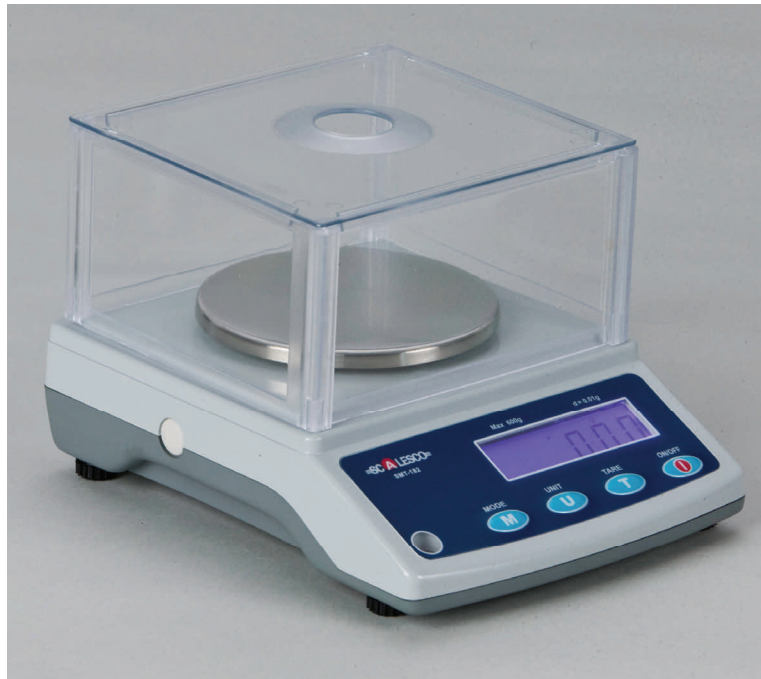


SMT-182

Precision Balance

User Manual



Scalesco Measurement Technology Inc.

1200 Indus Street Suite A, Fairmont MN 56031 USA

Toll Free: 1-866-587-9773 Fax: 1-507-238-5447 E-Mail: sales@scales-co.com

Version 2.0 - May 2009

UNITED STATES

This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. His equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CANADA

This digital apparatus does not exceed the Class A limits for radion noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectroniques depassant les limites applicable aux appareils numeriques de la Class A prescrites dans le Reglement sur le brouillage radioelectrique que edicte par le minister des Communications du Canada.



Risk of Electrical shock. Do not remove cover.

No user serviceable parts inside.

Refer servicing to qualified Scalesco service personnel.

Scalesco Measurement Technology reserves the right to change specifications at any time.

UNPACKING AND INSTALLING THE SCALE

Unpacking the scale

Check packaging for any obvious evidence of damage. Inspect the unit for shipping damage. Immediately report shipping damage to Scalesco at 1-866-587-9773.

Remove contents from packaging, your product should include:

1. 120 VAC 60 Hz, 6vDC @ 200 mA wall mount adapter
2. Scale with stainless steel weight platter (remove blue protective film)

Draft Shield

If you are missing an item please contact Scales-co for immediate replacement at no charge, shipped via UPS ground.

Installing the scale

1. Mount the scale on a stable, level surface that is free from air currents, rapid temperature changes and vibration. This may effect the weighing accuracy or the stability of the displayed weight.
2. Remove Overload protection screw (save for transit and future use), insert the plastic plug to cover access hole.
2. Carefully install, do not force, the weight platter on top load bridge. Make sure the weight platter does not touch any adjacent surfaces, make sure the power cords, remote display cables are not touching the live weighing surface.
3. Be sure all feet are in contact with the counter, use the leveling feet and level bubble, if applicable to your model, to make a firm contact.
4. Connect the AC adapter's power plug to the scale, then plug the AC adapter into a appropriate outlet, properly grounded.
5. Turn the unit on for **5 minutes**, to allow the electronics and load cell to warm up to room temperature.
6. Place a known weight on the scale to test the weighing accuracy. Your scale should display within the weighing tolerance shown within the Weighing Tolerances section of this manual.

Trouble Shooting Tip!

