Accurate
TECHNOLOGY INC.
Linear Digital Measuring Systems

DIGI Compact LCD Readout

Firmware Version b 1.100 or greater

Installation & Operation

Warranty

Accurate Technology, Inc., warrants this product against defective parts and workmanship for 1 year commencing from the date of original purchase. Upon notification of a defect, Accurate Technology, Inc., shall have the option to repair or replace any defective part. Such services shall be the customer's sole and exclusive remedy. Expenses incidental to repair, maintenance, or replacement under warranty, including those for labor and material, shall be borne by Accurate Technology, Inc. (Including freight or transportation charges during the first 30 days).

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To request repair work (either warranty qualified parts or not), contact Accurate Technology, Inc. directly by phone, fax, or e-mail. A Returned Merchandise Authorization (RMA) number is required before returning a product for repair.

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SAFETY WARNING

Before installing this product on any machinery Turn off the machine and disconnect power.

SAFETY WARNING

P/N 800-1361-001 Rev 10-2016

Table of Contents

SECTION 1 GENERAL INFORMATION

Introduction

This Digital Readout, (DRO), is one of two available from Accurate Technology for use with DIGI Family measuring systems and products.

The following pages describe the set-up and operation of the **Compact Readout** when used with DIGI Family products.

What This Manual Includes

This manual includes information for:

Digital Readout, LCD, Compact
Part Number: 700-1600-710
Firmware Version b 1.100 & higher
*(Press and hold the **DATUM** key for 7 seconds to display the readout firmware version.)*

Specifications

Resolution	.1inch .1mm or .01inch .01mm or .001inch .01mm or 1/16, 1/32 or 1/64 inch
Repeatability:	.001inch or .01mm
Readout Range:	± 999.999 in; ± 399 63/64 in; ± 9999.99 mm
Operating Power:	1 CR123 Lithium Battery
Operating Temp:	40 to 110°F

This Product was MADE IN USA

Mounting the Readout

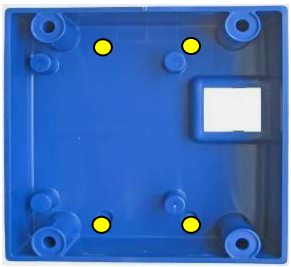
Consult the *Installation* document you received for installation of other components of your measuring system.

Surface Mount Configuration

The Compact readout may be mounted:

- Using Velcro or Double sided tape.
- Punch out any of the four holes from the inside of the back case.
- Using any of the four holes on the back of the case.

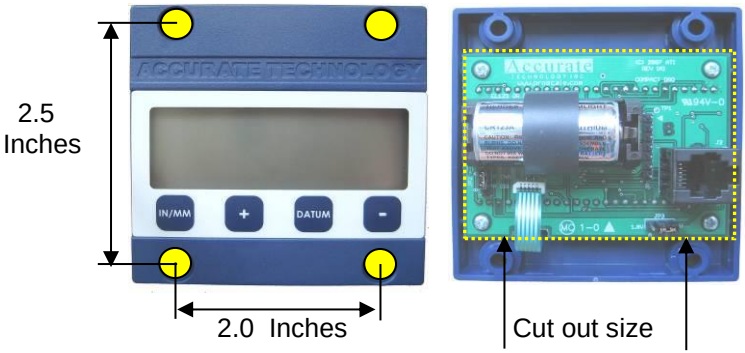
NOTE: Use a #4 or M3 screw *not longer than 3/8 " (9mm).*



Panel Mount Configuration

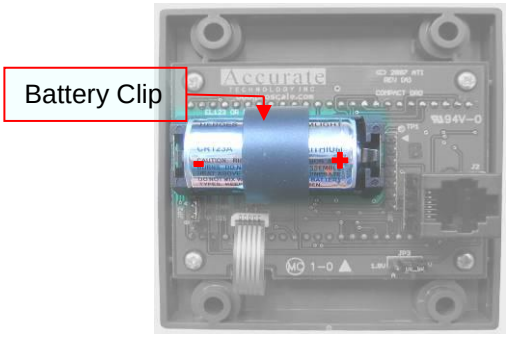
A cutout should be made in the panel of at least 2.2 x 1.7 inches, (56 x 43mm) but no larger than 2.6 x 2.0 inches (66 x 50 mm).

