Accurate
TECHNOLOGY INC.
Linear Digital Measuring Systems

ProTable-SA

Operation Manual

For ProTable-SA

Serial Number --------

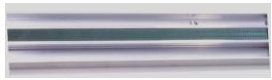
System Serial Numbers

ProTable: --------

Readout: RG----

Encoder: EB----

Scale: ST----



Factory Scaling Factor: 1.00000

DO NOT CHANGE the Scaling Factor setting. DOING SO WILL VOID YOUR CALIBRATION. If the Readout is reset or replaced, reprogram it with the Scaling Factor shown above.

Custom settings for your ProTable-SA:

Pr 39 – Non-Linear Compensation Enable set to: 1 (on)

Pr 40 – Non-Linear Compensation Interval set to: 5.0000

Pr 41 – Temperature Compensation Enable set to: 1

Pr 44 – Temperature Comp. Coefficient set to: 150

If your Digital Readout or electronic scale are replaced, the complete system requires re-calibration.

WARRANTY

Accurate Technology, Inc. warrants the ProTable-SA Measuring System against defective parts and workmanship for 3 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).

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.

Accurate Technology, Inc.

+1 828.654.7920

www.proscale.com

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SECTION 1 GENERAL INFORMATION

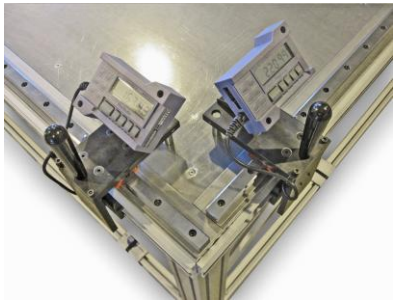
Introduction

ProTable-SA is a family of single and multi-axis, contact and non-contact, dimensional measuring systems. They are ideal for Quality Control or Quality Assurance applications in both controlled and non-environmentally controlled areas of manufacturing.

ProTable-SA comes in two basic configurations: free-standing (with optional legs) or as a benchtop system (standard).
Several standard measurement ranges are available up to 240in.

ProTable-SA is often designed and built to meet customer specifications or requirements for a particular application or measuring environment. Custom lengths, measuring jaws and other distinct features are also available through on-line collaboration with our CAD department.

ProTable-SA is available with several options and accessories.





What This Manual Includes

This manual includes set-up and operation information for ProTable-SA Measuring Systems with Readout firmware version 5. (The firmware version is displayed on readout power-up, i.e. P5.050C)

ProTable Specifications

Measuring Range:	
ProTable-2	Up to 25 inches, 625mm
ProTable-4	Up to 50 inches, 1.2m
ProTable-6	Up to 75 inches, 1.9m
ProTable-8	Up to 100 inches, 2.5m
ProTable-10	Up to 120 inches, 3.0m
ProTable-12	Up to 145 inches, 3.6m
ProTable-14*	Up to 170 inches, 3.6m
ProTable-16*	Up to 195 inches, 4.9m
ProTable-20*	Up to 240 inches, 6.0m
Accuracy:	
Standard Model	± .003inches (0.08mm) over entire range * ± .005 inches (unless on-site setup is done)
Resolution:	Inches: 1, 2, 3, or 4 decimal places Millimeters: 1 or 2 decimal places
Repeatability:	.01mm or .001in
Operating Temp:	40 to 95°F (4 to 35 C)
Temp Coefficient:	15ppm / °F (pre-programmed into DRO)
Power:	One CR123 Lithium Battery (custom units may use 12-24VDC)
Battery Life:	8-9 months
System Warranty:	Three years from date of purchase.
SPC Output Format:	Mitutoyo Digimatic® SPC
Encoder:	Inductive Series II encoding system
Max. Slew Rate:	120 inches/second (3000mm/sec.)

ProTable-SA is intended for use indoors. Outdoor use will affect operation, accuracy, and void the warranty.

All ProTables are manufactured in the USA

SECTION 2 CONFIGURATION

Assembly

ProTable-SA is nearly ready-to-use out of the box. Complete the following steps prior to use.

