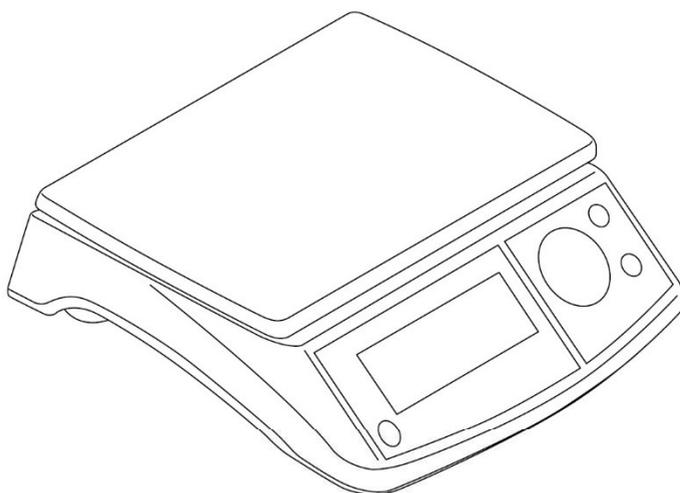




GRAM

SERIES
S2



EN



OPERATION MANUAL

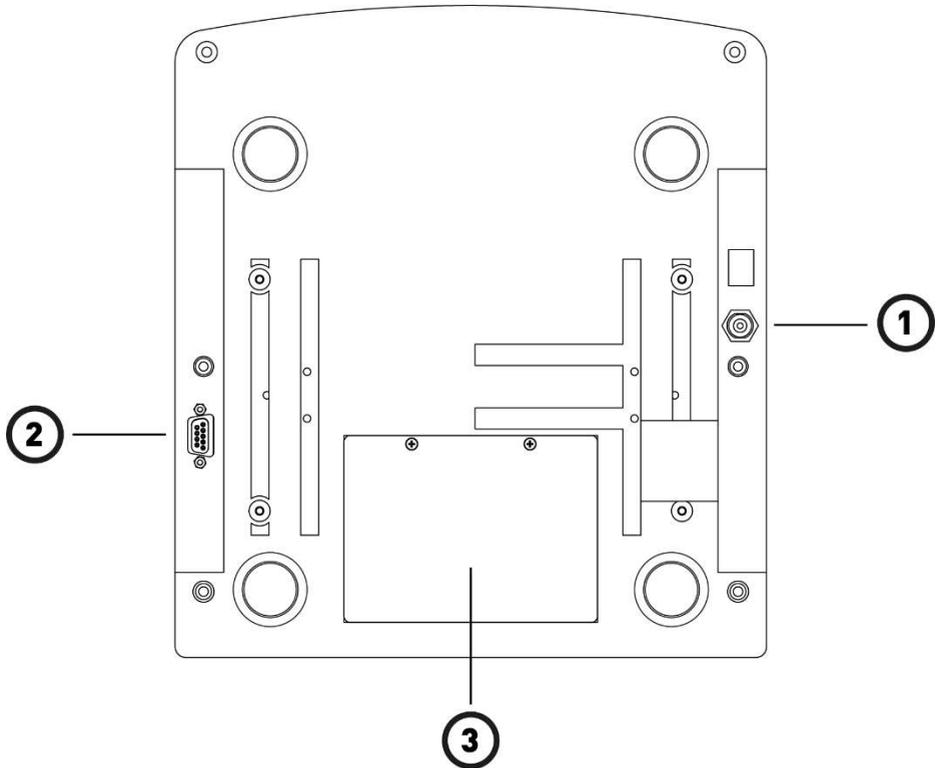


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1. Before using S2

S2 connections:

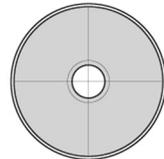
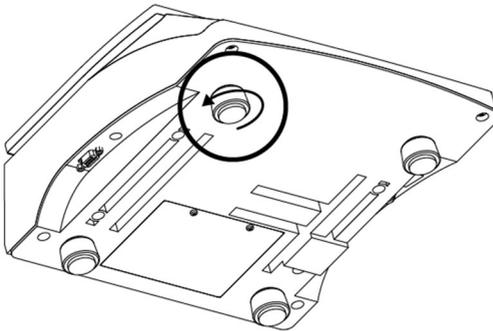
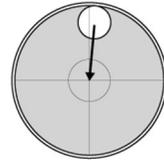
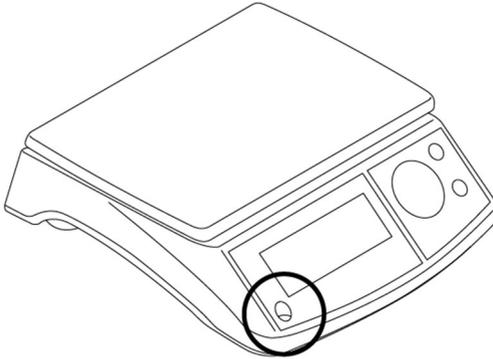


1. AC/DC power adapter, output 7,5 Vdc – 1 A
2. Data output, serial RS-232.
3. Battery 6V-4Ah

Plug the AC/DC adaptor to to an electrical outlet to charge the battery before its first use.

The scale should be placed on a smooth and flat surface.

For correct operation, S2 scale must be level in the horizontal plane. Before using the balance, check the bubble level included in the balance, and adjust the feet if necessary.



