



210 and 215
WEIGHT INDICATOR
Installation and Technical Manual



8200-M411-O1 Rev D
02/11

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| |
|--|
| 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
SENSITIVE**

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.



All rights reserved. Reproduction or use, without expressed written permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. While every precaution has been taken in the preparation of this manual, the Seller assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend to a great extent upon the individual accuracy, skill and caution. For this reason the Seller is not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging the procedures do so entirely at their own risk.

SPECIFICATIONS

Unless otherwise noted, the specifications apply to both the Model 210 and Model 215.

| | | |
|-------------------------|---|--|
| Power Requirements: | 100 to 240 VAC (50/60 Hz) at 0.4A Max. | |
| 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 °F (-10 to +40 °C) Humidity: 90% non-condensing (maximum) | |
| Display: | 210 | 215 |
| | Six digit, seven segment, 0.6" high LED | Six digit, seven segment, 1" high LCD |
| 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/IIILD) | |
| 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/IIILD) | |
| 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: | 210 | 215 |
| | Tons, Pounds, Pounds-Ounces, Ounces, Metric Tons, Kilograms, Grams | Pounds, Pounds-Ounces, Ounces, Kilograms, Grams |
| Keypad: | Color coded Membrane type, 22 keys | |
| Standard I/O: | (1) bi-directional RS232 (20mA) (1) output only RS232 (20mA) | |
| Battery Operation: | 210EU - CAM-350 Type, 12V 2Ah 215 - 10 "AA" Size, NiMH, 2300mAh | |

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 REMPLAC'E PAR UN TYPE INCORRECT. REJETEZ LES BATTERIES UTILISE'ES SELON LES INSTRUCTIONS.

SPECIFICATIONS, CONT.

Unless otherwise noted, the specifications apply to both the Model 210 and Model 215.

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)
- Numeric keypad
- Keypad tare function
- Count feature with accumulator
- Time and Date with selectable 12 or 24 hour operation
- Checkweigher
- Three Preset Weight Comparators
- Axle Weigher (CWL-40) Operation Mode

Optional Features:

Analog Output*, Allen-Bradley Interface*, 10/100 mbps Ethernet Adapter*, Additional Serial Port*, Checkweigher Light Bar*, 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 210/215 indicators are precision weight-measuring instruments. As with any precision instrument, they require an acceptable environment to operate at peak performance and reliability. This section is provided to assist you in obtaining such an environment.

Environmental

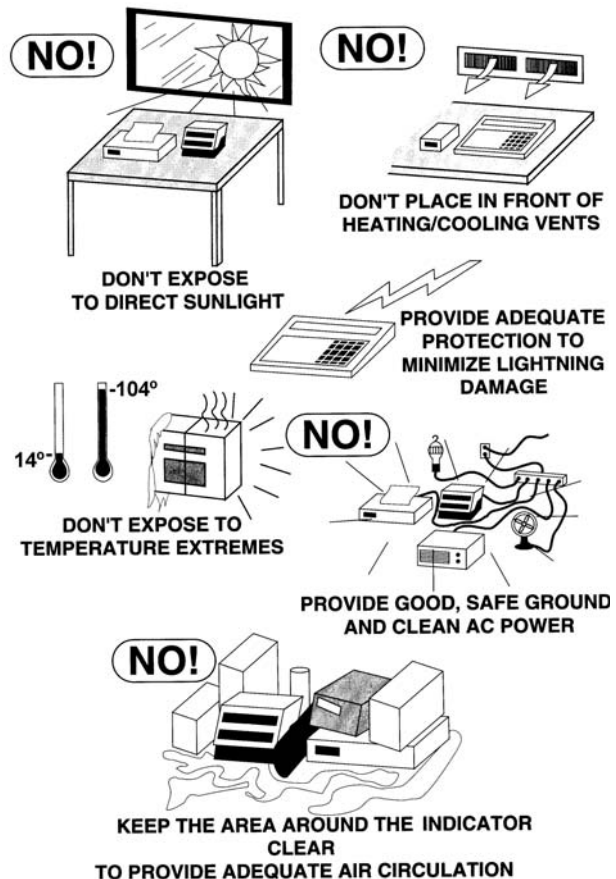
The Model 210/215 indicators meet or exceeds all certification requirements within a temperature range of 14 to 104 °F (-10 to +40 °C).

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, CONT.

Electrical Power

The 210/215 indicators have 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 210/215 (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 210/215 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 210/215 indicator come already installed on a scale, the following information describing the installation of the indicator does not apply.

The Model 210/215 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.

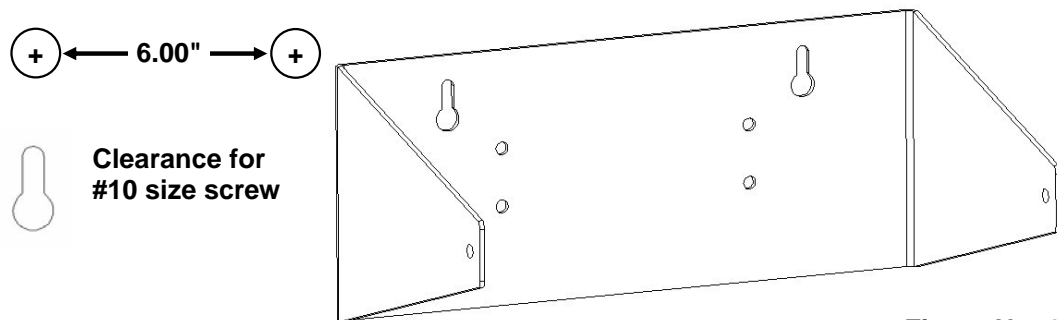


Figure No. 1

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.

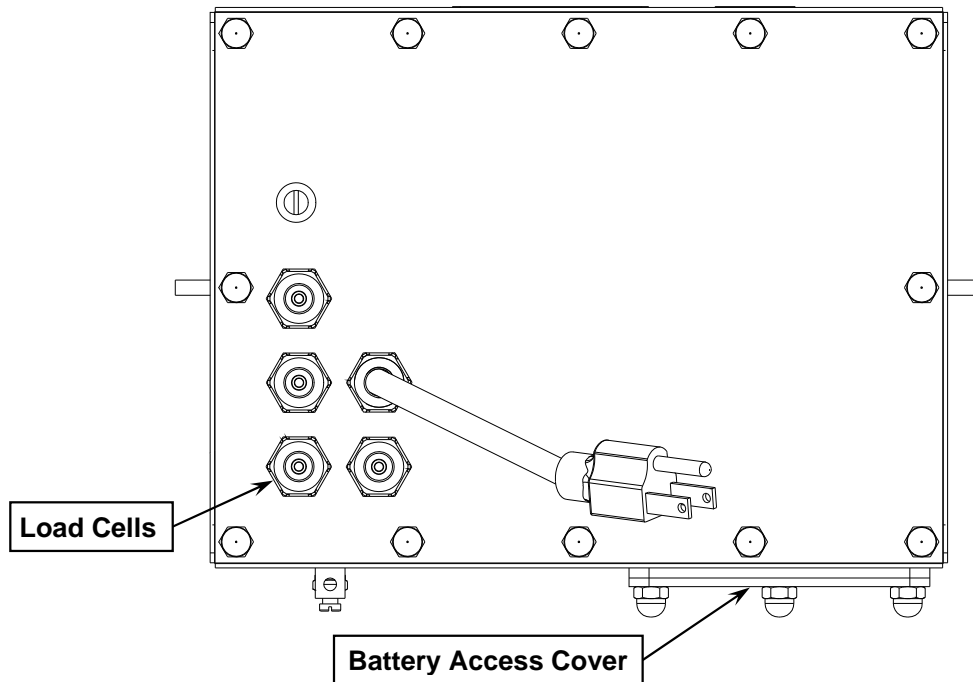


Figure No. 2

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. Remove the three acorn nuts securing the Battery Access Cover to the bottom of the indicator and then remove the battery tray (Model 215) or the battery (Model 210).
2. After removing the battery tray or 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. 8 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.

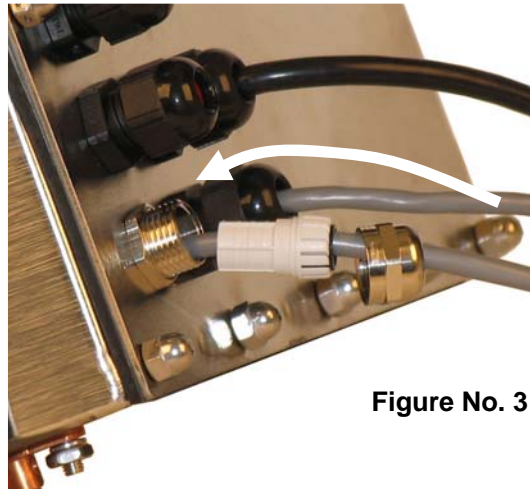


Figure No. 3

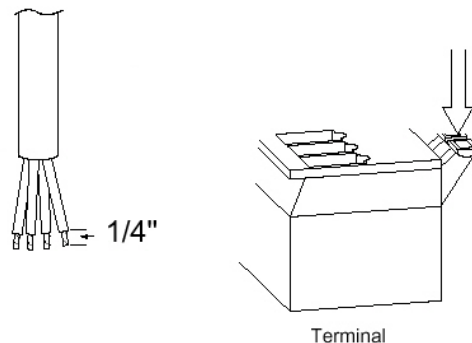


Figure No. 4

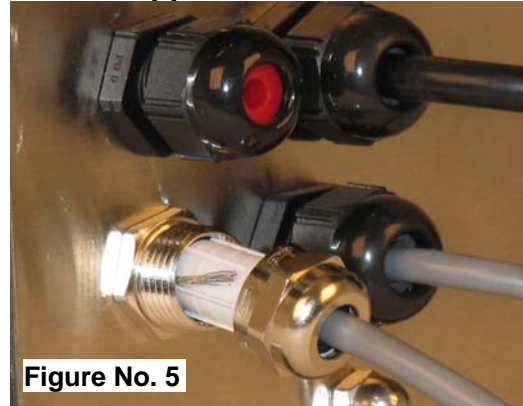
| LOAD CELL TERMINAL BLOCK P1 | | | |
|-----------------------------|--------------|--------------|--------------|
| TERMINAL NO. | Function | TERMINAL NO. | Function |
| 1 | + EXCITATION | 5 | - SIGNAL |
| 2 | + SENSE | 6 | - SENSE |
| 3 | + SIGNAL | 7 | - EXCITATION |

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!



Load Cell Cable Connection (Standard Gland Connector)

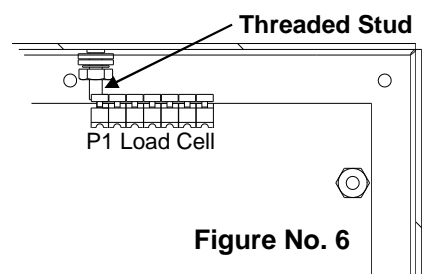
The following instructions describe the load cell connection should it be desired to route the load cell cable through a standard gland connector. If a standard gland connector is used, the shield wire should be connected to the threaded stud inside the indicator enclosure.

1. Remove the three acorn nuts securing the Battery Access Cover to the bottom of the indicator and then remove the battery tray (Model 215) or the battery (Model 210).
2. After removing the battery tray or battery, remove the 12 acorn nuts securing the back panel to main housing, and then loosen a gland connector for the load cell cable. Refer to Figure No. 2 for illustration of connector layout.
3. Slip the single cable from the load cell or load cell junction box through the gland connector and into the enclosure.
4. 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.
5. Connect each of the wires to terminal block P1 referring to labels on circuit board for terminal connections. Refer to Figure No. 8 for terminal block location.
6. 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.
7. 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.



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 210/215 indicators 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. 8 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 | |
|--|------------------------|----------------------------|------------------------|
| <u>TERMINAL NO.</u> | <u>Function</u> | <u>TERMINAL NO.</u> | <u>Function</u> |
| 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 (requires additional hardware)

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. 8). The 4 inputs are defined as follows:

| <u>TERMINAL NO.</u> | <u>Function</u> |
|----------------------------|------------------------|
| 1 | Gross |
| 2 | Print |
| 3 | Zero |
| 4 | Tare |
| 5 | Common |

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

Optically Isolated Outputs (requires additional hardware)

Preset Weight Comparator Checkweigher Logic Level Output

If desired, you may use the optically isolated outputs from your Model 210/215 indicator's preset weight comparators or checkweigher to remotely (up to 100 feet) control peripheral devices used to manage the flow of material or signal when the weight is within preset limits.

