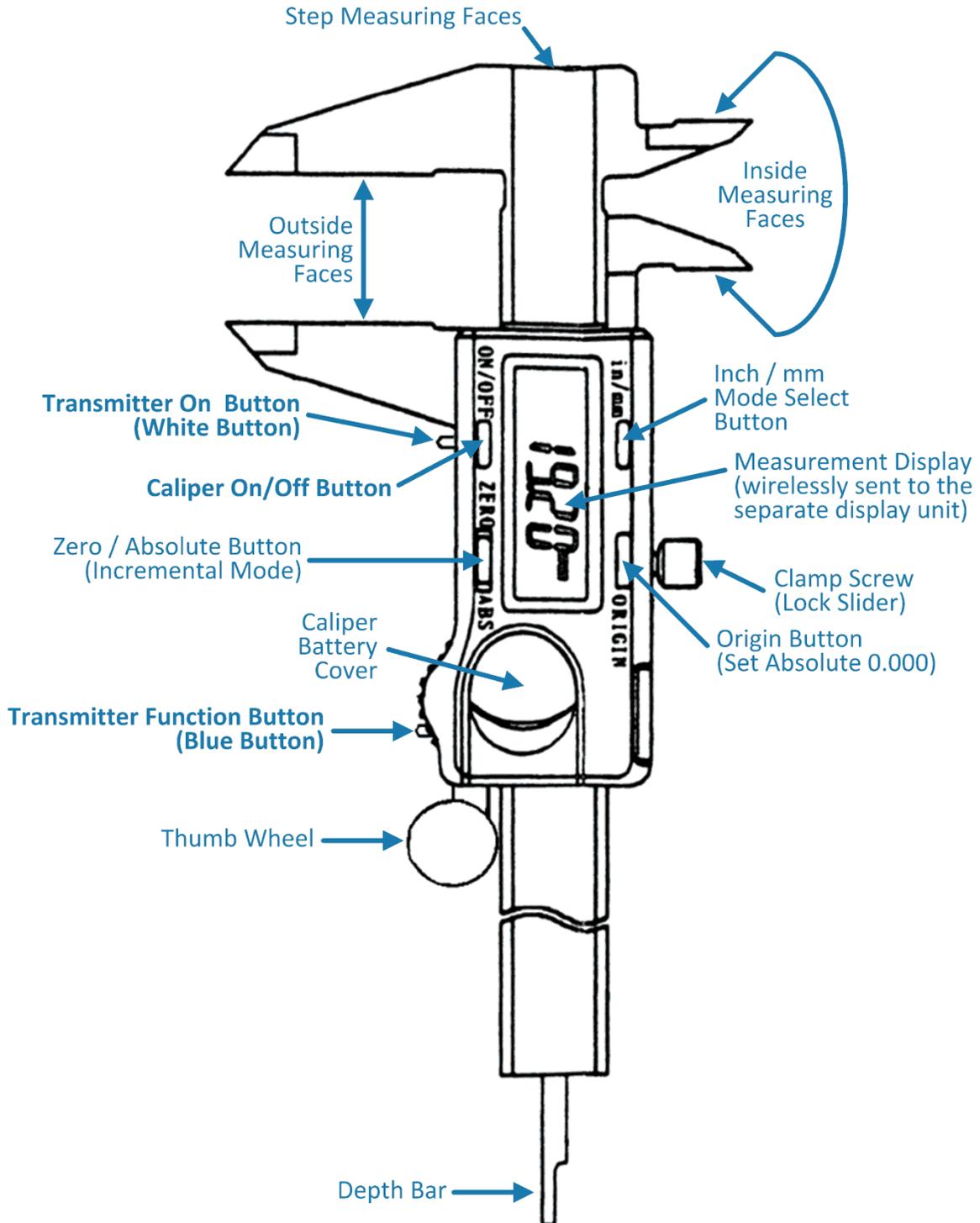


EasyReadTools 6"/150mm Caliper with Wireless Display

Instructions



Product details:

The underlying measurement tool is a standard 6" digital caliper, with typical ± 0.0005 " resolution and ± 0.001 " accuracy. The wireless system does not affect resolution or accuracy. The value on the separate display unit is updated approximately three (3) times per second. Wireless range is over 20 feet (over 6 meters). The separate Display Unit (not shown) has two strong magnets in the back so the display can be attached to any suitable metal surface (steel/iron/tin but not aluminum and some stainless steels).

