IQplus® 810
MADE IN USA

IQplus 810

Digital Weight Indicator

INSTALLATION MANUAL

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

August 1996 Software Rev. 2.3

16846

IQ plus 810
MADE IN USA

Serial #
Model #
Operating Voltage
Date Purchased
Options Installed

Important reference information. Record and save after calibration is completed.

IQplus 810	VOLTS CALIBRATION VALUES		
	V ZERO	V VAL	V SPAN
CHANNEL 1			
CHANNEL 2			
CHANNEL 3			
CHANNEL 4			

IQplus 810	WEIGHT CALIBRATION VALUES		
	W ZERO	W VAL	W SPAN
CHANNEL 1			
CHANNEL 2			
CHANNEL 3			
CHANNEL 4			

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Software Rev. 2.3

TABLE OF CONTENTS

1. INTRODUCTION

Welcome to the IQplus 810 Digital Indicator. When used for straight weighing applications, the standard IQplus 810 has more useful features than any digital weight indicator available. When used to its fullest in complex applications, the IQplus 810 becomes an expandable and programmable process controller with an impressive array of powerful options. The basic installation and operation of the standard model is explained in the first part of this manual. The second half of the manual provides a working background in the use of available options for sophisticated applications.

The IQplus™ system software is standard on all three models: the Desktop Model DT, the Stainless Steel Model SS, and the Survivor® Model HE for hostile environments. The SS and HE are designed as NEMA 4X washdown batching models. All models are NTEP Certified for Class III and IIIL at 10,000 divisions. Complete specifications will be found in Section 12 of this manual. All standard models come with the following features:

- Choice of 100-125 or 200-250 VAC operation at 50-60Hz.
- 10-key numerical keyboard for setpoint, fixed tare, or configuration parameter entry.
- LED indicators for Input Channels 1-4, Units, Accumulate, and Rate of Change mode.
- Single-channel load cell input, with expansion capability to four input channels.
- Load cell excitation voltage with remote sensing able to support 32 -700 Ω, or 16 - 350 Ω load cells.

- Front panel configuration, or downloadable setup from personal computer or ASCII terminal.
- Front panel calibration, with EEROM non-volatile storage of calibration constants.
- Field-replacement of IQplus 810 complete units or individual components without recalibration.
- Sixteen fully programmable setpoints, either continuously running, or as steps in a batching sequence.
- Four digital setpoint outputs with expansion capability to 16 digital setpoint outputs.
- One Electronic Data Processing (EDP) serial port configurable as duplex RS-232 or 20mA current loop, with optional RS-485.
- One printer serial port configurable for simplex RS-232 and/or simultaneous 20mA current loop.
- Formattable custom printing, including time, date, and custom headers.
- Three digital inputs, TTL or switch closure, configurable to duplicate keyboard functions or to facilitate batching operations.
- Advanced analog filtering, and exclusive digital RATTLETRAP™ vibration filtering.
- Multifunctional 200 I.D. Truck IN/OUT program.

A basic design principle of the IQplus 810 was flexibility, but with expansion capability built in. The configuration charts in Section 6 reflect this flexible concept. The configuration charts in Section 6 include ALL possible software options, and so may appear lengthy at first glance. There are nine separate menu sections--some are common to all applications, but some are devoted purely to setting up optional features.

With the standard IQplus 810 models without add-on options, many of the sections can be disregarded. If you don't have the Bar Graph, or Analog Output options, there is no need to go into those configuration menus. Likewise, if your application does not require Setpoints, that section can be skipped over.

The organization of this manual follows a similar flexible pattern. For basic weighing applications, read only the basic installation and operational information in Sections 2-6. If your application requires the use of setpoints, all the necessary information can be found in Sections 2-8. If yours is a high-end application with extensive setpoint control of peripheral equipment, remote operation, RS-485 communication from a host computer, etc., you should also read the advanced information in Sections 7, 9, and 10. The Appendix contains important information on signal filtering selections that will be used in all applications.

Application Specialists at Rice Lake Weighing Systems are available for help with unique situations not covered in the manual. The IQplus 810 has several downloadable configuration features, simplifying communication with the Application Specialists. Your entire configuration can be saved to a PC floppy disk on an attached computer. That disk can be sent through the mail or over the phone lines via modem to Rice Lake Weighing Systems for assistance with complex setups. The revised disk can then be used to directly download the new configuration to your IQplus 810. That configuration can then be transferred directly via serial communication lines to other IQplus 810 units.

A print copy of your entire configuration, or just the setpoint configuration, can also be generated easily. The printout can be made on any printer which is connected to the indicator, or can be made on a printer connected to an attached PC. These print versions of the configuration can be mailed or sent via FAX transmission to Rice Lake Weighing Systems for assistance.

Detailed information on all downloadable configuration features will be found in Section 14.10 of the Appendix.

OPTIONAL FEATURES AND EQUIPMENT

Many of the optional features available for the IQplus 810 will be visible on the indicator's display in the setup menu, but are not selectable until the options are installed. To avoid confusion, these optional features are shown in italicized type on the charts in Section 6 of the manual. Those optional features include:

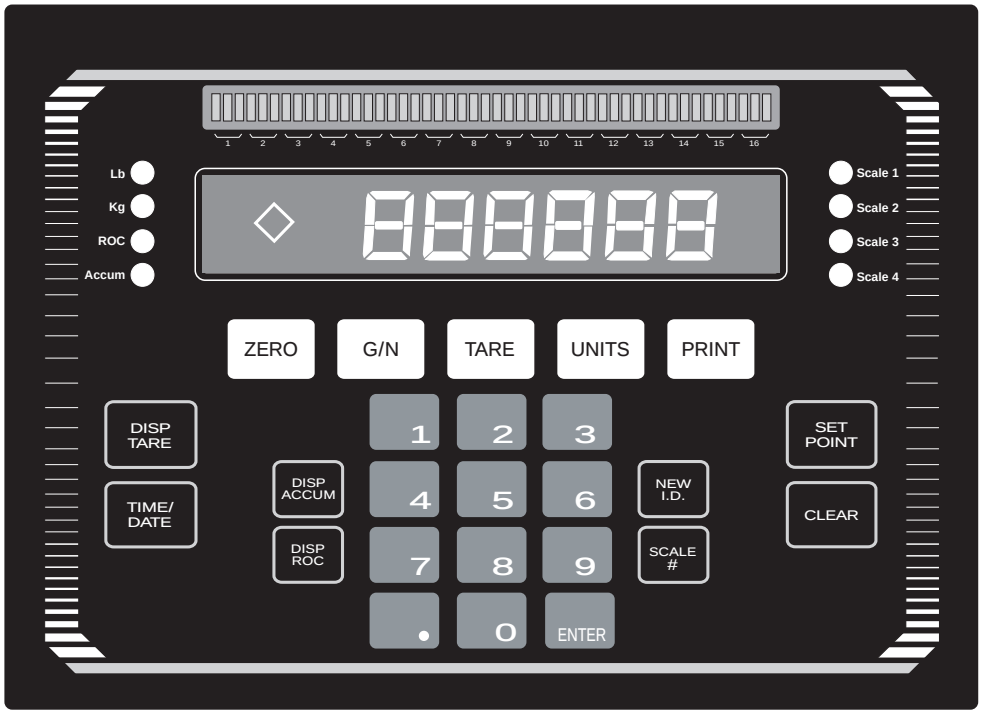
- Bar Graph
- Rate of Change Function
- Accumulate Function
- Peak Hold Function
- High Speed (100/sec) Update Function
- 2nd Load Cell Input Channel
- 3rd Load Cell Input Channel
- 4th Load Cell Input Channel
- Single or Dual Channel Pulse Input Function
- Digital Outputs 5-16 for Setpoints
- 3rd Auxilliary Serial Port
- Single Channel Analog Output Option
- Dual Channel Analog Output Option

Other options are available, but do not appear in the software set up menus, as they are hardware options. These hardware options include:

- Expansion Board Option
- 4, 8, and 16-Channel Input/Output Relay Modules in Choice of Several AC and DC Voltages
- RS-485 Communication Option
- Remote Keyed Switch for Accessing Supervisor Switch Mode
- Panel Mounting Kit
- Wall Mounting Kit
- NEMA 4X Reinforced Fiberglass Survivor™ Enclosure
- NEMA 4X Stainless Steel Enclosure
- Start/Run/Stop Batching Switch

A complete working explanation of all possible options can be found in Section 10 of this manual. For those options which require installation and operation instructions in further detail, these instructions are included as separate sheets when the options are ordered.

2. FRONT PANEL KEY FUNCTIONS



IQplus 810 Desktop and Stainless Steel Model Faceplate

IQplus 810 Survivor® Model Faceplate

These keys are used to enter a numerical value into the system. The normal use is to press the digits, followed by the **ENTER** key and/or a function key. As the digits are pressed, the numbers are displayed. If the operator doesn't follow the digits with a function key within a period of time, the digits entered will be ignored and the display will revert to the current basic display mode.

If a mistake is made entering digits, the **CLEAR** key can be pushed to erase each individual entered digit in sequence. Pushing the **GROSS/NET** key before the **ENTER** key is pressed will effectively cause the entire value to be erased and the display to revert to the appropriate mode.

ZERO

The **ZERO** key is used to eliminate weight from the display when in the Gross mode, and with no tare in the system. The **ZERO** button will not function when the indicator is in motion, or when the weight on the display is beyond the selected zero range.

G/N

The **GROSS/NET** key is used to toggle the operating mode between Gross and Net display modes. In the Net display mode, the net weight is displayed and the N annunciator is illuminated. In the Gross display mode, the gross weight is displayed and the G annunciator is illuminated. The **GROSS/NET** key can also be used to immediately revert the display to the normal weighing mode if any other value is currently on the display. A tare must be in the system to enter the Net mode.

TARE

The **TARE** key is used to zero a weight indication in the net mode of operation by placing that weight into the tare register. It has 100 percent tare capability. The system must be in a standstill condition as indicated by the display symbol before a tare can be acquired.

When the **TARE** key is pressed in the Gross mode, the instrument automatically changes to the Net mode and the current gross weight is tared off the scale. The T and Rhombus on the display will be illuminated to indicate that a tare has been put into the system.

The operator may choose to key in a numerical value for the tare, followed by the **TARE** key. The entered number will become the tare value. The scale will switch to the Net mode if it is in the Gross mode when this operation is performed. The T and an E will be illuminated in the rhombus to indicate that a manually entered tare is in the system.

UNITS

The **UNITS** key is used to toggle the displayed weight information between the primary and secondary units. The display will also revert to the current Gross or Net display mode if anything else was in the display when the **UNITS** key is pressed. Since there are only two annunciators provided for units, the configuration (setup menu) will select the primary and secondary units of pounds, kilograms, ounces, grams, tons, or grains. The standard label for the annunciators will be LB and KG, but OZ, G, and TN. Others can be supplied upon request.

PRINT

The **PRINT** key can be configured to operate in one of three modes: as a print only button in the Normal Weighing Mode, as a revolving truck terminal data entry key as in Truck In/Out Mode 1, or as a fixed resident truck terminal data entry key as in Truck Mode 2. In all modes, the **PRINT** key is only available when the scale is at standstill . The printed format of tickets is configuration-selectable. See Appendix 14.6 for further information on ticket formatting.

In the Normal Weighing Mode with Demand Print chosen, when the **PRINT** key is pressed (without a preceding ID number as in the Truck In/Out Mode), the configuration-formatted ticket will be printed.

DISP TARE

In the normal weighing mode, the **DISPLAY TARE** key is used to display the current tare weight in the tare weight register. When the **DISPLAY TARE** key is pressed, the T annunciator will light and the current tare weight will be displayed. The displayed tare weight will remain on the display until time-out occurs or another function key is pressed.

In the Truck In/Out Mode, if any number is keyed in followed by the **DISPLAY TARE** key, the number will be displayed if it is in the system as a truck ID. If the keyed number isn't in memory, it will not remain on display. With a valid stored ID displayed, pressing the **CLEAR** key prompts the operator, “CLR ID?”. Pressing the **CLEAR** key again, clears the stored ID from the system.

In the Truck In/Out Mode, **DISPLAY TARE** is also used to place the indicator in a "memory access" mode where all stored ID numbers in the system's memory can be viewed, or all truck ID numbers and associated tares can be printed. See Section 3.4 for more information.

TIME/ DATE

The **TIME/DATE** key is used to display time and date information. When the **TIME/DATE** key is pressed, the display shows time information in the form HH.MM or MM.HH. If the **TIME/DATE** key is pressed again, date information is displayed in the form MM.DD.YY or DD.MM.YY. To update either the time or the date, the operator can enter numeric information while the time or date is displayed (before time-out) and then press the **ENTER** key. The entered data will become the current time/date. All time values entered should be in 24-hour, military format. The indicator will automatically assign "AM" or "PM" if 12-hour formatting has been selected.

DISP ACCUM

The **DISPLAY ACCUMULATE** key is used to display the weight which is in the accumulate register. When the operator presses the **DISPLAY ACCUM** key, the accumulate annunciator is activated and the current accumulated weight is displayed. If the **CLEAR** key is pressed, the operator is prompted “CLR AC?”. If the **CLEAR** key is then pressed, the accumulation is cleared from the system. If the optional Accumulate feature is not installed, this key is non-functional.

DISP ROC

The **DISPLAY RATE OF CHANGE** key is used to display the rate of change of the weight data on the current analog input. The rate of change is expressed as change in weight over a preset period of time (lbs/min, gals/hour, etc.).

Pressing the **DISPLAY RATE OF CHANGE** key will immediately switch the display to the Rate of Change Mode if any other mode is currently displayed. The ROC annunciator will also light in this mode. If the optional Rate of Change feature is not installed, this key is non-functional.

NEW I.D.

The **NEW IDENTIFICATION NUMBER** key is used in the Truck In/Out program to enter a truck's ID number which has been keyed into the system with the numerical keyboard. When a truck is being weighed on the scale, entering the truck's ID number then pressing **NEW ID** will both enter the number and associated tare, and send a command to print out a weigh-in ticket.

SCALE #

The **BASE #** (Survivor® Model) or **SCALE #** (Desktop and Stainless Steel Models) key is used to select the desired analog input source channel that is displayed, or a total of selected combinations of source channels. The combinations available for totalling are selectable in the setup menu.

Pressing this key displays the next available source channel (scale #) and lights the annunciator light for that scale #. Successive presses of the key scrolls the source input options available and lights the appropriate scale # annunciator. More than one scale # annunciator will light to indicate sources which are totalled. If the indicator has only the standard single-channel A/D input module, this key is non-functional.

SET POINT

The **SETPOINT** key is used to access current setpoint values so that the values can be viewed or changed. When the **SETPOINT** key is pressed, the display will show "SP 1" for 2 seconds, then switch to the current setpoint value. Subsequent presses of this key will access the next setpoints (SP 2, etc.) and values in the same manner. If a displayed setpoint is disabled by pressing **CLEAR**, the message "OFF" will be displayed.

The operator may change a setpoint value (or an "OFF" display from a setpoint disabled in the above manner) by keying in a number, then pressing the **ENTER** key. A setpoint that was configured as "OFF" in the Setup Mode, however, cannot be reactivated through the front panel in this manner. If a keying error is made when changing a value, the **CLEAR** key can be used to erase individual digits before the value is entered. After the value is entered, the display will show the new value. To return to the Normal Weighing Mode, press **GROSS/NET**, or wait for the time out.

CLEAR

The **CLEAR** key is normally used to clear numerical digits entered via the keyboard, or to clear values from the memory of special functions.

When the **SETPOINT** key is used, the **CLEAR** key can be used to disable setpoints or erase individual digits as described above.

When the **DISP ACCUM** key is used, the **CLEAR** key erases the total in the accumulator.

When the **DISP TARE** key is pressed in the Normal Weighing Mode, the current tare value is displayed. If the **CLEAR** key is then pressed, a message prompt will appear (CLR TR?) asking the operator if he wishes to clear the tare register. If the **CLEAR** key is then pressed again, the tare will be cleared from the register.

When the **DISP TARE** key is used in the Truck In/Out Mode, the **CLEAR** key erases truck ID's.

Lb
Kg
ROC
Accum

These annunciator lights are located on the left side of the display. See UNITS, DISPLAY RATE OF CHANGE, and DISPLAY ACCUMULATE key descriptions above for information.

Scale 1
Scale 2
Scale 3
Scale 4

These annunciator lights are located on the right side of the display. See **BASE #** or **SCALE #** key descriptions above for more information.

3. OPERATIONAL MODES

3.1 NORMAL WEIGHING MODE

This is the normal operations mode for the IQplus 810. In this mode, the Truck In/Out Program is also available for use if it has been selected in the setup menu.

In the normal weighing mode, gross weight on the scale can be displayed at any time by pressing the **GROSS/NET** key, toggling between the modes. The **G** annunciator will be illuminated when the gross weight is being displayed, and the **N** annunciator will be displayed when net weight is being displayed.

Simple tare weight calculations are done with the scale in the normal weighing mode.

• Push Button Tare Operation

With the weight that is to be the tare weight placed on the scale, push the **TARE** key. A **T** symbol will be displayed, indicating acceptance of the tare value. This will automatically put the scale into the net mode, as evidenced by the **N** annunciator being illuminated. The display will read zero until the scale is loaded with product. Net product weight will then be displayed after loading. At any time, pressing the **GROSS/NET** key will toggle the display back to the gross mode, displaying gross weight and the **G** annunciator.

• Keyed Tare Operation

This operation uses the numeric keyboard on the front panel for tare weight entry. While in the gross mode, use the keyboard to key in a tare value, and press the **TARE** key. This shifts the scale to the net mode and accepts the entered value as the tare weight. The display will illuminate a **TE** (tare entered) with the tare value. Once a tare weight is accepted, and the **PRINT** key is pushed, the indicator will automatically send out a "gross-tare-net" printout. If no tare has been accepted when a print command is given, the printout will be a single-line gross weight .

In the gross weighing mode, the **ZERO** key is used to remove small weight variations at zero from the weight display. The **ZERO** key should not be used as a tare key.

3.2 SUPERVISOR SWITCH MODE

This is actually a submode of the Normal Weighing Mode. An optional remote switch hard-wired to a digital input is necessary to access this mode. This mode allows a supervisor to make major changes in a setpoint or batching program without entering the setup mode. This switch is normally a keyed switch, with the key carried by a supervisor. When the switch is keyed active, the entire setpoint menu is accessible for changes in setpoint types and values by the supervisor. These changes are possible without entering the case or breaking the legal Weights and Measures seal.

The optional keyed switch is offered for all models of the IQplus 810. The switch is wired into jumper J8 on the main board and mounted either on the outside of the indicator enclosure, or in a separate remote case. See *Remote Switch for Accessing the Supervisor Switch Mode* in Section 4. Complete installation instructions accompany the optional keyed switch.

3.3 SETUP MODE

This mode disables all normal weighing functions. As all configuration parameters (even those which relate to a HB-44 Legal-For-Trade scale) are accessible in this mode, it is necessary to open the indicator case to access this mode.

With the case open, the OPERATE/SETUP switch (labeled SW1) will be found near the top edge of the main CPU board. This switch has two positions--OPERATE, which puts the indicator in the normal weighing mode, and SETUP, which puts the indicator in the setup mode.

When a Legal-For-Trade scale is entirely configured, calibrated, and inspected, a Weights and Measures legal seal will seal the case shut. Only the two modes above will then be accessible without breaking the seal.

3.4 TRUCK IN/OUT MODE

The indicator can be set up with either of two different methods for handling ID numbers and truck tares, with two selectable options available with each method. In the first method, called AUTO CLEAR ID, a truck's ID number and tare weight are temporarily stored in memory until a final weigh-out ticket is printed, which automatically clears the ID and weight from memory. This method might be used in an operation like a grain storage elevator where a customer's truck might cross the scale only a few times each year, making ID and tare weight storage impractical.

In the second method, called STORED ID, the indicator permanently stores the tare weights and ID numbers of up to 200 trucks. That information can be used for subsequent weighings with those trucks, and is erased only when manually cleared from the indicator's memory. STORED ID might be used to eliminate repetitive weigh-ins in an operation like a cement plant where the same trucks would be crossing the scale many times each day.

To accommodate different local weights and measures regulations, each of the two main methods of operation has two additional options: KEYED TARES and VALUE SWAPPING. By choosing one of the six modes in the Truck In/Out menu reproduced below, the desired mix of parameters can be selected.

OFF	**MODE 1**	**MODE 2**	**MODE 3**	**MODE 4**	**MODE 5**	**MODE 6**
(NO TRUCK TARE)	(AUTO CLEAR ID) (KEYED TARES) (VALUE SWAP)	(AUTO CLEAR ID) (NO KEYED TARES) (VALUE SWAP)	(STORED ID) (KEYED TARES) (VALUE SWAP)	(STORED ID) (NO KEYED TARES) (VALUE SWAP)	(STORED ID) (KEYED TARES) (NO VALUE SWAP)	(STORED ID) (NO KEYED TARES) (NO VALUE SWAP)

KEYED TARES - This option allows a truck tare weight to be entered with an ID by keying the weight value in through the digital keyboard. Modes 1, 3, and 5 allow keyboard entry of tares. Some municipalities do not allow tare weights of trucks to be entered via a keyboard, but require that it be taken from the scale readout. If the local regulations do not allow tare weights of trucks to be entered by keyboard, choose one of the modes (2, 4, or 6) which does not enable KEYED TARES.

VALUE SWAPPING - This useful option assures the operator that the lesser of two weight values associated with an ID will always be read as the tare weight, regardless of the order in which the weights were entered. For instance, if a truck crosses the scale fully loaded at weigh-in, then unloads and crosses the scale empty at weigh-out, the indicator will assign the lesser (truck empty) weight for the tare weight when the final weigh-out ticket is printed. Modes 1, 2, 3, and 4 allow the VALUE SWAPPING option. Modes 5 and 6 do not enable it.

All modes of the Truck In/Out program allow an operator to quickly check the memory to determine if the ID of a truck has been stored. The operator keys in the ID number of the truck, then presses **DISP TARE**. If the entered ID number remains on the display, it is in memory. If some other ID, or the message, "NO ID" appears on the display, the entered ID is not in memory.

Entering any number, then pressing the **DISP TARE** key places the indicator in a memory access mode where all truck ID numbers in memory can be seen on the display by scrolling with repeated presses of the **DISP TARE** key. If desired, both ID numbers and associated tare weights can be printed out as follows: after a number has been keyed in and **DISP TARE** has been pressed to enter the memory access mode, the operator can press **PRINT** to print out all ID's and associated tare weights currently in the indicator's memory.

OPERATIONAL SEQUENCE - AUTO CLEAR: Modes 1,2

Truck ID's and tare weights are erased after the full transaction has taken place. The sequence is:

A. Truck moves onto the scale for weigh-in.
B. Operator keys in an ID number (up to six digits), then presses **NEW ID.** This stores the ID and tare weight into the memory, and prints a weigh-in ticket like the one shown at right.

```
ID. NO. 304812
GROSS  15000. LB STORED
11/22/1991 10:24 AM
```

Note: If the ID was already in the memory when **NEW ID** is pressed, the system will display an error condition (BAD ID) and then abort the operation.

C. This information associated with the ID number will remain in the memory until the transaction is complete and the final ticket is printed at weigh-out.

D. After filling the truck, the driver pulls onto the scale for weigh-out and hands the scale operator the weigh-in ticket.

E. The operator enters the ID number from the ticket and presses **PRINT.** A weigh-out ticket like the one shown at right is printed, and the ID number and stored tare are then automatically deleted from memory.

```
ID. NO. 304812
GROSS       100000. LB
TARE         15000. LB RECALLED
NET          85000. LB
11/22/91   10:55 AM
```

NOTE: Modes 1, 3, and 5 allow tares to be keyed in from the keyboard, instead of taking the weight from the scale. Before entering the ID, the operator enters the desired tare weight on the keyboard, then presses the **TARE** key to enter the value into the memory. The ID is then keyed in and **NEW ID** is pressed. The printed ticket notes this by printing "KEYED" at the end of the TARE line.

```
ID. NO. 304812
GROSS       100000. LB
TARE         10672. LB  RECALLED KEYED
NET          89328. LB
11/22/93   10:55 AM
```

OPERATIONAL SEQUENCE - STORED ID: Modes 3, 4, 5, 6

In these modes, tare weights and associated ID's are stored in memory until they are manually erased. This means that an initial empty weigh-in, and printing a weigh-in ticket are unnecessary. Therefore, once a loaded truck pulls onto the scale and the operator knows that the truck's ID and tare weight are in the memory, he enters only the ID number before pushing **PRINT** to complete the transaction with a weigh-out ticket.

An ID and tare weight can be erased from memory by entering the ID number, then pressing the **DISP TARE** key which will display the ID. Pressing the **CLEAR** key twice deletes the ID and tare value from memory. A new ID and tare weight can then be entered as described above.

Use of Multiple Scales

If multiple scales are used with the Truck Program, the indicator can send either individual scale weights or the total weight on all scales to the ticket printer:

If individual scale weights are desired on the printed tickets, use the SCALE # key to display the scale channel desired. When a print command is sent, the data from the scale that is displayed will be sent to the printer. The scale number will also appear on the printed ticket.

```
ID. NO. 304812      SCALE #2
GROSS       100000. LB
TARE         15000. LB RECALLED
NET          85000. LB
11/22/91   10:55 AM
```

If the total weight of all scales is desired on the printed tickets, use the SCALE # key to display the total of all active channels. When a print command is sent, the total from all scales will be sent to the printer. The words “SCALE TOTAL” will appear on the printed ticket.

```
ID. NO. 304812      SCALE TOTAL
GROSS       100000. LB
TARE         15000. LB RECALLED
NET          85000. LB
11/22/91   10:55 AM
```

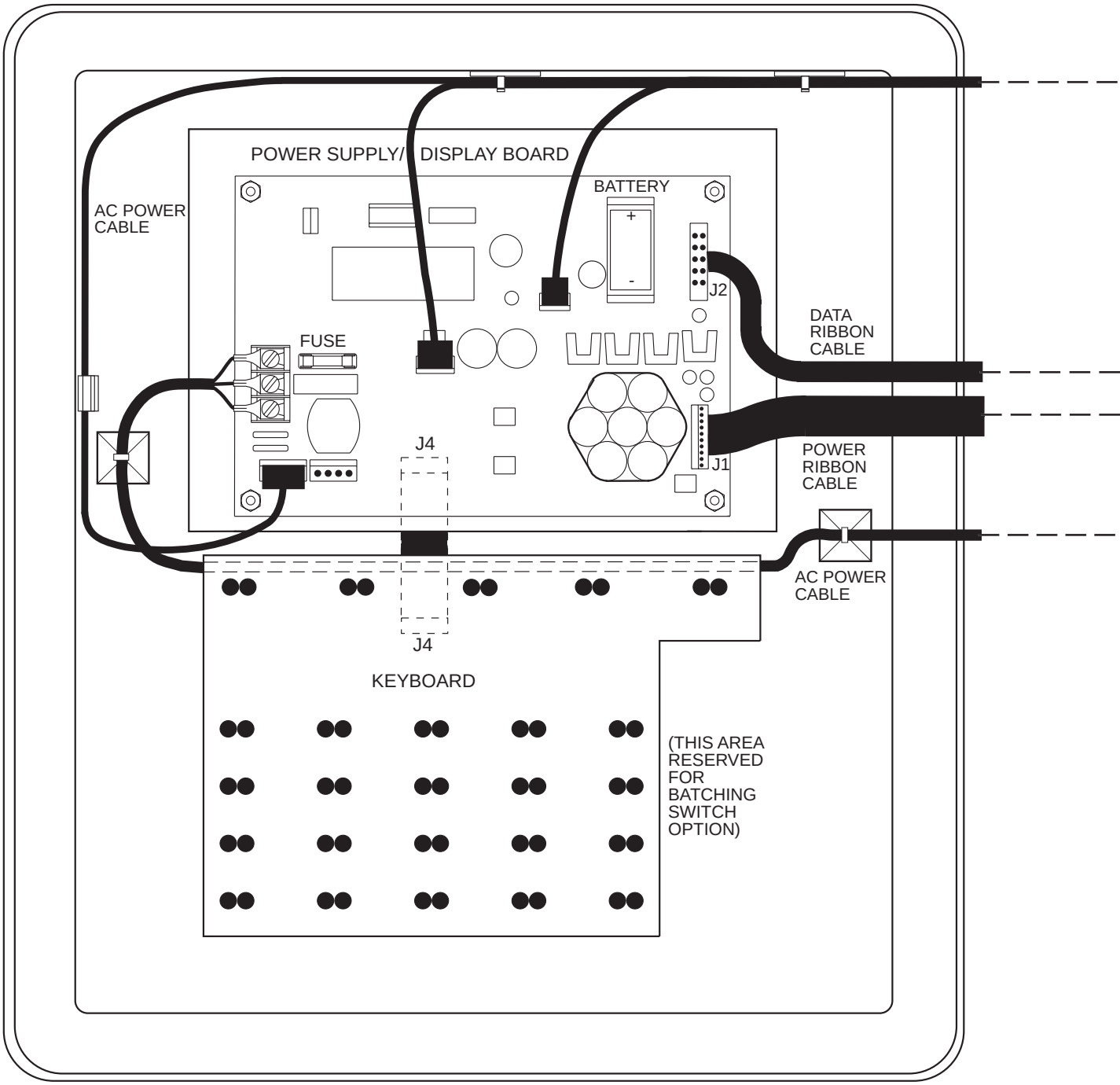
If using only a single scale setup on channel 1, no scale number will appear on the printed tickets.

4. INSTALLATION AND WIRING

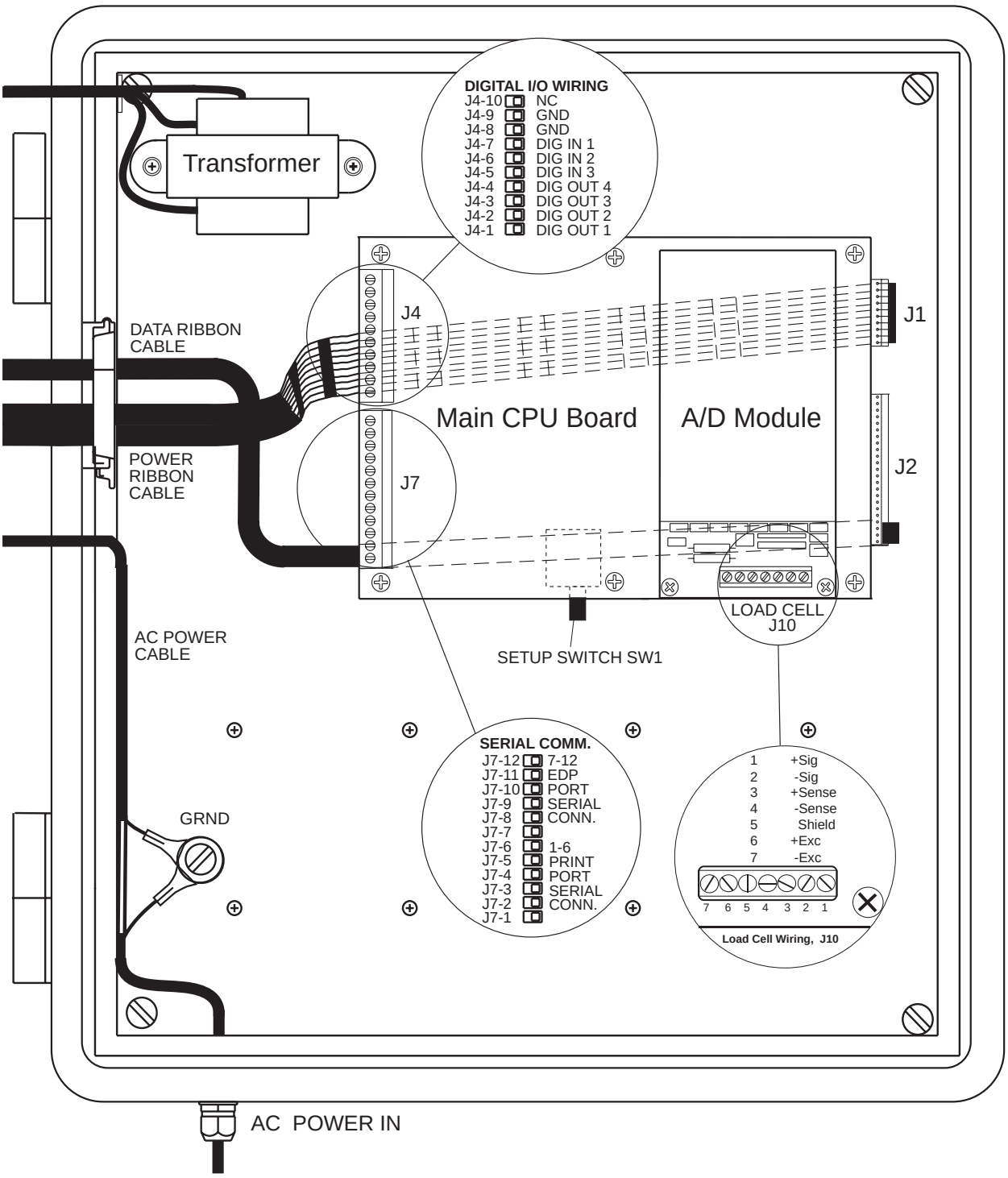
AC LINE CONNECTION

All models of the IQplus 810 are factory-configured for 60 Hz AC input line frequency. If the unit is to be used with a European-standard 50 Hz AC power supply, the configuration must be altered before plugging the unit into the power source. The IQplus 810 has no ON/OFF switch and, therefore, will be powered immediately when the line cord is plugged into the proper receptacle.

The transformer is pre-wired to the Power Supply/Display Board for 110-130 VAC operation. In addition to the transformer connection, the correct 0.25A, 250V slo-blo fuses have also been installed for 100-130 VAC operation. Do not attempt to operate the IQplus 810 with 220VAC input line voltage unless the appropriate power modifications have been made.



IQplus 810 Survivor® Model HE


DIGITAL I/O WIRING
J4-10 NC
J4-9 GND
J4-8 GND
J4-7 DIG IN 1
J4-6 DIG IN 2
J4-5 DIG IN 3
J4-4 DIG OUT 4
J4-3 DIG OUT 3
J4-2 DIG OUT 2
J4-1 DIG OUT 1
Transformer
J4
J1
DATA RIBBON CABLE
Main CPU Board
A/D Module
POWER RIBBON CABLE
J7
J2
LOAD CELL J10
AC POWER CABLE
SETUP SWITCH SW1
SERIAL COMM.
J7-12 7-12
J7-11 EDP
J7-10 PORT
J7-9 SERIAL
J7-8 CONN.
J7-7
J7-6 1-6
J7-5 PRINT
J7-4 PORT
J7-3 SERIAL
J7-2 CONN.
J7-1
1 +Sig
2 -Sig
3 +Sense
4 -Sense
5 Shield
6 +Exc
7 -Exc
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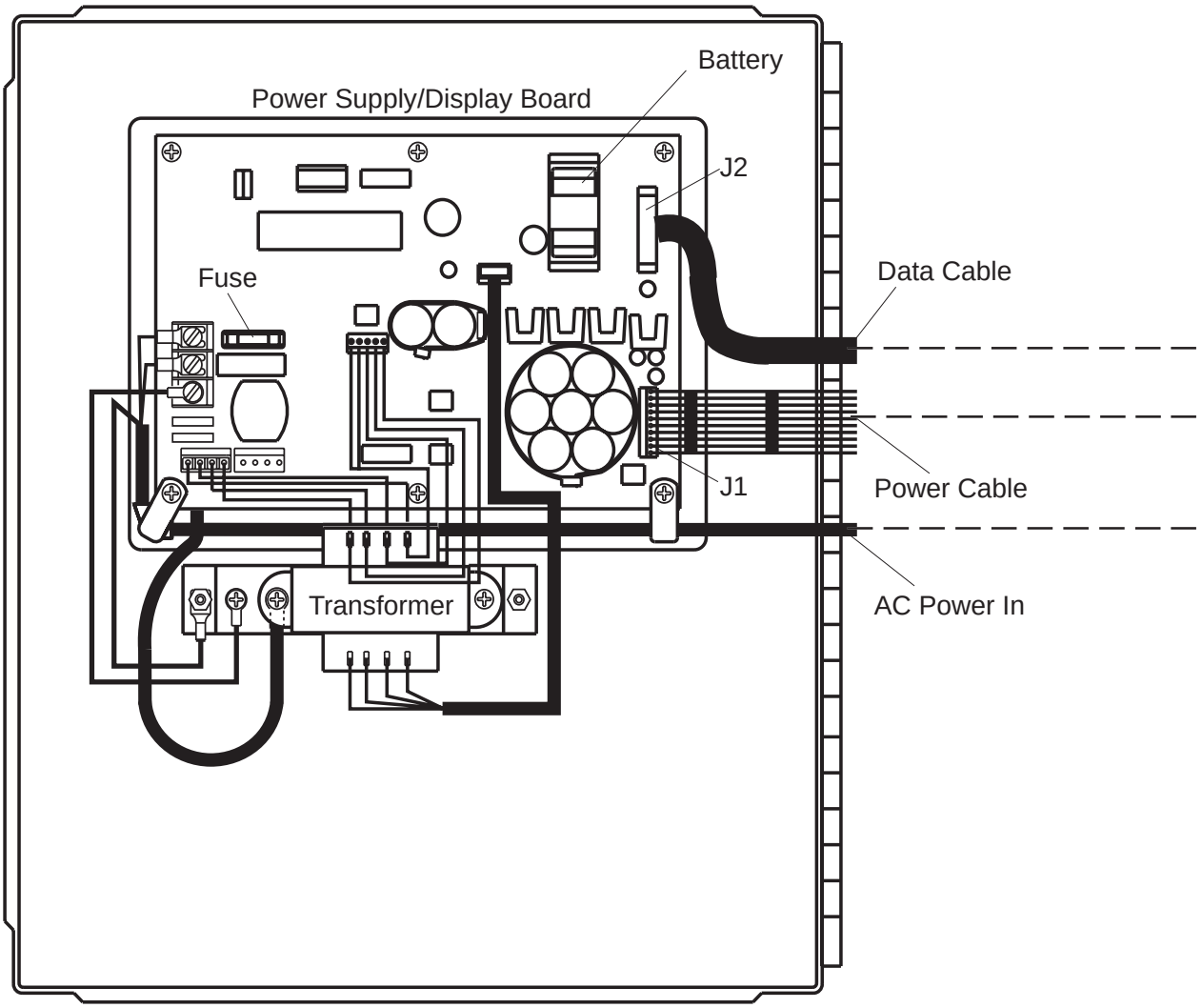
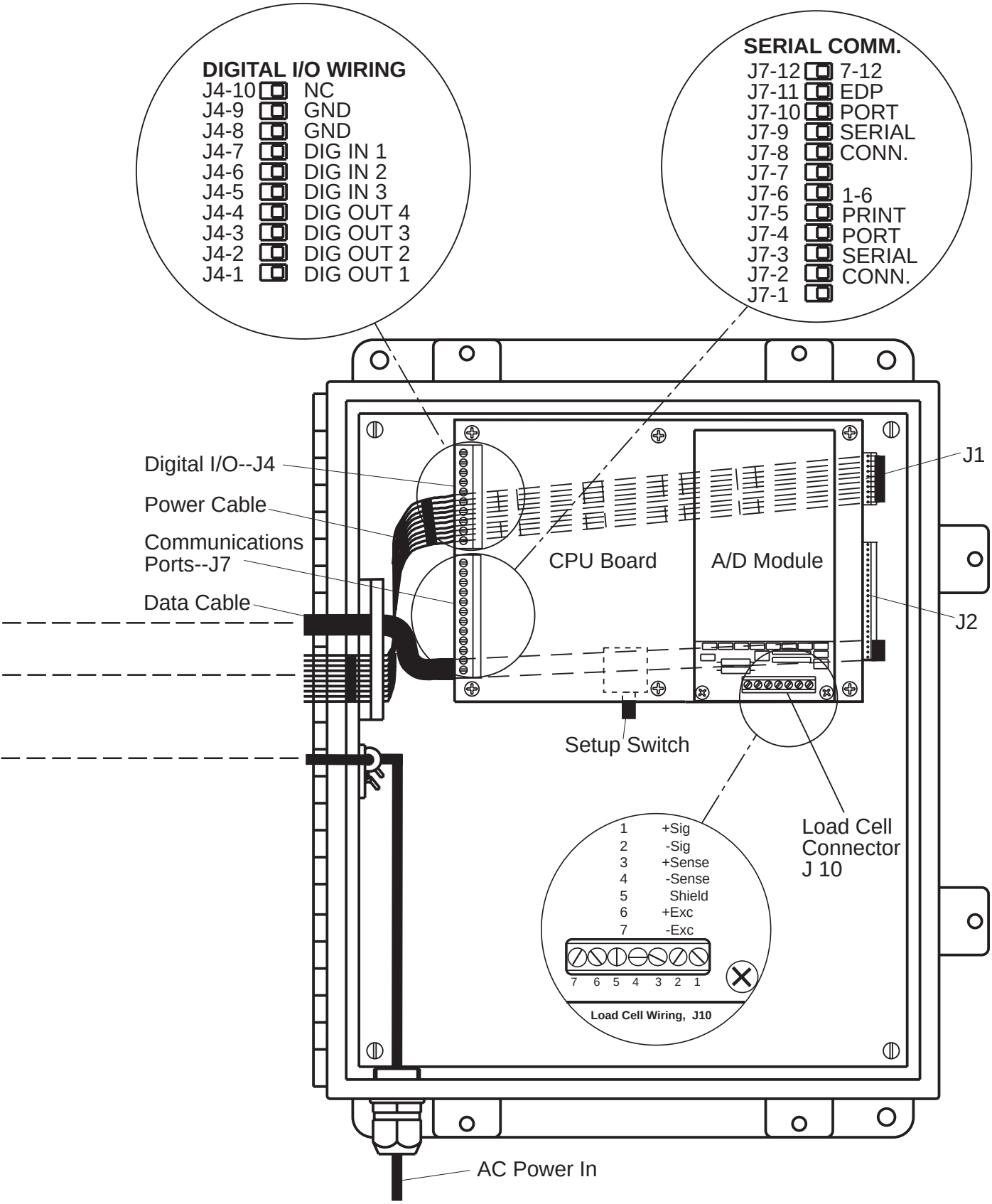
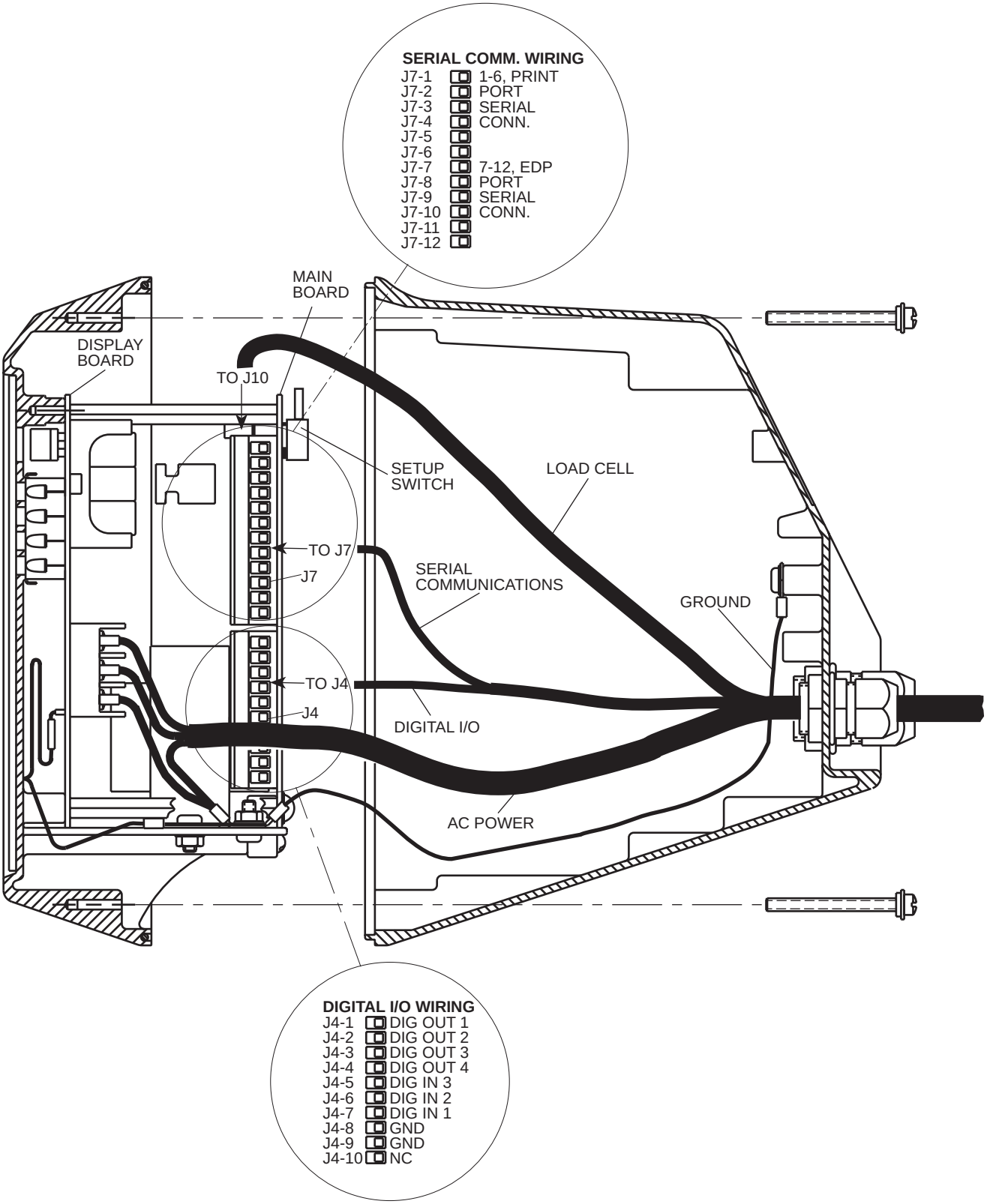
Load Cell Wiring, J10
GRND
AC POWER IN



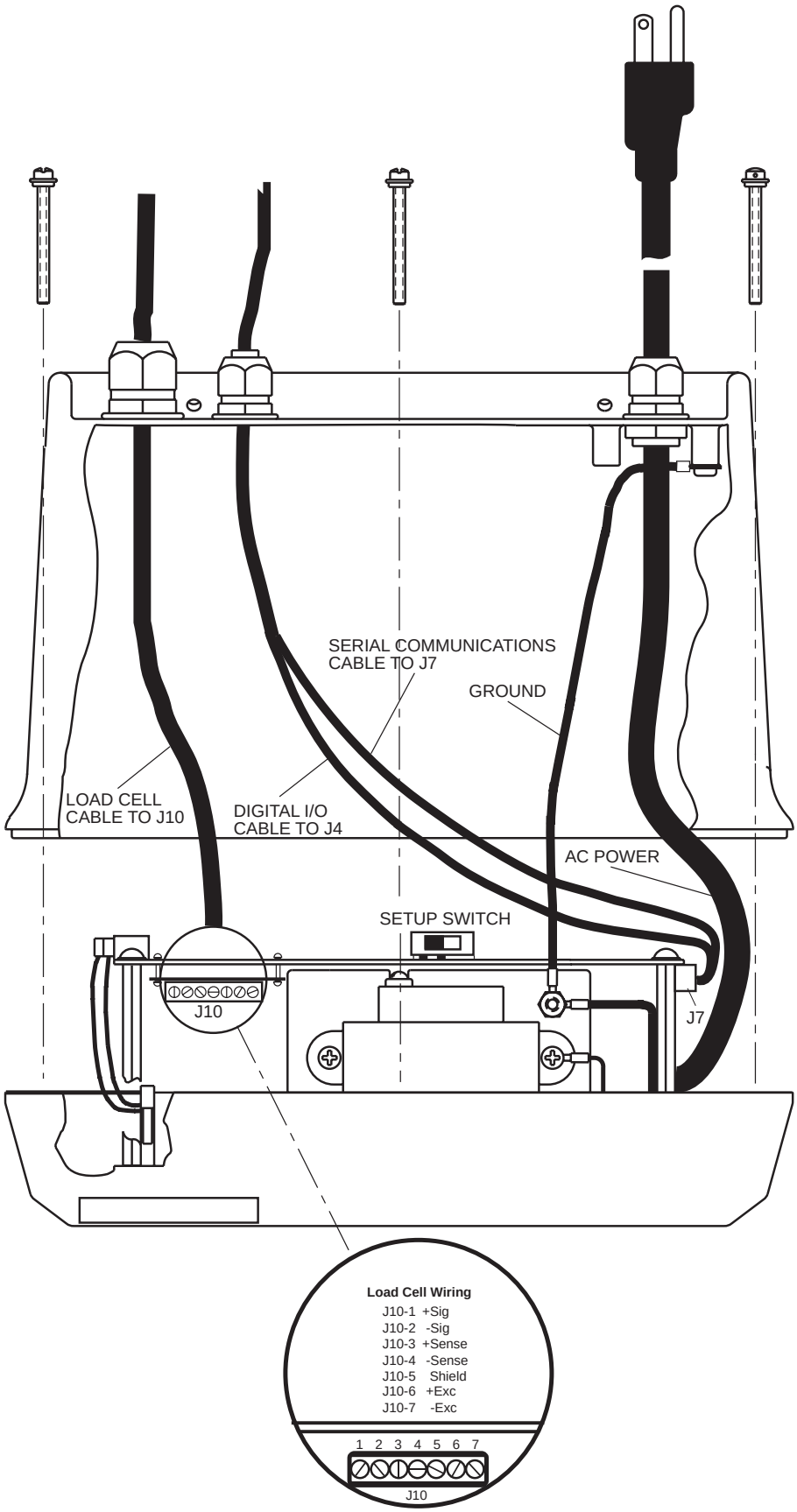
IQplus 810 Stainless Steel Model



IQplus 810 Stainless Steel Model



IQplus 810 Desktop Model, Side View



IQplus 810 Desktop Model, Cutaway Top View

MAIN BOARD TO DISPLAY/POWER SUPPLY BOARD CONNECTION

The main CPU board is connected to the display/power supply board using two ribbon cables supplied with the unit. The power cable connects J1 of the display/power supply board to J1 of the CPU board, and the data cable connects J2 of each of the boards. For applications that do not require the use of the optional expansion board, only the first ten pins of J2 are necessary to connect the main board to the display/power supply board.

