



User Manual

DRO-MG-MDU-IX,

Introduction

Thank you for purchasing the M-DRO mini single axis display console.

The MDU display console encoder input is located on the rear, please ensure the power is switched off when connecting the encoder and the connector locking screws are tightened. The power switch is also located on the rear of the console.

During power up procedure it is possible to enter the console set up menus. This enables the operator to change factory settings including encoder resolution and count direction. This is generally only required on the first power up after completing the readout install and generally standard factory settings are suitable. Please see the display console setup section in this manual

Specifications

Dimensions	(h) 48mm x (w) 96mm x (d) 44mm
Weight	160g
Operating Voltage	9 volts DC (9 ~ 24V DC)
Current	100mA
Measurement Range	+/- 999.999mm for resolution 0.001mm +/- 9999.99mm for resolution 0.01mm
Encoder Resolution	0.001 ~ 0.999mm
Encoder Input	5v TTL Quadrature 90° phase difference
Linear correction	+/-1 ~ 999 microns per 1m
Working Temperature	+10°C ~ +40°C

Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
N/C	0V	N/C	Screen	N/C	A	+5V	B	Z

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Compliance



Attention: Your product is marked with this symbol. It means that used electrical products should not be mixed with general household waste. There is a separate collection system for these products.



The mains power cable and encoder cables must be routed away from moving parts, coolant and swarf.

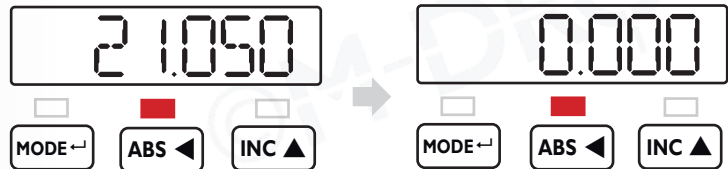
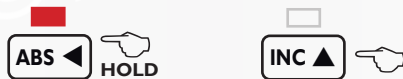


The console must be switched off when connecting or disconnecting the encoder.

Digital Readout Operation

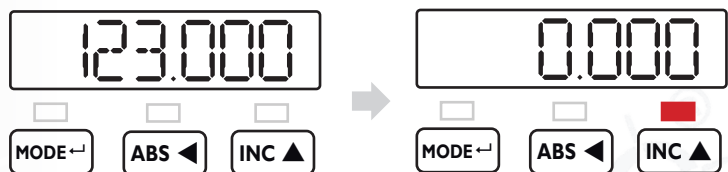
Zero ABS Value

Press and hold the ABS key and short press on the INC key will zero the display.



Zero Incremental Value

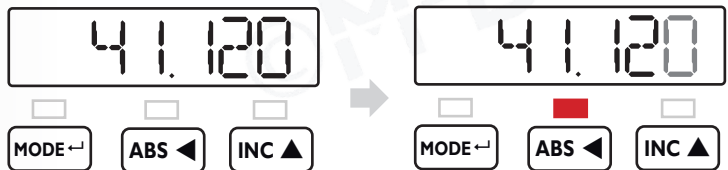
A short press on the INC will zero the display.



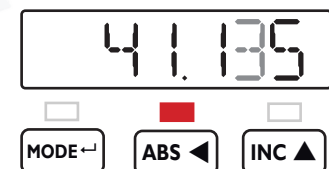
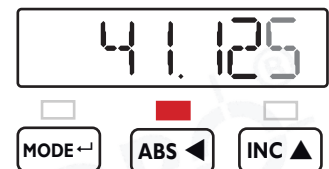
Setting Absolute Value

An Absolute zero (ABS) position is generally set as the main fixed datum on a work piece or the start point of a saw stop

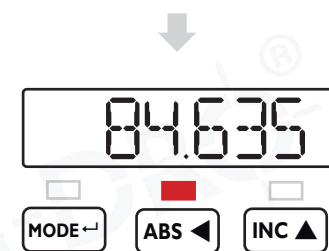
Press and hold the ABS button for 5 seconds the digit will start to flash. Use the UP arrow to scroll through 0 ~ 9 to select desired last digit.



Press left arrow to skip to next left digit. Use the UP arrow to scroll through 0 ~ 9.