Install the readout by screwing the four screws in the each corner of the front case directly into the panel. The rear half of the readout case is not necessary when it is used in a panel mounted configuration with a panel of sufficient thickness to hold the 4 mounting screws. If your panel is too thin to hold screws, you may 'sandwich' the panel between the front and rear halves of the readout case and install 4 screws long enough to extend through the entire assembly and into the rear half case of the readout.



Changing the Battery

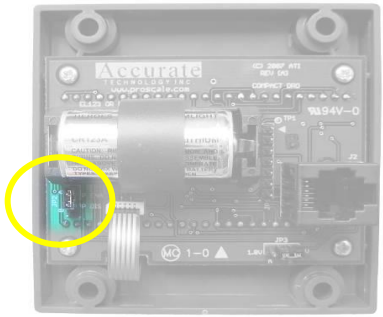
A low battery indicator will appear in the lower left corner of the screen on the DRO when a new battery is needed.



To replace the battery, remove the 4 screws in the corners of the readout case. Separate the two cases, remove the battery clip and the old battery. Install a new CR123 3V, or equivalent, Lithium battery, noting the proper orientation. Replace the battery clip and back case half, and reinstall the 4 screws.

Circuit Board Jumpers

JP1 **FACTORY USE ONLY**



JP2 **Programming Lock-out**

The Front panel programming of the Compact readout can be enabled or disabled. Programming is enabled when the shorting jumper is installed on position A. To disable programming, install it on position B. When programming is disabled, the user cannot access the programming functions via the front panel as described in the PROGRAMMING. This provides a method of configuring the readout with specific parameters then preventing unauthorized or accidental configuration changes.

Jumper on position A: Programming Enabled
Jumper on position B: Programming Disabled

JP3 **Encoder Voltage**

FACTORY DEFAULT = B
(Do not change)

SECTION 2 OPERATION

Readout Keys

The keys on your readout, illustrated below, have multiple functions.

Timing, (how long a key is depressed) is important. This manual uses the terms "*momentarily*" to describe a key press of less than 0.8 seconds and *"press and hold*" to describe a key press of 2 seconds or longer.

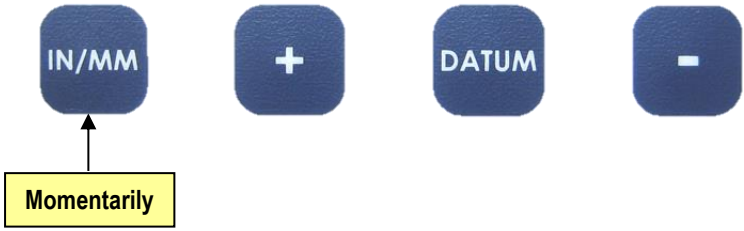
The execution of a key's function is performed on "key release for momentary" key presses and after the allotted "time has elapsed for press & hold" operations. **See Below.**

	Momentarily	Press & Hold
How long a key is pressed?	Less than .8 seconds	More than 2 seconds
When key function is executed?	On key release	While holding

Key Press and Function Summary

	Momentarily Press	Press & Hold
IN/MM	Cycles measurement units displayed: inches, fractions, mm	After 3 seconds toggles between ABS/INC
(in programming mode)	Increments program parameter list	no effect
+ (plus key)	increments displayed value	increments faster
(in programming mode)	increments parameter value	increments faster
DATUM	forces reading to programmed value	After 7 seconds displays FW version After 9 seconds enters Programming After 3 seconds exits programming
(in programming mode)	forces parameter to factory default	no effect
- (minus key)	decrements displayed value	Decrements faster
(in programming mode)	decrements parameter value	Decrements faster

