
MONitor

The Digital Display has the ability to monitor a position to detect position drift or measurement variance. To activate the monitoring mode, position the readhead to the desired location and momentarily press the **MON** key. The MON symbol will flash on the display to indicate that the position monitor mode is active.

If the readhead moves outside the programmed tolerance the displayed reading flashes, indicating a drift condition. When the readhead is moved back within the programmed tolerance, the displayed reading will stop flashing.

To exit the monitor mode, momentarily press the **MON** key. The MON symbol will stop flashing and the currently displayed position will also stop flashing.

NOTE: Position monitor mode can only be activated while in the ABS measuring mode. If the ABS/INC key is depressed while monitoring, the position-monitoring mode is automatically exited.

The display can be programmed to automatically enter or exit the MONitor mode based on elapsed time or movement of the encoder.

If the programmable **auto monitor** is enabled (Programming parameter Pr19 set to 1), the Digital Display will automatically enter monitor mode after either 30 or 60 seconds of no encoder motion. If the programmable auto monitor is disabled, the ProScale will automatically exit monitor mode if the encoder is moved beyond a programmable distance from the monitored position. This option, in conjunction with auto monitor activation, allows the ProScale to be kept in monitor mode without manually pressing the monitor key.

(See Programming Parameters 19,20, 21. Factory default is OFF.)

SEND

The Digital Display provides an output port that can be used to send measurement information to a compatible SPC device such as a printer or data acquisition unit. After connecting the SPC device to the 10 pin connector on the display, the user may initiate the data transmission by momentarily pressing the **SEND** key. This signals the SPC device to acquire the data from the digital display.

Pressing the **SEND** key displays “ **Snd** ” on the display for 1 second to show activation of the send function (even if no SPC device is attached to the ProScale).

The data format and connector style of the ProScale SPC output is the same as Mitutoyo SPC. This is an industry standard that can be interfaced with most available SPC products including multiplexers, RS232 converters and PC plug-in boards. Data from the ProScale is sent to the SPC connector in either millimeters or decimal inches, whichever is currently displayed on the LCD.

If no SPC device is attached to the display, the SEND key has no other function.

See *Section 6 Accessories* for interface and data acquisition products descriptions.

F1 / F2

These keys are used for special features and/or Custom programming functions.

Programming

Several functions of the digital display are user programmable. The following instructions describe what features are available and how to change the system's factory defaults to customize the display for your application.

The keys pictured have multiple functions. Timing, which is how long a key is depressed, and the combination of the keys pressed is important. This manual uses the term "*momentarily*" to describe a key press of typically less than 1 second. Whereas "*press and hold*" is used imply a key press of typically longer than 1.5 seconds. As an example; when using a PC keyboard to type a CAPITAL letter you would "*press and hold*" the SHIFT key and "*momentarily* depress the appropriate letter key.

The "*function*" associated with the key(s) pressed is executed on the key *RELEASE*, not the key *DEPRESS*. This is important since some keys execute different functions based on how long they are depressed. These key operations, once tried, quickly become intuitive.



To enter programming mode, *press and hold* the **MODE** key and then *momentarily* press the **0** (zero) key. The **MODE** key must be held for approximately 1 second before the depression of the **0** (zero) key.

Once you are in the Programming Mode, *momentarily* pressing the **MODE** key will advance through the Programming Parameter list.

To step backwards in the Programming Parameter list *press and hold* the **ON/OFF** key and *momentarily* press the **MODE** key.

Momentarily pressing the **+** (plus) key while displaying a Programming Parameter will increase the parameter setting.

Momentarily pressing the **-** (minus) key while displaying a Programming Parameter will decrease the parameter setting.

Momentarily pressing the **0** (zero) key while displaying a Programming Parameter will revert the parameter to its factory default setting.

CAUTION: The **Limit Mode (See Programming Parameters 14,15 16 17)** functionality is still active even while the display is in programming mode. Changing LIMITS may result in the Limit/Monitor Signal hardware output becoming active immediately.

To exit programming mode, *press and hold* the **MODE** key and then *momentarily* press the **0** (zero) key.

NOTE: The display will automatically exit programming mode after 60 seconds of no key activity.

Programming Parameters are listed below. Values in [] are the available range of values that can be programmed for that entry. Factory defaults are shown in **bold**.

Pr0 – Encoder Direction [0,1]

Change value to reverse the direction of measurement readings.

Pr1 – Enable/Disable Segment Offset [0, 1]

0 = For ABSOLUTE scales shorter than 430mm, (16.9in). ALL Incremental scales
1 = For All ABSOLUTE scales longer than 430mm, (16.9in).

Pr2 – High Speed Readhead [0, 1]

0 = Normal Readhead

1 = High Speed Readhead

Use this setting *only* if instructed by special instructions included with High Speed Readheads. A setting of 1 will impact battery life.

Pr3 – Enable/Disable the +, - and ZERO keys [0,1]

0 = Disables operation of Zero, + and – keys (Display will be in Lock Mode).

1 = Enables operation of Zero, + and – keys.

Pr4 – Display Resolution [0, 1, or 2]

Sets the displayed resolution in *decimal* mode. (No change in fractions mode.)

0 = Reduced resolution Inch = xxx.xx MM = xx.x

1 = Normal resolution Inch = xxx.xxx MM = xx.xx

2 = Increased resolution Inch = xx.xxxx MM = xx.xx (Inch mode only)

Auto scaling will allow measurements of over 100 inches when in high resolution.

