

WILDCAT[®]

Scale

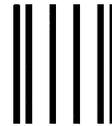
Technical Manual

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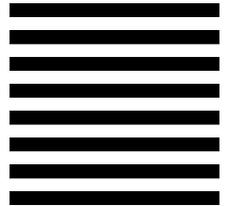
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INTRODUCTION

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Columbus, Ohio 43240
(US and Canada) 614- 438-4511
(All Others) 614-438-4888

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This device complies with Part 15 of the FCC Rules and the Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

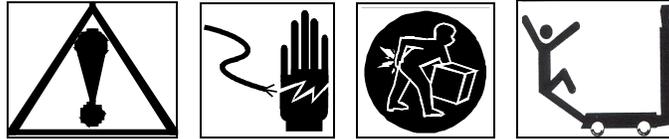
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, 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 or her own expense.

This manual correctly describes the operation and functionality of the WILDCAT scale containing software version 125362 Sr 2.00. The software version is displayed during the power-up sequence.

**METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR
CHANGES WITHOUT NOTICE.**

PRECAUTIONS

SAFETY NOTICE



Product safety is a fundamental concern at METTLER TOLEDO. Use common sense and follow the simple precautions listed below to ensure your safety and optimize the use and performance of this product.

- Read this manual before operating or servicing this product. Save this manual for future reference.
- Observe safety warnings located throughout this manual.
- Use caution when lifting or moving heavy equipment.
- Engage wheel brakes before operating WW (mobile / wheeled) products.
- Do not use this product in washdown environments. Never immerse electronic products in liquids.
- This product should be serviced by qualified personnel. Exercise care when moving, testing, or adjusting this product.
- Disconnect all power to this product before installing, servicing, or cleaning.
- Use only METTLER TOLEDO parts for repair.
- Observe electrostatic handling precautions for electronic components. Allow at least 30 seconds after power disconnection to allow charges to dissipate before servicing any electronic components.
- Allow the product to stabilize at ambient room temperature before applying power.

FAILURE TO FOLLOW THESE PRECAUTIONS COULD RESULT IN DAMAGE TO EQUIPMENT OR BODILY HARM.

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Introduction

The WILDCAT bench and portable scale is designed to meet the real world requirements of manufacturing, agricultural, packaging, and general weighing applications, and is ready to use right out of the box. This manual provides important information for installing and servicing the scale. For information on operating the scale, refer to the Operator's Card provided with the unit.

The WILDCAT scale is intended for use in general purpose industrial and commercial environments. For the best performance, it should not be used in environments requiring washdown, immersion in liquids, or exposure to corrosive chemicals.

Specifications

The WILDCAT scale is available in three base sizes. Specifications for the models below are listed on the next page.

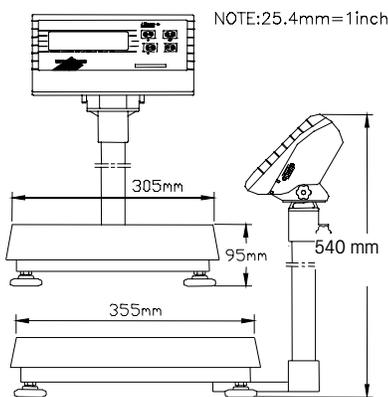


Figure 1-1: WS30R, WS60R

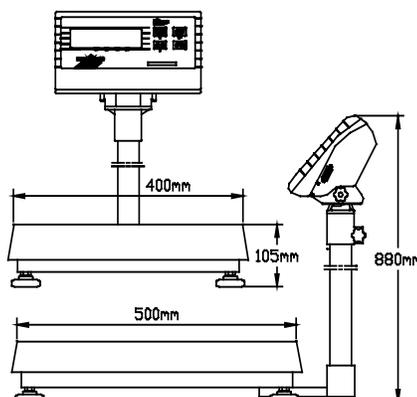


Figure 1-2: WS60LR, WS150R

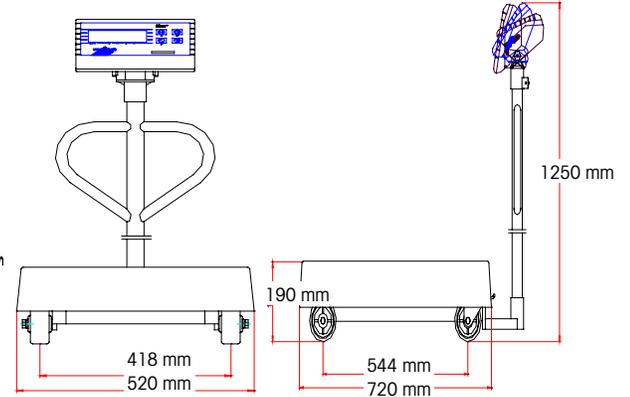


Figure 1-3: WW250, WW500

METTLER TOLEDO WILDCAT Scale Technical Manual

	WS30R/WS30VR	WS60R/WS60VR	WS60LR/WS60LVR	WS150R/WS150VR	WW250VR	WW500VR
Displayed Resolution	Up to 10,000d					
Maximum Capacity	30 kg (60 lb)	60 kg (150 lb)	60 kg (150 lb)	150 kg (300 lb)	250 kg (500 lb)	500 kg (1000 lb)
Minimum Division Size Trade -Approved Build	0.01 kg (0.02 lb)	0.01kg (0.05 lb)	0.02 kg (0.05 lb)	0.05 kg (0.1 lb)	0.1 kg (0.2 lb)	0.2 kg (0.5 lb)
Maximum Back weight	30 kg (60 lb)	10 kg (4 lb)		30 kg (95 lb)	90 kg (200 lb)	180kg (400 lb)
Safe Overload	45 kg (90 lb)	90 kg (225 lb)		225 kg (450 lb)	300 kg (660 lb)	600 kg (1320 lb)
Corner Loading	100% of full capacity.					
Base Dimensions W x D x H	305 x 355 x (95 – 110)** mm 12 x 14 x (3.8 – 4.3**) in		400 x 500 x (105 – 120)** mm 15.7 x 19.7 x (4.1 – 4.6)** in		510 x 710 x 200 mm 20 x 28 x 7.8 in	
Scale Dimensions W x D x H	305 x 500 x (540 – 555)** mm 12 x 19.7 x (21.3 – 21.8)** in		400 x 650 x (885 – 990)** mm 15.7 x 25.6 x (34.8 – 35.3)** in		510 x 850 x 1320 mm 20 x 33.5 x 52 in	
Actual Weight	11 kg (24 lb)		22 kg (49 lb)		50 kg (110 lb)	
Shipping Weight	14 kg (31 lb)	30 kg (66 lb)			51 kg (112 lb)	
Load Cell (2mV/V)	100 kg (220 lb)			250 kg (550 lb)	500 kg	1000 kg
Construction	Platter: Fabricated 304 Stainless Steel Base Support Frame: Formed and Welded Carbon Steel Polyurethane Painted Navy Blue Display Enclosure: ABS Charcoal Gray Plastic					
Column Construction	350 mm (14 in) stainless steel		700 mm (28 in) stainless steel		1118 mm (44 in) stainless steel	
Environment	General purpose, dry. Load cell is moisture- and dust-resistant.					
Display	Six-digit, 25 mm (1 in) tall, high contrast, LCD					
Keypad	4 color-coded, tactile-feel keys ZERO, TARE, FUNCTION, and PRINT					
Approvals	UL Listed Industry Canada AM-5319* NTEP Class III #99-053*					
Power	10.2 VDC / 0.15 A (AC transformer included) or six "D" cells					
Battery Life	Up to 500 hrs with six 'D Cell' batteries					
Operating Temp.	-10°C to 40°C with 10 to 95% relative humidity, non-condensing					
Storage Temperature	-20°C to 60°C with 10 to 95% relative humidity, non-condensing					
Data Output	ASCII via RS-232 standard					
Weighing Units	pounds, kilograms and grams					

*NTEP and Industry Canada approvals pending on WW models

** The height will vary depending on the height of the leveling feet.

***Information not available at this time.

Table 1-1

2

Assembly Procedures

Assembly Instructions

Assembly instructions for the WILDCAT scale are provided with the unit. A copy of these instructions appears below and on the next page.