Balance S2 is a device sensitive to temperature changes. To achieve the maximum performance and accuracy, it is advisable to install the scale at his place and keep it on at least 30 minutes before using.

2. On / Off



Press and hold the key  for 2 seconds.

All segments and symbols switch on for a second on the LCD display to verify that they are functioning properly.

Below we show the version code for the device's firmware.

To switch off the device, press and hold the key for 2 seconds.

An **OFF** message will appear to warn that the device will be switched off when the key is released.

3. Initial zero setting

If the **In I-0** option in the operating options menu is activated, when switching on the device it will automatically reset to zero and will be indicated on the display with the message **-00-**.

Automatically resetting to zero at the start requires the scale to remain stable for at least 5 seconds. For as long as the scale is moving, the **-00-** indication will be maintained for a maximum of 10 seconds.

If this time is exceeded without achieving a stable indication, the display will show the message **Err 0** and then the weight on the scale.

If the weight on the load receptor is higher than 10% of the scale's maximum capacity, the error message **Err 0** will be displayed, followed by the weight on the scale.

4. Keypad operation

4.1. TARE



A short pulse activates the tare function. This may be “*Normal tare*” or “*Preset tare*” depending on the operating mode selected in the options menu.

- **Preset tare.** The tare stays in the memory after emptying the platform. The >T< indication on the display stays constant, non-flashing. When the platform is emptied, the display shows the tare value with a negative sign. To undo the tare, press the tare button again with an empty platform.
- **Normal tare.** The tare is automatically deactivated when the platform is emptied. The >T< indicator is switched on intermittently in the LCD display.

When double clicking on this key, the tare mode alternates from “preset tare” to “normal tare”. The default operating mode for tare is “preset tare”, although this value can be changed in the options menu.

If the reading is less than 50 divisions, the display will automatically set to zero instead of a tare.

If there is a preset tare in the memory and the platform is empty, pressing this button deactivates the tare.

If the $\pm 5\text{Lb}$ option has been activated, the tare function only operates if the weight is stable. If the stability indicator is switched off, pressing this key has no effect.

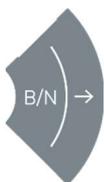
4.2. ESC key



In "weight indicator" mode, performs the "CLEAR" function: cancels the tare, cancels the "hold" mode, and resets the accumulated total weight.

In "menu" mode, it performs the "ESC" function: it returns to the previous level of the menu without making any changes. If you are in the main menu, you exit the menu mode and return to normal operating mode (weight mode).

4.3. Gross / Net



When the tare function is activated, a short press alternates the display of the net weight per gross each time the button is pressed. While viewing the net weight, the "NET" indication is activated in the LCD display.

In "menu" mode, advance to the next available option. If you are editing a numeric value, this key increases the value of the digit that is flashing..

4.4. "Hold" mode On / Off



A short press switches to On / Off the "HOLD" mode

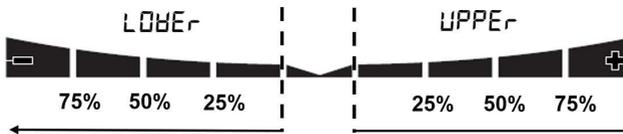
In "menu" mode, advance to the previous option. If you are editing a numeric value, this key decrements the value of the digit that is flashing.

4.5. MENÚ / Activación control de límites



Keep the key pressed down for 2 seconds to access the settings menu.

A short press switches on / off the limits control function. When the limit control function is activated, an indication at the bottom of the LCD display shows whether the weight on the plate is less than the **LOWER** value or is greater than the **UPPER** value. When the weight is between the two values, a signal appears indicating that the weight is in the range defined by the lower limit and the upper limit.



To change the lower and upper limits, access the configuration menu and access the "Limits" function (see section 12). A double click on this key allows direct access to this section of the configuration menu.

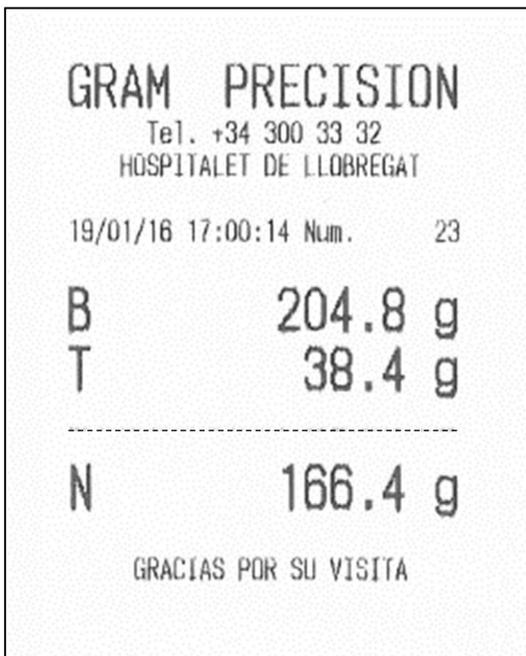
4.6. PRINT / SUM



In "menu" mode, access the next level or validate the selected option, acting as "Enter" key. If you are editing a numeric value, this key moves the cursor (blinking digit) to the next digit. If you are editing a numerical value, double press this key, or keep it pressed for more than 2 seconds, validate the contents of the display and return to the previous level of the configuration menu.

In weighing mode, it acts as a printing and addition key.