1. Remove the ProTable-SA from its container. **NOTE: SYSTEM IS HEAVY. GET A HELPER TO LIFT SYSTEM OUT OF THE BOX.**
2. Unwrap the moving stage assembly.
3. Install the digital readout onto the carriage with the provided M6 Socket Head bolts.
4. Plug the encoder into the digital readout.
5. Be sure that the encoder is firmly engaged under the plastic Guide Clip. (The Guide Clip ensures the encoder safely moves 1:1 with the carriage in both directions.)
6. Inspect the galvanized steel debris shield (if ordered) for shipping damage. The Guide Clip should not touch the shield anywhere along the full range of travel. If it does, carefully bend the debris shield to suit.
7. Close the jaws together. Quickly press-and-release the DATUM button on the readout. The display should now show 0.000 inches (or 0.00mm). Press the UNITS key (quick press and release) to change the displayed units if desired.

Power and I/O connections

The digital readout used with ProTable-SA is the Enhanced readout model. This is powered by a single CR123 lithium battery. Unless specially ordered, the readout will deliver to you with the battery installed.

A battery indicator will appear on the left side of the LCD screen. There are 3 tiers of battery shown, which represent the voltage level of the battery. When only one tier is left, a new battery should be prepared for installation. Typical battery life for these readouts is typically 8 months, but life will depend on how often the readout is being used, and how the programming options are configured.

Battery Replacement:

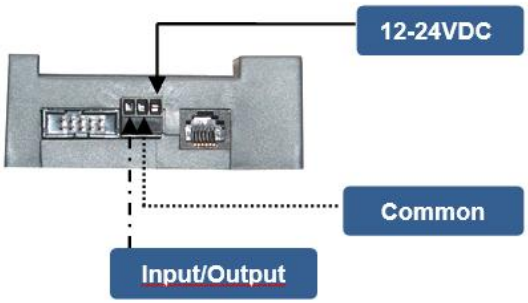
Remove the 2 screws in the upper right and lower left corners of the readout. Lift the cover off. Remove the old battery and install a new battery, noting the proper orientation. Replace the cover and screws.

NOTE: If battery is replaced in 4 minutes or less, recalibration is not required.

External Power:

The readout also supports use of external power if:

1. The input power is 12 – 24 volts DC.
2. The 3-position male terminal plug for the readout has been supplied.



NOTE: If external power is used, but a power loss occurs, the readout will automatically switch to battery power (if a battery is installed). The readout will automatically switch back to external power when it is restored.

Initial Gage Set-up

The initial parameters such as a datum point, measurement units, and resolution are factory set for your ProTable-SA System.

Measurement Units: Press the UNITS key to select either inches or millimeters.

Resolution: The digital readout is factory set to show 3 decimal places in inches, and 2 decimal places in millimeters. To change the resolution, see the full version of **Readout Installation & Operation Manual**, Programming Mode, Parameter Pr4.

Many other features of the system can be added or customized; see the **Readout Installation & Operation Manual** for more information on these.

Calibration

Your ProTable-SA has been calibrated at the factory using NIST traceable gage bars. A report of the calibration is included with your shipment (and kept on file at our factory for 12 years).

When ProTable-SA is calibrated at the factory, a scaling factor in the digital readout is sometimes used to correct for linear errors.

DO NOT CHANGE THIS SCALING FACTOR; DOING SO MAY VOID YOUR CALIBRATION. If your readout is replaced or reset to factory defaults, reprogram the factory scaling settings (shown on page 2) to ensure optimal accuracy.

ProTable-SA systems are designed to minimize mechanical measurement errors. However, changes in mechanical soundness (such as loose bolts, worn-out bearing, etc), table deflection (due to a non-level surface, or large loads), or severe temperature changes can affect the accuracy and repeatability of the entire system. In addition, inconsistent measuring techniques (such as multiple operators) might contribute to measurement errors. A Gage R & R study should be considered if numerous operators will be using the system.

Maintenance

A regular schedule for cleaning is recommended.

Tabletop, Jaw Faces, Electronic Scale, and Readout: These components should be kept free of dust, dirt, and residue as much as possible. These parts can be cleaned using compressed air (up to 80psi), or by wiping with a nonabrasive cleaner.
NOTE: Do not use solvent based cleaners to clean the electronic scale.

Bearing Rails: The steel bearing rails should be kept as clean as possible. Each felt wiper should be OILED MONTHLY to keep bearings in optimal condition.

Guide Clip: Replace at least once per year.

Battery: Replace when indicator is down to last bar, or each 9 months.

Calibration: System accuracy should be checked monthly, and recalibrated yearly.

