ArlynGuard Scales

Type B, C, F & P

MKE-5-IS(-MP) (-SP) (-422) (-485)

Instruction Manual

ARLYN SCALES

INDUSTRIAL, VETERINARY & CUSTOM SCALES

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v13.0.072020-Doc#4500-R1.04

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YOUR NEW SCALE

Congratulations on your purchase of an Arlyn Intrinsically Safe 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
- ❑ Large Memory Capacity
- ❑ Eight Unit Conversions Standard
- ❑ High Accuracy Parts Counting on Many Models
- ❑ Automatic or Numeric Entry Tare
- ❑ Sealed "Click-Type" Control Panel
- ❑ A variety of FM approved load cells are available
- ❑ Computerized Self Testing
- ❑ Automatic Zero Tracking
- ❑ Full Text and Floating-Point Entry
- ❑ On Line Help
- ❑ Optional Weight Average Function
- ❑ Optional Setpoints
- ❑ Optional Multiple Platforms

Precautions

1. Prevent inflammables 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.

This Manual

This instruction manual (DOC4500) covers the installation and operation of the MKE-5-IS Intrinsically Safe Scale Indicator. Indicated below are the manual's current revision number and number of pages. Please check this manual and its control drawings for missing pages. The installation cannot continue unless all pages are present.

Instruction Manual DOC4500	MKE-5-IS Instruction Manual	40 Pages
Control Drawing DOC4010	MKE-5-IS General Dimensions	1 Sheet
Control Drawing DOC4011	MKE-5-IS Indicator Label Drawing	1 Sheet

Control Drawing #4013	MKE-5-IS Inst. and Wiring Diagram	7 Sheets
Control Drawing #3015	Approved Load Cells, Label Drawing	1 Sheet

FACTORY MUTUAL APPROVAL AND INTRINSIC SAFETY

The MKE-5-IS SAW Scale System has been rated intrinsically safe by Factory Mutual only when used with specific intrinsically safe Arlyn load cells and the installation is performed by a qualified technician who conforms to the guidelines described in this manual. Consult the chapter titled "Installation and Wiring" along with the control drawings in the back of this document for information pertaining to the installation and wiring of the approved strain gage Load Cells.

MKE-5-IS (a). Digital Weight Indicator System

Intrinsically Safe for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T3C Tamb = -25°C to +40°C; Temperature Class T3B Tamb = -25°C to +60°C in accordance with Control Drawing No.4013; Intrinsically safe apparatus for use in Class I, Zone 0, AEx ia IIC T3 Ta = -25°C to+60°C; in accordance with Control Drawing No. 4013; Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, E, F & G; Temperature Class T6 Tamb = -25°C to +60°C; in accordance with Control Drawing No.4013; Hazardous (Classified) Locations.

Load Cells Models 520-10000L-IS, 520-5000L-IS, 520-5000-IS, 520-2500-IS, 520-1250-IS, 620-300-IS, 620-100-IS, 620-50-IS, 620-25-IS, 620-10-IS, 320-500-IS, 320-250-IS

Intrinsically Safe (Entity) for use in Class I, II and III, Division 1, Groups A, B, C, D, E, F and G; Temperature Class T6 Tamb = -25°C to +60°C; in accordance with Control Drawing No.4013; Intrinsically safe apparatus for use in Class I, Zone 0, AEx ia IIC T6 Ta = -25°C to +60°C; in accordance with Control Drawing No. 4013; Nonincendive for use in Class I, II, III, Division 2, Groups A, B, C, D, E, F & G; Temperature Class T6 Tamb = -25°C to +60°C; in accordance with Control Drawing No.4013; Hazardous (Classified) Locations.

Intrinsic Safety, Limitations and Restrictions

The following items represent limitations and restrictions concerning using this scale system as a FM approved intrinsically safe system. All items on this list must be adhered to for FM approval to be valid. Disregarding any of these items would violate intrinsic safety and FM approval, possibly resulting in serious death.

1. The installation needs to be performed by a qualified technician who is familiar with National Electrical Code and RP 12.6 (Recommended Practice) requirements for installation of equipment in hazardous areas. Consult NEC Article 504, Intrinsically Safe Systems, published through the Instrument Society of America.
2. Only Arlyn, FM approved, 4500-ohm load cells may be used. Up to four may be connected.
3. The installation technician must conform to all instructions and control drawings in this manual.
4. The indicator and load cells must have the appropriate labeling that is in compliance with the control drawings.
5. All wiring and connections must comply with the National Electrical Code (NEC).
6. The cable type and length limitation must comply with the control drawings.
7. No modifications of this system may be made in the field. Component level repair is not permitted on Factory Mutual approved equipment. It is mandatory to return the unit to Arlyn Scales for repair.
8. Removal of the battery is not allowed when the scale is located in a hazardous area. The indicator must be removed from its mounting bracket and taken to a safe area. Only then can the battery cover be removed and the battery recharged or replaced.
9. If using external power source to power the scale system, the power source must be rated for intrinsic safety and must comply with the entity parameters associated with this scale system. Alternatively, if the power source is through a safety barrier, the barrier must match the intrinsic safety parameters of the scale system.
10. To avoid the possibility of static buildup, the indicator housing must not be cleaned or rubbed down with a dry cloth while it is located in a hazardous area.

INITIAL SET-UP AND OPERATION

The MKE-5-IS is simple to install and operate. It has the ability to operate on battery power as well as an external power supply. The other wiring necessary is for the attachment of load cells and optional cables for Setpoints and Serial Communication. For the battery operation, focus on the section "Battery Operation – Charging and Use" A complete understanding of the care, maintenance and operation of the battery and its holder is vital for its safe operation.

Before doing the actual installation, you may wish to get some batteries charging now!

Installation Checklist

Please use the following checklist to guide you through the installation and setup. This checklist is only a guide. You should read all applicable areas in this manual at each step of the checklist.

Initial Preparation

1. Read the section at the beginning of this manual entitled "This Manual". Using the information found there, make sure that all pages have been included in this manual along with the appropriate drawings. The installation cannot continue unless all documents are present.
2. Examine Control Drawing # 4013. This drawing indicates the types of hazardous environments that this scale may be safely used in. Ensure that this scale is safe for use in your hazardous environment.
3. Consult the label drawings for both the indicator and load cells (DOCS 3015 and 4011). Make sure that ALL labels are present and in the correct location. FM approval is not valid if a label is incorrect, unreadable, missing or if the text on the label isn't the same as indicated in the control drawings.

Okay, Let's Get Started

1. Prepare the hazardous area by making it temporarily safe while performing this installation.
2. Carefully unpack scale from shipping carton. Save packing material for possible future use.
3. If the level legs are included separately, then screw one into each corner underneath the scale. If the level legs are already screwed into the platform, they MUST be unscrewed and extended out so they can hold the platform above ground.
4. Place scale on a level surface and adjust the level legs so that all four legs are touching the surface. The platform should not be allowed to "rock" in any direction.
5. 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 and other inaccuracies.
6. Decide on a location for the indicator. The unit can be mounted to a wall or desk using the supplied "L" bracket.
7. Unscrew and remove the mounting bracket from the indicator.
8. Attach the indicators mounting bracket to a wall or other appropriate mounting.
9. Remove the indicator from the hazardous area. Charge the battery.
10. Obtain all of the necessary load cells and cables appropriate for your installation (four load cells maximum).
11. Mount all load cells and complete the wiring using DOC 4013 as a reference. Make sure that the cable is of the correct type indicated on the drawing and that total length is less than the maximum indicated.
12. It is recommended that you ground your platform to a suitable earth ground.
13. Using an Ohmmeter, check the resistances of the four leads and compare them against the table. Also check each lead to each load cell frame looking for shorts. There should not be any continuity between the four load cell signal leads and any of the load cell frames.
14. While the indicator is still in a safe area, install three charged batteries into the battery holder and secure the cover. Read and head the warnings in the next section before working with batteries.
15. Once the battery is installed, move the indicator into the hazardous area and attach it to its mounting bracket. Tighten the thumbscrew.

16. Connect the load cell/platform to the pigtail cable from the indicator. Single load cells purchased from Arlyn Scales will already have this connector attached.
17. The scale is now ready to use. The system should be tested for proper operation prior to making the area hazardous.

Normal Operation

1. Activate the scale by using the Main Power Switch on the rear of the unit to the "Battery" or "I" position. The scale will run a self-test procedure to check its load sensors and electronic circuitry. Upon proper completion, scale will settle on zero. Allow a five-minute warm-up time for stabilization and most accurate results.
2. The scale can also be turned on from an external power supply through the barrier and turning off the battery switch using the Main Power Switch.
3. Most pre-assembled scales come from the factory in a calibrated condition. There is no reason to do an initial calibration on these scales.
4. If you are wiring the load cells yourself, the indicator may require setup and calibration. Please refer to the sections later in this manual for calibration instructions, or call Arlyn's Service Department (800-645-4301 Ext 101) and we will help you through it. It is not a difficult or time-consuming process.
5. 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 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 also important, especially in the case of large capacity platforms, that the platform not be impacted from the sides while there is a heavy load on the platform.
6. It is normal for a small amount of zero drift to occur over short periods of time. For the most accurate readings, the scale may re-acquire a true zero by using the ZERO button just prior to weighing.

Startup Caution

Every time the scale is powered up, **please wait at least 30 seconds** before placing a weight on the scale or pressing any buttons. The scale has to initialize all its parameters and remember your previous settings and that takes a little bit of time.

Platform Leveling Legs

Platforms will come with leveling legs that lifts the platform from the ground and provide the clearance for the internal load cell sensors to bend. At shipping, these leveling legs are screwed into the platform tightly (with no clearance) to protect the platform and the legs during shipping.

POWER MANAGEMENT

The MKE-5-IS Display Indicator can be powered from two different sources – internally housed **Rechargeable Batteries** or **Optional External Power Supply** (Intrinsically Safe External Supply or Power Supply through an approved barrier).

Battery Operation – Charging and Use

The MKE-5-IS Display Indicator is designed to use high capacity, three (3) AA 1.2V rechargeable batteries. The batteries can be changed by opening the screw-on battery cover on the left side of the indicator, and pulling out the discharged batteries. Newly charged batteries can then be inserted to power the indicator.

The scale firmware is designed to remember its "last zero" state. This means then since the scale will be turned off when changing batteries, after the scale is powered on again and connected back to the platform, it will not zero out the current weight on the platform. If this is not desired, then this setting can easily be changed.

The rechargeable batteries used in this indicator have been approved by FM. The use of any other batteries violates FMs approval. Additional and replacement batteries must be purchased from Arlyn Scales.

Caution

Battery Power Safety Considerations – IMPORTANT!

In order for this indicator to be safely operated in a hazardous area, battery care, operation and maintenance must be fully understood before you start the installation.

This battery holder was designed specifically for use in hazardous environments. It contains an internal current limiting circuit whose function it is to restrict the amount of power that the unit can supply, even if its outputs are shorted together. The battery holder is highly impact resistant, and designed to keep gasses, dust and other foreign materials out. When replacing batteries, you must ensure that there are no foreign materials inside the holder, and that the correct battery has been installed with the proper polarity.

Factory Mutual (FM) requires that the battery holder be designed in such a way as to eliminate any possibility of the holder coming apart and ejecting the battery if the unit is dropped or impacted sharply. In order to maintain this integrity, the cover must be securely fastened after installing the battery. Do not over tighten. Hand tightening is satisfactory. Failure to do so may cause the unit to eject the battery if the unit is dropped. The battery must never be exposed while it is located in a hazardous area.

AT NO TIME WHATSOEVER SHOULD THE BATTERY COVER BE OPENED WHILE THE SCALE IS LOCATED IN A HAZARDOUS AREA. DOING SO WOULD VIOLATE THE INTRINSICALLY SAFE DESIGN, POSSIBLY CAUSING AN EXPLOSION RESULTING IN SERIOUS INJURY OR DEATH.

Battery Charging

Batteries can be recharged using any standard charger designed to charge a 2000-2600 mAh NiMH AA cell. A charger is also available from Arlyn Scales. Most commercial chargers cannot charge a single battery so batteries are commonly charged in pairs.

The battery section explains this in more detail below.

Caution

Do not attempt to remove the battery cover while the unit is located in a hazardous area. Doing so will violate intrinsic safety, possibly causing an explosion or fire resulting in death or serious injury.

To remove the battery, the indicator must first be moved to a safe area.

- Place the power switch in the OFF or “0” position.
- Disconnect the load cell cable from the upper right side of the indicator.
- Loosen the thumbscrew and slide the indicator housing off of the “L” shaped mounting bracket.
- Remove the indicator from the hazardous area.
- Once in the safe area, the battery may be removed and charged.
- Visually inspect the inside of the empty battery holder to ensure that there are no foreign materials inside. Also check to verify that there is no damage to any of the internal components.
- Insert a charged battery into the holder “PLUS” end first. Tighten the cover securely.

External Power Operation

The MKE-5-IS Display Indicator can be configured with the ability to be powered by an IS power supply or power supplies through certain approved barriers with matching Entity Parameters. See Doc #4013 – Installation and Wiring Diagram for further details. This is an optional method of powering the display indicator, available for purchase.

A typical external power supply configuration is a 4.3V DC supply from a safe (or unclassified area) passing through an ARL-BR-IS-PWR(-LC) safety barrier before entering the indicator’s external power cable.

External Power Safety Considerations

- Make sure the external power source matches the entity parameters and specifications of the MKE-5-IS Digital Indicator.
- If using a Safety Barrier, only approved barriers with matching parameters can be used for this operation.

AT NO TIME WHATSOEVER SHOULD THE MKE-5-IS DISPLAY INDICATOR BE POWERED DIRECTLY FROM AN UNCLASSIFIED OUTLET OR AN UNMATCHED APPROVED SOURCE OR BARRIER. DOING SO WOULD VIOLATE THE INTRINSICALLY SAFE DESIGN, POSSIBLY CAUSING AN EXPLOSION RESULTING IN SERIOUS INJURY OR DEATH.

Switching Between External Power and Battery Operation

The indicator can only be powered using one power source at a time. All MKE-5-IS Display indicator units are equipped with a 3-state SPDT (single pull double throw) rocker switch on the side of the indicator. The rocker switch is mapped as follows:

I -> Battery Operation
0 -> OFF
II -> External Power Operation

To utilize the external power supply (if available and connected), switch the indicator to "II". The indicator will turn on once the supply begins.

The battery does not get charged automatically when the external power supply is used to power the indicator. It needs to be charged separately as indicated in various sections of this document.

Load Cell Wiring

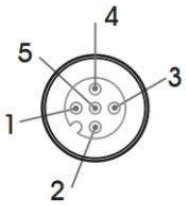
Caution

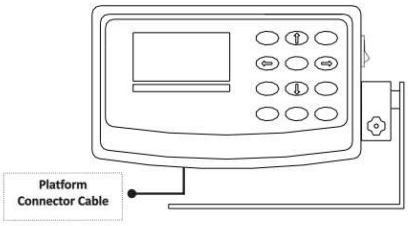
Only Arlyn, FM approved load cells may be used. The list of approved load cells is as follows:
520-10000L-IS, 520-5000L-IS, 520-5000-IS, 520-2500-IS, 520-1250-IS
320-500-IS, 320-250-IS
620-300-IS, 620-100-IS, 620-50-IS, 620-25-IS, 620-10-IS

The MKE-5-IS is equipped with a locking DIN connector on the upper right side of the housing for connecting load cells. In order for FM approval to be valid, the following must be adhered to:

- Only Arlyn, FM approved load cells may be used.
- Up to four of the cells from the above list may be connected to the scale.
- The type and length of connecting cables must conform to the control drawings.
- The maximum total cable length is **not to exceed 133ft!**
- Please consult control drawing 4013 for details on wiring, maximum lengths and obtaining extra, approved cable.

LOAD CELL CONNECTOR





Single Load Cell Resistance Readings
Each load cell will have the following internal resistances. There should be no continuity between the load cell frame and any wire.