WILDCAT® Scale Assembly Instructions
Báscula Portátil de Mesa WILDCAT® Instrucciones Para Ensamblaje
Instruccions D'assemblage de la Bascule WILDCAT®

1 Additional tools you may need (Herramientas adicionales que pudiese necesitar)
Outils supplémentaires dont vous pourriez avoir besoin

2

3

4

5

6 Plug in or use 6 "D" size batteries (Enchufa o utilice seis baterías tipo "D")
Branchez le courant ou utilisez 6 piles de taille "D"

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C1561100A

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Figure 2-1: Assembly instructions for Models WS30, WS60, and WS150

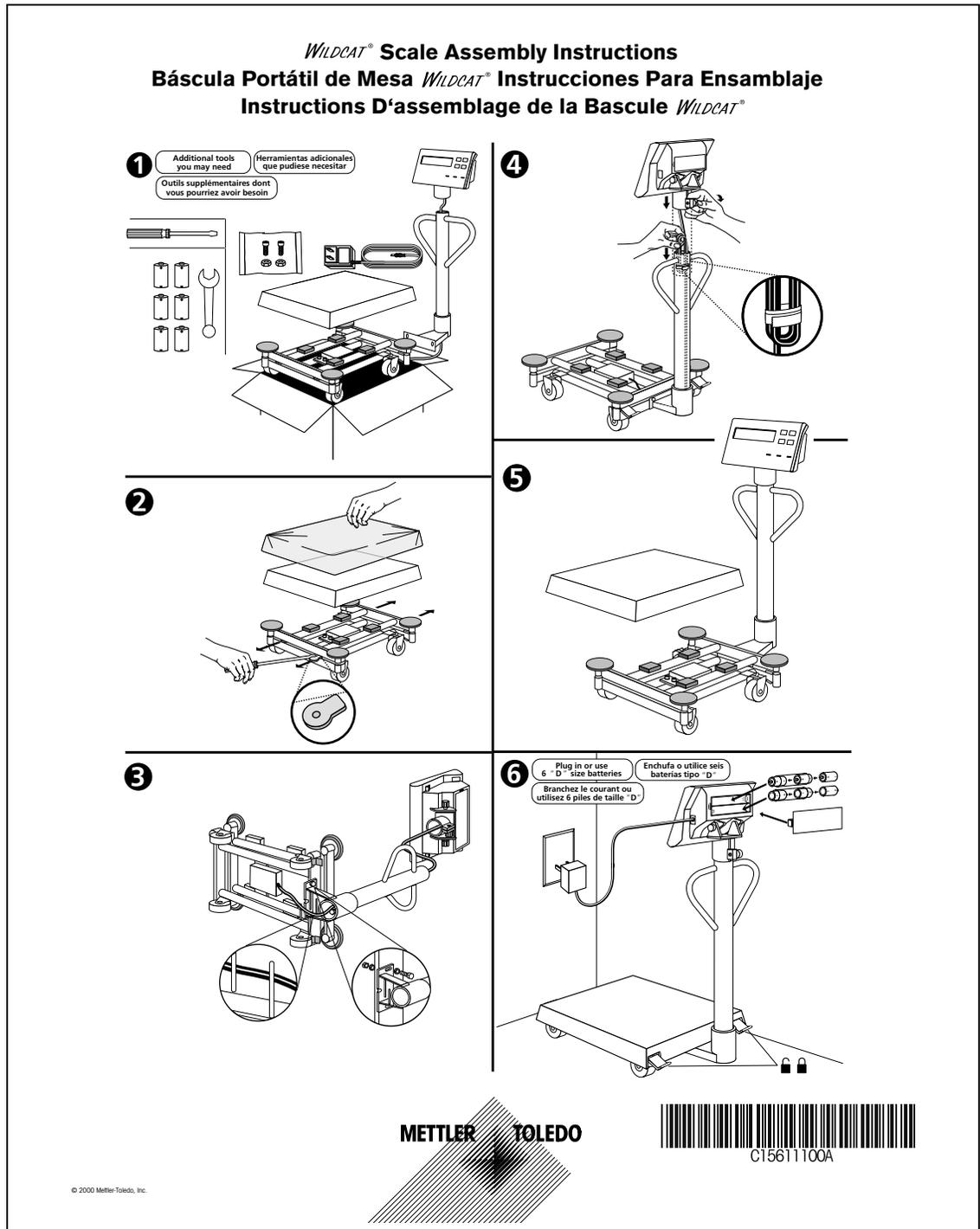


Figure 2-2: Assembly instructions for Models WW250 and WW500

Load Cell Wiring

Figure 2-3 shows the load cell terminal strip wiring for the WILDCAT scale.

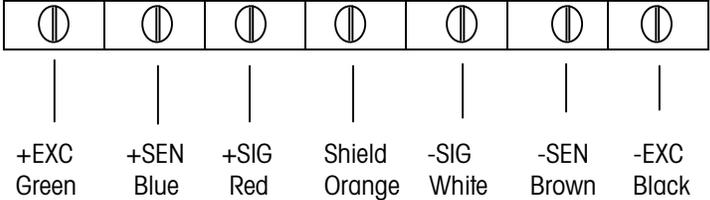


Figure 2-3

Serial Port Connections

The WILDCAT scale provides a bi-directional RS-232 port to be used to send data to or receive commands from a computer, printer, or other serial device. The following chart (Table 2-1) describes the pin configuration of the 9-pin D-Sub female connector on the side of the terminal (indicator) of the WILDCAT scale. The maximum recommended cable length for RS-232 is 50 feet (15 meters).

NOTE: Bi-directional capability was added in version 2.0 software. Previous versions did not provide ASCII input commands.

Pin	Signal	Description
1		Not Connected
2	RxD	Receive Data
3	TxD	Transmit Data
4		Not Connected
5	Gnd	Logic Ground
6		Not Connected
7		Not Connected
8		Not Connected
9		Not Connected

Table 2-1

Table 2-2 shows the ASCII commands that may be used to communicate with the WILDCAT scale via the serial port. A more complete explanation is given in Appendix 3.

ASCII Command	Function Performed in the WILDCAT Scale
C	Clear Tare
T	Tare
P	Print
Z	Zero

Table 2-2

3

Programming and 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.

The WILDCAT scale is calibrated at the factory. Functional programming is also completed at the factory, so that the WILDCAT scale is ready to use right out of the box. There is no need to change any of the softswitch parameters or to calibrate the scale. However, for commercial purposes (legal for trade), the WILDCAT scale must be calibrated using certified test weights. All operational changes and calibration can be performed using the scale keyboard.

The programming mode of the WILDCAT scale consists of main blocks (F1, F2, and F3), each containing sub-blocks (F1.1, F1.2, and so on.) An overview of the programming mode is shown below.

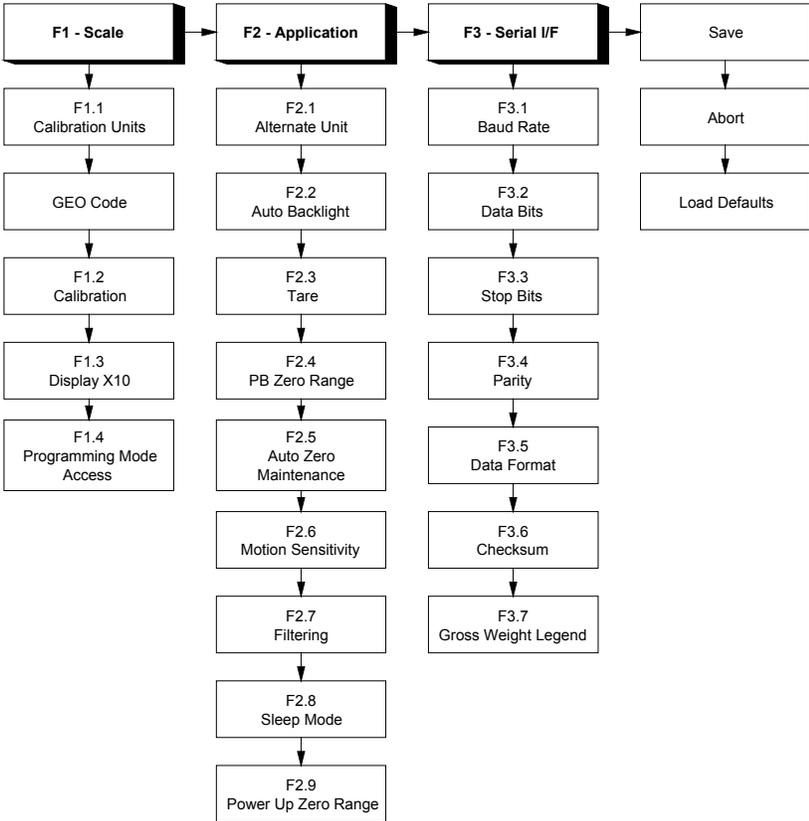


Figure 3-1

Key Functions

Should you need to reconfigure the WILDCAT scale, the following keys are used in the programming mode to configure the program blocks.



ZERO

Back up to the previous step.



TARE

Moves the data entry position one digit to the left.



FUNCTION

Increments the numeric data entry digit and/or allows the programmer to view the next display in a selection list.



PRINT

Accepts/terminates a data entry.