J11 (12V) - ACTIVE REMOTE OUT JUMPER

The Active Remote Out jumper J11, when connected, allows the 210/215 indicator to supply (source) 12 VDC to a solid-state relay or other load of 200 ohms or greater. To operate from the 12 VDC source, the positive connection from the relays must be connected to the PWC connector pins and the negative wire from the relays to the GND pin. See Figure No. 8 for jumper and REMOTE OUTPUT connector location.

INSTALLATION, CONT.

For completely isolated outputs, J11 must be open (positioned on one plug-in pin only or removed) and the user must provide 12 to 24 VDC to the SRC pin and a ground return to the load. The load must still be 200 ohms or greater.

To connect the control cable to the preset weight comparator/checkweigher logic level output connector P10, first loosen the gland connector located on the right side on the back of the 210/215. Refer to Figure No. 8 for the exact location of the connector. Slip the cable through the connector and into the enclosure. Remove 2 inches of the cable insulating jacket and then 1/4 inch of insulation from each of the internal wires (refer to Figure No. 4). Make the proper terminations on terminal block P10. To terminate a wire, first press down on the terminal block release bar, insert the wire into the terminal and remove pressure from the release bar locking the wire in place.

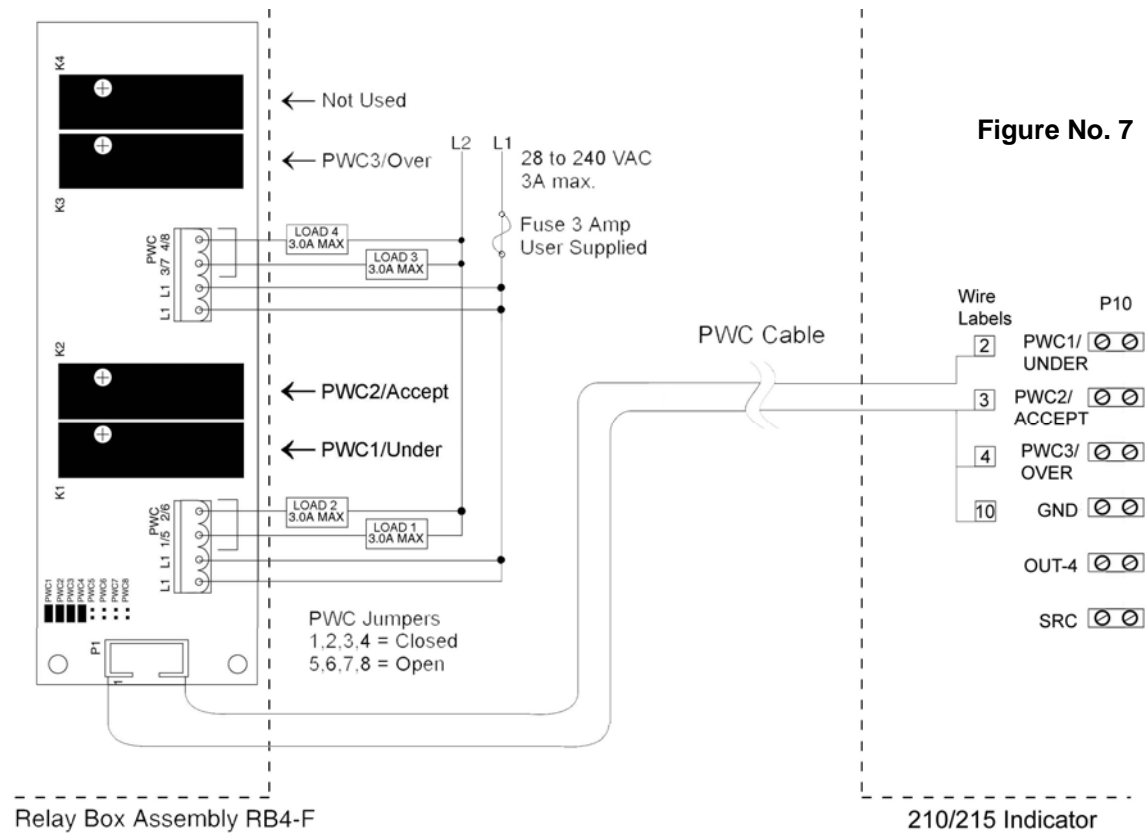
Relay Board - (Optional)

The relay board (Cardinal p/n 8539-C062-0A) is mounted in the RB4-F external junction box for use with the 210/215 Indicator. Connect devices to be controlled as shown in Figure No. 7.

The relays *must* be configured to be on (closed) or off (open) at weights under the preset weight then switch at the preset weight from on-to-off or off-to-on by setting the under preset condition to on or off during setup and calibration or setup review. Refer to the Setup and Calibration, "d out" (Digital Output) section of this manual for more information.

EXAMPLE: d oUt= 1,1

The PWC1 relay is on (closed) for weights under the preset weight and off (open) for weights equal to or over the preset weight.



NOTE! All relays are the "normally-open" type that will open when power to indicator is lost.

INSTALLATION, CONT.

Main PCB

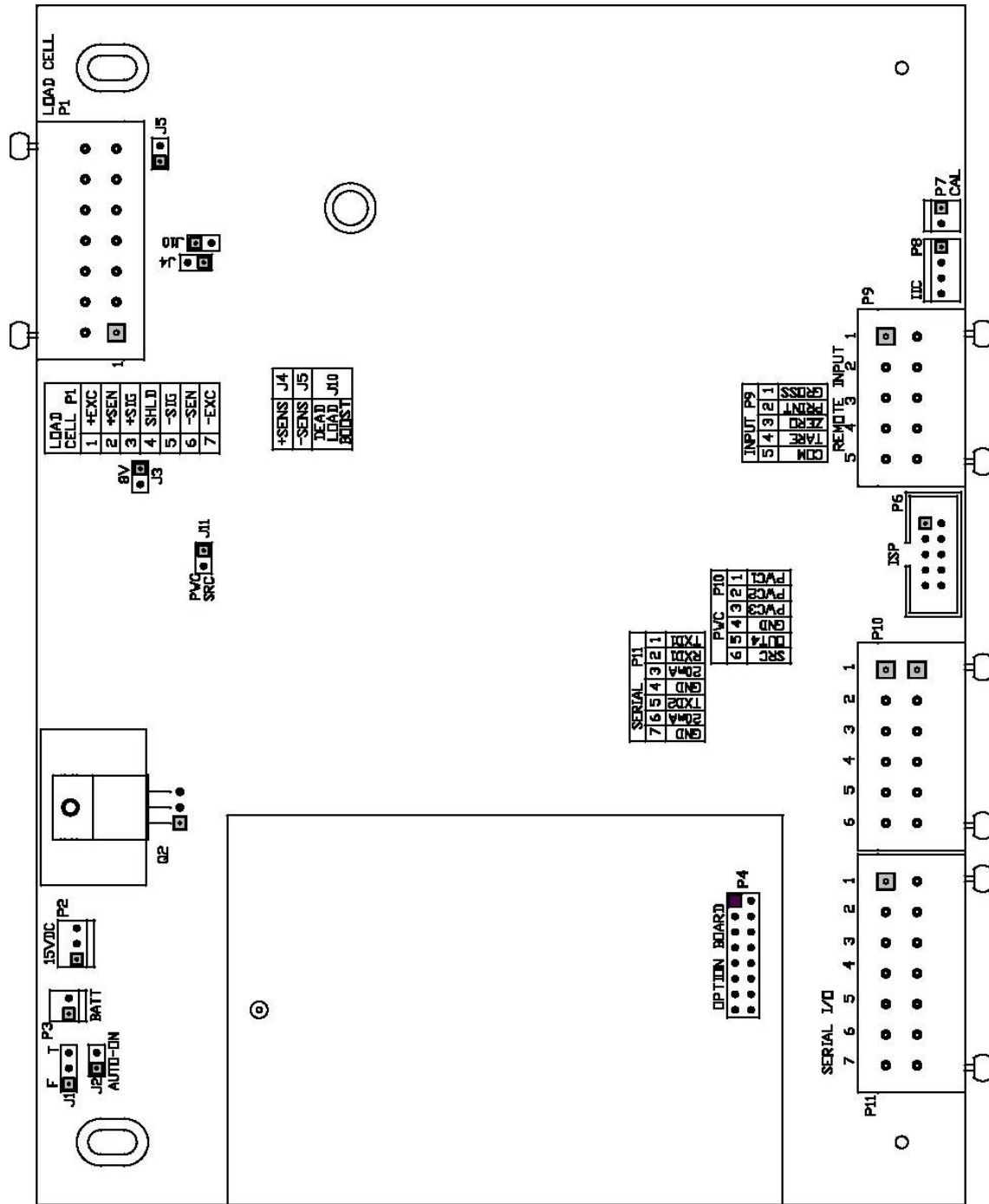


Figure No. 8

INSTALLATION, CONT.

Main PCB Jumpers

J1 - BATTERY CHARGE MODE (210 Only)

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 – PWC SRC (SOURCE)

The J11 jumper, when connected (closed) supplies 12 VDC from the 210/215 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. Slide the battery (Model 210) or battery tray (Model 215) into the opening, until you feel resistance and the edge of the battery/battery tray 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/battery tray in place.



IMPORTANT! On the Model 215, the battery tray (with or without batteries) must be installed for the indicator to function.

KEYPAD FUNCTIONS

The Model 210/215 is equipped with a 22-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.

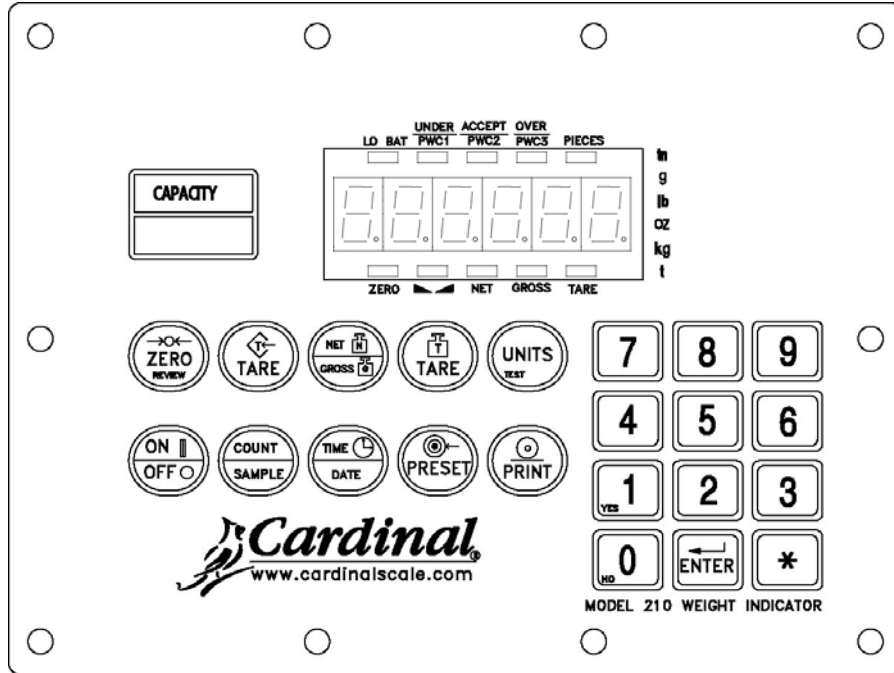


Figure No. 9 (210 Keypad)

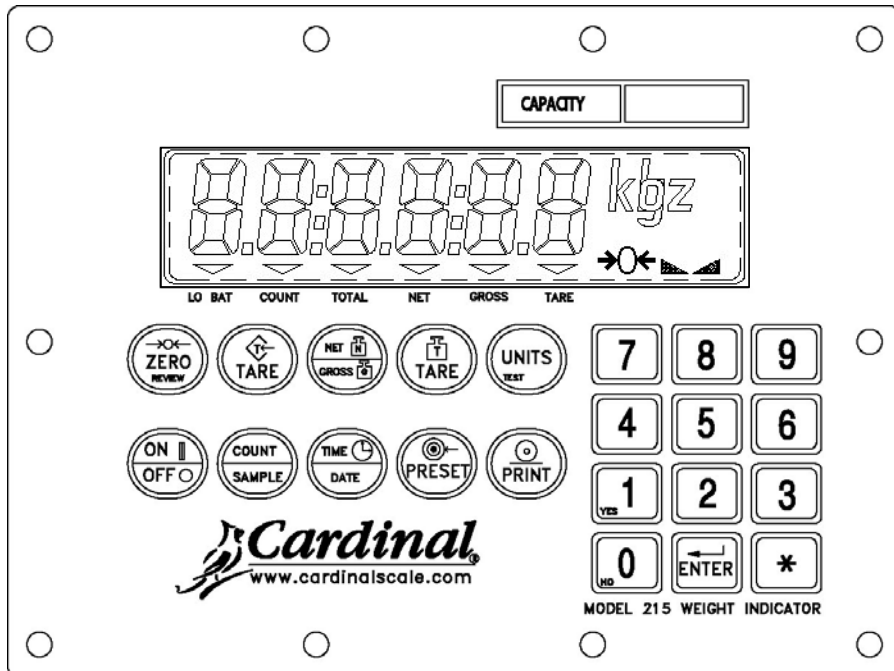


Figure No. 10 (215 Keypad)



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

KEYPAD FUNCTIONS, CONT.

