Cardinal®

Cardinal Scale Manufacturing Co.

205

WEIGHT INDICATOR

INSTALLATION and TECHNICAL MANUAL

ISO REGISTERED 9001

8200-M024-O1 Rev H
02/11

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Printed in USA

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TABLE OF CONTENTS

SERIAL NUMBER ______________________

DATE OF PURCHASE __________________

PURCHASED FROM ___________________

____

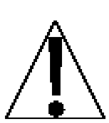
____

____

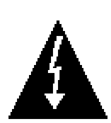
RETAIN THIS INFORMATION FOR FUTURE USE

PRECAUTIONS

Before using this indicator, read this manual and pay special attention to all "WARNING" symbols:



IMPORTANT



ELECTRICAL WARNING

STATIC SENSITVE

FCC COMPLIANCE STATEMENT

WARNING! This equipment generates uses and can radiate radio frequency and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user will be responsible to take whatever measures necessary to correct the interference.

You may find the booklet “How to Identify and Resolve Radio TV Interference Problems” prepared by the Federal Communications Commission helpful. It is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 001-000-00315-4.

PROPER DISPOSAL

When this device reaches the end of its useful life, it must be properly disposed of. It must not be disposed of as unsorted municipal waste. Within the European Union, this device should be returned to the distributor from where it was purchased for proper disposal. This is in accordance with EU Directive 2002/96/EC. Within North America, the device should be disposed of in accordance with the local laws regarding the disposal of waste electrical and electronic equipment.

It is everyone’s responsibility to help maintain the environment and to reduce the effects of hazardous substances contained in electrical and electronic equipment on human health. Please do your part by making certain that this device is properly disposed of. The symbol shown below indicates that this device must not be disposed of in unsorted municipal waste programs.

SPECIFICATIONS

Power Requirements:	100 to 240 VAC (50/60 Hz) at 0.4A
Enclosure Type:	Stainless Steel wall or desk-mount
Enclosure Size:	9 3/16" W x 7 1/2" H x 3 1/8" D (233mm W x 191mm H x 79mm D)
Weight:	8.2lbs - *(9.6lb with battery)*
Operating Environment:	Temperature: 14 to 104 ºF (-10 to +40 ºC) Humidity: 90% non-condensing (maximum)
Display:	Six digit, seven segment, 0.6" high LED
Transducer Excitation:	12 VDC
(Jumper selectable)	8 VDC with battery operation (jumper selectable)
Signal Input Range:	1.0 mV min. to 40 mV max. (with dead load boost)
Number of Load Cells:	8 each, 350 OHM minimum resistance
Load Cell Cable Length:	1500 feet maximum. ***Consult factory for other requirements***
	30 feet maximum without sense lines
Division Value:	1, 2, or 5 x 10, 1, 0.1, 0.01, 0.001 commercial
	0 to 99, non-commercial
Sensitivity:	
NON-COMMERCIAL	0.15 uV/e
NTEP	0.3uV/e (Class III/IIIL)
CANADA	0.3uV/e (Class III/IIIHD)
OIML	0.7 uV/e (Class III)
Scale Divisions:	
NON-COMMERCIAL	100 to 240,000
NTEP	100 to 10,000 (Class III/IIIL)
CANADA	100 to 10,000 (Class III/IIIHD)
OIML	100 to 10,000 (Class III)
Internal Resolution:	1 part in 16,777,216
Tare Capacity:	Scale Capacity
Sample Rate:	1 to 100 samples per second, selectable
Auto Zero Range:	0.5 or 1 through 9 divisions
Weighing Units:	Tons, Pounds, Pounds-Ounces, Ounces,
	Metric Tons, Kilograms, Grams
Keypad:	Color coded Membrane type, 7 keys
Standard I/O:	(1) bi-directional RS232 (20mA)
	(1) output only RS232 (20mA)
Battery Operation:	205EU - CAM-350 Type, 12V 2Ah

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

ATTENTION: RISQUE D'EXPLOSION SI LA BATTERIES EST REMPLACE'E PAR UN TYPE INCORRECT. REJETEZ LES BATTERIES UTILISE'ES SELON LES INSTRUCTIONS.

SPECIFICATIONS, CONT.

Standard Features:

- Push button tare function
- Gross, tare, net conversion
- Selectable key lockout
- Hi-Resolution mode
- Adjustable filtering
- Gross and Net accumulators
- Dual serial ports
- Remote input lines for Zero, Tare, Gross and Print (1000 feet maximum)
- Programmable print format using Visual Print or nControl (2 Visual Tickets available)
- SMA level 2 compliant serial communications
  (For more information see http://www.scalemanufacturers.org)
- Field re-programmable via PC interconnection
- Test feature (performs display and internal tests)
- Auto Shutoff and Sleep modes
- Battery operation
  (Requires additional hardware and includes additional documentation)

Optional Features:

Analog Output*, Allen-Bradley Interface*, 10/100 mbps Ethernet Adapter*, Additional Serial Port*, Internal Relay Box*, External Relay Box*, Special Filtering, and Column Mounting

*This feature requires additional hardware and includes additional documentation.

Certifications:

This equipment is certified to comply with the requirements for a Class III/IIIL device by the

- National Conference on Weights and Measurements (Certificate No. 01-011)
- Measurement Canada (Approval No. AM-5397)
- And for a Class III device by OIML R-76 (Certificate No. DK 0199.47).

EUROPEAN DECLARATION OF CONFORMITY

Manufacturer: Cardinal Scale Manufacturing Company
PO Box 151
203 East Daugherty
Webb City, Missouri 64870 USA
Telephone No. (417) 673-4631
Fax No. (417) 673-5001

Product: Non-automatic Weight Indicating Instrument
Model Numbers 200, 205, 210, 210FE, 215, 220 and 225
Serial Number EXXXYY-ZZZ
where XXX = day of year
YY = last two digits of year
ZZZ = sequential number

The undersigned hereby declares, on behalf of Cardinal Scale Manufacturing Company of Webb City, Missouri, that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

European Standard EN 45501: 1992 and equivalent International Recommendation OIML R76, edition 1992
EU Type Approval Certificate Number DK 0199.159
Report No. DANAK-1910304

Council Directive 2006/95/EC Low Voltage Directive
as amended by Council Directive 93/68/EEC (22 July, 1993)

Council Directive 90/384/EEC (20 June, 1990) on the Harmonization Of the Laws of Member States relating to non-automatic weighing Systems as amended by:
Council Directive 93/68/EEC (22 July, 1993)

European Standard EN50082: 1995 for radiated emissions and
European Standard EN50082-2: 1995 Class B for EMC immunity.

The Technical Construction File required by this Directive is maintained at the corporate headquarters of Cardinal Scale Manufacturing Company, 203 East Daugherty, Webb City, Missouri.

Ginger Harper
Director, Quality Assurance

PRECAUTIONS

Static Electricity

CAUTION! This device contains static sensitive circuit cards and components. Improper handling of these devices or printed circuit cards can result in damage to or destruction of the component or card. Such actual and/or consequential damage **IS NOT** covered under warranty and is the responsibility of the device owner. Electronic components must be handled only by qualified electronic technicians who follow the guidelines listed below.

ATTENTION! ALWAYS use a properly grounded wrist strap when handling, removing or installing electronic circuit cards or components. Make certain that the wrist strap ground lead is securely attached to an adequate ground. If you are uncertain of the quality of the ground, you should consult a licensed electrician.

ALWAYS handle printed circuit card assemblies by the outermost edges. **NEVER** touch the components, component leads or connectors. **ALWAYS** observe warning labels on static protective bags and packaging and never remove the card or component from the packaging until ready for use. **ALWAYS** store and transport electronic printed circuit cards and components in anti-static protective bags or packaging.

SITE PREPARATION REQUIREMENTS

The Cardinal 205 indicator is a precision weight-measuring instrument. As with any precision instrument, it requires an acceptable environment to operate at peak performance and reliability. This section is provided to assist you in obtaining such an environment.

Environmental

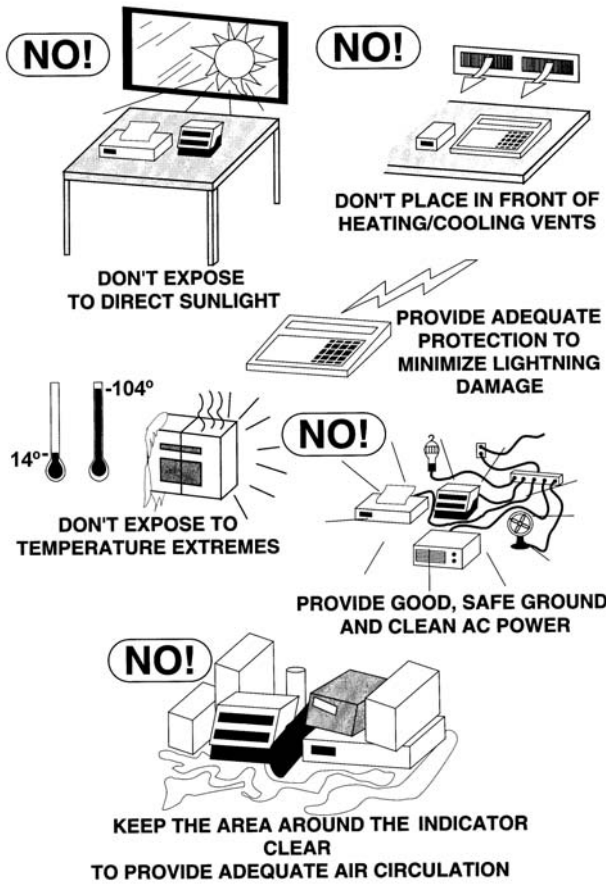
The Model 205 indicator meets or exceeds all certification requirements within a temperature range of 14 to 104 °F (-10 to +40 °C).

In order to keep cooling requirements to a minimum, the indicator should be placed out of direct sunlight and to provide adequate air circulation, keep the area around the indicator clear.

Make certain the indicator is not directly in front of a heating or cooling vent. Such a location will subject the indicator to sudden temperature changes, which may result in unstable weight readings.

Insure that the indicator has good, clean AC power and is properly grounded.

In areas subject to lightning strikes, additional protection to minimize lightning damage, such as surge suppressors, should be installed.



SITE PREPARATION REQUIREMENTS

Electrical Power

The 205 indicator has been designed to operate from 100 to 240 VAC at 50/60 Hz. Note that a special order is not required for operation at 230/240 VAC.

CAUTION! - To avoid electrical hazard and possible damage to the indicator, DO NOT, under any circumstance, cut, remove, alter, or in any way bypass the power cord grounding prong.

- The socket-outlet supplying power to the indicator should be on a separate circuit from the distribution panel and dedicated to the exclusive use of the indicator.
- The socket-outlet shall be installed near the equipment and shall be easily accessible. Note that the power cord on the 205 (without the Battery Option) serves as the power disconnect.
- The wiring should conform to national and local electrical codes and ordinances and should be approved by the local inspector to assure compliance.
- For outdoor operations, the socket-outlet must provide GFCI (ground fault circuit interrupter) protection.
- On installations requiring 230/240 VAC power, **it is the responsibility of the customer** to have a qualified electrician install the proper power cord plug that conforms to national electrical codes and local codes and ordinances.

Electrical Noise Interference

To prevent electrical noise interference, make certain all other wall outlets for use with air conditioning and heating equipment, lighting or other equipment with heavily inductive loads, such as welders, motors and solenoids are on circuits separate from the indicator. Many of these disturbances originate within the building itself and can seriously affect the operation of the indicator. These sources of disturbances must be identified and steps must be taken to prevent possible adverse effects on the indicator. Examples of available alternatives include isolation transformers, power regulators, uninterruptible power supplies, or simple line filters.

Transient Suppression

The following recommendations will help to reduce transients:

- Always use shielded cables to connect signal wires to the weight indicator.
- Secure the cables in the cable clips provided inside the indicator.
- Connect the cable shield (indicator end only) to a ground point inside the indicator. Keep wires that extend beyond the shield as short as possible.
- Do not run load cell or signal cables from the weight indicator along side or parallel to wiring carrying AC power. If unavoidable, position the load cell and signal cables a minimum of 24" away from all AC wiring.
- Always use arc suppressors across all AC power relay contacts (see recommendations at http://www.paktron.com/pdf/Quencharch_QRL.pdf).
- Use zero voltage switching relays, optically isolated if possible.

INSTALLATION

Before beginning installation of your Model 205 Weight Indicator, make certain that the indicator has been received in good condition. Carefully remove the indicator from the shipping carton and inspect it for any evidence of damage (such as exterior dents or scratches) that may have taken place during shipment. Keep the carton and packing material for return shipment if it should become necessary. It is the responsibility of the purchaser to file all claims for any damages or loss incurred during transit.

Mounting

NOTE! Should your 205 indicator come already installed on a scale, the following information describing the installation of the indicator does not apply.

The Model 205 indicator is housed in a Stainless Steel wall or desk-mount enclosure. The gimbal may be mounted on a desktop or other smooth, flat, horizontal surface or may be mounted on a wall. Refer to Figure No. 1 for a layout of wall-mounting bolts.

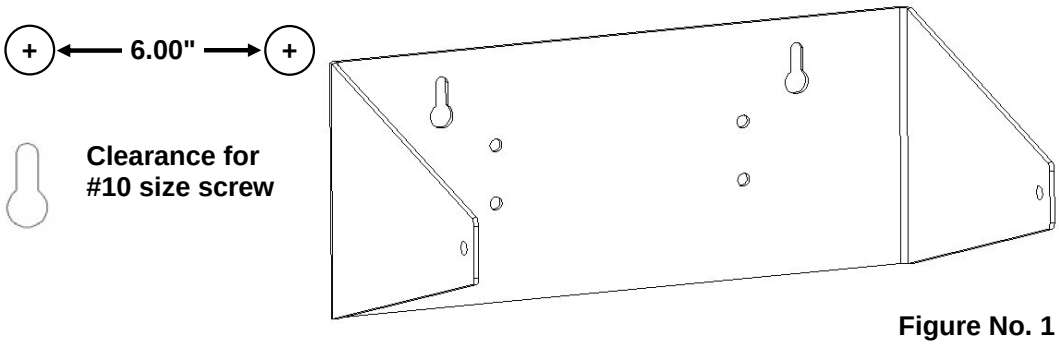


Figure No. 1

If wall mounted, make certain the mounting surface is strong enough to support the indicator. The mounting location should be where the display is easily viewed while being close enough to provide the operator easy access to the keypad. Carefully lay out the mounting hole locations, then drill and install the anchor bolts. Attach the gimbal to the wall and securely tighten the retaining bolts.

