LIGHTSPEED

OVER / UNDER CHECKWEIGHER
& STAND ALONE INDICATOR

TECHNICAL MANUAL

PRELIMINARY
MARCH 2008

WESTERN SCALE CO. LTD.

LIGHTSPEED OVER/UNDER CHECKWEIGHER
TECHNICAL MANUAL

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INTRODUCTION

The Lightspeed Checkweigher meets the most critical customer needs by joining quick, stable weight readings with the strength to survive the harsh industrial environments found in food-processing and other industries.

The DYNARREST vibration filtering system uses digital signal processing and Western's advanced A/D weighing algorithms to capture, stabilize, and display weights with outstanding speed and accuracy while the sturdy, compact design and stainless steel construction protect the scale from damage and ease maintenance costs.

Lightspeed Checkweighers are perfectly suited for virtually all portioning, checking and light industrial weighing needs. Large buttons and displays improve human-machine interface in applications from simple weighing, to instant target weight acquisition, to storing Product IDs and acceptance ranges.

As always, Western's dedication to durability, functionality, and versatility make the Lightspeed Checkweigher *engineered for the diversity of the weighing industry.*

Disclaimer

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

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 Lightspeed indicator PCBs must observe proper electrostatic discharge (ESD) handling procedures.

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

CAUTION! HIGH VOLTAGES are present inside the Lightspeed indicator enclosure.

Features

Improved Interface

- Large, easy to read LED display (7/8^{ths} inch digits, 22 mm)
- Oversize keys with international symbols
- Brightly coloured checkweighing bar graph for quick results
- Intuitive target modes and product storage

Durable & Sanitary

- 304 stainless steel base, feet, column and indicator enclosure
- NEMA 4X / IP66 with enclosure breather vent
- Simple, strong and reliable base design (12 Ga. Frame)
- Open design increases drainage and decreases potential for contaminants
- Overload stops for load cell protection

Excellent Serviceability

- Easy to navigate software menu and calibration
- Calibrate to any test weight value
- Terminal wiring

Advanced Capabilities

- DYNArrest digital filtering for fast and stable weighing in high vibration areas.
- Store 100 products with weight ranges
- *MADE IN CANADA.*

Specifications

Excitation:	5 VDC, Up to 4 x 350 Ω or 8 x 700 Ω load cells
Analog Input Range:	0 - 19 mV
Resolution:	5,000 d (scale) or 10,000 d (indicator only); 1 million internal counts
Measurement Speed:	100 weight samples/sec.
Power:	AC Input: 90 - 240 VAC Consumption: 500 mW
Display:	6 digit, 7 segment, LED weight display Bright LED bar graph and annunciators
Communications:	Full duplex RS-232 serial port Configurable data format Selectable output strings
Temperature Range:	14°F to 104°F / -10°C to 40°C
Approvals:	NTEP & Measurement Canada pending
Sizes & Capacities:	9 x 9 base: 5 lb, 10 lb, 25 lb 12 x 12 base: 25 lb, 50lb, 100 lb

KEYPAD & SCALE FUNCTIONS

The Lightspeed indicator utilizes 7 keys for operator interfacing. To maximize indicator functionality, some keys perform multiple functions.

