



MATHESON

The Gas Professionals

DS-R Series Electronic Cylinder Scales



Instructions

*READ AND COMPLY WITH THESE INSTRUCTIONS BEFORE
INSTALLING, OPERATING, OR SERVICING*

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I. SERVICE

General Service

A unit which is not functioning in a normal manner should be removed from service until such time that repairs or replacement can be made. Upon completion of repair, full testing should be performed to assure the user that the unit has been returned to its original operating parameters. MATHESON can repair or replace equipment. To arrange for repair or replacement service, call 1-800-828-4313 and ask for the Warranty Administrator. **No product will be received by MATHESON without indication of gas service and without proper return material authorization provided by the warranty administrator. (All repairs must be made by MATHESON or an assigned and approved facility to maintain any warranties or guarantees).**

If the unit is under an applicable warranty, return the unit to MATHESON for repair or replacement. To arrange for warranty service, call 1-800-828-4313 and ask for the Warranty Administrator. **No product will be received by MATHESON without indication of gas service and without proper return material authorization provided by the warranty administrator.**

If advised by the Warranty Administrator to return the product to MATHESON, prepare the product for shipment and write, in large lettering the RMA Number assigned by the Warranty Administrator on the outside of the box. Also, if required by the Warranty Administrator, supply the completed RMA form with the product. Make sure that the product is adequately packaged, in the original shipping container if possible, and shipped prepaid (MATHESON will not accept COD freight) with a description of the observed deficiency to the attention of the:

Warranty Administrator
MATHESON
166 Keystone Drive
Montgomeryville, PA 18936

The user is expected to periodically inspect the product for leaks, loose or worn parts, broken or non-functioning components and to address those situations immediately. If the user would require verbal assistance in ascertaining the potential of a problem with any MATHESON product, contact the local MATHESON branch for assistance or your MATHESON Sales Representative.

II. LIMITED WARRANTY

This equipment is sold by MATHESON under the warranties set forth in the following paragraphs. Such warranties are extended only with respect to the purchase of this equipment directly from MATHESON or MATHESON's Authorized Agent as new merchandise and are extended to the first Buyer thereof other for than the purpose of resale.

For a period of one year from date of original delivery (ninety days in corrosive service) to Buyer or to Buyer's order, this equipment, is warranted to be free from functional defects in materials and workmanship and to conform to the description of this equipment contained in this manual and any accompanying labels and/or inserts, provided that this equipment is properly operated under the conditions of normal use and that regular and periodic maintenance and service is performed or replacements are made in accordance with the instructions provided. Expendable parts of this equipment are similarly warranted to be free from functional defects in materials and workmanship and to conform to the description of this equipment contained in this manual and any accompanying labels and/or inserts. The foregoing warranties shall not apply if the equipment has been repaired other than by MATHESON or a service facility designated by MATHESON, or if this equipment has not been operated and maintained in accordance with written instructions provided by MATHESON, or has been altered by anyone other than MATHESON, or if the equipment has been subject to abuse, misuse, negligence or accident.

MATHESON's sole and exclusive obligation and the Buyer's sole and exclusive remedy under the above warranties is limited to repairing or replacing, free of charge, at MATHESON's sole discretion, the equipment or part which is telephonically reported to be a problem to the local MATHESON Branch Location, and which if so advised, is returned with a written statement of the observed deficiency, not later than seven days after the expiration of the applicable warranty, to the MATHESON Gas Equipment Technology Center during normal business hours, transportation charges prepaid, and which, upon examination, is found to comply with the above warranties. The Buyer shall pay for return trip transportation charges for the equipment or part.

MATHESON shall not be otherwise liable for any damages including but not limited to incidental damages, consequential damages, or special damages, whether such damages result from negligence, breach of warranty or otherwise.

There are no express or implied warranties that extend beyond the warranties hereinabove set forth. MATHESON makes no warranty of merchantability or fitness for a particular purpose with respect to the equipment or parts thereof.

Acceptance of the equipment by the final buyer indicates the final buyer's acceptance of all warranties and limitations set forth above.

III. USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically, with the frequency of such inspections depending upon the scope of use. Damaged, worn or contaminated equipment should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, MATHESON recommends that a telephonic or written request for service advice be made to the MATHESON Equipment Engineering Group in Montgomeryville, Pennsylvania or to the nearest MATHESON branch location.

This equipment or any of its parts should not be altered without the prior written approval of MATHESON Equipment Engineering Group. The user of this equipment shall have the sole responsibility for any malfunction, which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than MATHESON or a service facility designated by MATHESON. Further, the ultimate user of the equipment is responsible for the training and safe operation of the equipment by personnel in his/her employ.