WIRING LOAD CELL TO MAIN CPU BOARD (Terminal J10)

For a single-channel A/D module and a 4-wire load cell cable, be sure to use jumper wires between pins 3–6 and pins 4–7 at terminal J-10. Newer single-channel A/D modules have jumper pins on the board near J-10. The sense jumpers are labeled JP1–JP2. For a 6-wire installation, remove the jumpers.

For dual-channel A/D modules, there are jumper pins on the board near J-10. The sense jumpers are labeled JP1–JP2 for channel one, and JP3–JP4 for channel two. Leave the jumpers installed for a 4-wire cable, and remove them for a 6-wire installation.

Depending on which model you have, a removable adapter may be attached to J-10. This allows you to make the load cell connections on the adapter while it is detached, and then plug it into the J-10 terminal strip.

LOAD CELL CONNECTOR--J10	
J10-1	CH1 SIG+
J10-2	CHI SIG-
J10-3	CH1 SENSE+
J10-4	CH1 SENSE-
J10-5	SHIELD
J10-6	CH1 EXC+
J10-7	CH1 EXC-

SERIAL COMMUNICATIONS CONNECTIONS to MAIN BOARD (Terminal J7)

Terminal block J7 is used for connecting both the Electronic Data Processing (EDP) port and the Printer port. Both ports must first be configured for the specific application as described in the *Setup and Configuration* section of this manual.

Printer Port:	RS-232	20 mA CL
J7-1		
J7-2		
J7-3		
J7-4		I- OUT
J7-5	RS-232 OUT	
J7-6	GND	I+ OUT

EDP Port:	RS-232	RS-485 (U24)**	20 mA (U22)*
J7-7		485-A	I+ IN
J7-8		485-B	I - IN
J7-9	RS-232 IN		
J7-10			I- OUT
J7-11	RS-232 OUT		
J7-12	GND		I+ OUT

*U22 has been factory-installed to enable 20 mA CL; U24 must NOT be installed if 20 mA CL is being used.
**U24 must be installed to enable RS-485 serial communication; U22 must be removed when U24 is used.

WIRING SETPOINT OUTPUTS & DIGITAL INPUTS - J4 (Main Board)

There are four standard digital outputs on terminal J4 on the main board designed primarily to be switch-closure outputs used for controlling relays operating other equipment. Each output is an open-collector circuit capable of sinking 250mA when "ON", and withstanding +40 VDC when "OFF". In addition, resistor pull-ups to +5 V are provided, making the outputs capable of driving TTL or 5V CMOS logic directly without the need for any additional circuitry. The logic levels are active low (i.e., a TTL low level indicates the output in "ON", and a TTL high level indicates the output is "OFF").

In addition to the four digital outputs, there are three standard digital inputs on the same terminal block connector. The inputs are intended to be used as duplicate keyboard functions, or to enable and start batch sequences. Each input has an internal pull-up to +5 V and is intended to interface to a single-throw switch but can also be connected to TTL or 5V CMOS logic. As with the digital outputs, the three digital inputs use active low logic levels to represent the "ON" state.

Connector (J4)	Digital I/O
J4-1	DIG OUT 1
J4-2	DIG OUT 2
J4-3	DIG OUT 3
J4-4	DIG OUT 4
J4-5	DIG IN 3
J4-6	DIG IN 2
J4-7	DIG IN 1
J4-8	GND
J4-9	GND
J4-10	NC

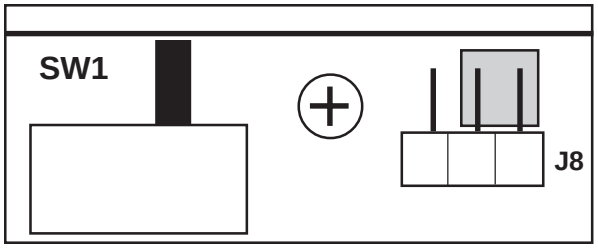
BATTERY INSTALLATION

The IQplus 810 requires a 4.5V Mercury Battery Assembly to maintain the real-time clock and to protect the system RAM when the unit is not connected to the line. The battery holder is located on the component side of the display/power supply board. A battery clip is also provided to help hold the battery in place. Battery life is estimated to be approximately three years. As a general service item, this battery should be replaced every two years.

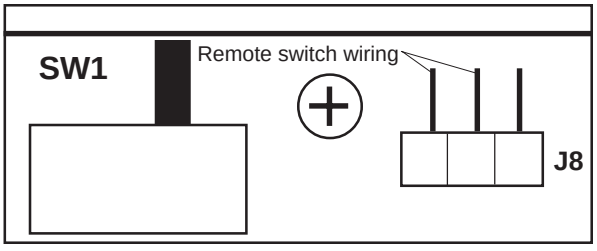
CAUTION: Battery replacement MUST be done with AC power applied to the unit. If the battery is removed without AC power applied, important configuration parameters may be lost from the system memory.

REMOTE SWITCH FOR ACCESSING THE SUPERVISOR SWITCH MODE

This is normally a keyed remote switch to prevent unauthorized tampering with setpoint parameters. The switch must be wired to J8 on the main board. When shipped, J8 will be jumpered as below.



Remove the existing jumper connecting the two J8 terminals furthest from SW1 (Setup Switch). Connect the remote switch wires to the two terminals closest to SW1 using appropriate connectors.



5. SERIAL COMMUNICATION PORTS

The IQplus 810 has two separate serial communications ports located on the main board. Both ports can be configured for Demand or Continuous operation, and a configuration parameter allows a choice of either port to be used as the demand print destination. The 1st serial port is an Electronic Data Processing (EDP) port, capable of full-duplex (bidirectional) RS232 or simplex 20 mA current loop communications. Half-duplex RS485 and full-duplex 20 mA current loop also is available as an option for the EDP port. The 2nd serial port is a printer port capable of simplex RS232 and 20mA transmission. An expansion board can add a third full-duplex serial communication port.

Both standard serial ports (EDP and Printer) can be configured for any of the following Baud rates;
300, 600, 1200, 2400, 4800, 9600 and 19,200

All serial ports can be configured for any of the following data bit formats;
7 or 8 data bits (7 bits with parity or 8 data bits with no parity)

All serial ports can be configured for any of the following parity formats;
None, Odd, and Even.

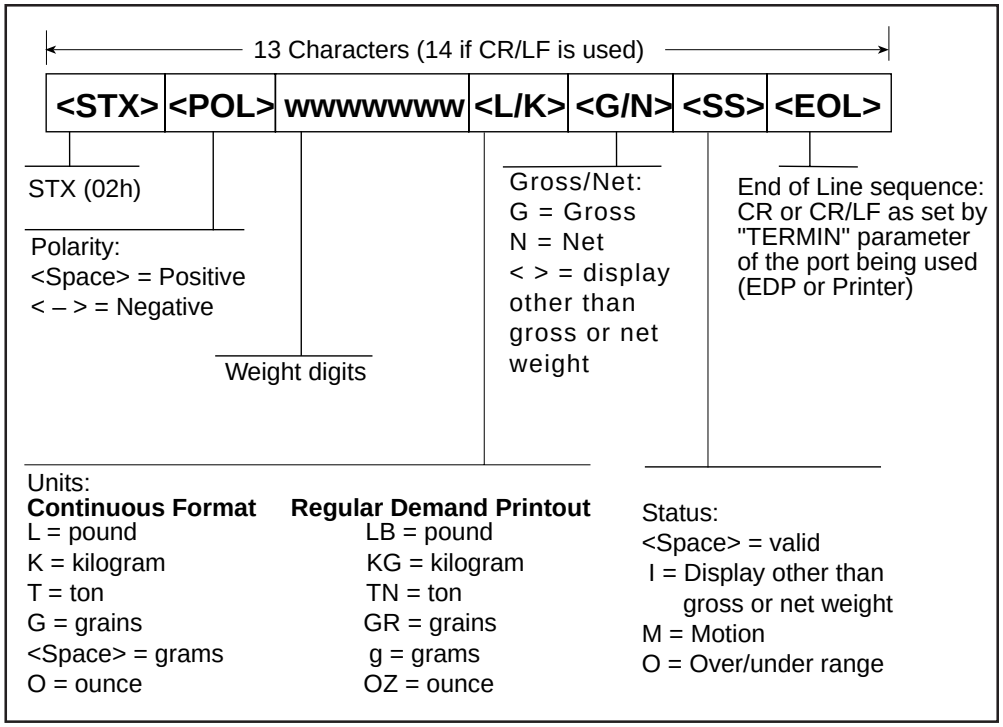
All serial ports are configured to operate with 1 start bit and 1 stop bit.

All serial ports can be configured for any of the following line termination characters;
<CR LF> or <CR>.

All serial ports can be configured to include an End of Line delay in milliseconds up to a maximum of 255 (2.55 seconds). This allows the ability to adapt to peripheral equipment that cannot buffer received data, and prevents the loss of data.

5.1 EDP PORT (1st serial port)

The EDP port is capable of continuous data transfer in CC (Consolidated Controls) format, or demand transmission in either a truck terminal print format, or a customized format for a demand-type printer. This allows the IQplus 810 to work with a wide variety of peripheral devices such as printers, scoreboard displays, and other remote equipment. The currently available CC continuous transmission format is shown below.



For RS-232 applications through the EDP port, neither of the integrated chips U22 nor U24 is installed on their respective soockets on the Main Board. J7-9 (IN), J7-11 (OUT), and J7-12 (GND) are used for the duplex RS-232 transmission. Simplex 20 mA output transmission is also available simultaneously on J7-10 (I- OUT) and J7-12 (I+ OUT). See Section 4, INSTALLATION AND WIRING for complete terminal connection information on serial ports.

When used for RS-485 applications, the EDP port can be configured to operate as a transceiver on a multi-drop twisted-pair line. U24 must be installed in the proper socket on the Main Board to configure the EDP port as a 485 transceiver. Before installing U24, make certain that U22 is NOT installed. J7-7 (RS-485-A) and J7-8 (RS-485-B) are used for RS-485 applications.

For simplex 20 mA Current Loop applications, the EDP current loop transmitter is designed so that duplex RS-232 and simplex 20 mA output are available simultaneously with the RS-232 configuration described above.

For full duplex 20 mA Current Loop applications with simultaneous simplex RS232 transmission, the EDP port can be configured as an active or passive current transmitter with an optically-isolated current receiver. U22 must be installed, and U24 must NOT be installed for duplex current loop applications. J7-7 (I+ IN), J7-8 (I- IN), J7-12 (I+ OUT), and J7-10 (I- OUT) are used when the EDP port is configured for duplex 20 mA current loop applications.

Terminal block J7 is used for connecting both the Electronic Data Processing (EDP) port and the Printer port. Both ports must first be configured for the specific application as described in the *Setup and Configuration* section of this manual.

EDP Port:	RS-232	RS-485 (U24)**	20mA (U22)*
J7-7		485-A	I+ IN
J7-8		485-B	I - IN
J7-9	RS-232 IN		
J7-10			I- OUT
J7-11	RS-232 OUT		
J7-12	GND		I+ OUT

*To enable 20 mA CL, U22 has been installed at the factory; be certain that U24 is NOT installed.
**To enable RS-485, U24 must be installed; be certain that U22 is NOT installed.

5.2 PRINTER PORT (2nd serial port)

The printer port on the IQplus 810 can be configured for simplex RS-232, and simultaneous simplex 20mA Current Loop operation.

For RS-232 applications, the printer port operates with the same voltage levels as the EDP port. When used for RS-232 applications, J7-5 (Tx) and J7-6 (GND) are used as wiring connections for the printer port. The printer port simultaneously provides simplex 20mA Current Loop output with no hardware configuration change necessary. The active current transmitter circuit is identical to the one used for the EDP port. J7-6 (I+ OUT) and J7-4 (I- OUT) are used for wiring connections for current loop applications. See the Printer Port wiring chart on the following page.

When the printer port is used in the continuous mode for data transmission, it also transmits in the CC (Consolidated Controls) data format reproduced on the previous page.

Terminal block J7 on the main board is used for connecting the Printer port as shown below.

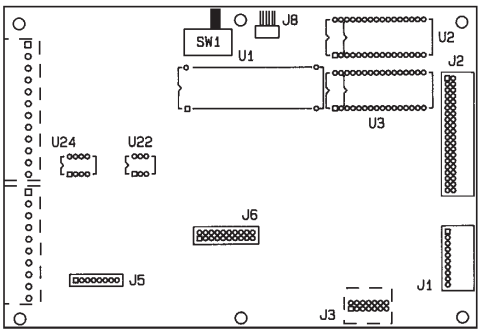
Printer Port:	RS-232	20mA CL
J7-1		
J7-2		
J7-3		
J7-4		I- OUT
J7-5	RS-232 OUT	
J7-6	GND	I+ OUT

5.3 AUXILIARY SERIAL PORT ON EXPANSION BOARD

See "Auxiliary Serial Port" section (10-8) in Optional Features Section.

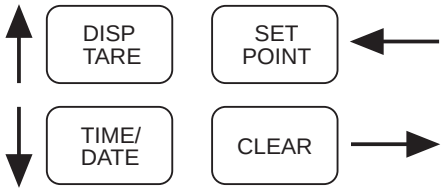
6. SETUP AND CONFIGURATION

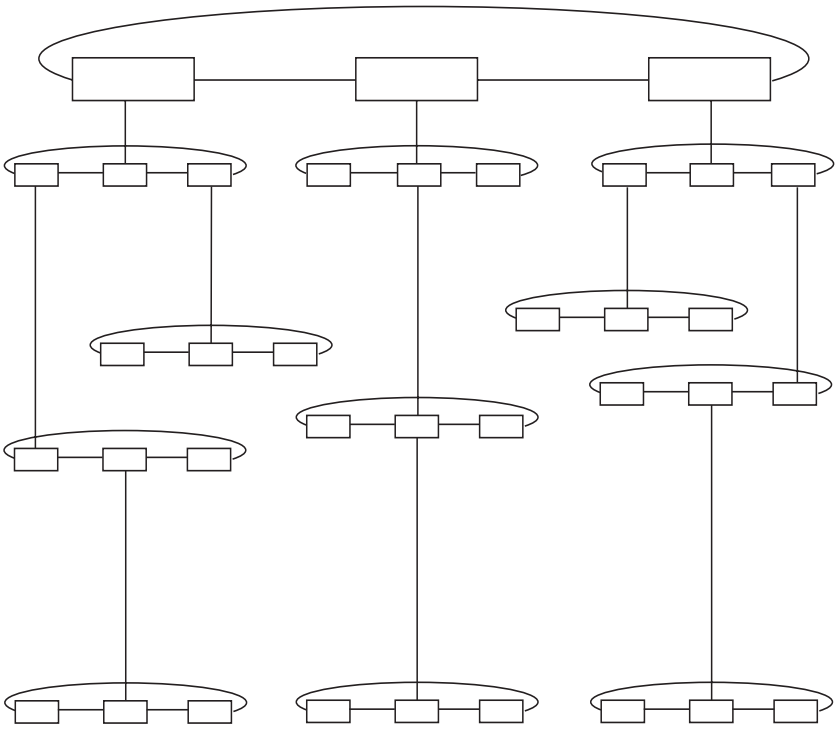
To setup and configure the IQplus 810, first open the case and locate the setup switch on the main CPU board . The setup switch (SW-1 on the main board diagram at right) is near the top edge of the board. Slide the switch to the right to access the setup mode.



CONFIG will now be displayed on the screen. The Configuration menu is one of nine separate main menu sections, each with its own submenu of parameter choices. On the following pages, each of the nine sections is shown as a separate group. At the beginning of each group is a page headed by a graphic of the nine main menus, with the menu name for that section broken out and enlarged. Some groups may be drawn on a single page, like the BAR GRAPH group, while others like the CONFIG group may require multiple pages.

In this setup mode, four front panel keys become directional navigators to move around in the setup menu. Display prompts appear on the screen as you move through the menu flowchart with the four directional keys. The four keys and their travel directions are shown at right.



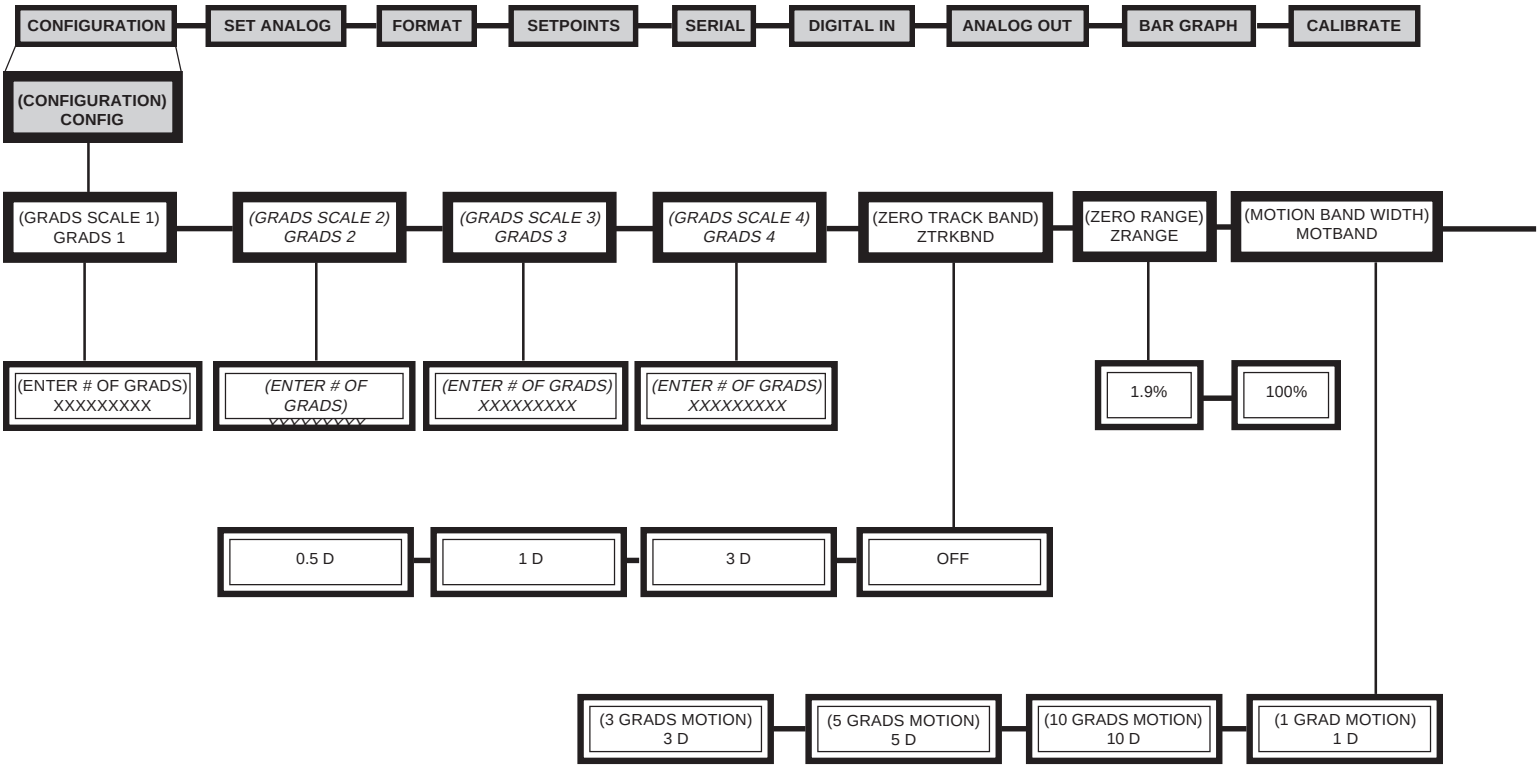


Sample Menu Cart with three Main Menu Groups

The setup menu is arranged with selectable options on several levels. The simplified graphic at left will illustrate how option parameters are arranged. Movement between option groups is possible only where lines are shown in the setup configuration charts beginning on the following page. Pressing the up or down directional keys will allow vertical movement between levels where lines are shown, and the left and right keys will allow horizontal movement along the lines. To select a parameter, move down through the levels by pressing the down (TIME/DATE) arrow key until reaching the level of choices for that parameter. When navigating down into a lower level, the first choice shown on the display screen in that level is the default setting. To change the default to other selections, scroll sideways with the left (SET-POINT) or right (CLEAR) arrow keys until the desired choice within that group is displayed (repeatedly pressing the left or right directional keys will scroll horizontally through the available choices, then repeat). With the desired choice displayed, push the up arrow key (DISP TARE). That action will both lock in your displayed choice as the new default, and exit you up to the next level. For parameters requiring a numerical entry (XXXXXX), key in the number via the numerical keyboard, press ENTER, and scroll up to lock in the number.

CAUTION. When exploring down through the levels of the menu chart, it is possible to accidentally change a parameter setting at the lower levels. The choice that is displayed when you exit up to a higher level will become the locked-in setting. When exploring an option group in the lower menu levels, remember which choice was displayed first when you scrolled down into the group. That choice was the default, and you MUST have that choice displayed when you exit the level to avoid changing the default. Before pressing the up arrow key, always remember that "What you see is what you get."

Complete descriptions of all setup parameter choices follows the menu charts in Section 6.1.



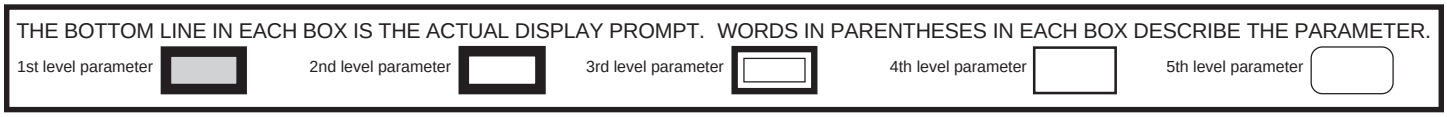
NOTES ON MENU CHARTS ORGANIZATION:

1) In each box, the words in parentheses describe the parameter; the actual display that is shown on the indicator is the word(s) on the bottom line not in parentheses. A more detailed description of each parameter choice will be found in Section 6.1, *Menu Descriptions*.

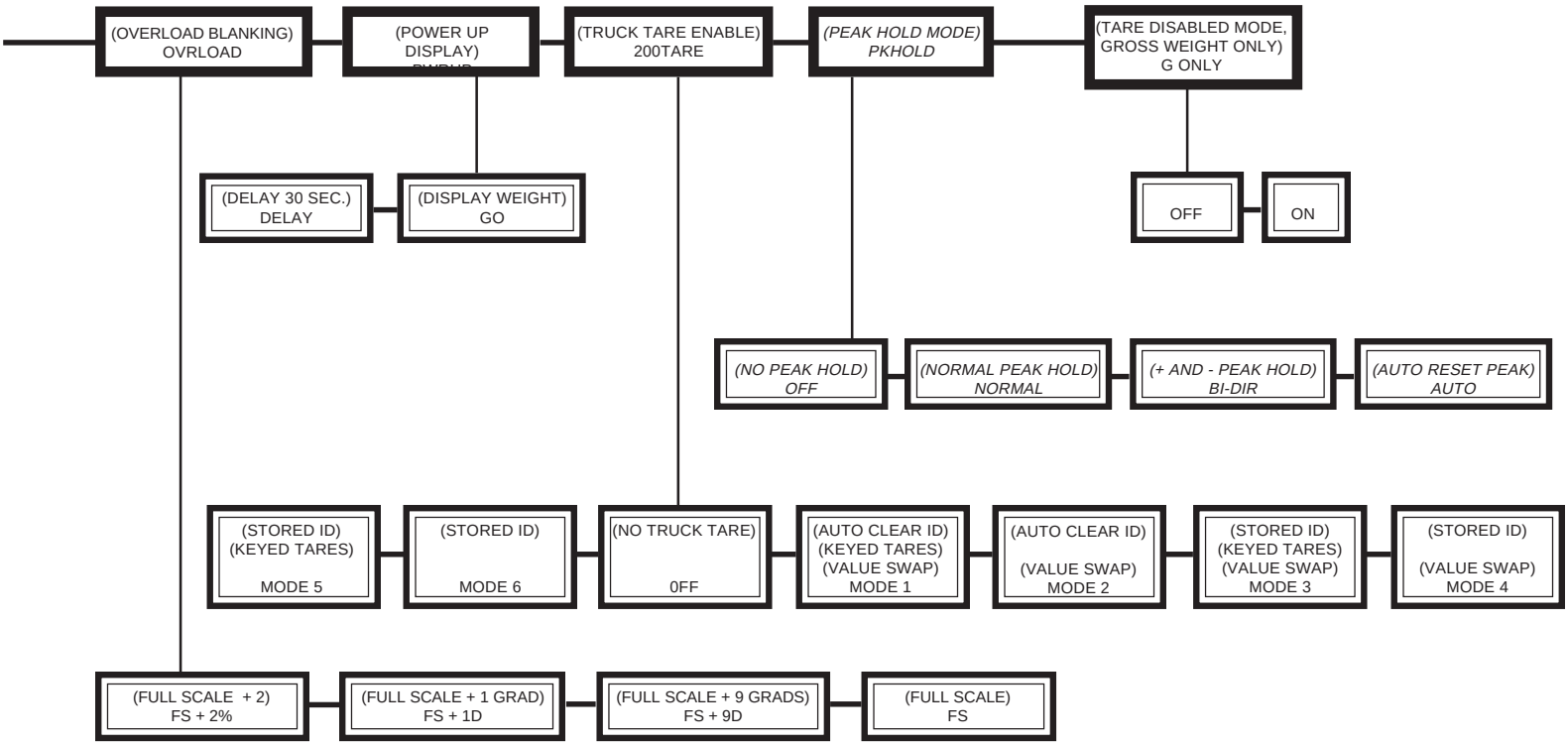
2) Any boxes for parameters and choices relating to optional features are shown in italicized type in the charts.

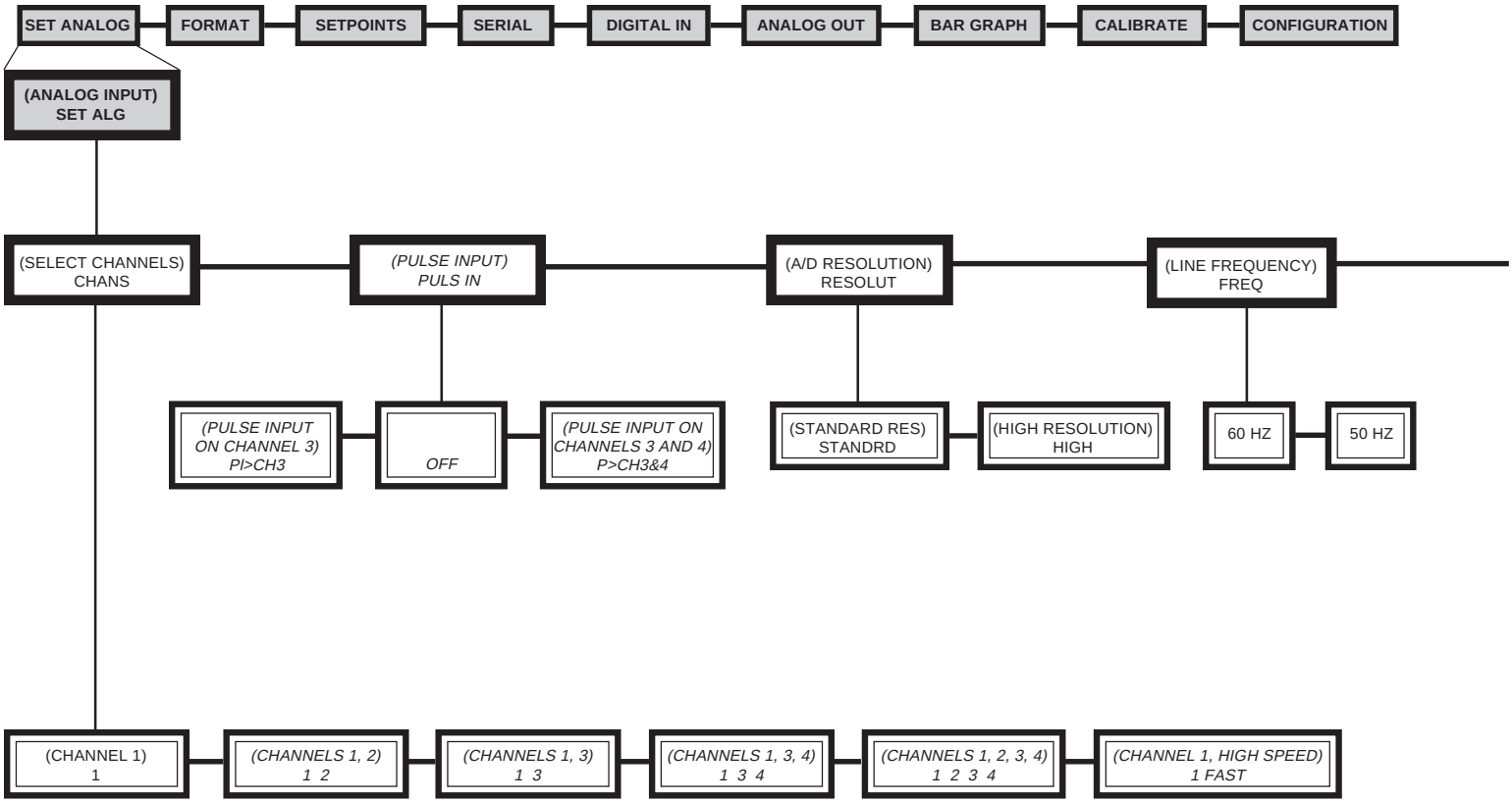
3) The factory-set default in each group of choices is the box connected by a vertical line to the next highest level.

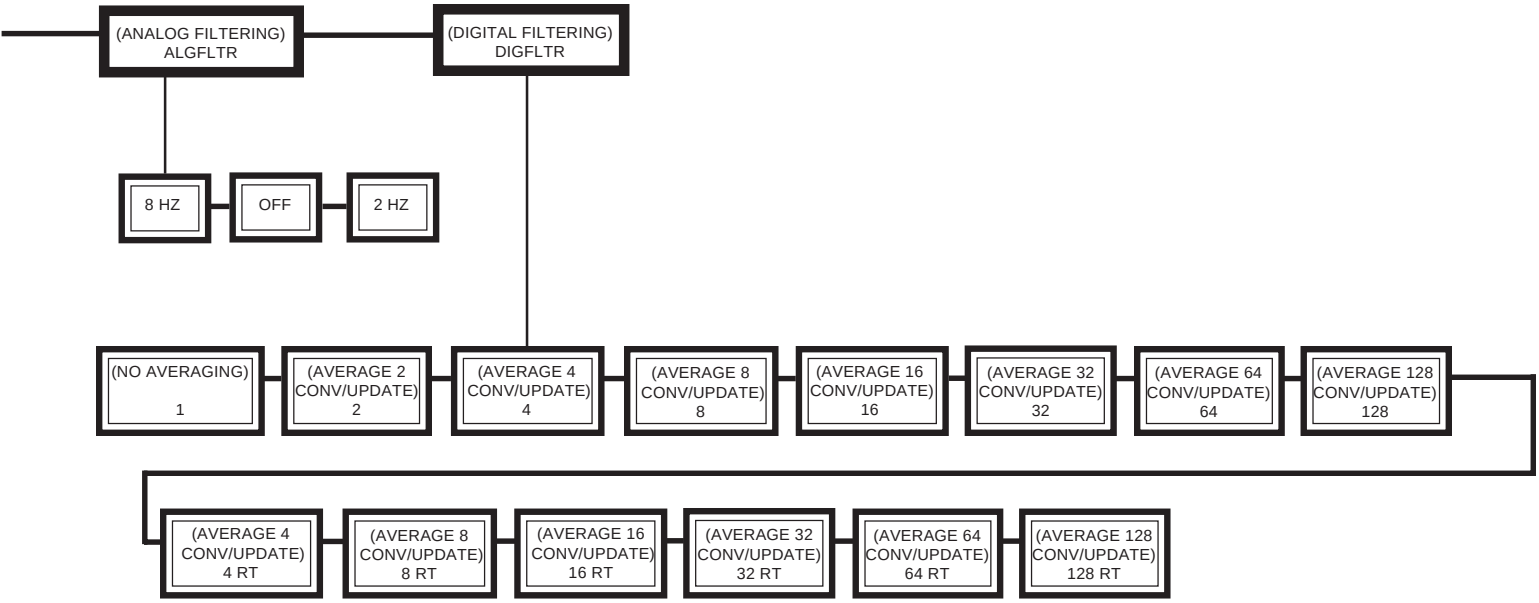
4) Parameters on different levels in the charts are keyed to the appearance of the box using the system below:

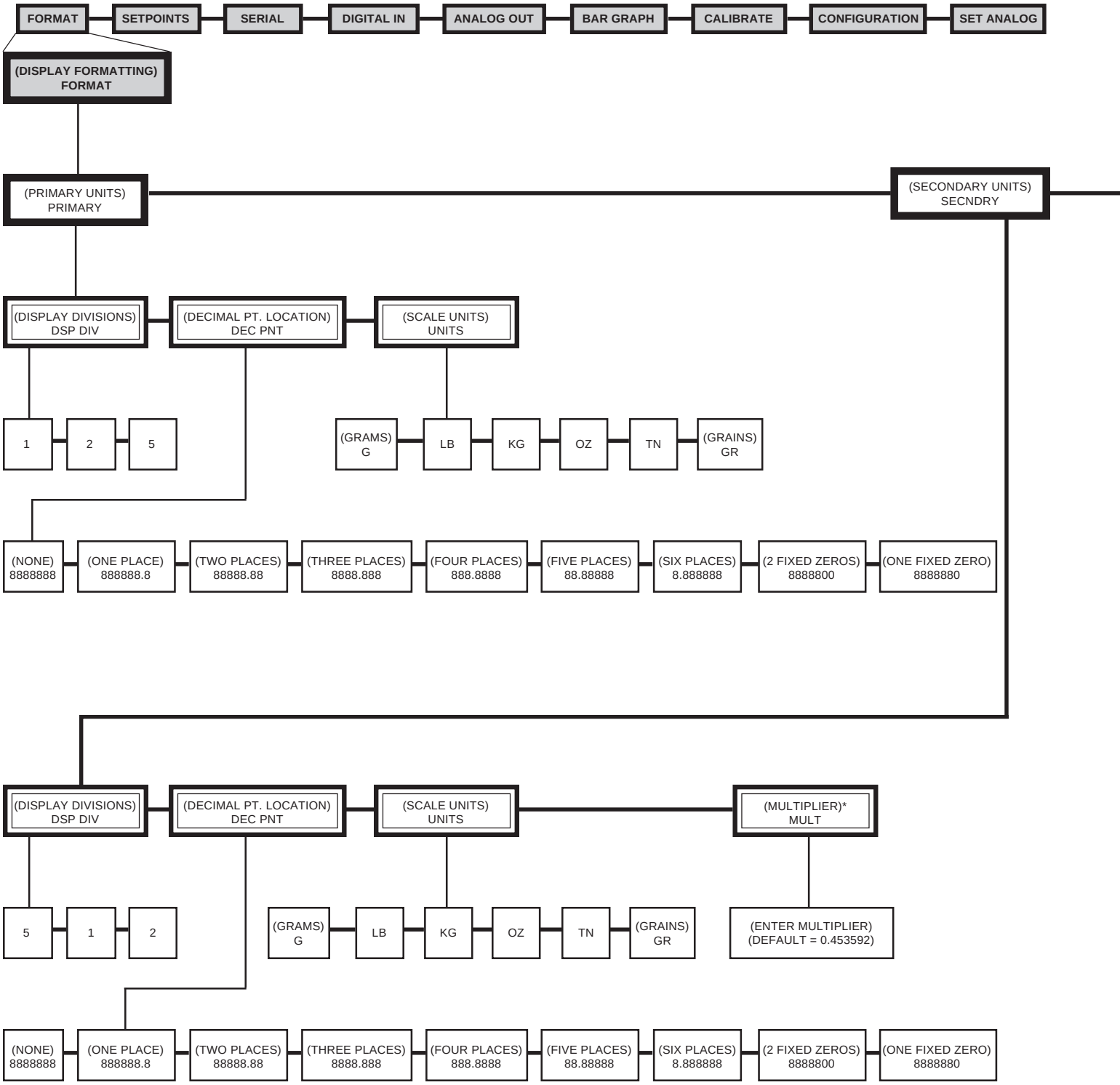


5) The nine shaded boxes across the top page of each new section refers to the nine 1st level parameters. All subparameters shown in a section will be found in the menu under the 1st level parameter that is shown enlarged and brought forward.


(OVERLOAD BLANKING)
OVRLOAD
(POWER UP
DISPLAY)
(TRUCK TARE ENABLE)
200TARE
(PEAK HOLD MODE)
PKHOLD
(TARE DISABLED MODE,
GROSS WEIGHT ONLY)
G ONLY
(DELAY 30 SEC.)
DELAY
(DISPLAY WEIGHT)
GO
OFF
ON
(NO PEAK HOLD)
OFF
(NORMAL PEAK HOLD)
NORMAL
(+ AND - PEAK HOLD)
BI-DIR
(AUTO RESET PEAK)
AUTO
(STORED ID)
(KEYED TARES)
MODE 5
(STORED ID)
MODE 6
(NO TRUCK TARE)
0FF
(AUTO CLEAR ID)
(KEYED TARES)
(VALUE SWAP)
MODE 1
(AUTO CLEAR ID)
(VALUE SWAP)
MODE 2
(STORED ID)
(KEYED TARES)
(VALUE SWAP)
MODE 3
(STORED ID)
(VALUE SWAP)
MODE 4
(FULL SCALE + 2)
FS + 2%
(FULL SCALE + 1 GRAD)
FS + 1D
(FULL SCALE + 9 GRADS)
FS + 9D
(FULL SCALE)
FS

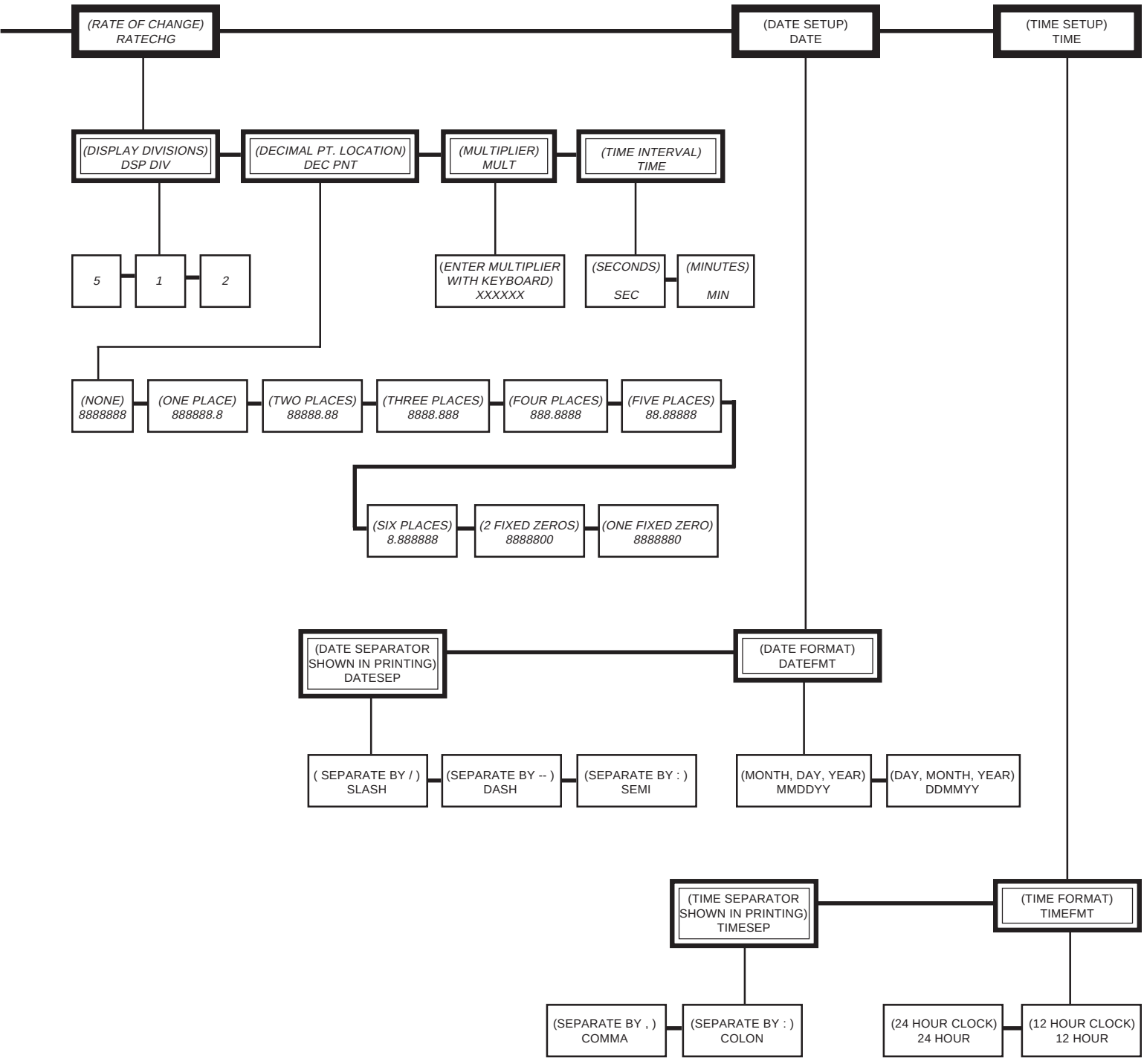

SET ANALOG
FORMAT
SETPOINTS
SERIAL
DIGITAL IN
ANALOG OUT
BAR GRAPH
CALIBRATE
CONFIGURATION
(ANALOG INPUT)
SET ALG
(SELECT CHANNELS)
CHANS
(PULSE INPUT)
PULS IN
(A/D RESOLUTION)
RESOLUT
(LINE FREQUENCY)
FREQ
(PULSE INPUT ON CHANNEL 3)
PI>CH3
OFF
(PULSE INPUT ON CHANNELS 3 AND 4)
P>CH3&4
(STANDARD RES)
STANDRD
(HIGH RESOLUTION)
HIGH
60 HZ
50 HZ
(CHANNEL 1)
1
(CHANNELS 1, 2)
1 2
(CHANNELS 1, 3)
1 3
(CHANNELS 1, 3, 4)
1 3 4
(CHANNELS 1, 2, 3, 4)
1 2 3 4
(CHANNEL 1, HIGH SPEED)
1 FAST

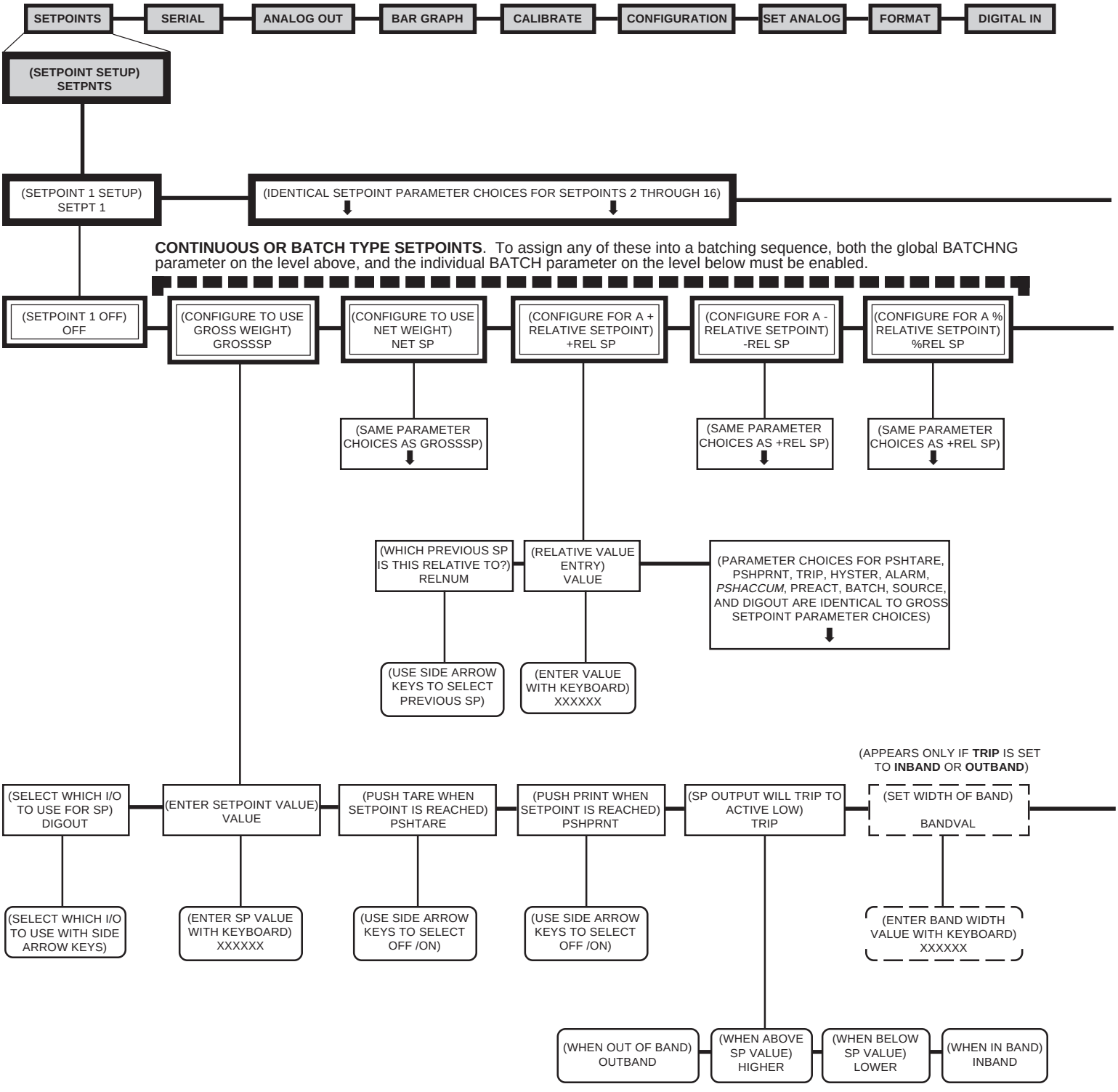

(ANALOG FILTERING)
ALGFLTR
(DIGITAL FILTERING)
DIGFLTR
8 HZ
OFF
2 HZ
(NO AVERAGING)
1
(AVERAGE 2
CONV/UPDATE)
2
(AVERAGE 4
CONV/UPDATE)
4
(AVERAGE 8
CONV/UPDATE)
8
(AVERAGE 16
CONV/UPDATE)
16
(AVERAGE 32
CONV/UPDATE)
32
(AVERAGE 64
CONV/UPDATE)
64
(AVERAGE 128
CONV/UPDATE)
128
(AVERAGE 4
CONV/UPDATE)
4 RT
(AVERAGE 8
CONV/UPDATE)
8 RT
(AVERAGE 16
CONV/UPDATE)
16 RT
(AVERAGE 32
CONV/UPDATE)
32 RT
(AVERAGE 64
CONV/UPDATE)
64 RT
(AVERAGE 128
CONV/UPDATE)
128 RT

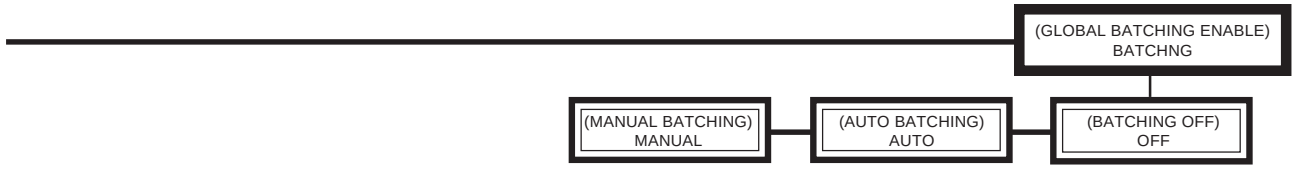


* The Multiplier is relative to the primary units. It is the conversion factor by which the primary units are multiplied by to obtain the secondary units. Some common examples of multipliers for conversion into different units are listed below. See *Conversion Factors for Secondary Units* in the Appendix for a complete listing of multipliers.