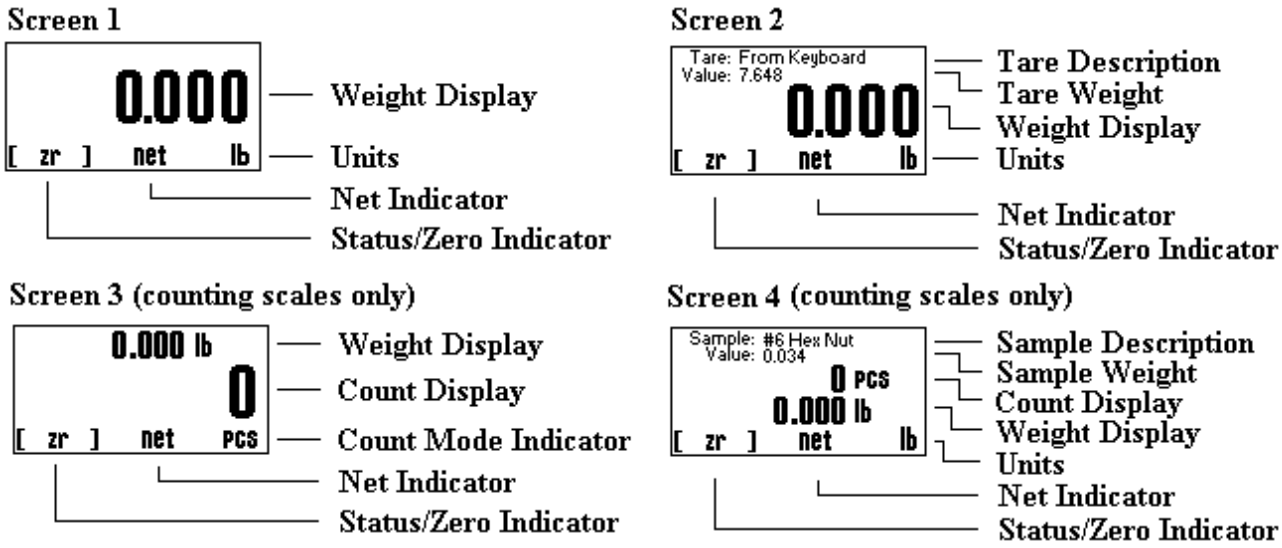
WIRE	READING
Red to Black	4500 ohms +/- 10%
Red to White	3375 ohms +/- 10%
Red to Gray	3375 ohms +/- 10%
Any color to frame	Infinity, open circuit

PIN	FUNCTION	COLOR
1	BROWN	NO CONNECTION
2	WHITE	- SIGNAL
3	BLUE	+ EXCITATION (3.15 VDC)
4	BLACK	- EXCITATION
5	GRAY	+ SIGNAL

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. By doing this, you will step through the screens shown below in order. For non-counting scales screens 3 and 4 are skipped.

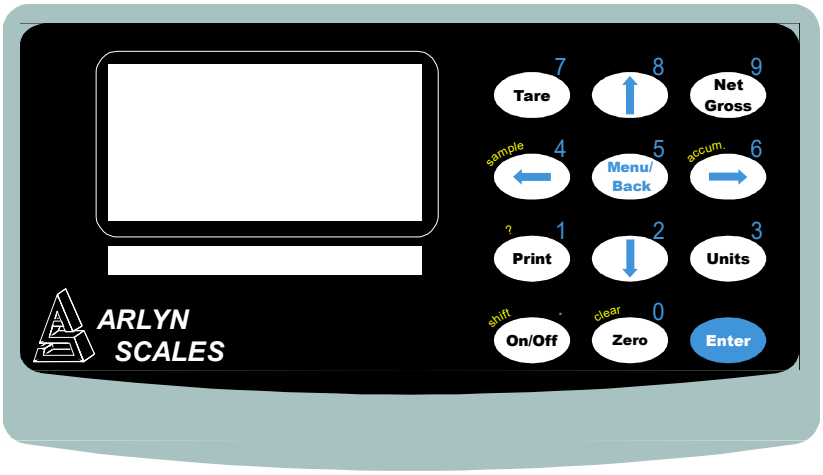


WEIGHT DISPLAY	Shows the weight on the platform in the current units setting.
COUNT DISPLAY	Shows the current piece count on the platform. If there are any totals in the accumulate register it will indicate “pcs acc”
UNITS	Shows the active conversion units.
NET INDICATOR	Shows “Net” if the indicator 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 “OVLD!” 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 and hold to reboot the scale. On battery pack equipped scales, press and hold this key to power it down.
TARE	Tares any weight on the platform and switch the scale to the net mode. Hold the key down to clear the tare
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 activated Units.
ZERO	Will zero the indicator.

Menu 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	Use arrows to navigate and select menu items.

Secondary Function Keys

SAMPLE*	Used to acquire a quick parts-counting sample from the platform. Pressing and holding this key down will clear the active sample. *Parts Counting Scales only.
ACCUM*	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. *Parts Counting Scales only.
? KEY	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 your input. In some areas this key needs to be pressed and held
NUMBER KEYS	Are used in various places to input floating point numbers.

*Parts Counting Scales only

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.

Tare Settings and Tare Definitions

Tares can also be taken, named, activated and stored permanently through the setup menu. Go to menu SETUP MENU → TARES. A list of options is displayed on the screen, Tare Definitions and Tare Settings.

Tare Definitions

In this screen, 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 0.00lb 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.

Multiplatform Consideration

If the scale is equipped for multiple platforms, then the user is given the option to select which platform the tare will apply to. Use the PLAT option on the lower menu to toggle between activated platforms that will apply to the current tare.

Tare Settings

In this screen, the way the tares behave can be changed. This also depends on what options you have installed in your system. The selection settings can be changed using the horizontal menu at the bottom of the screen. The following selections apply.

Persistent Tare (For all scales)

Selecting this option to "Yes" will allow the scale to maintain the tare activation even when the power is recycled. This will apply to both, stored tares and quick tares (tares from the keyboard). So, if the user activates a Tare from the Tare Definition Screen, and recycles power, the scale will remember the last tare activated. Please note that when the scale is turned on the next time while a tare has been activated, ***the scale will not show "0" with an empty platform.*** There will be negative number that will likely show up on the screen corresponding to your tared value. Selecting this option to "No" will remove the persistent tare feature. Tares will not be remembered after power is recycled.

Analog Enabled (For Analog Output "4-20ma" equipped scales only)

By default, if the user tares a weight from the platform (and the screen shows zero weight), the analog output will continue to detect the gross weight even if the screen shows zero, and therefore continues to produce the analog equivalent of the gross weight. Selecting this option to "Yes" will allow the activated tares to affect the 4-20ma analog output. For example, if the user tares a weight from the platform, and the screen shows zero weight, then this time, the analog output will produce 4ma (equivalent of 0 net weight). In effect, enabling this option will allow the analog output to reflect exactly what is on screen regardless of the weight on the platform.

Setpoint Enabled (For Setpoint equipped scales only)

By default, if the user tares a weight from the platform (and the screen shows zero weight), the setpoint will continue to evaluate the gross weight even if the screen shows zero, and therefore continues to control the outputs based on the gross weight. Selecting this option to "Yes" will allow the activated tares to affect the setpoint evaluation. For example, if the user tares a weight from the platform, and the screen shows zero weight, then this time, the setpoint will evaluate the command lines associated with the 0-net weight. In effect, enabling this option will allow the setpoint to reflect exactly what is on screen regardless of the weight on the platform.

Parts Counting Functions

The MKE-5-IS scale indicator is available with an optional parts counting function. The Parts Counting function 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 case 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 ("ACQUI").

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.

The System Menu

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

Backup

Use this function to create a backup of the current scale configuration internally. Use this function and follow the prompts on screen to perform a backup of your scale.

Restore

Use this function to restore a backup of a previous scale configuration. This is helpful if you already created a backup of your previous working configuration. Use this function and follow the prompts on screen to restore of your scale to a previous backed up configuration.

Restore to Factory Defaults

If the scale is not performing properly, and all other troubleshooting methods have failed, then the last resort is to restore the scale back to its factory calibrated settings. Use this function and follow the prompts on the scale to complete it.

To restore the scale back to Factory Defaults, perform the following steps:

1. Completely unplug the scale. Wait for a few minutes, then re-plug power to the scale.
2. Press the MENU button and go to SYSTEM. Press ENTER.
3. In the System Menu, scroll to SAW Scale Setup and then press ENTER.
4. Scroll down and select RESTORE TO FACTORY DEFAULTS. Press ENTER.
5. If there are any warnings that popup, just press ENTER to confirm.
6. If the Restore was successful, the scale will automatically reboot.
7. Wait for the scale to settle.
8. Place a test weight to see if the scale is reading appropriately.

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 (Future expansion)

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

Display Contrast

This allows you to adjust the contrast of the display for optimum viewing.

Display Refresh Interval (or Display Update Speed)

The Display Refresh Interval can be adjusted from .1 to six seconds.

Startup Parameters

The following startup parameters can be set here.

- The Startup Screen - Usually screen 1 which is the main weight screen. See the Main Display Screen to know which other screens are available. Other screens that can be set are:
    a. Screen 2 – The Tare Screen
    b. Screen 3 – The Parts Counting-A Screen.
    c. Screen 4 – The Parts Counting-B Screen.
    d. Screen 5 – The Multiple Platform Screen.
- The default Unit Conversion – Set the first unit to be displayed.
- Zero lock can be enabled or 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

This option 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.

Activate – ACT Activates/deactivates the auto shutoff feature.

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

Lbs-Oz Display

Enable the display to show the weight in “lbs and oz” instead of units in fractional form. For example, by default, the screen will 2 ½ lbs of weight as 2.50 lbs. In “lbs/oz” form, it will show as “2lbs 8oz”. Please note that this does not affect the communication output form.

CONFIGURATION AND CALIBRATION

Platform Advanced Setup

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 it 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. 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".

Platform Auto Setup

This setting should not be touched unless instructed by a Service Technician.

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 with 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.

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

This setting should not be touched unless instructed by a Service Technician.

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. The following selections apply.

Auto Zero – With this option selected, the scale will automatically zero out any weight on the platform. This is a good option for environments that are not prone to power failures. Also, it is a great option if you always want to start the scale at zero regardless of what the state of the platform (loaded or unloaded).

Last Zero – At initialization, the scale will zero out the platform to the last preserved zero state when the ZERO button was pressed. This means that the scale remembers the last time the ZERO button was pressed. This results in the scale remembering the value of the weight currently on its platform when the scale is shut off. In addition to that, suppose the weight was changed after the scale was shut off, the next time the scale is turned out, it will show the new weight. This is an excellent option for environments prone to power failures. It is also an excellent option if you need to constantly monitor the weight on the platform without interruptions.

None – The scale will initialize the platform based on its previous state. It is not a recommended to leave the scale in this option. The scale may start up with an unknown state.

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.

There are four settable options on the setup screen. To modify them, use the left and right arrow keys to line up on the appropriate entry in the horizontal menu located at the bottom of the screen, and then press ENTER. These menu items are as follows:

Active – ACTV: Activates or deactivates Zero Tracking.

Window – WIND: This is the window range above or below the current ZERO point that needs to be continuously compensated (up to 20% of full capacity) to correct zero shift. For example, over two days, you notice that the scale has shifted in weight by 0.2lbs, even though there is no weight on the platform (and was originally reading perfect 0) or a weight that was constant over two days is now reading 0.2lbs over. This is known as “Zero Shift” and can be corrected using Zero Tracking. After studying the scale’s behavior on this aspect, we can plug this 0.2lb range in this Window field. Now you will notice that your scale will zero out any deviations that falls within ±0.2lbs.

Noise Count – NCNT: This is the noise count of filtering mechanism. This sets the number of weight values that need to be discarded before considering that the new weight value is a new value and not part of the current weight value tracking process. The higher this number, the less accurate the weight value, the faster your performance.

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 an 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.

There are four settable options on the setup screen. To modify them, use the left and right arrow keys to line up on the appropriate entry in the horizontal menu located at the bottom of the screen, and then press ENTER. These menu items are as follows:

Active – ACTV: Activates or deactivates Software Filter.

Buffer – BUFFER: These are the number of averaging slots in the software filter. The higher this number, the slower the filtering process, the more accurate the weight reading.

Window – WIND: Set's the weight value window at which you want the filtering to take place. The standard value for this field could be the scale's resolution. So, if your scale is at a resolution of 0.02 lb, then set that value to this window. By default, the value has been set in factory.

If you set a lower value than the resolution of the scale, then the scale will be stricter in its filtering and almost all values from the platform will be hitting the noise count giving you a much slower performance.

Set a higher value and the scale will be more lenient in its filtering allowing more noisy values to pass through for processing giving you a better performance but higher inaccuracy in readability. The best way to approach this window is determining the range of fluctuation with the default setting. For example, by observing the scale, you notice that your scale is varying by 1lb. If that is the case, then set the value here to 1lb. You will then get stable readings within this range.

Noise Count – NCNT: This is the noise count of filtering mechanism. This sets the number of weight values that need to be discarded before considering that the new weight value is a new value and not part of the current weight value averaging process. The higher this number, the less accurate the weight value, the faster your performance.

Stability Control

If the scale display values are not stable due to a noisy or unstable environment and you do not want to estimate the actual value of the weight on the platform, the scale can estimate it for you.

Stability Control is not by any means a filtering mechanism. This feature should only be used if you know that the scale will always be unstable or in constant noise. What this feature does is lock in an appropriate weight based on the ***stability count*** and a ***stability window*** you have specified in this screen. The weight locked, may not be the most accurate weight of the object placed on the platform, but it is a best guess as computed by the Stability Control in this scale. Once the stability lock has been placed, the lock will not be removed until the platform experiences a weight change greater than the stability window. There are four settable options on the setup screen.

Active – ACTV: Activates or deactivates Stability Control.

Source – SRC: This sets the primary source of readings that the Stability Control mechanism will use to estimate the best lock-in weight. There are two selections here:

- *A/D Reading* - This selection makes the Stability Control mechanism take readings unfiltered and straight from the load cell. This is the fastest and the least complex selection and therefore the default.
- *Filtered* - This selection is an advanced selection. With this selection, Stability control uses filtered weights based on parameters set by the Software filter. Selecting this option automatically activates software filter. Make sure the parameters in Software filter are properly set or the scale will behave erratically. Use this selection only if you know what you are doing.

Window – WIND: The Window field operates similarly as explained in the Software Filter section.

S.C. Count – CNT: This number indicates the number of stable readings within the window set above to qualify a lock in. Suppose this number is set to 3, then the Stability Control mechanism will try to read 3 readings consecutively that are within the window above. If they fall within that window, then the weight will lock in, else, it will reset and start over until it gets 3 stable readings.

Noise Count – NCNT: This is the noise count of filtering mechanism. This sets the number of weight values that need to be discarded before considering that the new weight value is a new value and not part of the current weight value averaging process. The higher this number, the less accurate the weight value, the faster your performance.

After Stability Control is activated, an "S" appears at the bottom left of the screen during normal weight readings. While the scale does not have a stable reading, the S will appear crossed out. As soon as a weight has been found, it will lock this weight and the S will be uncrossed. Once the lock has been obtained, the reading will not budge until a weight change greater than the window set has occurred.

Zero / Motion Detect

This scale can detect if there is motion on the platform. There are four settable options on the setup screen. The first three are for the Motion Detect setup. The fourth option controls the zero indicator on the main display. To modify them, use the left and right arrow keys to line up on the appropriate entry in the horizontal menu located at the bottom of the screen, and then press ENTER.

Active – ACTV: Activates or deactivates motion detection.

Motion Window – MOTN: The Motion field determines the range of weight at which you want to define "motion". So, if the scale has been set on a moving truck, and you have determined that the scale always is within a certain weight range when the truck is moving normally at normal speeds, you would want to set the Motion window at that range. For example, say you have put a weight on the scale that would read 20lbs on a stable surface. But on the truck, it reads 18-23lbs. This means that your motion window is 5lbs. So now you know that you want to detect motion if and only if it is greater than 5lbs, so you can set the Motion window to 5lbs.

Time Interval – TIME: This works along with Motion Window to detect a stable reading. The reading must be stable within the motion window for this length of time (in seconds) in order to be considered a stable reading. As long as the weight remains within specified motion window within this time, the scale would confirm that there is no motion detected. If the weight jumps out of the motion window, then the scale would register as "Motion Detected" and reset the time interval.

Zero Window – ZERO: This controls how close the scale needs to be to the true zero point before lighting the zero indicator (ZR) on the bottom of the main display. For example, if you set the window to 1lb, then any weight from 0lb to 1lb will register as ZR (meaning ZERO condition).

