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Beacon Series

Owner's Manual



Beacon 20 • Beacon 45 • Beacon 65

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INTRODUCTION

The Beacon Remote Display Series incorporates the highest performance standards of any weighing display on the market. Scale Technicians all over the world have come to appreciate the Beacon's industry-leading Auto-Learn Technology and overall ease of use. The Beacon ALPHA models feature complete alphanumeric messaging capabilities and the entire series has been upgraded to include an improved enclosure, external keypad and expanded configuration and diagnostic options. Like all Western products, Beacon Remote Displays are engineered for durability, functionality, and the versatility of today's weighing industry.

The following information is for the exclusive use of **CAS** Dealers and customers.

SAFETY

Installation, configuration, and servicing are only to be done by qualified service personnel.

Power must be disconnected before servicing the unit. Disconnection from the line voltage is done by disconnecting the mains plug.

This equipment must be connected to a socket-outlet with a protective earthing connection. The socket outlet shall be installed near the equipment, and shall be easily accessible.

The fuse for models **Beacon 45, Beacon 45-SL, Beacon 65** should only be replaced by a 5A, 250V slow-blow fuse.

This equipment is intended for connection to multiple RATED VOLTAGES or FREQUENCIES. The switchover to the corresponding voltage is done automatically by the equipment.



CAUTION! HIGH VOLTAGES are present inside the Beacon enclosure.



Scale Service Technicians handling Beacon PCBs must observe proper electrostatic discharge (ESD) handling procedures.



ATTENTION! Unauthorized installation and service of this unit may void the warranty.

BEACON FEATURES

HIGH VISIBILITY

- A bigger, brighter display makes the Beacon easy to read over wide viewing angles and any lighting conditions.

EASY TO INSTALL & USE

- Auto-Learn Technology interprets the data format and output string of any scale indicator, reducing set-up time.
- The new easy-access enclosure improves installation and service times without sacrificing durability, functionality or weather resistance.
- The 3 button keypad accesses features and diagnostics without having to open the enclosure.

SAVE ENERGY

- Ultra-efficient LED technology is the smart choice for power conscious users.
- A built-in photo sensor automatically adjusts LED intensity for ambient lighting conditions.
- Power Save Mode reduces power consumption during long periods of inactivity.

WIRELESS COMMUNICATIONS

- Go wireless. Make installation easy and use remote displays where you never thought possible.
- The integrated radio option allows communications over several thousand feet.
- No external housings or radio knowledge required.

MORE...

- Beacon ALPHA models (8 & 12 character) have complete printable ASCII messaging capabilities, easy message scrolling and a programmable bar graph.
- The Beacon 45-SL model features a ready to use, built-in traffic light.
- All Beacon models feature:
 - Selectable brightness levels.
 - Built-in utility programs for axle weighing, traffic light control, freeze weight, etc.
 - Mirrored Display Mode.
 - Multi-drop communications.
 - Time & Date.

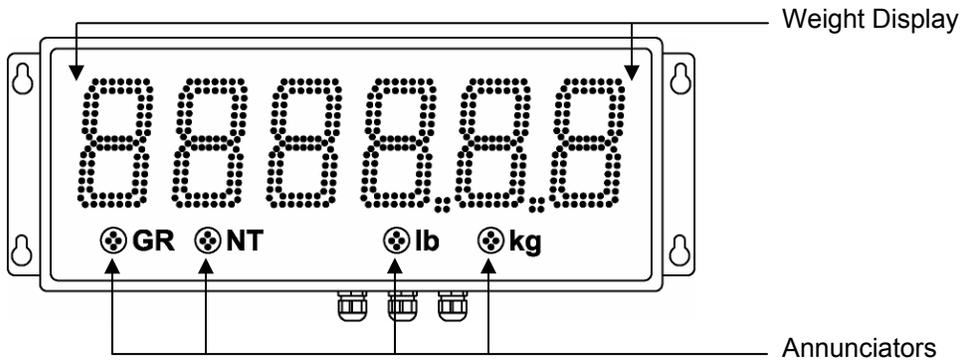
DISPLAY

Model	# of Characters	Character Height	Character Type	Decimal Places
Beacon 45	6	4.5" / 115mm	7 segment	Up to 2
Beacon 65	6	6.5" / 165mm	7 segment	Up to 2
Beacon 45 SL	6 + traffic signal	4.5" / 115mm	7 segment	Up to 2
Beacon Alpha 8	8	4" / 102mm	5 x 7 matrix	Up to 5
Beacon Alpha 12	12	3.5" / 89mm	5 x 7 matrix	Up to 5

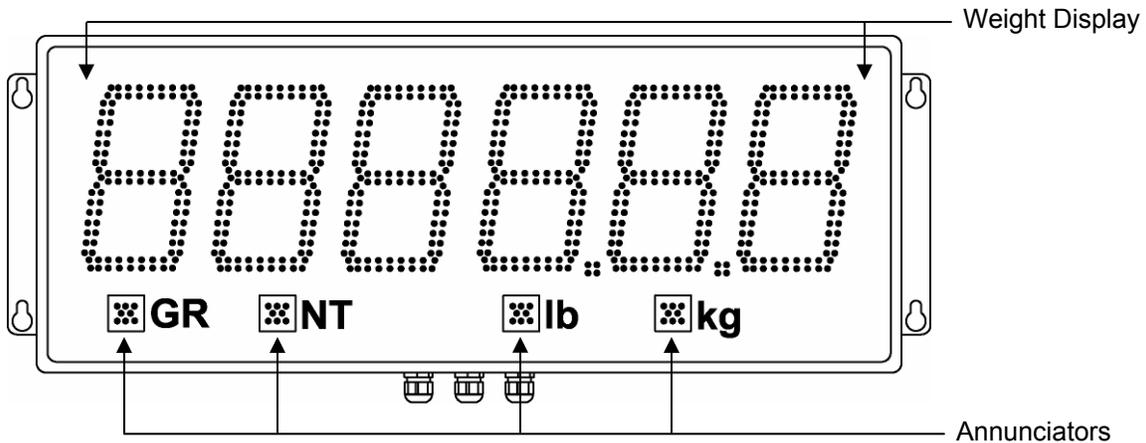
ANNUNCIATORS: GR = Gross Weighing Mode lb = Pounds
 NT = Net Weighing Mode kg = Kilograms

* t = Tonnes (UK, EU & AU models only. Replaces "lb")

