

# IQ plus<sup>®</sup> 210

*Digital Weight Indicator  
Version 1*

## Installation Manual



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# Revision History

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This section tracks and describes manual revisions for awareness of major updates.

| Revision | Date               | Description   |
|----------|--------------------|---|
| C        | September 21, 2022 | Revision history established; updated formatting and regulatory notes |
|          |                    |   |

*Table i. Revision Letter History*



*Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com/training](http://www.ricelake.com/training) or obtained by calling 715-234-9171 and asking for the training department.*

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# 1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing the *IQ plus*<sup>®</sup> 210 digital weight indicator.

Configuration and calibration of the indicator can be accomplished using the indicator front panel keys, the EDP command set, or Version 2.3 or later of the Revolution™ configuration utility. See [Section 3.1 on page 10](#) for information about configuration methods.



**Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.**



Manuals and additional resources are available from the Rice Lake Weighing Systems website at [www.ricelake.com](http://www.ricelake.com)

Warranty information can be found on the website at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Overview

The *IQ plus 210* is a single-channel digital weight indicator housed in a NEMA 4X indoor use only stainless steel enclosure. The indicator front panel consists of a large (.8 in, 20 mm), six-digit, seven-segment LED display, seven LED annunciators, and two piezo switches used to zero the scale and select the displayed units. Features include:

- Drives up to four 350Ω load cells
- Supports 4- and 6-wire load cell connections
- Two configurable digital inputs
- Single serial port supports full duplex, RS-232 communications at up to 9600 bps
- Available in 115 VAC and 230 VAC versions

## 1.2 Operating Modes

The *IQ plus 210* has two modes of operation:

### Weigh mode

Weigh mode is the production mode of the indicator. The indicator displays the gross weight and the LED annunciators indicate scale status and the type of weight value displayed. Once configuration is complete and a legal seal is affixed to the back of the indicator, this is the only mode in which the *IQ plus 210* can operate.

### Setup mode

Most of the procedures described in this manual require the indicator to be in setup mode, including configuration and calibration.

To enter setup mode, remove the large fillister head screw from the enclosure backplate. Insert a screwdriver or a similar tool into the access hole and press the setup switch once. The indicator display changes to show the word **CONFIG**.

## 1.3 Front Panel

Figure 1-1 shows the IQ plus 210 LED annunciators, buttons, and normal mode key functions.

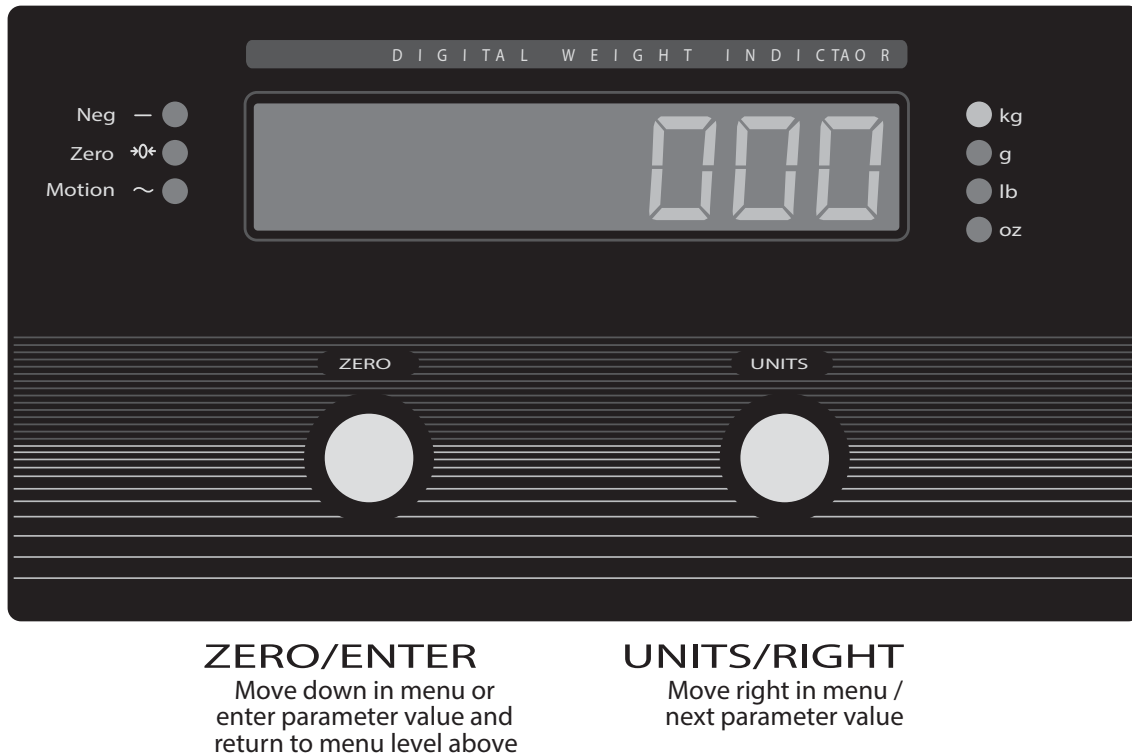


Figure 1-1. IQ plus 210 Front Panel

## 1.4 LED Annunciators

The IQ plus 210 display uses a set of seven LED annunciators to provide additional information about the value being displayed:

- **Neg** annunciator lights to show that the displayed value is negative.
- **Zero**: Weight is within 0.25 graduations of zero. This annunciator lights when the scale is zeroed.
- **Motion**: Scale in motion outside the specified motion band. Zeroing and print operations can only be done when the motion LED is off.
- **lb**, **kg**, **oz**, and **g** annunciators indicate the units associated with the displayed value: lb = pounds, kg = kilograms, oz = ounces, g = grams. lb and oz annunciators are both lit when the displayed weight is in pounds and ounces.

## 1.5 Indicator Operations

Basic IQ plus 210 operations are summarized below.

### Zero Scale

1. Remove material from the scale and wait for the **Motion** LED to go out.
2. Press the **ZERO** button. The zero annunciator lights to indicate the scale is zeroed.

### Change Display Units

Press the **UNITS** button to change the displayed units between primary and alternate units. The LED annunciators on the right side of the display show the current displayed units. If more than one alternate unit is configured, the display cycles through the alternate units before returning to primary units; if no alternate units are configured, the display does not change when the button is pressed.



## 2.0 Installation

The *IQ plus 210* digital weight indicator is designed for easy setup and installation. All models are pre-configured and weight calibrated before shipment, with the load cell connected to the indicator. For simple, standalone scale applications, hardware installation consists of attaching the indicator, mounting assembly, and bench scale, then leveling the scale.



**The *IQ plus 2100* is weight calibrated before shipment from the factory, but recalibration at the installation site is strongly recommended. Calibration by a certified scale technician is required for Legal-for-Trade applications.**

### 2.1 Unpacking and Assembly

Immediately after unpacking, visually inspect the *IQ plus 210* to ensure all components are included and undamaged. The shipping carton should contain the indicator, the indicator mount (tilt stand) and a parts kit. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

The parts kit contains the items listed below:

- Capacity label (PN 42350)
- One grounding clamp (PN 53075), external tooth lock washer, (PN 15133), and kep nut (PN 14626) for digital input or serial cable shield grounding against the enclosure.
- Two wing knobs with nylon washers for attaching the indicator to the mounting assembly, four rubber tilt stand feet (for tilt stand option) or bench scale feet, jam nuts, lock washers, and cap screws (for column and attachment bracket options).

To install, attach the mounting assembly to scale base, then assemble the indicator to the mounting assembly. Place the bench scale in the desired location then lift off the scale platter and locate the bubble level. Adjust the corner feet until the scale is level and all feet are in contact with the support surface. Tighten the jam nuts against the scale to lock-in the level adjustment.

Plug power cord into power outlet to begin weighing.



**The supply cord serves as the power disconnect for the *IQ plus 2100*. The power outlet supplying the indicator must be installed near the unit and be easily accessible.**

### 2.2 Factory Setup

The *IQ plus 210* is pre-configured and weight calibrated at the factory before shipment. Table 2-1 lists the default graduations and count-by configuration for each scale capacity.

| Scale Capacity | Count by  | Configuration Parameters |        |
|----------------|-----------|--------------------------|--------|
|                |           | DECPNT                   | DSPDIV |
| 5 lb           | 0.001 lb  | 888.888                  | 1D     |
| 10 lb          | 0.002 lb  | 888.888                  | 2D     |
| 25 lb          | 0.005 lb  | 888.888                  | 5D     |
| 50 lb          | 0.01 lb   | 8888.88                  | 1D     |
| 100 lb         | 0.02 lb   | 8888.88                  | 2D     |
| 2.5 Kg         | 0.0005 Kg | 88.8888                  | 5D     |
| 5 Kg           | 0.001 Kg  | 888.888                  | 1D     |
| 10 Kg          | 0.002 Kg  | 888.888                  | 2D     |
| 25 Kg          | 0.005 Kg  | 888.888                  | 5D     |
| 50 Kg          | 0.01 Kg   | 8888.88                  | 1D     |

**All capacities are pre-configured for 5000 graduations (GRADS parameter on CONFIG menu set to 5000).**

Table 2-1. Default Scale Configurations

If scale configuration must be changed, see [Section 3.0 on page 10](#) for detailed configuration information. See [Section 4.0 on page 19](#) for calibration instructions.

## 2.3 Indicator

The indicator enclosure must be opened to connect cables for load cells, communications and digital inputs.



**The IQ plus 210 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.**



Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.

This unit uses double pole/neutral fusing which could create an electric shock hazard. Procedures requiring work inside the indicator must be performed by qualified service personnel only.

The supply cord serves as the power disconnect for the IQ plus 210. The power outlet supplying the indicator must be installed near the unit and be easily accessible.

Ensure power to the indicator is disconnected, then remove the screws that hold the backplate to the enclosure body, then lift the backplate away from the enclosure and set it aside.

### 2.3.1 Cable Connections

The IQ plus 210 provides three cord grips for cabling into the indicator: two for the power cord and load cell cabling, the third for communications and digital input cables. The free cord grip comes with a plug installed to prevent moisture from entering the enclosure. If your application requires serial communication or digital input cabling, remove the plug and install cables as described in Sections [Section 2.3.4](#) and [Section 2.3.5](#) on page 6.

### Cable Grounding

Except for the power cord, all cables routed through the cord grips should be grounded against the indicator enclosure. Do the following to ground shielded cables:

- Use the lock washers, clamps, and keps nuts provided in the parts kit to install grounding clamps on the studs adjacent to the cord grips. Install grounding clamps only for cord grips that will be used; do not tighten nuts.
- Route cables through cord grips and grounding clamps to determine cable lengths required to reach cable connectors. Mark cables to remove insulation and shield as described below:
- For cables with foil shielding, strip insulation and foil from the cable 0.5" (15 mm) past the grounding clamp (see [Figure 2-1](#)). Fold the foil shield back on the cable where the cable passes through the clamp. Ensure silver (conductive) side of foil is turned outward for contact with the grounding clamp.
- For cables with braided shielding, strip cable insulation and braided shield from a point just past the grounding clamp. Strip another 0.5" (15 mm) of insulation **only** to expose the braid where the cable passes through the clamp (see [Figure 2-1](#)).
- For load cell cables, strip the yellow shield wire 0.75" past the grounding clamp. Fold wire back and secure between the cable and clamp. Shield wire function is provided by contact between the cable shield and the grounding clamp.
- Route stripped cables through cord grips and clamps. Ensure shields contact grounding clamps as shown in [Figure 2-1](#). Tighten grounding clamp nuts.
- Finish installation using cable mounts and ties to secure cables inside of indicator enclosure.