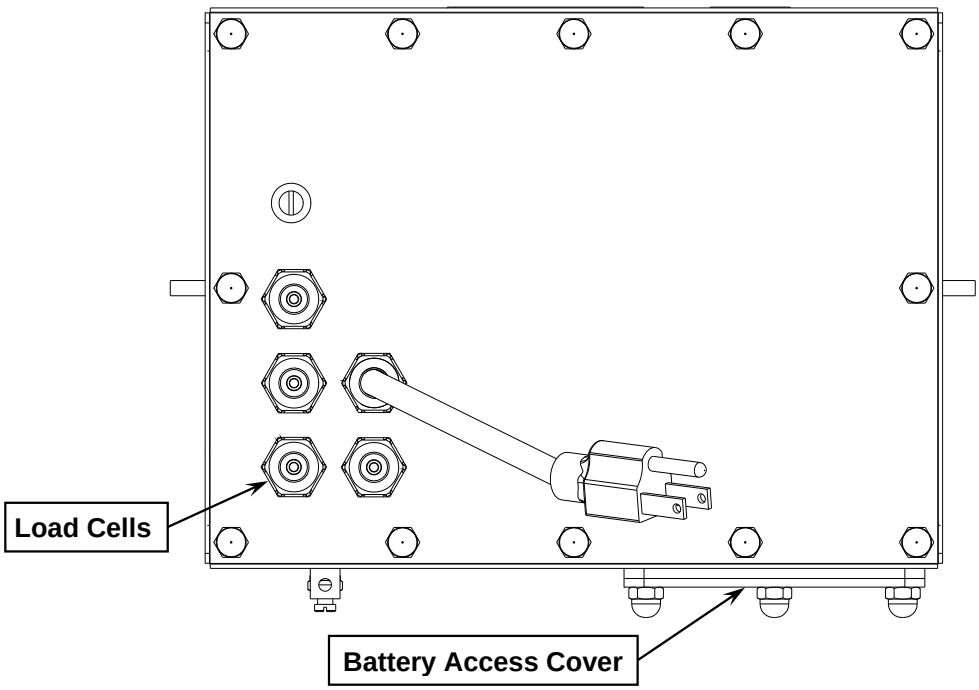


Figure No. 2

INSTALLATION, CONT.

Load Cell Connection

CAUTION! Disconnect any external load cell power supply before connecting load cells to the indicator. Failure to do so will result in permanent damage to the indicator.

Load Cell Cable Connection for RFI Suppression

The load cell cable should be routed through the special metallic gland connector and the shield wire must be connected to this gland connector for grounding and to eliminate RFI. Refer to Figure No. 2 and Figure No. 3 for the appropriate gland connector.

1. If using a battery, remove the three acorn nuts securing the Battery Access Cover to the bottom of the indicator and remove the battery.
2. After removing the battery, remove the 12 acorn nuts securing the back panel to main housing.
3. Loosen and remove the metal gland connector nut and remove the plastic insert.
4. Route the load cell cable through the nut and plastic insert and into the enclosure.
5. With the load cell cable routed into the enclosure, remove approximately 18 to 20 inches of the outer insulating jacket from the cable exposing the internal wires.
6. Cut the shield wire so that it extends past the outer jacket approximately 3/4 inch.
7. Remove 1/4" of insulation from the end of each of the 4 wires (without sense leads) or 6 wires with sense leads (refer to figure No. 4).
8. Connect each of the wires to terminal block P1 referring to labels on circuit board for terminal connections. Refer to Figure No. 7 for terminal block location.
9. To terminate a wire, press down on release bar for the terminal, insert wire into terminal opening then allow release bar to return to its original position, locking wire in place. Repeat procedure until all wires are in place.
10. Route load cell cable wires through the two cable clips provided on upper and left sides of enclosure interior.

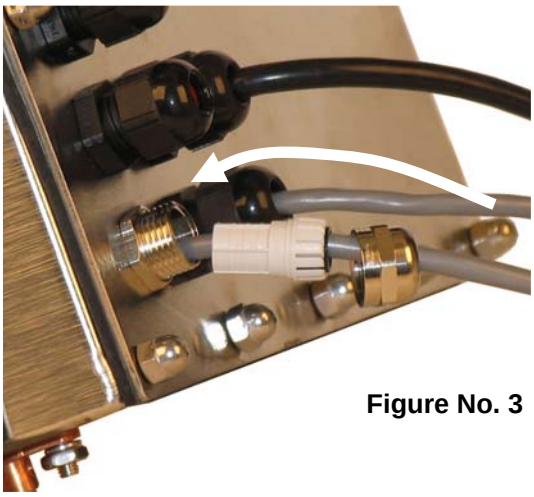


Figure No. 3

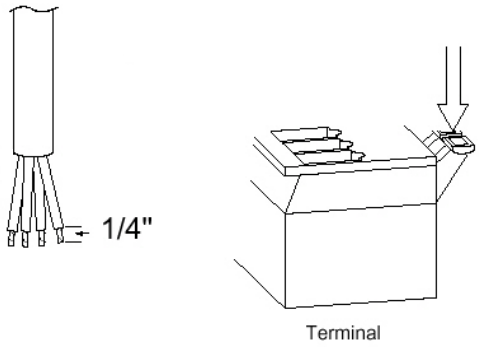


Figure No. 4

LOAD CELL TERMINAL BLOCK P1

TERMINAL NO.	Function	TERMINAL NO.	Function
1	+ EXCITATION	5	- SIGNAL
2	+ SENSE	6	- SENSE
3	+ SIGNAL	7	- EXCITATION

NOTE! If the sense leads are NOT used, you must install plug-in jumpers at J4 and J5 adjacent to the terminal block. These jumpers attach the sense leads to the excitation leads. If sense leads ARE used (as in motor truck scales), these plug-in jumpers should be positioned on one plug-in pin only or removed and stored for later use (see Figure No. 8).

INSTALLATION, CONT.

Load Cell Cable Shield Wire Connection for RFI Suppression

1. After all terminations have been made, remove the excess cable from the enclosure.
2. Referring to Figure No. 5, fold the shield wire back over the plastic insert and then insert the plastic insert (with the shield wire) into the gland connector.
3. The shield wire is secured when tightening the gland connector nut.
4. Do not over-tighten the connector but make certain it is snug.
5. **DO NOT USE TOOLS!** Finger tighten only!

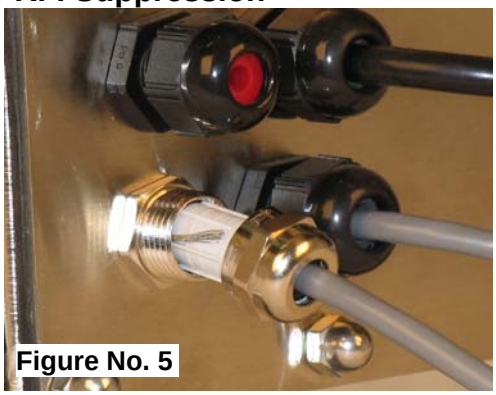


Figure No. 5

Load Cell Cable Connection (Standard Gland Connector)

The following instructions describe the load cell connection should it be desired to route the load cell cable through a standard gland connector. If a standard gland connector is used, the shield wire should be connected to the threaded stud inside the indicator enclosure.

1. Remove the 12 acorn nuts securing the back panel to main housing, then loosen a gland connector for the load cell cable. Refer to Figure No. 2 for illustration of connector layout.
2. Slip the single cable from the load cell or load cell junction box through the gland connector and into the enclosure.
3. Remove 3" of the outer insulation jacket then remove 1/4" of insulation from each of the 4 wires and shield (without sense leads) or 6 wires and shield (with sense leads). Refer to Figure No. 4.
4. Connect each of the wires to terminal block P1 referring to labels on circuit board for terminal connections. Refer to Figure No. 7 for terminal block location.
5. To terminate a wire, first press down on release bar for the terminal, insert wire into terminal opening then allow release bar to return to its original position, locking wire in place. Repeat procedure until all of wires are in place.
6. Route load cell cable through the two cable clips provided on upper and left sides of enclosure interior.

Load Cell Cable Shield Wire Connection (Standard Gland Connector)

The load cell cable shield wire should be connected to the threaded stud inside the indicator. This stud is located on the top inside of the indicator near the load cell connector P1. See Figure No.6.

The shield wire should be wrapped around the stud between the 2 flat washers and secured using hex nut.

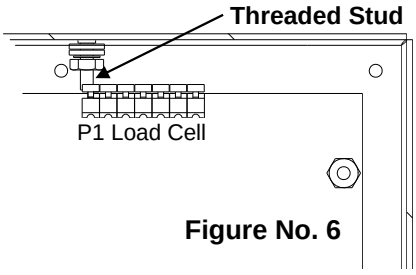


Figure No. 6

Load Cell Connections With Over 30 Feet Of Cable

For installations with over 30 feet of cable between the indicator and the load cells, sense wires should be used. The sense wires must be connected between the +SENS, -SENS terminals on the indicator and the +EXCITATION, -EXCITATION wires of the load cells or the +SENS, -SENS terminals of the load cell trim board or the section seal trim board.

INSTALLATION, CONT.

Serial I/O Cable Installation

The 205 indicator may be connected to a printer to record weight and associated data or it may be connected to a remote display or even to a computer for transmission of weight data. The weight data may be transmitted on demand (pressing the **PRINT** key or on receipt of a command from the computer). Refer to the Setup, SIO Serial I/O section of this manual.

1. Remove the 12 acorn nuts securing the back panel to main housing, then loosen a gland connector for the serial cable. Refer to Figure No. 2 for illustration of connector layout.
2. Slip the serial cable through the gland connector and into the enclosure.
3. Remove 2" of the outer insulation jacket then remove 1/4" of insulation from each of the wires (refer to Figure No. 4).
4. Connect each of the wires to the Serial Data terminal block (P11) referring to Figure No. 7 for terminal block locations.
5. To terminate, first press down on the release bar for the terminal, insert the wire into the opening then allow the release bar to return to its original position, locking the wire in place. Repeat the procedure until all of the wires are in place.

BI-DIRECTIONAL SERIAL INTERFACE		**SERIAL OUTPUT**	
TERMINAL NO.	**Function**	**TERMINAL NO.**	**Function**
1	TXD 1 - RS232	5	TXD 2 - RS232
2	RXD 1 - RS232	6	TXD 2 – 20 mA Active
3	TXD 1 – 20 mA Active	7	GROUND
4	GROUND		

Optically Isolated Inputs

Included with the I/O are 4 programmable inputs that may be used to remotely (up to 100 feet) initiate various functions within the indicator. These inputs are accessed via a terminal block (P9) on the back of the PC board (see Figure No. 7). The 4 inputs are defined as follows:

TERMINAL NO.	**Function**
1	Gross
2	Print
3	Zero
4	Tare
5	Common

NOTE! The input must be connected to Gnd to initiate the function.

INSTALLATION, CONT.

Main PCB

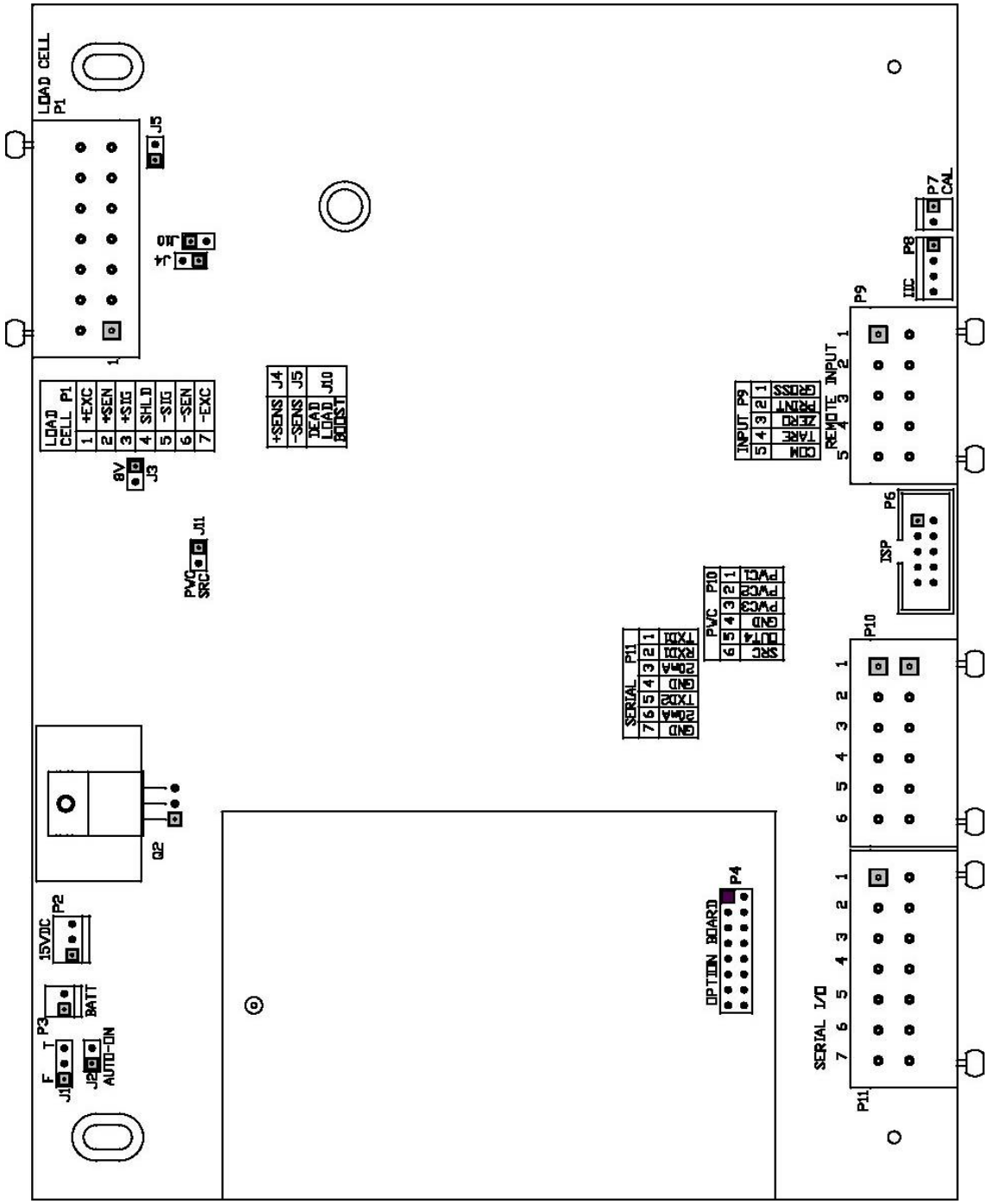


Figure No. 7

INSTALLATION, CONT.