The Caliper has four (4) buttons:

- On/Off** Turns the caliper on or off. The Caliper will auto turn on with any movement and auto turn off when not in use for a few minutes. **Turning on the Caliper does not turn on the Transmitter or the Display Unit.**
- Zero/Abs** Switch between absolute measurement (closed jaws for 0.0000) and incremental measurement (set a temporary zero at the current caliper position). The caliper display shows "inc" when in incremental mode. A new temporary zero can be set by pressing this button again. Press and hold button this button until the "inc" goes away to return to normal absolute mode. The display unit shows the same measurement as the caliper, but it does not include the "inc" mode indication.
- mm/inch** Switch between inch and mm mode at any time. Caliper shows either "in" or "mm" on the right side of the Caliper display. The display unit also shows the current mode.
- Origin** Set the absolute origin. Clean the outside measurement jaws and close tightly by pressing on the jaws (not by pressing on the thumb wheel), then press this button for 5 seconds. The display should be 0.0000. Typically, this procedure is only performed after changing the Caliper battery.

The Transmitter on the back of the caliper has two (2) buttons:

- White** Transmitter On Button, located near the lower jaw of the caliper. Press to turn on the transmitter. The Transmitter automatically turns off if the Caliper value has not changed for 5 minutes, if the Display unit is not turned on within 30 seconds, or when the Display Unit is turned off. While there is no indicator on the Caliper that the Transmitter is on, if the display unit is showing measurements, then the transmitter is on.
- Blue** Function button. Currently it is used for checking the battery voltages. Press it twice (with a short delay between the two presses, similar to a double click on a mouse) and the Display Unit shows the status of the battery in the Caliper, the battery in the Transmitter, and the battery in the Display Unit. The back light on the Display Unit flashes for each button press or click, as a visual feedback.

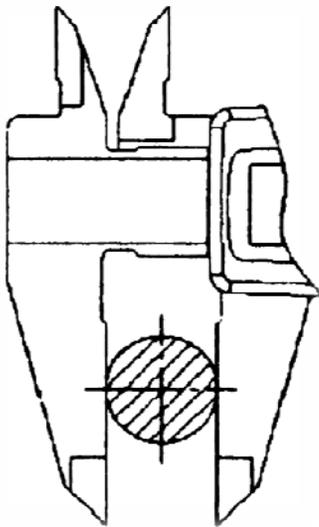
The Display Unit (Receiver) has one (1) button:

- Blue** Press once to turn on the Display Unit. Press once to turn it off.

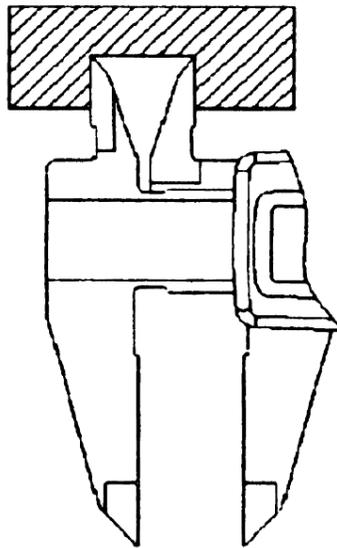
Making measurements:

The Caliper automatically turns on when the jaws are moved. Additionally, the On/Off button also turns the caliper on. To turn on the Transmitter in order to use the wireless display function, you must also turn on the Transmitter by pressing the small white button on the transmitter box attached to the back of the Caliper. The Transmitter does not need to be turned on if you are not using the separate display. Both the caliper and the transmitter automatically turn off if not used for a while.

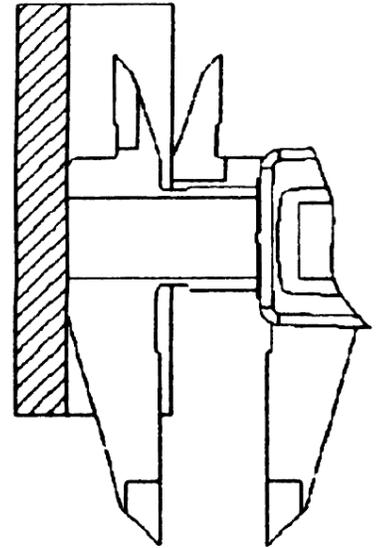
The Calipers Four (4) Measurement Surfaces