Entering the Programming Mode

To access the program blocks, the CAL jumper must be in place shorting the two pins on the Controller PCB. Refer to Figure 3-2 for the CAL position.

To configure the program blocks, you must enter the programming mode by pressing and releasing the **PRINT** and **ZERO** keys simultaneously.

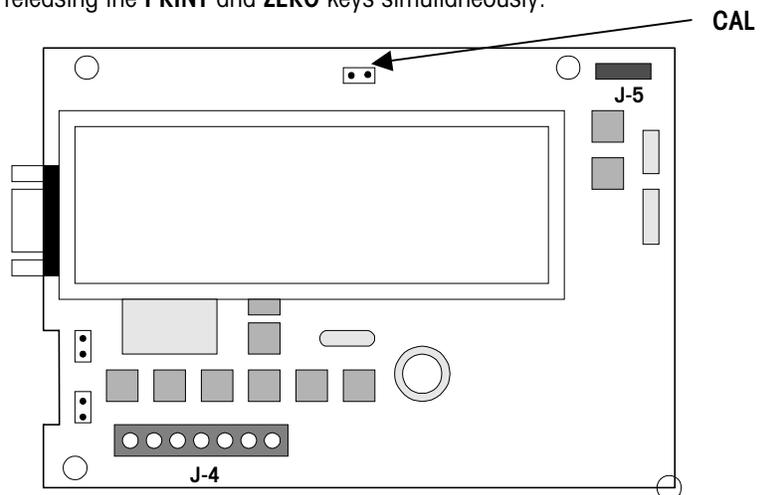


Figure 3-2

Entering and Configuring Program Blocks

Once the [F1] prompt is displayed, use the **PRINT** key to enter the block. Use the **FUNCTION** key to skip to the next block. Use the **ZERO** key to go to the previous block.

Once **PRINT** is pressed, the configuration advances to the first parameter in the F1 program block. The display shows the sub-block number and the current value setting. Press **PRINT** to accept the value and advance to the next sub-block or press the **FUNCTION** key to toggle through the choices until the desired selection is displayed.

After the desired selection is displayed, press **PRINT** to accept the value. Continue this procedure throughout the setup routine until all required changes have been made.

Exiting the Programming Mode

At the end of all the program blocks, there is a SAVE program block. In this block, you can use the **FUNCTION** key to select SAVE, ABORT or DEFAULT. When the desired choice is displayed, press **PRINT**. The scale exits the programming mode after the selection.

SAVE The WILDCAT scale will save all the changes you have made to the program blocks and then exit setup.

ABORT All changes will be discarded and the original programming will remain.

DEFAULT All blocks, except those steps denoted by *s in Table 3-1 are reset to the factory defaults.

Sealing the Enclosure (Legal for Trade)

After calibration is complete, setup step F1.4 should be programmed as a "0" to eliminate accidental changes to the calibration values. After programming is complete, remove the setup jumper CAL (Figure 3-2) to prevent setup access. Close the enclosure, tightening all four screws on the rear cover. Install the two plastic plugs over the bottom screws and seal the enclosure as shown in Figure 3-3.

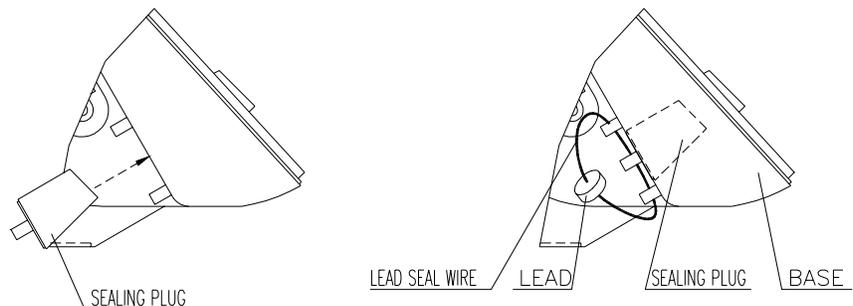


Figure 3-3

Factory Default Settings

STEP	DEFAULT	DESCRIPTION
F1.1	*, **	Calibration units – No default
GEO	*	Gravity adjust – No default
F1.2	0	Skip calibration
F1.3	0	Normal weight display
F1.4	0**	Programming mode access disabled
F2.1	0**	Alternative units = none (Unit switch disabled)
F2.2	0**	Auto Backlight disable
F2.3	1	Tare enable
F2.4	1**	Push button zero enabled, 2% range
F2.5	1**	Auto zero maintenance enabled within 0.5d window
F2.6	1	Motion sensitivity +/- 1d
F2.7	0	No Filtering
F2.8	0	Sleep mode disable
F2.9	1**	Auto zero capture at powerup range of +/- 2%
F3.1	9600	Serial output baud rate
F3.2	7	Data bits
F3.3	2	Stop bits
F3.4	2	Even parity
F3.5	2	Print format = single line gross-tare-net
F3.6	1	Checksum enable
F3.7	0	No printed legend for gross weight field

Table 3-1

*These setup steps are not reset during a Reset to Factory Defaults.

**Initial factory settings for WILDCAT scales with country code 000.

F1.1 = 1	F2.2 = 1	F2.5 = 2
F1.4 = 1	F2.4 = 2	F2.9 = 2
F2.1 = 2		

F1 Scale Block

The scale program block allows the user to set and calibrate the features that affect weighing performance.

[F1.1 2] CALIBRATION UNITS

Enter the value that corresponds to the type of test weights that will be used for calibration.

1 = lb

2 = kg

3 = g

[GEO 12] GRAVITY ADJUST

The WILDCAT scale is calibrated with a GEO code of 12 at the factory. To adjust the factory calibration to your specific area, refer to Appendix 4 for your GEO code. Enter the new GEO code and the calibration will automatically be adjusted for your specific location.

[F1.2 0] SCALE CALIBRATION

0 = Skip Calibration and proceed to F1.3

1 = Enter into the Calibration Sub-block.

[CAP.] SCALE CAPACITY

"CAP" displays momentarily then current scale capacity is shown. This value is available for numeric entry editing. Press **FUNCTION** to clear the data before entering new data.

Table 3-2 shows all possible selections for capacity and increment.

Increment Size	SCALE CAPACITIES (lb, kg or g)											
	1	-	-	2	-	3	4	5	6	-	8	10
0.001	1	-	-	2	-	3	4	5	6	-	8	10
0.002	2	-	3	4	5	6	8	10	12	15	16	20
0.005	5	6	-	10	-	15	20	25	30	-	40	50
0.01	10	12	15	20	25	30	40	50	60	-	80	100
0.02	20	24	30	40	50	60	80	100	120	150	160	200
0.05	50	60	-	100	-	150	200	250	300	-	400	500
0.1	100	120	150	200	250	300	400	500	600	-	800	1000
0.2	200	240	300	400	500	600	800	1000	1200	1500	1600	2000
0.5	500	600	-	1000	-	1500	2000	2500	3000	-	4000	5000
1	1000	1200	1500	2000	2500	3000	4000	5000	6000	-	8000	10000
2	2000	2400	3000	4000	5000	6000	8000	10000	12000	15000	16000	20000
5	5000	6000	-	10000	-	15000	20000	25000	30000	-	40000	50000

Table 3-2

- [Incr.] **INCREMENT SIZE**
"Incr" displays momentarily then the current increment size is displayed for editing. Press the **FUNCTION** key to toggle through valid selections.
- [E SCAL] Empty scale platform and press **PRINT** to continue.
- [15 CAL] Display countdown for zero setting. If motion sensitivity is not disabled and motion is detected at this step, the display will show [E 30]. Press **PRINT** and the display returns to the [E SCAL] prompt.
- [Add Ld] Place test weight on the scale platform. Press **PRINT**.
- [0000'0'] Enter test weight value. No decimal point is permitted. Maximum test weight is 100% of full scale capacity. There is no minimum test weight required but METTLER TOLEDO recommends using at least 50% of the scale capacity.
- [15 CAL] Display countdown for calibration. If motion is detected at this step then the display will show [E 30]. Press **PRINT** to return to the [Add Ld] prompt.
- [CAL d] "Calibration done" is displayed momentarily.
- [F1.3 0] **EXPANDED DISPLAY**
0 = Normal display mode
1 = Weight displayed in minors
- [F1.4 0] **PROGRAMMING MODE ACCESS**
If CAL jumper is installed on the Controller PCB, this step has no effect, and the programming mode is always accessible.
If CAL jumper is not installed on the Controller PCB:
0 = No access to view or change values in the programming mode.
1 = Programming blocks F2 and F3 may be accessed to change the parameters. Programming block F1 may only be viewed.

F2 Application Block

[F2.1 0] **ALTERNATE UNITS:**

Select the unit of measure desired as a secondary unit.