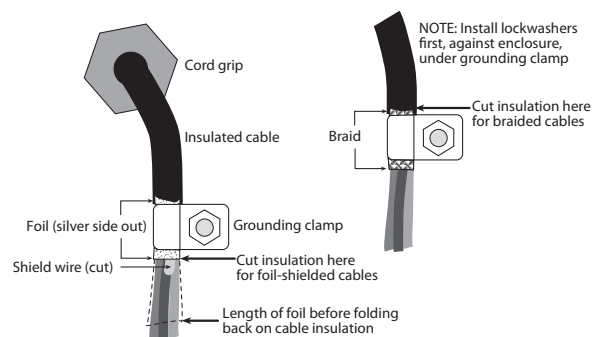


Figure 2-1. Grounding Clamp Attachment for Foil-Shielded and Braided Cables

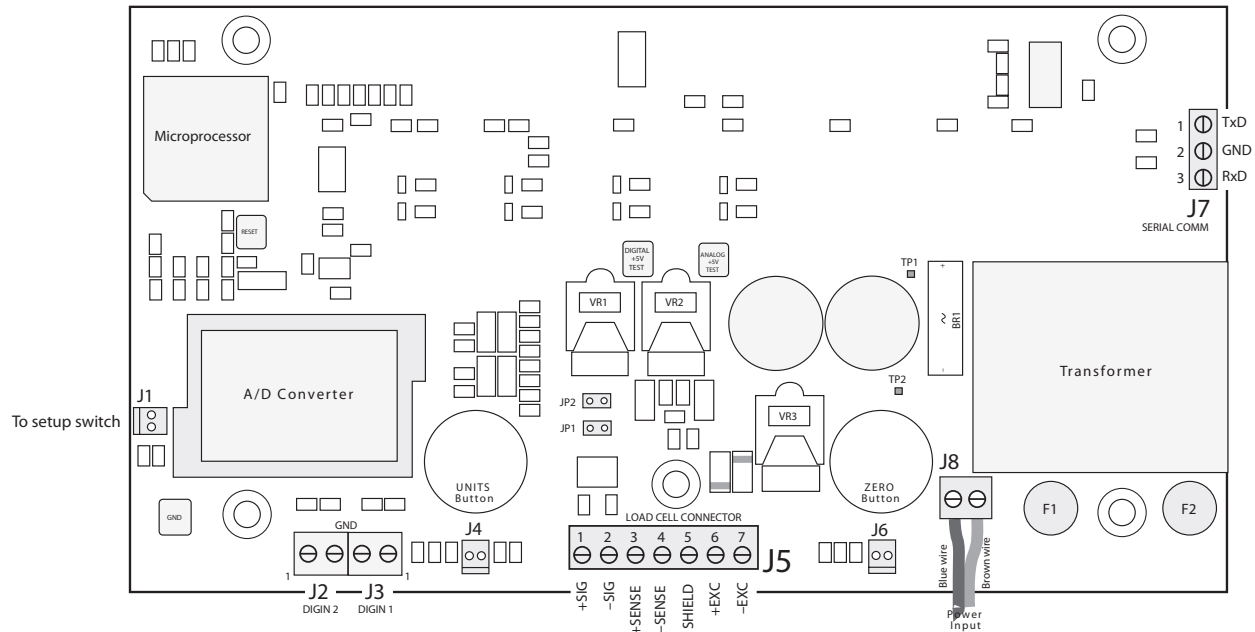


Figure 2-2. IQ plus 210 CPU and Power Supply Board

### 2.3.2 Load Cells

Wire the load cell cable from the load cell or junction box to connector J5 as shown in Table 2-2. If using 6-wire load cell cable (with sense wires), remove jumpers JP1 and JP2 (see Figure 2-2). For 4-wire installation, leave jumpers JP1 and JP2 on.



**All models come with ten feet of color-coded load cell cable. Do not cut this cable. The load cell is temperature-compensated for an exact cable length often feet. Cutting the load cell cable voids the load cell warranty.**

When connections are complete, use two cable ties to secure the load cell cable to the inside of the enclosure.

| J5 Pin | Function | RL1040<br>RL1042 | RL1380 |
|--------|----------|------------------|--------|
| 1      | +SIG     | Red              | White  |
| 2      | -SIG     | White            | Red    |
| 3      | +SENSE   | Blue             | --     |
| 4      | -SENSE   | Brown            | --     |
| 5      | +EXC     | Green            | Green  |
| 6      | -EXC     | Black            | Black  |

Table 2-2. J5 Pin Assignments and Load Cell Wire Color



**Use grounding procedure described in Section 2.3.1 on page 4 to attach shield wire to backplate.**

**For 6-wire connections, remove jumpers JP1 and JP2.**

### 2.3.3 Setting the Load Cell Compensation Jumper

The load cell compensation jumper (above the ZERO button location on the CPU board; see Figure 2-2) must be set for the type of load cell connected to the indicator:

- For load cells with balanced bridges, set the jumper in the OFF position. Example of balanced load cells include the RL1040, RL1250, RL1260, RL1380, and RL1385.
- For load cells with unbalanced bridges, follow the procedure below to determine the correct jumper position. Examples of unbalanced cells include the RL1042 and RL1010.

To determine the correct jumper position for unbalanced cells, do the following;

1. Disconnect load cell from indicator.
2. Use an ohmmeter to measure +EXC to +SIG and +EXC to -SIG. Measured values between the excitation line and each of the signal lines should be within 2–3Ω.

- Next, measure –EXC to +SIG and –EXC to –SIG. Measured values between the excitation line and each of the signal lines should be within 2–3Ω.
- If the +EXC measurements (step 2) are 5% larger than the –EXC measurements (step 3), set the compensation jumper in the ON position. If the +EXC measurements are < 5% greater (or are less) than the –EXC measurements, set the jumper in the OFF position.

### 2.3.4 Serial Communications

To attach serial communications cables, connect communications cables to connector J7 as shown in Table 2-3. Use cable ties to secure serial cable to the inside of the enclosure.

Use the SERIAL menu to configure serial communications. See [Section 3.2.4 on page 17](#) for configuration information.

| J7 Pin | Label | Function      |
|--------|-------|---------------|
| 1      | TxD   | RS-232 TxD    |
| 2      | GND   | RS-232 Ground |
| 3      | RxD   | RS-232 RxD    |

Table 2-3. J7 Pin Assignments

### 2.3.5 Digital Inputs

Digital inputs (connectors J2 and J3) can be used to perform remote ZERO and UNITS key presses or to send serial data to a printer (remote PRINT key function). The inputs are active (on) with low voltage (0 VDC) and can be driven by TTL or 5V logic without additional hardware. Use the DIG IN menu to configure the digital inputs. See [Section 3.2.5 on page 18](#) for information about configuring the digital inputs.

### 2.3.6 Enclosure Reassembly

Once cabling is complete, position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern shown in [Figure 2-3](#) to prevent distorting the backplate gasket. Torque screws to 15 in-lb (1.7 N-m).

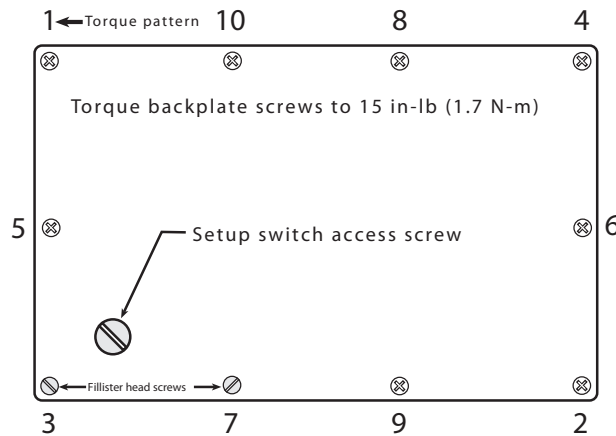


Figure 2-3. IQ plus 210 Enclosure Backplate

### 2.3.7 Board Removal

If you must remove the IQ plus 210 CPU board, use the following procedure:

- Disconnect power to the indicator. Remove backplate as described in [Section 2.3 on page 4](#).
- Remove connections to J5 (load cell cable), J7 (serial communications), J2 and J3 (digital inputs), J4 and J6 (piezo button inputs), and J1 (setup switch). Remove blue and brown power input wires at J8. See [Figure 2-2 on page 5](#) for connector locations.
- Remove the five nuts from the CPU board, then lift the board out of the enclosure.

To replace the CPU board, reverse the above procedure. Be sure to reinstall cable ties to secure all cables inside the indicator enclosure.

