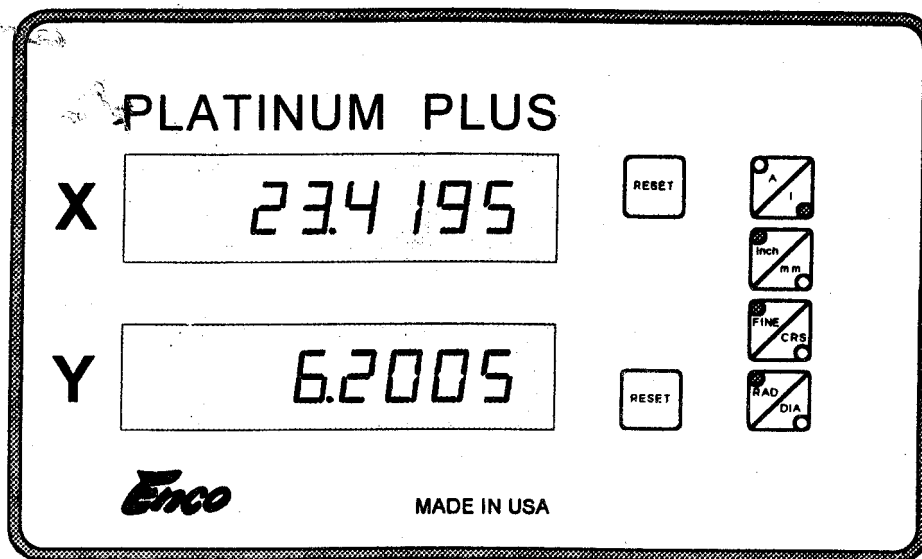


PLATINUM PLUS DIGITAL READOUT



OPERATOR'S MANUAL

Table of Contents

1	Features and Capabilities	1
2	Preparation For Use	2
	• Unpacking	2
	• General Installation Notes	2
	• Grounding	2
	• AC Power	3
	• Routing Scale Cables	3
	• Typical Display Installation	3
	• Installation Under Mounting Arm	3
3	Setup Screens: Setting Scale Resolutions, Scale Directions and Radius/Diameter Enable	4
	• Setup Screens Description	4
	• Entering the Setup Screens	4
	• Selecting the Desired Setup Screen	4
	• Scale Resolutions Description	5
	• Setting Scale Resolutions	5
	• Scale Directions Description	6
	• Setting Scale Directions	6
	• Radius/Diameter Enable Description	6
	• Enabling and Disabling the Radius/Diameter Button	6
	• Exiting the Setup Screens	6
4	Absolute and Incremental Modes	7
	• The Difference Between Absolute and Incremental Modes	7
	• Absolute and Incremental On a Sample Work Piece	7
	• Switching Between Absolute and Incremental Display Modes	7
5	Clearing the Display	8
	• Clearing Incremental Position Registers	8
	• Clearing Absolute Position Registers	8
6	Machine Error Compensation (Scale Factors)	9
	• Machine Error Compensation Description	9
	• Viewing MEC Factors	9
	• Clearing MEC Factors	10
	• General MEC Calibration Notes	10
	• Calibrating MEC	10

1

Features and Capabilities

Internal Nonvolatile Memory maintains data when DRO is off.

Bright, efficient LED display with wide viewing angle.

Absolute or Incremental display mode.

