MSI9300

Porta-Weigh+ Crane Scale

User Guide

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Measurement Systems International

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SECTION 1 – INTRODUCTION & INSTALLATION

INTRODUCTION

The Measurement Systems International Model 9300 Porta-Weigh Plus Crane Scale is designed to provide a rugged weight indicator and data system for any type and size of crane used in industry. The 9300 combines CellScale technology with MSI's advanced Crane Scale architecture providing both a local and remote display capability. Combined with other CellScale components, the 9300 is an advanced data gathering network suitable for process control, customer billing, safety monitoring, and any other weight related data gathering.

The 9300 circuitry is fully shock-mounted and water-proof making a rugged and reliable overhead scale for use indoors and out. The large 1.2" (30mm) digits are sunlight visible, and are readable at distances up to 50' (15m).

The 9300 can communicate with CellScale family indicators and modems at distances up to 1000' (300m) outdoors (even further with gain antennas). Both fixed and handheld indicators are available, as well as Modems for direct connection to computers.

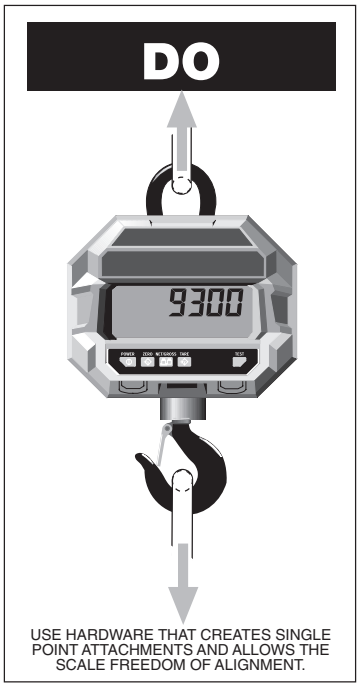
INSTALLATION

The 9300 installs easily by hanging it on the crane, using properly sized shackles. Follow proper loading procedures to ensure that side loading is eliminated. Please refer to MSI's brochure, "Crane Safety" when installing model 9300.

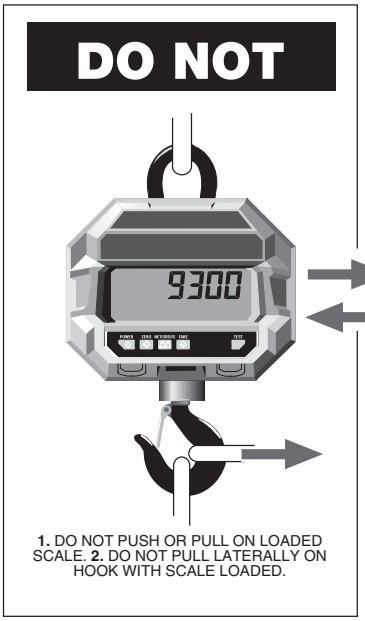
One of the most common installation problems is using an oversize shackle or too large a hook to interface with the 9300. This can cause off center loading and stress points that will reduce the life of the 9300 lifting eye or hook. Use the appropriate interface hardware for the capacity of the scale. If your interface hardware does not fit properly, MSI can supply the 9300 with oversize lifting eyes or shackle interfaces. If the crane hook is too large to fit in the lifting eye with single point interface, then install the scale using adaptive rigging.

If multiple attachments are needed, use a shackle or ring to attach the multiple lines to thus keeping a single point attachment to the scale. Single point attachments are necessary to ensure the safety and accuracy of the scale system.

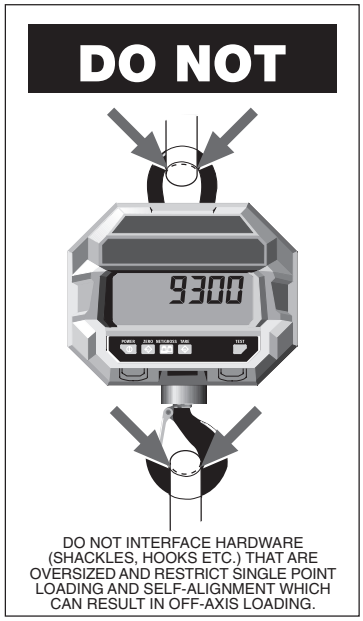
Regular maintenance inspections of the lifting system should be performed to ensure safety. Pay particular attention for signs of stress on any element in the load train.



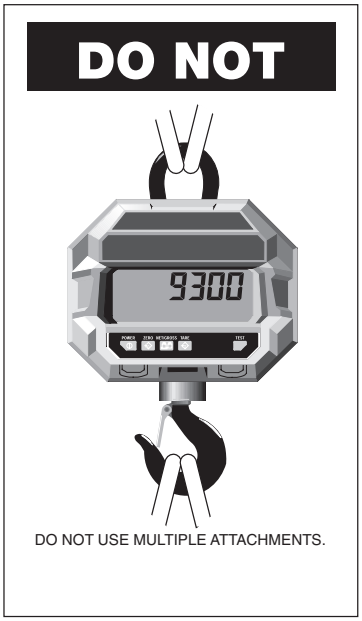
USE HARDWARE THAT CREATES SINGLE POINT ATTACHMENTS AND ALLOWS THE SCALE FREEDOM OF ALIGNMENT.



1. DO NOT PUSH OR PULL ON LOADED SCALE. **2.** DO NOT PULL LATERALLY ON HOOK WITH SCALE LOADED.



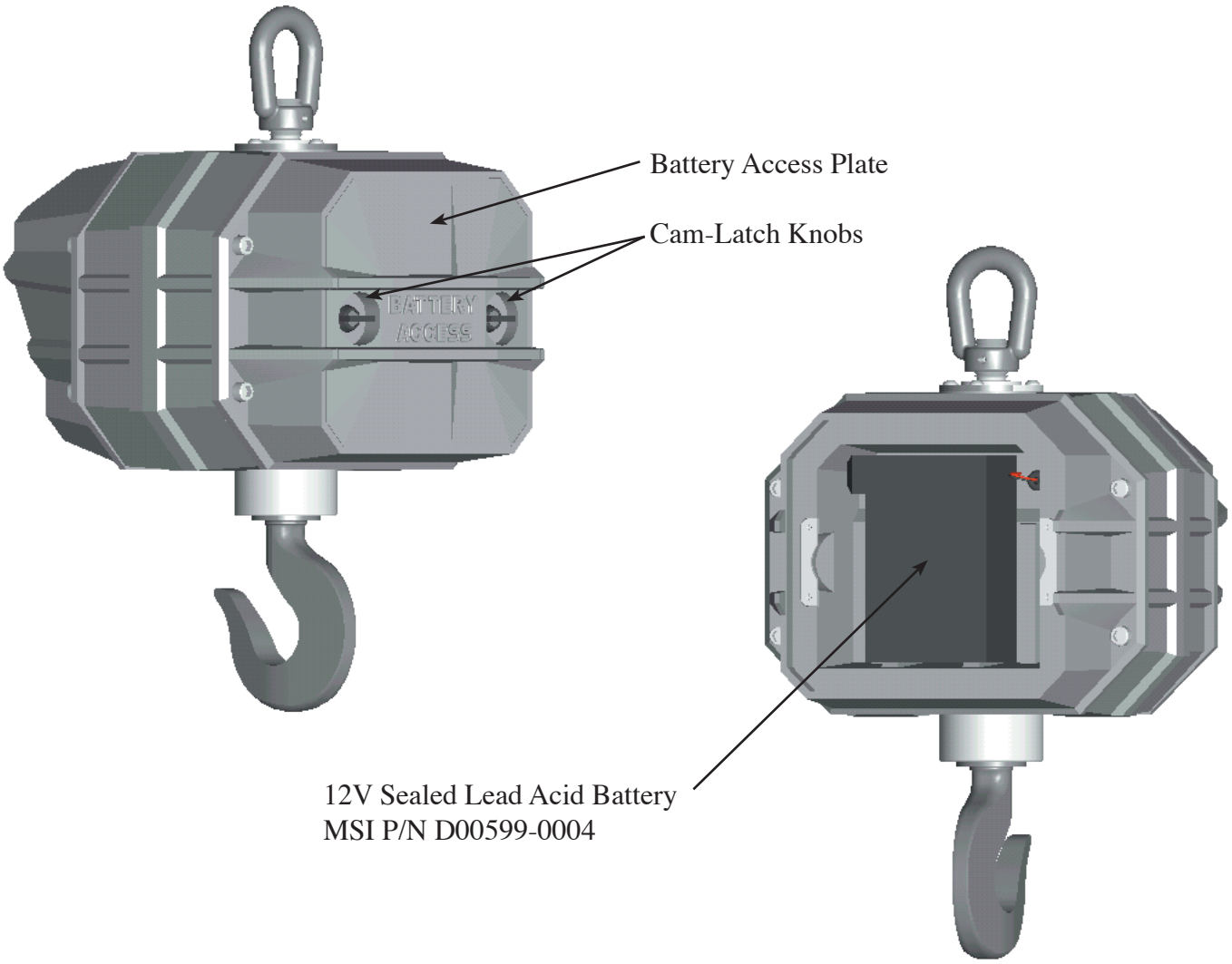
DO NOT INTERFACE HARDWARE (SHACKLES, HOOKS ETC.) THAT ARE OVERSIZED AND RESTRICT SINGLE POINT LOADING AND SELF-ALIGNMENT WHICH CAN RESULT IN OFF-AXIS LOADING.