When pressing this key, a ticket is printed with the weight shown on the LCD display. The ticket shows print date and time, the ticket's serial number, gross weight, tare and net weight. Additionally you can print a 3-line header and a footer line with constant information.



The print key has no effect while the stability indicator is switched off.

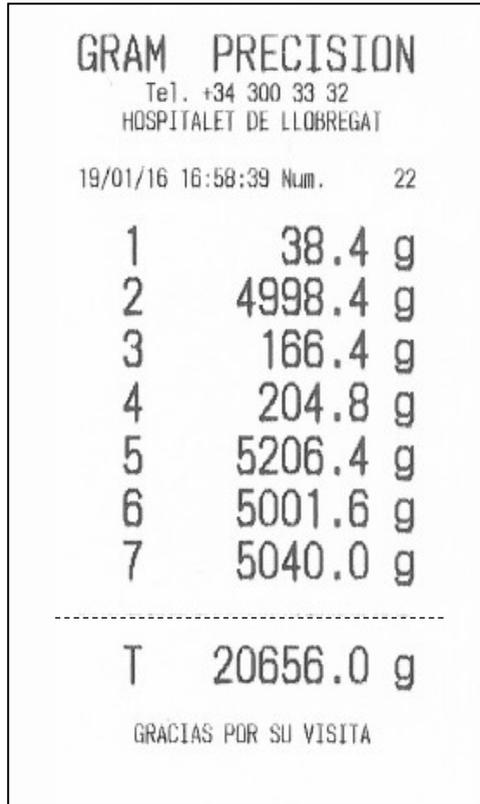
This gross/tare/net ticket is only possible provided no ticket with accumulated total has been initiated, which has a different format.

To initiate a ticket with accumulated total, enter the first object to be included in the ticket and double click on the print key. The weight shown on the display is printed and added to the accumulated total.

Double click the print key again to add and print each one of the next weighings.

At the end of each detail sum, the total accumulated sum appears in the display.

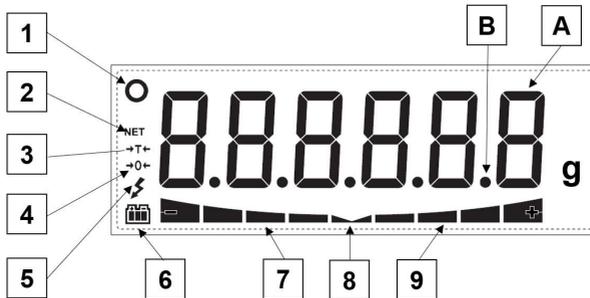
To complete the ticket and print the total line, hold down the print key for more than 2 seconds.



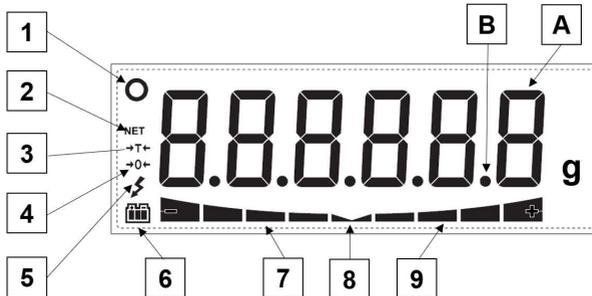
To show the total sum, press at the same time  and  keys (a short pulse, not a sustained pulse).

The total accumulated sum will appear in the display for 2 seconds.

5. Description of LCD display



A		<p>Displays the weight on the scale pan.</p> <p>In HOLD mode, the display flashes to indicate that the real weight on the scale is not being shown, with the last registered stable weight being shown instead.</p>
B		<p>Decimal point.</p>
1		<p>Stable weight reading: There is a weight on the platform that is not fluctuating.</p> <p>Flashes to indicate that there is movement on the scale.</p>
2		<p>Indicates net weight. The net weight is the real weight on the scale minus the tare. It is only displayed if a tare has been used.</p>
3		<p>Tare activated. The reading flashes when “normal” tare mode has been activated. A “preset” tare is retained even after the weight is removed from the scale platform.</p>
4		<p>Scale is set to zero (weigh is less than ¼ division)</p>



5		Connected to the mains.
6		Battery-operated.
7		<p>The weight is below the lower limit.</p> <p>The 4 segments of this indicator are activated proportionally to the difference between the weight on the pan and the value of the lower limit.</p> <p>The thickest segment indicates that the weight is less than the value set as a lower limit in a proportion of 100% or more.</p>
8		The weight is within the range between the lower limit and the upper limit.
9		<p>The weight is above the upper limit.</p> <p>The 4 segments of this indicator are activated proportionally to the difference between the weight on the balance and the value of the upper limit.</p> <p>The thickest segment indicates that the weight exceeds the value set as the upper limit in a proportion of 100% or more.</p>

6. Operation options and settings menu

To access the settings menu, keep the  key pressed down for 2 seconds. The display shows the  message for ½ second to indicate that from then on the indicator will start showing the different selection options. In the “menu” mode, the device’s pushbuttons adopt the function of navigation keys. These functions are indicated in the top part of each pushbutton: **ESC**, **←**, **↶**, **→**



Returns to the menu’s previous level without making any change.

When in the main menu, exit the menu mode and return to normal operation mode (weight mode).



It moves to the next menu option in the "left" direction, or changes between the different values that can be assigned to a specific option.

