

# Accurate

TECHNOLOGY INC.

*Linear Digital Measuring Systems*

# ProSet™



## User Manual

*Firmware V2.0 and Higher*



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# Warranty

Accurate Technology, Inc., warrants the ProSet against defective parts and workmanship for 3 years 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).

Except as expressly provided in this warranty, Accurate Technology, Inc., does not make any warranties with respect to the product, either expressed or implied, including implied warranties of merchantability or fitness for a particular purpose, except as expressly provided in this agreement.

Accurate Technology, Inc., shall not be liable for any special, incidental, or consequential damages or for loss, damage or expense directly or indirectly arising from the customer's use of or inability to use the equipment either separately or in combination with other equipment, or for personal injury or loss or destruction of other property, or from any other cause.

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.

## Accurate Technology, Inc.

+1 828.654.7920

+1 828.654.8824 (F)

[www.proscale.com](http://www.proscale.com)

[info@accurate-technology.com](mailto:info@accurate-technology.com)

### ***SAFETY WARNING***

**Before installing ProSet on any  
machinery:**

**Turn off the machine and  
disconnect the power.**

### ***SAFETY WARNING***

P/N 800-4060-001 Revision C

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## Introduction

ProSet is a ProScale Model 150-10 system with custom software in the digital display.

It is designed to be installed on the top and outside heads of a moulder to help reduce setup time when changing cutterheads.

After a new cutterhead is installed, the operator sets the digital display to “**radius**” mode by depressing a front panel key. He then adjusts the spindle position until the measured radius of the cutterhead is displayed. Depressing the key again sets the ProSet into “**width**” mode. Final adjustment of spindle position is made while monitoring the ProSet which is now displaying the final finished product dimension.

## Specifications

<b>Measuring Range*:</b>	0-250mm (10in)
<b>Accuracy:</b>	± .08mm; (.003 in)
<b>Resolution</b>	.01mm; (.001in)
<b>Repeatability:</b>	.01mm; (.001in)
<b>Display Range:</b>	± 9999.99 mm; ± 999.999 in; ± 399 63/64 in
<b>Operating Temp:</b>	0 to 51°C; 32 to 120°F
<b>Temp Coef:</b>	25ppm/°C; 13ppm/°F
<b>Max. Slew Rate:</b>	400 mm/sec. (15 inches/sec.)
<b>Encoder:</b>	6m (20'), six-conductor cable terminated by RJ12 connector.
<b>Dimensions:</b>	Available at <a href="http://www.proscale.com">www.proscale.com</a> .
<b>Warranty:</b>	Three years from date of purchase.

**\* MEASUREMENT lengths are approximately 100mm (4in) shorter than PHYSICAL lengths.**

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## Terminology

All ProSet systems consist of a **SCALE**, a **ENCODER**, and a **DIGITAL READOUT**.

The **SCALE** consists of a series of conductive patterns bonded to an aluminum extrusion.

The **ENCODER**, or readhead, contains a computer chip which transmits and receives signals to and from the scale. This data is then sent to the digital **READOUT**, where it can be displayed in millimeters, decimal inches, or fractions.

## Scale

All ProSet scales have a “zigzag” pattern on a green laminate.

To shorten ProSet scales. Call Accurate Technology for assistance, or visit: <http://www.proscale.com/other/absscalecut.htm>

**ProSet Scale Part # 700-1500-P10**



## Encoder

All ProSet encoders have an arrow on a label pointing in the direction of the “**BLACK END OF SCALE**”. Each ProSet scale will have one end painted black. This relationship is very important, since the encoder will work, but produce erratic results if installed backwards. To insure proper operation, be sure the arrow on the encoder is pointing toward the **BLACK** end of the scale.

The standard ProSet encoder has 20 ft. of cable. For special cable lengths, contact Accurate Technology, Inc.

**ProSet Encoder Part # 701-1500-240**



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## Digital Readout

- All ProSet LCD Readouts operate on 2 AA batteries.
- All Readouts have Auto Power Off and Auto Power On to deliver maximum battery life.
- All Readouts are programmable from the front panel with an internal jumper that allows front panel programming to be disabled.



**ProSet Digital Readout Part # 700-1600-600**

ProSet can be used on many brands and models of moulders. Therefore all installations will be a little different. It is the responsibility of the installer to follow the basics of good installation and choose the bolts, screws, or other mounting hardware for proper installation to assure reliable, error-free operation.