IV. YOUR NEW SCALE

Congratulations on your purchase of this MATHESON Digital Scale. This Scale offers a combination of versatility, accuracy and simplicity in an easy to use and easy to maintain package. Advanced menu driven operating software, large memory capacity and an easy to use menu structure allows the scale to be configured for almost any application. To obtain the best performance and greatest utilization from your scale, read this instruction booklet completely and carefully.

Please enter the Serial Number, which is located on the scale serial plate. Retain this information for future reference.

SERIAL NO _____

FEATURES

- Easy to read, LCD Graphics display
- Automatic Calibration
- Multiple Tare Weights
- No Moving Parts
- Positive Overload Stops (most models)
- Large Memory Capacity
- Eight Unit Conversions Standard
- Automatic or Numeric Entry Tare
- Sealed "Click-Type" Control Panel
- Abuse Resistant Stainless Load Cell (most models)
- Computerized Self Testing
- Automatic Zero Tracking
- Full Text and Floating Point Entry
- On Line Help
- Optional Time and Date
- Optional Battery Operation
- Optional Weight Average Function
- Optional Configurable RS-232 Port
- Optional Set points
- Optional Analog Output
- Optional Multiple Platforms
- Optional Windows Interface Software

PRECAUTIONS

1. Prevent flammables and liquids from entering scale head.
2. Always use the included wall transformer when using AC outlet. NEVER replace the wall transformer with a plug. This could cause electrical shock and severely damage to the scale.
3. Allow clearance on all sides of scale platform for accurate weighing.
4. Do not drop large loads on scale platform.
5. NEVER EXCEED THE RATED CAPACITY OF THE SCALE.
6. Do not pull on the connecting electrical cables.
7. Make sure that the scale and ramps are properly secured to the floor (most models).

BEST CONDITIONS FOR WEIGHING

1. The scale should be level.
2. Best operating temperature is about 68 degrees F.
3. The weighing area should be kept clean and dry.
4. The surface that the scale is resting on should be of solid construction and not prone to vibrations.
5. Don't install the scale near heater or air conditioner vents.
6. Avoid drafts.
7. Utilize a stable AC power supply. Avoid heavy motorized equipment on the same power line.
8. Do not operate the scale in close proximity of RF transmitters like cell phones and walkie-talkies.
9. Warm-up the scale before use or leave on "ready" mode.

INITIAL SET-UP AND OPERATION

1. Carefully unpack scale from shipping carton. Save packing material for possible future use.
2. If the level legs are included separately, then screw one into each corner underneath the scale.
3. Place scale on a level surface and adjust the level legs so that all four legs are touching the surface.
4. If your scale comes equipped with ramps, fix them to the floor using the mounting holes provided. This way the ramp will not move during normal use. Be careful not to let the scale platform rub up against the ramp or any other surface, as this would cause non-repeatability or other inaccuracies.
5. Plug into 117 VAC wall outlet.
6. For non-battery pack equipped scales, the scale will run a self-test procedure to check its load sensors and electronic circuitry. Upon proper completion, scale

will display the prompt (“ready”). Press the ON/OFF key to activate the unit. Press and hold the ON/OFF key to return the scale to the ready state.

For battery pack equipped scales, the screen will remain blank until you press the ON/OFF key. To shut the scale down, press and hold the ON/OFF key until the display blanks out.

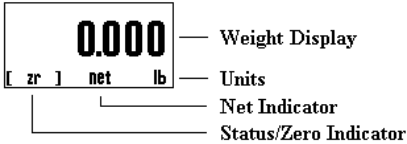
7. Allow a five-minute warm-up time for stabilization and most accurate results. Items to be weighed may be placed anywhere on the platform, but if heavy items are to be weighed, it is advisable to place them near the center. Many models are equipped with shock absorbers and positive overload stops for protection. Still, care should be taken to avoid putting excessive stress on the load cell system, as when heavy weights are dropped on the platform. It is normal for a small amount of drift to occur over periods of time. For the most accurate readings the scale may re-acquire a true zero by using the ZERO button prior to weighing.

V. CONTROLS AND INDICATORS

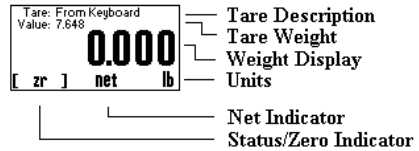
MAIN DISPLAY SCREEN

The scale is equipped with 128x64 LCD Graphics Display with a wide viewing angle and variable contrast. For normal operations, you have a choice of viewing weight information from two main screens. For parts counting scales, two more screens are available. You can switch screens by pressing the MENU key and then press ENTER to accept the “Next Screen” menu choice. Doing this will step through the screens shown below in order. For non-counting scales screens 3 and 4 are skipped.

