EPELSA

Installation Manual
ECO MULTIFUNCTION
Scale

- CONTENTS -

GBS-ECO-MF-V02

1. DESCRIPTION OF THE DISPLAY

```
6                              1      2
                                              4

Max    15    kg                          kg
Min    100   g
e=     5     g
                                        ► T
  (I I I)                                     │ kg
7                                       ► PT
  →0←
                                              5
8    [N]
                                        Pcs
9    ⋈
                                              3
10  ▮▮▮▯
```

The ECO scale's display is as shown in the figure above and consists of:

    1. Weight display: 5 digits.

    2. Price display: 6 digits.

    3. Amount display: 7 digits.

    4. Semi-automatic tare indicator.

    5. Numeric or coded tare indicator.

    6. Special scale indications.

    7. Zero weight indicator.

    8. Net weight indicator.

    9. Stable weight indicator.

    10. Battery status indicator.

2. DESCRIPTION OF THE KEYPAD
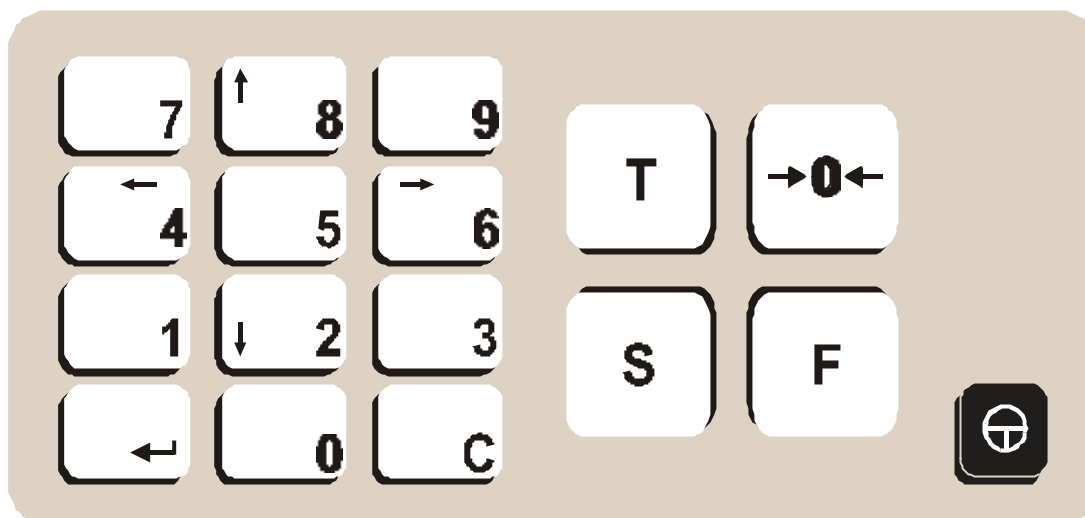
The unit has a 17-key keypad. Of these, the following are used to set the unit:

0 … **9** Numeric keys for entering numeric data.

8 ……….. Forward cursor for options with preset values.

2 ………. Back cursor for options with preset values.

C …..……. Key for erasing numeric values.

↵ ………… Key for confirming the item entered and moving to the next item to be programmed. (When the last item has been programmed, the scale restarts the cycle test).

3. TURNING ON THE SCALE AND ENTERING THE MAIN SET-UP MENU

The scale is turned on and off by pressing the key. When turned on, it starts a cycle test (it counts from 0 to 9).

