METTLER TOLEDO

PS90

Shipping Scales

Operator Manual

For PS90 units with **GeoCal**

15987200A
07/00

METTLER TOLEDO

Publication Problem Report

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PROBLEM(S) TYPE:	DESCRIBE PROBLEM(S):	*INTERNAL USE ONLY*
☐ Technical Accuracy	☐ **Text** ☐ **Illustration**	
☐ Completeness **What information is missing?**	☐ **Procedure/step** ☐ **Illustration** ☐ **Definition** ☐ **Example** ☐ **Guideline** ☐ **Feature** ☐ **Explanation** ☐ **Other (please explain below)**	☐ ***Info. in manual*** ☐ ***Info. not in manual***
☐ Clarity **What is not clear?**		
☐ Sequence **What is not in the right order?**		
☐ Other Comments **Use another sheet for additional comments.**		

Your Name: _____ Location: _____

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Fax this completed form to MTSP at (864) 472-7575

INTRODUCTION

This publication is provided as a guide for individuals in the operation, use, and care of this METTLER TOLEDO product.

Further information or assistance regarding this product may be obtained by writing to:

METTLER TOLEDO
1900 Polaris Parkway
Columbus, OH 43240-2020
(614) 438-4400

WARNING!

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, i.e., in accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

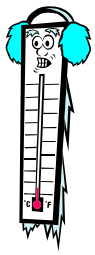
FOLLOW these instructions carefully.

SAVE this manual for future reference.

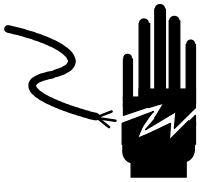
DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.

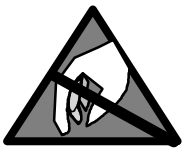


Note: If the unit has been stored or transported in below freezing temperatures, allow the unit to warm up to room temperature before turning on AC power.



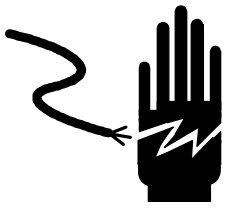
WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



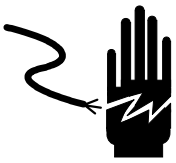
CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.



WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.



WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD, CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.

CAUTION

BEFORE CONNECTING OR DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT, ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTION'S ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT, OR BODILY HARM.

CONTENTS

1 Introduction

Thank you for purchasing a PS90 shipping scale from METTLER TOLEDO.

The legal-for-trade model of the PS90 shipping scale is a large, 150 × 0.05 lb (60 × 0.02 kg) or 300 x 0.1lb (150 x 0.05kg) capacity scale designed to meet the needs of the legal-for-trade parcel/manifest markets.

The PS90, like all METTLER TOLEDO products is designed for maximum durability and reliability in even the most demanding application environments. The PS90 is manufactured in one of METTLER TOLEDO's ten ISO 9000 certified facilities, so you are assured to receive a high-quality product.

The scale is designed for use in parcel shipping and other light industrial environments. This unit is not intended for wash-down or hazardous area operation, or for operation in environments of extreme dust, heat, cold, or humidity.

In the unlikely event you experience difficulties operating your scale, please contact your local distributor or METTLER TOLEDO representative from whom you purchased the scale.

Standard Features

The following are standard features built into each PS90 shipping scale.

- 150 lb or 300 lb capacity
- Painted steel base and sub-platter
- RS-232 serial interface to the scale base
- Automatic power down mode for energy conservation
- 12 VDC, 60mA power supply unit (wall-mount transformer)
- 2-key weight indicator

Optional Accessories

- 2-key Base mount display with 12 in. cable
- 2-key Tower display with 14 ft cable
- 2-key Wall mount display with 14 ft cable
- 2-key Dual wall mount displays with 6 ft cable
- 2-key Base/wall mount displays with 14 ft cable
- Stainless steel, ball transfer, or roller top platter
- Car lighter power jack

Specifications

The PS90 shipping scale conforms to and operates best within the specifications described in this section.

Physical Dimensions

- Base dimensions w/feet: 406.4 mm × 504.7 mm (16.00 in. × 19.87 in.)
- Stainless Steel Platter dimensions: 416.05 mm × 514.4 mm (16.38 in. × 20.25 in.)
- Roller Top Platter dimensions: 444.5 mm × 577.85 mm (17.50 in. × 22.75 in.)
- Ball Transfer Platter dimensions: 400.05 mm × 501.65 mm (15.75 in. × 19.75 in.) (shown below)
- Maximum dimensions w/indicator w/ball transfer only: 460.50 mm × 501.65 mm (18.13 in. × 19.75 in.)
- Height with Stainless Steel platter: 101.60 mm (4.00 in.)
- Height with Roller Top platter: 143.00 mm (5.63 in.)
- Height with Ball Transfer platter: 120.65 mm (4.75 in.)
- Weight: 17 kg (38 lbs.)
- Shipping weight: 20 kg (44 lbs)

XXXX= INCHES
[XXXX]= MM

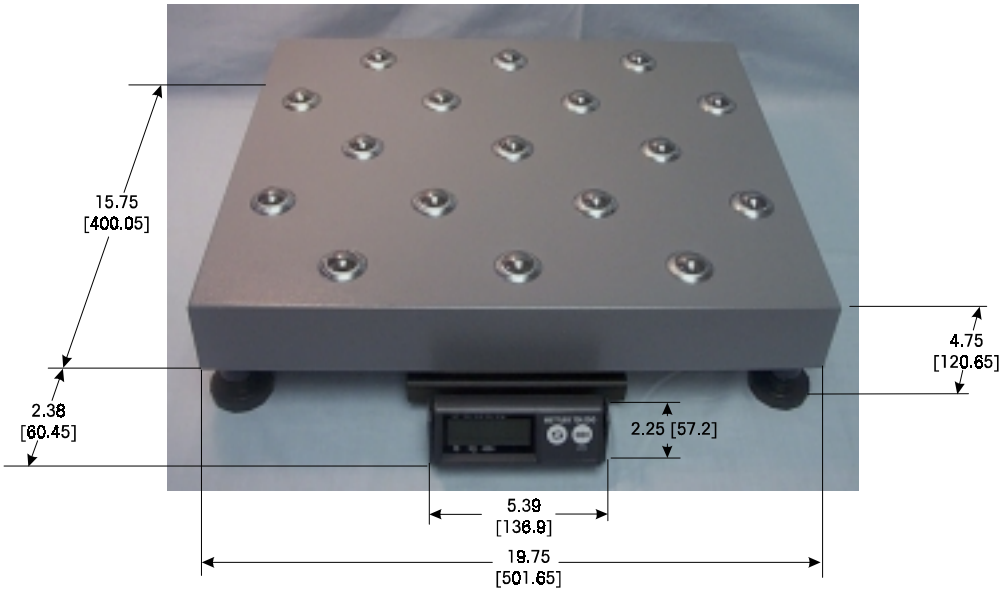


Figure 1-a: PS90 Dimensions

Power Requirements

The PS90 operates within an input voltage range of 7.5 to 15 VDC (at 60 mA).

- An external, wall mount 12 VDC voltage converter, supplies power to the PS90.
- An optional 12 VDC Autosensing power supply
- An optional 12 VDC Car Lighter Jack Cable can power the PS90.

Environmental Requirements

The PS90 operating range is –10° to +40°C (+14°F to +104°F) at 10 to 90% relative humidity, non-condensing. The shipping and storage temperature range is –20° to +60°C (-4°F to +140°F) at 0 to 95% relative humidity, non-condensing.

The scale is designed for use in parcel shipping and other light industrial environments. This unit is not intended for wash-down or hazardous area operation, or for operation in environments of extreme dust, heat, cold, or humidity.

Standards Compliance

The PS90 meets or exceeds USA NIST HB-44 and Canadian MC for a 3000 division, Class `III parcel scale.`

The PS90 has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules.

Electrical Interfaces

The PS90 scale's single board construction has a load cell connector (10 position ZIF), display connector (8 position phone jack), RS-232 interface (9-Pin DSUB), and an input power jack. The following interconnection diagram describes wiring connections for the PS90 shipping scale.

The PS90 can function as a peripheral device to a host through the RS-232 serial port. Calibration and setup can be done using the Host Interface command set. For detailed instructions describing calibration and setup using the Host Interface, please refer to the Appendix at the end of this manual.

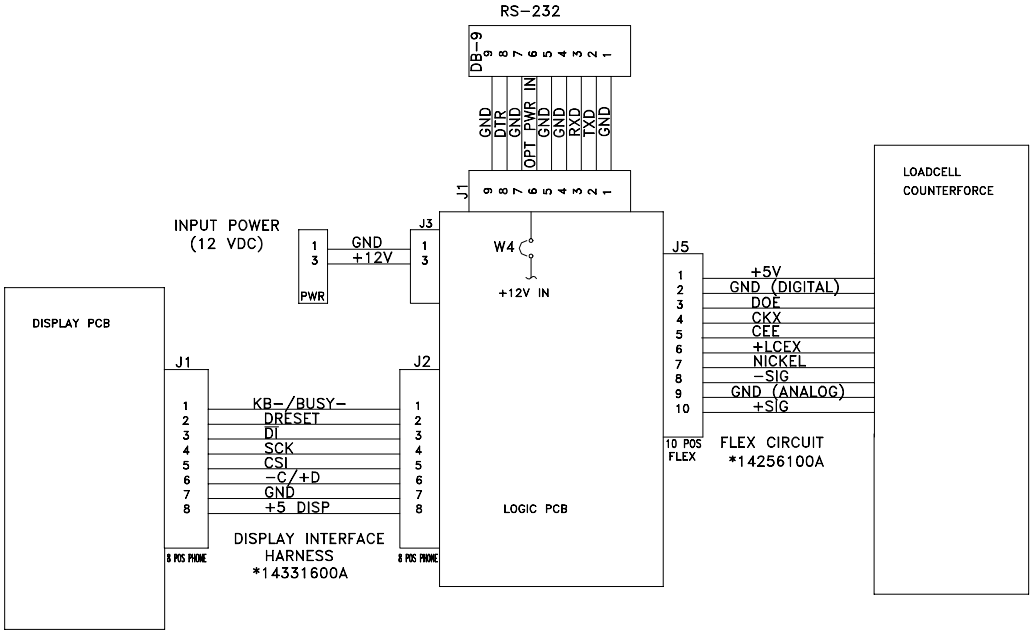


Figure 1-b: PS90 Electronic Interface Diagram

2 Installation and Calibration

This chapter gives detailed instructions and important information you will need to install the PS90 successfully. Please read this chapter thoroughly before you begin installation. This information is also covered in the PS90 Operator Instructions.