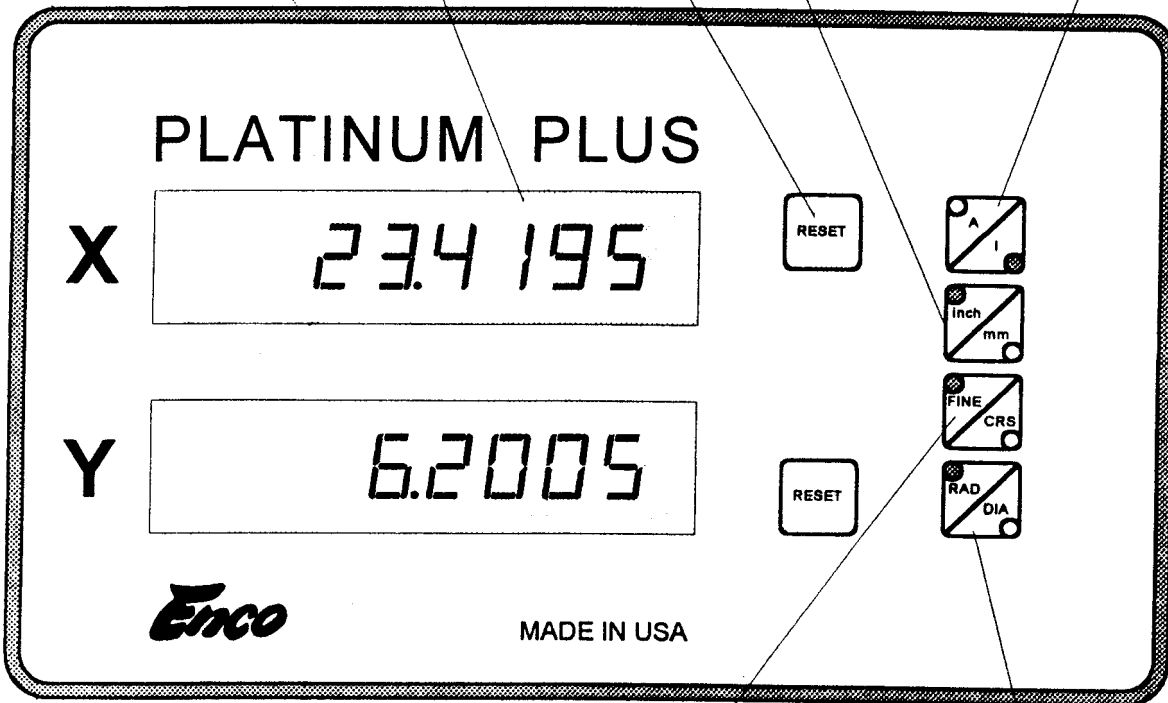
Setup Screens: Press and hold while DRO is flashing 8.8.8.8.8.8.8. to set the following:

- ◆ Scale Resolutions
- ◆ Scale Directions
- ◆ Radius/Diameter enable

Machine Error Compensation (Scale Factors).

Press to reset the display.

Inch or mm display mode.



Power input module at rear of DRO has:

- ◆ On/Off switch
- ◆ Fuse protection
- ◆ EMI filter for noise protection

Fine or Coarse resolution: In Fine, maximum scale resolution is displayed. In Coarse, less resolution is displayed.

Radius or Diameter: In Radius, the actual scale movement is displayed. In Diameter, double the scale movement will be displayed.

2

Preparation For Use

Unpacking

- ◆ **Inspect Shipping Containers.** Inspect for obvious damage that would indicate mishandling during shipment. Make note of any indications, such as: dented corners or torn sides.
- ◆ **Save Packing Material.** The shipping box and packing material should be opened carefully to permit reuse in case it is necessary to return any portion of the equipment.
- ◆ **Notify Carrier In Case of Damage.** If the display or other items show any external damage, or if parts have vibrated or broken loose, the carrier should be notified within ten days of receipt of shipment.
- ◆ **Check Packing List.** Any discrepancy between the items received and the items listed on the shipment packing list should be reported immediately to the Sargon distributor.

General Installation Notes

WARNING

**HAZARDOUS VOLTAGES.
USE EXTREME CAUTION.**

- ◆ All required electrical work should be performed by a qualified electrician.
- ◆ Mount the DRO a minimum of 6 inches away from any motors. The DRO may be mounted to the arm provided, or to a custom machined arm, mount, or stand.
- ◆ Refer to the applicable manual for scale installation.