During the initialization process (cycle test), you can enter the unit's set-up menu by pressing the internal set-up key, located on the scale's main board, which is accessed from the scale bottom (as explained in the section "**Connections**").
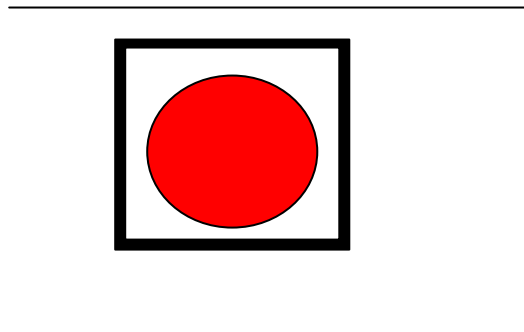
When you enter the set-up menu, the display shows:
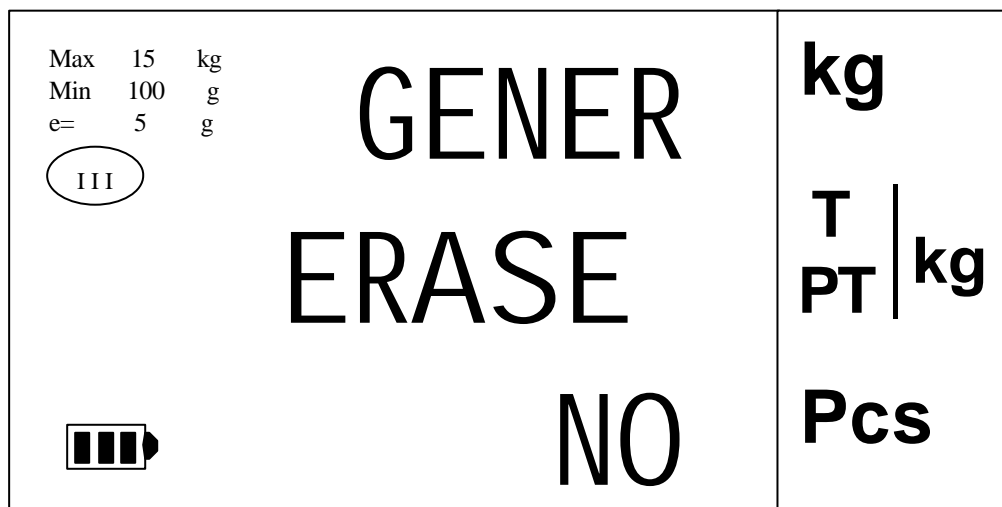
You are now in the scale's Installation Menu. Here, you will program all the options using the keys specified in the section "**Description of the keypad**".

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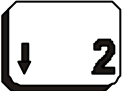
4.   PARAMETER SET-UP MENU

Once within the Installation Menu, you can program all the installation parameters, which are the following:

4.1. GENERAL ERASE

You must decide whether you wish to erase all the scale's data and settings.
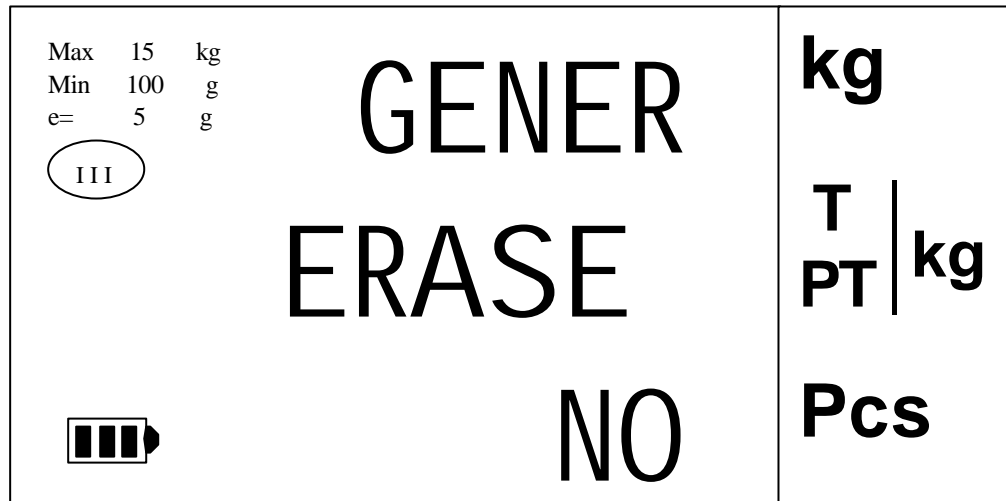
Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the [↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
NO	NO
YES	

4.2. CAPACITY

This selects the maximum capacity at which the scale will operate.

```
┌─────────────────────────────────────────┬──────────┐
│ Max    15   kg                          │  kg      │
│ Min   100   g       CAPAC                │          │
│ e=      5   g                           │  T       │
│  ╭─────╮                                 │      │kg  │
│  │ I I I │                               │  PT  │     │
│  ╰─────╯                                 │          │
│                                          │          │
│  ▮▮▮▶       15.000                      │  Pcs     │
└─────────────────────────────────────────┴──────────┘
```

Press the $\boxed{\uparrow \quad 8}$ or $\boxed{\downarrow \quad 2}$ keys to select the value and confirm with the

$\boxed{\hookleftarrow}$ key. You will then be prompted to program the next parameter.