0 = No unit switching

1 = lb

2 = kg

If the calibration unit is "kg", the available choice is only "lb". If the calibration unit is "lb" or "g", the choice is only "kg". If unit switching is enabled, a quick press of the **FUNCTION** key will change the unit.

[F2.2 0] **AUTO BACKLIGHT**

0 = Backlight can only be turned on manually by pressing the **FUNCTION** key.

1 = The backlight turns on during motion and stays on for 6 seconds after no-motion.

The manual on/off is always available. If unit switching is enabled, press and hold the **FUNCTION** key for 3 seconds to turn the back light on. If unit switching is disabled, a quick press of the **FUNCTION** key will turn the backlight on and off.

[F2.3 1] **TARE**

0 = Tare disabled

1 = Tare enabled

[F2.4 1] **PUSHBUTTON ZERO RANGE**

0 = Pushbutton zero disabled

1 = Enable pushbutton zero within +/- 2% of scale capacity

2 = Enable pushbutton zero within +/- 20% of scale capacity

[F2.5 1] **AUTO ZERO MAINTENANCE**

Auto Zero Maintenance (AZM) automatically compensates for small changes in zero resulting from material build-up or temperature changes. Select the weight range (+/-) around gross zero within which the scale will capture zero. If residual weight on the scale exceeds the weight range, the scale will not capture zero. AZM is disabled in the net mode.

0 = No AZM.

1 = AZM within 0.5d window.

2 = AZM within 1d window.

3 = AZM within 3d window.

[F2.6 1] MOTION SENSITIVITY SELECTION

The motion detection feature determines when a no-motion condition exists on the scale platform. The sensitivity level determines what is considered stable. Printing, pushbutton zero, and tare entry are blocked during instability.

0 = Motion detector disabled

1 = 1.0 d motion sensitivity

2 = 3.0 d motion sensitivity

[F2.7 0] FILTER

Filtering compensates for environmental disturbances such as vibration or drafts.

0 = NONE

1 = LIGHT

2 = NORMAL

3 = HEAVY

[F2.8 0] SLEEP MODE (power saving)

0 = Disable

1 = Enable the sleep mode automatically after 5 minutes of stability.

[F2.9 1] POWER UP ZERO RANGE

0 = Auto Zero capture at powerup disabled.

1 = Auto Zero capture at powerup range of +/-2%

2 = Auto Zero capture at powerup range of +/-10%.

If power-up zero capture is disabled, the scale will display weight after powerup. Otherwise, if weight is not in zero-capture range, the display shows [E E E] or [-E-E-E], until weight is within the capture range.

F3 Interface Block

[F3.1] BAUD RATE

[9600] Choose a baud rate from a selection list of 1200, 2400, 4800, or 9600 baud

[F3.2 7] DATA BITS

7 = 7 data bits

8 = 8 data bits

- [F3.3 2] **STOP BITS**
1 = 1 stop bit
2 = 2 stop bits
- [F3.4 2] **PARITY**
0 = No parity
1 = Odd parity
2 = Even parity
- [F3.5 2] **DATA OUTPUT FORMAT**
0 = Mettler Toledo Continuous with STX
1 = Demand, single line, displayed weight only
2 = Demand, single line, gross, tare, net
3 = Demand, three line gross, tare, net
- [F3.6 1] **CHECKSUM (Only if F3.5 = 0)**
0 = No checksum
1 = Checksum
- [F3.7 0] **PRINTED GROSS WEIGHT LEGEND**
0 = No Legend
1 = B (bruto)
2 = G (gross)

Exit Sub-Block

At the end of the programming mode, there are three choices to exit. Use the **FUNCTION** key to move between the choices.

- [SAVE] Press **PRINT** to accept the changes in the program mode and exit programming.
- [Abort] Press **PRINT** to ignore any changes in the program mode and exit programming.
- [dFAULT] Press **PRINT** to reset all program block parameters to factory defaults and exit programming.

Parameters marked with an asterisk (*) in Table 3.1 will not be reset

Calibration

When the WILDCAT scale is used in legal-for-trade commercial applications, it must be calibrated with certified test weights to the capacity and increment size shown on the data plate. The capacity and increment size is selectable in the programming mode in sub-block F1.2. Calibration is also completed in sub-block F1.2.

Gravity Adjustment

The WILDCAT scale terminal has built in compensation to allow factory calibration with destination correction capabilities to compensate for variances caused by gravitational forces. If the WILDCAT scale is subjected to a different gravitational force at its destination location, this can be compensated for electronically by adjusting the geo value. The GEO value has 32 settings. The GEO value for any world location can be found in the GEO value table in Appendix 4 as long as the geographical coordinates and elevation above sea level are known. This value is programmed in the Scale block when prompted for [GEO xx].

4

Maintenance and Troubleshooting

Cleaning

	 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.

Periodically clean the keyboard and covers with a soft clean cloth that has been dampened with a mild window type cleaner or detergent. DO NOT USE ANY TYPE OF INDUSTRIAL SOLVENT OR CHEMICALS. DO NOT SPRAY CLEANER DIRECTLY ONTO THE UNIT. DO NOT HOSE DOWN.

Troubleshooting

If operational difficulties are encountered, first obtain as much information as possible regarding the problem. Failures and malfunctions often may be traced to simple causes such as loose connections, low battery power, or improper setup. Additional troubleshooting is best performed by substitution. A PCB or load cell believed to be defective may be checked by replacing the suspect part with known good part and then observing whether the problem is corrected.

Error Codes

The following table lists the WILDCAT scale's error messages.

Error Message	Description	Probable Action
E1	ROM error	Check Power Supply Voltages. Replace Controller PCB.
E2	Internal RAM error	Check Power Supply Voltages. Replace Controller PCB.
E7	EEPROM data incorrect.	Check Power Supply Voltages. Replace Controller Logic PCB.
E30	Scale in motion during calibration	Press PRINT to return to [E SCAL] or [ADD LD].
E32	Insufficient calibration test weight or insufficient signal from load cell	Press PRINT , then add additional test weight. Recalibrate using more test weight.
E34	Calibration Test Weight too large	Press PRINT . Use test weight less than 100% of scale capacity.
E E E	Scale not zeroed at power up	Auto Zero on power-up (F2.9) is enabled and the weight is greater than zero. Zero the scale or remove the weight until zero is captured. Re-calibrate the scale.
-E E E	Scale not zeroed at power up.	Auto Zero on power-up (F2.9) is enabled and the weight is on the platform. Add weight until zero is captured. (Put platform on). Re-calibrate the scale.

Error Message	Description	Probable Action
----	Overload indication.	Weight on scale exceeds calibrated capacity by more than 9d. Decrease load on scale.
----	Underload indication.	Weight on scale is below gross zero by more than 9d. Increase load on scale.

Table 4-1

Voltage Checks

AC Power Test

Using a Multi-meter, check the AC input power. Input power must be within -15% and +10% of the nominal AC line voltage.

Controller PCB Input Voltage Test

Confirm the AC adapter is outputting a voltage of at least 9 VDC. If the WILDCAT scale has power and the Controller PCB does not function properly, replace the PCB.

Check Battery Voltage—(Battery-powered units)

If the WILDCAT scale does not respond by pressing the **PRINT** key for approximately 3 seconds, the battery pack may be completely discharged. Install a new set of six "D" cells and retest.

RS232 Serial Output Test

Use the following test procedure to determine whether the RS232 serial port is operational.

- Remove power and disconnect the data cable from the WILDCAT scale.
- Set the volt meter to read 20 volts DC.
- Connect the red lead to pin 3 of the WILDCAT serial port connect the black lead to pin 5.
- Apply power. The meter should read as follows:
- In Demand mode, the meter should read between -5 and -15 VDC with no fluctuation.
- To test the Demand output, press the **PRINT** key on the WILDCAT scale and the display should fluctuate between -5 volts to +5 volts for the duration of the transmission, then become stable again. This indicates the terminal has transmitted data.
- In Continuous mode, the meter should fluctuate between -5 and +5 VDC continuously. The constant fluctuation on the meter display indicates the scale/terminal is transmitting information.

Parts Replacement and Adjustments

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

Battery Replacement

The battery symbol at the lower left of the display is used to indicate low battery power. The cursor above the battery symbol will illuminate when there is approximately 15 minutes of operation remaining.

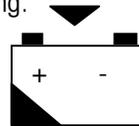


Figure 4-1

When the cursor is "on" above the battery symbol, change the batteries as soon as possible. To change the batteries:

1. Open the battery door on the rear of the WILDCAT terminal.
2. Remove the six batteries.

 CAUTION
THE WILDCAT SCALE CANNOT RECHARGE BATTERIES. IF RECHARGEABLE BATTERIES ARE USED, THEY MUST BE RECHARGED WITH A COMMERCIALY AVAILABLE RECHARGER THEN REINSTALLED INTO THE TERMINAL.