After ZERO/MOTION DETECT is activated, the scale needs to be rebooted for this option to take effect. After reboot, a tiny '○' indicator appears at the bottom of the screen. If the platform is moving, the '○' indicator will show as it is seen here. If the platform is within the bounds of 'No Motion' as set here, then the '●' indicator will be crossed out.

Multi-Platform Settings (for Multiple Platform Configurations Only)

This screen allows you to configure the scale to calculate the "Sum" or the "Difference" between the weights of two connected platforms.

You can also configure the scale to automatically scroll through all platforms at specific intervals. This means that after a certain periodic interval, the scale will show the individual weight on each platform alternatively.

The following settings apply:

Platform Total – TOTAL: Toggle this option to select either "Sum" or "Diff" function between the weights of both platforms. For "Diff", the equation is: PLATFORM 1 – PLATFORM 2 = DIFFERENCE.

Auto Scroll – SCROL: Use this option to toggle the Auto Scroll Enable option.

Auto Scroll Time (sec.) – TIME: Set the time period between each platform display interval.

Adjust Zero Offset

Use this function to reset the Calibration Zero Constant. This is similar to the first part of the Span Calibration procedure except you do not need a known weight for calibration. However, it is required that the platform remain empty during this process.

View Raw ADC Data

This function is used for troubleshooting purposes. If the calibration is done improperly or if the scale is installed incorrectly, then the weight value seen on the screen maybe off or not reading at all (showing 0). To make it easier to self-troubleshoot this issue, this screen allows to first check if the scale analog conversion hardware is still in working order.

The screen shows the raw, unprocessed digital counts coming from the analog to digital converter (ADC). The ADC is directly connected to the load cells. The behavior of the platform directly affects these numbers. Here is an overview what the numbers mean:

a) 83884xx – The last two digits should be constantly moving. This means the ADC is working properly but the platform is not connected to the indicator. Please check the platform cable and try again.
b) 8xxxxxx – If these numbers don't equal to the number in part (a), and the last two digits are constantly moving, then it means the platform is connected properly.
    - Press the Platform with your hand.
        - If the numbers are increasing then the legs are screwed in at the right level.
        - If the numbers are decreasing, then the legs are screwed in all the way. Unscrew the legs out a little so that the platform is "floating" above the ground. If you have installed the load cells on your own, then this means one or more of the load cells have been installed upside down.
    - If all the items above check out, then just perform a Span Calibration of the scale to get back to working condition.
c) 0000000 – The ADC is damaged. Please call Customer Service for further assistance.
16777215 – Something is wrong with the ADC configuration. Perform a Restore to Factory Defaults to attempt to fix this issue. If it doesn't work, call Customer Service for further assistance.

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.

Try to troubleshoot the scale using the "View Raw ADC Data" feature in conjunction with the below checks.

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 in 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.

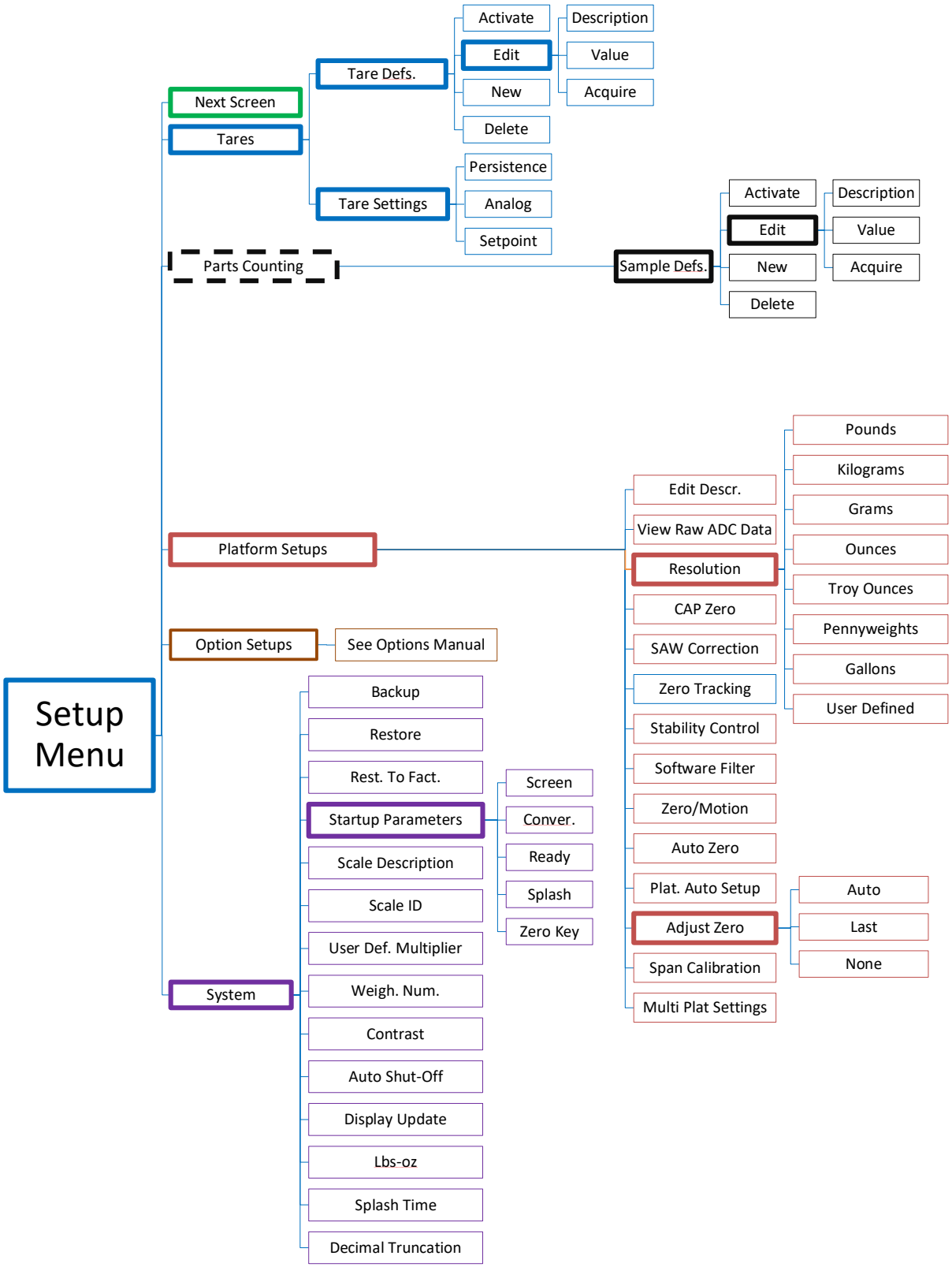
- ❑ On platform scales check that all four level legs are solid against the floor.
- ❑ Check for any mechanical interference. Is there anything rubbing against the platform?
- ❑ Perform span calibration.

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. The following sequence walks you through Full Calibration.

1. Press MENU button (#5) ---- setup menu screen will appear
2. Scroll to PLATFORM SETUPS and press ENTER.
3. In the Platform Setups Menu, scroll to SPAN CALIBRATION and press ENTER.
4. The next warning message warns you about the consequences of performing an incorrect calibration. Read the warning message, and then press ENTER
5. Input the calibration weight on the space provided. The calibration weight must be at least 50% of full capacity. If you make a mistake, press ZERO until the mistake clears.
6. Press ENTER to confirm input of calibration weight.
7. Remove all weight from the platform. The current weight is shown at the top left side of the screen. Make sure that the reading is as stable as it can be. Then press ENTER.
8. Wait for the next prompt to appear.
9. When the prompt appears, place the known weight on the platform.
10. Wait for the raw count on the top left side of the screen to stabilize (about 5 seconds). Press ENTER to confirm the placing of weight.
11. Wait for a few seconds until the calibration procedure completes.
12. Press MENU/BACK to go all the way back to the weight screen.

PRIMARY MENU TREE



Options Guide

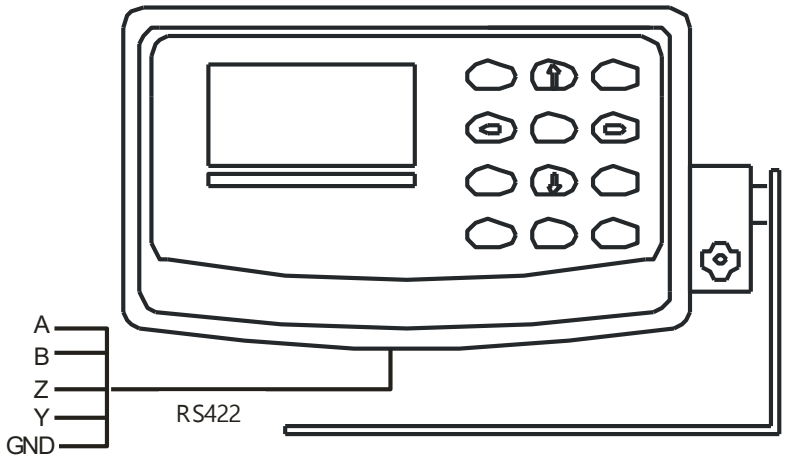
INTRODUCTION TO OPTIONS

This section will cover the operation and setup of all of the options available for your scale. It is important to note that some described menu items will be missing if that option was not installed in your specific scale. All of the options listed may be installed in any scale and may run concurrently. Any of the options may be installed later at the factory if it wasn't installed at time of purchase. Call our service department for details.

RS422 COMMUNICATIONS PORT

The RS422 option is a fully capable, bi-directional communications port. The port can be configured to operate at a variety of baud rates and the output data frames are definable by the user. The printing of a frame can be initiated by pressing the print button, by an external command or continuously when the print stream mode is activated.

The communications port also contains an extensive external command interface allowing the ability to perform remote key presses.



Configuring the Port

Baud rate and other parameters can be configured through the Port Configuration screen that can be accessed under menu SETUP MENU → OPTION SETUPS → RS485 → PORT CONFIG. The options are shown below. The UI of "RS485" is used for communication via RS422.

BAUD RATE	Settable to 110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 31250 or 38400 bits per second.
DATA BITS	Seven or Eight
STOP BITS	One or Two
PARITY	Even, odd or none
ECHO	On or off. When echo is enabled the scale will echo each character the scale receives back to the user.

Perform Test Print

As an aid to port configuration we have included a "perform test print" function to the RS422 menu. Executing this will cause your current Print Frame to print. To access this function, go to the menu SETUP MENU → OPTION SETUPS → RS485 → PERFORM TEST PRINT.

Loop Back Test

You may also test the operation of the RS422 port by performing a loop back test. On the output connector, A and B (transmitted and received data) need to be shorted together. When you perform the test, the scale sends data and reads it back through its own port, where it is compared and the results are show.

Print Stream Mode

Print stream mode will continuously print the currently active print frame at fixed time intervals. Stream mode can be configured using menu SETUP MENU/OPTION SETUPS/RS485/PRINT STREAM. The lower menu selection ENB will enable or disable print stream mode, and TIME will be the number of seconds between the beginning of each print frame. Time settings of .5 to 1638 seconds (27.3 minutes) can be entered. Avoid using time values of less than .5 seconds as it may slow down or lock up the scale.

When stream mode is enabled, use the print button or the external *P command to start or stop the printing process.

Printing at Stability Using Motion Detection and Stability Control

All Arlyn digital indicators have the capability of detecting motion and/or stabilizing the weight and using it to control printed outputs. This can be useful in many applications. For example, if you wanted to print labels for several items, you could simply place each item on the platform, and when the scale gets a stable reading it will print the label automatically. The Motion Detect, Stability and printing at stability are fully configurable through their respective setup screens.

The Motion Detect indicator looks like an 'M' and it is located just to the right of the Zero Indicator / Bar Graph located on the bottom of the display. It is crossed out if there is no motion, and it is uncrossed if there is motion.

The Stability Control indicator looks like a circle and it is also located just to the right of the Zero indicator/Bar Graph located on the bottom of the display. The circle is unfilled when the weight is not stable and filled when the weight is stable.

Print at Stability configuration allows the user to choose what control they want to use to print. The user can choose Motion Detect only, Stability control only, or both Motion Detect and Stability control. Take a look at the Instructions Manual to see how the Motion Detect and Stability Control can be set.

Sending a PRINT command or pressing the PRINT button on the front panel will send a PRINT request to the scale, and the scale will only print if the motion and stability conditions are met.

The Print-At-Stability Setup Screen

Follow the menu tree down this path to locate this setup screen: SETUP MENU / OPTION SETUPS / RS485 / PRINT AT STABILITY.

There are five settings that control this function:

Activate – ACTV: This will activate or deactivate this function. Select ACTV from the horizontal menu on the bottom of the screen, and then press ENTER to change this setting.

Percentage of Capacity – PCT: This is the percent of full scale capacity, which, if the scale reading falls below, will not automatically print. For example, a 100lb full capacity scale set to 1% will not automatically print when there is less than 1lb on the platform. In most applications, there is no purpose to generating a print after removing weight from the platform. This percent can be set to two decimal places.

Stability Timeout – TIMEOUT: This is the time set by the user to timeout retrieval of the value after a certain period of time. By default, this value is 0, which means that the scale is never going to timeout to print a weight values. It will continue to look for a stable point to retrieve a weight value for printing. If the number is set other than 0, then this is the period that the scale will try to print a weight value, and if it fails, it will print "TIMEOUT" in ASCII on the terminal.

Negativity – NEG: By setting this to "YES", the automated print will work on both sides of zero. When set to "NO" it will only work with positive weights. The user must take into consideration here that if this parameter is set to "NO", then when the scale is reading zero, the output may be erratic even though the scale is stable. This is because the value 0 in the scale is not a true stable zero. The zero here may be a long decimal that goes beyond the resolution. In this case, the value maybe negative and therefore, impeding the printing process. It is recommended to set this to "YES" if the zero value is important.

Zero Notify – ZERO NTFY: If this option is set to "YES", then each time the scale is zeroed or a zero command is sent through one of the communication ports, the indicator will wait for the scale to stabilize and detect if there is no motion. Once these conditions are detected, the word "ZERO" appears on the output terminal in ASCII.

Control Source – CONTROL: This option can be switched between Motion, Stability, Motion and Stability based on your preferences. This determines how you want the Print at Stability to operate, whether based on Motion Detect, Stability Control or both. It is important that when you choose these options, these features need to be activated within the system to operate properly.

Print Stream Mode with Print-At-Stability

Print Stream and Print at Stability can work together. If you want the scale to print weights constantly, then activate both of these features together and they will work in tandem with each other.

Print Frame

The print frame is a list of up to 20 functions for the scale to perform each time a print request is received. The list is executed in the same order as shown is shown. A function can either be an item to be printed or a command for the scale.

With the MKE-5 indicator has the ability to store only one frame. For the capability of defining multiple frames, please look at our Arlyn UpScale Touchscreen Display.

Defining and Editing the Print Frame

Go to the menu SETUP MENU/OPTION SETUPS/RS485/PRINT FRAME.

Default Print Frame

By default, the Print Frame has two functions stored; Weight and Unit with Carriage-Return (CR) and Line-Feed (LF) at the end of the Frame. This allows the scale to print out the weight and unit to the RS422 output.

This is what a 25.5lb weight would look like on a 620L scale equipped with RS422(or USB/Ethernet/RS485) printed on Serial Port Terminal:

```
25.50 lb
```

Defining a Custom Print Frame

To re-define the frame, line up on NEW on the lower menu and then press ENTER to add a function. The function NULL will be added to the list. We want to change this to the WEIGHT function. Press the right arrow key to line up on FNC+ on the lower menu. Press ENTER twice to select the WEIGHT function. To add a CR to this function, use the right arrow key to line up on CR on the lower menu and then press ENTER.

You will then see a check mark under the column "C". To turn on the LF, press the right arrow once more to line up on LF and then press ENTER. This completes the definition.

The lower menu items on the frame editing screens are outlined below.

Selection	***Description***
NEW	Adds a new default function (NULL) to the function list.
INS	Inserts a new function (NULL) before the currently selected function line.
DEL	Deletes the currently selected function line.
FNC+/-	Changes the function of the current line. Available functions and their explanations are outlined below.
SRC	On many of the functions you need to specify the source of the data. For example, the WEIGHT function must know what platform (on multiple platform scales) the reading should come from. SRC will step through all available platforms.
CR	Includes a carriage return at the end of the current function
LF	Includes a line feed at the end of the current function.
SP	Allows you to print space(s) at the end of the current function. When activated a "?" will show up in the function list on the current line and allow you to enter a number. The number of spaces must be between 0 and 15.