Grounding

- ◆ The AC outlet should be a three prong grounded outlet (per article 250 of the US National Electrical Code). If it is not, use a grounded adapter and verify that the adapter is grounded.
- ◆ Verify that the machine is grounded. If it is not, a ground must be installed.
- ◆ Install a 14 AWG stranded wire (customer provided) from the ground lug located on the back of the DRO to the machine power ground connection. If this is not possible, drill/tap at an alternate location on the machine. Secure the ground wire using star or split washers to ensure adequate connection. Use an approved anti-oxidation compound at the connection where the paint is scraped.

AC Power

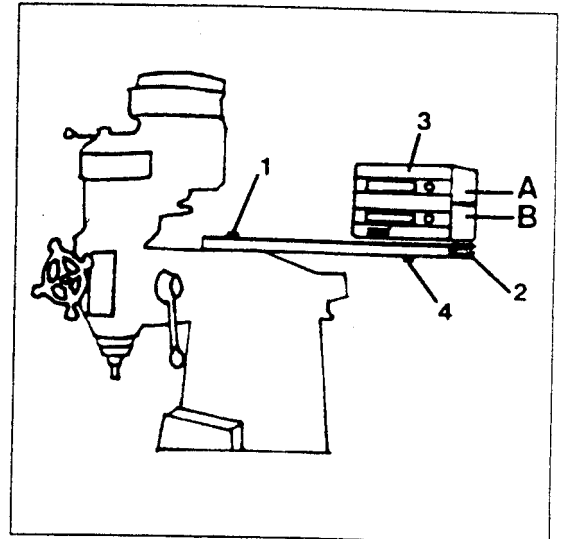
- ◆ Do not use machine power lines for the DRO. Use a separate 120 or 240 VAC outlet. If an outlet is not available, one should be installed near the DRO mounting location.
- ◆ The AC power outlet should be of the same voltage as that indicated on the identification/serial number label on the back of the DRO.
- ◆ Use the power cord supplied. Do not modify the power cord in any way.

Routing Scale Cables

- ◆ Connect and secure the scale connectors to the DRO. Using tie-wraps, secure the scale cables and dress any excess slack. Do not wrap any AC power lines with the scale cables. Maintain a minimum of 6 inch spacing from AC lines and cross at right angles.

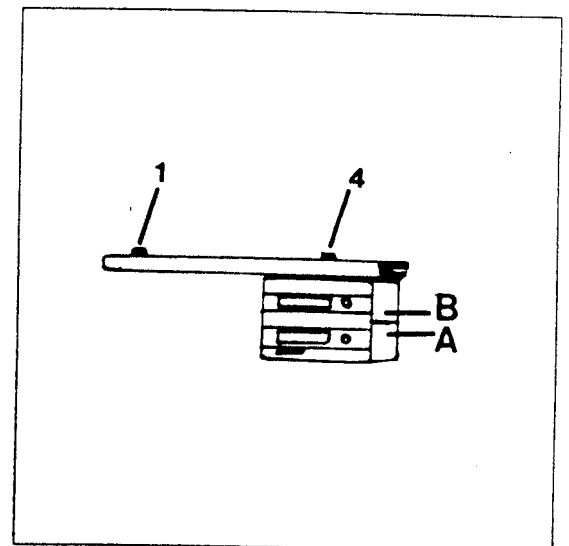
Typical Display Installation

1. Remove the large eye bolt located on top of the milling machine column (Index 1).
2. Mount the arm (Index 2) as shown.
3. Bolt the DRO to the mounting arm with the 5/16-18 bolt (Index 4) provided in the hardware kit.



Installation Under Mounting Arm

1. Remove screws at both sides of the DRO case extrusion.
2. Remove the top and bottom halves of the case extrusion.
3. Mount the bottom half of the case (Index B) on the top side of the DRO.
4. Mount the top half of the case (Index A) on the bottom side of the DRO. The top half should now have the mounting hole in its center.
5. Mount the DRO as shown.