Secondary Units	=	Primary Units	x	Multiplier
Kg	=	Lb	x	0.453592
Lb	=	Ton	x	2000.0
Grams	=	Lb	x	453.592
Oz	=	Lb	x	16.0
Grains	=	Lb	x	6998.9
Gallons of water	=	Lb	x	0.1198
Lb of water	=	Gallons	x	8.347


(RATE OF CHANGE)
RATECHG
(DATE SETUP)
DATE
(TIME SETUP)
TIME
(DISPLAY DIVISIONS)
DSP DIV
(DECIMAL PT. LOCATION)
DEC PNT
(MULTIPLIER)
MULT
(TIME INTERVAL)
TIME
5
1
2
(ENTER MULTIPLIER WITH KEYBOARD)
XXXXXX
(SECONDS)
SEC
(MINUTES)
MIN
(NONE)
8888888
(ONE PLACE)
888888.8
(TWO PLACES)
88888.88
(THREE PLACES)
8888.888
(FOUR PLACES)
888.8888
(FIVE PLACES)
88.88888
(SIX PLACES)
8.888888
(2 FIXED ZEROS)
8888800
(ONE FIXED ZERO)
8888880
(DATE SEPARATOR SHOWN IN PRINTING)
DATESEP
(DATE FORMAT)
DATEFMT
(SEPARATE BY /)
SLASH
(SEPARATE BY --)
DASH
(SEPARATE BY :)
SEMI
(MONTH, DAY, YEAR)
MMDDYY
(DAY, MONTH, YEAR)
DDMMYY
(TIME SEPARATOR SHOWN IN PRINTING)
TIMESEP
(TIME FORMAT)
TIMEFMT
(SEPARATE BY ,)
COMMA
(SEPARATE BY :)
COLON
(24 HOUR CLOCK)
24 HOUR
(12 HOUR CLOCK)
12 HOUR


SETPOINTS
SERIAL
ANALOG OUT
BAR GRAPH
CALIBRATE
CONFIGURATION
SET ANALOG
FORMAT
DIGITAL IN
(SETPOINT SETUP)
SETPNTS
(SETPOINT 1 SETUP)
SETPT 1
(IDENTICAL SETPOINT PARAMETER CHOICES FOR SETPOINTS 2 THROUGH 16)
CONTINUOUS OR BATCH TYPE SETPOINTS. To assign any of these into a batching sequence, both the global BATCHNG parameter on the level above, and the individual BATCH parameter on the level below must be enabled.
(SETPOINT 1 OFF)
OFF
(CONFIGURE TO USE GROSS WEIGHT)
GROSSSP
(CONFIGURE TO USE NET WEIGHT)
NET SP
(CONFIGURE FOR A + RELATIVE SETPOINT)
+REL SP
(CONFIGURE FOR A - RELATIVE SETPOINT)
-REL SP
(CONFIGURE FOR A % RELATIVE SETPOINT)
%REL SP
(SAME PARAMETER CHOICES AS GROSSSP)
(SAME PARAMETER CHOICES AS +REL SP)
(SAME PARAMETER CHOICES AS +REL SP)
(WHICH PREVIOUS SP IS THIS RELATIVE TO?)
RELNUM
(RELATIVE VALUE ENTRY)
VALUE
(PARAMETER CHOICES FOR PSHTARE, PSHPRNT, TRIP, HYSTER, ALARM, PSHACCUM, PREACT, BATCH, SOURCE, AND DIGOUT ARE IDENTICAL TO GROSS SETPOINT PARAMETER CHOICES)
(USE SIDE ARROW KEYS TO SELECT PREVIOUS SP)
(ENTER VALUE WITH KEYBOARD)
XXXXXX
(APPEARS ONLY IF TRIP IS SET TO INBAND OR OUTBAND)
(SELECT WHICH I/O TO USE FOR SP)
DIGOUT
(ENTER SETPOINT VALUE)
VALUE
(PUSH TARE WHEN SETPOINT IS REACHED)
PSHTARE
(PUSH PRINT WHEN SETPOINT IS REACHED)
PSHPRNT
(SP OUTPUT WILL TRIP TO ACTIVE LOW)
TRIP
(SET WIDTH OF BAND)
BANDVAL
(SELECT WHICH I/O TO USE WITH SIDE ARROW KEYS)
(ENTER SP VALUE WITH KEYBOARD)
XXXXXX
(USE SIDE ARROW KEYS TO SELECT OFF /ON)
(USE SIDE ARROW KEYS TO SELECT OFF /ON)
(ENTER BAND WIDTH VALUE WITH KEYBOARD)
XXXXXX
(WHEN OUT OF BAND)
OUTBAND
(WHEN ABOVE SP VALUE)
HIGHER
(WHEN BELOW SP VALUE)
LOWER
(WHEN IN BAND)
INBAND



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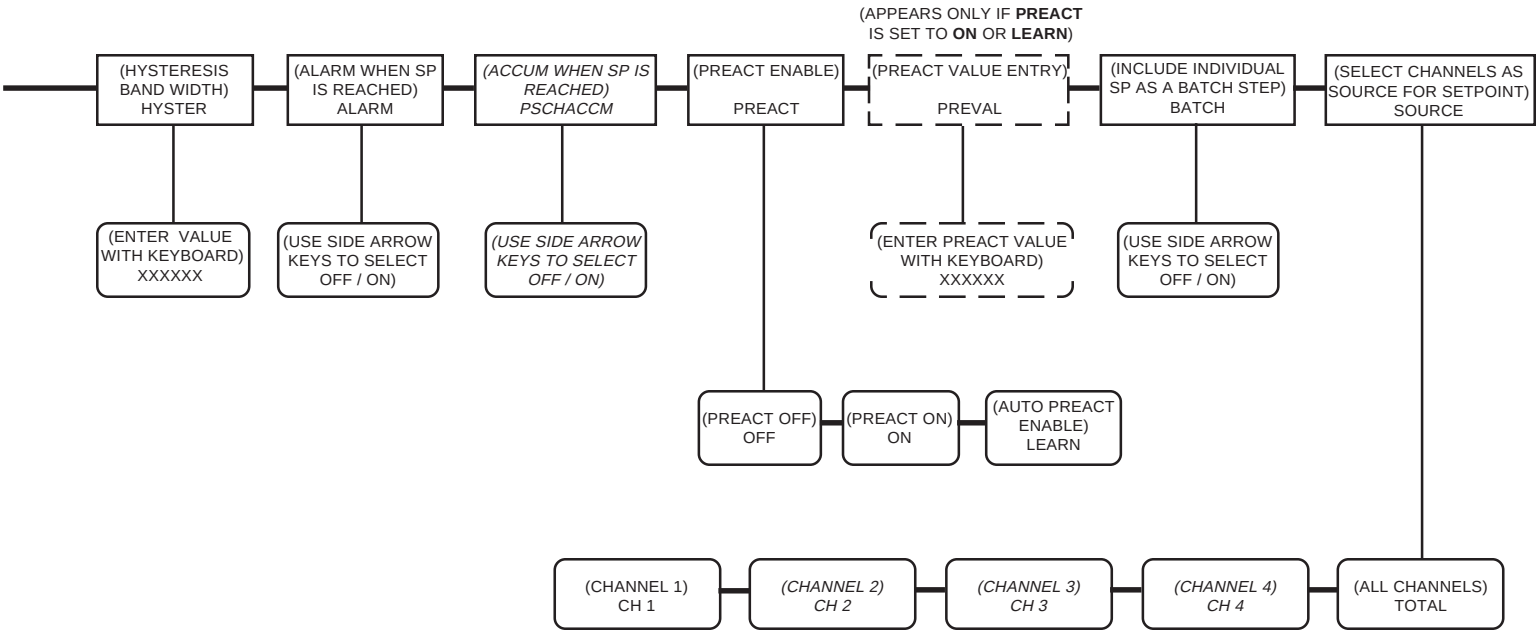

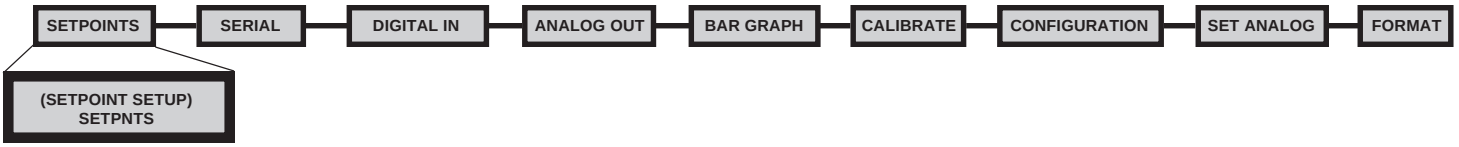

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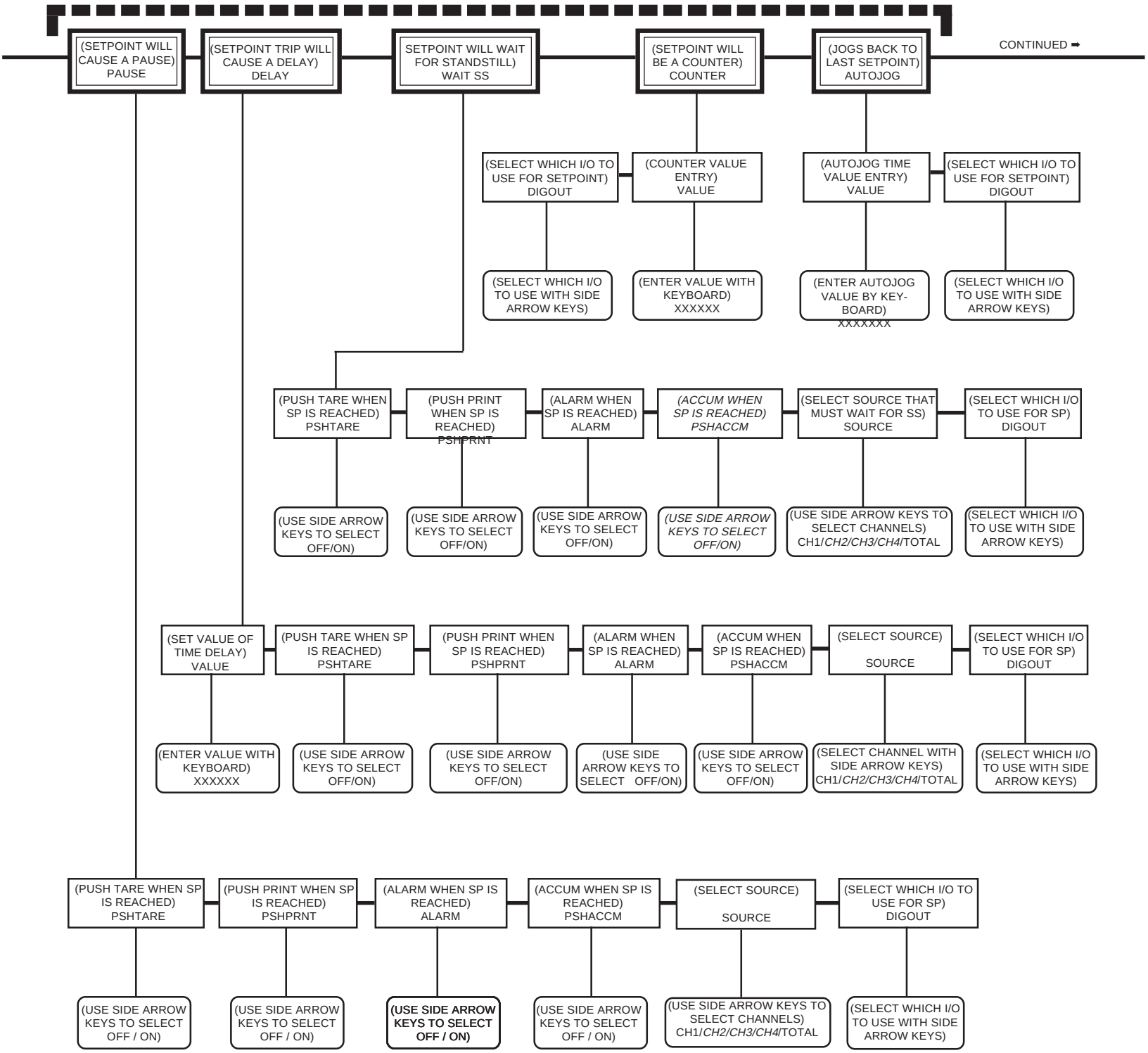
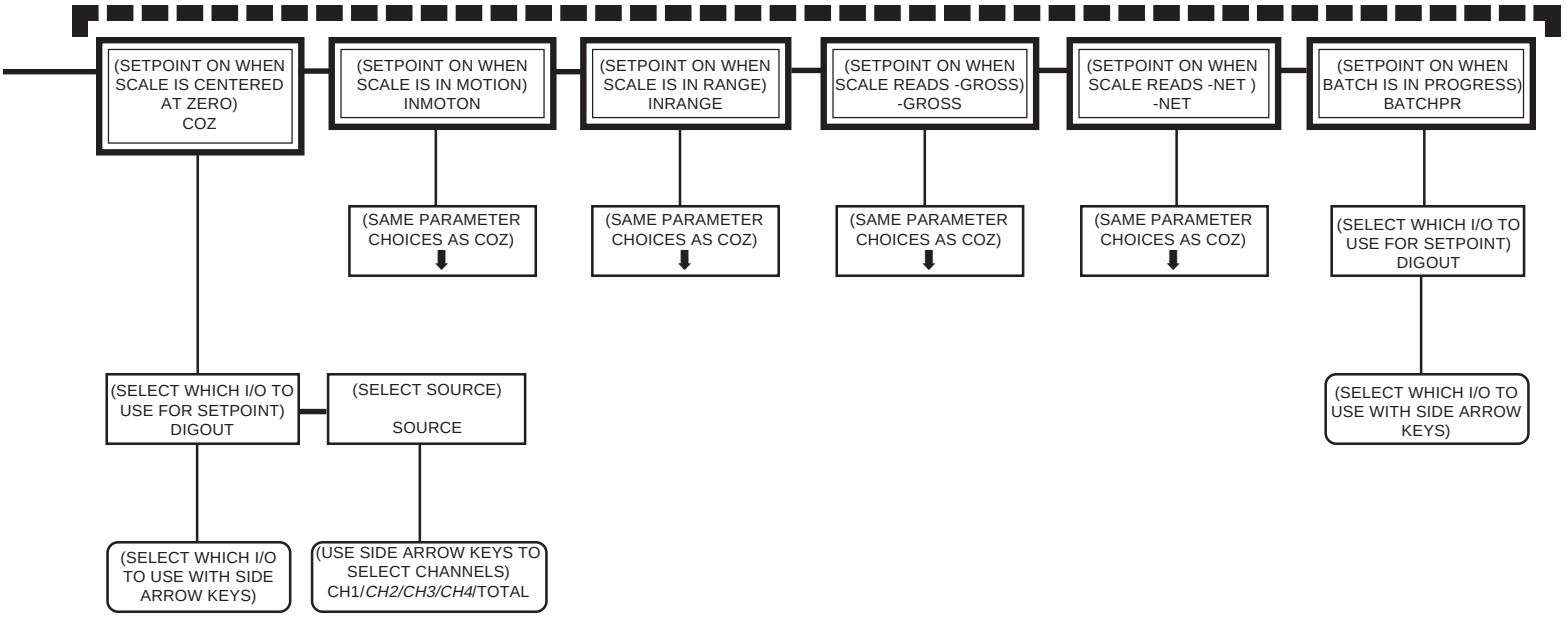
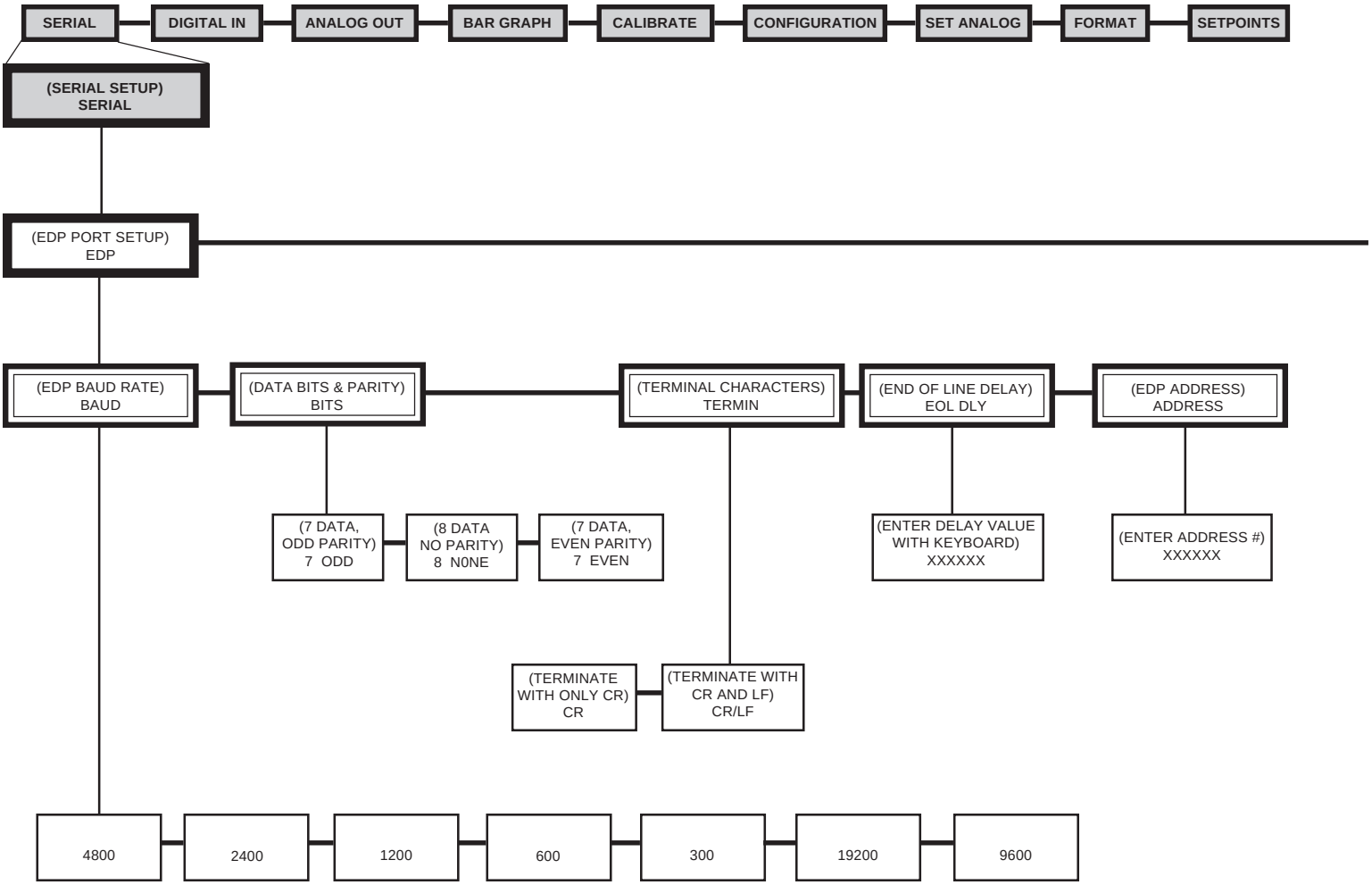
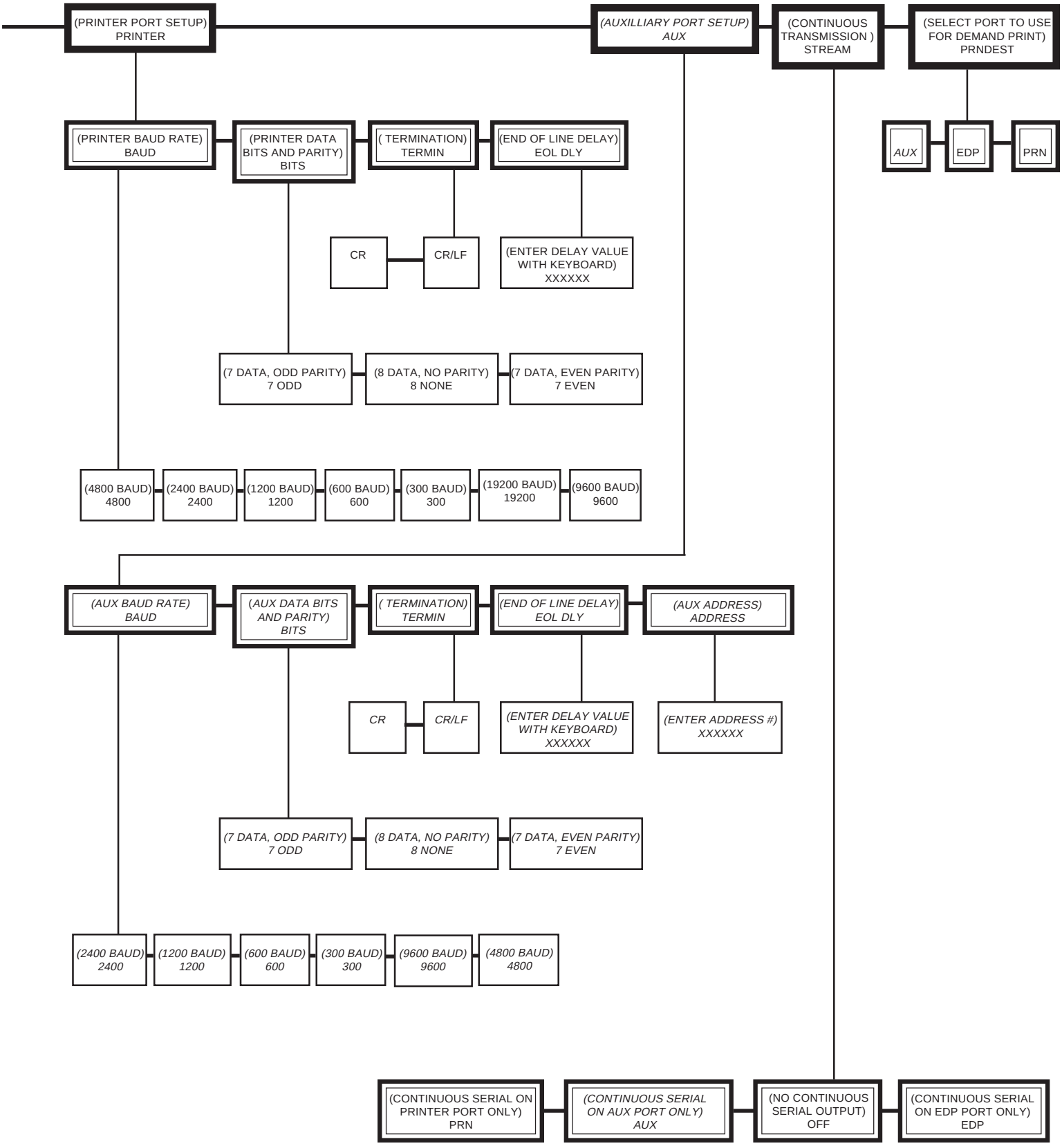
BATCH TYPE SETPOINTS. When the global BATCHING parameter in the level above is enabled by a MANUAL or AUTO setting, selecting any of these batching functions automatically includes them in the batching sequence.

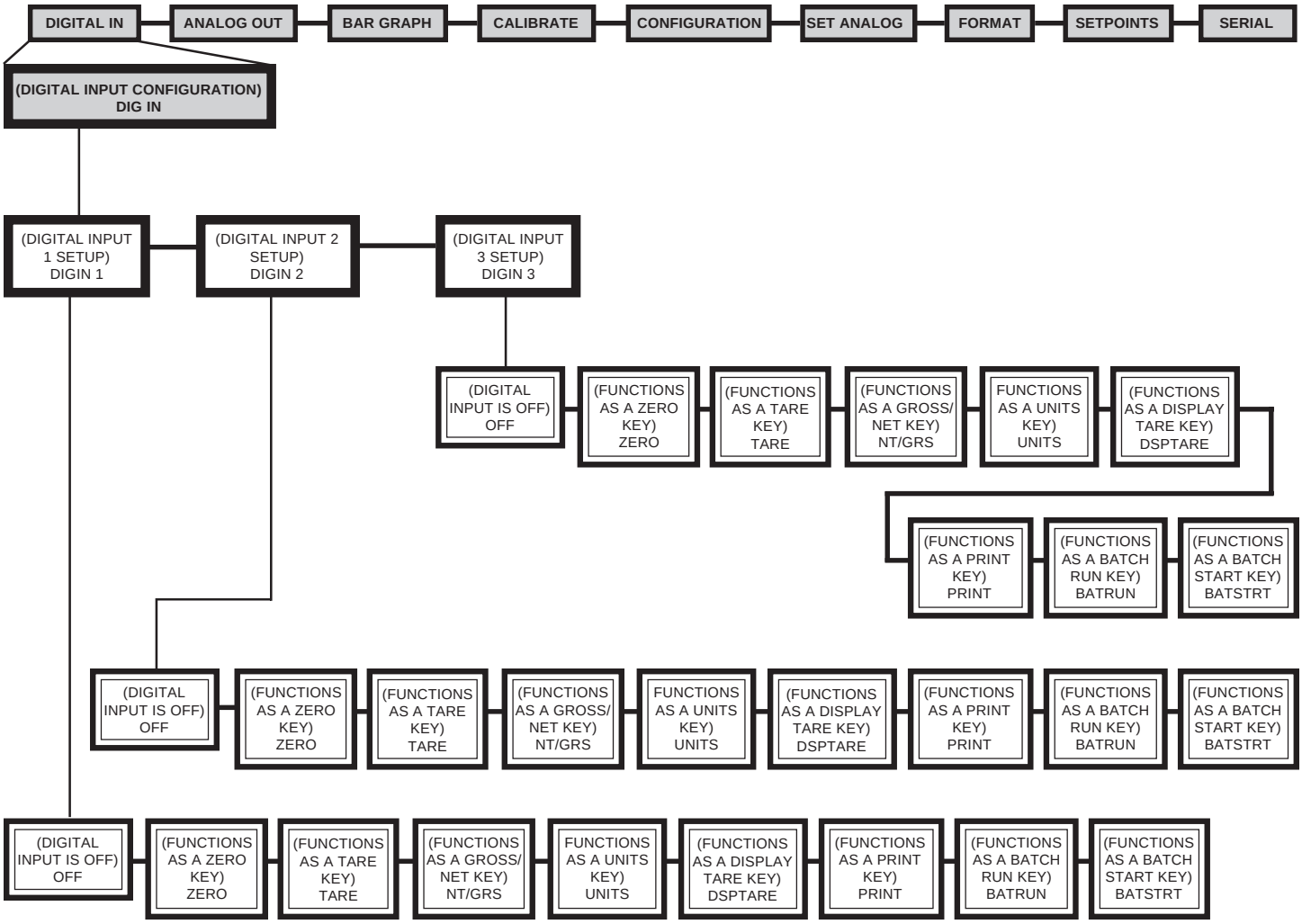


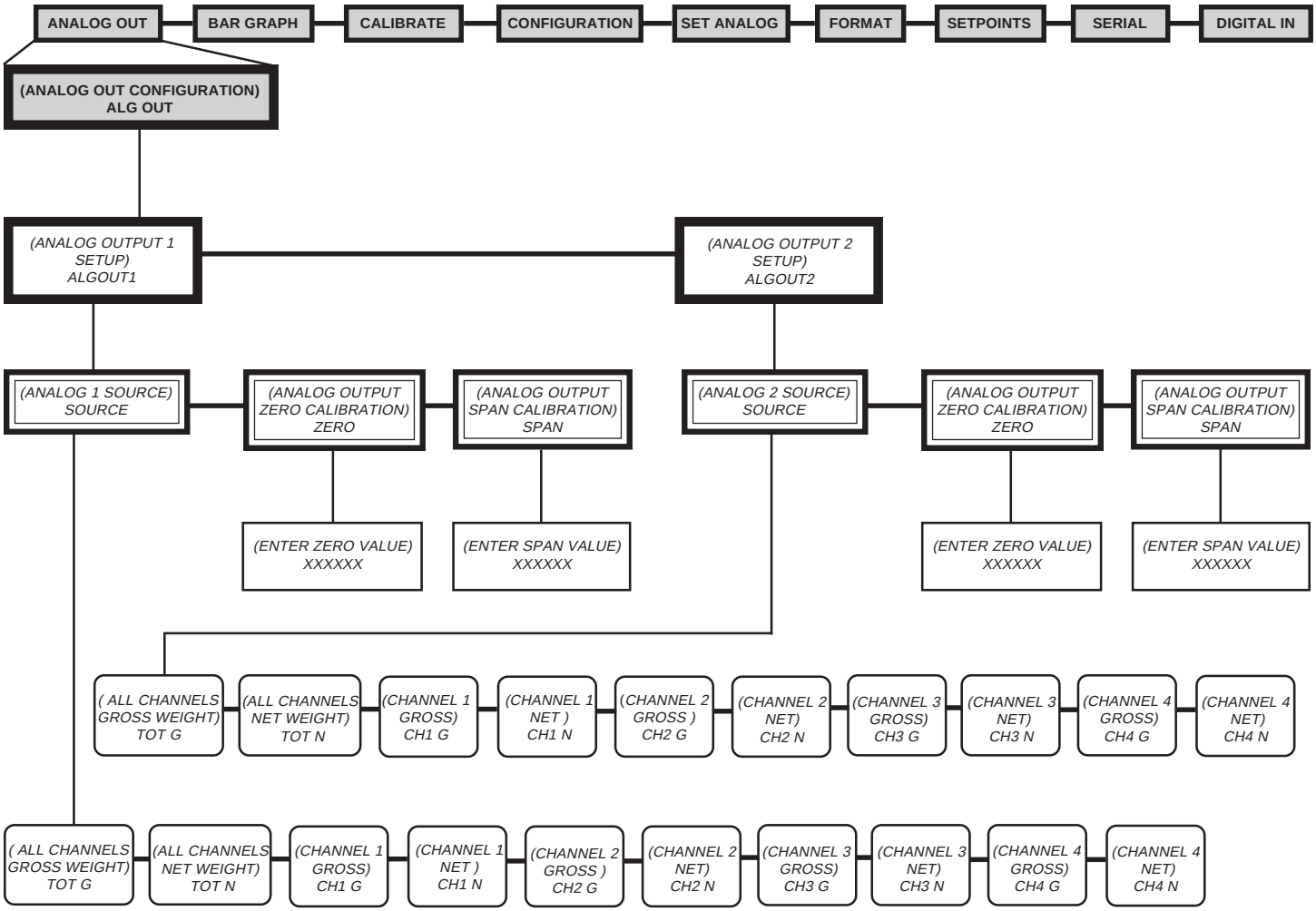
CONTINUOUS TYPE SETPOINTS. These setpoint types are always continuous and cannot be assigned as steps in a batch sequence.

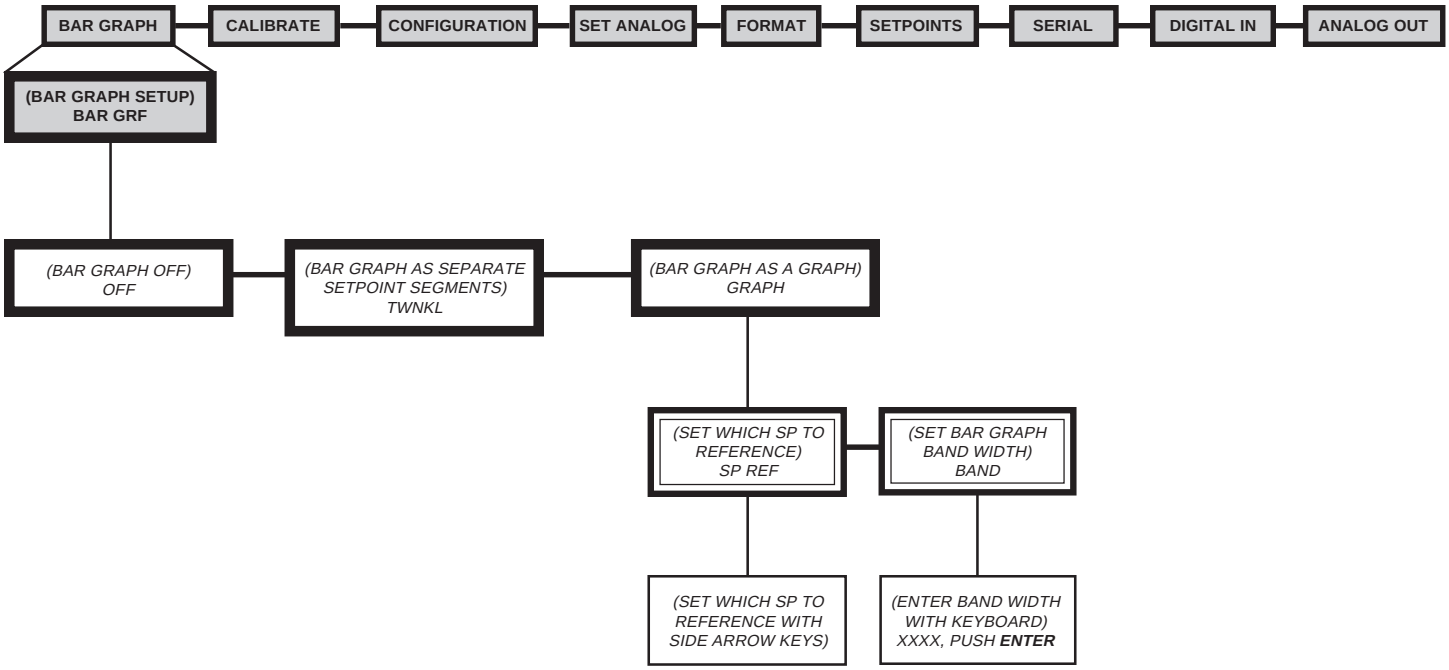


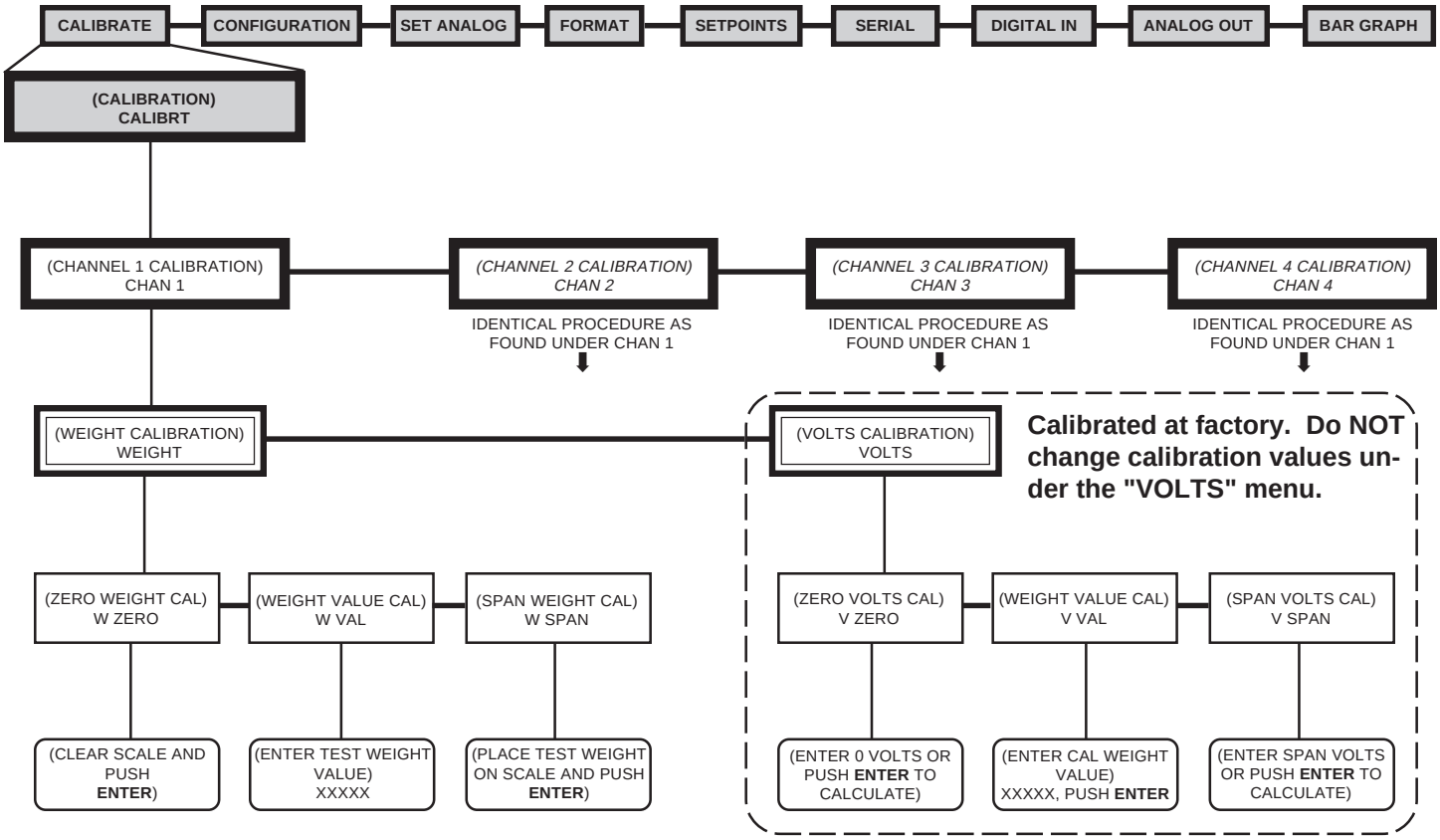

SERIAL
DIGITAL IN
ANALOG OUT
BAR GRAPH
CALIBRATE
CONFIGURATION
SET ANALOG
FORMAT
SETPOINTS
(SERIAL SETUP)
SERIAL
(EDP PORT SETUP)
EDP
(EDP BAUD RATE)
BAUD
(DATA BITS & PARITY)
BITS
(TERMINAL CHARACTERS)
TERMIN
(END OF LINE DELAY)
EOL DLY
(EDP ADDRESS)
ADDRESS
(7 DATA,
ODD PARITY)
7 ODD
(8 DATA
NO PARITY)
8 N0NE
(7 DATA,
EVEN PARITY)
7 EVEN
(ENTER DELAY VALUE
WITH KEYBOARD)
XXXXXX
(ENTER ADDRESS #)
XXXXXX
(TERMINATE
WITH ONLY CR)
CR
(TERMINATE WITH
CR AND LF)
CR/LF
4800
2400
1200
600
300
19200
9600


(PRINTER PORT SETUP)
PRINTER
(PRINTER BAUD RATE)
BAUD
(PRINTER DATA BITS AND PARITY)
BITS
(TERMINATION)
TERMIN
(END OF LINE DELAY)
EOL DLY
CR
CR/LF
(ENTER DELAY VALUE WITH KEYBOARD)
XXXXXX
(7 DATA, ODD PARITY)
7 ODD
(8 DATA, NO PARITY)
8 NONE
(7 DATA, EVEN PARITY)
7 EVEN
(4800 BAUD)
4800
(2400 BAUD)
2400
(1200 BAUD)
1200
(600 BAUD)
600
(300 BAUD)
300
(19200 BAUD)
19200
(9600 BAUD)
9600
(AUXILLIARY PORT SETUP)
AUX
(CONTINUOUS TRANSMISSION)
STREAM
(SELECT PORT TO USE FOR DEMAND PRINT)
PRNDEST
AUX
EDP
PRN
(AUX BAUD RATE)
BAUD
(AUX DATA BITS AND PARITY)
BITS
(TERMINATION)
TERMIN
(END OF LINE DELAY)
EOL DLY
(AUX ADDRESS)
ADDRESS
CR
CR/LF
(ENTER DELAY VALUE WITH KEYBOARD)
XXXXXX
(ENTER ADDRESS #)
XXXXXX
(7 DATA, ODD PARITY)
7 ODD
(8 DATA, NO PARITY)
8 NONE
(7 DATA, EVEN PARITY)
7 EVEN
(2400 BAUD)
2400
(1200 BAUD)
1200
(600 BAUD)
600
(300 BAUD)
300
(9600 BAUD)
9600
(4800 BAUD)
4800
(CONTINUOUS SERIAL ON PRINTER PORT ONLY)
PRN
(CONTINUOUS SERIAL ON AUX PORT ONLY)
AUX
(NO CONTINUOUS SERIAL OUTPUT)
OFF
(CONTINUOUS SERIAL ON EDP PORT ONLY)
EDP


DIGITAL IN
ANALOG OUT
BAR GRAPH
CALIBRATE
CONFIGURATION
SET ANALOG
FORMAT
SETPOINTS
SERIAL
(DIGITAL INPUT CONFIGURATION)
DIG IN
(DIGITAL INPUT 1 SETUP)
DIGIN 1
(DIGITAL INPUT 2 SETUP)
DIGIN 2
(DIGITAL INPUT 3 SETUP)
DIGIN 3
(DIGITAL INPUT IS OFF)
OFF
(FUNCTIONS AS A ZERO KEY)
ZERO
(FUNCTIONS AS A TARE KEY)
TARE
(FUNCTIONS AS A GROSS/ NET KEY)
NT/GRS
FUNCTIONS AS A UNITS KEY)
UNITS
(FUNCTIONS AS A DISPLAY TARE KEY)
DSPTARE
(FUNCTIONS AS A PRINT KEY)
PRINT
(FUNCTIONS AS A BATCH RUN KEY)
BATRUN
(FUNCTIONS AS A BATCH START KEY)
BATSTRT


ANALOG OUT
BAR GRAPH
CALIBRATE
CONFIGURATION
SET ANALOG
FORMAT
SETPOINTS
SERIAL
DIGITAL IN
(ANALOG OUT CONFIGURATION)
ALG OUT
(ANALOG OUTPUT 1 SETUP)
ALGOUT1
(ANALOG OUTPUT 2 SETUP)
ALGOUT2
(ANALOG 1 SOURCE)
SOURCE
(ANALOG OUTPUT ZERO CALIBRATION)
ZERO
(ANALOG OUTPUT SPAN CALIBRATION)
SPAN
(ANALOG 2 SOURCE)
SOURCE
(ANALOG OUTPUT ZERO CALIBRATION)
ZERO
(ANALOG OUTPUT SPAN CALIBRATION)
SPAN
(ENTER ZERO VALUE)
XXXXXX
(ENTER SPAN VALUE)
XXXXXX
(ENTER ZERO VALUE)
XXXXXX
(ENTER SPAN VALUE)
XXXXXX
(ALL CHANNELS GROSS WEIGHT)
TOT G
(ALL CHANNELS NET WEIGHT)
TOT N
(CHANNEL 1 GROSS)
CH1 G
(CHANNEL 1 NET)
CH1 N
(CHANNEL 2 GROSS)
CH2 G
(CHANNEL 2 NET)
CH2 N
(CHANNEL 3 GROSS)
CH3 G
(CHANNEL 3 NET)
CH3 N
(CHANNEL 4 GROSS)
CH4 G
(CHANNEL 4 NET)
CH4 N
(ALL CHANNELS GROSS WEIGHT)
TOT G
(ALL CHANNELS NET WEIGHT)
TOT N
(CHANNEL 1 GROSS)
CH1 G
(CHANNEL 1 NET)
CH1 N
(CHANNEL 2 GROSS)
CH2 G
(CHANNEL 2 NET)
CH2 N
(CHANNEL 3 GROSS)
CH3 G
(CHANNEL 3 NET)
CH3 N
(CHANNEL 4 GROSS)
CH4 G
(CHANNEL 4 NET)
CH4 N


BAR GRAPH
CALIBRATE
CONFIGURATION
SET ANALOG
FORMAT
SETPOINTS
SERIAL
DIGITAL IN
ANALOG OUT
(BAR GRAPH SETUP)
BAR GRF
(BAR GRAPH OFF)
OFF
(BAR GRAPH AS SEPARATE SETPOINT SEGMENTS)
TWNKL
(BAR GRAPH AS A GRAPH)
GRAPH
(SET WHICH SP TO REFERENCE)
SP REF
(SET BAR GRAPH BAND WIDTH)
BAND
(SET WHICH SP TO REFERENCE WITH SIDE ARROW KEYS)
(ENTER BAND WIDTH WITH KEYBOARD)
XXXX, PUSH ENTER



Detailed directions for calibration procedures are found in Section 8, *Calibration*.