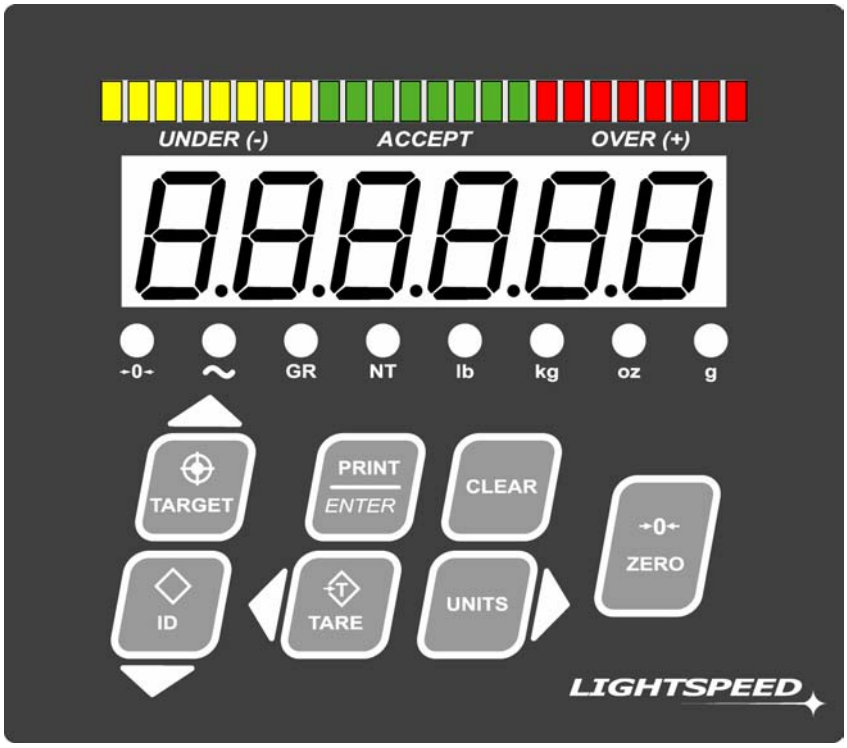


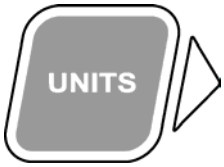
Fig. 1: Keypad

ZERO: Sets the weight display to ZERO.

The scale will not zero if:

- Weight on the scale is in MOTION;
- The weight on the scale exceeds the allowed ZERO RANGE;
- The ZERO function has been disabled.

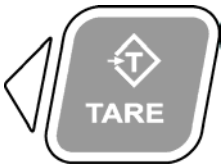
*When one of these situations occurs, the display will briefly read **"Err"**.*



UNITS: Toggles between Primary and Secondary Weighing Units.

Units are selected or disabled in Calibration Mode.

RIGHT ARROW: Moves the cursor RIGHT when entering values.



TARE: Acquires tare value from weight on the scale (Container, Box, etc.).

The scale will not tare if:

- Weight on the scale is in MOTION;
- The scale weight is negative;
- The TARE function has been disabled.

*When one of these situations occurs, the display will briefly read **"Err"**.*

LEFT ARROW: Moves the cursor LEFT when entering values.

In Canadian Legal for Trade applications, previous tare weights must be cleared before a new tare weight can be acquired.

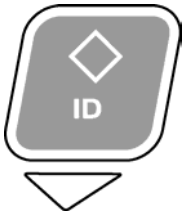
CLEAR: Erases any previously acquired tare values.

PRINT: Transmits data string or scale ticket through COM1.

ENTER KEY: Confirms entered values.

TARGET: Used to set Target and Over/Under values (if enabled).

UP ARROW: Scrolls UP through Calibration Parameters; Increments values.



ID: Used to store Over/Under values (if enabled)

DOWN ARROW: Scrolls DOWN through Calibration Parameters; Decrements values.

DISPLAY & ANNUNCIATORS

The Lightspeed uses a high intensity Light Emitting Diode (LED) display with a quick update rate. The LED bar graph visually signals over, under or accept conditions and the LED annunciator lamps communicate scale status and mode information to the user.

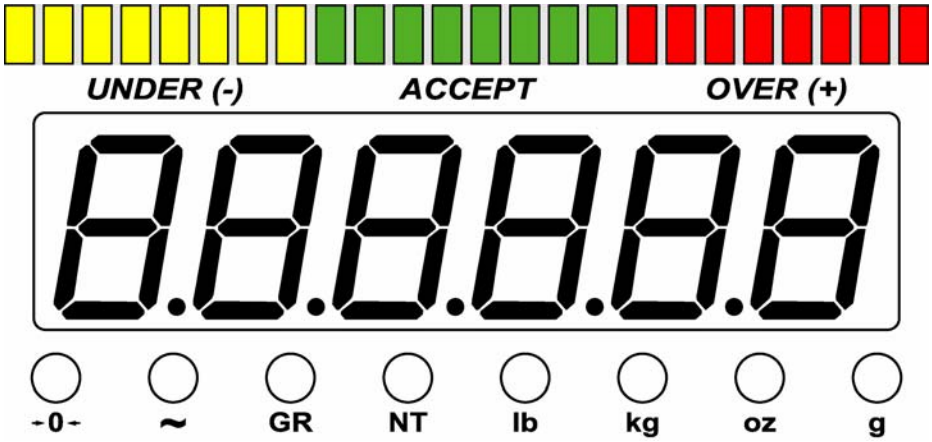


Fig. 2: Display

Weight Display

- 6 digits (7 segments each). Up to 3 decimal points.
- Negative weights are indicated by a minus sign (-) on the far left character.

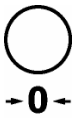
Checkweigher Bar Graph

UNDER: The scale weight is **less than** the desired target range.

ACCEPT: The scale weight is **within** the desired target range.

OVER: The scale in weight is **greater than** the desired target range.

Annunciators



CENTRE ZERO: The scale is within **±0.2** graduations of TRUE ZERO.

MOTION: The scale is **in motion**.

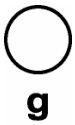
GROSS: The scale is in GROSS weighing mode.