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.

COUNT/SAMPLE KEY

This key performs two functions. The first time it is pressed, the indicator will count (unless piece weight is 0). The second time it is pressed (or if $P_c w = 0$ on the first press) will show the prompt $Add = 5$ on the display. Continued pressing of the **COUNT/SAMPLE** key will toggle between the $Add = 5, 10, 25, 50, 75$ prompts to select a sample size. When desired sample size is displayed, press the **ENTER** key **OR** with $Add = x(5, 10 \text{ etc.})$ displayed, using the numeric keypad, key-in any desired sample value, then press the **ENTER** key. Press the **ASTERISK** key to abort the input operation. To exit the count function and display weight, press the **NET/GROSS** key.

TIME/DATE KEY

This key is used to enter the clock mode to program the time, date and consecutive number.

Pressing the **TIME/DATE** key will enter the clock mode with the 210/215 displaying $Hour =$.

12-Hour Format Selected In Setup ($td = 12$)

1. With the display showing $Hour =$, press the **ENTER** key.
2. If the time displayed is correct, press the **ENTER** key and proceed to step 4.
3. If the displayed time is incorrect, use the numeric keys to enter the correct time and press the **ENTER** key.
4. The display will change to $Hz =$. Press the **ENTER** key.
5. The display will show YES .
 - If the time is before noon (12:00 PM), press the **ENTER** key.
 - If the time is after noon (12:00 PM), press the **0/NO** key, then press the **ENTER** key.
6. The display will show $DATE =$. Press the **ENTER** key.
7. If the date displayed is correct, press the **ENTER** key to proceed to the consecutive number prompt, $Cn.C no =$.
8. If the date displayed is incorrect, use the numeric keys to enter the correct date and press the **ENTER** key to proceed to the consecutive number prompt. Remember to enter the date in the same format (month-day-year or day-month-year) as selected by the USA setup parameter. Note that with the $USA = YES$ setting, the date format is month-day-year.

24-Hour Format Selected In Setup ($td = 24$)

1. With the display showing $Hour =$, press the **ENTER** key.
2. If the time displayed is correct, press the **ENTER** key and proceed to step 4.
3. If the displayed time is incorrect, use the numeric keys to enter the correct time and press the **ENTER** key. Note that with the 24-hour format selected, entering all times after noon (12:00 PM), you must add 12 to the time, i.e. 3 PM would be 1500.
4. The display will show $DATE =$. Press the **ENTER** key.
5. If the date displayed is correct, press the **ENTER** key to proceed to the consecutive number prompt, $Cn.C no =$.
6. If the date displayed is incorrect, use the numeric keys to enter the correct date and press the **ENTER** key to proceed to the consecutive number prompt. Remember to enter the date in the same format (month-day-year or day-month-year) as selected by the USA setup parameter. Note that with the $USA = YES$ setting, the date format is month-day-year.

KEYPAD FUNCTIONS, CONT.

Consecutive Number

If the consecutive number displayed is correct, press the **ENTER** key to resume normal operation. If the consecutive number displayed is incorrect, use the numeric keys to enter the correct consecutive number (up to 6 digits) and press the **ENTER** key to resume normal operation.

PRESET KEY

This key is used to enter the weight values for the three preset weight comparators or for the checkweigher feature depending on which feature was selected (setup parameter *d out*) during setup and calibration.

Preset Weight Comparator

If the Preset Weight Comparator feature was selected, the PWC1 annunciator will flash and the display will show the currently stored value for the number 1 preset weight comparator. If the value displayed is acceptable, press the **ENTER** key, otherwise, use the numeric keys to enter the new preset value and press the **ENTER** key. The PWC2 annunciator will now flash and the display will show the currently stored value for the number 2 preset weight comparator. As before, if the value displayed is acceptable, press the **ENTER** key, otherwise, use the numeric keys to enter the new value and press the **ENTER** key. The PWC3 annunciator will now flash and the display will show the currently stored value for the number 3 preset weight comparator. Again, if value displayed is acceptable, press the **ENTER** key, otherwise, use numeric keys to enter a new value and press the **ENTER** key.

Checkweigher

If the Checkweigher feature was selected and the **PRESET** key pressed, the ACCEPT and UNDER annunciators will flash and the preset value for the minimum acceptable weight will be displayed. Press the **ENTER** key if the displayed value is correct or use the numeric keys and enter the new value and press the **ENTER** key. The ACCEPT and OVER annunciators will now flash and the display will show the minimum value of weight over the accepted range. As before, if the value shown is correct, press the **ENTER** key. If the value is incorrect, enter the new value and press the **ENTER** key to save it. Note that this value must be greater than the accept value. Remember that both the preset weight comparators and checkweigher functions operate on the absolute value of weight ignoring the polarity. After the second preset value is entered, the indicator will return to normal operation.

PRINT KEY

Pressing this key will add the displayed gross or net weight or piece count to the associated accumulator and initiate the transmission of weight and other data selected during setup of the Print menu items 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.

If the *id* (ID Prompt) has been enabled during setup, when the **PRINT** key is pressed, the indicator will prompt for an ID to be printed on the ticket.

If the *id* is set to 1 (Yes), input up to 6 digits for the ID and then press the **ENTER** key to complete the transaction. Upon pressing the **ENTER** key, the print function will occur.

If the *id* is set to 0 (no), press the **ENTER** key to display the current ID. If ID displayed is acceptable, press the **ENTER** key again to complete transaction. Otherwise, input up to 6 digits for ID then press the **ENTER** key to complete the transaction. The print function will occur after the **ENTER** key is pressed.

Note that the indicator will not respond to the Print 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 are printed.

KEYPAD FUNCTIONS, CONT.

The 210/215 includes support for visual tickets. Visual tickets are designed by the PC based programs Visual Print or nControl, then downloaded to the indicator. Two programmable formats in addition to the standard print tab settings are allowed.

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 a visual ticket is not found it reverts to the print tab settings.

```
#2
10:19 08/23/2009
100.00 lb G
20.00 lb T
80.00 lb N
      0.00 lb GROSS ACCUM
      272.00 lb NET ACCUM
```

TICKET EXAMPLE

ZERO/REVIEW KEY

This key performs two functions. In normal operation, 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. Note that this selection is made during the setup and calibration of the indicator. Pressing this key after the **ASTERISK** key will enter the Review mode of Setup and Calibration. Refer to description of **ASTERISK** key and the Setup Review section of this manual for details.

TARE KEY (with diamond "T" symbol)

This is a dual function key. Pressing the **TARE** key alone (Pushbutton Tare mode) will store the current gross weight as a new tare weight and cause the weight display to change to the net weight display mode (Net annunciator turns on). Pressing it key after entering a numeric value (Keypad Tare) will cause the value entered to be accepted as a new tare weight.

NOTE! Tare weights equal to or greater than scale capacity cannot be entered. In addition, keypad tare weight division value must be same as scale division value. For example, a unit with .005 lb as division value will display *ERROR* if you enter 1.003 for tare weight.

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.

TARE KEY (with weight "T" symbol)

Pressing this key will display the current tare weight for three seconds.

UNITS/TEST KEY

This key performs two functions. In normal operation, it is used to select the units in which the weight is to be displayed. The available units of measure ("unit1" and "unit2") are enabled or disabled 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. Pressing this key after the **ASTERISK** key will enter the Test mode. The Test mode is used to conduct a test of all display elements. Refer to description of **ASTERISK** key for details.

0 THROUGH 9 KEYS

These keys are used to enter numeric data during the setup and calibration as well as during normal operation of the indicator. **NOTE:** The 1 and 0 keys have dual functions. They are used to enter numeric data during setup and calibration as well as during normal operations and are also used to answer yes (1 = YES) or no (0 = NO) to various prompts.

ENTER KEY

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

KEYPAD FUNCTIONS, CONT.

ASTERISK KEY

This key is used for several functions. During Setup, when a setup parameter (not a parameter value) is displayed, pressing it key will "backup" to the previous prompt. In normal operation, this key is used in conjunction with other keys on the keypad to access additional indicator features. These features and their associated key combinations are as follows:

ASTERISK, ZERO/REVIEW KEY

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

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.

ASTERISK, UNITS KEY

This combination will enter the Test mode. The Test mode is used to test of all the display elements. It consists of five (5) cycles, each lasting about one (1) 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 (210) 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 **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are:

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

In addition to using the **ASTERISK, PRINT** key combination to change the print ticket format, the operator (just prior to printing the ticket) can change the print ticket format at the end of the weighing operation. This is accomplished by performing the normal weighing operation, then pressing the desired format number (0, 1 or 2), followed by pressing the **PRINT** key.

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

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 and Figure No.10 for location of the annunciators.

ZERO (210)

→○← (215)

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 further 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 itself off.

UNDER/PWC1 (210 Only)

This annunciator is used to signal that the displayed weight is less than the minimum value of acceptable weight used in the Checkweigher feature. Note that this annunciator is active only when the Checkweigher feature is enabled.

The PWC1 annunciator is turned on to indicate that the displayed weight is equal to or greater than the weight value stored as preset number 1. Note that this annunciator is active only when the Preset Weight Comparator feature has been enabled.

ACCEPT/PWC2 (210 Only)

This annunciator is used to signal that the displayed weight is within the acceptable weight limits for the Checkweigher feature. That is, it is equal to or greater than the minimum acceptable weight and equal to or less than the maximum acceptable weight. Note that this annunciator is active only when the Checkweigher feature has been enabled.

The PWC2 annunciator is turned on to indicate that the displayed weight is equal to or greater than the weight value stored as preset number 2. Note that this annunciator is active only when the Preset Weight Comparator feature has been enabled.

ANNUNCIATORS

OVER/PWC3 (210 Only)

This annunciator is used to signal that the displayed weight is equal to or greater than the minimum value of over weight used in the Checkweigher feature. Note that this annunciator is active only when the Checkweigher feature has been enabled.

The PWC3 annunciator is turned on to indicate that the displayed weight is equal to or greater than the weight value stored as preset number 3. Note that this annunciator is active only when the Preset Weight Comparator feature has been enabled.

tn (210 Only)

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 (210 Only)

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).

PIECES (210)

COUNT (215)

This annunciator shows that the display is in the Count mode and the value displayed is the count quantity and not weight.

TOTAL (215 Only)

This annunciator shows that the display is in the Count mode and that the value displayed is the current contents (total) of the count accumulator.

SETUP AND CALIBRATION

Your Model 210/215 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. 11.

