

# AURORA

REMOTE DISPLAYS

## INSTALLATION & TECHNICAL MANUAL



**NEW Aurora G2 Controller Board  
with External Keypad**



**WESTERN SCALE CO. LTD.**

---

**AURORA 45 - AURORA 65 - AURORA 45 SL  
L.E.D. REMOTE WEIGHT DISPLAYS  
INSTALLATION & TECHNICAL MANUAL**

**SOFTWARE RELEASE 4-00, 06/2008**

Copyright © 2005 - 2008 **Western Scale Co. Limited**. All rights reserved.

Published by: **Western Scale Co. Limited**.

Information in this *Installation / Technical Manual* is subject to change without notice due to correction or enhancement. The information described in this manual is the property of Western Scale Co. Ltd. No part of this manual may be reproduced or retransmitted in any form, without the expressed written permission of Western Scale Co. Ltd.

**Western Scale Co. Limited**

1670 Kingsway Avenue  
Port Coquitlam, B.C.  
Canada  
V3C 3Y9

Tel: (604) 941-3474

Fax: (604) 941-4020

[www.westernscale.ca](http://www.westernscale.ca)

[info@westernscale.ca](mailto:info@westernscale.ca)

**FOR TECHNICAL SUPPORT REGARDING THIS PRODUCT, PLEASE CALL  
YOUR AUTHORIZED WESTERN DEALER:**

---

**TABLE OF CONTENTS**

**INTRODUCTION ..... 2**

    SAFETY ..... 2

    AURORA FEATURES ..... 3

    DISPLAY ..... 4

    KEYPAD ..... 4

    OPENING THE AURORA 45 / 45 SL / 65 ENCLOSURE ..... 5

**INSTALLATION..... 6**

    PRE-INSTALLATION ..... 6

    MOUNTING INSTRUCTIONS..... 6

    LOWERING THE ELECTRONICS PLATE..... 7

    COMMUNICATIONS WIRING..... 8

**START-UP..... 10**

    POWER ON/OFF ..... 10

    RESET BUTTON..... 10

    AUTO-LEARN ..... 10

    LEARN BUTTON..... 10

    DIAGNOSTIC INDICATOR LIGHTS ..... 11

**CONFIGURATION MODE..... 12**

    ENTERING CONFIGURATION MODE ..... 12

    NAVIGATING CONFIGURATION PARAMETERS ..... 12

    EDITING CONFIGURATION PARAMETERS ..... 12

    EXIT & SAVE CONFIGURATION ..... 12

    CONFIGURATION PARAMETERS..... 13

        Parameter 1.0: Daytime Brightness Level ..... 13

        Parameter 1.1: Nighttime Brightness Level ..... 13

        Parameter 1.2: Power-Save Mode..... 13

        Parameter 1.3: Mirror Display Mode ..... 13

        Parameter 1.4: Multi-Drop ID ..... 14

        Parameter 1.5: Radio Channel Select ..... 14

        Parameter 1.6: Utility Program Select..... 14

    AUTO-LEARN PARAMETERS..... 15

        Parameter 2.0: Manual Learn (Assisted Learn) ..... 15

        Parameter 2.1: Start-up Auto-Learn ..... 15

        Parameter 2.2: Leading Zero Suppression ..... 15

        Parameter 2.3: Set Scale Over ..... 16

        Parameter 2.4: Lock Units..... 16

        Parameter 2.5: Lock Weighing Mode..... 16

        Parameter 2.6: Lock Traffic Light..... 16

    TIME / DATE / TEMP PARAMETERS..... 17

        Parameter 3.0: Time Display ..... 17

        Parameter 3.1: Date Display ..... 17

        Parameter 3.2: Reserved for future use..... 17

        Parameter 3.3: Weight Display ..... 17

        Parameter 3.4: Time Threshold ..... 17

    DIAGNOSTIC PARAMETERS ..... 18

        Parameter 9.0: Com Port ..... 18

        Parameter 9.1: String Counter ..... 18

        Parameter 9.2: Baud Rate ..... 18

        Parameter 9.3: Configuration Lockout ..... 18

        Parameter 9.4: Number Counter..... 18

        Parameter 9.8: Test Display..... 18

        Parameter 9.9: Reset Defaults..... 18

**UTILITY PROGRAMS ..... 19**

**WIRELESS SET-UP ..... 24**

**AURORA 45 SL TRAFFIC LIGHT CONTROL..... 26**

**TIME & DATE ..... 27**

**TROUBLESHOOTING & ERROR MESSAGES ..... 28**

## **INTRODUCTION**

The Aurora Remote Display Series incorporates the highest performance standards and the most features of any weighing display, making them the best choice for remote viewing applications. The new G2 Controller board incorporates an external keypad to access many new and improved features such as standard time and date. Like all Western products, Aurora Remote Displays are designed with durability, functionality, and versatility in mind. Western: Engineered for the diversity of the weighing industry.

The following information is for the exclusive use of **WESTERN** 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 Aurora 45, Aurora 45 SL and Aurora 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 Aurora enclosure.*



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



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

## **AURORA FEATURES**

### *HIGH VISIBILITY*

- A bigger, brighter display (4.5 or 6.5 inches high) makes the Aurora display 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 Drop-down electronics carriage makes installation and service quick and easy.
- 3 button keypad to access features and diagnostics without opening the enclosure.

### *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.

### *SAVE ENERGY*

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

### *MORE...*

- A ready to use, built-in traffic light (Aurora 45 SL model only).
- 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**

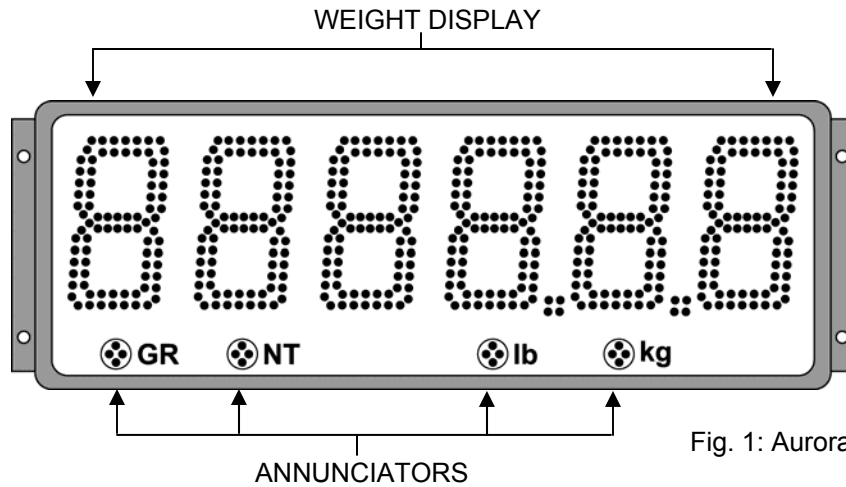


Fig. 1: Aurora 45 Example

WEIGHT DISPLAY: 6 LED digits (7 segments). Up to 2 decimal places.

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

**KEYPAD**

The membrane keypad features an integrated light sensor window to detect changing ambient light conditions and 3 tactile push buttons used to set time and date (page 27) as well as access *Configuration Mode* (page 12).

The keypad connects to J10 on the Controller Board.

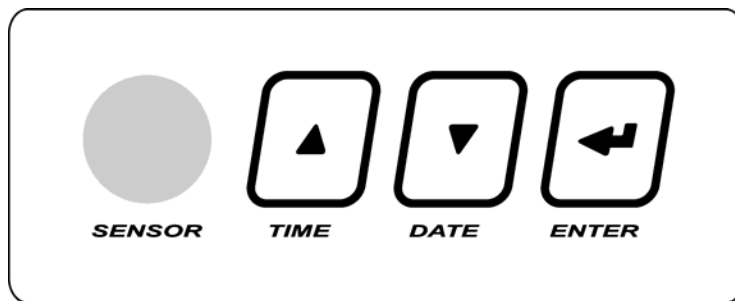


Fig. 2: Aurora Keypad

**OPENING THE AURORA 45 / 45 SL / 65 ENCLOSURE**

1. Make sure the unit is disconnected from power.
2. Remove the captive screws from the bottom of the enclosure.
3. Slowly, guide the Electronics Carriage out of the Main Enclosure, being careful to avoid bending any LED leads. Each LED is mounted very close to the PCB to help prevent bending.
4. The Electronics Carriage has tabs on either end that allow it to rest on the Main Enclosure flange when mounted (As seen in Fig. 3 & 4).