## 2.4 IQ Plus 210 Indicator Repair Parts

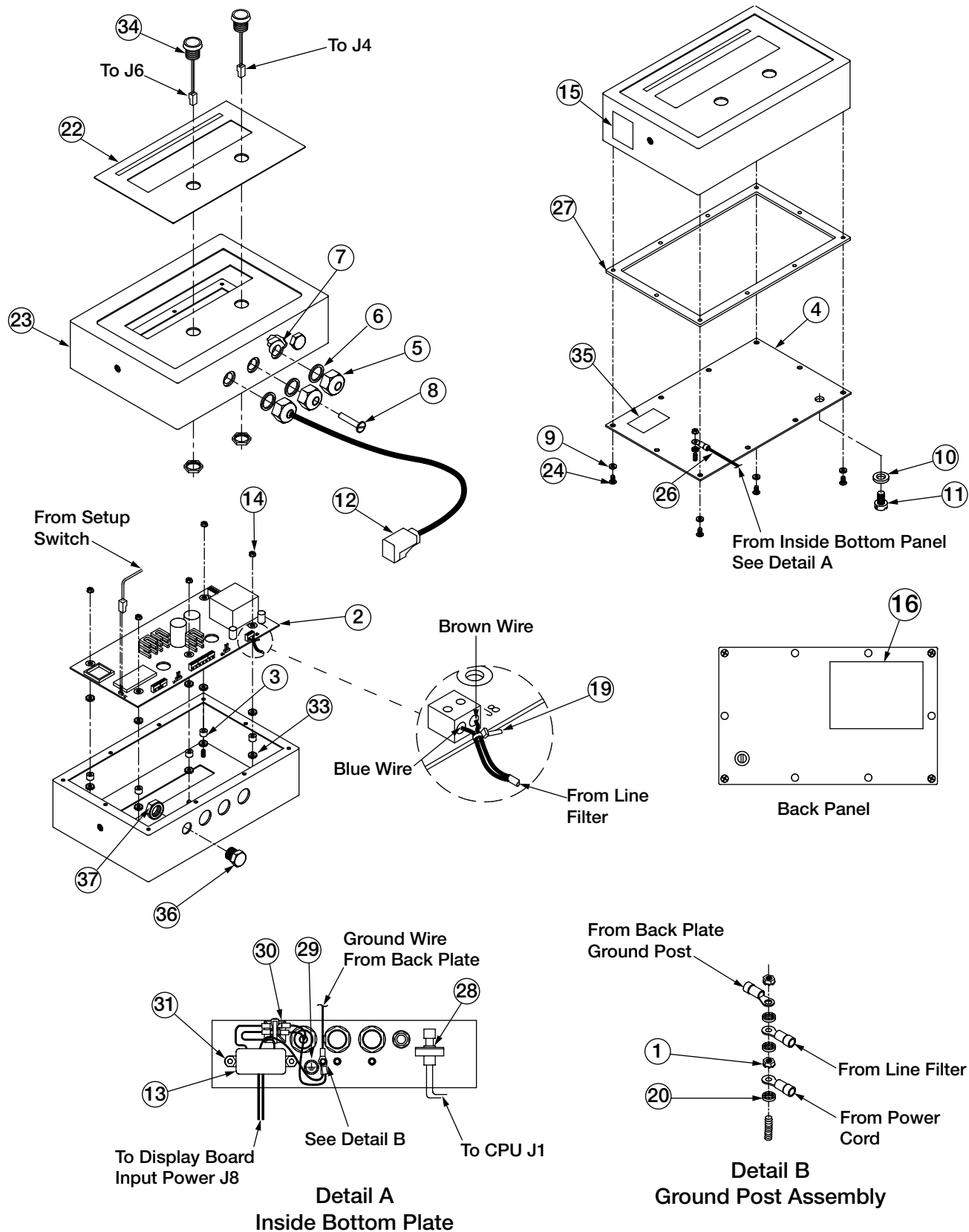


Figure 2-4. IQ Plus 210 Indicator Parts Illustration

| Item No. | Part No. | Description                                  | Qty |
|----------|----------|--|-----|
| 1        | 14626    | Keyp nuts, 8-32NC hex                        | 3   |
| 2        | 53651    | Display and CPU board assembly, 115 VAC      | 1   |
|          | 53650    | Display and CPU board assembly, 230 VAC      | 1   |
| 3        | 15365    | Board mounting spacers                       | 5   |
| 4        | 52483    | Enclosure backplate                          | 1   |
| 5        | 15626    | Cable grips, PG9                             | 2   |
| 6        | 30375    | Nylon seal rings for cable grips             | 3   |
| 7        | 15627    | Locknuts, PCN9                               | 3   |
| 8        | 19538    | Cable grip plugs                             | 2   |
| 9        | 45042    | Sealing washers                              | 1/4 |
| 10       | 44676    | Sealing washer for setup switch access screw | 1   |
| 11       | 42640    | Setup switch access screw, 1/4 x 28NF x 1/4  | 1   |
| 12       | 41965    | Power cord assembly, 115VAC                  | 1   |
|          | 45254    | Power cord assembly, 230VAC                  | 1   |
| 13       | 41964    | Line filter assembly                         | 1   |
| 14       | 14621    | Keyp nuts, 6-32NC hex                        | 5   |
| 20       | 15134    | Lock washers, internal tooth, No. 8 , Type A | 4   |
| 22       | 52853    | Overlay membrane panel                       | 1   |
| 23       | 52482    | Enclosure                                    | 1   |
| 24       | 14862    | Screws, 8-32NC x 3/8                         | 8/4 |
| 26       | 45043    | Ground wire, 4-in., No. 8                    | 1   |
| 27       | 39037    | Backplate gasket                             | 1   |
| 28       | 49910    | Setup switch assembly                        | 1   |
| 29       | 16892    | Ground/Earth Label                           | 1   |
| 30       | 15650    | Cable tie mounts                             | 1   |
| 31       | 45302    | Line filter standoffs                        | 2   |
| 33       | 15131    | Lock washers, external tooth, No. 6, Type A  | 10  |
| 34       | 61113    | Piezo switches                               | 2   |
| 35       | 30623    | Fillister head screws, 8-32NC x 7/16         | 2   |
| —        | 53848    | 200 mA TR5 subminiature fuses, 115 VAC       | 2   |
|          | 53881    | 100 mA TR5 subminiature fuses, 230 VAC       | 2   |

Table 2-4. IQ Plus 210 Repair Parts List

**WARNING**

**For protection against risk of fire, replace fuses only with same type and rating fuse.**

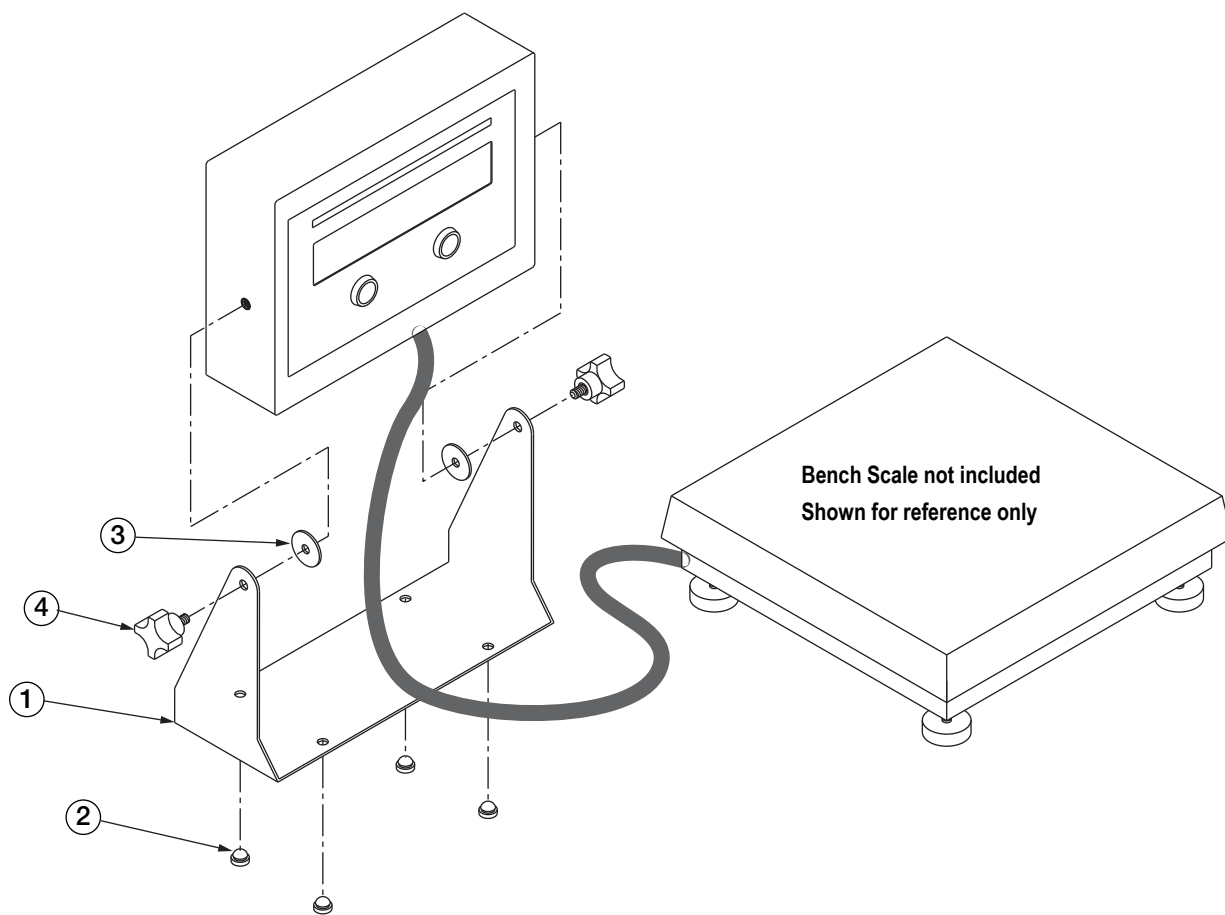


Figure 2-5. IQ Plus 210 Tilt Stand Assembly

| Item No. | Part No. | Description               | Qty |
|----------|----------|---------------------------|-----|
| 1        | 29635    | Tilt stand                | 1   |
| 2        | 42149    | Tilt stand feet           | 4   |
| 3        | 15144    | Nylon washers, 1/4x1x1/16 | 2   |
| 4        | 30342    | Wing knobs                | 2   |

Table 2-5. IQ Plus 210 Tilt Stand Assembly Parts List

## 3.0 Configuration

To configure the *IQ plus 210* indicator, the indicator must be placed in setup mode. The setup switch is accessed by removing the large fillister head screw on the enclosure backplate. Insert a screwdriver into the access hole and press the switch to enter setup mode.

When the indicator is placed in setup mode, the word **CONFIG** is shown on the display. The **CONFIG** menu is the first of the main menus used to configure the indicator. Detailed descriptions of these menus are given in [Section 3.2 on page 14](#). When configuration is complete, press the setup switch again to exit setup mode, then replace the setup switch access screw.

### 3.1 Configuration Methods

The *IQ plus 210* indicator can be configured by using the front panel buttons to navigate through a series of configuration menus or by sending commands or configuration data to the EDP port. Configuration using the menus is described in [Section 3.1.3 on page 11](#).

Configuration using the EDP port can be accomplished using either the EDP command set described in [Section 5.0 on page 22](#) or Version 2.3 or later of the Revolution™ configuration utility.

#### 3.1.1 Revolution Configuration

The Revolution configuration utility provides the preferred method for configuring the *IQ plus 210* indicator. Revolution runs on a personal computer to set configuration parameters for the indicator. When Revolution configuration is complete, configuration data is downloaded to the indicator.

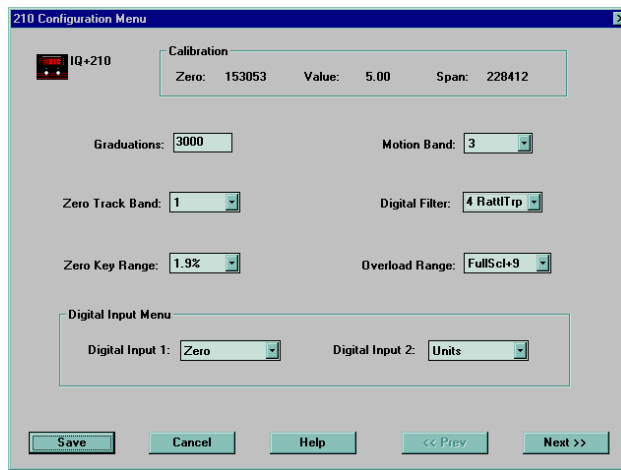


Figure 3-1. Sample Revolution Display

Revolution supports both uploading and downloading of indicator configuration data. This capability allows configuration data to be retrieved from one indicator, edited, then downloaded to another.

To use Revolution, do the following:

1. Install Revolution on an IBM-compatible personal computer running Windows® 3.11 or Windows 95. Minimum system requirements are 8MB of extended memory and at least 5MB of available hard disk space.
2. With both indicator and PC powered off, connect the PC serial port to the RS-232 pins on the indicator EDP port.
3. Power up the PC and the indicator. Use the setup switch to place the indicator in setup mode.
4. Start the Revolution program.

[Figure 3-1](#) shows an example of one of the Revolution configuration displays.

Revolution provides online help for each of its configuration displays. Parameter descriptions provided in this manual for front panel configuration can also be used when configuring the indicator using Revolution: the interface is different, but the parameters set are the same.



### 3.1.2 EDP Command Configuration

The EDP command set can be used to configure the *IQ plus 210* indicator using a personal computer, terminal, or remote keyboard. Like Revolution, EDP command configuration sends commands to the indicator serial port; unlike Revolution, EDP commands can be sent using any external device capable of sending ASCII characters over a serial connection.