"If your scale is not weighing accurately upon installation, go to the calibration instructions found in this manual to perform a new calibration. Your scale may have become out of tolerance due to a large change in the altitude from initial factory calibration or a mechanical shift during the shipment of the product."

Battery Installation

Your model of Precision balance operates on four (4) "C" Batteries. The expected life of the batteries is 20 hours of use with the backlight turned off.

Remove the battery cover on the bottom of the scale, insert the batteries into the appropriate location, making sure you align the batteries into the correct positive (+) and negative (-) orientation.

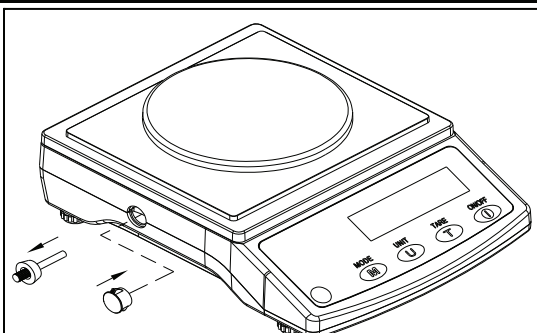
It is recommended to remove the batteries if using AC power or storing the unit for future use.

Overload Protection Screw

Remove Overload protection screw and save for future use.

Cover hole with plastic knob to protect from dust and dirt.

Replace overload protection screw for shipping and transit.



Technical Specification

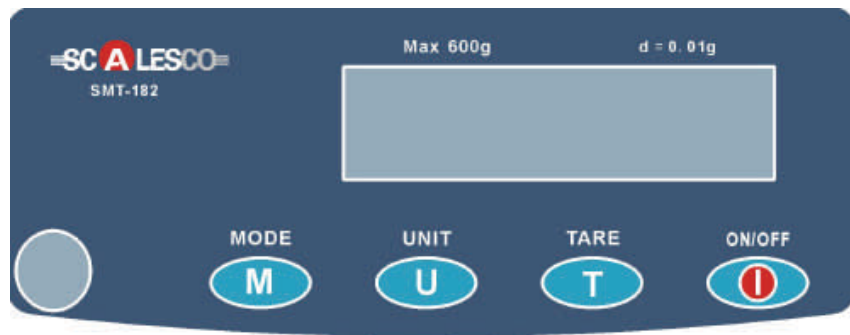
Model # (Part #)	SMT-182 (182-300)	SMT-182 (182-600)	SMT-182 (182-010)
Capacity and Resolution	300 x 0.01 g	600 x 0.01 g	1000 x 0.01g
Linearity & Std Deviation	+/- 1d	+/- 1d	+/- 2d
Operating Temp	10° - 35° C / 50° - 95° F		
Tare Range	Up to 100% of max. capacity, subtractive (subtract tare weight from max capacity = new max capacity)		
Overload	Maximum capacity + 9 divisions (division = resolution setting)		
Stabilization	Up-to 3 seconds to stable weight reading		

Features and Operator Keypad

The Model SMT-182 Precision balance is an affordable solution for many applications. Perfect for use in manufacturing factories, mines, agriculture, water conservation, medicine, food analysis, gems and jewelry, and educational laboratories.

It provides an big backlite LCD display for great visibility when used indoors and outdoors. Design for use within stable environments where fluctuation of temperature, humidity and vibration are limited.

Features include a simple counting feature for weighing small components, % weighing for use to compare the weight of similar items or check weighing. Use the draft shield to reduce improve weighing accuracy due to wind currents.



Power On and Power Off the scale.



Switches the displayed weight between **grams**, **oz**, **g** (grains), **ct** (carat), **ozt** (troy ounce) and **dwt** (penny weight).



1) Performs a Zero Function.

2) Tare removes the weight of a container from the display and returns the scale to zero weight.



1) Quick press to enter counting and % weighing function

2) Long press to enter configuration mode for set-up of units of measure, backlight setting, auto off, baud rate, RS-232 format, and calibration mode

Operating Instructions

Standard Weighing

1. Turn on the scale, using the **ON/OFF** key. The scale perform a test sequence. If everything is OK, the display will show zero weight and the scale is ready for use.
2. Press the **TARE** key if display is not showing "0.000" weight.
3. Place your item on the weight platter, it may take up to 3 seconds for the weight to stabilize.
4. Press the **UNITS** key to change the units of measure from grams to oz, ozt, dwt, ct or grains. You can eliminate units of measure in the configuration mode.
5. If your are using a container to weigh objects and want to see the net weight, place the container on the scale, press the **TARE** key. The display should show "0.000" weight and "Net" will display if displayed weight is over 2% of scale capacity. Place your items in the container, to determine the net weight.