DO NOT USE MULTIPLE ATTACHMENTS.

BATTERY REMOVAL & REPLACEMENT

1) Turn the 9300 Off.
2) With one hand, hold the battery access to prevent it from falling.
3) Rotate the two cam-latch knobs counter-clockwise until the plate latches disengage.
4) Carefully back the plate out of the battery well. The battery might be loose and subject to falling.
5) Remove the battery by pulling straight back.
6) Install a fully charged battery by plugging it in to the exposed battery jacks. The 9300 will turn on briefly then turn itself off.
7) Reseat the access panel.
8) Turn the cam-latch knobs clockwise until the plate is reseated. Make sure the plate is firmly in place.



CAUTION

The Battery Access Plate and the Sealed Lead Acid Battery are potential falling hazards. When opening the battery access, be sure to hold the battery to prevent it from falling. This battery contains Lead and should be recycled when it has reached its end of life.

BATTERY LIFE

The 9300 battery life depends on a number of factors: Brightness of the LED and number of segments lit, the amount of RF activity, and the age and condition of the SLA (sealed lead acid) battery. The 9300 will automatically turn the scale off when the SLA battery drops to approximately 10.5V. You must recharge the battery when this happens. Leaving a discharged battery in the scale, which has a maintenance battery drain, can result in a deep discharged battery which will shorten its service life.

SLA batteries do not suffer from memory effects and actually benefit from frequent rechargings. Recharge the battery whenever it is convenient even when it still has available life. Due to the maintenance discharge imposed on the battery by the 9300 electronics, **do not store the 9300 away with the battery inside**. Remove the battery.

Battery Use Guidelines

1) Recharge whenever convenient. Do not wait for the scale to shut itself off if your work situation permits.
2) If you need the scale continuously, keep a fully charged spare battery. Replace the drained battery as close as possible to the low battery warning, or earlier.
3) SLA Batteries that have not been deep discharged should withstand 500 to 1500 charging cycles.
4) The low battery warning will indicate about 2-4 hours of additional use before the 9300 turns itself off.
5) If the 9300 is not going to used again soon, remove the SLA battery to prevent deep discharge while the unit is in storage.

BATTERY CHARGER

Each 9300 is shipped with a battery charger designed to charge and maintain the battery. Exact charging time will depend on the degree of discharge of the battery. A battery removed when the low battery warning first appears should take about 4 hours to fully charge.

Using the Charger

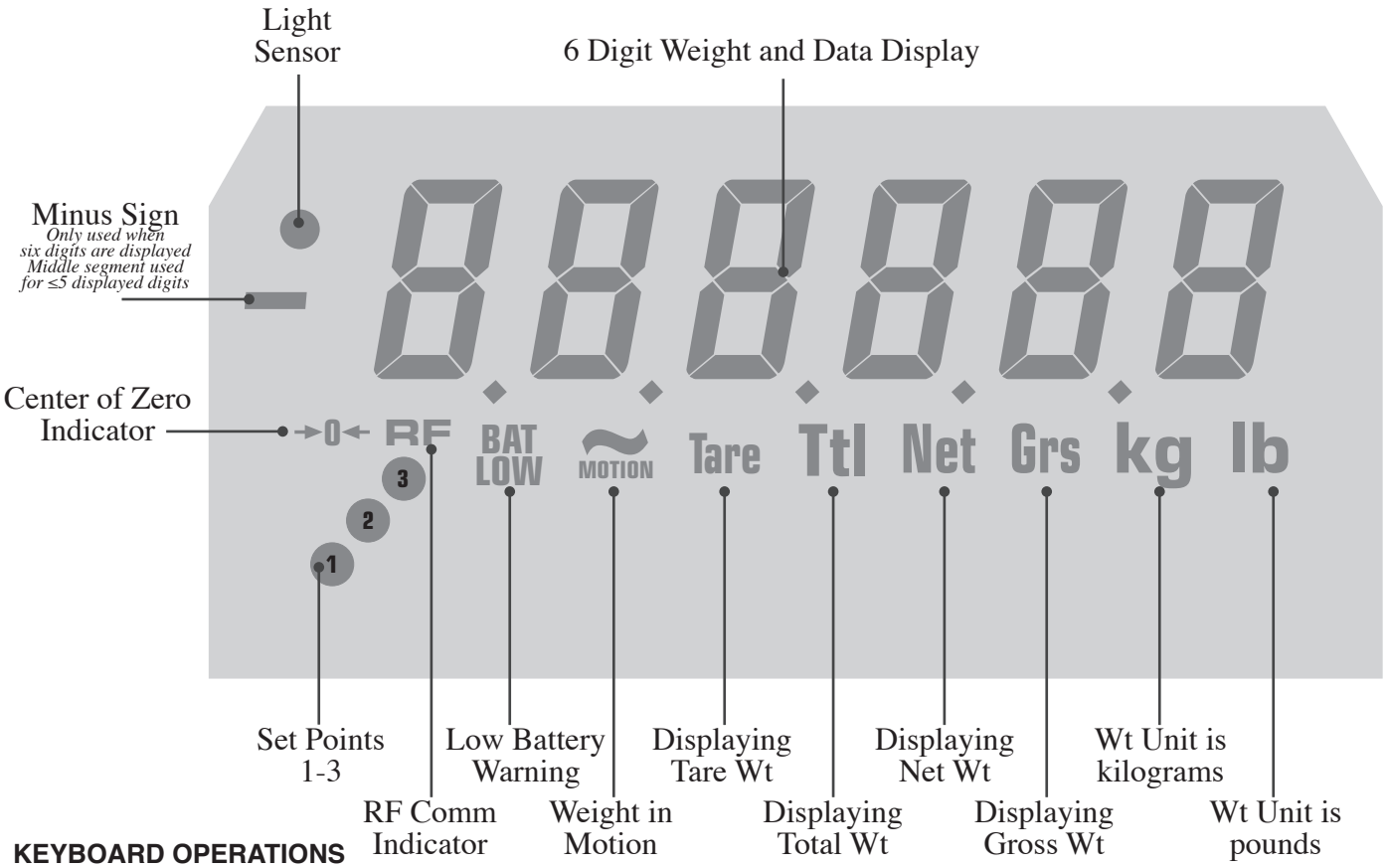
1) Remove the Battery from the 9300. See previous page for removal instructions.
2) Connect the charger assembly to the AC supply (86-260VAC). The Power Status light should be green. If the power status light fails to illuminate, check your AC power connection and make sure the Vin jack is fully seated. AC power cords suitable for any world location are available from MSI.
3) Plug in the polarized connector to the jacks on the battery.
4) The Charge Status light should turn ORANGE indicating fast charge.

