



DIGITAL WEIGHT INDICATOR AND CONTROLLER

OPERATOR MANUAL



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Standard Features

The Doran *GuardianXL* is a full-featured digital weight Indicator with a number of advanced features including dual displays, keypad data entry, set points, accumulators, ID, date & time and serial data communications capability. NTEP approved to 10,000 divisions, the *GuardianXL* calibration and pushbutton features can be accessed via the front panel using a pass code. NTEP integrity is maintained by an audit trail feature that records all metrological activity. Powered by external rechargeable battery or AC line power, the *GuardianXL* carries approvals from NTEP and Factory Mutual.

5. **Dual Displays** – Bright, highly visible, 1” high, 6 digit, red LED display is the primary digital weight display. A two line, 32 character, alphanumeric, backlit Liquid Crystal Display (LCD) provides custom messaging for excellent user feedback, including Mode, Status and Units.
6. **Zero** – Pushbutton ZERO up to 100% of scale capacity.
7. **Tare** – A tare value can be entered in two ways – pushbutton tare or digital tare entry.
8. **Keypad Data Entry** – Numeric keypad for digital entry of tare and set point values. Numeric pushbuttons have dual function to access pushbutton indicator functions.
9. **Gross/Net** – Display gross or net weight at the push of a button
10. **Units** – Selects up to 6 weight display units – lb, kg, g, oz, lb&oz or user units.
11. **Print** – Activates a serial data transmission to external devices
12. **Accumulator and Counter** – automatically accumulates gross and net weight. Standard print string available for accumulator and counter output.
13. **Time & Date**
14. **Digital Calibration** – Set via front panel with operator pass code, and recorded in two audit trail memory. Select any capacity value and the corresponding resolution will be automatically selected. Zero and Span are independently set, allowing for easy calibration in large scale filling or hopper applications.
15. **Resolution** – Display resolution from 200 to 50,000 divisions.
16. **Update Rate** – Select from 5.5 to 11 updates/second
17. **Digital Filters** - Wide selection of digital filter settings for maximum stability in the presence of vibration or air movement.
18. **Auto Zero Tracking** feature compensates for small changes in zero and is selectable from 0.5 to 5.0 divisions.
19. **Full Duplex RS-232 Communications** standard
20. **Digital I/O Standard** – Access to four TTL inputs and four TTL outputs on board.
21. **Microprocessor Watchdog System** monitors operation to prevent scale failure or lock-up under severe fault conditions.
22. **Approvals** – NTEP Class III certification to 10,000 divisions.

Optional Accessories

23. **Internally Mounted Relay Control Board**

24. **Fiber Optic Communications**

25. **Digital I/O Controls** Including:

- Switch Input
- RS-232 Output
- Optional Fiber Optic Input
- Optional Relay Output
- Optional Remote Display

26. **4-20mA Analog Output** passive and active

Scale Operation

The *GuardianXL* has many advanced features. This section will describe how to operate an installed and functioning *GuardianXL* indicator.

Front Panel Features

The *GuardianXL* is equipped with a 19 pushbutton keypad. The layout is shown in Figure 2.1 below. The *GuardianXL* display is divided into five areas.