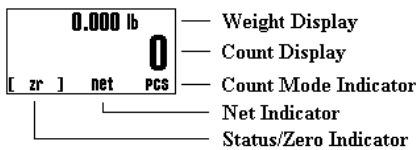
Screen 1



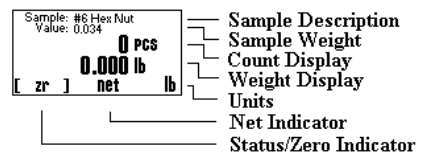
Screen 2



Screen 3 (counting scales only)



Screen 4 (counting scales only)

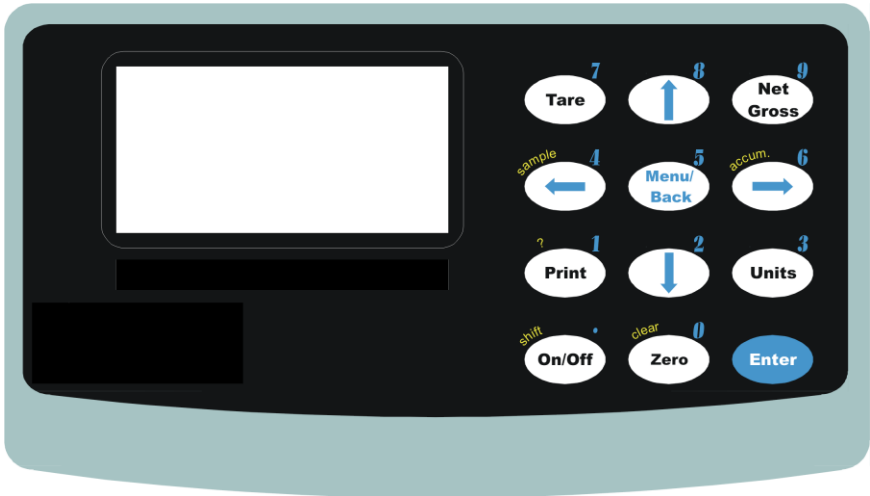


WEIGHT DISPLAY	Shows the weight on the platform in the current units setting.
COUNT DISPLAY	Shows the current piece count on the platform. If there are any totals in the accumulate register it will indicate “pcs acc”
UNITS	Shows the active conversion units.
NET INDICATOR	Shows “Net” if the indicator is in net weighing mode.
STATUS/ZERO	Shows either “Zr” if the platform is at zero, a bar graph showing how close the scale is to maximum capacity or “Ouch!” if the platform is overloaded.
TARE DESCRIPTION	Shows the description of the active tare weight. If the tare was taken from the keyboard using the TARE key it will show “From Keyboard”.
TARE WEIGHT	Shows the weight value of the active tare.
SAMPLE DESCR	Shows the description of the active sample weight. If the sample was taken from the keyboard using the SAMPLE key it will show “From Keyboard”.
SAMPLE WEIGHT	Shows the weight value of the active sample.

FRONT PANEL / KEYBOARD

The front panel has a twelve button, click touch key panel that allows easy menu navigation as well as full text and floating point entry.

The main scale functions are shown in black, menu navigation and floating point numeric entry keys are blue and the secondary functions are yellow.



Main Function Keys

- | | |
|-----------|---|
| ON/OFF | Press once to place the scale in its normal operating mode. Pressing and holding the key will return the scale to the “ready” mode. On battery pack equipped scales, press and hold this key to power it down. |
| TARE | Pressing this key will tare any weight on the platform and switch the scale to the net mode. Holding this key down will clear any active tare weight. |
| NET/GROSS | Will toggle the indicator between the net and gross mode. The net mode will show the weight on the platform minus any tared weight. |
| UNITS | Pressing this key allows you to step through the various conversions. By default, the conversions available are pounds, kilograms, grams and ounces. There are four other conversions available that can be activated in the setup menu. This will add troy ounces, pennyweights, grains and a user defined conversion to the list. |
| ZERO | Will zero the indicator. |

Main Navigation Keys

- MENU/BACK** Using this key from the weight display will access the setup menu. In all other areas it is used to back out from menus or to complete an operation.
- ENTER** This key is used to select items and to complete operations in the various menus.
- ARROWS** Are used to navigate and select menu items.