   If the status light remains Green when the battery is first plugged in, the battery may be defective.
5) Charge until the status light turns GREEN.

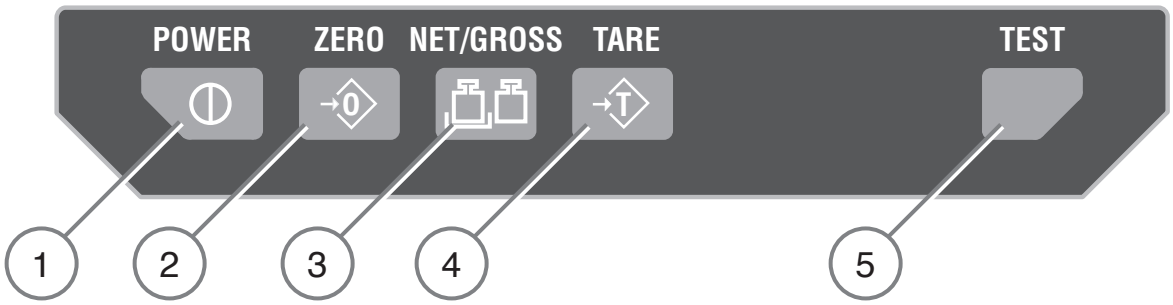
When the charge cycle is complete you can (and should) leave the battery on the charger until it is needed. The charger keeps a maintenance float charge on the battery to ensure the best possible operation times. For scales that are in high usage, MSI recommends obtaining a spare battery so one can always be on the charger.

9300 PORTA-WEIGH PLUS DISPLAY

The 9300 has six 1.2” (30.5mm) ultrabright LED Digits along with annunciators. The brightness of the display is automatically adjusted to the lighting conditions. When the ambient light is dim, the LEDs are lower in intensity. When ambient light is bright, the LED intensity level is increased to allow sunlight readability.



KEYBOARD OPERATIONS



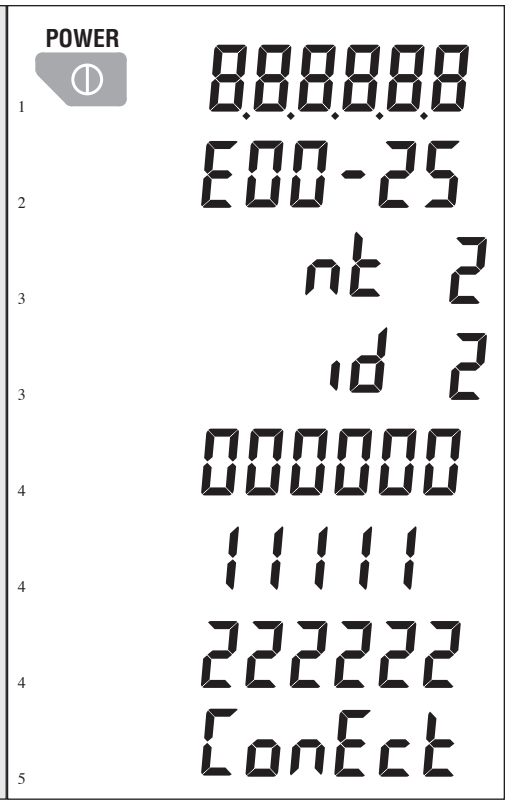
1) POWER – Push to turn the scale on or off.
2) ZERO – Used to zero the scale. The zero range is usually 100% of full scale unless prohibited by legal-for trade settings.
3) NET/GROSS – Switches scale between NET and GROSS weight readings (assuming a Tare value has been stored).
4) TARE – When in GROSS mode, pushing TARE will zero any weight on the scale and cause the scale to go into the NET mode. When in NET mode, pushing TARE will display the TARE value for 2 seconds, then revert back to the NET weight display. In NET mode, pushing TARE twice will set a new Tare. Pushing TARE followed immediately by ZERO will clear the Tare value and revert the scale to Gross Mode
5) TEST/USER Key – When pushed, this causes a display segment check, and provides battery and RF Network information. Also programmable for USER desired functions. See SETUP USER KEY. User Key Functions Available: Units (kg/lb) • Total • Test (default) • Scan List Increment (multi-channel systems) • °F/°C

SECTION 2 – SCALE OPERATION

POWER

To Turn On the Power

1) Push POWER. The system performs a display check: All segments and annuciators illuminate for 3 seconds.
2) The LED displays the firmware Rev number.
3) Next, the display shows the Network address followed by the ID address. This is the operating network address for any slave device to log onto.
   The network and ID Address are usually but not always the same. Numbers for Network range from 0 to 31 and for address from 0-254. Initially the 9300 display will not know the Network address and will skip this step.
4) The display begins a numeric test while the CellScale component is establishing Network and Comm Port connections. The count up pattern will continue for 10-20 seconds and will sometimes restart. This is normal.
5) Once the RF Network is established and the Comm Port connection to the display is set the display will read "Conect" (sic). The scale is now ready for operation.



MULTIPLE SCALE CHANNELS

The 9300 is capable of hosting multiple independent scale inputs. These are connected wirelessly using 6260CS or 9300 crane scales setup as Network Slaves, or by special order, additional inputs can be wired directly into the 9300. In addition, the CellScale Math channels can be used for manipulating the scale data. To directly access additional channels, the TEST/USER key can be programmed to "S List" to scroll through the available scale channels. See "USER KEY FUNCTION" in this manual. See the CellScale User Guide for the procedure to add additional channels. The 9300 keypad operates on the displayed channel only.

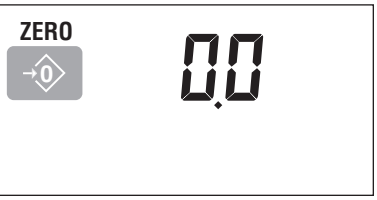
ZERO

Sets the zero reading of the scale. Use the zero key to take out small deviations in zero when the scale is unloaded. (See "TARE" for zeroing (Taring) package or pallet weights)

To Zero

Push ZERO. The weight reading must be stable within ±1 division for the zero function to work.
The backup memory stores the zero reading, and can restore it even if power fails.

The numeric digits display "0" (or 0.0 or 0.00, etc.).



Rules for Use:

1) Works in GROSS mode or NET mode. Zeroing while in Net mode will zero the gross weight causing the display to show the negative Tare value.
2) The scale must be stable. The scale will not zero if the motion detect annunciator is on.
3) The scale will accept a zero setting over the full Range of the scale (NTEP and other Legal-for-trade models may have a limited zero range). Zero settings above 4% of full scale will subtract from the overall capacity of the scale. For example if you zero out 100 lb. on a 1000 lb. scale the overall capacity of the scale will reduce to 900 lb. plus the allowed over-range amount.

TARE

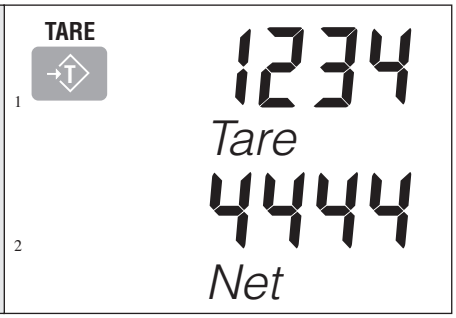
Tare is typically used to zero out a known weight such as a packing container or pallet and display the load in NET weight. A Tare value is entered in one of three ways:

1) AUTO TARE – When the TARE key is pushed twice, the current weight is zeroed and Net Weight is displayed. This is the only Tare function available from the 9300 keypad.
2) KEYBOARD TARE – Available from a 3750CS or 9750 Indicator only. Using the numeric keys, the operator keys in the desired Tare Weight then pushes the ENTER Key. See the 3750CS or 9750 User Guides.
3) TARE UP/DOWN – Available from a 3750CS Indicator only. Using the Scroll Keys, the Tare value is changed one scale division at a time. TARE UP/DOWN is useful for increasing or decreasing the current Tare value slightly. The Keyboard Tare and Tare Up/Down modes can be disabled through the use of SETUP TARE. In the "AUTO" mode a single push of the TARE key will enact AUTO TARE. See the 3750CS User Guide.