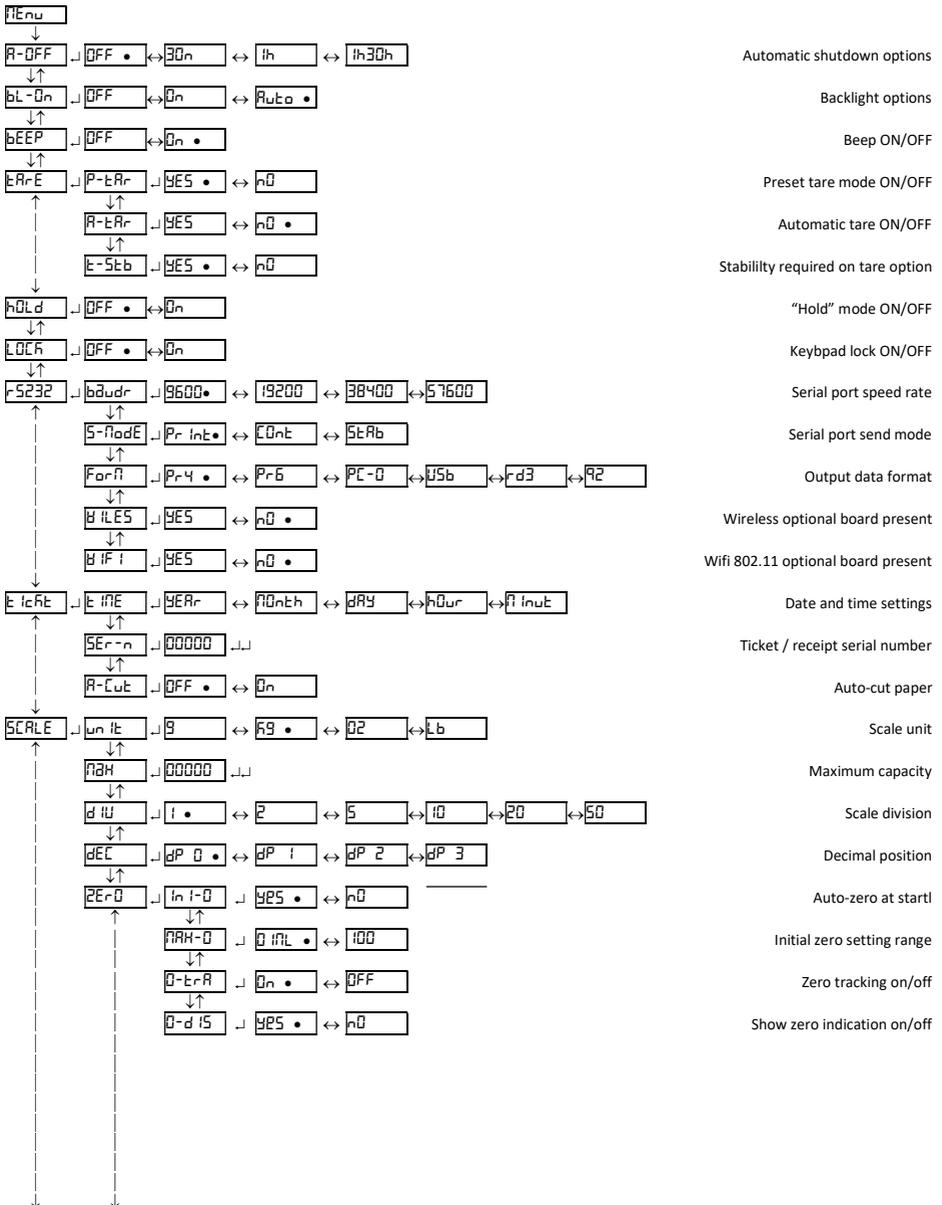


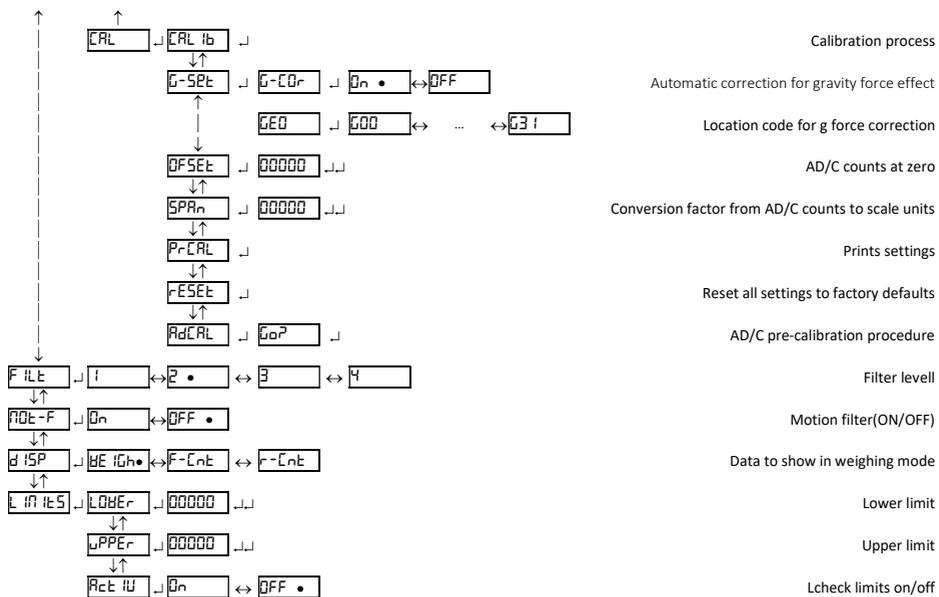
Moves to the next level of the options menu or shows the current value of an option. When changing the selected value for an option (using the **←** and **→** keys), pressing this key will validate the change. In “edition” mode (manual input of a parameter value), one short click moves you to the next digit on the display. A long hold or a double click validates the entered value.