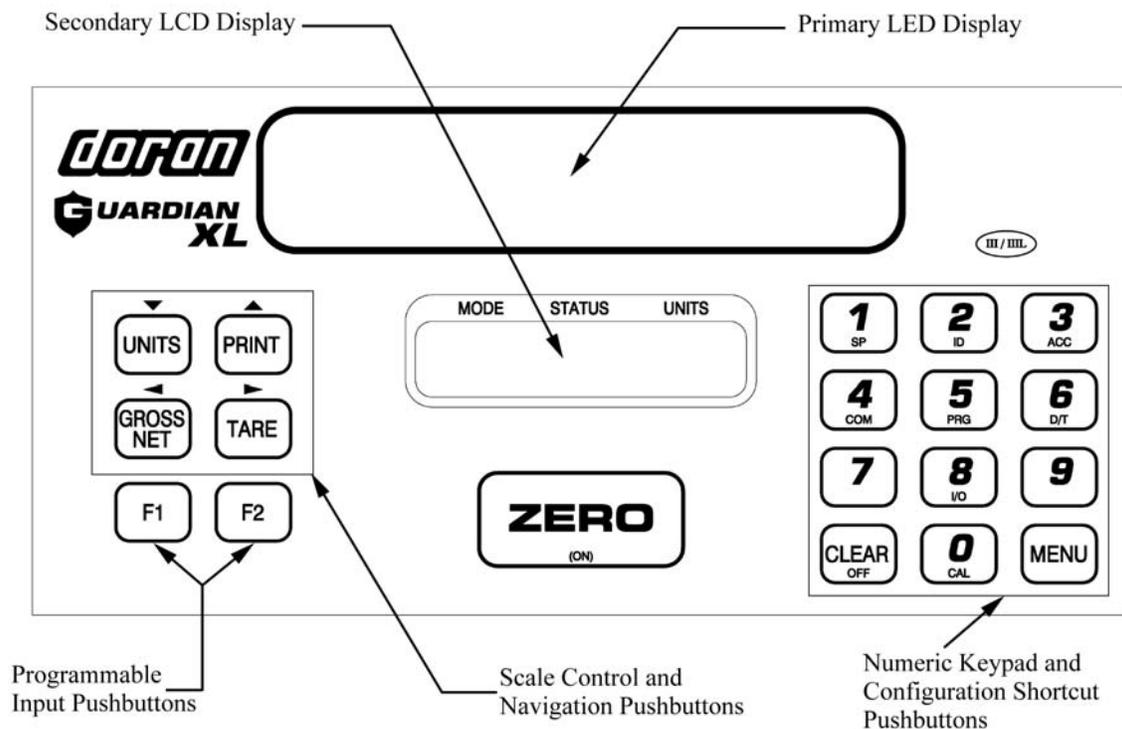


Figure 2.1 *GuardianXL* Front Panel Layout

Primary LED Display

The primary display consists of six bright, 1" high, seven-segment red LED digits. These digits typically display the current weight and are visible up to 50 feet away.

Secondary LCD Display

The two line 32-digit alphanumeric backlit LCD display provides feedback to the user. This display is primarily used for displaying the gross / net mode, center of zero status, motion, displayed units, setup mode and calibration mode information.

Scale Mode Control and Navigation Pushbuttons

The blue pushbuttons on the left of the touch panel controls the displayed units, gross / net mode, tare, print and programmable pushbuttons. These pushbuttons also navigate through the setup and calibration modes.

Numeric Keypad and Configuration Shortcut Pushbuttons

The purple numeric keypad is used to enter data for tares, setpoints and setup configuration. The setup and calibration mode is entered through shortcut pushbuttons that have setup and calibration menu abbreviations below the numbers on the keypad. These dual function shortcut pushbuttons provide quick access to specific parameters in the setup and calibration modes.

Scale Zero Pushbutton

This is the most often used feature of the indicator. Therefore the ZERO pushbutton is centered on the front panel and the largest pushbutton on the *GuardianXL*.

Modes of Operation

Weighing Mode

The weighing mode of the *GuardianXL* is the most commonly used mode. While in this mode, the primary display will indicate current weight and the secondary display will indicate gross / net, center of zero, motion and displayed weight units. The rest of this Chapter describes this mode in detail.

Output Mode

The output mode is only active while the *GuardianXL* is in the weighing mode and when any output is enabled. The second line of the secondary display will indicate the status of each setpoint output while the indicator displays all weigh information included in the weighing mode. A sample output status line is “1- 2- 3- 4*” where a dash to the right of the output number indicates an inactive output while an asterisk to the right of the output number indicates an active output. Outputs are accessible at terminal block TB3 or by the Digital I/O option.

Batch Mode

The batch mode controls outputs in a batch sequence. Batch sequences require no programming to implement, simply select a canned batch sequence from the menu and the program is ready to run. The second line of the secondary display will indicate the status of each setpoint output while the indicator displays all weigh information included in the weighing mode. A sample output status line is “1- 2- 3- 4*” where a dash to the right of the output number indicates an inactive output while an asterisk to the right of the output number indicates an active output. If a standard batch sequence does not meet your needs, the batch sequence can be altered by changing setpoint configurations.

Setup Mode

The setup mode allows configuration of the standard non-metrological parameters for the *GuardianXL*. A standard parameter is one that cannot affect the weighing mode of the scale. For instance fiber optic output, auto sleep delay, accumulator and setpoint values are examples of these standard parameters. These standard parameters can be easily accessed through shortcut pushbuttons, or protected with a pass code.

Calibration Mode

The calibration mode allows configuration of the metrological makeup and calibration of the *GuardianXL*. Sealed parameters are those that can affect the weighing mode of the *GuardianXL*. Access to this mode can be done through the entry of a pass code or by pressing the sealed calibration switch located inside the *GuardianXL* housing in combination with a pass code. Only authorized DORAN SCALE distributors are factory trained to configure the *GuardianXL*. For information relating to your nearest DORAN SCALE authorized distributor call DORAN SCALE's Sales Department at 1-800-262-6844.

Test Mode

The *GuardianXL* provides a test mode for the outputs, fiber optic communications, serial port and 4-20mA option.