*Note: Upon completion of your tare weighing, after removing your container the display will show a negative weight. Press the **TARE** key to return the scale to zero weight.*

Percentage Weighing

Percentage weighing is to be used if you want to compare the weight of one item to others, also know as check weighing. The % weighing function has two functions , they are:

1. Place a weight on scale that is considered either 10%, 20%, 30%,40%, 50%, 60%, 70%, 80%, 90%, or 100% of your target weight
2. Place a weight on the scale and manually input the % using the keyboard. (for use on %'s not available for item 2, like 15.01% or 150%

% weighing using default setting of 10%, 20%, 30%, 40% - - - - 100%

1. Quick press the **Mode** key , press the **MODE** key once "pct" is displayed.
2. Press the **UNIT** key to enter into % weighing mode.

"10 PCT" is displayed. This is 10 %.

Note: Press the ON/Off key at any time, if you made a mistake, press the MODE key to exit the % and counting mode.

Operating Instructions

3. Press the **UNIT** to scroll between 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% and input. Upon reaching your selection, press the **TARE** key to accept.

“-PSL-” and “XX.XX pct” is displayed and flashing

4. Add your sample weight on the scale, the display will flash then stabilize indicating the “XX.XX” percentage you have selected.

*Press the **MODE** key to exit the % mode and return to normal weighing mode.*

% weighing using keyboard input of percentage.

1. Quick press the **Mode** key , press the **MODE** key once “pct” is displayed.

2. Press the **UNIT** key to enter into % weighing mode.

“10 PCT” is displayed. This is 10 %.

*Note: Press the ON/Off key at any time, if you made a mistake, press the **MODE** key to exit the % and counting mode.*

3. Press the **UNIT** and scroll to “inPUt”. Press the **TARE** key to accept.

“0.01” is displayed and “1” is flashing

4. Use the **UNIT** key to change flashing number from 0-9, use the **MODE** key to move to the next digit. Below is an example of entering 55.01%.

A) Press the **UNIT** key until 5 appears, press **MODE** to accept and move to next entry.

B) Press the **UNIT** key until 5 appears, press **MODE** to accept and move to next entry.

C) “0” is flashing, press the **MODE** key to accept.

D) Press the **UNIT** key until 1 appears, press **TARE** to accept

“-PSL-” and “55.01 pct” is displayed and flashing

5. Add your sample weight on the scale, the display will flash then stabilize indicating the “55.01” percentage you have selected.

*Press the **MODE** key to exit the % mode and return to normal weighing mode.*

Operating Instructions

Counting Feature

THE SMT-182 provides a simple counting feature allowing you to use the high resolution of the scale to determine accurate counts.

Hint: Use the stainless steel weight platter, by turning it over so small items do not roll off of the weight platter.

Tip: For best counting results, the single piece weight of the item you are counting should be greater than or equal to the resolution of your scale 0.01 grams. The lighter the item you are counting, the higher the number of sample pieces should be used during the sampling process.

There are two methods the 182 has available for counting. They are:

1. Using pre-set sample sizes of 10, 20, 50, 100, 200, 500 or 1K (1000) pieces.
2. Input unique sample size (other than default)

Below are the instructions for each function

1. Counting using default samples sizes 10, 20, 50, 100, 200, 500, 1000

1. Quick press the **Mode** key , "pc" is displayed.
2. Press the **UNIT** key to enter into counting mode.

"10 PC" is displayed. This is 10 sample pieces.

Note: Press the ON/Off or MODE key at any time, to exit the counting mode.

3. Press the **UNIT** to scroll between 10 PC, 20 PC, 50 PC, 100 PC, 200 PC, 500 PC, 1 k PC (1,000 pieces) and input. Upon reaching your selection, place your sample size on the scale and press the **TARE** key to accept.