3. Insert six new or recharged "D" size batteries as illustrated on the battery housing.

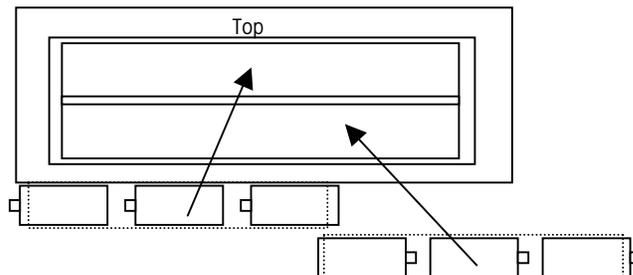


Figure 4-2 - Shown With Rear Battery Panel Removed

4. Reinstall the rear cover over the batteries and press into place.
5. Test for proper operation.

The operating time for a new set batteries depends on how the scale is used. Estimates (without backlight) are shown below. Using the backlight feature reduces battery life.

Operation	Battery Life
Continuous use	400 hrs (Approximately 17 days)
8 hours per day	500 hrs (Approximately 3 months)

Keyboard Replacement

1. Remove power by removing the six "D" size batteries from the rear battery compartment and/or disconnecting the AC power adapter.
2. Remove the four screws securing the front and back halves of the cover.
3. Disconnect the keyboard tail from the Controller PCB. Discard the old front cover.
4. Connect the keyboard tail of the new front cover to J5 of the Controller PCB.
5. Secure the front cover to the back cover with the four screws.
6. Apply power then press and hold the **ON/OFF (PRINT)** key for 3 seconds.
7. Test the operation of the new keyboard.

Controller PCB Replacement

To replace the PCB, follow the procedures below.

1. Remove power by removing the six "D" size batteries from the rear battery compartment and/or disconnecting the AC power adapter.
2. Remove the four screws securing the front and back halves of the cover.
3. Disconnect the keyboard tail from the Controller PCB and set the front cover aside.
4. Disconnect the battery harness from the Controller PCB.
5. Disconnect the load cell cable from the J4 terminal strip on the Controller PCB.
6. Remove the two hex standoffs from the side of the enclosure that secures the serial output connector to the back cover of the WILDCAT.
7. Remove the four screws that secure the Controller PCB to the back cover.
8. Using proper static electricity precautions, carefully remove the Controller PCB and place it in a protective static bag.
9. Install the new Controller PCB using the same screws removed in the previous step.
10. Install the two hex standoffs to the side of the enclosure that secure the serial output connector to the back cover of the scale. Reconnect the load cell cable.
11. Reconnect the AC adapter and battery harnesses removed previously.
12. Connect the keyboard tail of the front cover to J5 of the Controller PCB.
13. Secure the front cover to the back cover with the four screws.
14. Apply power to the scale then press and hold the **ON/OFF** key for 3 seconds.
15. Reprogram, recalibrate and test the operation of the new Controller PCB.

Load Cell Replacement

1. Remove power by removing the six "D" size batteries from the rear battery compartment and/or disconnecting the AC power adapter.
2. Remove the four screws securing the front and back halves of the cover.
3. Disconnect the keyboard tail from the Controller PCB and set the front cover aside.
4. Disconnect the load cell wiring from the J4 terminal strip on the Controller PCB.
5. Loosen the grip bushing on the side of the enclosure enough to slide the load cell cable out.
6. Remove the stainless steel platform from the base.
7. Loosen and remove the top load cell mounting bolts that secure the top frame to the load cell.
8. Set the top frame and the load cell spacer aside.
9. Turn the WILDCAT scale on its side to access the bottom load cell bolts.
10. Loosen and remove the bottom load cell mounting bolts.
11. Remove the load cell from the base and pull the excess cable out through the bottom of the column.
12. Reinstall a new load cell by following the steps above in reverse order.

Note - Lubricate the threads and under the head of the load cell mounting bolts before reinstalling.

13. Using a torque wrench, tighten the load cell mounting bolts to the specifications shown in Table 4-2.

MODEL	METRIC	ENGLISH
WS30R/WS30VR	20 N•m	15 ft•lbs
WS60R/WS60VR	20 N•m	15 ft•lbs
WS60LR/WS60LVR	20 N•m	15 ft•lbs
WS150R/WS150VR	30 N•m	22 ft•lbs
WW250VR	40 N•m	30 ft•lbs
WW500VR	80 N•m	55 ft•lbs

Table 4-2

14. After replacing a load cell, the overload stops must be checked and adjusted (if needed). Refer to the next section for the overload stop adjustment procedure.
15. Thread the load cell cable through the column from the bottom.
16. Insert the load cell cable through the grip bushing on the side of the enclosure.
17. Connect load cell cable to the J4 terminal strip on the Controller PCB (Figure 2-2).
18. Tighten the grip bushing on the side of the enclosure to secure the load cell cable.
19. Connect the keyboard of the front cover to J5 of the Controller PCB.
20. Secure the front cover to the back cover with the four screws.
21. Coil the excess load cell cable and insert it into the column. A small length of tape applied to the ends of the coils allows the cable to slide into the column easier.
22. Apply power to the scale. Press and hold the **ON/OFF (PRINT)** key for 3 seconds.
23. Recalibrate and test the operation of the new load cell.

Overload Stop Adjustment

1. The overload stops must be checked and reset if the top or bottom frame or the load cell has been replaced.
2. Remove the stainless steel platform from the base.
3. Using the proper size feeler gauge, check all six overload stops as shown in Figure 4-3. The correct gap measurements can be found in Table 4-3.
4. If the gaps are not set properly, proceed to the following steps.
5. Loosen the overload screw jam nuts. Refer to Figure 4-4.
6. Using the proper size feeler gauge, turn the screw until you feel a slight drag on the feeler gauge.
7. Tighten the jam nut and recheck the gap. Readjust if necessary.
8. Adjust all six overload stops using this procedure.
9. Reinstall the platform and make sure the scale weighs to full capacity.

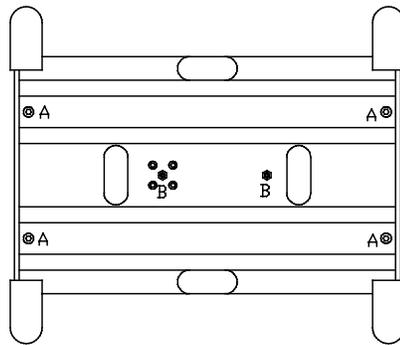


Figure 4-3a: WS models

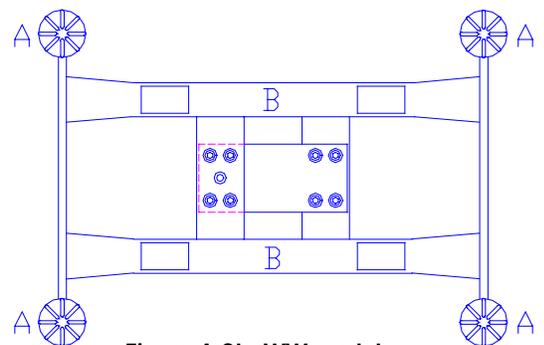


Figure 4-3b: WW models

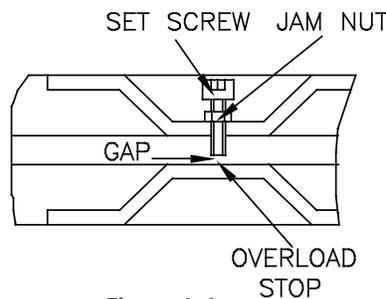


Figure 4-4

Position	WS30R Overload Gap	WS60R Overload Gap	WS60LR Overload Gap	WS150R Overload Gap	WW250VR Overload Gap	WS500VR Overload Gap
A	2 mm (0.078 in)	2 mm (0.078 in)	4 mm (0.157 in)	4 mm (0.157 in)	4mm .16 in	6 mm .24 in
B	0.75 mm (0.03 in)	0.75 mm (0.03 in)	1 mm (0.04 in)	1 mm (0.04 in)	1 mm .04 in	1.2 mm .05 in

Shift Test

A shift test verifies that the scale weighs correctly irrespective of load placement. If the scale does not pass the shift test, verify the overload stop gaps before replacing the load cell. No adjustment for the shift is possible. If the scale does not pass the shift test, the load cell must be replaced.

For NTEP and Canadian Weights and Measures tests, use weights equal to 1/2 the scale's capacity. Place the test weight sequentially at each of the positions A, B, C, D and E as shown in Figure 4-5. These positions are the centers of the four quadrants of the platform and the center of the platform. Note the terminal's reading of the weight at each position. The difference between any two positions in the shift test cannot exceed the tolerance shown in Table 4-4.