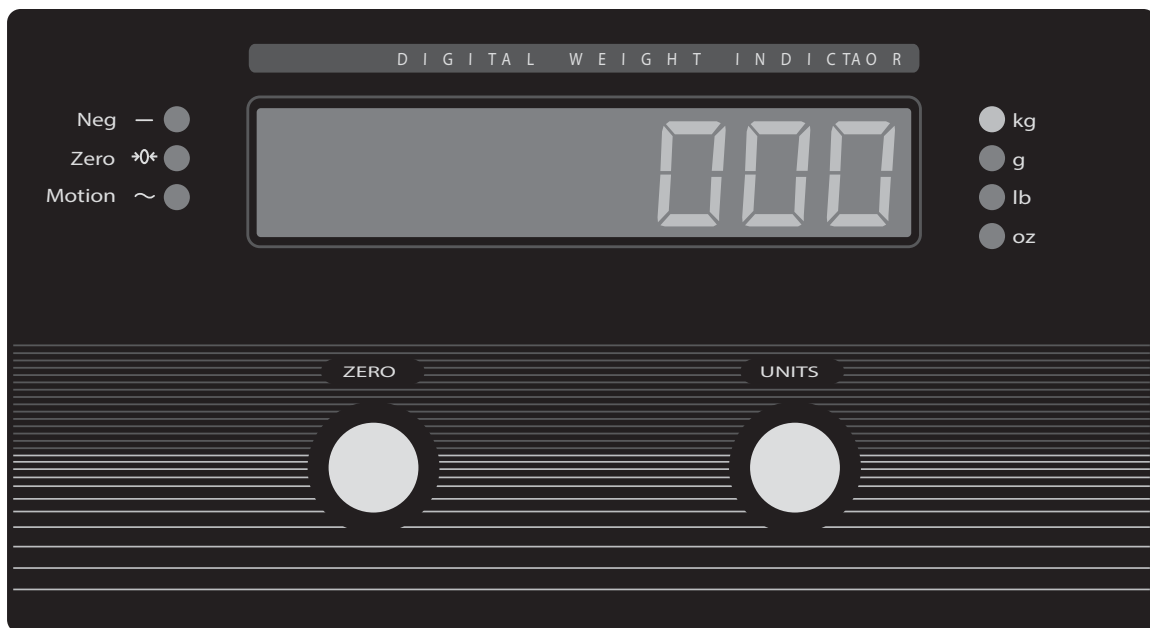
EDP commands duplicate the functions available using the indicator front panel and provide some functions not otherwise available. EDP commands can be used to simulate pressing front panel buttons, to configure the indicator, or to dump lists of parameter settings. See [Section 5.0 on page 22](#) for more information about using the EDP command set.

### 3.1.3 Front Panel Configuration

The *IQ plus 210* indicator can be configured using a series of menus accessed through the indicator front panel when the indicator is in setup mode. Table 3-1 summarizes the functions of each of the main menus.

| Menu   |               | Menu Function  |
|--------|---------------|--|
| CONFIG | Configuration | Configure grads, zero tracking, zero range, motion band, overload, and digital filtering parameters. |
| FORMAT | Format        | Set format of primary units, select alternate display units.   |
| CALIBR | Calibration   | Calibrate indicator. See <a href="#">Section 4.0 on page 19</a> for calibration procedures.          |
| SERIAL | Serial        | Configure serial port.   |
| DIG IN | Digital Input | Assign digital input functions.  |
| DEFLT  | Default       | Restore default configuration.   |
| VERS   | Version       | Display installed software version number.   |

Table 3-1. *IQ plus 210* Menu Summary



#### ZERO/ENTER

Move down in menu or enter parameter value and return to menu level above

#### UNITS/RIGHT

Move right in menu / next parameter value

Figure 3-2. Front Panel Key Functions in Setup Mode

### Front Panel Menu Navigation

The front panel buttons are used to navigate through the menus in setup mode (see [Figure 3-2](#)). The **UNITS (RIGHT)** button scrolls right (horizontally) on the same menu level; the **ZERO (ENTER)** button moves down (vertically) to different menu levels and serves as an Enter key for selecting parameter values within the menus.

Most of the configuration menus have three or four levels. **Figure 3-3** shows the general structure of the *IQ plus 210* configuration menus. Note the following:

- On the first (main) menu level, press **RIGHT** to scroll through the menus. Pressing **RIGHT** from the **VERS** menu wraps around to the **CONFIG** menu. Press **ENTER** from any of the main menus to move down to the first parameter for that menu.
- On the middle (parameter) menu levels, press **RIGHT** to scroll through the parameter prompts for the menu. When the last parameter is displayed, pressing **RIGHT** returns to the level above. Press **ENTER** from any parameter prompt to move down to the values prompts for that parameter.
- On the bottom (parameter value) menu level, press **RIGHT** to scroll through the values for the parameter. Pressing **RIGHT** from the last value wraps around to first value. Press **ENTER** to select the value and return to the parameter prompt.

To edit numerical values, use the **RIGHT** button to select the digit; use the **ENTER** button to increment or decrement the value of the flashing digit (see **Figure 3-5 on page 13**). Once all digits have been edited, press **ENTER** to save the value and return to the parameter prompt.

## Menu Navigation General Structure

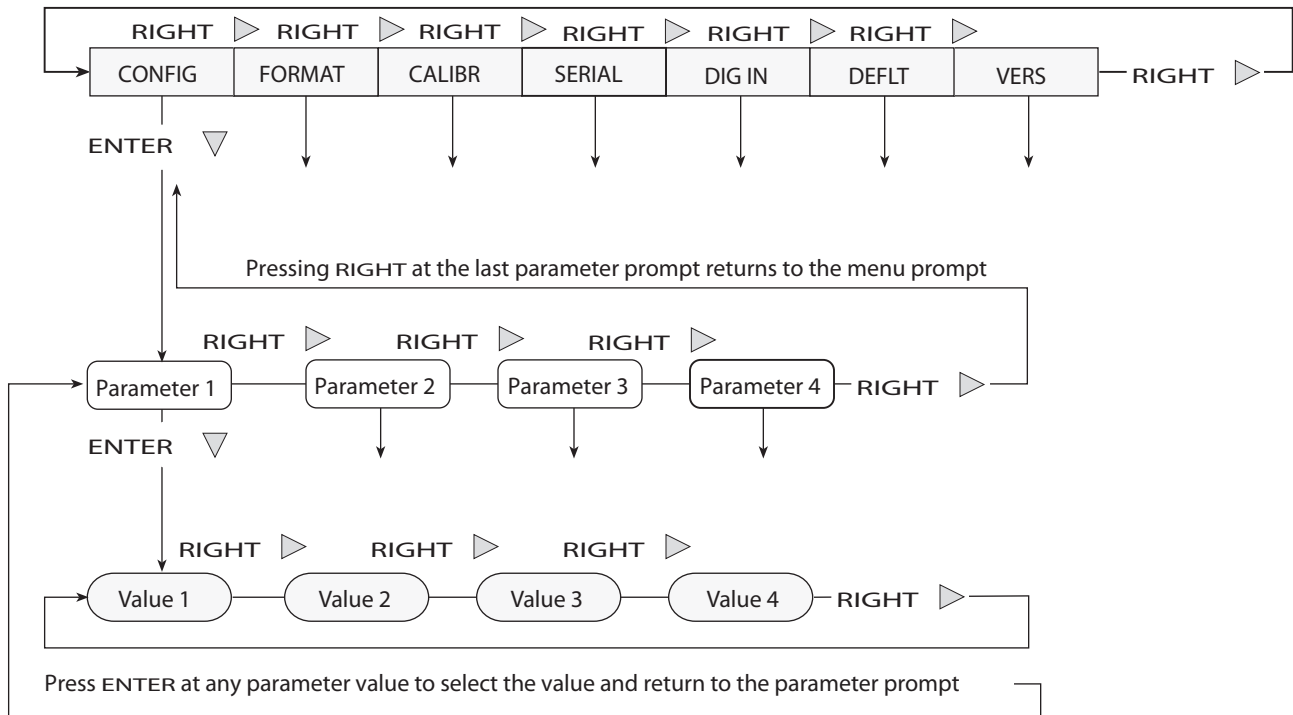
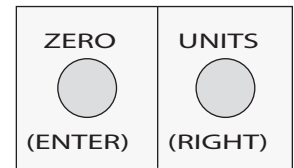


Figure 3-3. General Menu Structure

# Menu Navigation Serial Menu Example

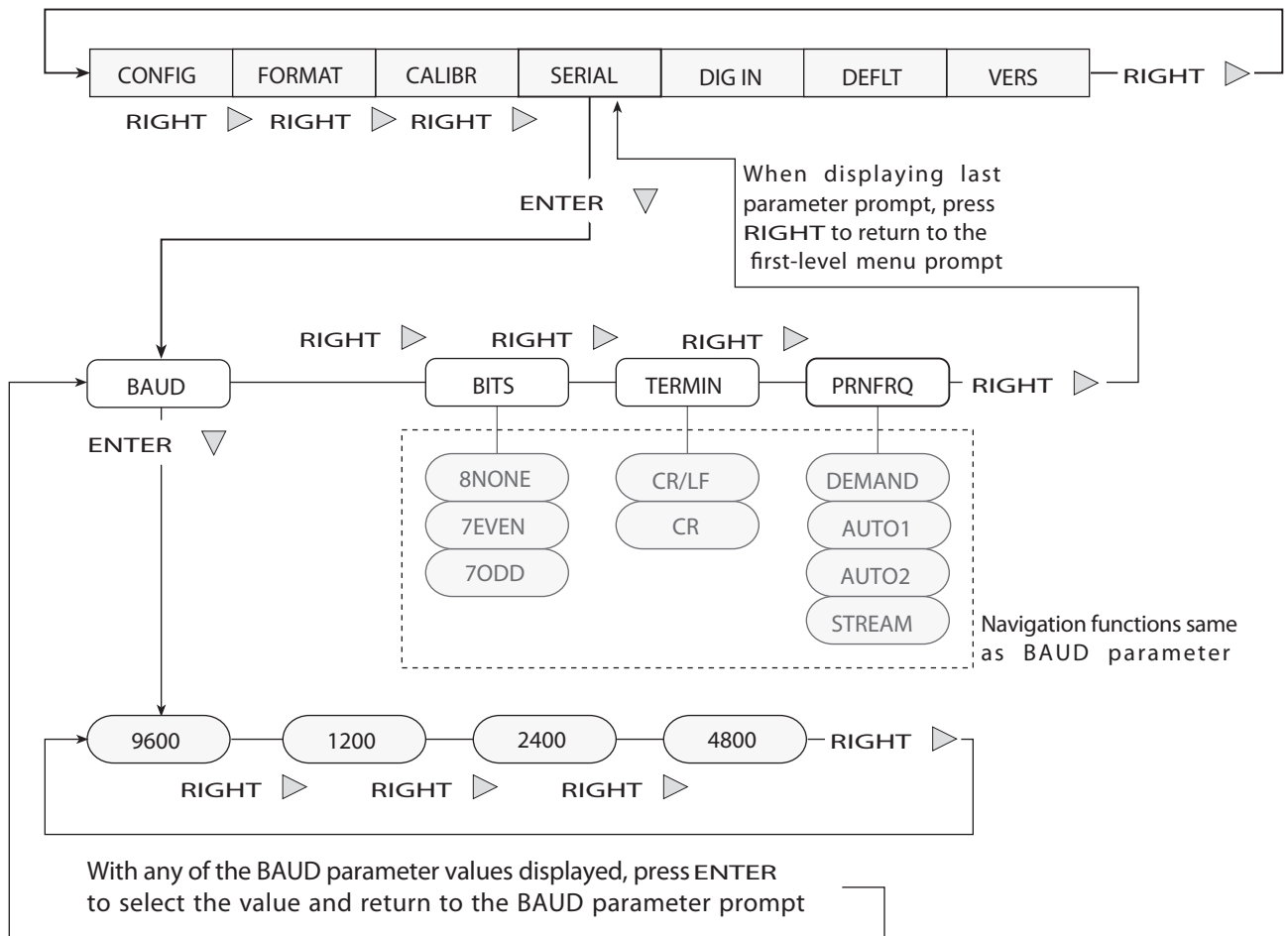
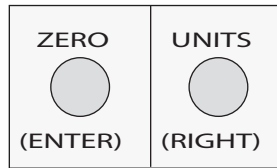


Figure 3-4. Setup Mode Menu Navigation



To edit numeric values, press the UNITS (RIGHT) button to select the leftmost digit. Each digit flashes when selected: Press ZERO (ENTER) to increment the value of the selected digit; press the RIGHT button to move right to the next digit.