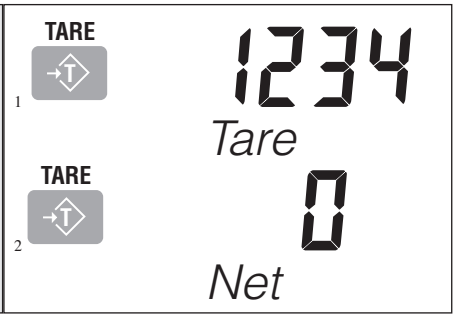
To Auto Tare (in Gross Mode)

1) From Gross Mode, push TARE. The current weight is stored in the Tare register, the display mode changes to Net, and the display reads 0. All following readings are deviations from the set Tare value.	

To Read the Current Tare Value

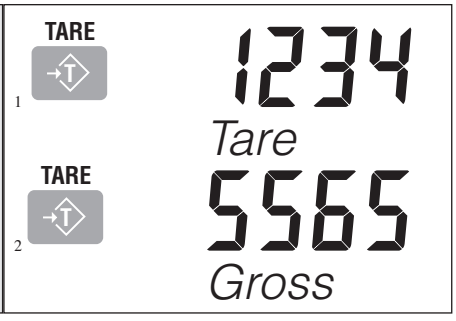
1) From Net Mode, push TARE. The current weight stored in the Tare register is displayed for 2 seconds. Then the display mode reverts to Net Weight.	

To Auto Tare (in Net Mode)

1) From Net Mode, push TARE. The current Tare value is displayed. 2) Within 2 seconds, push TARE again. Assuming no motion, the current Gross weight is stored to the Tare register, and the mode is set to Net weight with the new tare value. All following readings are deviations from the set Tare value.	

To Clear Tare and Revert to Gross Mode

Use the Net/Gross to return to Gross Mode without clearing the Tare value.

1) From Net Mode, push TARE. The current Tare value is displayed. 2) Within 2 seconds, push ZERO. The current Tare weight is cleared from the Tare register, and the mode is set to Gross weight.	

Tare - Rules for Use:

1) Only positive gross weight readings can be tared. Weight can be tared in both the NET and GROSS modes. When in the NET mode, the TARE is not cumulative, all the weight is zeroed.
2) The motion annunciator must be off. The weight reading must be stable.
3) Setting or changing the tare has no effect on the Gross zero setting.
4) Taring will reduce the apparent over range of the scale. For example, taring a 10 lb. container on a 60 lb. scale, the scale will overload at a net weight of 50 lb. (60-10) plus any additional allowed overload (usually ~4% or 9d).
5) The scale stores the Tare value in the current ID Code memory until cleared. Each available ID Code can store independent Tare values.

Multiple Tare Memories

The 9300 is capable of storing Tare values through the use of the ID Codes. Each ID code stores an independent Tare. ID Codes are accessible through the 3750CS or 9750, or through a Modem using Host Commands.

SPECIAL TARE MODES

The Tare function has two special modes. These modes are configured through the Comm Port. See the Model 9000 User Manual for information on configuring the Tare Mode.

UNIV TAR

The Universal Tare feature allows a single Tare value to be shared by all ID Codes. With UNIV TAR enabled the individual Tares stored with each ID Code are ignored (but not erased). Disabling UNIV TAR will restore the original Tare values. UNIV TAR is intended for those applications where a common carrier or pallet is used, but multiple ID Codes are necessary for data collection.

AUTO CLR

Enabling “AUTO CLR” causes the 9300 to clear the Tare Value after each lift greater than 0 NET. The Tare Value is cleared and the display mode reverts to Gross Weight once the load is removed (the weight goes below 0 NET). The “ON TOTAL” setting clears the Tare Value after the load is totaled. The default for the “AUTO CLR” function is “DISABLED” . When disabled, the Tare Value can only be cleared manually (see “To Clear Tare and return to Gross Mode”.)

NET/GROSS

Switches the display between Net and Gross modes. Net Weight is defined as Gross Weight minus a Tare Weight.

To Switch Between Net Mode and Gross Mode

Switching back to Gross mode from Net mode will not clear the Tare value. This allows the operator to use the Gross Mode temporarily without having to reestablish the Tare value. Only manually clearing the Tare or setting a new Tare will change the tare value held before switching into Gross Mode.OIML Legal-for-trade units only: The NET/GROSS key is temporary action only. The Gross weight is displayed for 2 seconds and then the display returns to the Net Mode. The only way to return to permanent Gross readings is to clear the Tare (see Clear Tare procedure).

1) Starting in the NET weight mode, push NET/GROSS. The weight mode will change to Gross weight. *If you are in Gross Mode and a Tare value has not been established, the Net/Gross key has no effect.* 2) Pushing NET/GROSS again will revert the display to the NET mode.	1 NET/GROSS → GRS 2 NET/GROSS → NET

UNITS

Allows easy weight units conversions. Although the CellScale offers up to 8 units, the 9300 will only display pounds or kilograms.

This operation requires that the Test/User Key function is set to Units. See “Setup USER key Function ”.

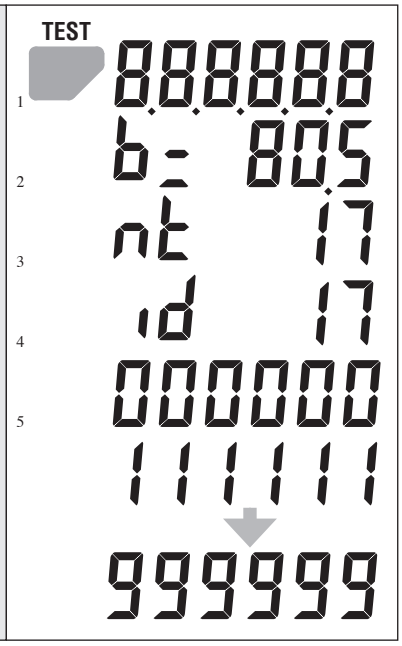
To Change the UNITS

Push the TEST/USER key (programmed as UNITS). The weight display will toggle between kg and lb.	1 TEST → kg TEST → lb

TEST

Provides a functional system test, and an on-demand display check without disturbing the current weighment. The Test function can be interrupted by pushing any key during the test.

To start the Test

Push the TEST/USER key (programmed as TEST). The display will do the following steps: 1) All LEDs are illuminated for 1 second. 2) The battery condition in approximate per cent of remaining life is displayed. 3) The Network Address is displayed. *Numbered from 0-31* 4) The Network ID is displayed. *Numbered from 0 to 254* 5) The display digits count up from 0 to 9. 6) Returns to normal weight mode.	

INTERNAL TEMPERATURE DISPLAY

The 9300 can monitor its internal temperature. This feature is for use in Foundry applications or any other Crane use around high temperature sources. The temperature display can be set to display automatically at 20 second intervals (see page 15) and will display in degrees C or degrees F. The purpose of monitoring the internal temperature is to ensure that the scale is not damaged by overlong exposure to high temperatures. The 9300 offers a heat shield option for foundry use that increases the dwell time possible when lifting melt pots.

The 9300 must be removed from the high heat source when the internal temperature reaches 185°F or 85°C.

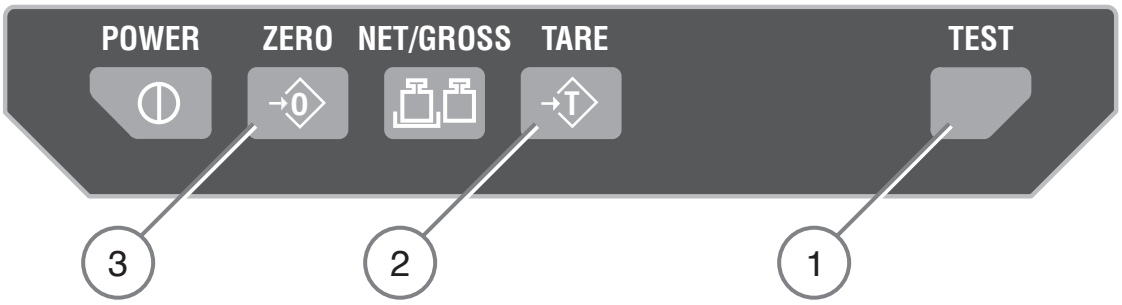
To Manually Display the 9300 Internal Temperature

USER key Function set to " °F °C ". Temperature units are set in the Setup Menus.