TEST	Quickly test the print frame without having to return to the scale's normal operating mode. (Future Expansion)

Print Frame Functions

You can add up to 20 functions to Print Frame. The functions are executed in the order they are defined in the list. You can add a CR (carriage return), LF (line feed) or trailing spaces to most functions. This is useful when designing labels.

Function List

Function	***Action***
NULL	Does nothing, but allows CR, LF and spaces to be printed.
WEIGHT	Prints a six-digit weight value. It will be net or gross depending on mode. Use SRC to select the platform.
NETWGT	Prints a six-digit weight reading corrected for tare. Use SRC to select the platform.
GRSWGT	Prints a six-digit weight value ignoring any active tare weight. Use SRC to select the platform.
NGTEXT	Prints "NET" or "GROSS" depending on mode. This is meant to be used with the weight function. Use SRC to select the platform
PLATTOT	Prints a gross total reading of all active platforms.
COUNT	Prints the current piece count. Use SRC to select the platform.
ACCUM	Prints the value in the parts counting accumulate register. Use SRC to select the platform.
CNTACC	Prints a total of the current piece count plus the part count in the accumulate register. Use SRC to select the platform.
TIME12	Prints the current time in 12-hour format. (when the time and date option is installed)
TIME24	Prints the current time in 24-hour format. (when the time and date option is installed)
DATE	Prints the current date in the format as selected in the Date Format in Time and Date Option Configuration. (when the time and date option is installed).
SCADES	Prints the 14-character scale description as entered in the system menu.
SCAID#	Prints the scale ID number as entered in the system menu.
WEIGH#	Prints the auto-incrementing weigh number who's starting value was entered in the system menu. This number will increment each time a frame is printed.
TEXDEF	Prints a 14-character text string that was entered as a text definition. Use SRC to select the text definition.
UNITXT	Prints a 3-character indication of the currently selected unit conversion. (lb, kg, oz, etc).
TARDES	Prints the 14-character description of the current active tare weight.
SMPDES	Prints the 14-character description of the current active sample weight (parts counting).
ASCII	Will send a single ASCII character to the port. Among other things this is useful to send ESC sequences to the printer to change fonts etc. Use SRC to enter the ASCII code.
CHFONT	Change Font. Works only with EPSON compatible printers. Use SRC to select the font. See explanation below.
CHPNT	Change Point size. Use SRC to toggle through the choices 16,20,24,30,36,40,42,48,52,56,60,64

Print Frame Design Examples

Simple Weight Print

The first example is a simple print frame that will print the weight followed by a carriage return and a line feed.

FUNCTN	**SOURCE**	**C**	**L**	**SP**
Weight	P1			1

External Command Interface

The external command interface allows the user to control the scale and manipulate memory data through the RS422 interface. There are three basic command types, these are:

The * Command (Keyboard Emulation) – This allows you to simulate key presses remotely.

It should be noted that the command list described below is the **proposed list of commands**. As our scale continues to develop, commands are added as each firmware revision comes out. The revision in which the command was added is shown just to the right of the command in parenthesis. If (X) is indicated it means that the command has not been implemented yet and is slated for future release. To check the revision number of your scale, watch the Arlyn Logo splash-screen when you first turn on your scale. Firmware upgrades can be purchased and installed in your indicator. . Some commands can be implemented based on customer request. If it is imperative for the customer to have a certain command type, contact our service department for more information and to get quote for the functionality to be implemented.

Print Request Response Time

When the scale receives a print request (*P) there is a small time-delay while the scale computes and formats its output frame. For any frame function that outputs weight or parts count the response time is typically 100 milliseconds (1/10th second). For almost all other frame functions the response is almost immediate.

External Command Limitations

It is important that when sending repeated print requests (*P) to the scale that you wait for the scale to completely transmit its print frame, and then wait a small amount of time before sending the next request. If the scale receives a print request while it is still transmitting, the scale could actually lock up requiring a power off reset. Also, it is advisable to wait a small amount of time after the output frame is complete to give the scale a chance to do its own "housekeeping chores". To immediately send another print request directly after a transmission could bog down the scale's displayed update rate and keyboard response.

The [*] Command: Used for Keyboard Emulation

A number of external commands can be sent to the scale to simulate keyboard presses. These commands are listed below. Each command must be prefixed with a * character and no CR is required.

Command	***Keypress***
*P or *1	Print Key - (1)
*C or *3	Units Key - (3)
*Z or *0	Zero Key - (0)
*N or *9	Net/Gross Key - (9)
*T or *7	Tare Key - (7)
*U or *8	Up Arrow Key - (8)
*D or *2	Down Arrow Key - (2)
*L or *4	Left Arrow Key - (4)
*R or *6	Right Arrow Key - (6)
*.	Decimal Point - (On/Off)
*O	On/Off Key will reboot the scale. Power down mode in Battery.
*M or *5	Menu/Back Key - (5)
*E	Enter Key - (Enter)

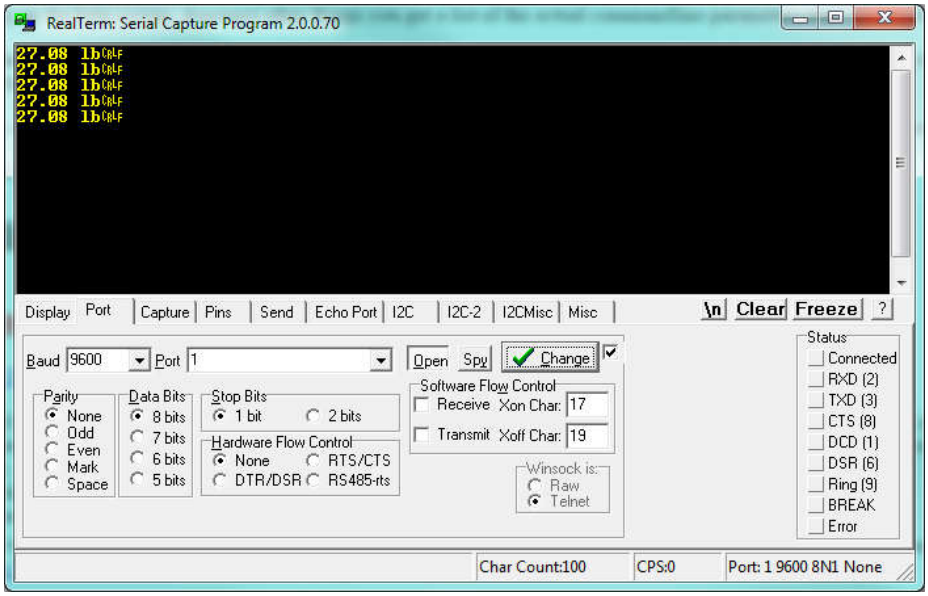
Care must be taken when sending key commands via RS422 as some keys will perform different functions depending on the scale's operating mode.

Test Using Terminal

You can also test the scale communication using a Serial Terminal. To do this, first you will need to download a suitable terminal (if you don't have one). We recommend RealTerm (https://sourceforge.net/projects/realterm/files/)

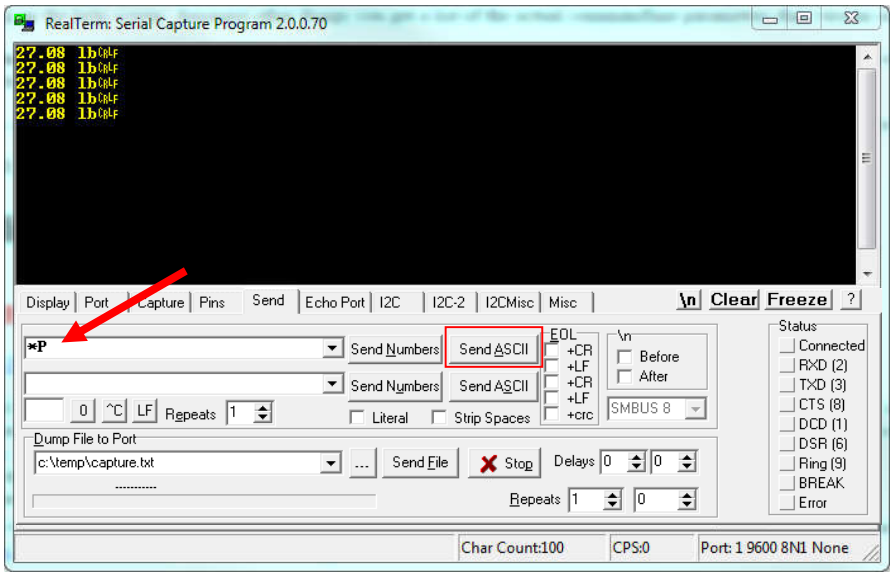
Direct Link to File: https://sourceforge.net/projects/realterm/files/latest/download?source=files

In RealTerm (or your favorite terminal), setup the connection using the COM port of your Serial Communication.



Make sure the **Port** designation on the bottom right of the screen shows the correct connection parameters. Then press the PRINT button on the scale to start sending data on to the terminal.

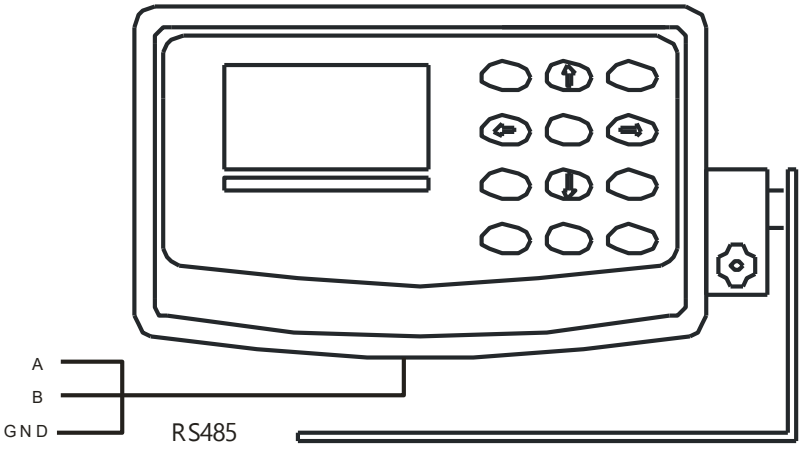
Alternatively, you can also send Print Command to the scale to retrieve weight. Use the **Send Tab** to do this:



RS485 COMMUNICATION

The RS485 communication framework is similar to the RS422 Communication Framework. The RS485 Communication option is a fully capable, bi-directional communications port. The output data frames can be customized to certain data types other than weights from the scale. The printing of a frame can be initiated by pressing the print button, by an external command or continuously when the print stream mode is activated.

The communications port also contains an extensive external command interface allowing the ability to perform remote key presses.



Configuring the Port

Baud rate and other parameters can be configured through the Port Configuration screen that can be accessed under menu SETUP MENU → OPTION SETUPS → RS485 → PORT CONFIG. In this screen, you can only **enable** or **disable** the RS485 Communication port.

<RS485 indicator depiction>

Perform Test Print

[Refer to Perform Test Print in RS422 Chapter]

Print Stream Mode

[Refer to Print Stream Mode in RS422 Chapter]

Print at Stability Using Motion Detection and Stability Control

[Refer to Print at Stability in RS422 Chapter]

Print Frame

The RS485 Print Frame configuration is shared with the RS422 Framework. Refer to Print Frame in RS422 Section.

External Command Interface

[Refer to the External Command Interface in RS422 Section]

SETPOINT CONTROLLER

The setpoint controller gives your scale the capability to output a signal to external equipment when certain conditions are met. This is particularly useful in filling operations, either to sound alarms or to control filling machinery.

A Setpoint Command Set is a recipe of commands that the scale executes based on the current weight reading. In operation, if the displayed weight satisfies the recipe, the command set directs any of the outputs to switch on or off. The MKE-5 Indicator only supports the storage of 3 Setpoint Definitions (or 3 Recipes). This means you can define up to sixteen commands directed towards any output but only within 3 Setpoint Definitions (each containing 16 commands). If you require more than three Setpoint Definitions, (or more than 3 Setpoint Recipes), please look at our Arlyn UpScale Touchscreen Indicator.

With a little finesse in creating formulas, simple setpoints, filling control cycles, over and under check weighing and many other functions are possible.

IMPORTANT NOTE: During Scale reboot, the scale will momentarily toggle all setpoints to check for malfunction. This might cause your valve systems to open (or close) during that initial moment. A fix is already being implemented (as of this writing) for this issue. All Software versions at 6.123b and below will have this feature. A workaround would be to add a manual switch that would be used to shut off your system if the scale is every rebooted.

Output Specifications and Notes

The setpoint controller has eight separate outputs and is expandable to sixteen. Each output is an open collector that is capable of sourcing 4.5ma or sink 10ma of current. Care must be taken not to exceed these values. This is sufficient to drive LEDs or sound buzzers. If higher output currents are needed then external relays need to be installed. We normally provide 117VAC, 10Amp Solid State Relays as an optional add-on. We also provide 60VDC DC Solid State Relays. Optical relays have some important advantages over mechanical relays, the actuation current for optical relays is usually less a 10ma but mechanical relay coils require currents often exceeding the limit. Optical relays have no mechanical switches to wear out and more importantly they isolate the scale from the load, thus protecting it from voltage spikes. If excessive noise is coupled back to the scale it could lock up or damage its microprocessor or memory.

It should be noted that when you command an “OFF” CONDITION, the output will be grounded. In most open collector (switched ground) wiring schemes this will actuate the external light or relay. To help eliminate this confusion, each setpoint formula has an optional invert function to invert the output.

Even though the output is an open collector, it differs from the standard open collector output in that the output will assume a high condition (3.3VDC) when it is switched on without the need for an external pull up resistor, allowing direct connection into any TTL level input.

Creating Setpoints Formulas

To access setpoints, go to the menu SETUPMENU/OPTION SETUPS/SETPOINT CONTROLLER.

The Setpoint Definition Screen

In this screen, you will see a list of available setpoint definitions. If there are none, you will see “None Defined”. The creation, editing and deletion of setpoints are similar to the creation of tares and parts counting samples. To add a new setpoint definition, select NEW on the lower menu and press ENTER. A New Setpoint Definition will then be added to the list with a description of “SetPt#001”. This new setpoint definition is deactivated and contains an empty formula list.

To edit this new setpoint definition or any other one, use the UP and DOWN ARROW keys to select the desired setpoint definition, select EDIT on the lower menu, and then press ENTER. The Edit Setpoint Definition screen will be shown.

Invert – INV=On/Off: If it is on then all outputs related to this setpoint will be inverted. This is useful when using the open collector output for the reasons stated earlier in this section.

Cycle Mode – CYCLE=On/Off: The cycle option is used to create an operation cycle as described earlier in this section.

Negative Reading – NEG=On/Off: The Negative option is used to determine if the scale needs to evaluate negative weight values. If NEG = Off, then the setpoint controller will not evaluate negative weights, as in it will treat both negative and positive weights the same. Example, if the display shows -10 lbs or +10 lbs, the setpoint evaluator will evaluate these values as positive values. If NEG = On, then it will differentiate between the two values.

Platform – PLAT=PL1: This option only appears when the scale is equipped with Multiple platforms. The user can select if the setpoint conforms to a particular platform. If it is the case, then the setpoint will only evaluate weights corresponding to that platform.

Parts Counting – PARTS=On/Off: This option only appears when the scale is equipped with Parts Counting. The user is given a choice of whether the setpoint should respond to count value instead of weight value.

To change any of these options simply select the appropriate entry in the lower menu and press ENTER.

Creating and Editing Formulas

The formula is a list of up to nine lines that are evaluated and acted upon in the order they are entered.

To access the formula list select EDIT in the lower menu and then press ENTER. All of the current formula lines will be displayed or "None Defined" if there aren't any. Using the NEW and INS in the lower menu to add or insert new lines.

Each line consists of four parts. These are CMD (command), EXP (expression), VALUE and OUT. CMD is an action to take. The only two commands currently available are ON and OFF. EXP is an expression and can be < (less than), <= (less than or equal to), > (greater than) and >= (greater than or equal to). Value is the setpoint weight value and OUT is the output channel (1-8) that the CMD command will work on.

