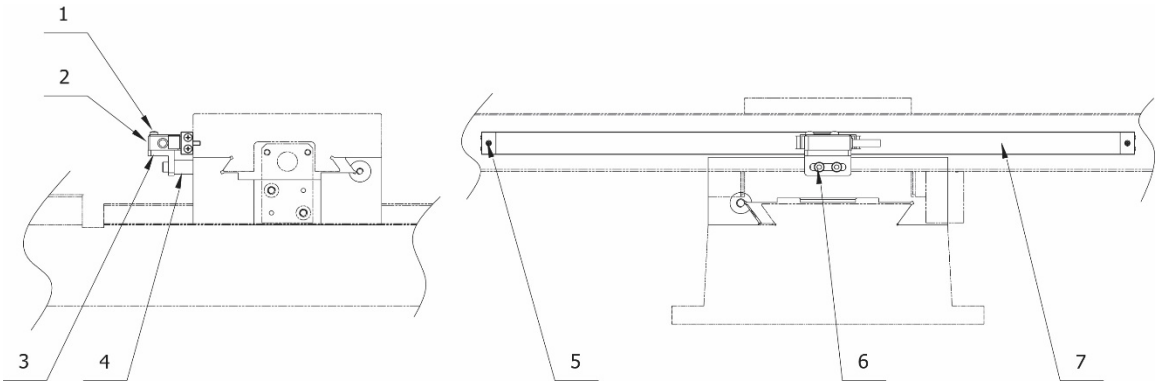
1. Remove the retainer that attaches the chip guard bellows to the back of the mill table. Two screws hold the retainer in place; remove the screws and the retainer and set them aside.
2. Remove the two socket head cap screws that secure the Y-axis bearing retainer to the front of the saddle.
3. Unscrew the Y-axis screw from the machine. The bearing retainer and screw will come out of the front of the machine. When it is about 1/3 of the way out, remove the socket head cap screw and washer from the back end of the screw.
4. Loosen the Y-axis gib and slide the mill table and saddle forwarded off the machine. *(Caution! The table and saddle on a bench mill weighs up to 60 pounds, so you might want to have a friend help you with this step.)*
5. Clean the back side of the mill table and the saddle to remove all chips and oil.
6. On the back side of the mill table, mark two hole locations as shown below.



7. Drill and tap the two holes M3 to a depth of 8 mm (0.3 in). Use a 2.5 mm or #39 tap drill and an M3x0.5 metric tap.
8. On the back of the saddle, mark two hole locations as shown below.



9. Drill and tap the two holes M4 to a depth of 8 mm (0.3 in). Use a 3.3 mm or #30 tap drill and an M4x0.7 metric tap.
10. Use two M3x10 pan head screws to attach the magnetic scale to the back of the mill table.
11. Reassemble the mill table and adjust the X-axis gib.
12. Install the X-axis reader with a 13 mm reader mounting spacer and reader mounting bracket as shown in the drawing below.



Item	Qty	Item
1	2	M3x14 pan head machine screw
2	1	Reader
3	1	Reader mounting bracket
4	1	13 mm reader mounting spacer
5	2	M3x10 pan head machine screw
6	2	M4x20 socket head cap screw
7	1	Scale 460 mm

Install the Y-Axis Scale and Reader

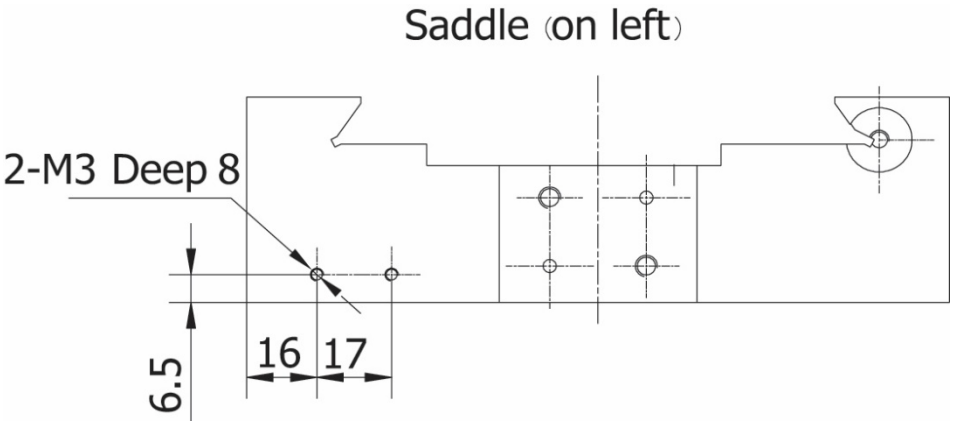
Scales come in different lengths for different bench mills.