3

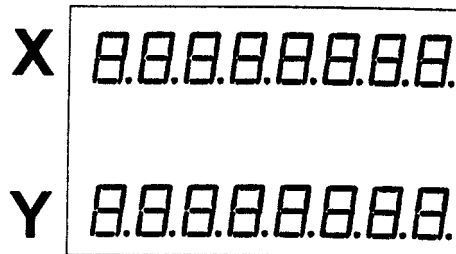
Setup Screens: Setting Scale Resolutions, Scale Directions and Radius/Diameter Enable

Setup Screens Description

Instead of using internal switches, scale resolutions, scale directions and radius/diameter button enable are programmed from the DRO's front panel.

Scale resolutions, scale directions and radius/diameter enable are stored in the DRO's nonvolatile memory. Once set, the DRO may be powered down. When powered up at a later time the settings will still be intact.

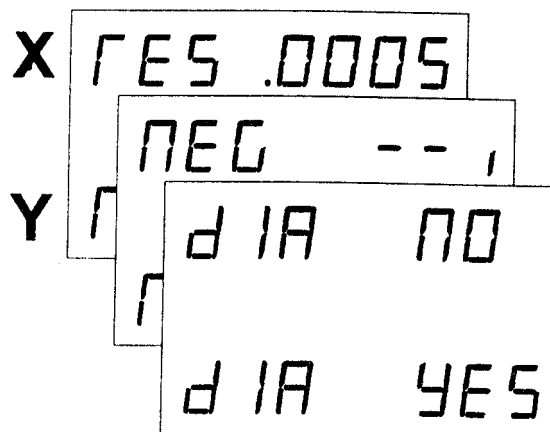
Entering the Setup Screens



X 8.8.8.8.8.8.8.8.
Y 8.8.8.8.8.8.8.8.

After power up and while the display is still flashing **8.8.8.8.8.8.8.8.** press and hold **[A/I]** until one of the setup screens is displayed.

Selecting the Desired Setup Screen



X RES .0005
NEG --
Y DIA NO
DIA YES

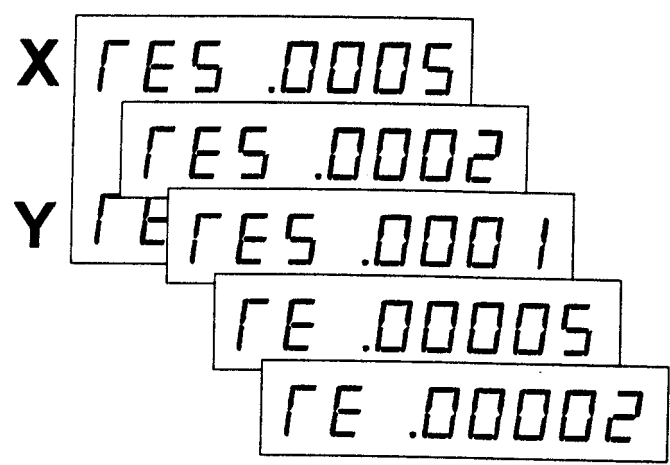
Press **[RAD/DIA]** as required until the desired setup screen is displayed.

Scale Resolutions Description

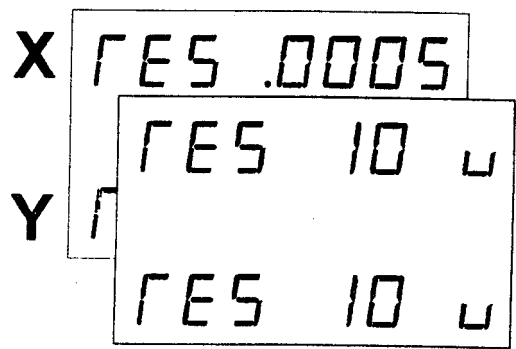
Each axis on the DRO must be set to the resolution which matches the scale being used for that axis. Resolutions available on the DRO are shown to the right. The scales must be metric. When inch mode is selected, the metric scale inputs are converted by the DRO to display in inches.

MICRON	INCH
10.0	0.0005
5.0	0.0002
2.0	0.0001
1.0	0.00005
0.5	0.00002

Setting Scale Resolutions



Press **RESET** for the desired axis to go through the available resolutions.