IN/MM key

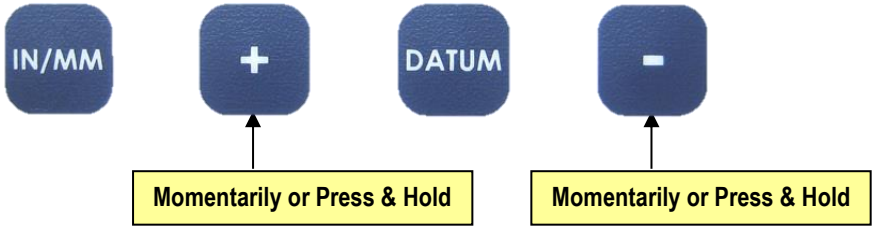


The Compact readout can display measurement/position information in inches, fractions or millimeters. To change the display mode, momentarily press the **IN/MM** key. With each key press, the DRO cycles through decimal inches, fractions (16ths, 32nds, 64ths) and millimeters.

When the readout is in 1/16 or 1/32 inch fraction mode, a series of 'bars' in the upper right corner of the LCD, each representing 1/64th of an inch, may appear. For example; the LCD pictured below left is set to display 32nds of an inch. As you can see there is one 'bar' in the upper right corner of the LCD indicating an additional 1/64 of an inch measurement making the true, full resolution measurement 2 13/64ths.
Some users find this resolution unnecessary and prefer the 16ths or 32nds mode instead. For better resolution, switch to 64ths mode. For the best resolution switch to a decimal mode – inches or millimeters.

When the measurement is greater than 99 63/64 inches, a **+100** and/or **+200** will illuminate in the upper right portion of the display to indicate this amount must be added to the displayed reading. For example; the LCD pictured above right is indicating a measurement of 151 39/64 inches. If the measurement was 351 39/64 inches, the **+100** and **+200** will be illuminated on the display.

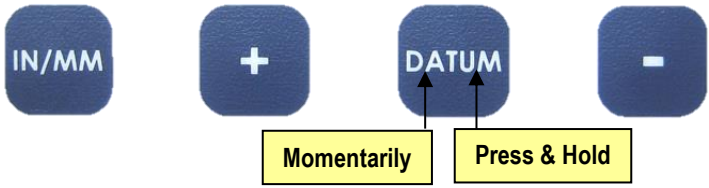
+ & - Keys



Momentarily pressing the **+** or **-** key increments or decrements the currently displayed value by one unit of measurement.

Pressing and holding the **+** or **-** key will cause the displayed value to change continuously. Continue pressing the key to cause the amount of change to speed up. This allows for quick adjustments over a large range of values. These keys may be locked out to prevent accidental offset entries.
See Section 2 Programming, ***Parameter Pr3***

Datum Key



Momentarily pressing the **DATUM** key forces the readout to a user programmed value. This can value can be zero or any other displayable value.
See Section 2 Programming, ***Parameter Pr1***

Pressing & Holding the **DATUM** key:

- For 7 seconds will display the firmware version.
- For 9 seconds will enter programming mode.
- For 3 seconds will exit programming mode.

The **DATUM** key can also be locked out to prevent accidental entries.
See Section 2 Programming, ***Parameter Pr3***

Absolute vs Incremental Measurements

The Compact readout provides the ability to make relative, or incremental, measurements and still retain the measurements system's absolute position in memory. To enter the Incremental (or return to Absolute) measurement mode, press and hold the **IN/MM** key for 3 seconds. The **ABS** or **INC** indicator will illuminate on the display.

While in Incremental mode, the **+** and **–** keys are used to set offsets and the **DATUM** key is used to zero the display.

Example of an Incremental Measurement (with no offsets):

1) Enter the incremental mode (press and hold the **IN/MM** key 3 seconds.)
2) Make a measurement.
3) Momentarily depress **IN/MM** or **DATUM** key to re-zero the readout.
4) Make another measurement.
5) Repeat as necessary.

