SMART WEIGHING SOLUTIONS

2100
Digital Indicator
Operator Manual

For use with Software Versions 2.0 and above

2100-602-250

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"Everything should be made as simple as possible, but not simpler."

- Albert Einstein -

CE

N2708

Table of Contents

1. Introduction

The **2100** is a precision digital indicator using the latest Sigma-Delta A/D technology to ensure fast and accurate weight readings.

1.1. Approvals

- NSC S403 approval (6000 divisions at 1μV/division).
- NMI TC6033 approval (6000 divisions at 1μV/division).
- C-tick approved and CE approved.

1.2. Features

- 27mm alpha-numeric LCD display (LED back-lighting).
- Checkweighing, kg/lb switching, totalising, intelligent batching, counting, live weight, hold/peak hold functions.
- Real time clock and calendar.
- Soft Power On/Off for inactivity auto power down.

1.3. rin-SMART Software Options

- 0224 (SERIAL) Enable RS-232 serial communications
- 0225 (SETP) Enable setpoint output

1.4. Manuals

For more information on the **2100** refer to the **2100 Reference Manual** and **2100 Quick Start Manual** (available free of charge from www.rinstrum.com).

2. Safety

2.1. Operating Environment

- Operating Temperature: –10 to 50°C
- Humidity: <90% non-condensing
- Operating Voltage: Shown on rear label

2.2. Electrical Safety

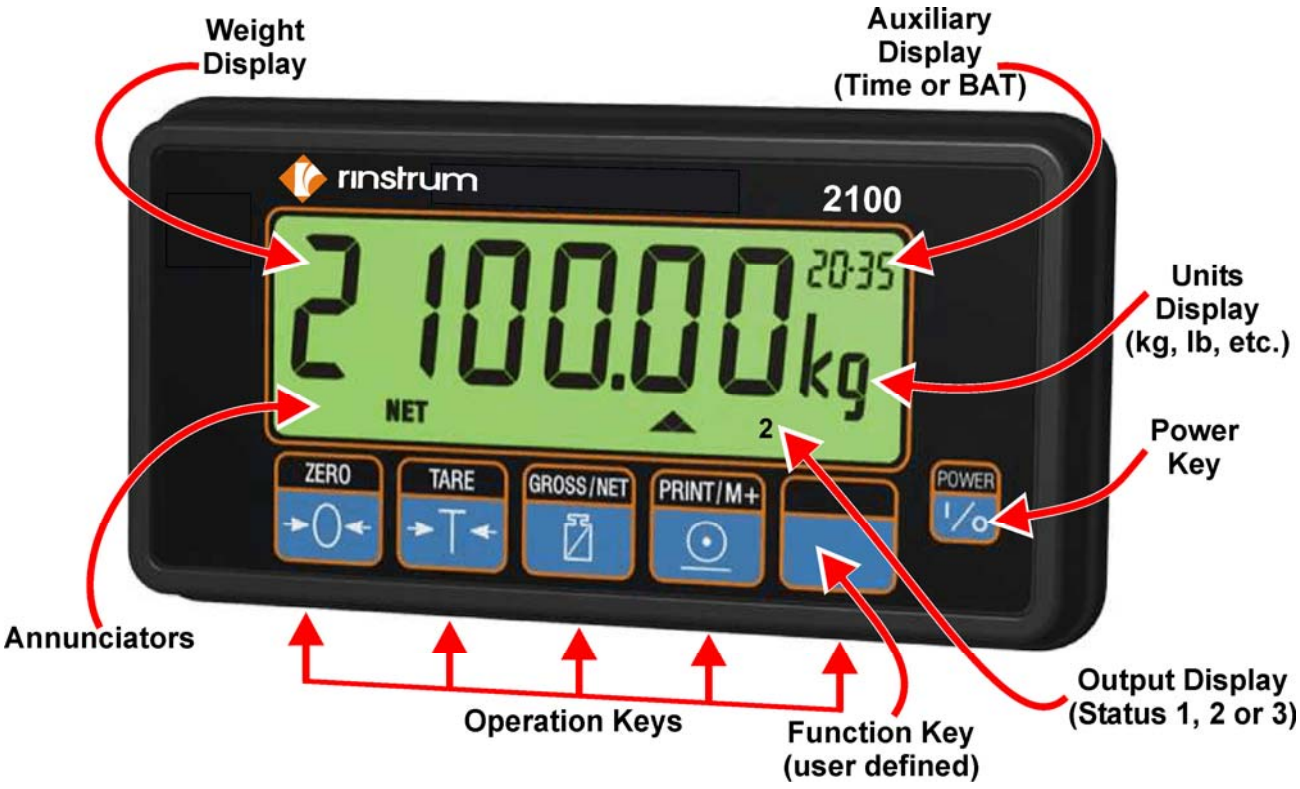
- For your protection all mains electrical hardware must be rated to the environmental conditions of use.
- The mains electrical outlet must be of protection earth contact.
- Pluggable equipment must be installed near an easily accessible power socket outlet. A permanently connected supply must have a readily accessible disconnect device.
- To avoid the possibility of electric shock or damage to the instrument, always switch off or isolate the instrument from the power supply before maintenance is carried out.