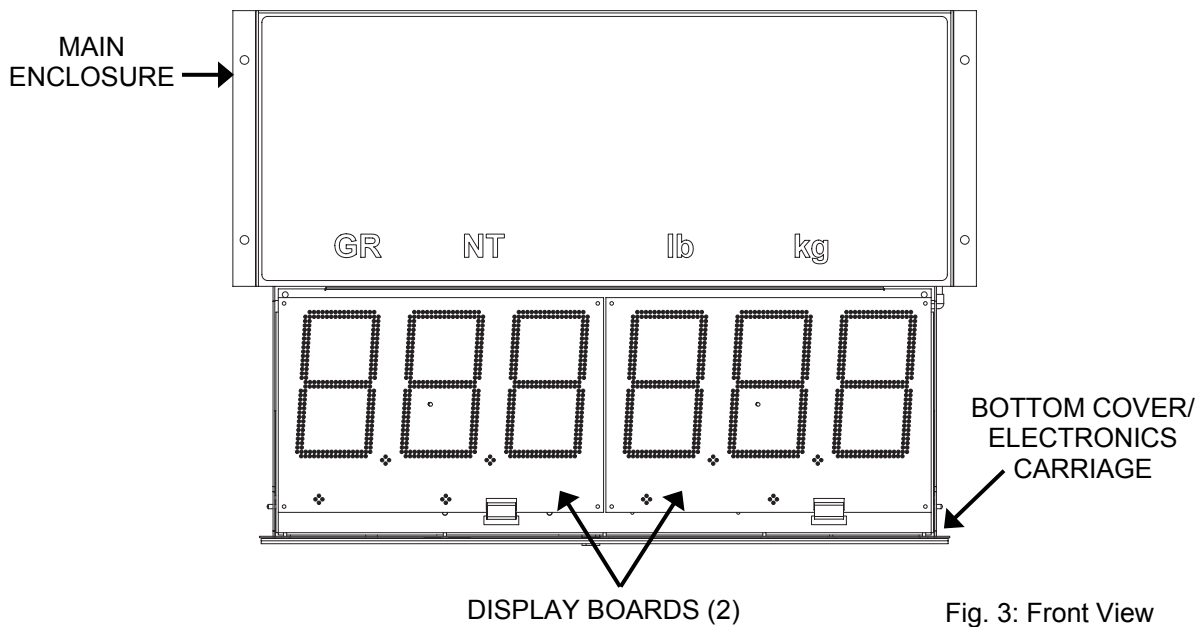


Fig. 3: Front View

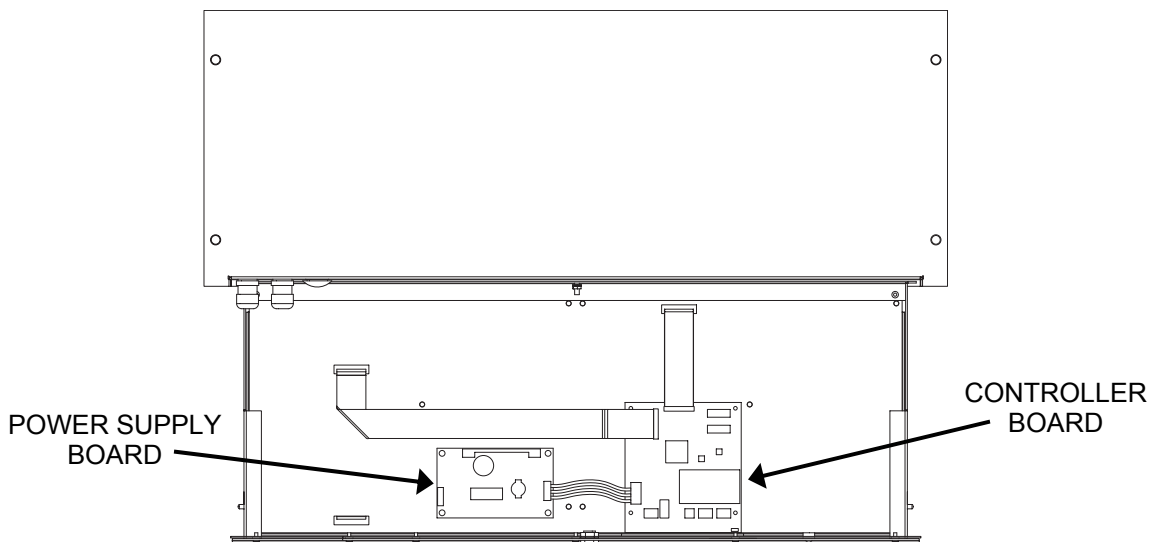


Fig. 4: Back View

## **INSTALLATION**

### **PRE-INSTALLATION (Receiving Inspection)**

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

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

### **MOUNTING INSTRUCTIONS**

Mounting-hole patterns for the Aurora Remote Displays are given in the diagram below:

Aurora 45:



Aurora 65 & Aurora 45 SL:

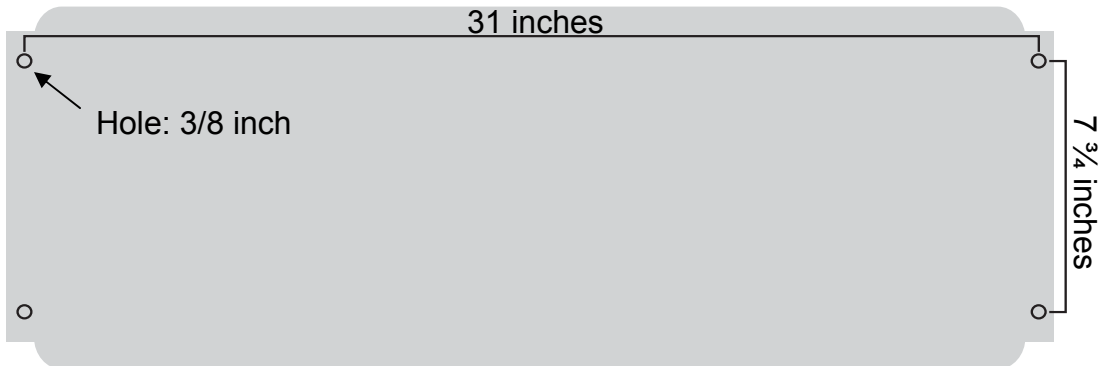


Fig. 5: Hole Patterns



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 (Aurora 45: 20 lbs, Aurora 65 & 45SL: 32 lbs).
3. Allow proper clearance for lowering and removing the Electronics Carriage.
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.

Imperial:

5/16-18 UNC Hex Cap Bolts - 4pcs/unit (min. 1" long)

5/16 Steel Flat Washer - 4pcs/unit

Metric:

M8x1.25 Hex Cap Bolts - 4pcs/unit (min. 25mm long)

M8 Steel Flat Washer - 4pcs/unit

5. Run communication cables into the enclosure via strain reliefs (as required).



*NOTE: The Electronics Carriage may be removed to reduce weight when installing.*

**LOWERING THE ELECTRONICS PLATE**

1. Remove the two (2) captive screws holding the Electronics Plate to the Electronics Carriage.
2. Slowly, allow the Electronics Plate to swing down, making access easier for wiring and service (As seen in Fig. 6).