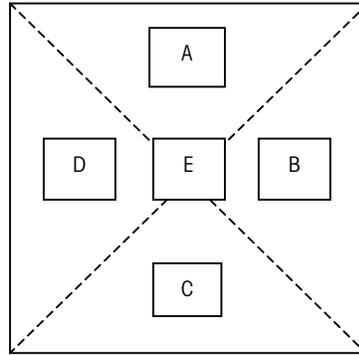


Figure 4-5

For an OIML test, use weights equal to 1/3 the scale's capacity. Place the weight sequentially at each of the positions A, B, C, D, and E as shown in Figure 4-6. These positions are the centers of the four quadrants of the platform and center of the platform. Note the terminal reading of the weights at each position. The difference between any two positions in the shift test cannot exceed the tolerance shown in Table 4-4.

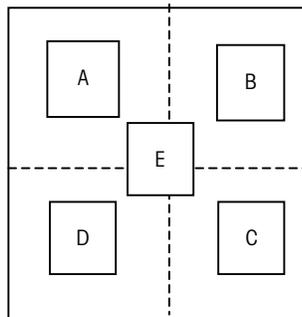


Figure 4-6

	SCALE CAPACITY	DISPLAY INCREMENT	US and CANADA TEST WEIGHT	OIML TEST WEIGHT	TOLERANCE (NEW)	TOLERANCE (IN SERVICE)
WS30R/WS30VR	30 kg/60 lb	0.01 kg/ 0.02 lb	15 kg/30 lb	10 kg/20 lb	+/- 0.01 kg +/- 0.02 lb	+/- 0.02 kg +/- 0.04 lb
WS60R/WS60VR	60 kg/150 lb	0.02 kg/ 0.05 lb	30 kg/75 lb	20 kg/50 lb	+/- 0.02 kg +/-0.05 lb	+/- 0.04 kg +/- 0.1 lb
WS60LR/WS60LVR	60 kg/150 lb	0.02 kg/ 0.05 lb	30 kg/75 lb	20 kg/50 lb	+/- 0.02 kg +/- 0.05 lb	+/- 0.04 kg +/- 0.1 lb
WS150R/WS150VR	150 kg/300 lb	0.05 kg/0.1 lb	75 kg/150 lb	50 kg/100 lb	+/- 0.05 kg +/- 0.1 lb	+/- 0.10 kg +/- 0.2 lb
WW250VR	250 kg/500 lb	0.1 kg/0.2 lb	125 kg/250 lb	80kg/170 lb	+/-0.1 kg +/-0.2 lb	+/- 0.2 kg +/- 0.4 lb
WW500VR	500 kg/1000 lb	0.2 kg/0.5 lb	250 kg/500 lb	170 kg/350 lb	+/- 0.2 kg +/- 0.5 lb	+/- 0.4 kg +/- 1.0 lb

Table 4-4

Power-Up Sequence

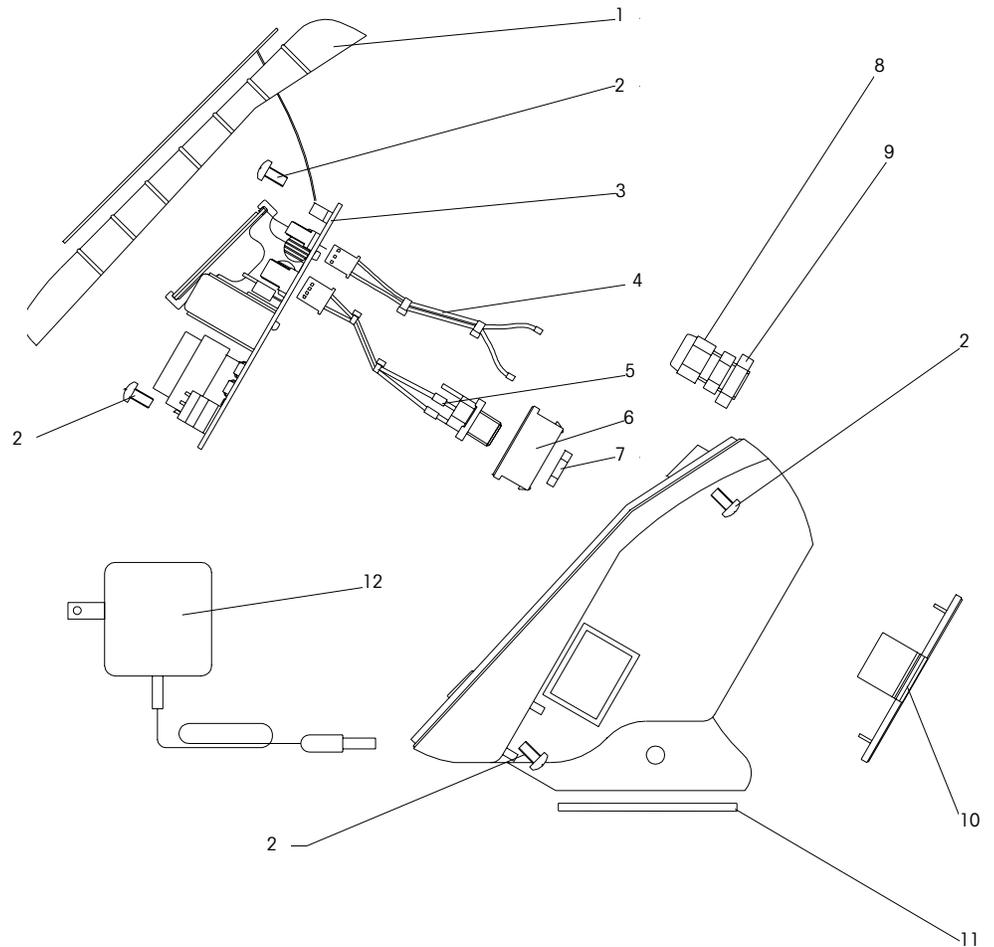
Upon power up, showing all numbers 0-9 checks the display, and a diagnostic self test is performed on the memory and microprocessor. An error message is displayed if any component fails the test. The program number [125362] is shown next, followed by the revision [Sr. 2.00].

If everything tests okay, the WILDCAT scale will show [0.00] on the display. The power-up sequence requires a few seconds to complete.

5

Parts List

Terminal



Item	P/N	Description	Quantity
1	1274820TC	Front Cover, Keyboard & Overlay Assembly	1
2	R0512000A	Screw, M4 x 6	8
3	1274830TC	Main PCB w/ Backlight	1
	1274840TC	Main PCB w/o Backlight	
4	1244660TC	Battery Harness	1
5	1244670TC	Power Supply Harness	1
6	1244540TC	Power Supply Plate	1
7	1211010TC	Nut, Power Supply	1
8	12901800A	Grip Bushing	1
9	14577900A	Grip Bushing Nut	1
10	1244530TC	Battery Cavity Cover Plate	1
11	1244640TC	Rubber Bar	2
12	1244740TC	Wall Adapter, 120 VAC, US Plug	1
	1259670TC	Wall Adapter, 220 VAC, US Plug	
	1259690TC	Wall Adapter, 230 VAC, EU Plug	

Column and Base (WS30, WS60, WS60L, WS150)