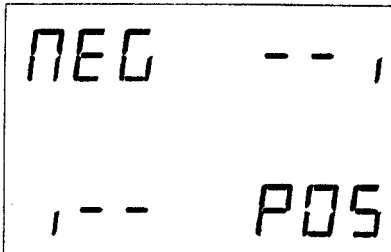


Press **inch/mm** to change between inch and metric displays. In mm mode the resolutions are displayed in microns (0.001 mm).

**Scale Directions
Description**

Scale movement is displayed as either positive or negative, depending on the direction of machine movement. Scale direction can be set, in the DRO, for each axis, so that movements are properly displayed for the machine being used.

**Setting Scale
Directions**



X NEG -- ,
Y , -- POS

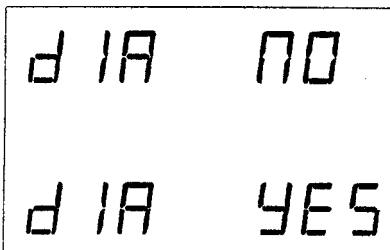
Press **RESET** for the desired axis to switch between positive and negative scale directions.

**Radius/Diameter
Enable
Description**

When radius/diameter enable has been set as described below, the radius/diameter button will then affect each axis that has been enabled and will not affect any axis that has been disabled.

Radius tracks the actual scale movement. Diameter displays double this movement.

**Enabling and
Disabling the
Radius/
Diameter
Button**



X d 1A NO
Y d 1A YES

Press **RESET** for the desired axis to switch between radius/ diameter button enabled (YES) and disabled (NO).

**Exiting the
Setup Screens**

When scale resolutions, scale directions and radius/diameter button enable are all correctly set, exit setup mode by pressing **Alt**.

4

Absolute and Incremental Modes

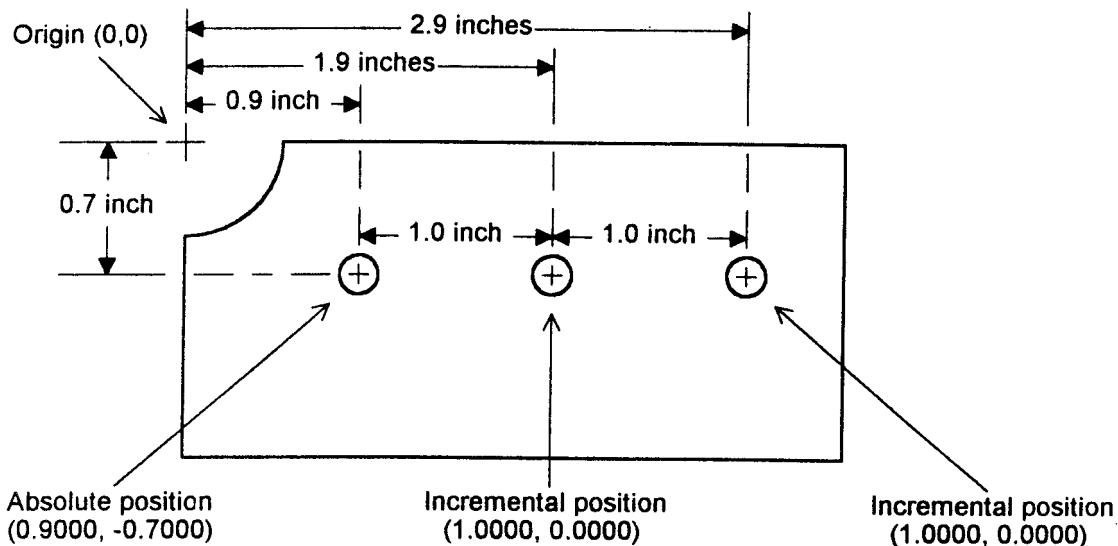
The Difference Between Absolute and Incremental Modes

The absolute position is the distance between a fixed starting point on the work piece and another point to which the machine has been moved. The incremental position refers to distances that are not measured with reference to a fixed origin, but instead, the distance is measured between the previous point and some new point.