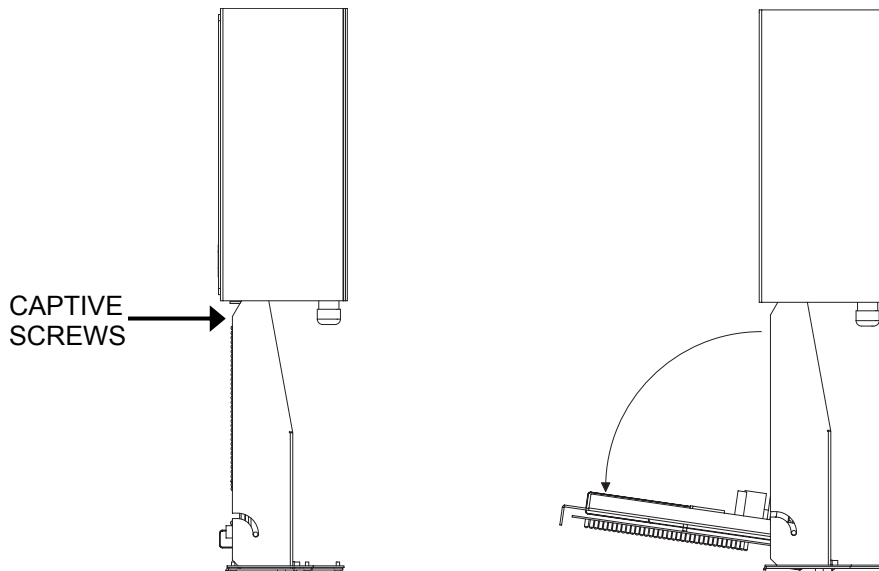


Fig. 6: Side View

**COMMUNICATIONS WIRING**

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

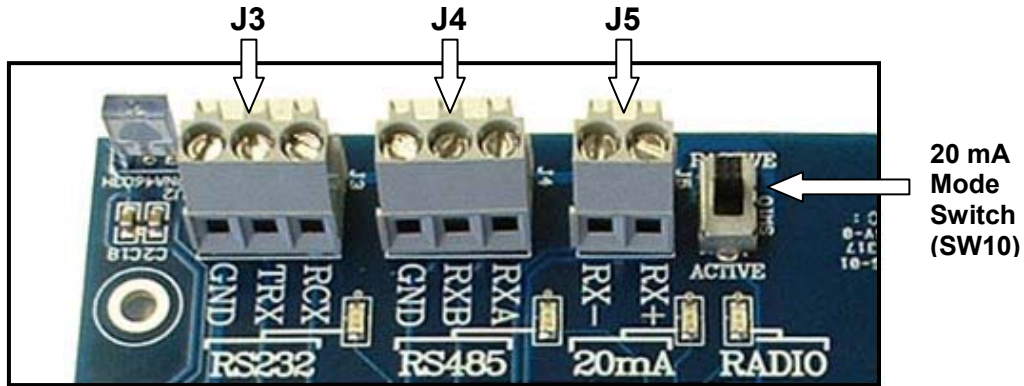
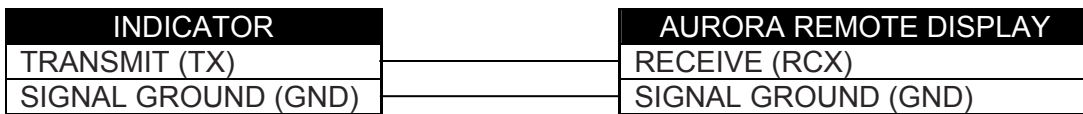


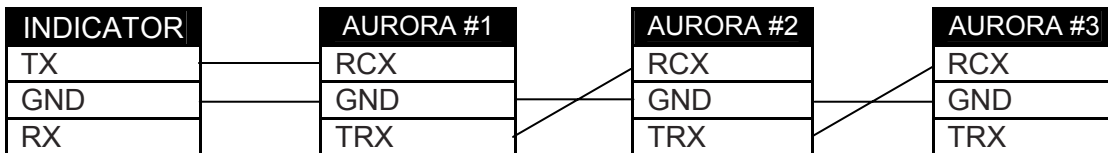
Fig. 7: Communication Terminals

**RS 232 Wiring**

Terminate the indicator's communication wires at the RS 232 terminal (J3). See Fig. 7 & table below:

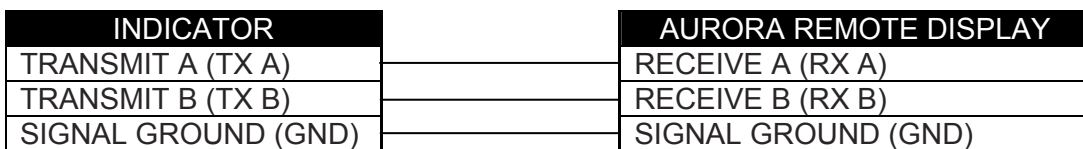


**RS 232 Daisy Chain / Multi-Drop Wiring**



**RS 485 / 422 Wiring**

Terminate the indicator's communication wires at the RS 485 terminal (J4). See Fig. 7 & table below:

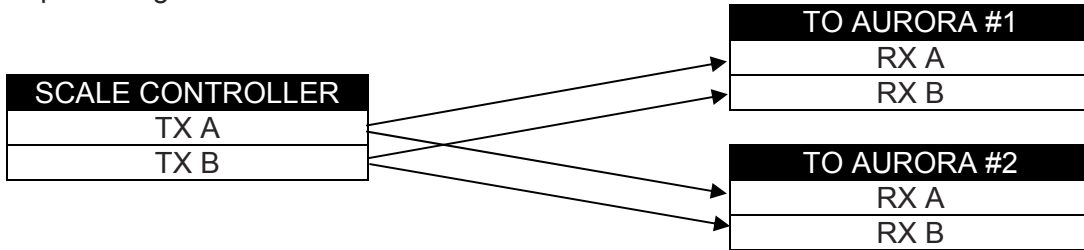


### RS 485 Daisy Chain / Multi-Drop Wiring

Parallel Wiring



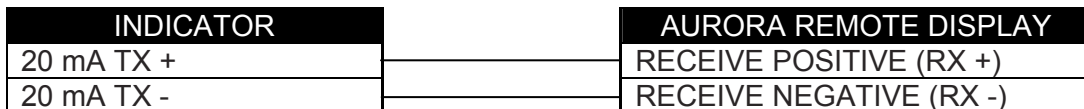
Split Wiring



*NOTE: For more information regarding RS 485 Multi-Drop and setting Multi-Drop Addresses, see page 22.*

### 20 mA Current Loop Wiring

Terminate the indicator's communication wires at the 20 mA Current Loop terminal (J5). See Fig. 7 & 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.

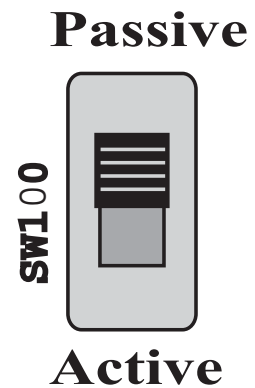


Fig. 8: 20 mA Mode Switch

## **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. 4-00).

### **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 15).*

### **LEARN BUTTON**

- If Automatic Start-up Auto-Learn is disabled, the LEARN button on the Controller board must 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.

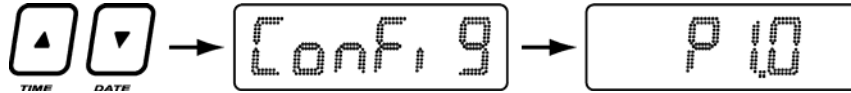
### RADIO Light:

- **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 costs. 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
<b>0= ID 0 &lt;</b> 1= ID 1 2= ID 2 3= ID 3 Etc.	Sets the unit ID if multiple remote displays are networked together. Up to four (4) 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 22.



*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
<b>0 = Ch 0 &lt;</b> 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
<b>0 = OFF &lt;</b> 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 Etc.	Several Utility Programs are pre-installed in the Aurora remote display. For a complete list of programs and descriptions, see page 19.