Keypad Functions

ZERO / Scale Power On

The ZERO pushbutton is also used to zero the scale prior to making a reading. The ZERO pushbutton functions over the full range of the scale in standard operation. In legal for trade mode, it will be limited to a zero band equal to $\pm 1.9\%$ of scale capacity. When the indicated weight is within the center of zero band (gross zero ± 0.25 division) the secondary display will indicate $\rightarrow 0 \leftarrow$ in the center of the secondary display.

To zero the scale in gross mode, wait until the scale is stable and press the ZERO pushbutton. The scale will zero immediately.

The ZERO function will also work while the scale is in net mode. When in net mode, press zero and the scale will return to gross mode, zeroing out the scale weight. The tare value is saved and the scale can still switch from gross to net mode. This feature is useful when there is a consistent tare value used, but unwanted material is spilled onto the base surface between weighments.

TARE

A tare weight can be entered on the *GuardianXL* in two ways – Pushbutton Tare or Digital Tare entry.

To use Pushbutton Tare, simply place the tare item on the scale platform and press TARE. The scale will store this tare weight, automatically switch to Net weight mode and display zero weight. If you switch to the Gross mode by pressing the GROSS/NET pushbutton, the actual tare weight will be displayed. If the tare item is then removed from the scale, the scale will display the negative tare weight in the Net mode and zero in the Gross mode.

To enter a Digital Tare, enter the weight through the keypad. The tare must be a positive, non-zero weight. This will place the indicator into entry mode and once the desired weight is entered press TARE to save the tare weight. If any errors are made while entering the tare weight, press CLEAR and reenter the weight. After the tare weight is stored, the scale will show zero in the Net mode when the tare item is on the scale. When the scale is empty, the scale shows the negative tare weight in the Net mode and zero in the Gross mode.

To recall the tare weight at any time, press MENU and TARE. The main display will indicate the tare weight in the currently selected units. The secondary display will show “RECALL TARE”. To exit this mode press CLEAR.

To clear a tare weight press 0 on the keypad then TARE. This will remove the tare from memory. If not cleared, the TARE weight will remain in memory, even if the indicator is turned off.

GROSS / NET

Press the GROSS / NET pushbutton to switch the display mode from gross weight to net weight, or from net to gross modes. The current mode is indicated on the secondary display with the word “GROSS” or “NET”. If a tare value has been entered, then the net value is the gross weight less the tare weight. If a tare is not currently stored, the display remains in gross mode when the GROSS / NET pushbutton is pressed. When a tare is entered the *GuardianXL* switches to the Net mode automatically.

UNITS

The UNITS pushbutton permits the operator to select from six displayed weight units. Simply press the UNITS pushbutton and the secondary display will indicate the correct weight in the current weight unit “lb”, “kg”, “g”, “oz”, “lb-oz” or “user”. The UNITS pushbutton can be configured to allow the selection of any combination of units listed above, preventing accidental selection of undesired units.

PRINT

The PRINT pushbutton transmits print string data via an RS-232 cable or through the Fiber Optic option. This feature is also used in conjunction with the Digital I/O to relay control commands.

CLEAR

The CLEAR pushbutton is used to cancel any digital entry from the keypad. Pressing CLEAR when the secondary display reads “ENTRY” will return the scale to the weigh mode from a digital entry mode.

F1, F2 Programmable Pushbuttons

These pushbuttons can be programmed as an output or function trigger and also act as batch controls while in the batch mode. See Chapter 4, Setpoint Output and I/O Function Parameters for details. See Chapter 7 for batch mode information.

MENU

The MENU pushbutton allows access to tare recall, and general configuration of the *GuardianXL* including: setpoints, preacts, accumulators, RS-232 port, date/time and calibration access. Pressing MENU, then a shortcut pushbutton on the numeric keypad accesses these configuration features and the non-calibration menu. There are nine shortcut pushbuttons on the numeric keypad. Each shortcut pushbutton has an abbreviated feature name accompanying the number on a numeric pushbutton. Each of these shortcut features is described below. To avoid accidental entry into these features, access can be eliminated through the use of a pass code.

Programming and Recalling Setpoint & Preact Weight Values (MENU – SETPOINT)

The *GuardianXL* has four Setpoints and four Preacts. To access the Setpoint or Preact weight values, press MENU, then 1 (SP) on the numeric keypad. This key sequence places the *GuardianXL* into the recall mode. The primary display will show the stored weight value and the polarity. The secondary display will show “RECALL SP 1” when in the recall Setpoint mode or “RECALL PRACT 1” for the recall Preact mode. Press numbers 1, 2, 3 or 4 on the numeric keypad once, to recall the respective setpoint value. Press any of the same numeric key twice will recall the respective Preact value. When review of the Setpoint or Preact values is complete, press CLEAR to exit the recall mode.