Secondary Function Keys

- SAMPLE** In counting scales is used to acquire a quick parts counting sample from the platform. Pressing and holding this key down will clear the active sample.
- ACCUM** In counting scales is used to add the piece count to the accumulate register allowing the totaling of parts. Pressing and holding this key will clear the accumulate register.
- ? KEY** Can be used in various areas to call up help screens. In some areas this key needs to be pressed and held.
- SHIFT** Used by the text-editing screen to toggle caps on/off.
- CLEAR** Used in some editing screens to clear input lines and numbers. In some areas this key needs to be pressed and held.
- NUMBER KEYS** Are used in various places to input floating point numbers.

VI. SYSTEM OPERATION

BASIC MENU OPERATION

The scale operating system uses a menu driven interface that is both intuitive and easy to use. To access the setup menu press the MENU/BACK key.

There are two basic menu types. The first is a simple list of items. To select an item in the list, use the UP and DOWN ARROW keys to line up on the desired item and then press ENTER.

The second type of menu is a horizontal list displayed along the bottom of the screen. These menu items indicate operations to be performed. To select one, use the RIGHT and LEFT ARROW keys to select the desired item and then press ENTER. Horizontal menus may show a single or double headed arrow on the right side to indicate that there are more selections to the left and/or right that are not displayed.

Horizontal menus and lists are often used together to perform an operation on a specific item. For example, to delete a tare entry, use the UP and DOWN ARROWS to select the desired tare from the list, then use the LEFT and RIGHT ARROWS to select the menu item "DEL" in the horizontal menu. Pressing ENTER will perform the operation.

Selecting menu items will often lead to other menus, sometime drilling down several levels deep. Use the MENU/BACK key to back your way out. Continuing back will eventually bring you back to the top, which is the main weight display screen. Consult the menu tree in the back of the manual for help in navigating menus.

TARE FUNCTIONS

The tare function allows you to temporarily remove from the display any weight that may be on the platform. Tare weights are often used in filling processes. For example, the user will place an empty box on the platform. The scale will indicate the weight of the box. The user then presses the TARE key. The scale will now indicate a weight of zero and will switch to the NET mode. The box can now be filled. The scale will read out only the weight of the material. Switching to the GROSS mode will show the weight of the material plus the weight of the box. To clear any active tare, press and hold the TARE key.

Defining, Editing and Storing Tares

Tares can also be taken, named, activated and stored permanently through the setup menu. Go to menu SETUP MENU/TARES. A list of all tare definitions will be shown.

To add a new tare, line up on NEW in the lower menu and then press ENTER. A new tare will be added to the list with the default description of Tare #XXX. The number XXX is assigned by the system by counting up the number of tares and then adding one.

It is possible that after adding and deleting a few tares that two tares will have the same description. This is acceptable, albeit confusing, and the description can be changed later. This new default tare will have a weight value of 0.00 lb when first created.

Editing Tares

You can edit any tare by using the arrow keys to line up on it and the “EDIT” function in the lower menu and then press ENTER. The next screen will show the tare with its description and weight value in pounds. The lower menu allows you to change the description (“DESCR”), enter the value directly (“VALUE”) or acquire it automatically from the platform (“ACQUI”).

Deleting Tares

To delete a tare from the list simply line up on it and the “DEL” function in the lower menu. Press ENTER to delete it. Once a tare has been deleted it is removed permanently from memory.

Activating Tares

To activate a tare from the list, line up on it and the “ACTV” function in the lower menu, then press ENTER. The tare will be made active, the scale switched to NET mode and you will immediately be placed back in the weighing screen you were in when you accessed the setup menu.

PARTS COUNTING FUNCTIONS

Parts counting mode enables you to count parts automatically on the platform. In order to be accurate, the parts you are counting must be of a consistent weight from piece to piece and be heavy enough to be detectable by the scale. Scales that have low maximum capacities can count very light parts while scales of heavier capacities can only count heavier parts. Attempting to count parts that are too light will cause the indicator to drift and become non-repeatable.

Parts counting is actually a two step process, first the scale needs to know how much each part weighs. This is called sample acquisition. Second, the counting mode must be activated with the desired sample.

There are two ways to acquire a sample. One way is to take a quick sample on the platform from the front panel. The other way is to use the setup menu where samples can be taken, named, stored and activated in a similar manner as tares. Multiple platform scales have the distinct advantage of allowing you to take your sample on a low capacity platform (to get a very accurate sample) and do the actual counting on a large capacity platform.