Moves to the next menu option in the “right” direction or changes between the different values that can be assigned to a specific option.

The following table summarizes the different settings and options:





NOTE: The symbol • on the table below indicates the factory settings for each option.

7. Auto-off option A-OFF

This option programs the device's automatic switch-off after a time on idle (not being used). The device is understood to be on idle if there is no variation in the weight indication, and no key is pressed.

The possible options are the following:

OFF ●

The device always remains switched on. Option selected at source.

30n

The device switches off automatically after 30 minutes of inactivity.

1h

The device switches off automatically after 1 hour of inactivity.

1h30n

The device switches off automatically after 1:30 hours of inactivity.

8. Operation of the backlight bL-On

This option controls the performance of the LCD display backlight. Together with the **Auto-off** option, it reduces power consumption and extends battery life. The device is deemed to be inactive if there are no changes in weight indication and no key has been pressed.

The possible options are the following:

Auto ●

The backlight switches off automatically after 6 seconds of inactivity. This is the option selected at source.

OFF

The backlight is always switched off.

On

The backlight is always switched on.

9. Sound when pressing a key bEEP

This function activates (“On”) or deactivates (“Off”) the emission of a sound when one of the keypad buttons is pressed.

The factory setting for this option is “On”.

10. Tare tArE Options

The possible options are:

P-tAr Preset tare: The tare will be maintained until the tare key is pressed again with an empty scale. It is the default option.

R-tAr Auto-tare: When a stable weight is detected, the indicator sets a tare automatically. When the scale is emptied, the tare disappears (goes back to zero).

t-5tb Yes (default option): The weight needs to be stable to set a tare.

11. Hold mode hOLd

This function activates (On) or deactivates (Off) the **hold** mode. When this operating mode is activated, the display always shows the last stable weight of the load placed on the platform. That is, even if the load is removed from the platform, the display will continue to show the last weight indicated. If the load has been removed, the weight is shown intermittently to indicate that the **hold** mode is in operation. Clicking the “HOLD” key activates / deactivates the “HOLD” mode.

12. Keypad lock LOCK

This function locks the keypad except for the on / off button and access to the options menu.

When a key is pressed with the keypad lock activated, no action is performed and the display shows LOCK for 1 second. That is, while the keypad is locked it is not possible to set a tare, reset to zero, print a ticket or reset total accumulated weight.

This option stays in the memory and is not deactivated when the device is switched off and on.

13. Limits control LIMITS

This function allows you to set the lower and upper limit, as well as to select whether the limit control must be activated when the equipment is turned on.

The possible options are:

LOWER Value of the lower limit, including the decimal part.

UPPER Value of the upper limit, including the decimal part.

ACT U Yes / No: Activate the limit control when turning on the device. The H-L key turns on/off the limit control in weighing mode.

14. Serial port RS-232

r5232

S2 scale can be connected to other devices to send and receive information via an RS-232 interface. The connection is made using the DB9 connector on the scale chassis.



2	RxD
3	TxD
5	GND

In this menu, it is possible to configure the different data transmission options from the indicator.

bAudr

It allows the speed to be selected at which the serial interface will be connected. The possible options are: 9600 bauds, 19200 bauds, 38400 bauds, or 57600 bauds. Transmission format for each byte is 8 bits without parity bit, 1 stop bit ("8,n,1") and is not configurable.

S-Mode

Mode in which the data frame transmission will be made:

Pr Int ●

Cont

StAb

- When pressing the print key.
- Continuously, at a rate of 5 frames sent per second.
- Automatically every time there is a new stable weight on the scale.

Form

Data frame format. Enables selecting the following options.

PR4 ●

Connection to model **PR4** printer. A ticket is sent in a format for this printer model.

PR6

Connection to model **PR6** printer. A ticket is sent in a format for this printer model.

PC-Q

Data frame in a compatible format with the GRAM model **K3** weight indicator. For connecting to **PC with Virtual Key application**.

USB

Data frame in a format for the **GRAM USB** adapter cable.

rd3

Data frame in a format for the **GRAM RD3** model weight repeater display.

Q2

Connection to model **Q2** label printer. A ticket is sent in a format for this printer model.

WILE5

Wireless mode for use with GRAM wireless adapters.

WIFI1

WiFi 802.11 for use with GRAM WiFi adapters.

14.1. Serial port RS-232: PR4/PR6/Q2 printer

When selecting this option, the indicator will send weight information in a ticket print format for GRAM PR4, PR6 or Q2 printers.

The ticket can have up to 3 lines for header and 1 line for footer. The header and footer content is programmable by the user. The options for configuring this document are in the **Ticket** section of the main menu.

If selecting a **PR6** printer, the **A-Cut** (automatic paper cutting) option in the **Ticket** menu automatically changes to **ON**.

14.2. Serial port RS-232: Frame format PC0

The indicator sends the following byte frames (always 14 bytes in length).