Example of an Incremental Measurement (with offsets):

1) Enter the incremental mode (press and hold the **IN/MM** key 3 seconds.)
2) Set the desired offset by depressing the **+** or **–** key.
3) Make a measurement.
4) Momentarily depress **IN/MM** key to reset the readout and apply the offset entered previously, or momentarily depress the **DATUM** key to re-zero the display before the next measurement.

NOTES:

a. Offsets are stored when leaving the Incremental mode. Any offsets will be recalled the next time you switch from Absolute to Incremental mode.

b. While in Incremental mode, the Units of Measurement cannot be changed. If the display is reading **mm** when you enter the INC mode you cannot change to **inches** without first returning to the ABS mode.

Key Lock

The user can lock-out the operation of the **+, DATUM** and **–** key functions to prevent accidental changes of the currently displayed value.
To lock these keys set
See Section 2 Programming, ***Parameter Pr3***

Resolution

The readout can be configured to display measurements 3 resolutions.

1. Low– the resolution is .1in or .1mm.
2. Normal– the resolution is: .01in or .01mm.
3. High– the resolution is: .001in or .01mm

The display of fractions remains the same for all settings: 1/16, 1/32 & 1/64
See Section 2 Programming, ***Parameter Pr4***

Measurement Units

The measurement units displayed on the Readout are user configurable. The table below provides a matrix for selecting the measurement units that may be displayed when pressing the **UNITS** key.
See Section 2 Programming, ***Parameter Pr11***

Programming Parameter Pr 11 Value	Measurement Units Displayed
0	All inch units, and millimeters
1	Millimeters only
2	Decimal inches and millimeters
3	Decimal inches and centimeters
4	All inch units, and centimeters
5	Centimeters only
6	Decimal inches only

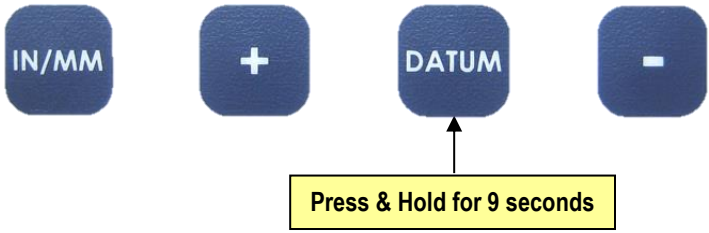
Auto on/off

To prolong battery life, the Readout has a built-in function that turns off the Readout after a period of no movement or key activity. The Auto On/Off function is programmable from 0 (always on), to 240 (minutes) before entering sleep mode. Press any key or move the measurement system to wake up the Readout. Any key press or system motion while the Readout is awake restarts the Auto On/Off timer.
See Section 2 Programming, ***Parameter Pr12***

Readout Programming

Several functions of this readout are user programmable. The following describes what features and functions are available and how to change the factory defaults to customize the system to suit your application needs.

To enter Programming mode, press and hold the **DATUM** key for 7 seconds. After approximately 7 seconds the readout firmware version (**C 1.xxx**) will be displayed for 2-3 seconds and then the readout will enter programming mode. **PR 1** is displayed, immediately followed by the programmed value for Pr1. Release the **DATUM** key. You are now in programming mode.



Once you are in the Programming mode, momentarily pressing the **IN/MM** key will advance through the Programming Parameter list, first displaying the Programming Parameter number, Pr x, then the currently programmed value for that parameter.

Momentarily press the **+** key to increase the parameter value setting.

Momentarily press the **-** key to decrease the parameter value setting.

Momentarily press **DATUM** to reset the parameter to the factory default value.

Exit Programming

Press and hold the **DATUM** key for 3 seconds.

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

Programming Parameters

The Digi readout programming parameters are listed below.
Values in **[ ]** are the available range of values that can be entered for that parameter. Factory defaults are shown in **Bold Red**.

NOTE: Programming parameters are not sequentially numbered due to firmware differences between measurement systems and the provision for future enhancements, functions and custom features.
Some Parameters are not applicable to all Digi systems.