Once the last digit has been edited, press RIGHT again and the digit stops flashing. Press ENTER to save the value entered and return to the menu level above, or press RIGHT to edit the value again, starting with the leftmost digit.

Figure 3-5. Editing Procedure for Numeric Values

## 3.2 Menu Structures and Parameter Descriptions

The following sections provide graphic representations of the IQ plus 210 menu structures. In the actual menu structure, the values under each parameter are arranged horizontally. To save page space, menu choices are shown in vertical columns. The factory default setting appears at the top of each column. Most menu diagrams are accompanied by a table that describes all parameters and parameter values associated with that menu. Default parameter values are shown in bold type.

### 3.2.1 Configuration Menu

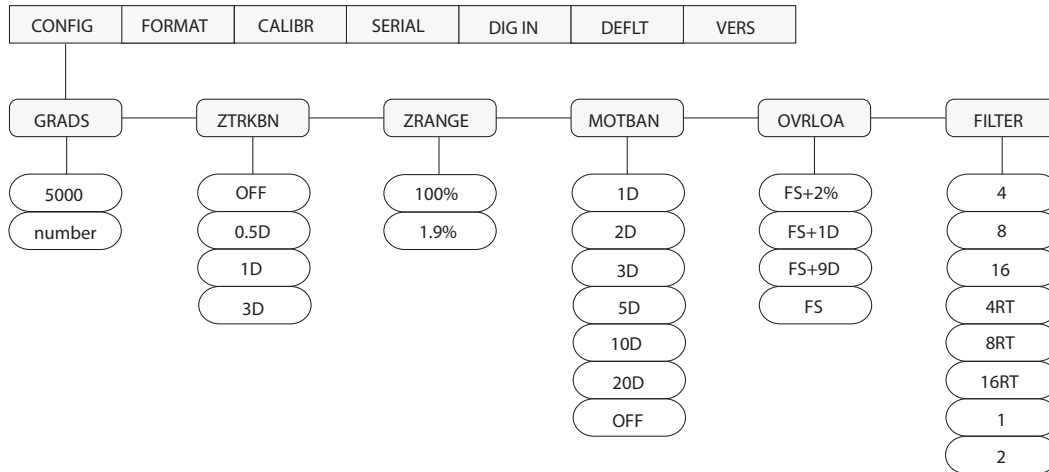


Figure 3-6. Configuration Menu

| CONFIG Menu      |   |  |
|------------------|---|--|
| Parameter        | Choices   | Description  |
| Level 2 submenus |   |  |
| GRADS            | <b>5000</b><br>number                               | Graduations. Specifies the number of full scale graduations. The value entered must be in the range 1–10 000 and should be consistent with legal requirements and environmental limits on system resolution.<br>To calculate GRADS, use the formula, $GRADS = \text{Capacity} / \text{Display Divisions}$ .<br>Display divisions for primary and secondary units are specified on the FORMAT menu.   |
| ZTRKBN           | <b>OFF</b><br>0.5D<br>1D<br>3D                      | Zero track band. Automatically zeroes the scale when within the range specified, as long as the input is within the configured zero range (ZRANGE parameter). Selections are ± display divisions. Maximum legal value varies depending on local regulations.   |
| ZRANGE           | <b>100%</b><br>1.9%                                 | Zero range. Selects the range within which the scale can be zeroed. The 1.9% selection is ± 1.9% around the calibrated zero point, for a total range of 3.8%. Indicator must be at standstill to zero the scale. Use 1.9% for legal-for-trade applications.  |
| MOTBAN           | <b>1D</b><br>2D<br>3D<br>5D<br>10D<br>20D<br>OFF    | Motion band. Sets the level, in display divisions, at which scale motion is detected. If motion is not detected for 1 second or more, the standstill symbol lights. Some operations, including print, tare, and zero, require the scale to be at standstill. Maximum legal value varies depending on local regulations.<br>If OFF is selected, ZTRKBN should also be set to OFF.   |
| OVRLOA           | <b>FS+2%</b><br>FS+1D<br>FS+9D<br>FS                | Overload. Determines the point at which the display blanks and an out-of-range error message is displayed. Maximum legal value varies depending on local regulations.  |
| FILTER           | <b>4</b><br>8<br>16<br>4RT<br>8RT<br>16RT<br>1<br>2 | Digital filtering. Selects the digital filtering rate used to reduce the effects of mechanical vibration from the immediate area of the scale.<br>Choices indicate the number of A/D conversions that are averaged to obtain the displayed reading. A higher number gives a more accurate display by minimizing the effect of a few noisy readings, but slows down the settling rate of the indicator. Values with the RT suffix provide a raised threshold for filtering larger noise spikes. |

Table 3-2. Configuration Menu Parameters

### 3.2.2 Format Menu

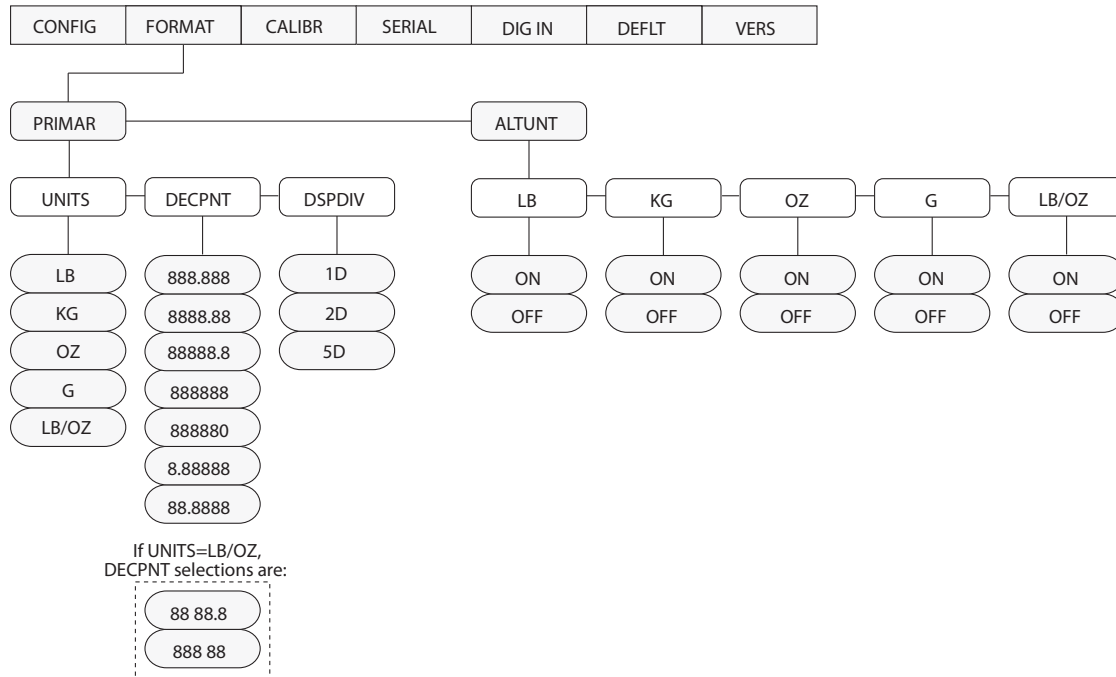


Figure 3-7. Format Menu

| FORMAT Menu                             |  |   |
|---|--|---|
| Parameter                               | Choices  | Description   |
| <b>Level 2 submenus</b>                 |  |   |
| PRIMAR                                  | UNITS<br>DECPNT<br>DSPDIV  | Specifies the decimal position, display divisions, and units used for the primary units. See Level 3 submenu parameter descriptions.  |
| ALTUNT                                  | LB<br>KG<br>OZ<br>G<br>LB/OZ   | Specifies which alternate units can be displayed by pressing the UNITS. See Level 3 submenu parameter descriptions.<br>NOTE: The LB/OZ setting is not a Legal-for-Trade setting.  |
| <b>Level 3 submenus</b>                 |  |   |
| <b>Primary Units (PRIMAR Parameter)</b> |  |   |
| DECPNT                                  | <b>888.888</b><br>8888.88<br>88888.8<br>888888<br>888880<br>8.88888<br>88.8888<br><b>or</b><br>88 88.8<br>888 88 | Decimal point location. Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements.<br>If LB/OZ is selected as the primary unit, DECPNT selections are 88 88.8 and 888 88. |
| DSPDIV                                  | 1D<br>2D<br>5D   | Display divisions. Selects the minimum division size for the primary units displayed weight.  |

Table 3-3. Format Menu Parameters

| FORMAT Menu                        |                              |  |
|------------------------------------|------------------------------|--|
| Parameter                          | Choices                      | Description  |
| UNITS                              | LB<br>KG<br>OZ<br>G<br>LB/OZ | Specifies primary units for displayed and printed weight. Values are: LB=pound; KG=kilogram; OZ=ounce; G=gram; LB/OZ=pounds and ounces.  |
| Alternate Units (ALTUNT Parameter) |                              |  |
| LB<br>KG<br>OZ<br>G<br>LB/OZ       | ON<br>OFF                    | Alternate units. Determines which units are displayed when the UNITS button is pressed. The value for the primary unit (selected on the PRIMAR parameter) is always ON.<br>NOTE: The LB/OZ setting is not a Legal-for-Trade setting. |

Table 3-3. Format Menu Parameters (Continued)

### 3.2.3 Calibration Menu

See Section 4.0 on page 19 for calibration procedures.