Unpacking and Setup

Please inspect the package as the carrier delivers it.

- If the shipping container is damaged, check for internal damage and file a freight claim with the carrier if necessary.
- If the container is undamaged, open the box, remove the scale, and place it on a solid, flat surface.

If you choose to dispose of the package, please recycle the materials.

Please keep the packing material and shipping insert in case the scale needs to be returned to METTLER TOLEDO. The PS90 is a precision instrument and may be permanently damaged if not shipped in factory-approved packaging.

Typical package contents for the PS90 include:

- PS90 Shipping Scale
- Wall/Base mount Display
- Installation Instructions
- Power Supply (may be mounted on the base on some models)
- RS232 Serial Cable
- Double-sided foam adhesive (used to mount remote display if needed)

Installation

The PS90 shipping scale is fully assembled at the factory, and you should not have to assemble the unit. To install components other than those installed at the factory, please refer to Chapter 5 Service and Maintenance.

The proper environment enhances the operation and longevity of the scale.

1. Locate a suitable environment for the scale. Refer to Chapter 1 for environmental specifications.
2. Place the scale on a sturdy, level surface and remove four (4) red shipping retainers before you operate the scale. There is only one visible on each corner of the scale. Using a large screwdriver, insert it between the top and bottom of scale and gently apply enough pressure so they become loose and can be pulled out refer to Figure 2-a.

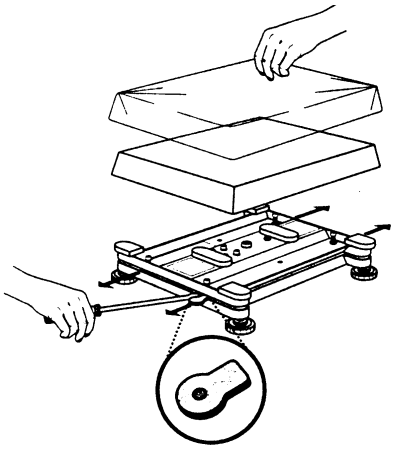


Figure 2-a

3. The display may be attached to the scale base by installing the two (2) plastic mounting pins. Plug one end of the display harness into the phone jack located on the display and the other end into the phone jack located on the left-hand side of the PCB cover assembly. We have included double-sided foam adhesive designed to secure the display mount to a suitable wall location. The adhesive pad fits inside of the display bracket. You can peel the backing off and adhere one (1) side to the display mount and the other to the desired surface. The display can easily pivot to enhance the viewing angle.

4. Level the scale by turning the adjustable feet on the bottom of the unit. When the bubble in the bubble indicator is within the circle, the PS90 is level (see Figures 2-b, 2-c). The feet must be adjusted so the scale does not rock.

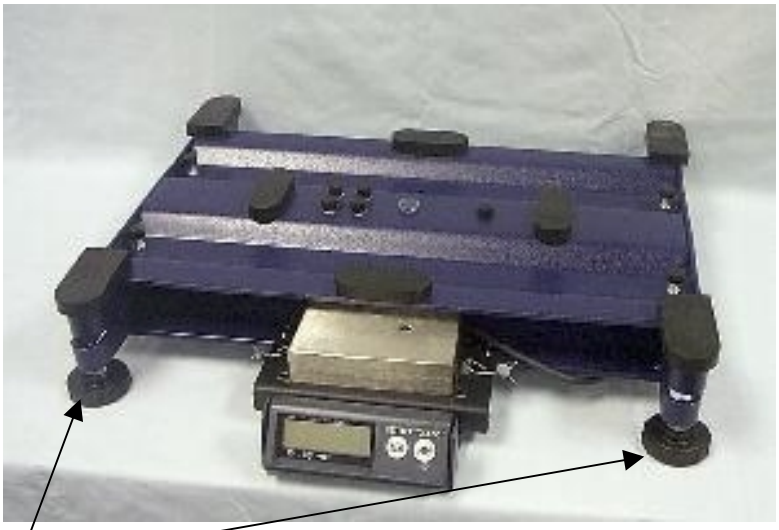


Figure 2-b: PS90 Leveling Feet

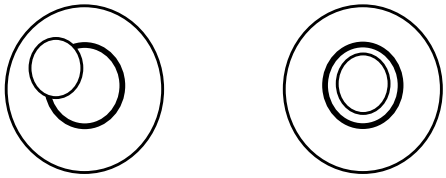
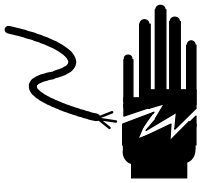


Figure 2-c: Level Indicator

5. Unpack the power supply and plug it into the power jack in the scale base. The jack is recessed on the bottom of the base toward the center front. Plug the line cord into a **properly grounded** AC power outlet. Figure 2-d illustrates proper power supply connection.



WARNING!

AC power sources must have proper short circuit and over current protection in accordance with local and national electrical regulations. Failure to provide this may result in bodily injury and/or property damage.

NOTE: Inside of barrel is positive.

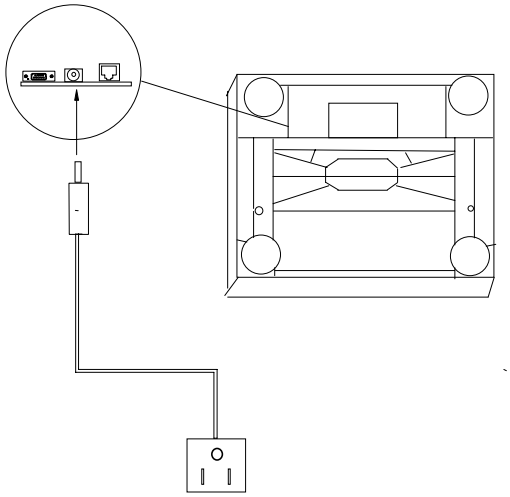


Figure 2-d: Power Cable Connection

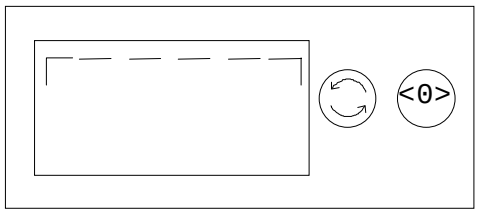
Basic Information

The following sections describe some basic information that you will need to know as you install, calibrate, and use the PS90 in normal operating mode.

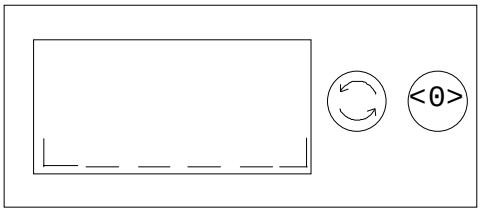
The Display

The PS90's display consists of six digits and five cursor positions. Each digit is composed of seven segments and is 12 mm high. A PS90 cursor can appear above one or more of the legends printed on the display to indicate the current unit, stable conditions, zero, or options in setup mode.

The display area also indicates over-capacity and under-capacity conditions. Over- and under-capacity are indicated on the display as follows:



Over Capacity



Under Capacity

Keys and Navigation

The PS90 keypad contains a UNITS key and a ZERO key:

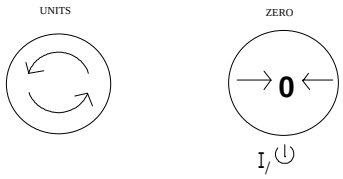


Figure 2-e:
UNITS and ZERO Key

The functions for each key **in normal operating mode** are as follows:

- **UNITS**—Press UNITS to switch between the selected main units and alternate units.
- **ZERO**—Press ZERO to zero an empty scale. The reading must be within 2% of the calibrated zero.

If the scale is in Sleep mode (as defined in the Sleep program block), press ZERO to “awaken” the scale. The scale then goes through its normal power-up sequence and returns to normal operating mode.

The functions for each key **in setup mode** are as follows:

- **UNITS**—Press and hold UNITS for up to 8 seconds to enter setup mode. When a program block option is displayed for selection, press UNITS to confirm the selection.
- **ZERO**—Press ZERO to scroll through a list of parameter options.