SAMPLE ACQUISITION

There are two methods for acquiring samples. First is the “Quick Sample” method and the second is to define a sample in the scale’s memory for permanent storage. In general, the more parts that you use during your sample acquisition the more accurate your parts counting will be. Using a quick sample restricts you to sample sizes of 10, 25, 50 or 100 pieces. This is acceptable in many circumstances, especially when the parts are fairly heavy. Saving a sample in memory allows you to choose any size sample and is far more accurate.

Quick Sample

The quick sample is limited to sample sizes of 10, 25 and 50 and 100 pieces, which is all that is required for many operations. To take a quick sample, press the SAMPLE key. The number 10 will be displayed. Press the LEFT ARROW until the desired sample size is displayed, and then press ENTER. For best general accuracy use the largest convenient sample size.

Remove all weight, or place an empty container on the platform, and press ENTER.

Place the correct amount of parts on the platform and then press ENTER. The scale will now automatically switch to a counting screen.

Quick samples cannot be stored for future use and will remain active only until the power is removed, a new sample is taken or the sample is cleared through the keyboard. Proceed to the section “Counting Parts”.

Defining, Saving and Editing Samples

Samples can be taken, named, activated and stored permanently through the PARTS COUNTING menu. Go to menu SETUP MENU/PARTS COUNTING. A list of all sample definitions will be shown. To add a new sample, line up on NEW in the lower menu and then press ENTER. A new sample will be added to the list with the default description of Sample #XXX. The number XXX is assigned by the system by counting up the number of samples already defined and then adding one. It is possible that after adding and deleting a few samples that two samples will have the same description. This is acceptable, albeit confusing, and the description can be changed later. This new default sample will have a weight value of 0.00 lb when first created.

Editing Samples

You can edit any sample by using the arrow keys to line up on it and the “EDIT” function in the lower menu and then press ENTER. The next screen will show the sample with its description and weight value in pounds. The lower menu allows you to change the description (“DESCR”), enter the value directly (“VALUE”) or acquire it automatically from the platform (“ACQU”).

Deleting Samples

To delete a sample from the list simply line up on it and the “DEL” function in the lower menu. Press ENTER to delete it. Once a sample has been deleted it is removed permanently from memory.

Activating Samples

To activate a sample from the list, line up on it and the “ACTV” function in the lower menu, then press ENTER. The sample will be made active, and the scale switched to a counting screen. You can now zero the scale and begin counting that part.

Deactivating Samples

If you wish to clear a sample from memory, simply press and hold the SAMPLE key until it clears.

COUNTING PARTS

With sample acquisition complete you may now count your parts. On the top of the counting screen is displayed the sample's description (or "taken from keyboard" if a quick sample was used) and the actual piece weight. Start by emptying the platform or place an empty container on the platform and then press the ZERO key. Now place your parts on the platform and the count will be shown on the display.

NOTE: You should always zero the platform with the ZERO key prior to counting parts.

ACCUMULATE FUNCTION

Your scale has an accumulate function that will allow you to keep a running total of parts counted. To activate, place your parts on the platform and then press the ACCUM key. "Acc" will be shown on the display and the number of parts that were on the platform are added into the accumulate register. While in the accumulate mode the display will show what is in the accumulate register PLUS the number of parts on the platform.

To clear the accumulate register, press and hold the ACCUM key until it clears.

TEXT DESCRIPTIONS

Many items carry descriptions, which can be changed at any time. These descriptions are useful in the case of tares and counting samples because the descriptions are shown on the display when activated, eliminating confusion. The scale itself also has a description and ID number that can be changed in the SETUP MENU/SYSTEM/SCALE DESCRIPTION menu. Further, there are text definitions that can be created and used in RS232 operations like label printing.

All of these text entries are fourteen characters in length and can be edited through the text-editing screen. When activated, the text is shown on the top of the screen with an arrow pointing at the first character. In the lower part of the screen is the entire character set with the current selection highlighted. The keys used for the editing are shown below.

ARROW KEYS	Use them to select a character in the lower list.
7 and 9 KEYS	Use these to position the arrow on the top line.
ENTER KEY	Changes the character above the arrow to the character selected in the list and then advances the arrow to the next position.
CLEAR KEY	Will clear the entire line and place the arrow in the leftmost position.
MENU KEY	Will complete the operation.
SHIFT KEY	Selects either upper case or lower case characters.
? KEY	On line help.

SYSTEM MEMORY ALLOCATION AND USAGE

The scale's memory is organized as 485 memory slots. The operating system uses ten of these for internal tasks and the setup for the default platform uses four. This leaves 471 slots available for user definitions that can take the form of tares, counting samples and other functions. Each definition uses memory differently and is outlined below:

DEFINITION	USAGE
Platform	4 slots
Tare	1 slot
Counting Sample	1 slot
Print Frame	2 slots
Text Def	1 slot
Setpoints	4 slots

For a detailed description on your current memory usage, access menu SETUP MENU/SYSTEM/MEMORY STATUS.