Main PCB Jumpers

J1 – BATTERY CHARGE MODE

Place jumper J1 in the Full position when operating the indicator totally from battery power and only recharging the battery pack when it is low. Place jumper J1 in the Trickle position when operating the indicator from commercial power and using the battery pack to supply power only in the event of a power loss.

J2 – AUTO-ON JUMPER

The AUTO-ON jumper J2, when connected, will cause the indicator to power on automatically whenever power is applied to the power input connector. If power is lost momentarily and then reapplied, the indicator will turn on without pressing the **ON** key.

J3 – 8V EXCITATION JUMPER

The 8V EXCITATION jumper J3, when connected, sets the load cell excitation voltage to 8V for operation with the 12 VDC battery. To operate from the 12 VDC battery, the load cell excitation voltage MUST be set to 8 VDC (J3 *closed*). Battery operation with the load cell excitation voltage set to 12V will result in an unstable weight display.

J4 AND J5 – SENSE JUMPERS

If the sense leads are NOT used, you must install plug-in jumpers at J4 and J5 adjacent to the terminal block. These jumpers attach the sense leads to the excitation leads. If sense leads ARE used (as in motor truck scales), these plug-in jumpers should be positioned on one plug-in pin only or removed and stored for later use.

J10 – DEAD LOAD BOOST JUMPER

For very low dead loads (less than 10% of the combined load cell capacity) connect the dead load boost jumper J10 on the printed circuit board.

J11 – 12V PWC SRC (SOURCE)

The J11 jumper, when connected (CLOSED) supplies 12 VDC @ 25mA from the 205 indicator to a solid-state relay or other load of 200 ohms or greater. When J11 is OPEN (positioned on one plug-in pin only or removed), the 12 to 24 VDC must be provided from an external source to P10-6. The load must still be 200 ohms or greater.

Re-Installing The Rear Panel

After all terminations have been made, remove the excess cable from the indicator enclosure and securely tighten each of the cable gland connectors. Do not over-tighten these connectors but make certain they are snug. **DO NOT USE TOOLS!** Finger tighten only! Insure any unused gland connectors are plugged.

1. Make certain no cables or wires are exposed between the main housing and rear panel and then place the rear panel onto the main housing.
2. Secure with the 12 acorn nuts removed earlier. Follow a diagonal pattern when tightening the acorn nuts.
3. If using a battery, slide the battery into the opening, until you feel resistance and the edge of the battery is flush with the bottom of the indicator.
4. Replace the Battery Access Cover and install the three acorn nuts removed earlier, securing the battery in place.

KEYPAD FUNCTIONS

The Model 205 is equipped with a 7-key keypad. The keypad is used to enter commands and data into the indicator. This section describes each key along with its normal function. It is helpful to refer to the actual indicator while reading this section.

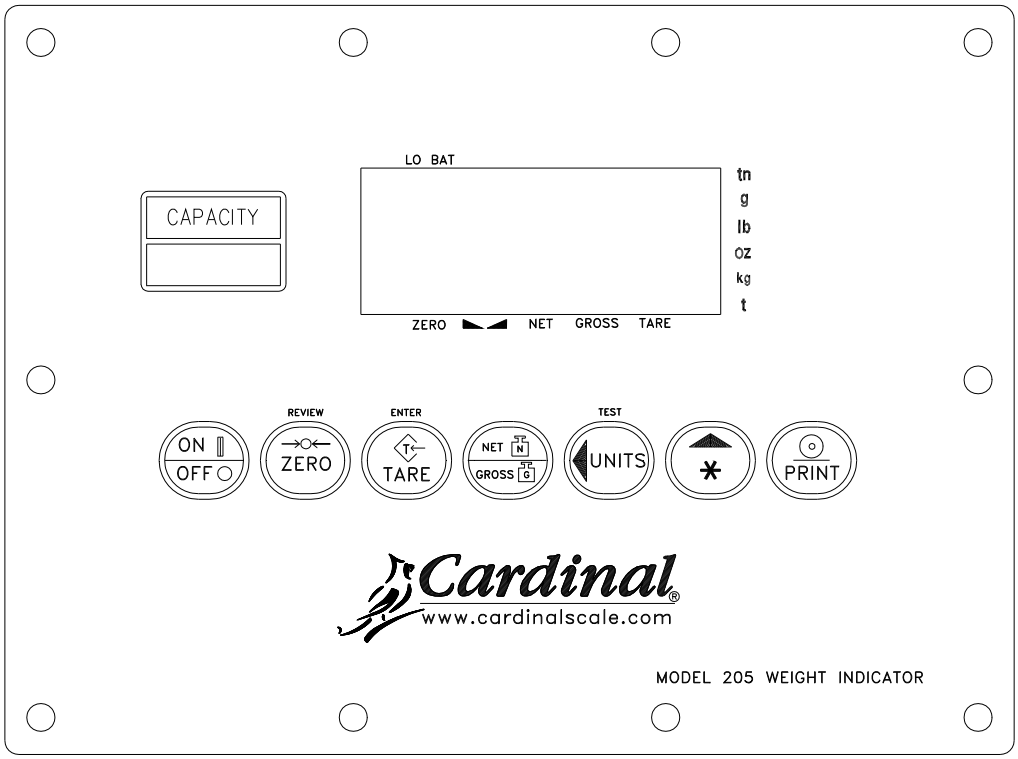


Figure No. 8

DO NOT operate the keypad with pointed objects (pencils, pens, etc). Damage to keypad resulting from this practice is NOT covered under warranty.

ON/OFF KEY

This key performs two functions. Pressing it when the indicator is off will apply power to the indicator. If the indicator is already on, pressing this key will turn the indicator off.

ZERO KEY/REVIEW

Pressing this key will cause an immediate zeroing of the weight display up to the selected limit of 4% or 100% of the scale's capacity. This selection is made during the setup and calibration of the indicator. Note the indicator will not respond to this command unless the weight display is stable.

> Pressing the **ASTERISK** key before the **ZERO KEY/REVIEW** key will enter the Review mode of Setup and Calibration. Refer to the Setup Review section of this manual.

TARE/ENTER

Pressing the **TARE** key alone will store the current gross weight as the new tare weight and the weight display will change to the net weight display mode (Net annunciator will turn on).

> Pressing the **ASTERISK** key before the **TARE/ENTER** key serves two purposes. First, when reviewing setup parameters, pressing the **TARE/ENTER** key will display the current setting of the parameter. Second, the **TARE/ENTER** key is used to signal completion of the entry of data and causes the indicator to process the data entered.

KEYPAD FUNCTIONS, CONT.

NET/GROSS KEY
This key is used to toggle between Net and Gross weight modes. The selected mode is indicated by turning on the appropriate annunciator on the display. Note that if no valid tare weight has been entered, pressing this key will cause a momentary “notArE” display error and the indicator will remain in the Gross weight mode.

UNITS / ◀ LEFT ARROW KEY/TEST
This key is used for several functions. In normal operation, this key is used to select the units in which the weight is to be displayed. The available units of measure ("unit1" and "unit2") are selected in setup. The available units include tons, pounds only, pound-ounces, ounces only, Tonnes (metric tons), kilograms, and grams. Note that not all combinations are supported.

During setup, this key is used to advance the cursor left to the next position when inputting setup parameters.

Pressing the **ASTERISK** key before the **UNITS/LEFT ARROW KEY/TEST** key will enter the Test mode. Refer to the description of the **ASTERISK** key below for details.

ASTERISK / ▲ UP ARROW KEY
This key is used for several functions. During setup, when a setup parameter (not a parameter value) is displayed, pressing this key will "backup" to the previous prompt. Also during setup, when a parameter value is displayed, pressing this key will "toggle" between the different available values for the setup parameter. In normal operation, this key is used in conjunction with the other keys on the keypad to access additional indicator features. These features and their associated key combinations are as follows:

ASTERISK, ZERO KEY
This combination will enter the Review mode of Setup and Calibration. Refer to Setup Review section of this manual for details.

ASTERISK, TARE KEY
This combination will display the current tare weight for three (3) seconds.

ASTERISK, NET/GROSS KEY
This combination will display the Net accumulator.

ASTERISK, NET/GROSS KEY, PRINT KEY
This combination will print the Net accumulator.

ASTERISK, NET/GROSS KEY, ZERO KEY
This combination will zero (clear) the Net accumulator.

ASTERISK, NET/GROSS KEY, NET/GROSS KEY
This combination will display the Gross accumulator.

ASTERISK, NET/GROSS KEY, NET/GROSS KEY, PRINT KEY
This combination will print the Gross accumulator.

ASTERISK, NET/GROSS KEY, NET/GROSS KEY, ZERO KEY
This combination will zero (clear) the Gross accumulator.

KEYPAD FUNCTIONS, CONT.

ASTERISK, UNITS KEY

This combination will enter the Test mode. The Test mode is used to conduct a test of all display elements. The test consists of 5 cycles, each lasting about one second:

1. All horizontal segments will turn on (no annunciators).
2. All vertical segments and decimal points will turn on (no annunciators).
3. All annunciators will turn on.
4. All display elements off.
5. The model number (205) and the software version X.X.
6. The calibration numbers (C1 to C4).

ASTERISK, PRINT KEY

This combination is used to *change* the selected print ticket format. Pressing the **ASTERISK** then the **PRINT** key will display a prompt "Prt=". Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, press the **ASTERISK/UP ARROW** key to "toggle" between the different available values, then press the **TARE/ENTER** key to save it. Allowable values are:

0 = print tab settings 1 = visual ticket format 1 2 = visual ticket format 2

NOTE! When a print format is selected, it will remain active until changed by the operator.

PRINT KEY

Pressing this key will add the displayed gross or net weight to the associated accumulator and initiate the transmission of weight and other data depending on the Print Tab Settings (see example) via the selected printer output port (see Port= under Print menu) unless the continuous data feature of this port was enabled during setup and calibration. Note that the indicator will not respond to this command unless the weight display is stable. If displaying gross weight, the only weight printed is gross weight. If displaying net weight, the gross, tare, and net weights will print.

The 205 includes support for visual tickets. Visual tickets are designed by the PC based programs Visual Print or n Control, then downloaded to the indicator. The 205 allows two programmable formats in addition to the standard print tab settings format.

Print formats are selected by using the **ASTERISK** and **PRINT** keys in combination (refer to the next section for details). **NOTE!** When the **PRINT** key is pressed the indicator looks for the selected format. If no visual ticket is found it reverts to the print tab settings.

```
#2
100.00  lb  G
 20.00  lb  T
 80.00  lb  N
      0.00  lb  GROSS ACCUM
    272.00  lb  NET ACCUM
```

TICKET EXAMPLE

ANNUNCIATORS

Annunciators are turned on to indicate that the display is in the mode corresponding to the annunciator label or that the status indicated by the label is active. The annunciators flash on and off to indicate that the indicator is waiting for input from the keypad for the mode indicated by the flashing annunciator. Refer to Figure No. 9 for the location of the annunciators.

ZERO

This annunciator is turned on to indicate that the weight displayed is within +/- 1/4 division of the center of zero.

◣◢ (STABLE)

This annunciator is turned on when the weight display is stable. When off, it means that the change in successive weight samples is greater than the motion limits selected during setup.

NET

This annunciator is turned on to show that the displayed weight is the net weight (gross weight less tare weight).

GROSS

This annunciator is turned on to show that gross weight is displayed. Gross weight will be displayed when no tare weight is stored.

TARE

This annunciator is turned on to show that the displayed weight is the tare weight.

LO BAT

This annunciator is used with the battery operation and will turn ON to indicate the battery has less than one hour useful life before recharging will be required. If continued use furthers drains the battery, no change in operation will occur until just before the battery voltage drops to a level where operation is affected. At this level, the indicator will automatically turn off.

T

This annunciator is located to the right of the weight display and is turned on to show that the displayed weight unit is tons.

g

This annunciator is located to the right of the weight display and is used to indicate that the displayed unit of weight measurement is grams.

lb

This annunciator is located to the left of the weight display and is turned on to show that the displayed weight unit is pounds.

oz

This annunciator is located to the right of the weight display and is turned on to show that the displayed weight unit is ounces.

kg

This annunciator is located to the left of the weight display and is used to indicate that the displayed unit of weight measurement is kilograms.

t

This annunciator is located to the right of the weight display and is used to indicate that the displayed unit of weight measurement is Tonnes (metric tons).

SETUP AND CALIBRATION

Your Model 205 indicator has been thoroughly tested and calibrated before being shipped to you. If you received the indicator attached to a scale, calibration is not necessary. If the indicator is being connected to a scale for the first time or recalibration is necessary for other reasons, proceed as indicated.

The calibration switch is located on a bracket on the inside of the enclosure rear panel. You may gain access to this switch simply by removing the calibration switch access screw on the rear panel. Refer to Figure No. 9.

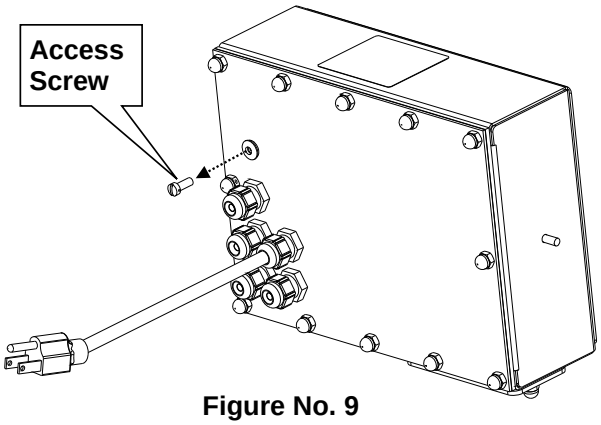


Figure No. 9

During the setup and calibration process it will be necessary to enter operational parameters via the 205 keypad. Pressing the **TARE/ENTER** key will cause the data entered or displayed to be retained and the 205 to advance to the next prompt. The functions of numeric keys are replaced by using the **UNITS/LEFT ARROW** and the **ASTERISK/UP ARROW** keys. The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/LEFT ARROW** key. Pressing the **ASTERISK/UP ARROW** key will change the blinking character to the next value. Continue to press this key to "toggle" between the different available values for the setup parameter. Pressing the **ASTERISK/UP ARROW** key when a setup parameter (not a parameter value) is displayed, will "backup" to the previous prompt.

DO NOT operate the keypad with pointed objects (pencils, pens, etc). Damage to keypad resulting from this practice is NOT covered under warranty.

Enter Setup Mode

To enter the setup mode, with the indicator ON, insert a small screwdriver or other tool through the calibration switch access hole on the rear panel. Press and release the calibration switch. The menu SEtUP will be displayed. Continue to press and release the switch to rotate through the beginning point for entering the setup mode.