For example, a simple formula to activate the output when a certain weight is exceeded is made up of two lines as shown below:

CMD	EXP	VALUE	OUT	
Off	<	5.0	1	// Start with light off
On	>=	5.0	1	// On if 5lb or greater

This can be interpreted as:

Line 1: Output #1 is off if weight is less than 5.00lb
Line 2: Output #1 is on if weight is greater than or equal to than 5.00lb

You will notice that every output possibility must be dealt with when creating a formula.

The next example represents a much more complicated definition. The scale would have three lights connected to three outputs and operate in an UNDER / ACCEPT / OVER check weighing scenario.

There will be a red light connected to output #1 to indicate an "**under**" condition, a green light connected to output #2 for an "**accept**" condition and a yellow light connected to output #3 to show an "**over**" condition. We can program the red light to be on whenever the weight is less than 5lb, the green light to be on only between 5 and 5.2lb and the yellow light to be on whenever the weight is above 5.2lb indicating an over condition. In practice, the user would start filling the container until the green light comes on.

It is less confusing to make a formula of this nature if you deal with the complete operation of one light at a time. We recommend laying the formula out on paper first and then enter it into the system.

CMD	EXP	VALUE	OUT	
On	<	5.00	1	// Deal with "under" (red) light first
Off	>=	5.00	1	

Off	<	5.00	2	// Now the “accept” (green light), to be on only between 5 and 5.2lb
On	>=	5.00	2	
Off	>	5.20	2	
Off	<=	5.20	3	// Now the “over” (yellow) light to be on anytime the weight is above 5.2lb
On	>	5.20	3	

When this formula is executed, the scale evaluates each line in order. This calculation is done in memory only, and the outputs are not affected until the formula is complete. The entire formula is evaluated on each and every display update, which is programmable through the system menu.

You may wonder why it is necessary to have to use an On condition at the beginning. This was done to increase flexibility as there may be many cases where the user wants the light to start in the on state, turn off during a certain weight range and on again when above that range. You have to specify every possible condition for the output when making formulas.

This last example will show an automated filling operation using the cycle option. The goal here would be to have output #1 connected to a filling valve and the cycle starting with this valve in the off condition. The user places a box on the scale below the filling apparatus, press the ZERO key to zero out the weight of the box, press the ENTER key to start filling and have the setpoint controller switch the filling valve off when 5lb is reached. The user then removes the box from the scale and the output will remain off until the next cycle is initiated by pressing the ENTER key.

Start in the setpoint definition screen by enabling the CYCLE option and setting the INIT option to off.

Here is the formula:

CMD	EXP	VALUE	OUT	
On	<	5.00	1	// Will actually go on as soon as the ENTER key is pressed.
Off	>=	5.00	1	// Switch off at 5 lb and end cycle

That’s all there is to it. The output will go off at 5lb and remain off until the next cycle.

Notes on Cycle Mode

The cycle function is used when it is desirable to “latch” the output to a specific state when a process is complete. Consider the following examples with and without the cycle option. In both cases the setpoint is set to fill a box to 5lb and then shut off.

Cycle Off: The output is on as the box fills and the scale monitors the process. At 5lb the output switches off. The user then removes the box from the scale. When he does that, the indicated weight falls below 5 lb, the filling valve switches back on dumping material all over the platform.

Cycle On: When 5lb is reached the output switches off, and remains off until the user initiates the cycle again by pressing the ENTER key.

There are two other points concerning process cycles:

1. There may only be one cycling setpoint definition active at any given time. All other activated setpoint definitions will work normally along with it.

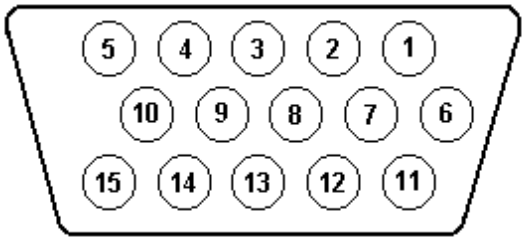
2. To abort the cycle, press the ENTER key. The output will then obtain the same state it would have taken if the process had completed normally.

When changing the command line operations within a Cycling Setpoint Definition, you must **REBOOT** the scale for the settings to take effect. This requirement is only for a Cycle mode setpoint. If you do not reboot, then the previous settings will continue to remain active.

Output Connector and Pin Diagram

In most cases there will be a single cable with a 15-pin subminiature D type female connector added to the scale for interfacing to external equipment.

1. Setpoint #4 Output
2. Setpoint #5 Output
3. Setpoint #6 Output
4. Setpoint #7 Output
5. Setpoint #8 Output
6. Setpoint #3 Output
7. Setpoint #2 Output
8. Setpoint #1 Output
9. Digital Ground (For Scales sold before 3/7/2015)
10. +3.3 VDC
11. Digital Ground (For Scales sold after 3/7/2015)



WEIGHT AVERAGING

The weight averaging option allows the scale to display an average weight taken from the platform over a specific time period. Readings are sampled from the platform forty times per second so a five second average would average 200 readings. Weight averaging can be setup to operate from a front panel key (the "8" key) or to operate on a continuous basis.

Push Button Operation

Pressing the EIGHT- key will start the average. While the average is being taken, the status bar on the bottom of the screen will display "**Avg**" and the graph bar will show the amount of time left. When the average is completed the result is locked on the display and the text "**Loc**" will be shown on the status bar. While the reading is locked the UNITS, NET/GROSS and other front panel keys will still operate as normal. To release the lock simply press the EIGHT-key again. While the average is being taken it can be aborted at any time by pressing the EIGHT-key.

For Multiple Platforms

For Multiple platforms, if you have selected the Multiple Platform screen, then press the "6" button to perform weight averaging.

Continuous Operation

When configured for continuous operation, constant averages at the selected time interval will be taken and locked on the display. The text "**Avg**" will be shown on the status bar and the time progress shown on the graph line. The average key (the EIGHT-key) is used to start and stop this process.

Configuring the Weight Average Option

The configuration parameters for the weight average option can be found in the menu SETUPMENU/OPTION SETUPS/WEIGHT AVERAGING. There are three settable options here.

Activate – ACTV: Activates or deactivates weight averaging.

Type of Averaging – TYPE: Push button or continuous operation.

Time of Averaging – TIME: Average acquire time can be set from one to sixty-three seconds.

MULTIPLE PLATFORM OPERATION

Your scale has the capability of running up to three input devices at any one time. Normally only one is used, a load cell, and the scale is programmed to have a single platform containing that load cell. The scale can be configured to run from multiple platforms there are only a few basic operational differences:

1. An extra display screen is added showing the readings from each individual platform as well as the total weight from all platforms.

2. When viewing individual platform screens, you can manually scroll through different platforms. Press SHIFT+UP in sequence or SHIFT+DOWN in sequence to scroll through the platforms. On the primary weight screens the active platform number is indicated on the bottom of the screen just to the right of the status bar (PL1, PL2 etc.).

3. On the extra platform, you can just use UP key or DOWN key without the need to press SHIFT key. For example, to zero platform 2 use the DOWN ARROW to get the indicator on the right side of the screen to point at platform 2 and then press the ZERO key.

4. An extra menu is inserted in the menu SETUP MENU → PLATFORM SETUPS. This is a menu that shows the description of each platform and allows you select one for editing.

5. When taking or activating tares, parts counting samples, taking a quick sample or pressing the TARE, UNITS, NET/GROSS or ZERO key, the operation will be performed only on the currently selected platform.

6. An auto-scroll feature is available in the Platform Setup screen. This feature allows the indicator to scroll through individual weight screens at specified time intervals. To setup auto-scroll, go to SETUP MENU → PLATFORM SETUP. Choose any activated platform and press EDIT. Scroll down to MULTIPLATFORM SETTINGS. Press ENTER. The horizontal options and the screen text should be clear enough to set the correct settings. It is recommended that the scroll timer should be set no less than 5 seconds. Any number lesser than that can cause some instability in scale readings.

7. FOR DUAL PLATFORMS ONLY: To show the difference between the two platform scales, do the same steps as defined in step 6 above. In the MULTIPLATFORM SETTINGS, select Platform Total to be either "**Sum**" or "**Difference**".

8. If the multiple platform scale has options attached to it, such as RS422, RS485 etc. make sure to read the special notes for that section, if any, that might apply specifically for multiple platform operation.

KEY LOCK PASSWORD PROTECT

This key lock option adds the capability of disabling the front panel by having all of the function keys locked out, until a valid password is entered. Once a valid password is entered, the keys will remain unlocked until the scale is powered down and powered up. By default, the option is not active until an initial password is set.

Keypad Lock

1. Press the menu button. Unlock keys by entering the current password, if necessary.
2. Navigate to Options Setup and then scroll down to "Set Password".
3. "Enter new password" will appear on the display. Enter the desired password (4 digits long)
4. Confirm the password by retyping the intended password. Confirmation is used to assure that a mistyped password is not stored.

Keypad Unlock

1. Press menu button.
2. “Enter Password” will appear on the top line of the display. Enter the password previously set.
3. The function keys will remain unlocked until the scale’s power is powered down and powered up.

Deactivating Keypad Lock

1. Follow the above procedure for setting the password.
2. Instead of entering a password simply press enter twice.
3. This will clear the password and deactivate the key lock option until the password is set again.

SPECIFICATIONS

Model	*Capacity*	*Resolution*	*Platform Size*
B5	5lb / 2.2kg	0.001lb \ 0.0005kg	12" x 16"
B10	10lb / 4.5kg	0.002lb \ 0.001kg	12" x 16"
B25	25lb / 11kg	0.005lb \ 0.002kg	12" x 16"
B50	50lb / 22kg	0.01lb \ 0.005kg	12" x 16"
B100	100lb / 45kg	0.02lb \ 0.01kg	12" x 16"
B150	150lb / 67kg	0.05lb \ 0.02kg	12" x 16"
C30	300lb / 136kg	0.1lb \ 0.05kg	9.25" x 9.25" (or 14" x 14")
P5	500lb / 226kg	0.1lb \ 0.05kg	20" x 27" (Other sizes avail.)
P10	1,000lb / 453kg	0.2lb \ 0.1kg	20" x 27" (Other sizes avail.)
F50	5,000lb / 2260kg	1lb \ 0.5kg	4' x 4' (Other sizes avail.)
F100	10,000lb / 4536kg	2lb \ 1kg	4' x 4' (Other sizes avail.)
F200	20,000lb / 9072kg	5lb \ 2kg	6' x 8' (Other sizes avail.)

Power Requirements Battery Operation or External Power Supply through Safety Barrier.
Classification Intrinsically Safe
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 MKE-5-IS Intrinsically Safe LCD Graphics Display (or Arlyn UpScale Touchscreen Display through Safety Barrier)
Display Speed Adjustable from 0.1 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 ArlynGuard B - Stainless steel platform cover, aluminum construction.
ArlynGuard C – Aluminum Frame/Stainless Steel Pan. All Stainless construction optional.
ArlynGuard F - Diamond plate steel. Aluminum or stainless steel is optional.
ArlynGuard P - Aluminum. Stainless steel is optional.
Load Cell Stainless steel construction for reliability (most models)
Controls Units conversion, Net/Gross, Tare, Zero with secondary functions
Overall Dimensions 13"W x 16"D x 1.5"H (ArlynGuard B), 20"W x 27"D x 1.5H (ArlynGuard P), Depends on model ordered.
Shipping Weight 21 lbs. (ArlynGuard-B), 30 lbs. (ArlynGuard-P), Depends on model ordered.
Options Available Setpoints, RS485 communication, RS422 communication, Weight average and hold, Multi-platform
Approvals Intrinsically Safe Model MKE-5-IS(-a)(-b) Digital Weight Indicator System. Load Cell Models 520-10000L-IS, 520-5000L-IS, 520-5000-IS, 520-2500-IS, 520-1250-IS, 620-300-IS, 620-100-IS, 620-50-IS, 620-25-IS, 620-10-IS, 320-500-IS, 320-250-IS which are Factory Mutual (FM) Approved components as per Approval Standard 3600, 3610, 3611 and 3810.

LIMITED WARRANTY

Note: Each scale comes with a visible or invisible tamper seal. If this seal is found to be broken or manipulated, the warranty is void.

Arlyn Scales warrants that your Arlyn Scales equipment and systems, when properly installed will operate per written specifications. All systems and components are warranted against defects in materials and workmanship for a period of one year.

Arlyn Scales warrants that the equipment sold hereunder will conform to the written specifications authorized by Arlyn Scales. Arlyn Scales warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, Arlyn Scales will, at their option, repair or replace such goods returned within the warranty period subject to the following conditions:

Upon discovery by Buyer of such nonconformity, Arlyn Scales will be given prompt written notice with a detailed explanation of the alleged deficiencies.

Individual electronic components returned to Arlyn Scales for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment.

Examination of such equipment by Arlyn Scales confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; Arlyn Scales will be the sole judge of all alleged non-conformities.

Such equipment has not been modified, altered or changed by any person other than Arlyn Scales. Arlyn Scales will have reasonable time to repair or replace the defective equipment. The buyer is responsible for shipping both ways.

In no event will Arlyn Scales be responsible for travel time, or on-location repairs, including assembly or disassembly of equipment, nor will Arlyn Scales be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ARLYN SCALES WILL NOT, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES

ARLYN SCALES AND BUYER AGREE THAT ARLYN SCALES SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN ARLYN SCALES, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

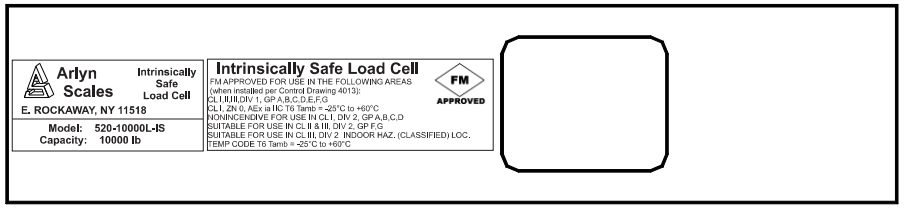
NO TERMS, CONDITIONS OR UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF ARLYN SCALES AND THE BUYER.

CONTROL DRAWINGS

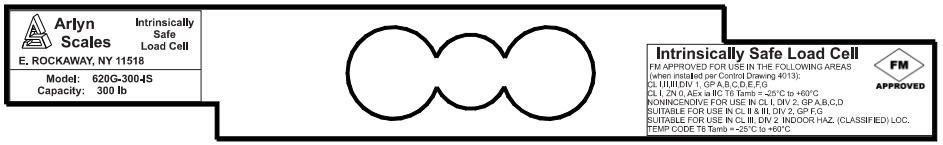
The following drawings, required for the installation of the MKE-5-IS Scale System, are listed below and are included on the following pages.

Doc No	Title
4010	MKE-5-IS General Dimensions
4013	MKE-5-IS Intrinsically Safe Scale System, Installation and Wiring Diagram
4011	MKE-5-IS Indicator Label Drawing
3015	Approved Load Cells, Label Drawing

Model: 5200L-IS Series



Model: 620G-IS Series



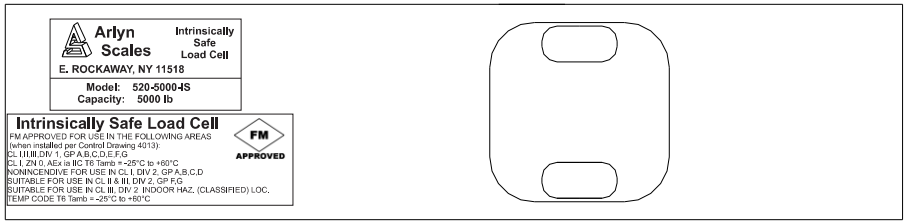
NOTES:

There are two labels per load cell. Both labels must be present on each load cell in order for the FM approval to be validl.

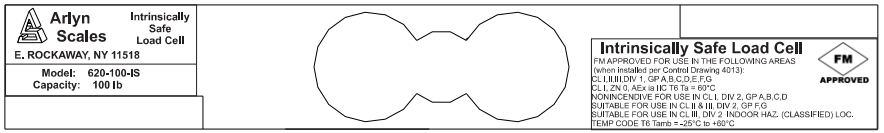
The FM approval label is the same for all five load cell types.

The Model/Capacity Label is different for each Load cell type.

