



GS100R WEIGHING CONTROLLER

Setup Manual

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1 INTRODUCTION

The GS100R is the ideal controller for high-speed, high-accuracy weighing, batching and level measurement operations. Offset and span trim calibration functions make this controller ideally suited to tank and silo applications, without the application of masses.

The GS100R is straightforward to use, and has a built-in LCD display and five front-panel buttons. The slim, case is 35mm DIN-rail compatible, ensuring hassle-free mounting. Designed specifically for use in weighing applications, the GS100R comes factory pre-calibrated to suit either a 4-wire or a 6-wire strain gauge input. Setup (or re-calibration) is simple, with on-screen, step-by-step instructions.

Relays, serial and analog output options make this instrument valuable for stand-alone control or as a PLC interface. Output and input isolation eliminates the need for any special consideration when interfacing to PC, PLC or HMI analog/serial inputs.

2

GENERAL INFORMATION

2.1

Model codes

GS100 SERIES MODEL CODES

GS100	Gedge Series
R	DIN 35 rail mount
- LV	15-48V AC / 10-72V DC power supply
- HV	85-265V AC / 95-370V DC power supply
- R	Relay outputs (2) form A
- 2	RS232 isolated output
- 4	RS485 isolated output
- A	Analog output option installed

OPTIONS (AS SPARE PARTS)

GS - 2	RS232 isolated serial output
GS - 4	RS485 isolated serial output
GS - A	Analog isolated source powered output (4-20mA, 0-10 V)

2.2 Specifications

Input	4/6-wire strain gauge, 1-5mV/V
Power supply	HV 85-265V AC/95-370V DC or LV 15-48V AC/10-72V DC
Power (max)	5W, fully optioned, 8 loadcells
Easy setup	Intuitive text prompts for easy setup.
Calibration	Pre-calibrated for 0-10,000 counts (2mV/V sensor gain at full scale). Can be recalibrated using the auto (apply mass) or mV/V method. Adjustable zero offset.
Security	Calibration and setpoint functions have independent security code access. Setpoint functions are independently configurable, and accessible through the F2 key.
Excitation	5V DC excitation supplied (powers up to 8 x 350 Ω loadcells).

Sampling rate	Up to 50Hz
Resolution	18-bit
Accuracy	0.005% of reading
Temp. drift	Typically 3ppm/°C

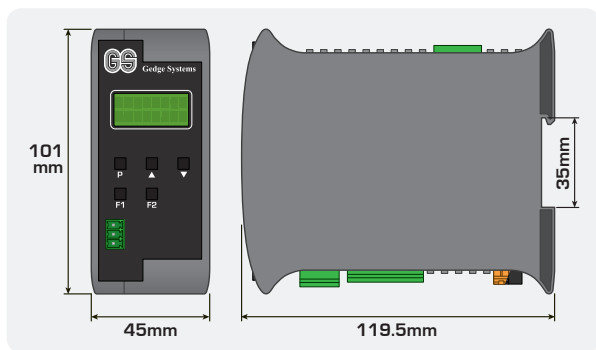
OPTIONAL OUTPUTS

Analog output	Isolated 16-bit 4-20mA/0-10V output (fully scaleable). 7 updates/sec. Window programmable over any range within the full-scale range of the controller
Serial port	Isolated GS option 2 or 4 <i>Modes:</i> ASCII, Modbus RTU slave, Ranger A output (5 updates/sec). <i>Data rates:</i> 300-38400. Odd, even or no parity.
Relay outputs	2 x 5A Form A relays

3 CASING & DISPLAY

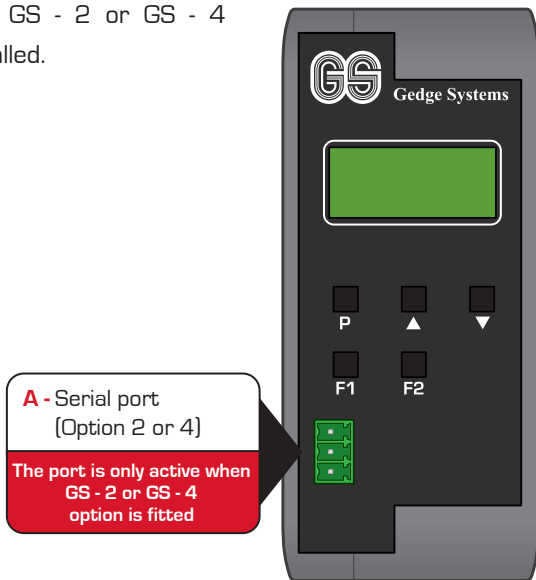
3.1 Case dimensions

Dimensions	101 x 45 x 119.5mm (H x W x D)
DIN rail	35mm



3.2 Front panel

The GS100R has a 2 x 8-digit alphanumeric LCD display and five front-panel buttons. It also includes a serial terminal, which is active in models with GS - 2 or GS - 4 installed.







- P** This button is typically used to save your settings and advance to the next step in the setup process. The function of a single keypress of this button from the operational display can be user programmed - see 5.2H.
- ▲** This button is typically used to scroll through options or increase values in the setup menu. Pressing this button from the main display will allow you to view/reset the peak value and view the mV value of the input (see 3.3).
- ▼** This button is typically used to scroll through options or decrease values in the setup menu. Pressing this button from the main display will allow you to view/reset the valley value (see 3.3).
- F1** This button is used to access the **input setup and calibration** menu. See section 5.
- F2** This button is used to access the **setpoint setup** menu (see section 6) and the **setpoint easy access** menu (see section 8).




3.3 Display shortcuts (view mode)

Press  at any time to return to the main display.