Pr 1 – DATUM Key Value **[0** to ± 999.999in**]** or **[0** to ±9999.99mm**]**
The programmed value that will be recalled whenever the DATUM key is pressed during normal operation.
Default = 0

Pr 2 – Reverse Readings **[0** or 1**]**
This parameter controls the sign of travel (positive vs negative) when the measuring system is moved.
Default = 0

Pr 3 – Key Lockout **[0** or 1**]**
This parameter controls the operation of the +, -, and DATUM keys. If enabled, (set to 1), these keys will not function and the **LOCK** symbol will appear on the display. This prevents accidental changes when depressing these keys during normal operation.
Default = 0

Pr 4 – Readout Resolution **[**1, 2 or **3]**
This parameter sets the number of places to the right of the decimal point on the display.
A value of **1** will display x.x.
A value of **2** will display x.xx
A value of **3** will display x.xxx
Default = 3
NOTES:
Decimal inch mode has a maximum of 3 places.
Millimeter mode has a maximum of 2 places (even if parameter is set to 3.)
Fractions mode is not affected by this setting.

Pr 5 – Wake Up Movement ····· **[0.10 to 10mm]**
This parameter sets the amount of encoder/sensor movement required to automatically wake up the Readout (when it is turned off or in sleep mode).
Default Value = 0.10mm

Pr11 – Readout Measurement Units ····· **[0 to 6]**

This parameter controls the type of measuring units the Readout displays when the **UNITS** key is pressed. The table below illustrates the possible combinations of measuring units that will be displayed by changing this parameter.

Default Value = 0

Pr 11 Setting	Displayable Units
0	All inch units and millimeters
1	Millimeters only
2	Decimal inches and millimeters
3	Decimal inches and centimeters
4	All inch units and centimeters
5	Centimeters only
6	Decimal inches only

Pr12 – Readout Auto-Off Time ····· **[0 to 240]**

This parameter changes the amount of time before the display turns off to conserve battery power. The value is the number of minutes of idle operation (no movement or key presses) before the display turns off. When this parameter is enabled (≠ **0**), pressing the **ON/OFF** key or movement of the encoder or system will wake up the Readout.

A value of '**0**' disables the Auto Off feature (the Readout is always on).

Default Value = 15 (minutes)

Pr13 – Linear Compensation ····· **[0.00001 to 9.99999]**

This parameter invokes a linear multiplier correction in the Readout that is applied to the actual measurement prior to any offsets. This adjusted measurement is then displayed on the Readout. This is useful, for instance, if you would like to display half, double, or other values that can be achieved by multiplying the actual measurement by the value of the parameter setting.

Use care when enabling this function. It will force the readout to display a value different from the actual measurement or position.

This Programming Parameter does not apply to all Digi Systems and products. *DO NOT change this value unless instructed to do so by a factory technician!*

Default Value = 1.00000

Restore All Programming to factory settings

Remove the battery. Press and hold **IN/MM** key while reinstalling the battery.

Frequently Asked Questions

What F/W (Firmware) version do I have?

Press and hold the **datum** key for 7 seconds to display the readout firmware version.

The readings are "backwards"?

You can change reading direction of the measurements by changing the value of **Programming Parameter Pr 2.**

The keys don't seem to do what they are supposed to do.

Timing, (how long a key is depressed) is important. This manual uses the terms "*momentarily*" to describe a key press of less than 0.8 seconds and *"press and hold*" to describe a key press of 2 seconds or longer.
The execution of a key's function is performed on "key release for momentary" key presses and after the allotted "time has elapsed for press & hold" operations

What does `no Enc` *mean?*

If the encoder cable is unplugged from the readout , ***`no Enc`*** *will appear on the display. To clear: Be sure the encoder is on the scale and plugged into the readout.*

What does `b FAIL` *mean?*

When the readout displays this message it means the battery voltage has dropped to a level where reliable operation is no longer possible. Install new batteries to clear this message.

What does `P FAIL` *mean?*

When the readout displays this message it means the battery voltage has dropped to a level where reliable programming is not possible. Install new batteries to clear this message.

Thank you for choosing an
AMERICAN MADE PRODUCT

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