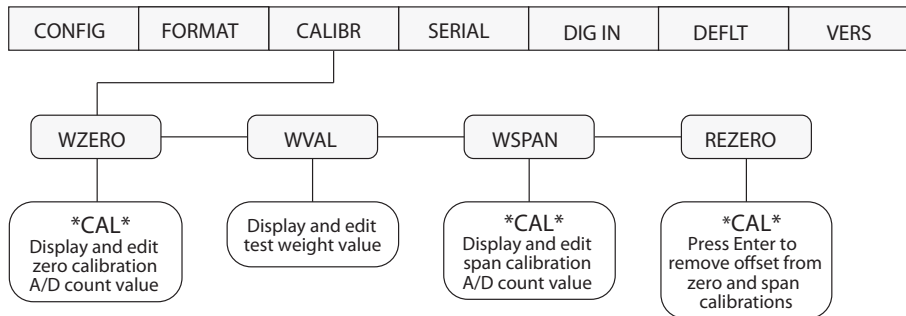


Figure 3-8. Calibration Menu

| CALIBR Menu      |         |  |
|------------------|---------|--|
| Parameter        | Choices | Description  |
| Level 2 submenus |         |  |
| WZERO            | —       | Display and edit the zero calibration A/D count value.   |
| WVAL             | —       | Display and edit the test weight value.  |
| WSPAN            | —       | Display and edit the span calibration A/D count value.   |
| REZERO           | —       | Press ENTER to remove an offset value from the zero and span calibrations.<br>Use this parameter only after WZERO and WSPAN have been set. See Section 4.0 on page 19 for more information about using this parameter. |

Table 3-4. Calibration Menu Parameters

### 3.2.4 Serial Menu

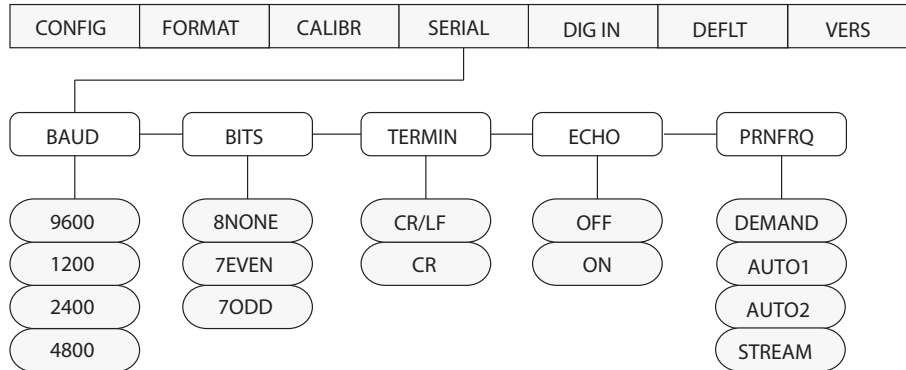


Figure 3-9. Serial Menu

| SERIAL Menu |                                    |  |
|-------------|------------------------------------|--|
| Parameter   | Choices                            | Description  |
| BAUD        | 9600<br>1200<br>2400<br>4800       | Baud rate. Selects the transmission speed for the serial port.   |
| BITS        | 8NONE<br>7EVEN<br>7ODD             | Selects number of data bits and parity of data transmitted from the serial port.   |
| TERMIN      | CR/LF<br>CR                        | Termination character. Selects termination character for data sent from the serial port.   |
| ECHO        | OFF<br>ON                          | This command enables or disables echoing of the serial commands sent to the indicator.   |
| PRNFRQ      | DEMAND<br>AUTO1<br>AUTO2<br>STREAM | <p>Print frequency. Specifies when the indicator sends data to the serial port:</p> <p>DEMAND:When a PRINT digital input is activated or the KPRINT EDP command received.</p> <p>AUTO1:Output enabled by scale in motion; transmitted when scale returns to standstill.</p> <p>AUTO2:Output enabled by scale at center of zero; transmitted when a positive scale weight is at standstill.</p> <p>STREAM:Continuous output. See <a href="#">Section 6.3 on page 27</a> for output format.</p> <p>Weight data is sent to the serial port in displayed units except when other units are specified using one of the XGx EDP commands (see <a href="#">Section 5.0 on page 22</a>).</p> <p>If DEMAND, AUTO1, or AUTO2, is selected for this parameter, serial output is formatted as follows:</p> <p><b>wwwwwww uu GROSS</b></p> <p>where <b>wwwwwww</b> is a 7-digit weight field (leading zeroes suppressed, including decimal point and minus sign, if required), <b>uu</b> is the units designator (lb, kg, oz, or G).</p> <p>If pounds/ounces (LB/OZ) is specified as the primary units, the serial output is formatted as shown below:</p> <p><b>xxx lb yyyy oz GROSS</b></p> <p>where <b>xxx</b> is the three-digit pounds weight (including minus sign, if required) followed by <b>lb</b> and a space; and <b>yyyy</b> is the four-digit ounce weight (including decimal point) followed by <b>oz</b>.</p> |

Table 3-5. Serial Menu Parameters

### 3.2.5 Digital Input Menu

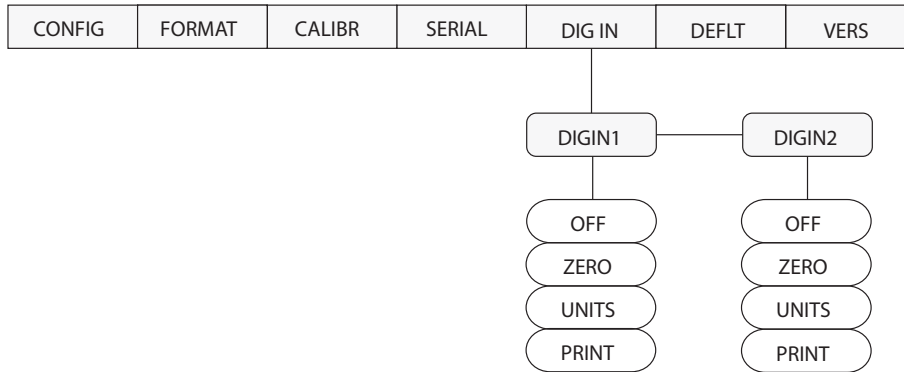


Figure 3-10. Digital Input Menu

| DIG IN Menu             |                               |   |
|-------------------------|-------------------------------|---|
| Parameter               | Choices                       | Description   |
| <b>Level 2 submenus</b> |                               |   |
| DIGIN1<br>DIGIN2        | OFF<br>ZERO<br>UNITS<br>PRINT | Specifies the function activated by digital inputs 1 and 2. |

Table 3-6. Digital Input Menu Parameters

### 3.2.6 Default Menu

The DEFLT menu is used to reset indicator configuration to the default values. There are no parameters associated with the DEFLT menu. From the DEFLT menu, press **ENTER (ZERO)** to move down to the **RESET** parameter. Press **ENTER** again to reset the indicator to the default configuration values or press **RIGHT (UNITS)** to cancel the indicator reset and return to the menu level above.

**NOTE: All load cell calibration settings are lost when the RESET function is performed.**

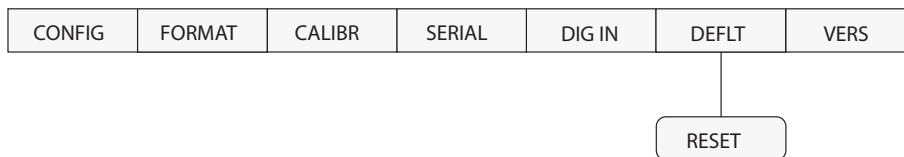


Figure 3-11. Default Menu

### 3.2.7 Version Menu

The VERS menu is used to check the software version installed in the indicator. There are no parameters associated with the VERS menu: when selected, the indicator displays the installed software version number.

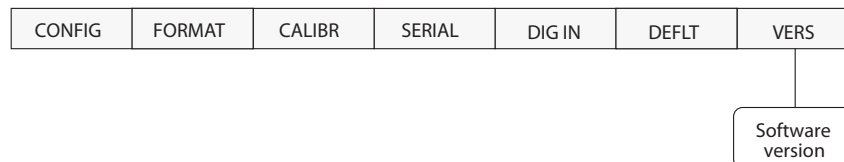


Figure 3-12. Version Menu



## 4.0 Calibration

The *IQ plus 210* can be calibrated using the front panel, EDP commands, or the Revolution™ configuration utility. Each method consists of the following steps:

- Zero calibration
- Entering the test weight value
- Span calibration
- Optional rezero calibration for test weights using hooks or chains.

The following sections describe the calibration procedure for each of the calibration methods.

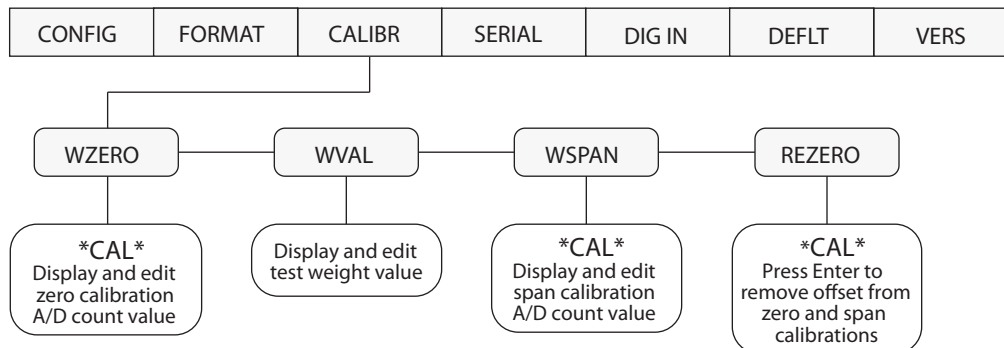


Figure 4-1. Calibration (CALIBR) Menu

### 4.1 Front Panel Calibration

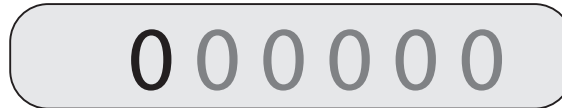
To calibrate the indicator using the front panel, do the following:

1. Place the indicator in setup mode (display reads **CONFIG**) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Press the **RIGHT (UNITS)** button until the display reads **CALIBR** (see Figure 4-1). Press **ENTER (ZERO)** to go to zero calibration (**WZERO**).
3. With **WZERO** displayed, press **ENTER** to calibrate zero. The indicator displays °CAL° while calibration is in progress. When complete, the A/D count for the zero calibration is displayed. Press **ENTER** again to save the zero calibration value and return to the **WZERO** prompt or use the procedure shown in Figure 4-2 on page 20 to edit the value. When done, press **RIGHT** to go to the **WVAL** prompt.
4. With **WVAL** displayed, press **ENTER** to show the test weight value. If the value is equal to the test weight you are using, press **ENTER** again to save the value and return to the **WVAL** prompt; if the value is incorrect, use the procedure shown in Figure 4-2 on page 20 to edit the value. When done, press **RIGHT** to go to the **WSPAN** prompt.



**Note** When calibrating the indicator with **LB/OZ** as the primary unit, enter the **WVAL** value in ounces. For example, to calibrate a 5 lb scale using **LB/OZ**, enter 80 (5 lb x 16 oz/lb) as the **WVAL** value.

5. With **WSPAN** displayed, place test weights on the scale then press **ENTER** to calibrate span. The indicator displays °CAL° while calibration is in progress. When complete, the A/D count for the span calibration is displayed. Press **ENTER** again to save the span calibration value and return to the **WSPAN** prompt or use the procedure shown in Figure 4-2 on page 20 to edit the value. When done, press **RIGHT** to go to the **REZERO** prompt.



To edit numeric values, press the **UNITS (RIGHT)** button to select the leftmost digit. Each digit flashes when selected: Press **ZERO (ENTER)** to increment the value of the selected digit; press the **RIGHT** button to move right to the next digit.