6.1 MENU DESCRIPTIONS

CONFIGURATION MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
GRADS 1	Graduations. This parameter specifies the number of full scale graduations. The value entered should be consistent with legal requirements and environmental limits on the useful system resolution. Enter value with numerical keyboard then exit upward to enter the new value. This parameter, and the first three parameters (DSP DIV, DEC PNT, and UNITS) under Primary Scale in the FORMAT 1st level menu, define the scale capacity. For example, if GRADS = 10,000, DSP DIV = 5, DEC PNT = 88888.88, and UNITS = LB, then the scale capacity is 500.00 LB in .05 increments	0 to 100,000 **Default = 10,000** √
GRADS 2 *GRADS 3* *GRADS 4*	Same as GRADS 1 for the optional input channels 2-4.	Same as GRADS 1
ZTRKBND	Zero Track Band. Automatically zeroes the scale when it is within the range of selected values, as long as the input is within the ZRANGE, and the scale is in standstill. Selections are ± DD. Maximum legal value varies depending on local regulations.	**OFF**√ 0.5 D 1 D 3 D
ZRANGE	Zero Range. Selects the range within which the scale may be zeroed. The 1.9% selection is ±1.9% around the calibrated zero point, for a total range of 3.8%. Indicator must be in standstill to zero the scale. **Use 1.9% for Legal-For-Trade applications.**	**1.9%**√ 100%
MOTBAND	Motion Band. Sets the level at which scale motion is detected by comparing the present display update with the previous update. If motion is not detected for 1 second or more, the standstill symbol lights and the scale can process a Print command. Maximum legal value varies depending on local regulations.	**1 D**√ 3 D 5 D 10 D
OVRLOAD	Overload. Determines the point at which the display blanks and an error message is displayed, indicating an out-of-range condition. Maximum legal value varies depending on local regulations.	FS **FS + 2%**√ FS + 1D FS + 9D
PWR UP	Power Up Mode. In the GO mode, the scale goes into operation immediately after a brief power up display test. In the DELAY mode, the scale does a power up display test, then must warm up (WARM UP and the standstill symbol are displayed) with no motion detected for 30 seconds before going into operation. If motion is detected within that period, the 30-second sequence restarts. The delay is used where local regulations require a warm-up period.	**GO**√ DELAY
200TARE	200 ID/Tare Truck In/Out Mode. If enabled by selecting one of the six Truck In/Out modes, the indicator shifts from the Normal Weighing Mode into the truck mode selected. See Section 3.4. MODE 1: Auto Clear ID, Keyed Tares, Value Swapping MODE 2: Auto Clear ID, No Keyed Tares, Value Swapping MODE 3: Stored ID, Keyed Tares, Value Swapping	**OFF**√ MODE 1 MODE 2 MODE 3 MODE 4 MODE 5 MODE 6

6.1 MENU DESCRIPTIONS (CONTINUED)

CONFIGURATION MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
200TARE	Continued from previous page MODE 4: Stored ID, No Keyed Tares, Value Swapping MODE 5: Stored ID, Keyed Tares, No Value Swapping MODE 6: Stored ID, No Keyed Tares, No Value Swapping	See previous page
PK HOLD	Peak Hold Function. This optional feature will hold the display on the highest net weight achieved during a weighing cycle. For complete information, see the Peak Hold Function page in the *Optional Features* Section.	**OFF**√ NORMAL BI-DIR AUTO
G ONLY	Gross Weight Only. This function does not allow tares to be entered, nor can the display be shifted to the Net mode. Used primarily for cattle scales, the indicator MUST NOT have a tare value entered when the unit is placed in Setup mode and this parameter is selected. If a tare has been entered, it must first be cleared while G ONLY is OFF.	**OFF**√ ON

6.1 MENU DESCRIPTIONS (CONTINUED)

SET ANALOG MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
CHANS	Selects the channels for analog input to the indicator. The standard unit has a single channel, but up to four input channels are optional, as are various combinations of the channels, with the optional expansion board. A separate option will allow Channel 1 to be selected as a high-speed update channel (FAST) with an update rate of 100/sec.	**1**√ 1, 3, 4 1, 2 1, 2, 3, 4 1, 3 FAST
RESOLUT	Selects between Standard (360,000 grads at 120 Volts, 60 Hz, 20 updates/second) and High Resolution (740,000 grads at 120 Volts, 60 Hz, 10 updates/second). Internal resolution in grads is increased by 20% if using 50Hz power supply .	**STANDRD**√ HIGH
PULS IN	Available only with the optional expansion board. Enables the Pulse Input feature and chooses the input channel or channels through which the pulse input will be transmitted. Channel 3, or a combination of channels 3 and 4, are the available selections.	**OFF**√ PI>CH3 P>CH3+4
FREQ	Selects the frequency of the incoming AC power source.	**60 HZ**√ 50 HZ
ALGFLTR	Selects the Analog Filtering range for filtering electrical interference and mechanical noise in selected frequencies from the nearby environment. OFF has the least filtering effect; 8 HZ has medium filtering effect; 2 HZ has the highest filtering effect. Normally, choose the lowest filtering which gives a stable display, but if digital filtering will also be needed, select either 8 HZ or 2 HZ for the analog filter. See also the section subtitled, *Analog Filter Selections*, in the Appendix.	OFF **8 HZ**√ 2 HZ
DIGFLTR	Selects the Digital Filtering rate for eliminating the effects of mechanical noise or vibration from the immediate area of the indicator. The choices indicate the number of A/D conversions per update 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 to stabilize on the new weight. Rattletrap™ selections with "RT" after the number are the most effective at filtering out repeating vibrations caused by mechanical noise from nearby machines, but increase the settling times over standard digital filter selections. The RT selections should be used where necessary to eliminate mechanical vibration. See also the section subtitled *Digital Filter Selections*, in the Appendix.	1 4RT 2 8RT **4**√ 16RT 8 32RT 16 64RT 32 128RT 64 128

6.1 MENU DESCRIPTIONS (CONTINUED)

FORMAT MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(PRIMARY)		
DSP DIV	Display Divisions. Selects the value of the minimum division size of the displayed weight.	**1**√ 2 5
DEC PNT	Decimal Point Location. Determines the location of the decimal point or dummy zeros in the display. Value should be consistent with legal requirements locally.	**8888888**√ 888888.8 88.88888 88888.88 8.888888 8888.888 8888800 888.8888 8888880
UNITS	Units. Specifies the units for displayed and printed weight. GR is the abbreviation for Grains, G is for Grams.	**LB**√ OZ TN GR G KG
(SECNDRY)		
DSP DIV	Display Divisions. Selects the value of the minimum division size of the displayed weight.	1 2 **5**√
DEC PNT	Decimal Point Location. Determines the location of the decimal point or dummy zeros in the display. Value should be consistent with legal requirements locally.	8888888 **888888.8**√ 88.88888 88888.88 8.888888 8888.888 8888800 888.8888 8888880
UNITS	Units. Specifies the units for displayed and printed weight. GR is the abbreviation for Grains, G is for Grams.	LB OZ TN GR G **KG**√
MULT	Multiplier. This is the conversion factor by which the primary units are multiplied by to obtain the secondary units. The default is 0.453592, which is the conversion factor to change pounds to kilograms. To toggle between Primary and Secondary units, press the **UNITS** key.	**0.453592**√ Enter other choices via the keyboard.
(RATECHG)		
DSP DIV	Display Divisions. Selects the value of the minimum division size of the displayed weight.	**1**√ 2 5
DEC PNT	Decimal Point Location. Determines the location of the decimal point or dummy zeros in the display.	**8888888**√ 888888.8 88.88888 88888.88 8.888888 8888.888 8888800 888.8888 8888880
MULT	Multiplier. This is the conversion factor by which the primary units are multiplied by to obtain the Rate of Change units. The default is 1.0000.	**1.0000**√ Enter other choices via the keyboard.
TIME	Time. This sets the time units for the Rate of Change function.	**SEC**√ MIN

6.1 MENU DESCRIPTIONS (CONTINUED)

FORMAT MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(DATE)		
DATEFMT	Date Format. This specifies the format in which the date will be printed and displayed, either month/day/year, or day/month/year.	**MMDDYY**√ DDMMYY
DATESEP	Date Separator. This specifies the separation character between the day, month, and year when the date is printed. The display, however, will always show a period separating these elements.	**SLASH /**√ DASH -- SEMI :
(TIME)		
TIMEFMT	Time Format. This specifies the format in which the time will be displayed and printed, either in 12-hour, or 24-hour format. The actual setting of the time is done through the front panel **TIME/DATE** key, and is always entered in 24 hour format.	**12 HOUR**√ 24 HOUR
TIMESEP	Time Separator. This specifies the separation character beween the minutes and hours when the time is printed. The display, however, will always show a period separating these elements.	**COLON :**√ COMMA ,

6.1 MENU DESCRIPTIONS (CONTINUED)

SETPOINT MENU DESCRIPTIONS (Defaults in BoldType with √)

NAME	DESCRIPTION	CHOICES
(Level 1) SETPNTS	Setpoints. This parameter choice begins the individual setpoint number menus. Beneath each of the level 2 selections (SETPNT 1 to SETPNT 16) will be found the lower level choices to configure each of the individual setpoints.	**OFF**√ STPT 1 to STPT 16 BATCHNG
(Level 2) BATCHNG	Batching Enable. If MANUAL or AUTO is selected, this allows a batching sequence to be run. This parameter serves as a software safety lockout for establishing a batch sequence. If this parameter is OFF, no individual setpoints can be assigned as batch steps.	**OFF**√ MANUAL AUTO
(Level 3)		
GROSSSP	Gross Setpoint. The setpoint value will be a gross weight.	XXXXXX Enter value with keyboard.
NET SP	Net Setpoint. The setpoint value will be a net weight.	
+REL SP	Positive Relative Setpoint. The setpoint value will be added to a previous specified setpoint to arrive at this value.	XXXXXX Enter value with keyboard.
-REL SP	Negative Relative Setpoint. The setpoint value will be subtracted from a previous specified setpoint to arrive at this value.	RELNUM (select previous setpoint that this one relates too)
%REL SP	Percentile Relative Setpoint. The setpoint value will be a percentage value of a previous specified setpoint.	**SP 1**√
PAUSE	Pause the batching sequence while the selected action is performed. This choice automatically makes the setpoint part of a valid batching sequence if one has been established.	PSHTARE PSHPRNT ALARM PSHACCM DIGOUT
DELAY	Delay the batching sequence for a specified time (units in 0.1 sec) while the selected action is performed. This choice automatically makes the setpoint part of a valid batching sequence if one has been established.	XXXXXX PSHTARE PSHPRNT ALARM PSHACCM DIGOUT
WAIT SS	Wait Until Standstill (◺◿) is achieved before the selected action is performed. This choice automatically makes the setpoint part of a valid batching sequence if one has been established.	SOURCE, plus the five choices above.
COUNTER	Establishes the number of identical batch sequences to be run. When the specified number of sequences has been run, the sequence will pause until the BATCH START digital input is pushed. This choice automatically makes the setpoint part of a valid batching sequence if one has been established.	Enter number of batches desired. DIGOUT 1-16 **(default matches setpoint #)**
AUTOJOG	Automatically Jog The Previous Operation. This checkweighs the prior NET SP, GROSS SP, or REL SP setpoint operation to be certain its value is true in the standstill condition. If the prior setpoint value is not true in standstill, the prior operation will jog ON for a selected time value period (units in 0.1 sec), or until the prior setpoint value is met. This sequence repeats until the prior setpoint is met in standstill.	XXXXXX Enter Jog Time with keyboard. Select which digital output to use to jog prior operation

6.1 MENU DESCRIPTIONS (CONTINUED)

SETPOINT MENU DESCRIPTIONS (Defaults in BoldType with √)

NAME	DESCRIPTION	CHOICES
The following six setpoints can be used to monitor scale or indicator conditions and activate relays, alarms, etc. when certain conditions occur. These are always continuously running functions.		
(Level 3, cont.)		
COZ	Center of Zero. No value need be set for this setpoint. Anytime the scale is in the center of the zero range, this selection will turn on the digital output associated with this setpoint.	DIGOUT 1-16 **(default matches the setpoint #)** SOURCE
INMOTON	In Motion. No value need be set for this setpoint. Anytime the scale is not in the standstill condition, this selection will turn on the digital output associated with this setpoint.	same as above
INRANGE	In Range. No value need be set for this setpoint. Anytime the scale is within the normal operating range (not over/under loaded), this selection will turn on the digital output associated with this setpoint.	same as above
- GROSS	Negative Gross Weight Reading. No value need be set for this setpoint. Anytime the scale is registering a gross weight less than zero, this selection will turn on the digital output associated with this setpoint.	same as above
- NET	Negative Net Weight Reading. No value need be set for this setpoint. Anytime the scale is registering a net weight less than zero, this selection will turn on the digital output associated with this setpoint.	same as above
BATCHPR	Batch Processing Signal. No value need be set for this setpoint. Anytime a batch sequence is in progress, this selection will turn on the digital output associated with this setpoint.	DIGOUT 1-16 **(default matches the setpoint #)**
(Level 4)		
VALUE	Value. This is the numerical value to be compared against in setpoint types GROSS SP, NET SP, +REL SP, -REL SP, AND %REL SP. If the value is a time unit (AUTOJOG, DELAY) units are in 0.1 second. In the COUNTER setpoint, value is the number of consecutive batches to be run.	XXXXXX Enter value with keyboard.
PSHTARE	Push **TARE** when value is reached. This selection automatically enters the registered weight as a tare, and internally shifts the indicator into processing net weight. The display, however, may remain in gross mode.	**OFF**√ ON
PSHPRNT	Push **PRINT** when value is reached. This selection automatically sends a print command when the setpoint value is reached.	**OFF**√ ON
TRIP	This selects the condition which will trip the setpoint. It can trip when the weight is higher than the setpoint value, lower than the value, within a band established around the value, or outside of that band.	**HIGHER**√ LOWER INBAND OUTBAND

6.1 MENU DESCRIPTIONS (CONTINUED)

SETPOINT MENU DESCRIPTIONS (Defaults in BoldType with √)

NAME	DESCRIPTION	CHOICES
(Level 4, cont.)		
BANDVAL	Bandwidth Value. Usually hidden, if the TRIP parameter is set to either INBAND or OUTBAND, this parameter will appear and offer a way to set the value of the band. A band selected will fall equally ± on both sides of the setpoint value.	XXXXXX Enter total width of band with keyboard.
HYSTER	Hysteresis. This value sets a ± band around the setpoint value that must be exceeded before the setpoint will trip again once it has shut off.	XXXXXX Enter value with keyboard
ALARM	Alarm. This selection will flash an ALARM message on the display screen when the setpoint value is reached.	**OFF**√ ON
PSHACCM	Accumulate. When the setpoint value is reached, this selection will cause that actual value to be totalled in the accumulator register. The operator can access that register for viewing at any time by pressing the **DISP ACCUM** key.	**OFF**√ ON
PREACT	Preact. This allows the setpoint to cut off prior to the original setpoint value to allow for free fall material to settle onto the scale. The ON setting adjusts the setpoint value to that original value minus the PREACT VALUE. The LEARN setting adjusts the value the same way initially, but then adjusts the preact value in the next batch based upon the accuracy of the current preact operation so as to automatically correct for overfill or underfill.	**OFF**√ ON LEARN
PREVAL	Preact Value. This parameter only appears if PREACT is set to ON or LEARN. The value selected adjusts the trip value of the setpoint configured with the PREACT parameter.	XXXXXX Enter value with keyboard
BATCH	Batch Step Enable. When ON, this setpoint is part of any batch sequence established. If OFF, the setpoint remains a continuously running setpoint. This option is available only for the setpoint types which can be either continuous or batch setpoints (GROSS SP, NET SP, +REL SP, -REL SP, %REL SP).	**OFF**√ ON
SOURCE	Source Channel. This selects which input channel (1-4, or TOTAL) the indicator should obtain the reading from. This multi-channel option is available only on the setpoint types which can be either continuous or batch setpoints.	**TOTAL**√ CH1 CH3 CH2 CH4
DIGOUT	Digital Output. This selection specifies the digital output which this setpoint will be assigned to. The default setting is the same as the setpoint number (SP3 = digital output #3).	1 - 4 (Standard) 5-16 (Optional) **Same as SP#**√

6.1 MENU DESCRIPTIONS (CONTINUED)

SERIAL COMMUNICATIONS MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(EDP Port)		
BAUD	EDP Port Baud Rate. Selects the transmission speed for the Electronic Data Processing port.	300 **4800**√ 600 9600 1200 19200 2400
BITS	EDP Port Data Bits and Parity. Selects number of data bits and parity of data transmitted through the Electronic Data Processing port.	**7 ODD**√ 8 NONE 7 EVEN
TERMIN	EDP Port Terminal Characters. Selects how a line of data transmitted through the Electronic Data Processing port will end.	**CR/LF**√ CR
EOL DLY	EDP Port End-of-Line Delay. Sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output. Values are in units of 0.01 second (100 = 1 second).	Enter value with keyboard. Units are in .01 sec divisions; maximum is 225
ADDRESS	EDP Port Address. The number entered will be the designation by which this indicator will be known in an interconnected system using RS-485 communication. Any number between 01 and 255 may be chosen for the address.	Enter address number with keyboard
(Printer Port)		
BAUD	Printer Port Baud Rate. Selects the transmission speed for the Printer serial port.	300 **4800**√ 600 9600 1200 19200 2400
BITS	Printer Port Data Bits and Parity. Selects number of data bits and parity of data transmitted through the Printer port.	**7 ODD**√ 8 NONE 7 EVEN
TERMIN	Printer Port Terminal Characters. Selects how a line of data transmitted through the Printer port will end.	**CR/LF**√ CR
EOL DLY	Printer Port End-of-Line Delay. Sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output. Values are in units of 0.01 second (100 = 1 second).	Enter value with keyboard. Units are in .01 sec divisions; maximum is 225
(Auxiliary Port)		
BAUD	Auxiliary Port Baud Rate. Selects the transmission speed for the Auxiliary serial port.	300 **2400**√ 600 4800 1200 9600
BITS	Auxiliary Port Data Bits and Parity. Selects number of data bits and parity of data transmitted through the Auxiliary port.	**7 ODD**√ 8 NONE 7 EVEN
TERMIN	Auxiliary Port Terminal Characters. Selects how a line of data transmitted through the Auxiliary port will end.	**CR/LF**√ CR

6.1 MENU DESCRIPTIONS (CONTINUED)

SERIAL COMMUNICATIONS MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(Auxiliary Port)		
EOL DLY	Auxiliary Port End-of-Line Delay. Sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output. Values are in units of 0.01 second (100 = 1 second).	Enter value with keyboard. Units are in .01 sec divisions; maximum is 225.
ADDRESS	Auxiliary Port Address. The number entered will be the designation by which this indicator will be known in an interconnected system using RS-485 communication. Any number between 01 and 99 may be chosen for the address.	Enter address number with key-board
STREAM	Selects the serial port that will be used for Continuous transmission	**OFF**√ AUX EDP PRN
PRNDEST	Print Destination. Selects the serial port for data transmission when the PRINT button is pushed, or the PRINT command is sent. Nor-mally, a demand or "dumb" printer would be connected to this port.	**EDP**√ AUX PRN

6.1 MENU DESCRIPTIONS (CONTINUED)

DIGITAL INPUT MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
DIGIN 1	Selects the function that will be activated when the dry-contact closure switch or TTL input device that is connected to Digital Input 1 is pulled low (active). The digital input device can be set to duplicate the function of any one of six front panel keys, or can be set as a "batching start" or "batching run" button in a batching sequence.	**OFF**√ DSPTARE ZERO PRINT TARE BATRUN NT/GRS BATSTRT UNITS
DIGIN 2	Selects the function that will be activated when the dry-contact closure switch or TTL input device that is connected to Digital Input 2 is pulled low (active). The digital input device can be set to duplicate the function of any one of six front panel keys, or can be set as a "batching start" or "batching run" button in a batching sequence.	**OFF**√ DSPTARE ZERO PRINT TARE BATRUN NT/GRS BATSTRT UNITS
DIGIN 3	Selects the function that will be activated when the dry-contact closure switch or TTL input device that is connected to Digital Input 3 is pulled low (active). The digital input device can be set to duplicate the function of any one of six front panel keys, or can be set as a "batching start" or "batching run" button in a batching sequence.	**OFF**√ DSPTARE ZERO PRINT TARE BATRUN NT/GRS BATSTRT UNITS

6.1 MENU DESCRIPTIONS (CONTINUED)

ANALOG OUT MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(ALGOUT 1)		
SOURCE	This specifies the channels which will be used as a source for the analog output. The Gross or Net value of the source channels can also be specified.	**TOT G**√ TOT N CH1 G CH1 N CH2 G CH2 N CH3 G CH3 N CH4 G CH4 N
ZERO	Zero Calibration Value. Enter the zero value via the keyboard. For complete instructions on analog calibration, see the Analog Output instruction sheet available when this option is ordered.	XXXXX Enter value via the keyboard.
SPAN	Span Value. Enter span value via the keyboard. For complete instructions on analog calibration, see the Analog Output instruction sheet available when this option is ordered.	XXXXX Enter value via the keyboard.
(ALGOUT 2)		
SOURCE	This specifies the channels which will be used as a source for the analog output. The Gross of Net value of the source channels can also be specified.	**TOT G**√ TOT N CH1 G CH1 N CH2 G CH2 N CH3 G CH3 N CH4 G CH4 N
ZERO	Zero Calibration Value. Enter the zero value via the keyboard. For complete instructions on analog calibration, see the Analog Output instruction sheet available when this option is ordered.	XXXXX Enter value via the keyboard.
SPAN	Span Value. Enter span value via the keyboard. For complete instructions on analog calibration, see the Analog Output instruction sheet available when this option is ordered.	XXXXX Enter value via the keyboard.

6.1 MENU DESCRIPTIONS (CONTINUED)

BAR GRAPH MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
OFF	The bar graph is turned off.	**OFF**√ TWINKL GRAPH
TWINKL	The TWINKL mode allows active setpoints to light up bar graph segments, allowing the operator to visually monitor the currently active setpoints. The 48 bar graph segments are divided into 16 equal 3-segment sections, and each section is assigned to one of the 16 setpoints. SP1 is assigned the three segments on the far left of the graph, SP2 lights the next three segments, and so on until SP16 lights the three segments on the far right. Both continuous and batch type setpoints light the bar graph sections, but in different ways. Continuous type setpoints are constantly scanned by the indicator, and so the bar graph sections for these setpoints are constantly updated (depending on the setting) in the TWINKL mode. Batch type setpoints are scanned only while active and until tripping, then are off for the remainder of the batch sequence. Therefore, batch setpoints only light up their 3-segment graph sections when the batch setpoints are in progress, or "hot". Once the batch setpoint is tripped, the light section goes off, and the next section alights while that setpoint is "hot". A third manner in which the bar graph displays setpoints is during a check or modification of setpoint values using the SETPOINT key on the front panel while the indicator is in the normal weighing mode. If the **SETPOINT** key is pressed, SP 1 will appear on the display, and the first three leftmost bar graph segments will light. After 1 second, the display will shift to show the current value of that setpoint, and the middle segment of the three active segments on the bar graph will blink, indicating that the value can now be modified via the keyboard. If no changes are necessary, press **SETPOINT** again to see the SP 2 value, and so on. This function is also available in the GRAPH mode.	**OFF**√ TWINKL GRAPH
GRAPH	The GRAPH mode allows the operator to monitor increasing or decreasing weight value of a selected setpoint as, for example, during a filling operation. A band is established (see BAND menu description on following page) around the setpoint value. Each of the 48 bar graph segments is approximately equal to 2% of the band value. The graph lights when the weight is within this band. When the band width is established around the value for the setpoint, the graph will begin to light from the left at the bottom of the band as weight increases. At the selected setpoint value, the graph will be totally lit. As the setpoint value is exceeded, graph segments go off from the left until all segments are off at the top of the band.	**OFF**√ TWINKL GRAPH

6.1 MENU DESCRIPTIONS (CONTINUED)

BAR GRAPH MENU DESCRIPTIONS (Defaults in Bold Type with √)

NAME	DESCRIPTION	CHOICES
(GRAPH)		
SP REF	When set in the GRAPH mode, this selects the setpoint number that the bar graph will monitor.	**SP1**√ -- SP16
BAND	This establishes the band width around the setpoint value. Half of the total band value selected will fall below the setpoint value, and half will fall above the value. For example: if a setpoint value is established at 1,000 LB gross weight, and the BAND is set at 100, then the graph will begin to light (left to right) at 900. It will be totally lit at 1000. Increasing weight beyond 1000 will cause graph segments to go off (left to right) until all segments are off at 1100.	**100**√ Enter band width value via keyboard

7. SETPOINT AND BATCH PROCESSING

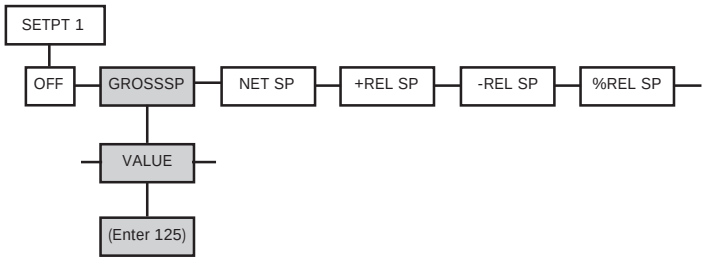
The IQplus 810 system contains 16 assignable setpoints that can be selected to function as either continuous-type (free-running) setpoints, or batch-type (sequential-step) setpoints.

1) **Continuous-type setpoints** are the type common to many digital indicators--if a setpoint is turned on, the indicator's Central Processing Unit (CPU) is continuously updating it 20 times per second during weighing. If the scale's weight value meets the particular setpoint value, the setpoint's assigned digital output "trips" ON to a logic-low voltage condition.
2) **Batch-type setpoints** are essentially individual steps in a batch-processing routine. They are active one at a time in an ordered sequence. The IQplus 810 can be set to perform many batch-processing type functions without the use of the usual digital outputs or relays. Therefore, all batch-type setpoints do not necessarily need to be attached to a digital output. If all 16 setpoints were assigned as batch steps, an ordered batching process with 16 separate operations could be established. Each step would be ON (logic-low voltage) only during the active time of its order in the consecutive routine, then would go OFF and the next step would become active.

CONTINUOUS SETPOINTS WITH ASSOCIATED NUMERICAL VALUE

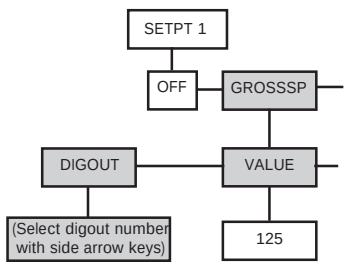
For many of the setpoints that are continuous-type setpoints, a numerical setpoint value can also be assigned. The indicator will then compare that assigned value to the actual weight once during each A/D conversion (20/sec). In other words, setpoint processing is occurring continuously for all continuous-type setpoints. Anytime the assigned numerical value for a continuous setpoint is met, the assigned digital output for that setpoint will trip. The following continuous setpoint types shown in gray can have an assigned numerical value:

Once the setpoint type is selected (GROSSSP, NET SP, etc.), a numerical value may be set by scrolling down beneath the setpoint type to the next level in the setup menu. In that level, the first menu prompt arrived at will be VALUE. Scroll down once again, and enter the desired numerical value with the keyboard. Press ENTER, then scroll back up to VALUE prompt. Below is an example of setting Gross Weight (GROSSSP) as the setpoint type and 125 as the numerical value for Setpoint 1.

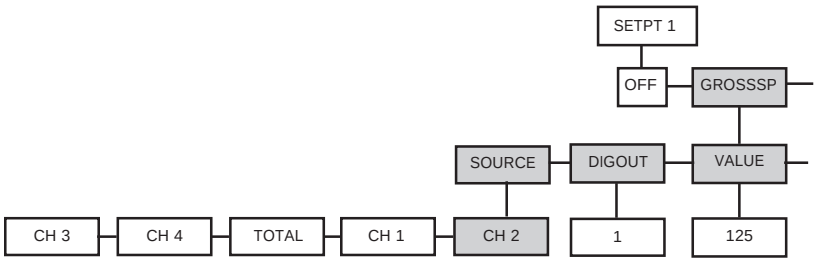


NOTE: The system must be in Setup Mode in order to select the type of setpoint. Once the *type* of continuous setpoint is established, the setpoint *value* may then be assigned or altered in either Normal Weighing or Setup Modes. In Setup Mode, a value is entered with the keyboard as shown at left. In Normal Weighing Mode, a value can be set or changed using the SETPOINT key and keyboard entry as described in Section 2 of this manual.

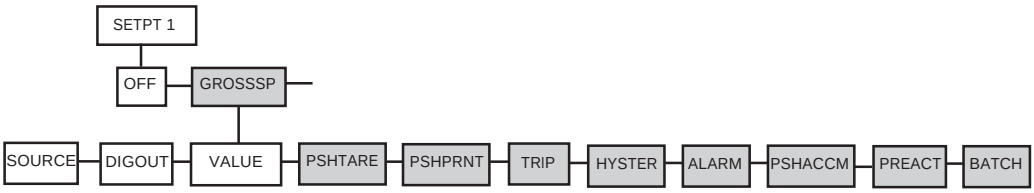
Each setpoint can have an assignable digital output (1 - 16, or NONE). The default digital output for each setpoint is the same number as the setpoint (e.g., setpoint 3 has digital output 3 assigned). If multiple setpoints are connected to a single digital output, any one of the setpoints that is met will trip the output (the logical "OR" condition). The assigned digital output for a setpoint can be changed by scrolling left from the VALUE prompt to DIGOUT; scroll down and display the digital output number desired; scroll back up to lock in the choice.



Each setpoint also has an assignable input channel selection, named SOURCE in the menus. The SOURCE prompt is on the same level as DIGOUT, and immediately to the left. Here the setpoint can be assigned to any of four scale channels (CH1 - CH4), or to the total of all channels (TOTAL). It is important to note that all setpoint processing is independent of the display. For example, a 125 LB Gross Weight setpoint assigned to input channel 2 will trip whenever channel 2 has gross weight of 125 LB of greater, whether or not channel 2 is displayed.

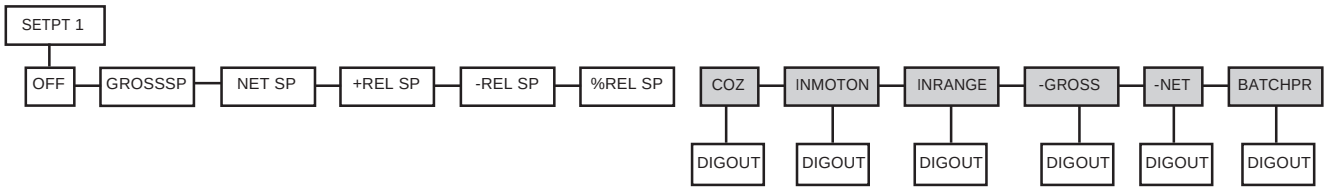


Once these four major parameters (type, value, digital output, and source) are established for a continuous setpoint, there may be other minor parameters you want to add to the setpoint. Those options are found on the same level, and to the right of the VALUE prompt. They are shown below in gray, and are briefly explained in the graphic on page 7.1, and explained in detail in the "Setpoints Types" section that follows this section.

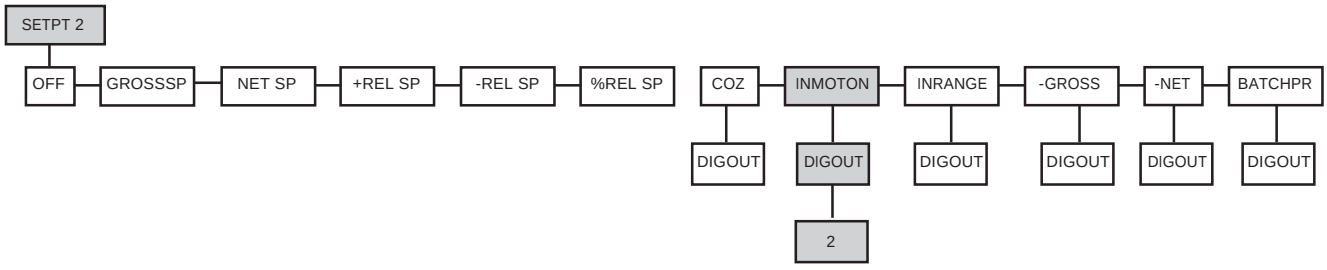


CONTINUOUS SETPOINTS WITHOUT ASSIGNED VALUE

You will notice in the graphic on page 7.1 that several types of continuous setpoints cannot be assigned a numerical value, but only a digital output. Those setpoint types are shown below in gray. These are specialized functions to indicate a scale condition, and the setpoint digital output is ON when a pre-set condition is met.

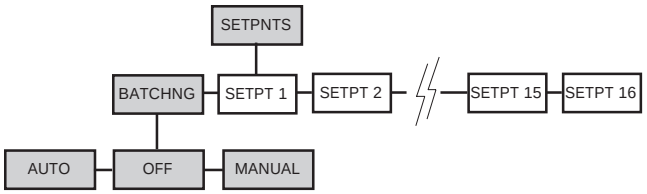


For instance, a digital output wired to turn on a warning light whenever a scale is in motion may be desired. In the setup example below, the light should be connected to digital output 2. Setpoint 2 would be ON anytime the scale was in motion, and Digital Output 2 would control the light.



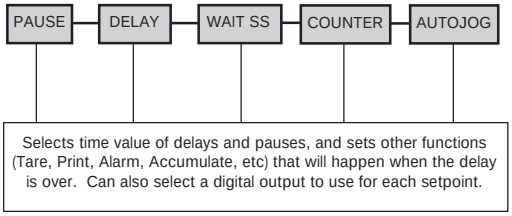
BATCH STEP SETPOINTS

The system has a global setup parameter, BATCHNG, which enables a batch sequence to be run manually or automatically by using selected setpoints as batch steps. This parameter is found in the 1st level SETPNT menu immediately to the left of SETPT 1. This parameter must first be set to MANUAL or AUTO before any setpoints can be individually assigned as batch steps in a processing operation.



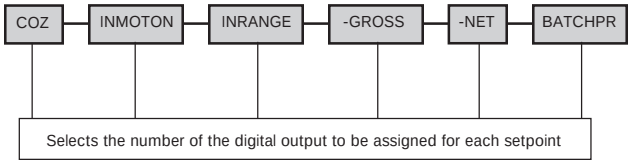
Once the global setup parameter has been enabled for batching as shown above, individual setpoints can be configured and assigned as steps in the batching routine. When selecting setpoint types for batching steps, use the following guide in designing a batching routine:

1. The setpoint types PAUSE, DELAY, WAIT SS, COUNTER, and AUTOJOG are dedicated batch-type setpoints, and will automatically be included as part of a batching sequence if selected, and the global batching parameter is enabled.

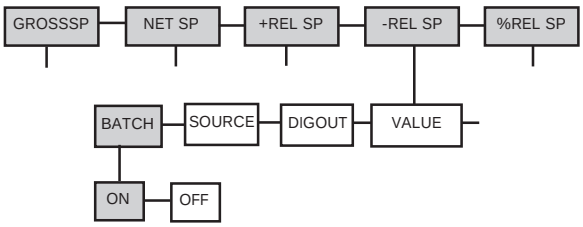


NOTE: For detailed descriptions of these and other setpoint types, see the "Setpoint Types" section which follows this section.

2. The setpoint types COZ, INMOTION, INRANGE, -GROSS, -NET, and BATCHPR indicate scale conditions only and would have no useful function in a batching sequence. These setpoint types are "continuous-type-only" and cannot be included as steps in a batching sequence.



3. The setpoint types GROSSSP, NET SP, +REL SP, -REL SP, and %REL SP can be assigned as steps in a batching sequence, but each such setpoint must be individually assigned to the batch sequence. These five types of setpoints are individually assigned as a batch step by turning their BATCH parameters to ON. The BATCH parameter is found on the same level as VALUE and three places to the left.



Setpoints which have enabled, but not been assigned as a batch step with either of the above two methods, will be continuously running during the batch sequence. If a digital output has been assigned to a setpoint that is a batch step, the digital output is turned on (active low) while the batch step is active, and turned off when the setpoint is satisfied, and control passes to the next batch step on the next A/D cycle. When the last batch step setpoint is satisfied, the system either stops and waits for the start signal (if BATCHNG is set to MANUAL), or it automatically restarts at the first batch step setpoint (if BATCHNG is set to AUTOMATIC).

In addition to assigning setpoints as batch steps, two digital inputs (BATRUN, and BATSTRT) must be connected to a set of batching switches. An optional Batching Switch Kit is available for that purpose.

NOTE: Continuous or batch step setpoints operate independently from the display. For instance, if the display is in GROSS mode, a PUSH TARE batch step will not change the display to NET weight, but the indicator will internally process net weight for the batch. Similarly, a setpoint batch step command to switch to a different input source channel will make the switch internally, but the display will remain on the manually-selected channel.

SETPOINT TYPES

OFF This setpoint is ignored--it is turned off. This is the default for all setpoints.

THE FOLLOWING SETPOINT TYPES MAY BE EITHER CONTINUOUS OR BATCH STEP:

GROSS SP The current Gross reading is compared to the setpoint VALUE.

NET SP The current Net reading is compared to the setpoint VALUE.

+RELATIVE SP The current Gross reading is + relative compared to a previous specified setpoint VALUE. For example, if Setpoint 1 has a VALUE of 200, and the +rel setpoint has a VALUE of 10 and references Setpoint #1, the trip value would be 210 (Gross or Net depending on the setpoint referenced).

-RELATIVE SP The current Gross reading is - relative compared to a previous specified setpoint VALUE. For example, if Setpoint 1 has a VALUE of 200, and the -rel setpoint has a VALUE of 10 and references Setpoint #1, the trip value would be 190 (Gross or Net depending on the setpoint referenced).

%RELATIVE SP The current Gross reading is % relative compared to a previous specified setpoint VALUE. For example, if Setpoint 1 has a VALUE of 200, and the %rel setpoint has a VALUE of 10 and references Setpoint #1, the trip value would be 20. If the % VALUE is 120, then the trip value would be 240 (Gross or Net depending on the setpoint referenced).

THE FOLLOWING SETPOINT TYPES MAY ONLY BE BATCH TYPE SETPOINTS:

PAUSE The Batch sequence is paused. A message is displayed for the operator. A digital input START activated by the operator is necessary to proceed. Note that this will wait indefinitely if the START is never activated.

DELAY The Batch sequence is delayed for a specified time. The setpoint VALUE is the delay time in 10ths of a second.

STANDSTILL WAIT The Batch sequence will pause until the scale is at standstill (not in motion).

COUNTER Specifies the number of identical batch sequences to perform. When the number of batches has been run, the batch sequence is paused until the operator activates the START digital input. Typically only one batch counter would be placed as the first step in an AUTOMATIC batch sequence.

AUTOJOG Autojog loops back to the previous setpoint to verify that it has been met in the Standstill condition. If the previous setpoint is not currently met in Standstill, it will turn back on (jog) until it is met, or until the time-out value set in Autojog passes. If time-out happened, the process will repeat itself until the previous setpoint is finally met.

An example would be a fast-speed hopper filling operation to a predetermined weight. The first fill attempt may trip the setpoint early because the momentum of material falling into the hopper gives a weight reading higher than actual. If the next setpoint is Autojog, the indicator will go back to the previous (fill) setpoint, wait for Standstill, then verify the weight against the setpoint value for the fill. If not met, the fill hopper will jog open for a set time, or until the weight is met. The looping back will repeat until the Standstill weight of the fill meets the setpoint value. When met, the batch sequence will move to the next batch step.

THE FOLLOWING CONTINUOUS SETPOINT TYPES CANNOT BE USED AS BATCH STEPS :

CENTER OF ZERO This setpoint trips its assigned digital output on when the scale is at Center of Zero.

IN MOTION This setpoint trips its assigned digital output on when any scale is in motion.

IN RANGE This setpoint trips its assigned digital output on when the scale is within the capacity range

NEGATIVE GROSS This setpoint trips its assigned digital output on when the Gross weight is negative.

NEGATIVE NET This setpoint trips its assigned digital output on when the Net weight is negative.

BATCH PROCESSING This setpoint trips its assigned digital output on when a batch sequence is running.

THE OPTIONS AND PARAMETERS AVAILABLE FOR SETPOINTS VARY BASED ON THE TYPE OF SETPOINT. ONLY THE FOLLOWING PARAMETERS THAT WOULD LOGICALLY BE USED WITH EACH TYPE OF SETPOINT ARE AVAILABLE IN SETUP MODE.

VALUE This is the setpoint value. For types GROSS SP, NET SP, +RELATIVE SP, -RELATIVE SP, and %RELATIVE SP, it is the NUMERICAL value to be compared against. The type AUTOJOG uses the VALUE as the number of 10ths of a second to use as a timeout in the autojog procedure. The DELAY type uses the VALUE as the number of 10ths of a second to delay. The COUNTER uses VALUE as a count down indicator for the number of consecutive batches to run. All other types of setpoints do not use VALUE.

REL SETPOINT NUM This is used to indicate what setpoint value this setpoint is relative to. Only setpoint numbers lower than the current setpoint number can be referenced. The only types that have this parameter are +REL SP, -REL SP, and %REL SP.

TARE If ON, this will cause an automatic push of the TARE key when the setpoint is tripped. This option is available on setpoint types GROSS SP, NET SP, +REL SP, -REL SP, %REL SP, PAUSE, DELAY, and WAIT FOR STANDSTILL. **NOTE: If the indicator display is in GROSS mode, the display will remain in GROSS mode, but the indicator will internally process the NET value as requested by the setpoint command. To display the NET value, the operator can press the G/N key to toggle the display to the NET mode.**

PRINT If ON, this will cause an automatic push of the PRINT key when the setpoint trips. This option is available on setpoint types GROSS SP, NET SP, +REL SP, -REL SP, %REL SP, PAUSE, DELAY, and WAIT SS.

TRIP This indicates that the setpoint should trip whenever the weight on the scale is:

•Higher than the setpoint VALUE (HIGHER);

•Lower than the setpoint VALUE (LOWER);

• (INBAND) Within the bandwidth (BANDVAL) set around the setpoint VALUE;

• (OUTBAND) Outside the bandwidth (BANDVAL) set around the setpoint VALUE.

•This option is available on setpoint types GROSSSP, NET SP, +REL SP, -REL SP, and %REL SP. INBAND and OUTBAND are available only when these setpoint types are used

as continuous-type setpoints.

BAND VALUE This parameter is normally hidden and only available if the TRIP option is set to INBAND or OUTBAND. The parameter then appears directly to the right of TRIP on the same level in the setup menu. It is the total ±value for the bandwidth and is centered around the setpoint numerical value.

ALARM If ON, this will cause the ALARM message to flash on the display as long as the setpoint is tripped (the setpoint must be a continuous type). This option is available on setpoint types GROSS SP, NET SP, +REL SP, -REL SP, and %REL SP.

ACCUMULATE If this optional function is purchased and turned ON, it allows the weight value when the setpoint is tripped, to be added to the total in the accumulator register. If the setpoint is part of a batching sequence, the totals will accumulate throughout the batch. The accumulate register can be viewed at any time by the operator pressing the **DISP ACCUM** key on the front panel.

PREACT If OFF, no preact calculation will occur on this setpoint. If set to ON, the PREACT VALUE is used to adjust the trip value. The trip value is the original setpoint value minus the preact value. If set to the auto-correcting mode, LEARN, the PREACT VALUE is used in the same way as the ON state. However, the PREACT VALUE is automatically re-calculated for each setpoint cycle. LEARN reads the last batch sequence preact operation for overweight or underweight and adjusts the current value accordingly. Note this calculation assumes that the input value is changing at a relatively constant rate. This option is available on setpoint types GROSSSP, NET SP, +REL SP, - REL SP, and %REL SP.

PREACT VALUE This parameter is normally hidden and only visible in the menu chart when PREACT is set to ON, or LEARN. The parameter appears directly to the right of PREACT and on the same level. This value is used to adjust the setpoint value if PREACT is ON or LEARN.

BATCH When this is set to ON, the setpoint is a step in any batch sequence that has been enabled. Batch step setpoints act as consecutive operations in a program. If this parameter is set to OFF for a setpoint, the setpoint remains a continuously running setpoint. This option is available on setpoint types which can be either continuous or batch step types (GROSSSP, NET SP, +REL SP, -REL SP, and %REL SP).

DIGOUT Digital Output. This selects the number of the digital output that will trip when the setpoint is satisfied. It may be set to NONE if no output is desired. This parameter is available on all setpoint types. If more than one setpoint references the same digital output, the digital output will be tripped by any of the referenced setpoint outputs.

SOURCE This selects which input channel (1 - 4, or TOTAL) the setpoint processor should obtain the reading from. This option is available on setpoint types GROSS SP, NET SP, +REL SP, - REL SP, and %REL SP. **NOTE: The display will remain on the original channel, but the indicator will internally make the channel switch and process the information from the selected channel.**

The following pages contain setpoint worksheets to assist the installer in establishing a setpoint operation or planning a batching routine.