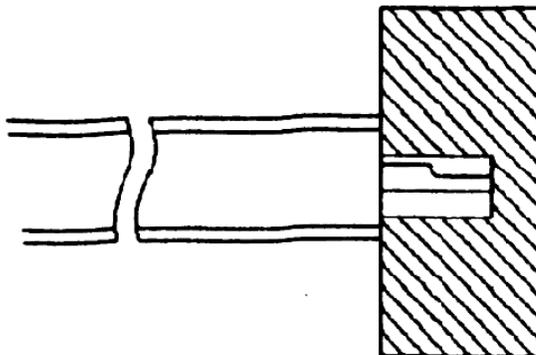
Outside Measurement



Inside Measurement



Step Measurement



Depth Measurement

How to use this product:

Turn of power to the Caliper either moving the jaws or by pressing the Caliper on/off button. As with most high quality calipers, the Caliper remembers the absolute origin (0.0000 when the jaws are closed), so there is no need to reset the origin when the Caliper is turned on. Even if the caliper jaws are moved while turned off, the Caliper will present correct values when the caliper display is later powered on.

Turn on power to the wireless transmitter by pressing the white button on the black transmitter box on the back of the Caliper, near the Caliper's on/off button. The transmitter automatically turns off when the system has been idle for a few minutes. There is no direct indication that the Transmitter is on.

Turn on power to the Display Unit by pressing the only button on the unit. Press this button again to turn off the Display Unit. The Display Unit automatically turns off if idle for 5 minutes.

There are two ways to use this product. One is as a normal caliper, and the other is using the wireless display feature. As a caliper only, the usage is no different to any other digital caliper you are already familiar with. The previous two pages show you the locations of the various buttons, and the four measurement surfaces.

To use the wireless display feature, three things need to be turned on,

1. the Caliper,
2. the Transmitter, and
3. the Display Unit (Receiver).

If all are powered on, the Display Unit shows the same measurement as the current value presented on the Caliper's digital display. The back light on the Display Unit automatically turns on whenever there is any change in measurement. The back light remains on for 5 seconds after the measurement stops changing. The backlight will come on as soon as the measurement changes again. The backlight automatically turns off (as just described) to save battery power and give longer usage life for the batteries in the display unit.

The Display Unit has two (2) powerful magnets embedded in the back surface so that the display unit can be conveniently and securely positioned on many of the metal surfaces of milling machines, VMCs, lathes, etc. The Display Unit can just as easily lie flat on a desk or work bench when you might use it to make measurements of a work piece and you prefer the large, easy-to-read, back lit display on the Display Unit to the small display on the Caliper.

Expected use:

The motivation for creating this product was my experience with doing setup and in process checks on a milling machine and lathe, for prototype work, and first article. Often fixtures or cutting tools (on a lathe) obstruct or hinder making measurements with the caliper and then reading the measurement from the display. Work pieces clamped in a vice are close enough to the mill's table that the caliper's beam prevents using the caliper with the display facing the user.

On a lathe, I often find I want to make measurements near the headstock and I don't want to move the cutting tools. Consequently, the caliper comes in from behind the work piece, and the display is facing the head stock. Moving the caliper to see the display causes errors of several thousandths as the caliper is slid out. The locking screw on a caliper makes it a two handed operation. The wireless display solves all these problems and it has a large, backlit display that is very easy to read (especially for those of us still in denial about our need for glasses). If you think about it, about half of all measurements with a caliper will have the display facing away from you. It's even worse if you are a lefty or are tortured by Murphy's Law.

Replacing Batteries:

Caliper Battery, CR1632:

The Caliper battery should have an operational life of greater than 2.5 years under normal operation. Low battery voltage is indicated on the Caliper by a low battery icon that blinks. The battery condition can also be checked by double clicking the function button (blue button) on the Transmitter, and monitoring the voltage shown on the Display Unit. To replace the Caliper battery, slide the battery cover off and remove the old battery. Replace it with a fresh CR1632 button cell. Install the battery with the "+" sign facing outward. Slide the cover back on. Regardless of what the Caliper's display indicates, be sure to re-establish the absolute origin after installing a new battery. Clean the outside measurement jaws and tightly close them. Then press the Zero/Abs button for 5 seconds. The display should show 0.0000. If the origin setting does not work, try removing the battery for 30 seconds, then re-installing and then set the origin again.