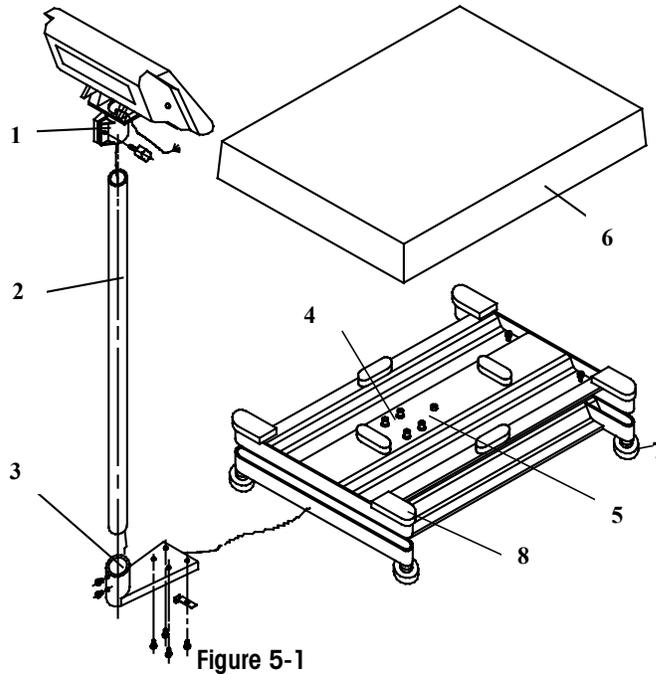
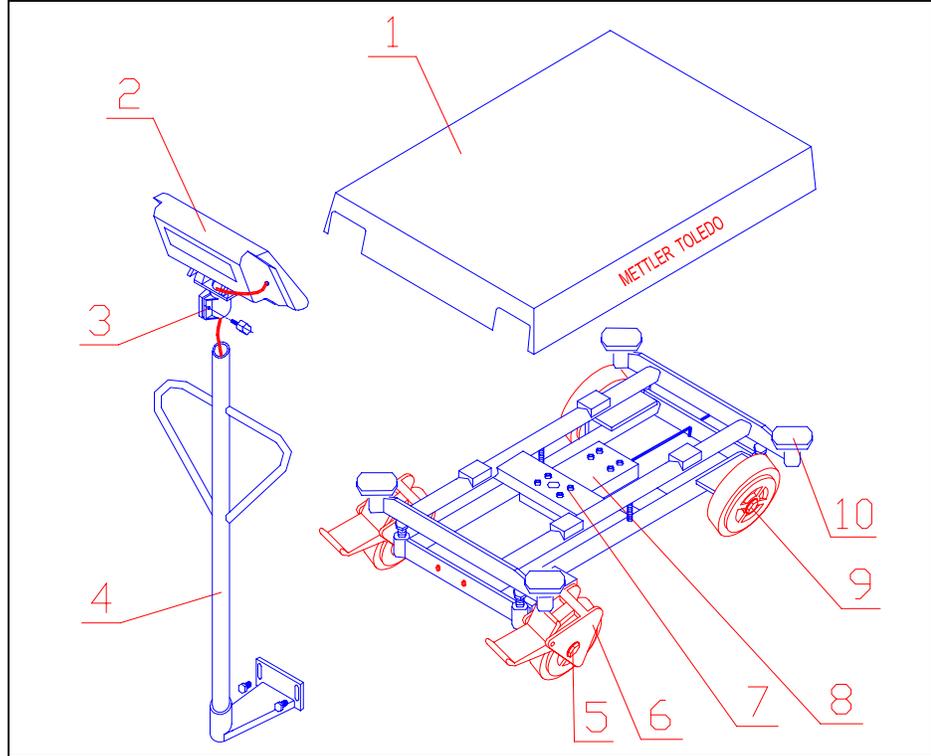


Figure 5-1

Item	P/N	Description	Quantity
1	1264310TC	Indicator Bracket Assembly	1
2	1251050TC	Stainless Steel Column, 350 mm high	1
	1251030TC	Stainless Steel Column, 680 mm high	
3	1237750TC	Column Bracket	1
4	1239760TC	Load Cell, 100 kg (WS30R, WS60R, WS60LR)	1
	1239790TC	Load Cell, 250 kg (WS150R)	
5	1025040TC	Load Cell Mounting Bolts, M6 × 25	8
6	1258830TC	Stainless Steel Platter, (WS30R, WS60R)	1
	1258810TC	Stainless Steel Platter, (WS60LR, WS150R)	
7	1250090TC	Adjustable Foot	4
8	1250060TC	Rubber Platter Supports (WS60LR, WS50R)	4
	1259240TC	Rubber Platter Supports (WS30R, WS60R)	

Figure 5-2

Column and Base (WW250 and WW500)



Item	P/N	Description	Quantity
1	1349260TC	Stainless Steel Platter, 500 × 700mm	1
2		Terminal - Refer to page 5-1	
3	1264310TC	Indicator Bracket Assembly	1
4	1349290TC	Column Assembly	1
5	1024380TC	Wheel Mounting Bolts, M12 × 90	
6	1317020TC	4" Polyurethane Wheel Set (2 wheels with brakes)	4
7	1146570TC	Load Cell, BMI-500 kg	1
	1182830TC	Load Cell, BMI-1000 kg	
8	1180330TC	Load Cell Mounting Bolts, M10 × 60	8
	1025270TC	Load Cell Mounting Bolts, M12 × 70	
9	1024400TC	Wheel Mounting Bolts, M12 × 110 (for brakes)	
10	1366340TC	Rubber Platter Supports (WW250VR)	4
		Rubber Platter Supports (WW500VR)	

6

Appendices

Appendix 1: Demand Mode Output

Demand mode output occurs when a print request is received from the **PRINT** push button. The line format, baud rate, character length, and parity are selectable in the programming mode.

Demand mode output is blocked when the scale is "in motion" or when the weight is below 20d of gross weight or over capacity. When one of those situations occurs, the print request is ignored and is not buffered. Zero must be captured at powerup before a demand mode output can occur. After one output, the WILDCAT scale must see motion before it will send data again.

Weight Field Format

Displayed Weight Format (Gross or Net)

Data	M	-	-	-	-	-	L	S	Units	S	B	C	L
	S						S	P		P		R	F
	D						D						
Note	3							4	5	4	2	6	8

Table 6-1: Gross Weight

Data	M	-	-	-	-	-	L	S	Units	S	N	C	L
	S						S	P		P		R	F
	D						D						
Note	9							4	5	4	10	6	8

Table 6-2: Net Weight

Single Line – Gross, Tare, Net Weights

Single-line gross weight format is output if no tare weight has been taken.

Data	M	-	-	-	-	-	L	S	Units	S	B	S	M	-	-	-	-	-	L	S	Units
	S						S	P		P		P	S						S	P	
	D						D					D	D						D		
Note	3						4	5	4	2	4	3						4	5		

Data	S	T	S	M	-	-	-	-	-	L	S	Units	S	N	C	L
	P		P	S						S	P		P		R	F
	D		D	D						D						
Note	4	10	4	9						4	5	4	10	6	8	

Table 6-3: Single Line – Gross, Tare, Net Weights

Multiple Line – Gross, Tare, Net Weights

If no tare weight has been taken, only the gross weight field is output.

Data	M	-	-	-	-	-	L	S	Units	S	B	C	L
	S						S	P		P		R	F
	D						D						
Note	3						4	5	4	2	6	8	

Table 6-4: Multiple Line – Gross Weight

Data	M	-	-	-	-	-	L	S	Units	S	T	C	L
	S						S	P		P		R	F
	D						D						
Note							4	5	4	10	6	8	

Table 6-5: Multiple Line – Tare Weight

Data	M	-	-	-	-	-	L	S	Units	S	N	C	L
	S						S	P		P		R	F
	D						D						
Note	9							4	5	4	10	6	8

Table 6-6: Multiple Line – Net Weight

Demand Format Notes

- 2 Gross weight legend. Selectable in the programming mode as a space, "B" for bruto or "G" for gross.
- 3 The gross weight data fields are padded with leading spaces to 7 digits.
- 4 ASCII Space <SP> character, hex value 20.
- 5 Weight units (lb, kg, g) as selected in setup and by the FUNCTION key.
- 6 ASCII Carriage Return <CR> character, hex value 0D.
- 7 Optional checksum character: Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> characters. The checksum calculation for multiple lines of data includes the <LF> character from the previous line of data.
- 8 ASCII Line Feed <LF> character, hex value 0A.
- 9 The net weight field is right justified and padded with spaces to seven digits.
 A negative net weight is indicated by a minus character before the most significant digit of the weight value. For example, a weight of -55.00 is printed with one leading space (sp=space): sp-55.00.
- 10 Weight field descriptors. The "TR" and "N" legends are printed (for net weight) after the tare and net weight fields to identify them.

Appendix 2: Continuous Mode Output

The continuous output format is output as the display is updated (approximately 7 times per second). The format is fixed except for baud rate, data bits, stop bits, parity, and the selectable checksum character. The continuous output mode provides compatibility with METTLER TOLEDO products that require real-time weight data (for example, Models 8624, 9323, 9325, and other accessories).

Continuous data output at a 1200-baud rate will slow the display update rate. Use 4800 baud or faster to maintain the maximum update rate.

The continuous output includes status bytes that indicate the operating conditions in the terminal.

Character	1	Status			Indicated Weight						Tare Weight							
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	
Data	S T X	S W A	S W B	S W C	M S D	-	-	-	-	L S D	M S D	-	-	-	-	L S D	C R	C H K
Note	1	2			3						4						5	6

Table 6-8: Continuous Format Output

Continuous Format Notes

- 1 ASCII Start of Text <STX> character, hex value 02.
- 2 SWA, SWB, and SWC: Status Words A, B, and C. Refer to Tables 6-9, 6-10, and 6-11 for status bytes.
- 3 Displayed weight: Six digits of displayed weight. No decimal point in field.
- 4 Tare weight: Six digits of tare weight data. No decimal point in field.
- 5 ASCII Carriage Return <CR> character, hex value 0D.
- 6 Optional checksum character: Checksum is defined as the 2's complement of the seven low order bits of the binary sum of all characters preceding the checksum character, including the <STX> and <CR> characters.