SEtUP	Setup Mode (starts at USA prompt)
A-d	Analog to Digital Filtering (starts at dFLt= prompt)
CAL	Calibration (starts at CAL 1 prompt)
S io	Serial Input/Output (starts at bAUd prompt)
Print	Print Tab Settings (starts at PArt prompt)
F SPAn	Fine Span Adjustment
H i rES	Display high-resolution weight mode
LoCoUt	Key lock out function

If you press the **TARE/ENTER** key at the SEtUP prompt, you may proceed through to the next section (up to and including F SPAn) by pressing the **TARE/ENTER** key.

IMPORTANT! Setup may be interrupted at any time. ALL data previously entered and finalized with the *TARE/ENTER* key will be retained in the non-volatile memory.

SETUP AND CALIBRATION, CONT.

Pressing the calibration switch *at any prompt* will return you to the SEtUP menu. To exit setup, press the **ASTERISK/UP ARROW** key with any of the above menu selections displayed or cycle power at any time (press the **ON/OFF** key twice).

NOTE! With the exception of the SEtUP prompt, the prompts displayed for each section are different if you push the calibration switch instead of pressing the **TARE/ENTER** key to proceed through the section. *For example*, if you press the calibration switch with the SEtUP displayed, the next prompt displayed will be A-d. If you step through the setup prompts by pressing the **TARE/ENTER** key, the next prompt displayed will be A-dP. In addition, at a prompt with the P displayed, you must press the **TARE/ENTER** key, the **1/YES** key then the **TARE/ENTER** key again to proceed with that section. To skip the section and advance you to the next menu selection, press the **TARE/ENTER** key twice.

S E t U P

USA: (Domestic or International)

With SEtUP displayed, press the **TARE/ENTER** key. The display will change to USA:. Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

USA: 1 (Domestic)
- trL : no
- CAP + 4% to OC

USA:0 (International)
- trL : yes
- CAP + 9 grads to OC
- PT printed with tare
- Lamp test on power up

LFt: (Legal For Trade)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

LFt: 1

Interval Settings (Int:) allowed are: 1, 2, 5, 10, 20, 50

LFt:0

Interval Setting (Int:) is selectable from 1 to 99.

NOTE! When both LFt: 1 *and* USA: 1, the followings results occur:

- Scale must have between 100 and 10,000 divisions
- trA : .5 or 0 to 3
- Inhibit serial data during input
- trL : no
- CAP + 4% to OC

NOTE! When LFt: 1 *and* USA:0, the followings results occur:

- UnS : 1
- trL : yes
- CAP + 9 grads to OC
- PT printed with tare
- Lamp test on power up

SETUP AND CALIBRATION, CONT.

Unit 1: (Weighing Unit 1)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are:

0 = none	3 = lb (pounds)	6 = tonnes (metric tons)
1= tn (tons)	4 = oz (ounces)	7 = lb/oz (pounds/ounces)
2= g (grams)	5 = kg (kilograms)	

int: (Interval Setting)
Press the **TARE/ENTER** key to show the current value.

If LFt = 1 (Legal For Trade = YES), use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 1, 2, 5, 10, 20 or 50.

If LFt=0 (Legal For Trade = NO), use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 1 through 99.

In either case, if the setting displayed is acceptable, press the **TARE/ENTER** key again it.

dPP: (Decimal Point Setting)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 0, 1, 2 or 3.

0 = XXXXXX	2 = XXXX**.**XX
1= XXXXX**.**X	3 = XXX**.**XXX

CAP: (Capacity)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 1 through 999,999. **NOTE!** Capacity cannot exceed 999,999.

Unit2: (Weighing Unit 2)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are:

0 = none	3 = lb (pounds)	6 = tonnes (metric tons)
1= tn (tons)	4 = oz (ounces)	7 = lb/oz (pounds/ounces)
2= g (grams)	5 = kg (kilograms)	

NOTE! The selection for Unit2 cannot be the same as Unit 1. In addition, dependent upon the selection for Unit 1 and the interval and decimal point settings, not all unit combinations are available.

trA: (Zero Tracking Range)
Press the **TARE/ENTER** key to show the current value assigned to the Automatic Zero Tracking Range. This is the value in scale divisions that will be automatically zeroed off. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 0 (disables Zero Tracking), .5, or 1 through 9.

SETUP AND CALIBRATION, CONT.

trL= (4% Zero Range)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

trL=1 (Yes)
4% of scale capacity

trL=0 (No)
Full capacity (no limit)

PU0= (Power-Up Zero Feature)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

PU0=1 (Yes)
Automatic Re-Zero on Power-Up

PU0=0 (No)
No Re-Zero on Power-Up

SLEEP= (Sleep Mode Feature)
The Sleep Mode feature conserves battery power when the indicator remains unused for a selected period of time. With the feature enabled, the load cell excitation will be reduced and the display will be blank.

Press the **TARE/ENTER** key to show the current status of this feature. If a number other than 0 is shown, this feature is selected and the number shown corresponds to the number of minutes of a stable zero weight reading before the indicator enters the sleep mode. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting (0 to 10) and then press the **TARE/ENTER** key to store the new setting. Note that selecting 0 disables this feature.

A oFF= (Auto Shutoff)
The Automatic Shutoff feature will automatically turn the indicator off (when it is not in use) after a predetermined period of inactivity to prolong battery life. To turn the indicator back on you must press the **ON / OFF** key.

Press the **TARE/ENTER** key to show the current status for this feature. A number other than 0 indicates that the auto shutoff feature is enabled and the displayed number corresponds to the number of minutes of stable weight displayed before the indicator is turned off automatically. Note that a 0 indicates the feature has been turned off. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting (0 to 10) and then press the **TARE/ENTER** key to store the new setting.

CLtAr= (Clear Tare)
The Clear Tare feature allows the indicator to clear the Stored Tare weight when the Net weight goes below a value greater than 1/2 the stored tare weight or goes below zero (a negative net weight after display of a positive net weight). With this feature enabled, the operator must re-set the tare after completion of a transaction when the load (container plus item) is removed from the scale.

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

CLtAr=1 (Yes)
Automatically clears Stored Tare when Net weight goes below zero

CLtAr=0 (No)
Stored Tare is not cleared when Net weight goes below zero

SETUP AND CALIBRATION, CONT.

A - d (A - d2) - Analog to Digital Filtering

dFLt: (Digital Filtering)

With A - d (A - d2) displayed, press the **TARE/ENTER** key. The display will change to dFLt:. Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 0, 1, 2 or 3. Note, that if you select 3 (Custom Filtering) two additional prompts will be displayed.

dFLt:

0	Disabled – NO Filtering
1	MINIMAL FILTERING (sample rate = 2)
2	MODERATE FILTERING (sample rate = 1)
3	CUSTOM FILTERING

NOTE! The prompts, F: (Filter Level) and b: (Break Range) will only be displayed if you selected 3 (Custom Filtering) for the dFLt: (Digital Filtering) prompt.

F: (Filter Level)

Press the **TARE/ENTER** key to show the current setting for the filter level. The filter level is a number from 1 to 99 that corresponds to the level of filtering with 99 being the greatest filtering and 1 the least. To accept the value displayed, press the **TARE/ENTER** key, otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

b: (Break Range)

Press the **TARE/ENTER** key to show the current setting for the break range. The break range is a number from 1 to 255 that corresponds to the number of division change to break out of the filtering. Press the **TARE/ENTER** key to keep the displayed value or use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Note that selecting 0 disables this feature.

Sr: (Sample Rate)

Press the **TARE/ENTER** key to show the current setting for the sample rate. The value displayed is the sample rate in samples per second. Press the **TARE/ENTER** key to save the displayed value or use the **ASTERISK/UP ARROW** key to toggle to a new value (1 to 100) and then press the **TARE/ENTER** key to save it.

UnS: (Motion Range)

Press the **TARE/ENTER** key to view the current setting for the range of motion detection. If the displayed value is acceptable, press the **TARE/ENTER** key to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new range (the number of divisions of change permitted before indicating unstable) and then press the **TARE/ENTER** key to save the new setting. Allowable range values are: 0 through 99 divisions.

SC: (Stable Count)

Press the **TARE/ENTER** key to view the current setting for the number of consecutive stable weight readings before indicating stable weight. This helps filter weight readings for stability when trying to capture stable weight. If the displayed value is acceptable, press the **TARE/ENTER** key to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new value and press the **TARE/ENTER** key to save the new setting. Allowable values for the stable count are: 3 through 255.

SETUP AND CALIBRATION, CONT.

FILTER SETTING RECOMMENDATIONS

Non Critical Sample Rate

If the sample rate is not critical, as in static weighing, set dFLt: to "0" (no filtering), dFLt: "1" (F:6, b:12, Sr: 2/Sec), *or* dFLt: "2" (F:6, b:8, Sr: 1/Sec).

Critical Sample Rate

If the sample rate is critical, as in a filling operation, use the Custom Filtering (set dFLt: to "3").

1. Sr: SAMPLE RATE (1 to 50 samples/second) determination:

Set the sample rate as close as possible to produce a display graduation change for every graduation of material added to the scale.

$$\frac{\text{Material Flow Rate (lbs/second)}}{\text{Resolution}} =$$

EXAMPLE: $\frac{100\text{lbs/sec}}{10\text{lbs}} = 10\text{s/s} = Sr$

2. b: BREAK RANGE (1 to 255 graduations) determination:

Turn the filtering off by setting the dFLt: setting to "0". Operate the system as it will be normally used and, by observation, determine the number of grads of instability that needs to be filtered out. Set the break range (b:) to that value.

$$\frac{\text{Weight Change}}{\text{Graduation Value}} = b$$

EXAMPLE: 20,000 x 10lb capacity scale with 800lb variation in the weight display.

$$\frac{800}{10} = b = 80$$

3. F: FILTER SETTING (1 to 99) determination: Set to desired results.

4. If stability is unacceptable with any setting of F:, reduce the sample rate and/or increase the break range, b: setting for increased filtering.

SETUP AND CALIBRATION, CONT.

CAL (CAL2) - Calibration

With CAL (CAL2) displayed, press the **TARE/ENTER** key. The display will change to show the current setting no. If calibration is desired, press the **ASTERISK/UP ARROW** key (display will change to YES) and then the **TARE/ENTER** key to continue to the CAL 1: setting, otherwise press the **TARE/ENTER** key to advance to the S no menu.

CALIBRATION MODES

The 205 indicator has five modes that can be used to perform calibration. Three of the modes require a test load or test weights, one requires the scale to be empty (and at zero) and the last uses the calibration "C" numbers from a previous calibration. The modes are as follows:

1. **Dual-Point with Zero (First Zero)**
   This is a standard calibration method requiring one weight, an empty scale and has one conversion factor. This method uses two calibration points (CAL 1: and CAL2:) to establish a zero (no load) calibration value and to span the indicator. The two points correspond to zero weight and the test load or test weight and can be applied in any order. This method should be used for first-time calibration and complete recalibration.

2. **Dual-Point <u>without</u> Zero (False Zero)**
   This calibration method requires one test weight and establishes a new conversion factor only. It is used to establish a false (temporary zero) zero without affecting the zero calibration value stored during the last calibration. This is particularly useful in tank weighing applications, where it may be impractical or impossible to completely empty the tank. This method uses two calibration points, CAL 1: and CAL2:. The value of the test weight is entered when CAL 1: is displayed and the **NET/GROSS** key is pressed when CAL2: is displayed.

3. **Single-Point for Span Only (Last Zero)**
   This calibration method requires one test weight and establishes a new conversion factor (span) without affecting the zero calibration value stored during the last calibration. This minimizes placing and removing test weights and is especially useful when checking high capacity scales. This method uses two calibration points, CAL 1: and CAL2:. The value of the test weight is entered when CAL 1: is displayed and the **ZERO** key is pressed when CAL2: is displayed.

4. **Single-Point for Zero Only (Only Zero)**
   This calibration method requires no test weight, an empty scale and establishes a new zero without affecting the conversion factor (span). This is useful to regain the full range of zero limit when the dead load of the scale has changed. This would occur for example, if a guard rail has been added to the scale platform. This method uses two calibration points, CAL 1: and CAL2:. The **TARE/ENTER** key is pressed when CAL 1: is displayed and the **ZERO** key is pressed when CAL2: is displayed.

5. **Calibration "C" Numbers**
   The calibration "C" numbers (C 1, C2, C3 and C4) are displayed only during the Test mode operation and are shown at the end of the test. Each number is displayed for approximately 4 seconds, allowing you to record them. These numbers correspond to the calibration setting of the indicator. The numbers may be up to three digits in length. By recording these numbers you will be able to return the indicator to its present calibration settings without using test weights simply by entering the "C" numbers. *Refer to the Calibration "C" Number section of this manual for instructions on viewing the "C" numbers*.

SETUP AND CALIBRATION, CONT.

Dual-Point with Zero (First Zero) Calibration

IMPORTANT! The functions of numeric keys are replaced by using the **UNITS/LEFT ARROW** and the **ASTERISK/UP ARROW** keys. The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/LEFT ARROW** key. Pressing the **ASTERISK/UP ARROW** key will change the blinking character to the next value.

CAL 1: – First Calibration Weight

The display will show CAL 1:0. This is the first of two calibration weights. This weight could be ZERO (NO LOAD) or the TEST WEIGHTS / TEST LOAD.

- If the first calibration weight is to be ZERO (NO LOAD), press the **TARE/ENTER** key.
- If the first calibration weight is to be the TEST WEIGHTS / TEST LOAD, use the **UNITS/LEFT ARROW** and **ASTERISK/UP ARROW** keys to input the value of the calibrated test weights. **NOTE!** When entering values for CAL 1:, the digits start displaying on the right side of the display and proceed to the left. When large values are used (more than 3 digits), the CAL 1: prompt will automatically scroll off the left side of the display to show the additional digits on the right as they are entered.
- Place the weights on the scale platform, then press the **TARE/ENTER** key.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: CAL 2:.

CAL 2: - Second Calibration Weight

The display will show CAL 2:0. This is the second of two calibration weights. This weight could be ZERO (NO LOAD) or the TEST WEIGHTS / TEST LOAD.

- If the second calibration weight is to be ZERO (NO LOAD), press the **TARE/ENTER** key.
- If the second calibration weight is to be the TEST WEIGHTS / TEST LOAD, use the **UNITS/LEFT ARROW** and **ASTERISK/UP ARROW** keys to input the value of the calibrated test weights. **NOTE!** When entering values for CAL 2:, the digits start displaying on the right side of the display and proceed to the left. When large values are used (more than 3 digits), the CAL 2: prompt will automatically scroll off the left side of the display to show the additional digits on the right as they are entered.
- Place the weights on the scale platform, then press the **TARE/ENTER** key.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: CAL 3:.