THE SYSTEM MENU

The system menu contains many useful features for checking and configuring your scale. To access, select menu SETUP MENU/SYSTEM. Each feature is outlined below.

Scale Description / Scale ID Number

Each scale can be assigned a unique description and ID number. This is useful for printing labels and other processes.

Udef Conversion Multiplier

Allows you to enter the multiplier (from pounds) for the user-defined conversion.

Auto Increment Weight Number

This number will increment each time the PRINT button is pressed. It can be useful in label printing and statistical operations. It's starting value can be set here.

Display Contrast

Allows you to adjust the contrast of the display for optimum viewing.

Memory Status

Will give a detailed breakdown of memory slot usage and free memory available. The number indicated is the number of slots, not the number of definitions. Each definition uses memory differently. See the section above entitled "System Memory Allocation and Usage".

Display Update Speed

The display update speed can be adjusted from .1 to six seconds.

Startup Parameters

The following startup parameters can be set here;

- a) The startup screen and conversion units can be set here.
- b) The "ready" prompt and the splashscreen can be enabled/disabled.

- c) Zero lock can be enabled/disabled. Zero lock disables the front panel ZERO key. When this function is enabled the user must press the ZERO and the PRINT key simultaneously to zero the scale.

Erase User Memory

The entire user memory can be erased at one time, if necessary, using this option. It will erase all user-defined tares, counting samples, text definitions, print frames and setpoints but will leave platforms and other system memory intact.

Revision Number

Reads out the current operating system revision number.

Auto Shut-Off

Auto Shut-Off allows you to set your scale to automatically shut off when a preset time limit has been reached and there has been no activity on the scale. This feature is mainly used on battery pack equipped scales to prevent the battery from inadvertently being deep discharged. Auto Shut-Off can also work on non-battery equipped scales but its operation is slightly different. In a battery equipped scale the unit will completely shut down and the display will blank. The scale can later be turned on again using the normal means. On non-battery equipped scales, the display will blank but the scale will remain in the same condition as when it shut down. Zero, active tare and active parts counting sample as well as the current screen will all be retained. Pressing any key will return the scale to its normal operating mode.

An inactive scale can be defined as no keys being pressed, and there has been no activity on the platform. It should be noted that anything that causes a small increase or decrease in the platform reading will be considered an active platform. Avoid vibrating surfaces, digital filtering constants of non-factory default values, or anything else that causes the platform reading to drift if this feature is used.

To configure Auto Shut-Off, go to the menu SETUP MENU/SYSTEM/AUTO SHUT-OFF. There are two settable options available.

ACT Activates/deactivates the auto shutoff feature.

TIME Is the time, in minutes, that the unit will shutoff due to inactivity. Any time from 1 to 25 minutes can be used.

VII. CONFIGURATION AND CALIBRATION

PLATFORM ADVANCED SET-UP

The scale's operating system revolves around one or more platform definitions that are stored in memory, with most scales only having one weighing platform. Each platform is fully configurable as to its capacity, displayed resolution, filtering, calibration and many other parameters which will be outlined in detail below.

To access the platform setups press the MENU/BACK key to activate the setup menu. Select PLATFORM SETUPS from the menu and then press ENTER. If your scale has multi-platform capability then a list of platforms will be shown. The adding, deleting and selection of these platforms are similar to tares and parts counting samples. If your scale is a single platform type then you will be shown only the platform setup menu.

Description

A fourteen-character description can be assigned to the platform. The default description is "Plat#001".

Auto Setup

Auto Setup will erase all of the parameters for the selected platform and return it to the default state. It also erases the platform's span and cornering calibration. Auto setup is useful when the scale is first manufactured or when the user inadvertently changes a calibration parameter that adversely affects the scale and then forgets the calibration parameter or its original value.

Upon activation you will be presented a selection of platform capacities and resolutions. Pick the appropriate entry and then press ENTER. Auto setup will be performed. A span calibration is now necessary.

Input Source

Each platform can take its input from a variety of sources. On multi-platform capable scales, there can be up to eight input channels that can be driven from standard load cells, 4-20ma or DC voltages. On single platform units there is only one channel. The default value is "LC Channel 0".

Corner Calibration

Corner calibration is only used in special cases where there is a single platform with four load cells installed in it and the load cells are not matched to each other, and the platform doesn't use any summing electronics. Corner calibration is not required in any of our standard models.