### Mounting the Scale & Encoder

1. Note the orientation of the Encoder on the scale. Be sure the arrow on the Encoder points towards the “**BLACK END OF SCALE**”. This orientation is critical for proper operation of ProSet. Be sure the mounting location for the Encoder and scale will allow this orientation. Take care when sliding the Encoder onto the scale so the brass “fingers” inside the Encoder do not get damaged. (A slight “wiggling” motion when installing the Encoder on the scale will simplify the process.)
2. Determine an appropriate mounting location for the system. Most applications of the ProSet will have the Encoder held stationary while the scale is passed through the Encoder. The ProSet will also operate properly if the Encoder is moved along the scale (see figures on next page).
3. If the Encoder is mounted stationary, the scale should be attached to a moving part of the moulder spindle using the *Connector Link*. Mount the Encoder using three screws or bolts. Mount one end of the connector link to the scale using an M5 (or 10-32) screw and the other end to the moving part. Check that the scale is properly aligned with the direction of motion of the moving part. Be sure both connections are secure or inaccurate/erratic readings could result. (The connector link compensates for small misalignments of the installation and acts as a *shear pin*).

(Note: Failure to use the connector link could void the warranty.)



*Connector Link*

- 
4. If you choose to hold the scale stationary and move the Encoder, you should use the *Guide Clip* to move the Encoder along the scale (see figure on next page). The connector link is not necessary in this configuration.

Mount the scale using a M5 (or 10-32) screw. Be sure the scale is properly aligned as the Encoder is moved (the Guide Clip will compensate for slight misalignment).

Adjust scale alignment as necessary.

For accurate measurements, the guide clip must be mounted perpendicular to the direction of travel of the Encoder. The guide clip should exert some pressure over the full range of travel on the Encoder so the two move as a single unit.



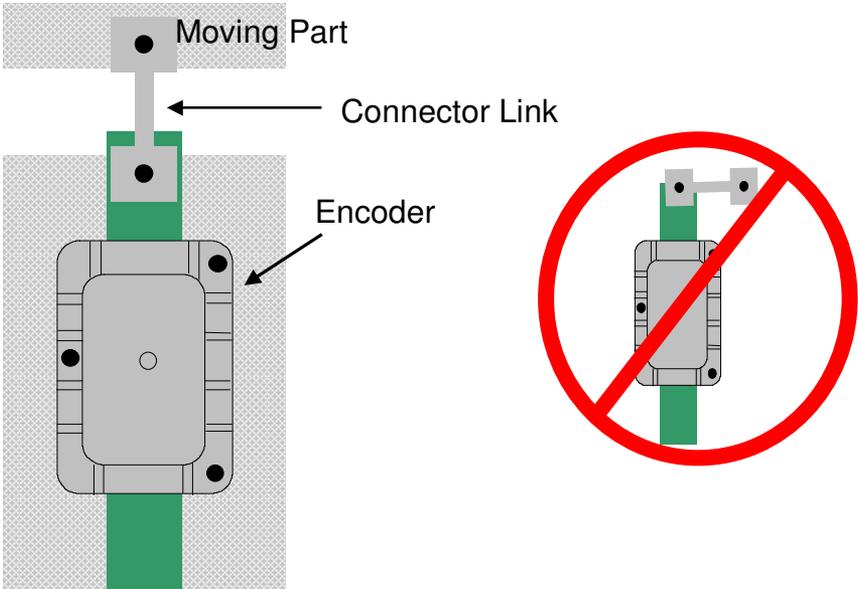
*Guide Clip*

*Note: Failure to use the guide clip could void the warranty.*

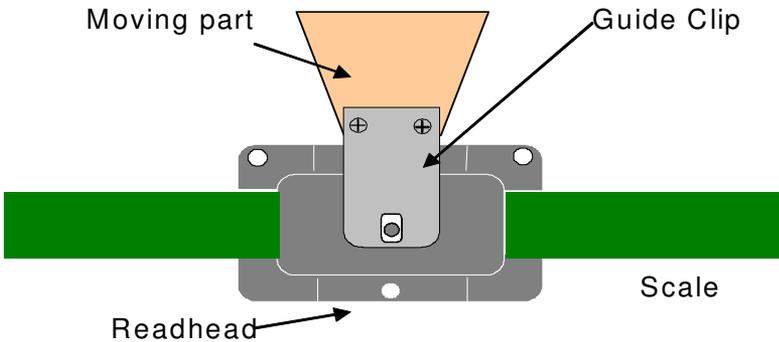
5. The Digital Readout may be mounted in a location which allows for easy viewing by the operator. (see page 10: *Mounting the Readout*) The location of all parts should also safeguard the cable from possible damage. ProSet wiring should be kept away from electrical wiring and motors. Plug the Encoder into the display. See Section 3: *Calibration* and Section 4: *Digital Readout Operation*.