CAL 3: - Last Calibration Weight

The display will show CAL 3:0. This weight is not used. Press the **TARE/ENTER** key to skip CAL 3: and advance to SAMP.

SETUP AND CALIBRATION, CONT.

Dual-Point without Zero (False Zero) Calibration

IMPORTANT! The functions of numeric keys are replaced by using the **UNITS/LEFT ARROW** and the **ASTERISK/UP ARROW** keys. The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/LEFT ARROW** key. Pressing the **ASTERISK/UP ARROW** key will change the blinking character to the next value.

CAL 1: – First Calibration Weight

The display will show CAL 1:0. This is the first of two calibration steps. This weight is the TEST WEIGHTS / TEST LOAD.

- Place the weights on the scale platform.
- Using the **UNITS/LEFT ARROW** and **ASTERISK/UP ARROW** keys, input the value of the calibrated test weights / test load, then press the **TARE/ENTER** key. **NOTE!** When entering values for CAL 1:, the digits start displaying on the right side of the display and proceed to the left. When large values are used (more than 3 digits), the CAL 1: prompt will automatically scroll off the left side of the display to show the additional digits on the right as they are entered.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: CAL2:.

CAL2: - Second Calibration Weight

The display will show CAL2:0. This is the second of two calibration steps.

- Remove the weights on the scale platform, and then press the **NET/GROSS** key.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: S to2.

Single-Point for Span Only (Last Zero) Calibration

CAL 1: – First Calibration Weight

The display will show CAL 1:0. This is the first of two calibration steps. This weight is the TEST WEIGHTS / TEST LOAD.

- Zero the scale, and then place the weights on the scale platform.
- Using the **UNITS/LEFT ARROW** and **ASTERISK/UP ARROW** keys, input the value of the calibrated test weights / test load, then press the **TARE/ENTER** key. **NOTE!** When entering values for CAL 1:, the digits start displaying on the right side of the display and proceed to the left. When large values are used (more than 3 digits), the CAL 1: prompt will automatically scroll off the left side of the display to show the additional digits on the right as they are entered.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: CAL2:.

CAL2: - Second Calibration Weight

The display will show CAL2:0. This is the second of two calibration steps.

- Remove the weights on the scale platform, and then press the **ZERO** key.
- The display will advance to S to2.

SETUP AND CALIBRATION, CONT.

Single-Point for Zero Only (Only Zero) Calibration

IMPORTANT! The functions of numeric keys are replaced by using the **UNITS/LEFT ARROW** and the **ASTERISK/UP ARROW** keys. The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/LEFT ARROW** key. Pressing the **ASTERISK/UP ARROW** key will change the blinking character to the next value.

CAL 1= – First Calibration Weight

The display will show CAL 1=0. This is the first of two calibration steps.

- Insure the scale is empty.
- Press the **TARE/ENTER** key.
- Starting at the left and proceeding right, a series of dashes will appear on the display. The dashes will stay on the display momentarily, then disappear, after which the display will show: CAL2=.

CAL2= - Second Calibration Weight

The display will show CAL2=0. This is the second of two calibration steps.

- Press the **ZERO** key.
- The display will advance to S ioP.

Calibration "C" Numbers

1. With CAL 1= displayed, press the **TARE/ENTER** key (with diamond "T" symbol).
2. At the C 1= prompt, press the **TARE/ENTER** key to show the current value of the C 1 number.
3. If the C 1= number displayed is acceptable, press the **TARE/ENTER** key again to save it.
4. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to enter a new C 1= number, then press the **TARE/ENTER** key.
5. Repeat steps 2 through 4 for C2=, C3= and C4=.

NOTE! If any components have been changed that affect calibration and/or your scale is used in a commercial application and must be "Legal for Trade" you cannot use the "C" numbers to re-calibrate.

SETUP AND CALIBRATION, CONT.

S io (S io2) - Serial Input/Output

With S io (S io2) displayed, press the **TARE/ENTER** key. The display will change to show the current setting no. To skip configuring the S io (serial input/output) and proceed to the Pr int2 menu, press the **TARE/ENTER** key again. To configure the S io, press the **ASTERISK/UP ARROW** key (display will change to YES) and then press the **TARE/ENTER** key. After pressing the **TARE/ENTER** key, the display will change to bAUd:.

bAUd: (Serial Port Baud Rate)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new baud rate for the serial ports and then press the **TARE/ENTER** key to save it. Allowable values are:

12 = 1200 Baud	24 = 2400 Baud	48 = 4800 Baud
96 = 9600 Baud	19 = 19.2k Baud	38 = 38.4k Baud
76 = 76.8k Baud		

PrtY: (Serial Port Parity)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are:

0 = NONE (No Parity)	1 = Odd Parity	2 = Even Parity

bitS: (Serial Port Data Bits)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 7 or 8.

StoP: (Serial Port Stop Bits)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 1 or 2.

Cont 1: (Continuous Output Serial Port 1)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

Cont 1: YES	Cont 1: no
Continuous Output	No Continuous Output

If Cont 1: YES (Continuous Output) is selected, an additional prompt, tYPE: will be displayed.

If Cont 1: no (No Continuous Output) is selected, proceed to the Weight On Demand section.

tYPE: (Continuous Output Format)

Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are:

0 = SMA	3 = Rice Lake IQ355	6 = Number
1 = SB-400	4 = AnDFV	7 = Toledo Short
2 = SB-200	5 = WI110	8 = SB500 with Traffic Light

SETUP AND CALIBRATION, CONT.

If SMA is selected, the data will be transmitted in the following format:

<lf><s><r><n><m><f><xxxxxx.xxx><uuu><cr>

Where:

lf =	Line Feed	
s =	Flags	Z= center of Zero, O = Overcap, E = zero Error, e = weight not currently being displayed
r =	Range	1, 2, 3, ...
n =	Mode	G = Gross, T = Tare, N = Net
m =	Motion	M = Motion, " "(*blank*) = no motion
f =	Custom	Custom flag
xxxxxx.xxx =	Weight	Six digits with decimal point
uuu =	Units	ton, lb , l/o, oz , t , kg , g
cr =	Carriage Return	(hex 0D)

If SB-400* or Computer is selected, the data will be transmitted in the following format:

<s><xxxxxx><d><uu><m><cc><cr>

Where:

s =	Sign	"-" = negative, " " (*blank*) = positive
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Added to string if enabled in setup
uu =	Units	tn, lb, l/o, oz, t, kg, g
m =	Mode	G = Gross, N = Net
cc =	Weight Status	OC = overcap CZ = center of zero MO = motion ee = weight not currently being displayed
cr =	Carriage Return	(hex 0D)

*The SB-80, SB-300 (*multiple displays not supported*) and WinVRS use the SB-400 format.

If SB-200 is selected, the data will be transmitted in the following format:

<cr><s><xxxxxx><d><c><uu><m> ETX

Where:

cr =	Carriage Return	(hex 0D)
s =	Sign	"-" = negative, " " (*blank*) = positive
xxxxxx.xxx =	Weight	(with leading zeros)
d =	Decimal point	Embedded into weight (after weight dpp=0)
c =	status	m = motion o = overcap e = weight not currently being displayed
uu =	Units	tn, lb, l/o, oz, t, kg, g
m =	Mode	G = Gross, N = Net
ETX =	End of TeXt	(hex 03) MUST terminate ALL serial commands

If Rice Lake IQ355 is selected, the data will be transmitted in the following format:

<stx><s>xxxxxxx<u><m><s><cr><lf>

If AnDFV is selected, the data will be transmitted in the following format:

<hdr1>,xxxxx<uu><cr><lf>

If WI110 is selected, the data will be transmitted in the following format:

<m><sp><s>xxxxx<sp><uu><cr><lf>

If number only is selected, the data will be transmitted in the following format:

xxxxxx<cr><lf>

If Toledo Short is selected, the data will be transmitted in the following format:

<stx><swa><swb><swc>xxxxxx<cr><sum>

Weight On Demand
If continuous output has not been selected for Serial Port 1 (Cont1=NO), the 205 indicator will respond to a weight request (ENQ).

The host device (computer) sends:

ENQ - (hex 05)

The 205 will respond:

<s><xxxxxx><d><uu><m><cc><cr>

Where:

s =	Sign	"-" = negative, " " (*blank*) = positive
xxxxxx.xxx =	Weight	Six digits
d =	Decimal point	Added to string if enabled in setup
uu =	Units	tn, lb, l/o, oz, t, kg, g
m =	Mode	G = Gross, N = Net
cc =	Weight Status	OC = overcap CZ = center of zero MO = motion ee = weight not currently being displayed
cr =	Carriage Return	(hex 0D)

NOTE! The Weight On Demand function is not available for Serial Port 2.

Cont2: (Continuous Output Serial Port 2)
Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting then press the **ENTER** key to save it.

Cont2: YES
Continuous Output

Cont2: no
No Continuous Output

If Cont2: YES (Continuous Output) is selected, an additional prompt, TYPE: will be displayed.

TYPE: (Continuous Output Format)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are:

0 = SMA	3 = Rice Lake IQ355	6 = Number
1 = SB-400	4 = AnDFV	7 = Toledo Short
2 = SB-200	5 = WI110	8 = SB500 with Traffic Light

NOTE! See Continuous Output Serial Port 1, TYPE: for description of output formats.

SETUP AND CALIBRATION, CONT.

tHrS= (Threshold Weight)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER**` key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new value for the threshold weight or zero (0) to disable the traffic light and then press the **TARE/ENTER** key to save it.

The threshold weight is used to automatically toggle between the Red and Green lights.

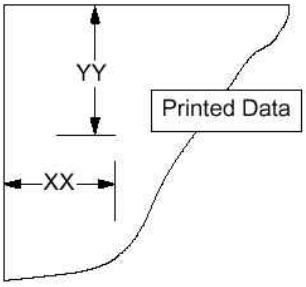
- When the scale gross weight is less than the threshold weight, the Green light will be on, otherwise the Red light will turn on and stay on until the weight goes below the threshold weight or a ticket is printed.
- When a ticket is printed, the Green light will turn on and stay on until the scale gross weight goes below and back above the threshold weight and then the Red light will turn on.
- **NOTE!** If you enter a zero (0) for the threshold weight (tHrS=0), the traffic light feature will be disabled (turned off).

SETUP AND CALIBRATION, CONT.

Pr int (Pr intP) - Print Tab Settings

With Pr int (Pr intP) displayed, press the **TARE/ENTER** key. The display will change to show the current setting no. To skip configuring the Print Tab Settings and proceed to the FSPAnP menu, press the **TARE/ENTER** key again. To configure the Print Tab Settings, press the **ASTERISK/UP ARROW** key (display will change to YES) then the **TARE/ENTER** key. After pressing the **TARE/ENTER** key the display will change to Port:.

The general format for the input is A = YY.XX where A is the character identifying the data printed, YY is the number of lines down and XX is the number of spaces to the right.



NOTE! Enter 00 in either the YY or XX location to disable the data from printing.

Port: (Select Port for Printer)
Press the **TARE/ENTER** key to show the current value. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values are: 1 or 2.

NOTE! Although either port can be used for the printer port, it is recommended to use the bi-directional port 1 with a bi-directional cable.

id : (ID Prompt Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of ID prompt printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

CnC n: (Consecutive Number Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of consecutive number printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

GroSS: (Gross Weight Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of Gross weight printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

tArE: (Tare Weight Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of Tare weight printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

nEt: (Net Weight Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of Net weight printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

SETUP AND CALIBRATION, CONT.

G ACC: (Gross Weight Accumulator Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of Gross weight accumulator printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

n ACC: (Net Weight Accumulator Print Location)
Press the **TARE/ENTER** key to show the current setting for the location of Net weight accumulator printing. If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input a new location and then press the **TARE/ENTER** key to save it.

CrLF: (Carriage Return Line Feed) - ***Data Format Termination***
Data transmitted from the serial I/O port can be terminated with a single carriage return and either no line feed or a single line feed command. Press the **TARE/ENTER** key to view the current setting. A YES on the display means the data will be terminated with a carriage return AND a line feed while a no on the display means the data will be terminated with a single carriage return only.

If the setting displayed is acceptable, press the **TARE/ENTER** key again to save it. Otherwise, use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it.

EoP: (End-Of-Print Line Feeds)
At the end of a data transmission to a printer, the indicator can transmit a pre-selected number of line feed commands to space the paper in the printer to the desired position for withdrawal or for the next print.

Press the **TARE/ENTER** key to view the current setting. If the displayed value is acceptable, press the **TARE/ENTER** key to save it. Otherwise, use the **ASTERISK/UP ARROW** and **UNITS/LEFT ARROW** keys to input the number of End-Of-Print linefeeds and then press the **TARE/ENTER** key to save it. Allowable values are: 0 through 99.

SETUP AND CALIBRATION, CONT.

F SPAn (FSPAn?) - Fine Span Adjustment

NOTE! The FSPAn and Hi rES modes require a load of 10% of Capacity be on the scale before adjustments can be made.

With the F SPAn? prompt displayed after pressing the **TARE/ENTER** *key at the last Print prompt:*

With FSPAn? displayed, press the **TARE/ENTER** key. The display will change to show the current setting no. To skip the Fine Span Adjustment and return to the SEtUP menu, press the **TARE/ENTER** key again. To perform the Fine Span Adjustment, place a calibrated test weight on the scale and press the **ASTERISK/UP ARROW** key (display will change to YES) and then the **TARE/ENTER** key.

After pressing the **TARE/ENTER** key, the display will change to show the amount of the test weight and the annunciators will alternately flash off and on i.e. (all ON, weighing unit off, then all OFF, weighing unit ON). Press the **ASTERISK/UP ARROW** key to increase the span *OR* press the **UNITS/LEFT ARROW** key to decrease the span. Press the ASTERISK key to return to the previous prompt or press the **TARE/ENTER** key to exit FSPAn? and return to the SEtUP menu.

With the F SPAn prompt displayed after pressing the Calibration switch:

With F SPAn displayed, place a calibrated test weight on the scale and press the **TARE/ENTER** key. After pressing the **TARE/ENTER** key, the display will change to show the amount of the test weight and the annunciators will alternately flash off and on (all ON, weighing unit off, then all OFF, weighing unit ON). Press the **ASTERISK/UP ARROW** key to increase the span *OR* press the **UNITS/LEFT ARROW** key to decrease the span. Press the **ASTERISK/UP ARROW** key to return to the previous prompt or press the **TARE/ENTER** key to exit F SPAn and return to the SEtUP menu.