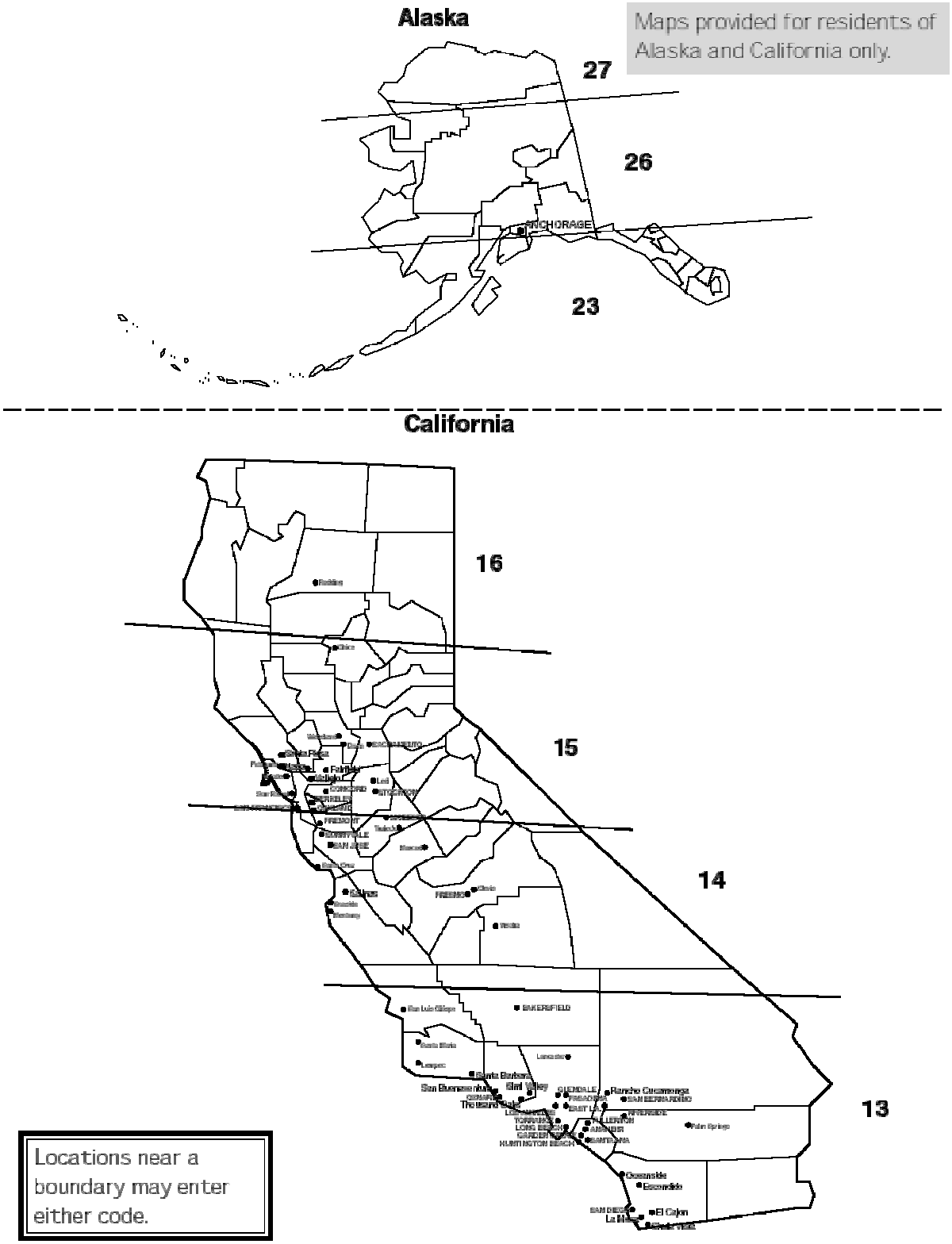
Initial Calibration using GeoCal

The PS90 shipping scale must be calibrated when the unit is initially installed to correct for local gravity variations thereby ensuring accurate weighing results. If the GeoCal capabilities of your PS90 unit have been activated, the unit has been pre-calibrated from the factory. If this is the case, the first time the PS90 is powered up from the factory it should display the **Geo in** prompt as follows:

This indicates that you must select the code for your location. The latitude and altitude of your location both effect gravity and the calibration of your scale. Therefore, it is important to select the proper code. Refer to the table below in order to determine the code for your area. If your location is not listed select closest one.

GeoCal Location Codes

State	Code	State	Code	State	Code
Alabama		**Kansas**	14	**North Dakota**	18
Birmingham & North	13	**Kentucky**	14	**Ohio**	
South of Birmingham	12	**Louisiana**	12	Akron & North	16
Alaska	See map	**Maine**	18	South of Akron	15
Arizona		**Maryland**	15	**Oklahoma**	13
Phoenix & North	12	**Massachusetts**	17	**Oregon**	
South of Phoenix	11	**Michigan**		Salem & North	18
Arkansas	13	Northwest of Lake Michigan	18	Between Oakridge & Salem	17
California	See map	Southeast of Lake Michigan	17	South of Oakridge	16
Colorado		**Minnesota**	18	**Pennsylvania**	16
Denver & North	13	**Mississippi**		**Rhode Island**	16
South of Denver	12	Kosciusko & North	13	**South Carolina**	13
Connecticut	16	South of Kosciusko	12	**South Dakota**	17
Delaware	15	**Missouri**		**Tennessee**	13
Florida		North of Springfield	15	**Texas**	
West Palm Beach & North	11	Springfield & South	14	Northeast of Colorado River	12
South of West Palm Beach	10	**Montana**		Southwest of Colorado River	11
Georgia	12	Helena & North	18	**Utah**	13
Hawaii	9	South of Helena	17	**Vermont**	17
Idaho		**Nebraska**	15	**Virginia**	14
North of Salmon River Mtns	17	**Nevada**	13	**Washington, DC**	15
South of Salmon River Mtns	16	**New Hampshire**	17	**Washington State**	18
Illinois		**New Jersey**	16	**West Virginia**	15
Bloomington & North	16	**New Mexico**	11	**Wisconsin**	
South of Bloomington	15	**New York**		Green Bay & North	18
Indiana		Albany & North	17	South of Green Bay	17
North of Indianapolis	16	South of Albany	16	**Wyoming**	
Indianapolis & South	15	**North Carolina**		North of Casper	15
Iowa		Raliegh & North	14	Casper & South	14
North of Des Moines	17	South of Raliegh	13		
Des Moines & South	16				


Alaska
Maps provided for residents of Alaska and California only.
27
26
23
ANCHORAGE
California
16
15
14
13
BAKERSFIELD
Locations near a boundary may enter either code.

The sequence for selecting your GeoCal code is as follows:

1. Press the ZERO key to display the first code option and continue pressing it to scroll through all of the available codes.
2. Press the UNITS key to select the code for your location. The display will then prompt **done**. Press the UNITS key again to restart the scale.

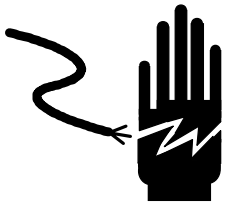
Power-up Sequence

The PS90 goes through a power-up sequence each time power is applied or the scale is brought from its power-down ("sleep") state. The scale performs a diagnostic test on its ROM and RAM, then proceeds to normal operating mode. The power-up sequence is as follows:

To "awaken" the PS90 whenever it is in sleep mode, press the ZERO key.

1. All segments of the display characters are activated. This verifies operation of all segments.
2. The scale displays the software part number followed by the software revision status.
3. The scale then captures zero (if the zero reading is within ± 10% calibrated capacity on power-up) and is ready for normal operation.

PS90 Calibration



WARNING

ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.

You can calibrate the PS90 scale using the UNITS and ZERO keys, or you can calibrate the unit remotely from a computer terminal through its Host interface. Details on calibration using a Host Interface are given in the Appendix at the end of this manual.

To calibrate the PS90 at the scale:

1. Disconnect the power from the scale.
2. Remove the platter, break the legal-for-trade seal (if present), and remove the PCB cover plate to give access to the PCB.
3. Move the calibration switch SW1 to the off position and then set the PCB bracket back into position and set the platter on the scale.

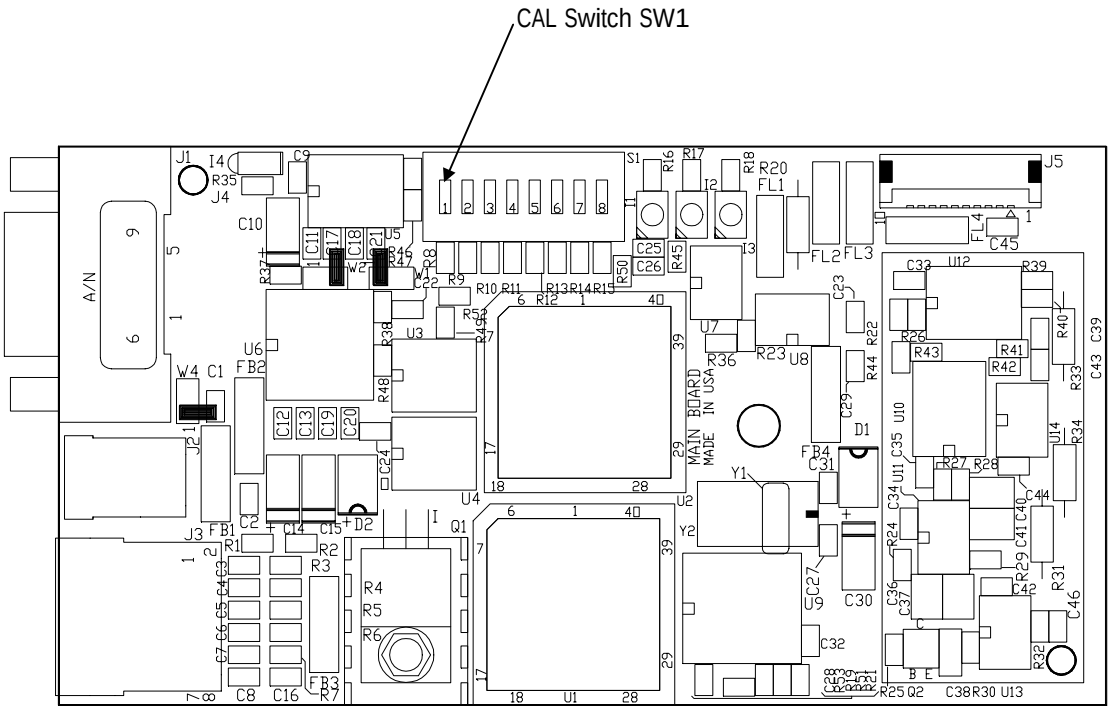


Figure 2-f: CAL Switch on Main PCB

4. Connect the power to the scale.
5. Enter the setup mode by pressing and holding the UNITS key for up to eight seconds until the message **Setup** is displayed. Release the UNITS key.
6. Press the UNITS key several times until the **Cal** prompt appears, then press ZERO to display YES or NO. Select Yes to calibrate or select No to abort calibration. If Yes, press UNITS to begin the calibration process.
7. At the **Empty** prompt, insure that the empty platter is on the sub-platter, then press UNITS.
8. At the **Add XX** prompt the unit is indicating how much weight should be placed on the platter, only 50 lb (for 150lb capacity), 20 kg (for 60kg capacity), 125 lb (for 300lb capacity), or 50 kg (for 150kg capacity) may be used. A cursor appears over either lb or kg on the lens to indicate which units are required. Place the appropriate weight on the platter, then press UNITS. The scale automatically determines a span factor then indicates **Done** while the calibration values are saved.
9. Remove the calibration weight from the scale platter and press the UNITS key again to restart the unit.
10. Verify zero and span using the test weights.
11. Disconnect power in order to move the calibration switch (SW1) to the ON position, and reassemble the scale.