2.3. Cleaning

- To maintain the instrument, never use harsh abrasive cleaners or solvents. Wipe the instrument with a soft cloth **slightly** dampened with either methylated spirits or warm soapy water.

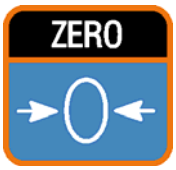
3. Basic Operation

3.1. User Interface Display and Controls



3.2. Keypad Buttons

Key	Description
	**POWER:** The **Power** key is used to turn the instrument ON and OFF. • To Turn Instrument OFF: Press and hold the **<POWER>** key for three seconds (until the display blanks). • **Operator Menu Setup:** Press and hold the **<POWER>** and **<ZERO>** keys for two seconds. • **Software Options:** Press and hold the **<POWER>** and **<FUNCTION>** keys for two seconds.

Key	Description
	**ZERO:** The **Zero** key sets the display weight to gross zero, providing the weight is within the zero range of the instrument (Tare weight is cleared).
	**TARE:** The **Tare** key temporarily sets the weight on the instrument to be displayed as zero. Refer to Using Tare page 8 for more information.
	**GROSS/NET:** The **Gross/Net** key toggles the weight display between the Gross and the Net weight.
	**PRINT/M+:** The **Print/M+** key sends data to the attached peripheral device. **M+** indicates the instrument has a memory (ie. each printed weight is automatically added to the internal Total Weight).
	**FUNCTION:** This key is programmable to suit customer requirements. A key label identifying the special function will be attached. (Refer to page 9 for information on Special Functions).

3.3. Annunciators

Symbol	Name	Description
	**ZERO**	Lit when the displayed reading is within ± ¼ of a division of true zero.
NET	**NET**	Lit when the display reading represents NET weight.
	**MOTION**	Lit when the displayed reading is not stable.
	**OVER**	Lit when the weight is over setpoint target.
	**PASS**	Lit when the weight is between under and over setpoint targets.
	**UNDER**	Lit when the weight is under the setpoint target.
	**ZERO BAND**	Lit when the displayed weight is within the zero dead band setting.

4. Basic Weighing

4.1. Normal Weighing

- Ensure instrument is On and zero annunciator is lit.
- Place your item on the weigh platform.
- Read the weight display.

4.2. Using Tare

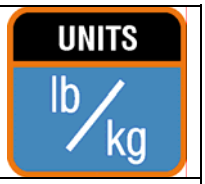
- Indictor displays zero with zero annunciator lit.
- Place the container on the weigh platform.
- Press the **<TARE>** key.

- Indicator will show the displayed zero weight and net annunciator will be lit.
- Fill container to required weight.
- Press the **<GROSS/NET>** key to toggle between the net weight and total weight.

5. Special Functions

5.1. Units Switching (kg / lb)

- Press the **<UNITS>** key to switch the display between kilograms and pounds.



Note: Printing and serial communications will use the units displayed (either kg or lb), but calibration weights and targets, etc., must be entered in the primary display units of the indicator.

5.2. Counting

- Place the container on the weigh platform and press **<TARE>** if required.

- Place the sample pieces to be counted on the weigh platform.
- Press and hold the **<COUNT>** key for two seconds. The default number of pieces in the sample will be displayed.

- Use the **<GROSS/NET>** and **<PRINT/M+>** keys to alter the number of pieces.

- Press **<COUNT>**. The current sample will be stored against the entered pieces. The letter **p** (for pieces) displays when in counts display.

- Press the **<COUNT>** key to toggle between the weight display and the counts display.

5.3. Hold

- Press the **<HOLD>** key to hold the displayed weight at its current weight.

- The displayed Units will flash to indicate that the reading is held.
- Press the **<HOLD>** key again to release the weight reading and return the display to normal weighing.

5.4. Peak Hold

- Press the **<PEAK>** hold key to hold the largest absolute weight (either positive or negative). The **2100** compares the current weight reading with the stored peak and updates the peak reading whenever a larger weight is detected.

- Press the **<PEAK>** key to toggle between the current weight and the peak weight.

- Press and hold the **<PEAK>** key for two seconds to clear the peak value and reset back to zero.

5.5. Live Weight

- Move the animal onto the weigh platform.
- Press and hold the **<LIVE WT>** key for two seconds.

- '**- - - - - -**' is displayed until a reliable weight reading has been acquired.
- Once a weight has been determined the **2100** beeps to indicate how reliable the reading is.
  -A **single** beep indicates that the sample is too unreliable and has been discarded.
  -A **double** beep indicates that the sample is reliable but is made up of many averages.
  -A **triple** beep indicates that the sample was taken as a result of no motion and is very reliable.
- Press the **<LIVE WT>** key to force the **2100** to take another reading if required.