Push the TEST/USER key. The current internal temperature will display for 2 seconds.	

SECTION 3 – 9300 SETUP MENU

KEY FUNCTIONS DURING SETUP

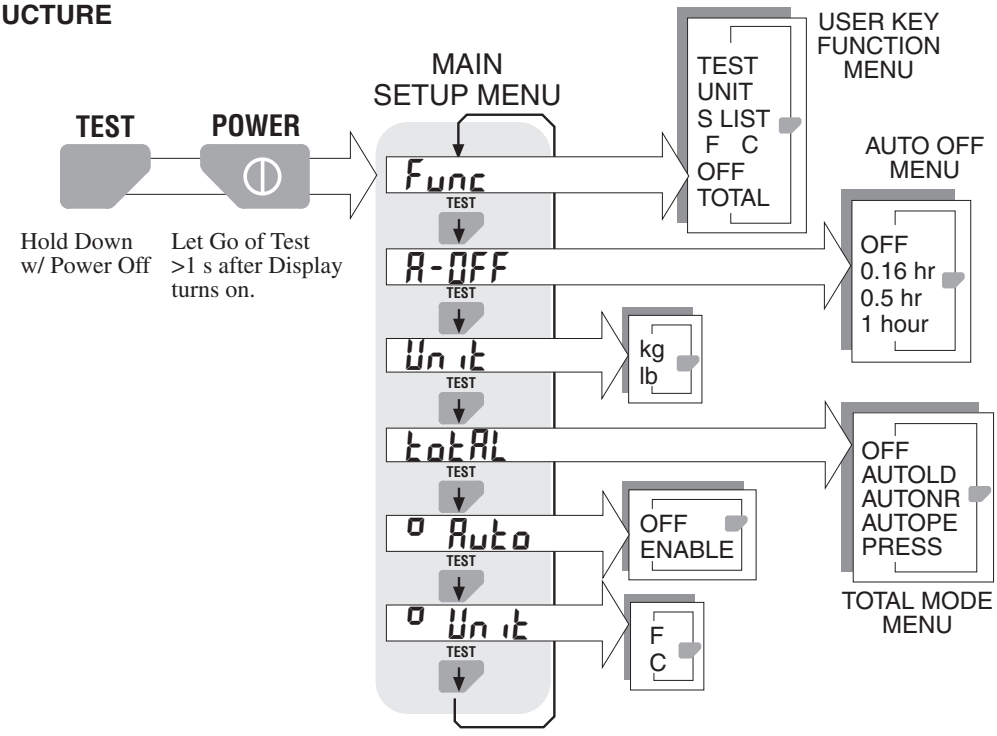


1) The Test key is used to scroll through menu selections.
2) The Tare key is used to select the displayed menu choice.
3) The Zero key is used to exit out of the current menu. At the root level the Zero key turns off the Setup mode and returns the 9300 to weight display.

To Start the Setup Menu

1) If the 9300 is on, turn it off with the POWER key.
2) Press and hold the TEST key.
3) While still holding the TEST key, turn on the 9300 with the POWER key.
4) Release the TEST key after the segment test screen is finished.
5) After a few seconds, the display will show the first Setup Menu item, "FUNC".

SETUP MENU STRUCTURE



USER KEY FUNCTION

The TEST/USER key can be programmed to 1 of 6 functions:

1) TEST – Default function. Provides segment test of the display, battery level, and RF Network information.
2) UNIT – Switch between pounds (lb) and kilograms (kg).
3) S LIST – (Scan List) Change displayed channel to the next channel in the CellScale Scan List. Applicable to multichannel systems only.
4) °F °C – Displays the internal 9300 temperature for 2 seconds.
5) OFF – No function
6) TOTAL – If manual total is enabled, pushing the TEST/USER key will add the current weight to the Total register. Subsequent pushes will display the totaled weight until Total is reset by returning to zero (below the total threshold, see the CellScale User Guide for more information on total threshold). If in any Auto-Total mode, the USER key functions as View Total, displaying the Total Weight for two seconds.

To Set the User Key Function

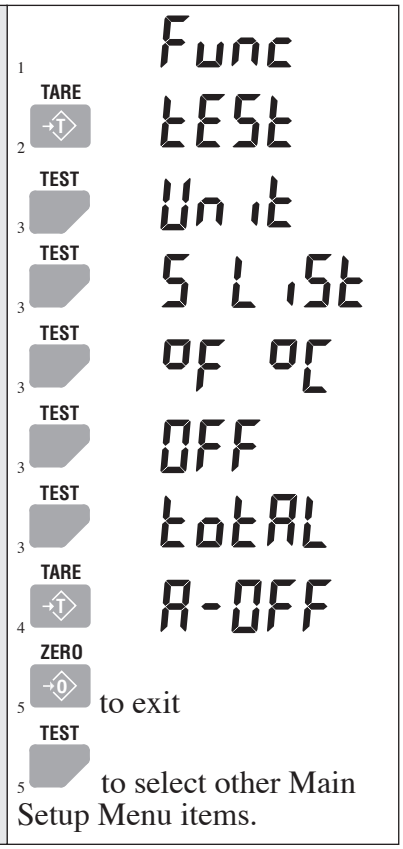
1) Start the Setup Mode using the procedure on the previous page.

2) With the display reading "Func" press the TARE (Select) key. The currently programmed USER key mode will display flashing.
The example assumes the dejault function TEST is the current USER key function.

3) Use the TEST (Scroll) key to scroll through the choices.
In this example the TEST key function will be changed to TOTAL.

4) When the desired choice is shown, Press TARE (Select) to select it.
Pushing TARE (Select) places the displayed function as the USER key function, and exits the FUNC menu.

5) The next Main Menu item, "A-OFF" will appear. Either select another Setup procedure with the TEST (Select) key, or return to weighing mode by pushing ZERO (Exit).



to exit

to select other Main Setup Menu items.

AUTOMATIC OFF

The 9300 can be set to turn itself off in periods of inactivity by enabling the Automatic Off feature. The Auto Off timer is reset whenever a button is pushed or weight changes. There are 4 settings:

1) OFF – Feature disabled
2) 0.16 hr – 9300 will turn off in approximately 10 minutes
3) 0.5 hr – 9300 will turn off in ~30 minutes
4) 1 hour – 9300 will turn off in ~1 hour.

To Setup Automatic Off

1) Start the Setup Mode using the procedure on page 12.

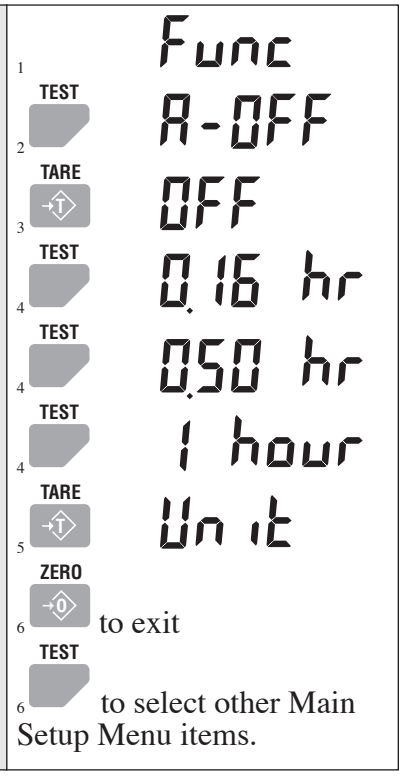
2) Use the TEST (Scroll) key to scroll to “A-OFF”.

3) With the display reading “A-OFF” press the TARE (Select) key. The currently programmed Auto-Off setting will display flashing.
The example assumes the Auto-Off function was OFF.

4) Use the TEST (Scroll) key to scroll through the choices.
In this example the Auto-Off function will be set to 1 hour.