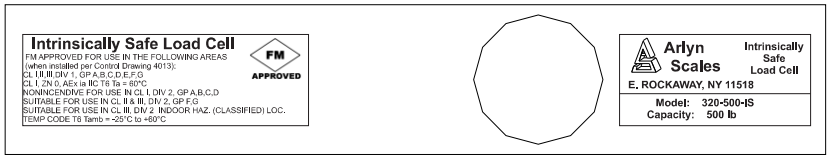
Model: 5200-IS Series



Model: 6200-IS Series



Model: 3200-IS Series

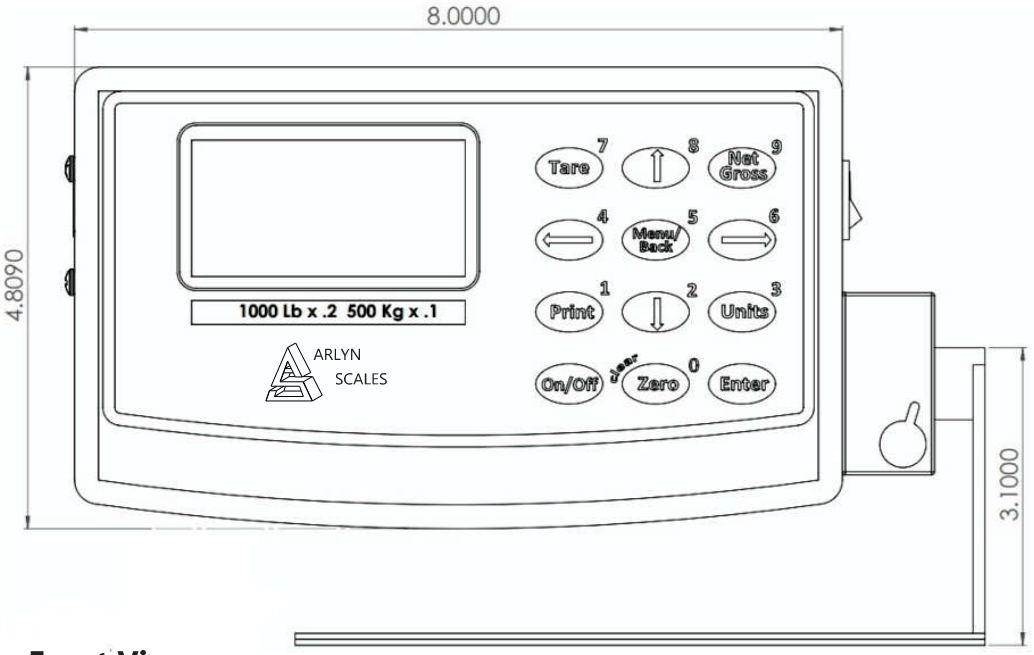


Title:

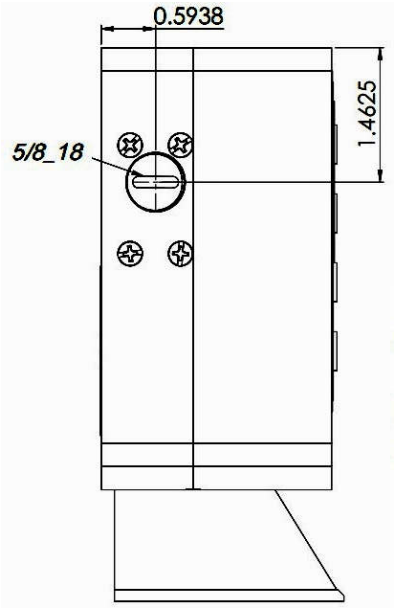
Intrinsically Safe Load Cells Label Drawings

*** NOTE ***
This is a Factory Mutual approved document. No revisions can be made to this document without prior Factory Mutual approval.

DocNo: 3015 **Sheet 1 of 1** **Rev. 1.05**

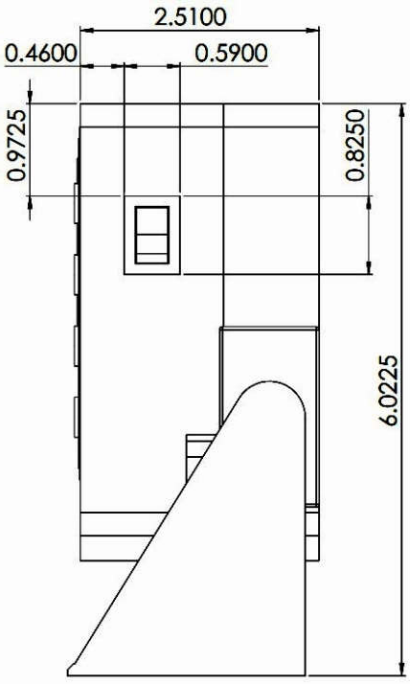


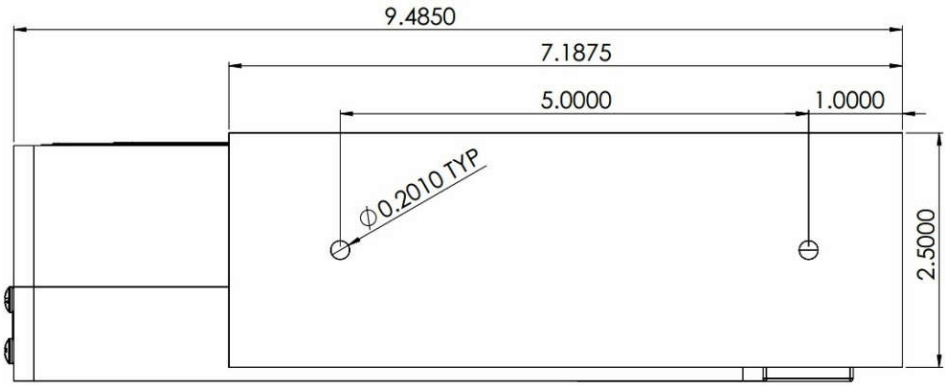
Front View



Left View

Right View





Bottom View

NOTE: All units are in inches unless otherwise noted.

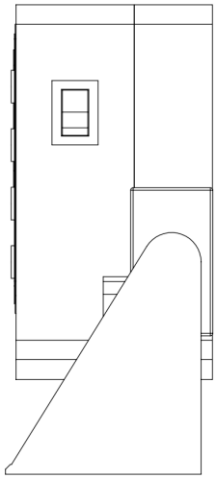
Title:

Model MKE-5-IS Indicator General Dimensions

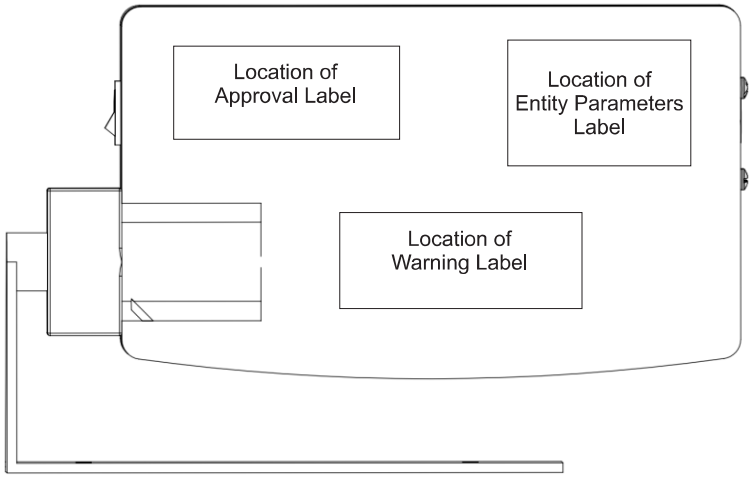
*** NOTE ***
This is a Factory Mutual approved document. No Modifications may be made without prior approval from Factory Mutual.

DocNo: 4010 **Sheet 1 of 1** **Rev. 1.03**

Right SideView



Rear View



Warning Label

WARNINGS

DO NOT OPEN BATTERY COVER IN A HAZARDOUS AREA. TO RECHARGE BATTERY, MOVE THIS ENTIRE SCALE INDICATOR TO A SAFE AREA, REMOVE THE BATTERY AND RECHARGE.. AFTER CHARGING, PLACE BATTERY IN ITS HOLDER AND TIGHTEN THE COVER BEFORE RETURNING TO A HAZARDOUS AREA.

TO AVOID THE POSSIBILITY OF STATIC BUILDUP, THIS HOUSING MUST NOT BE RUBBED OR CLEANED WITH A DRY CLOTH.

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY OR SUITABILITY FOR DIVISION 2.

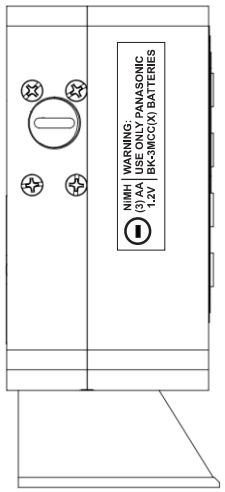
Approval Label

Arlyn Scales, E. Rockaway, NY 11518
Model: MKE-5-IS **Serial:**

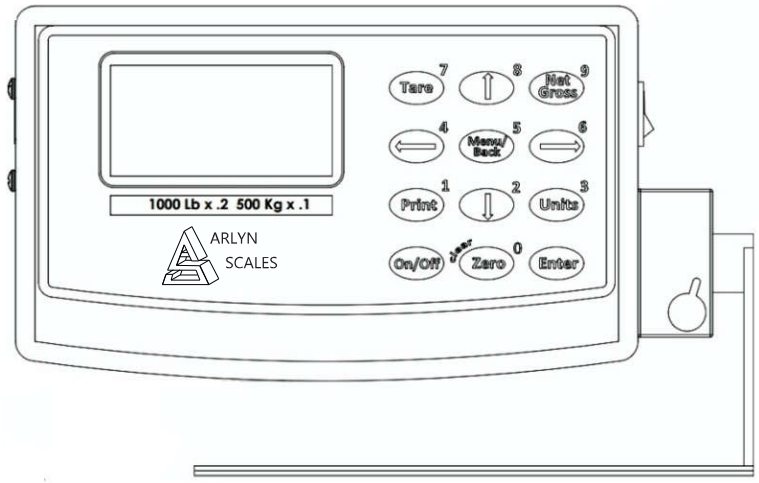
FM APPROVED

INTRINSICALLY SAFE FOR USE IN THE FOLLOWING AREAS
Class I, II, III, Division 1, Groups A, B, C, D, E, F & G; T3C Ta =40°C, T3B Ta = 60°C
Class I, Zone 0, AEx ia IIC Ga T3 Ta = 60°C
NON-INCENDIVE
Class I, II, III, Division 2, Groups A, B, C, D F & G; T6 Ta = 60°C
(when installed per Control Drawing 4013)

Left SideView



Front View



Entity Parameters Label

MKE-5-IS	Entity/NIFW Input Params	Output Params
	Vmax (or Ui) = 4.935V	Uo = 4.935V
	Imax (or Ii) = 1.94A	Io = 1.94A
	Pi = 850mW	Po = 850mW
	Ci =15uF	Co =85uF
	Li =0.1uH	Lo =12uH

Battery Label

NiMH (3) AA 1.2V	WARNING: USE ONLY PANASONIC BK-3MCC(X) BATTERIES

*** NOTES ***

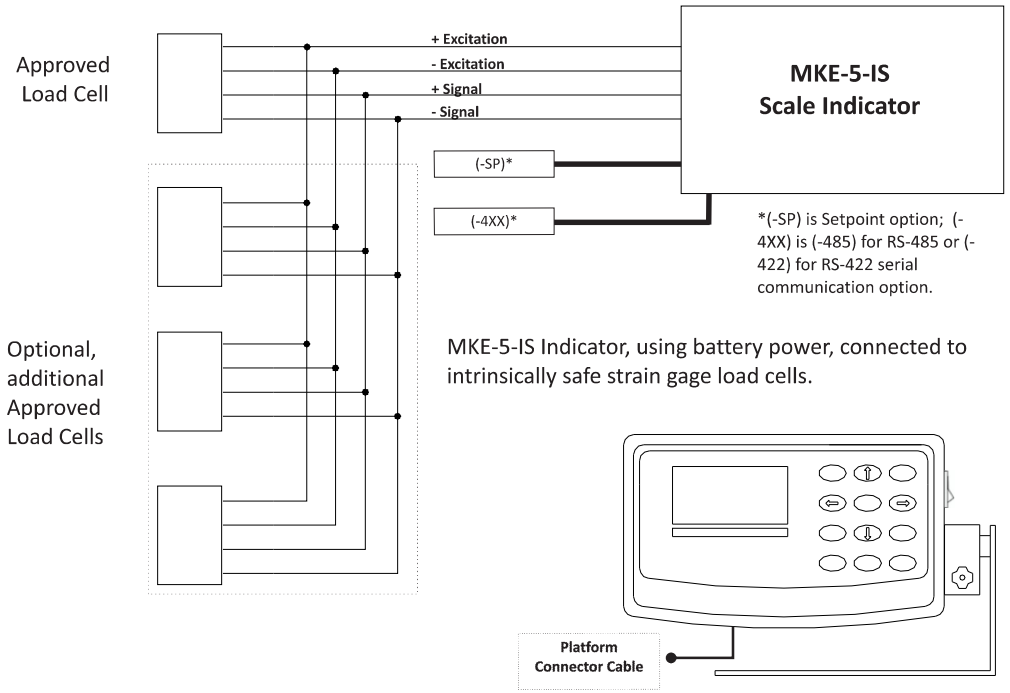
There are four labels; (1) Approval Label, (2) Warning Label (3) Entity Parameters Label and (4) Battery Label. All labels must be present on the rear face of the indicator as shown.

Title: Model MKE-5-IS Label Drawing

*** NOTE ***
This is a Factory Mutual approved document. No revisions can be made to this document without prior Factory Mutual approval.

DocNo: 4011 Sheet 1 of 1 **Rev. 1.06**

HAZARDOUS AREA



MKE-5-IS Indicator, using battery power, connected to intrinsically safe strain gage load cells.

CABLE TYPES AND MAXIMUM LENGTHS

All external wiring for the load cell(s) and/or communications interface MUST use a specific cable obtained from Arlyn Scales.

The communications interface cable is available complete with connector. Its length may be specified when ordering. Load cells are supplied with a connecting cable already attached. Cable may be obtained from Arlyn Scales to increase its length, or to use as wiring in multiple load cell applications.

WARNING - MAXIMUM CABLE LENGTHS

The maximum cable length is not to exceed 133 feet. This is the sum of all cable lengths, including the original load cell's connecting cable(s), the IR communications interface cable, and all interconnecting wiring.

Exceeding the maximum total length of 133 feet will impair intrinsic safety, violate FM approval, and will render the unit incapable of being used safely in a hazardous environment.

WARNING - BATTERY REMOVAL

DO NOT OPEN BATTERY COVER IN A HAZARDOUS AREA. TO RECHARGE BATTERY, MOVE THIS ENTIRE SCALE INDICATOR TO A SAFE AREA, REMOVE THE BATTERY AND RECHARGE.

AFTER CHARGING, PLACE BATTERY IN ITS HOLDER AND TIGHTEN THE COVER BEFORE RETURNING TO A HAZARDOUS AREA.

WARNING - STATIC ELECTRICAL CHARGES

To avoid the possibility of static buildup, the indicator housing MUST NOT be rubbed or cleaned with a dry cloth.

HAZARDOUS AREA APPROVALS

This system, when installed in accordance with this document, has been approved by Factory Mutual for use in the following hazardous areas:

Intrinsically Safe Class I, II, III, Division 1, Groups A, B, C, D, E, F & G
Class I, Zone 0, Gas Group IIC
Class I, II, III Division 2, Groups A, B, C, D, F & G
Hazardous (Classified) Locations.

Load Cells: Temperature Class T6 @ +60C
MKE Indicator: Temperature Class (Divisions) T3C at +40C; T3B at +60C
MKE Indicator: Temperature Class (Zones) T3 at +60C

APPROVED LOAD CELLS

The MKE-5-IS Scale System has been rated as intrinsically safe by Factory Mutual when used with approved Arlyn load cells from the following list.