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## Typical ProSet Installations



*Encoder stationary, Scale moves*



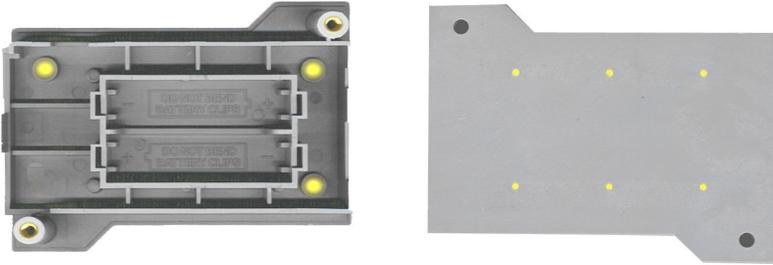
*Scale stationary, Encoder moves*

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## Mounting the Digital Readout

The ProSet Readout may be mounted:

- Using Velcro or Double sided tape
- Drilling out the 3 holes from the inside of the case
- Using any of the six holes on the back of the case which may tapped for M2 or 4-40 screws.



The Digital Readout should be cleaned periodically with compressed air to remove any dust on the lens and keys.

All mounting fasteners should be checked occasionally for tightness.

### Changing the Batteries

A low battery indicator will appear in the lower left corner of the LCD display when new batteries are needed.

Remove the screws in the upper right and lower left corners. Pull the cover off. Remove the old batteries. Reinstall new AA Alkaline batteries, noting the proper orientation. Replace the cover and tighten the screws.

## **CAUTION: DO NOT BEND BATTERY CLIPS!**

**THESE CLIPS ARE DESIGNED TO BE LOOSE WHEN THE CASE IS OPEN AND WILL COMPRESS AND SECURE THE BATTERIES IN PLACE WHEN THE CASES ARE SCREWED TOGETHER.**

**KEY TIMING**

The keys pictured below have multiple functions. Timing (how long a key is depressed) is important. This manual uses the term “*momentarily*” to describe a key *press and release* of less than .8 seconds. Whereas “*press and hold*” is used to describe a key *press and release* of 1 second or longer.



	<b>Momentarily</b>	<b>Press &amp; Hold</b>
<b>How long a key is pressed?</b>	Less than .8 seconds	More than 1 second
<b>When is key function executed?</b>	On key release	While holding

A function is executed on the “key release” for momentary key presses. A function is executed after the allotted time has elapsed for “press & hold” operations.

The ProSet must be calibrated before its initial use. This operation determines the actual position of the cutter arbor relative to the machine bed/fence.

**Enter CALIBRATION mode**

Press and hold the **ON/OFF** key, then momentarily press the **UNITS** key. Release both keys at the same time. The ProSet is now in calibration mode and the “**r**” and **mm** (or **in**) on the LCD should flashing.

**Set Initial ‘Radius’ Setting**

With the ProSet in Calibration Mode, use the ‘+’ or ‘-’ keys on the display to scroll to and set in the exact measured radius of the cutterhead installed on the spindle you are calibrating. The “+” or “-” keys on the digital display are used to adjust a reading. For instance, if you need to set the display to read greater than its current value, use the “+” key. Conversely, to reduce the current displayed reading, use the “-” key.

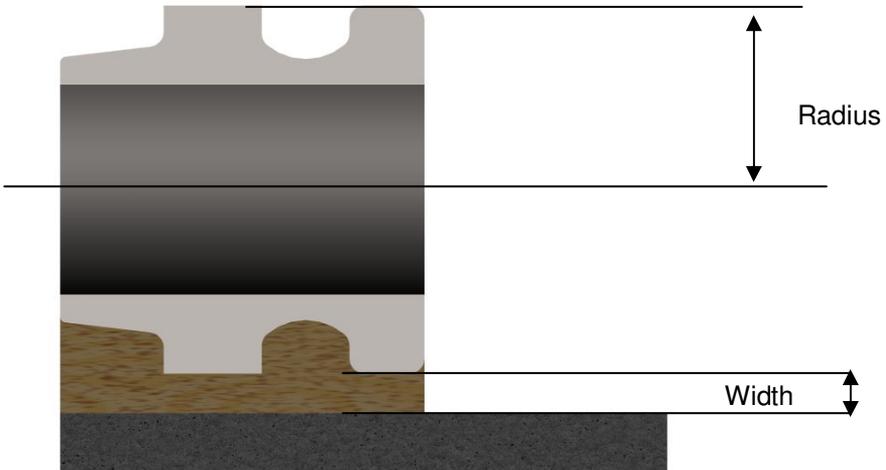
Note: When you press the ‘+’ or ‘-’ key, the display scrolls slowly for a couple seconds and then speeds up.