5) When the desired choice is shown, Press TARE (Select) to select it.
Pushing TARE (Select) places the displayed setting as the Auto-Off mode, and exits back to the Main Setup Menu.

6) The next Main Menu item, “Unit” will appear. Either select another Setup procedure with the TEST (Select) key, or return to weighing mode by pushing ZERO (Exit).



UNITS

The 9300 will display and convert weight in pounds or kilograms. The TEST/USER key can be set to switch between lb and kg if desired. If only 1 weight unit is needed, use this procedure to set the desired unit.

To Setup the Weight Unit

1) Start the Setup Mode using the procedure on page 12.

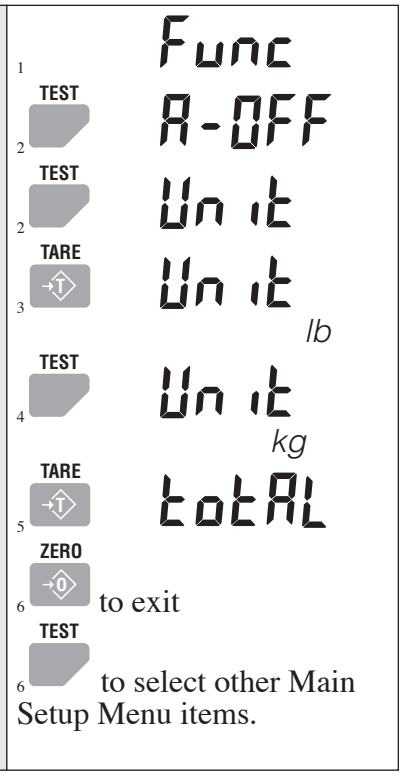
2) Use the TEST (Scroll) key to scroll to “Unit”.

3) With the display reading “Unit” press the TARE (Select) key. The currently programmed Unit setting will display flashing.

4) Use the TEST (Scroll) key to switch between kg and lb.
In this example the unit will be changed to kg.

5) When the desired choice is shown, Press TARE (Select) to select it.
Pushing TARE (Select) sets the weight unit, and exits back to the Main Setup Menu.

6) The next Main Menu item, “Total” will appear. Either select another Setup procedure with the TEST (Select) key, or return to weighing mode by pushing ZERO (Exit).



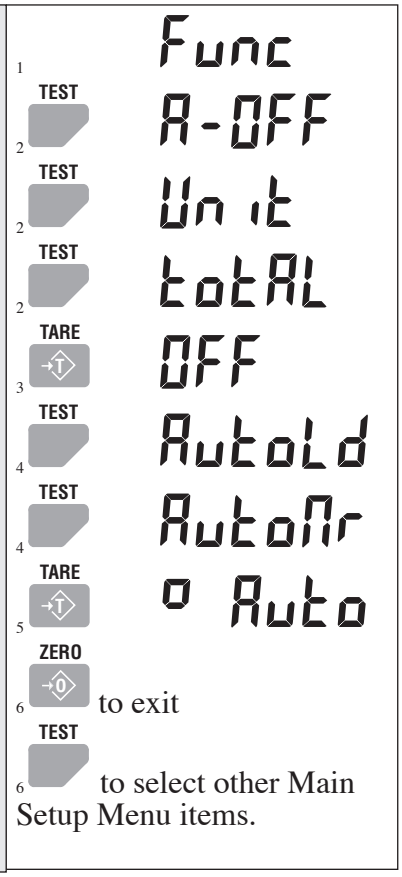
TOTAL

The 9300 CellScale feature set provides Total and Statistics capabilities. The 9300 keypad allows the enabling and display of some of these features. More extensive total and statistics capability is provided when a 9750 or 3750CS meter is part of the network. However, the 9300 allows the setting of the following Total features:

1) OFF – Total feature turned off
2) Autoload – The autoload feature provides an algorithm for totaling that requires a 3750CS equipped with an auxiliary push button. Intended for commodity loading into containers. See the CellScale User Guide for a complete description of the Autoload feature.
3) Autonorm – The Autonorm Total will automatically total all steady weights above the auto total threshold. Once totaled, the weight must return to near zero before the scale will autototal again. The autonorm total totals the last settled weight before the scale went back to zero, so be sure the weight is removed rapidly from the scale.
4) Autopeak – Similar to Autonorm except the weight totaled will be the highest settled weight before the weight returns to near zero.
5) Press – Indicates that a manual total key must be pressed to cause a total to occur. This can be the USER key programmed to total, or total keys found on the 3750CS or 9750 indicators.

To Set the Total Mode

1) Start the Setup Mode using the procedure on page 12.
2) Use the TEST (Scroll) key to scroll to “Total”.
3) With the display reading “Total” press the TARE (Select) key. The currently programmed Total setting will display flashing.
4) Use the TEST (Scroll) key to scroll through the total modes.
   In this example the mode will be changed to “AutoNorm” (AutoNr).
5) When the desired choice is shown, Press TARE (Select) to select it.
   Pushing TARE (Select) sets the Total mode, and exits back to the Main Setup Menu.
6) The next Main Menu item, “° Auto” will appear. Either select another Setup procedure with the TEST (Select) key, or return to weighing mode by pushing ZERO (Exit).

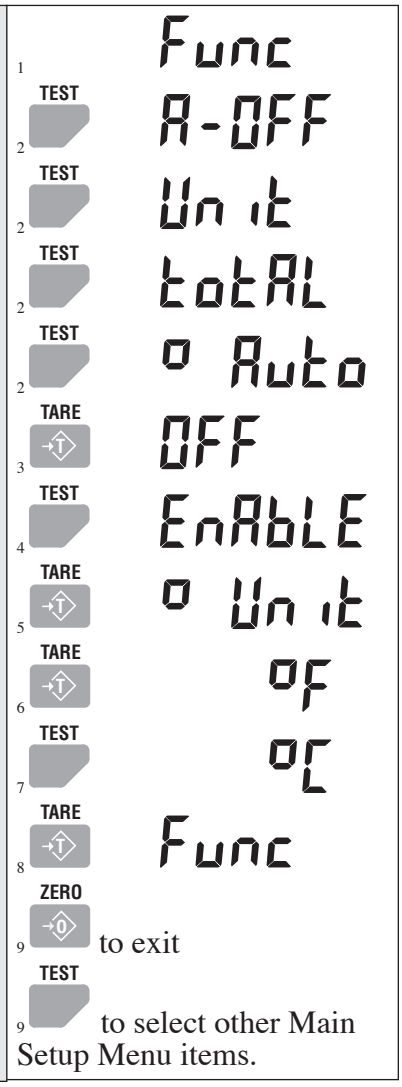


AUTOMATIC TEMPERATURE DISPLAY

The 9300 will display its internal temperature once every 20 seconds if enabled with the following procedure.

To Enable Auto Temp Display (° Auto) & Set Temperature Units

1) Start the Setup Mode using the procedure on page 12.
2) Use the TEST (Scroll) key to scroll to "° Auto".
3) With the display reading "° Auto" press the TARE (Select) key. The currently programmed Auto-Temperature setting will display flashing.
4) Use the TEST (Scroll) key to Enable the Auto-Temperature mode.
5) When the desired choice is shown, Press TARE (Select) to select it.
   Pushing TARE (Select) sets the Auto-Temp mode either OFF or Enable, and exits back to the Main Setup Menu.
6) The next Main Menu item, "° Unit" will appear. Push TARE (Select) to setup the desired temperature unit (°F or °C).
7) Use the TEST (Scroll) key to select °C or °F.
8) Push TARE (Select) to set the temperature unit.
9) The next Main Menu item, "Func" will appear. Either select another Setup procedure with the TEST (Select) key, or return to weighing mode by pushing ZERO (Exit).



SECTION 4 – THE EMBEDDED CELLSCALE

ACCESSING THE CELLSCALE

The 9300 is a shell interface to an embedded CellScale. To access the advanced features of the CellScale a Comm Port is provided on the 9300 front casting. This Comm Port is only used for interfacing to the CellScale and cannot be used as an output of any kind.