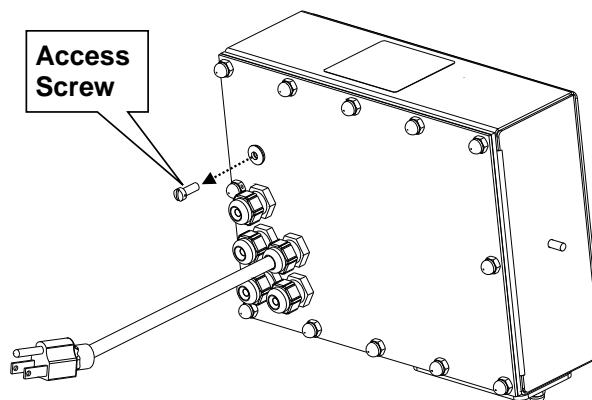


Figure No. 11

During the setup and calibration process it is necessary to enter operational parameters via the indicator's keypad. Pressing the **ENTER** key without entering a new value will retain the current setting and advance to the next prompt. To change a setting, enter a new value and press the **ENTER** key. This will save the new value and advance to the next prompt. Pressing the **ASTERISK** key 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.

| | |
|---------------|---|
| <i>SETUP</i> | Setup Mode (starts at <i>USR</i> prompt) |
| <i>R-d</i> | Analog to Digital Filtering (starts at <i>dFLt=</i> prompt) |
| <i>CAL</i> | Calibration (starts at <i>CAL 1</i> prompt) |
| <i>Sio</i> | Serial Input/Output (starts at <i>brUd</i> prompt) |
| <i>Print</i> | Print Tab Settings (starts at <i>Port</i> prompt) |
| <i>F SPAn</i> | Fine Span Adjustment |
| <i>Hi RES</i> | Display high-resolution weight mode |
| <i>LoCOut</i> | Key lock out function |

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



IMPORTANT! Setup may be interrupted at any time. **ALL** data previously entered and finalized with the **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** 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 **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 *R-d*. If you step through the setup prompts by pressing the **ENTER** key, the next prompt displayed will be *R-d²*. In addition, at a prompt with the *2* displayed, you must press the **ENTER** key, the **1/YES** key then the **ENTER** key again to proceed with that section. To skip the section and advance to the next menu selection, press the **ENTER** key twice.

SEtUP

USA = (Domestic or International)

With *SEtUP* displayed, press the **ENTER** key. The display will change to *USA* = . 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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

USA = 1 (Domestic)

dRtE = mm/dd/yy
t-rL = no
CRP + 4% to OC

USA = 0 (International)

dRtE = dd/mm/yy
t-rL = yes
CRP + 9 grads to OC
PT printed with tare
Lamp test on power up

If you selected **USA = 0** (International), an additional prompt, "**PASS**=" will be displayed.
If you selected **USA = 1** (Domestic) proceed to **Lft**= (Legal For Trade).

PASS (Password Y/N)

The *PASS* (Password Y/N) prompt determines whether a password is required to enter Setup and Calibration on indicators programmed for international use. Note that this prompt is only displayed when *USA* = 0 (International) is selected.

With the display showing *PASS*, 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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

PASS (No)

Password protection is not needed.
Setup advances to the *Lft* = prompt

PASS (Yes)

Password protection is desired. The
next prompt will be *PASS* =

Press the **ENTER** key to see the current password value. If the password displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the numeric keys enter the new password (up to 6 digits) and then press the **ENTER** key to save it.

Password Operation

With the *PASS* prompt enabled (set to YES), anytime the operator tries to enter *SEtUP*, the display will show the *PASS* = prompt requiring the operator to enter the correct password. If the wrong password is entered the indicator displays *ErrOr* momentarily and returns to the weight mode. Note that the password is not displayed when the operator is entering it.

It is recommended to write the password down and store it in a secure location. If the password is forgotten or lost and a change to the indicator setup is required, the indicator must be reprogrammed. **WARNING!** Reprogramming the indicator will erase all the contents of the Nov-Ram and memory.

SETUP AND CALIBRATION, CONT.

LFt = (Legal For Trade)

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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **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 USR = 1, the followings results occur:

Scale must have between 100 and 10,000 divisions

ErrA = .5 or 0 to 3

Inhibit serial data during input

Disables **COUNT** key

DATE = mm/dd/yy

ErrL = no

CRP + 4% to OC

NOTE! When LFt = 1 and USR = 0, the followings results occur:

UnS = 1

DATE = dd/mm/yy

ErrL = yes

CRP + 9 grads to OC

PT printed with tare

Lamp test on power up

Unit = (Weighing Unit 1)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are:

0 = none

1 = tn (tons) – Only on 210

2 = g (grams)

3 = lb (pounds)

4 = oz (ounces)

5 = kg (kilograms)

6 = tonnes (metric tons) – Only on 210

7 = lb/oz (pounds/ounces)

Int = (Interval Setting)

Press the **ENTER** key to show the current value.

If LFt = 1 (Legal For Trade = YES), using the numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 1, 2, 5, 10, 20 or 50.

If LFt = 0 (Legal For Trade = NO), using the numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 1 through 99.

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

dPP = (Decimal Point Setting)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 0, 1, 2 or 3.

0 = XXXXXX

1 = XXXXX.X

2 = XXXX.XX

3 = XXX.XXX

SETUP AND CALIBRATION, CONT.

CRP: (Capacity)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 1 through 999,999.

NOTE! Capacity cannot exceed 999,999.

Unit 2: (Weighing Unit 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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are:

| | |
|------------------------------------|---|
| 0 = none | 4 = oz (ounces) |
| 1 = tn (tons) – <i>Only on 210</i> | 5 = kg (kilograms) |
| 2 = g (grams) | 6 = tonnes (metric tons) – <i>Only on 210</i> |
| 3 = lb (pounds) | 7 = lb/oz (pounds/ounces) |



NOTE! The selection for Unit 2 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.

TR: (Zero Tracking Range)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 0 (disables Zero Tracking), .5, or 1 through 9.

TRL: (4% Zero Range)

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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

| | |
|---------------------------------------|--|
| TRL = 1 (Yes) 4% of scale capacity | TRL = 0 (No) Full capacity (no limit) |
|---------------------------------------|--|

PUD: (Power-Up Zero Feature)

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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

| | |
|--|--|
| PUD = 1 (Yes) Automatic Re-Zero on Power-Up | PUD = 0 (No) No Re-Zero on Power-Up |
|--|--|

TD: (12 or 24 Time Format)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to select the format (12 or 24 hour) of the Model 210 clock operation, then press the **ENTER** key to save it. Note that in the 24 hour format, 12 is added to all times after noon, i.e. 3 PM would be 1500.

| | |
|--|---|
| TD = 12 12 hour clock (3PM displays 3:00) | TD = 24 24 hour clock (3PM displays 15:00) |
|--|---|

SETUP AND CALIBRATION, CONT.

d out = X, Y (Digital Output)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to select the X, Y values for the digital output, then press the **ENTER** key to save it.

d out = X, Y

where: X = State below cutoff (0 = LOW, 1 = High)
Y = Preset Number or Checkweigher Mode

- 0 = Digital Output is disabled
- 1 = Low State before cutoff with 1 active Preset
- 2 = Low State before cutoff with 2 active Presets
- 3 = Low State before cutoff with 3 active Presets
- 11 = High state before cutoff with 1 active Preset
- 12 = High state before cutoff with 2 active Presets
- 13 = High state before cutoff with 3 active Presets
- 4 = Low State before cutoff on Checkweigher Mode
- 14 = High state before cutoff on Checkweigher Mode
- 5 = Axle Weigher Operation Mode

P-bAL = (Preset Print-On-Balance)

With only one Preset selected (*d out* = 1 or 11), an additional prompt *P-bAL* = (automatic Print on Balance) will be displayed. If selected (*P-bAL* = YES), when the weight is above or equals the preset value and all motion stops, weight will be printed (if a printer is attached). Note that the weight must go below 50% of the preset value before another print operation can be performed.

If the setting displayed is acceptable, press the **ENTER** key to save it. Otherwise, using the numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

P-bAL = 1 (Yes)

Automatic Print on Balance Enabled

P-bAL=0 (No)

Automatic Print on Balance Disabled

P-bAL = (Checkweigher Print-On-Accept)

With Checkweigher selected (*d out* = 4 or 14), an additional prompt *P-bAL*, Print on Balance, (automatic print on accept) will be displayed. If selected (*P-bAL* = YES), when the scale weight is stable and in the accept range of the checkweigher, the weight will be printed (if a printer is attached).

If the setting displayed is acceptable, press the **ENTER** key to save it. Otherwise, using the numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

P-bAL = 1 (Yes)

Automatic Print on Accept Enabled

P-bAL=0 (No)

Automatic Print on Accept Disabled

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. **NOTE!** The sleep mode only functions on the 215, when the indicator is powered by the NiMH batteries and not by AC power.

Press the **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 **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new value (0 to 10) then press the **ENTER** key to store the new setting. Note that entry of a 0 disables this feature.

SETUP AND CALIBRATION, CONT.

***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 **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 **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new value (0 to 10) then press the **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 **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **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

***ID* = (ID Prompt)**

The *ID* = (ID=) prompt enables an ID prompt before printing a ticket.

With the display showing *ID* =, 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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

***ID* = 1 (Yes)**

ID = will be displayed when **PRINT** key is pressed and printed on the ticket.

***ID* = 0 (No)**

Normal print operation (no ID prompt) will occur.

If you selected *ID* = 1 (Yes, ID Prompt), an additional prompt, "*ACLR* =" will be displayed.

If you selected *ID* = 0 (No ID Prompt) proceed to *A-d* (*A-d*²) Analog to Digital Filtering.

***ACLR* = (Auto Clear ID)**

The *ACLR* = (Auto Clear ID) prompt determines whether the ID is automatically cleared after printing the ticket. Note that it is only displayed when *ID* = YES is selected.

With the display showing *ACLR* =, 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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

***ACLR* = 1 (Yes)**

Automatically clears the ID after the ticket has printed.

***ACLR* = 0 (No)**

ID is not cleared when ticket prints and can be used for next transaction.

SETUP AND CALIBRATION, CONT.

$R - d (R - d^2)$ - Analog to Digital Filtering

$dFlt$ (Digital Filtering)

With $R - d (R - d^2)$ displayed, press the **ENTER** key. The display will change to $dFlt$. Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key to save it. Otherwise, using the numeric keys enter the new setting, then press the **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 **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 **ENTER** key, otherwise, use the numeric keys to enter a new value then press the **ENTER** key to save it.

b (Break Range)

Press the **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 **ENTER** key to keep the displayed value or use the numeric keys to enter a new value and press the **ENTER** key to save the new setting. Note that entry of a 0 disables this feature.

Sr (Sample Rate)

Press the **ENTER** key to show the current setting for the sample rate. The value displayed is the sample rate in samples per second. Press the **ENTER** key to save the displayed value or use the numeric keys to enter a new value (1 to 100) and press the **ENTER** key to save it.

$Un5$ (Motion Range)

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

$5C$ (Stable Count)

Press the **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 for use with Auto Print on Balance, or and anything trying to capture stable weight. If the displayed value is acceptable, press the **ENTER** key to save it. Otherwise, use the numeric keys to enter a new value and press the **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 $dFLtz$ to "0" (no filtering), $dFLtz$ = "1" ($F=6$, $b=12$, $sr=2/Sec$), or $dFLtz$ = "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 $dFLtz$ 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 $dFLtz$ 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 (CALP) - Calibration

With CAL (CALP) displayed, press the **ENTER** key. The display will change to show the current setting no. If calibration is desired, press the **1/YES** key, then press the **ENTER** key to continue to the CAL 1= setting, otherwise press the **ENTER** key to advance to the S no menu.

CALIBRATION MODES

The 210/215 indicators have 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 CAL 2=) 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 without 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 CAL 2=. The value of the test weight is entered when CAL 1= is displayed and the **NET/GROSS** key is pressed when CAL 2= 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 CAL 2=. The value of the test weight is entered when CAL 1= is displayed and the **ZERO** key is pressed when CAL 2= 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 CAL 2=. The **ENTER** key is pressed when CAL 1= is displayed and the **ZERO** key is pressed when CAL 2= is displayed.

5. Calibration “C” Numbers

The calibration “C” numbers (C 1, C 2, C 3 and C 4) 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

$[\text{CAL } 1=$ – First Calibration Weight

The display will show $[\text{CAL } 1=0$. 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 **ENTER** key.
- If the first calibration weight is to be the TEST WEIGHTS / TEST LOAD, use the numeric keys to input the value of the calibrated test weights. **NOTE!** When entering values for $[\text{CAL } 1=$, 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 $[\text{CAL } 1=$ 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 **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: $[\text{CAL } 2=$.