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## Set Initial 'Width' Setting

Depress the 'R/W' key on the display. The flashing 'r' will disappear but the **mm** (or **in**) indicator will continue to flash. At this point you can choose one of the following methods:

1. Carefully position the spindle such that the knife is barely touching the fence and set a value of '0' into the digital display. This will represent a width of zero for the final outfeed dimension. Or,
2. Run a sample piece of stock and accurately measure the minimum width of the sample. Enter this value into the digital display using the "+" or "-" keys, to represent the minimum final width of the out feed product.



## Exit CALIBRATION mode

Press and hold the **ON/OFF** key, then momentarily press the **UNITS** key. Release both keys at the same time. The ProSet is now in Operational mode and the "r", **mm**, or **in** indicators on the LCD should NOT be flashing..

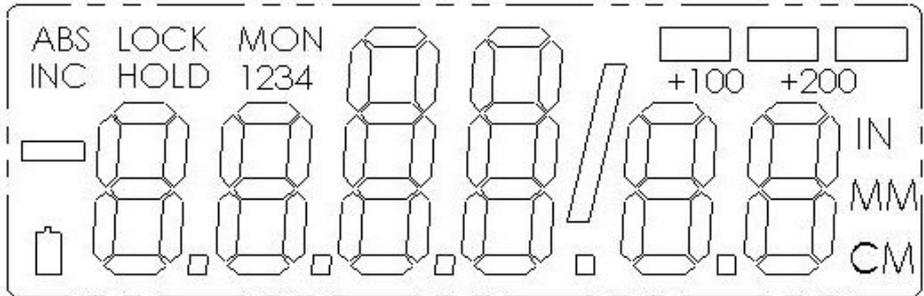
If the direction of movement (+ and -) on the digital display is opposite the desired direction, the display programming must be changed. See Section 4: *Programming (Programming Parameter Pr0)*.

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## **Maintenance**

Although the ProSet will operate in an environment of non-conductive debris such as sawdust, the system should be cleaned of excess debris occasionally. This will prevent premature damage to the scale or Encoder. Should the scale become difficult to move, check to see if debris has built up under the Encoder and remove if necessary. Find and remove any burrs which may have developed on the aluminum scale. Do not use any liquid lubricants on the scale assembly, as this may impede the Encoder's ability to operate properly and will attract other contaminants to the scale.

## The LCD



The above figure illustrates all the segments available on the Digital Display.

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

## Readout Keys



### Key Press Timing

The keys pictured above, found on all ProSet Digital Displays, have multiple functions. Timing, that 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 LETTER key.

In addition the key(s) "*function*" is executed on the key RELEASE, not the key DEPRESS. This is important since some keys execute different functions

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based on how long they are depressed. These key operations, once tried, quickly become intuitive.

### ON/OFF

Momentarily pressing the **ON/OFF** key will cause the display to turn on or off. The Firmware Version is displayed on power-up or when **ON/OFF** key is pressed. While on, if no key presses or positional changes occur within 15 minutes, the Digital Display will automatically turn itself off to conserve battery life. While off, if a position change is detected ( $\geq .05\text{mm}$  or  $.002\text{in}$ ) or the **ON/OFF** button is pressed, the display will automatically turn itself on with no loss of measurement information.

**(Programming Parameter Pr1. Factory default set to 15 minutes.)**

NOTE: Battery voltage can be displayed by pressing and holding the **ON/OFF** key for 5 seconds while display is turned on.

### UNITS

The digital display can show measurement information in Imperial or Metric. To change the current display mode, momentarily press the **UNITS** key. With each key press the display will cycle through decimal inches, fractional inches (1/16), (1/32), (1/64) and metric based on the setting of **Programming Parameter Pr2**.