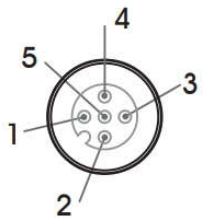
3200-IS Series (denoted as 320-xxxx-IS models, e.g. 320-500-IS, 320-1000-IS, etc.)
5200-IS Series (denoted as 520-xxxx(L)-IS models, e.g. 520-2500-IS, 520-5000-IS, 520-10000L-IS, etc.)
6200-IS Series (denoted as 620-xxxx-IS models, e.g. 620-10-IS, 620-25-IS, 620-50-IS, etc.)
620G-IS Series (denoted as 620G-xxxx-IS models, e.g. 620G-60-IS, 620G-100-IS, 620G-300-IS, etc.)

*(-SP) is Setpoint option; (-4XX) serial communication option;

POWER SWITCH

The MKE-5-IS indicator is equipped with a Single Pull Double Throw (SPDT) Rocker Switch above the L-bracket mounting hardware. Use this switch to change the power source of the indicator between battery power and external power (intrinsically safe or through barrier). The switch is marked as following:

I -> Battery Power
0 -> OFF
II -> External Power



PLATFORM CONNECTOR CABLE

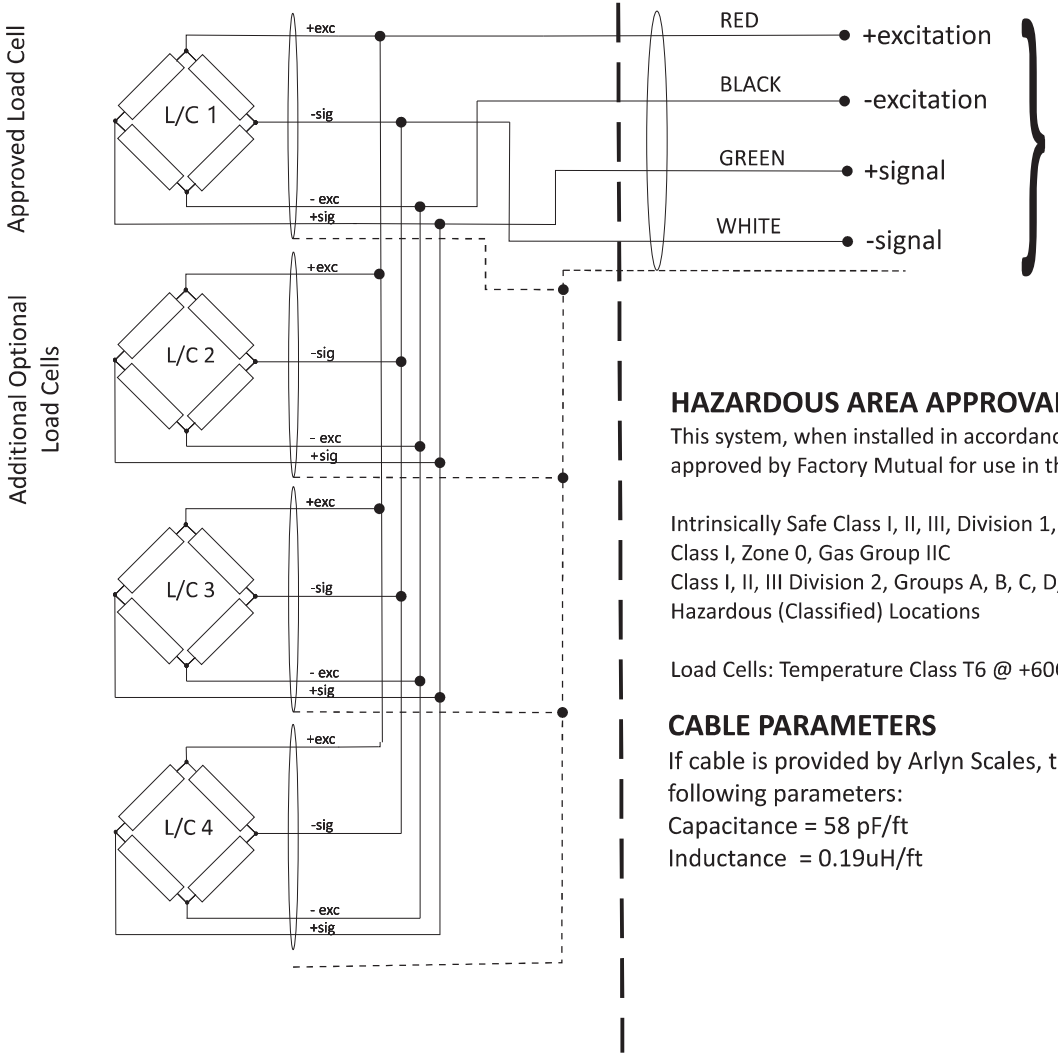
PIN#	COLOR	DESCRIPTION
1	BROWN	NO CONNECTION
2	WHITE	- SIGNAL
3	BLUE	+ EXCITATION (3.3 VDC)
4	BLACK	- EXCITATION
5	GRAY	+ SIGNAL

Title: **MKE-5-IS Scale Indicator, Battery Powered, connected to Approved Strain Gage Load Cells**

*** NOTE ***
This is a Factory Mutual (FM) approved document. No revisions can be made to this drawing without prior Factory Mutual approval.

HAZARDOUS AREA

UNCLASSIFIED AREA



The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus when the following is true:

The Voc, Vt or Uo of all barriers combined shall not exceed Vmax or 18V.
The Isc, It, Io of all barriers combined shall not exceed Imax, Ii or 440mA.
The Po of all barriers combined shall not exceed Pi or 900mW.
The lowest Ca(Co) of any barrier shall not be exceeded.
The lowest La(Lo) of any barrier shall not be exceeded.

HAZARDOUS AREA APPROVALS

This system, when installed in accordance with this document, has been approved by Factory Mutual for use in the following hazardous areas:

Intrinsically Safe Class I, II, III, Division 1, Groups A, B, C, D, E, F & G
Class I, Zone 0, Gas Group IIC
Class I, II, III Division 2, Groups A, B, C, D, F & G
Hazardous (Classified) Locations

Load Cells: Temperature Class T6 @ +60C

CABLE PARAMETERS

If cable is provided by Arlyn Scales, then the cable will have the following parameters:
Capacitance = 58 pF/ft
Inductance = 0.19uH/ft

APPROVED LOAD CELLS

3200-IS Series
5200-IS Series
6200-IS Series
620G-IS Series

*(See Sheet 1 for details)

ENTITY PARAMETERS

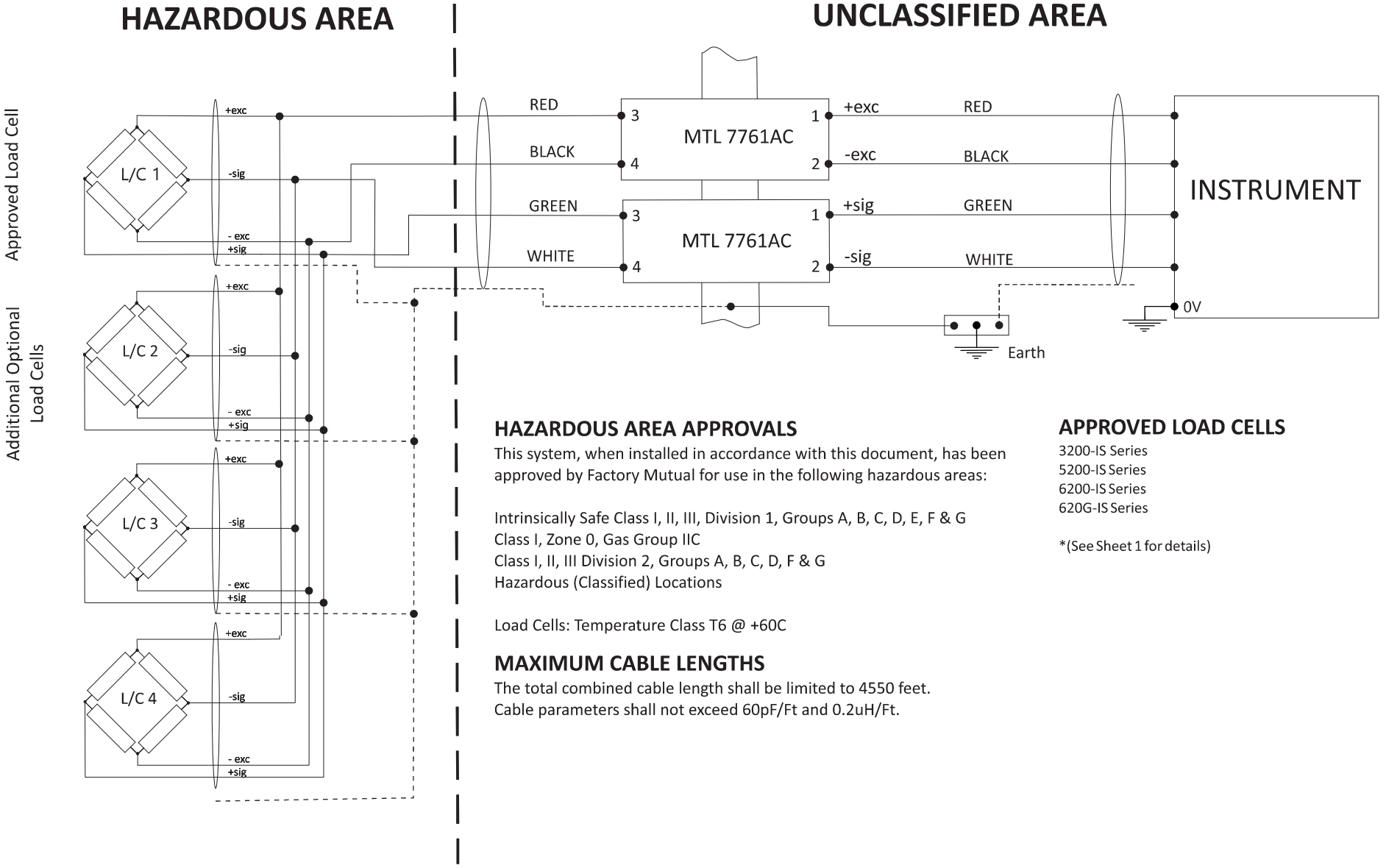
Vmax (or Ui) = 18V
Imax (or Ii) = 440mA
Pi = 900mW
Ci = 0
Li = 0

NOTES

1. No revision or drawing without prior FM Approval
2. Installations in the U.S. should be in accordance to with should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the latest edition of the National Electrical Code (ANSI/NFPA 70). Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 ohm.
3. Install Intrinsic Safe barriers in accordance with barrier instructions.
4. Apparatus connected to the system shall not use or generate voltage greater than 250V.
5. Associated apparatus must be FM Approved.

Title: **Intrinsically Safe Load Cells Installation and Wiring Diagram - General**

*** NOTE ***
This is a Factory Mutual (FM) approved document. No revisions can be made to this drawing without prior Factory Mutual approval.



HAZARDOUS AREA APPROVALS

This system, when installed in accordance with this document, has been approved by Factory Mutual for use in the following hazardous areas:

Intrinsically Safe Class I, II, III, Division 1, Groups A, B, C, D, E, F & G
Class I, Zone 0, Gas Group IIC
Class I, II, III Division 2, Groups A, B, C, D, F & G
Hazardous (Classified) Locations

Load Cells: Temperature Class T6 @ +60C

MAXIMUM CABLE LENGTHS

The total combined cable length shall be limited to 4550 feet.
Cable parameters shall not exceed 60pF/Ft and 0.2uH/Ft.

APPROVED LOAD CELLS

3200-IS Series
5200-IS Series
6200-IS Series
620G-IS Series

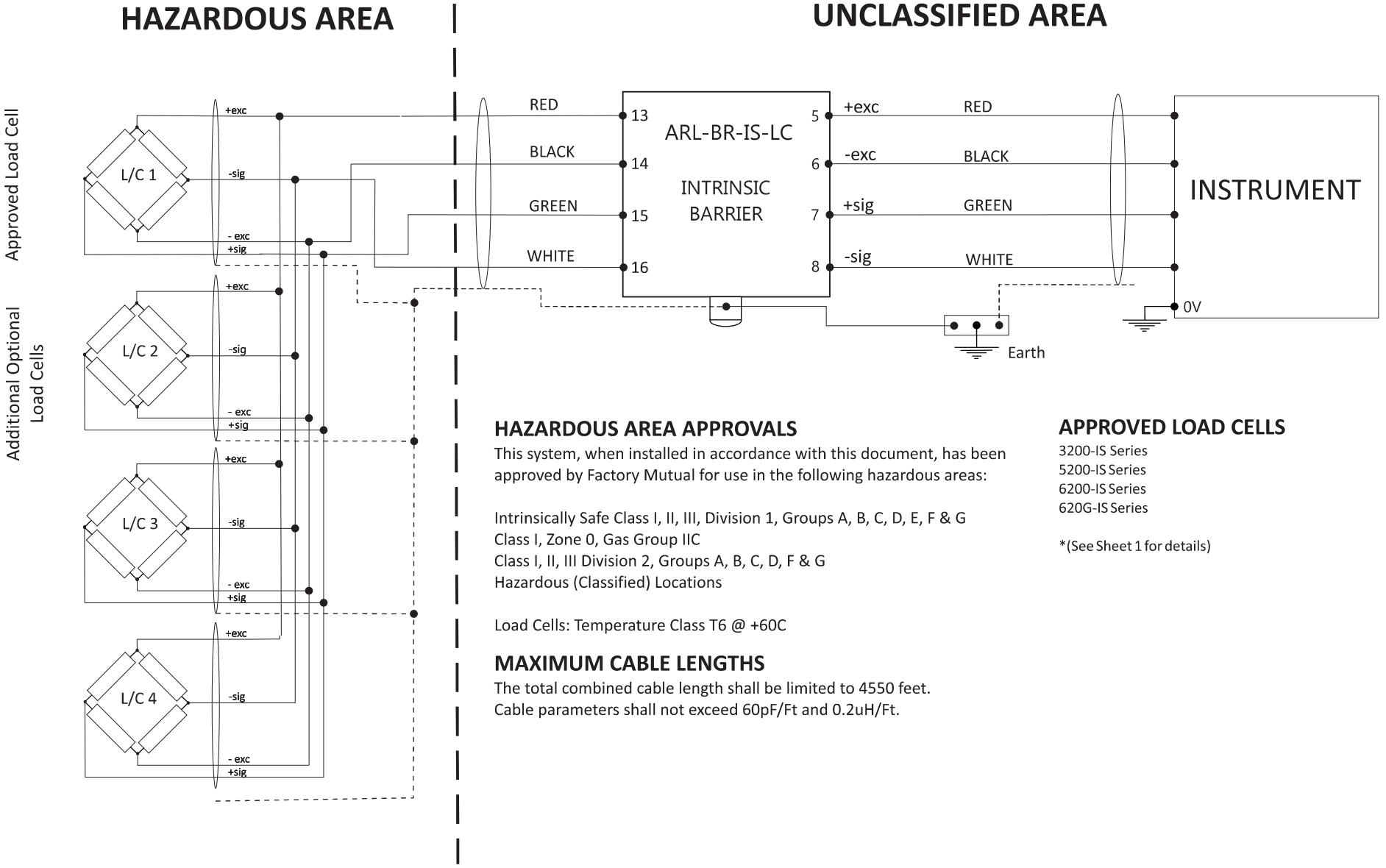
*(See Sheet 1 for details)

NOTES

1. No revision or drawing without prior FM Approval
2. Installations in the U.S should be in accordance to with should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the latest edition of the National Electrical Code (ANSI/NFPA 70). Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 ohm.
3. Install Intrinsic Safe barriers in accordance with barrier instructions.
4. Apparatus connected to the system shall not use or generate voltage greater than 250V.
5. Associated apparatus must be FM Approved.

Title: **Intrinsically Safe Load Cells Installation and Wiring Diagram - MTL Barriers**

*** NOTE ***
This is a Factory Mutual (FM) approved document. No revisions can be made to this drawing without prior Factory Mutual approval.



HAZARDOUS AREA APPROVALS

This system, when installed in accordance with this document, has been approved by Factory Mutual for use in the following hazardous areas:

Intrinsically Safe Class I, II, III, Division 1, Groups A, B, C, D, E, F & G
Class I, Zone 0, Gas Group IIC
Class I, II, III Division 2, Groups A, B, C, D, F & G
Hazardous (Classified) Locations

Load Cells: Temperature Class T6 @ +60C

MAXIMUM CABLE LENGTHS

The total combined cable length shall be limited to 4550 feet.
Cable parameters shall not exceed 60pF/Ft and 0.2uH/Ft.