NET: The scale in NET weighing mode (a tare weight is stored)

lb: The scale is weighing in **POUNDS**.

kg: The scale is weighing in **KILOGRAMS**.

oz: The scale is weighing in **OUNCES**.



g: The scale is weighing in **GRAMS**.

INSTALLATION

Pre-Installation

It is always good practice to verify that your Lightspeed checkweigher or Lightspeed indicator is complete and undamaged upon receipt.

- Check over packaging for any signs of damage.
- Remove the Lightspeed from protective packaging and check for damage.
- Verify that the box includes the Lightspeed checkweigher or indicator with:
  - User Manual
  - Column Assembly Hardware, if applicable (4 bolts & 4 washers)

Location & Leveling

1. Bolt the column/indicator assembly to the bottom of the scale base using the hardware provided and remove the shipping bolt supporting the load cell from underneath.
2. Place the scale on a solid, flat surface and remove the scale platform cover. The bubble level mounted on the scale frame is visible.
3. Adjust the scale feet until the bubble is within the “bull’s-eye” and all scale feet (including the column support foot) are securely on the surface.
4. Set overload stops and replace the scale platform cover.

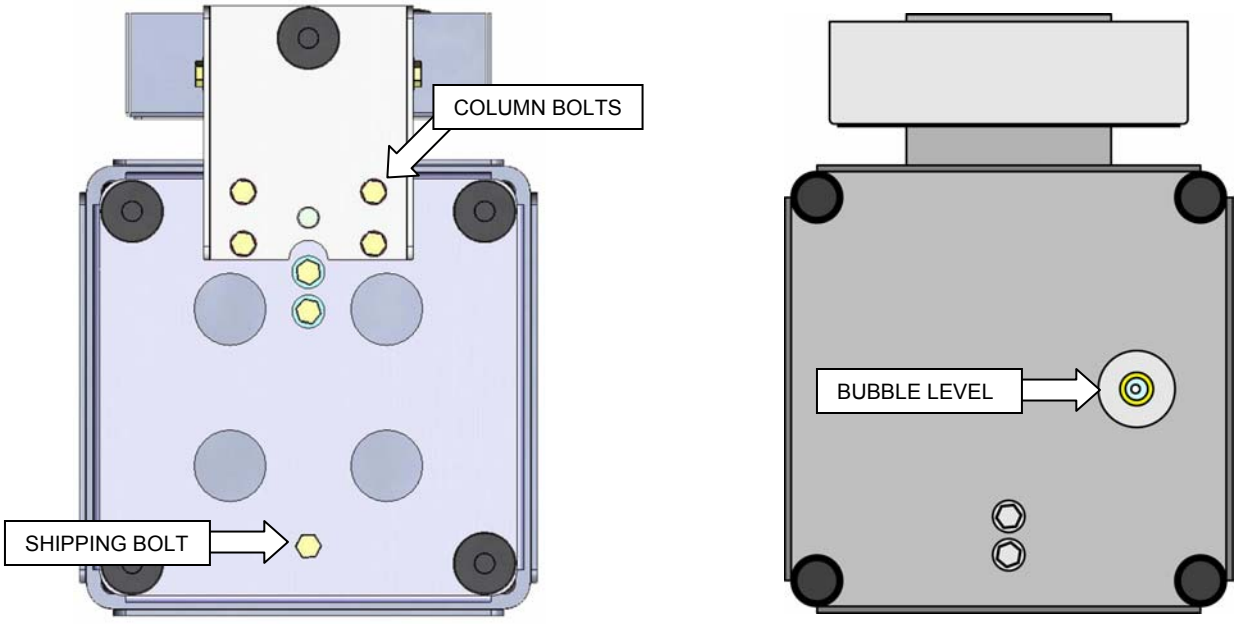


Fig. 3: Top & Bottom Views

WIRING

Opening the Lightspeed Enclosure

1. Make sure the unit is disconnected from power.
2. Remove the screws from the back of the enclosure.
3. Lift the back cover away from the enclosure. Be sure to observe proper ESD procedures when handling PCBs.