SETPOINT WORKSHEET--CONTINUOUS RUNNING SETPOINTS

SP #	SETPOINT TYPE	VALUE ASSIGNED	OTHER FUNCTIONS ASSIGNED	DIGITAL OUPUT
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

CONTINUOUS OR BATCH TYPE SETPOINTS

OFF	+ REL SP
GROSSP	- REL SP
NET SP	% REL SP

CONTINUOUS TYPE SETPOINTS

COZ	- GROSS
INMOTON	- NET
INRANGE	BATCHPR

SETPOINT WORKSHEET--BATCH SEQUENTIAL SETPOINTS

SP #	SETPOINT TYPE	VALUE ASSIGNED	OTHER FUNCTIONS ASSIGNED	DIGITAL OUTPUT #
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

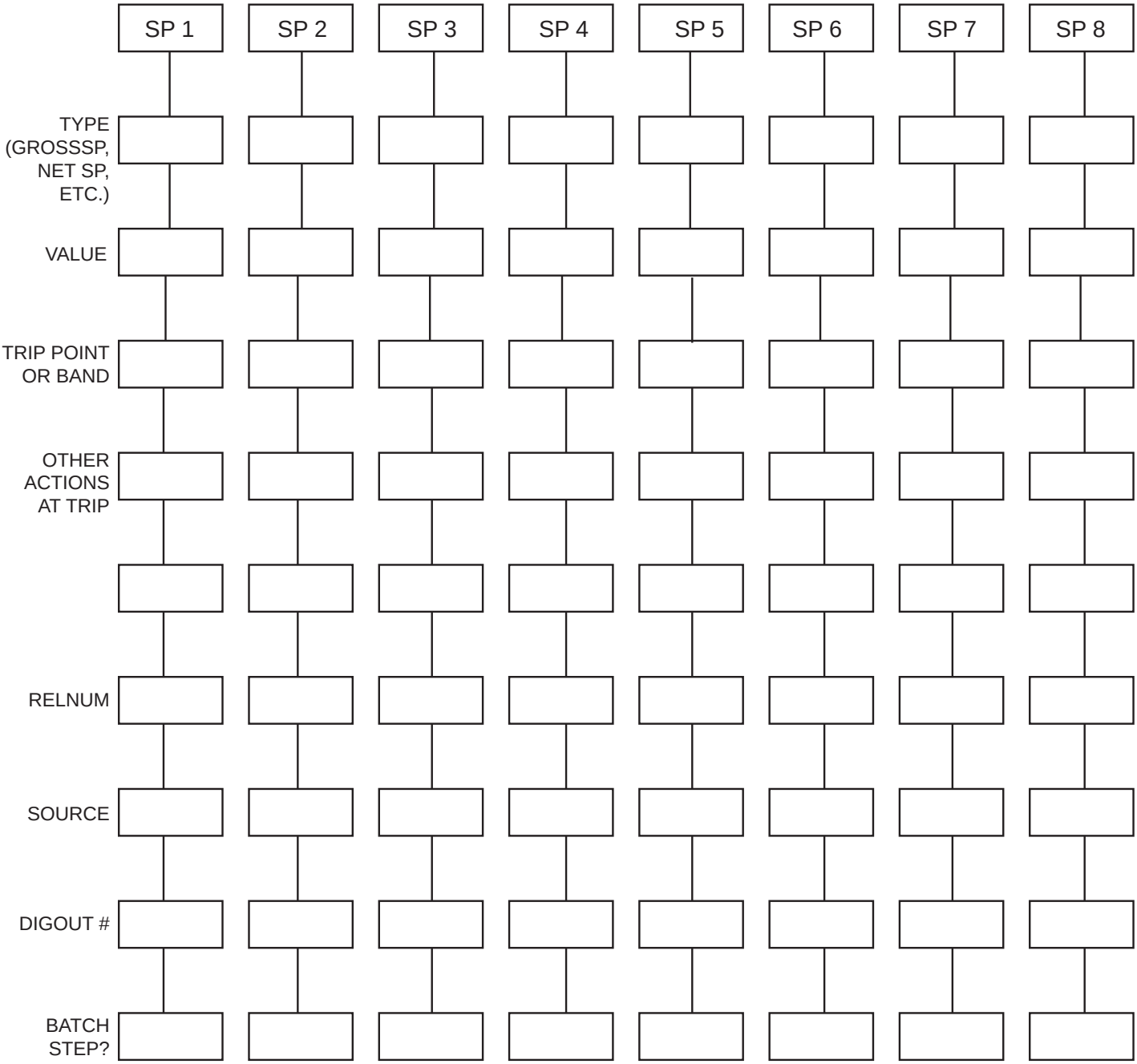
CONTINUOUS OR BATCH TYPE SETPOINTS

OFF	+ REL SP
GROSSP	- REL SP
NET SP	% REL SP

BATCH TYPE SETPOINTS

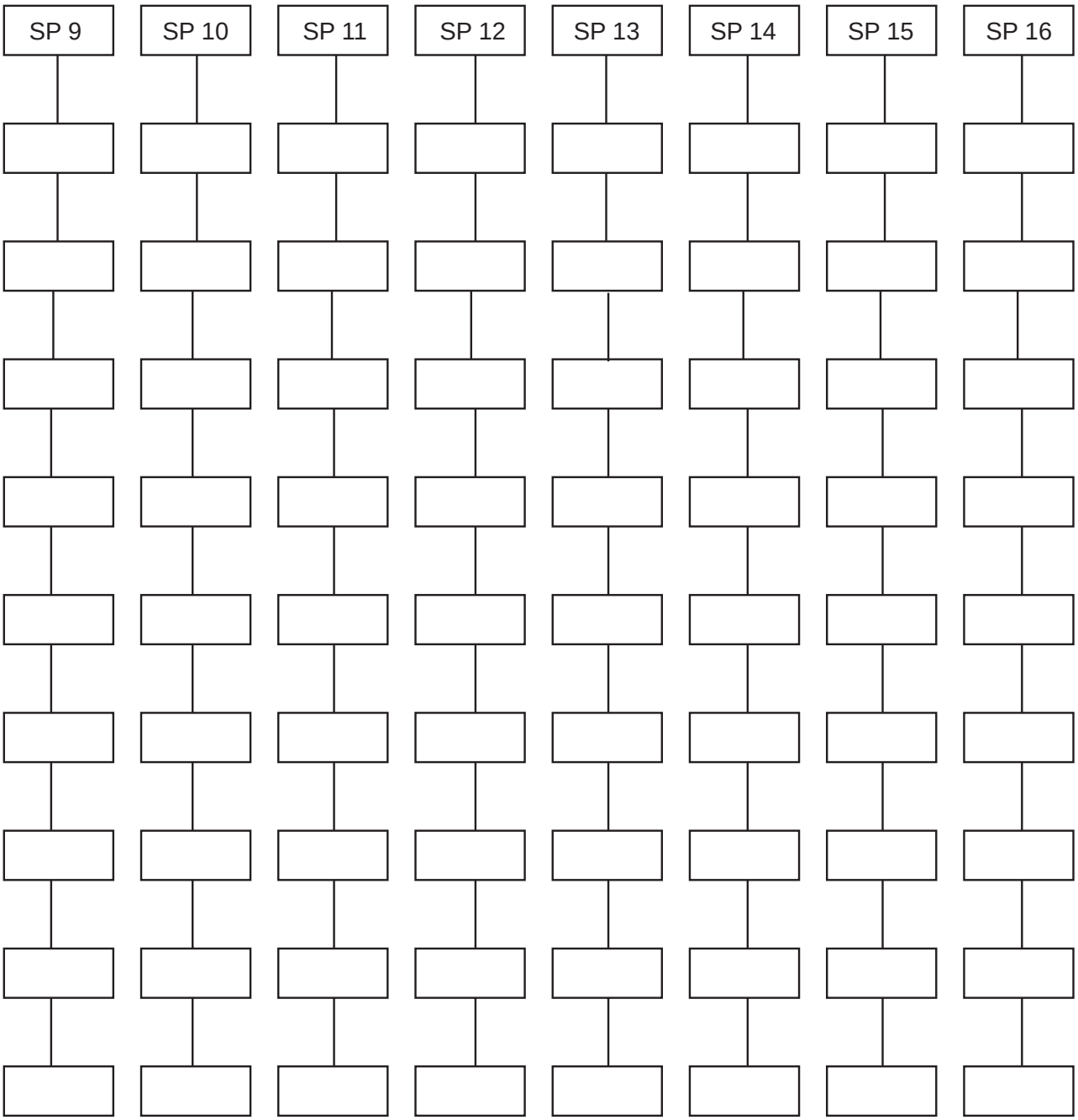
PAUSE	COUNTER
DELAY	AUTOJOG
WAIT SS	

BATCHING WORKSHEET



BATCH STEP SEQUENCE

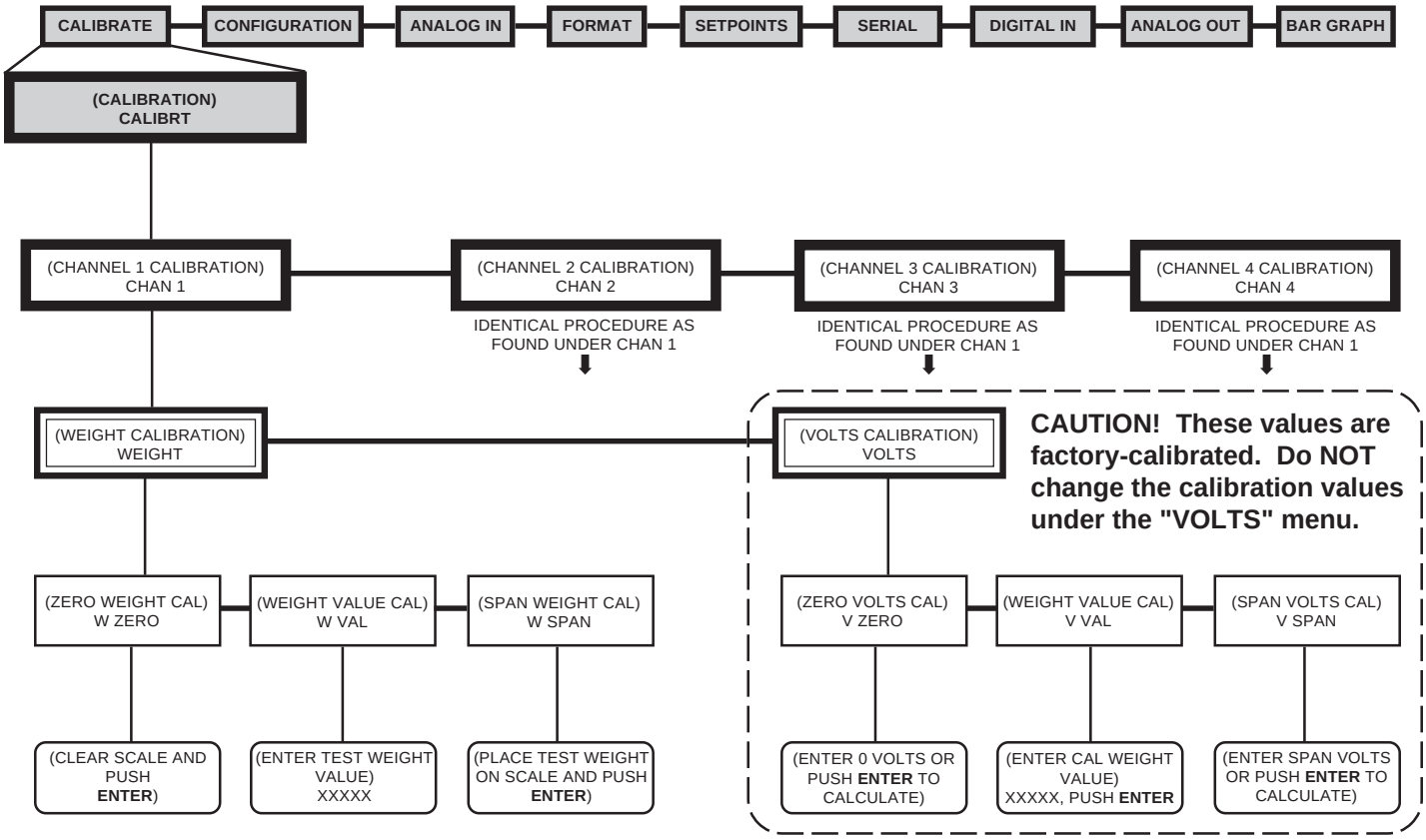
BATCH RUN	BATCH START								
DIGITAL INPUT #	DIGITAL INPUT #								



NUMBER OF BATCHES

COUNTER

8. CALIBRATION



The IQplus 810 features factory voltage-calibration of the main board and A/D module combination. The board and module are then shipped as a calibrated unit, with the voltage calibration constants stored within, and accessible under V ZERO, V VAL, and V SPAN under the VOLTS Calibration menu. This factory voltage calibration ensures that all IQplus 810's read MV/V signals identically, so complete units are interchangeable in the field.

The only field calibration necessary is a standard weight calibration to match the particular scale to the IQplus 810 MV/V standard. The weight calibration values resulting (W ZERO, W VAL, and W SPAN) are then stored within the unit, and accessible under those headings in the Calibration menu. These are the three number constants that match this, or any, IQplus 810, to the particular scale's weighing characteristics. Of course, if multiple scales are used with the IQplus 810, a separate weight calibration will be necessary for each channel, and each channel will have its own three weight calibration constants.

During the weight calibration procedure, the three values for each channel (W ZERO, W VAL, and W SPAN) should be recorded on the appropriate chart on the following page, or on the first page of this manual. Those values can then be used when replacing IQplus 810 units--without the need for any recalibration with test weights.

The three values for the voltage calibration (V ZERO, V VAL, and V SPAN) should also be recorded on the charts.

NOTE: W ZERO is calculated as [x + 10] ÷ 10, where *x = the input signal (in millivolts) when the indicator is at zero*. For example, if the input is 2.01456 mV at zero, W ZERO = [2.01456 + 10] ÷ 10 = **1.201456**. W SPAN is calculated as 10,000 ÷ y, where *y = the input signal change (in millivolts)*. Following the previous example, if the span is 32.035688 mV, then W SPAN = 10,000 ÷ [32.035688 – 2.01456] = **333.09874**.

IQplus 810 WEIGHT CALIBRATION PROCEDURE:

1. Put the unit into the SETUP MODE by sliding the setup switch on the main board to the right. Use the left directional arrow key (SETPOINT) to scroll left in the first level menu until "CALIBRT" is displayed.

2. Press the down arrow key (TIME/DATE) to display "CHAN 1". Press again to display "WEIGHT". Press again to display "W ZERO". If "W VAL" or "W SPAN" is displayed, scroll sideways until "W ZERO" is displayed. Remove all load from scale and allow time for the scale to settle.

3. Press the down arrow key again to display the current default setting. Press (ENTER) and wait until a value reappears on the display. This value is now the calibrated "W ZERO" number which should be added to the chart at right for CHANNEL 1. Note that this number is a numerical constant, not a weight value.

IQplus 810	WEIGHT CALIBRATION VALUES		
	W ZERO	W VAL	W SPAN
CHANNEL 1			
CHANNEL 2			
CHANNEL 3			
CHANNEL 4			

4. Scroll up once to return to "W ZERO". Scroll right once to "W VAL". Scroll down once to the current default setting. Key in the numerical value of the test weight you will use. Press (ENTER). This value is now the calibrated "W VAL" number which should be added to the Weight Calibration Values chart for CHANNEL 1.

5. Scroll up once to return to "W VAL". Scroll right once to "W SPAN". Scroll down once to display the current default setting. Place the test weight on the scale and allow to settle. Press (ENTER) and wait until a value reappears on the display. This value is now the calibrated "W SPAN" number which should be added to the Weight Calibration Values chart for CHANNEL 1. Note that this number is not the value of your test weight, but a calibration number representing that weight. Remove the test weight.

6. Repeat the above steps for channels 2-4 if necessary.

7. It is possible to replace an A/D converter in the field without losing calibration. The original voltage calibration constants must be known to do a field swap of A/D converters while retaining calibration. Therefore, you may want to record those constants now on the chart at right, and on the first page of the manual. Scroll into the VOLTS menu and copy the figures under the appropriate heading in the Volts Calibration Values chart.
CAUTION: DO NOT CHANGE ANY OF THE VALUES UNDER THE VOLTS MENU. Contact an authorized IQplus 810 Service Technician for assistance with replacement of a defective A/D converter.

IQplus 810	VOLTS CALIBRATION VALUES		
	V ZERO	V VAL	V SPAN
CHANNEL 1			
CHANNEL 2			
CHANNEL 3			
CHANNEL 4			

7. When weight calibration is completed and all numbers recorded, scroll upward four times to exit to the first level "CALIBRT" display.

8. Slide the setup switch back to the previous position to exit SETUP MODE and return to NORMAL WEIGHING MODE.

9. REMOTE OPERATION VIA EDP SERIAL PORT

The IQplus 810 can be configured, calibrated, and even operated from a remote keyboard or computer communicating in RS-232 and feeding into the Electronic Data Processing (EDP) serial port of the indicator. Coded commands are keyed into the remote keyboard then entered using the ENTER key on the keyboard or computer.

9.1 OPERATING COMMANDS

COMMANDS THAT DUPLICATE PRESSING A KEY (K)	
K0	KSETPOINT
K1	KBASE
K2	KTOTAL
K3	KZERO
K4	KTARE
K5	KUNITS
K6	KPRIM
K7	KSEC
K8	KDISPTARE
K9	KDISPACCUM
KDOT	KDISPROC
KENTER	KTIMEDATE
KNET	KDATE
KGROSS	KTIME
KGROSSNET	KLEFTARROW (Must be in Setup Mode)
KCLR	KRIGHTARROW (Must be in Setup Mode)
KPRINT	KUPARROW (Must be in Setup Mode)
KNEWID	KDOWNARROW (Must be in Setup Mode)

Example: entering a 15 lb tare weight via the EDP port:

Type K1, press ENTER
Type K5, press ENTER
Type KTARE, press ENTER on keyboard.

The IQplus 810 display will show a TE (Tare Entered by keyboard) in a lighted rhombus, and the weight display will shift to NET mode.

SETUP PARAMETERS WHICH CAN BE CHANGED WHILE IN OPERATING MODE
All parameters in the SETPOINT sub-menu
STREAM
PRNDEST
DIGIN 1
DIGIN 2
DIGEN 3
BARGRF
BARREF
BARBAND

The setup parameters above can be changed by EDP command while in the Operating Mode. Type in the exact command for the parameter, followed by = and the choice or value for that parameter. Pess ENTER key on the keyboard. Do not add spaces when typing commands. Exact commands for all parameters and values begin on the nex page.

Example: Setting Digital Input 3 to send a Print command:

Type DIGIN3=PRINT Press ENTER key on keyboard.

SPECIAL-PURPOSE COMMANDS:

DUMPALL (Print copy of entire menu chart, listing current parameter defaults)

RESETCONFIGURATION (Restore factory-settings for parameter defaults.) Accepted only in SETUP mode, but effective only after leaving SETUP mode. **CAUTION: This command also eliminates both weight and voltage calibration figures that make the IQplus 810 field-interchangeable.**

9.2 CONFIGURATION COMMANDS

Configuring the IQplus 810 from a remote keyboard is possible by first placing the unit in SETUP mode, then typing the command for each parameter, followed by = and the choice or value for that parameter. Do not add spaces when typing commands.

Example: Setting Motion Band Parameter to 5.

Type MOTBAND=5. Press ENTER key on keyboard.

To view the choices available for any parameter, type a query in the form of the command followed by =? and press ENTER.

Example: Viewing available choices for the Peakhold parameter

Type PKHOLD=? Press ENTER.

To change the value of a parameter while in the SETUP mode, enter the parameter command followed by = and the choice or value for that parameter. Note that if an incorrect command is attempted, the screen will show "?Unknown Command". Also note that any changes made are not effective until the unit is taken out of the SETUP mode.

Example: Changing Truck IN/OUT Program to Mode 5

Type TARE200=MODE5. Press ENTER on keyboard.

The following charts give the parameter commands followed by the available choices for each parameter. Commands and choices must be entered exactly as they appear in the charts, separated by a = sign with no spaces around the = sign. When the choice calls for a Number, the value should be entered using the 10-key numerical commands as shown on the previous page.

CONFIGURATION SUB-MENU

GRADS1	Number
GRADS2	Number
GRADS3	Number
GRADS4	Number
ZTRKBND	OFF, 0.5, 1, 3
ZRANGE	1.9%, 100%
MOTBAND	1, 3, 5, 10
OVRLOAD	FS, FS+2%, FS+1D, FS+9D
PWRUPMD	GO, DELAY
TARE200	OFF, MODE1, MODE2, MODE3, MODE4, MODE5, MODE6
PKHOLD	OFF, NORMAL, BI-DIR, AUTO
GONLY	OFF, ON

SET ANALOG SUB-MENU

CHANS	1, 12, 13, 134, 1234, 1FAST
PULSIN	OFF, P1>CH3, P>CH3+4
RESOLUT	STANDRD, HIGH
FREQ	60HZ, 50HZ
ALGFLTR	OFF, 2HZ, 8HZ
DIGFLTR	1, 2, 4, 8, 16, 32, 64, 128, 4RT, 8RT, 16RT, 32RT, 64RT, 128RT

FORMAT SUB-MENU

PRI.DSPDIV	1, 2, 5
SEC.DSPDIV	1, 2, 5
ROC.DSPDIV	1, 2, 5
PRI.DECPNT	8888800, 8888880, 8888888, 888888.8, 88888.88, 8888.888, 888.8888, 88.88888, 8.888888
SEC.DECPNT	8888800, 8888880, 8888888, 888888.8, 88888.88, 8888.888, 888.8888, 88.88888, 8.888888
ROC.DECPNT	8888800, 8888880, 8888888, 888888.8, 88888.88, 8888.888, 888.8888, 88.88888, 8.888888
PRI.UNITS	LB, KG, OZ, TN, GR,
SEC.UNITS	LB, KG, OZ, TN, GR,
ROC.UNITS	LB, KG, OZ, TN, GR,
SEC.MULT	Number
ROC.MULT	Number
DATEFMT	MMDDYY, DDMMYY
DATESEP	SLASH, DASH, SEMI
TIMEFMT	12HOUR, 24HOUR
TIMESEP	COLON, COMMA

SETPOINTS SUB-MENU

BATCHING	OFF, MANUAL, AUTO
SETPOINT	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

NOTE: The setpoint number must be set prior to choosing subsequent commands that follow for that setpoint.

KIND	OFF, GROSSP, NETSP, +RELSP, -RELSP, %RELSP, PAUSE, DELAY, WAITSS, COUNTER, AUTOJOG, COZ, INMOTON, INRANGE, -GROSS, -NET, BATCHPR
VALUE	Number
BANDVAL	Number
HYSTER	Number
SOURCE	TOTAL, CH1, CH2, CH3, CH4
RELNUM	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
PSHTARE	OFF,ON
PSHPRINT	OFF, ON
ALARM	OFF, ON
PSHACCUM	OFF, ON
TRIP	HIGHER, LOWER, INBAND, OUTBAND
PREACT	OFF, ON, LEARN
PREVAL	Number
BATCH	OFF, ON
DIGOUT	NONE, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

SERIAL SUB-MENU

EDP.BAUD	19200, 9600, 4800, 2400, 1200, 600, 300
PRN.BAUD	19200, 9600, 4800, 2400, 1200, 600, 300
AUX.BAUD	9600, 4800, 2400, 1200, 600, 300
EDP. BITS	8NONE, 7EVEN, 7ODD
PRN. BITS	8NONE, 7EVEN, 7ODD
AUX. BITS	8NONE, 7EVEN, 7ODD
EDP.TERMIN	CR, CR/LF
PRN.TERMIN	CR, CR/LF
AUX.TERMIN	CR, CR/LF
EDP.EOLDLY	Number
PRN.EOLDLY	Number
AUX.EOLDLY	Number
EDP.ADDRESS	Number
AUX.ADDRESS	Number
STREAM	OFF, EDP, PRN, AUX
PRNDEST	EDP,PRN, AUX

DIGITAL IN SUB-MENU

DIGIN1	OFF, ZERO, TARE, NT/GRS, UNITS, DSPTARE, PRINT, BATRUN, BATSTRT
DIGIN2	OFF, ZERO, TARE, NT/GRS, UNITS, DSPTARE, PRINT, BATRUN, BATSTRT
DIGIN3	OFF, ZERO, TARE, NT/GRS, UNITS, DSPTARE, PRINT, BATRUN, BATSTRT

ANALOG OUT SUB-MENU

SOURCE1	GROSS, NET, CH1, CH2, CH3, CH4
ZERO1	Number
SPAN1	Number
SOURCE2	GROSS, NET, CH1, CH2, CH3, CH4
ZERO2	Number
SPAN2	Number

BAR GRAPH SUB-MENU

BARGRF	OFF, TWINKL, GRAPH
BARREF	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
BARBAND	Number

CALIBRATE SUB-MENU

CH1.VZERO	Number
CH2.VZERO	Number
CH3.VZERO	Number
CH4.VZERO	Number
CHI.VSPAN	Number
CH2.VSPAN	Number
CH3.VSPAN	Number
CH4.VSPAN	Number
CH1.VVAL	2, 3
CH2.VVAL	2, 3
CH3.VVAL	2, 3
CH4.VVAL	2, 3
CH1.WZERO	Actual Value
CH2.WZERO	Actual Value
CH3.WZERO	Actual Value
CH4.WZERO	Actual Value
CH1.WSPAN	Actual Value
CH2.WSPAN	Actual Value
CH3.WSPAN	Actual Value
CH4.WSPAN	Actual Value
CH1.WVAL	Actual Value
CH2.WVAL	Actual Value
CH3.WVAL	Actual Value
CH4.WVAL	Actual Value

10. OPTIONAL FEATURES

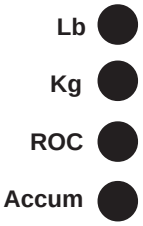
Many optional features are available for the IQplus 810. The following page contains an applications chart showing both software and hardware options that are available for the various models. The remainder of the section consists of a brief explanation of each option. Detailed installation and operation instructions accompany each option when ordered.

10.1 APPLICATIONS CHART

Optional Features	Desktop Model	SS Model	HE Model	Notes
Rate of Change Function	19359	19359	19359	FI
Accumulate Function	19361	19361	19361	FI
Peak Hold Function	19360	19360	19360	FI
Bar Graph	19363	19363	19363	MB
Single Channel Load Cell Input Module	19371	19371	19371	MB or EB
Setpoint Output Expander Module	19362	19362	19362	MB
Analog Output Module 1	19357	19357	19357	MB or EB
4-Channel Relay Rack	19365[1]	19376	19376	MB
16-Channel Relay Rack	NA	15975	15975	MB
Duplex 20 mA CL for EDP Port	19374	19374	19374	MB
RS-485 Communication for EDP Port	19372	19372	19372	MB
Expansion Board	19370[2]	19370[2]	19370[2]	MB
RS-485 Communication for Auxiliary Port	19372	19372	19372	EB
Dual-Channel Load Cell Input Module	19356	19356	19356	MB or EB
Analog Output Module 2	19357	19357	19357	EB
Supervisor Setup Switch	19375	19375	19375	MB
Start/Stop/Run Batching Switch	19369[3]	19368	19368	
Panel Mount Kit	19364	NA	NA	
Wall Mount Kit	19353	NA	NA	

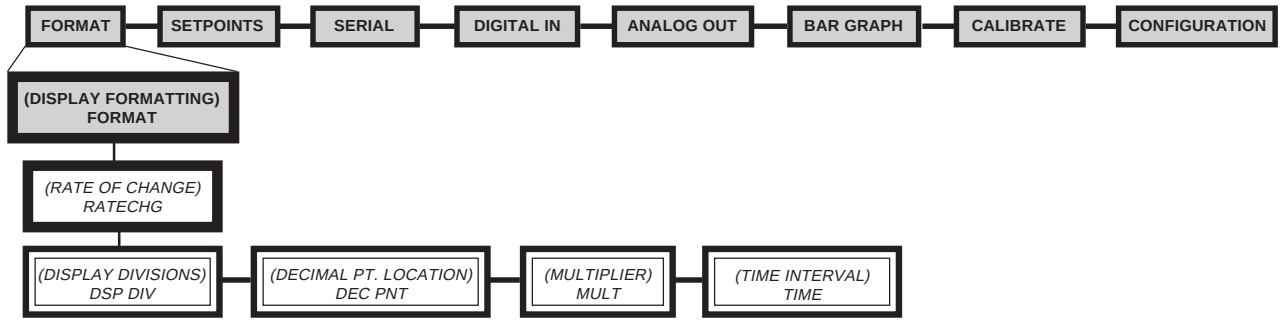
NOTES:
FI - FACTORY INSTALLED. Software option which must be installed at factory.
MB - MAIN BOARD. Hardware option which mounts on Main CPU Board.
EB - EXPANSION BOARD. Hardware option which mounts on Expansion Board.
1 - Will only fit in Desktop model if Expansion Board has not been installed.
2 - Includes Dual Pulse Input Function, Remote Keyboard Input, and Auxiliary Serial Communication Port. This option will not fit in the Desktop model if the 4-channel relay rack has been installed.
3 - Includes separate NEMA 4 switch enclosure and 5 ft cable for external remote mounting.
NA - NOT APPLICABLE

10.2 RATE OF CHANGE OPTION



In the normal weighing mode, the IQplus 810 with the Rate of Change (ROC) function activated, will display a change in weight over a preset period of time. This data could include pounds per minute, grams per second, gallons per hour, etc. The change can either be positive, negative, or an absolute value, as determined in the setup mode. The ROC annunciator will light when the display is showing Rate of Change information. The ROC feature is a software function which must be installed at the factory.

The configuration settings for the Rate of Change mode are found under the 1st level menu, FORMAT, and are reproduced below.

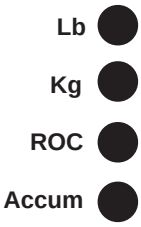


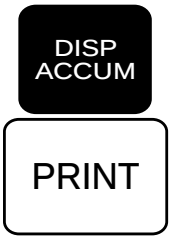
The setup for the ROC function is similar in many respects to the set up for the Secondary Units that are converted and displayed on the indicator when the **UNITS** key is pressed. In this function, though, the units are established in the setup mode, and the display is accessed in the operating mode by pressing the **DISP ROC** key. If the ROC units will be the same as the Primary Units, Display Divisions and Decimal Point location will be the same under RATECHG as those settings under Primary Units. If, however, the ROC units will differ from the Primary Units, then Display Divisions, Decimal Point location, and Multiplier will be altered to reflect the new units. For instance, if the operator was in the LB base as the Primary Unit, and wanted to view the ROC of gallons of gasoline, he would have to know that one gallon of gasoline weighs 6 lbs (For a wide range of conversions, see *Conversion Factors* in the Appendix). With DSP DIV and DEC PNT set the same as PRIMARY, the MULT setting should be entered as "6". This will cause the ROC units to change by one increment every time the scale changes weight by six pounds.

The last parameter is used to set the time increments. The operator has a choice between seconds or minutes. The display will show “MIN” for minutes and “SEC” for seconds.

In the normal operating mode, the operator can press the **DISP ROC** key to select a Rate of Change display. When this is selected, the ROC annunciator light will be lit.

10.3 ACCUMULATE OPTION





The Accumulate function is used to add weight data to a register for later access by the operator. The accumulator can keep a running total of weights entered either automatically by the setpoints, or manually by an operator pressing the **PRINT** key when the accumulate function is active.

With either the automatic or the manual entry method, the register will accumulate gross weight values only if no tare has been entered into the system. If a tare has been entered (indicated by the T or TE annunciator being lit), the accumulator will automatically always add net weight to the register.

Accumulate is a software function which must be installed at the factory. Once installed, it is always on and available for use. Therefore, there are no configuration settings for Accumulate found in the menu charts. To verify that the Accumulate function is installed, press the **DISP ACCUM** key. If present, the ACCUM annunciator on the left side of the display will light.

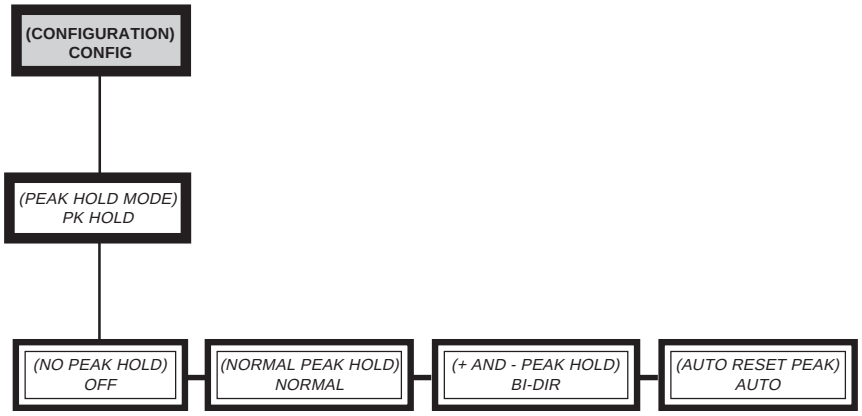
In the normal operating mode with Accumulate active and a weight value on the display, press the **PRINT** key to store that value in the accumulate register. Subsequent presses of the **PRINT** key will add whatever value is on the display to the register. To view the accumulated weight currently in the register, press the **DISP/ACCUM** key. The ACCUM annunciator will light, and a value will appear on the display. That value is the total currently in the accumulator register. With that number displayed, pressing the **PRINT** key again prints the accumulated weight through any serial port configured in the “Demand” mode. When **PRINT** is used as above to print out the displayed register, that value is not accumulated in the register--in other words, the register does not accumulate itself when printed. The display will return to normal weight display after five seconds without a key stroke, or by pressing the **N/G** key. The total accumulated weight can be cleared from the register by pressing the **DISP/ ACCUM** key until the total accumulated weight is displayed and then pressing the **CLEAR** key. The display will then prompt the operator with “CLEAR ACC?”. The operator must then press the **CLEAR** key again to clear the register. If the operator does not want to clear the accumulate register, he can press the **N/G** key to exit the accumulator function, or wait five seconds without making a key stroke to automatically go back to the normal weighing mode.

The automatic accumulator can be tied to the setpoints for automatic operation. The automatic accumulate function can be tripped immediately when the setpoint value is reached, or after the value is reached AND when the scale achieves standstill. Settings for those setpoint-activated accumulate functions will be found in the SETPNTS section of the menu charts.

10.4 PEAK HOLD OPTION

The Peak Hold function is used to determine, display, and print the greatest Net weight data achieved during a weighing cycle. A weighing cycle ends when the Print command is given, or when the peak Net weight is manually cleared by the **CLEAR** key. Peak Hold tracks only Net weight, and operates independently of the display. For example, if the indicator is displaying Gross weight, but AUTO Peak Hold is active, the display will remain in Gross, but the Net peak weight will be automatically printed when standstill is achieved at zero. Peak Hold is a software feature which must be installed at the factory.

The Peak Hold function is enabled and configured in the Setup Mode under the 1st level menu, CONFIG.



1. NORMAL (Positive Peak, Manual Reset). This is the basic peak hold function in which a weight is applied to a scale and the greatest Net weight value is held in memory until the weight is removed from the scale, and the **CLEAR** key is pressed. If the display is in Gross mode, the peak Net weight can be displayed by toggling to the Net mode with the **N/G** key.

2. BI-DIR (Bi-Directional Peak, Manual Reset). This is the same as the NORMAL version above except that the peak can either be a positive or negative number, determined by the absolute weight value. This means that if a positive peak is displayed, a negative weight value of greater absolute value could update the peak information in the same cycle. As above, the peak cycle is reset by pressing the **CLEAR** key after the weight has been removed.

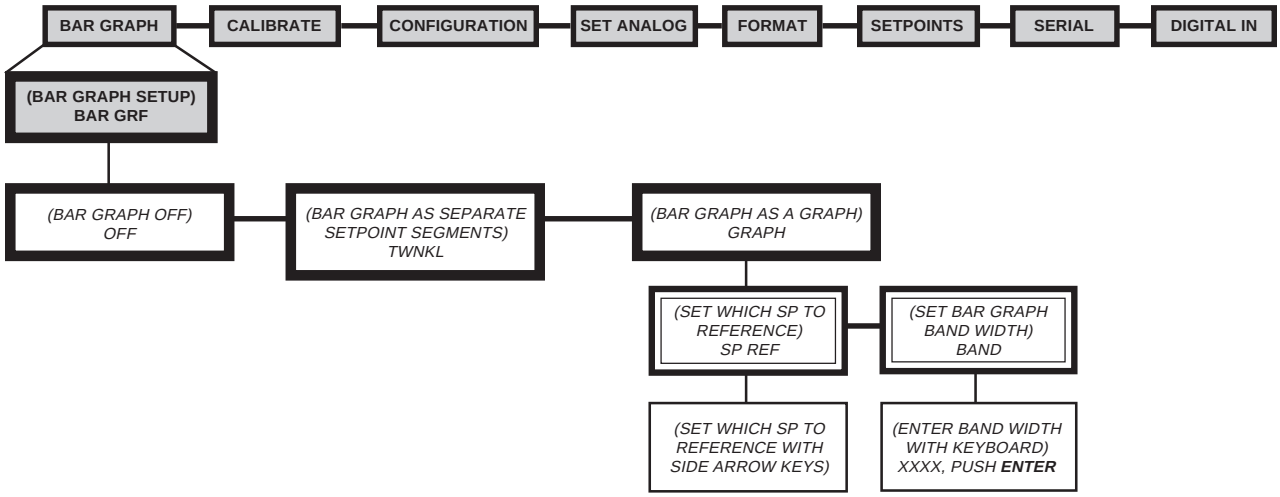
3. AUTO (Positive Peak, Auto Print, Auto Reset). This is the same as the NORMAL version except that an automatic print command occurs after the scale achieves standstill, and when the scale load has dropped back down to 0 ±10 display divisions. Following the print command, the peak value is cleared and reset automatically. As in the above two modes, the peak hold value can also be cleared by the **CLEAR** key, or by a manual press of the **PRINT** key.

The Peak Hold function will only track the primary analog input of the indicator. The digital display can be set to display other analog inputs or gross weight information data using the **N/G** mode key during Peak Hold function cycles.

10.5 BAR GRAPH

The Bar Graph features 48 LED segments that can be scaled to represent weight, speed, or batch step progress. It can be used to monitor the progress of batch steps in a batching sequence, with assigned segments lighting when a particular batch step is active. The bar graph can also be used as a visual graph to monitor individual setpoint operations like a filling operation, with segments progressively lighting as the fill weight increases until all 48 are lit when the setpoint weight is achieved. The bar graph can also be set up around a band rather than a single setpoint value. In this case, the segments begin to light at the bottom of the band value, are entirely lit at the middle of the band, and progressively extinguish until all are out at the top end of the band. The bar graph's 48 segments can be divided into 16 mini-graphs of 3 segments each, with each mini-graph assigned to one of the 16 setpoints. When the operator presses the front panel **SETPOINT** key, the respective mini-graph for that setpoint lights, and the middle segment flashes when the setpoint value can be changed with the keyboard.

The Bar Graph functions are configured in the Setup Mode under a separate 1st level menu, BAR GRF, reproduced below.



During a batching operation where the setpoints are configured as steps in a batching sequence, the bar graph can be programmed to illuminate the appropriate three segments in the sequence while a particular setpoint (batch step) is active. This is the "TWINKL" selection mode shown above. This gives the operator a visual indication of which setpoint is “hot” during a batch process. Any continuous setpoints that are not part of the batch process are shown as continuously on by the bar graph.

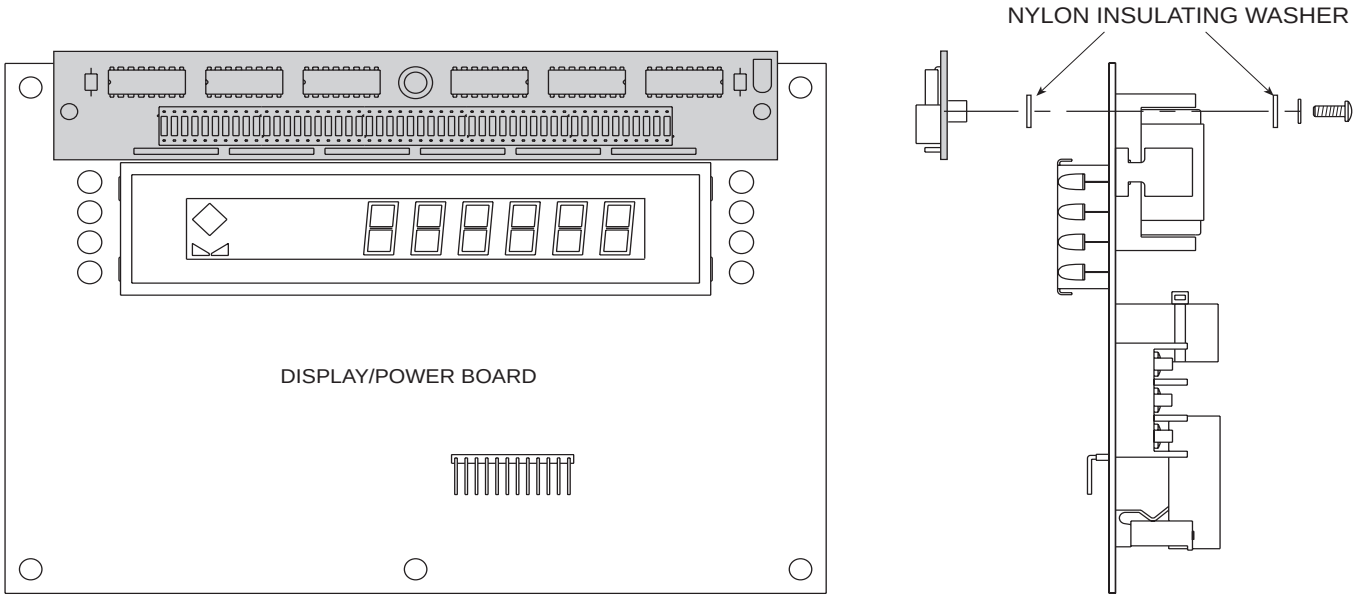
Another use for the Bar Graph is to monitor the active weight value of a setpoint during a filling operation. This gives the operator a visual indication of the level of completion of a particular setpoint. This is the "GRAPH" selection mode. If the band width ("BAND") is set to equal the setpoint value, each of the 48 segments is equal to approximately 2% of the total set point value. When the ingredient begins to fill, all of the bar graph segments will be off. The segments will begin to light from left to right as the weight value increases to meet the setpoint value.

Another popular use for the bar graph in "GRAPH" mode is as an “over/under” indicator. In this application the low level is set at one end of a band width and the high level is set at the other end. The difference between the low and high points becomes the “accept” band. When the weight on the scale is below the accept band, all segments of the bar graph (except the last segment on the left) are dark . When the weight reaches the low level point, the bar graph segments begin to light from left to right. When the weight is half way between the high and low points, all of the bar graph segments will be illuminated. As the weight increases from this point the segments will begin to turn off from left to right. When the weight exceeds the high point of the band, all of the segments will be turned off except the last one on the right. This segment remains on to show that the upper range of the band has been exceeded.

The Bar Graph can be configured to display the value of a pulse input from a shaft encoder. It can also be used to display a particular load cell channel. In this case the weight value of scale 1 could be displayed digitally while the weight value of scale 2 could be displayed graphically on the bar graph.

10.5 BAR GRAPH (continued)

The Bar Graph is an optional hardware feature that is recommended for all set point applications. Any of the IQplus 810 models can be fitted with the Bar Graph. It mounts on the front side of the Display Board as shown below.



Bar Graph Mounted on Display Board

10.6 EXPANSION BOARD OPTION

The IQplus 810 Expansion Board is a separate hardware board which provides the additional room for adding other options to the system. The Expansion Board mounts directly in back of the main Board on standoffs furnished for that purpose. Ribbon cables are used to connect the Main and Expansion Boards. Some options are included as part of the Expansion Board; others are purchased separately and mounted onto the Expansion Board.

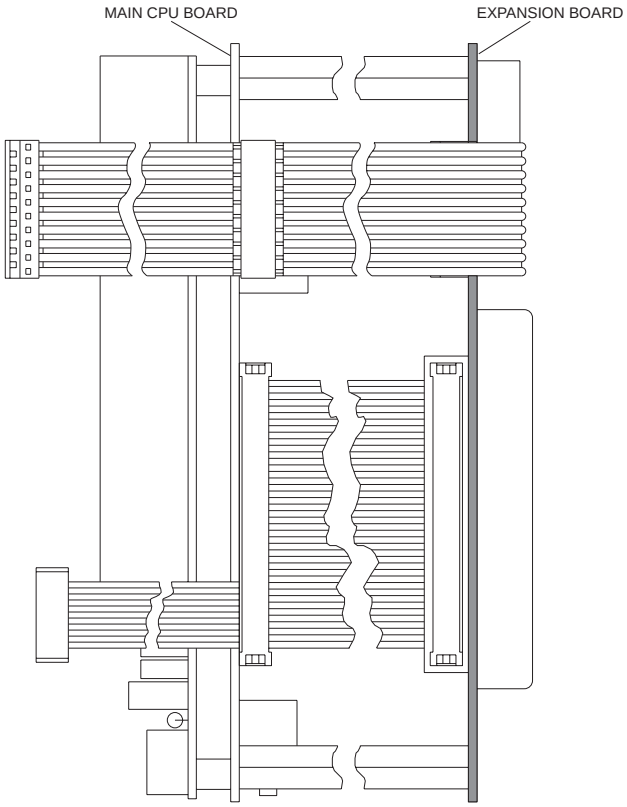
Options included with purchase of the Expansion Board are:

- An auxiliary, EDP-type serial port
- Two pulse input (frequency counter) channels
- An alternate remote keyboard input

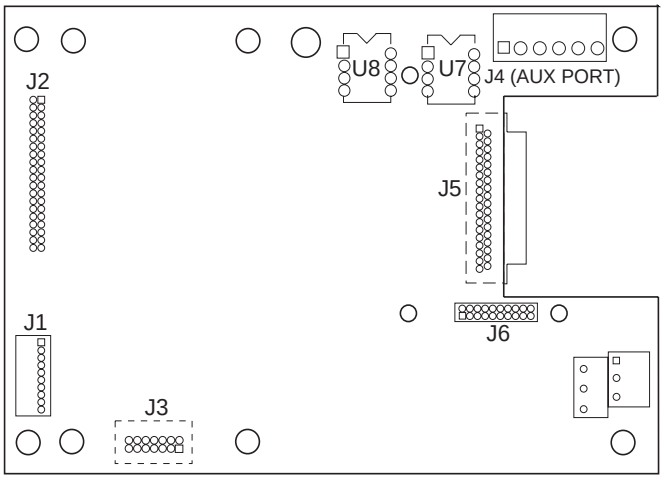
Additional options which mount on the Expansion Board are:

- A single or dual load cell input module
- An analog output module
- RS-485 serial communication chip (U7) for the auxiliary EDP serial port.

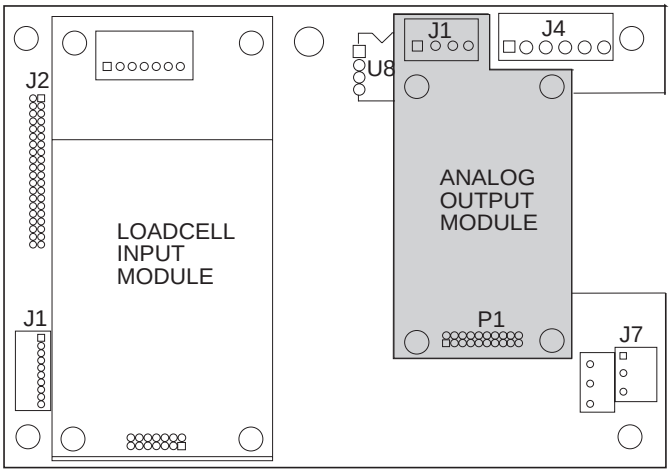
NOTE: If the Expansion Board is mounted in the IQplus 810 Desktop model, the unit will accommodate neither the 4-channel nor the 16-channel relay rack. SS and HE models will accommodate both the Expansion Board, and any of the optional relay racks.



Expansion Board--Side View



Expansion Board--Component Side

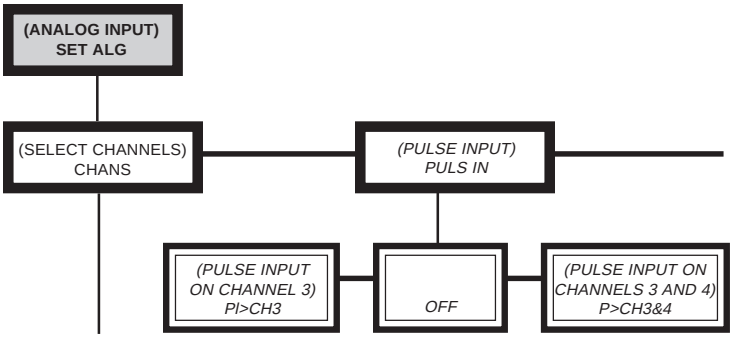


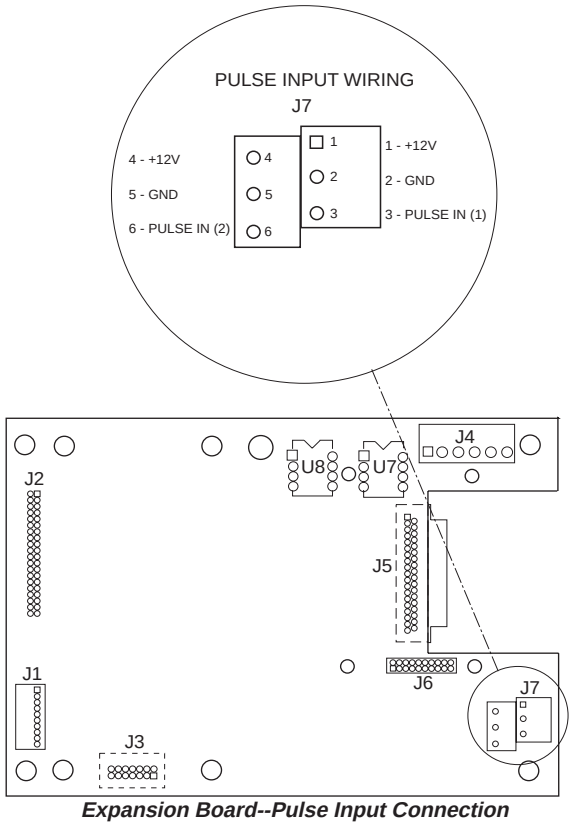
Expansion Board with Modules Installed--Component Side

10.7 PULSE INPUTS, SINGLE OR DUAL--J7

The Pulse Input circuitry for up to two sources is built into the Expansion Board. This option provides a means to measure the frequency of pulses from devices such as shaft encoders and flow meters. Two separate pulse input channels are provided with the Expansion Board, and both are completely isolated from the rest of instrument ground. Pulse inputs can only be used on channels 3, or 3 and 4. Up to 50 mA from the isolated +12V is provided for powering the external device if necessary.