"XXX pc" is displayed and flashing

Note: If "SLAC" displays this indicates you did not place your samples on the scale or they weight on the scale is less than 0.003 grams

4. Add your remaining items to be counted

Press the MODE key to exit the % mode and return to normal weighing mode.

Operating Instructions

2. Counting using keyboard input of sample size

1. Quick press the **Mode** key , “pc” is displayed.

2. Press the **UNIT** key to enter into counting mode.

“10 PC” is displayed. This is 10 pieces.

Note: Press the ON/Off key at any time, if you made a mistake, press the MODE key to exit the % and counting mode.

3. Press the **UNIT** and scroll to “inPUt”. Press the **TARE** key to accept.

“1” is displayed and flashing

4. Use the **UNIT** key to change flashing number from 0-9, use the **TARE** key to move to the next digit. Below is an example of entering 25 pieces.

A) Press the **UNIT** key until 2 appears, press **MODE** to accept and move to next entry.

B) Press the **UNIT** key until 5 appears, press **TARE** to accept

“-SLAC-” and “25 pc” is displayed and flashing

4. Add your sample weight on the scale, the display will flash then stabilize indicating the “25” pieces as you have selected.

Press the MODE key to exit the % mode and return to normal weighing mode.

5. Add your remaining items on the scale.

Configuration and set-up

The 182 balance allows you to configure your scale to meet your operational needs.

Units of Measure-

Turn on the most commonly used units of measure and turning off unused units of measure will adjust the use of the UNIT key. The factory default setting is for all units of measure turned on.

1. Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.
2. Press the **UNIT** key to scroll between "on" and off". Press the **TARE** key to accept your setting and move to the next selection "U2 on".
3. When you have finished your selection, press the **ON/OFF** key to exit and return to normal weighing mode or the **MODE** key to return to the configuration menu and set-up your next selection.

U1 (g-grams), U2 (ct-carat), U3 (oz-ounce), U4 (gn-grains), U5 (ozt- troy ounce), U6 (dwt-penny weight), U7 (t-tola)

Units of Measure—Capacity and Resolutions			
Part Number	182-300	182-600	182-010
Grams	300 x 0.01	600 x 0.01	1000 x 0.01
Grains	4,269 x 0.2	9,259 x 0.2	15,4320 x 0.2
Carat	1,500 x 0.05	3,000 x 0.1	5,000 x 0.1
Ounce	10.582 x 0.0005	21.164 x 0.001	35.274x 0.001
Penny Weight	192.9 x 0.01	385.8 x 0.01	643 x 0.01
Troy Ounce	9.645 x 0.0005	19.2905 x 0.0005	32.151x 0.001
Tola	25.721 x 0.001	51.441 x 0.001	85.735 x 0.001

Configuration and set-up

Auto Power Off-

To conserve battery life, configure the unit to power off after no activity of 1-10 minutes. The default factory setting is none.

1. Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.
2. Press the **MODE** key "Pd no" is displayed.. Press the **UNIT** key to scroll between "PD 1", "PD 2", "PD 3", "PD 5", "PD 10".
3. Press the **TARE** key to accept your setting and move to the next configuration setting "bl on" or press the **ON/OFF** key to exit and return to normal weighing mode.

"PD 1" (1 minute auto off); "PD 2" (2 minutes auto off); "PD 3" (3 minutes auto off); "PD 5" (5 minutes auto off); "PD 10" (10 minutes auto off); "Pd no" (always on)

Back Light Settings-

To conserve battery life, configure the unit to power off after no activity of 1-10 minutes. The default factory setting is none.

1. Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.
2. Press the **MODE** 2 times key "bL on" is displayed.. Press the **UNIT** key to scroll between "bL Off" and "bL on" .
3. Press the **TARE** key to accept your setting and move to the next configuration setting "b9600" or press the **ON/OFF** key to exit and return to normal weighing mode.

Baud Rate Settings-

To adjust the baud rate settings to 1200, 2400, 4800, 9600, 19,200.

1. Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.
2. Press the **MODE** 3 times key "b9600" is displayed.. Press the **UNIT** key to scroll between the available settings.
3. Press the **TARE** key to accept your setting and move to the next configuration setting "do-St" or press the **ON/OFF** key to exit and return to normal weighing mode.