The CellScale offers Set Points, ID Codes, and other advanced features which are controlled either through a remote Indicator such as the 3750CS or the 9750 Handheld. These features are also accessed by connecting a terminal program in a PC to the Comm Port. Tested terminal programs that function well with the CellScale include ProComm Plus, Qmodem, HyperTerm (shipped with many versions of Windows), WinTerm, and ZTerm or Microphone (for Macintosh). Usually a VT102 emulation is used. All commands are single letter except when entering data.

Settings for your terminal program are: 9600 baud, 8 bit, 1 start bit, 1 stop bit, no parity, Handshaking usually not required, but you can turn on Xon/Xoff if you desire.

While the Comm Port is in use, the 9300 display is in standby with the message “C-Port” displayed. The only key that will function in this mode is the Power key.

The CellScale Terminal Access Mode is used to set Network parameters, Scale parameters, Set Points, and other various setup conditions. Refer to the CellScale User Guide for detailed information.

CONNECTION PROCEDURE

The 9300 must be on and finished with its startup sequence before connecting the terminal cable to a PC.

1) Without connecting the PC or Terminal to the 9300, turn the 9300 on. Wait for the startup sequence to complete (usually about 10-15 seconds). When weight is displayed, the 9300 is ready.

2) Connect the PC to the 9300 through the Comm Port. When the 9300 detects a valid Comm Port from your PC or Terminal, it will automatically switch into the “C-Port” mode.

Some Computers might have trouble connecting to the 9300 (“C-PORT” does not appear) due to handshake lines or incompatible output levels. If this happens, press and hold the NET/GROSS key and then push TEST. This will force the 9300 into the “H-PORT” mode and provide access to the embedded CellScale.

3) With “C-PORT” or “H-PORT” displayed you can access the Terminal menus in the CellScale.

4) Send a Break command (keystroke varies between terminal programs) to restart the Terminal Access Mode menus in the CellScale. Sometimes it is necessary to send the R character to refresh the screen. The ESC key will back out of menus.

5) Once in the Terminal Access Mode menus, commands are usually a single number or letter. Refer to the 9000 CellScale User Guide for further information.

COMM PORT CABLE

The 9300 comes standard with one Comm port cable wired for RS-232 (MSI P/N 501705-0001) following the AT standard for 9 pin serial cables (DCE). An unterminated cable is available (MSI P/N 12023) if you wish to wire your own serial cable for RS-232.

Comm Port Cable Color Code RS-232

Brown – Transmit output from CellScale, connect to receive of DTE.

Black – Receive input to CellScale, connect to transmit of DTE.

White – CTS Input to CellScale. Connect to RTS or RTR output of DTE.

Grey – RTS/RTR output from CellScale. Connect to CTS input of DTE.

Blue – Signal Ground

Drain Wire – Connect to metal shell.

SET POINTS

The Internal CellScale can monitor up to 32 Set Points. Set Points are used for safety warnings and process control. The 9300 has LED annunciators for Set Points 1 through 3. Set Points are programmed from a 3750CS, a 9750, or through the Terminal Access Mode. On special order MSI can supply audible alarms, sirens, or other warning devices for Set Point outputs.

SCALE CALIBRATION

The 9300 is best calibrated using a remote indicator such as the 3750CS or the 9750 Handheld. Calibration procedures using these devices are covered in their respective User Guides. If the 9300 is not RF equipped, the only way to calibrate it is through the Comm Port using the Terminal Access Mode. The Calibration Procedure for this is covered in the CellScale Model 9000 User Manual.

MSI recommends having test weights of at least 50% capacity to properly calibrate the Crane Scale. The calibration procedures will operate with as little as 12.5% of capacity, though rated accuracy cannot be guaranteed. Very large capacity scales are often calibrated using transfer techniques. Weigh something on a truck scale, then pick it up on the Crane scale and match the weight during the calibration procedure. The CellScale software permits multi-point calibration (up to 9 span points + Zero), but multi-point calibration is not usually necessary with our standard product line, being very linear from zero to capacity. The need for Multi-Point calibration is left up to the Scale Technician.

Calibration Tips

1) Make sure that the scale and load are stable (not swinging or vibrating) for every calibration step.
2) Prevent off-center loading during calibration. The scale must be perpendicular to the earth to prevent cosine theta errors. Adjust the rigging as necessary so that the pull is straight through the center of the scale.
3) Calibration always starts with the zero load. Remove all rigging that is not always present on the scale. However, it is sometimes best to calibrate zero with the rigging necessary for picking up the test weights attached to the scale. It's effect on dead load can be zeroed out later.
4) If rigging has not been zeroed out, make sure you add its weight to the test weight when entering the calibration weight.
5) Multi-point calibration can be done in any random order, as long as the zero step is first.

CELLSCALE SETTINGS FOR 9300

Certain Terminal Access Settings are required for compatibility with the 9300 display board. These settings should not be changed. The default settings should be:

MAIN > SYSTEM > POWER: Set to AC (Display board checks battery, do not set to 12V SLA).

MAIN > SYSTEM > LEDs: Turn all off and turn Power to Low. (LEDs can't be seen anyway, saves power to turn them off).

Do not modify Comm Port 1 baud rate settings. This could interfere with communications with the display board.

APPENDIX – SPECIFICATIONS & DIMENSIONS

HARDWARE OVERVIEW

Electronics

- μC Board: 6 layer SMD, AM186ESLV based w/ Flash Memory – 512kbytes of Flash Program Memory, 512kbytes of non-volatile RAM.
- Power Supply / I/O Board: power regulation and I/O for MM – Input range 10-16V. Optional direct AC board 90-260VAC.
- 2 Channel A/D Board: 4 layer SMD, 24bit A/D.
- Highly integrated Radio Modem: 2.4GHz Spread Spectrum. Protected Antenna.
- Display Board: 4 Layer SMD with six 1.2" (30mm) digits and 14 backlit annunciators.

Housing

- Alodined Cast Aluminum. Double O-ring gasketed. NEMA 4, IP66

Load Train

- Load Cell: 4340 Aircraft Quality Steel
- Industry Standard Lifting Eyes and Bottom Hooks

GENERAL FEATURES

Channels 1-4 – Scale Input Channels

- Internal Load Cell connected to Channel 1. Optional additional scale inputs by special order for multipoint lift situations.

Channel 5

- Channel 5 allows remote access to inputs on remote Slave CellScales

Channel 6

- Channel 6 is math calculations. Up to 8 separate math channels can be used to combine conversions from multiple scale channels. Supported functions are: multiply, divide, add, subtract, absolute value, square root, and constants. Multiple levels of parentheses are available for any scaling or channel data manipulation formulas.

Excitation

- 5 V (+5V relative to ground). Current limited and over-voltage protected to Factory Mutual standards. AC (switched DC) or DC excitation.

Radio Link

- Frequency Hopping Spread Spectrum in 32 channels @ 2.4 GHz. Allows 32 collocated networks of scales and peripheral devices (MSI Models 9020, 9750, 3750CS, etc.).

Calibration

- Via RF or Input Comm Port. Calibration is accomplished through a computer program residing on any computer. The calibration program is user friendly, with menus that are easy to use on a full graphics screen. Calibration is also available using the 3750CS or 9750 Meters. Sealing the system is not necessary due to password protected calibration routines. Seal can be provided on front panel in Legal-For-Trade systems.

GENERAL SPECIFICATIONS

Calibration Parameters (Programmed via Terminal Access Mode)

- CAL – Zero then Span, up to 10 point calibration (counting 0)
- AZM – OFF, ON (.5d), 1d to 255d Programmable
- Motion Detect – OFF, ON (.5d), 1d to 255d (programmable in 1d steps)
- Software Filter – None, LOW, HIGH
- Zero – 100% of capacity, limited by Legal-for-trade settings.
- Units – lb, kg on 9300 display. Ton, Ton (metric), oz, g, daN, or user defined using the math channels through remote indicators (3750CS or 9750).
- Standard Crane Scale Capacities – 500 lb / 250 kg, 2000 lb / 1000 kg, 5000 lb / 2500 kg, 10000 lb / 5000 kg, 20000 lb / 10000 kg, 30000 lb / 15000 kg, 50000 lb / 25000 kg, 70000 lb / 35000kg, 100000 lb / 50000kg. Larger capacities available on request. MSI can provide load cells to 500 tons. Any scale can be calibrated to a smaller capacity. e.g. a 2000 lb scale could be calibrated to overload at 1800 lb.
- "d" Scale divisions – Any resolution from 10,000 divisions or less. Standard 9300 resolution is 2000d to 5000d. Having more resolution than needed can cause settling delay.