Pulse inputs must be enabled by making the correct selections in the SET ANALOG Section of the menu charts reproduced below. Pulse inputs are configurable for channel 3, or channels 3 and 4.

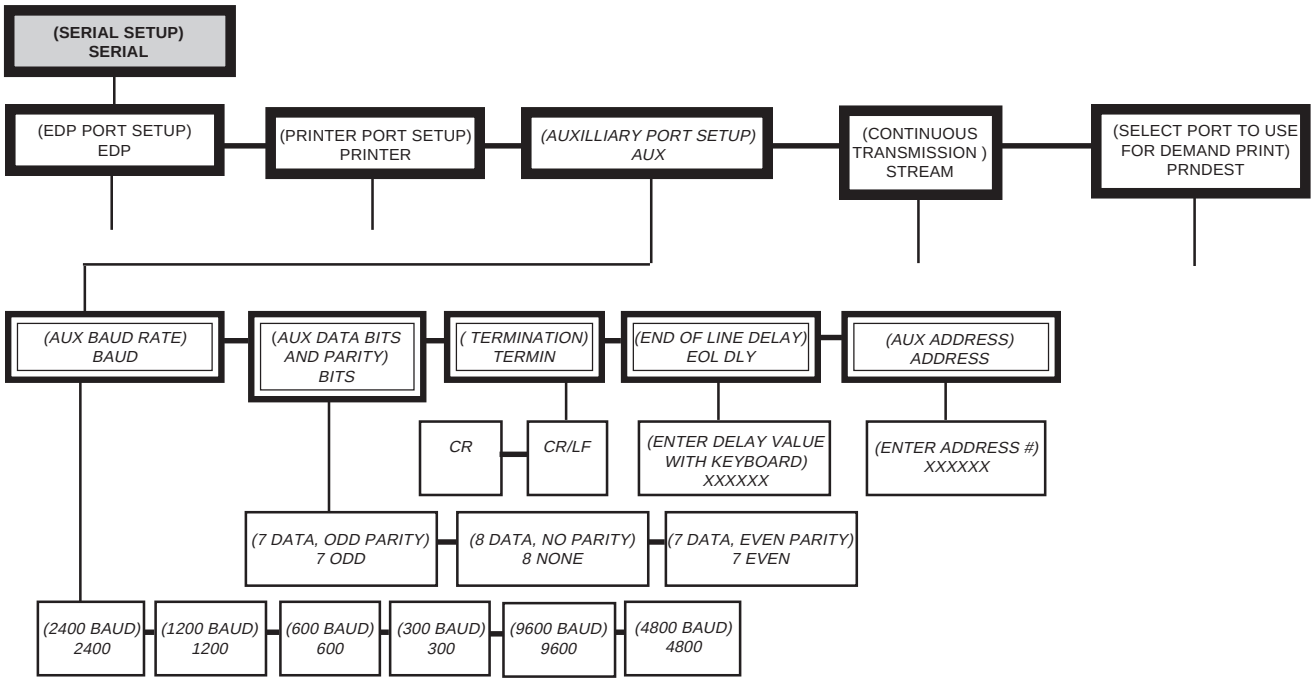




Expansion Board--Pulse Input Connection

10.8 AUXILIARY SERIAL PORT--J4

An electronic data processing serial port is also available on the Expansion Board. This auxiliary third serial communications port is designated as AUX in the Serial menu charts reproduced in part below. It can be connected as a RS-232 transmitter, a 20 mA current loop transmitter, or by adding the integrated chip U7, an RS-485 transceiver. The AUX port can be configured for continuous stream or demand print communications. The other menu selections are similar to the EDP port selections, with the exception that the AUX port has a maximum baud rate of 9600, rather than 19200.



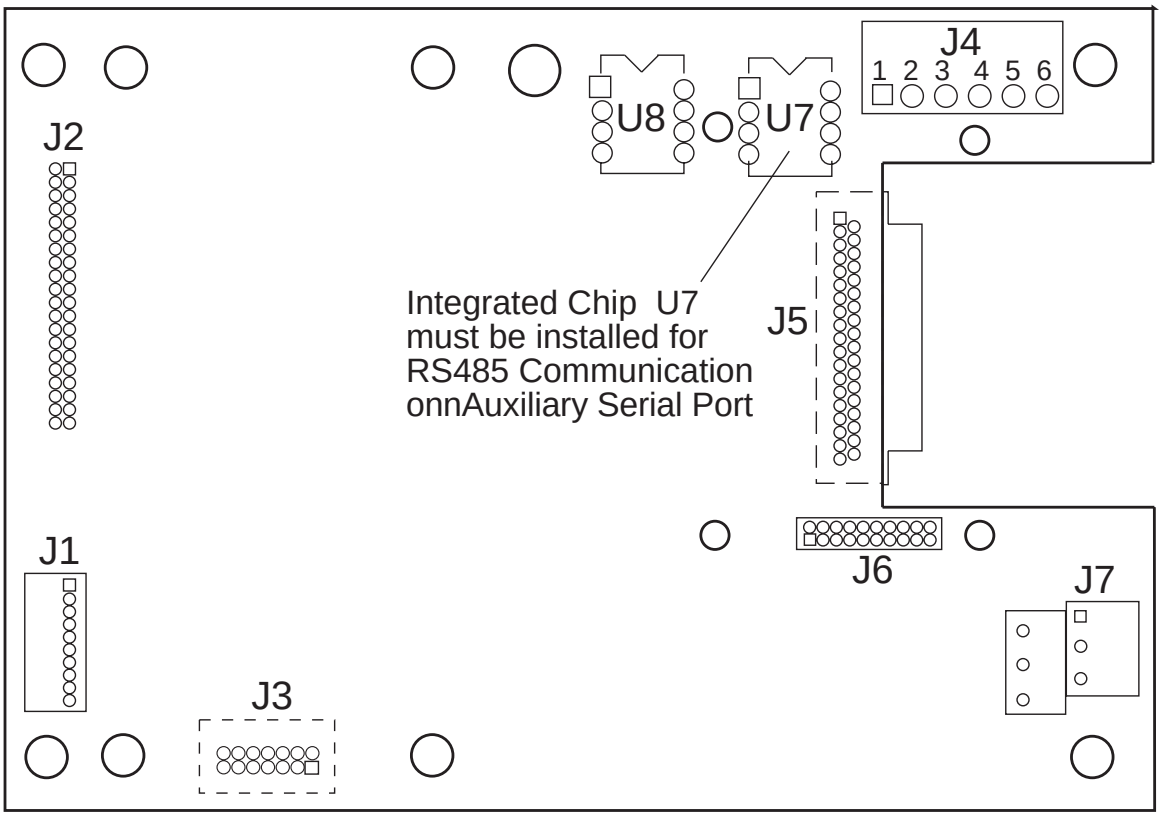
10.8 AUXILIARY SERIAL PORT--J4 (Continued)

For RS-232 applications through the AUX port, neither of the integrated chips U7 nor U8 is installed on the respective sockets on the Expansion Board. J4-5 (OUT) and J4-6 (GND) terminal connections are used for output-only RS-232 communication. Output-only 20 mA Current Loop transmission is also available simultaneously on J4-4 (I- OUT) and J4-6 (I+ OUT).

When used for RS-485 applications, the AUX port can be configured to operate as a transmitter-only on a multi-drop twisted-pair line. U7 must be installed in the proper socket on the Expansion Board to configure the AUX port as an RS-485 transmitter. Before installing U7, make certain that U8 is NOT installed. J4-1 (RS-485-A) and J4-2 (RS-485-B) terminal connections are used for RS-485 applications. The port address is set in configuration under the SERIAL menu.

For simplex (output-only) 20 mA Current Loop applications, the AUX current loop transmitter is designed so that RS-232 and 20 mA input are available simultaneously with the RS-232 configuration described above.

AUX	RS-232	RS-485	20mA
J4-1		485-A	
J4-2		485-B	
J4-3			
J4-4			I- OUT
J4-5	RS-232 OUT		
J4-6	RS-232 GND		I+ OUT



10.9 REMOTE KEYBOARD INPUT CONNECTOR--J5

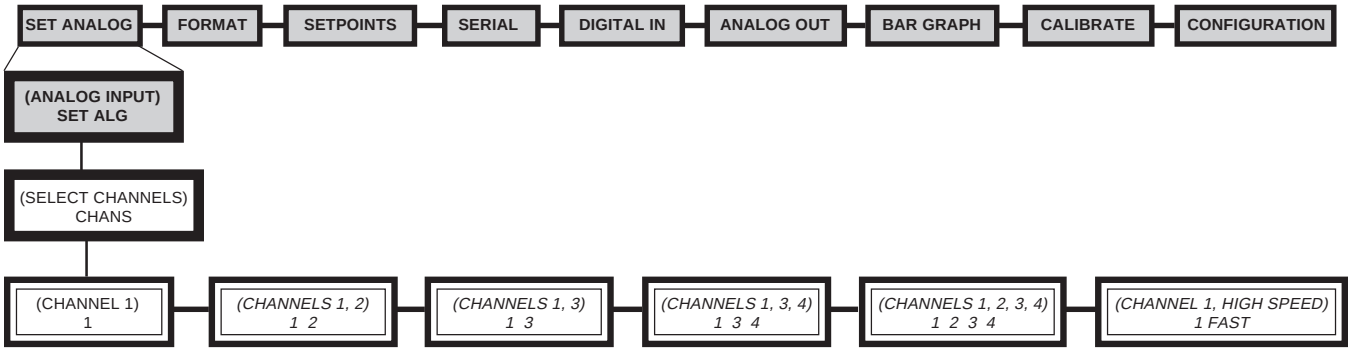
The alternate keyboard connector provides a means for connecting a remote keyboard to the IQplus 810 system. All inputs are active low with pullups to +5V. Any of the front panel keyboard functions can be activated by shorting the appropriate alternate keyboard input to ground with hard-contact switches, or by achieving TTL logic- low levels. When a remote keyboard is being used, the built-in keyboard is still functional and available for use. Terminal connections (J5 on the Expansion Board) for a remote keyboard are listed below.

J5-1	GROUND	J5-10	GROUND	J5-19	nc	J5-28	GROUND
J5-2	(spare)	J5-11	3	J5-20	GROUND	J5-29	2
J5-3	(spare)	J5-12	4	J5-21	(spare)	J5-30	DISP ACCUM
J5-4	PRINT	J5-13	6	J5-22	CLEAR (Right)	J5-31	5
J5-5	SETPOINT (Left)	J5-14	7	J5-23	NEW ID	J5-32	DISP ROC
J5-6	ZERO	J5-15	9	J5-24	SCALE #	J5-33	8
J5-7	TARE	J5-16	. (Decimal Point)	J5-25	GROSS/NET	J5-34	TIME/DATE (Down)
J5-8	DISP TARE (Up)	J5-17	ENTER	J5-26	UNITS	J5-35	0
J5-9	GROUND	J5-18	GROUND	J5-27	1	J5-36	GROUND
						J5-37	nc

10.10 MULTIPLE SCALE INPUTS

The standard IQplus 810 has a single analog input channel. It can be expanded to 2, 3, or 4 channels. The channels can be selected and processed individually or as a total by toggling with the **SCALE #** key. The red annunciators for the appropriate scales will light to indicate the active source channel(s). A separate option allows Channel 1 to be selected as a high-speed channel, weighing at 100 updates per second. The indicator's power supply will support up to 32-700Ω load cells or 16-350Ω load cells, all on one channel or split up amongst multiple channels. The configuration settings enabling multiple channel inputs and the high-speed weighing are found in the Analog Input 1st level menu, SET ALG, reproduced below. Note that *only* the channels specified are operational with the various multi-channel setups. For instance, channel 2 is not operational with the 1, 3 channel or the 1, 3, 4 channel setup.

NOTE: If the indicator is displaying the TOTAL of all channels, and any active scale on any channel goes into an underrange or overrange condition, the display will blank out.



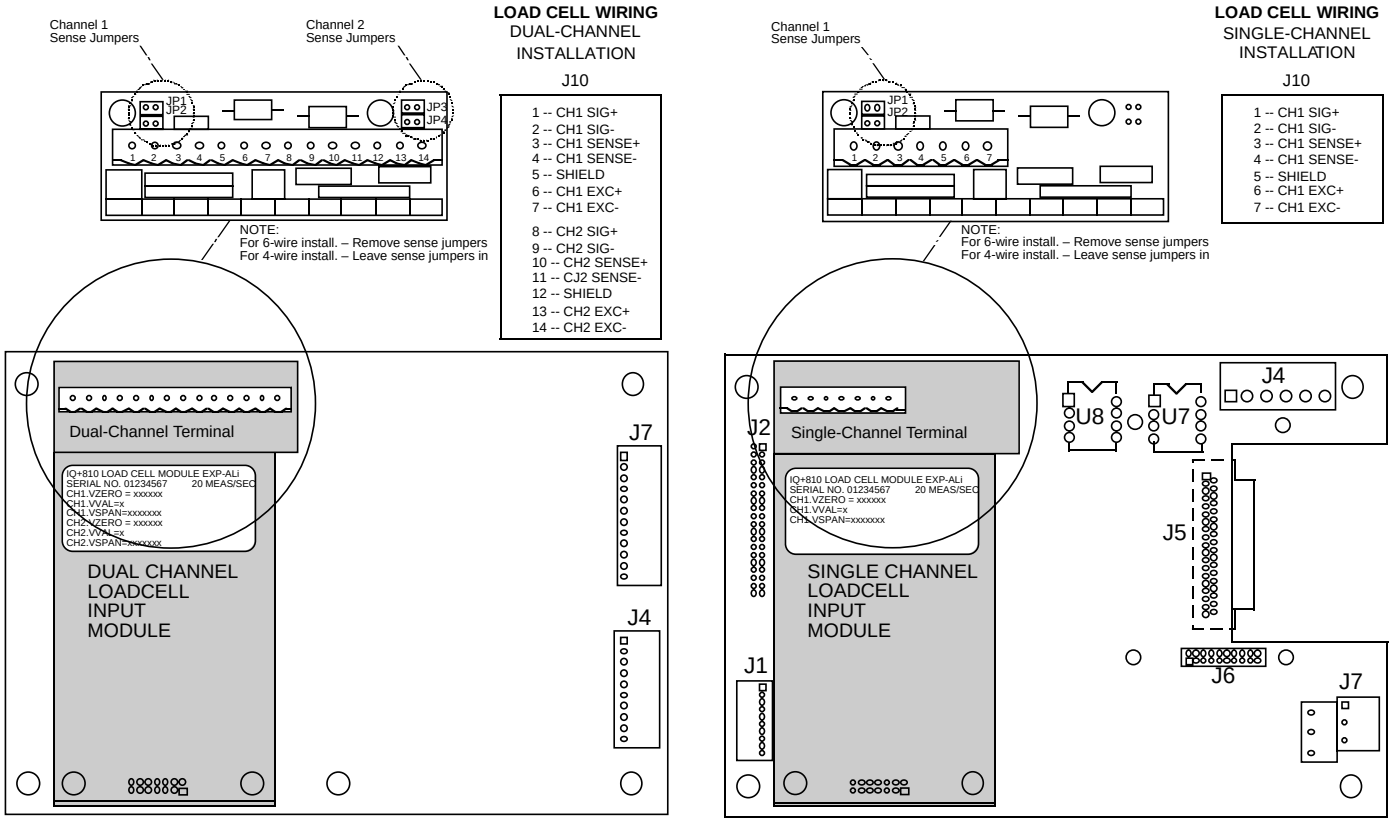
The most common use of multiple channel weight indicators is in axle weighing truck scales. In this application two, three, or four truck scales are placed end to end. In a three-scale system, the front scale weighs the front axle of the truck. The second scale weighs the drive axles of the truck, and the third weighs the trailer axles. The IQplus 810 indicator could display each axle weight individually or display the sum of all scales.

It is also possible to do multiple “loss in weight” or filling applications using one indicator. There are 16 setpoints available on the IQplus 810. Each set point can be assigned to any one of the load cell input channels. The only restrictions are that the application not require high speed display updates and that the weights in each tank not be simultaneously displayed to the operator. It is possible, however, to monitor two tanks at once--one channel can be watched on the bar graph, while monitoring the other channel on the digital display. It is important to remember that setpoint operations and multiple selected channels are processing information, whether or not those channels are displayed to the operator. Setpoint functions in Net mode on Channel 2, for instance, can be automatically running even though the operator's display may be in Gross mode on Channel 1.

There is no restriction on the capacity and graduation of each load cell input channel. Each channel has its own individual setup parameter for graduations. Display divisions, decimal point location, and units must be configured the same for all channels.

10.10 MULTIPLE SCALE INPUTS (continued)

The hardware choices necessary to add multiple channels allow several possible combinations of multiple channels. Either a single or a dual channel input module can be mounted on the main board and/or the expansion board. Both modules plug into female connectors already installed on the boards. The only external difference between the single-channel and dual-channel module is the terminal strip for wiring the load cell(s).



INSTALLATION ON MAIN BOARD

INSTALLATION ON EXPANSION BOARD

The software choices under the SET ALG main menu allow the following combinations:

(CHANNEL 1) 1	Single-channel module on main board
(CHANNELS 1, 2) *1 2*	Dual-channel module on main board
(CHANNELS 1, 3) *1 3*	Single-channel module on both main and expansion board. **NOTE: Channel 2 is not operational with this setup.**
(CHANNELS 1, 3, 4) *1 3 4*	Single-channel module on main board, and dual-channel on expansion board **NOTE: Channel 2 is not operational with this setup.**
(CHANNELS 1, 2, 3, 4) *1 2 3 4*	Dual-channel on both main and expansion boards

IMPORTANT NOTE: When installing Dual-channel modules, be sure to enter the VZERO, VVAL, and VSPAN values listed on Volts Calibration label (on module). Go to the Calibrate-Volts submenu on the IQplus 810 to enter these values. (Refer to Section 8 of the Operator Manual.)

NOTE: To obtain maximum filtering capability when using Dual-channel analog input modules, install Software Version 2.3 or higher.

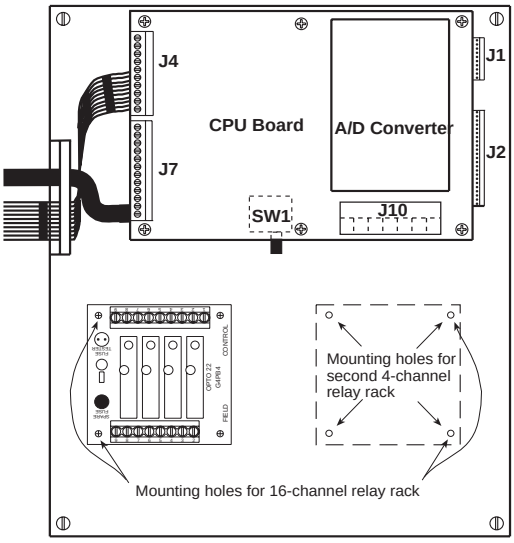
10.11 4, 8, AND 16-CHANNEL RELAY BOARDS FOR SETPOINT OUTPUTS

Relay boards are available to convert the 5 VDC indicator signals to either AC or DC working voltages. This allows the indicator to control (or receive input from) peripheral equipment operating at various voltages. Individually-fused input and output relays are designed to plug into either the 4-channel board or the 16-channel board. AC output relays are rated at 3A working voltage, with a 4A fuse. Both input and output relays are available in either AC or DC voltage configuration. Each board has a fuse tester for troubleshooting, and one spare fuse.

A single 4-channel board can be mounted in any of the IQplus 810 models. On the SS and HE models, the board is mounted in pre-drilled holes in the panel holding the main CPU board. On the Desktop model, standoffs are furnished to mount a panel for the relay board on the main CPU board.

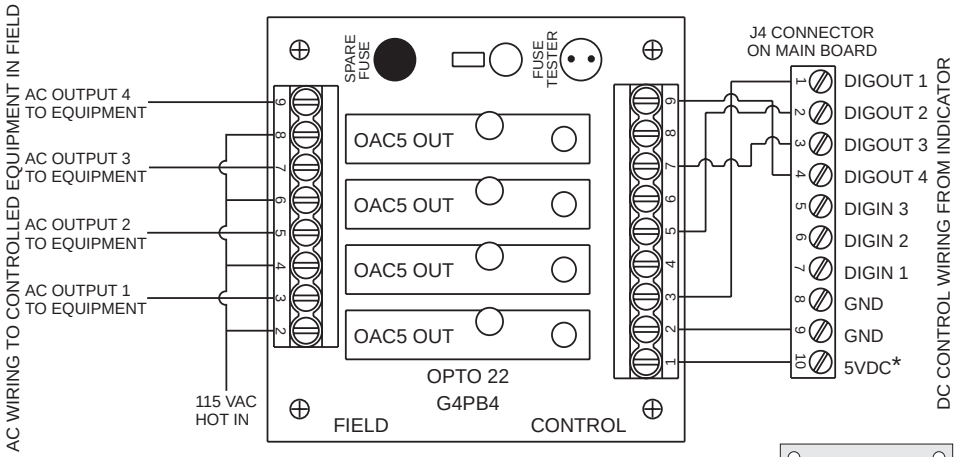
For an 8-channel system, two 4-channel boards can be mounted side by side in either the SS or HE models as shown at right. The Desktop model will not accommodate a second 4-channel board.

The 16-channel board mounts in same outer holes used for the 4-channel boards in the SS and HE models. The Desktop model will not accommodate the 16-channel board.



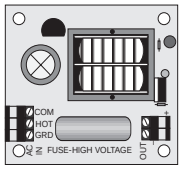
Wiring connections will vary according to the application. Some sample diagrams are shown below and on the next page to illustrate the general principles. NOTE: Each relay board must be energized with a +5V input into #1 of the CONTROL terminal strip from #10 of the J4 terminal strip on the main board. J4-#10 must be energized by jumpering it to J1-#4 of the main board. This jumper connection will have been installed at the factory ONLY if a relay board was originally ordered with the indicator.

Typical Wiring to Provide 4 AC Outputs from J4 on Main Board

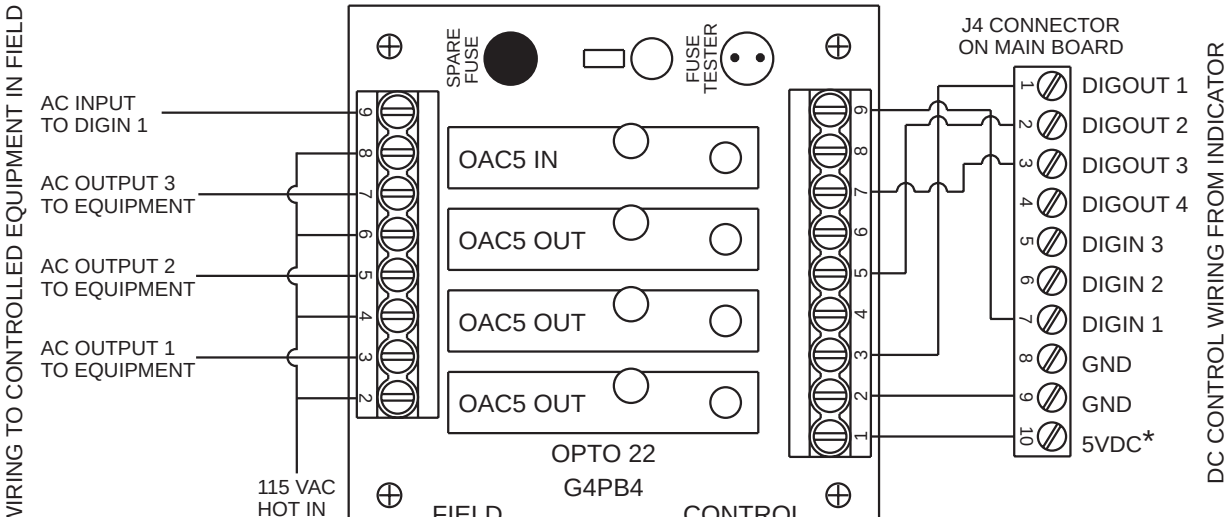


*NOTE: Boards manufactured prior to August, 1996 may not have 5 VDC power supplied to J4, pin 10. To provide 5 VDC power for digital output operation with those boards, use external power supply board (part # 16418) as shown at right.

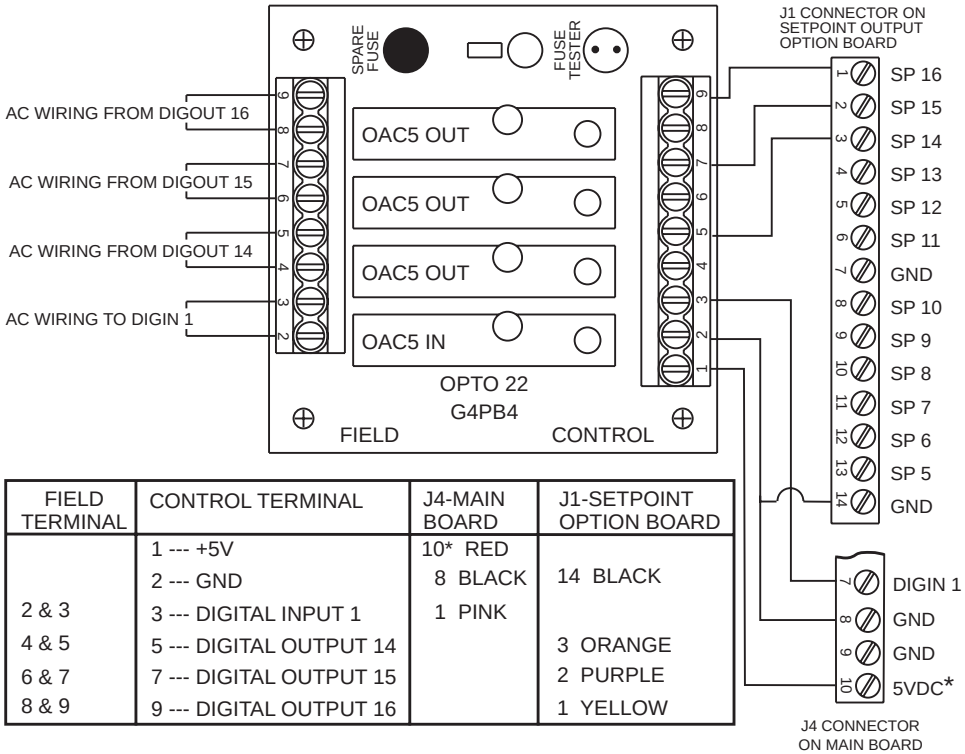
Boards manufactured after that date have a 5 VDC supply at J4, pin 10 which can be used to power digital outputs on relay boards.



Typical Wiring for 3 AC Outputs, 1 AC Input from J4 0n Main Board



Typical Wiring for 1 AC Input from J4 on Main Board, and 3 AC Outputs from J1 on Setpoint Output Expander Board



FIELD TERMINAL	CONTROL TERMINAL	J4-MAIN BOARD	J1-SETPOINT OPTION BOARD
	1 --- +5V	10* RED	
	2 --- GND	8 BLACK	14 BLACK
2 & 3	3 --- DIGITAL INPUT 1	1 PINK	
4 & 5	5 --- DIGITAL OUTPUT 14		3 ORANGE
6 & 7	7 --- DIGITAL OUTPUT 15		2 PURPLE
8 & 9	9 --- DIGITAL OUTPUT 16		1 YELLOW

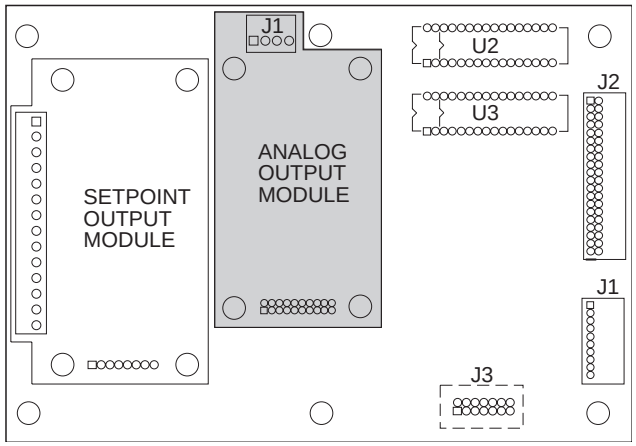
*NOTE: TO PROVIDE +5V AT J4 PIN 10, JUMPER RED WIRE FROM J1, PIN 4 ON MAIN BOARD TO J4 PIN 10 ON MAIN BOARD.

10.12 SINGLE AND DUAL ANALOG OUTPUT OPTION

ANALOG OUTPUT SETUP AND CALIBRATION

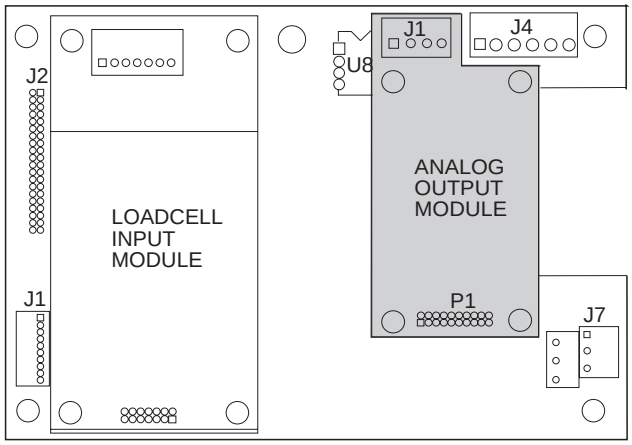
The IQplus 810 may have 1 or 2 Analog Output Modules installed. Either output may be setup for 0 to 10 volt, or for 4 to 20 milliamp analog output. With this arrangement, you may use one output for 0 to 10 volt operation and the other output for 4 to 20 milliamp output, or you may make both of them the same type of output. Each of these modules has separate calibration parameters in the configuration menu under Analog Out, but each is installed and calibrated in the same manner.

Analog output module #1 is located on the back side of the main board immediately behind the configuration switch as shown at right.



INSTALLATI0N ON MAIN BOARD

Analog output module #2 is located on the back side of the expander board as shown at right.



INSTALLATION ON EXPANSION BOARD

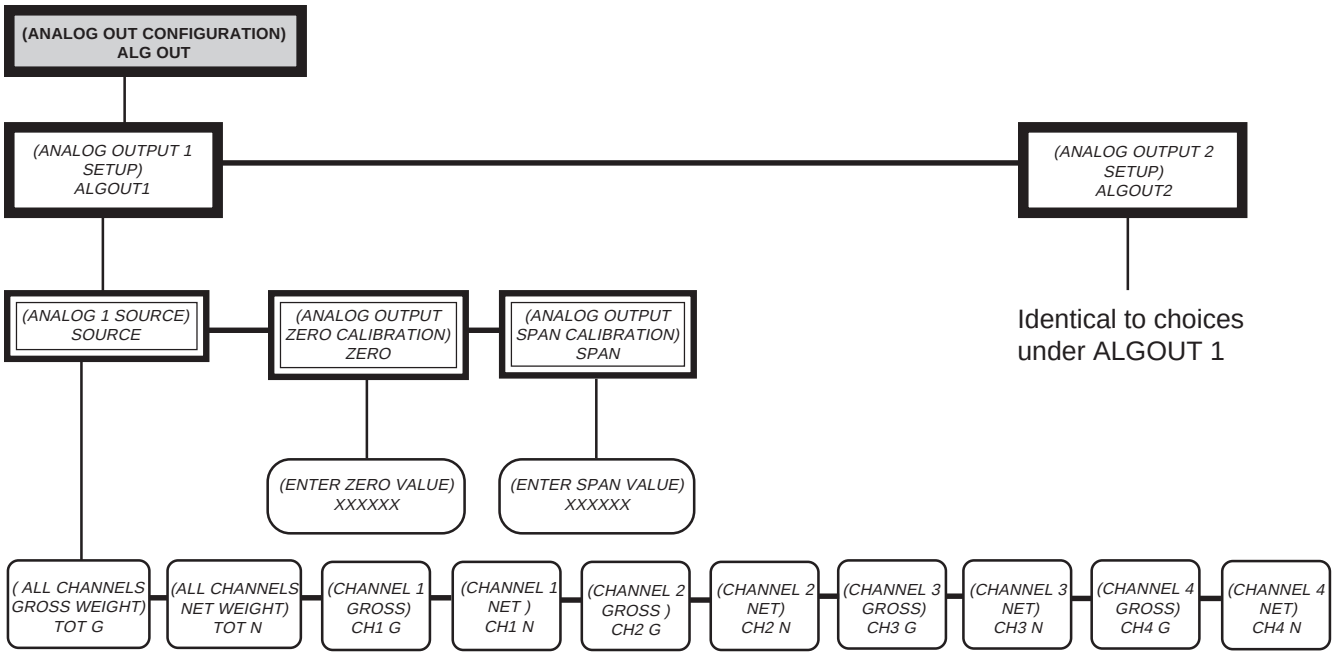
To hook up an Analog Output, locate the J1 connector on the Analog Output module. This is a 4-position plugable connector that is on one end of the Analog Output board. The pinout at right lists functions for the pins of this connector. NOTE that Pin 1 of this connector is located closest to the outer edge of the PC board. Pin #1 is designated in the diagrams above by a square, rather than a round, pin designation.

Pin #	Function
1	+ Current Out
2	- Current Out
3	+ Voltage Out
4	- Voltage Out

ANALOG OUTPUT JI PINOUT

Before the Analog Output can be configured and calibrated, the IQplus 810 must be configured and calibrated to the scale. Please refer to the SETUP AND CONFIGURATION section of the manual to do the configuration and calibration on the IQplus 810 to the scale.

After the IQplus 810 is configured and calibrated to the scale you may configure and calibrate the Analog Output. This is done by entering CONFIGURATION as you did for the Setup and moving horizontally to the selection labeled “ALG OUT”. This is the Analog Output setup selection, reproduced on the next page. For a detailed explanation of calibrating analog outputs, refer to the instruction sheets sent with the Analog Output Option.

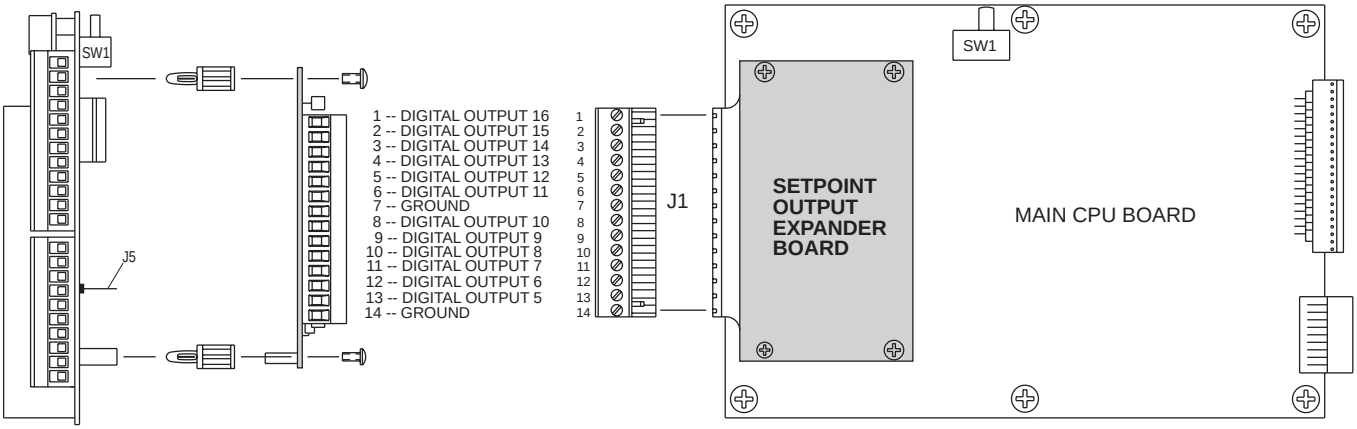

(ANALOG OUT CONFIGURATION)
ALG OUT
(ANALOG OUTPUT 1 SETUP)
ALGOUT1
(ANALOG OUTPUT 2 SETUP)
ALGOUT2
Identical to choices under ALGOUT 1
(ANALOG 1 SOURCE)
SOURCE
(ANALOG OUTPUT ZERO CALIBRATION)
ZERO
(ANALOG OUTPUT SPAN CALIBRATION)
SPAN
(ENTER ZERO VALUE)
XXXXXX
(ENTER SPAN VALUE)
XXXXXX
(ALL CHANNELS GROSS WEIGHT)
TOT G
(ALL CHANNELS NET WEIGHT)
TOT N
(CHANNEL 1 GROSS)
CH1 G
(CHANNEL 1 NET)
CH1 N
(CHANNEL 2 GROSS)
CH2 G
(CHANNEL 2 NET)
CH2 N
(CHANNEL 3 GROSS)
CH3 G
(CHANNEL 3 NET)
CH3 N
(CHANNEL 4 GROSS)
CH4 G
(CHANNEL 4 NET)
CH4 N

10.13 SETPOINT EXPANDER OPTION

There are four standard digital outputs on the Main Board designed primarily to be switch-closure outputs used for controlling relays. The Setpoint Expander Board adds 12 more digital output terminals to bring the total to 16. Like the original digital outputs, each of these is an open-collector circuit capable of sinking 250 mA when "ON" and withstanding +40 VDC when "OFF". In addition, resistor pull-ups to +5 V are provided, making the outputs capable of driving TTL or 5V CMOS logic directly without the need for any additional circuitry. The logic levels are active low. For example, a TTL low level indicates the output is "ON", and a high level indicates the output is "OFF".

The Setpoint Expander Board mounts on standoffs on the component side of the Main Board. An 8-pin male terminal (J5 on the Main Board), plugs into a socket on the Setpoint Expander Board as it is being mounted on the standoffs. For reference purposes, the J5 connector pinouts are shown at the bottom of the page. With the HE or SS models, it will be necessary to temporarily remove the Main Board from its mounted position to gain enough clearance to install the Setpoint Expander Board. The Main Board can then be re-attached in its original position. With the Desktop model, the Setpoint Expander can be mounted with the Main Board in place.

When wiring the setpoints to the digital out terminals, remember that digital outputs 1-4 remain on the J4 terminal of the Main Board, and 5-16 are on the J1 terminal of the Setpoint Expander Board.



Setpoint Expander Board Mounting

Connector Pinout, J5 (Main Board)
to Setpoint Expander Board

J5-1	+5D
J5-2	DOUTSTB
J5-3	RESET
J5-4	DOUTCLK
J5-5	SDOUT
J5-6	GND
J5-7	HGND
J5-8	HGND

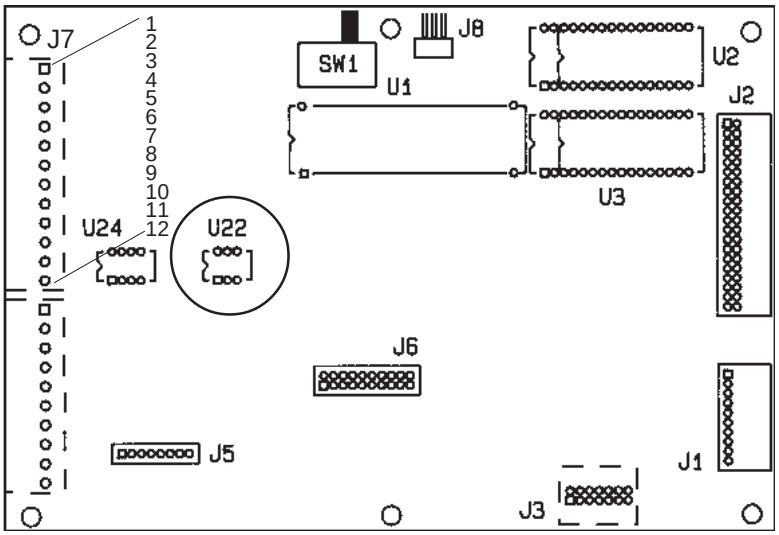
10.14 EXPANDED SERIAL COMMUNICATION OPTIONS

1. ADDING DUPLEX 20 mA CURRENT LOOP TO EDP SERIAL PORT

In standard form, the EDP port has duplex RS-232 serial and simultaneous output-only 20 mA Current Loop (CL) communication. To change the simplex 20 mA CL to duplex, integrated chip U22 must be installed in the proper connection on the Main Board. Integrated Chip U24 must not be installed with this application. When used for duplex 20 mA CL communication, Main Board connections on the J7 terminal are: J7-7 (I+ IN), J7-8 (I- IN), J7-10 (I- OUT), AND J7-12 (I+ OUT).

EDP Port	RS-232	20 mA (U22)*
J7-7		I+ IN
J7-8		I - IN
J7-9	RS-232 IN	
J7-10		I- OUT
J7-11	RS-232 OUT	
J7-12	GND	I+ OUT

*Integrated chip U22 must be installed; U24 must NOT be installed.



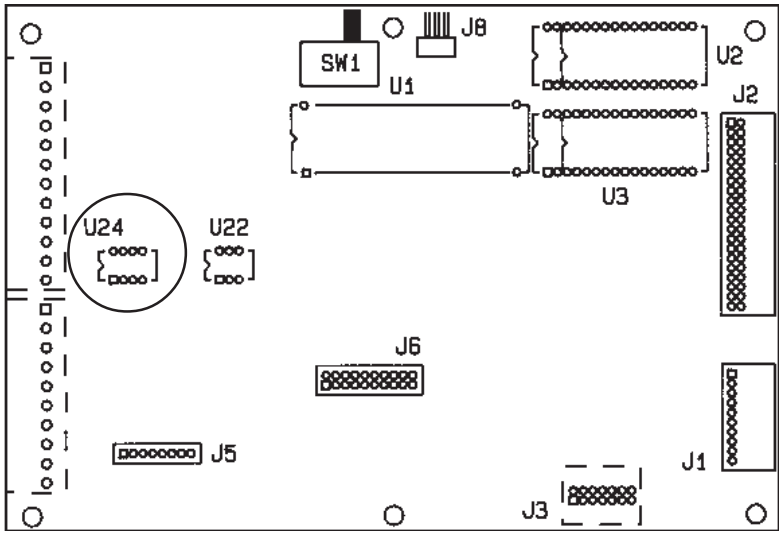
Main Board Location of Duplex 20 mA CL Chip, U-22

2. ADDING RS-485 TO EDP SERIAL PORT

When used for RS-485 applications, the EDP port can be configured to operate as a transceiver on a multi-drop twisted-pair line. Optional integrated chip, U24 must be installed in the proper socket on the Main Board to configure the EDP port for RS-485 format. Before installing U24, make certain that U22 is NOT installed. J7-7 (RS-485-A) and J7-8 (RS-485-B) are used for RS-485 applications.

EDP Port	RS-485 (U24)*
J7-7	485-A
J7-8	485-B
J7-9	RS-232 IN
J7-10	
J7-11	RS-232 OUT
J7-12	GND

*Integrated Chip U24 must be installed; U22 must NOT be installed.



Main Board Location of RS-485 Chip, U-24

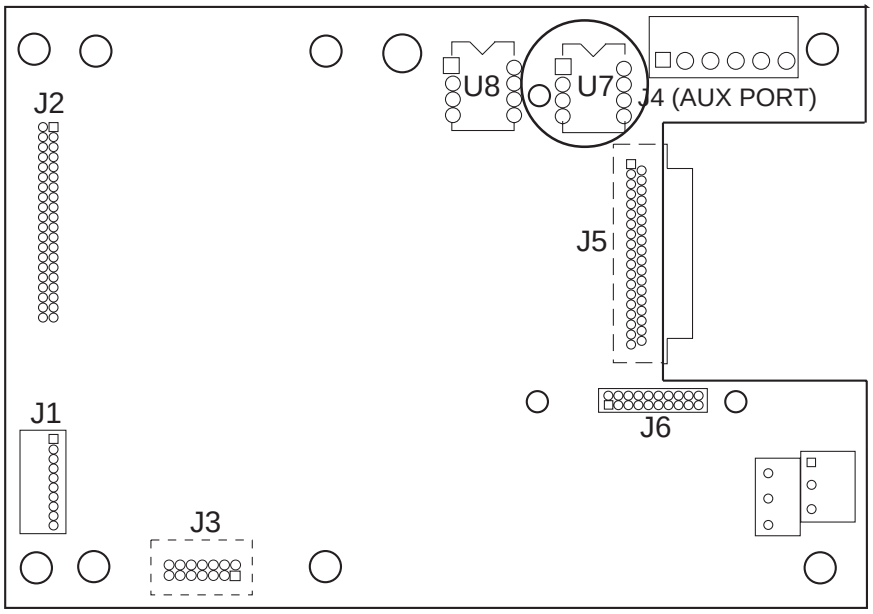
10.14 EXPANDED SERIAL COMMUNICATION OPTIONS (Continued)

3. ADDING RS-485 TO AUXILIARY COMMUNICATION PORT ON EXPANSION BOARD

When used for RS-485 applications, the auxiliary serial port can be configured to operate as a transmitter on a multi-drop twisted-pair line. Integrated Chip U7 must be installed in the proper socket on the Expansion Board to configure the AUX port as a 485 transceiver. Before installing U7, make certain that U8 is NOT installed. Terminal J4 on the Expansion Board is used for the AUX serial port connections. J4-1 (RS-485-A) and J4-2 (RS-485-B) are used for RS-485 applications.

AUX Port	RS-485 (U7)*
J4-1	485-A
J4-2	485-B
J4-3	RS-232 IN
J4-4	
J4-5	RS-232 OUT
J4-6	GND

*Integrated Chip U7 must be installed; U8 must NOT be installed.



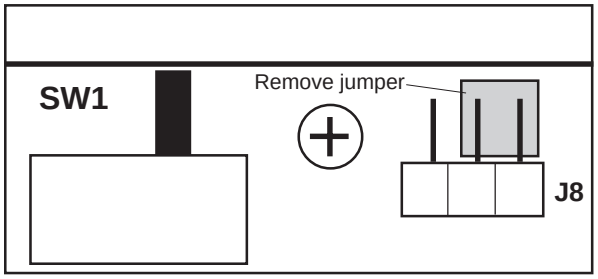
Expansion Board Location of RS-485 Chip, U7

10.15 SUPERVISOR SETUP SWITCH - J8 ON MAIN BOARD

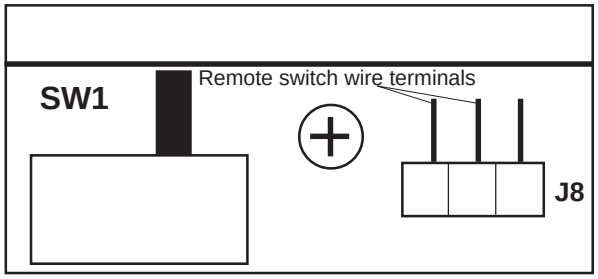
With the Supervisor Setup Switch, a modified SETUP mode can be accessed without entering the case or breaking the legal Weights and Measures seal. This mode allows access to all setup parameters except those which are involved in legal-for-trade transactions (Grads, Display Divisions, etc.). The Supervisor Setup Switch must be unlocked with a key, which prevents tampering with important parameters by unauthorized operators. The key is normally carried by a supervisor.