Load Cell Wiring

1. Ensure the unit is not plugged in or powered on.
2. Run the cable from the load cell or junction box through the strain-relief and wire the indicator power to the Load Cell Terminal Block (J4). See table below:

LOAD CELL TERMINAL (J4)	LOAD CELL WIRE
+EXC	Positive Excitation
+SNS	Positive Sense
+SIG	Positive Signal
SHLD	Shield Wire
-SIG	Negative Signal
-SNS	Negative Sense
-EXC	Negative Excitation

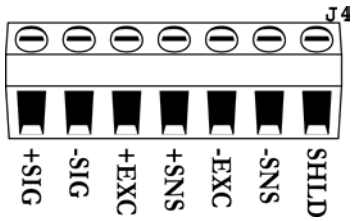
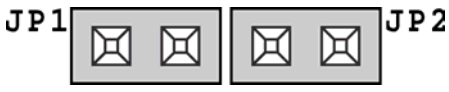


Fig. 4: Load Cell Terminal

Load Cell Jumpers

The Lightspeed accommodates 4 or 6 wire load cells. When using 4 wire load cells (No SENSE wires), the pins on JP1 and JP2 must be jumpered. For 6 wire load cells, remove the jumpers. See illustration below:

4 wire load cell – Jumpers ON



6 wire load cell – Jumpers OFF

Fig. 5: Load Cell Jumpers

Communications Wiring (RS 232)

1. Ensure the Lightspeed and communicating device (printer, remote display, PC) are disconnected from power.

2. Run communication cable through the strain-relief and wire to the COM1 Terminal. See table below:

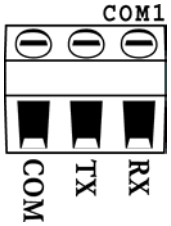


Fig. 6: COM1 Terminal

COM TERMINAL (COM1)		COMMUNICATING DEVICE
RX	←	TX
TX	→	RX
COM	↔	SIG GND, or COM

Default Communications Settings:

- **9600 Baud**
- **No Parity**
- **8 Data Bits**
- **1 Stop Bit**
- **Transmits CONTINUOUSLY**

Communications settings can be adjusted in Calibration Mode by qualified Technicians.

Powering Up

1. Installers must take proper steps to prevent noise, static, or other power problems.

ATTENTION! In noisy industrial environments, power-conditioning filters are a requirement to ensure a fail-safe operation under all conditions. Indicators should not share AC power with electrical motors and switchgear. Consult the site engineer for clean AC power.

CAUTION! HIGH VOLTAGE! Only trained personnel should attempt any internal AC wiring.

2. Connect the AC power cord from the indicator into a power outlet.

3. The unit will power up and briefly display the software version number.

CHECKWEIGHING (WITH STATS REPORT)

ACCEPT, UNDER and OVER weights must be set when checkweighing with the Statistics Report. The bright, color bar graph indicates under, accept and over weight conditions. In Calibration Mode, enable this Checkweighing mode (P6.0) and the Stats Report Output (P6.7).

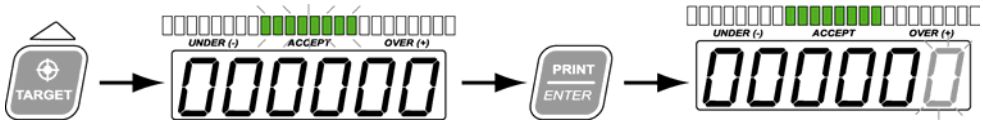
Example:

Product Target Weight: 210 g
Minimum Accept Weight: 10 g — Below this weight (200 g) the UNDER lights illuminate.
Maximum Accept Weight: 10 g — Above this weight (220 g) the OVER lights illuminate.

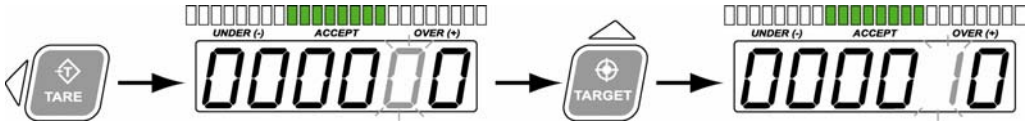
Set ACCEPT Target Weight:

1. Press the **TARGET** key until the green ACCEPT bar begins to flash.

2. Press **ENTER**. The current ACCEPT target weight is displayed with the cursor digit flashing.



3. Use the **UP**/**DOWN** and **LEFT**/**RIGHT ARROW** keys to enter the new ACCEPT target weight and press ENTER to set. (210 grams)

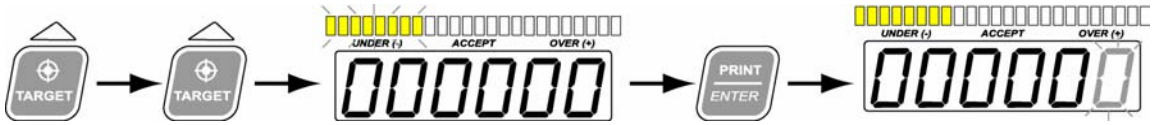


Note: The Targeting Mode display will timeout after 3 seconds and return to normal weighing mode if ENTER is not pressed.