$[\text{CAL } 2=$ - Second Calibration Weight

The display will show $[\text{CAL } 2=0$. 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 **ENTER** key.
- If the second calibration weight is to be the TEST WEIGHTS / TEST LOAD, use the numeric keys to input the value of the calibrated test weights. **NOTE!** When entering values for $[\text{CAL } 2=$, 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 $[\text{CAL } 2=$ 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 **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: $[\text{CAL } 3=$.

$[\text{CAL } 3=$ - Last Calibration Weight

The display will show $[\text{CAL } 3=0$. This weight is not used. Press the **ENTER** key to skip $[\text{CAL } 3=$ and advance to $5 \text{ } 10^2$.

SETUP AND CALIBRATION, CONT.

Dual-Point without Zero (False 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.

- Place the weights on the scale platform.
- Using the numeric keys, input the value of the calibrated test weights / test load, then press the **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: CAL 2=.

CAL 2= - Second Calibration Weight

The display will show CAL 2=0. This is the second of two calibration steps.

- Remove the weights on the scale platform, 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: 5 10².

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, then place the weights on the scale platform.
- Using the numeric keys, input the value of the calibrated test weights / test load, then press the **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: CAL 2=.

CAL 2= - Second Calibration Weight

The display will show CAL 2=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 5 10².

SETUP AND CALIBRATION, CONT.

Single-Point for Zero Only (Only Zero) Calibration

$CAL 1=$ – 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 **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 steps.

- Press the **ZERO** key.
- The display will advance to 5.00^2 .

Calibration “C” Numbers

1. With $CAL 1=$ displayed, press the "diamond T" TARE key.
2. At the $C 1=$ prompt, press the **ENTER** key to show the current value of the $C 1$ number.
3. If the $C 1=$ number displayed is acceptable, press the **ENTER** key again to save it.
4. Otherwise, use the numeric keys to enter a new $C 1=$ number, then press the **ENTER** key.
5. Repeat steps 2 through 4 for $C 2=$, $C 3=$ and $C 4=$.



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.

5 10 (5 10?) - Serial Input/Output

With 5 10 (5 10?) displayed, press the **ENTER** key. The display will change to show the current setting *no*. To skip configuring the 5 10 (serial input/output) and proceed to the *Prnt?* menu, press the **ENTER** key again. To configure the 5 10, press the numeric key **1/YES** (display will change to *YES*) and then press the **ENTER** key. After pressing the **ENTER** key, the display will change to *baud*.

baud (Serial Port Baud Rate)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new baud rate for the serial ports, then press the **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 | | |

Prnt? (Serial Port Parity)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 0, 1, or 2.

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

bits (Serial Port Data Bits)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 7 or 8.

stop (Serial Port Stop Bits)

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 numeric keys enter the new setting, then press the **ENTER** key to save it. Allowable values are: 1 or 2.

Cont 1 (Continuous Output Serial Port 1)

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 numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