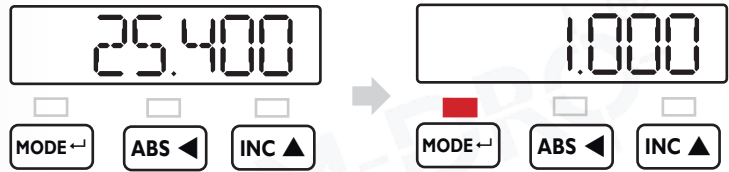


Repeat above until desired ABS value is displayed. Press MODE key to save.



Metric and Inch

A short press on the MODE key will toggle between mm/inch display.

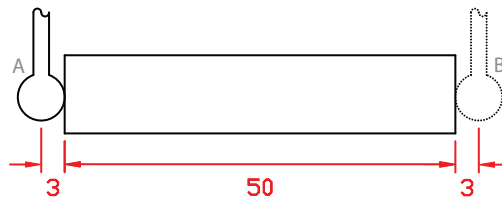


Note; Inch mode LED will be on above mode key.

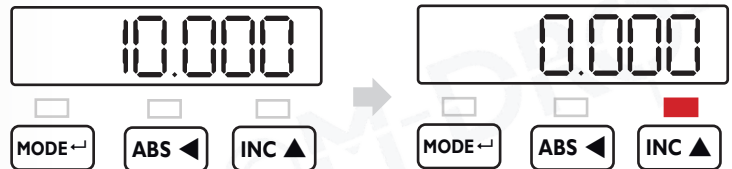
Centre Find (1/2 function)

A simple function to find the centre of a work piece.

Note; function needs to be activated in set up menu before use. Please see set up section.



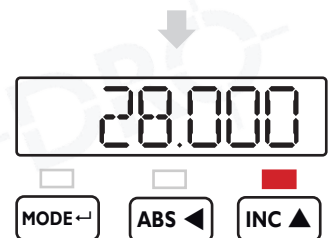
Align on the edge of the work piece (point A). Press INC key to zero axis.



Align on the opposite edge of the work piece (point B).



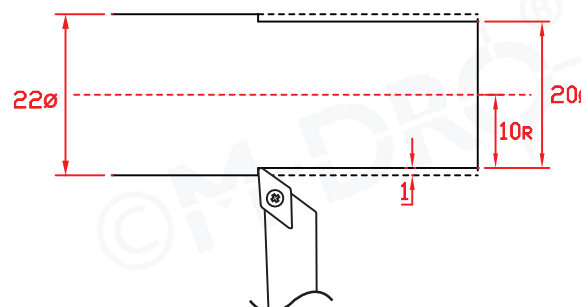
Press and hold INC key for 5 seconds.



Radius and Diameter Display

Radius mode will display the physical travel, in this example 1mm.

Diameter mode will display the actual diameter. Take a skim cut and measure the diameter. In this example 22mm diameter. Enter the measurement as an ABS value. Taking a 1mm cut will reduce the diameter by 2mm, the display will read 20mm.



Note; function needs to be activated in set up menu before use. Please see set up section.

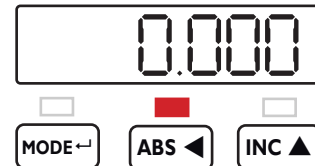
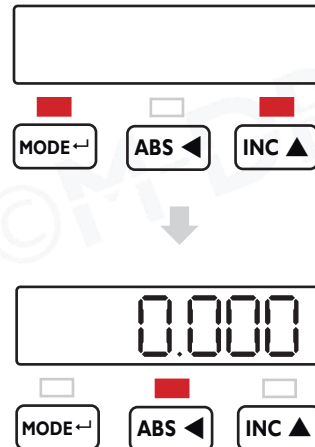
Encoder Fixed Reference Datum

If the encoder has a fixed reference point, this can be used as a zero reference position or a value can be assigned. At the point the reference is triggered a zero or pre-set datum will be displayed.

The function needs to be activated in set up menu before use. Please see set up section.

Typical Application; a fixed calibration position on a saw stop or fixed start point on a machine axis.

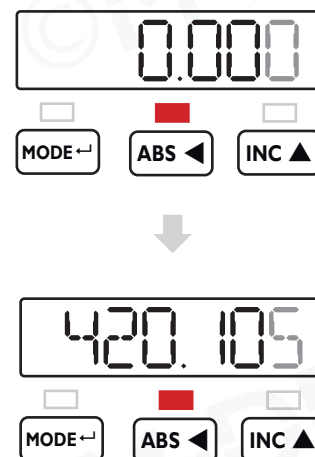
With the function activated in the set up menu. Power up the console. The display will not show a value but the LEDs above MODE and INC will be lit. Travel the encoder, once the reference point is detected the display will start count.