Hi rES - Display High Resolution Weight

With Hi rES on the display, pressing the **TARE/ENTER** key will show the active weight in "high resolution" mode (in 1/10 interval). Press the **PRINT** key to print the weight (followed by the text TEST) via the selected printer output port enabled during setup and calibration. Press the **TARE/ENTER** key to return to the Hi rE S prompt. To exit the Hi rE S mode, press the calibration switch or cycle power (press the **ON/OFF** key twice).

LoCoUt - Key Lock Out Function

With LoCoUt on the display, pressing *any* key will display LoCd (locked) or UnLoCd (unlocked) for the current key state. Pressing a locked key during normal operation will results in a 1/2 second display LoCd and the key will be ignored. To exit the LoCoUt function, press the calibration switch or cycle power (press the **ON/OFF** key twice).

NOTE! The menu selections Hi rES and LoCoUt can only be selected using the calibration switch.

SETUP REVIEW

The 205 indicator allows several operational parameters to be reviewed and changed without breaking the calibration seal. These operational parameters are:

Power Up Zero Reset Enable/Disable
Sleep Mode Feature Enable/Disable
Auto Shutoff Feature Enable/Disable
Clear Tare Feature Enable/Disable

Serial Input / Output Configuration
- Baud Rate
- Parity
- Number of Data Bits
- Number of Stop Bits
- Continuous Output Port 1
  - Continuous Output Format
    - Type
- Continuous Output Port 2
  - Continuous Output Format
    - Type

Print Tab Settings
- Printer Port Selection
- Gross Weight
- Tare Weight
- Net Weight
- Gross Weight Accumulator
- Net Weight Accumulator
- CRLF Data Format Termination
- End-Of-Print Line Feeds

To enable the Setup Review feature, with the indicator ON:

1. Press the **ASTERISK/UP ARROW** key. The indicator will respond by showing the FUnCt: (Function) prompt and alternately flashing off and on (all ON, weighing unit off, then all OFF, weighing unit ON) the annunciators.
2. Press the **ZERO/REVIEW** key. The display will change to the prompt for the selection of power-up zeroing (PU0:).
3. Using the same procedure as described in the Setup and Calibration section of this manual make the required changes.
4. Press the **ASTERISK/UP ARROW** key to return to the previous prompt.
5. To exit Setup Review, press the **ASTERISK/UP ARROW** key to step through the remaining prompts *OR* at anytime, cycle the power (press the **ON/OFF** key twice).

CALIBRATION “C” NUMBERS

The “C” numbers are displayed only during the Test mode operation by pressing the **ASTERISK/UP ARROW** key then the **UNITS/TEST** key. The "C" numbers are shown at the end of the test operation and each number is displayed for approximately 4 seconds, allowing you to record them. Each number may be up to three (3) digits in length. By recording these numbers you will be able to return the indicator to its present calibration settings without using test weights simply by entering the “C” numbers. *Refer to the Setup and Calibration, CAL section of this manual for instructions on using the "C" numbers*.

If any components have been changed that affect calibration and/or your scale is used in a commercial application and must be "Legal for Trade" you cannot use "C" numbers to re-calibrate.

ACCUMULATORS

To *view* the NET accumulator:

1. Press the **ASTERISK/UP ARROW** key then the **NET/GROSS** key.

2. Press the **ASTERISK/UP ARROW** key to return to normal operation.

To *print* the NET accumulator:

1. Press the **ASTERISK/UP ARROW** key, the **NET/GROSS** key, then the **PRINT** key

2. The indicator will return to normal operation when printing has been completed.

To *clear* (zero) the NET accumulator:

1. Press the **ASTERISK/UP ARROW** key, the **NET/GROSS** key, then the **ZERO** key

2. Press the **ASTERISK/UP ARROW** key to return to normal operation.

To *view* the Gross accumulator:

1. Press the **ASTERISK/UP ARROW** key then the **NET/GROSS** key twice.

2. Press the **ASTERISK/UP ARROW** key to return to normal operation.

To *print* the Gross accumulator:

1. Press the **ASTERISK/UP ARROW** key, the **NET/GROSS** key twice, then the **PRINT** key

2. The indicator will return to normal operation when printing has been completed.

To *clear* (zero) the Gross accumulator:

1. Press the **ASTERISK/UP ARROW** key, the **NET/GROSS** key twice, then the **ZERO** key

2. Press the **ASTERISK/UP ARROW** key to return to normal operation.

BEFORE YOU CALL FOR SERVICE

The 205 indicator has been designed to provide you with years of trouble-free operation. However, should you experience a problem, please refer to the troubleshooting guide below before you call for service. The following describes several types of symptoms along with suggested remedies.

PROBLEM	POSSIBLE SOLUTIONS
Display does not turn on	AC operation: Is the AC power cord fully inserted into the wall receptacle? Check wall receptacle for proper AC power. Try another electrical appliance in the same receptacle, does it work? Check the circuit breaker. Has there been power failure? Battery operation: Check if battery is installed and correctly. Is battery discharged? Replace or recharge.
Incorrect weight displayed	Has the indicator been calibrated? Insure that the scale platform isn't touching an adjacent object. Check the load cell connector wiring. If using four (4) wire load cells, insure the sense lead jumpers (J4 & J5) are installed. Have proper operation procedures been followed?
Indicator will not display weight	Refer to Error Codes section and make certain that the "oCAP" message is not displayed. If so, and scale is not loaded, perform the calibration sequence.
The printer prints but does not use the Print Tab Settings or prints a test ticket	The print tab setting or visual ticket format must be selected prior to beginning the weighing operation or just prior to printing the ticket. To select the ticket format prior to beginning the weighing operation: **1.** Press the **ASTERISK/UP ARROW** key then the **PRINT** key. The display will change to the "Prt:". **2.** Press the **TARE/ENTER** key to show the current value. **3.** If the value displayed is acceptable, press the **TARE/ENTER** key again to save it. **4.** If the displayed value is incorrect (or another ticket format is desired), use the **ASTERISK/UP ARROW** key to toggle to a new setting and then press the **TARE/ENTER** key to save it. Allowable values for ticket formats are: 0 = print tab settings 1 = visual ticket format 1 2 = visual ticket format 2 **NOTE!** When a print format is selected, it will remain active until changed by the operator.

ERROR CODES

The 205 indicator is equipped with software that indicates when an error in the operation takes place. The following lists the error codes displayed by the 205 along with their meaning. Should you encounter an error code, please refer to this list for the cause.

CALbtn (Calibration button)

CALbtn will be displayed (until the condition changes), on power-up if the calibration switch is pressed in by the operator, the calibration access screw is the wrong length and is depressing the switch, the switch is disconnected from the PC board, or the switch is defective.

CORRECTIVE ACTION: Release the switch. Insure correct screw (#10 x ½ Stainless Steel fillister head) was installed for the calibration access screw. Referring to Figure No. 6, make sure calibration switch cable is plugged into P7 on the PC board. Replace calibration switch assembly. Consult your scale service provider.

ConFiG (Configuration)

E^2PROM checksum failure. Indicates improper stored calibration data, calibration is necessary.

CORRECTIVE ACTION: Recalibrate with calibrated test weight.

Error (Error)

An invalid keypad entry was attempted:

A. **PRINT** key pressed with a negative weight.
B. **TARE/ENTER** key pressed to enter a push button tare value of a negative value.
C. **TARE/ENTER** key pressed to enter a tare weight value that exceeds the scale capacity.
D. **TARE/ENTER** key pressed to enter a tare weight value that is inconsistent with the scale division value (i.e. attempt to enter a tare of 123 with scale divisions of 5).
E. **ZERO** key pressed when the gross weight is outside the scale zero weight range.
F. **UNITS/TEST** key pressed to change to kg when the kg tare weight value exceeds 4 digits in length.

CORRECTIVE ACTION: Determine which of the reasons for the error display is applicable and take the appropriate corrective action.

ErrAh (Error Analog high)

1. The load cell input is above the range of the indicator.

CORRECTIVE ACTION: Check for improper load cell wiring, excessive load, and for output of 1 to 40mV.

2. Load cell or circuit failure.

CORRECTIVE ACTION: Consult your scale service provider.

ErrAL (Error Analog Low)

1. The load cell input is below the range of the indicator.

CORRECTIVE ACTION: Check for improper load cell wiring and for output of 1 to 40mV.

2. Load cell or circuit failure.

CORRECTIVE ACTION: Consult your scale service provider.

ERROR CODES, CONT.

Err 1 (Error 1)
A program checksum mismatch has been detected.

CORRECTIVE ACTION: Consult your scale service provider.

Err 3 (Error 3)
Internal RAM failure.

CORRECTIVE ACTION: Consult your scale service provider.

HuH? (HuH?)
UNITS key pressed in an attempt to perform a unit conversion that is not allowed.

CORRECTIVE ACTION: Determine the reason for the error display and take the appropriate corrective action.

notArE (no tarE)
NET key pressed with no stored tare weight value.

CORRECTIVE ACTION: Determine the reason for the error display and take the appropriate corrective action.

oCAP (over Capacity)
The load on the scale exceeds the scale capacity plus nine (9) divisions.

CORRECTIVE ACTION: Remove the over capacity load from the scale platform. May indicate miscalibration.

-oF- (overflow)
The indicator is attempting to display a positive number greater than six (6) digits in length or a negative number of more than five (5) digits.

CORRECTIVE ACTION: Return to Gross Weight mode and review Tare value. May indicate miscalibration.

toob iG (too big)
UNITS key pressed in an attempt to perform a unit conversion where the interval would have been greater than 50.

CORRECTIVE ACTION: Determine the reason for the error display and take the appropriate corrective action.

UnStb (Unstable)
Motion is present when trying to perform a print function.

CORRECTIVE ACTION: Wait for a stable weight display (*STABLE* annunciator on) before performing any of this operation.

CALIBRATION SEAL INSTALLATION

If your Model 205 Weight Indicator is used in a commercial application it must be tested and sealed by your local weights and measurements official. The 205 is designed to accept a lead and wire security seal to prevent unauthorized access to the calibration adjustments. Refer to Figure No. 10 for details on the installation of the seal.

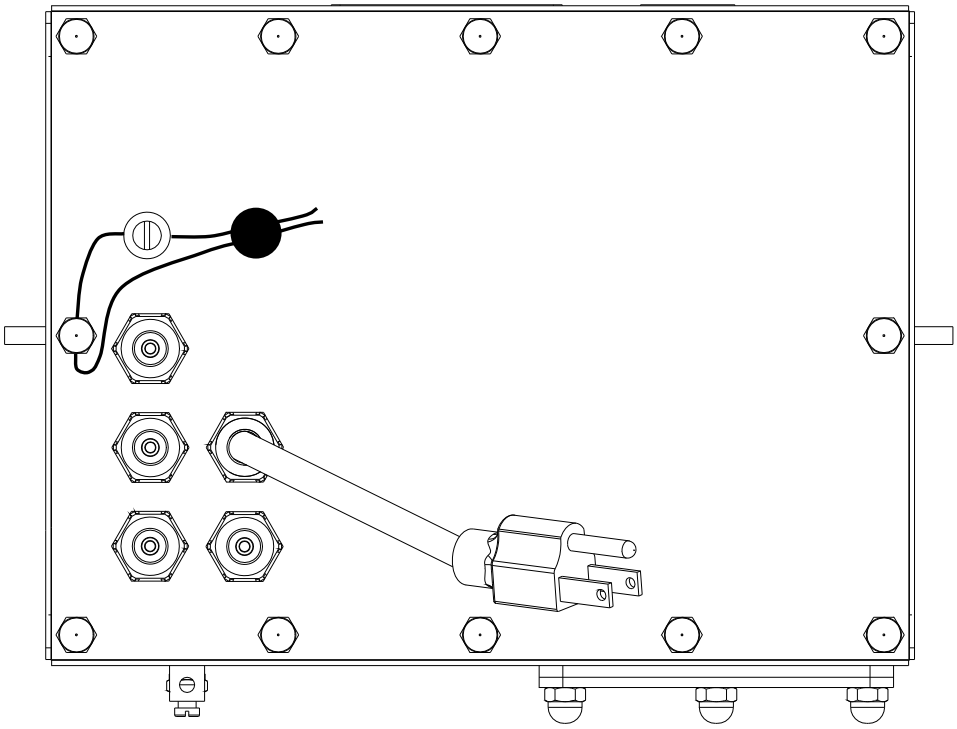
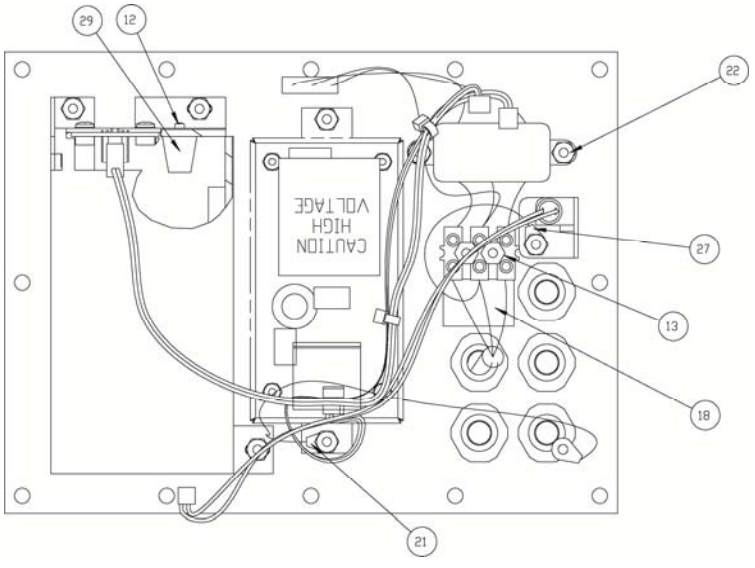