Y-Axis Dimension Table

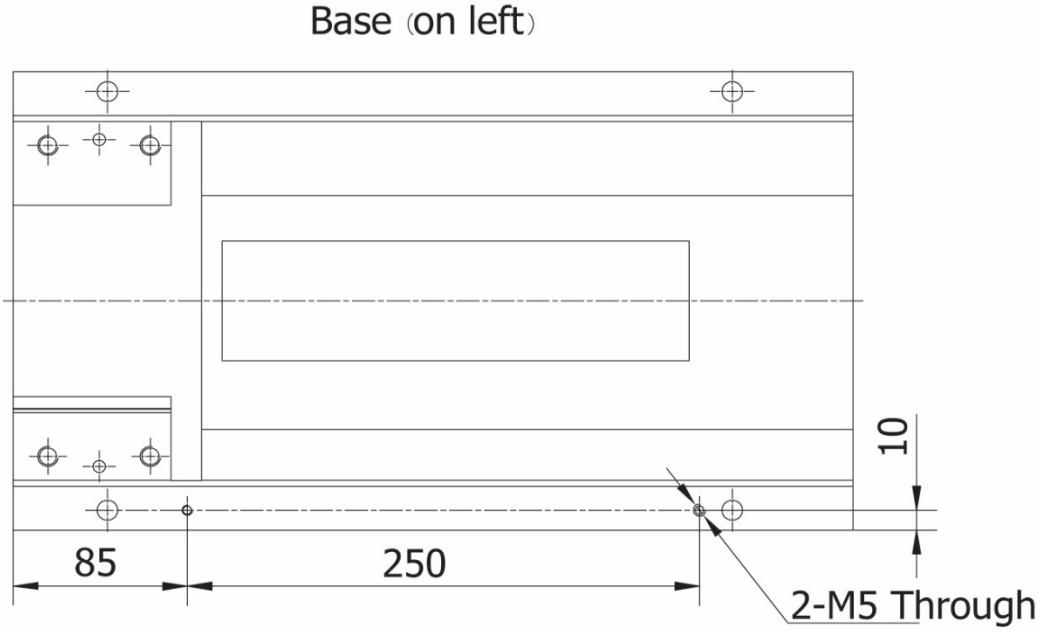
Machine	Y Scale Length	Dimension B	Dimension T	SIEG Model
LMS 5500 Bench Mill	240 mm	250 mm	85 mm	X2.7/SX2.7

Follow these steps to install the scale and reader for the X-axis.

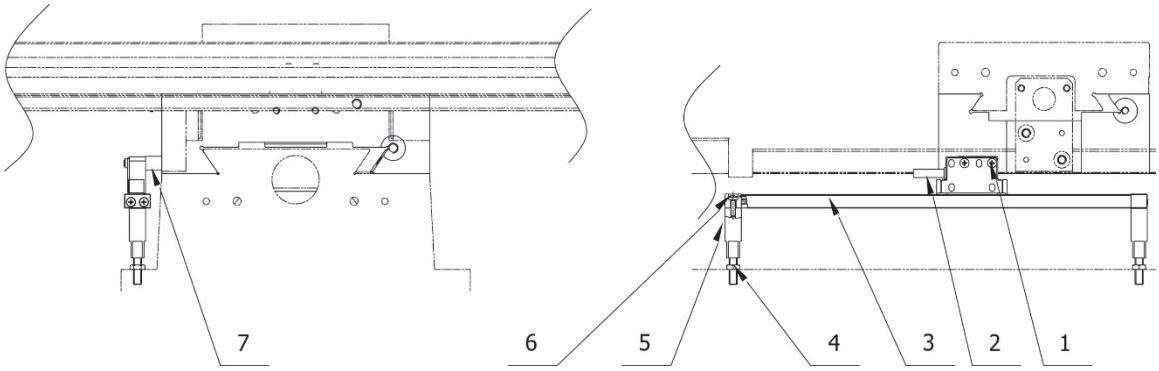
1. On the left side of the saddle, mark two hole locations as shown below.