Setting Reference Datum Value

A fixed reference datum value can be saved and recalled by passing the encoder fixed reference datum or recalled manually.

During power up press and hold the INC button.



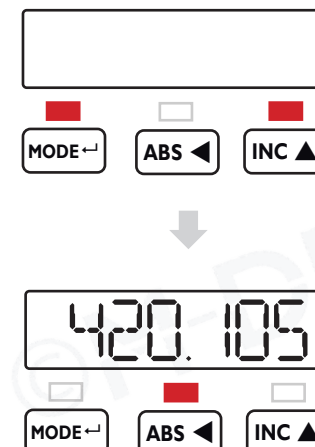
The right digit will flash. Use the UP arrow to scroll through 0 ~ 9 to select desired number. Press left arrow to skip to next left digit. Repeat above until desired datum value is displayed. Press MODE key to save.



With the function activated in the set up menu. Power up the console. The display will not show a value but the led above MODE and INC will be lit.

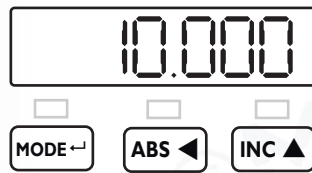


Travel the encoder, once the reference point is detected the display will start counting from reference value.



Manual Recalling Reference Datum Value

Once a fixed reference datum value is saved this can be recalled by pressing and holding the ABS key and short press on the MODE will recall the datum.



Display Unit Set Up

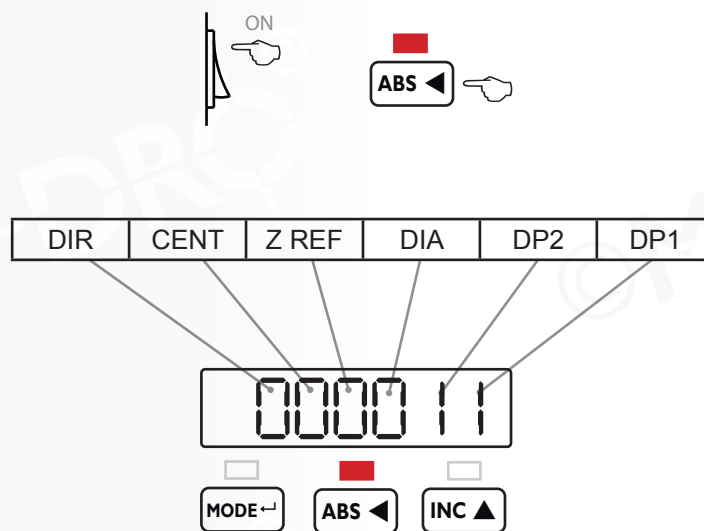
I.1 General Set Up

Turn the unit on using the power switch located on the rear panel. During power up press and hold the button(s) indicated to enter the setup parameter.

- 1 - Function active
- 0 - Function inactive

When you have entered a set up menu, use the up arrow to change the value of the flashing digit and press the left arrow key to move to the next digit.

During power up press and hold the ABS button.

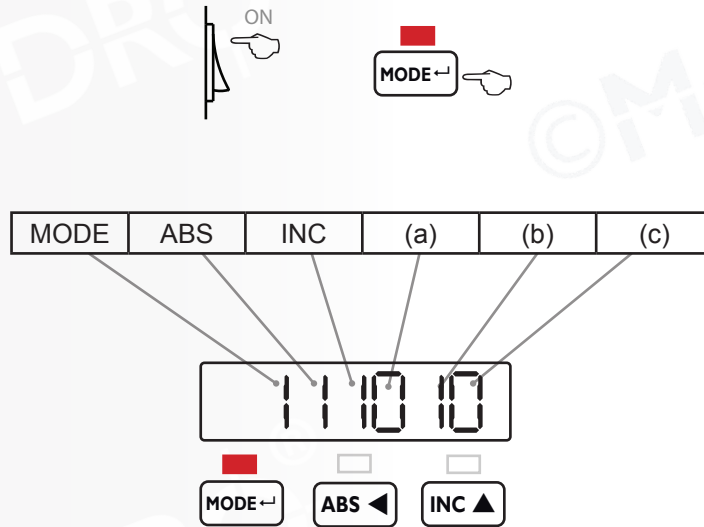


DIR	Change the positive and negative scale count direction.
CENT	Centre find function
Z REF	Encoder reference datum trigger zero (or preset)
DIA	Radius or Diameter display
DP2	Display 2 decimal places
DP1	Display 1 decimal place. (set DP2 and DP1 to active for 3 decimal places)

Press MODE key to save changes and switch unit off.