Power Consumption

- Battery Life – 20-30 Hrs depending on brightness and average number of segments on. Without RF Modem 40-60 Hrs.

Approvals (pending)

- NTEP, OIML, Factory Mutual, NEMA, FCC

Temperature

- Operating
  -40°C to 85°C (-40° to 185° F)
  NTEP/OIML
  -10°C to 40°C (14° to 104° F)

RFI/EMI Shielding

- Exceeds NIST HB44 and European Standards.

Real Time Clock

- Supports date/time stamping in US or European time and date. Backed up by a replaceable Lithium Battery (Typical life >5 years). Clock data available via RF interfaces (3750CS, 9750, 9020).

Data I/O

- Any scale data is available via RF Modem or through the 3750CS or 9750 Indicators.

Totalization and Statistics

- Push button or Automatic. Total weight up to 999,999,999. Weighments counter up to 65,535. Totals are stored with each ID register. Min, Max, Average, Standard Deviation, and Coefficient of Variance computed and stored for each ID.

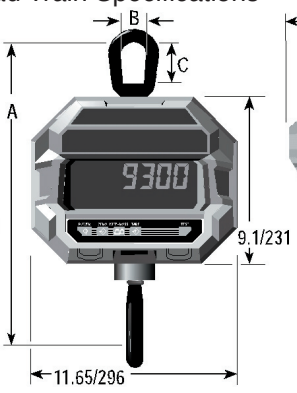
Internal Set Points

- 3 Contacts internal (SS Relays). Programmable for form A or form B (normally open or normally closed). Relays rated for 60V @ 350mA. 2.5Ω maximum contact resistance. Accessible by special order.

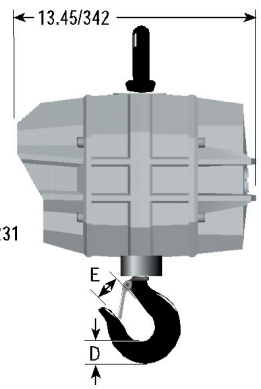
9300 Porta-Weigh + Crane Scale

Dimensions and Load Train Specifications

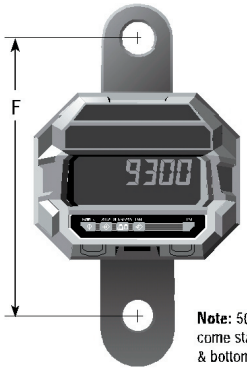
CR= Crosby or equivalent.
* These dimensions also apply to 50/70/100,000 pound models with hook and shackles.
** Resolution subject to change for NTEP and OIML approved units.
*** Ultimate overload - 490% of kg capacity.
**** Ultimate overload - 475% of lb capacity/430% of kg capacity.
***** Ultimate overload - 450% of kg capacity.



FRONT VIEW



SIDE VIEW



FRONT VIEW
(50/70/100,000 LB MODELS)

Note: 50/70/100,000 lb models come standard with top shackle & bottom swivel hook.

DIMENSIONS AND SPECIFICATIONS

CAPACITY	RESOLUTION**	A*	B*	C*	D*	E*	F	HOOK	EYE NUT OR SHACKLE	APPROX. SHIP WT.
500 lb	0.2 lb	18.3 in	2.25	3.06	1.44	1.34	-	3 ton	CR #7	53 lb
250 kg	0.1 kg	465 mm	57.1	77.7	37.0	34.0	-	Swivel	Eye Nut	24 kg
2,000 lb	1 lb	18.3 in	2.25	3.06	1.44	1.34	-	3 ton	CR #7	53 lb
1,000 kg	0.5 kg	465 mm	57.1	77.7	37.0	34.0	-	Swivel	Eye Nut	24 kg
5,000 lb	1 lb	20.5 in	2.50	3.50	1.81	1.69	-	5 ton	CR #8	62 lb
2,500 kg	0.5 kg	521 mm	64.0	89.0	46.0	42.9	-	Swivel	Eye Nut	28 kg
10,000 lb	2 lb	20.5 in	2.50	3.50	1.81	1.69	-	5 ton	CR #8	62 lb
5,000 kg	1 kg	521 mm	64.0	89.0	46.0	42.9	-	Swivel	Eye Nut	28 kg
20,000 lb	5 lb	28.5 in	4.00	6.25	2.59	2.25	-	10 ton	CR #11	105 lb
10,000 kg	2 kg	724 mm	101.6	159	65.8	57.2	-	Swivel	Eye Nut	47 kg
30,000 lb	10 lb	30.0 in	4.00	6.25	3.00	3.00	-	15 ton	CR #11	125 lb
15,000 kg	5 kg	762 mm	101.6	159	76.2	76.2	-	Swivel	Eye Nut	55 kg
50,000 lb	10 lb	41.0 in	5.00	6.00	3.66	3.63	15.0	25 ton	CR 25 ton	235 lb
25,000 kg	5 kg	1041 mm	127	152	93.0	92.0	381	Swivel***	Shackle #2130	106 kg
70,000 lb	20 lb	43.2 in	5.00	6.00	4.56	3.75	15.0	35 ton	CR 40 ton	270 lb
35,000 kg	10 kg	1097 mm	127	152	116	95.0	381	Swivel****	Shackle #2140	121 kg
100,000 lb	20 lb	52.1 in	5.75	6.65	5.06	4.25	16.25	CR 45 ton	CR 55 ton	420 lb
50,000 kg	10 kg	1324 mm	146	169	129	108	413	S1 Swivel*****	Shackle #2140	189 kg

OPTIONS AND ACCESSORIES

- Substitute Shackle for bottom swivel hook
- Oversized top lifting eye or shackle
- Direct wired input power, AC or DC, (specify required voltage)
- Audible Alarm or Very Loud Siren
- Heat Shield for Foundry Operations
- Stand-alone Option – Remove CellScale RF Modem
- Slave Load Cell Input – RF 9300 or 6260CS units can function as slave Crane Scale inputs to a 9300 or other CellScale based products. Up to three RF connected slaves are possible.
- Fast SLA Battery Charger (Included) – Cordsets available for Europe, UK, Australia, and USA/Japan.
- 24V Battery Charger for Vehicle Applications
- Serial Input Cable 4m (Included) – MSI P/N 501705-0001. Not usable for data output. Used for addressing the embedded CellScale for Setup and/or Calibration.
- Spare 12V SLA Battery – MSI P/N D00599-0004

THE MSI LIMITED WARRANTY

MEASUREMENT SYSTEMS INTERNATIONAL, INC., WARRANTS load sensing elements and meters against defects in workmanship and materials for a period of one year from date of purchase and warrants electrical cables and batteries against the same defects for a period of ninety (90) days from date of purchase.

Any device which proves defective during the warranty period will be replaced or repaired at no charge; provided that the defective device is returned to the Company freight pre-paid.

In no event shall the Company be liable for the cost of any repairs or alterations made by others except those repairs or alterations made with its specific written consent, nor shall the Company be liable for any damages or delays whether caused by defective workmanship, materials or otherwise.

The Company shall not be liable for any personal injury or property damage resulting from the handling, possession or use of the equipment by the customer.

The warranty set forth herein is exclusive and is expressly in lieu of all other warranties, express or implied, including without limitation any implied warranties of merchantability or fitness, or of any other obligations or liability on the part of the Company.

The liability of the Company under this warranty is limited solely to repairing or replacing its products during the warranty periods; and the final judgment and disposition of all claims will be made by MEASUREMENT SYSTEMS INTERNATIONAL, INC.

MADE IN THE USA

PUB.276-10-02A

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