Status Byte Definition

The following tables detail the status bytes for the standard continuous output.

Bit Identification Table For Status Byte A				
		Dummy Zero or Decimal Position		
Bit	XXXX00	XXXXX0	XXXXXX	XXXXX.X
0	0	1	0	1
1	0	0	1	1
2	0	0	0	0
		Dummy Zero or Decimal Position		
	XXXX.XX	XXX.XXX	XX.XXXX	X.XXXXX
0	0	1	0	1
1	0	0	1	1
2	1	1	1	1
		Increment Size		
	X1	X2	X5	
3	1	0	1	
4	0	1	1	
5	Always = 1			
6	Always = 0			

Table 6-9

Bit Identification Table For Status Byte B	
Bit	Function
0	Gross = 0, Net = 1
1	Sign, Positive = 0, Negative = 1
2	Out of Range = 1, In Range = 0
3	Motion = 1
4	lb = 0, kg = 1 (see also Byte C, bits 0, 1, 2)
5	Always = 1
6	Power-up Not Zeroed = 1

Table 6-10

Bit Identification Table For Status Byte C	
Bit	Function
0	lb or kg = 0, grams = 1
1	Always = 0
2	Always = 0
3	Print Request = 1
4	Expand Weight Display = 1
5	Always = 1
6	Always = 0

Table 6-11

Appendix 3: ASCII Input Commands

Beginning with software version 2.00, the WILDCAT scale has the ability to receive certain ASCII characters via the serial port to perform simple keyboard functions. Previous versions of software did not have this capability. The software version can be viewed at power up.

The ASCII input commands will operate when the serial port is programmed for either demand output or continuous output. The input character format must be the same as the data output format selected in setup including baud rate, data bits, parity and stop bits. The remote commands are subject to the same restrictions as the keyboard equivalents. For instance, tare, zero and print commands will only operate if sent when there is no motion on the scale. When sending multiple commands, there must be a time delay of at least one-half second (500 milliseconds) between each remote ASCII command character.

These ASCII commands duplicate the front panel functions. Note that all characters are uppercase and no control characters such as <CR> (carriage return) or <LF> (line feed) need to be sent. If they are sent, they will be ignored. All ASCII characters other than the ones listed below will also be ignored.

The following commands are recognized by the WILDCAT scale when the output mode is programmed as either demand mode or continuous output.

Command	Function	Description
C	Clear	Clear tare value
T	Tare	Performs a pushbutton tare
P	Print	Transmit data or set print bit in continuous output
S	Print	Transmit data or set print bit in continuous output
Z	Zero	Zero the scale (if within range and no-motion)

Appendix 4: GEO Codes

Use the following Geo Codes if you relocate the WILDCAT scale to a location other than the original location where it was calibrated.

Northern and Southern Latitude in Degrees and Minutes	Height above sea-level in meters										
	0 325	325 650	650 975	975 1300	1300 1625	1625 1950	1950 2275	2275 2600	2600 2925	2925 3250	3250 3575
	Height above sea-level in feet										
	0 1060	1060 2130	2130 3200	3200 4260	4260 5330	5330 6400	6400 7460	7460 8530	8530 9600	9600 10660	10660 11730
0° 0' — 5° 46'	5	4	4	3	3	2	2	1	1	0	0
5° 46' — 9° 52'	5	5	4	4	3	3	2	2	1	1	0
9° 52' — 12° 44'	6	5	5	4	4	3	3	2	2	1	1
12° 44' — 15° 6'	6	6	5	5	4	4	3	3	2	2	1
15° 6' — 17° 10'	7	6	6	5	5	4	4	3	3	2	2
17° 10' — 19° 2'	7	7	6	6	5	5	4	4	3	3	2
19° 2' — 20° 45'	8	7	7	6	6	5	5	4	4	3	3
20° 45' — 22° 22'	8	8	7	7	6	6	5	5	4	4	3
22° 22' — 23° 54'	9	8	8	7	7	6	6	5	5	4	4
23° 54' — 25° 21'	9	9	8	8	7	7	6	6	5	5	4
25° 21' — 26° 45'	10	9	9	8	8	7	7	6	6	5	5
26° 45' — 28° 6'	10	10	9	9	8	8	7	7	6	6	5
28° 6' — 29° 25'	11	10	10	9	9	8	8	7	7	6	6
29° 25' — 30° 41'	11	11	10	10	9	9	8	8	7	7	6
30° 41' — 31° 56'	12	11	11	10	10	9	9	8	8	7	7
31° 56' — 33° 9'	12	12	11	11	10	10	9	9	8	8	7
33° 9' — 34° 21'	13	12	12	11	11	10	10	9	9	8	8
34° 21' — 35° 31'	13	13	12	12	11	11	10	10	9	9	8
35° 31' — 36° 41'	14	13	13	12	12	11	11	10	10	9	9
36° 41' — 37° 50'	14	14	13	13	12	12	11	11	10	10	9
37° 50' — 38° 58'	15	14	14	13	13	12	12	11	11	10	10
38° 58' — 40° 5'	15	15	14	14	13	13	12	12	11	11	10
40° 5' — 41° 12'	16	15	15	14	14	13	13	12	12	11	11
41° 12' — 42° 19'	16	16	15	15	14	14	13	13	12	12	11
42° 19' — 43° 26'	17	16	16	15	15	14	14	13	13	12	12
43° 26' — 44° 32'	17	17	16	16	15	15	14	14	13	13	12
44° 32' — 45° 38'	18	17	17	16	16	15	15	14	14	13	13
45° 38' — 46° 45'	18	18	17	17	16	16	15	15	14	14	13
46° 45' — 47° 51'	19	18	18	17	17	16	16	15	15	14	14
47° 51' — 48° 58'	19	19	18	18	17	17	16	16	15	15	14
48° 58' — 50° 6'	20	19	19	18	18	17	17	16	16	15	15
50° 6' — 51° 13'	20	20	19	19	18	18	17	17	16	16	15
51° 13' — 52° 22'	21	20	20	19	19	18	18	17	17	16	16
52° 22' — 53° 31'	21	21	20	20	19	19	18	18	17	17	16
53° 31' — 54° 41'	22	21	21	20	20	19	19	18	18	17	17
54° 41' — 55° 52'	22	22	21	21	20	20	19	19	18	18	17
55° 52' — 57° 4'	23	22	22	21	21	20	20	19	19	18	18
57° 4' — 58° 17'	23	23	22	22	21	21	20	20	19	19	18
58° 17' — 59° 32'	24	23	23	22	22	21	21	20	20	19	19

METTLER TOLEDO WILDCAT Scale Technical Manual

Northern and Southern Latitude in Degrees and Minutes	Height above sea-level in meters										
	0	325	650	975	1300	1625	1950	2275	2600	2925	3250
	325	650	975	1300	1625	1950	2275	2600	2925	3250	3575
	Height above sea-level in feet										
0	1060	2130	3200	4260	5330	6400	7460	8530	9600	10660	11730
1060	2130	3200	4260	5330	6400	7460	8530	9600	10660	11730	
59° 32' — 60° 49'	24	24	23	23	22	22	21	21	20	20	19
60° 49' — 62° 9'	25	24	24	23	23	22	22	21	21	20	20
62° 9' — 63° 30'	25	25	24	24	23	23	22	22	21	21	20
63° 30' — 64° 55'	26	25	25	24	24	23	23	22	22	21	21
64° 55' — 66° 24'	26	26	25	25	24	24	23	23	22	22	21
66° 24' — 67° 57'	27	26	26	25	25	24	24	23	23	22	22
67° 57' — 69° 35'	27	27	26	26	25	25	24	24	23	23	22
69° 35' — 71° 21'	28	27	27	26	26	25	25	24	24	23	23
71° 21' — 73° 16'	28	28	27	27	26	26	25	25	24	24	23
73° 16' — 75° 24'	29	28	28	27	27	26	26	25	25	24	24
75° 24' — 77° 52'	29	29	28	28	27	27	26	26	25	25	24
77° 52' — 80° 56'	30	29	29	28	28	27	27	26	26	25	25
80° 56' — 85° 45'	30	30	29	29	28	28	27	27	26	26	25
85° 45' — 90° 00'	31	30	30	29	29	28	28	27	27	26	26

METTLER TOLEDO
Scales & Systems

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Columbus, Ohio 43240

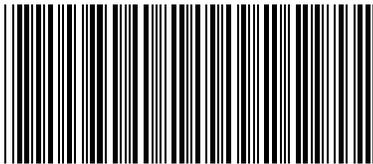
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