APPROVED LOAD CELLS

3200-IS Series
5200-IS Series
6200-IS Series
620G-IS Series

*(See Sheet 1 for details)

NOTES

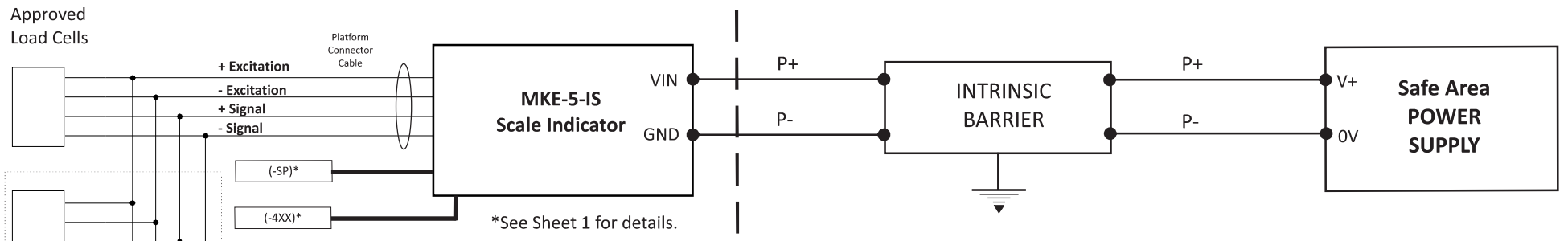
1. No revision or drawing without prior FM Approval
2. Installations in the U.S. should be in accordance to with should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the latest edition of the National Electrical Code (ANSI/NFPA 70). Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 ohm.
3. Install Intrinsic Safe barriers in accordance with barrier instructions.
4. Apparatus connected to the system shall not use or generate voltage greater than 250V.
5. Associated apparatus must be FM Approved.

Title: **Intrinsically Safe Load Cells Installation and Wiring Diagram - ARL-BR-IS-LC Barrier**

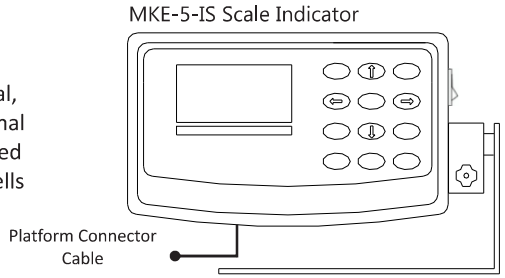
*** NOTE ***
This is a Factory Mutual (FM) approved document. No revisions can be made to this drawing without prior Factory Mutual approval.

HAZARDOUS AREA

UNCLASSIFIED AREA



MKE-5-IS configured for Approved Strain Gage Load Cells, powered by external power supply through Intrinsic Barrier.



The MKE-5-IS indicator is equipped with a Single Pull Double Throw (SPDT) Rocker Switch above the L-bracket mounting hardware. Use this switch to change the power source of the indicator between battery power and external power (intrinsically safe or through barrier supply). The switch is marked as following:

I -> Battery Power
0 -> OFF
II -> External Power

The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus when the following is true:

Vmax (or Ui) ≥ Voc, Vt, or Uo
Imax (or Ii) ≥ Isc, It or Io (*Combined Isc, It or Io for ALL BARRIERS ≤ Imax)
Po ≤ Pi
Ca (or Co) ≥ Ci + Ccable
La (or Lo) ≥ Li + Lcable

HAZARDOUS AREA APPROVALS

This system, when installed in accordance with this document, has been approved by Factory Mutual for use in the following hazardous areas:

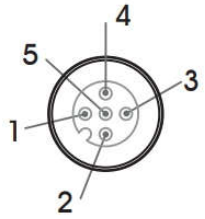
Intrinsically Safe Class I, II, III, Division 1, Groups A, B, C, D, E, F & G
Class I, Zone 0, Gas Group IIC
Class I, II, III Division 2, Groups A, B, C, D, F & G
Hazardous (Classified) Locations.

Load Cells: Temperature Class T6 @ +60C
MKE-5-IS: Temperature Class (Divisions) T3C at +40C; T3B at +60C
MKE-5-IS: Temperature Class (Zones) T3 at +60C

MKE-5-IS
Entity/NIFW Output Parameters:
Uo = 4.935V
Io = 1.94A
Po = 850mW
Co = 85uF
Lo = 12uH

MKE-5-IS
Entity/NIFW Input Parameters:
Vmax (or Ui) = 4.935V
Imax (or Ii) = 1.94A
Pi = 850mW
Ci = 15uF
Li = 0.1uH

Cable Parameters:
Capacitance = 58 pF/ft
Inductance = 0.19uH/ft



PLATFORM CONNECTOR CABLE

PIN#	COLOR	DESCRIPTION
1	BROWN	NO CONNECTION
2	WHITE	- SIGNAL
3	BLUE	+ EXCITATION (3.3 VDC)
4	BLACK	- EXCITATION
5	GRAY	+ SIGNAL

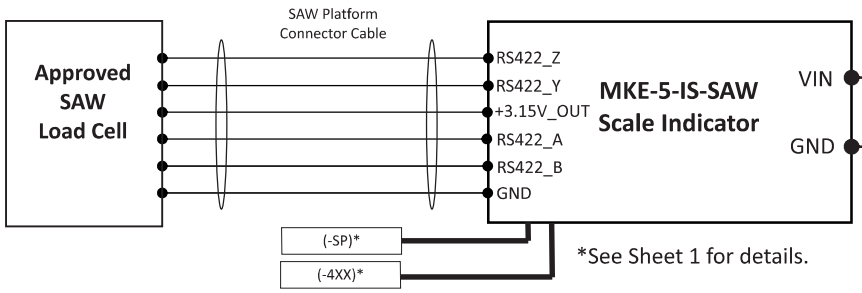
NOTES

1. No revision or drawing without prior FM Approval
2. Installations in the U.S. should be in accordance to with should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the latest edition of the National Electrical Code (ANSI/NFPA 70). Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 ohm.
3. Install Intrinsic Safe barriers in accordance with barrier instructions.
4. Apparatus connected to the system shall not use or generate voltage greater than 250V.
5. Associated apparatus must be FM Approved.

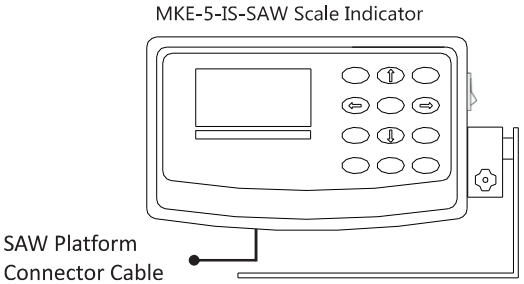
Title: **MKE-5-IS Scale Indicator, w/ External Power Supply through Intrinsic Barriers, connected to Approved Strain Gage Load Cells**

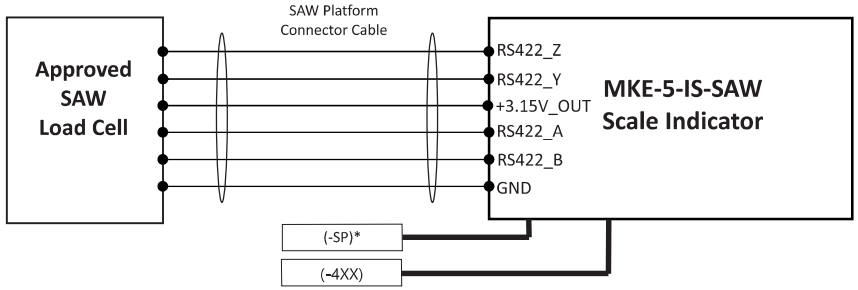
*** NOTE ***
This is a Factory Mutual (FM) approved document. No revisions can be made to this drawing without prior Factory Mutual approval.

HAZARDOUS AREA



MKE-5-IS-SAW Indicator configured for SAW Load Cell connectivity, powered by an external power source through an intrinsically safe barrier.



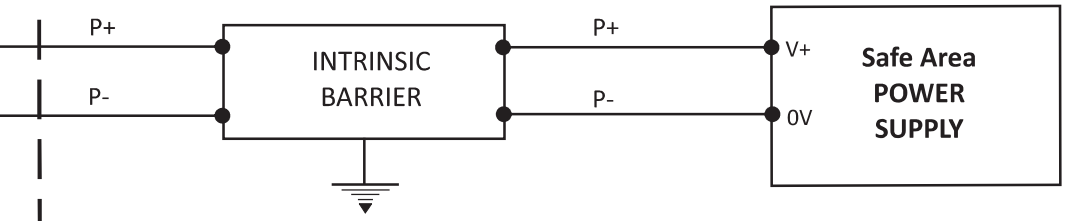


The MKE-5-IS-SAW indicator can operate in the Hazardous environment powered by the battery and no external power supply.

The MKE-5-IS indicator is equipped with a Single Pull Double Throw (SPDT) Rocker Switch above the L-bracket mounting hardware. Use this switch to change the power source of the indicator between battery power and external power (intrinsically safe or through barrier supply). The switch is marked as following:

I -> Battery Power
0 -> OFF
II -> External Power

UNCLASSIFIED AREA



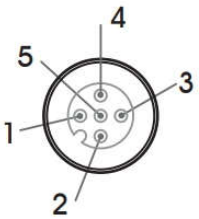
MKE-5-IS
Entity/NIFW Input Parameters:
Vmax (or Ui) = 4.935V
Imax (or Ii) = 1.94A
Pi = 850mW
Ci = 15uF
Li = 0.1uH

MKE-5-IS
Entity/NIFW Output Parameters:
Uo = 4.935V
Io = 1.94A
Po = 850mW
Co = 85uF
Lo = 12uH

APPROVED SAW LOAD CELLS

SAW-IS-X, SAW-IS-T, SAW-IS-L, SAW-IS-C, SAW-IS-H, SAW-IS-HL, SAW-IS-JL, SAW-IS-KL, SAW-IS-ML

MKE-5-IS SAW LC CONNECTOR



PIN#	COLOR	DESCRIPTION
1	BROWN	RS422_Z
2	WHITE	RS422_Y
3	BLUE	+3.15VDC OUT
4	BLACK	RS422_A
5	GRAY	RS422_B
SHIELD	BARE	GND

Title: **MKE-5-IS Scale Indicator, w/ Battery & External Power Supply, connected to Approved SAW Load Cell.**

*** NOTE ***
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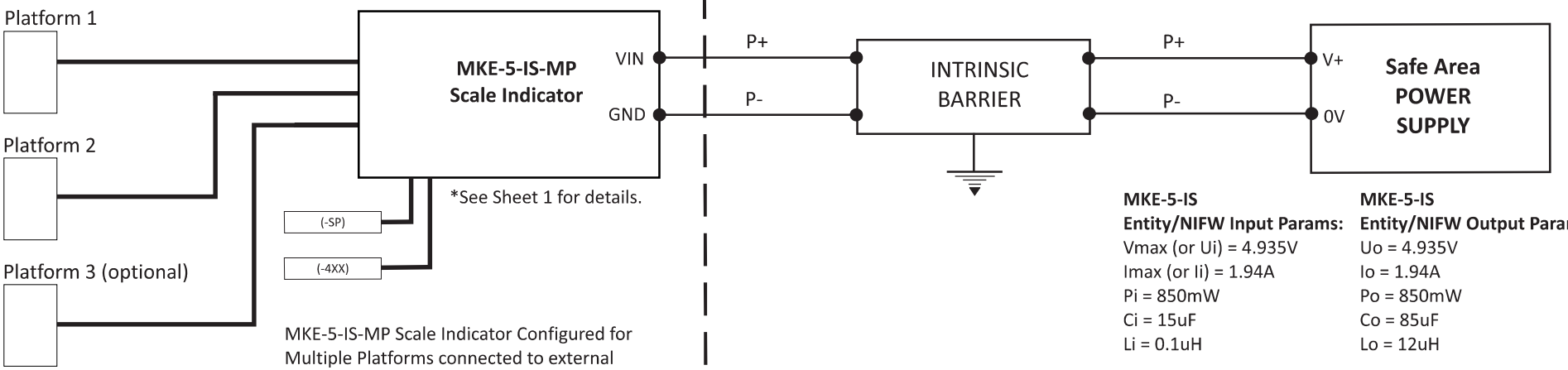
HAZARDOUS AREA

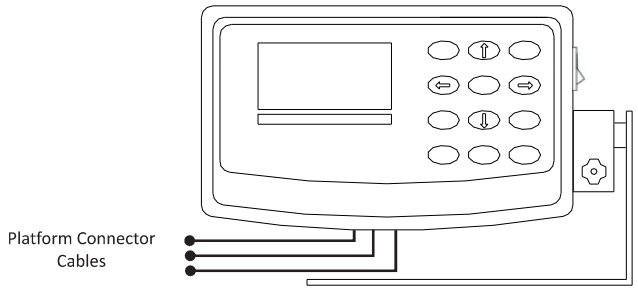
UNCLASSIFIED AREA



MKE-5-IS-MP Scale Indicator Configured for Multiple Platforms connected to external power source through intrinsic barrier.

MKE-5-IS Entity/NIFW Input Params:
Vmax (or Ui) = 4.935V
Imax (or Ii) = 1.94A
Pi = 850mW
Ci = 15uF
Li = 0.1uH

MKE-5-IS Entity/NIFW Output Params:
Uo = 4.935V
Io = 1.94A
Po = 850mW
Co = 85uF
Lo = 12uH

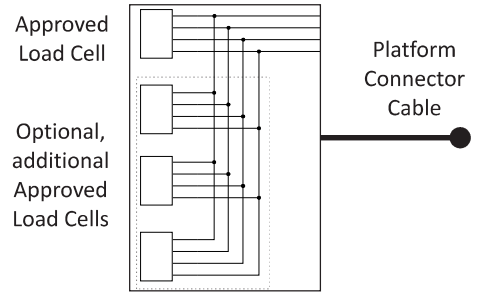


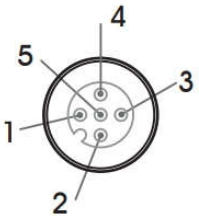
MKE-5-IS-MP Scale Indicator

The MKE-5-IS indicator is equipped with a Single Pull Double Throw (SPDT) Rocker Switch above the L-bracket mounting hardware. Use this switch to change the power source of the indicator between battery power and external power (intrinsically safe or through barrier supply). The switch is marked as following:

I -> Battery Power
0 -> OFF
II -> External Power

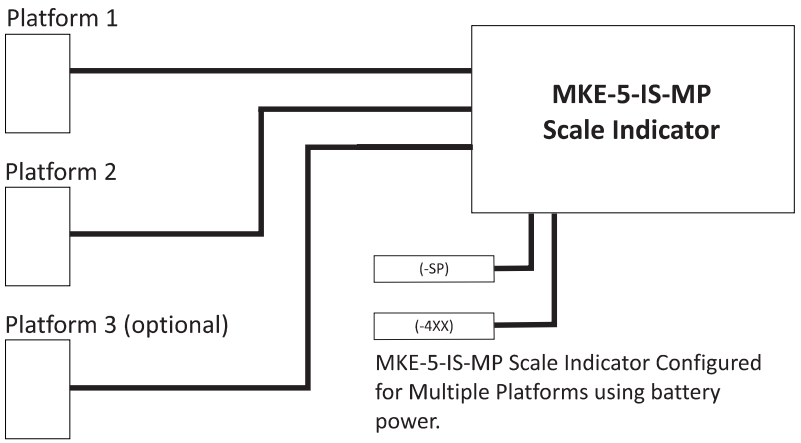
SINGLE PLATFORM (STRAIN GAGE) LOAD CELLS WIRING DIAGRAM (see Sheet 1)





PLATFORM CONNECTOR CABLE

PIN#	COLOR	DESCRIPTION
1	BROWN	NO CONNECTION
2	WHITE	- SIGNAL
3	BLUE	+ EXCITATION (3.3 VDC)
4	BLACK	- EXCITATION
5	GRAY	+ SIGNAL



MKE-5-IS-MP Scale Indicator Configured for Multiple Platforms using battery power.

Title: **MKE-5-IS System - Multiple Platform with Battery and External Power Supply - Installation & Wiring Diagram**

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