Measurements over 100 inches will automatically be reduced to 3 decimal places.

Pr5 – Metric Display Units [0, 1]

Controls whether the measured value is displayed in millimeters or centimeters when in metric mode.

0 = millimeters

1 = centimeters

Pr6 – Disable Fractions/Inches [0, 1, 2]

0 = All measurement modes (millimeters or centimeters, inches and fractions)

1 = No Fractions. Only decimal inches and metric units* will be displayed.

2 = Only Metric. No Imperial (decimal inches or fractions) will be displayed.

* Pr5 will determine if mm or cm are displayed for metric units.

Pr7 – Scaling Factor [.001 .. 99.999] **Default = 1.000** (No Scaling.)

The multiplier applied to the measurement. Scaling factors less than 1.000 will make the displayed measurement less than the actual measurement. Scaling factors greater than 1.000 will make the displayed measurement greater than the actual measurement.

Pr8 – Automatic Power Off [0 to 60] **Default = 15.**

Sets the amount of time in ‘minutes without activity’ before the display automatically turns off.

0 = Disables Auto Off.

Encoder motion or ON/OFF key “wake-ups” the display and resets the timer.

Pr9 – Auxiliary Keys Enable/Disable [0..7]

0 = ABS/INC, MON and HOLD Disabled

1 = ABS/INC Key Enabled

2 = MON Key Enabled

4 = HOLD Key Enabled

7 = All Keys Enabled

To enable keys, add up combination of key values. A value of 2 enables only the MON key. A value of 7 enables all 3 Keys.

Pr10 – Offset Addition Enable [0, 1]

0 = Offset Addition Disabled

1 = Offset Addition Enabled.

SEE ALSO Pr11, Pr12, Pr13

Pr11 – Offset Addition 1 [-999.999 to 999.999in] or [-9999.99 to 9999.99mm]

When offset 1 is selected (see section 4 -*Offset Addition*), this value is added to the current ABS position. **Default = 1.000IN**

Only active if Pr10 is set to 1. Note: Default is set in Inches

Pr12 – Offset Addition 2 [-999.999 to 999.999in] or [-9999.99 to 9999.99mm]

When offset 2 is selected (see section 4 -*Offset Addition*), this value is added to the current ABS position. **Default: 1.500IN**

Only active if Pr10 is set to 1. Note: Default is set in Inches

Pr13 – Offset Addition 3 [-999.999 to 999.999in] or [-9999.99 to 9999.99mm]

When offset 3 is selected (see section 4 -*Offset Addition*), this value is added to the current ABS position and displayed. **Default: 2.000IN**

Only active if Pr10 is set to 1. Note: Default is set in Inches

Pr14 – Output Signal Mode [0, 1]

Configures the hardware output signal for activation on MONitor drift conditions or Upper/Lower limit alarm conditions. (24VDC displays only)

0 = Monitor drift,

1 = Limit.Alarm

SEE ALSO Pr15, Pr16, Pr17

Pr15 – Output Polarity [0, 1].

Used to configure the signal output. N/O or N/C in relation to circuit ground.

0 = N/O, the output is Normally Open (not conducting to ground).

1 = N/C, the output is Normally Closed (conducting to ground).

Pr16 – Lower Limit [-999.999 to 999.999in] or [-9999.99 to 9999.99mm]

Sets the lower limit alarm value. **Default = 0.000IN.**

Active only when parameter Pr14 = 1. Note: Default is set in Inches

Pr17 – Upper Limit [-999.999 to 999.999in] or [-9999.99 to 9999.99mm]

Sets the upper limit alarm value. **Default = 5.000IN.**

Active only when parameter Pr14 = 1. Note: Default is set in Inches

Pr18 – Drift Tolerance [.01 to 9999.99mm] or [.001 to 999.999in].

Range of motion allowed (+ or -) while in MONitor mode. **Default = .01IN.**

Note: Default is set in Inches

Pr19 – Automatic Monitor ON Time [0, 1 or 2]

Configures display to automatically activate MONitor mode after 30 or 60 seconds of encoder inactivity.

0 = disabled. 1 = 30 seconds. 2 = 60 seconds.

Pr20 – Automatic Monitor OFF Enable[0, 1]

Configures display to automatically exit MONitor mode after a programmed distance (**Pr21**) has been exceeded from the drift tolerance position (**Pr18**).

0 = disabled 1 = enabled.

Pr21 – Automatic Monitor OFF Distance [0.001 to 999.999in] or [0.01 to 9999.99mm].

The distance that must be exceeded from the drift tolerance position (**Pr18**) to activate auto monitor off. **Default = 0.500in**

This parameter is relevant only when **Pr20=1**. **Note: Default set in Inches**

Pr22 – Backlight ON time [0, 1, 2, 3 or 4]

The ON time of the LCD backlighting (24VDC displays only).

0 = always off. 1 = 3 seconds. 2 = 7 seconds. 3 = 15 seconds. 4 = always on.

Backlighting is activated when a key is pressed.

Pr23 – Future Enhancement DO NOT CHANGE [0,1,2] **Default =1**

Pr24 – Future Enhancement DO NOT CHANGE [0..63] **Default =0**

Pr25 – Future Enhancement DO NOT CHANGE [0..31] **Default =0**

CAUTION: Pressing and holding the ON/OFF and MODE key for 10 seconds while the display is turned off will perform a full segment LCD test AND re-set all programming parameters to factory defaults