1.2 Key Locking

During power up press and hold the MODE button.



MODE	1 - Key active ~ 0 - key locked
ABS	1 - Key active ~ 0 - key locked
INC	1 - Key active ~ 0 - key locked
(a)	Set to 0 for correct operation
(b)	Set to 1 for correct operation
(c)	Set to 0 for correct operation

Press MODE key to save changes and switch unit off.

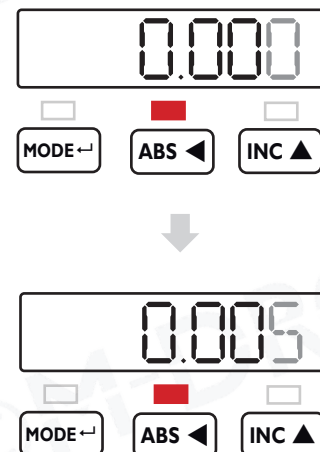
1.3 Resolution Setting

During power up press and hold the ABS & INC buttons.



The right digit will flash. Use the UP arrow to scroll through 0 ~ 9 to select desired number. Press left arrow to skip to next left digit. Repeat above until the encoder resolution is displayed. Press MODE key to save changes and switch unit off.

Acceptable setting range: 0.001 ~ 0.999mm



1.4 Linear Error Correction

A linear compensation value can be calculated from actual measured results taken using high accuracy standards.

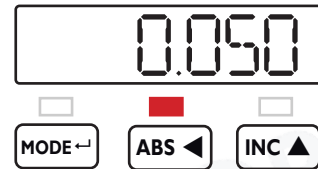
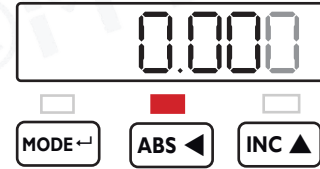
Acceptable setting range: 0 ~ +/-999 microns per 1m

For example: An error of +5um per 100mm would require a compensation value 50um per m.

During power up press and hold the MODE, ABS & INC buttons.



The right digit will flash. Use the UP arrow to scroll through 0 ~ 9 to select desired number. Repeat above until the encoder resolution is displayed. Press MODE key to save changes and switch unit off.



Troubleshooting

Symptom	Solution
Console will not switch on.	<ul style="list-style-type: none"> • Check the power cable is connected and switched on. • Check the power switch on rear of unit is switched on.
The display works but gives erratic reading, the last digit fluctuates and jumps to new figures at random.	<ul style="list-style-type: none"> • There maybe excessive wear or play in the machine slide ways, which the display is reading. Make the necessary adjustments to slide ways. • There maybe excessive vibration generated from the machine slide ways and moving parts. Make the necessary adjustments to the machine. • The linear encoder may not be mounted securely enough or there maybe to much flex in the mounting brackets. • Reset all setting back to factory settings
Readings are not correct.	<ul style="list-style-type: none"> • Check the connections of the linear encoders are sound and correct scale is connected on each axis. • Check the resolution is set correctly for the linear scales being used. • Check the radius/diameter mode. The X-axis will display double when in the diameter mode. • Check the Linear Error Compensation. • Check the linear scale and its cable for damage. • Check there is no binding or physical obstruction in the path of the encoder movement. • Check the linear encoder cable is not tangled and snagged. • Swap the linear encoder to another to confirm whether the scale is faulty or the console.
Buttons are not working	<ul style="list-style-type: none"> • Check button lock function is off.
Display only shows LED above MODE and INC on power up.	<ul style="list-style-type: none"> • Check encoder Encoder reference datum function is off.





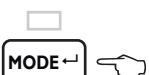











Cleaning

- Do not use corrosive or abrasive cleaning materials.
- Do not use compressed air.
- Disconnect the power supply before cleaning
- Use a small amount of mild soap to a lint-free cloth to wipe over the display console. Avoid the connectors on the rear of the display.

Factory Default Settings

Press and hold the following keys and switch on the display.

Factory Default

	→	
	→	
 	→	
	→	
 	→	
  	→	

Warranty

For warranty information, please go to www.machine-dro.co.uk

Notes

Contact Details

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