The PS90 is now calibrated and ready to configure to your needs. Chapter 3 of this manual gives setup and configuration details.

Metrological Seal Installation

If a wire seal is required for W & M requirements. The PS90 can be sealed after calibration and setup by installing a wire seal on the Main PCB access cover, as shown in Figure 2-g or by installing a tamper evident label on each end of the Main PCB access cover, as shown in Figure 2-h.

NOTE: Switch SW1 must be in the ON position prior to sealing the Main PCB access cover.

Figure 2-g: Wire Seal Installation

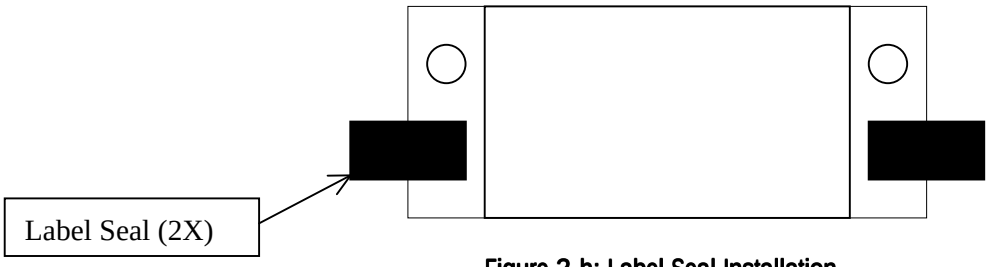


Figure 2-h: Label Seal Installation

3 Configuring the Setup Parameters

This chapter discusses basic information related to PS90 configuration and specific instructions on configuring each program block and operating parameter.

Basic Setup Information

The following sections describe some basic information that you will need to know as you configure the setup parameters for the PS90.

Program Block Access

The PS90's operational parameters are configured in setup mode through a series of program blocks. The program blocks are accessed as follows:

1. Press and hold the UNITS key for up to eight seconds until the message **Setup?** is displayed. Release the UNITS key. When released, the PS90 displays either the **Pb 0** or **Alt** prompt indicating the first program block.

Exit Setup

Exit setup mode as follows:

1. Press UNITS to display the **End** prompt.
2. Press ZERO to display the desired exit option. Exit options include:
   - No—Do not exit setup mode at this time.
   - Save—Save all changes program block parameters then exit setup mode.
   - Abort—Exit setup mode but do not save any changes made in this session.
   - Various Defaults—Reset all program block parameters to a pre-specified set of values, then exit setup mode. For details, refer to the End Program Block section.
3. Press UNITS to carry out the displayed option. The PS90 automatically exits setup mode and returns to normal operating mode unless No is selected.

There are two alternate ways to exit the setup mode:

- The scale automatically leaves the setup mode after it has been calibrated.
- Disconnect the power from the scale. Changes **will not** be saved.

Configuring Setup Parameters

This section describes the program blocks that govern normal operation including:

- Push Button Zero *
- Zero Cursor *
- Power-up Units *
- Build *
- Alternate Units
- Mode *
- Filter
- Baud
- ASCII
- Parity
- Stop Bits
- Protocol
- Sleep
- GeoCal *
- Calibration *
- End

This is the order that they appear in the prompts.

* The Push Button Zero, Zero Cursor, Power-up Units, Capacity/Increment (Build), Display Mode, GeoCal Activation, and Calibrate program blocks are hidden in setup mode when the Metrology PCB switch SW1 is in the ON position. These program blocks are used only when the jumper is removed and the scale is being calibrated. Please refer to Chapter 2 for calibration details.

The PS90 can also be configured remotely through the METTLER TOLEDO Host Interface. Details for configuring the scale using the Host Interface are given in the Appendix at the end of this manual.

To configure the PS90 at the scale, enter the setup mode by pressing and holding the UNITS key for up to eight seconds until the message **Setup** is displayed. Release the UNITS key, then configure the PS90 program block parameters.

Push Button Zero Program Block

The Push Button Zero program block lets you configure the range within which the PS90 can capture zero. The only push button zero capture range currently supported is ± 2%. (Metrology PCB jumper must be removed.)

To configure the program block:

1. Press UNITS to display the **Pb 0** prompt, then press ZERO.

2. Press UNITS again to accept the 2 pct option. The PS90 continues to the Zero Cursor program block.

Zero Cursor Program Block

The Zero Cursor program block lets you enable or disable the center of zero indicator on the PS90. (Metrology PCB jumper must be removed.)

To configure the program block:

1. Press UNITS to display the **0 CurS** prompt, then press ZERO.
2. Press ZERO to display the desired approval setting, enable or disable.
3. Press UNITS to accept the displayed option. The PS90 continues to the Power-up Unit program block.

Power-up Unit Program Block

The Power up Unit program block lets you select which units will be active on the PS90 upon startup. This program block will effect the build options that are seen in the Build program block.

To configure the program block:

1. Press UNITS to display the **unitS** prompt, then press ZERO.
2. Press ZERO to display the desired setting, pounds or metric.
3. Press UNITS to accept the displayed option. The PS90 continues to the Build / Alternate Units program block.

Build Program Block

The build program block lets you chose a capacity and increment size setting for the product based on the model you have purchased and the power-up units selection. (Metrology PCB jumper must be removed.)

To configure the program block:

1. Press UNITS to display the **buiLd** prompt, then press ZERO.
2. Press ZERO to display the desired approval setting. Option may vary as follows:

Standard PS90, 3000d

Power-up units = Pounds		Power-up units = Metric	
150-05	150 x 0.05 lb.	60-02	60 x 0.02 kg
300-1	300 x 0.1 lb.	150-05	150 x 0.05 kg

3. Press UNITS to accept the displayed option. The PS90 continues to the Alternate Units program block.

Note: the scale can only be sealed in the build that is listed on the data label.

Alternate Units Program Block

This program block lets you enable or disable unit switching during normal operation.

To configure the program block:

1. Press UNITS to display the **ALt** prompt, then press ZERO.
2. Press ZERO to display the desired approval setting, enable or disable.
3. Press UNITS to accept the displayed option. The PS90 continues to the Mode / Filter program block.

Mode Program Block

The Mode program block lets you configure which mode is used to display weight. (Metrology PCB jumper must be removed.)

To configure the program block:

1. Press UNITS to display the **nodE** prompt, then press ZERO.
2. Press ZERO to display the desired mode. Options include:
   - Normal
   - Expanded – typically x10
   - Classifier – weight classifier rounding
3. Press UNITS to accept the displayed mode option. The PS90 continues to the Filter program block.

Filter Program Block

The Filter program block lets you configure the noise filter that is used in determining weight stability on the scale. The PS90 disregards environmental noise such as vibrations that affect the weighing accuracy according to the filter setting.

To configure the program block:

1. Press UNITS to display the **FiLtEr** prompt, then press ZERO.
2. Press ZERO to display the desired noise filter. Options include:
   - Light
   - Medium
   - Heavy

Settling time increases with heavier filter setting.

3. Press UNITS to accept the displayed filter option. The PS90 continues to the Baud program block.

Baud Program Block

This program block lets you set the baud rate (the speed at which data is transmitted in bits-per-second).

To configure the program block:

1. Press UNITS to display the **bAud** prompt, then press ZERO.
2. Press ZERO to display the desired baud rate. Options include:
   - 300
   - 1200
   - 2400
   - 4800
   - 9600
   - 19200
3. Press UNITS to accept the displayed baud rate option. The PS90 continues to the ASCII program block.

ASCII Program Block

The ASCII program block lets you select the number of bits that make up an ASCII character. Most METTLER TOLEDO equipment communicates using seven data bits.

To configure the program block:

1. Press UNITS to display the **ASCii** prompt, then press ZERO.
2. Press ZERO to display the desired bit selection. Options include:
   - Seven (7)
   - Eight (8)
3. Press UNITS to accept the displayed option. The PS90 continues to the Parity program block.

Parity Program Block

The Parity program block lets you select the parity option for data transmission. Parity is an error checking mechanism. To configure the program block:

1. Press UNITS to display the **PAr** prompt, then press ZERO.
2. Press ZERO to display the desired parity option. Options include:
   - Space
   - Mark
   - Odd
   - Even
   - None
3. Press UNITS to accept the parity option. The PS90 continues to the Stop program block.

Note: options will depend on the ASCII bits selection.

Stop Program Block

The Stop program block lets you select the number of stop bits to be transmitted for each ASCII character. Most METTLER TOLEDO products will work with either 1 or 2 stop bits.

To configure the program block:

1. Press UNITS to display the **StoP** prompt, then press ZERO.
2. Press ZERO to display 1 or 2 stop bits, then press UNITS to accept the displayed selection. The PS90 continues to the Protocol program block.

Protocol Program Block

Toledo protocol contained in the PS90 is identical to the Toledo protocol within the industrial builds of the 8213 and PS60. The PS90 replaces the industrial versions of the 8213.