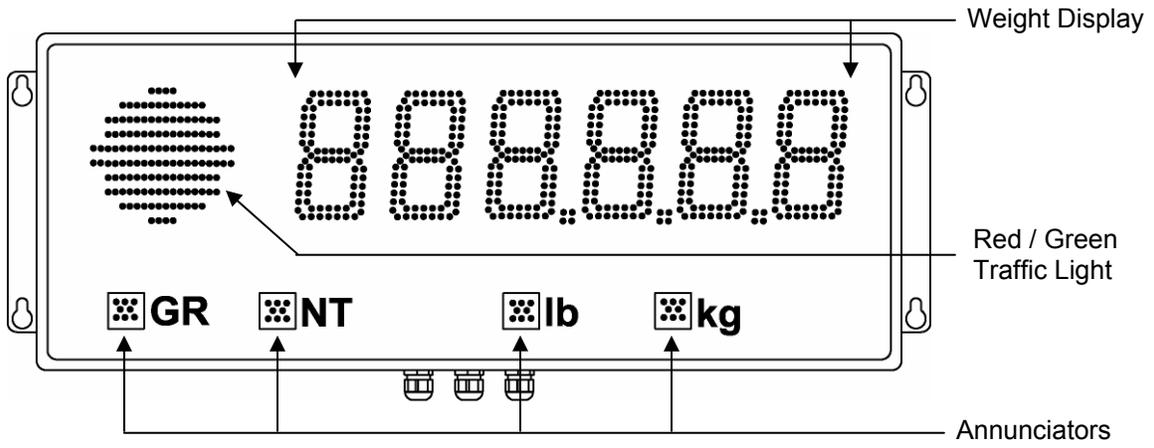
Beacon 45



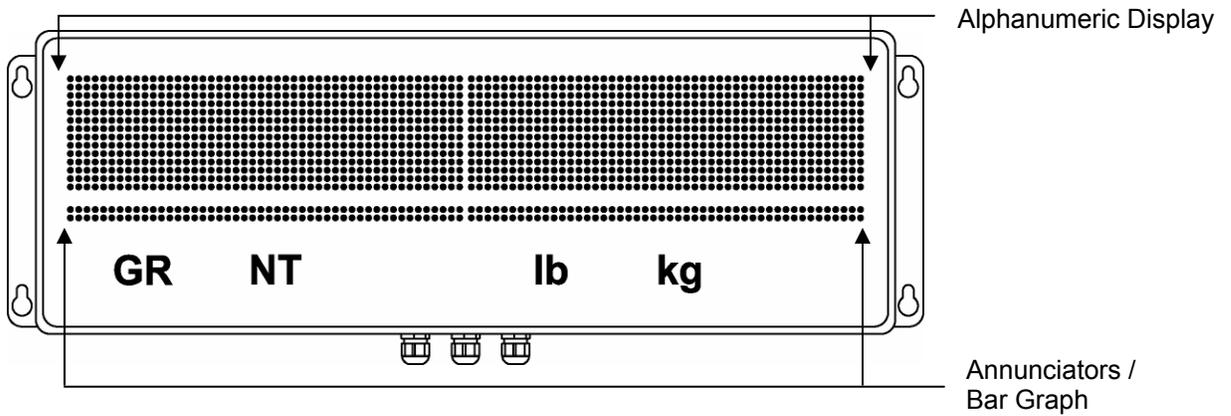
Beacon 65



Beacon 45-SL



Beacon ALPHA 8



Beacon ALPHA 12

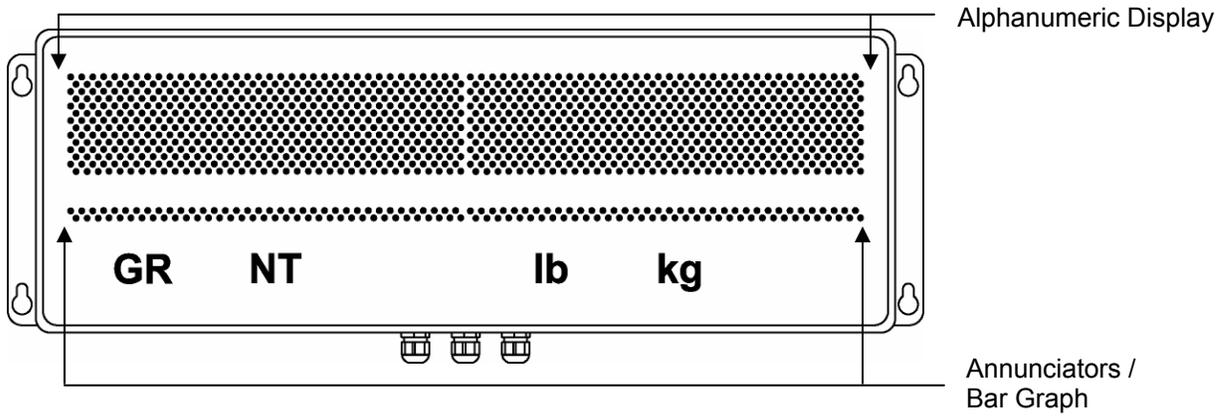


Fig. 1: Beacon Display Models

KEYPAD

The membrane keypad has 3 tactile push buttons used to set time and date (page 34) as well as access the Beacon’s *Configuration Mode* (page 15). An integrated light sensor window detects changing ambient light conditions.

The keypad connects to J10 on the Controller Board.

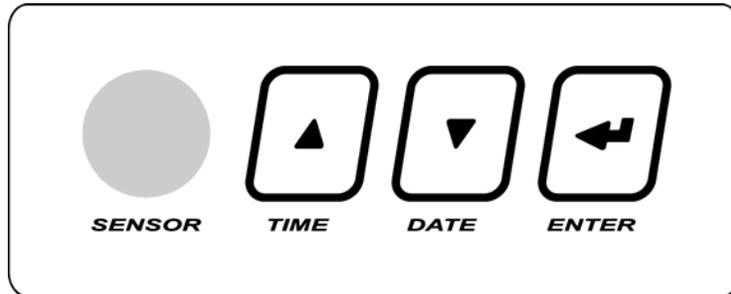


Fig. 2: Beacon Keypad

DIMENSIONS

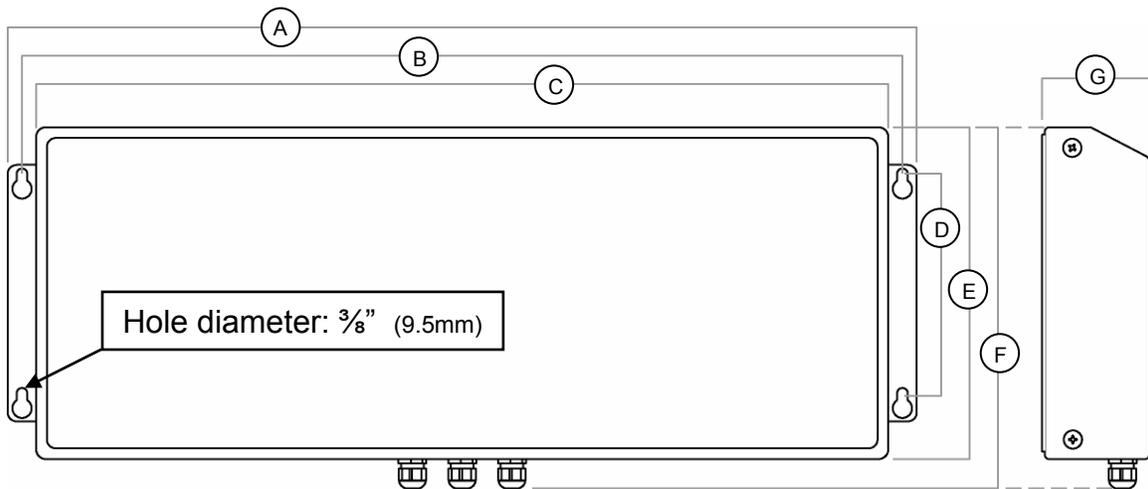


Fig. 3: Beacon Dimensions

Model	A	B	C	D	E	F	G	Weight
Beacon 45	24" 610mm	23" 584mm	22" 559mm	6" 152mm	8 7/8" 225mm	10 1/8" 257mm	3 1/2" 89mm	17 lb 7.75 kg
Beacon 65	32" 813mm	31" 787mm	30" 762mm	7 3/4" 197mm	11 3/4" 298mm	13" 330mm	3 1/2" 89mm	28 lb 12.7 kg
Beacon 45 SL	32" 813mm	31" 787mm	30" 762mm	7 3/4" 197mm	11 3/4" 298mm	13" 330mm	3 1/2" 89mm	28 lb 12.7 kg
Beacon Alpha 8	32" 813mm	31" 787mm	30" 762mm	7 3/4" 197mm	10 1/4" 260mm	11 1/2" 292mm	3 1/2" 89mm	23 lb 10.4 kg
Beacon Alpha 12	32" 813mm	31" 787mm	30" 762mm	7 3/4" 197mm	10 1/4" 260mm	11 1/2" 292mm	3 1/2" 89mm	23 lb 10.4 kg

INSTALLATION

PRE-INSTALLATION (Receiving Inspection)

It is always good practice to verify that the Beacon Remote Display is complete and undamaged upon receipt.

- Check over packaging for any signs of damage.
- Remove the Beacon Remote Display from its protective packaging and check for damage.
- Verify that the shipment includes:
 - Beacon Remote Display (complete and intact)
 - Beacon Installation & Technical Manual

OPENING THE NEW Beacon ENCLOSURES

1. Make sure the unit is disconnected from power.
2. Remove the Phillips head screws from each side of the enclosure.
3. Slowly, guide the Front Cover off of the Main Enclosure (See Fig. 4).

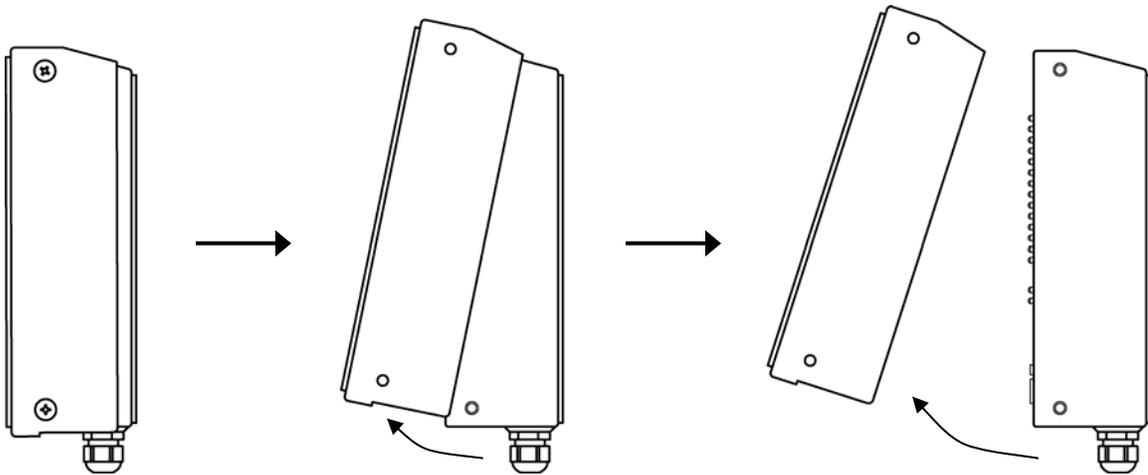


Fig. 4: Side View Opening

LOWERING THE ELECTRONICS PLATE

1. Remove the captive screws holding the Electronics Plate to the Main Enclosure (Fig. 5). The Beacon 45 has two (2) captive screws. Other Beacon models have three (3).
2. Slowly, allow the Electronics Plate to swing down. The Controller board and Power Supply board are now accessible for installation, wiring and service (Fig. 6).