| | |
|---|---|
| <i>Cont 1</i> : <i>YES</i> Continuous Output | <i>Cont 1</i> : <i>no</i> 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 **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the numeric keys enter the new setting, then press the **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>
```

SETUP AND CALIBRATION, CONT.

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 210/215 indicator will respond to a weight request (ENQ).

The host device (computer) sends:

ENQ - (hex 05)

The 210/215 will respond:

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

Where:

| | | |
|--------------|-----------------|---|
| s = | Sign | "-" = negative, " " (<i>blank</i>) = 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 numeric keys, **0/NO** or **1/YES**, enter the new setting and 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 **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the numeric keys enter the new setting, then press the **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.

ƧHr 5: (Threshold Weight)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new value for the threshold weight or enter a zero (0) to disable the traffic light and then press the **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 (ƧHr 5 = 0), the traffic light feature will be disabled (turned off).

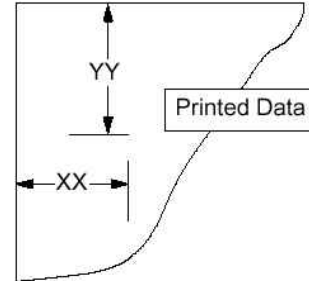
SETUP AND CALIBRATION, CONT.

Print (Print?) - Print Tab Settings

With *Print (Print?)* displayed, press the **ENTER** key. The display will change to show the current setting *no*. To skip configuring the Print Tab Settings and proceed to the *FSRN?* menu, press the **ENTER** key again. To configure Print Tab Settings, press the numeric key **1/YES** (display will change to *YES*) and then the **ENTER** key. After pressing the **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 **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new setting and then press the **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.

Hour: (Time Print Location)

Press the **ENTER** key to show the current setting for the location of time printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

Date: (Date Print Location)

Press the **ENTER** key to show the current setting for the location of date printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

ID: (ID Prompt Print Location)

Press the **ENTER** key to show the current setting for the location of ID prompt printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

Con: (Consecutive Number Print Location)

Press the **ENTER** key to show the current setting for the location of consecutive number printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

Gross: (Gross Weight Print Location)

Press the **ENTER** key to show the current setting for the location of Gross weight printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

Tare: (Tare Weight Print Location)

Press the **ENTER** key to show the current setting for the location of Tare weight printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

SETUP AND CALIBRATION, CONT.

nEt : (Net Weight Print Location)

Press the **ENTER** key to show the current setting for the location of Net weight printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

G RLL : (Gross Weight Accumulator Print Location)

Press the **ENTER** key to show the current setting for the location of Gross weight accumulator printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

n RLL : (Net Weight Accumulator Print Location)

Press the **ENTER** key to show the current setting for the location of Net weight accumulator printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

Count : (Count "number of pieces on the scale" Print Location)

Press the **ENTER** key to show the current setting for the location of Count (number of pieces on scale) printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** to save it.

ERLH : (Piece Weight Print Location)

Press the **ENTER** key to show the current setting for the location of Piece weight printing. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new location and then press **ENTER** 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 **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 **ENTER** key again to save it. Otherwise, using the numeric keys, **0/NO** or **1/YES**, enter the new setting, then press the **ENTER** key to save it.

EOPL : (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 **ENTER** key to view the current setting. If the displayed value is acceptable, press the **ENTER** key to save it. Otherwise, use the numeric keys to enter the new the number of End-Of-Print linefeeds, then press the **ENTER** key to save the new setting. Allowable values are: 0 through 99.

SETUP AND CALIBRATION, CONT.

F *SPRn* (*FSPRn?*) - Fine Span Adjustment



NOTE! The *FSPRn* and *HRES* modes require a load of 10% of Capacity be on the scale before adjustments can be made.

With the *FSPRn?* prompt displayed after pressing the **ENTER** key at the last *Print* prompt:

With *FSPRn?* displayed, press the **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 **ENTER** key again. To perform the Fine Span Adjustment, place a calibrated test weight on the scale, press the numeric key **1/YES** (display will change to *YES*) and then the **ENTER** key.

After pressing the **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 **1/YES** to increase the span OR press the **0/NO** key to decrease the span. Press the **ASTERISK** key to return to the previous prompt or press the **ENTER** key to exit *FSPRn?* and return to the *SETUP* menu.

With the *FSPRn* prompt displayed after pressing the Calibration switch:

With *FSPRn* displayed, place a calibrated test weight on the scale and press the **ENTER** key. After pressing the **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 **1/YES** to increase the span OR press the **0/NO** key to decrease the span. Press the **ASTERISK** key to return to the previous prompt or press the **ENTER** key to exit *FSPRn* and return to the *SETUP* menu.

HRES - Display High Resolution Weight

With *HRES* on the display, pressing the **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 **ENTER** key to return to the *HRES* prompt. To exit the *HRES* mode, press the calibration switch or cycle power (press the **ON/OFF** key twice).

LOCK - Key Lock Out Function

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



NOTE! The menu selections *HRES* and *LOCK* can only be selected using the calibration switch.

SETUP REVIEW

The 210/215 indicators allow several operational parameters to be reviewed and changed without breaking the calibration seal. These operational parameters are:

- Power Up Zero Reset Enable/Disable
- Time Format
- Digital Output Control Enable/Disable
- Sleep Mode Feature Enable/Disable
- Auto Shutoff 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
 - Continuous Output Port 2
 - Continuous Output Format

- Print Tab Settings
 - Printer Port Selection
 - Time
 - Date
 - Consecutive Number
 - Gross Weight
 - Tare Weight
 - Net Weight
 - Gross Weight Accumulator
 - Net Weight Accumulator
 - Count
 - Piece Weight

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

1. Press the **ASTERISK** 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 (*PUZ =*).
3. Using the same procedure as described in the Setup and Calibration section of this manual, make the required changes.