 Used to view/reset the **PEAK** value and to view the input value in mV.

- Press the  button once from the main display. **PEAK** appears, along with the maximum measured weight value since the instrument was turned on (or reset). To reset **PEAK**, press both the  and  buttons together now.
- Press the  button again. **MV** appears, along with the current value of the input signal in mV.

 Used to view/reset the **VALLEY** value.

- Press the  button once from the main display. **VALLEY** appears, along with the minimum measured weight value since the instrument was turned on (or reset). To reset **VALLEY**, press both the  and  buttons together now.

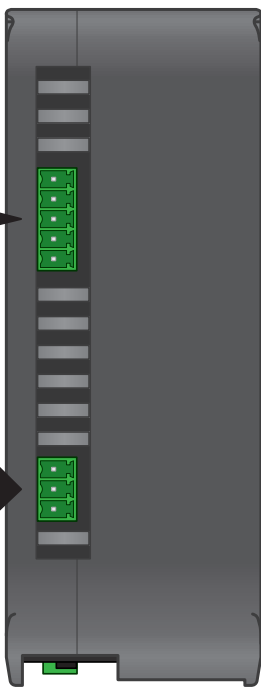
4 WIRING

4.1 Top view

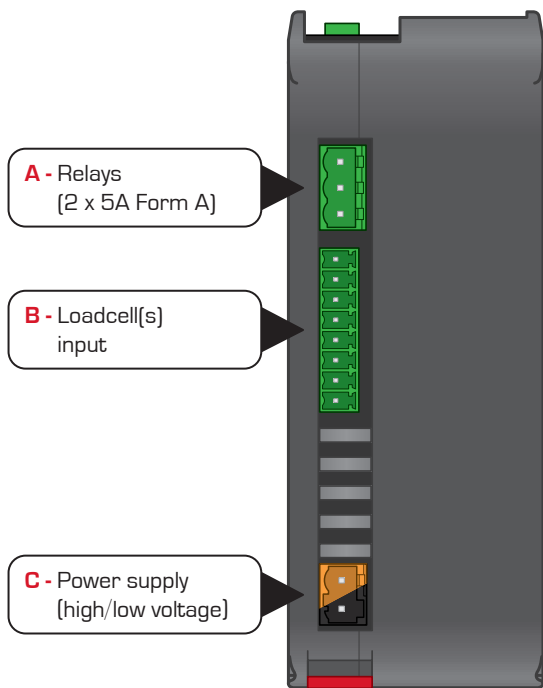
A - Input function pins

B - Analog output

This option is only available
when GS - A is installed



4.2 Bottom view



4.3 Power supply

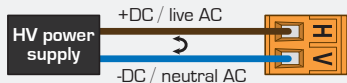
(see 4.2C)

Before you begin, determine whether your controller is configured for low or high voltage power supply. Check the label on the unit against the colour of the connector:

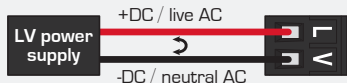
- **Orange** = high voltage (85-265V AC, 95-370V DC)
- **Black** = low voltage (15-48V AC, 10-72V DC)

REMEMBER TO SWITCH YOUR POWER SUPPLY OFF BEFORE YOU BEGIN WIRING. NEVER CONNECT YOUR LOW VOLTAGE CONTROLLER TO MAINS POWER.

**High voltage
(HV)**



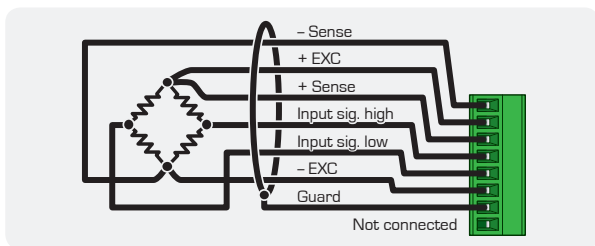
**Low voltage
(LV)**



4.4 Loadcell input module

(see 4.2B)

Wire your loadcell input module as shown in the diagram. This input module is pre-calibrated for 0-10,000 counts full scale with a 2.000mV/V load cell sensor.



YOU MAY CONNECT MULTIPLE LOADCELLS IN PARALLEL, OR USE A LOADCELL FIELD JUNCTION BOX (GKJB6-7T5).

4.5 Analog output (if fitted)

(see 4.1B)

If your controller has analog output fitted, wire it as shown.

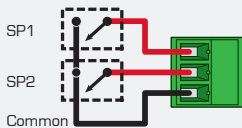


If you do not have analog output fitted then skip this step.

4.6 Relays (if fitted)

(see 4.2A)

If your controller has relays fitted, wire them as shown. Relays can be programmed to operate within the total span range of the controller.



If you do not have relays fitted then skip this step.

4.7 Serial port (if activated)

(see 3.2A)

If you opted for an active serial port on your GS100R, wire it now as shown.

If you do not have an active serial port, skip this step.

Option 2



Option 4

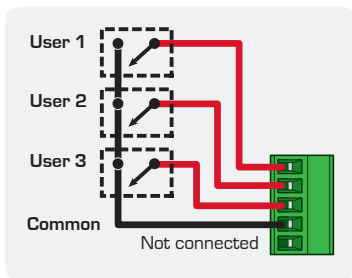


IF YOU DID NOT OPT FOR A SERIAL PORT WHEN YOU ORDERED YOUR GS100R, AN INACTIVE SERIAL TERMINAL WILL BE INSTALLED ON THE FRONT PANEL.

4.8 Function pins (if required) (see 4.1A)

Connect switches as required between the function pins.

Pin functions are user configurable, and can be set up in 5.2I-K.



See Appendix B for a list of input functions.