When the display is in 1/16 or 1/32 inch fraction mode, a series of “bars” in the upper right corner of the LCD each represent an additional 1/64th of an inch measurement. For instance:.. When in 1/16 inch mode and three bars are showing, the measurement displayed is rounded *down* to closest 1/16 inch and each illuminated bar indicates an additional 1/64 of an inch (“heavy”) measurement. For better resolution switch to 1/32 or 1/64 fraction mode. For the best resolution switch to a decimal mode.

### + and – Keys (active ONLY in CALIBRATION mode)

The + (plus) and – (minus) keys are used to change the currently displayed position to a different value. The **DATUM** key on a ProSet switches between **R**adius and **W**idth modes. Momentarily depressing the + key increments the current position by one unit of measurement. Momentarily depressing the – key decrements the current position by one unit. Pressing and holding the + or – keys will cause the displayed position to change continuously. Holding down the key will cause the amount of change to speed up. This allows for quick adjustments over a range of large values. These keys are “locked out” when the display is not in NORMAL mode.

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## ProSet Operation

Whenever a new, or re-ground, cutterhead is installed, simply set the ProSet display to 'r' mode with the 'R/W' key – “r” flashing and mm (or in) not flashing. (ProSet must be unlocked. See below.) Next, adjust the spindle position –not the readout- until the measured radius of that cutterhead is displayed on the ProSet readout.

Switch back to 'w' mode by depressing the 'R/W' key and the ProSet calculates and displays the outfeed dimension. You can further adjust the spindle position until the desired outfeed dimension is displayed.

To change the measurement units, press the UNITS key to cycle through the available measuring units. Note: Programming parameter **Pr 2** may limit the type of measuring units that can be displayed.

### Locked Mode

The user can also lockout the radius change operation on the ProSet. To activate or deactivate the lock feature, press and hold the UNITS key for approximately 3 seconds. When the ProSet is locked, the LOCK symbol is displayed on the LCD and the R/W key does not function.

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## Programming Parameters

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

### To enter Programming Mode:

1. Press and hold the **UNITS** key then momentarily press the **DATUM** key.
2. The LCD will briefly display: **PG on** (Programming On), then **Pr 1**, (indicating Programming Parameter #1)
3. Release the **UNITS** key

**Pr0** – Reading Direction (Encoder Direction) [0,1]  
Change the value to reverse the direction for positive readings.

**Pr1** – Auto Power Off Time [0 ... 60, **15**]  
Sets the time in minutes of system inactivity before the display unit shuts off to conserve battery life. A value of 0 prevents auto power off.

**Pr2** – Measurement Units Mode [0, 1, 2]  
Sets the type of measurement units allowed to be displayed.  
0 – All units. Millimeters, Decimal Inches, Fractions.  
1 – Millimeters, Decimal Inches. No fractions.  
2 – Millimeters only.

**Pr3** – Show negative Outfeed values [0, 1]  
0 – Negative values represented as Err 8.  
1 – Negative values displayed. (NOT RECOMMENDED)

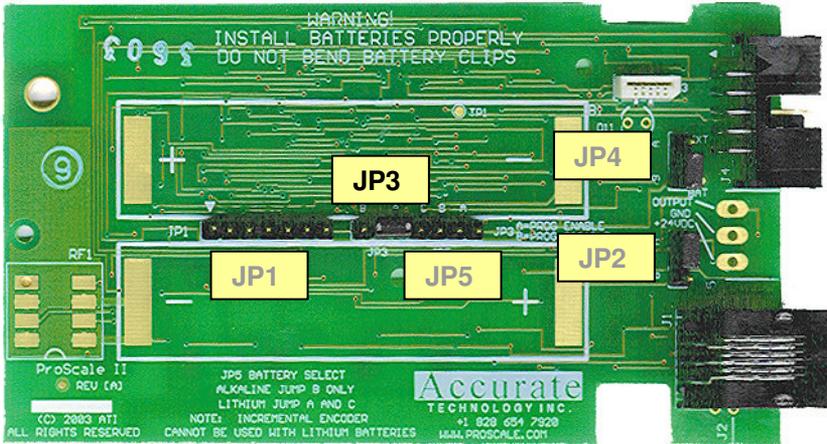
Note: Under normal conditions, the ProSet should never show Err 8 or negative outfeed values. If calibrated properly, this would indicate that the cutting head has moved beyond the fence or into the moulder bed surface.

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# Jumpers

Although the ProSet readouts use a keyboard-programming mode to enable and configure features, there are several selection jumpers located on the circuit board for additional system configuration.