## AUTO-LEARN PARAMETERS

### Parameter 2.0: Manual Learn (Assisted Learn)

Value	Description
Lxxxxx	<p>Manual Learn 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.</p> <p>A blinking L will be displayed in the left hand corner to indicate you are still in learning mode.</p> <p>To lock in the learned string's settings, press ENTER.</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 OFF, the display will startup using settings stored in memory from the last learn.</p> <p>Parameter 2.0 must be activated or the LEARN button on the Controller board must be pressed before the Aurora will go into Auto-Learn Mode again.</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**

<b>Value</b>	<b>Description</b>
<b>0 = Auto &lt;</b> Value for scale over target weight.	If there is no scale over status character in the weight string, or the indicator continues to transmit past maximum capacity, the unit can be set to blank the display when the weight goes past a preset weight value.  Use the <b>UP/DOWN</b> keys to set the weight threshold and press <b>ENTER</b> . 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 Units**

<b>Value</b>	<b>Description</b>
<b>0 = Auto &lt;</b> 1 = lb ON ( <i>or t</i> ) 2 = kg ON 3 = Both OFF	Weight 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.  On European models the lb enunciator is replaced with t.

**Parameter 2.5: Lock Weighing Mode**

<b>Value</b>	<b>Description</b>
<b>0 = Auto &lt;</b> 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: Lock Traffic Light**

<b>Value</b>	<b>Description</b>
<b>0 = Auto &lt;</b> 1 = RED 2 = GREEN 3 = OFF	The Traffic Light (Aurora 45 SL) display may be locked RED, GREEN or OFF as required.

## TIME / DATE / TEMP PARAMETERS

The Aurora remote display can cycle between displaying weight, time and date 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.

### Parameter 3.0: Time Display

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

### Parameter 3.2: Reserved for future use

Value	Description
	Not available at this time

### Parameter 3.3: Weight Display

Value	Description
0 = OFF 1 = Cycle <b>2 = No Cycle &lt;</b>	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 to 20 min. <b>1 min &lt;</b>	Selects the number of minutes that the scale must be at zero before the "Time/Date/Temp/Weight Cycle" is displayed.

**DIAGNOSTIC PARAMETERS****Parameter 9.0: Com Port**

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

**Parameter 9.1: String Counter**

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

**Parameter 9.2: Baud Rate**

<b>Value</b>	<b>Description</b>
300 600 1200 4800 9600 19200	Displays the baud rate currently being utilized for serial communications.

**Parameter 9.3: Configuration Lockout**

<b>Value</b>	<b>Description</b>
0 = Disabled < 1 = Enabled	When enabled, no configuration parameters can be changed. Disable this parameter to restore user changes.

**Parameter 9.4: Number Counter**

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

**Parameter 9.8: Test Display**

<b>Value</b>	<b>Description</b>
N/A	Cycles through time, digits, annunciators & decimal characters.

**Parameter 9.9: Reset Defaults**

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

## 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	<b>&amp;&lt;CR&gt;</b>	<i>38, 13</i>
GREEN light	Aurora 45 SL only	<b>*&lt;CR&gt;</b>	<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.
- A weigh ticket (using ASCII characters) must be created on the scale indicator that sends the scale weight and a <CR> character to the Aurora display with a button press.

Example:     **123456 lb g<CR>**

- When the Aurora receives the ticket, it displays the weight and keeps displaying it 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, basic alphanumeric messaging, 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

1. To enable Command Mode for Aurora 45 / 45 SL / 65, 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 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	<b>G</b> or <b>g</b>	71 or 103
NET weight	<b>N</b> or <b>n</b>	78 or 110
POUNDS	<b>L</b> or <b>l</b>	76 or 108
KILOGRAMS	<b>K</b> or <b>k</b>	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.*

### Alphanumeric messaging to the scoreboard

All Aurora 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, and not a weight value.

Alphanumeric messages are displayed from left to right.

### Control Commands

Control commands are single ASCII characters (preceded by @ and followed by <CR>) that are transmitted to the Aurora to control additional features such as the built-in traffic light (Aurora 45 SL).

CONTROL COMMAND		ASCII	DEC
RED light	Aurora 45 SL only	&	38
GREEN light	Aurora 45 SL only	*	42
Light OFF	Aurora 45 SL only	%	37
Turn ON flashing display		(	40
Turn OFF flashing display		)	41
FLASH display 3 times		!	33

### 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



*NOTE: Do not transmit Control Commands within a WEIGHT data string. Control Commands must be transmitted alone or in conjunction with an Alphanumeric message data string.*

## Multi-Drop IDs & Networking

Aurora displays using Multi-Drop networking must be in Command Mode. The Multi-drop ID (0 to 3) must also be set (*Configuration Mode* Parameter 1.4, page 14).

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 20).

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<sub>n</sub>), 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 on 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.

## **WIRELESS SET-UP**

### **AURORA INTEGRATED WIRELESS INSTALLATION**

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

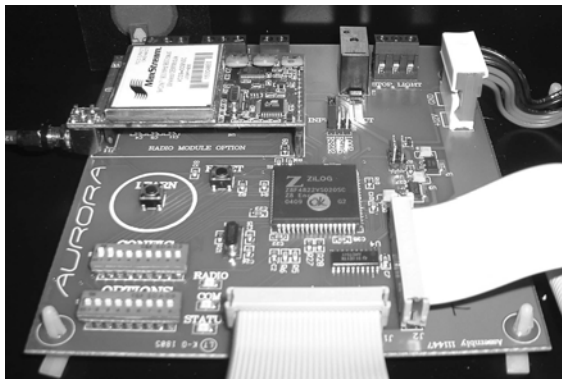


Fig. 9: Radio Module on Controller board

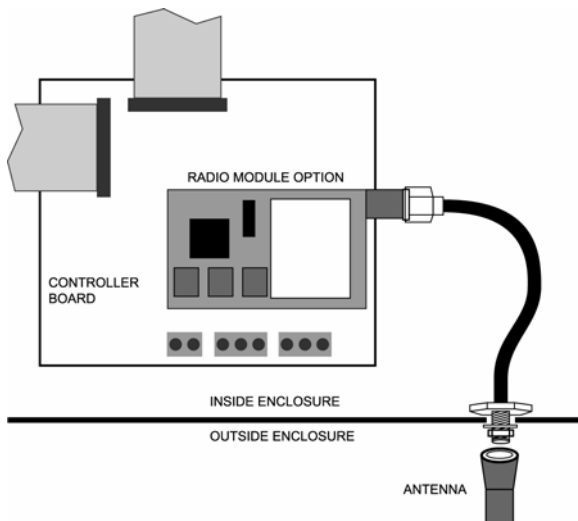
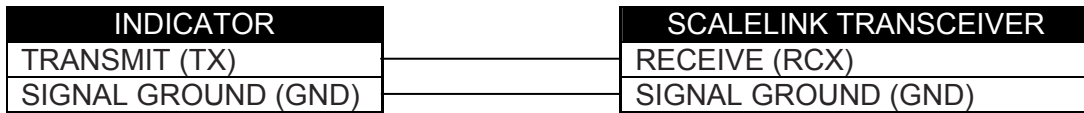


Fig. 10: Wireless Kit Installation

## 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.*

**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.

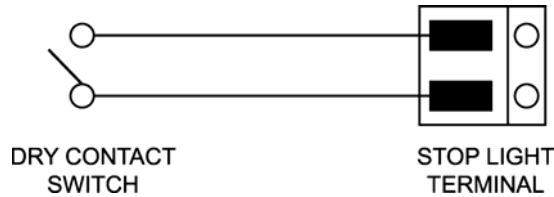


Fig. 11: Stop Light Terminal Wiring

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



*NOTE: The remote switch will be disabled if the Aurora has a traffic light controlling Utility Program selected.*



*NOTE: The remote switch will be disabled if the built-in 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 19.

PRG 3 CONTROL COMMAND	ASCII	DEC
RED light	<b>&amp; &lt;CR&gt;</b>	38, 13
GREEN light	<b>* &lt;CR&gt;</b>	42, 13

PRG 5 CONTROL COMMAND	ASCII	DEC
RED light	<b>@ &amp; &lt;CR&gt;</b>	64, 38, 13
GREEN light	<b>@ * &lt;CR&gt;</b>	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 19.