Configuration and set-up

Data Output Format

The 182 precision balance allows you to adjust the transmit method through the RS-232 port. The available settings are:

“do-5t” - transmit data upon stable weight

“do-Co” - continuously transmit data.

“doff” - RS-232 mode off

Press and hold the **MODE** key for 3 seconds, “U1 on” is displayed.

1. Press the **MODE** 4 times key “do-5t” is displayed.. Press the **UNIT** key to scroll between the available settings.
2. Press the **TARE** key to accept your setting and move to the next configuration setting “ICXXX” or press the **ON/OFF** key to exit and return to normal weighing mode.

Weighing Tolerances & Calibration

Model # (Part #)	SMT-182 (182-030)	SMT-182 (182-060)	SMT-182 (182-010)
Max Capacity	300 grams	600 grams	1000 grams
Resolution	0.01 grams	0.01 grams	0.01 grams
Weighing Tolerance	0.01 grams	0.01 grams	0.02 grams
Calibration Weight Choices (grams)	50, 100, 150, 200, 250, 300	100, 200, 300, 400, 500, 600	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

From time to time, all scales may require calibration to provide an accurate weighing. When calibrating your scale, you are teaching the scale a zero weight reading, and a known accurate weight(s).

The SMT-182 provides two methods of calibration. Single weight calibration allows you to use the weight supplied with your scale to calibrate your scale or multi-point calibration allowing you to choose up-to 4 weight or linearization [points for calibration.

Calibration

WARNING!

Calibrating your scale with inaccurate or the incorrect weights as defined in the Weighing Tolerances and Calibration Section will cause your scale to weigh incorrectly. Use a professional weight to perform single weight calibration. When handling your weight, use gloves or a cloth to make sure you do not transfer oil from your fingertips, place the weight back into its container for storage purposes in a warm location. Always calibrate your scale in a vibration free environment away from air currents for best performance.

Single Weight Calibration Instructions

Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.

1. Press the **MODE** key 5 times "1CXXX" is displayed.. Press the **UNIT** key to scroll to:

SMT-182-300 gram capacity scale - - - - -"1C100"

SMT-182-600 gram capacity scale - - - - -"1C200"

SMT-182-1000 gram capacity scale - - - - -"1C500"

2. Press the **TARE** key to accept your setting.

"2C OFF" is displayed

3. Press the **TARE** key to accept

"CAL 0" is displayed

4. With no weight on the weight platter, press the **TARE** key to begin zero calibration.

"C 100". "C 300" or C 500" is displayed

5. Place your calibration weight on the scale, wait for 2 seconds for the weight to stabilize, press the **TARE** key to finish calibration.
6. The scale will briefly display the counts status and return to normal weighing mode showing the calibration weight value. Your calibration is complete.

*Note: If the scale does not display zero weight upon removing the weight, press the **TARE** key to return the scale to zero. Repeat calibration steps if an error was made during the calibration process.*

Calibration

Multi Weight or Linear Calibration

For optimum performance, teaching your scale more than one know weight can increase the scales repeatability and accuracy. The SMT-182 allows you to use up-to 4 different calibration weight linear points to calibrate your scale. You can choose to use 2 or 3 linearization weight points.

Press and hold the **MODE** key for 3 seconds, "U1 on" is displayed.

1. Press the **MODE** key 5 times "1CXXX" is displayed.. Press the **UNIT** key to scroll to the first calibration weight value:

SMT-182-300 gram capacity scale - - - -"1C 50", "1C100", "1C150", "1C200", "1C250", "1C300"

SMT-182-600 gram capacity scale - - "1C100", "1C200", "1C300", "1C400", "1C500". "1C600"

SMT-182-1000 gram capacity scale - - "1C100", "1C200", "1C300", "1C400", "1C500". "1C600", "1C700", "1C800", "1C900", "1C 1t" (1000 grams)

2. Press the **TARE** key to accept your setting.

"2C OFF" is displayed

3. Press the **UNITS** key to select another higher weight value.

4. Press the **TARE** key to accept your setting

"3C OFF" is displayed

5. Press the **TARE** key to enter into Calibration mode or repeat steps 3 and 4 to enter more linear calibration weight points, then press the **TARE** key to enter into calibration mode..