Set UNDER Weight:

1. Press the TARGET key twice until the yellow UNDER bar begins to flash.

2. Press ENTER. The current UNDER weight is displayed with the cursor digit flashing.

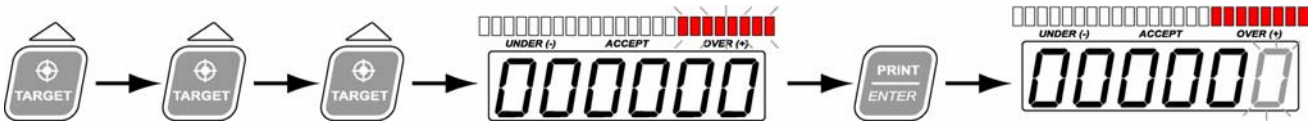


3. Use the ARROW keys to enter UNDER weight and press ENTER to set. (Example: 10 grams below target)

Set OVER Weight:

1. Press the TARGET key three times until the red OVER bar begins to flash.

2. Press ENTER. The current OVER weight is displayed with the cursor digit flashing.



3. Use the ARROW keys to enter OVER weight and press ENTER to set. (Example: 10 grams above target)

STATISTICS REPORT

The Lightspeed indicator has a built in Statistics Report useful for monitoring the production line. A user-selected number of weigh transactions is stored into memory and the compiled Statistics Report is automatically transmitted from the COM port to a printer or PC.

- Enable the Statistics Report output using Parameter 6.7 in Calibration Mode. Ensure Parameter 5.2 is not set to “STREAM” Mode
- Set the sample size (number of weigh transactions taken before the Statistics Report is transmitted).
    - Press and hold the PRINT button for 3 seconds.
    - Use the UP/DOWN and LEFT/RIGHT ARROW keys to enter the number of transactions.
    - Set this value to zero to disable the Statistics Report without accessing Calibration Mode.
- Begin weighing. Once the sample size is reached, the Statistics Report is automatically transmitted.

Stats Report sample printout:

OVER = 10g	Over weight threshold
UNDR = 10g	Under weight threshold
ACPT = 210g	Target weight
OVER = 2	Over weight count
UNDR = 3	Under weight count
ACPT = 15	Accept count
AVG = 210.0g	Average weight
HIGH = 240g	Highest weight
LOW = 170g	Lowest weight
SD = 13.78	Standard Deviation statistic (measure of spread)
CV = 0.07 PCT	Co-efficient of Variation (SD/AVG)
SS = 20	Sample size (number of weigh transactions sampled)

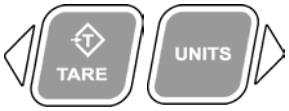
CALIBRATION MODE

Calibration Keys

UP **DOWN** **LEFT** **RIGHT** **ENTER**

Entering Calibration Mode

1. Press and hold the **LEFT** and **RIGHT ARROW** keys together.



2. ‘”**CAL**” is displayed, followed by “**PASS**” for password.

3. Key in the 4 digit password. The factory default password is “**0001**”.

   Use the **LEFT** & **RIGHT ARROW** keys to select the digit. The selected digit will flash.

   Use the **UP** & **DOWN ARROW** keys to increase and decrease the value of the digit.

   Press the **ENTER** key when done.

4. The first Calibration Mode parameter (**P1.0**) is displayed. If the password is incorrect the display will read “**FAIL**”.

The Lightspeed utilizes electronic sealing. For more information on the password, sealing, and the electronic audit trail, see page 24.

Navigating Calibration Parameters

1. Use the **UP** and **DOWN ARROW** keys to find the parameter. Calibration Parameters are displayed by the letter "P" preceding the parameter number. (Ex. "**P1.1, P1.2, P1.3 …**").

2. Holding down the **UP** or **DOWN ARROW** key for more than 1 second will scroll through the Calibration Sub-blocks for quicker navigation. (Ex. "**P1.0, P2.0, P3.0 ...**").