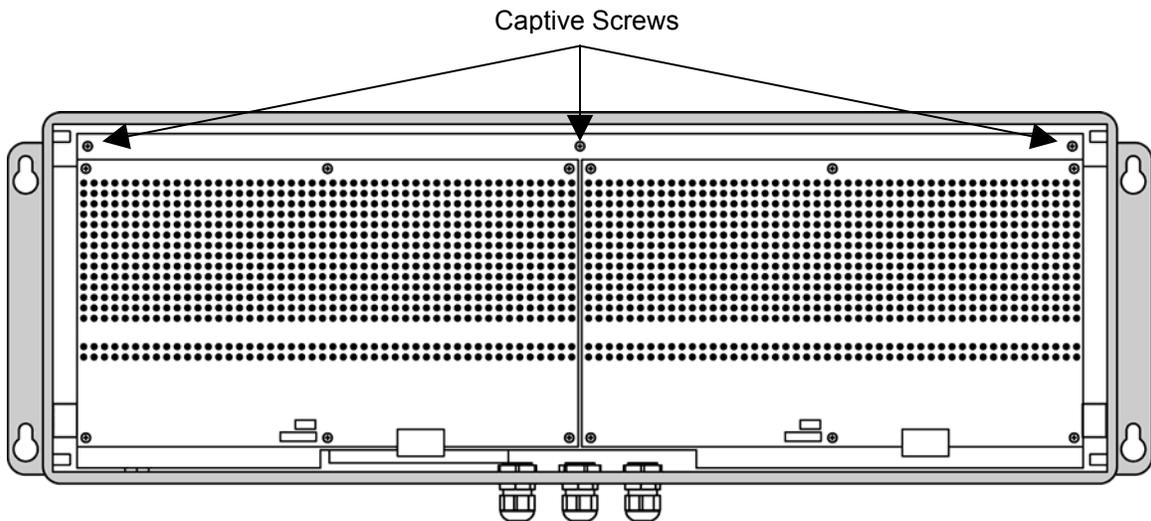


Fig. 5: Open Enclosure

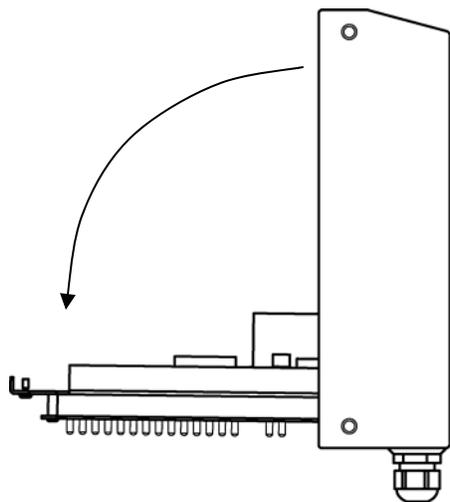


Fig. 6: Electronics Plate Down

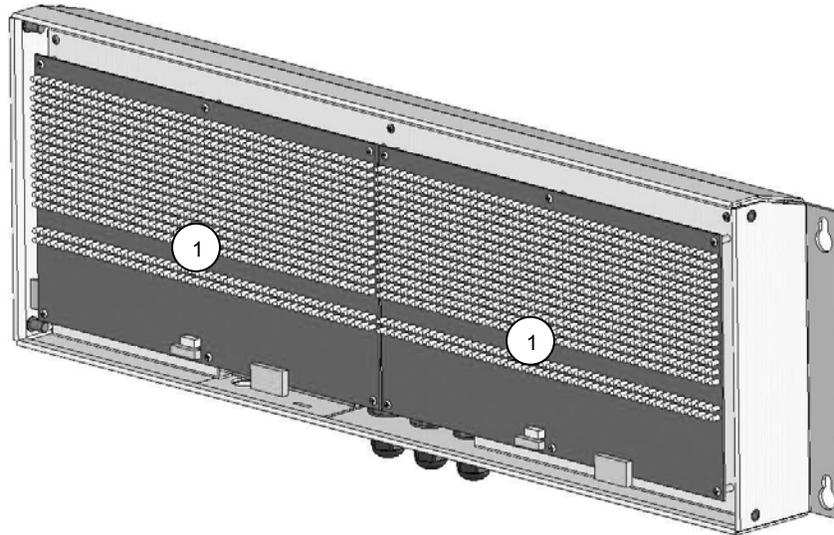
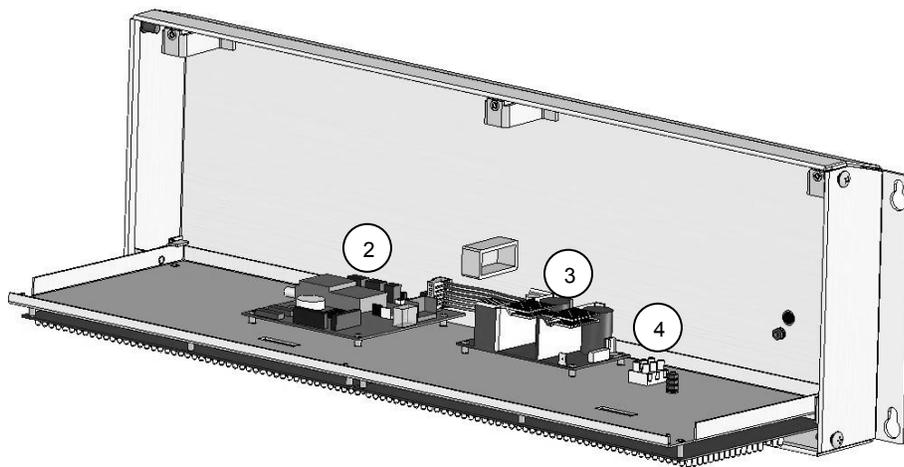
AURORA CIRCUIT BOARDS

Fig. 7: Display Boards



- ① Display Boards (2 per unit)
- ② Controller Board
- ③ Power Supply Board
- ④ Power Wiring Terminal

Fig. 8: Controller & Power Boards

MOUNTING INSTRUCTIONS

1. Inspect the installation site for properly grounded power. The socket-outlet shall be installed near the equipment and shall be easily accessible.
2. Ensure that mounting structures will bear the weight of the display (See weights and dimensions for each model on page 6).
3. Allow proper clearance above the display for lifting and removing the Front Cover. Allow proper clearance below for incoming cables.
4. Use proper hardware, including wall anchors where necessary, when mounting the enclosure. The Hex cap bolt length is specified as minimum. The appropriate length must be determined specifically for each application.

SAE	METRIC
5/16-18 UNC Hex Cap Bolts (min. length: 1")	M8x1.25 Hex Cap Bolts (min. length: 25mm)
5/16 Steel Flat Washer	M8 Steel Flat Washer

5. Run communication cables up into the enclosure via the cable strain-reliefs as necessary (Fig. 9).

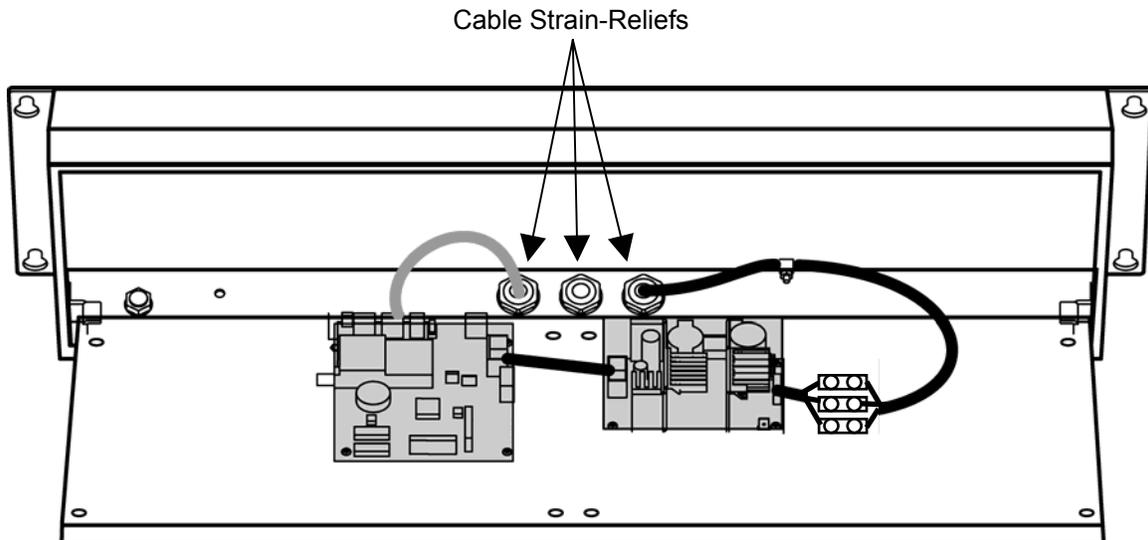


Fig. 9: Cable routing



NOTE: *The Front Cover and Electronics Plate may be removed to reduce weight when installing.*

COMMUNICATIONS WIRING

All communications wiring terminates at the Controller board. Communications should be wired before applying power to the unit.