4.8 Power up

Once you have completed the wiring process it is safe to switch on your power supply. Ensure that your display is functioning before you proceed.

5 SETUP & CALIBRATION

Enter the calibration mode by pressing **F1**.

5.1 Enter calibration PIN

A **__ _ ENTER CAL PIN** scrolls across the bottom row and **0** appears in the top row. Use the **▲** and **▼** buttons to enter your security code (factory default 1). Then press **P**. If the correct PIN is entered then the setup is started at 5.2.




If an incorrect PIN number is entered, **__ _ ACCESS DENIED** scrolls across the display and it returns to the normal operating mode.

YOU WILL BE GIVEN THE OPPORTUNITY TO CHANGE YOUR PIN NUMBER AT THE END OF THIS SECTION (5.9). IF YOU HAVE FORGOTTEN YOUR PIN NUMBER, SEE SECTION 9.

5.2 Input setup

- A** ___ **INPUT SETUP** scrolls across the bottom row and **Skip** appears in the top row. Press **(P)** to skip to 5.3, or the **(▲)** button and then **(P)** to **Enter** input setup.
- B** ___ **SAMPLING RATE** scrolls across the bottom row and the current selection appears in the top row. Use the **(▲)** and **(▼)** buttons to select: **1Hz**, **10Hz** (default) or **50Hz**. Then press **(P)**.
- C** ___ **DECIMAL POINT POSITION** scrolls across the bottom row and the current selection appears in the top row. Using the **(▲)** and **(▼)** buttons, select: **No DP**, **0.0**, **0.00**, **0.000** or **0.0000**, and then press **(P)**.
- D** ___ **ROUNDING** scrolls across the bottom row and the current display rounding appears in the top row. Use the **(▲)** and **(▼)** buttons to select: **None**, **2**, **5** or **10**. Then press **(P)**.

ROUNDING is quoted in display counts and is not influenced by decimal point position. (Eg. If your input signal is 5.3, the display will show: 5.3 at **None**, 5.4 at **2**, 5.5 at **5**, or 5.0 at **10**).

- E** _ _ _ **MODE** scrolls across the bottom row and the current weighing mode appears in the top row. Use the  and  buttons to select **Normal** (default) or **Batch**, and then press .

*In **Normal** (default) mode the controller displays the gross or net weight on the display, and does not perform batch calculations.*




*In **Batch** mode the controller displays batch or gross weight, and SP 1 and SP 2 function as dedicated batch control setpoints. Refer to Appendix A.2 for additional information.*











F






If you selected Normal in 5.2E:

Skip step 5.2G and continue to 5.2H now.

- G** _ _ _ **BATCHING DIRECTION** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select either **Negative** or **Positive**, and then press .

- H** _ _ _ **PROG BUTTON** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select a function¹ to be performed when the  button is pressed from the operational display: **Hold**, **Tare/Batch**², **Zero**, **Peak**, **Peak Rst** or **Print**. Then press .
- I** _ _ _ **USER INPUT1** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select a function¹ to be performed when the User 1 input pin³ at the rear of the meter is activated: **Lock**, **Tare/Batch**², **Zero**, **Peak**, **Peak Rst** or **Print**. Then press .
- J** _ _ _ **USER INPUT2** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select a function¹ to be performed when the User 2 input pin³ at the rear of the meter is activated: **Hold**, **Tare/Batch**², **Zero**, **Peak**, **Peak Rst** or **Print**. Then press .

- K _ _ _ **USER INPUT3** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select a function¹ to be performed when the User 3 input pin³ at the rear of the meter is activated: **Tare/Batch**², **Zero**, **Peak**, **Peak Rst** or **Print**. Then press .

-
- 1 For more information on available functions, see Appendix B.
 - 2 **Tare/Batch** options are subject to the weighing mode selected in 5.2E above. (**Normal** mode = **Tare** option, **Batch** mode = **Batch** option.) See Appendix A for more information.
 - 3 See 4.7 to wire rear input pins.

5.3 Display setup

A ___ **DISPLAY SETUP** scrolls across the bottom row and **Skip** appears in the top row. Press **(P)** to skip to 5.4, or the **(▲)** button and then **(P)** to **Enter**.

B ___ **LINE 1 DISPLAY SOURCE** scrolls across, and the currently selected line 1 (top row) display source appears. Use the **(▲)** and **(▼)** buttons to select: **Net/ Batch** or **Live**. Press **(P)**.

Net/ Batch option is subject to the weighing mode selected in 5.2E. (Normal mode = Net option, Batch mode = Batch option.)

C ___ **LINE 2 DISPLAY SOURCE** scrolls across, and the currently selected line 2 (bottom row) display source appears. Use the **(▲)** and **(▼)** buttons to select: **Off**, **Net/ Batch** or **Live**. Then press **(P)** to accept.

Net/ Batch option is subject to the weighing mode selected in 5.2E. (Normal mode = Net option, Batch mode = Batch option.)

Choosing Off will cause line 2 to display either net or gross (whichever value is not currently being displayed on line 1). If the net and gross values are equal then line 2 will show gross.

5.4 Calibration

A **___ CALIBRATION TECHNIQUE** scrolls across the bottom row and **Skip** appears in the top row. Press **(P)** to skip to 5.5, or use the **(▲)** and **(▼)** buttons select: **Auto, mV/V, Zero** or **E_Cal**. Then press **(P)**.

Your GS100R is factory pre-calibrated for 0-10,000 counts (2mV/V sensor gain at full scale).

AUTO - Uses zero and span values to calculate the scale and offset. This is the most accurate calibration method, but requires known low and high input signals, usually supplied by test weights. There are separate zero and span calibration procedures, so you do not have to perform both at the same time.