The wiring for the switch is connected to the two terminals on J8 (Main Board) that are closest to the SW1 switch. The two terminals farthest from SW1 will be jumpered at the factory. Remove that existing jumper connecting the two J8 terminals farthest from SW1 . Connect the remote switch wires to the two terminals closest to SW1 using appropriate connectors.

The switch body can be mounted in a hole in the case drilled for that purpose, or can be mounted remotely.

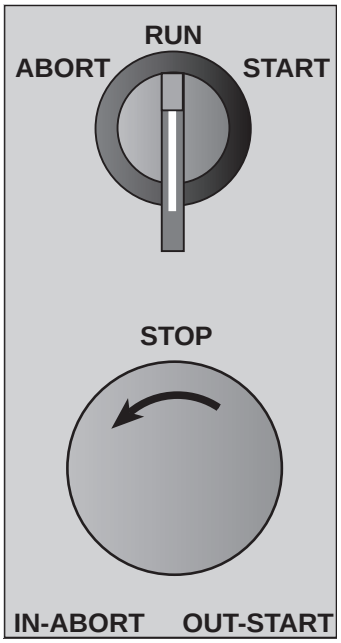


J8 on Main Board with Factory Jumper Attached



Wiring Terminals for Supervisor Setup Switch Wire

10.16 START/STOP/RUN BATCHING SWITCH



The Batching Switch option comes as a complete unit with legend plate, locking stop button, and run/start/abort 3-way switch. With the SS and HE models, the unit can be mounted directly on the face of the case by drilling 7/8" holes for the two switches. The Desktop model has insufficient room for switches on the case, and a special FRP case is available for mounting the switch unit remotely. The remote mounting kit includes case, 5 ft. of cable, and O-ring and cord grip for sealing. Either mounting method is waterproof, and maintains a NEMA 4X rating.

Both switches are wired into the indicator's digital output connection terminal according to the wiring diagram below. Each switch requires a separate digital input, leaving one of the IQplus 810's original three digital inputs available for other use. 5VDC power to operate the switches is available on the indicator's digital input terminal (J4) after jumpering a wire from J1-4 on the Main CPU Board to J4-10.

After the switches are mounted and wired, the IQplus 810's software must be configured for the correct digital input functions. Detailed configuration instructions are found on the following page.

The Batching Switch is designed for safety and ease and speed of operation, yet is flexible enough to allow choices when restarting a halted batch. Three general principles govern the operation of the switches:

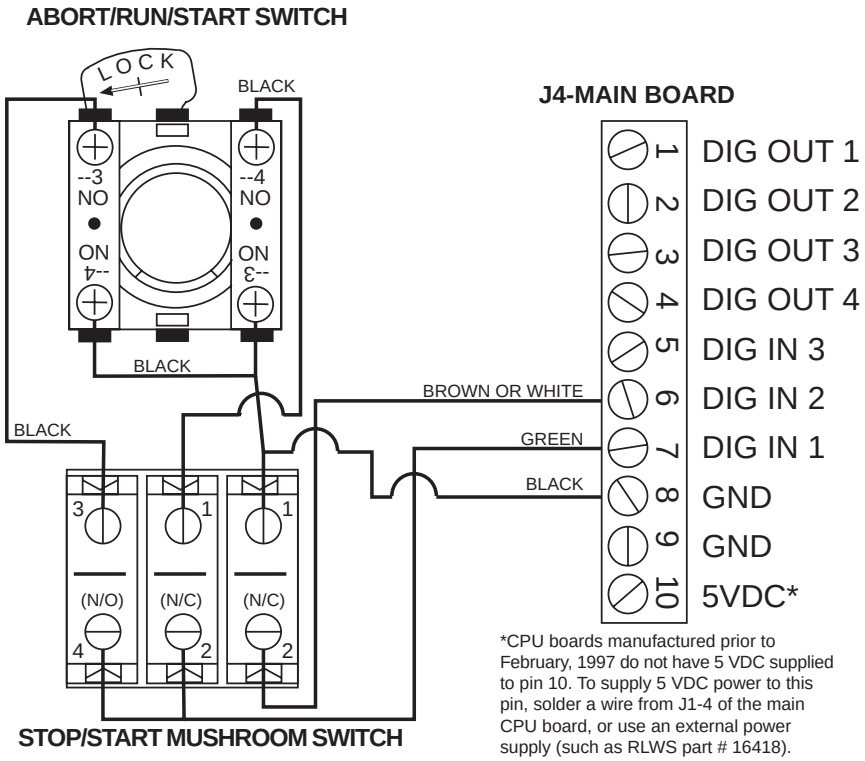
1) The red stop button must be in the OUT position to allow the batch process to run. To begin a batch process, the 3-way switch must momentarily be turned to START. If the stop button is pushed during the batch process, the process halts and the button locks in the IN position. Turning the 3-way switch to START while the stop button is locked IN will not resume the batch process. The stop button must be turned counterclockwise to unlock it, and release it into the OUT position.

2) When the stop button is used to halt a batching operation, the operation will continue *where it left off* by following these steps:

   A. Unlock the stop button to OUT.
   B. Turn the 3-way switch to START.

3) When the stop button is used to halt a batching operation, the operation will *abort and return to the beginning step* by following these steps:

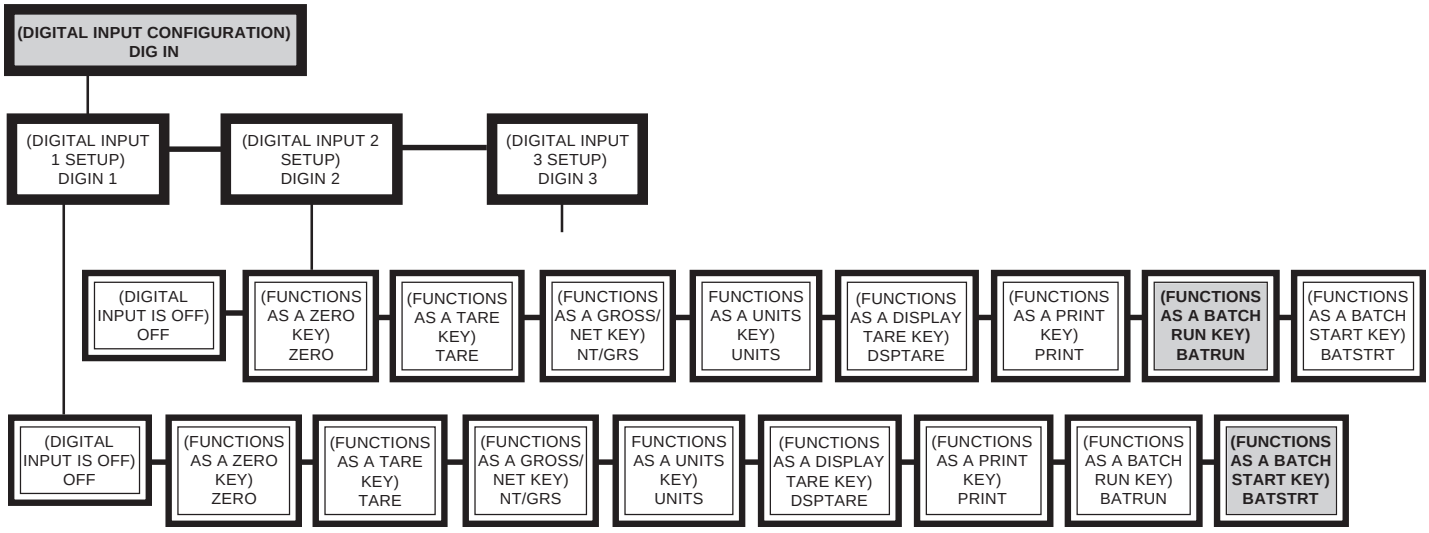
   A. Before unlocking the stop button, turn the 3-way switch to ABORT.
   B. Unlock the stop button to OUT.
   C. Turn the 3-way switch to START.



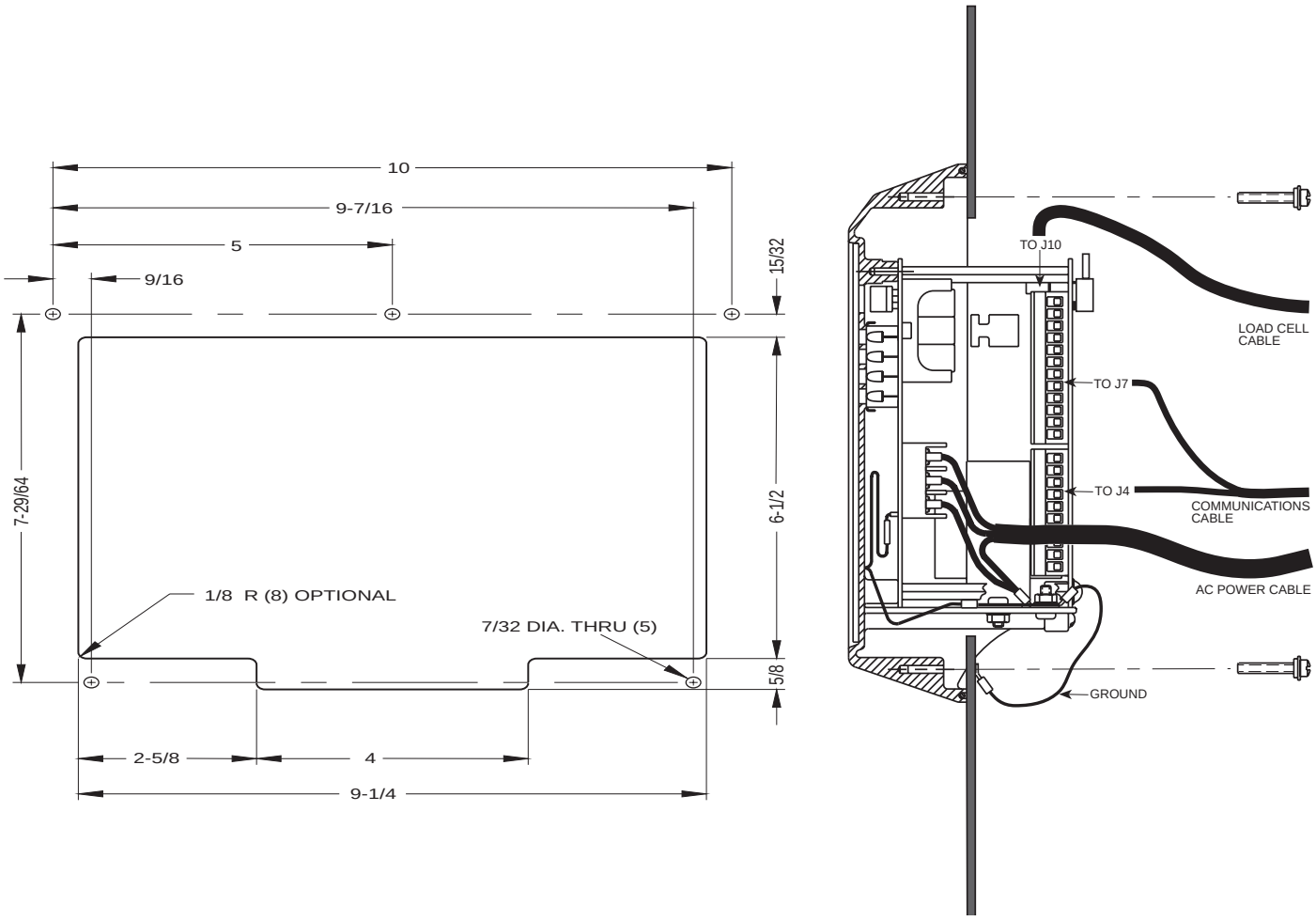
*CPU boards manufactured prior to February, 1997 do not have 5 VDC supplied to pin 10. To supply 5 VDC power to this pin, solder a wire from J1-4 of the main CPU board, or use an external power supply (such as RLWS part # 16418).

CONFIGURING THE BATCHING SWITCH OPTION

When the hardware switches and wires are completed, place the indicator in the setup mode using SW1 on the Main CPU Board. Under the main level menu, DIG IN, move down under DIG IN 1 and choose BATSTRT as the digital input 1 selection. Then move down under DIG IN 2 and choose BATRUN as the digital input 2 selection. With SW1, place the unit back into the normal weighing mode when the digital input configuration above is completed.



10.17 PANEL MOUNTING KIT FOR IQplus 810 DESKTOP MODEL



The Panel Mounting Kit contains five screws with washers which replace the original screws holding the body to the faceplate. A template constructed from the drawing above may be used to mark the hole cut-out in the panel.

1. Unplug the AC power cord before beginning.

2. Remove the back of the indicator by unscrewing the six machine bolts holding the back to the faceplate.

3. Temporarily remove any cable connections from the indicator terminals. Remove the ground cable from the cast lug on the rear of the indicator case.

4. Using a template made from the drawing above, transfer the cut-out to the panel. Cut out the panel and drill the holes to size.

5. Hold the faceplate against the panel as shown and secure with the five machine screws and washers provided.

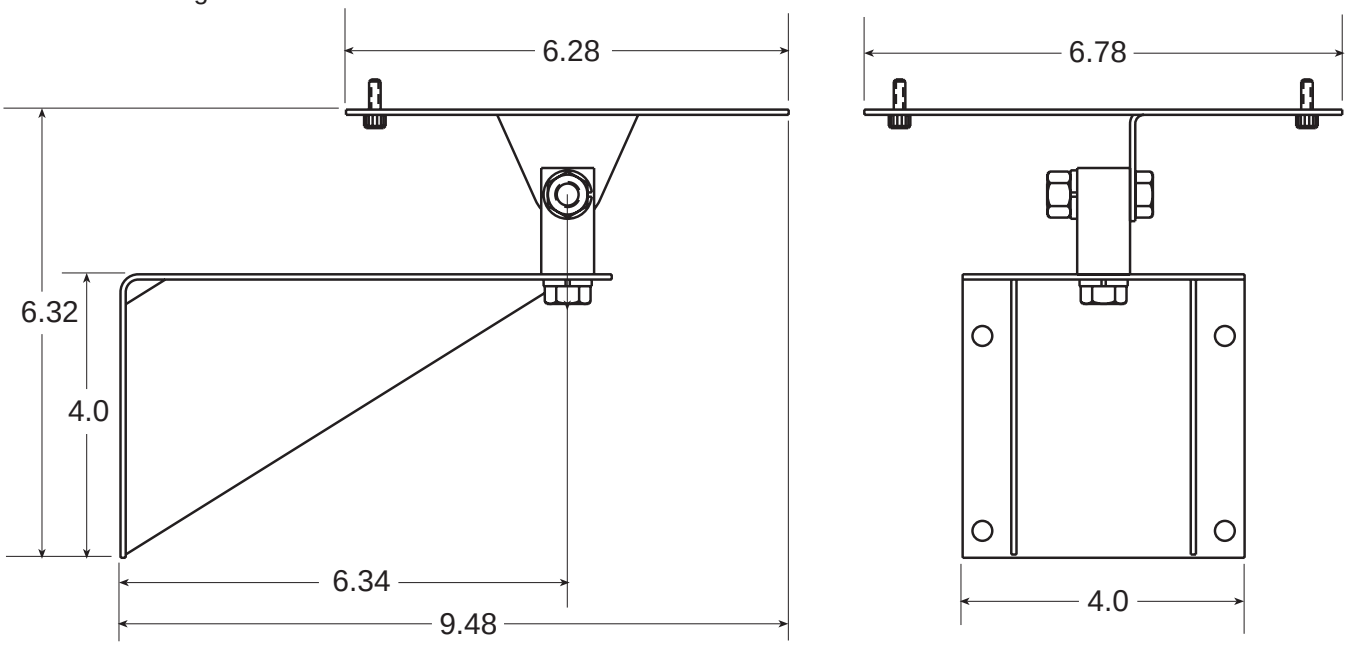
6. Attach the ground wire that was connected to the lug on the indicator body to one of the five screws.

7. Re-attach cables to indicator terminals. Power up and test the indicator.

10.18 WALL MOUNT KITS

DESKTOP MODELWALL/TILT MOUNT

A Wall Mount Kit is available for mounting the Desktop model against vertical surfaces. The indicator mounting plate both swivels and tilts for adjusting the viewing angle. The indicator case is secured to the mounting plate with two machine screws turned into threaded holes in the bottom of the indicator body. Overall dimensions are shown in the diagram below.



10.19 100 Hz HIGH-SPEED OPTION

The Jetpak™ version of the IQplus 810 features an update rate of 100 updates per second. This option cannot be added after purchase to modify an existing unit, but must be initially ordered as a high-speed unit. The necessary hardware—a dedicated, single-channel 100 Hz A/D converter—must be installed at the factory. High-speed Jetpak™ units are identified by a special label on the A/D converter, and the letter "X" in the model number tag.

Software indicators also designate the unit as a high-speed version. Upon startup, the unit will run through a lamp test, then display the word FAST for two seconds. After setup has been completed and the unit is exiting the SETUP mode, the word FAST will again flash onto the display momentarily.

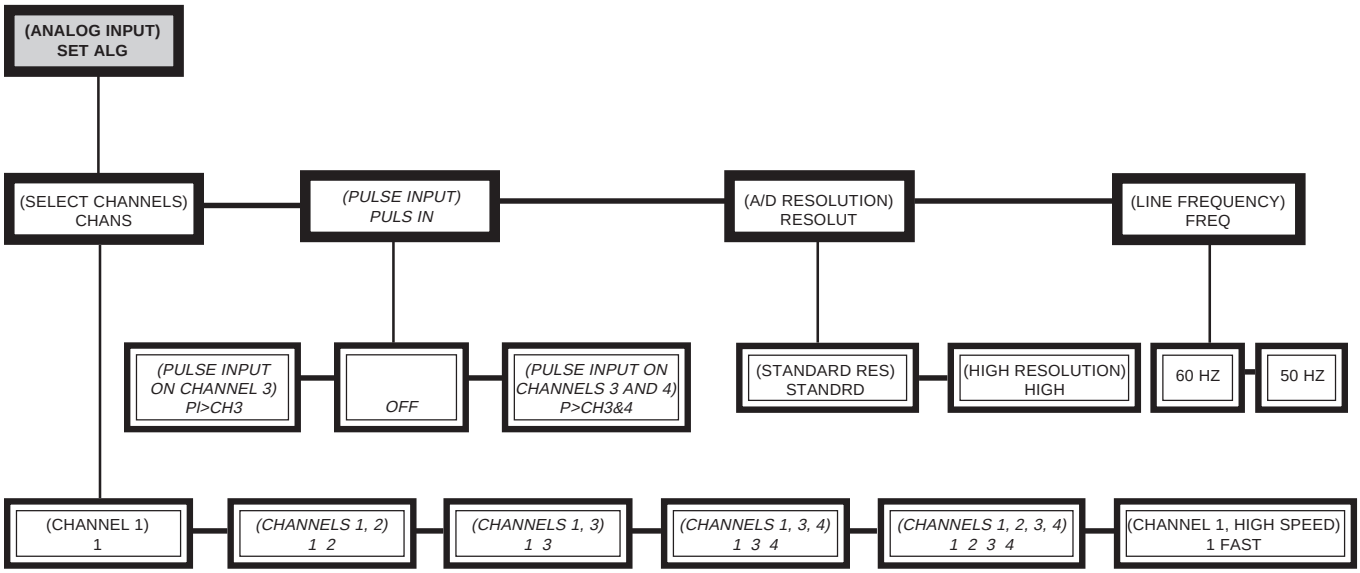
The Jetpak™ version of the IQplus 810 is a dedicated single-channel, high-speed indicator. As such, the high-speed A/D precludes the use of multiple input channels. When setting up the unit, the only selection available under the CHANS parameter (see menu graphic below) is 1 FAST. Any other menu selections involving multiple channel choices (e.g., PULSE INPUT) will be either disabled or limited to single-channel choices. All other features of the standard IQplus 810 system are compatible with the Jetpak™ option.

Please note that the complete weighing system must be streamlined to take full advantage of the high-speed weighing capabilities of the Jetpak™ unit.

- Operating more than two continuously-running setpoints requires intensive work from the microprocessor and will generally slow the actual update rate to less than 100 per second. Batch step setpoints, however, do not affect the update rate and can run at 100 per second.

- Operations which depend heavily on serial communications will not affect the A/D converter rate, but will slow down the capabilities of the overall system. The practical limit for serial transmission is approximately only 50 readings per second, even though the A/D is updating at 100 per second. Continuous Streaming format, End-of-Line delays, and extensive EDP serial port commands all act to slow down the overall system performance. Slow baud rate selections will further reduce the capabilities of the system. A special high-speed data streaming version is available. Consult the factory for specifications and limitations.

- Inappropriate settings, like filtering selections which require long settling times, will also slow down the overall speed of the weighing system.



10.20 RECIPE STORAGE SOFTWARE OPTION

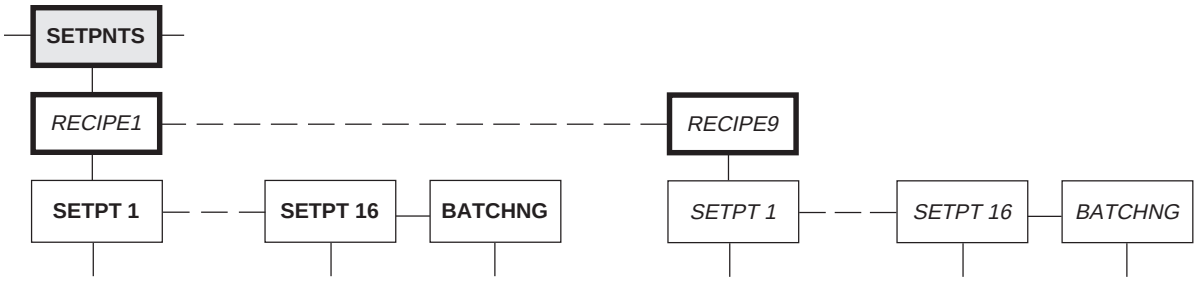
This option provides nine "stored" recipes and one "working" recipe. Each recipe has 16 setpoints. You can configure all nine working recipies from the "SETPNTS" configuration submenu or by using EDP commands. Also, you can copy a stored recipe into the currently running "working" recipe from the front panel or with EDP commands. Then, you can use the **SETPOINT** key to modify the working recipe without affecting the stored recipe. Also, by using an EDP command, you can save the working recipe as a stored recipe.

To copy a stored recipe into the working recipe location:
Enter a number corresponding to one of the stored recipes and press **NEW ID**. The indicator prompts "NEW REC" and copies the recipe into the working recipe. Return to the normal operating mode by pressing **GROSS/NET**, or wait until the display switches back.

While in normal operating mode, you can press **NEW ID** to verify which recipe was last copied to the working recipe location. The indicator responds with "RECIP x" (where x = the recipe number). Once again, return to the normal operating mode by pressing **GROSS/NET**, or wait until the display switches back.

To change the working recipe:
You can change the working recipe from the front panel by using the **SETPOINT** key, as described in the *IQplus 810 Installation Manual*. Changes to the working recipe do not affect the stored recipes. To undo changes to the working recipe, copy the original stored recipe over the working recipe.

Accessing the recipes in setup mode:
In the setup mode, you access the recipes from the "SETPNTS" submenu. There are 16 configurable setpoints for each of the nine recipes.



EDP commands:
You can modify the working recipe by using the EDP commands listed in the setpoints submenu in the *IQplus 810 Installation Manual*. You can use these EDP commands in both the normal operating and setup modes. You must use upper case letters for the commands.

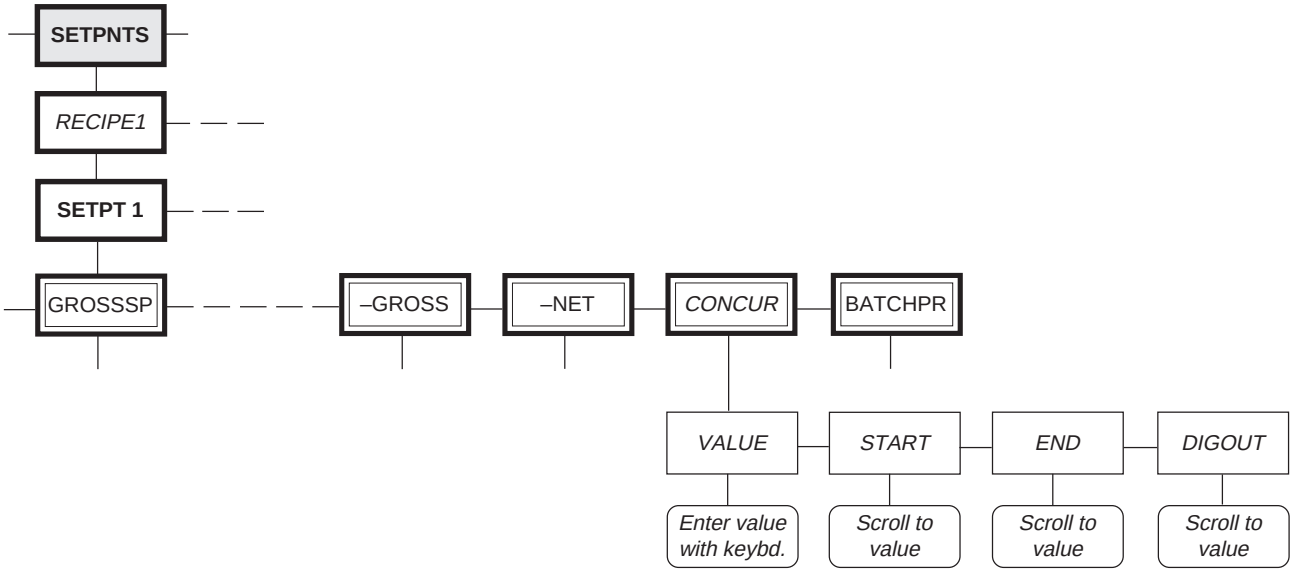
NEW EDP COMMANDS FOR MOVING RECIPES:	
RECIPE	Corresponds to the recipe number affected by RECIPESAVE and RECIPERECALL commands
RECIPESAVE	Copies the working recipe into the recipe previously selected with the RECIPE command
RECIPERECALL	Copies the recipe designated by RECIPE command into the working recipe
RECIPEDUMP	Sends all setpoint parameter settings for the current working recipe to the EDP port. (Similar to DUMPALL, but dumps only the setpoint parameters)

10.20 RECIPE STORAGE SOFTWARE OPTION (Continued)

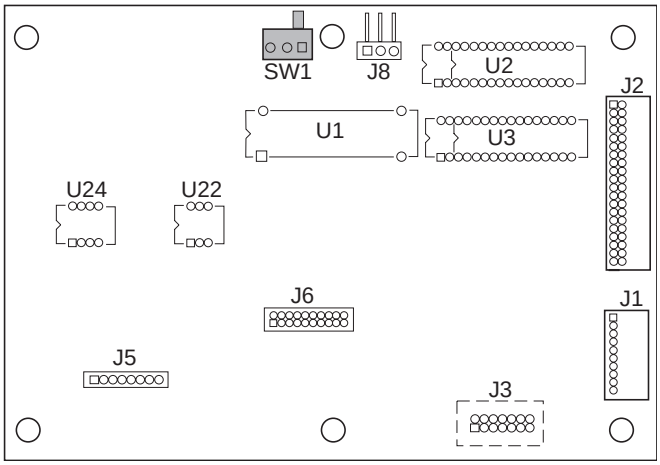
CONCUR (AUX) setpoints:
This software option adds a new kind of setpoint, called CONCUR, which can keep a digital output active over the duration of several setpoints. The following parameters apply to concurrent setpoints: VALUE, START, END, and DIGOUT.

CONCURRENT SETPOINT TYPES:	
Type 1:	The digital output becomes active at the beginning of the START setpoint and returns to an inactive state at the beginning of the END setpoint.
Type 2:	The digital output becomes active at the beginning of the START setpoint and returns to an inactive state after VALUE (in 10ths of seconds).

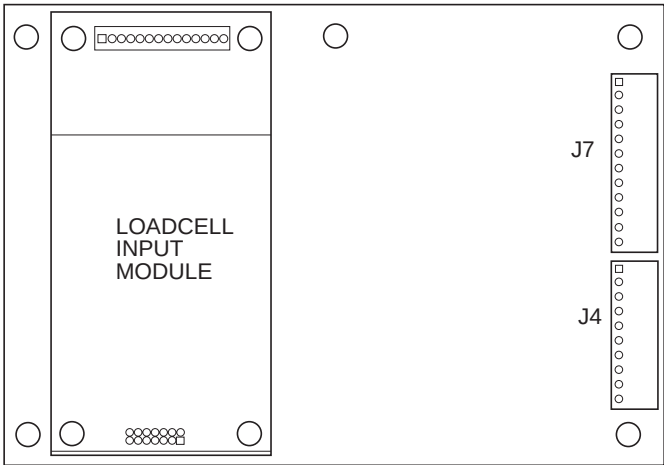
If the VALUE parameter is greater than 0, then the Type 2 concurrent setpoint is implemented. Otherwise, Type 1 is implemented. The maximum number of Type 2 concurrent setpoints is five.
Two new EDP commands, START and END, change the START and END concurrent setpoints, respectively.



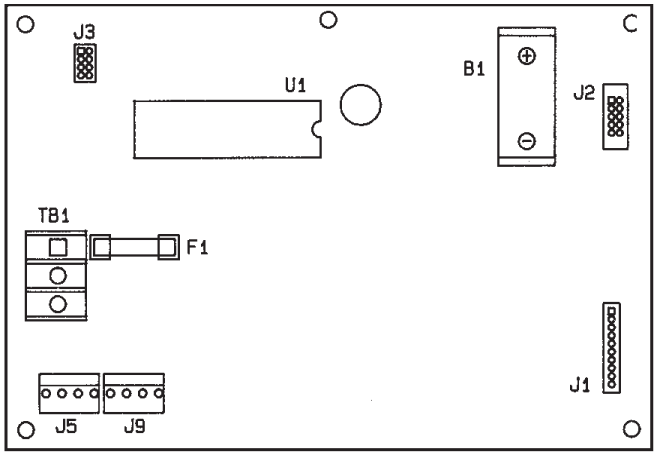
11. BOARD DIAGRAMS



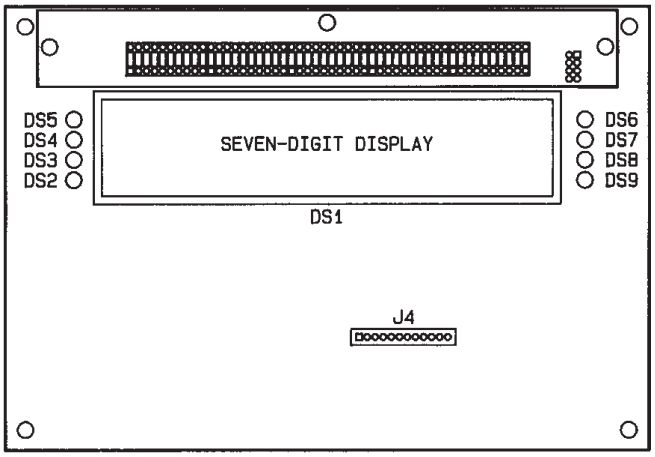
MAIN BOARD--COMPONENT SIDE



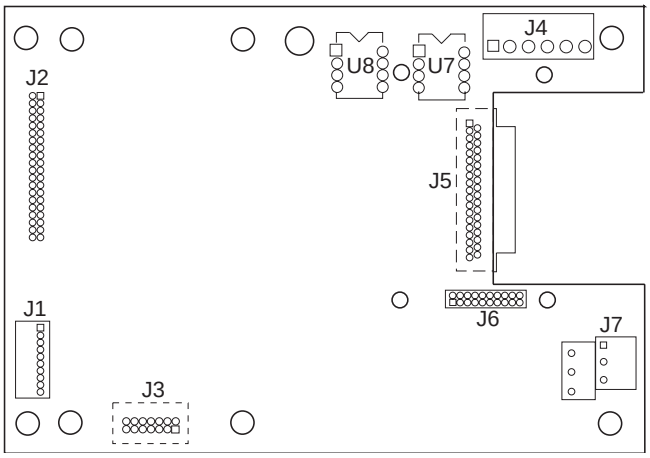
MAIN BOARD--REAR, 2-CHANNEL INPUT MODULE



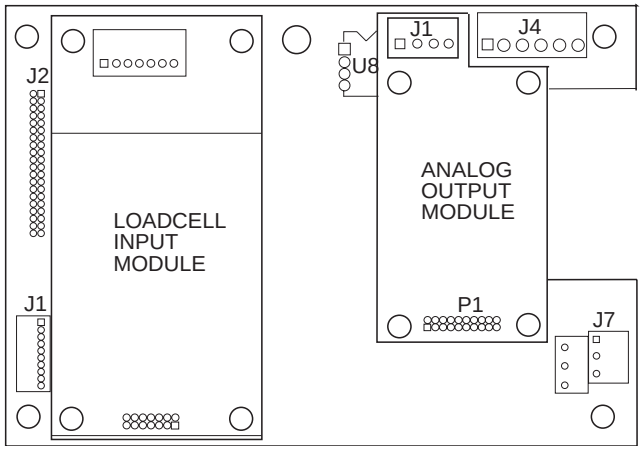
DISPLAY/POWER BOARD--COMPONENT SIDE



DISLPAY/POWER BOARD--SOLDER SIDE



EXPANSION BOARD--COMPONENT SIDE



EXPANSION BOARD WITH MODULES INSTALLED

12. SPECIFICATIONS

ANALOG SPECIFICATIONS

Full Scale Input Signal	5 to 39 mV including Deadload (Initial load)
Analog Signal Input Range	0.6 mV/V - 3.9 mBV/V
Analog Signal Sensitivity	0.3 microvolts/graduation minimum
Input Impedance	>10 MΩ
Noise (Referred to Input)	0.3 μV p-p with 2 Hz Analog Filter, Digital Filter 4
Internal Resolution	Selectable: 300,000 - 740,000 counts
Display Resolution	>100,000 dd, limited only by internal resolution and system noise
Measurement Rate	20 Meas/sec
Input Sensitivity	Normally 130 nV per internal count, <60 nV with expanded resolution or digital filtering
System Linearity	Within 0.01% of FS
Zero Stability	140 nV/°C, maximum; 10 nV/°C typical
Span Stability	3.5 ppm/°C, maximum
Recommended Recalibration	3 years
Calibration Method	By software through front panel, with storage of voltage and weight constants in EEROM
Common Mode Voltage	± 4V, referred to earth
Common Mode Rejection	140 dB, minimum @ 50 or 60 Hz with 2 Hz or 8 Hz Analog Filter, Digital Filter 4
Normal Mode Rejection	90 dB, minimum @ 50 or 60 Hz with 2 Hz Analog Filter 80 dB, minimum @ 50 or 60 Hz with 8 Hz Analog Filter
Input Overload	±12V continuous, static discharge protected
Excitation Voltage	10 ± 0.5 Vdc, 16 x 350Ω load cells
Analog Filter	Software selectable: Off, 2 , 8 Hz typical / 3 pole
Digital Filter	Software selectable: Off, 1, 2, 4, 8, 16, 32, 64, 128 typical / 3 pole. Enhanced vibration capability available through Rattletrap® hybrid digital filtering.
Sense Amplifier	Differential Amplifier with 6-wire sensing
RFI Protection	Signal, excitation, and sense lines protected by capacitor bypass
Analog Output	Optional: fully isolated 0-10VDC or 4-20 mA, 14 bit resolution

DIGITAL SPECIFICATIONS

Microcomputer	NEC μPD75216A Display processor, Hitachi 64180 Main processor Program Memory: 128K x 8 RAM: 16K used, 16K x 8 spare EEROM: 128 x 16, 93C46
Digital Inputs:	3 inputs, TTL or switch closure, Active Low, Special purpose setpoint Supervisor input
Digital Outputs	4 outputs, Open collector with TTL pullup, 250 mA sink, 40V withstand
Expansion Digital Outputs	Optional: 12 additional 250 mA, 40V Withstand

SERIAL COMMUNICATION

EDP Port	19200, 9600, 4800, 2400, 1200, 600, 300 Baud. Full Duplex RS-232 or 20 mA Current Loop, RS485 optional
Printer Port	19200, 9600, 4800, 2400, 1200, 600, 300 Baud. Simplex RS232, or 20 mA Current Loop
Both Ports	Selectable: RS-232 or 20 mA Current Loop standard, RS-485 optional on EDP 8 data bits, no parity 7 data bits, even parity 7 data bits, odd parity

OPERATOR INTERFACE

Display	14 mm (0.55 inch), 14-segment vacuum fluorescent, 7 full digit display. Decimal point available at each digit. Eight red LED annunciators
Additional Symbols	Tare, Entered Tare, Tare In System, Standstill, Net, Gross, Center of Zero, Minus Sign, lb, kg, Entry Mode
Color	Blue-green main display, red annunciators
Keyboard	25-key flat membrane panel. Tactile feel is provided by stainless steel domes
Bar Graph (optional)	48-segment red display tracks net or gross weight functions, or setpoint functions

POWER

Line Voltages	120 or 240 Vac +10% / –15%
Frequency	50 or 60 Hz
Power Consumption	12 VA with minimum configuration, 30 VA with all options
Fusing	0.25A SB (UL/CSA) 5x20mm @120V operation 0.125A SB (UL/CSA) 5x20mm @240V operation

ENVIRONMENTAL

Operating Temperature	–10 to +40°C (legal operating range) –10 to +50°C (industrial operating range)
Storage Temperature	–25 to +70°C, limited by battery life
Electric Field Rejection	Per SMA requirements
Emissions	FCC Part 15 Class A, UL 466, UL 508 and CISPR 22 Class A
Electrical Safety	According to IEC 950, UL 1950, CSA 220

MECHANICAL

	IQ+ 810 Desktop	**IQ+ 810 Survivor®**	**IQ+ 810 SS**
Overall Dimensions	11" W, 8.5" H, 8.5" D	16" W, 17.5" H, 8" D	12.6" W, 15.5" H, 6.3" D
Weight	15.0 LB	17.3 LB	24.0 LB
Enclosure Classification	NEMA 4	NEMA 4X	NEMA 4X
Enclosure Materials	Die-cast Zinc	Fiberglass Reinforced Polyester	Stainless Steel

NTEP CERTIFICATION

CoC Number	92-013
Class	Certified for 10,000 Divisions, Class III and IIIL

13. WARRANTY AND SERVICE INFORMATION

Seller warrants that the IQplus 810 will conform to written specifications, drawings, and other descriptions made by the manufacturer, including any modification thereof. The Seller warrants the goods against faulty workmanship and defective materials. If any goods fail to conform to these warranties, Seller will, as its sole and exclusive liability hereunder, repair or replace such goods if they are returned within the following warranty period:

Twelve (12) months from date of shipment from manufacturer.

These warranties are made upon the express condition that:

1) Rice Lake Weighing Systems is given prompt written notice upon discovery by Buyer of such nonconformity, with a detailed explanation of the alleged deficiencies;
2) Such goods are returned to the Seller at the expense of the Buyer;
3) Examination of such goods by Seller discloses that the nonconformity actually exists and was not caused by accident, misuse, neglect, alteration, improper installation, improper or unauthorized repair, or improper testing, and
4) Such goods have not been modified, altered, or changed by any person other than the Seller or its duly authorized repair agents.

Rice Lake Weighing Systems will have a reasonable time to repair or replace such goods.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND OR FITNESS FOR A PARTICULAR PURPOSE. SELLER WILL NOT IN ANY EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

IN ACCEPTING THIS WARRANTY, THE PURCHASER OR BUYER AGREES TO WAIVE ANY AND ALL OTHER CLAIM OR RIGHT TO WARRANTY, OR IF SUCH BE THE CASE, ANY CLAIM OF WARRANTY FROM RICE LAKE WEIGHING SYSTEMS, INCORPORATED. SHOULD THE SELLER BE OTHER THAN RICE LAKE WEIGHING SYSTEMS, INCORPORATED, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR ITS WARRANTY CLAIM OR CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of the Seller.

Rice Lake Weighing Systems, Inc., 230 West Coleman Street, Rice Lake, WI 54868
Main Office (715) 234-9171 Service (715) 234-2003 Fax (715) 234-6967

14. APPENDIX

14.1 ANALOG FILTER (ALGFLTR) SELECTION

Analog filtering uses electrical components (usually special capacitors and other "voltage smoothing" elements) to make the DC voltage from the load cell to the A/D converter as free of surges and fluctuations as possible. These capacitors have a tendency toward smoothing out the major, low-freqency voltage bumps, while easily tracking the smaller, high-frequency changes. Analog filtering is generally more effective than digital filtering in preventing voltage fluctuations caused by electrical or radio frequency interference. Voltage fluctuation caused by such electrical interference usually shows as a regular rolling up and down of the display. In the chart below, note that settings for increased filtering effect that screen out more electrical noise, also tend to increase settling time, therefore slowing down the display in achieving Standstill. Generally,use the lowest filtering effect which yields a quiet or stable display.

It is generally the best practice to attempt to clear interference first with just the anaolg filter so the signal will be clear entering the A/D converter. When testing the effect of the anolog filter in this manner, set the digital filter at its lowest setting, 1. If the highest rate of analog filtering does not stablize the display, leave the analog filter on at 8 Hz or 2 Hz, and begin increasing the digital filter settings.

ALGFLTR	FILTERING EFFECT	APPROXIMATE SETTLING TIME*
None	Low (>25Hz)	64 ms
8 Hz	Medium (>8Hz)	200 ms
2 Hz	High (>2Hz)	800 ms

*Settling times are relative and dependent on interference level

14.2 DIGITAL FILTER (DIGFLTR) SELECTIONS

Standard digital filtering is purely a software function, that uses mathematical averaging to try to eliminate the variant digital readings that the A/D converter sends periodically because of external vibration. Digital filtering does not effect the indicator's measurement rate, but does affect the settling time. The selections from 1 to 128 reflect the number of readings averaged per update period. When a reading is encountered that is outside a predetermined band, the averaging is overridden, and the display "jumps" directly to the new value.

Advanced Rattletrap™ digital filtering (selections with RT after the number) indicate a mode that can be viewed as a hybrid combination of the best features of analog and digital filtering. RATTLETRAP™ uses a vibration-dampening algorithm developed in actual industrial applications with extreme vibration present. This filtering mode evaluates the frequency of a repeating vibration, then derives a composite displayed weight equal to the actual weight on the scale less the vibration-induced flaws. It is particularly effective for eliminating repeating vibration or mechanical interference from nearby machinery. RT selections will eliminate much more mechanical vibration than standard digital filtering, but usually also increase settling time over standard digital filtering.

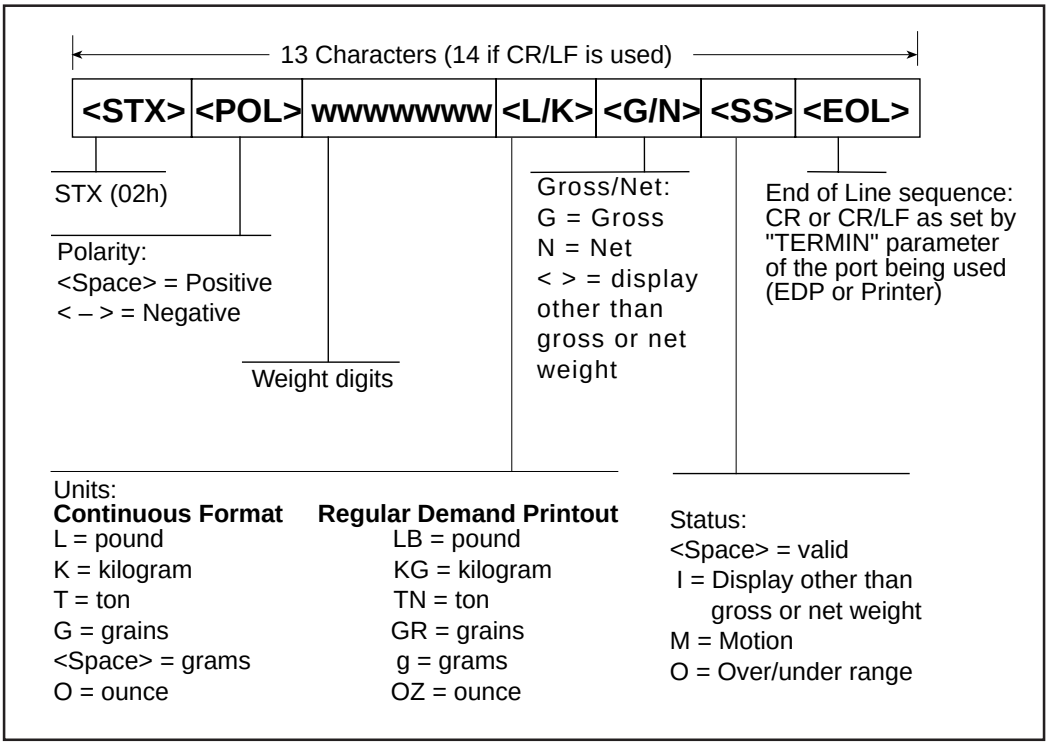
Digital filtering is more effective in eliminating effects of mechanical noise and vibrations than is analog filtering. Such mechanical noise usually shows on the display as a random changing of the least-significant digit. The trade off with using a high number of averages (and therefore a very accurate reading) is that the settling time increases as the number of averages chosen increases. So even though the higher-numbered selections give a more accurate reading, if speed of display is important use the lowest selection which gives a stable display.

When using digital filtering, analog filtering is usually set to High (2 HZ). When testing the effect of the analog filter, set the digital filter to 1.

14.3 CONTINUOUS TRANSMISSION (STREAM) DATA FORMAT

Any serial communications port which has been selected in the Serial menu for continuous (STREAM) mode of transmission will communicate in the CC Data Format as the default format. The CC format (Consolidated Control) is widely used throughout the industry for data communication, and was therefore chosen as the default format.

For specialized applications, it is also possible to construct other data formats to use in the continuous transmission mode. Current information on custom data formatting can be obtained by calling the Specials Department at Rice Lake Weighing Systems, Inc., (800)-472-6703



CC DATA FORMAT

14.4 CONVERSION FACTORS FOR SECONDARY SCALE UNITS

The IQplus 810 has the capability to mathematically convert a weight into many different types of units and instantly display those results with a press of the **UNITS** key.

In the 1st level menu, FORMAT, the primary units display can be converted with a multiplier into many possible forms for display as secondary units. The **UNITS** key is used to toggle between primary units display and secondary units display. The default setting is LB for primary, and KG for secondary, and the annunciator lights are labelled accordingly. Four other standard annunciator labels are available for ounces, tons, grams, and grains.

However, the range of possibilities for the secondary units display is not limited to the six units listed. If a correct conversion multiplier is entered under the secondary units parameter in the FORMAT menu, conversion possibilities are nearly unlimited. The annunciator for the secondary scale may still read KG as a label, but the multiplier entered may be actually allowing the display to show gallons or cubic feet of a liquid, lineal feet of wire, newtons, dynes, psi, etc.

The Conversion Factors beginning on the following page list multipliers for converting a wide range of possible units.