3. Press the **ENTER** key to select the parameter for editing.

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

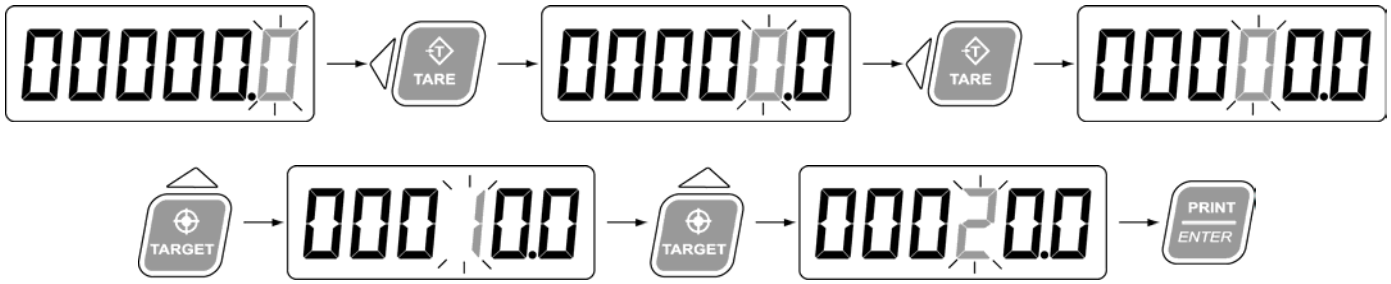
Editing Calibration Parameters

1. Use the **UP** and **DOWN ARROW** keys to edit the parameter value.

2. Press **ENTER** to confirm the parameter value.

To edit a numeric value (Ex. Weight), use the **LEFT** and **RIGHT ARROW** keys to select the digit and the **UP** and **DOWN ARROW** keys to alter the digit's value. Press the **ENTER** key when done.

Example: Enter 20.0 (Note: Decimal point is determined by P1.2)



Exit & Save Calibration

1. Press the **LEFT** and **RIGHT ARROW** keys together.

2. The indicator will exit Calibration Mode and return to Weighing Mode. All calibration information is saved.

CALIBRATION PARAMETERS

Scale Calibration Sub-block 1.x

Parameter	Value	Description
P1.0 Graduations	**1d <** 2d 5d 10d 20d 50d 100d	Select scale graduations (d). Setting this parameter to higher than 10d will set the decimal point to 0, and display 2 leading zeros at ZERO (00). Setting to 100D will result in 3 zeros at ZERO (000).
P1.1 Decimals	0 0.0 0.00 **0.000 <**	Select decimal places (Up to **3**).
P1.2 Deadload Scale	**E SCL**	Displays "**E SCL**" for "empty scale". Once the scale is empty, press **ENTER** to calibrate deadload value (Scale zero calibration).
P1.3 Calibrate Scale	**SPAn** **005.000 <**	Displays "**SPAn**". Place test weight on the scale. Enter the test weight value using the **ARROW** keys. Press **ENTER** to start calibration.
P1.4 Scale Capacity	**005.000 <** 0 to 999999	Enter the Scale Capacity using **ARROW** keys. Press **ENTER** to select.
P1.5 Overload	**0d <** 1d 2d 2PC (2%)	Selects the number of divisions over scale capacity in which blanks the display for a scale over condition. Choose between 0, 1, 2 divisions or 2% of capacity.
P1.6 Calibrated Units (Primary Units)	**1 = kg <** 2 = lb	Selects the Primary scale units used for calibrating the scale. Setting this parameter affects P1.7 and P1.8 automatically.
P1.7 Power ON Units	**1 = kg <** 2 = lb 3 = oz 4 = g	Selects the default units that the scale powers up to.
P1.8 Alternate Units 1	0 = Disabled 1 = kg **2 = lb <** 3 = oz 4 = g	Selects alternate unit of measurement 1. Setting to 0 disables alternate unit of measurement 1.
P1.9 Alternate Units 2	**0 = Disabled <** 1 = kg 2 = lb 3 = oz 4 = g	Selects alternate unit of measurement 2. Setting to 0 disables alternate unit of measurement 1.

Zero and Motion Settings Sub-block 2.x

Parameter	Value	Description
P2.0 Pushbutton Zero Range	**2% <** 10% 90%	Selects the range (from zero to capacity) within which the scale can be zeroed. LFT must be 2%. Example: Scale can be zeroed within ± 2% of calibrated zero.
P2.1 AZSM Zero Tracking	OFF **0.5d <** 1d 2d 3d	Selects the zero tracking range specified in +/- displayed divisions. Example: Automatically zeros the scale within ± 0.5d of calibrated zero. Must be within the Zero Range.
P2.2 Power Up ZERO IZSM	0 = Disabled **1 = Enabled <**	When enabled, the scale will automatically zero on power up (Up to 18% of scale capacity).
P2.3 Scale Motion	OFF 1d **2d <** 3d 5d 10d	Selects the Scale Motion band in displayed divisions. Determines the number of divisions at which the scale is sensitive to motion (Motion annunciator turns ON).
P2.4 Motion Timer	**4 <** Range: 1 - 20	Selects the time (in 0.25 second intervals) the Motion annunciator will remain ON after the scale weight stabilizes within tolerance. Example: For a motion time of 1 second, set this value to 4.
P2.5 Blank Display on Motion	**0 = Disabled <** 1 = Enabled	When enabled, the display blanks when motion is detected.