## 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.

**TROUBLESHOOTING & ERROR MESSAGES**

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

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

AURORA<sup>20</sup>

2 INCH REMOTE DISPLAY

**INSTALLATION &  
TECHNICAL MANUAL**



**WESTERN SCALE CO. LTD.**



---

**AURORA 20  
SUPER BRIGHT REMOTE DISPLAY  
INSTALLATION & TECHNICAL MANUAL**

**SOFTWARE RELEASE 3.2, 03/2006**

Copyright © 2005, 2006 **Western Scale Co. Limited**. All rights reserved.

Published by: **Western Scale Co. Ltd.**

Information in this *Installation / Technical Manual* is subject to change without notice due to correction or enhancement. The information described in this manual is the property of Western Scale Co. Ltd. No part of this manual may be reproduced or transmitted in any form, without the expressed written permission of Western Scale Co. Ltd.

**Western Scale Co. Ltd.**

1670 Kingsway Avenue  
Port Coquitlam, B.C.  
Canada  
V3C 3Y9

Tel: (604) 941-3474

Fax: (604) 941-4020

[www.westernscale.ca](http://www.westernscale.ca)

[info@westernscale.ca](mailto:info@westernscale.ca)

**FOR TECHNICAL SUPPORT REGARDING THIS PRODUCT, PLEASE CALL  
YOUR AUTHORIZED WESTERN DEALER:**

---

**TABLE OF CONTENTS**

**INTRODUCTION ..... 2**  
DISCLAIMER ..... 2  
AURORA FEATURES ..... 3  
DISPLAY ..... 4

**INSTALLATION ..... 4**  
PRE-INSTALLATION ..... 4  
OPENING THE AURORA 20 ENCLOSURE ..... 5  
MOUNTING INSTRUCTIONS ..... 5

**WIRING ..... 6**  
POWER WIRING ..... 6  
COMMUNICATIONS WIRING ..... 6  
    Communication Input Jumper ..... 6  
    RS 232 Wiring ..... 7  
    RS 422 Wiring ..... 7  
    RS 485 Multi-Drop Wiring ..... 7  
    20 mA Current Loop Wiring ..... 8  
    20 mA Current Loop Mode Switch ..... 8

**START-UP ..... 9**  
POWER UP ..... 9  
AUTO-LEARN ..... 9

**BUTTONS ..... 9**  
LEARN BUTTON ..... 9  
RESET BUTTON ..... 9

**DIAGNOSTIC INDICATOR LIGHTS ..... 10**  
STATUS LIGHT (STATS) ..... 10  
COM LIGHT ..... 10  
RADIO LIGHT ..... 10

**CONFIGURATION ..... 11**  
    Switch 1: Brightness Level ..... 11  
    Switch 2: Leading Zeros ..... 11  
    Switch 3: Start-up Auto-Learn ..... 12  
    Switches 4 & 5: Multi-Drop ID ..... 12  
    Switches 6 & 7: Radio Channel Select ..... 13  
    Switches 8 & 9: Utility Program Select ..... 13

**AURORA UTILITY PROGRAMS ..... 14**  
PROGRAM 1: Normal Mode ..... 14  
PROGRAM 2: Freeze Weight ..... 14  
PROGRAM 4: Command Mode ..... 15

**TROUBLESHOOTING & ERROR MESSAGES ..... 18**

**WIRELESS SET-UP ..... 20**  
AURORA REMOTE DISPLAY ..... 20  
INDICATOR ..... 20  
SCALELINK WIRELESS TRANSCEIVER ..... 21  
WIRELESS CONNECTION TEST ..... 21

## **INTRODUCTION**

The Aurora Remote Display Series is the latest development from Western, the company which first brought LED remote displays to the weighing industry in the 1980s.

New technologies, materials, and construction methods have allowed a remarkable evolution in remote displays, making them more affordable, easier to read, and a vital part of any scale system. Aurora Remote Displays incorporate the most standard features of any weighing display, making it the best choice for virtually any application.

Like all Western products, Aurora Remote Displays are designed with durability, functionality, and versatility in mind. Users are assured that Aurora Remote Displays meet the specified local Weights & Measures regulations for anywhere in North America.

Western: Engineered for the diversity of the weighing industry.

## **DISCLAIMER**

The following information is for the exclusive use of **WESTERN** Dealers and Customers.

Since Aurora Remote Displays are a valuable component of your weighing system, installation and configuration procedures (as described in this manual) should only be carried out by qualified Scale Service Technicians as authorized by Western.



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



**CAUTION!** HIGH VOLTAGES are present inside the Aurora enclosure.



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

## **AURORA FEATURES**

### *HIGH VISIBILITY*

- New, brighter LEDs and a smart digit layout (2 inches high) make the Aurora 20 easy to read over wide viewing angles, in foul weather, and in direct sunlight.

### *EASY TO INSTALL & USE*

- Auto-Learn Technology interprets the data format and output string of any scale indicator, reducing set-up time. No digit shifting required.
- Easy-access, spacious enclosure makes installation and service quick and easy.

### *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.

### *SAVE ENERGY*

- Ultra-efficient LED technology is the smart choice for power conscious users.

### *MORE...*

- Selectable Indoor/Outdoor brightness levels.
- Leading Zero Suppression.
- Multi-drop Communications.
- Selectable Program Modes (Normal Mode, Command Mode, and Freeze Weight).

## DISPLAY

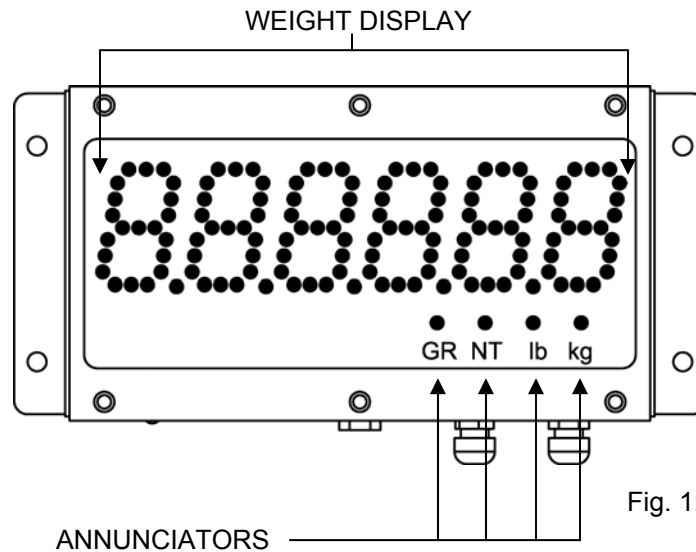


Fig. 1: Aurora 20 Display

**WEIGHT DISPLAY:** 6 LED digits (7 segments). Up to 5 decimal places.

**ANNUNCIATORS:**

- GR = Gross Weighing Mode
- NT = Net Weighing Mode
- lb = Pounds
- kg = Kilograms

## INSTALLATION

### PRE-INSTALLATION (Receiving Inspection)

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

- Check over packaging for any signs of damage.
- Remove the Aurora Remote Display from its protective packaging and check for damage.
- Verify that the shipment includes:
  - Aurora 20 Remote Display (complete and intact, with power cord)
  - Aurora 20 Installation / Technical Manual
- Aurora Remote Displays ordered with the Wireless option should include:
  - Integrated Radio Module (mounted on the Controller board)
  - Internal Antenna Cable
  - External Antenna

## OPENING THE AURORA 20 ENCLOSURE

1. Make sure the unit is disconnected from power.
2. Remove the 6 screws (with sealing washers) from the front of the enclosure.
3. Guide the front panel away from the main enclosure. Be sure to watch the internal cable connections!