Figure No. 10

PART IDENTIFICATION

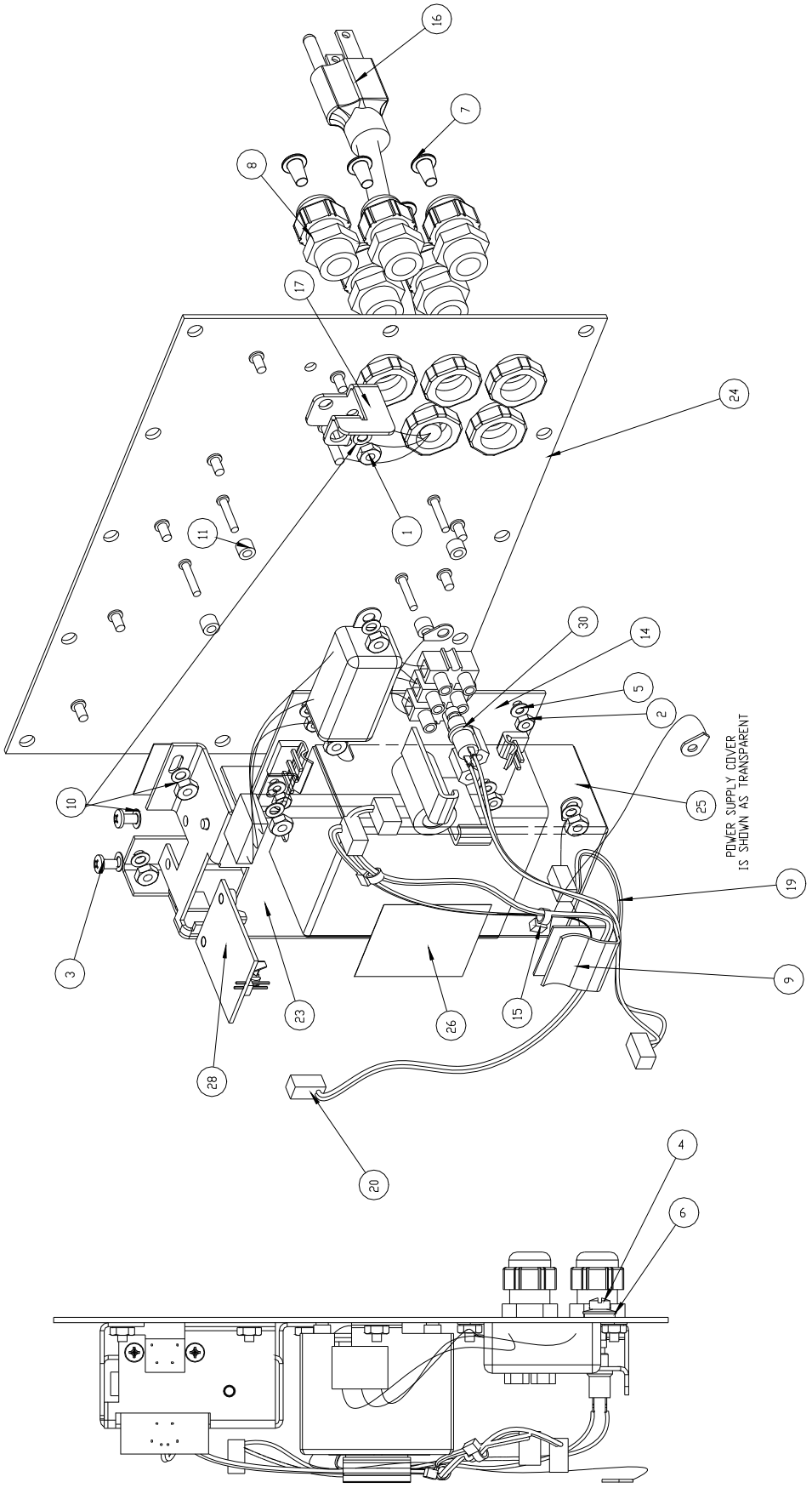
(Rear Enclosure Sub Assembly)

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	8	6013-0039	HEX NUT #6-32
2	4	6013-0245	HEX NUT #4-40
3	2	6021-0654	SCW PAN HEAD #6-32 x .250 PDMS
4	1	6021-1108	SCW FILLISTER MACHINE-SCW #10-32 x .375 S.S.
5	4	6024-0108	WASHER LOCK INT. TOOTH #4 S.S.
6	1	6024-1081	WASHER FLAT #10 NEOPRENE BACKING S.S.
7	4	6540-1104	PLUG, HOLE 0.173-.240 RED POLYETH
8	5	6610-2248	GLAND CONNECTOR
9	1	6610-5007	CABLE CLIP
10	10	6680-0004	WASHER LOCK INT. TOOTH #6 Z/P
11	4	6680-0138	SPACER #6 x .187 NYLON
12	1	6680-0200	POP RIVET
13	2	6680-0203	SPACER (PCB) #6-32 x .500
14	1	6800-1032	POWER SUPPLY BOARD
15	2	6980-0014	WIRE TIE 4” BLACK
16	1	6980-1030	POWER CORD 18/3 SVT CEE 6.3 FT
17	1	8200-B019-08	BRACKET: CALIBRATION SWITCH
18	1	8200-B104-08	LABEL: 205/210 TERM. BLOCK
19	1	8200-B204-0A	CABLE: 205/210 POWER SUPPLY OUTPUT
20	1	8200-B205-0A	CABLE: 205/210 BATTERY CABLE
21	1	8200-B212-0A	CABLE: GND
22	1	8200-B215-0A	CABLE: AC POWER W/FILTER 205/210 DWI
23	1	8200-C012-08	BRACKET, BATTERY HOLDER
24	1	8200-C016-0A	WELDMENT: ENCLOSURE REAR
25	1	8200-C018-08	POWER SUPPLY COVER
26	1	8510-C346-0I	LABEL – HIGH VOLTAGE
27	1	8512-B350-0A	WIRE: 18GA, GRN, 5.0, #8RT/TINNED
28	1	8200-B206-0A	BATTERY POWER BOARD
29	1	8526-B232-08	SPRING, BATTERY COVER
30	1	8539-B254-0A	ASSEMBLY: CABLE, CALIBRATION SWITCH



PART IDENTIFICATION

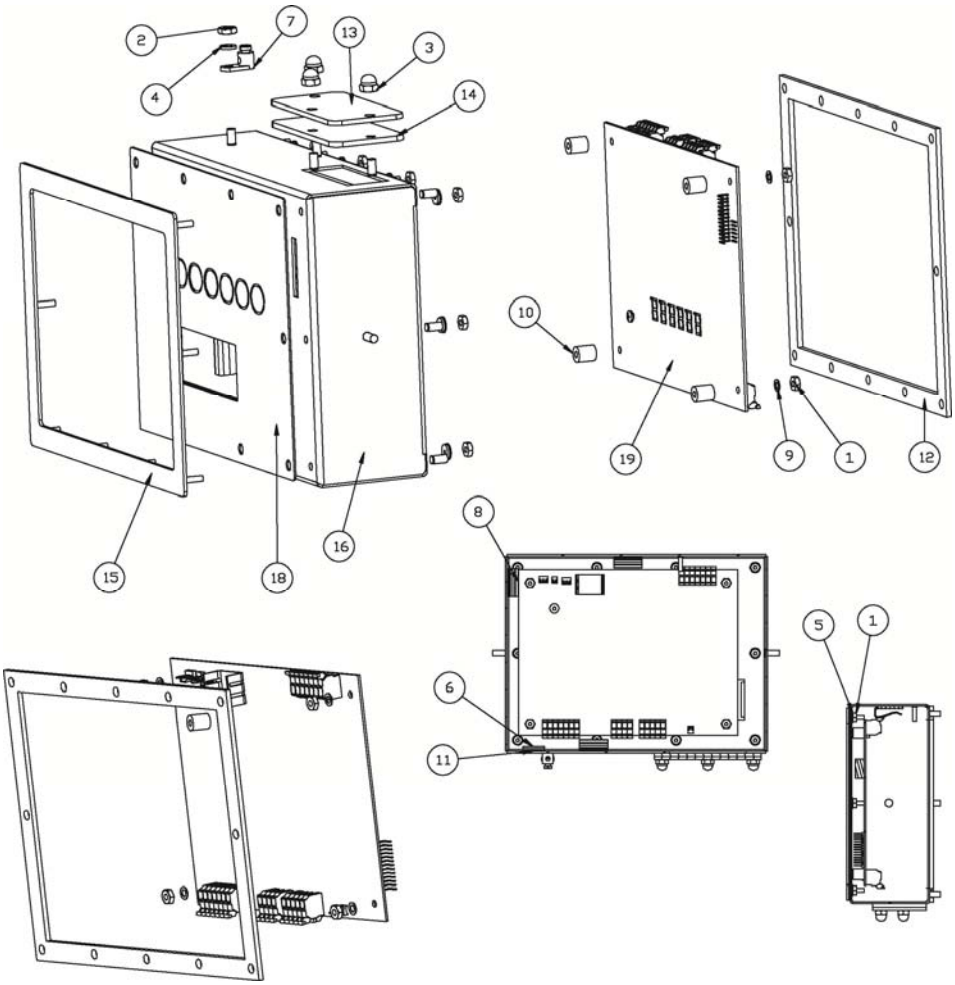
(Rear Enclosure Sub Assembly)



PART IDENTIFICATION

(Front Enclosure Sub Assembly)

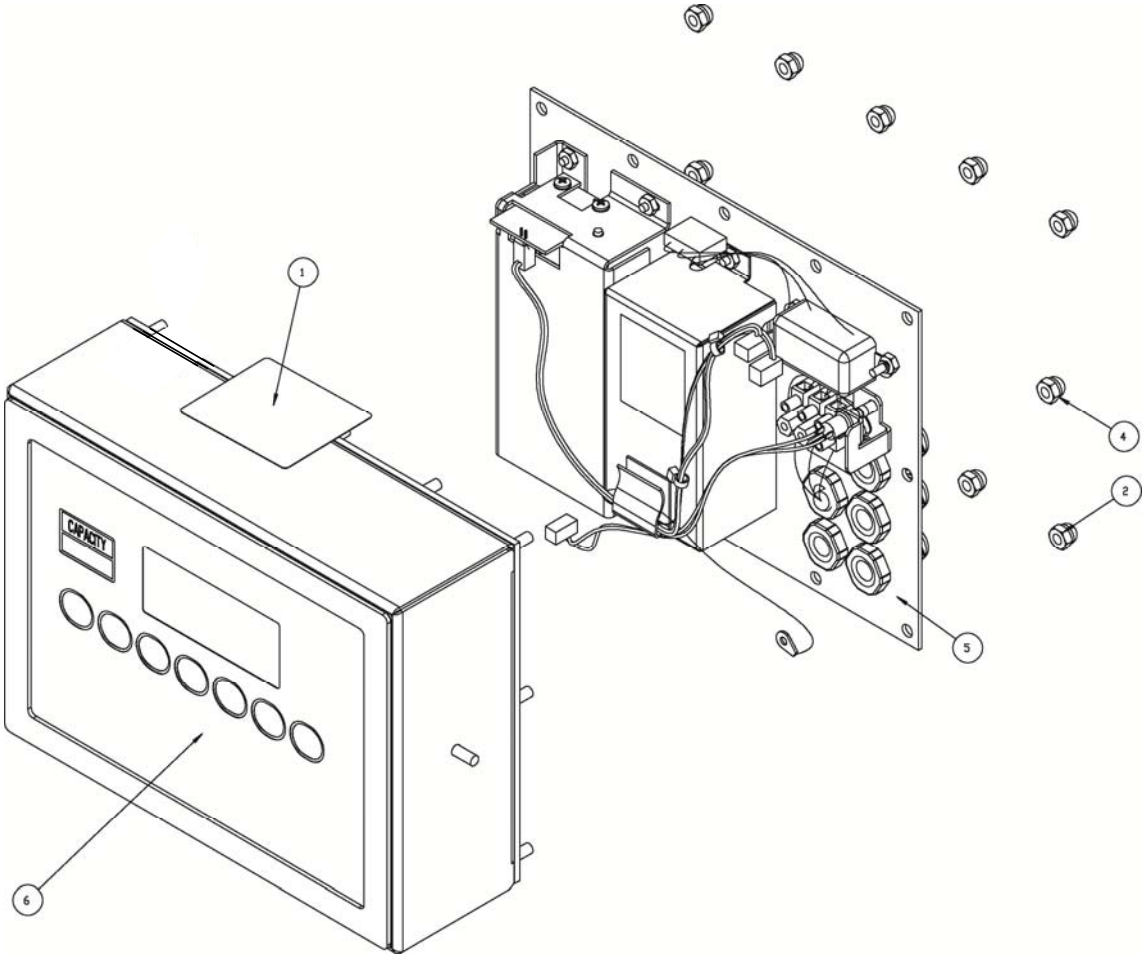
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	14	6013-0039	NUT HEX #6-32
2	1	6013-0297	NUT 10-32 HEX
3	3	6013-0433	NUT HEX #10-32 ACORN S.S.
4	1	6021-0623	SCW PAN HEAD #6-32 x .750 PDMS
5	10	6024-1078	WASHER FLAT #6 NEOPRENE BACKING S.S.
6	1	6560-0064	DESSICCANT 1 x 1 BAG
7	1	6610-5002	GROUND LUG
8	3	6610-5007	CABLE CLIP
9	4	6680-0004	WASHER LOCK INT. TOOTH #6 Z/P
10	4	6680-1049	SPACER (PCB) #6 x ..438
11	1	6710-1017	TAPE DBL SIDED 1.0 WIDE 45 MIL THK.
12	1	8200-B014-08	GASKET FOR 210 ENCLOSURE
13	1	8200-B020-08	COVER, BATTERY
14	1	8200-B021-08	GASKET: BATTERY DOOR
15	1	8200-C015-0A	WELDMENT: BEZEL FOR 210
16	1	8200-C017-0A	WELDMENT: ENCLOSURE, FRONT
18	1	8200-D100-08	KEYPAD: 205 DWI
19	1	8200-D201-0A	PCB ASSEMBLY - 205 CONTROLLER



PART IDENTIFICATION

(Final Assembly)

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	593GR986	SERIAL TAG ASSEMBLY
2	11	6013-0433	NUT HEX #10-32 ACORN S.S.
4	1	8200-B026-08	NUT HEX #10-32 ACORN S.S. DRILLED
5	1	8200-D207-0A	SUB ASSEMBLY: REAR ENCLOSURE
6	1	8200-D208-1A	SUB ASSEMBLY: FRONT



APPENDIX A:
MODEL 205DC

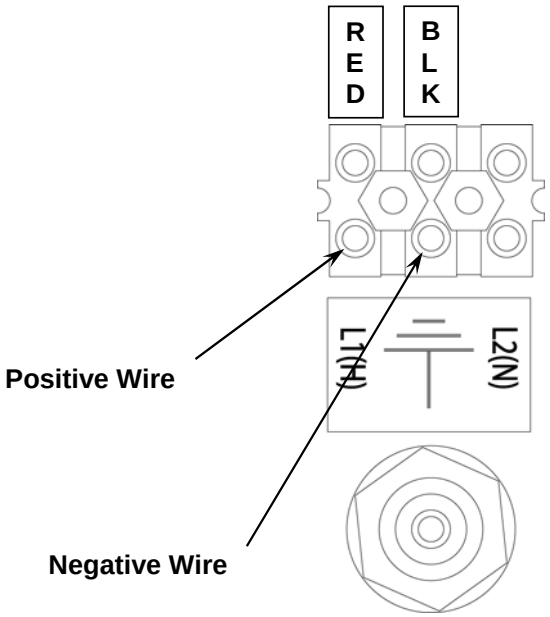
The Model 205DC indicator has been created to change the input power requirement from 115-230VAC, 0.4A to 12-15VDC, 1.0A. The AC input filtering and AC–DC converter components have been removed from the back panel of the indicator.