2. Drill and tap the two holes M3 to a depth of 8 mm (0.3 in). Use a 2.5 mm or #39 tap drill and an M3x0.5 metric tap.
3. On the left side of the machine base, mark two hole locations as shown below.



4. Drill and tap the two holes M5 to a depth of at least 13 mm (0.5 in). Through holes are ok. Use a 4.2 mm or #19 tap drill and an M5x0.8 metric tap.
5. Install an M5 nut on each standoff post and screw the standoff posts into the M5 holes in the base.
6. Install the Y-axis scale onto the standoff posts using two M3x10 pan head machine screws.
7. Install the Y-axis reader using a 10 mm reader mounting spacer, and M3x10 pan head machine screws as shown in the drawing below.



]

Item	Qty	Item
1	2	M3x25 pan head machine screw
2	1	Reader
3	1	Scale 240 mm
4	2	M5 nut
5	2	Mounting standoff post
6	2	M3x10 pan head machine screw
7	1	10 mm reader mounting spacer

Install the Z-Axis Scale and Reader

Scales come in different lengths for different model bench mills.

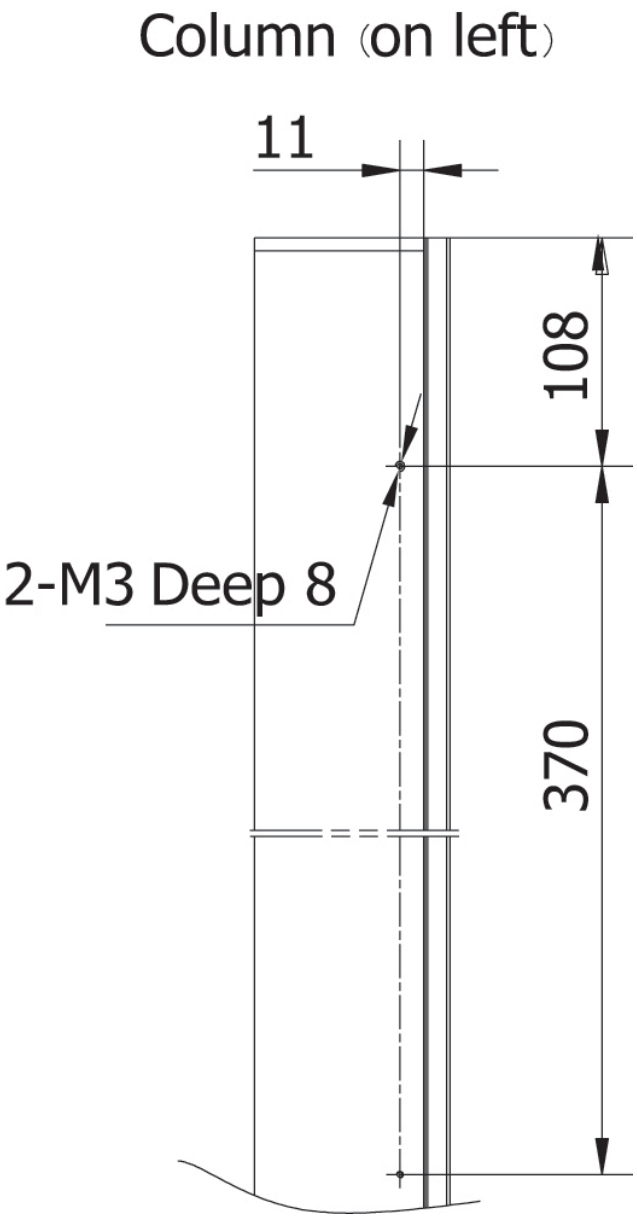
Z-Axis Dimension Table

Machine	Z Scale Length	Dimension C	Dimension T	Dimension R	SIEG Mo
LMS 5500 Bench Mill	360 mm	370 mm	108 mm	109.5 mm	X2.7/SX