0	1	2	3	4	5	6	7	8	9	10	11	12	13
02h	69h	20h	20h	20h	30h	2Eh	30h	30h	30h	6Bh	67h	0Dh	03h
STX	'l'	spc	spc	spc	0	.	0	0	0	k	g	CR	ETX

0 Start of text.

1 Status (tare, zero, net, stable, unstable).

2 Sign (blank space if value is positive, or '-' if negative.

3..9 Numerical value (ASCII) of the weight shown on the LCD display, including the decimal point.

10..11 Measurement unit: 'g', 'kg', 'oz', 'lb'.

12 Carriage return.

13 End of text.

The status byte is built from the binary values of the display indications (tare, zero, gross/net and stability). 20h is added to the result to ensure that the result is printable.

Bit 0 (01h) The transmitted value is the gross weight.

Bit 1 (02h) A tare is set.

Bit 2 Not used, always 0.

Bit 3 (08h) The indicator is set to zero.

Bit 4 Not used, always 0.

Bit 5 Not used, always 0.

Bit 6 (40h) The weight is stable.

Bit 7 Not used, always 0.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
N/A	Stability	N/A	N/A	zero	N/A	Tare	B / W

Examples:

The status byte is **61h** ('a')

61h – 20h = 41h →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (non-zero)	Bit 2	Bit 1 (Tare off)	Bit 0 (Gross)
0	1	0	0	0	0	0	1

The status byte is **69h** ('i')

69h – 20h = 49h →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (zero)	Bit 2	Bit 1 (Tare off)	Bit 0 (Gross)
0	1	0	0	1	0	0	1

The status byte is **62h** ('b')

62h – 20h = 42h →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (non-zero)	Bit 2	Bit 1 (Tare on)	Bit 0 (Net)
0	1	0	0	0	0	1	0

The status byte is **63h** ('c')

63h – 20h = 43h →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (non-zero)	Bit 2	Bit 1 (Tare on)	Bit 0 (Gross)
0	1	0	0	0	0	1	1

The status byte is **6Ah** ('j')

6Ah – 20h = 4Ah →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (zero)	Bit 2	Bit 1 (Tare on)	Bit 0 (Net)
0	1	0	0	1	0	1	0

The status byte is **6Bh** ('k')

6Ah – 20h = 4Ah →

Bit 7	Bit 6 (stable)	Bit 5	Bit 4	Bit 3 (zero)	Bit 2	Bit 1 (Tare on)	Bit 0 (Gross)
0	1	0	0	1	0	1	1

14.3. Serial port RS-232: USB frame format

Format compatible with the **GRAM USB** adapter for PC-type computer with Microsoft Windows operative system.

From the PC's point of view, the **GRAM USB** adapter is a keypad emulation that transforms the information transmitted by S2 scale into a keypad input.

This option should be selected to make the data transmission from S2 scale compatible with a keypad input in the PC.

14.4. Serial port RS-232: RD3 frame format

Format compatible with **GRAM RD3** weight repeater display.

When selecting this transmission format, the weight indicated by S2 appears simultaneously in the **RD3** repeater.

14.5. Serial port RS-232: Communication protocol

The S2 scale is provided with a communication protocol that allows the device to be commanded remotely.

The table below lists the available commands and the response of the S2 scale.

COMMAND	RESPONSE
v	Returns a message with the identification of the "GRAM S2 Vxxxx" firmware version.
\$	Weight request. The S2 device transmits a weight information frame in PC0 format.
z	The indicator automatically sets to zero.
f	Increases the value of the digital filter (1..4). If the filter is 4, the 'f' command sets the filter to 1.
H1	Programs line 1 of the ticket header and responds "H1 OK".
H2	Programs line 2 of the ticket header and responds "H2 OK".
H3	Programs line 3 of the ticket header and responds "H3 OK".
F1	Programs the ticket's footer line and responds "F1 OK".

For commands H1, H2, H3 and F1, the format is the following:

0	1	2	3	4	5	6	...	30	31	32	33	34	35
STX	C	C	L	L	L	L	...	L	L	L	L	L	ETX

Where:

STX = ASCII 2

ETX = ASCII 3

C = Command (2 characters)

L = 32-character ASCII text line

15. Ticket Menu t icft

This menu has various options for configuring the information that appears printed in the tickets generated by the S2 scale.

t inE

Time setting of the S2 scale internal clock.

5Er-n

Value of the next ticket number to be printed. It is automatically increased with each print, whether it is a single ticket or a ticket with accumulated total.

R-Lut

Automatic paper cutting ON/OFF. This function is only possible with ESC/Pos printers equipped with paper cutting device.

Programming the ticket header and footer is not done through the indicator keypad but through the RS-232 serial port.

16. Scale configuration menu SCALE

This menu features the options for parameterising and setting the measurement scale of the instrument.

UNIT

Measurement unit: g, kg, oz, lb.

MAX

Maximum capacity of the scale. Enter the value, including the decimal digits.

DIV

Division: The smallest increment that the instrument can measure. Possible values are 1,2,5,10,20 or 50.

DEC

Decimal dot position.

ZERO

Configuration menu for the instrument's options associated with "zero".

INIT-0

Initial zero setting at start Yes / No.

MAX-0

Allows you to select the limit of the zero-setting device. Possible options are MAX (zero is allowed for any weight on the scale) or OIML (follows established rules by the OIML R76 technical regulation).

Z-T-R

Zero tracking device activated or deactivated.

Z-DIS

Show zero indicator in the display Yes/No.

CAL

Calibration menu.