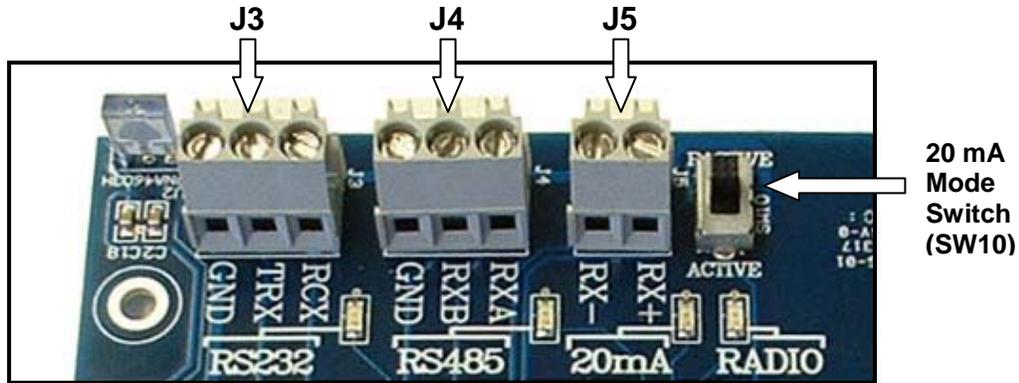
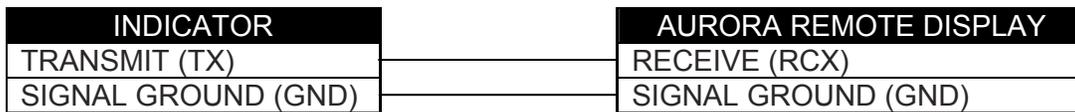


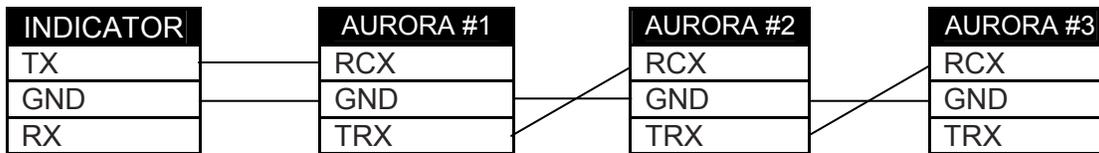
Fig. 10: Communication Terminals

RS 232 Wiring

Terminate the indicator's communication wires at the RS 232 terminal (J3). See Fig. 10 & table below:

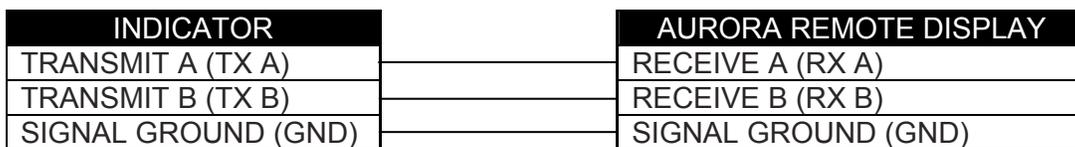


RS 232 Daisy Chain / Multi-Drop Wiring



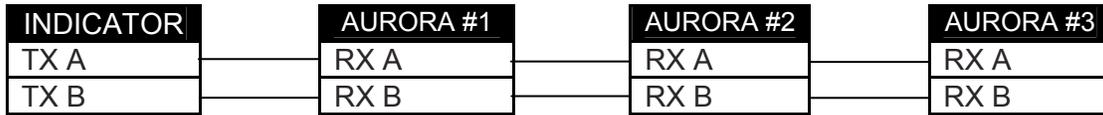
RS 485 / 422 Wiring

Terminate the indicator's communication wires at the RS 485 terminal (J4). See Fig. 10 & table below:

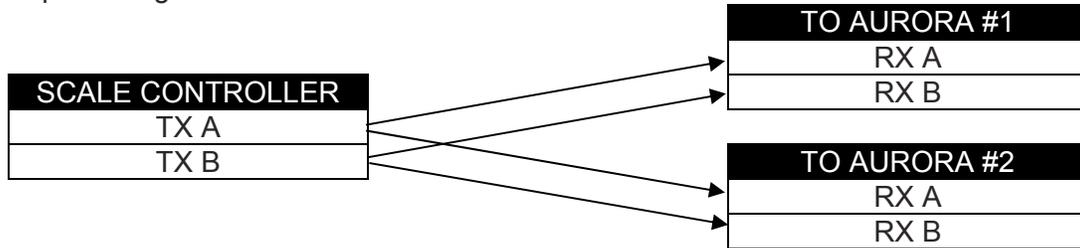


RS 485 Daisy Chain / Multi-Drop Wiring

Parallel Wiring



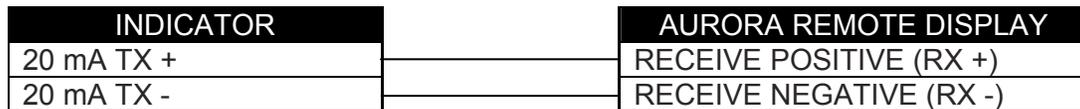
Split Wiring



NOTE: For more information regarding RS 485 Multi-Drop and setting Multi-Drop Addresses, see page 29.

20 mA Current Loop Wiring

Terminate the indicator's communication wires at the 20 mA Current Loop terminal (J5). See Fig. 10 & table below:



20 mA Current Loop Mode Switch

- After the current loop is wired, ACTIVE or PASSIVE mode must be selected via the switch on the Controller board (SW 10).
- Select ACTIVE if the Aurora is required to supply the 20 mA current to the communicating device (indicator).
- Select PASSIVE if the communicating device (indicator) supplies the current to the Aurora display. If unsure of these requirements, check the device's manual.

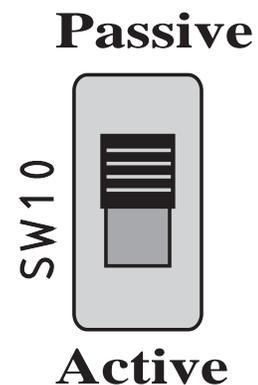


Fig. 11: 20 mA Mode Switch

START-UP

POWER ON/OFF

- The Aurora has no ON/OFF button or switch. Plugging the unit into AC power will turn the unit ON. Disconnecting AC power will turn the unit OFF.
- Once power is applied, the Aurora performs a self test by counting up 1 to 9, flashing annunciators and decimals, and displaying the software revision number (Ex. 4-12). This self test may be disabled in *Configuration Mode* (P1.7).

RESET BUTTON

- The RESET button on the Controller board allows Technicians to cycle power on the unit without disconnecting/connecting AC power.

AUTO-LEARN

- On power up, the Aurora automatically enters Auto-Learn Mode, analyzing the serial communications settings and incoming data from the indicator.
- The output string must contain number characters. An STX character (ASCII 02) and/or CR character (ASCII 13) must also be included.
- Once Auto-Learn is successful (about 10 seconds after power up) the current weight is displayed.



NOTE: Automatic Start-up Auto-Learn may be disabled for custom applications. Please see Auto-Learn Parameters (page 19).

LEARN BUTTON

- If Automatic Start-up Auto-Learn is disabled, the LEARN button on the Controller board may be pressed to enter Auto-Learn Mode.

DIAGNOSTIC INDICATOR LIGHTS

The Aurora has 7 diagnostic indicator lights located on the Controller board.

3.3V Light:

- Turns **ON** when voltage is supplied to the Controller board.

12V Light:

- Turns **ON** when voltage is supplied to the Display boards.

STATUS Light:

- The Aurora's "heartbeat". **BLINKS** when the processor is running.
- **Rapid blinking** (3 times per second) indicates that the Aurora is in Auto-Learn Mode, attempting to interpret a data string.
- **Regular blinking** (Once per second) indicates that the Aurora has successfully learned a data string and is running properly.

RS232 Light:

- **FLASHES ON** each time the Aurora receives a character through the RS232 com port.

RS485 Light:

- **FLASHES ON** each time the Aurora receives a character through the RS485 com port.

20mA Light:

- **FLASHES ON** each time the Aurora receives a character through the 20 mA Current Loop port.

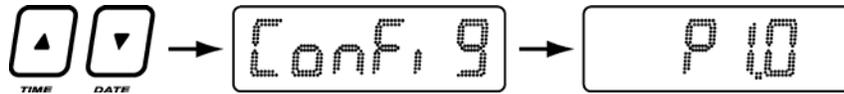
RADIO Light:

- **FLASHES ON** when the Aurora's Radio Module receives data.
- This light will only illuminate if the Radio Module is installed.

CONFIGURATION MODE

ENTERING CONFIGURATION MODE

1. Press & hold the **UP** and **DOWN ARROW** keys together.
2. “**ConFig**” is flashed on the display.
3. The first *Configuration Mode* parameter (**P1.0**) is displayed.



In Configuration Mode, if no keys are pressed for 10 seconds, the scale weight is displayed with a blinking “C” on the left-hand side.

NAVIGATING CONFIGURATION PARAMETERS

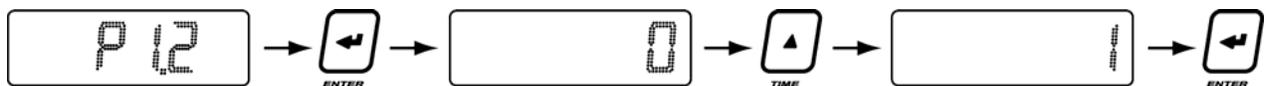
1. Use the **UP & DOWN ARROW** keys to find the parameter. Configuration Parameters are displayed by the letter “P” preceding the parameter number (Ex. “**P1.0, P1.1, P1.2 ...**”).