Once the last digit has been edited, press **RIGHT** again and the digit stops flashing. Press **ENTER** to save the value entered and return to the menu level above, or press **RIGHT** to edit the value again, starting with the leftmost digit.

Figure 4-2. Editing Procedure for Numeric Values

6. The rezero function is used to remove a calibration offset when hooks or chains are used to hang the test weights.
  - If no other apparatus was used to hang the test weights during calibration, remove the test weights and press **RIGHT** to return to the CALIBR menu.
  - If hooks or chains were used during calibration, remove these and the test weights from the scale. With all weight removed, press **ENTER** to rezero the scale. This function adjusts the zero and span calibration values. The indicator displays °CAL° while the zero and span calibrations are adjusted. When complete, the adjusted A/D count for the zero calibration is displayed. Press **ENTER** again to save the rezero value and return to the **REZERO** prompt or use the procedure shown in Figure 4-2 to edit the value. When done, press **RIGHT** to return to the CALIBR menu.
7. Press the setup switch to exit setup mode.

## 4.2 EDP Command Calibration

To calibrate the indicator using EDP commands, the indicator EDP port must be connected to a terminal or personal computer. See Section 5.0 on page 22 for more information about using EDP commands. Once the indicator is connected to the sending device, do the following:

1. Place the indicator in setup mode (display reads **CONFIG**) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Send the WZERO EDP command to calibrate zero. The indicator displays °CAL° while calibration is in progress.
3. Send the WVAL command to enter the test weight value in the following format:  
WVAL=nnnnnn<CR>
4. Place test weights on scale equal to the specified WVAL.
5. Send the WSPAN EDP command to calibrate span. The indicator displays °CAL° while calibration is in progress.
6. To remove an offset value, clear all weight from the scale, including hooks or chains used to hang test weights, then send the REZERO EDP command. The indicator displays °CAL° while the zero and span calibrations are adjusted.
7. Send the KEXIT EDP command to exit setup mode.

### 4.3 Revolution™ Calibration

To calibrate the indicator using Revolution, the indicator must be in setup mode with the EDP port connected to a PC running the Revolution configuration utility. Use the following procedure to calibrate the indicator:

1. Select **Calibrate Indicator** from the Revolution main menu.
2. On the Weight Calibration display, select the indicator model (**IQ+210**) and communications port then click **OK**.
3. Revolution uploads calibration data from the indicator then presents the information in a display like that shown in [Figure 4-3](#).
4. Enter the **Value of Test Weight** to be used for span calibration then click **OK**.
5. The Zero Calibration dialog box prompts you to remove all weight from the scale. Clear the scale and click **OK** to begin zero calibration.



**Note** *NOTE: If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.*

6. When zero calibration is complete, the Span Calibration dialog box prompts you to place test weights on the scale for span calibration. Place test weights on the scale then click **OK**.
7. The Rezero dialog box prompts you to remove all weight, from the scale (including hooks or chains). Remove the weights then click **OK**.
8. When calibration is complete, the **New Settings** fields of the Weight Calibration display are filled in. Click **Exit** to save the new values and return to the Revolution main menu; to restore the previous calibration values, click **Restore Settings**.

| Current Settings | New Settings |
|------------------|--------------|
| Zero: 108667.    | Zero:        |
| Value: 10000.    | Value:       |
| Span: 528683.    | Span:        |

Calibration Status

- Zero calibration finished
- Test weight applied
- Span calculation finished
- Load removed from scale
- Rezero calibration finished

Value of Test Weight:

Start Help Restore Settings Exit

Figure 4-3. Revolution Calibration Display

## 5.0 EDP Commands

The *IQ plus 210* indicator can be controlled by a personal computer or remote keyboard connected to the indicator serial port. Control is provided by a set of EDP commands that can simulate front panel key press functions, display and change setup parameters, and perform reporting functions. The EDP port provides the capability to print configuration data or to save that data to an attached personal computer. This section describes the EDP command set and procedures for saving and transferring data using the serial port.

### 5.1 The EDP Command Set

The EDP command set can be divided into five groups: key press commands, reporting commands, the RESETCONFIGURATION special function command, parameter setting commands, and transmit weight data commands.

When the indicator processes an EDP command, it responds with the message *OK*. The *OK* response verifies that the command was received and has been executed. If the command is unrecognized or cannot be executed, the indicator responds with *??*.

The following sections list the commands and command syntax used for each of these groups.

#### 5.1.1 Key Press Commands

Key press EDP commands (see [Table 5-1](#)) simulate pressing the buttons on the front panel of the indicator.

| Command     | Function   |
|-------------|--|
| KZERO       | Press the ZERO button  |
| KUNITS      | Press the UNITS button   |
| KPRIM       | Display primary units  |
| KPRINT      | Send demand data to serial port                                |
| KRIGHTARROW | In setup mode, move right in the menu (press the UNITS button) |
| KENTER      | In setup mode, press the ENTER (ZERO) button                   |
| KEXIT       | In setup mode only, exit setup mode                            |

Table 5-1. EDP Key Press Commands

#### 5.1.2 Reporting Commands

Reporting commands (see [Table 5-2](#)) send specific information to the EDP port. These commands can be used in both setup mode and normal mode.

| Command | Function                                     |
|---------|--|
| DUMPALL | List all parameter values                    |
| VERSION | Write <i>IQ plus 210</i> software version    |
| P       | Write current displayed weight.              |
| ZZ      | Write current weight and annunciator status. |
| RS      | Reset the indicator                          |
| S       | Write one frame of stream format             |

Table 5-2. EDP Reporting Commands

#### 5.1.3 The RESETCONFIGURATION Command

The RESETCONFIGURATION command can be used to restore all configuration parameters to their default values.

This command is equivalent to using the RESET function on the DEFLT menu.



**Note** All load cell calibration settings are lost when the RESETCONFIGURATION command is run.

### 5.1.4 Parameter Setting Commands

Parameter setting commands allow display or change to the value for a configuration parameters (Tables 5-3 through 5-8).

Current configuration parameter settings can be displayed in either setup mode or normal mode using the following syntax:

`command<ENTER>`

Most parameters can only be changed in setup mode. Use the following command syntax when changing parameter values:

`command=value<ENTER>`

where **value** is a number or a parameter value. Use no spaces before or after the equal (=) sign. If you type an incorrect command or value, the display reads **??**. Changes to the parameters are saved as they are entered but typically do not take effect until you exit setup mode.

For example, to set the motion band parameter to 5, type the following:

`MOTBAND=5D<ENTER>`

| Command | Description       | Values                         |
|---------|-------------------|--------------------------------|
| GRADS   | Graduations       | 1–10 000                       |
| ZTRKBN  | Zero track band   | OFF, 0.5D, 1D, 3D              |
| ZRANGE  | Zero range        | 1.9%, 100%                     |
| MOTBAND | Motion band       | 1D, 2D, 3D, 5D, 10D, 20D, OFF  |
| OVRLOAD | Overload          | FS+2%, FS+1D, FS+9D, FS        |
| FILTER  | Digital filtering | 1, 2, 4, 8, 16, 4RT, 8RT, 16RT |

Table 5-3. CONFIG EDP Commands

| Command   | Description                     | Values  |
|---|---------------------------------|---|
| PRI.DECPNT                                      | Primary units decimal position  | 8.88888, 88.8888, 888.888, 8888.88, 88888.8, 888888, 888880 (88 88.8 or 888 88 in LB/OZ display mode) |
| PRI.DSPDIV                                      | Primary units display divisions | 1D, 2D, 5D  |
| PRI.UNITS                                       | Primary units                   | LB, KG, OZ, G, LB/OZ  |
| ALT.LB<br>ALT.KG<br>ALT.OZ<br>ALT.G<br>ALT.LBOZ | Enable alternate units          | ON, OFF   |

Table 5-4. FORMAT EDP Commands

| Command | Description        | Values            |
|---------|--------------------|-------------------|
| WZERO   | Zero calibration   | —                 |
| WVAL    | Test weight value  | test_weight_value |
| WSPAN   | Span calibration   | —                 |
| REZERO  | Rezero             | —                 |
| LC.CD   | Set deadload count | value             |
| LC.CW   | Set span count     | value             |

Table 5-5. CALIBR EDP Commands

| Command    | Description                       | Values                       |
|------------|-----------------------------------|------------------------------|
| EDP.BAUD   | Serial port baud rate             | 1200, 2400, 4800, 9600       |
| EDP.BITS   | Serial port data bits/parity      | 8NONE, 7EVEN, 7ODD           |
| EDP.TERMIN | Serial port termination character | CR/LF, CR                    |
| EDP.ECHO   | Serial port echo command          | OFF, ON                      |
| PRNFREQ    | Print frequency                   | DEMAND, AUTO1, AUTO2, STREAM |

Table 5-6. SERIAL EDP Commands

| Command          | Description            | Values                  |
|------------------|------------------------|-------------------------|
| DIGIN1<br>DIGIN2 | Digital input function | OFF, ZERO, UNITS, PRINT |

Table 5-7. DIG IN EDP Commands

### 5.1.5 Normal Mode Commands

The serial transmit weight data commands (see Table 5-8) transmit data to the serial port on demand. The transmit weight data commands are valid only in normal operating mode.

| Command | Description                                | Response Format   |
|---------|--|---|
| SX      | Start serial streaming                     | OK or ??  |
| EX      | Stop serial streaming                      | OK or ??  |
| RS      | Reset system                               | —   |
| XG      | Transmit gross weight in displayed units   | nnnnnn UU<br>where nnnnnn is the weight value, UU is the units. |
| XGL     | Transmit gross weight in pounds            |   |
| XGK     | Transmit gross weight in kilograms         |   |
| XGO     | Transmit gross weight in ounces            |   |
| XGG     | Transmit gross weight in grams             |   |
| XGC     | Transmit gross weight in pounds and ounces |   |
| XE      | Query system error conditions              | nnnnn nnnnn   |

Table 5-8. Normal Mode EDP Commands

## 5.2 Saving and Transferring Data

Connecting a personal computer to the IQ plus 210 EDP port allows you to save indicator configuration data to the PC or to download configuration data from the PC to an indicator. The following sections describe the procedures for these save and transfer operations.

### 5.2.1 Saving Indicator Data to a Personal Computer

Configuration data can be saved to a personal computer connected to the EDP port. The PC must be running a communications program such as PROCOMMPLUS®.

When configuring the indicator, ensure that the values set for the BAUD and BITS parameters on the SERIAL menu match the baud rate, bits, and parity settings configured for the serial port on the PC.

To save all configuration data, send the DUMPALL EDP command to the indicator. The IQ plus 210 responds by sending all configuration parameters to the PC as ASCII-formatted text.

### 5.2.2 Downloading Configuration Data from PC to Indicator

Configuration data saved on a PC or floppy disk can be downloaded from the PC to an indicator. This procedure is useful when a number of indicators with similar configurations are set up or when an indicator is replaced.

To download configuration data, connect the PC to the EDP port as described in Section 5.2.1. Place the indicator in setup mode and use the PC communications software to send the saved configuration data to the indicator. When transfer is complete, calibrate the indicator as described in Section 4.0 on page 19.



**Note** Calibration settings are included in the configuration data downloaded to the indicator. If the receiving indicator is a direct replacement for another IQ plus 210 and the attached scale is not changed, recalibration is not required.