MV/V - Uses values from the load cell manufacturer's test certificate, making it ideal for silo and tank applications.

ZERO - Allows manual adjustment of the calibrated zero offset.

E_CAL - Allows the user to view and edit the electronic calibration values (zero offset and scale factor). These two values are updated when any calibration is performed. Noting these values and entering them into another instrument will copy the calibration. You may also 'trim' these values to alter the current calibration.

B The step that you proceed to now will depend on your selection in **5.4A**.

Auto: Complete steps 5.4C-I




mV/V: Complete steps 5.4J-M

Zero: Complete steps 5.4N-O

E_Cal: Complete steps 5.4P-R

Please note that following calibration you will be automatically directed back to the operational display. To enter step 5.5, you must select **Skip** at 5.4.

▶▶ AUTO CALIBRATION METHOD ▶▶




C ___ **CALIBRATE ZERO** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select **No** or **Yes**. Press .




D



If you selected No in 5.4C:

Skip step 5.4E and continue to 5.4F now.

E _ _ _ **REMOVE WEIGHT - PRESS P TO ACCEPT** scrolls across the bottom row and the current no-load value appears in the top row. Remove the weight. Use the  and  buttons to adjust the no-load value if required. Then press .




F ___ **CALIBRATE SPAN** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select **No** or **Yes**. Press .

G

**If you selected No in 5.4F:**

Skip step 5.4H and continue to 5.4I now.




H _ _ _ **ADD CAL WEIGHT - ENTER DESIRED SPAN -**

PRESS P TO ACCEPT scrolls across the bottom row and the current span value appears in the top row. Apply a calibration weight to the weigh platform. Then use the  and  buttons to adjust the value, and press  to accept.




I If **Auto** calibration was successful, you will be directed out of the calibration menu to the operational display without viewing any further scrolling messages.




If calibration fails, _ _ _ **CALIBRATION FAILED** will scroll across the display twice and you will be directed out of the calibration menu to the operational display. Check your signal and connections, and then repeat the calibration procedure.

▶▶ MV/V METHOD ▶▶

- J** **___ ENTER TOTAL FULL SCALE WEIGHT OF LOAD CELLS IN COUNTS** scrolls across the bottom row and the current selection appears in the top row. Using the  and  buttons, enter the total full scale weight of the connected load cell(s) in counts. Then press .

Refer to the load cell manufacturer's test certificate.




- K** **___ ENTER MV/V FROM LOAD CELL** scrolls across the bottom row and the current selection appears in the top row. Using the  and  buttons, enter the mV/V (or average mV/V) of the connected load cell(s). Press .

- L** **___ SET ZERO NOW ?** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select **No** or **Yes**. Press .

*Selecting **Yes** sets your zero position when the load cells are powered up and in position.*

- M** **mV/V** calibration is now complete. You will be directed out of the calibration menu to the operational display.


▶▶ ZERO (OFFSET) CALIBRATION ▶▶

- N** **___ ADJUST OFFSET** scrolls across the bottom row and the currently selected zero value appears in the top row. Place a known weight on the weigh platform if required, and then use the  and  buttons to enter the desired value at this weight. Then press  to accept.




The offset will be automatically calculated to match the desired weight, and the scale factor will not be altered. Normally the weight would be removed from the weigh platform and the desired value would be zero.

- O** **Zero** calibration is now complete. You will be directed out of the calibration menu to the operational display.

▶▶ E-CAL METHOD ▶▶

- P** **___ E_CAL ZERO OFFSET** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to adjust the zero offset value, and then press .

*After a calibration has been performed, the **E_CAL ZERO OFFSET** value shows the resulting zero offset.*

- Q** **___ E_CAL SCALE FACTOR** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to adjust the scale factor value, and then press .

*After a calibration has been performed, the **E_CAL SCALE FACTOR** value shows the resulting scale factor.*

- R** **E_Cal** calibration is now complete. You will be directed out of the calibration menu to the operational display.

5.5 Zero maintenance

▶▶ 5.5 Quick Access from operating mode ▶▶

Short-press **[F1]**. Use **[▲]** & **[▼]** to enter PIN. Press **[P]** 4 times.

A **___ ZERO MAINTENANCE** scrolls across the bottom row and **Skip** appears in the top row. Press **[P]** to skip to 5.6, or the **[▲]** button and then **[P]** to **Enter** zero maintenance.

B **__ _ AUTO ZERO** scrolls across the bottom row and the current selection appears in the top row. Use the **[▲]** and **[▼]** buttons to select **Off** or **On**, and press **[P]**.




*If **AUTO ZERO** mode is **On**, the controller's offset will be automatically adjusted so that the instrument reads zero when it senses that the scale is not loaded. See Appendix C for more information.*

C






If you selected Off in 5.5B:




Skip steps 5.5D-E and continue to 5.5F now.

- D** _ _ _ **CAPTURE BAND** scrolls across the bottom row and the current selection appears in the top row. Adjust this value using the  and  buttons, and then press .

See Appendix C for more information.

- E** _ _ _ **MOTION BAND** scrolls across the bottom row and the current selection appears in the top row. Adjust this value using the  and  buttons, and then press .

See Appendix C for more information.

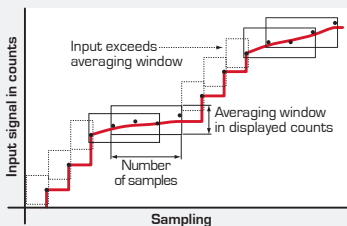
- F** _ _ _ **ZERO BAND** scrolls across the bottom row and the current selection appears in the top row. Adjust this value using the  and  buttons, and then press .