To program a Setpoint or Preact weight value, simply enter the weight value using the keypad. This places the *GuardianXL* into the “ENTRY” mode and the weight value is echoed to the primary display. Use the UNITS key only to toggle the polarity of the setpoint weight value. If an error is made when entering the weight, press CLEAR to exit the entry mode. When the number is correctly displayed press MENU and the secondary display will read “SETPOINT ENTRY” and “SELECT 1,2,3,4,M”. Press the number of the setpoint (1, 2, 3 or 4) you want to save the current displayed weight. Press the MENU to enter the Preact entry mode, the secondary display will read “PRACT ENTRY” and “SELECT 1,2,3,4,M” Press the number of the Preact (1, 2, 3 or 4) you want to save the current displayed weight.

After the value is saved the scale will return to the weigh mode.

Scale ID (MENU – ID)

Allows entry of the scale ID number. To configure the scale ID, press MENU then CLEAR. The secondary display will read “SET SCALE ID ENTER ID NUMBER”. Simply enter the scale ID number – up to 6 digits and press ZERO to accept.

Accumulator and Counter (MENU – ACCUMULATOR)

This displays the value of the accumulator and counter. The maximum value for the accumulator and counter is limited to six digits, i.e. 999999. When the maximum value is reached, the accumulator will not accumulate and the secondary display will read “ACCUMUALTOR ERROR”.

Press MENU 3 (ACC) to enter the accumulator recall mode. The secondary display will read “GROSS ACCUM lb ACCUM RECALL”. The accumulator recall mode will display the accumulator value in the units currently selected in the weigh mode as well as either gross or net mode. To toggle between the gross and net values press the GROSS / NET pushbutton. A net accumulator value can only be accessed by having an active tare in the weigh mode.

To clear the accumulator and counter values, press CLEAR while in the accumulator recall mode. The accumulator counter is incremented once every time a manual or automatic accumulation occurs. The counter value cannot be displayed on the front panel.

The counter value can be printed using the Fiber Optic option. When in accumulator recall mode, press PRINT to execute a print string that contains the gross accumulated weight, net accumulated weight and counter. Accumulating of weights is possible with an auto accumulate function. To exit the accumulator recall mode, press MENU.

Fiber Optic Communications Protocol (MENU – COMMUNICATIONS)

Pressing MENU then 4 (COMM) on the numeric keypad places the *GuardianXL* into the setup mode. To exit to the weigh mode, press MENU.

Batch Programming (MENU – PROGRAM)

Pressing MENU then 5 (PRG) for batch mode programming information.

Date Time (MENU – DATE / TIME)

This allows recall of the current date and time. Press MENU to exit the date time recall mode.

I/O Configuration (MENU – I/O)

Pressing MENU then 8 (I/O) on the numeric keypad places the *GuardianXL* into setup mode. To exit to the weigh mode press MENU.

Audit Trail and Calibration (MENU – CALIBRATION)

Pressing MENU then 0 (CAL) on the numeric keypad places the *GuardianXL* into the calibration mode. This shortcut pushbutton allows access to the entire calibration mode. The audit trail counter is displayed in the primary display, while the secondary display reads PARAMETER AUDIT. The parameter audit trail tracks changes in metrologically related parameters in the calibration mode by incrementing every time changes are saved to the *GuardianXL*.

Press TARE (▶) to advance to the calibration audit trail counter. The calibration audit trail counter is displayed in the primary display, while the secondary display reads CALIBRATE AUDIT. The calibration audit trail tracks changes in calibration by incrementing every time the *GuardianXL* is calibrated. Press TARE (▶) to advance to the calibration mode entry point. The secondary display will read ACCESS CAL MODE ENTER PASS CODE. Access to the calibration mode requires a pass code.

Limited Warranty

DORAN SCALES, INC. warrants its products to be free from defects in material and workmanship for a period of two (2) years from date of shipment. Any product found to be defective within this time period may be returned to DORAN's factory, freight prepaid, with prior return authorization for repair or replacement at no charge.

DORAN's liability under this warranty is limited to the repair or replacement of the defective product and in no event shall DORAN be liable for consequential or indirect damage to equipment or personnel. Nor shall DORAN be liable for damages to equipment or for personal injury caused by misuse, overload, accidental damage, alteration, improper installation, or unauthorized opening of the equipment. Under no circumstances will DORAN be responsible for any indirect or consequential damages due to errors in weighing or failure of a DORAN product to perform properly.

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