Transmitter Battery, CR2032:

The Transmitter battery is in the small black box on the back of the Caliper. This operation requires some disassembly and there are several small parts. Perform the disassembly on a on a clean desk with a container to hold the small parts while changing the battery.

Open the box by undoing two screws. Carefully note the location of the two buttons and the box orientation with respect to the caliper. The brown flex circuit connecting the circuit board to the caliper is very delicate. Undo the two screws that hold the circuit board and box attached to the Caliper. If there are washers on the screws, be careful not to lose them. The circuit board can now be removed from the box. Be especially careful of the brown flex circuit. If you wish, you can release it from the circuit board, by first sliding the black part of the connector away from the board. This releases the flex. Later you will need to re-insert the flex and slide the black part back to the original position to lock the flex in place. Remove the old battery and replace it with a new CR2032 button cell. Install the new battery with negative side (that has a black ring) facing the circuit board, and the positive terminal (flat metal with product info marked on it) facing up. Re-assemble the flex if you previously removed it. Insert the circuit board back in the box, making sure that the buttons are in their correct position and are free to move. Attach the board and box to the caliper with the two small screws that were previously removed. Check that the caliper still slides correctly. If there were washers on the screws that hold the circuit board and box onto the caliper, and you lost them, then the screws go in too far and interfere with the caliper's sliding movement. Re-attach the lid, pushing any slack flex into the box as the lid is tightened in place. To avoid cross-threading the lid screws, turn them counter-clockwise in the hole until you feel the thread catch the prior thread in the box. Then tighten the screw being careful not to over tighten the screws for the lid as it will strip the plastic. Don't force anything.

The battery life for the Transmitter is not yet know, but is probably six months to a year.

Display Unit Battery, 3 x AAA:

Undo the four corner screws. Replace all three AAA batteries with new cells; don't mix old with new. The strong magnets in the bottom of the box can pull the batteries out of the battery holder, so after installing the batteries in the battery holder, wrap the assembly with a layer of thin adhesive tape. When closing the box, the magnets tend to pull the battery assembly into the middle, and the box can't be closed. Here's how I do it: Cut a 1 inch wide strip of paper 8" long—any scrap page of letter size paper will do. Wrap the strip around the battery holder so that the battery holder is in the middle and you have two 3" lengths of paper that you can use to position the battery against the side of the case that does not have the on/off button. Place the lid on the box and then with it almost closed, slide the strip of paper out. Then snap the lid in place. It's easier than this description makes it sound. To avoid cross-threading the lid screws, turn them counter-clockwise in the hole until you feel the thread catch the prior thread in the box. Then tighten the screw being careful not to over tighten the screws for the lid as it will strip the plastic. Don't force anything.

Battery life for the Display Unit batteries is not yet known. Battery life will be significantly increased if you turn off the Display Unit when you are finished making measurements, rather than leaving it to auto turn off after 5 minutes of being idle.

Product Safety:

To ensure user safety, use this Caliper in conformance with the specifications, functions and directions provided in this User's Manual. Do not disassemble, short-circuit, charge, or heat the battery. If a battery is swallowed, immediately consult a doctor. The outside and inside measuring jaws of this caliper have a sharp edge. Handle it with care to avoid injury.

Never apply a voltage (e.g. engraving with an electric engraver) on any part of the caliper as it will damage the caliper electronics.

Avoid getting the product wet with water or coolant. Immersing the caliper in coolant will probably ruin it. When cleaning the caliper, the sliding surfaces can be lubricated with a light oil.

The front of the LCD in the display unit is a soft material and can be easily scratched. If it needs to be cleaned, use a soft cloth that is damp (not wet) and may have a small amount of light detergent. After wiping the surface with the damp cloth, dry it with a dry soft cloth. Do not press hard on the LCD surface. Do not use solvents.

Caliper Specifications

- Resolution: ± 0.0005 " (± 0.012 mm)
- Accuracy: ± 0.001 " (± 0.024 mm)
- Power: button cell (CR1632), 3.0V
- Battery life: more than 2.5 years under normal operation
- Response speed: Unlimited (no limit to how fast the slider is moved)
- Protection rating: IP40
- Operating environment: temperature 32°F to 104°F (0°C to +40°C)
- Relative humidity <80%
- Storage temperature: 14°F to 122°F (-10°C to +50°C)