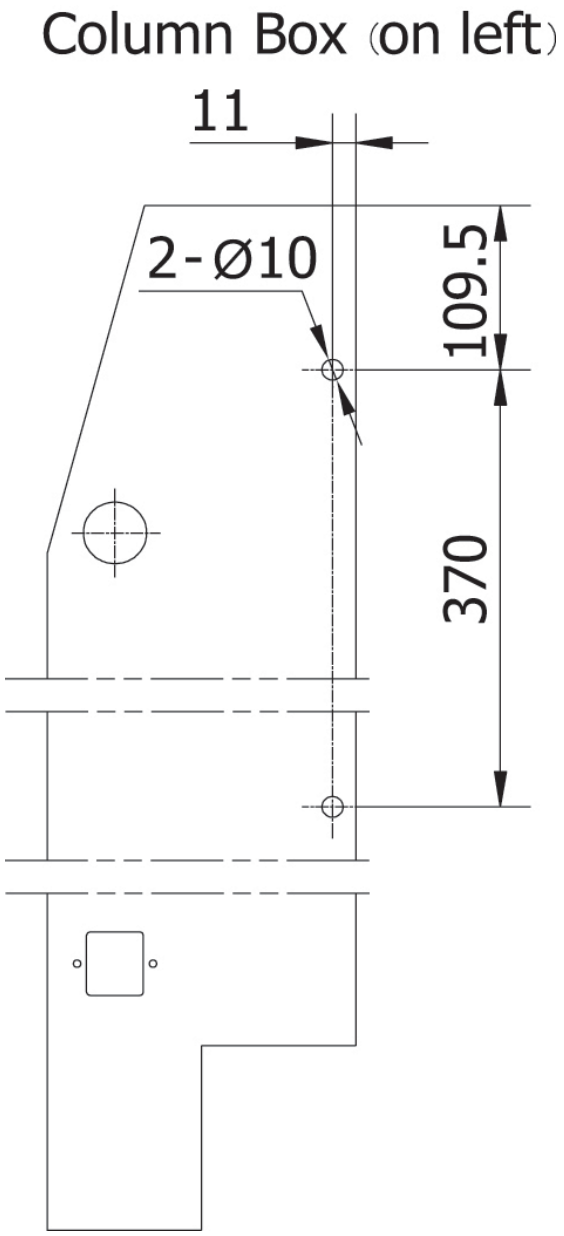
Follow these steps to install the scale and reader for the Z-axis.

1. Remove the four socket head cap screws that secure the sheet metal column housing to the column.
2. Pull the cover back, but be aware that it is still connected by some wires.

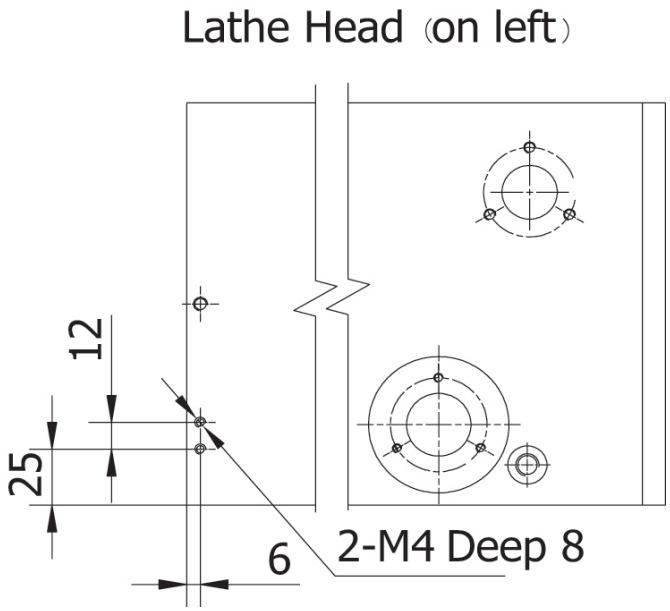
3. On the left side of the column, mark two hole locations as shown below. Don't drill these holes yet.