"CAL 0" is displayed

6. With no weight on the weight platter, press the **TARE** key to begin zero calibration.

"C XXX is displayed

7. Place your next calibration weight on the scale, wait for 2 seconds for the weight to stabilize, press the **TARE** key, continue steps 4 and 5 if necessary"

"C XXX is displayed

8. The scale will briefly display the counts status and return to normal weighing mode showing the calibration weight value. Your calibration is complete.

*Note: If the scale does not display zero weight upon removing the weight, press the **TARE** key to return the scale to zero. Repeat calibration steps if an error was made during the calibration process.*

Communication and Specifications

The SMT-182 Precision balance includes a 9-pin RS-232 port for transmitting the weight to your host device using a straight pass thru cable (not supplied). You can purchase this cable from scales-co, PN# S100-001.

Communication Specification: 12-19.200 Baud Rate, **8** Data Bits, **None** parity, **1** stop bit, 1 start bit

ASC II Output Format: " AAB B(+/-) XXXX.XX UNIT<CR><LF>

AA = Working Mode: WT - weighing mode; CT-counting mode; PC—% mode

BB= Status: OL—Overload; ST-stable; US-unstable

Your weight will transmit upon stable weight reading or continuously the format above.

Trouble Shooting Tip -

Use Windows HyperTerminal or similar program to test communication.

CABLE PIN-OUT SPECIFICATIONS

<u>PIN</u>	<u>Scale</u>	<u>Host</u>	<u>PIN</u>
1	EMPTY		1
2	TXD (Out)	RXD (In)	2
3	RXD (In)	TXD (Out)	3
4			4
5	Ground	Ground	5
6,7,8,9			6,7,8,9

Care and Maintenance

Cleaning—Use a damp cloth with mild detergent to clean your scale.

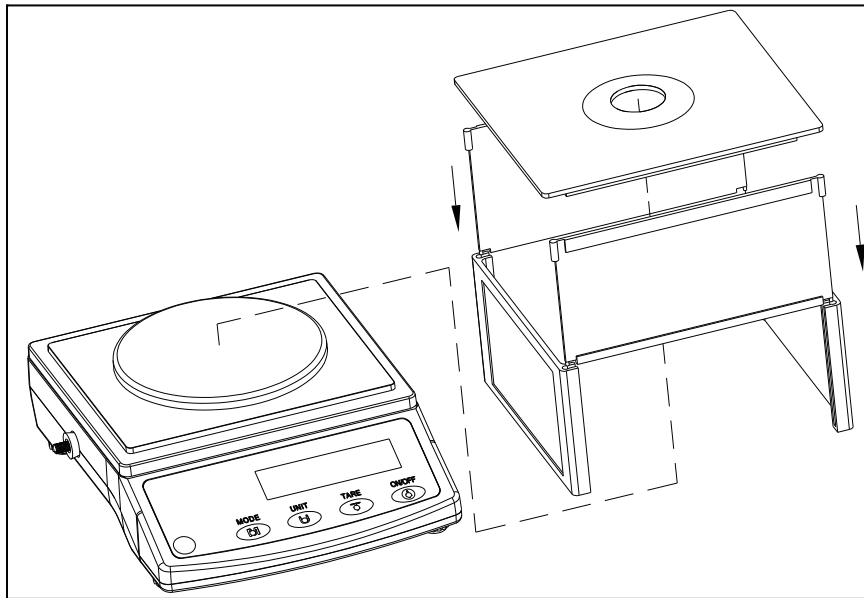
Calibration Schedule—In order to maintain the highest accuracy, you should implement a monthly, quarterly or yearly calibration schedule.

Handle with Care—Precision scales include sensitive load cells. Dropping the unit or placing weights on the scale that are heavier than the rated capacity of your scale may cause damage to the load cell.

Draft Shield Assembly Instructions

The SMT-182 includes a Top Access clear plastic draft shield using the following parts:

- One (1) top cover
- Two (2) Front and Back Panels
- Two (2) Side Panels



To assemble side plates:

1. Carefully insert the pins from the front plate and back plate into one of the side panels
2. Carefully the other side panel into the front and back plates
3. Place completed assembly on top of scale
4. Place top cover on draft shield.