- Once the animal is removed, the **2100** automatically clears the previous reading ready for the next animal and displays '**- - - - - -**' once more.
- Press and hold the **<LIVE WT>** key for two seconds to return the indicator to normal weighing.

- In normal weighing the Live Weight key operates exactly like a manual **<HOLD>** key. Press the key once to hold a weight and again to release it.

5.6. Showing Totals

- The **<PRINT/M+>** key is used not only to print the current weight but also to add that weight to the current total.

- When the **<TOTAL>** key is pressed the **2100** displays **count** followed by the number of items in the total.

- After this the **2100** displays **TOTAL** followed by the current total weight.
- If counting is active **QTY** is also displayed along with the total quantity of items in the total.
- If the total weight is too large to display in six digits, the weight is shown in two sections labelled with the upper six digits displayed before the lower six digits.
- Press and hold the **<PRINT/M+>** key to cause the total accumulated weight to be printed and then cleared.

5.7. Batching

- The **2100** operates a two speed single material filling sequence with an optional dump to weight or time.
- Press the **<BATCH>** key to start the single material operation.

- During operation press the **<BATCH>** key to Pause batching and again to re-start batching. While paused the **2100** will display **PAUSE** on the display.

- Press and hold the **<BATCH>** key for two seconds to abort the batch.

- While a batch is running (or paused) all keyboard keys other that the batch key are blocked (ie. Zero, Tare, Gross/Net, Print/M+).
- If the **2100** has printing enabled there will be a standard batch print ticket automatically generated for each batch.

5.8. Setting Target Weights

- Press and hold the **<TARE>** key for two seconds to enter the material target weights.

- The **2100** displays **TARG A**.
- Press the **<TARE>** key to step through the available targets, flight and hysteresis options.

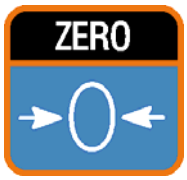
- Press the **<GROSS/NET>** key to select an option to change. The digit to change will be flashing.

- Press the **<GROSS/NET>** key to move the flashing digit.

- Press the **<PRINT/M+>** key to change the flashing digit. The left-most digit can be changed from **0** to **9** or to '**–**' which is for entering negative targets.

- Press the **<BATCH>** key to save the settings.

- To return to normal weighing, press the **<ZERO>** key. An alternate method is to press the **<TARE>** key to select **- End -** and then press the **<GROSS/NET>** key.



Note: Two Speed Feeder

TARG A = Target Batch Weight
TARG B = Preliminary Batch Weight

6. Error Messages

Error	Description
(U - - - - - -)	The weight reading is below the normal weighing range.
(O - - - - - -)	The weight reading is above the maximum capacity of the equipment.
(ZERO) (ERROR)	The weight is outside the zero range tolerance setting. See Note below.
(STABLE) (ERROR)	The scale motion has prevented a zero, tare or print operation from occurring. See Note below.
(QA) (DUE)	Quality assurance testing is due. Press any key to clear this warning for one hour.

Note: The **ZERO** and **STABLE** error messages are accompanied by a series of long beeps. The messages repeat until a key is pressed.

7. Battery Operation

BAT is flashed on the auxiliary display if the battery voltage falls below 11V. If the battery voltage falls below 10.5V the instrument automatically powers down.

8. Diagnostic Errors

Error	Description	Action
E00001	Power supply voltage too low.	Check supply
E00002	Power supply voltage too high.	Check scale / cables
E00004	Load cell excitation voltage too low. (8 volts for up to 8 x 350 ohm load cells)	Check scale / supply
E00008	Load cell excitation voltage too high. (8 volts for up to 8 x 350 ohm load cells)	Check scale / supply
E00010	Temperature outside limits. (–10 to +50°C ambient)	Check location
E00020	Scale build incorrect. (100 to 30000 grads).	Fix up scale build
E00100	Digital setup information lost.	Re-enter setup
E00200	Calibration information lost.	Re-calibrate
E00300	All setup information lost.	Enter setup and calibrate
E00400	Factory information lost. (FATAL)	Service
E00800	EEPROM memory chip failed. (FATAL)	Service
E02000	ADC out of range. Possible load cell or cable damage.	Check load cell cable
E04000	Battery backed RAM data lost.	Re-enter setup
E08000	FLASH program memory incorrect. (FATAL)	Service

The **E** type error messages are additive. For example, **E00005** (00001 + 00004) would indicate that both Excitation and Power Supply Voltage are low. The numbers add in hexadecimal as follows:

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - A - B - C - D - E - F
(For example, 2 + 4 = 6, or 4 + 8 = C)

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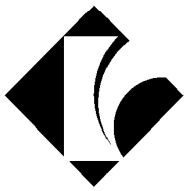

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