The input power wiring and the main printed circuit board power wiring have been changed. The input power source can be provided by the user and is to be 12-15VDC, 1A. The main printed circuit board positive (red) power wire is connected to the L1(H) terminal and the negative (black) wire is connected to the GND terminal of the input power terminal block.

Strip ¼" of insulation from each of the power source positive and negative wires. Solder tin each wire. Connect the positive (+) voltage source wire to the terminal marked L1(H) on the terminal block as shown below. Connect the negative (-) voltage source wire to the terminal marked GND on the terminal block as shown below.

The indicator can be operated as described in this manual.

IMPORTANT! The indicator is shipped with the load cell excitation voltage set to 12V (J3 *open*) for a 14-15 VDC source. To operate from a 12-14 VDC source, the load cell excitation voltage MUST be set to 8V (J3 *closed*). Operation with the load cell excitation voltage set to 12V will result in an unstable weight display. Refer to Figure No. 7 for the location of J3.



STATEMENT OF LIMITED WARRANTY

WARRANTY TERMS

Cardinal Scale Manufacturing Company warrants the equipment we manufacture against defects in material and workmanship. The length and terms and conditions of these warranties vary with the type of product and are summarized below:

PRODUCT TYPE	TERM	MATERIAL AND WORKMANSHIP	LIGHTNING DAMAGE See note 9	WATER DAMAGE See note 7	CORROSION See note 4	ON-SITE LABOR	LIMITATIONS AND REQUIREMENTS
VEHICLE SCALE WEIGHT INDICATORS	**1 YEAR**	**YES**	**YES**	**YES**	**YES**	**NO**	**1,2,3,5,6 A,B,C,D**
VEHICLE SCALE LOAD CELLS Ex. Hydraulic	**5 YEARS**	**YES**	**YES**	**YES**	**YES**	**90 DAYS**	**1,2,3,5,6 A,B,C,D**
HYDRAULIC LOAD CELLS	**LIFE**	**YES**	**YES**	**YES**	**YES**	**90 DAYS**	**1,5,6,8 A,B,C,D**

PRODUCT TYPE	TERM	MATERIAL AND WORKMANSHIP	LIGHTNING DAMAGE See note 9	WATER DAMAGE See note 7	CORROSION See note 4	ON-SITE LABOR	LIMITATIONS AND REQUIREMENTS
VEHICLE SCALE STRUCTURE	5 YEARS	YES	YES	YES	YES	90 DAYS	1,2,3,5,6 A,B,C,D
ALL OTHER CARDINAL PRODUCTS	1 YEAR	YES	NO	YES	YES	NO	1,2,5,6 A,B,C,D
REPLACEMENT PARTS	90 DAYS	YES	NO	YES	YES	NO	1,2,4,5,6 A,B,C,D
IN-MOTION VEHICLE SCALES	1 YEAR	YES	NO	YES	YES	90 DAYS	1,2,5,6 A,B,C,D

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315-WARRANTY-CAR-G

APPLICABLE LIMITATIONS AND REQUIREMENTS

1. This warranty applies only to the original purchaser. The warranty does not apply to equipment that has been tampered with, defaced, damaged, or had repairs or modifications not authorized by Cardinal or has had the serial number altered, defaced or removed.
2. This warranty is not applicable to equipment that has not been grounded in accordance with Cardinal's recommendations.
3. This equipment must be installed and continuously maintained by an authorized Cardinal dealer.
4. Applies only to components constructed from stainless steel.
5. This warranty does not apply to equipment damaged in transit. Claims for such damage must be made with the responsible freight carrier in accordance with freight carrier regulations.
6. Warranty term begins with date of shipment from Cardinal.
7. Only if device is constructed for outdoor use.
8. Lifetime warranty applies to damages resulting from water, lightning, and voltage transients and applies only to the hydraulic load cell structure itself (does not include pressure transducers, rubber seals, o-rings, and associated wiring).
9. Except for hydraulic load cells, warranty coverage for damage resulting from lightning is valid ONLY when the device is installed in strict accordance with Cardinal's installation instructions including the use of recommended grounding and surge suppression circuitry.

EXCLUSIONS

A.) This warranty does not include replacement of consumable of expendable parts. The warranty does not apply to any item that has been damaged due to unusual wear, abuse, improper line voltage, overloading, theft, fire, lightning, water, prolonged storage or exposure while in purchaser's possession or acts of God unless otherwise stated herein.

B.) This warranty does not apply to peripheral equipment not manufactured by Cardinal. This equipment will normally be covered by the equipment manufacturer's warranty.

C.) This warranty sets forth the extent of our liability for breach of any warranty or deficiency in connection with the sale or use of our product. Cardinal will not be liable for consequential damages of any nature, including but not limited to loss of profit, delays or expenses, whether based on tort or contract. Cardinal reserves the right to incorporate improvements in material and design without notice and is not obligated to incorporate said improvements in equipment previously manufactured.

D.) This warranty is in lieu of all other warranties expressed or implied including any warranty that extends beyond the description of the product including any warranty of merchantability or fitness for a particular purpose. This warranty covers only those Cardinal products installed in the forty-eight contiguous United States and Canada.

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Addendum to the
200, 205, 210 and 215
Installation and Technical Manual

TEST MODE

This addendum is to inform you of the TEST MODE feature in the 200, 205, 210 and 215 Weight Indicators. This addendum should be used in addition to the Installation and Technical manual for your indicator.

NOTE! On the 200 and 205, the functions of numeric keys are replaced by using **UNITS/LEFT ARROW** and **ASTERISK/UP ARROW** keys. The cursor location is identified by the blinking character and can be advanced to the left to the next position by pressing the **UNITS/LEFT ARROW** key. Pressing the **ASTERISK/UP ARROW** key will change the blinking character to the next value.

To Start Test Mode

1. Remove calibration access screw.
2. Press **ON/OFF** key to turn indicator ON.
3. Insert a small screwdriver or other tool into the access hole and press the CAL switch.
4. Display will change to SEtUP.
5. Press **UNITS/TEST** key.
6. Display will change to tESt:.
7. Press **ENTER** key to show current test function value (which will be 0, test feature off).
8. Using the numeric keys, enter test function value and then press **ENTER** key.
   4 = raw A/D readings
   16 = display milliVolts
9. Display will change to SEtUP.
10. Press ∗ (ASTERISK) key to begin test.
11. Display will change to show test data.

To Change Test Mode

1. With indicator displaying test data, insert a small screwdriver or other tool into the access hole and press the CAL switch.
2. Display will change to SEtUP.
3. Press **UNITS/TEST** key.
4. Display will change to tESt:.
5. Press **ENTER** key to show current test function value.
6. Using the numeric keys, enter test function value and then press **ENTER** key.
   4 = raw A/D readings
   16 = display milliVolts
7. Display will change to SEtUP.
8. Press ∗ (ASTERISK) key to begin test.
9. Display will change to show test data.

To Stop Test Mode

1. With indicator displaying test data, insert a small screwdriver or other tool into the access hole and press the CAL switch.
2. Display will change to SEtUP.
3. Press **UNITS/TEST** key.
4. Display will change to tESt:.
5. Press **ENTER** key to show current test function value.
6. Press numeric **0** key (0 = test feature off) and then press **ENTER** key.
7. Display will change to SEtUP.
8. Press ∗ (ASTERISK) key to stop test and reset indicator.
9. The indicator is now ready for normal operation.

IMPORTANT! Once TEST MODE has been enabled, the indicator will power on with TEST on the display. Operator must press ENTER key to stay in test mode or press ∗ (ASTERISK) key to disable test mode.

ADDENDUM FOR MANUALS:
8200-M035-O1 Rev B 10/09, 8200-M024-O1 Rev G 10/09, 8200-M411-O1 Rev C 10/09
01/10

Addendum to the 200, 205, 210 and 215 Installation and Technical Manual

This addendum is to inform you of changes to the 200, 205, 210 and 215 Weight Indicators. This addendum should be used in addition to the Installation and Technical Manual for your indicator. Refer to the manual for information concerning the installation, setup, and operation of your 200, 205, 210 or 215 Weight Indicator.

REMOTE INDICATOR SETUP

Beginning with version 2.6.1 of the firmware, an additional prompt has been added to the **A-d** section of the setup.

> If the indicator is to function as a remote indicator, press the **YES** key at the SErSCL prompt. If not then press the **NO** key at the prompt.
>
> If SErSCL was set to **YES** then, an additional prompt has also been added in the **SIO** section for selecting the port for the LOCAL/REMOTE communications.
>
> At the LrP prompt enter either **1** for port 1 or **3** if the optional 2xx-RS232 card is being used.

IMPORTANT!

If a 200, 205, 210 or 215 indicator is to be used as the LOCAL and as the REMOTE, then both indicators **MUST** have Rev 2.6.1 or greater software installed.

If a combination of 200, 205, 210 or 215 and a 225 indicator are to be used in a LOCAL/REMOTE configuration, then the 200, 205, 210 or 215 indicator **MUST** have Rev 2.6.1 or greater software installed, and the 225 indicator **MUST** have Rev 1.0.K or greater software installed.

∗∗∗ This operation is not support with a 220 indicator. ∗∗∗

ADDENDUM FOR MANUALS:
8200-M035-O1 Rev B, 8200-M024-O1 Rev G and H, 8200-M411-O1 Rev C and D
02/11

CONTINUOUS DATA OUTPUT FORMATS

TOLEDO

Beginning with version 2.6.1 of the firmware, the Toledo output has been expanded to provide a selection between the short or long format and also whether or not to include the optional checksum.

If type 7 is chosen at the tSHort prompt, press the **YES** key to select the SHORT format or press the **NO** key to select the LONG format.

If the optional checksum is to be included press the **YES** key at the CSU prompt, otherwise press the **NO** key for no checksum.

Short Format:

<stx><swa><swb><swc>xxxxxx<cr><sum>

Long Format:

<stx><swa><swb><swc>xxxxxxyyyyyy<cr><sum>

Where

<stx>	is an ASCII Start-of-Text character
<swa>	is status character a
<swb>	is status character b
<swc>	is status character c
xxxxxx	is the displayed weight
yyyyyy	is the tare weight
<cr>	is an ASCII carriage return
<sum>	is the optional checksum

CONTINUOUS DATA OUTPUT FORMATS, CONT.

RANGER 5000 FORMAT A

Beginning with version 2.6.1 of the firmware, the Ranger 5000 Format A has been added to the Continuous Data Output Formats. In setup, select type 9 for the Ranger 5000 format.

At the StArtb prompt, enter the decimal value for the start character.
Valid entry is 0 to 126.

At the Endb 1 prompt, enter the decimal value for the first end character.
Valid entry is 0 to 126.

At the Endb 2 prompt, enter the decimal value for the second end character.
Valid entry is 0 to 126.

If the above items are '0' then the character will not be included in the data stream.

Format

<StArtb>Sign WeightA(7) Status

Where,

Sign	is the sign of the weight (' ' for positive, '-' for negative)
WeightA	is a seven character string containing the current weight including the decimal point. If there is no decimal point, then the first character is a space. Leading zero blanking applies.
Status	provides information on the weight reading. The characters G/N/U/O/M/E represent Gross/Net/Underload/Overload/Motion/Error respectively.

CONTINUOUS DATA OUTPUT FORMATS, CONT.

GEDGE 1650 FORMAT 4

Beginning with version 2.6.1 of the firmware, the GEDGE 1650 Format 4 has been added to the Continuous Data Output Formats. In setup, select type 10 for the GEDGE format.

At the tdAtE prompt, enter the format for the date and time (0-4).

At the StrtC prompt, enter the decimal value for the start character (0-126)

At the EbLoC prompt, enter the decimal value for the end block character or data separator (0-126).

At the dbUb prompt, enter the decimal value for the device number (0-99).

Format

<Bg><DT><BD><No><BD><W1><BD><D2><D3><D4><D5><D6><D7><BD><En>

Where,

Bg	is the starting character, if 0 then it is not transmitted.
DT	is the Date and Time the following BD character is output only if the date/time is output.
BD	Block division character.
D2	Displayed weight identity. **G**=gross, **N**=net
D3	**M** scale is in motion, **S** scale is stable.
D4	**I**nscale (0>=weight<=capacity) **O**vercap **U**=below zero
D5	**Z**=Center-of-Zero, otherwise ASCII space
D6	**E**=Tare not equal to 0, otherwise ASCII space
D7	Always an ASCII space
En	End of transmission character
No	Device Number 01 thru 99. If set to 0 above, then nothing is output.
W1	Displayed weight.

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Addendum to the 200, 205, 210 and 215 Installation and Technical Manual

This addendum is to inform you of changes to the 200, 205, 210 and 215 Weight Indicators. This addendum should be used in addition to the Installation and Technical Manual for your indicator. Refer to the manual for information concerning the installation, setup, and operation of your 200, 205, 210 or 215 Weight Indicator.

LINEARIZATION FOR GUARDIAN SCALE

Beginning with version 2.6.4 of the firmware, an additional prompt has been added after the CALP section of the setup.

> If a **GUARDIAN** scale is connected to the indicator, at the SSTP prompt press the **YES** key.
>
> The tLo= prompt will be displayed. This is the low end of the range of weight that requires adjusting. For example, if after performing linearization testing, the displayed weight is 5 lbs low between 10,000 lbs and 15,000 lbs, the value for the tweak low weight is 10000.
>
> Input the tweak low weight value and then press the **ENTER** key.
>
> The tHi= prompt will be displayed. This is the high end of the range of weight that requires adjusting. Using the example above, the value for the tweak high weight is 15000.
>
> Input the tweak high weight value and then press the **ENTER** key.
>
> The tUAL= prompt will be displayed. This is the amount of weight that needs to be added (or subtracted) from the range of weight to bring the displayed weight into tolerance. Again, using the example above, the Tweak Weight value would be 5.
>
> Input the tweak weight value (pressing the **NET** key will change the sign) and then press the **ENTER** key.

When the indicator is turned on, it will display SSt for a couple of seconds if the SSTP prompt was answered **YES** in setup.

ADDENDUM FOR MANUALS:
8200-M035-O1 Rev B, 8200-M024-O1 Rev G and H, 8200-M411-O1 Rev C and D
02/11