Trouble Shooting and Error Codes		
Symptom	Possible Cause	Remedy
Cannot turn on	<ul style="list-style-type: none"> No power to scale Incorrectly installed battery 	<ul style="list-style-type: none"> Verify AC adapter connections and voltage Replace batteries, check polarity
Poor weighing accuracy	<ul style="list-style-type: none"> Improper calibration Unstable environment Debris touching pan Scale was not zeroed prior to use 	<ul style="list-style-type: none"> Perform calibration Move scale to stable location Clean any debris near weight platter Press the TARE key to zero the scale prior to use
Will not Calibrate	<ul style="list-style-type: none"> Unstable environment Incorrect calibration weight used 	<ul style="list-style-type: none"> Move scale to suitable location Use correct calibration weight
-ADC-, ERRAD	<ul style="list-style-type: none"> Load cell damage 	<ul style="list-style-type: none"> Perform Calibration Scale needs replacement
-OL-	<ul style="list-style-type: none"> Overload condition 	<ul style="list-style-type: none"> Excess weight applied to scale, remove weight Perform Calibration
-LO-	<ul style="list-style-type: none"> Low battery 	<ul style="list-style-type: none"> Replace batteries
UNSTA	<ul style="list-style-type: none"> Weight is unstable 	<ul style="list-style-type: none"> Too much vibration, move to new location Perform Calibration
0-Err	<ul style="list-style-type: none"> Zero error—too much weight on scale during power on Load cell is damaged 	<ul style="list-style-type: none"> Remove weight, power off/on Perform Calibration
ERREP	<ul style="list-style-type: none"> EEPROM error 	<ul style="list-style-type: none"> Perform Calibration Scale needs replacement
-CSL-	<ul style="list-style-type: none"> Calculated piece weight is less than 0.005 grams and too small of part to count accurately 	<ul style="list-style-type: none"> Too small of a part to count accurately
SLAC	<ul style="list-style-type: none"> Sample weight is to less than 0.003 grams 	<ul style="list-style-type: none"> Increase sample size
-PSL-	<ul style="list-style-type: none"> 0.5d of weight applied for % weighing 	<ul style="list-style-type: none"> Too little weight on scale, add more weight

Limited Warranty Policy

Scalesco Measurement Technology Inc (hereafter referred to as "SMTI") products are warranted against defects in material and workmanship for a period of one (1) year from the date of shipment.

During the warranty period SMTI will repair, or at its option, replace at no charge any component(s) determined defective by a authorized SMTI representative, provided the equipment is returned freight prepaid, to Scalesco Measurement Technology Inc.

The warranty will not apply to products that:

1. Have had repairs or modifications not authorized by SMTI.
2. Have been subject to damage by accident, misuse, careless handling, inappropriate installation, fire, water submersion or act of God.
3. Have been exposed to corrosive material
4. Have foreign material penetrating or within the product.
5. Have been determined to weigh accurately after calibrating according instructions within the user manual.

SMTI's liability is confined to the factory repair, product or parts replacement, and does not extend coverage to labor, material or service charges involved in removal of the equipment to return to the factory or from on-site repair.

SMTI is not responsible for any direct expenses or consequential damage due to errors in weighing or failure of a Scalesco brand product to perform properly.

SMTI reserves the right to incorporate changes in material, operation and design of the products without notice and is not obliged to incorporate the same changes in equipment previously or currently manufactured.

This warranty is limited exclusively to defective Scalesco brand products. The SMTI warranty is limited to initial the installing customer and is not intended to insure the benefit of a secondary owner in the event of resale after use. This warranty is in lieu of all other warranties, expressed or implied.

Return Policy

See our website for the up-to-date return policy at <http://www.scales-co.com>.

Service Information

If you experience any difficulty, the Scalesco team is available to help you between the hours of 8:00 AM and 5:00 PM CST, M-F, toll free 1-866-587-9773 or 507-238-9773. For after hours support, e-mail us at sales@scales-co.com.

Scalesco Measurement Technology Inc.