See Appendix C for more information.




5.6 Averaging

Your controller has input signal averaging, optimising stable measurement.




If the change in input exceeds the averaging window value it will not average, ensuring fast response when there are large differences between readings. (E.g. When a product is being dropped into a bag).



- A** **__ _ AVERAGING PARAMETERS** scrolls across the bottom row and **Skip** appears in the top row. Press **(P)** to skip to 5.7, or the **(▲)** button and then **(P)** to **Enter** averaging parameters setup.

- B** **___ AVE SAMPLES** scrolls across the bottom row and the currently selected averaging appears in the top row. Using the  and  buttons, alter the number of input samples that the controller will average, and then press .

Increasing the number of samples will stabilise measurement, but it will also slow down response rates. Typical value is 4.

- C** **___ AVE WINDOW** scrolls across the bottom row and the currently selected averaging window value appears in the top row. Using the  and  buttons, alter the signal averaging window. Then press .

If your input signal contains large noise spikes, then you can increase the size of averaging window to ensure that these pulses are still averaged. However, increasing the averaging window too far will reduce the ability of the controller to respond quickly to real changes in input signal. A setting of 0 averages all reading. A typical value is 10% of your system capacity.

5.7 Analog output setup (if installed)




Some models do not have this option installed - these instructions are only relevant to controllers with analog output.

A **___ ANALOG OUTPUT SETUP** scrolls across the bottom row and **Skip** appears in the top row. Press **[P]** to skip to 5.8, or the **[▲]** button and then **[P]** to **Enter** analog output setup.

B **___ DATA SOURCE FOR ANALOG O/P** scrolls across the bottom row and the currently selected data source appears in the top row. Using the **[▲]** and **[▼]** buttons, select: **Net/Batch** or **Live**, and then press **[P]**.

Net/Batch option is subject to the weighing mode selected in 5.2E. (Normal mode = Net option, Batch mode = Batch option.)

C **___ LOW SCALE VALUE FOR ANALOG O/P** scrolls across the bottom row and the currently selected low scale value appears in the top row. Use the **[▲]** and **[▼]** buttons to set the low scale value. Then press **[P]**.

- D **_ _ _ HIGH SCALE VALUE FOR ANALOG O/P** scrolls across the bottom row and the currently selected high scale value appears in the top row. Use the  and  buttons to set the high scale value. Then press .

5.8 Serial setup (if installed)

Please note that some models do not have this option installed - these instructions are only relevant to controllers with serial output. Configuring the serial port on your GS100R (as specified below) will allow you to connect your controller to a PC or another device.




A _ _ _ **SERIAL SETUP** scrolls across the bottom row and **Skip** appears in the top row. Press **P** to skip to 5.9, or the **▲** button and then **P** to **Enter** serial port setup.

B _ _ _ **SERIAL MODE** scrolls across the bottom row and the current selection appears in the top row. Using the **▲** and **▼** buttons, select either: **ASCII, Modbus (RTU)** or **Ranger A**. Then press **P**.

ASCII is a simple protocol that allows connection to various PC configuration tools.

Modbus is an industry standard RTU slave mode that allows connection to a wide range of devices, such as PC's or PLC's.

Ranger A is a continuous output, used to drive remote displays and other instruments in the Rinstrum™ range. (Ranger is a tradename belonging to Rinstrum Pty Ltd.)

- C** ___ SERIAL DATA SOURCE scrolls across the bottom row and the currently selected data source appears in the top row. Using the  and  buttons, select: **Net/ Batch** or **Live**, and then press .




Net/ Batch option is subject to the weighing mode selected in 5.2E. (Normal mode = Net option, Batch mode = Batch option.)

- D**












If you selected ASCII or Modbus in 5.8B:

Skip step 5.8E and continue to 5.8F now.

- E** _ _ _ RANGER OUTPUT MODE scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select either **Cont.** (continuous) or **Pulsed**. Then press .

*In **Cont.** (continuous) mode, the controller outputs a continuous stream of data. In **Pulsed** mode, the controller outputs a single string when the print function is triggered from a user input button or pin (see 5.2H-K and Appendix B).*

- F** ___ **BAUD RATE** scrolls across the bottom row and the current selection appears in the top row. Using the  and  buttons, select: **300, 600, 1200, 2400, 4800, 9600, 19200** or **38400**, and then press .
- G** ___ **PARITY** scrolls across the bottom row and the current selection appears in the top row. Using the  and  buttons, select: **None, Odd** or **Even**. Press .
- H** ___ **SERIAL ADDRESS** scrolls across the bottom row and the currently selected serial address appears in the top row. Use the  and  buttons to alter the serial address, and then press .

*The serial address parameter is used to identify a particular device when it is used with other devices in a system. [It applies particularly to **Modbus** mode when used on an option 4 (RS485) serial network.] The serial address of the controller must be set to match the serial address defined in the master device.*

For serial register tables, see Appendix D.

5.9 Edit calibration PIN

- A** _ _ _ **EDIT CAL PIN** scrolls across the bottom row and **Skip** appears in the top row. Press **(P)** to skip and return to the operational display, or the **(▲)** button and then **(P)** to **Enter** and change your PIN number.
- B** _ _ _ **ENTER NEW CAL PIN** scrolls across the bottom row and the current PIN (default 1) appears in the top row. Using the **(▲)** and **(▼)** buttons, enter your new calibration PIN number. Then press **(P)** to exit and return to the operational display.

6 SETPOINT SETUP

Enter the setpoint setup mode by pressing and holding the **F2** button for 3 seconds.