*Quick Note: Hold down the **UP** or **DOWN ARROW** key for more than 1 second to scroll through the Configuration Sub-blocks for quicker navigation (Ex. “**P1.0, P2.0, P3.0 ...**”).*



EDITING CONFIGURATION PARAMETERS

1. Navigate to the parameter and press **ENTER** to display the parameter value.
2. Use the **UP** and **DOWN ARROW** keys to edit the parameter value.
3. Press **ENTER** to confirm the parameter value.



EXIT & SAVE CONFIGURATION

1. Press the **UP** and **DOWN ARROW** keys together.
2. The display flashes “**SAve**” and “**rESEt**” before exiting *Configuration Mode*. All configuration information is saved and the display resets itself for normal operation.

CONFIGURATION PARAMETERS

Parameter 1.0: Daytime Brightness Level

Value	Description
0 = Low 1 = Med Low 2 = Med High 3 = High <	Set the brightness of the display for daytime viewing. The built-in light sensor automatically detects daylight conditions and sets the display brightness to this level.

Parameter 1.1: Nighttime Brightness Level

Value	Description
0 = Low < 1 = Med Low 2 = Med High 3 = High	Set the brightness of the display for nighttime viewing. The built-in light sensor automatically detects night conditions and sets the display brightness to this level.



NOTE: Lowering the brightness level at night helps reduce nighttime glare and energy consumption. Passing headlights, spotlights, etc. will NOT activate the daytime brightness level.

Parameter 1.2: Power-Save Mode

Value	Description
0 = OFF 1 = ON <	Automatically dims display brightness one level below the selected brightness level (day or night, as applicable) if there is no activity on the scale for 10 minutes. Brightness levels are restored when motion is detected on the scale. This feature saves power and increases LED longevity.

Parameter 1.3: Mirror Display Mode

Value	Description
0 = OFF < 1 = Mirror 2 = Cycle	Mirror display for viewing from a vehicle's rear-view or side-view mirrors. When "Cycle" is selected, the display will cycle between Normal and Mirror Display Modes every 5 seconds.

Parameter 1.4: Multi-Drop ID

Value	Description
0 = ID 0 < 1 = ID 1 2 = ID 2 3 = ID 3 4 = ID 4 5 = ID 5 6 = ID 6 7 = ID 7 8 = ID 8 9 = ID 9	Sets the unit ID if multiple remote displays are networked together. Up to ten (10) Aurora displays can be networked on a single serial or radio connection. Messages are sent to individual displays using control codes and these IDs. For Multi-Drop instructions, see page 29.



NOTE: If Multi-Drop is not being used, it is very important that the Multi-Drop ID be set to 0.

Parameter 1.5: Radio Channel Select

Value	Description
0 = Ch 0 < 1 = Ch 1 2 = Ch 2 3 = Ch 3 4 = Ch 4 5 = Ch 5	Sets the radio frequency channel (0-5) for the optional Integrated Wireless Module. If there are multiple scale/remote display installations at a given site, each installation must have its own unique radio channel selected to prevent interference.



NOTE: The Aurora Remote Display must be set to the same radio channel as the scale indicator's wireless transceiver.



NOTE: If the wireless connection experiences interference problems from another radio site, switching radio channels will most likely correct the problem.

Parameter 1.6: Utility Program Select

Value	Description
0 = OFF < 1 = Pgm1 - Green light at 0 2 = Pgm2 - Red light on motion 3 = Pgm3 - Normal w/ Cmds 4 = Pgm4 - Freeze Weight 5 = Pgm5 - Command Mode-G2 6 = Pgm6 - Axles w/ Total 7 = Pgm7 - Axles Driving ON 8 = Pgm8 - Axles Driving OFF Etc. 12 = Pgm12 - Legacy Cmd Mode	Several Utility Programs are pre-installed in the Aurora remote display. For a complete list of programs and descriptions, see page 26.

Parameter 1.7: Start-up Display Test

Value	Description
0 = OFF 1 = ON <	The Aurora automatically performs a digit testing “count” at power up (1-9). If set to OFF, the display will not perform this count. This parameter is useful for applications where the display needs to re-start quickly or is repeatedly turned off and on. Ex. When a power shut-off is used to blank the display.

Parameter 1.8: Communications Lost Error

Value	Description
0 = OFF 1 = ON <	If communications are lost, the Aurora shows dashes across the display (-----). If set to OFF, the dashes will not be shown. This parameter is useful for applications where interrupting communications is used to blank the display.

AUTO-LEARN PARAMETERS

Parameter 2.0: Auto-Learn / Assisted Auto-Learn

Value	Description
L#####	<p>Activates Auto-Learn Mode from inside <i>Configuration Mode</i>. The remote display will analyze and attempt to learn the string. The message “LEARN” will be displayed. When the remote display is successful, the weight will be shown on the display. A blinking “L” on the left indicates learning mode.</p> <p>Assisted Auto-Learn: If necessary, use the UP & DOWN ARROW keys to set the weight in the correct position on the display.</p> <p>To lock in the Auto-Learn or Assisted Auto-Learn settings, press ENTER. Disable Start-up Auto-Learn (Parameter 2.1) to avoid re-learning the string at future start-ups.</p>

Parameter 2.1: Start-up Auto-Learn

Value	Description
0 = OFF 1 = ON <	<p>The Aurora automatically enters Auto-Learn Mode on start-up. If set to OFF, the display will start-up using settings stored in memory from the last learn.</p> <p>The Aurora will not go into Auto-Learn Mode again unless Parameter 2.0 is activated or the LEARN button on the Controller board is pressed.</p>

Parameter 2.2: Leading Zero Suppression

Value	Description
0 = OFF < 1 = ON	<p>In some cases, the scale indicator may transmit leading zeros in the output string. If leading zeros are NOT required, they may be suppressed. The Aurora will automatically remove the leading zeros and replace them with blank spaces on the display.</p>



NOTE: Leading Zeros may also be disabled using the scale indicator (if possible).

Parameter 2.3: Set Scale Over

Value	Description
0 = Auto < Value for scale over target weight.	If there is no scale over status character in the weight string, or the indicator continues to transmit weight past maximum capacity, the unit can be set to blank the display when the weight goes past a preset weight value. Use the UP/DOWN keys to set the weight threshold and press ENTER . Holding the keys down will cause the weight threshold to change in steps of 10000. Single key presses will cause the weight threshold to change in steps of 100.

Parameter 2.4: Lock Weighing Units

Value	Description
0 = Auto < 1 = lb ON (or t) 2 = kg ON 3 = Both OFF	Weighing Units (lb, kg, and t) are automatically displayed from the indicator's output string. The Units annunciators may be locked ON or OFF as required. t annunciator replaces lb on UK, EU & AU models.

Parameter 2.5: Lock Weighing Mode

Value	Description
0 = Auto < 1 = Gross ON 2 = Net ON 3 = Both OFF	Weighing Mode (Gross/Net) is automatically displayed from the indicator's output string. The Mode annunciators may be locked on or off as required.

Parameter 2.6: Traffic Light Switch Settings

Value	Description
0 = Light OFF 1 = RED / <u>GREEN</u> 2 = GREEN / RED < 3 = OFF / <u>GREEN</u> 4 = OFF / <u>RED</u> 5 = GREEN Lock 6 = RED Lock 7 = OFF / <u>Flashing GREEN</u> 8 = OFF / <u>Flashing RED</u> 9 = Display On / <u>Blank Display</u>	Sets the function of the Traffic Light Switch (Aurora 45 SL only). The display may be locked RED, GREEN or OFF as required. Blank Display option (9) is available for all models. Switch is normally OPEN - See 1 st condition in list. When switch is CLOSED (activated) - See underlined condition in list. Ex: When set to 2, the light is GREEN when the switch is OPEN and RED when the switch is CLOSED.

Parameter 2.7: Set Decimal Point

Value	Description
0 = OFF 1 = 1 decimal place 2 = 2 decimal places	Decimal points are automatically displayed from the indicator's output string. If not, setting this parameter forces the decimal point into the displayed weight.

Parameter 2.8: Com Port Timeout (Normal Mode)

Value	Description
10 < (seconds) Range: 5 to 20 (seconds)	<p>Sets a timer for loss of communications from the indicator or other device. The timer begins after communications are cut-off. If the selected time is reached before communications are re-established, the "Communications Lost" error is displayed.</p> <p>Example: If set to 20 (maximum), the Aurora will wait 20 seconds from the last communication received before displaying dashes.</p>

Parameter 2.9: Com Port Timeout (Command Mode)

Value	Description
0 < (OFF) Range: 0 to 20 (seconds)	<p>Sets a timer in Command Mode for loss of communications from the indicator or other device. The timer begins after the last command is received. If the selected time is reached before the next command is received, the "Communications Lost" error is displayed.</p> <p>By default, this timeout is set to 0 (OFF). In this case, the Aurora will continue to display the last command until another command is received, no matter how much time elapses.</p> <p>Example: If set to 20 (maximum), the Aurora will wait 20 seconds from the last command received before displaying dashes.</p>

TIME / DATE / TEMP PARAMETERS

The Aurora remote display can be set to cycle between displaying weight, time, date and temperature every 5 seconds when: **a)** the weight display is at zero **AND**; **b)** there is no activity on the scale for the selected time period (P3.4).