The Protocol program block lets you select a pre-configured set of scale commands. Protocols are configured in the factory according to your ordering information. This section gives instructions on how to select a protocol only.

To select a protocol:

1. Press UNITS to display the **Proto** prompt, then press ZERO.
2. Press ZERO to display the desired protocol. Options include:
   - Toledo (MT command set)
   - Proto 1 (Fed Ex command set)
   - Proto 2 (Weightronix SC-320 com. set)
   - Proto 3 (Weightronix 3870 com. set)
   - Proto 4 (UPS command set)
   - Proto 5 (Purolator command set)
   - Proto 6 (Airborne command set)
   - Disable(turns off communications)
3. Press UNITS to accept the protocol option. The PS90 continues to the Sleep program block.

Sleep Program Block

Power is saved if RS-232 interface is not used.

In normal operating mode the scale is powered-up by pressing the ZERO (ON/OFF) key.

The Sleep program block lets you configure the sleep timer. Power consumption is reduced by approximately 60% while in Sleep mode. **IMPORTANT: For battery powered units, it is important to turn battery power off (using the rocker switch underneath the scale) when the scale is not in use.**

To configure the Sleep program block:

1. Press UNITS to display the **SLEEP** prompt, then press ZERO.
2. Press ZERO to display the desired sleep timer option. Options include:
   - **Disable**—the PS90 will not power-down regardless of time between transactions (inactivity)
   - **5 min**—the PS90 will enter Sleep mode after 5 minutes with no activity
3. Press UNITS to accept the sleep timer option. The PS90 continues to the GeoCal / End program block.

GeoCal Program Block

This program block lets you enable the GeoCal prompt at power-up. If this setting is enabled, the unit will prompt for the entry of a GeoCal code after setup is exited.

To configure the program block:

1. Press UNITS to display the **GEo in** prompt, then press ZERO.
2. Press ZERO to display the desired setting, enable or disable.
3. Press UNITS to accept the displayed option. The PS90 continues to the Cal program block.

Calibration Program Block

See Chapter 2 for detailed information about activating GeoCal and calibrating the PS90. (Metrology PCB jumper must be removed.)

End Program Block

The End program block lets you save the configuration and exit setup mode. This program block does not have parameters to configure.

To use the End program block:

1. Press UNITS to display the **End** prompt.
2. Press ZERO to display the desired exit option. Exit options include:
   - **Default**—Reset all program block parameters to standard MT values, then exit setup mode.
   - **Abort**—Exit setup mode but do not save any changes made in this session.
   - **Save**—Exit setup mode and save changes made in this session.
   - **Def x**—Company specific.

   If you are using software from one of the following carriers your PS90 scale can be completely configured for use by selecting one of the options below:

Carrier	End prompt selection
• RPS	Default
• DHL	Default
• Fed Ex	Def 1
• UPS	Def 4
• Purolator	Def 5
• Airborne	Def 6

   Choosing a default, rather the selecting SAVE, will automatically set the following program blocks:

- Zero Cursor
- Power-up Units
- Units Switching
- Filter
- BAUD
- ASCII BIT String
- PARITY
- STOP BITS
- Sleep Mode
- Protocol
- Display Mode

If your carrier is not listed try the default option, otherwise contact your carrier.

3. Press UNITS to carry out the displayed option.

4

Operating Instructions

This chapter gives information that an operator will need to become familiar with the scale and perform its functions in normal operating mode. The scale operates based on the current program block configuration. Please refer to Chapter 3 for more information on configuring the PS90.

Keypad and Display

The PS90 has a simple LCD weight display with two keys that are used to perform scale functions. Weight is displayed using up to six 7-digit numeric characters with decimal point and comma. Cursors (horizontal bars) at the bottom of the display indicate current weight units and zero condition when zero is captured.

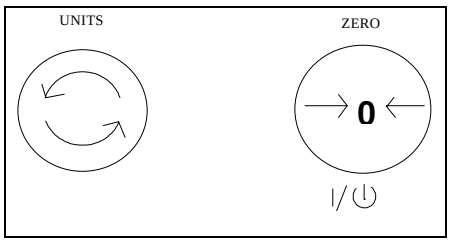


Figure 4-a: PS90 Keypad

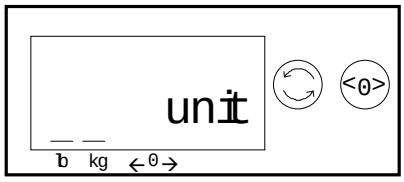


Figure 4-b: PS90 Display

Operator Functions

The PS90 supports one primary function: parcel weighing. Other operator functions described in this chapter include:

- Unit switching
- Zero the scale
- Repower from Sleep mode

Parcel Weighing

Before weighing parcels on the PS90, please be sure the scale is configured as desired (Chapter 3) and power is applied as instructed in Chapter 2 of this manual.

You may wish to recapture zero periodically when the scale is in continuous use. It is not necessary to press ZERO before each transaction.

To weigh a package:

1. Press ZERO to capture zero. The display reads **0.00** and a cursor appears above the zero indicator in the legend.
2. Place the parcel to be weighed on the platter. The display reads the parcel weight with a cursor above the current weight units legend.
3. Record the parcel weight, then remove the parcel from the platter.

Unit Switching

The PS90 lets you view the displayed scale weight in primary and secondary units. Alternate units must be configured (in setup mode) to convert and display in alternate units.

If primary and alternate units are the same (as configured in the Alternate Units program block), unit switching is effectively disabled. The UNITS key displays the same weight and unit when the UNITS key is pressed.

To switch units:

1. With scale weight displayed, press the UNITS key. The PS90 automatically converts the displayed weight to weight in the alternate unit as indicated by the cursor.
2. Press UNITS again to reconvert alternate units back to primary units and return weight display to the primary unit.

Zeroing the Scale

Periodically the PS90 scale may need to be re-zeroed. Press ZERO to capture zero. The scale will re-zero provided the weight is within 2% of the scale capacity. The PS90 display will indicate a zero reading.

If zero change exceeds the 2% limit, the scale will not capture zero. In this case, cycle power or recalibrate.

Repowering from Sleep

If the PS90 display is blank after a period of inactivity, the ZERO key "awakens" the unit from its power-saving (sleep) mode.

When the ZERO key is pressed, the PS90 goes through its power-up sequence and returns to normal operating mode.

5 Service and Maintenance

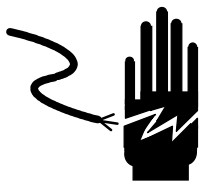
This chapter gives information on servicing, upgrading, and maintaining the PS90 including cleaning and regular maintenance, troubleshooting, and installing optional equipment kits.

Cleaning and Regular Maintenance

You may need to wipe the keypad and platter with a clean, soft cloth that has been dampened with a mild cleaner. Do not use any type of industrial solvent such as toluene or isopropanol (IPA). These may damage the display finish. Do not spray cleaner directly onto the terminal.

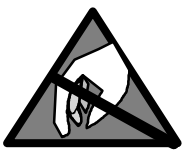
Troubleshooting

The PS90 shipping scale is designed to be virtually error free and reliable. If problems do occur, do not attempt to repair the scale before you have determined the source of the problem. Record as much information as possible about what has happened including any messages and physical responses. The following troubleshooting information may help to determine the cause of the problem.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

Error Code Section

Error codes are displayed on the weight indicator with a leading “E” to distinguish themselves from weight data.

Display Code	Meaning	Action
E 1	Program memory checksum error	• Call Mettler-Toledo Service
E 2	Processor or data memory error	• Call Mettler-Toledo Service
E 3	Scale configuration non-volatile memory error	• Calibrate scale. • If error remains, call Mettler-Toledo Service.
E 4	Scale compensation non-volatile memory error	• Call Mettler-Toledo Service
_____ | |	Scale overcapacity	• Remove excess weight from scale and it should return to weighing range. • If error remains, reset the scale. • If error remains, calibrate the scale. • If error remains, call Mettler-Toledo Service.
|_____|	Scale under zero	• Make sure that the platter is not rubbing against or touching nearby cables or objects and reset the scale. • If error remains, remove the platter and make sure that the sub-platter of the scale is not making contact with nearby cables or objects. If an interference is cleared, install the platter and reset the scale. • If error remains, calibrate the scale. • If error remains, call Mettler-Toledo Service.
- - - . - -	Scale failed to capture zero at power up or reset.	• Follow the steps for the scale under zero error.

Wall Transformer

The wall transformer (when connected to the proper AC input and disconnected from the scale) may read as high as 18.3 VDC. The wall transformer should read from 7 VDC, up to 17 VDC when connected to the scale. If the voltage measured is not within this range, replace the wall transformer. The center conductor of the wall transformer is positive.

Main PCB

From PC - **DB25-F** RS232 SERIAL PORT		**To PS90 - DB9-M (Male)**	
2	TRANSMIT	3	RECEIVE
3	RECEIVE	2	TRANSMIT
7	SIG GROUND	1,4,5,7, or 9	SIG GROUND

Table 1 Standard PC RS232 DB-25 To PS90

From PC - **DB9-F** RS232 SERIAL PORT		**To PS90 – DB9-M (Male)**	
2	RECEIVE	2	TRANSMIT
3	TRANSMIT	3	RECEIVE
5	SIG GROUND	1,4,5,7, or 9	SIG GROUND

Table 2 Standard PC RS232 DB9 To PS90

To test the Main PCB: (Unit must be setup for standard MT communications (Default)):

1. Start your communications software such as ComTool (Part Number KN000000K64).
2. Setup your software for:
   - 7 data bits
   - Even parity
   - 1 stop bit
   - Baud rate that matches the computer's baud rate

Blank or Half Display

Remove power, then check the display interface harness from the scale to the display. Apply power to the unit. If the blank display continues, replace the display.

No Keypad Interaction

To test operation of the keypad, remove power, then reapply. With power to the unit, attempt to enter setup mode by pressing and holding the UNITS key. If the display does not indicate setup mode, replace the display.