Tare Settings Sub-block 3.x

Parameter	Value	Description
P3.0 Regulatory	0 = NTEP 1 = CANADA **2 = NONE <**	Sets how the TARE operates based on regulatory agency. **NTEP:** Allows a tare weight to be acquired at any positive weight (>0). Tares can only be cleared when GROSS weight is at no load. New tares may be acquired even if a previous tare weight is present. **CANADA:** Allows a tare weight to be acquired at any positive weight (>0). Tares can only be cleared when GROSS weight is at no load. Previous tare weights must be cleared before a new tare weight can be acquired. **NONE:** Allows a tare weight to be acquired at any positive weight (>0). Tares can be cleared at any time. New tares may be acquired even if a previous tare weight is present.
P3.1 Lockout Tare	**0 = Disabled <** 1 = Enabled	Locks out the **TARE** key. The Operator cannot tare the scale.
P3.2 Auto Tare	**0 = Disabled <** 1 = Enabled	Automatically tares the scale when the weight is greater than 5 displayed divisions, there is no motion, and the scale is in GROSS mode.
P3.3 Auto Clear	**0 = Disabled <** 1 = Enabled	Automatically clears tare values when the scale is at GROSS zero.

Scale Filtering Settings Sub-block 4.x

Parameter	Value	Description
P4.0 Filter Preset	1 = Light **2 = Medium <** 3 = Heavy 4 = Animal 1	Adjusts filter parameters **P4.1 to P4.4** to a preset value. Use this to quickly find a starting point for scale filtering. The User can then fine tune the filtering if required using the parameters below.
P4.1 Filter Frequency	0.5 Hz 1 Hz **2 Hz <** 3 Hz	Frequency in Hertz of the front end digital filter. A lower frequency will make the scale more immune to vibrations, but will also slow down the response time of the display.
P4.2 A/D Averaging	10 **50 <** 75 100 150 200	Selects the number of A/D conversions that are averaged to obtain a displayed reading. A higher number gives a more accurate display by reducing noisy readings, but slows down the settling rate of the display.
P4.3 A/D Averaging Cut-Out Threshold	**2d <** 4d 8d 12d 14d 18d	Sets the weight change threshold in displayed divisions where the A/D averaging is suspended. This will make the display more responsive to weight changes above the cut-out threshold.
P4.4 A/D Averaging Cut-Out Sensitivity	**2 <** 5 8 10 12 15	Specifies the number of consecutive A/D samples above the Cut-Out Threshold before A/D Averaging is suspended.
P4.5 Display Update Rate	**0 = Fast Update <** **1 = 0.25 <** 2 = 0.50 3 = 0.75 4 = 1.00	Configures how often the display is updated in seconds. If set to 0 the display updates at full speed.

Serial Communications Sub-block 5.x

Parameter	Value	Description
P5.0 **COM1** **Baud Rate**	**1200** 2400 4800 **9600 <** 19200	Transmission speed (baud rate) for COM1.
P5.1 **COM1** **Data Format**	**8 <** 7-E 7-O	Parity and bits for COM1. 8-bit, No parity; 7-bit, Even parity; or 7-bit, Odd parity.
P5.2 **COM1** **Transmission Mode**	**0 = Stream <** 1 = Transmit on print 2 = Ticket 3 = Poll Mode 4 = Stream No Motion	Controls the operation of the COM1 port: 0: Continuous output "stream" mode. 1: Output data string when **PRINT** key is pressed. 2: COM port operates in ticket mode* 3: Poll Mode. Indicator responds with a weight to these commands: '?' Poll for weight 'K' units kg 'Z' ZERO 'L' units lb 'T' TARE 'O' units oz 'C' CLEAR 'G' units g 4: Outputs continuously unless the scale is in motion.
P5.3 **COM1** **Output String Format**	**0 = DF1500 <** 1 = Condec 2 = Toledo 3 = Cardinal 4 =Weightronix	String emulation for continuous serial stream. *Only DF1500 currently available*
P5.4 **COM1** **Stream Delay**	**0 = No Delay <** 1 = 0.25 sec 2 = 0.5 sec 3 = 0.75 sec 4 = 1 sec	Inserts a delay between serial transmissions (select 0.25 second intervals). 0 = No delay.