Parameter 3.0: Time Display

Value	Description
0 = OFF < 1 = Time (AM/PM) 2 = Military (24 Hour)	Activates the TIME function in 12 hour or 24 hour clock formats.

Parameter 3.1: Date Display

Value	Description
0 = OFF < 1 = MMDDYY (US Format) 2 = YYMMDD (International) 3 = DDMMYY (UK)	Activates the DATE function in US, ISO or UK format.

Parameter 3.2: Temperature Display

Value	Description
0 = OFF < 1 = °F (degrees Fahrenheit) 2 = °C (degrees Celsius)	Activates the temperature function (in °F or °C) when the optional temperature probe is installed (Page 35).

Parameter 3.3: Weight Display

Value	Description
0 = OFF 1 = Cycle 2 = No Cycle <	OFF: Weight will NOT BE DISPLAYED at all. ON: Weight is displayed in the "Time/Date/Temp/Weight Cycle". No Cycle: Weight is NOT in the "Time/Date/Temp/Weight Cycle".

Parameter 3.4: Time Threshold

Value	Description
1 < (minute) Range: 1 to 20 (minutes)	Selects the number of minutes that the scale must be at zero before the "Time/Date/Temp/Weight Cycle" is displayed.

AUTO-LEARN DETECTION PARAMETERS

Parameter 8.0: Baud Rate Detection / Override

Value	Description
0 = Auto-Detect < 1 = 300 2 = 600 3 = 1200 4 = 2400 5 = 4800 6 = 9600 7 = 14400 8 = 19200 9 = 38400	Displays the current baud rate detected by Auto-Learn. Example: "9600A" = 9600 Baud, Automatically detected. If necessary, the baud rate may be manually set by selecting options 1 to 9. Select 0 to automatically detect Baud Rate during Auto-Learn.

Parameter 8.1: Data String Start Character

Value	Description
## Example: 0, 2, 3, 13	Displays the Start Character of the indicator's data string as detected by Auto-Learn. In most cases, this character will be 2 (STX), 3 (ETX) or 13 (CR). If necessary, use the UP & DOWN ARROW keys to manually set the correct character then press ENTER .

Parameter 8.2: Data String Length

Value	Description
## Range: 0 to 40	Displays the total number of characters in the indicator's data string as detected by Auto-Learn. Example: The number of characters between 2 start characters (see P8.1). If necessary, use the UP & DOWN ARROW keys to manually set the correct length then press ENTER .

Parameter 8.3: Weight Start Position

Value	Description
## Range: 1 to 40	Displays the position of the first weight character in the indicator's data string as detected by Auto-Learn. If necessary, use the UP & DOWN ARROW keys to manually set the correct position then press ENTER .

Parameter 8.4: Weight Length

Value	Description
## Range: 0 to 40	Displays the number of weight characters in the indicator's data string as detected by Auto-Learn (Excluding decimal and sign characters). If necessary, use the UP & DOWN ARROW keys to manually set the correct length then press ENTER .

Example: Western DF1500 Data String

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
STX	P	W	W	W	W	W	W	W	Sp	U	U	Sp	M	M	Sp	ST	CR	LF

Parameter 8.1 = 2: Detected data string begins with a decimal 2 (ASCII STX character).

Parameter 8.2 = 19: Detected data string contains 19 characters.

Parameter 8.1 = 3: Weight begins at the 3rd character of the detected data string.

Parameter 8.2 = 10: Weight includes up to the 10th character of the detected data string.

STX: Start of Text (ASCII 02)

P: Polarity (- or Spc)

W: Weight Character (# or Spc)

S: Space (ASCII 32)

U: Units Characters (KG or LB)

M: Mode Characters (GR or NT)

ST: Status Character (Spc, O, M, or -)

CR: Carriage Return (ASCII 13)

LF: Line Feed (ASCII 10)

DIAGNOSTIC PARAMETERS**Parameter 9.0: Com Port**

Value	Description
Port 0 = RS232 Port 1 = RADIO Port 2 = 20mA Port 3 = RS485	Displays the currently active Com Port.

Parameter 9.1: String Counter

Value	Description
0 to 65535	Counter indicates the number of characters received. Counter rolls over after 65535.

Parameter 9.2: Baud Rate

Value	Description
#####	Displays the baud rate currently being utilized for serial communications. Ex. "9600".

Parameter 9.3: Configuration Lockout

Value	Description
0 = Disabled < 1 = Enabled	When enabled, no configuration parameters can be changed. Disable this parameter to allow changes.

Parameter 9.4: Number Counter

Value	Description
0 to 65535	Counter indicates the number of numeric characters received. Counter rolls over after 65535.

Parameter 9.8: Test Display

Value	Description
N/A	Cycles through digits, annunciators & decimal characters followed by the software version, time and date.

Parameter 9.9: Reset Defaults

Value	Description
0 = Do Not Reset 1 = RESET	Resets Configuration Parameters to <u>factory defaults.</u>

UTILITY PROGRAMS

The Aurora displays have several auxiliary functions that may be activated via Parameter 1.6 in *Configuration Mode*.

PROGRAM 0: NORMAL OPERATION

- No Utility Program is selected.

PROGRAM 1: SIMPLE TRAFFIC LIGHT

- Traffic light is GREEN on zero;
- Otherwise, traffic light is RED.

PROGRAM 2: MOTION TRAFFIC LIGHT

- Traffic light is RED when scale motion is detected;
- Otherwise, traffic light is GREEN.

PROGRAM 3: NORMAL OPERATION WITH TRAFFIC LIGHT COMMANDS

- The display accepts a continuous data stream from the indicator;
- The continuous stream may be interrupted by control commands used to switch the traffic light.

CONTROL COMMAND		ASCII	DEC
RED light	Aurora 45 SL only	&<CR>	<i>38, 13</i>
GREEN light	Aurora 45 SL only	*<CR>	<i>42, 13</i>

PROGRAM 4: FREEZE WEIGHT (CAPTURE PRINT STRING)

- This program is useful for cattle auctions and other applications where a weight value must be displayed regardless of what is happening on the scale.
- Create a weigh ticket on the scale indicator that sends the scale weight and a <CR> character (ASCII characters) to the Aurora display using the PRINT button or a hot key.

Example: **123456 lb g<CR>**

- When the Aurora receives the ticket, it flashes the weight 3 times then freezes the weight on the display until the next weigh ticket is received.



NOTE: This application assumes a legal-for-trade indicator is used to send the weigh ticket. Please review local Weights and Measures requirements.

PROGRAM 5: COMMAND MODE (G2)

All Aurora displays can be setup to receive commands directly from the scale system or PC. Supported commands include transmitting weights, messages, traffic light control, and additional display functions.

Command Mode disables Auto-Learn and fixes communications at 9600-N-8-1.

The Aurora looks only for specific commands sent by the indicator or scale controller.



NOTE: This improved Command Mode is for the G2 Controller board. Use Legacy Command Mode (Pgrm 12) when replacing older Controller boards.

Activating Command Mode

To enable Command Mode for Aurora 45, 45-SL, 65, ALPHA 8 & ALPHA 12, set Parameter 1.6 in *Configuration Mode* to **5**.

Transmit a Weight String

Use numeric ASCII characters followed by a **<CR>** character.

Example:

- To display “1000”, transmit: **1000<CR>**

Transmit Weight Status Characters

Status characters may be embedded anywhere in the weight string to control the annunciator lights. Status characters may be upper or lowercase, and in any order, before or after the weight.

STATUS COMMAND	ASCII	DEC
GROSS weight	G or g	71 or 103
NET weight	N or n	78 or 110
POUNDS	L or l	76 or 108
KILOGRAMS	K or k	75 or 107

Example:

- To display 1000 lb gross, transmit: **1000LG<CR>** -or- **g11000<CR>**



NOTE: If no gross/net character is sent to the Aurora, the “GR” annunciator will illuminate by default when a weight string is detected.

Alphanumeric messaging to the scoreboard

Aurora 45, 45-SL and 65 models can display alphanumeric messages within the limitations of a 7 segment digit. Text and numbers sent as a message must be preceded by the @ character (decimal 64) and followed by a Carriage Return <CR> character (decimal 13). All characters in the data string are then treated as an alphanumeric message instead of a weight value and are displayed from left to right.

Aurora ALPHA models can display the entire printable ASCII character set and scrolling messages. Alphanumeric message strings must be preceded by the “ character (decimal 34) and followed by a Carriage Return <CR> character (decimal 13) to differentiate them from weight strings. Characters are displayed from left to right.

When an alphanumeric data string is longer than the unit’s number of display characters, Aurora ALPHA models will automatically scroll the message (right to left) up to the maximum data string length of 40 characters.

Control Commands

Control commands are ASCII characters that are transmitted to the Aurora to control additional features such as the built-in traffic light (Aurora 45 SL) and scrolling (Aurora ALPHA).

Control Commands must be preceded by the @ character (decimal 64) and followed by a Carriage Return <CR> character (decimal 13).