SECTION 3 OPERATION

Measure a Part

1. Slide the moving carriage to the right until the part to be measured will fit between the jaws.

2. Place the part to be measured onto the tabletop and against the fixed jaw.

3. Slide the moving carriage up against the part. The part length is displayed on the readout. *NOTE: Do not slam the carriage into your part, or apply a heavy side load on the carriage; this is a precision gage, not a compression tool.*

4. Press the SEND key if a data transmitter is connected.

Measure Parts Relative to a Reference

1. Slide the moving carriage to the right until the reference part will fit between the jaws.

2. Place the reference part onto the tabletop and against the fixed jaw.

3. Slide the moving carriage up against the reference part.

4. The reference length is displayed on the readout. Press and hold the ABS/INC button for 3 seconds to switch to relative (**INC**) measurement mode. (The **ABS** indicator will turn off and **INC** indicator will turn on when relative/incremental mode is in use.)

5. Measure the next parts using the same method as in steps 1 - 3. The difference in length between the reference and the production parts is shown on the readout. (A negative number indicates the production part is shorter than the reference part.)

6. If desired, the difference can be transmitted by pressing the SEND key.

7. Press the ABS/INC key for 3 seconds to return to the absolute (**ABS**) mode when done making relative/incremental measurements.

Readout Operation and Customization

Key Functions: Information about how all the keys work (primary and secondary functions) is included in the Complete V5 Digital Readout Operation Manual (download that manual at **Version 5 Readout Installation & Operation Manual**).

Symbols: Information about all the symbols on the digital readout's screen are included in the Complete V5 Digital Readout Operation Manual.

Customization: The digital readout included on your ProTable-SA system has MANY user-configuration settings, plus various modes of operation that can be enabled for more utility. Refer to the Complete V5 Digital Readout Operation Manual for further information.

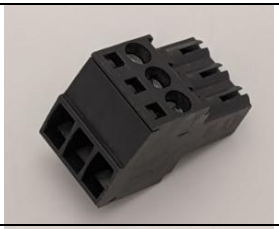
Additional modes available include:

- Absolute and incremental modes
- Offset addition modes
- Go and NoGo mode
- Monitor mode
- Hold mode

Error & Alert Messages

Message	What it means
F Err	The readout is attempting to display a fractional value larger than 399 63/64ths
no Enc	There is not an encoder connected to the readout, or the connected encoder has a fault.
no PoS	The readout has not been calibrated yet, or when an inductive type encoder is connected after power/signal failure.
DISABL	Displays if the ABS or SEND keys are pressed but their functions are disabled in programming.
SEND	The SEND function was activated.
LOCK	The keypad is in LOCK mode, but an attempt was made to change the calibration. Unlock the keypad to fix this.
P LOCK	The keypad is LOCKed, but an attempt was made to change the calibration. Change programming parameter Pr3 to fix this.
no oFF	Offsets are disabled, but an attempt was made to apply an offset value.
MON	Monitor mode is turned on, and the system is out of the allowable tolerance zone.
No Co	Non-linear compensation is enabled, but there is no look-up data for the displayed measurement.
UNDEF	Shows when F3 is pressed while in Non-linear calibration mode and no points are currently stored. Also displays when F4 is pressed and no points are currently stored.
Co x	A compensation point was stored to memory.
BAD PT	The current value is not close enough to the expected compensation value.
CD x	The previously entered compensation point was deleted.
Co END	Compensation entry has been completed.
Hi LMT	A programmed upper limit has been exceeded.
Lo LMT	A programmed lower limit has been exceeded.
RESET	The programming parameters were reset to factory defaults.
No PGM	Access to the programming menu was attempted, but it is currently locked out (see Complete Manual for details).
NO BAT	The readout was powered on with an external power connection, but a backup battery is not installed.
E Warn	The connected encoder is drawing too much current and battery life will be reduced.

SECTION 4 ACCESSORIES

External Power and I/O plug Part number 200-1016-001. Adds external power and/or input/output capabilities to the readout.	
Switching power supply Part number 550-2003-001. Provides 15VDC power to the readout.	
Wireless Data Transmitter Part number 700-1037-004. Transmits measurement values to a remote computer. With proper configuration, the readout's battery can be used to power this transmitter (see transmitter's User Manual for details).	

Thank you for choosing ProTable

IT WAS PROUDLY MADE IN THE USA

Accurate Technology, Inc.
270 Rutledge Rd. Unit E
Fletcher, NC 28732 USA
828-654-7920
www.proscale.com