4. Press the **ASTERISK** key to return to the previous prompt.
5. To exit Setup Review, press the **ENTER** key to step 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** 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** key then the **NET/GROSS** key.
2. Press the **ASTERISK** key to return to normal operation.

To *print* the NET accumulator:

1. Press the **ASTERISK** 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** key, the **NET/GROSS** key, then the **ZERO** key
2. Press the **ASTERISK** key to return to normal operation.

To *view* the Gross accumulator:

1. Press the **ASTERISK** key then the **NET/GROSS** key twice.
2. Press the **ASTERISK** key to return to normal operation.

To *print* the Gross accumulator:

1. Press the **ASTERISK** 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** key, the **NET/GROSS** key twice, then the **ZERO** key
2. Press the **ASTERISK** key to return to normal operation.

To *view* the Count accumulator:

1. Press the **ASTERISK** key then the **COUNT/SAMPLE** key.
2. Press the **ASTERISK** key to return to normal operation.

To *print* the Count accumulator:

1. Press the **ASTERISK** key, the **COUNT/SAMPLE** key, then the **PRINT** key
2. The indicator will return to normal operation when printing has been completed.

To *clear (zero)* the Count accumulator:

1. Press the **ASTERISK** key, the **COUNT/SAMPLE** key, then the **ZERO** key
2. Press the **ASTERISK** key to return to normal operation.

NOTES FOR THE MODEL 215 ONLY

1. If *L F T* (Legal For Trade) is enabled, the scale must be at Gross weight zero to review the accumulators.
2. The scale must return to Gross weight zero between accumulations.
3. When viewing the Gross or Net accumulators, the display will toggle between the total accumulator and the total count for the selected accumulator.

BEFORE YOU CALL FOR SERVICE

The 210/215 indicators have 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 | <p>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?</p> <p>Battery operation: Check if battery is installed and correctly. Is battery discharged - replace or recharge.</p> <p>NOTE! The battery tray (with or without batteries) must be installed for the Model 215 to function.</p> |
| Incorrect weight displayed | <p>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?</p> |
| Indicator will not display weight | <p>Refer to Error Codes section and make certain that the $\square \bar{L} \bar{R} \bar{P}$ message is not displayed. If so, and scale is not loaded, perform the calibration sequence.</p> |
| The printer prints but does not use the Print Tab Settings or prints a test ticket | <p>The print tab setting or visual ticket format must be selected prior to beginning the weighing operation or just prior to printing the ticket.</p> <p>To select the ticket format prior to beginning the weighing operation:</p> <ol style="list-style-type: none">1. Press the ASTERISK key then the PRINT key. The display will change to the "P-T-".2. Press the ENTER key to show the current value.3. If the value displayed is acceptable, press the ENTER key again to save it.4. If the displayed value is incorrect (or another ticket format is desired), use the numeric keys to enter the new value, then press the ENTER key to save it. <p>To select the ticket format just prior to printing the ticket:</p> <ol style="list-style-type: none">1. Press the desired format number.2. Pressing the PRINT key. <p>Allowable values for ticket formats are:</p> <ul style="list-style-type: none">0 = print tab settings1 = visual ticket format 12 = visual ticket format 2 <p>NOTE! When a print format is selected (by either method), it will remain active until changed by the operator.</p> |

ERROR CODES

The 210/215 indicators are equipped with software that indicates when an error in the operation takes place. The following lists the error codes displayed by the 210/215 along with their meaning. Should you encounter an error code, please refer to this list for the cause.

Calibration (Calibration button)

Calibration 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)

Config indicates E²PROM 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** key pressed to enter a push button tare value of a negative value.
- C. **ENTER** key pressed to enter a tare weight value that exceeds the scale capacity.
- D. **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. **lb/kg** 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.

Error Ah (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.

Error AL (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 1 (Error 1)

A program checksum mismatch has been detected.

CORRECTIVE ACTION: Consult your scale service provider.

Error 3 (Error 3)

Internal RAM failure.

CORRECTIVE ACTION: Consult your scale service provider.

ERROR CODES, CONT.

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.

no tArE (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.

too biG (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)

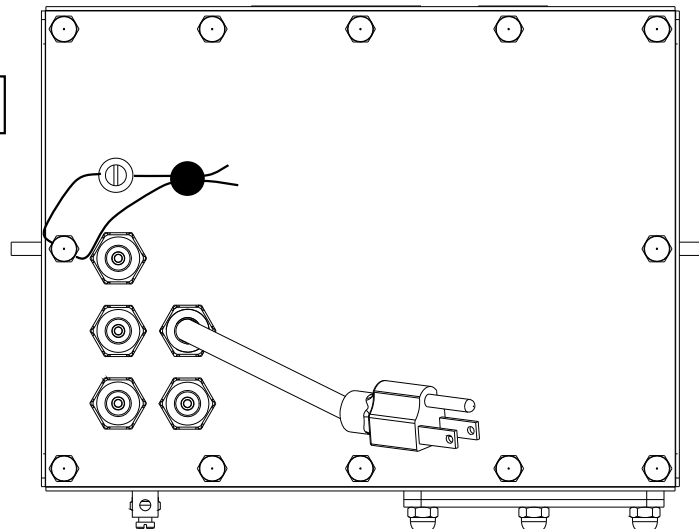
Motion is present when trying to perform a print function.

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

CALIBRATION SEAL INSTALLATION

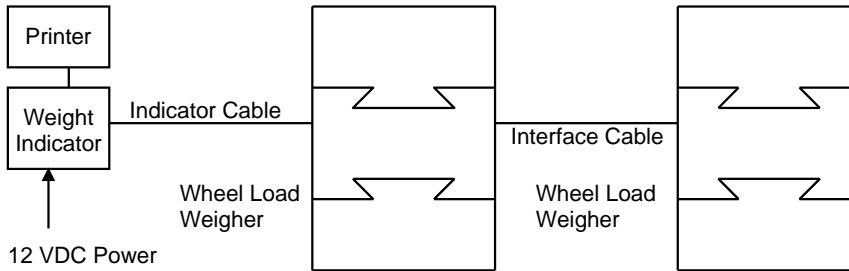
If your Model 210/215 Weight Indicator is used in a commercial application it must be tested and sealed by your local weights and measurements official. The 210/215 is designed to accept a lead and wire security seal to prevent unauthorized access to the calibration adjustments. Refer to Figure No. 12 for details on the installation of the seal.

Figure No. 12

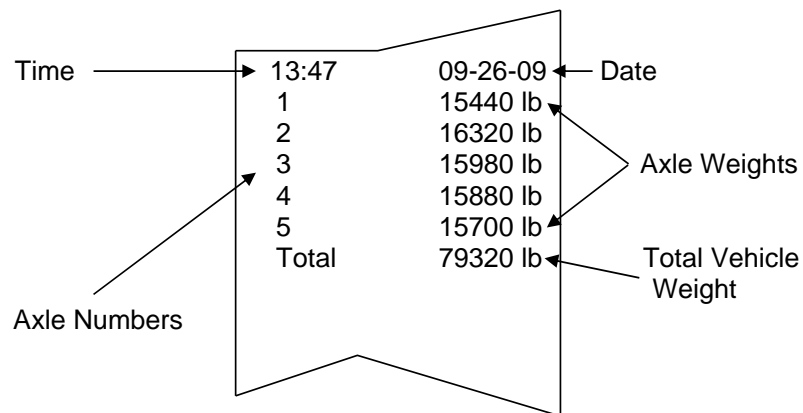


AXLE WEIGHER MODE OPERATION

After placing the wheel load weighers on the ground in front of the vehicle(s) to be weighed, the two weighers are connected together using the interconnection cable assembly. One weigher (makes no difference which) is connected to the indicator using the indicator interface cable. The interconnection diagram is shown below:



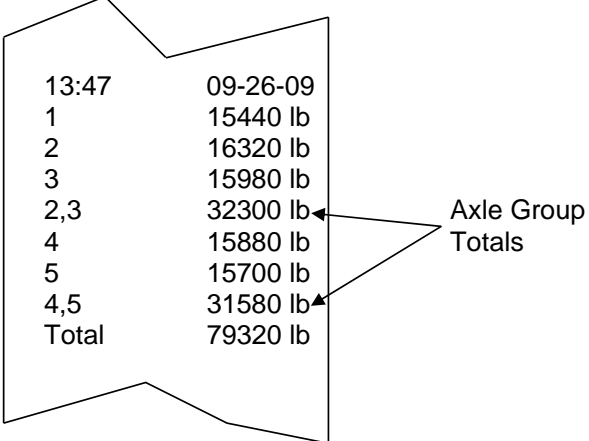
1. With power applied to the indicator, press the **ON** key to turn on the indicator.
2. Verify that the weight display is at zero (**00**). If not, press the **ZERO** key.
3. Have the vehicle driven forward until the first axle is on the center of the wheel load weighers.
4. Observe the weight of the first axle and press the **PRINT** key to record the weight, date and time.
5. Have the vehicle pull forward until the next axle is on the center of the wheel load weighers. **NOTE!** If the next axle is a tandem or tridem set of axles, place **ONLY** the first axle of the group on the wheel load weighers.
6. Observe the weight of this axle and press the **PRINT** key to record the weight, date and time.
7. Repeat step 5 until all of the remaining axles have been weighed and printed.
8. After the last axle has been weighed and its value recorded, pull the vehicle off the wheel load weighers.
9. Press the * (asterisk) key and then press the **PRINT** key. The total of all of the vehicle axle weights will be recorded and printed. The example below illustrates a typical print ticket for a five-axle truck.



AXLE WEIGHER MODE OPERATION, CONT.

Additional Features