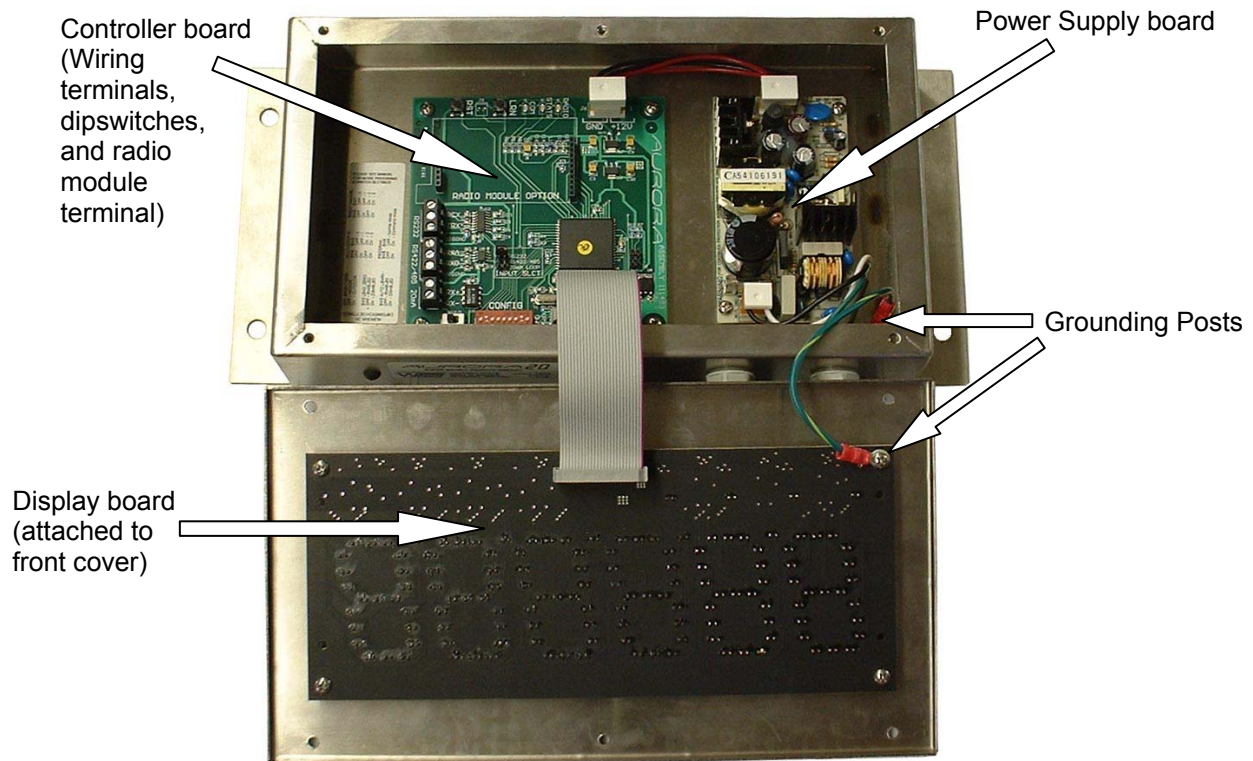


Fig. 2: Open Aurora 20

## MOUNTING INSTRUCTIONS

1. Inspect the installation site for properly grounded power.
2. Ensure that mounting structures (walls, posts, etc.) will bear the weight of the display (Aurora 20: 5 lbs).
3. Use proper hardware, including wall anchors where necessary, when mounting the enclosure. Secure the Main Enclosure to wall or pole mounted bracket with 5/16ths bolts.
4. Run power and communication cables into the enclosure via strain reliefs (as required).

## **WIRING**

### **POWER WIRING**

The Aurora 20 is wired for power at the factory. The factory supplied power cord may be removed for direct AC wiring if necessary.



**CAUTION! HIGH VOLTAGE!** Only trained personnel should attempt power wiring.

### **COMMUNICATIONS WIRING**

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

#### **Communication Input Jumper**

A communications input type (RS 232, RS 422/485, or 20 mA Loop) must be selected by placing the jumper on the appropriate pins.

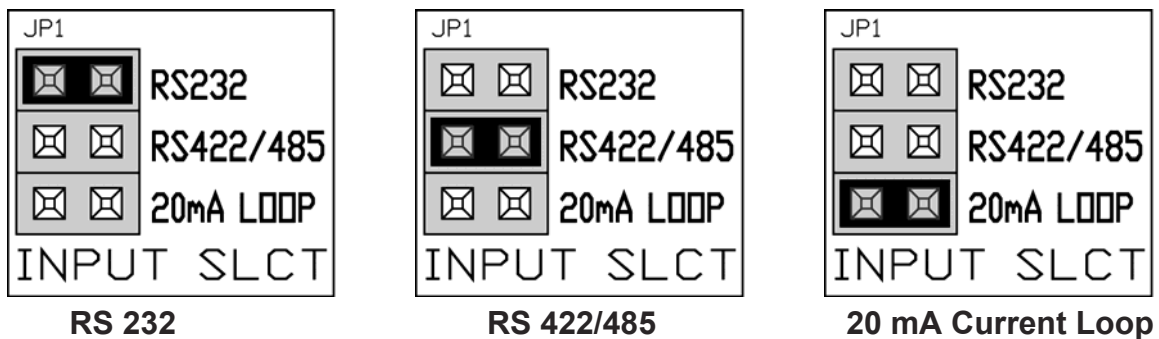


Fig. 3: Jumper Positions



**NOTE:** When the Radio Module option is properly installed, the Communication Input Jumper is over-ridden.

**RS 232 Wiring**

1. Set the Communication Input Jumper (JP 1) to **RS232**.
2. Terminate the indicator's communication wires at the RS 232 terminal (J3). See table below:

INDICATOR	AURORA REMOTE DISPLAY
TRANSMIT (TX)	RECEIVE (RCX)
RECEIVE (RX)	NO CONNECTION
SIGNAL GROUND (GND)	SIGNAL GROUND (SIG GND)

**RS 422 Wiring**

1. Set the Communication Input Jumper (JP 1) to **RS422 / 485**.
2. Terminate the indicator's communication wires at the RS 422 / 485 terminal (J4). See table below:

INDICATOR	AURORA REMOTE DISPLAY
TRANSMIT A (TX A)	RECEIVE A (RX A)
TRANSMIT B (TX B)	RECEIVE B (RX B)

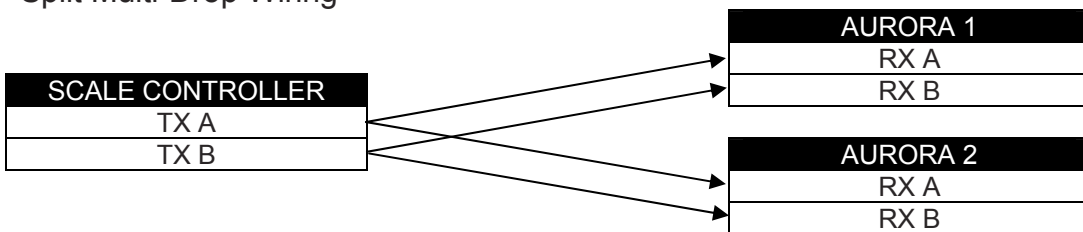
**RS 485 Multi-Drop Wiring**

1. Set the Communication Input Jumper (JP 1) to **RS422 / 485**.

Parallel Multi-drop wiring

SCALE CONTROLLER	AURORA 1	AURORA 2	AURORA 3	ETC.
TX A	RX A	RX A	RX A	RX A
TX B	RX B	RX B	RX B	RX B

Split Multi-Drop Wiring



**NOTE:** Multi-Drop IDs are set using the CONFIG Dip-switches. For settings, see Configuration, page 11.



### 20 mA Current Loop Wiring

1. Set the Communication Input Jumper (JP 1) to **20mA LOOP**.
2. Terminate the indicator's communication wires at the 20 mA Current Loop terminal (J5). See table below:

INDICATOR	AURORA REMOTE DISPLAY
20 mA TX +	RECEIVE POSITIVE (RX +)
20 mA TX -	RECEIVE NEGATIVE (RX -)

### 20 mA Current Loop Mode Switch

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

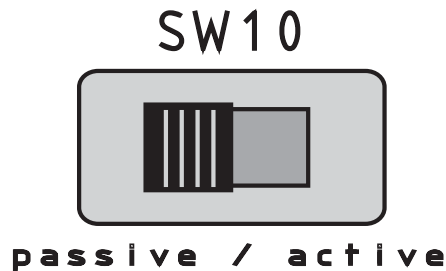


Fig. 4: 20 mA Mode Switch

---

## **START-UP**

### **POWER UP**

- The Aurora 20 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.