6.1 Enter setpoint PIN

A **_ _ _ ENTER SP PIN** scrolls across the bottom row and **0** appears in the top row. Use the **▲** and **▼** buttons to enter your security code (factory default 1). Then press **P**. If the correct PIN is entered then the setup is started at 6.2.


If an incorrect PIN number is entered, **_ _ _ ACCESS DENIED** scrolls across the display and it returns to the normal operating mode.

YOU WILL BE GIVEN THE OPPORTUNITY TO CHANGE YOUR PIN NUMBER AT THE END OF THIS SECTION (6.3). IF YOU HAVE FORGOTTEN YOUR PIN NUMBER, SEE SECTION 9.

6.2 Edit setpoints

A ___ **EDIT SETPOINT** scrolls across the bottom row and **Skip** appears in the top row. Press **P** to skip to 6.3, or use the **▲** and **▼** buttons to select a setpoint to edit: **SP 1** or **SP 2**. Then press **P**.

B ___ **SP VALUE** scrolls across, and the display value at which the setpoint will activate appears. Adjust this value using the **▲** and **▼** buttons, and then press **P**.

C  **If you selected SP 1 in 6.2A:**

Skip step 6.2D and continue to 6.2E now.

D ___ **TRAIL SP1** scrolls across the bottom row and the current selection appears in the top row. Use the **▲** and **▼** buttons to select **Off** or **On**. Press **P**.

*If you choose **On**, the selected setpoint will be automatically adjusted whenever SP 1 is changed, so that the 2 setpoints always trail each other by the same amount. Note: Set negative polarity if the setpoint operates before SP 1.*

E






If you selected **Batch** in 5.2E:

SP 1 and **SP 2** are reserved for batch functions when your controller is in **batching mode**.




Skip steps 6.2F-J and continue to 6.2K now.

F




___ **SP SOURCE** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select **Net/Batch** or **Live**. Then press .

Net/Batch option is subject to the weighing mode selected in 5.2E. (Normal mode = Net option, Batch mode = Batch option.)


G

___ **SP ACTIVATION** scrolls across the bottom row and the current selection appears in the top row. Using the  and  buttons, select the relay activation to operate **Above** or **Below** the setpoint value, and then press .




*Select **Above** for the relay to turn on above the setpoint value and off below it. Select **Below** for the relay to turn on below the setpoint value and off above it.*

- H _ _ _ **HYSTERESIS VALUE** scrolls across, and the current selection appears. Adjust this value using the  and  buttons, and then press .

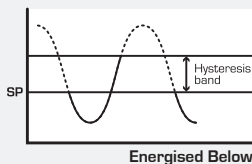
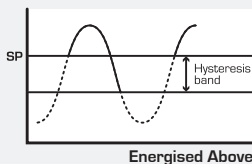
This defines the separation band between setpoint activation and deactivation, and will operate as per the type [set in 6.2J.]

- I  **If you set the HYSTERESIS VALUE to 0 in 6.2H:**

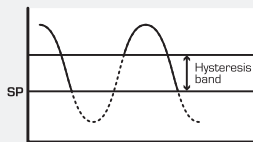
Skip step 6.2J and continue to 6.2K now.

- J _ _ _ **HYSTERESIS TYPE** scrolls across, and the current selection appears. Use the  and  buttons to select **Alarm** or **Cntrl**, and then press .

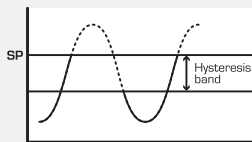
ALARM - Setpoint value setpoint activation point
Hysteresis value setpoint deactivation point






CNTRL - Setpoint value setpoint deactivation point
Hysteresis value setpoint reactivation point






Energised Above




Energised Below

- K** ___ **MAKE DELAY** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to adjust the make delay value as required, and then press .

The make delay value defines the delay between setpoint activation and when the relay turns on. This value is in tenths of a second.

- L** ___ **USER ACCESS ?** scrolls across the bottom row and the current selection appears in the top row. Use the  and  buttons to select **Off** or **On**. Press .

*Choosing **On** will allow the selected setpoint to be quick-edited via the  button without entering a PIN (see section 8). User access can be independently configured for each setpoint.*

M _ _ _ **EDIT SETPOINT** scrolls across the bottom row and **Skip** appears in the top row. You are now back at 6.2A.

To edit another setpoint, follow the instructions from 6.2A-M again. If you do not wish to edit another setpoint, press **P** now to **Skip** to 6.3.

6.3 Edit setpoint PIN

- A** ___ **EDIT SP PIN** scrolls across the bottom row and **Skip** appears in the top row. Press **P** to skip and return to the operational display, or the **▲** button and then **P** to **Enter**.
- B** ___ **ENTER NEW SP PIN** scrolls across the bottom row and the current PIN (default 1) appears in the top row. Using the **▲** and **▼** buttons, enter your new setpoint entry PIN number. Then press **P** to save and exit to the operational display.

7 FACTORY ANALOG OUTPUT CAL




FACTORY ANALOG OUTPUT CALIBRATION IS PRECISELY SET BEFORE SHIPPING THIS INSTRUMENT. DO NOT ACCESS THIS FEATURE UNLESS INSTRUCTED BY THE MANUFACTURER. FOR ANALOG OUTPUT SCALING, SEE 5.7.

7.1 Factory calibration

- A** Start with your controller powered off. Power up the controller while holding the **F1** button.
- B** **___ ENTER CAL PIN** scrolls across the bottom row and **0** appears in the top row. Use the **▲** and **▼** buttons to enter your security code (factory default 1). Then press **P**. If the correct PIN is entered, continue to 7.1C.

If an incorrect PIN is entered, **___ ACCESS DENIED** scrolls across and it returns to the main display.