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY	CONVERSELY x BY
Acres	Square feet	4.356×10^{4}	2.296×10^{-5}
Acres	Square meters	4047	2.471×10^{-4}
Acres	Square miles	1.5625×10^{-3}	640
Ampere-hours	Coulombs	3600	2.778×10^{-4}
Ampere-turns	Gilberts	1.257	0.7958
Ampere-turns per cm.	Ampere-turns per inch	2.54	0.3937
Angstrom units	Inches	3.937×10^{-9}	2.54×10^{8}
Angstrom units	Meters	10^{-10}	10^{10}
Ares	Square meters	10^{2}	10^{-2}
Atmospheres	Feet of water	33.90	0.02950
Atmospheres	Inch of mercury at 0°C	29.92	3.342×10^{-2}
Atmospheres	Kg per square meter	1.033×10^{4}	9.678×10^{-5}
Atmospheres	mm of mercury at 0°C	760	1.316×10^{-3}
Atmospheres	Pascals	1.0133×10^{5}	0.9869×10^{-5}
Atmospheres	Pounds per square inch	14.70	0.06804
Barns	Square centimeters	10^{-24}	10^{24}
Bars	Atmospheres	.9869	1.0133
Bars	Dynes per square cm	10^{6}	10^{-6}
Bars	Pascals	10^{5}	10^{-5}
Bars	Pounds per square inch	14.504	6.8947×10^{-2}
Board feet	Cubic meters	2.3597×10^{-3}	4.238×10^{2}
Btu	Ergs	1.0548×10^{10}	9.486×10^{-11}
Btu	Foot-pounds	778.3	1.285×10^{-3}
Btu	Joules	1054.8	9.480×10^{-4}
Btu	Kilogram-calories	0.252	3.969
Btu per hour	Horsepower-hours	3.929×10^{-4}	2545
Bushels	Cubic feet	1.2445	0.8036
Bushels	Cubic meters	3.5239×10^{-2}	28.38
Calories, gram	Joules	4.185	0.2389
Carats (metric)	Grams	0.2	5
Celsius	Fahrenheit	(°C x 9/5) + 32 = °F	(°F - 32) x 5/9 = °C
Celsius	Kelvin	°C + 273.1 = K	K - 273.1 = °C
Chains (surveyor's)	Feet	66	1.515×10^{-2}
Circular mils	Square centimeters	5.067×10^{-6}	1.973×10^{5}
Circular mils	Square mils	0.7854	1.273
Cords	Cubic meters	3.625	0.2758
Cubic feet	Cords	7.8125×10^{-3}	128
Cubic feet	Gallons (liq U.S.)	7.481	0.1337
Cubic feet	Liters	28.32	3.531×10^{-2}
Cubic inches	Cubic centimeters	16.39	6.102×10^{-2}
Cubic inches	Cubic feet	5.787×10^{-4}	1728
Cubic inches	Cubic meters	1.639×10^{-5}	6.102×10^{4}
Cubic inches	Gallons (liq U.S.)	4.329×10^{-3}	231
Cubic meters	Cubic feet	35.31	2.832×10^{-2}
Cubic meters	Cubic yards	1.308	0.7646
Cups	Cubic centimeter	2.366×10^{2}	4.227
Curies	Becquerels	3.7×10^{10}	2.7×10^{-11}
Cycles per second	Hertz	1	1
Degrees (angle)	Mils	17.45	5.73×10^{-2}
Degrees (angle)	Radians	1.745×10^{-2}	57.3
Dynes	Pounds	2.248×10^{-6}	4.448×10^{5}
Electron volts	Joules	1.602×10^{-19}	0.624×10^{19}
Ergs	Foot-pounds	7.376×10^{-8}	1.356×10^{7}
Ergs	Joules	10^{-7}	10^{7}
Ergs per second	Watts	10^{-7}	10^{7}
Ergs per square cm	Watts per square cm	10^{-3}	10^{3}
Fahrenheit	Kelvin	(°F + 459.67) / 1.8	1.8K - 459.67
Fahrenheit	Rankine	°F + 459.67 = °R	°R - 459.67 = °F
Faradays	Ampere-hours	26.8	3.731×10^{-2}
Fathoms	Feet	6	0.16667
Fathoms	Meters	1.8288	0.5467
Feet	Centimeters	30.48	3.281×10^{-2}
Feet	Meters	0.3048	3.281
Feet	Mils	1.2×10^{4}	8.333×10^{-5}
Feet of water at 4°C	Inches of mercury at 0°C	0.8826	1.133
Feet of water at 4°C	Kg per square meter	304.8	3.281×10^{-3}
Feet of water at 4°C	Pascals	2.989×10^{3}	3.346×10^{-4}
Fermis	Meters	10^{-15}	10^{15}

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY	CONVERSELY x BY
Foot candles	Lux	10.764	0.0929
Foot lamberts	Candelas per sq meter	3.4263	0.2918
Foot-pounds	Gram-centimeters	1.383×10^{4}	1.235×10^{-5}
Foot-pounds	Horsepower-hours	5.05×10^{-7}	1.98×10^{6}
Foot-pounds	Kilogram-meters	0.1383	7.233
Foot-pounds	Kilowatt-hours	3.766×10^{-7}	2.655×10^{6}
Foot-pounds	Ounce-inches	192	5.208×10^{-3}
Gals	Meters per second	9.807	0.102
Gallons (liq U.S.)	Cubic meters	3.785×10^{-3}	264.2
Gallons (liq U.S.)	Gallons (liq Br. lmp.)	0.8327	1.201
Gammas	Teslas	10^{-9}	10^{9}
Gausses	Lines per square cm	1.0	1.0
Gausses	Lines per square in	6.452	0.155
Gausses	Teslas	10^{-4}	10^{4}
Gausses	Webers per square in	6.452×10^{-8}	1.55×10^{7}
Gilberts	Amperes	0.7958	1.257
Grads	Radians	1.571×10^{-2}	63.65
Grams	Dynes	980.7	1.02×10^{-3}
Grams	Grains	15.43	6.481×10^{-2}
Grams	Ounces (avdp)	3.527×10^{-2}	28.35
Grams	Poundals	7.093×10^{-2}	14.1
Grams per cm	Pounds per in	5.6×10^{-3}	178.6
Grams per cu cm	Pounds per cu in	3.613×10^{-2}	27.68
Grams per square cm	Pounds per square ft	2.0481	0.4883
Hectares	Acres	2.471	0.4047
Horsepower	Btu per minute	42.418	2.357×10^{-2}
Horsepower	Foot-lbs per minute	3.3×10^{4}	3.03×10^{-5}
Horsepower	Foot-lbs per second	550	1.182×10^{-3}
Horsepower	Horsepower (metric)	1.014	0.9863
Horsepower	Kilowatts	0.746	1.341
Horsepower (metric)	Btu per minute	41.83	2.390×10^{-2}
Horsepower (metric)	Kg-calories per minute	10.54	9.485×10^{-2}
Horsepower (metric)	Watts	7.355×10^{2}	745.7
Inches	Centimeters	2.54	0.3937
Inches	Feet	8.333×10^{-2}	12
Inches	Meters	2.54×10^{-2}	39.37
Inches	Miles	1.578×10^{-5}	6.336×10^{4}
Inches	Mils	10^{3}	10^{-3}
Inches	Yards	2.778×10^{-2}	36
Inches of mercury at 0°C	Pascals	3.386×10^{3}	2.953×10^{-4}
Inches of mercury at 0°C	Pounds per square inch	0.4912	2.036
Inches of water at 4°C	Inches of mercury	7.355×10^{-2}	13.60
Inches of water at 4°C	Kg per square meter	25.40	3.937×10^{-2}
Inches of water at 15.6°C	Pascals	2.488×10^{2}	4.02×10^{-3}
Joules	Foot-pounds	0.7376	1.356
Joules	Watt-hours	2.778×10^{-4}	3600
Kilogram-calories	Kilogram-meters	426.9	2.343×10^{3}
Kilograms	Tonnes	10^{-3}	10^{3}
Kilograms	Tons (long)	9.842×10^{-4}	1016
Kilograms	Tons (short)	1.102×10^{-3}	907.2
Kilograms	Pounds (avdp)	2.205	0.4536
Kilograms per sq meter	Pounds per square feet	0.2048	4.882
Kilometers	Feet	3281	3.408×10^{-4}
Kilometers	Inches	3.937×10^{4}	2.54×10^{-5}
Kilometers	Light years	1.0567×10^{-13}	9.4637×10^{12}
Kilometers per hour	Feet per minute	54.68	1.829×10^{-2}
Kilometers per hour	Knots	0.5396	1.8532
Kilowatt-hours	Btu	3413	2.93×10^{-4}
Kilowatt-hours	Foot-pounds	2.655×10^{6}	3.766×10^{-7}
Kilowatt-hours	Horsepower-hours	1.341	0.7457
Kilowatt-hours	Joules	3.6×10^{6}	2.778×10^{-7}
Kilowatt-hours	Kilogram-calories	860	1.163×10^{-3}
Kilowatt-hours	Kilogram-meters	3.671×10^{5}	2.724×10^{-6}
Kilowatt-hours	Pounds of water evap. at 212°F	3.53	0.284
Kilowatt-hours	Watt-hours	10^{3}	10^{-3}
Knots	Feet per second	1.688	0.5925
Knots	Meters per minute	30.87	0.0324
Knots	Miles per hour	1.1508	0.869

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY	CONVERSELY x BY
Lamberts	Candelas per square cm	0.3183	3.142
Lamberts	Candelas per square in	2.054	0.4869
Leagues	Miles	3	0.33
Links	Chains	0.01	100
Links (surveyor's)	Inches	7.92	0.1263
Liters	Bushels (dry U.S.)	2.838×10^{-2}	35.24
Liters	Cubic centimeters	10^{3}	10^{-3}
Liters	Cubic inches	61.02	1.639×10^{-2}
Liters	Cubic meters	10^{-3}	10^{3}
Liters	Gallons (liq U.S.)	0.2642	3.785
Liters	Pints (liq U.S.)	2.113	0.4732
$Log_e N$	$Log_{10} N$	0.4343	2.303
Lumens per sq foot	Foot-candles	1	1
Lumens per sq meter	Foot-candles	0.0929	10.764
Lux	Foot-candles	0.0929	10.764
Maxwells	Kilolines	10^{-3}	10^{3}
Maxwells	Megalines	10^{-6}	10^{6}
Maxwells	Webers	10^{-8}	10^{8}
Meters	Feet	3.28	30.48×10^{-2}
Meters	Inches	39.37	2.54×10^{-2}
Meters	Miles	6.214×10^{-4}	1609.35
Meters	Yards	1.094	0.9144
Meters per minute	Feet per minute	3.281	0.3048
Meters per minute	Kilometers per hour	0.06	16.67
Mhos	Siemens	1	1
Miles (nautical)	Feet	6076.1	1.646×10^{-4}
Miles (nautical)	Meters	1852	5.4×10^{-4}
Miles (statute)	Feet	5280	1.894×10^{-4}
Miles (statute)	Kilometers	1.609	0.6214
Miles (statute)	Light years	1.691×10^{-13}	5.88×10^{12}
Miles (statute)	Miles (nautical)	0.869	1.1508
Miles (statute)	Yards	1760	5.6818×10^{-4}
Miles per hour	Feet per minute	88	1.136×10^{-2}
Miles per hour	Feet per second	1.467	0.6818
Miles per hour	Kilometers per hour	1.609	0.6214
Miles per hour	Kilometers per minute	2.682×10^{-2}	37.28
Miles per hour	Knots	0.869	1.1508
Millimeters	Inches	3.937×10^{-2}	25.4
Millimeters	Microns	10^{3}	10^{-3}
Mils	Meters	2.54×10^{-5}	3.94×10^{4}
Mils	Minutes	3.438	0.2909
Minutes (angle)	Degrees	1.666×10^{-2}	60
Minutes (angle)	Radians	2.909×10^{-4}	3484
Nepers	Decibels	8.686	0.1151
Newtons	Dynes	10^{5}	10^{-5}
Newtons	Kilograms	0.1020	9.807
Newtons per square meter	Pascals	1	1
Newtons	Pounds (avdp)	0.2248	4.448
Oersteds	Amperes per meter	7.9577 x 10	1.257×10^{-2}
Ohms	Ohms (International)	0.99948	1.00052
Ohms circular-mil per ft	Ohms per sq mm per meter	1.66×10^{-3}	6.024×10^{2}
Ohms per foot	Ohms per meter	0.3048	3.281
Ounces (fluid)	Quarts	3.125×10^{-2}	32
Ounces (avdp)	Pounds	6.25×10^{-2}	16
Pints	Quarts (liq U.S.)	0.50	2
Pounds	Grams	453.6	2.205×10^{-3}
Pounds (force)	Newtons	4.4482	0.2288
Pounds carbon oxidized	Btu	14,544	6.88×10^{-5}
Pounds carbon oxidized	Horsepower-hours	5.705	0.175
Pounds carbon oxidized	Kilowatt-hours	4.254	0.235
Pounds of water (dist)	Cubic feet	1.603×10^{-2}	62.38
Pounds of water (dist)	Gallons	0.1198	8.347
Pounds per foot	Kg per meter	1.488	0.6720
Pounds per square in	Dynes per square cm	6.8946×10^{4}	1.450×10^{-5}
Pounds per square in	Pascals	6.895×10^{3}	1.45×10^{-4}
Poundals	Dynes	1.383×10^{4}	7.233×10^{-5}
Poundals	Pounds (avdp)	3.108×10^{-2}	32.17

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY BY	CONVERSELY x BY
Quadrants	Degrees	90	11.111×10^{-2}
Quadrants	Radians	1.5708	0.637
Quarts (U.S. dry)	Cubic cms	1101.4	9.9079×10^{-4}
Quarts (U.S. liquid)	Cubic cms	946.4	1.057×10^{-3}
Radians	Mils	10^{3}	10^{-3}
Radians	Minutes	3.438×10^{3}	2.909×10^{-4}
Radians	Seconds	2.06265×10^{5}	4.848×10^{-6}
Rods	Feet	16.5	6.061×10^{-2}
Rods	Miles	3.125×10^{-3}	320
Rods	Yards	5.5	0.1818
Roentgens	Coulombs per kilogram	2.58×10^{-4}	3.876×10^{3}
Rpm	Degrees per second	6.0	0.1667
Rpm	Radians per second	0.1047	9.549
Rpm	Rps	1.667×10^{-2}	60
Slugs	Kilograms	1.459	0.6854
Slugs	Pounds (avdp)	32.174	3.108×10^{-2}
Square feet	Square centimeters	929.034	1.076×10^{-3}
Square feet	Square inches	144	6.944×10^{-3}
Square feet	Square meters	9.29×10^{-2}	10.764
Square feet	Square miles	3.587×10^{-8}	27.88×10^{6}
Square feet	Square yards	11.11×10^{-2}	9
Square inches	Circular mils	1.273×10^{6}	7.854×10^{-7}
Square inches	Square centimeters	6.452	0.155
Square inches	Square mils	10^{6}	10^{-6}
Square inches	Square millimeters	645.2	1.55×10^{-3}
Square kilometers	Square miles	0.3861	2.59
Square meters	Square yards	1.196	0.8361
Square miles	Acres	640	1.562×10^{-3}
Square miles	Square yards	3.098×10^{6}	3.228×10^{-7}
Square millimeters	Circular mils	1973	5.067×10^{-4}
Square mils	Circular mils	1.273	0.7854
Steres	Cubic meters	1	1
Stokes	Square meter per second	10^{-4}	10^{-4}
Tablespoons	Cubic cms	14.79	6.761×10^{-2}
Teaspoons	Cubic cms	4.929	0.203
Tonnes	Kilograms	10^{3}	10^{-3}
Tonnes	Pounds	2204.63	4.536×10^{-4}
Tons (long)	Pounds (avdp)	2240	4.464×10^{-4}
Tons (metric)	Kilograms	10^{3}	10^{-3}
Tons (short)	Pounds	2000	5×10^{-4}
Torrs	Newtons per square meter	133.32	7.5×10^{-3}
Varas	Feet	2.7777	0.36
Watts	Btu per hour	3.413	0.293
Watts	Btu per minute	5.689×10^{-2}	17.58
Watts	Foot-lbs per minute	44.26	2.26×10^{-2}
Watts	Foot-lbs per second	0.7378	1.356
Watts	Horsepower	1.341×10^{-3}	746
Watts	Kilogram-calories per minute	1.433×10^{-2}	69.77
Watt-seconds	Gram-calories (mean)	0.2389	4.186
Watt-seconds	Joules	1	1
Webers	Maxwells	10^{8}	10^{-8}
Webers per square meter	Gausses	10^{4}	10^{-4}
Yards	Feet	3	.3333
Yards	Varas	1.08	0.9259

14.5 ASCII CHARACTERS WITH DECIMAL AND HEX EQUIVALENTS

	ASCII	DEC.	HEX	ASCII	DECIMAL	HEX	ASCII	DECIMAL	HEX	ASCII	DECIMAL	HEX
Ctrl @	NUL	0	00	@	64	40	Ç	128	80		192	C0
Ctrl A	SOH	1	01	A	65	41	ü	129	81		193	C1
Ctrl B	STX	2	02	B	66	42	é	130	82		194	C2
Ctrl C	ETX	3	03	C	67	43	â	131	83		195	C3
Ctrl D	EOT	4	04	D	68	44	ä	132	84		196	C4
Ctrl E	ENQ	5	05	E	69	45	«a	133	85		197	C5
Ctrl F	ACK	6	06	F	70	46	å	134	86	ã	198	C6
Ctrl G	BEL	7	07	G	71	47	ç	135	87	A	199	C7
Ctrl H	BS	8	08	H	72	48	ê	136	88		200	C8
Ctrl I	HT	9	09	I	73	49	ë	137	89		201	C9
Ctrl J	LF	10	0A	J	74	4A	«e	138	8A		202	CA
Ctrl K	VT	11	0B	K	75	4B	ï	139	8B		203	CB
Ctrl L	FF	12	0C	L	76	4C	î	140	8C		204	CC
Ctrl M	CR	13	0D	M	77	4D	«i	141	8D		205	CD
Ctrl N	SO	14	0E	N	78	4E	a	142	8E		206	CE
Ctrl O	SI	15	0F	O	79	4F	A	143	8F		207	CF
Ctrl P	DLE	16	10	P	80	50	´E	144	90	õ	208	D0
Ctrl Q	DC1	17	11	Q	81	51	æ	145	91	D	209	D1
Ctrl R	DC2	18	12	R	82	52	Æ	146	92	E	210	D2
Ctrl S	DC3	19	13	S	83	53	ô	147	93	Ë	211	D3
Ctrl T	DC4	20	14	T	84	54	ö	148	94	E	212	D4
Ctrl U	NAK	21	15	U	85	55	«o	149	95		213	D5
Ctrl V	SYN	22	16	V	86	56	û	150	96	í	214	D6
Ctrl W	ETB	23	17	W	87	57	«u	151	97	î	215	D7
Ctrl X	CAN	24	18	X	88	58	y	152	98	ï	216	D8
Ctrl Y	EM	25	19	Y	89	59	Ö	153	99		217	D9
Ctrl Z	SUB	26	1A	Z	90	5A	u	154	9A		218	DA
Ctrl [	ESC	27	1B	[	91	5B	ø	155	9B		219	DB
Ctrl \	FS	28	1C	\	92	5C	£	156	9C		220	DC
Ctrl]	GS	29	1D	]	93	5D	Ø	157	9D		221	DD
Ctrl ^	RS	30	1E	^	94	5E	x	158	9E	«i	222	DE
Ctrl _	US	31	1F		95	5F	ƒ	159	9F		223	DF
	space	32	20	`	96	60	á	160	A0	O	224	E0
	!	33	21	a	97	61	í	161	A1	ß	225	E1
	“	34	22	b	98	62	ó	162	A2	O	226	E2
	#	35	23	c	99	63	ú	163	A3	O	227	E3
	$	36	24	d	100	64	ñ	164	A4	O	228	E4
	%	37	25	e	101	65	Ñ	165	A5	O	229	E5
	&	38	26	f	102	66	?	166	A6	µ	230	E6
	'	39	27	g	103	67	°	167	A7	p	231	E7
	(	40	28	h	104	68	¿	168	A8	p	232	E8
	)	41	29	i	105	69	®	169	A9	U	233	E9
	*	42	2A	j	106	6A		170	AA	U	234	EA
	+	43	2B	k	107	6B	½	171	AB	U	235	EB
	,	44	2C	l	108	6C		172	AC	ÿ	236	EC
	-	45	2D	m	109	6D	¼	173	AD	ˆy	237	ED
	.	46	2E	n	110	6E	¡	174	AE		238	EE
	/	47	2F	o	111	6F	-	175	AF		239	EF
	0	48	30	p	112	70		176	B0		240	F0
	1	49	31	q	113	71		177	B1	±	241	F1
	2	50	32	r	114	72	²	178	B2		242	F2
	3	51	33	s	115	73	³	179	B3	3/4	243	F3
	4	52	34	t	116	74	'	180	B4		244	F4
	5	53	35	u	117	75	«A	181	B5		245	F5
	6	54	36	v	118	76	ˆÅ	182	B6	+	246	F6
	7	55	37	w	119	77	A	183	B7	,	247	F7
	8	56	38	x	120	78	©	184	B8	⁰	248	F8
	9	57	39	y	121	79	¹	185	B9	"	249	F9
	:	58	3A	z	122	7A		186	BA	.	250	FA
	;	59	3B	{	123	7B	«	187	BB		251	FB
	<	60	3C	|	124	7C		188	BC		252	FC
	=	61	3D	}	125	7D	¢	189	BD		253	FD
	>	62	3E	~	126	7E	¥	190	BE		254	FE
	?	63	3F	DEL	127	7F		191	BF		255	FF

14.6 CUSTOM PRINT FORMATTING PROCEDURE

The IQplus 810 has a formatable print function available as a standard feature. This feature allows the installer to customize the **Demand Print** serial output to meet the needs of the user. With this feature, the IQplus 810 can be setup to print special information such as company name and address, scale identification information, etc. This feature also allows the installer to customize the format of the printed weight ticket and to have trailing information as well.

The formatable print option is modified through the EDP serial port. This requires the installer to use a terminal or PC to enter the new print format into the IQplus 810. The print format that can be entered may include numbers, upper and lower case letters, punctuation marks, and special control characters. In short, you may enter any character on the ASCII code chart in any combination or order up to 80 characters maximum length. Also, the Gross and Net printouts have separate 80 character buffers which allows the installer to setup different printouts for the Gross weight and the Net weight printouts.

The current printout configuration may be checked or changed after establishing bidirectional communications with the IQplus 810. This may be accomplished with the use of a terminal or PC running a terminal software program. When setting up to communicate with the IQplus 810, you must match the baud rate, data bits and parity of both devices so that they can understand each other.

After establishing communications with the indicator, you may check what the current configuration of the Gross Demand printout is by entering in:

"GFMT" and pushing RETURN or ENTER

The IQplus 810 will then respond by sending the current configuration for the Demand Gross Printout which will look something like this:

GFMT=\S\n\nGROSS\G\n\n\D\n

The actual printout that will result with this format will look like:

SCALE #1

GROSS 5021 LB

01/14/92 12:37 PM

The Net Demand Printout may also be checked in a similar way by entering:

"NFMT" and pushing RETURN or ENTER

The IQplus 810 will then respond by sending the current configuration for the Demand Net Printout which will look something like this:

NFMT=\S\n\nGROSS\G\nTARE \T\nNET \N\n\n\D\n

The actual printout that will result with this format will look like:

SCALE #1

GROSS 5021 LB
TARE 500 LB
NET 4521 LB

01/14/92 12:38 PM

To understand how these formats produce these printouts, we must first understand what commands we have to work with to do this formatting. The following is a list of the commands that we have to work with when setting up a print format:

1. \n This command means “New Line” and tells the indicator to send the line terminator list that has been selected by the installer for the demand serial port. This is setup in the Serial Communications area of the setup menu for each of the serial ports under terminator (TERMIN).

2. \S This command tells the indicator to send the “Scale Number” that is currently selected on the display.

3. \D This command tells the indicator to send the “Time and Date” information.

4. \G This command tells the indicator to send the “Gross Weight” information that is on the currently selected scale.

5. \T This command tells the indicator to send the “Tare Weight” information for the currently selected scale.

6. \N This command tells the indicator to send the “Net Weight” information for the currently selected scale.

Any other information in the format string is treated as literal data and is printed as listed.

To understand this better, we will look at the Net Demand string and break it down. The standard string for the Net Demand is as follows:

NFMT=\S\n\nGROSS\G\nTARE \T\nNET \N\n\n\D\n

This example breaks down as follows:

NFMT= This is the command that tells the indicator that what you are entering is formatting information for the Net Demand serial string.

\S This is a command that tells the indicator to send the scale identification information such as -- SCALE #1.

\n\n This is a command that tells the indicator to send two sets of line terminators as selected in the setup menu for that serial port. This will end up being either Carriage Return/Carriage Return or Carriage Return/LineFeed /Carriage Return/Line Feed depending on what you have selected in the setup menu. For this example, this will terminate the first line which has the scale identification printed on it and then terminate the next line to give a double line spacing and move the printer to the beginning of the third line.

GROSS This is literal data that is printed as it is encountered in the serial format string. In this example, the word GROSS will be printed on the beginning of the third line.

\G This is a command that tells the indicator to send the current Gross Weight of the currently selected scale and the units designation. In this example, the Gross weight will be printed on the third line following the word GROSS from above.

\n This is a command that tells the indicator to send 1 line terminator that was selected for this serial port in the setup menu. This will be either Carriage Return or Carriage Return/Line Feed and will send the print to the beginning of the forth line for this example.

TARE This is literal data that is printed as it is encountered in the serial format string. In this example, the word TARE and 1 space will be printed on the beginning of the fourth line.

\T This is a command that tells the indicator to send the Tare Weight for the currently selected scale and the units designation. In this example, the Tare Weight will be printed on the fourth line following the word TARE from above.

\n This is a command that tells the indicator to send 1 line terminator that was selected for this serial port in the setup menu. This will be either Carriage Return or Carriage Return/Line feed and will send the print to the beginning of the fifth line for this example.

NET This is literal data that is printed as it is encountered in the serial format string. In this example, the word NET and 2 spaces will be printed on the beginning of the fifth line.

\N This is a command that tells the indicator to send the current Net Weight for the currently selected scale and the units designation. In this example, the Net Weight will be printed on the fifth line following the word NET from above.

\n\n This is a command that tells the indicator to send 2 sets of line terminators as selected in the setup menu for that serial port. This will end up being either Carriage Return/Carriage Return or Carriage Return/LineFeed /Carriage Return/Line Feed depending on what you have selected in the setup menu. For this example, this will terminate the fifth line which has the Net Weight printed on it and then terminate the next line to give a double line spacing and move the printer to the beginning of the seventh line.

\D This is a command that tells the indicator to send the current Date and Time. The format for date will be either MM/DD/YY or DD/MM/YY depending on how the date format has been setup in the setup menu. The time format can be either 12 hour or 24 hour depending on how the setup menu for the time format has been selected. For this example, the printout may look something like - 01/14/92 12:38 PM which will be printed at the beginning of the seventh line.

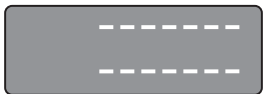
NOTE: Even though the printout for this example would take upwards of 80 characters to print, we only used 39 characters of our 80 character buffer to format this output string.

As can be seen, it is a fairly straightforward process to format a new demand print string. To format the Gross Demand string you would follow the same procedure as above except use the GFMT command in place of NFMT.

14.7 DISPLAY ERROR CODES

OVER CAPACITY

GROSS WEIGHT < 0



A/D CONVERTER
OUT OF RANGE

If an error code appears on the display:

- ✓ Check for improper wiring. Make sure there are no cut or broken wires.
- ✓ Verify that sense jumper blocks or jumper wires are properly installed.
- ✓ Check for proper excitation voltages.
- ✓ Make sure the indicator is properly configured. Check number of grads, channel selection, display divisions, formats, etc.
- ✓ Make sure W ZERO and W SPAN values are correct.
- ✓ Make sure volts calibration values are correct.
  CAUTION! – Do not change the factory settings.
- ✓ Check the software revision. In older versions with multiple scale applications, the display blanks when any scale goes over or under range.
- ✓ Call Rice Lake Weighing Systems for assistance.

14.8 REPLACEMENT PARTS LIST

Service/Replacement Parts

14875 ..... Machine screw 10-32 NF for enclosure
15137 ..... Neoprene washer for enclosure screws
15401 ..... M-F Standoff standard unit
15402 ..... Adhesive 1/2" foot
15462 ..... Power cord assembly
15626 ..... Black cord grip PG 9
15627 ..... Black cord grip locknut
15628 ..... Black cord grip 1/2"
15630 ..... Black cord grip locknut 1/2"
15879 ..... 10-Position terminal block
15882 ..... 2-Position terminal block
15883 ..... 3-Position terminal block
15928 ..... 3-Position lever
15929 ..... N.O. contact block
15930 ..... 40 mm Push-lock switch
16027 ..... Switch enclosure
16534 ..... 14-Segment VFD display
16880 ..... ID Plate, aluminum
16884 ..... Adhesive membrane label
16885 ..... Capacity label
19623 ..... Membrane switch panel
19624 ..... Enclosure front
19625 ..... Enclosure back
19626 ..... Bar graph board
19627 ..... Display/power supply board
19628 ..... Main CPU
19632 ..... Single channel A/D
19635 ..... Gasket O-ring
19638 ..... 3-Board set with transformer
19644 ..... Battery assembly
19647 ..... Transformer
19650 ..... Legend plate

19249 ..... IQ plus™ 810, die-cast enclosure, 120 VAC
19250 ..... IQ plus™ 810, die-cast enclosure, 240 VAC

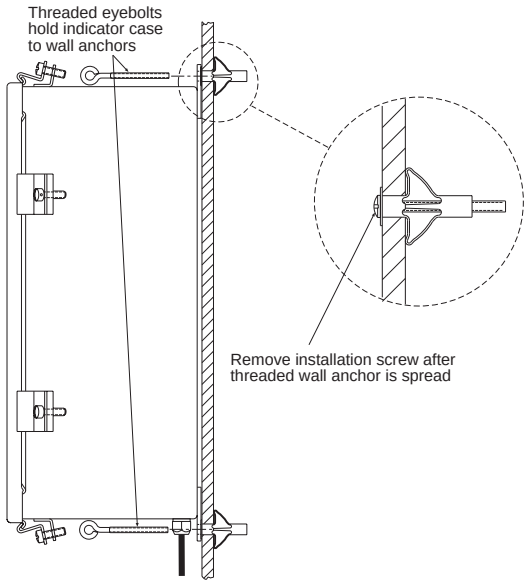
Option/Accessories

19353 ..... Wall mount kit
19356 ..... Dual load cell input module
19371 ..... Single load cell input module
19357 ..... Analog output module, 0-10 VDC/4-20 mA
19359 ..... Rate of change
19360 ..... Peak hold
19361 ..... Accumulator
19362 ..... 12-channel digital setpoint output module
19363 ..... 48 Segment LED bar graph module
19364 ..... Panel mount kit
19365 ..... 4-channel relay rack
15975 ..... 16-channel relay rack
I/O relay modules sold separately:
15969 ..... DC input relay module
15970 ..... Dry contact output relay
15971 ..... AC output relay module
15972 ..... AC input relay module
19366 ..... Load cell port quick connect
19367 ..... Serial port quick connect
19369 ..... Batching Start/Stop switch
19370 ..... Expansion board
19372 ..... RS485 serial communication
19374 ..... 20 mA full duplex EDP port
19375 ..... Supervisor setpoint lockout switch
19629 ..... Expansion board
19630 ..... Setpoint expansion board
19631 ..... Analog output board
19632 ..... Single channel A/D
22825 ..... Dual channel A/D
22446 ..... Hotline™ Software Package
16846 ..... IQ plus™ 810 Installation Manual

14.9 WALL MOUNTING OF SS AND HE MODELS

Both the stainless steel case of the SS model and the FRP case of the HE model can be mounted directly to a wall. If either unit is to be permanently mounted to a wall with screws or hex bolts, Underwriter's Laboratory (UL) requires the AC power cord to be run in conduit and connected to the case with a conduit hub using standard construction practices.

If the unit is portable, then the standard power cord as supplied may be used. The typical mounting diagram at right shows a method of mounting either indicator to a wall while maintaining portability. Four #10 wall anchors are first set in place using the installation screws supplied with the anchors. These screws are then discarded and threaded eyebolts are used to anchor the indicator to the wall.



14.10 SAVING, TRANSFERRING, AND DOWNLOADING CONFIGURATION

After the IQplus 810 has been completely configured and calibrated, the following options are available for saving, transferring, or downloading that configuration and calibration information.

Print Paper Copy of Complete Configuration—With unit in SETUP mode, press **PRINT**. The entire configuration and calibration figures will be sent in ASCII format to any properly installed and configured printer attached to the indicator's EDP serial port.

Print Paper Copy of Setpoint Configuration —The unit must be placed in the Supervisor Switch mode. When in that mode, press PRINT. The configuration of all the setpoints will be sent to any properly installed and configured printer attached to the indicator's EDP serial port. See Section 3.2 for information on the Supervisor Switch mode.

Save Complete Configuration to Disk—A standard communications software program like PROCOMM® or XTALK® must be running on the computer in order to format and save the configuration information that the IQplus 810 will be sending through its EDP port. The EDP port of the indicator must be wired to a RS-232 standard communications port of an IBM-compatible computer. The communication format is duplex RS-232. When all connections are complete, place the indicator in SETUP mode and press the PRINT key (or type in DUMPALL on the computer keyboard, followed by the ENTER or RETURN key).

Save Setpoint Configuration to Disk—All connections are identical to those for *Save Complete Configuration to Disk* above. When all connections are complete, place the indicator in Supervisor Switch mode and press the PRINT key.

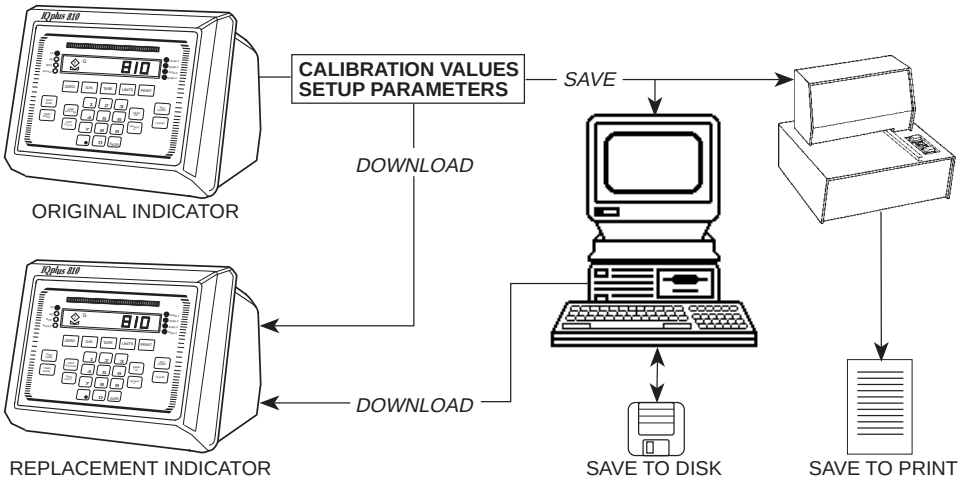
CAUTION! Before downloading anything into a receiving indicator as detailed in the two examples below, enter the receiving indicator's SETUP menu to determine the Voltage Calibration values in the indicator's memory. Write those figures down on the chart on page 1.1 of this manual before proceeding.

Directly Download Complete Configuration to Another IQplus 810 Indicator—Connect the EDP ports of both machines using the wiring for duplex RS-232 format. Both indicators must have the same settings for baud rate, parity, and bits. Both indicators must be in the SETUP mode. Press the PRINT key of the transmitting indicator to download all settings to the receiving indicator. **NOTE:** The original indicator will download its Voltage Calibration figures to the receiving indicator. Those figures are only valid for the original indicator, and should be replaced in the setup of the receiving indicator. To do so, enter the CALIBRT menu chart of the receiving indicator, and scroll to the VOLTS sub-menu. Scroll to the VZERO, VVAL, and VSPAN values, and replace the values shown with the values from the chart on the first page of the manual.

Download Complete Configuration From PC Disk to Another IQplus 810 Indicator—A standard communications software program like PROCOMM® or XTALK® must be running on the computer. The EDP port of the indicator must be wired to the RS-232 standard communications port of an IBM-compatible computer. The communication format is duplex RS-232. Both indicator and computer must have the same settings for baud rate, parity, and bits.

When all connections are complete, place the indicator in SETUP mode. Instruct the computer to download the configuration file from the PC to the indicator (See the software owner's manual for details).

Replace the downloaded Voltage Calibration figures as explained in the NOTE above.



QUESTIONS ABOUT THE HOTLINE 810 COMMUNICATION OPTION

Do I have to be familiar with computers and have a powerful computer to use this program?

Very minimal computer knowledge is necessary. Without a doubt, the handiest and simplest tools when working with the IQplus 810 are a small computer and the Hotline™ program. Available as an option, this useful program was specially designed for technicians with little computer training, and access to only the most basic of computers. Hotline™ is written on a floppy disk that can be plugged into nearly any IBM-compatible personal computer (PC), even much older models with only 8MHZ microprocessors. The computer must have DOS 3.3 or above and at least 1Mb of space on the hard drive for the program. A standard 3-wire cable to transmit the RS 232 data is connected from a serial port on the computer to the EDP serial port of the indicator. The program then automatically finds the indicator's baud rate, bits, and parity settings and matches them on the computer.

How long does it take to learn to use Hotline™?

You can use it immediately and learn as you work because the program is presented intuitively. IQplus 810 configuration parameters are set, saved, and transferred in a series of very user-friendly screens. Pop-up windows appear with multiple choice boxes asking the operator to make his choices.

What can I do with the Hotline™ program?

- The complete setup of all parameters can be done on a computer screen. You can see an entire sub-menu with all choices on a large computer screen, rather than just a single parameter choice on the small indicator screen. As an added bonus, on-screen help in choosing parameters is available during set-up at the touch of a key. For this step, you do not have to be connected to the indicator, so the set-up can be done at your office or anywhere a computer is located.

- When the set-up is complete, Hotline™ saves it as a file. Hotline™ can then download (copy) the entire set-up file into any IQplus 810 indicator. The file can be saved for future use unchanged, or modified any number of times with different parameter choices.

- With a portable computer and Hotline™, you have both a powerful diagnostic tool, and a link to expert assistance. You can plug into any IQplus 810 indicator and instantly see a large, on-screen version of its complete set-up—without having to break the official seal to enter the case, and physically switch the indicator into its SETUP mode. With a modem, the setup can be telephoned to another location for analysis. For example, the setup might be telephoned to Application Specialists familiar with the particular setup at Rice Lake Weighing Systems. Setpoint parameter changes can be made and downloaded from either location.

- Many different "recipe" variations for a batch process controlled by an IQplus 810 can be saved on a PC hard drive. Hotline™ can download and unload complete recipe setups into the indicator quickly with the indicator in the Normal Operating mode.

- An indicator can be calibrated to a particular scale from a PC with Hotline™, rather than from the front panel of the indicator. An upload will add these calibration figures to the file with the configuration settings. If an accident damages the original indicator, a replacement unit can be calibrated by downloading the file with the original calibration figures.

- The format of printed tickets can be changed with Hotline™. The program will even allow adding company names or other text to tickets for a custom look.

With Hotline™, do I still need communication software such as PROCOMM® or XTALK®?

Usually not. Unless transferring files by telephone with a modem, Hotline™ is the only communication software program you need to communicate with any IQplus 810. For modem transmission of files, PROCOMM® will also be needed.

Will I need a separate copy of Hotline™ for each IQplus 810 indicator I install?

No. A single Hotline™ can be used over and over with any number of IQplus 810 indicators.

1. Truck In/Out Program Changes:

If multiple scales are used with the Truck Program, the indicator can send either individual scale weights or the total weight on all scales to the ticket printer:

If individual scale weights are desired on the printed tickets, use the SCALE # key to display the scale channel desired. When a print command is sent, the data from the scale that is displayed will be sent to the printer. The scale number will also appear on the printed ticket.

SCALE #

If the total weight of all scales is desired on the printed tickets, use the SCALE # key to display the total of all active channels. When a print command is sent, the total from all scales will be sent to the printer. The words “SCALE TOTAL” will appear on the printed ticket after the truck ID number.

```
ID. NO. 304812      SCALE TOTAL
GROSS       100000. LB
TARE         15000. LB RECALLED
NET          85000. LB
11/22/91  10:55 AM
```

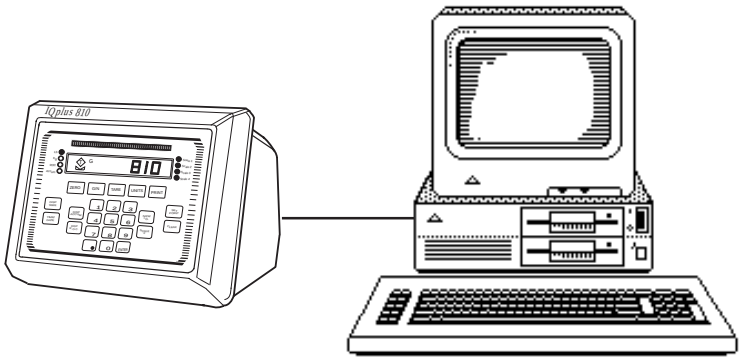
If using only a single scale setup on channel 1, no scale number will appear on the printed tickets.

2. Serial Commands Can Change Some Setup Parameters Without Entering Setup Mode:

Several setup parameters can now be changed “on the fly” using serial commands while in the Operating Mode. All parameters in the SETPOINT Sub-Menu can be changed in Operating Mode, plus the following parameters from other menus:

STREAM
PRNDEST
DIGIN 1
DIGIN 2
DIGIN 3
BARGRF
BARREF
BARBAND

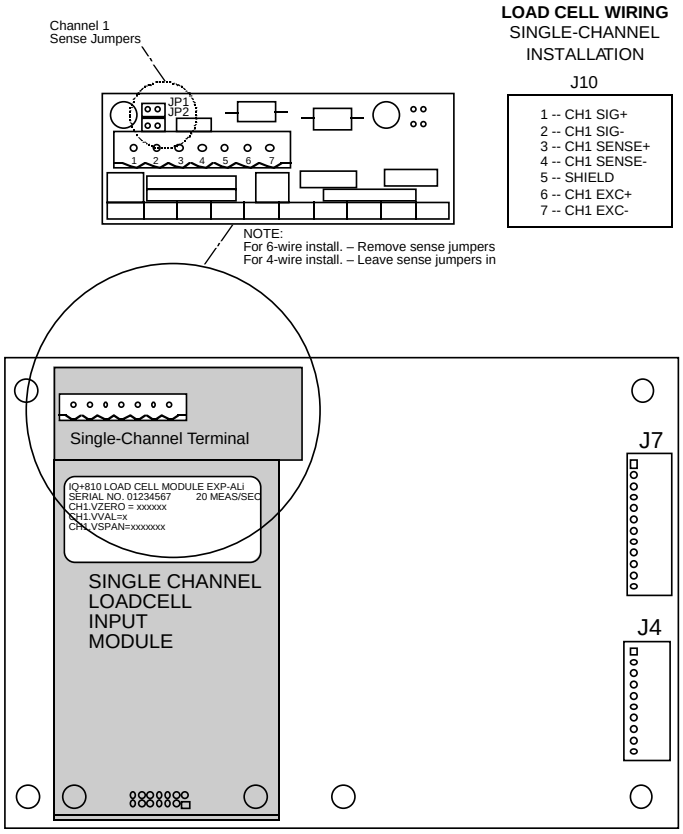
These parameters can be changed by entering special commands from a keyboard or computer connected to the indicator via the EDP serial port. To change one of these parameters, type in the parameter command (see Section 9.2 of the manual for a complete list of parameter commands) followed by = and the choice for the parameter setting. Do not use spaces around the = sign.



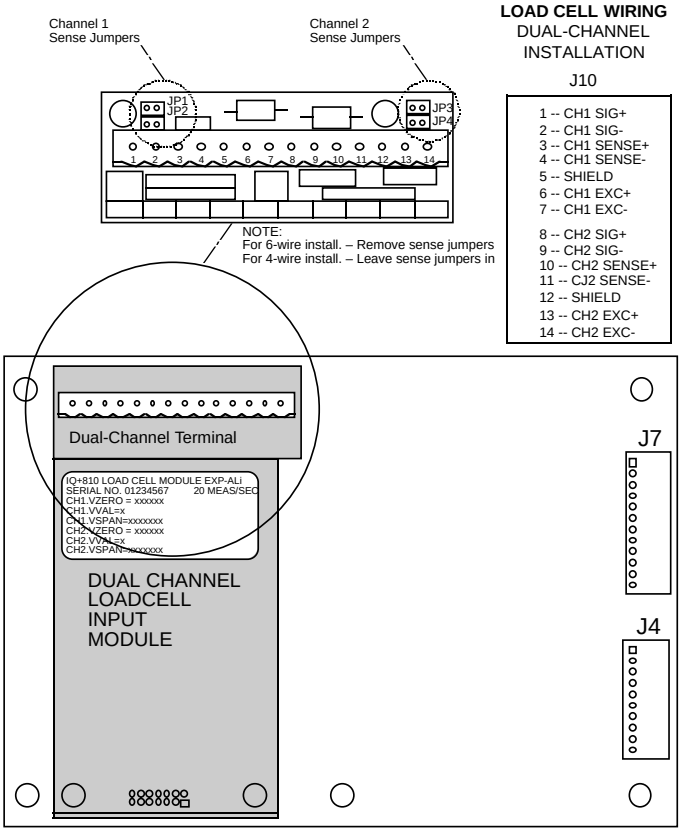
Example: Making the Printer Port the serial port used for continuous transmission:
Type STREAM=PRN on keyboard.
Press ENTER on keyboard.

LOAD CELL INPUT MODULES

New single-channel and dual-channel load cell input modules are now equipped with on-board sense jumpers to accommodate 4-wire and 6-wire installations. The new modules also include pluggable terminal blocks.



INSTALLATION ON MAIN BOARD



INSTALLATION ON MAIN BOARD

IMPORTANT! – When installing load cell input modules, be sure to enter the VZERO, VVAL, and VSPAN values listed on Volts Calibration label (on module). Go to the Calibrate-Volts submenu on the IQplus 810 to enter these values. (Refer to Section 8 of the *IQplus 810 Installation Manual*.) Once the voltage calibration is complete, the weight calibration can be performed.

SOFTWARE REVISION HISTORY

Version 1.0

This version was the original release.

Version 1.1 - 1.4

No new features were added; these revisions provided minor operating refinements to the original release.

Version 2.0

Accumulators retain their totals when leaving the SETUP mode, rather then automatically zeroing.

The 100 update per second function (1 FAST) is enabled in the CHANS parameter of the SET ALG menu.

When batching, the net or gross display mode reflects the type (Gross / Net) of the present batch step, and the scale number illuminators reflect the source scale selected for that batch step.

A tare value of zero can be entered.

Setpoint values can be changed, or setpoints can be turned on or off with front panel keystrokes while in the normal operating mode.

Version 2.1

Auto jog now references the first preceding weight setpoint (net, gross, or relative) rather than just the first preceding setpoint. This allows conditional setpoints like WAITSS, DELAY, PAUSE, etc. to be inserted directly before the Autojog setpoint.

Continuous setpoints reflecting a scale condition, such as COZ, INMOTION, INRANGE, -GROSS, -NET, and BATCHPR can now have a source scale associated with them, rather than be forced to use the source currently on the display.

Version 2.2

Unreleased.

Version 2.3

When using RS-485 mode, a carriage return has been added after the last character (ETX) in the response to purge the receive buffers of all IQplus 810's on the bus.

When using multiple scales, and in the TOTAL display mode, the unit will not blank when one scale goes below GROSS ZERO, but will display the positive total of all scales. The unit will blank, however, if one scale goes into an underrange condition.

The following parameters can be changed "on the fly" by keying in the correct EDP commands without the need to enter the SETUP mode: BARGRF, BARBAND.

The Truck In/Out Program was altered to allow printed tickets to reflect only the scale being displayed, rather than the total of all scales.

Each scale now has to be within its zero band to zero out, rather than having all scales zero by the TOTAL CHANS function.