



Using the Bluetooth DRO display



Getting started

The Android tablet included with your DRO has the SIEG DRO app preinstalled. To begin using it, you must pair the tablet to the DRO scales, and you must configure the app, as described in the following sections.

Chris' Tip: The table comes with a protective film on the screen. This film is sometimes hard to see but it can be removed to enhance visibility. If you are fine with the display with the film on, it can be left on to protect the device and does not impair operation.

If you want to use a different tablet as a display unit for your DRO, see “Using a different tablet as a display device” on page 8.

Pairing the devices

Be sure the Bluetooth transceiver is plugged in. (If you have the 4190 Deluxe Mini Mill, the transceiver is plugged in when the machine is plugged in.) Follow these steps to pair the Bluetooth transceiver with your Android tablet.

On the Android tablet:

1. Turn on the power and swipe up to unlock it.
2. Open Settings. (If you don't see a Settings icon near the center of the screen, open the app drawer—the middle icon of the quick launch bar on the bottom or right edge of the screen.)
3. In Settings, tap **Bluetooth** under Wireless & Networks.
4. Tap **Search For Devices** in the upper right corner of the screen.
5. Tap **HC-06** when it appears under Available Devices. On some models the device may be named **BT04-E**.
6. Enter the PIN 1234 and tap **OK**.

The devices are now paired.

Tip: If you're using a single display device for multiple DROs, you can change the name from **HC-06 (BT04-E)** to give each machine a unique name. Tap a name under Paired Devices, edit the name, and tap **OK**.

Configuring the app

Follow these steps to configure the DRO app for your installation.

1. Start the SIEG DRO app.
2. If it appears in the upper-right corner of the screen, tap **Connect** to select the correct Bluetooth device. Tap **HC-06 (BT04-E)** to select the DRO.
3. The vertical ellipsis in the upper right corner of the screen is a menu. Tap it and select *Settings*.
4. Here is where you tell the app about your machine. Make the appropriate settings for the type of machine, how many axes you have and so on.

NOTE: For the DRO scales from LittleMachineShop.com, the correct value for Axis CPI is 5080.00.

5. Tap the Back button at the bottom of the screen when you have made the settings.

Using the app

Your DRO should now be working. Turn a hand wheel and watch the numbers change.

The axis readouts appear at the left top of the screen.

The row of buttons across the bottom affect all axes.

The row of abs/incr buttons to the right of each axis readout affect that axis.

The right side of the screen is for more advanced functions.

	Chooses inch or mm display
	Sets the workspace origin to the current position of the machine
	Selects Absolute coordinates or Incremental coordinates for all axes
	Creates circular bolt patterns
	Creates rectangular bolt patterns
	Specifies tool offsets

Axis detail settings

Tap one of the axis position values to see the Axis Details.



Tap the Position value to enter the current position value.

	<p>Reduces the position value to half its value. Use this for centering.</p> <p>If you are viewing an absolute value, it stores half the absolute value in the incremental value.</p> <p>If you are viewing an incremental value, it halves the incremental value.</p>
	<p>Changes the sign of the position value and changes the “positive” direction of that axis.</p>
	<p>Tap to set the incremental value to zero. Hold to set both the absolute value and the incremental value to zero.</p>
	<p>Turns on the warning that you are approaching a defined point.</p>

Absolute versus incremental coordinates

The DRO keeps track of two coordinate systems: absolute and incremental.

Absolute coordinates are the overall coordinates of your work piece. Select a corner of the workpiece and use your edge finder to set the X- and Y-axes to 0.000 at this corner.

Incremental coordinates are used when you want to work on a feature, such as a bolt circle, that exists on your work piece. You can, for example, set an incremental 0, 0 position at the center of a circular bolt circle, and then use incremental values to place the holes.

Points and workspaces

Points are a set of coordinates that define a spot on your work piece. Workspaces keep track of points that you have recorded. The right side of the display window shows a list of recorded points.

You can create points several ways.

Saving a point

Any time you are at a location you want to save, tap **Add Point**. A point with the current coordinates is added to the list.