Indicator Locked

To test operation of the indicator, remove power, then reapply. With power to the unit, add weight. If no motion is displayed, replace either the load cell or the Logic PCB.

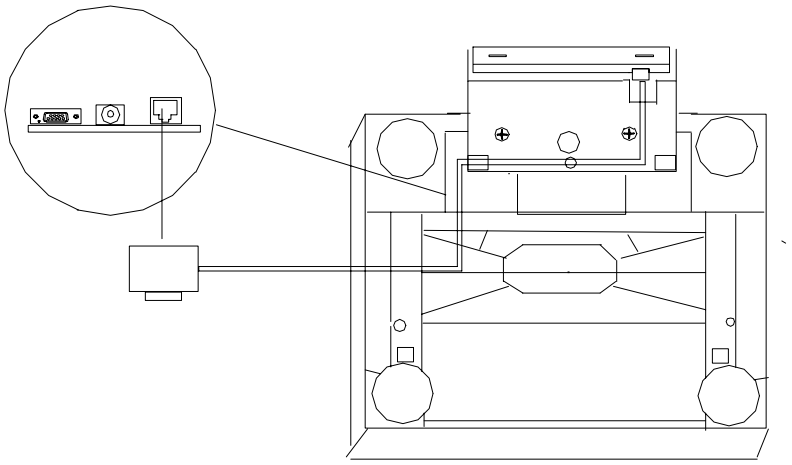
Load Cell Replacement

For load cell replacement, please use current revision of China Model Number MT1241-100 for PS90 (3000d).

Installing the Base Mount Display

A base mount display unit (2-key indicator) can be installed if one was not ordered initially for the PS90 shipping scale. To install the base mount display:

1. Attach the display unit to the bottom of the PS90 with the two ¼ turn fasteners. Press the fasteners into holes located in the bottom of the base of the scale and turn with tool to lock display unit to the base.
2. Install the display interface harness from the display as shown. Insert the display interface harness into the PCB as shown.



Installing the Ball Top Transfer Platter

A ball top transfer platter is available for the PS90. To install the ball transfer platter:

1. Place the ball top transfer platter on the PS90.
2. Ensure that the ball top transfer platter drops into place without mechanical interference.

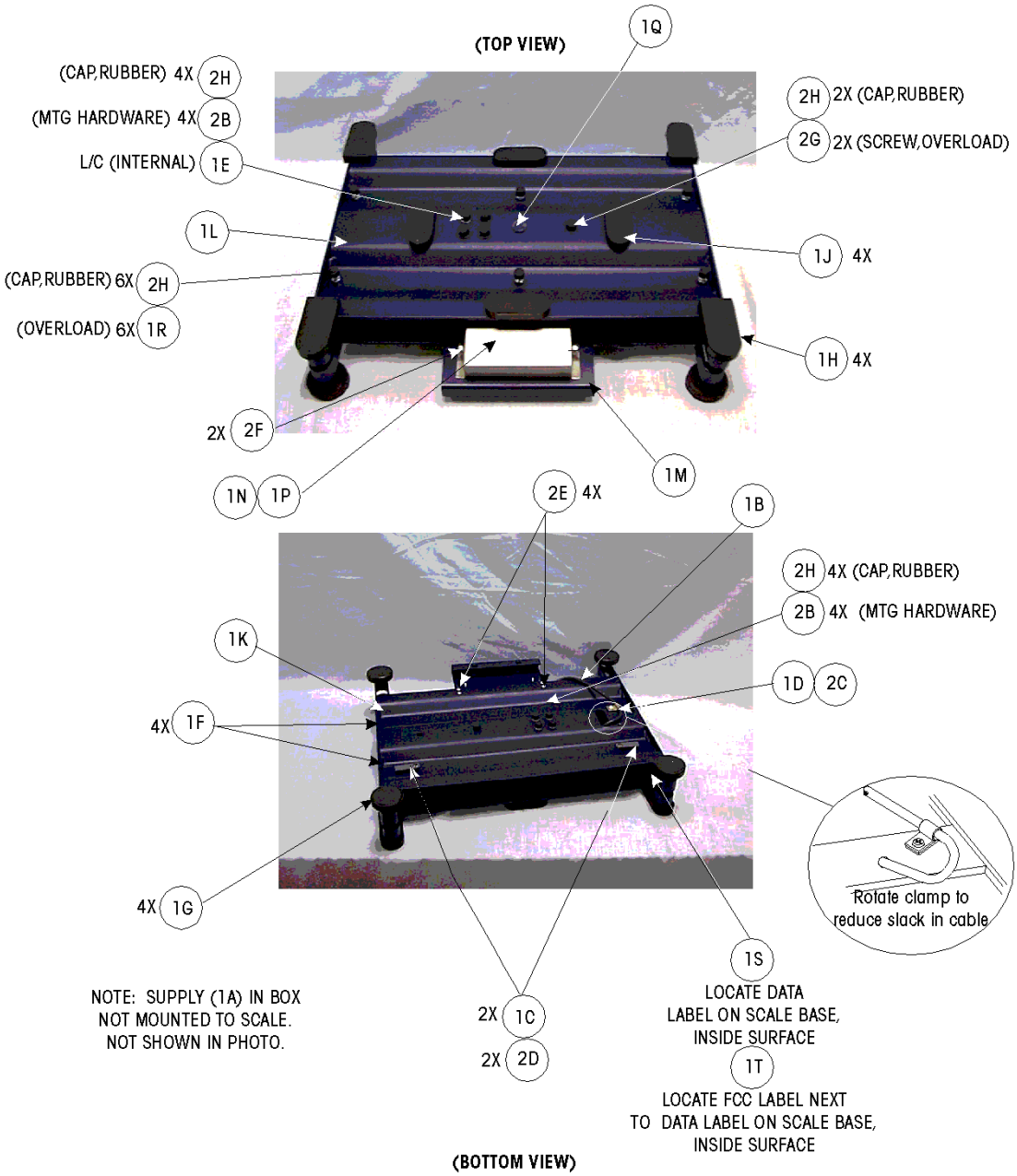
Note: If the unit fails to capture zero after power-up, re-calibration will be required.

6 Parts and Accessories

Please refer to the following diagrams and parts lists when ordering parts and accessories for the PS90 shipping scale.

PS90 Scale Parts UPS

Included with Scale:



PS90 Parts Lists UPS

Components:

Symbol	QTY	Description
1A	1	Wall mount, Indicator w/bracket
1B	1	Cable with Ferrite
1C	2	Cable retainers (2)
1D	1	Cable clamp
(ref)	0	Software---158685R
1E	1	250kg Loadcell
1F	4	Protective spacers (red)
1G	4	Feet
1H	4	Platter pads Outside (4)
1J	4	Platter Pads Inside (4)
1K	1	Scale base
1L	1	Platter support
1M	1	Indicator mounting plate
1N	1	PCB Assembly---(INCLUDES DB9 With HEX POST)
1P	1	Enclosure PCB
1Q	1	Level Bubble
1R	6	Overload stops (SCREW / NUT)
1S	1	Data Label
1T	1	FCC LABEL
*	1	Auto Sensing Power Supply 100 TO 250 VAC IN/9Vdc-12Vdc,200ma min OUT
*	1	RS232 Cable

Note: * indicates part not shown

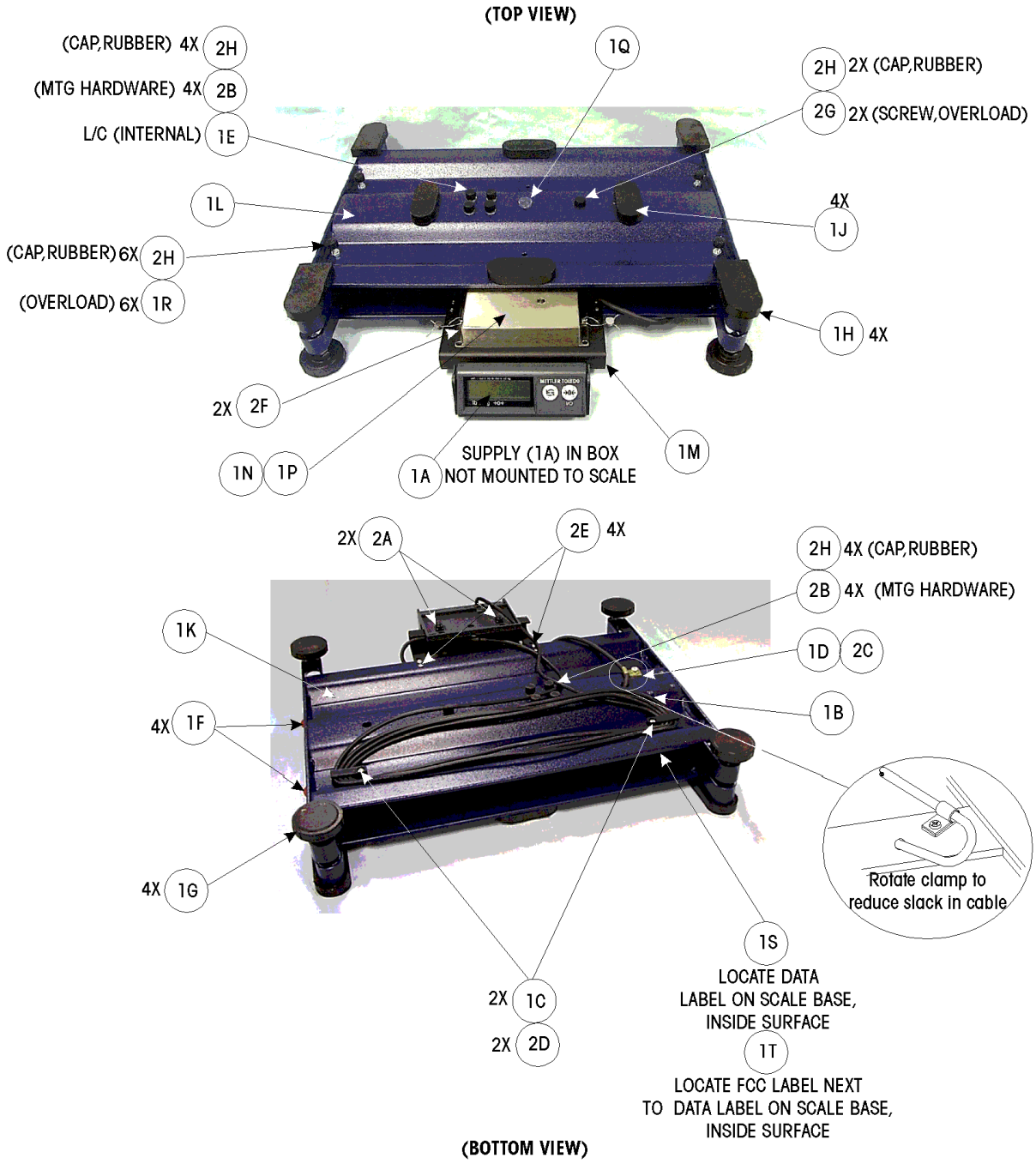
Hardware:

Symbol	QTY	Description
2A	2	Twist Mount
2B	8	L/C hardware (SCREW / WSR)
2C	1	Screw socket head (Cable Clamp mtg.)
2D	2	Screw M5 (Cable retainer)
2E	4	Screws, (bracket mounting)
2F	2	Sealing Screws
2G	2	Screw, Overload
2H	16	Cap, Overload Screw

Shipping Material

Shipping Container
EPS packing material
Instruction Installation PS90---A15856200A

PS90 Scale Parts, Basic



PS90 Basic Parts List

Components:

Symbol	QTY	Description
1A	1	Base mount, Indicator w/base
1B	1	Cable with Ferrite
1C	2	Cable retainers (2)
1D	1	Cable clamp
(ref)	0	Software---158685R
1E	1	100kg Loadcell
1F	4	Protective spacers (red)
1G	4	Feet
1H	4	Platter pads Outside (4)
1J	4	Platter Pads Inside (4)
1K	1	Scale base
1L	1	Platter support
1M	1	Indicator mounting plate
1N		PCB Assembly---(INCLUDES DB9 With HEX POST
1P	1	Enclosure PCB
1Q	1	Level Bubble
1R	6	Overload stops (SCREW / NUT)
1S	1	Data Label
1T	1	FCC LABEL
*	1	Power Supply 120 VAC,9VDC
*	1	RS232 Cable

Note: * indicates part not shown

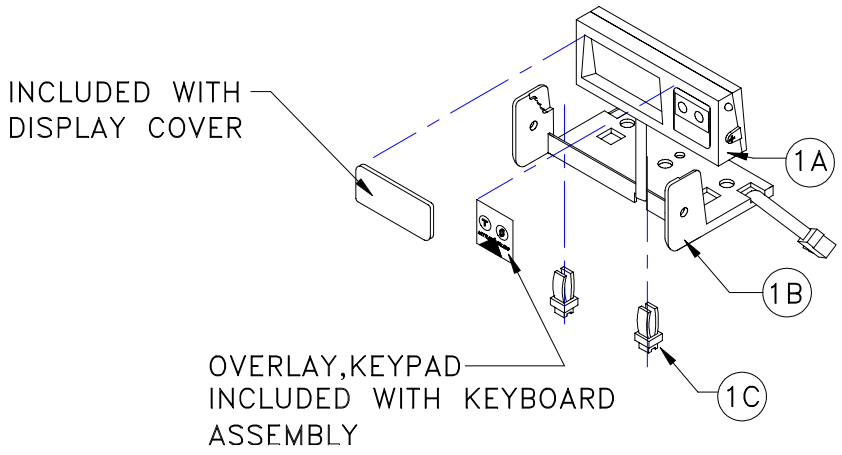
Hardware:

Symbol	QTY	Description
2A	2	Twist Mount
2B	8	L/C hardware (SCREW / WSR)
2C	1	Screw socket head (Cable Clamp mtg.)
2D	2	Screw M5 (Cable retainer)
2E	4	Screws, (bracket mounting)
2F	2	Sealing Screws
2G	2	Screw, Overload
2H	16	Cap, Overload Screw

Shipping Material

Shipping Container
EPS packing material
Instruction Installation PS90---A15856200A

Weight Display Parts



Parts List—Weight Display			
Ref #	**Part Number**	**Description**	**Qty**
1A	15705300B	Display PCB Assembly W/Cable	1
1B	15640800A	Display Base	1
1C	12051300A	Fastener,1/4 turn	2

NOTE: Some part numbers may have a revision letter in front of them.

Appendix: Host Interface

The METTLER TOLEDO PS90 shipping scale can function as a peripheral device to a host computer. In host mode you can:

- Calibrate the scale
- Configure setup parameters
- Request and receive weight data when the scale is in a stable state
- Request and receive the scale's status when the scale is in an unstable or invalid state
- Zero the scale and/or switch units (depending on setup)

The scale does not reply to host weight commands if it is in setup mode or if the scale cannot capture zero on power-up.

This section presents information and instructions on how to use the PS90 in host mode.

Communication Parameters

Data is transmitted and received by the scale through an RS-232 serial port connection. The following communication parameters are supported:

- Baud Rate (300, 1200, 2400, 4800, 9600, 19200)
- Parity (no, even, odd, mark, space)
- ASCII bit string (7 or 8)
- Stop bits (1, 2)
- The scale only responds to commands, continuous data output is not available.

Protocols

The scale can be programmed to respond to a selected "menu" of defined protocols. The host sends requests to the scale in the form of ASCII data and control characters as determined by the selected protocol. The scale responds to the host with a string of ASCII characters. ASCII characters and their binary conversions are listed in the following table:

ASCII Characters and Conversions

ASCII CHAR.	DEC	HEX	76543210	ASCII CHAR.	DEC	HEX	76543210
NULL	0	00	00000000	SPACE	32	20	00100000
SOH	1	01	00000001	!	33	21	00100001
STX	2	02	00000010	”	34	22	00100010
ETX	3	03	00000011	#	35	23	00100011
EOT	4	04	00000100	$	36	24	00100100
ENQ	5	05	00000101	%	37	25	00100101
ACK	6	06	00000110	&	38	26	00100110
BELL	7	07	00000111	’	39	27	00100111
Backspace	8	08	00001000	(	40	28	00101000
TAB	9	09	00001001	)	41	29	00101001
Line Feed	10	0A	00001010	*	42	2A	00101010
Vert. Tab	11	0B	00001011	+	43	2B	00101011
Form Feed	12	0C	00001100	,	44	2C	00101100
Carr. Return	13	0D	00001101	-	45	2D	00101101
Shift Out	14	0E	00001110	.	46	2E	00101110
Shift In	15	0F	00001111	/	47	2F	00101111
Data Link Esc	16	10	00010000	0	48	30	00110000
DC1	17	11	000010001	1	49	31	00110001
DC2	18	12	00010010	2	50	32	00110010
DC3	19	13	00010011	3	51	33	00110011
DC4	20	14	00010100	4	52	34	00110100
NAK	21	15	00010101	5	53	35	00110101
SYNCH IDLE	22	16	00010110	6	54	36	00110110
End Trans.	23	17	00010111	7	55	37	00110111
CANCEL	24	18	00011000	8	56	38	00111000
End Of Medium	25	19	00011001	9	57	39	00111001
Substitute	26	1A	00011010	:	58	3A	00111010
ESCAPE	27	1B	00011011	;	59	3B	00111011
FS (Cur. Right)	28	1C	00011100	<	60	3C	00111100
GS (Cur. Left)	29	1D	00011101	=	61	3D	00111101
RS (Cursor Up)	30	1E	00011110	>	62	3E	00111110
US (Cur. Down)	31	1F	00011111	?	63	3F	00111111

ASCII CHAR.	DEC	HEX	76543210	ASCII CHAR.	DEC	HEX	76543210
@	64	40	01000000	`	96	60	01100000
A	65	41	01000001	a	97	61	01100001
B	66	42	01000010	b	98	62	01100010
C	67	43	01000011	c	99	63	01100011
D	68	44	01000100	d	100	64	01100100
E	69	45	01000101	e	101	65	01100101
F	70	46	01000110	f	102	66	01100110
G	71	47	01000111	g	103	67	01100111
H	72	48	01001000	h	104	68	01101000
I	73	49	01001001	i	105	69	01101001
J	74	4A	01001010	j	106	6A	01101010
K	75	4B	01001011	k	107	6B	01101011
L	76	4C	01001100	l	108	6C	01101100
M	77	4D	01001101	m	109	6D	01101101
N	78	4E	01001110	n	110	6E	01101110
O	79	4F	01001111	o	111	6F	01101111
P	80	50	01010000	p	112	70	01110000
Q	81	51	01010001	q	113	71	01110001
R	82	52	01010010	r	114	72	01110010
S	83	53	01010011	s	115	73	01110011
T	84	54	01010100	t	116	74	01110100
U	85	55	01010101	u	117	75	01110101
V	86	56	01010110	v	118	76	01110110
W	87	57	01010111	w	119	77	01110111
X	88	58	01011000	x	120	78	01111000
Y	89	59	01011001	y	121	79	01111001
Z	90	5A	01011010	z	122	7A	01111010
[	91	5B	01011011	{	123	7B	01111011
\	92	5C	01011100	|	124	7C	01111100
]	93	5D	01011101	}	125	7D	01111101
^	94	5E	01011110	~	126	7E	01111110
_	95	5F	01011111		127	7F	01111111

Toledo Protocol Host Commands

Following is a listing of host commands and scale responses. Brackets "<>" are used to indicate that the characters within are a description of the transmitted data and are not part of the transmitted data string. <STX> indicates an ASCII Start Of Text character (HEX 02). <CR> indicates an ASCII Carriage Return (HEX 0D).