When downloading configurations that include changed serial communications settings, edit the data file to place the serial communications changes at the end of the file. Communication between the PC and indicator will be lost once the indicator receives settings for baud rate (BAUD parameter) or data bits and parity (BITS parameter) that do not match those configured for the PC.

## 6.0 Appendix

### 6.1 Error Messages

The IQ plus 210 indicator provides a number of error messages. When an error occurs, the message is shown on the indicator LED display. Error conditions can also be checked remotely by using the XE EDP command as described in [Section 6.1.2](#).

| Error Message | Description                          | Solution  |
|---------------|--------------------------------------|---|
| E A/D         | A/D physical error                   | Call Rice Lake Weighing Systems (Rice Lake Weighing Systems) Service.                   |
| EEEROM        | EEPROM physical error                |   |
| EVIREE        | Virgin EEPROM                        | Use the DEFLT menu to restore defaults, then recalibrate load cells.                    |
| EPCKSM        | Parameter checksum error             |   |
| EACKSM        | A/D calibration checksum error       | A/D converter requires recalibration. Call Rice Lake Weighing Systems Service.          |
| ELCKSM        | Load cell calibration checksum error | Recalibrate load cells.   |
| EIDATA        | Internal RAM checksum error          | Call Rice Lake Weighing Systems Service.  |
| INOVFL        | Internal overflow error              | Remove weight from scale. If error recurs, check configuration, check scale for damage. |
| OVERFL        | Overflow error                       | Weight value too large to be displayed.   |
| -----         | Gross > overload limit               | Gross value exceeds overload limit. Check configuration.                                |
| -----         | A/D underrange                       | A/D reading < -4 mV. Check scale for binding or damage.                                 |

Table 6-1. IQ plus 210 Error Messages

#### 6.1.1 Displayed Error Messages

The IQ plus 210 provides a number of front panel error messages to assist in problem diagnosis. Table 6-1 lists these messages and their meanings.

#### 6.1.2 Using the XE EDP Command

The XE EDP command can be used to remotely query the IQ plus 210 for the error conditions shown on the front panel. The XE command returns two 5-digit numbers in the format:

xxxxx yyyyy

where xxxxx contains a decimal representation of any existing error conditions as described in Table 6-2.

If more than one error condition exists, the number returned is the sum of the values representing the error conditions. For example, if the XE command returns the number 528, this value represents the sum of an A/D physical error (512) and an A/D calibration checksum error (16).

The second number returned (yyyyy) uses the same bit assignments as shown in Table 6-2 to indicate whether the test for the error condition was run. For example, the value yyyyy = 51807 represents the decimal equivalent of the binary value 1100 1110 0111 1111. Using the bit assignments in Table 6-2, this value indicates all tests were run.

| Error Code | Description                          | Binary Value        |
|------------|--------------------------------------|---------------------|
| 0          | No error                             | 0000 0000 0000 0000 |
| 1          | EEPROM physical error                | 0000 0000 0000 0001 |
| 2          | Virgin EEPROM                        | 0000 0000 0000 0010 |
| 4          | Parameter checksum error             | 0000 0000 0000 0100 |
| 8          | Load cell calibration checksum error | 0000 0000 0000 1000 |
| 16         | A/D calibration checksum error       | 0000 0000 0001 0000 |
| 32         | <b>not assigned</b>                  | 0000 0000 0010 0000 |
| 64         | Internal RAM checksum error          | 0000 0000 0100 0000 |
| 128        | <b>not assigned</b>                  | 0000 0000 1000 0000 |
| 256        | <b>not assigned</b>                  | 0000 0001 0000 0000 |
| 512        | A/D physical error                   | 0000 0010 0000 0000 |

Table 6-2. Error Codes Returned on XE Command

| Error Code | Description             | Binary Value        |
|------------|-------------------------|---------------------|
| 1024       | not assigned            | 0000 0100 0000 0000 |
| 2048       | Internal overflow error | 0000 1000 0000 0000 |
| 4096       | not assigned            | 0001 0000 0000 0000 |
| 8192       | not assigned            | 0010 0000 0000 0000 |
| 16384      | A/D underrange          | 0100 0000 0000 0000 |
| 32768      | Gross > overload limit  | 1000 0000 0000 0000 |

Table 6-2. Error Codes Returned on XE Command (Continued)

## 6.2 Status Messages

Two EDP commands, P and ZZ, can be used to provide status about the indicator. These commands are described in the following sections.

### 6.2.1 Using the P EDP Command

The P EDP command returns the current displayed weight value to the EDP port. If the indicator is in an under range or overload condition, the weight value is replaced with &&&&& (overload) or : : : : : (under range).

### 6.2.2 Using the ZZ EDP Command

The ZZ EDP command can be used to remotely query which annunciators are currently displayed on the indicator front panel. The ZZ command returns the currently displayed weight and a decimal number representing the LED annunciators currently lit. The format of the returned data is:

wwwwww zzz

where **wwwwww** is the current displayed weight, **zzz** is the annunciator status value (see Table 6-3). If more than one annunciator is lit, the second number returned is the sum of the values representing the active annunciators. For example, if the annunciator status value returned on the ZZ command is 136, the center of zero and lb annunciators are lit: 136 represents the sum of the values for the center of zero annunciator (128) and the lb annunciator (8).

| Decimal Value | Annunciator    |
|---------------|----------------|
| 1             | Reserved       |
| 2             | Negative value |
| 4             | oz             |
| 8             | lb             |
| 16            | g              |
| 32            | kg             |

Table 6-3. Status Codes Returned on the ZZ Command



### 6.3 Continuous Output (Stream) Format

Figure 6-1 shows the continuous output format sent to the IQ plus 210 EDP or printer port when the STREAM parameter (SERIAL menu) is set to either EDP or PRN.

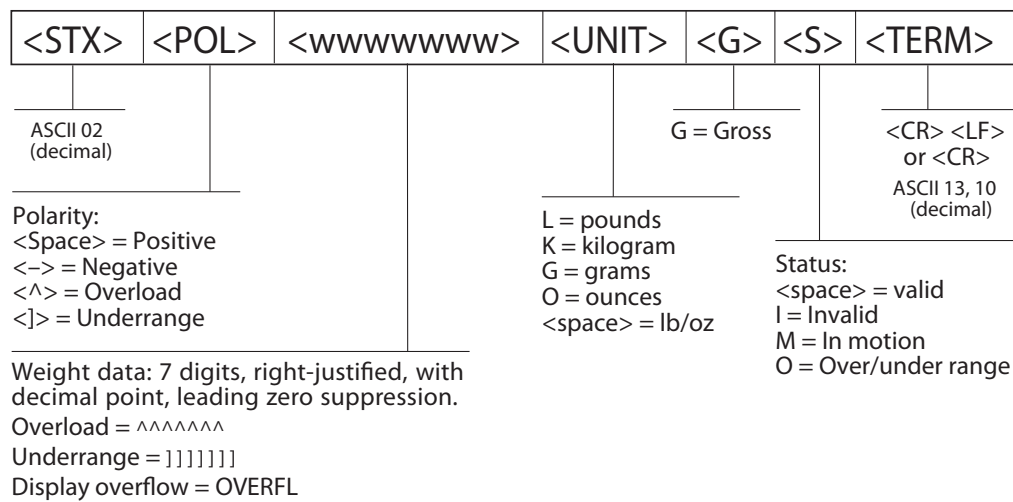


Figure 6-1. Continuous Output Data Format

### 6.4 Cable Specifications

| Cord Grip      | Diameter Range              |
|----------------|-----------------------------|
| PG9 (PN 15626) | 0.138 - 0.315" (3.5 - 8 mm) |

Table 6-4. Cord Grip Specifications

| Connector              | Torque   |
|------------------------|----------|
| Around cables          | 22 in-lb |
| Cord grip to enclosure | 33 in-lb |

Table 6-5. Cord Grip Torque Specifications

## 6.5 Specifications

### IQ plus 210 Indicator

#### Power

|                   |  |
|-------------------|--|
| Line Voltages     | 115 or 230 VAC                               |
| Frequency         | 50 or 60 Hz                                  |
| Power Consumption | 70 mA @ 115 VAC (8W)<br>35 mA @ 230 VAC (8W) |

#### Fusing

|         |  |
|---------|--|
| 115 VAC | 2 x 200 mA TR5 subminiature fuses<br>Wickmann Time-Lag 19374 Series<br>UL Listed, CSA Certified        |
| 230     | VAC 2 x 100 mA TR5 subminiature fuses<br>Wickmann Time-Lag 19372 Series UL<br>Recognized, VDE Approved |

#### Analog Specifications

|                         |  |
|-------------------------|--|
| Full Scale Input Signal | Up to 35 mV  |
| Excitation Voltage      | 10 ± 0.25 VDC,<br>4 x 350Ω load cells                                |
| Analog Signal           |  |
| Input Range             | 0.6 mV/V – 4.5 mV/V  |
| Analog Signal           |  |
| Sensitivity             | 0.3 μV/graduation minimum,<br>1.5 μV/grad recommended                |
| Input Impedance         | 200 MΩ, typical  |
| Display Resolution      | 10 000 dd  |
| Input Sensitivity       | 155 nV per internal count  |
| System Linearity        | Within 0.01% of full scale   |
| Calibration Method      | Software, constants stored in EEPROM                                 |
| Common Mode             |  |
| Voltage                 | –1.05 to +0.95 V, referred to earth                                  |
| RFI Protection          | Signal, excitation, and sense lines<br>protected by capacitor bypass |

#### Digital Specifications

|                |  |
|----------------|--|
| Digital Inputs | 2 inputs, TTL or switch closure,<br>active-low |
| Digital Filter | Software selectable                            |

#### Serial Communications

|             |   |
|-------------|---|
| Serial Port | Full duplex RS-232; 9600, 4800,<br>2400, 1200 bps; 7 or 8 data bits;<br>even, odd, or no parity |
|-------------|---|

#### Operator Interface

|                  |  |
|------------------|--|
| Display          | 6-digit LED display. 7-segment, .8 in<br>(20 mm) digits  |
| LED annunciators | Negative value, center of zero, motion,<br>kg, g, lb, oz |
| Keypad           | 2 piezo switches   |

#### Environmental

|                       |  |
|-----------------------|--|
| Operating Temperature | –10 to +40°C (legal);<br>–10 to +50°C (industrial) |
| Storage Temperature   | –25 to +70°C                                       |
| Humidity              | 0–95% relative humidity                            |
| Altitude              | 2000 m (6500 ft) maximum                           |

#### Enclosure

|                      |   |
|----------------------|---|
| Enclosure Dimensions | 9.5 in x 6 in x 2.75 in<br>24 cm x 15 cm x 7 cm |
| Weight               | 6.1 lb (2.8 Kg)                                 |
| Rating/Material      | NEMA 4X indoor use only, stainless steel        |

#### Approvals



##### NTEP

|                |           |
|----------------|-----------|
| CoC Number     | 00-045    |
| Accuracy Class | III/III L |



##### UL

|             |         |
|-------------|---------|
| File Number | E151461 |
|-------------|---------|

#### Measurement Canada Approved

|                |            |
|----------------|------------|
| Approval       | AM-5374    |
| Accuracy Class | III/III HD |



The IQ210 complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.





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230 W. Coleman St. • Rice Lake, WI 54868 • USA  
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319