CONTROL COMMAND		ASCII	DEC
RED light	Aurora 45 SL only	&	38
GREEN light	Aurora 45 SL only	*	42
FLASH RED light	Aurora 45 SL only	\$	36
FLASH GREEN light	Aurora 45 SL only	^	94
Light OFF	Aurora 45 SL only	%	37
Turn ON flashing display		(40
Turn OFF flashing display)	41
FLASH display 3 times		!	33
Display Time		{	123
Display Date		}	125
Display Temperature	with Temp. Option only	[91
Display Time/Date/Temp. Cycle]	93
Set display to MIRROR View Mode		_	95
Set display to NORMAL View Mode		+	43
Scroll speed (0 - fastest to 9 - slowest)	Aurora ALPHA only	=	61
MINIMUM weight for bar graph	Aurora ALPHA only	>	62
MAXIMUM weight for bar graph	Aurora ALPHA only	<	60
*** To disable bar graph, set both MIN and MAX weights to “0”			



NOTE: Control Commands must be transmitted alone. Do not transmit Control Commands within a WEIGHT data string or an ALPHANUMERIC MESSAGE data string.

Sample Command Mode Data Strings

DATA STRING		DISPLAY
0<CR>		“0” gross
1000 <CR>		“1000” gross
LN 1234 <CR>		“1234” lb net
1234 GK <CR>		“1234” kg gross
1234 L g <CR>		“1234” lb gross
@hello<CR>		“HELLO ”
@*<CR>	Aurora 45 SL only	GREEN light
@stop &<CR>	Aurora 45 SL only	“StoP ”, RED light
@hello<CR>@!<CR>		“HELLO ” flashing 3 times
“Western Scale<CR>	Aurora Alpha only	“Western Scale” scrolling
“Western Scale!<CR>	Aurora Alpha only	“Western Scale!” scrolling
@=9<CR>“Western Scale<CR>	Aurora Alpha only	“Western Scale” slow scroll
@>0<CR> @<5000<CR>	Aurora Alpha only	Bar graph will display from 0 to 5000. Ex. At 2500, the bar graph will be at 50% (independent of scale units).

Multi-Drop IDs & Networking

Aurora displays using Multi-Drop networking must be in Command Mode. The Multi-drop ID (0 to 9) must also be set (*Configuration Mode Parameter 1.4*, page 17).

When using Multi-drop, the Aurora will only respond after it has been selected. To select a display, transmit a # character (ASCII 35) followed by the correct ID number and a <CR> character (ASCII 13). Once this command is executed, control codes, alphanumeric messages and weight strings can be transmitted to the selected display as described in Command Mode (page 27).

An Aurora will remain selected until it receives a command containing a different ID.

Examples:

1. Select Multi-drop ID 1:
Transmitting #1<CR> selects the display with ID #1.
2. Select Multi-drop ID 3 and send a weight of 1000lb gross:
#3<CR>1000LG<CR>
The ID number may also be embedded with the weight string:
#3 1000LG<CR>
3. Send 3 different weights to 3 different scoreboards:
“#0 2000LG<CR>#1 3000LG<CR>#2 5000LG<CR>“
4. Send the text “hello” to scoreboard ID 3.
“#3@HELLO<CR>

PROGRAM 6: AXLE WEIGHING WITH TOTAL

- For use with axle scales only!

- Scale at zero – GREEN light.
- Truck drives its first axle on the scale, after motion stops – RED light. The Aurora displays the axle weight and axle number (A1).
- GREEN light – Ready for the next axle. The next axle is driven onto the scale. After motion stops – RED light. The Aurora displays the axle weight and axle number (A2). Repeat for each remaining axle.
- After the last axle (weight at or near ZERO) – RED light. The truck's total axle weight is displayed for 10 seconds (flashing).
- Scale at or near ZERO – GREEN light. Ready for the next truck.

PROGRAM 7: AXLE WEIGHING (DRIVING ON)

- For axle weighing on regular vehicle scales.

- Scale at zero – GREEN light.
- Truck drives its first axle on the scale, after motion stops – RED light. The Aurora displays the axle number (A1), then the axle weight – GREEN light.
- The next axle is driven onto the scale. After motion stops – RED light. The Aurora displays the axle number (A2), then the axle weight – GREEN light.
- This is repeated until all axles are on the scale. After motion stops – RED light. The Aurora displays the axle number (A_n), then the final axle weight – GREEN light.
- If there is no motion or significant weight change for 12 seconds, the truck's total scale weight is displayed and the truck can drive off the scale.

PROGRAM 8: AXLE WEIGHING (DRIVING OFF)

- Reverse of Program 7: Axle Weighing (Driving On)

- Truck drives on scale, Aurora displays total weight.
- Truck drives its first axle off the scale, after motion stops – RED light. The Aurora displays the axle number (A1), then the axle weight – GREEN light.
- This is repeated until all axles are off the scale.

PROGRAM 12: LEGACY COMMAND MODE

- Command Mode from previous generation Controller board;
- Used when interfacing a new scoreboard to an older installation.

AURORA 45-SL TRAFFIC LIGHT CONTROL

The built-in traffic light may be controlled by remote switch, serial commands or the pre-installed utility programs.

Remote Switch

1. Wire a dry contact, push-to-make switch to the Stop Light Remote Switch terminal (J23) on the Controller board. **DO NOT** supply any external power to this terminal.

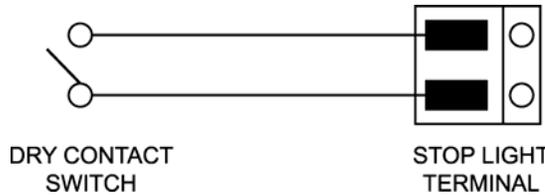


Fig. 12: Stop Light Terminal Wiring

2. The default condition for the switch (contact open) is a GREEN light. When the switch contact is closed, the light turns RED.



NOTE: Remote switch operation can be reversed, altered or disabled in Configuration Mode, Parameter 2.6.



*NOTE: The remote switch is **disabled** if a traffic light controlling Utility Program such as Command Mode is selected -OR- the traffic light is locked GREEN, RED or OFF in Configuration Mode, Parameter 2.6.*

Serial Commands

When the Aurora display is set to Program 3: Normal Operation with Traffic Light Commands or Program 5: Command Mode, it will accept serial commands to switch the built-in traffic light. For more information and a list of serial control commands and examples, see Utility Program descriptions, page 26.

PRG 3 CONTROL COMMAND	ASCII	DEC
RED light	& <CR>	38, 13
GREEN light	* <CR>	42, 13

PRG 5 CONTROL COMMAND	ASCII	DEC
RED light	@ & <CR>	64, 38, 13
GREEN light	@ * <CR>	64, 42, 13

Pre-Installed Utility Programs

Some of the Aurora's pre-installed utility programs are designed to control the built-in traffic light. For program overviews, see page 26.

WIRELESS OPTION INSTALLATION

AURORA INTEGRATED WIRELESS INSTALLATION

1. The Integrated Wireless Kit includes:
 - Radio Module
 - External Antenna
 - Internal Antenna Cable
 - FCC / Industry Canada Sticker
1. Ensure the Aurora display is disconnected from power and open the enclosure.
2. Place the Radio Module in the “Radio Module Option” terminals on the Controller Board.
3. Connect the Internal Antenna Cable to the threaded SMA terminal on the Radio Module.
4. Remove the rubber plug in the bottom of the Aurora enclosure
5. Remove the nut and lock washer from the threaded SMA terminal on the Internal Antenna Cable. Run the threaded SMA terminal through the hole in the bottom of the Aurora enclosure. Use the lock washer and nut to secure the SMA terminal.
6. Connect the External Antenna to the SMA connector on the bottom of the enclosure.
7. Power up the Aurora. **The Aurora is ready to receive radio signals.**

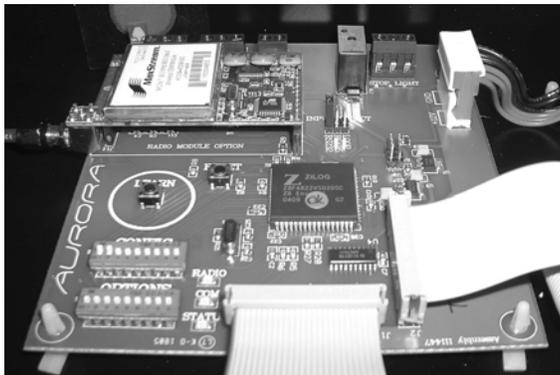


Fig. 13: Radio Module on Controller board

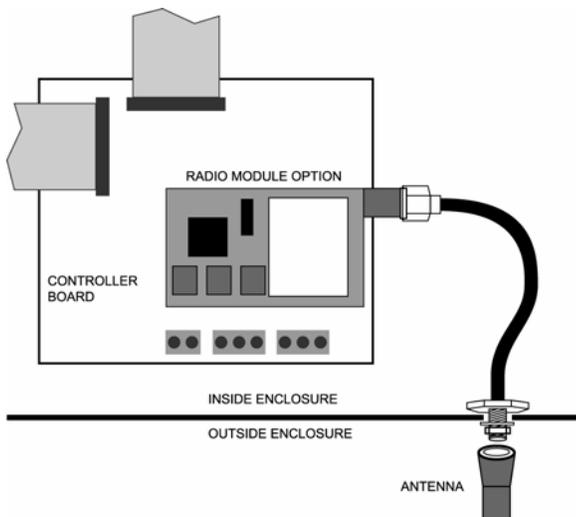
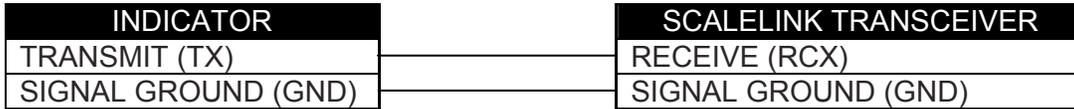


Fig. 14: Wireless Kit Installation

INDICATOR & WIRELESS TRANSCEIVER

1. Wire the ScaleLink Transceiver to the indicator (or other communicating device).



2. Verify communication settings between the ScaleLink and the indicator (or other communicating device). The ScaleLink’s default communication settings are:

Baud Rate	9600	Data Bits	8
Parity	None	Stop Bits	1



NOTE: The indicator and ScaleLink’s communication settings must match. If adjustments are required, see the ScaleLink Wireless Transceiver Manual or Indicator Manual.