Host Command	Description	Scale Response
W*	Send normal resolution weight data.	<STX>XXXX.X<CR> (for 300 x 0.1 lb build) or <STX>XXX.XX<CR> (for 150 x 0.05 kg build) or <STX>?<StatusByte><CR> (if current weight is invalid)
H	Send high resolution weight data.	<STX>XXXX.XX<CR> (for 300 x 0.1 lb build) or <STX>XXX.XXX<CR> (for 150 x 0.05 kg build) or <STX>?<StatusByte><CR> (if current weight is invalid)
Z	Zero scale unless in motion or out of range under or over capacity.	<STX>?<status byte><CR> Scale status byte.
A	Perform a confidence test of RAM, ROM, and EEPROM. Store results of tests in confidence status byte for later retrieval.	<STX><CR> The scale echoes back a <STX><CR> indicating the command was received.
B	Send results of confidence test.	<STX>?<confidence byte><CR> Confidence test status byte.
C	Initiate host interface scale configuration.	<STX>CALIBRATE?<CR>, See below
S	Initiate host interface setup.	<STX>SETUP?<CR>, See below
E	Enter "echo" serial port test mode. All characters sent to the scale will be echoed back to the host. "F" terminates the test.	<STX>E<CR> The scale echoes back the letter E indicating the command was received.
F	Exit "echo" serial port test mode.	<STX>F<CR> The scale echoes back the letter F indicating the command was received.
L	Switch to and send standard weight.	Same as for W above.
K	Switch to and send metric weight.	Same as for W above.

Table Note:* A status byte message **<STX>?<status byte><CR>** is sent in place of the requested weight data field if the scale is in motion, under zero, or over capacity when the weight data request is sent. The question mark "?" indicates that the following data is a non-ASCII status byte rather than weight data. See below for status byte definitions.

Scale Status Byte Format

When communicating in host mode using the standard Toledo protocol, the PS90 may send status bytes containing information such as motion and over/under-capacity conditions. The message <**STX**>**?**<**status byte**><**CR**> indicates transmission of a status byte. The status byte sent is an ASCII character that must be converted to binary form for decoding the bits. The ASCII character table with binary conversion (given in the previous section) can be used to convert status bytes. The bits of the status byte in the standard Toledo protocol are defined as follows:

Status Byte	
Bit No.	**Bit Description**
6	Always 1
5	Always 1
4	1 = Center of zero 0 = Not at center of zero
3	1 = Outside zero capture range 0 = Within range
2	1 = Under zero 0 = Within weighing range
1	1 = Over capacity 0 = Within weighing range
0	1 = Scale in motion 0 = Stable weight data

Scale Confidence Byte Format

When communicating in host mode using the standard Toledo protocol, the host may ask the PS90 to store and send confidence bytes containing information about RAM, ROM, and EEPROM testing. The message <**STX**>**?**<**confidence byte**><**CR**> indicates transmission of a confidence byte. The confidence byte sent is an ASCII character that must be converted to binary form for decoding the bits. The ASCII character table with binary conversion (given in the previous section) can be used to convert status bytes. The bits of the confidence byte in the standard Toledo protocol are defined as follows:

Status Byte	
Bit No.	**Bit Description**
6	1 = New status data available. 0 = Host has read data.
5	Bit is always a 0.
4	1 = ROM test failed. 0 = ROM test passed.
3	1 = RAM test failed. 0 = RAM test passed.
2	Bit is always a 0.
1	1 = Calibration Required. 0 = Calibration Data OK
0	1 = EEPROM test failed 0 = EEPROM test passed.

Calibrate Using Host Interface

ComTool (PN KN000000K64) can be used for all host to scale communications.

The PS90 shipping scale can be calibrated using the host interface. The command to initiate the calibration sequence is available in the METTLER TOLEDO command set. Calibration is based on the current scale configuration for units and capacity/increment. These can be changed (through the keypad or the host interface) before calibrating the scale through the host interface.

To calibrate using the host interface:

1. Remove the platter, break the legal-for-trade seal (if present).
2. Move the calibration switch (SW1) to the OFF position. Refer to the calibration diagram in Chapter 2 of this manual. DO NOT ENTER SETUP MODE. The PS90 does not respond to host commands in calibration mode. Replace the platter.
3. Send the command **C** to initiate calibration sequence. The scale responds **<STX>CALIBRATE?<CR><LF>**.
4. Send the command **Y** to continue with the calibration sequence, or send the command **N** to abort the sequence. The scale responds **<STX>UNLOAD SCALE- Y?<CR><LF>**.
5. Remove any weight on the platter and send the command **Y** to continue. A stable zero reading is taken, then the scale responds **<STX> ADD 50 LB- Y? <CR><LF>** or **<STX> ADD 20 KG- Y? <CR><LF>** or **<STX> ADD 125 LB- Y? <CR><LF>** or **<STX> ADD 50 KG- ? <CR><LF>**.

6. Add the requested calibration weight to the scale, then send the command **Y** to continue. The scale responds **<STX> CAL DONE <CR><LF>** or **<STX> INCORRECT AMOUNT OF WEIGHT <CR><LF>**.
7. Set SW1 switch to the ON position and replace cover.

Configure Scale Parameters Using Host Interface

Configuration parameters can also be sent using the host interface. A command to send a new scale configuration over the host interface is available in the METTLER TOLEDO command set.

To configure using the host interface:

1. From the host computer, send the host command **S** to initiate the configuration setup sequence. The scale responds with the current set bytes:

   <STX>$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}X_{13}X_{14}X_{15}X_{16}X_{17}X_{18}X_{19}X_{20}$<CR>

2. Determine the command string representing the configuration parameters that are desired. The command string consists of 22 characters beginning with an ASCII <STX> and terminated with an ASCII <CR>. The command string represents a 10-byte bit-mapped setup array stored in EEPROM. The 10-byte array is expanded for serial transmission so that the high-order four bits of each byte are zeroes and the low-order four bits are numbers representing the desired option for each program block. See the table below for definitions of each byte.

The table below lists the programming options available in each program block as they are used in Host Interface Setup. When downloading the scale setup it is strongly recommended that you modify only the selections that you need to change in the current setup bytes sent by the scale. Leave the values of all other setup bytes as they were when sent from the scale (including the selections that are currently not used). Then send the modified setup bytes string back to the scale.

X_1 = Not Used, Set to 0x00.
X_2 = Not Used, Set to 0x00.
X_3 = Not Used, Set to 0x00.
X_4 = GEO Entry Required:
- 0x01 = GEO Entry Required OFF
- 0x02 = GEO Entry Required ON

X_5 = Units Switching:
- 0x01 = Units Switching OFF
- 0x02 = Units Switching ON

X_6 = Zero Cursor:
- 0x01 = Zero Cursor OFF
- 0x02 = Zero Cursor ON

X_7 = Not Used, Set to 0x00.
X_8 = Sleep Mode:
- 0x01 = Sleep Mode OFF
- 0x02 = Sleep Mode ON

X_9 = Serial Port Protocol:
- 0x01 = Disabled
- 0x02 = Mettler Toledo
- 0x03 = FedEx
- 0x04 = Weightronix WT320
- 0x05 = Weightronix WT3870
- 0x06 = UPS
- 0x07 = Purolator
- 0x08 = Airborne

X_{10} = Stop Bit:
- 0x01 = One Stop Bit
- 0x02 = Two Stop Bits

X_{11} = Parity Bit:
- 0x01 = Space Parity Bit
- 0x02 = Mark Parity Bit
- 0x03 = Odd Parity Bit
- 0x04 = Even Parity Bit
- 0x05 = No Parity Bit

X_{12} = Data Bits:
- 0x01 = 7 Data Bits
- 0x02 = 8 Data Bits

X_{13} = Baud Rate:
- 0x01 = 300 Baud
- 0x02 = 1200 Baud
- 0x03 = 2400 Baud
- 0x04 = 4800 Baud
- 0x05 = 9600 Baud
- 0x06 = 19200 Baud

X_{14} = Weight Filter:
- 0x01 = Light Filter
- 0x02 = Medium Filter
- 0x03 = Heavy Filter

X_{15} = Weight Display Mode:
- 0x01 = DLC Echo Test Mode
- 0x02 = Expanded (X10) Weight Display
- 0x03 = Normal Weight Display
- 0x04 = Weight Classifier Display

X_{16} = Power up Units:
- 0x01 = Metric (kg)
- 0x02 = Pounds (lb)

X_{17} = Scale Build:
- 0x01 = 60 x 0.02 kg / 150 x 0.05 lb
- 0x02 = 150 x 0.05 kg / 300 x 0.1 lb

X_{18} = Not Used, Set to 0x00.
X_{19} = Pushbutton Zero Capture Range:
- 0x01 = +/- 2% of scale capacity

X_{20} = Not Used, Set to 0x00.

You can obtain the current configuration by sending the S command. Then you can abort without changing by sending the A command to abort.

3. Send the command desired new set of bytes to the scale:
   <STX>Y_1Y_2 ... $Y_{19}Y_{20}$<CR>
4. The scale will check to make sure the requested bytes are valid, then will echo the request: **<STX>Y_1Y_2 ... $Y_{19}Y_{20}$<CR>**. Or, if there were problems with the request, the scale returns the original, **unmodified** setup bytes to let the host know there was a problem: **<STX>X_1X_2 ... $X_{19}X_{20}$<CR>**

Before sending the **DONE** reply, the configuration file is analyzed just as if it had been constructed using the keyboard.

5. Send the command **Y** to continue and store the new setup bytes and the scale will respond with **<STX>DONE<CR>** when configuration is complete or **<STX>ABORT<CR>** if the modified bytes had problems.

NOTE: At any time the Host can send an **N** command to abort the Setup Download mode

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