Span Calibration

Span calibration adjusts the platform's sensitivity so that the display reads correctly. A calibrated weight is required to perform this and the procedure is outlined below in the "Span Calibration" section.

Resolution-Overload

Each platform has the capability of displaying its reading in any of eight standard conversion units. Only four are enabled by default and the user can enable the rest. The conversion units that are automatically enabled are pounds, kilograms, grams and ounces.

The remaining conversions are troy ounces, pennyweights, grains and a user defined conversion.

Each conversion unit's resolution can be set individually. To do this, select RESOLUTION-OVERLOAD from the platform menu. A list of conversions is displayed and each active conversion will have a check mark to its right.

Select the conversion you wish to modify and press ENTER. Use ACTV to activate/deactivate it, DPNT to change its decimal point location and CNT to change what the least significant displayed digit will count by. In the pounds configuration (the scale's native conversion unit) you can use OVRL to set the overload limit in pounds.

When setting resolution (DPNT and CNT) care must be taken not to exceed 5000 total displayed counts or a drifting reading may result. The maximum resolution is setup by default by auto setup but can be calculated easily by taking the scale's maximum capacity and dividing it by 5000. For example a 50 pound scale's resolution should be .01 pounds ($50 / 5000 = .01$).

Auto Zero

Auto zero determines how the platform will zero on power up. Selecting NONE will not perform any zeroing. Selecting AUTO ZERO will automatically zero out any weight on the platform and LAST ZERO will zero it to the value of the weight on the platform the last time the ZERO key was pressed.

Zero Tracking

A scale sitting for long periods of time without weight on the platform is prone to drift from zero due to temperature changes and a number of other factors. Generally this is not a problem and you can press the ZERO button to return the reading to zero before weighing. Zero tracking, when enabled, will detect small reading changes over time and correct the platform back to zero. Consult the service manual for details on setup and configuration.

Software Filter

The raw internal reading from the load sensor contains electronic noise and other factors that can cause the reading to be drifty and non-repeatable. All electronic scales incorporate some sort of filtering to compensate for this. Another use for filtering is to help stabilize a scale when it is used on a surface that is vibrating, in windy conditions, when subjected to RF interference or when used on a noisy power line. Your scale has two stages of filtering. The first is a electronic filter that is permanently enabled and the second is the software filter which is fully configurable.

In general, a low degree of filtering will cause the scale to be quick to react but prone to noise and vibrations. Heavy filtering will eliminate the noise and vibrations but the platform will react slowly to changes in weight. We have by default set up the optimum filtering parameters for general use. These should only be changed in extreme circumstances. The procedure is outlined in the service manual.

CALIBRATION AND TROUBLESHOOTING

Your scale has been precisely calibrated at the factory before shipping. It has the capability to adjust its own calibration to a certain degree to compensate for aging electronics, and temperature changes. This being the case, it is possible that you will never have to calibrate the scale. Doing so may leave you with a worse calibration than you started with. Does your scale really need to be calibrated? If so what steps are needed? Follow the steps outlined below to help make this determination.

Scale reads zero and will not move.

- Make sure that any and all shipping screws are removed from the platform.
- On platform scales, check that all four level legs are contacting solidly against the floor.
- If level legs are screwed in all the way then the stud from the level leg may be contacting the underside of the platform not allowing the load sensor to flex.

Scale reading is fluctuating wildly.

- Scale must be on a non-vibrating surface. Breezes may affect scales of lighter capacities.
- Scale must be installed on a clean power line. Electric motors, computers or any other devices can cause power line interference.
- RF interference can cause scale readings to fluctuate. Are there any transmitters nearby like cell phones or walkie-talkies?
- If the scale is a remote platform type, check to see if the cable from the platform to the indicator is plugged in properly. If so then remove the plug temporarily to check for bent or missing pins.
- Check for nicks or cuts on the platform cable.

Scale reading is different on different areas on the platform?

- On platform scales, check that all four level legs are solid against the floor. If a level leg is screwed in all the way then the stud from the level leg may be contacting the underside of the platform not allowing the load sensor to flex.
- Check for any mechanical interference. Is there anything rubbing against the platform?

Scale corners properly but does not indicate the correct weight.

- On platform scales check that all four level legs are solid against the floor.
- Check for any mechanical interference. Is there anything rubbing against the platform?
- Perform span calibration.