Absolute and incremental registers are both updated during table movement regardless of which is currently displayed.

Absolute and incremental registers are otherwise independent; that is, clearing one will not affect the other.

Absolute and Incremental On a Sample Work Piece



Switching Between Absolute and Incremental Display Modes

Press **[A/I]** to switch between absolute and incremental position displays. LEDs behind the button indicate which mode is active.

5

Clearing the Display

Clearing Incremental Position Registers

The absolute and the incremental position registers are cleared independently. Clearing one will not affect the other.

1. The DRO must be in incremental mode to clear the incremental registers.
2. Press **RESET** for the appropriate axis. The selected axis will be cleared.

Clearing Absolute Position Registers

The absolute and the incremental position registers are cleared independently. Clearing one will not affect the other.

1. The DRO must be in absolute mode to clear the absolute registers.
2. Press and hold **AVI** until all axes display **ZERO ABS**.
3. Press **RESET** for the appropriate axis. The selected axis will be cleared.

6

Machine Error Compensation (Scale Factors)

Machine Error Compensation Description

A standard vertical milling machine would have no error if its table movements followed perfectly straight lines. This, however, is not the case. There will always be some finite transfer error.

Definition. Transfer Error is the difference between displacement at the linear scale and displacement at the cutting tool.

Machine tool error is the difference between the actual length of a standard certified gauge block and the value displayed by a digital readout when the gauge block is measured using standard machine shop practices. This error will also be present in any work piece machined in that axis.

Machine Error Compensation (MEC) multiplies incoming scale signals by a factor such that the displayed value will be correct. This factor is stored in the DRO's nonvolatile memory and is set at the factory to 0.000000.

Example. A 10.0000 inch standard gauge block is measured on a knee mill with a result of 9.9950 inches. MEC will re-proportion this dimension so that the correct value (10.0000 inches) is displayed. The 0.0050 inch error has been distributed over the 10.0000 inches of travel. Thus the "Machine Error" has been "Compensated" for.

$$MEC\ Factor = \frac{9.9950 - 10.0000}{9.9950} = -0.000500$$

MEC should be a one time job. However, an operator may wish to recalibrate for a particular area on the machine table where work is to be performed.

Although MEC can improve machine table performance, it is not intended as a substitute for proper machine maintenance.

Viewing MEC Factors

1. Set the **MEC** switch on the back of the DRO to **CAL**.
2. Press and hold **[A/I]** to view the MEC scale factors for all axes.

$$MEC\ Factor = \frac{Measured_Value - True_Value}{Measured_Value}$$

Clearing MEC Factors

1. Set the **MEC** switch on the back of the DRO to **CAL**.
2. Press **RESET** for the axis which is to be cleared.
3. Return the **MEC** switch on the back of the DRO to **OFF**.

General MEC Calibration Notes

- ♦ The MEC procedure is performed on one axis at a time.
- ♦ For best results the DRO should be calibrated in the units (inch or mm) in which it will be used.
- ♦ The DRO should be calibrated on the table area that is most commonly used.
- ♦ Absolute and incremental modes have the same calibration factor for a given axis.

Calibrating MEC

1. Clear the MEC factor as described above.
2. Set the radius/diameter button to radius.
3. Enter the actual certified gauge block length by moving the table until the DRO displays the numerical value of the length. This is simply a method to enter numerical data without the use of a numeric keypad.
4. Set the **MEC** switch on the back of the DRO to **CAL**.
5. Press **RESET** for the selected axis.
6. Measure the gauge block (with the DRO) using standard machine shop procedures and practices. **RESET** may be used as necessary during measurement.
7. When the measured gauge block value is displayed, return the **MEC** switch on the back of the DRO to **OFF**. The displayed value will change to the first value entered, showing that the error correction has been made.
8. Measure the gauge block again to ensure the DRO is now properly calibrated.
9. Repeat the procedure for the remaining axis if required.