See section 9 if you have forgotten your PIN.




C ___ **CALIBRATE ANALOG O/P?** scrolls across, and the current selection appears. Use the  and  buttons to select **Yes** or **No**, and then press .




D



If you selected NO in 7.1C:

Skip steps 7.1E-F and continue to 7.1G now.

E ___ **CAL LOW ANALOG O/P** scrolls across the bottom row and the currently selected low scale value appears in the top row. Use the  and  buttons to set the low scale value. Then press .

F ___ **CAL HIGH ANALOG O/P** scrolls across the bottom row and the currently selected high scale value appears in the top row. Use the  and  buttons to set the high scale value. Then press .

G Analog output calibration is now complete. You will be directed to the operational display.

8 SETPOINT EASY ACCESS

If none of the setpoints have their easy access option switched on, then this feature will be disabled and the **F2** button will not respond to a short button press (see 6.2L).




8.1 Setpoint easy access

- A** Begin by pressing the **F2** button for less than 3 seconds. The setpoint name (**SP 1** or **SP 2**) will appear in the bottom row and the current value for that setpoint will appear in the top row. Using the **▲** and **▼** buttons, adjust the selected value. Then press **P** to accept the new setpoint value.
- B** If any other setpoints have the easy access option enabled then the same process is repeated for the next setpoint. Pressing **P** for the last enabled setpoint will exit and return to the operational display.

9 RESET PIN NUMBERS

If you have forgotten your PIN number, follow the procedure below to reset both the calibration and setpoint setup PIN numbers to their factory default of 1.

9.1 Reset PIN numbers

- A** Press ,  and  at the same time. (This key combination can be difficult to execute and you may need several tries to get it right.)
- B** When successful, a factory identification text will scroll across the display, followed by: **PIN RESET TO 1.**
- C** Reset the default PIN numbers if required by following the instructions in 5.9 (for setup and calibration) and 6.3 (for setpoint setup).

A

APPENDIX A
Tare & Batch Features

A.1

Tare

To access tare features, the controller's weighing mode must be set to **Normal** (see 5.2E). It is then possible to tare/reset tare from the **P** button or rear input pins (see 5.2H-K and Appendix B).

Tare - This feature 'zeroes' the display, and is usually used to deduct the weight of the container from the total weight, leaving only the weight of the product.

Tare Reset - This feature clears the current tare value and show the gross weight on the display.

A.2**Batch**

To access batching features, the controller's weighing mode must be set to **Batch** (see 5.2E). It is then possible to batch/reset batch from the **P** button or rear input pins (see 5.2H-K and Appendix B).

Batch - This function is used to display the live weight of the system but take regular 'batches' of product without continually changing the setpoint. When the **Batch** function is activated the display will tare and SP 1 and SP 2 will turn on.

Batch Reset - This feature resets the batch value to zero and halts any current batching operations.

Batching Direction - This parameter is set in 5.2G, and is based on whether product is being added to or discharged from the weighing system. See overleaf for how to use positive/negative batching directions.

Normal batching is when the weight increases as product is added to the weighing system. Set **BATCHING DIRECTION** to **Positive** (see 5.2G).

*Eg. Setting a setpoint value of 50Kg for SP 1 and 5Kg for SP 2 and enabling batching mode (**Positive** direction) will allow the user to fill a container to 50Kg with a potential speed change at 45Kg (50Kg - 5Kg). The cycle is initiated when the **Batch** function is triggered. The display tares, and when 45Kg net weight is shown, SP 2 drops out. If product continues to feed, at 50Kg SP 1 drops out, halting the fill. The user can then trigger the **Batch** function again if desired.*

Loss in weight batching is when the weight decreases as product is removed from the weighing system. Set **BATCHING DIRECTION** to **Negative** (see 5.2G).

*Eg. Setting a setpoint value of 50Kg for SP 1 and 5Kg for SP 2 and enabling batching mode (**Negative** direction) will allow the user to fill a container to 50Kg with a potential speed change at 45Kg (50Kg - 5Kg). The cycle is initiated when the **Batch** function is triggered. The display tares, and when 45Kg net weight is discharged, SP 2 drops out. If product continues to feed, at 50Kg SP 1 drops out, halting the product flow. The user can then trigger the **Batch** function again if desired. In this mode if there is not enough product then the GS100R will show the message **LOW PRODUCT**. If **gross > SP1**, the batch value is reset to zero and the display flashes **Batch**. SP1 is turned on (and SP2 if set up). If **gross < SP1**, batching is not started.*

B

APPENDIX B
Input Functions

This section provides information on user programmable functions that are accessible from the **P** button and rear pins (see 5.2H-K). Refer to the key for activation times.

Please note that availability of the **Tare/Batch** feature is subject to your selection in 5.2E.

KEY

P	Continuous press	→	Continuous pin activation
P ^{1/2}	Short press (1/2 sec)	→ ^{1/2}	Short pin activation (1/2 sec)
P ²⁺	Long press (2+ sec)	→ ²⁺	Long pin activation (2+ sec)

Hold	P →→	Freezes the current display value.
Lock	→	Locks the control panel.
Tare	P ^{1/2} →→ ^{1/2}	Tares display value (flashes Tare).
	P ²⁺ →→ ²⁺	Resets tare to zero (flashes Tare Rst and then shows gross).