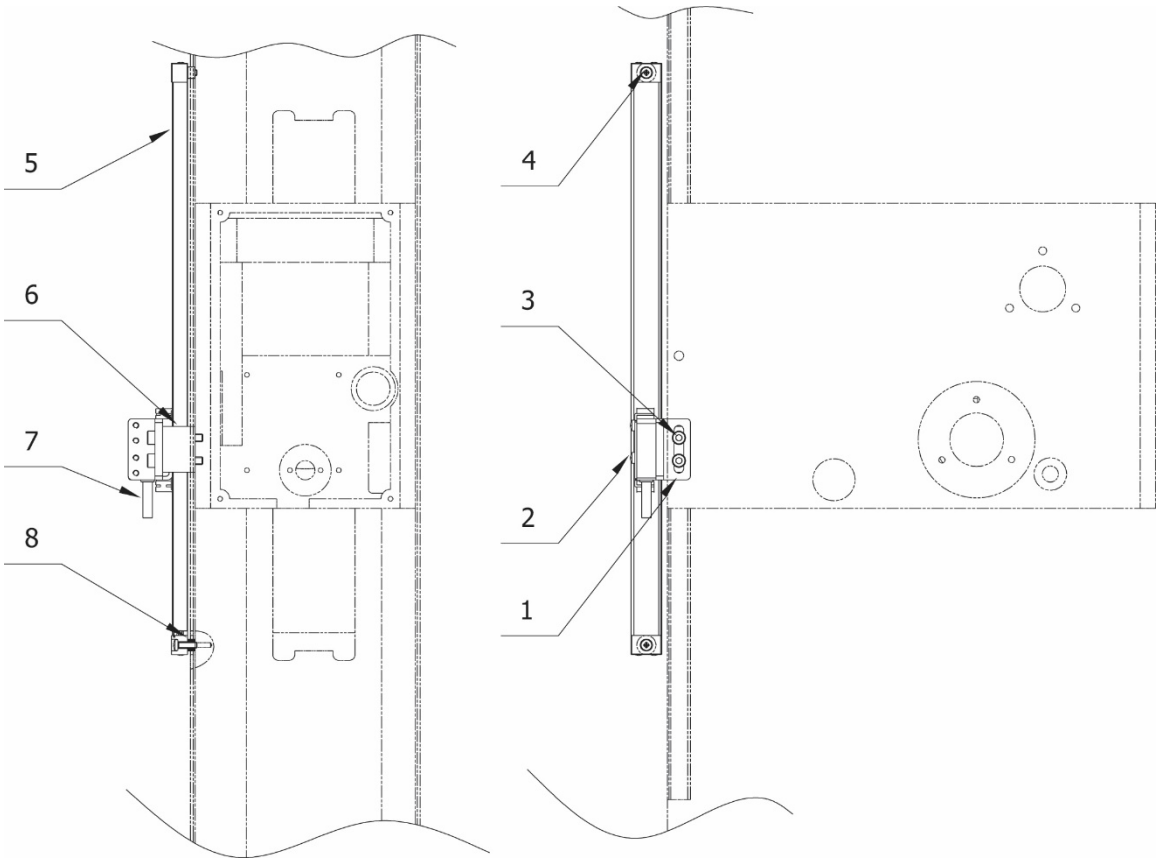
4. On the left side of the column housing, mark the two hole locations as shown below. These are clearance holes for the Z-axis scale mountings, so be sure they will align with the two holes in the column. Notice that these holes are large enough (10 mm) to provide clearance for slight misalignment.



5. Drill and tap the two holes in the column M3 to a depth of 8 mm (0.3 in). Use a 2.5 mm or #39 tap drill and an M3x0.5 metric tap.
6. Drill the two clearance holes in the column housing 10 mm (0.375”) through.
7. On the right side of the head assembly, mark two hole locations as shown below.



8. Drill and tap the two holes M4 to a depth of 8 mm (0.3 in). Use a 3.3 mm or #30 tap drill and an M4x0.7 metric tap.
9. Reinstall the sheet metal column housing to the column.
10. Install the Z-axis scale using two 4 mm round scale mounting spacers and M3x10 Phillips machine screws.
11. Install the Y-axis read head using a 17 mm reader mounting spacer, a reader mounting bracket and two M4x25 socket head cap screws as shown in the drawing below.