User configurable jumpers consist of three pins and a 'shorting block'. The center of these pins is 'Common'. One end pin is labeled 'A' and the other end pin is labeled 'B'.



*ProSet Circuit Board*

**JP1 FOR FACTORY USE ONLY**

**JP2 DOES NOT APPLY TO PROSET – DO NOT CHANGE**

**JP3 Programming Mode Enable/Disable**

Entry to the programming mode of the ProSet display can be enabled or disabled based on this jumper setting. To enable keyboard programming (default), install the shorting jumper in position A. **To disable keyboard programming, install the shorting jumper in position B.** When programming mode is disabled, the user cannot access the programming functions via the **Units + Datum** keys as described in the Section 4: *Programming Parameters*. This provides the user with a method of configuring the display with specific parameters and prevents unauthorized configuration changes.

**JP4 DOES NOT APPLY TO PROSET – DO NOT CHANGE**

**JP5 DOES NOT APPLY TO PROSET – DO NOT CHANGE**

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## Programming Summary

<b>Programming Parameter</b>	<b>Factory Function</b>	<b>Default</b>
Pr0	Reading Direction	0
Pr1	Auto off time	15 min.
Pr2	Measurement units	all
Pr3	Neg. readings or Err 8	Err 8

## Jumpers and Key Press Summary

### Circuit Board Jumpers

JP1	Factory Use Only
JP2	Factory Use Only
JP3	Programming Enable/Disable
JP4	Factory Use Only
JP5	Factory Use Only

## Key Press Functions:

**ON/OFF** (*Press & Hold*) + **UNITS** (*Momentarily*)  
Enter / Exit CALIBRATION mode

**UNITS** (*Press & Hold*) + **'0'** (*Momentarily*)  
Enter or Exit Programming Mode

*While in Programming mode:*

**UNITS** (*Momentarily*)

Advances through the Programming Parameter list.

**ON/OFF** (*Press & Hold*) + **UNITS** (*Momentarily*)

Steps backwards in Programming Parameter list

**+** (*Momentarily*) while displaying a Programming Parameter

Increases the Parameter setting.

**-** (*Momentarily*) while displaying a Programming Parameter

Decreases the parameter setting.

**Datum** (*Momentarily*) while displaying a Programming

Parameter Reverts the parameter to its Factory Default setting.

**ON/OFF** (*Momentarily*)

Turn Display power on or off

**ON/OFF** (*Press & Hold*) for 5 seconds

Display Battery Voltage

**ON/OFF** + **UNITS** (*Press & Hold Both keys 10 seconds with display power off*)

LCD Segment Test & resets ALL Programming parameters to factory defaults

## Frequently Asked Questions

### **What does “err 2” mean?**

If the Encoder is off the scale, or the Encoder cable is unplugged from the digital display, an “err 2” will appear on the display. To clear the error:

1. Be sure the Encoder is on the scale.
2. Unplug the connector from the display for one second.
3. Reconnect the Encoder cable to the digital display.

### **The battery clips seem to be very loose. Is this normal?**

Yes. DO NOT attempt to bend these clips or wedge anything between them and the case. These clips are designed to expand when the two case halves are screwed together.

### **Can I mount the scale/Encoder without the connector link/guide clip?**

The connector link and guide clip serve to provide an accurate method of transferring the movement of the moving part to the Encoder or scale, while also absorbing any stresses that may occur. If they are not used, the warranty could be voided.

### **The display reads numbers but they seem to be random.**

Be sure the Encoder is oriented correctly on the scale. One end of the scale is black. Be sure that the arrow on the Encoder is pointed in the correct direction.

---

## PRODUCT REGISTRATION

Fill out for your records **and**  
FAX to Accurate Technology @ +1.828.654.8824 or  
Register on-line at <http://www.proscale.com/registration.htm>

Name \_\_\_\_\_

E-Mail \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Region \_\_\_\_\_

Zip/Postal Code \_\_\_\_\_

Country \_\_\_\_\_

Purchased From: \_\_\_\_\_

Purchased When: \_\_\_\_\_

ProSet Serial Number: \_\_\_\_\_



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**Thank you for choosing an American Made  
Product**



**Accurate Technology, Inc.**

270 Rutledge Rd. Unit E

Fletcher, NC 28732 USA

800 233-0580 • 828-654-7920

Fax 828-654-8824

[www.proscale.com](http://www.proscale.com)

[customerservice@accurate-technology.com](mailto:customerservice@accurate-technology.com)

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