Possible values	Default value
3 kg	15 kg
6 kg	
12 kg / (6000 div 7)	
15 kg	
30 kg A / (3000 div)	
30 kg B / (6000 div)	

4.3. MULTI-RANGE

This selects whether the weight is to be displayed with the values marked by the multi-range.

This option will not appear when the capacity of **3 kg, 12 kg or 30 kg B** has been selected in the previous parameter.

```
Max     15      kg
Min     100     g
e=      5       g

  III

MULTI
INTER
OFF
```
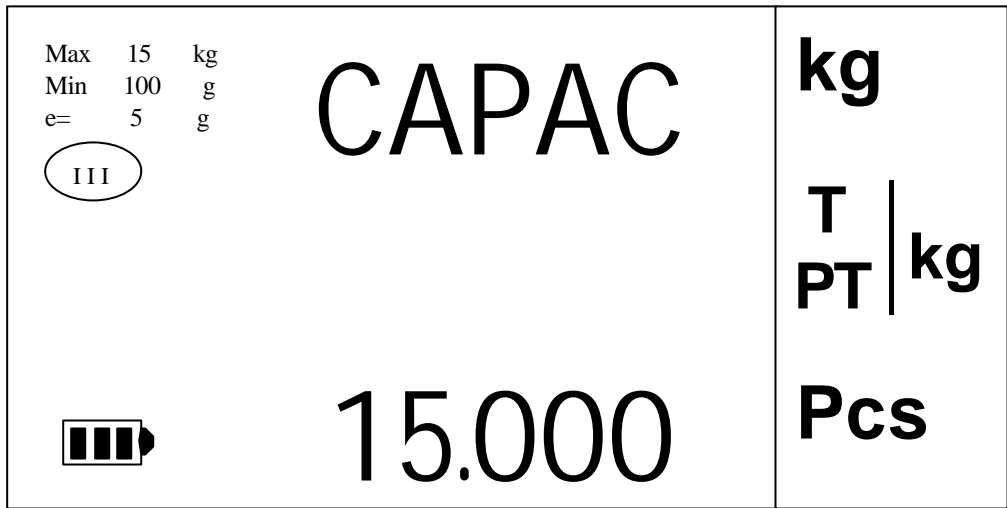
kg

T
PT | kg

Pcs

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
ON	OFF
OFF	

NOTE: The multi-range change point, when there is a tare, is performed on the **NET** weight.

4.4. INITIAL ZERO

This selects the maximum deadweight value that the scale will take as zero when it is powered on.

```
Max     15      kg
Min     100     g
e=      5       g

  III

INIT
ZERO
20
```

kg

T
PT | kg

Pcs

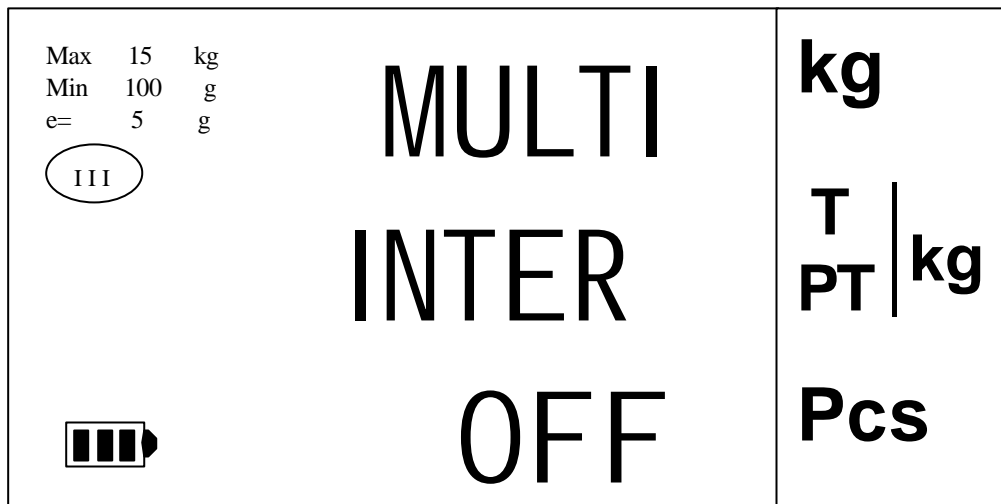It is expressed as a percentage of the scale's maximum capacity.