Creating bolt patterns



Tap to create a circular hole pattern. Enter the required values and tap **Create Circle**. A series of points is saved.



Tap to create a linear or grid hole pattern. Enter the required values and tap **Create Pattern**. A series of points is saved.

Going to a point

To go to a point, tap the point in the list. The display changes to show how far from the point you are. Simply move the table until the X- and Y- positions read zero and you are at the point.

To de-select a point, tap it again.

Previewing a workspace

Once you have a collection of points, you can get an idea if they are correct by previewing the workspace. Tap the vertical ellipsis menu to the right of the workspace name. Choose Preview Workspace to see the relationship of the points.

Tools

The DRO can keep track of your tool dimensions. This is useful if your tools maintain their Z-axis position between uses, such as when you use end mill holders or collet chucks to hold your end mills. Replacing a tool like this will return it to the same Z-axis position.

You can enter the values for the current tool using the [Square & Circle] button. Enter the values and tap **Set Tool Offset**.

This is also one way to select a predefined tool when you are using it. Tap the [Square & Circle] button and select the tool from the Predefined Tool list. Tap **Set Tool Offset**.

Adding a tool

To add a predefined tool, tap the vertical ellipsis menu in the upper right corner. Select Add Tool.

Name your tool and add the values for that tool. Tap **Save** to add the tool to the list of tools.

Choosing a predefined tool

To choose a tool and use the predefined offset, simply tap the tool in the list of predefined tools. The Tool Offset window appears. You can adjust any values you need for this job and tap **Set Tool Offset**. These changes are not saved with the tool.

Starting a work piece

Use this process to set the absolute X- and Y-axis coordinates for a new work piece. We'll describe the process using a mechanical edge finder. Note that using a laser edge finder makes the process significantly simpler because you don't need to account for the diameter of the edge finder.

These instructions set the 0, 0 location on your work piece at the rear left corner.

With the work piece secured in your vise, follow these steps:

1. Tap `abs/incr` in the bottom row so "abs" is highlighted.
2. Touch off the left side of the work piece.

3. Tap the X-axis value so X Axis Details appears.
4. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.
5. Raise your edge finder to clear the workpiece and turn the X-axis hand wheel so the X axis displays half the diameter of the edge finder. The center of the edge finder is now over the edge of the work piece.
6. Tap the X-axis value so X Axis Details appears.
7. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.
8. Touch off the back side of the work piece.
9. Tap the Y-axis value so Y Axis Details appears.
10. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.
11. Raise your edge finder to clear the workpiece and turn the Y-axis hand wheel so the Y axis displays half the diameter of the edge finder. The center of the edge finder is now over the edge of the work piece.
12. Tap the Y-axis value so Y Axis Details appears.
13. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.

Centering a work piece

Centering a workpiece is as easy as touching off two sides. Follow these steps:

1. Tap **abs/incr** in the bottom row so “abs” is highlighted.
2. Touch off one side of the work piece.
3. Tap the corresponding axis value so Axis Details appears.
4. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.
5. Raise your edge finder to clear the workpiece and move to the other side of the work piece.
6. Touch off the opposite side of the work piece.
7. Tap the corresponding axis value so Axis Details appears.
8. Tap **1/2**. The value changes to half the previous value. Tap **Close**.

Note that the that axis has changed to Incremental. If you want to set the absolute zero to the center of the work piece, follow these additional steps.

1. Move so the axis displays 0.000.
2. Tap the corresponding axis value so Axis Details appears.
3. Hold **zero set** until the Are You Sure message appears. Tap **Yes**, then tap **Close**.

Using a different tablet as a display device

The DRO app runs on Android devices. Here are the requirements:

- Android OS 4.0 or newer
- 7" multi-touch screen with 1024x600 resolution (recommended); 4" screen with 800x480 resolution (minimum)
- Bluetooth support

LittleMachineShop.com sells a suitable Android tablet, but as you can see from the requirements, almost any Android tablet that has Bluetooth capability will work.

Installing the DRO app

Go to the Apps store at Google Play to find and install Yuriy's Toys TouchDRO. Be sure to set the Counts Per Inch to 5080.