Item	Qty	Item
1	1	Reader mounting bracket
2	2	M3x14 pan head machine screw
3	2	M4x25 socket head cap screw
4	2	M3x10 pan head machine screw
5	1	Scale 360 mm
6	1	17 mm reader mounting spacer
7	1	Reader
8	2	4 mm round scale mounting spacer

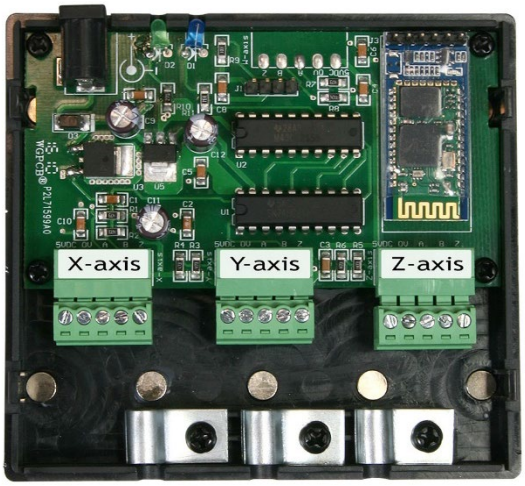
Adjusting the Read Heads

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

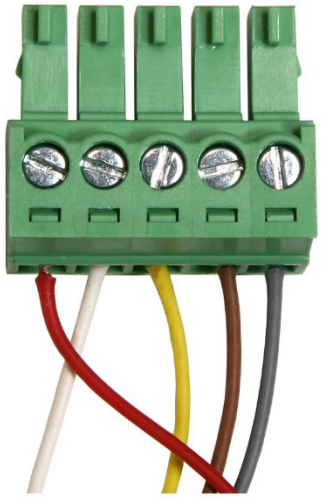
1. Use a small straight screwdriver to open the Bluetooth transceiver. Use both corner slots to open it.

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

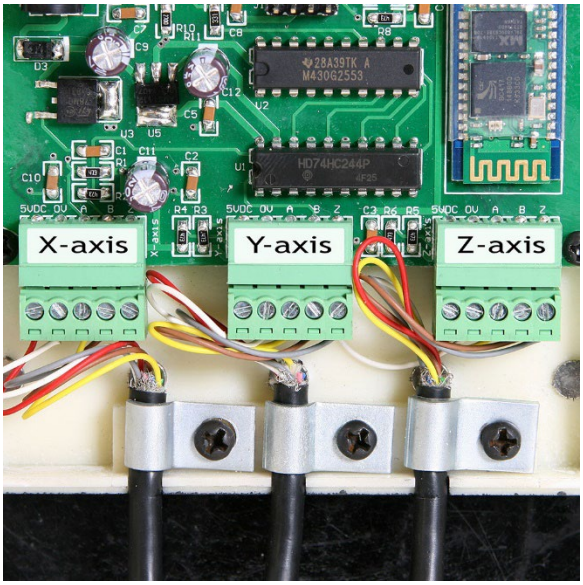
   Double check each wire to ensure that the wires are in the correct order and that the screw terminals are secure.



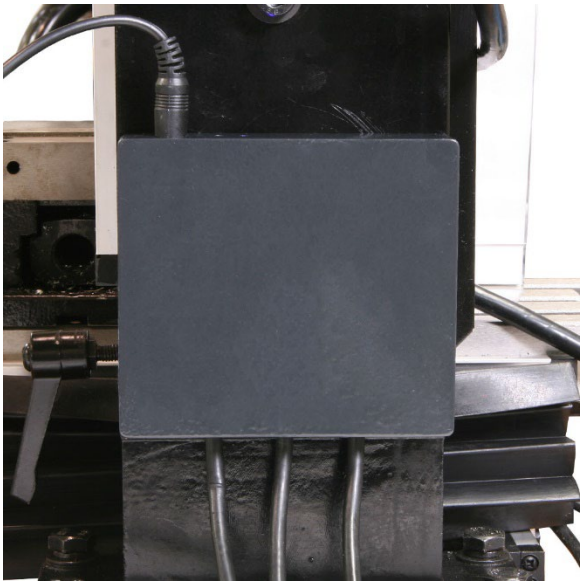
Chris' Tip: You can shorten the wires if that makes sense for your installation. It's good practice to tin (apply a bit of solder to) the bare wire ends. Be sure to leave enough length for full travel of your machine.

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, 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.