### **AUTO-LEARN**

- On power up, the Aurora 20 automatically enters Auto-Learn Mode, analyzing the serial communications and string type.
- The indicator's 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 Aurora will display the current weight.



NOTE: Automatic Start-up Auto-Learn may be disabled for custom applications. See Configuration, page 11.

## **BUTTONS**

### **LEARN BUTTON**

- If Automatic Start-up Auto-Learn is disabled, the LEARN button (**LRN**) on the Controller board must be pressed to enter Auto-Learn Mode.

### **RESET BUTTON**

- The RESET button (**RST**) on the Controller board allows the Technician to cycle power on the unit without disconnecting/connecting AC power.

## **DIAGNOSTIC INDICATOR LIGHTS**

The Aurora 20 has 3 diagnostic indicator lights located on the Controller board.

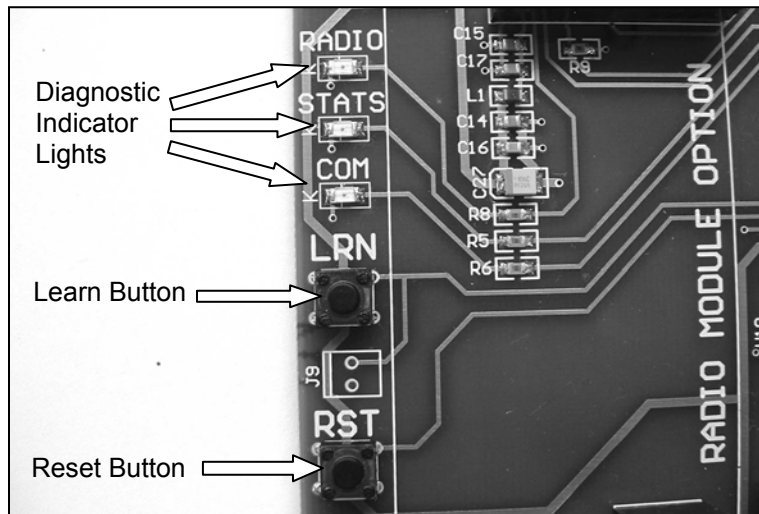


Fig. 5: Indicator Lights & Buttons

### **STATUS LIGHT (STATS):**

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

### **COM LIGHT:**

- **FLASHES ON** each time the Aurora receives a character through any of its COM Ports (including the radio).

### **RADIO LIGHT:**

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

**CONFIGURATION**

The Aurora 20 uses one bank of Dip Switches on the Controller board (SW 3) to set-up the configuration.



NOTE: Dip Switch settings take effect only after the Aurora has been reset (Cycle power directly or press the “RESET” button).

**CONFIG**



**Switch 1: Brightness Level**

There are 2 selectable brightness levels: Outdoor (brighter) and Indoor (less bright).

BRIGHTNESS LEVEL	SWITCH 1
Indoor (Default)	OFF
Outdoor	ON

**Switch 2: Leading Zeros**

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 20 will automatically remove the leading zeros and replace them with blank spaces on the display.

LEADING ZEROS	SWITCH 2
ENABLED (Default)	OFF
DISABLED (Remove Leading Zeros)	ON



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

**Switch 3: Start-up Auto-Learn**

On power up, the Aurora 20 automatically enters Auto-Learn Mode, analyzing the serial communications and string type. In certain situations, it may be necessary to disable this feature. Once disabled, the LEARN button on the Controller board must be pressed before the Aurora will go into Auto-Learn Mode.

START-UP AUTO-LEARN	SWITCH 3
ENABLED (Default)	OFF
DISABLED	ON

**Switches 4 & 5: Multi-Drop ID**

Up to four (4) Aurora displays can share a serial or radio connection. Messages are sent to individual displays using control codes and these Multi-Drop IDs. For Multi-Drop instructions, see page 17.

MULTI-DROP I.D.	SWITCH 4	SWITCH 5
0 (Default)	OFF	OFF
1	ON	OFF
2	OFF	ON
3	ON	ON



**NOTE:** If Multi-Drop is not being used, it is very important that Switches 4 & 5 be set in the OFF position.

**Switches 6 & 7: Radio Channel Select**

The 900 MHz Radio Module (optional) has 4 frequency channels. If there are multiple scale/remote display installations at a given site, each installation must have its own radio channel selected.

RADIO CHANNEL	SWITCH 6	SWITCH 7
0 (Default)	OFF	OFF
1	ON	OFF
2	OFF	ON
3	ON	ON



NOTE: The Aurora Remote Display must be configured with the same radio channel as the ScaleLink Wireless Transceiver connected to the indicator. See Wireless Set-Up, Page 22.



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

**Switches 8 & 9: Utility Program Select**

The Aurora has built-in utility programs that run in conjunction with the normal display functions.

PROGRAM	SW 8	SW 9
1 – NORMAL Mode (No program)	OFF	OFF
2 – FREEZE Weight	ON	OFF
3 – Reserved for future use	OFF	ON
4 – COMMAND mode.	ON	ON



NOTE: Please see the Aurora Utility Program section for program overviews (Page 14).

## **AURORA UTILITY PROGRAMS**

The Aurora 20 has several auxiliary functions that may be activated via the CONFIG dipswitches on the controller board.

<b>PROGRAM</b>	<b>SW 8</b>	<b>SW 9</b>
1 – NORMAL Mode (No program)	OFF	OFF
2 – FREEZE Weight	ON	OFF
3 – Reserved for future use	OFF	ON
4 – COMMAND mode.	ON	ON

**PROGRAM 1: NORMAL MODE - NO SPECIAL PROGRAM IS SELECTED.**

**PROGRAM 2: FREEZE WEIGHT - FOR USE WITH CATTLE AUCTIONS, ETC.**

- 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.
- A weigh ticket (using ASCII characters) must be created on the scale indicator that sends the scale weight and a <CR> character to the Aurora display with a button press.

Example:     **123456 lb g<CR>**

- When the Aurora receives this information, it displays the weight and keeps displaying it until another 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 3: RESERVED FOR FUTURE USE**

**PROGRAM 4: COMMAND MODE**

All Aurora displays can be setup to receive commands directly from the scale system or PC. Supported commands include transmitting weights, basic alphanumeric messaging, stoplight relay 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.

**Activating Command Mode**

1. To enable command mode, CONGIG dipswitches 8 and 9 on the Controller board must be set as follows:

PROGRAM	SW 8	SW 9
4 – COMMAND Mode	ON	ON



**REMEMBER:** Switch settings do not take affect until the Aurora is reset or powered up again.

**Transmit a Weight String**

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

Example:

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

**Transmit Status Characters**

Status characters may be imbedded 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	CHARACTER	ASCII
GROSS weight	<b>G</b> or <b>g</b>	
NET weight	<b>N</b> or <b>n</b>	
POUNDS	<b>L</b> or <b>l</b>	
KILOGRAMS	<b>K</b> or <b>k</b>	

Example:

- To display 1000 lb gross, transmit: **1000LG<CR>** -or- **GL1000<CR>**



## Control Commands

Control commands are single ASCII characters (followed by <CR>) that are transmitted to the Aurora to control additional features such as the built-in traffic light (Aurora 45 SL) and the traffic light relay.

CONTROL COMMAND	CHARACTER	ASCII
RED light – Relay switch RED	<b>&amp;</b>	38
GREEN light – Relay switch GREEN	<b>*</b>	42
Turn ON flashing weight display	<b>(</b>	40
Turn OFF flashing weight display	<b>)</b>	41
FLASH weight display 3 times	<b>!</b>	33

## Alphanumeric messaging to the scoreboard

All Aurora models can display alphanumeric messages within the limits of a 7 segment digit. When a letter other than **L**, **K**, **G**, or **N** is detected, it assumes that the message is alphanumeric. All characters in the data string are then treated as an alphanumeric message, and not a weight value.