If you wish to also record the total of any axle groups, press the number key corresponding to the number of axles in the axle group to be totaled when the first axle in the group is weighed. After the last axle in the group is recorded, the printer will automatically record the subtotal of the axle group weights. In the previous example, assume that axles 2 and 3 form a tandem pair of axles as do axles 4 and 5. To record the total weight of these axle groups, press the number 2 key followed by the **PRINT** key when printing axles 2 and 4. This indicates that the next two axles form an axle group whose total is to be recorded. The example below illustrates the print format when the two axle groups are identified.



| | |
|-------|----------|
| 13:47 | 09-26-09 |
| 1 | 15440 lb |
| 2 | 16320 lb |
| 3 | 15980 lb |
| 2,3 | 32300 lb |
| 4 | 15880 lb |
| 5 | 15700 lb |
| 4,5 | 31580 lb |
| Total | 79320 lb |

Note that there is a maximum of 9 single axles in an axle group and that the axles must be weighed in a consecutive group. The axles comprising the axle group are also identified on the printed record.

If you wish to print additional copies of the printed record for the vehicle, press the * (asterisk) key again followed by the **PRINT** key and a summary print will be produced. This can be repeated as often as necessary to secure the number of desired copies. Note, however, that as soon as the first axle of the next vehicle is printed, the weights from the previously weighed vehicle are cleared.

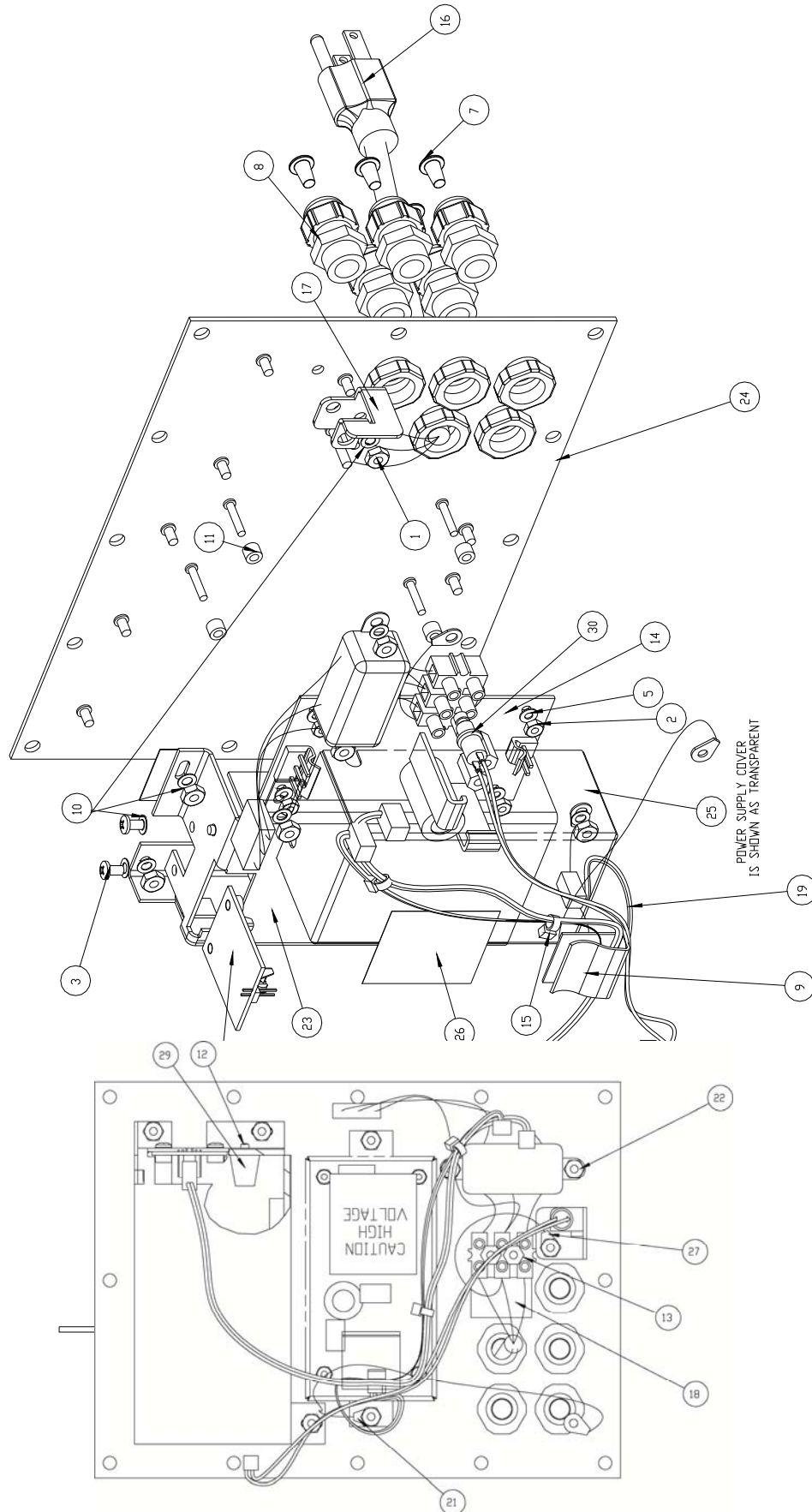
PART IDENTIFICATION

(210 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

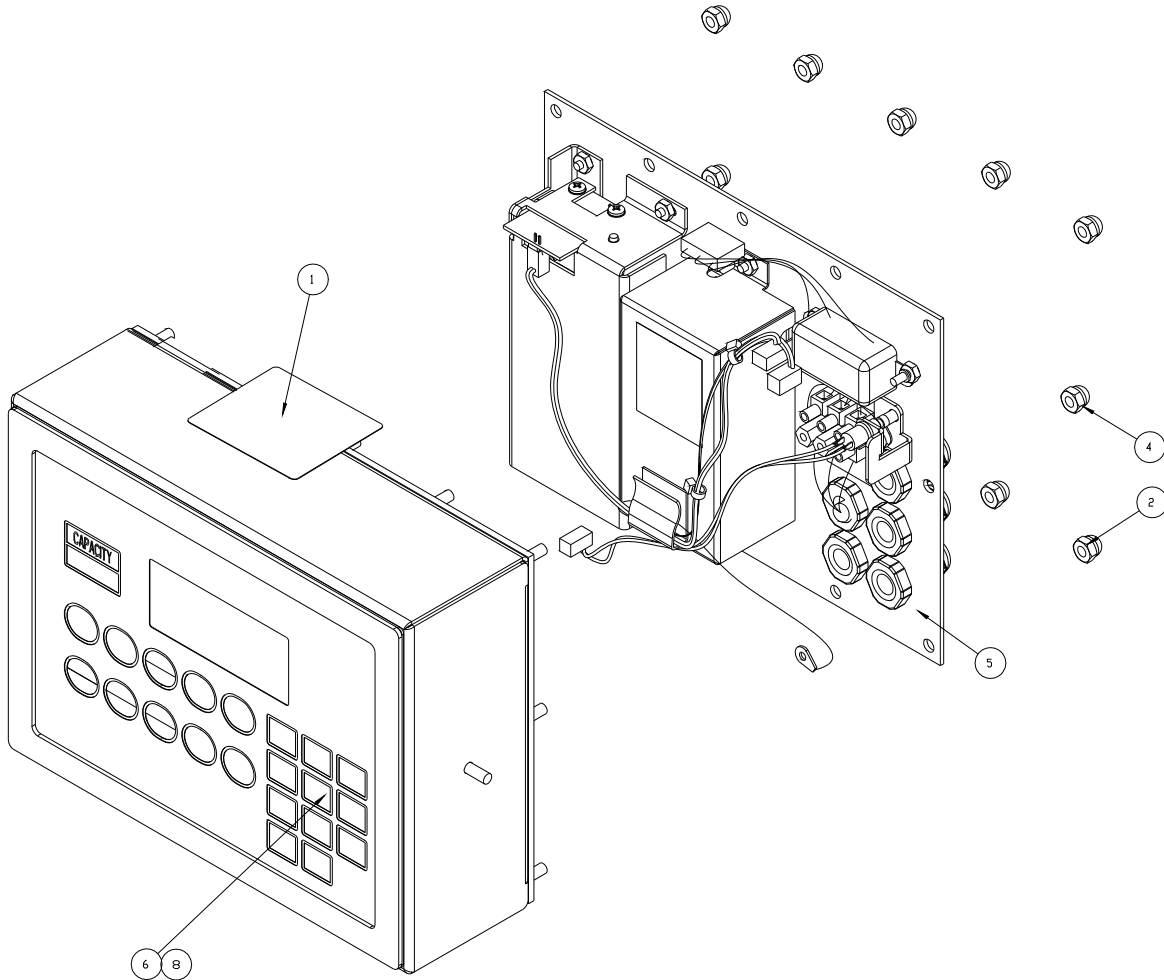
(210 Rear Enclosure Sub Assembly)



PART IDENTIFICATION

(210 Final Assembly)

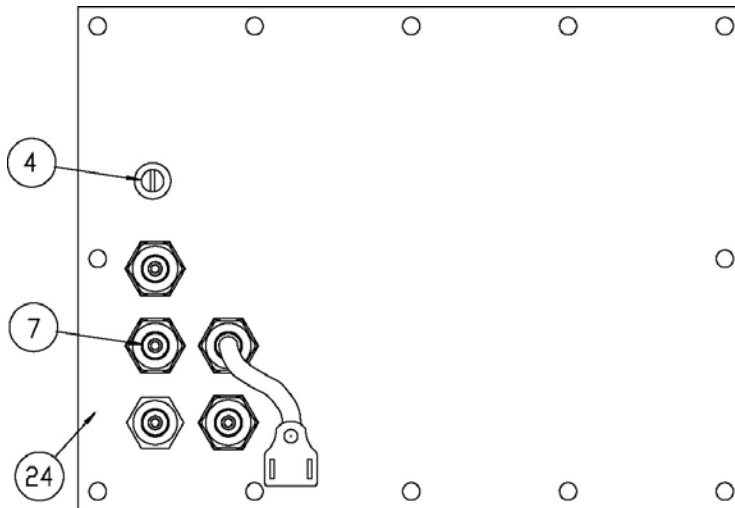
| ITEM NO. | QTY. | PART NUMBER | DESCRIPTION |
|----------|------|--------------|-----------------------------------|
| 1 | 1 | 593GR986 | SERIAL TAG ASSEMBLY |
| 2 | 11 | 6013-0433 | NUT HEX #10-32 ACORN S.S. |
| 4 | 1 | 8200-B026-08 | NUT HEX #10-32 ACORN S.S. DRILLED |
| 5 | 1 | 8200-D207-0A | SUB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



PART IDENTIFICATION

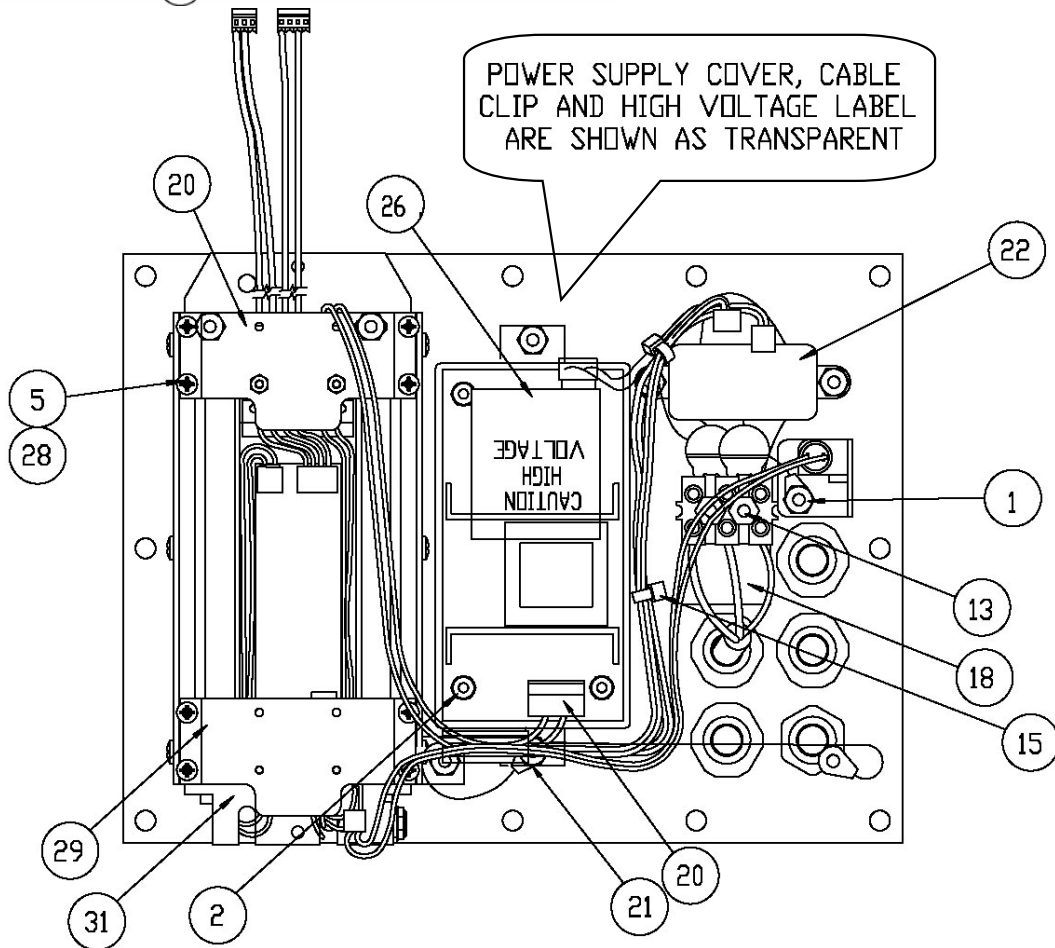
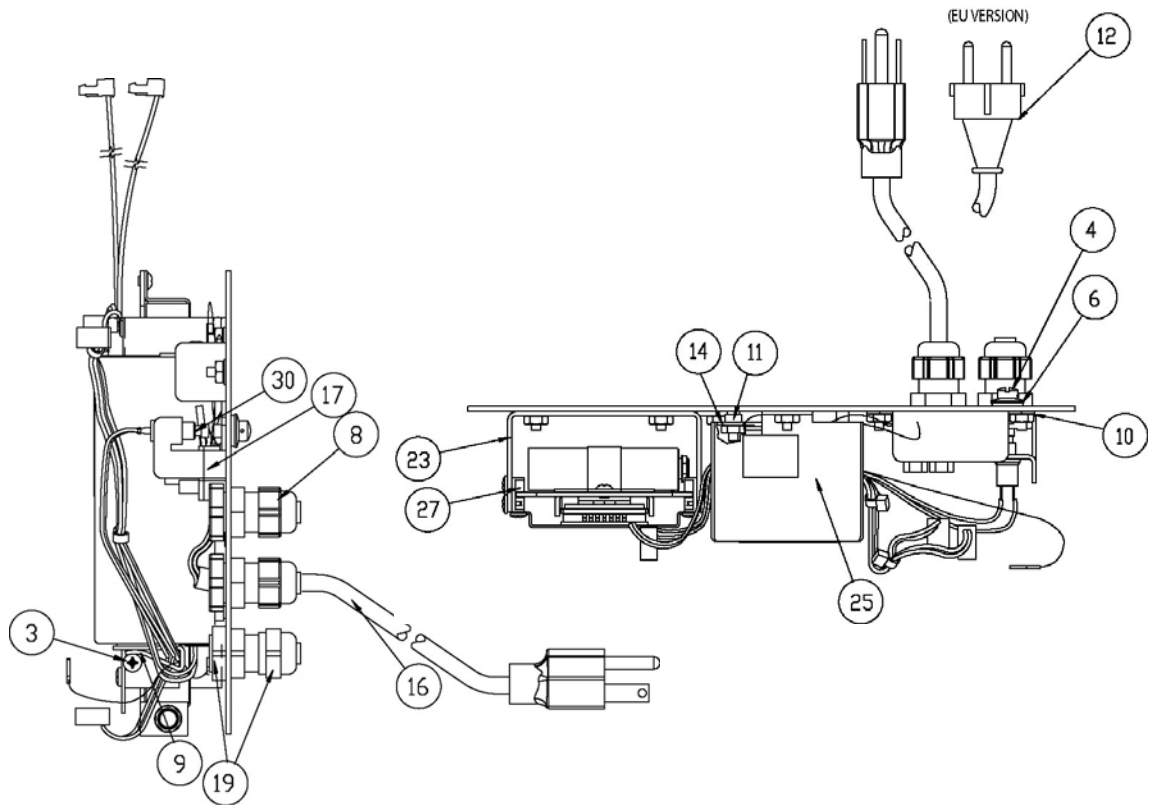
(215 Rear Enclosure Sub Assembly)

| ITEM NO. | QTY. | PART NUMBER | DESCRIPTION |
|----------|------|--------------|--|
| 1 | 8 | 6013-0039 | NUT HEX #6-32 |
| 2 | 3 | 6680-1107 | SPACER #4-40 x 0.75" |
| 3 | 6 | 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 | 8 | 6021-0502 | SCW PAN HEAD #4-40 x .187 PDMS |
| 6 | 1 | 6024-1081 | WASHER FLAT #10 NEOPRENE BACKING S.S. |
| 7 | 4 | 6540-1104 | PLUG, HOLE 0.173-.240 RED POLYETH. |
| 8 | 4 | 6610-2248 | CONN GLAND .187-.312 GRIP .599 MTG BLK |
| 9 | 1 | 6610-5007 | CABLE CLIP |
| 10 | 8 | 6680-0004 | WASHER LOCK INT. TOOTH #6 Z/P |
| 11 | 4 | 6680-0138 | SPACER #6 x .187 NYLON |
| 12 | 1 | 6980-0250 | EU POWER CORD H05VV-F3G 1mm, 10A/250V, BLACK |
| 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 | US POWER CORD 18/3 SVT CEE 6.3 FT |
| 17 | 1 | 8200-B019-08 | BRACKET: CALIBRATION SWITCH |
| 18 | 1 | 8200-B104-08 | LABE: 205/210 TERM. BLOCK |
| 19 | 1 | 6610-1506 | GLAND CONN. NICKEL |
| 20 | 1 | 8200-C420-0A | CONNECTOR BD./BRKT. ASSY. |
| 21 | 1 | 8200-B212-0A | CABLE: GND |
| 22 | 1 | 8200-B237-0A | CABLE: AC POWER W/FILTER 205/210 DWI |
| 23 | 1 | 8200-C404-08 | BATTERY BRACKET |
| 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 | 2 | 8200-C405-08 | BATTERY GUIDE |
| 28 | 8 | 6680-0052 | WASHER, LOCK HELICAL #4 |
| 29 | 1 | 8200-B410-08 | CONNECTOR BOARD MT. |
| 30 | 1 | 8539-B254-0A | ASSEMBLY: CABLE, CALIBRATION SWITCH |
| 31 | 1 | 8200-C415-0A | BATTERY TRAY ASSEMBLY |



PART IDENTIFICATION

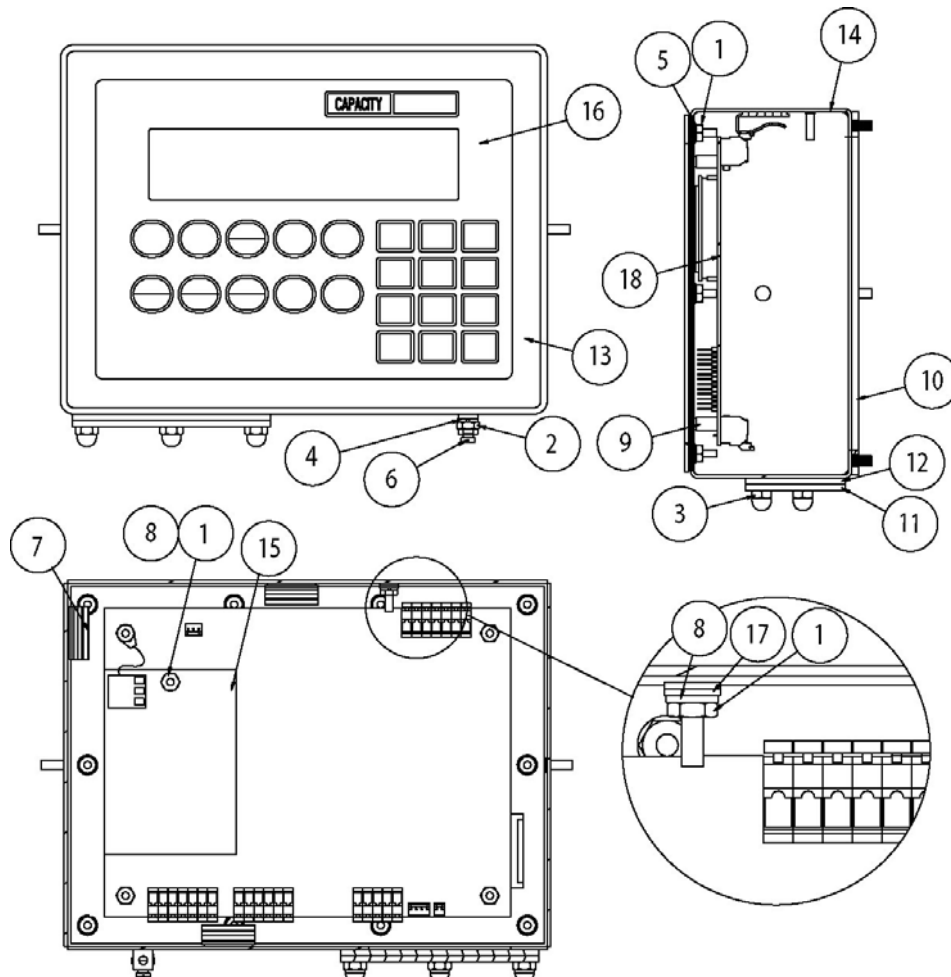
(215 Rear Enclosure Sub Assembly)



PART IDENTIFICATION

(215 Front Enclosure Sub Assembly)

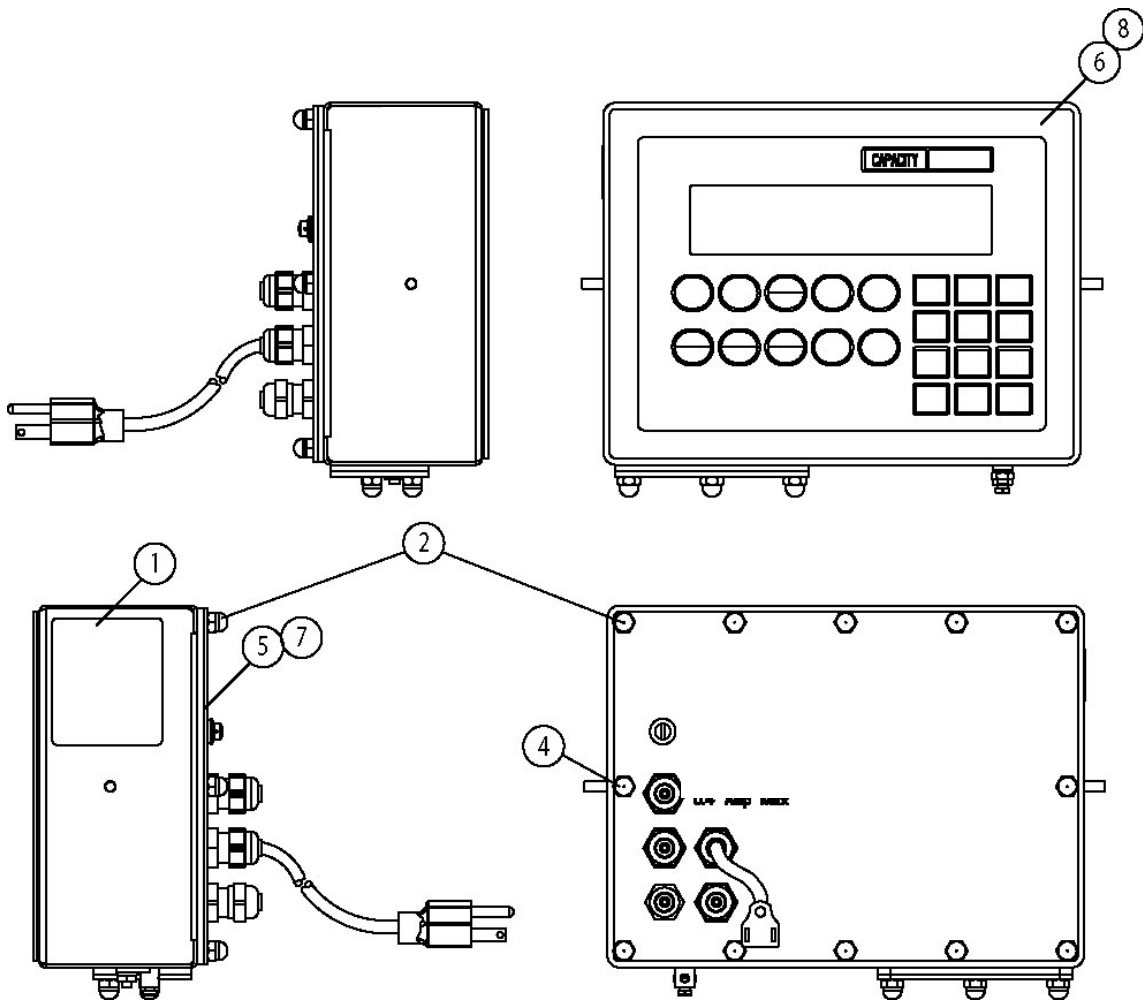
| ITEM NO. | QTY. | PART NUMBER | DESCRIPTION |
|----------|------|--------------|--|
| 1 | 16 | 6013-0039 | NUT, HEX #6-32 |
| 2 | 1 | 6013-0297 | NUT, HEX #10-32 |
| 3 | 3 | 6013-0433 | NUT, HEX #10-32 ACORN S.S. |
| 4 | 1 | 6024-0037 | WASHER, LOCK #10 HELICAL SPLIT |
| 5 | 10 | 6024-1078 | WASHER, FLAT #6 NEOPRENE BASCKING S.S. |
| 6 | 1 | 6610-5002 | GROUND LUG |
| 7 | 3 | 6610-5007 | CABLE CLIP |
| 8 | 6 | 6680-0004 | WASHER, LOCK INT. TOOTH #6 Z/P |
| 9 | 4 | 6680-0204 | SPACER (PCB) #6 x 0.531 |
| 10 | 1 | 8200-B014-08 | GASKET FOR 210 ENCLOSURE |
| 11 | 1 | 8200-B020-08 | COVER, BATTERY |
| 12 | 1 | 8200-B021-08 | GASKET: BATTERY DOOR |
| 13 | 1 | 8200-C015-0A | WELDMENT: BEZEL FOR 210 |
| 14 | 1 | 8200-C408-0A | WELDMENT: ENCLOSURE, FRONT |
| 15 | 1 | 8200-C210-0A | DAC PCB (OPTIONAL) |
| 16 | 1 | 8200-D402-08 | KEYPAD: 215 DWI |
| 17 | 2 | 6024-1022 | #6 FLAT WASHER |
| 18 | 1 | 8200-D401-0A | PC BD. ASSY. 215 MAIN |



PART IDENTIFICATION

(215 Final Assembly)

| ITEM NO. | QTY. | PART NUMBER | DESCRIPTION |
|----------|------|--------------|---|
| 1 | 1 | 593GR986 | SERIAL TAG ASSY. |
| 2 | 11 | 6013-0433 | NUT HEX #10 ACORN S.S. |
| 3 | 1 | 6650-0087 | LABEL: MADE IN USA |
| 4 | 1 | 8200-B026-08 | NUT HEX #10 ACORN S.S. DRILLED |
| 5 | 1 | 8200-D412-0A | SUB ASSEMBLY: REAR ENCLOSURE |
| 6 | 1 | 8200-D413-0A | SUB ASSEMBLY: FRONT 215 |
| 7 | 1 | 8200-D412-1A | SUB ASSEMBLY: REAR ENCLOSURE EU MODEL |
| 8 | 1 | 8200-D413-1A | SUB ASSEMBLY: FRONT 215-A (with DAC Option) |



APPENDIX A: MODEL 210DC AND 215DC

The Models 210DC and 215DC have 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.

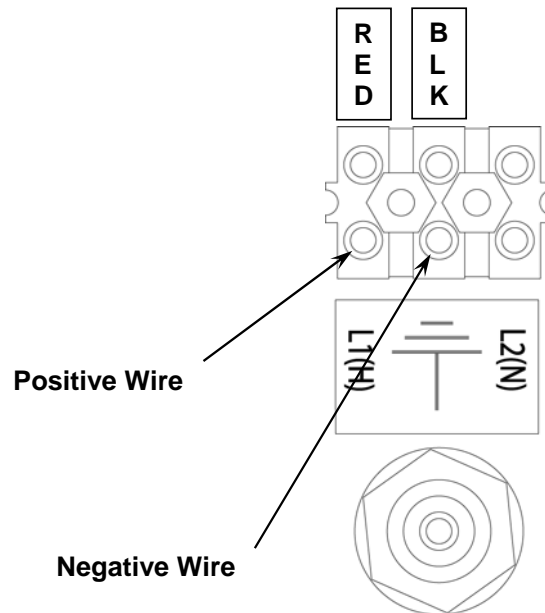
The input power wiring and the main printed circuit board power wiring have been changed. The input power source can be provided by the user and is to be 12-15VDC, 1A. The main printed circuit board positive (red) power wire is connected to the L1(H) terminal and the negative (black) wire is connected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

Strip $\frac{1}{4}$ " 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 indicators can be operated as described in this manual.



IMPORTANT! The indicators are 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. 8 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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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 or 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 **tEtE =**.
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 **tEtE =**.
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 **tEtE =**.
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 *5Er5LL* prompt. If not then press the **NO** key at the prompt.

If *5Er5LL* 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 *t Short* 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>xxxxxyyyyyy<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 *tdtE* prompt, enter the format for the date and time (0-4).

At the *St r tL* prompt, enter the decimal value for the start character (0-126)

At the *EbL oL* 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**n scale (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.



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 **LR** section of the setup.

If a **GUARDIAN** scale is connected to the indicator, at the **55t** prompt press the **YES** key.

The **tl** 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 **th** 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 **tURL** 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 **55t** for a couple of seconds if the **55t** 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