- Batch** $\boxed{P}^{1/2} \leftrightarrow 1/2$ Performs a batch operation.
If a batch is already in progress, no function will be performed.
*If you have just powered up following a power loss during batching, then activating this function will cause the controller to **Resume** without resetting the batch value.*
See Appendix A for more information.
- $\boxed{P}^{2+} \leftrightarrow 2+$ Resets the batch value to zero and flashes **Batch Rst.** Any current batching operations will be halted.
- Zero** $\boxed{P}^{1/2} \leftrightarrow 1/2$ Zeroes the weight if the zero offset (i.e. the difference between the current no load weight and the calibration no load value) is within the **ZERO BAND**.
*If the offset is less than the limit set in **ZERO BAND** (see 5.5F), the zero value is updated and the display flashes **ZERO**.*
*If the offset is greater than the limit set in **ZERO BAND** (see 5.5F), the zero value is not updated and the display scrolls **OUTSIDE OF ZERO BAND!***
See Appendix C for more information.
- $\boxed{P}^{2+} \leftrightarrow 2+$ Resets the zero offset value to the original calibration offset value. Display flashes **Rs Zero** and then shows gross.

Peak	$\boxed{P}^{1/2}$	Displays the peak value for 2 seconds.
	\boxed{P}^{2+}	Sets the peak value to the current input value. Display flashes Peak Rst.
	\rightarrow	Displays the peak value continuously.
Peak Rst	$\boxed{P} \rightarrow$	Sets the peak value to the current input value. Display flashes Peak Rst.
Print	$\boxed{P} \rightarrow$	Sends a single Ranger A output string.

*Serial Mode must be set to **Ranger A** (see 5.8B), and **RANGER OUTPUT MODE** must be set to **Pulsed** (see 5.8E).*

C

APPENDIX C

Zero Maintenance

The zero maintenance feature is used to automatically compensate for slow drift in loadcell output due to factors such as temperature change, rain and dust accumulation over time. The controller display will zero automatically, provided that changes to the loadcell remain within the user specified **CAPTURE BAND**, **MOTION BAND** and **ZERO BAND** parameters (see 5.5D-F).

CAPTURE BAND (5.5D) - This is the maximum number of display counts that the controller will automatically zero within. The **CAPTURE BAND** is referenced to the current zero value. If the input value on the load cell is not within the **CAPTURE BAND** setting then the controller displays the current loadcell value and does not zero.

***CAPTURE BAND** can be set from 1 to 254 counts, and should always be set to less than the smallest weight to be measured. Setting the **CAPTURE BAND** to 0 will turn the auto zero feature off.*

MOTION BAND (5.5E) - This provides a rate of change limit setting, to determine the number of counts/second allowed within the **CAPTURE BAND**. If the count change is within the **CAPTURE BAND**, but the speed of the count change is more than the selected **MOTION BAND**, then the controller displays the current loadcell value and does not zero.

*The **MOTION BAND** can be set from 0 to 255 counts. Typical value is 1 or 2 counts/sec.*

ZERO BAND (5.5F) - This provides a limit for the number of counts of zero offset allowed to accumulate, relative to the calibrated zero setting. If the accumulated zero offset becomes greater than this window, then the controller displays the current loadcell value and does not zero.

*The suggested limit for the **ZERO BAND** is 2% of the calibrated span. If the controller fails to zero, check for mechanical or electrical faults.*

D

APPENDIX D

Serial Register Tables

MODBUS REGISTERS - These are all holding registers and should be accessed via function codes 3 and 6. Register addresses are displayed in the Modicon™ addressing format. i.e. Register 65=40065 [subtract 1 for direct addressing].

16-BIT UNSIGNED		32-BIT SIGNED (2x16-bit)	
Address	Function	LSW / MSW	Function
40001	Alarm status*	40515 / 40516	Tared/Batch weight (net)
40065	Hysteresis SP1	40517 / 40518	mV
40071	Make delay SP1	40521 / 40522	Live weight (gross)
40066	Hysteresis SP2	40529 / 40530	Tare value
40072	Make delay SP2	40525 / 40526	Peak
40067	Hysteresis SP3	40527 / 40528	Valley
40073	Make delay SP3	40535 / 40536	Setpoint 1
40068	Hysteresis SP4	40537 / 40538	Setpoint 2
40074	Make delay SP4	40539 / 40540	Setpoint 3
*Bit 0=SP1, Bit 1=SP2, Bit 2 =SP3, Bit 3=SP4		40541 / 40542	Setpoint 4
		40587 / 40588	D/A scale low value
		40591 / 40592	D/A scale high value

ASCII REGISTERS


<i>16-BIT UNSIGNED</i>	
<i>Address</i>	<i>Function</i>
1	Alarm status*
65	Hysteresis SP1
71	Make delay SP1
66	Hysteresis SP2
72	Make delay SP2
67	Hysteresis SP3
73	Make delay SP3
68	Hysteresis SP4
74	Make delay SP4
* Bit 0=SP1, Bit 1=SP2, Bit 2=SP3, Bit 3=SP4	

<i>32-BIT SIGNED</i>	
<i>Address</i>	<i>Function</i>
3	Tared/Batch weight (net)
4	mV
39	Live weight (gross)
16	Tare value
12	Peak
13	Valley
6	Setpoint 1
7	Setpoint 2
8	Setpoint 3
9	Setpoint 4
34	D/A scale low value
36	D/A scale high value

RANGER A - This allows the controller to drive a remote display from the Rinstrum range. The following shows the output string format when Ranger A output is selected:

<Start> <Sign> <Output Value> <Status> <End>

<i>STRING CHARACTER(S)</i>	
<Start>	STX character (ASCII 02)
<Sign>	Output value sign (space for + and dash for -)
<Output Value>	Seven character ASCII string containing the current output value and decimal point. <i>(If there is no decimal point, then the first character is a space. Leading zero blanking applies.)</i>
<Status>	Single character output value status: U=Under, O=Over, E=Error
<End>	ETX character (ASCII 03)



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