3. Ensure the indicator is set-up to output **CONTINUOUSLY**.
4. Power up the Indicator and Transceiver together to **transmit radio signals**.

WIRELESS CONNECTION TEST

1. Verify that both the Wireless Transceiver and the Aurora Remote Display are set to the same radio channel.
2. Verify that the Wireless Transceiver is ON and transmitting.
3. Verify that the Radio LED on the Aurora Controller board is FLASHING.
4. Add weight to the scale.
5. Verify that the Aurora is correctly displaying Weight, Measurement Units (kg, lb), and Weighing Mode (GR, NT) as shown on the scale indicator.



NOTE: If the Aurora’s readings are incorrect, erratic, or very slow, a different radio channel may need to be selected.



NOTE: Aurora Radio Module Field Installation kits are available. Please contact the factory for more information.

TIME & DATE

The Aurora remote display has a precision time clock that compensates for variable temperature conditions. The battery on the Controller board (J22) provides back-up power for this clock.

SET TIME & DATE

Adjust Time

1. Make sure Time is enabled in *Configuration Mode* (Parameter 3.0)
2. Press and hold the **UP/TIME** key.
3. Use the **UP** and **DOWN ARROW** keys to select the correct hour and press **ENTER**.
4. Repeat for minutes and AM/PM if enabled (12 hour clock).

Adjust Date

1. Make sure Date is enabled in *Configuration Mode* (Parameter 3.1)
2. Press the **DOWN/DATE** key.
3. Use the **UP** and **DOWN ARROW** keys to select the correct year/month/day (International) or month/day/year (USA) and press ENTER.

BATTERY / BATTERY REPLACEMENT

The Aurora displays use a 3 Volt lithium battery. Power is drawn from the battery only when the unit is disconnected from AC power. If time and date are lost when the unit is disconnected from AC power, the battery likely needs replacement.

1. Remove the old battery from the J22 terminal on the Controller board by hand.
2. Observe proper battery polarity before inserting new battery.
3. Ensure the battery is seated correctly in the J22 terminal.



CAUTION! Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to their instructions.



CAUTION! Never use metal objects such as screwdrivers to remove batteries! This may result in personal injury or damage to the unit.

TEMPERATURE OPTION - INSTALLATION

1. Unpack the optional Temperature Probe Assembly. This assembly consists of the weather-sealed temperature probe contained in a Strain-Relief. A 4 conductor cable runs from the temperature probe to a 4 pin connector.
2. Ensure the Aurora display is disconnected from power and open the enclosure.
3. Remove the rubber plug from the hole in the bottom of the enclosure.
4. Remove the nut from the Strain-Relief and run the cable up through the hole in the bottom of the enclosure.
5. Run the connector and cable through the nut and use it to fasten the Strain-Relief to the enclosure.
6. Plug the Temperature Probe connector into the terminal (J9) on the Controller Board.
7. Power up the Aurora display. Enter *Configuration Mode* and set Parameter 3.2 to **1** for Fahrenheit or **2** for Celsius.
8. Exit *Configuration Mode*. The temperature will be displayed once the remote display has been reading zero for the time specified in Parameter 3.4 (Time Threshold).

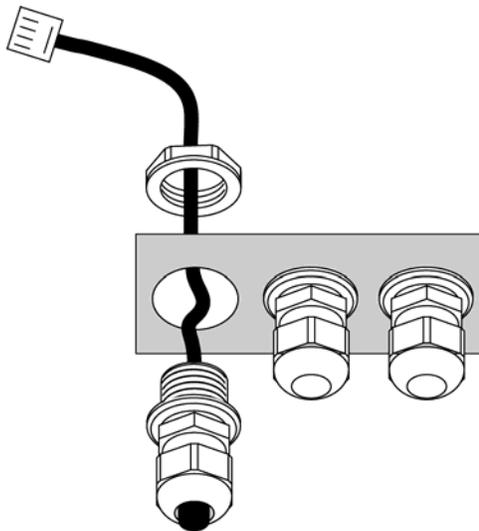


Fig. 15: Temperature Probe Installation

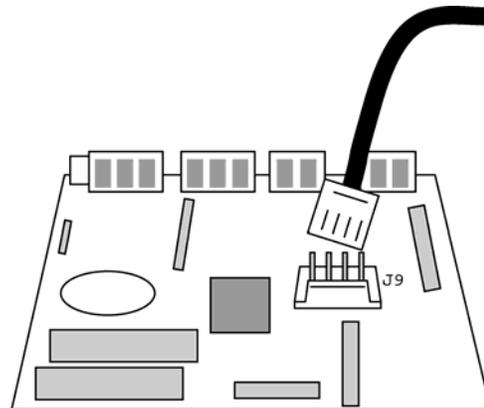


Fig. 16: Cable Connection to Controller Board



The Aurora's Digital Temperature Probe ensures accuracy to within ± 1 degree and will never need to be calibrated.

TROUBLESHOOTING & ERROR MESSAGES

<p>Unit won't power up:</p>	<ul style="list-style-type: none"> • Verify AC power source (Outlets, breakers, etc.) • Check power cord connections to Terminal Block and Ground Posts inside the Main Enclosure. • Verify internal power wiring from Terminal Block to the Power Supply board and Power Supply board to the Controller board. • Check fuses on Power Supply board and Controller board.
<p>Unit has power, but there is no display.</p>	<ul style="list-style-type: none"> • Verify Ribbon Cable connections from Controller board to the 2 Display boards. • Check 12V light and fuse on Controller board. • If the unit is in COMMAND mode, the display will remain blank until data is received.
<p>Display reads "Err 1".</p>	<ul style="list-style-type: none"> • Baud Rate Auto-Learn has failed. • Verify the correct terminal (RS 232, 485, 20 mA) is being used. • Verify cable to indicator. • Verify that data is being transmitted to the Aurora from the indicator and that the data string contains numeric characters.
<p>Display reads "Err 2".</p>	<ul style="list-style-type: none"> • Data String Auto-Learn has failed or Radio not receiving. • Verify the correct terminal (RS 232, 485, 20 mA) is being used. • Verify cable or radio connection to indicator. • Verify that a data string is being sent to the Aurora from the indicator and that the data string contains either an STX character (ASCII 02) or a CR character (ASCII 13).
<p>Display reads "Err 3"</p>	<ul style="list-style-type: none"> • The Aurora is receiving data on multiple communications ports.
<p>Display reads "Err 4"</p>	<ul style="list-style-type: none"> • The optional Temperature probe has not been detected.

Dashes across the display.	<ul style="list-style-type: none">• Communications have failed.• Verify the correct terminal (RS 232, 485, 20 mA) is being used.• Verify cable or radio connection to indicator.• Verify indicator serial port function.
STATUS light NOT blinking (OFF)	<ul style="list-style-type: none">• Verify that unit has power. When powered, if the Status light remains OFF, the processor is not running.
STATUS light blinking fast (3/second) for longer than 1 minute:	<ul style="list-style-type: none">• The Aurora is not able to Auto-Learn the data string or baud rate. See Error Messages "Err 1" and "Err 2".
RS232 light not flashing:	<ul style="list-style-type: none">• Verify the RS232 terminal is being used and check communications wiring at the indicator.• Verify that data is being sent to the Aurora from the indicator and that the data string contains numeric characters.
RS485 light not flashing:	<ul style="list-style-type: none">• Verify the RS485 terminal is being used and check communications wiring at the indicator.• Verify that data is being sent to the Aurora from the indicator and that the data string contains numeric characters.
20mA light not flashing:	<ul style="list-style-type: none">• Verify the 20mA terminal is being used and check communications wiring at the indicator.• Verify that data is being sent to the Aurora from the indicator and that the data string contains numeric characters.• Make sure the correct mode (ACTIVE or PASSIVE) is selected on the Controller board (SW10).
RADIO light not flashing:	<ul style="list-style-type: none">• Check that the Radio Module is properly installed. Ensure that the internal antenna cable is connected to the Radio Module and the external antenna.• No data is received. Verify data is being sent from the Wireless Transceiver connected to the scale indicator.