SPAN CALIBRATION

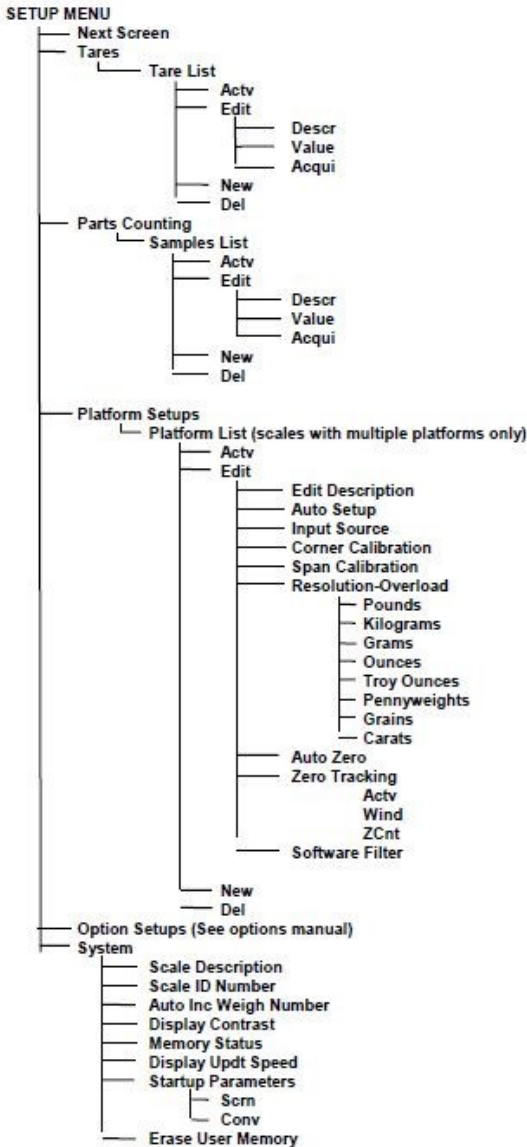
Span calibration is used to set the internal gain of the indicator so that it reads correctly. A calibrated weight is needed in order to perform a span calibration. Any weight may be used within the capacity range of the scale but a weight of 50% of capacity is recommended. Using weights of less than 10% of capacity is not recommended and may lead to an inaccurate calibration.

To start the procedure access menu SETUP MENU/PLATFORM SETUPS/SPAN CALIBRATION. The scale will prompt you for the value of the calibration weight in pounds. Enter the value through the keyboard and then press ENTER. Next, you are asked to remove all weight from the platform. When the weight is removed press ENTER. Now place the calibration weight on the center of the platform, pause a second for the scale to stabilize then press ENTER. The scale will now calibrate itself automatically and return you to the platform menu.

During span calibration a small number will be displayed in the upper left-hand corner. This number represents the raw unadjusted reading from the load cell and is not calibrated in any way. It is there only to confirm that the platform is operating properly. The number should increase when weight is applied to the platform.

VIII. MENU TREE DIAGRAM

The following menu tree will help you navigate through the various system menus.



IX. SPECIFICATIONS

Model	Capacity	Resolution	Platform Dimensions
DS-R-60-925	60 lbs./27.3 kgs.	.01 lb./0.0005 kg	9.25" x 9.25"
DS-R-300-925	300 lbs./136 kgs.	.05 lb./0.0005 kg.	9.25" x 9.25"
DS-R-300-14	300 lbs./136 kgs.	.05 lb./0.0005 kg.	14" x 14"
DS-R-500-14	500 lbs./227 kgs.	.1 lb./0.0005 kg.	14" x 14"
DS-R-500-2027	500 lbs./227 kgs.	.1 lb./0.0005 kg.	20" x 27"
DS-R-1K-2027	1000 lbs./454 kgs.	.2 lb./0.0005 kg.	20" x 27"
Power Requirements	117 VAC +/- 10% 50/60 Hz		
Accuracy	0.1% of full scale		
Leveling	Adjustable		
Tare Range/Zero Range	100% Full scale		
Electronics	All circuitry incorporated on one plug in board		
Display	LCD graphics display		
Display Speed	Adjustable from .1 to six seconds		
Overload Condition	Displayed warning at 102% of scale capacity. 150% by mechanical stops		
Operating Temperature	14F to 104F / -10C to 40C		
Construction	9.25" & 14" sizes -Stainless steel platform cover, aluminum construction. 20" x 27" size – aluminum diamond plate.		
Load Cell	Stainless steel construction for reliability		
Controls	Units conversion, Net/Gross, Tare, Zero with secondary functions		
Platform Height	1.5"H		
Options Available	Battery pack, Setpoints, Remote display, RS232 Interface, Time and date, Weight average and hold, Multi platform, Analog Output		

NOTES

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