16.1. Calibration menu CAL

The calibration menu can be directly accessed when switching on the indicator. To do this, power up the indicator and, while the LCD test is running with all segments switched on, at the same time press  and  keys (a short pulse, not a sustained pulse).

CAL 1b Adjustment using a known weight (automatically sets the initial zero and pending adjustment).

G-SET Gravity adjustment depending on the scale's geographical location:

G-COR ON / OFF correction (activates/deactivates automatic correction according to geographical location).

GEO Geographical location code (see attached table).

OFFSET Manual input (keypad) of the initial zero (in ADC accounts).

SPAN Manual input of the span slope, 5 digits.

PRCAL Prints a ticket with the configuration and adjustment settings in the device's memory.

RESET Resets all configurations to factory settings.

ADCAL ADC span pre-adjustment. Only to be used at factory using the correct load cell reference.

16.2. Scale adjustment CAL 1b

1. With the scale empty, select the "CAL 1b" option.
2. The display will show that the initial zero value is in progress with the blinking message "CAL 0".

3. Once the zero value has been adjusted, place the adjustment weight (a known mass weight) on the load receptor.
4. Enter the weight value in the indicator, including the decimal positions. Use the cursor movement keys to move through the different positions on the display.
5. Once you enter the weight value, double click on the \downarrow key to validate and move to next step. The display will show the blinking message “-CAL -” while acquiring the adjustment value.
6. Lastly, it will show the message “GE0” for a few seconds, asking for the code of the geographical location where you did the adjustment. The geographical location code is a value from 0 to 31, which you have to choose from the attached table. Use the \leftarrow and \rightarrow keys to change the value and validate by clicking on the \downarrow key.
7. Lastly, the message “SAVE” will briefly appear, indicating that the adjustment has been saved in the non-volatile memory. The indicator returns to normal use mode, displaying the weight on the load receptor.

If the automatic correction of the weight according to the geographical latitude and height (“G-Cor option”) is set to ON, the next time you switch on the indicator after an adjustment, once the display test and initial welcome message is completed, the user will be asked to enter the value corresponding to the geographical area where the scale will be used.

Once the value has been entered for the geographical area where the scale is used, it is recorded in the non-volatile memory of the indicator and the user will not be asked for it again.

The geographical area where the scale is used can be modified later whenever you wish by entering the menu with $MENU \rightarrow SCALE \rightarrow CAL \rightarrow G-SET \rightarrow GE0 \rightarrow G\ nn$ (for $nn \{0-31\}$).

The automatic correction of the setting according to geographical area can be disabled by entering the menu with $MENU \rightarrow SCALE \rightarrow CAL \rightarrow G-SET \rightarrow G-Cor \rightarrow OFF$.

16.3 Table of geographical adjustment values.

Geographical latitude in the northern or southern hemisphere in degrees and minutes.	Elevation above sea level in metres										
	0	325	650	975	1300	1625	1950	2275	2600	2925	3250
	325	650	975	1300	1625	1950	2275	2600	2925	3250	3575
	Elevation above sea level in feet										
0	1060	2130	3200	4260	5330	6400	7460	8530	9600	10660	
1060	2130	3200	4260	5330	6400	7460	8530	9600	10660	11730	
00°00' - 05°46'	5	4	4	3	3	2	2	1	1	0	0
05°46' - 09°52'	5	5	4	4	3	3	2	2	1	1	0
09°52' - 12°44'	6	5	5	4	4	3	3	2	2	1	1
12°44' - 15°06'	6	6	5	5	4	4	3	3	2	2	1
15°06' - 17°10'	7	6	6	5	5	4	4	3	3	2	2
17°10' - 19°02'	7	7	6	6	5	5	4	4	3	3	2
19°02' - 20°45'	8	7	7	6	6	5	5	4	4	3	3
20°45' - 22°22'	8	8	7	7	6	6	5	5	4	4	3
22°22' - 23°54'	9	8	8	7	7	6	6	5	5	4	4
23°54' - 25°21'	9	9	8	8	7	7	6	6	5	5	4
25°21' - 26°45'	10	9	9	8	8	7	7	6	6	5	5
26°45' - 28°06'	10	10	9	9	8	8	7	7	6	6	5
28°06' - 29°25'	11	10	10	9	9	8	8	7	7	6	6
29°25' - 30°41'	11	11	10	10	9	9	8	8	7	7	6
30°41' - 31°56'	12	11	11	10	10	9	9	8	8	7	7
31°56' - 33°09'	12	12	11	11	10	10	9	9	8	8	7
33°09' - 34°21'	13	12	12	11	11	10	10	9	9	8	8
34°21' - 35°31'	13	13	12	12	11	11	10	10	9	9	8
35°31' - 36°41'	14	13	13	12	12	11	11	10	10	9	9
36°41' - 37°50'	14	14	13	13	12	12	11	11	10	10	9
37°50' - 38°58'	15	14	14	13	13	12	12	11	11	10	10
38°58' - 40°05'	15	15	14	14	13	13	12	12	11	11	10
40°05' - 41°12'	16	15	15	14	14	13	13	12	12	11	11
41°12' - 42°19'	16	16	15	15	14	14	13	13	12	12	11
42°19' - 43°26'	17	16	16	15	15	14	14	13	13	12	12
43°26' - 44°32'	17	17	16	16	15	15	14	14	13	13	12
44°32' - 45°38'	18	17	17	16	16	15	15	14	14	13	13
45°38' - 46°45'	18	18	17	17	16	16	15	15	14	14	13
46°45' - 47°51'	19	18	18	17	17	16	16	15	15	14	14
47°51' - 48°58'	19	19	18	18	17	17	16	16	15	15	14
48°58' - 50°06'	20	19	19	18	18	17	17	16	16	15	15
50°06' - 51°13'	20	20	19	19	18	18	17	17	16	16	15
51°13' - 52°22'	21	20	20	19	19	18	18	17	17	16	16
52°22' - 53°31'	21	21	20	20	19	19	18	18	17	17	16
53°31' - 54°41'	22	21	21	20	20	19	19	18	18	17	17
54°41' - 55°52'	22	22	21	21	20	20	19	19	18	18	17
55°52' - 57°04'	23	22	22	21	21	20	20	19	19	18	18
57°04' - 58°17'	23	23	22	22	21	21	20	20	19	19	18
58°17' - 59°32'	24	23	23	22	22	21	21	20	20	19	19
59°32' - 60°49'	24	24	23	23	22	22	21	21	20	20	19
60°49' - 62°09'	25	24	24	23	23	22	22	21	21	20	20
62°09' - 63°30'	25	25	24	24	23	23	22	22	21	21	20
63°30' - 64°55'	26	25	25	24	24	23	23	22	22	21	21
64°55' - 66°24'	26	26	25	25	24	24	23	23	22	22	21
66°24' - 67°57'	27	26	26	25	25	24	24	23	23	22	22
67°57' - 69°35'	27	27	26	26	25	25	24	24	23	23	22
69°35' - 71°21'	28	27	27	26	26	25	25	24	24	23	23
71°21' - 73°16'	28	28	27	27	26	26	25	25	24	24	23
73°16' - 75°24'	29	28	28	27	27	26	26	25	25	24	24
75°24' - 77°52'	29	29	28	28	27	27	26	26	25	25	24
77°52' - 80°56'	30	29	29	28	28	27	27	26	26	25	25
80°56' - 85°45'	30	30	29	29	28	28	27	27	26	26	25
85°45' - 90°00'	31	30	30	29	29	28	28	27	27	26	26