Alphanumeric messages are displayed from left to right.

## Sample Command Mode Data Strings

DATA STRING	DISPLAY
<b>0 &lt;CR&gt;</b>	<b>“0” gross</b>
<b>1000 &lt;CR&gt;</b>	<b>“1000” gross</b>
<b>LN 1234 &lt;CR&gt;</b>	<b>“1234” lb, net</b>
<b>1234 GK &lt;CR&gt;</b>	<b>“1234” kg, gross</b>
<b>1234 L g &lt;CR&gt;</b>	<b>“1234” lb, gross</b>
<b>hello&lt;CR&gt;</b>	<b>“hELLo”</b>
<b>*&lt;CR&gt;</b>	<b>GREEN light</b> (Not Available for Aurora 20)
<b>stop &amp;&lt;CR&gt;</b>	<b>“StoP ”, RED light</b> (Not Available for Aurora 20)



NOTE: Do not transmit Control Commands within a WEIGHT data string. Control Commands should only be sent alone (followed by a <CR>), or within an Alphanumeric data string.

## Multi-Drop addressing

Aurora displays using Multi-drop must be in Command Mode. The Multi-drop address (0 to 3) is set using SW4 and SW5 on the CONFIG dipswitch bank (See page 12).

When using Multi-drop, the Aurora will only respond after it has been selected.

To select the display, transmit a “#” character (ASCII 35), followed by the correct ID number and a CR (ASCII 13) character. The Aurora will remain selected until it receives a command containing a different address.

### Examples:

1. Select multi-drop address 1:

Transmitting “#1<CR>” selects the display with ID #1.

2. Select multi-drop address 3, then send a weight of 1000lb gross:

“#3<CR>”

“1000LG<CR>”

The ID number may 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 address 3.

“#3 HELLO<CR>”

**TROUBLESHOOTING & ERROR MESSAGES**

<b>PROBLEM</b>	<b>PROBABLE SOLUTIONS</b>
<b>Unit won't power up:</b>	<ul style="list-style-type: none"> <li>• Verify AC power source (Outlets, breakers, etc.)</li> <li>• Check power cable connection to the Power Supply board.</li> <li>• Check fuse on Power Supply board.</li> <li>• Verify Power wiring from Power Supply board to Controller board.</li> </ul>
<b>Unit has power, but there is no display.</b>	<ul style="list-style-type: none"> <li>• Verify Ribbon Cable connection from the Controller board to the Display board.</li> <li>• If the unit is in COMMAND mode, the display will remain blank until data is received.</li> </ul>
<b>Dashes across the display.</b>	<ul style="list-style-type: none"> <li>• Verify the correct terminal (RS 232, 422/485, 20 mA) is being used and check wiring.</li> <li>• Verify that the Communications "Input Select" jumper is properly set.</li> </ul>
<b>Display reads "Err 1".</b>	<ul style="list-style-type: none"> <li>• Baud Rate Auto-Learn has failed.</li> <li>• Verify that the Communications "Input Select" jumper is properly set.</li> <li>• Verify the correct terminal (RS 232, 422/485, 20 mA) is being used and check wiring.</li> <li>• Verify that data is being sent to the Aurora from the indicator and that the data string contains numeric characters.</li> </ul>

<b>PROBLEM</b>	<b>PROBABLE SOLUTIONS</b>
<b>Display reads “Err 2”.</b>	<ul style="list-style-type: none"> <li>• Data String Auto-Learn has failed.</li> <li>• Verify the correct terminal (RS 232, 422/485, 20 mA) is being used and check wiring.</li> <li>• Verify that the Communications “Input Select” jumper is properly set.</li> <li>• 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).</li> </ul>
<b>STATUS light NOT blinking (OFF)</b>	<ul style="list-style-type: none"> <li>• Verify that unit has power. When powered, if the Status light remains OFF, the processor is not running.</li> </ul>
<b>STATUS light blinking fast (3/second) for longer than 30 seconds:</b>	<ul style="list-style-type: none"> <li>• The Aurora is not able to Auto-Learn the data string or baud rate. See Auto-Learn section.</li> </ul>
<b>RADIO light not flashing:</b>	<ul style="list-style-type: none"> <li>• Check that the Radio Module is properly installed. Ensure that the internal antenna cable is connected to the Radio Module and the external antenna.</li> <li>• No data is being sent from the ScaleLink Radio connected to the scale indicator.</li> </ul>
<b>COM light not flashing:</b>	<ul style="list-style-type: none"> <li>• Verify the correct terminal (RS 232, 422/485, 20 mA) is being used and check communications wiring at the indicator.</li> <li>• Verify that the Communications “Input Select” jumper is set to the proper communication mode (RS 232, 422/485, 20 mA).</li> <li>• Verify that data is being sent to the Aurora from the indicator and that the data string contains numeric characters.</li> <li>• If the Radio Module is being used, also see Probable Solutions for “Radio light not flashing”.</li> </ul>

## **WIRELESS SET-UP**

### **AURORA REMOTE DISPLAY**

1. With factory installed Radio Modules, the external antenna must be connected to the SMA terminal on the bottom of the Electronics Carriage.
2. Power up the Aurora. **The Aurora is ready to receive radio signals.**
3. If problems are experienced, ensure that the Radio Module hasn't been disconnected in shipping. The Radio Module should be secure in the "Radio Module Option" terminals (J10 & J11) as seen below.

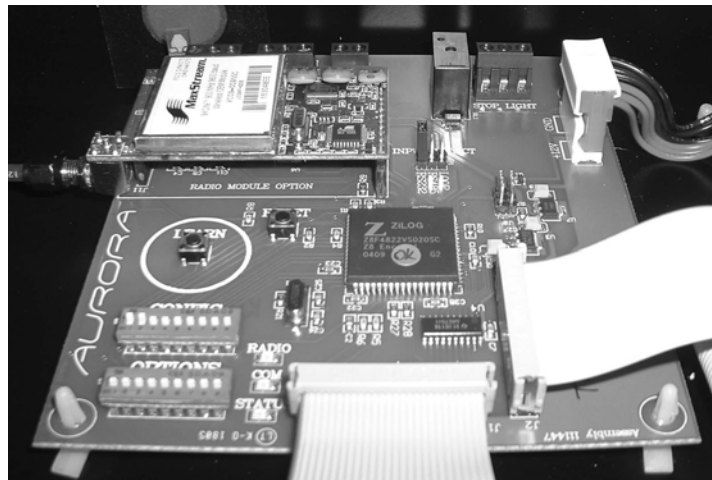


Fig. 6: Radio Module on Controller board



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

### **INDICATOR**

1. Connect the ScaleLink Wireless Transceiver to the indicator (or other communicating device) as directed in the ScaleLink Start-Up Guide.
2. Ensure the indicator is set-up to output **CONTINUOUSLY**.



NOTE: Note the indicator's communication settings, as the ScaleLink's settings may need to be adjusted to match.

**SCALELINK WIRELESS TRANSCEIVER**

1. The ScaleLink’s default communication settings are:

Baud Rate	9600	Data Bits	8
Parity	None	Stop Bits	1

If necessary, adjust the ScaleLink’s communication settings to match the indicator (or other communicating device).

2. Wire power to the ScaleLink transceiver using the indicator’s power supply or the optional 12 VDC power supply.
3. Power up the Indicator and ScaleLink to transmit radio signals.



NOTE: Check with your indicator’s manufacturer regarding using “piggy-back” power for the ScaleLink Transceiver.

**WIRELESS CONNECTION TEST**

1. Verify that both the ScaleLink Wireless Transceiver and the Aurora 20 are set to the same radio channel.
2. Verify that the Transmit LED on the ScaleLink Wireless Transceiver is ON and FLICKERING.
3. Verify that the Radio LED inside the Aurora 20 enclosure 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: If the indicator’s communication settings cannot be set, the ScaleLink’s settings must be adjusted. For directions, see the ScaleLink Wireless Transceiver Start-Up Guide.