Checkweigher Functions Sub-block 6.x

Parameter	Value	Description
P6.0 Check Mode	0 = Disabled **1 = CHKWEIGH <**	Selects the type of Checkweigher Over/Under function: 0 = Checkweigher functions are disabled 1 = Checkweigh with STATS REPORT. Acquires ACCEPT, OVER, and UNDER values from operator using keypad. ACCEPT value is entered for STATS REPORT purposes.
P6.1 Bar Graph Configuration	**0 = Solid Bar <** 1 = Bar Graph	Controls the OVER/UNDER bar graph display functions. 0 = Over/Under/Accept displayed as a solid bar 1 = Over/Under is displayed as a variable bar graph. Accept is a solid bar.
P6.2 ID Mode	**0 = Disabled <** 1 = Enabled	Enables the ID key to allow OVER/UNDER values to be stored and recalled. Up to 100 products with OVER/UNDER ranges can be stored.
P6.3 Clear ID memory	**Password**	Initializes all ID memories to zero. Calibration Password is required to clear memories.
P6.4 Blank Bar	**0 = Disabled <** 1 = Enabled	Blanks the Bar graph until weight is stable.
P6.5 Target Threshold	10% 20% 30% 40% **50% <** 60%	Weight must reach a certain % of the target weight before it is accepted as a valid weight sample. Used primarily with the Stats Report option to gather valid samples. Example: If the target threshold is set to 50% and the target weight is 100 g, a weight over 50 g must be on the scale to be a valid sample for the Stats Report.
P6.6 Auto Print	**000000 <** to 999999	Auto Prints when scale weight exceeds the minimum weight threshold. A weight below this threshold will not be printed. Example: If a value of 50 is entered, any weight above this will be printed automatically. The scale must return to zero for Auto Print to work on the next weighment. To Disable Auto Print, set to zero (000000).
P6.7 Statistics Report	**0 = Disabled <** 1 = Enabled	A Statistics Report is automatically transmitted by the indicator once a designated sample size is reached. Statistics that are printed include Min, Max and Average weights; Over and under counts; and Standard Deviation. See page 14 for more information. *Note:* P5.2 Must NOT be set to 0 (Stream Mode)

Scale Diagnostics Sub-block 9.x

Parameter	Value	Description
P9.0 AD Raw Counts	**'A'XXXXX**	Show AD converter raw counts for diagnostic purposes. The left most display will have a blinking "A" to indicate raw counts mode. Press **CLEAR** to exit.
P9.1 SPAN Edit	**XXXXXX**	Displays the scale's calibration factor. Use the **ARROW** keys to edit the value, followed by the **ENTER** key. Press **CLEAR** to exit.
P9.2 Display Test	N/A	Cycles through the display segments of the display. Press any key to exit.
P9.3 Password Display/Edit	-0001-	Display/change the calibration PASSWORD. Use the **ARROW** keys to edit the value, followed by the **ENTER** key. Press **CLEAR** to exit.
P9.4 Factory Reset	-PASS-	Reset all parameters back to factory values. Calibration password is required.
P9.5 Software Version	**X-XX**	Displays the indicator software version number.

SEALING THE INDICATOR (LEGAL FOR TRADE)

Electronic Seal

Calibration and configuration settings are electronically sealed with a password. This safeguard helps prevent accidental or unauthorized alteration of important scale settings.

> IMPORTANT! If the password is forgotten, Calibration Mode will be inaccessible. Record ALL password changes and alert the customer. If the password is lost, call the factory for assistance.

The Lightspeed features a **Category 1 Audit Trail System** for recording changes in calibration. Two counters are utilized:

Calibration Counter:	Increments by 1 whenever the scale is deadloaded or calibrated.
Configuration Counter:	Increments by 1 whenever changes are made to parameters affecting scale setup.

The counters increment for each Calibration Mode session where parameters are changed. Multiple changes may be made for each counter increase, but simply entering and exiting Calibration Mode does not increment the counters. The counters will count from 0 to 999 before rolling over to 0 again.

> **Important Note:** Because the Audit Trail becomes active during factory testing, the Calibration and Configuration Counters may not be **0** when the indicator is new out of the box.

The counters can be accessed at any time by pressing the **TARE** and **PRINT** keys together in Weighing Mode

The Calibration audit counter and Configuration audit count will alternate on the display until the **CLEAR** key is pressed.

TROUBLESHOOTING & ERROR MESSAGES

Unit won't power up:	Check diagnostic LED lamps on the Mother board.
GREEN LED **OFF**:	The Power Supply module is NOT receiving AC power. • Verify power source (Cords, Outlets, breakers). • If power source is good, the Power Supply module may be damaged.
GREEN LED **ON**:	The Power Supply module is receiving AC power. • Check Power Supply module connection to Mother board. • Power Supply module or Mother Board may be damaged.

Error Messages	Condition
	ZERO / TARE Error: • Scale in motion during ZERO or TARE. • See Page 4 & 5.
	Scale Overload Error: • Scale weight is over capacity: • Remove weight from scale