17. Digital filter FILT

The ADC converter of the S2 scale provides a reading of the electrical output of the connected load cell every 100ms.

The digital filter consists of a moving average of these readings.

Possible values are **1** (moving average of 2 readings), **2** (4 readings), **3** (8 readings), or **4** (16 readings).

A smaller filter value implies that rapid oscillations in the weight become more visible and vice versa.

18. Movement filter MOE-F

When activating the movement filter, the indicator does not show inconsistent changes of more than one division with a duration of less than 100 ms.

The result is that the indicator retains the last stable value while the weight has no consistent movement (in the same direction).

The stability indication in the top left corner of the display flashes to indicate this situation.

19 Value to be displayed in the indicator dISP

Allows you to select the value that should be shown in the LCD display. The options are the following:

- | | |
|-------|---|
| WEIGH | The indicator shows the weight. It is the default option. |
| F-CNT | Filtered ADC converter counts. |
| r-CNT | Unfiltered ADC converter counts. |

20 Characteristics of the S2 scale

Load cell

Input signal from the load cell	2 mV/V
Internal resolution	20bits AD converter, 1000000 counts
Measurement frequency	Maximum 80 samples per second
Linearity error	≤0.01% of the measurement range
Exciting voltage to the load cell	5 Vdc

User interface

Main indicator	5 LCD digits 25.4 mm in height. Backlit with panel backlight
Keypad	Membrane 7-key keypad
Acoustic warning	Piezoelectric intermittent-sound mini-buzzer (2300±300 Hz y 85 dB)

Serial communications

Port Tx/Rx: (Port 1)	Bi-directional RS-232C
Transmission speed	9600, 19200, 38400, 57600
Number of bits and parity	8 bits, no parity, 1 bit stop

Power

Network connection	Through 7.5V feeder; 1 A
Battery	6V-4AH; Service time 15/48 hours depending on use.

Operating conditions and mechanical data

Operational temperature range	+5°C/+35°C
Size (mm)	Overall 307x280x114 mm Pan 193x280 mm
Weight (kg)	3,1kg including battery
Assembly	Desktop
Tightness	IP 52
Levelling device	Adjustable feet and bubble level

21 Error messages

$RdC-E$	ADC fail: No ADC response	Indicator fault. See technical service.
$RdC-h$	Load cell input signal too high (> 20mV)	Damaged load cell. Wiring default.
$RdC-L$	Load cell input signal too low (< -20mV)	Damaged load cell. Wiring default.
bAt	Low battery.	Connect the AC / DC adapter to charge the battery.
$Err 0$	a) Auto-zero device out of limits b) A stable measure could not be obtained by attempting to initial zero	Empty the load receptor before power on the scale.
$Err n$	Adjustment weight > Max	Adjustment weight must be < Max
$Err d$	The division must be > 10 ADC counts	The resolution is too high, change the division to a higher value.
$Err E$	Cannot obtain a stable measurement for scale adjustment	
$-0 L-$	Overload: weight > Max + 9 · div	
$LOCk$	Keypad lock is enabled.	
$nOrE$	The RTC is damaged.	Indicator fault. See technical service.
$t tOn$	A totalization ticket has already been started.	Print the total before starting a new ticket.



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