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the [↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
10 %	20 %
20 %	

4.5. DIGITAL FILTER

This selects the filtering value for the digital weight filter.

Enter the value using the numeric keys ([0] … [9]) and confirm with the [↵] key. You will be prompted to program the next parameter.

If you make a mistake in entering the value, you can erase it by pressing the [C] key.

Possible values	Default value
50 to 99	90

4.6. SPECIAL INDICATIONS

This selects whether it is possible to display the special indications that appear in the display (capacity, step, minimum weigh, etc.).

```
Max    15    kg
Min    100   g
e=     5     g
( I I I )

SPECL
INDIC
ON

kg
T
PT | kg
Pcs
```

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the [↵] key. You will then be prompted to program the next parameter.
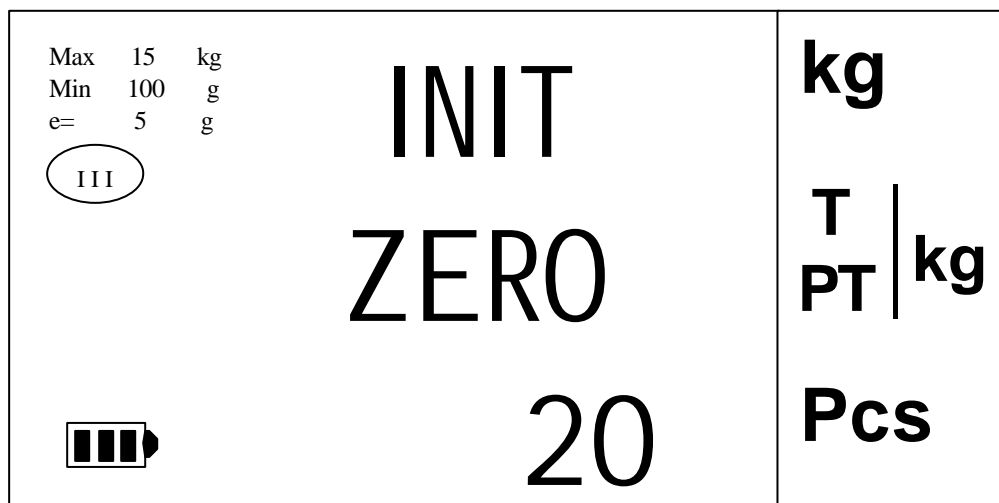
Possible values	Default value
ON	ON
OFF	

4.7. CUMULATIVE TARE

This selects whether it is possible to perform cumulative tares.

```
Max    15    kg
Min    100   g
e=     5     g
( I I I )

CUM
TARE
ON

kg
T
PT | kg
Pcs
```

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Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.
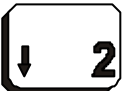
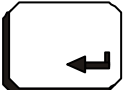| Possible values	Default value
ON	ON
OFF	

4.8. HIGH RESOLUTION

This selects whether it is possible to enable the mode by which the weight is displayed with a precision of X10. The scale enters this mode at the end of the initial cycle when this option is set to 'ON'. It is disabled automatically when the scale is turned off. The Tare function is permitted in this mode.

```
Max     15     kg                                    kg
Min    100     g          HIGH
e=       5     g                                   T
  ( I I I )                RES                     PT │ kg
  [███▶]                      OFF                  Pcs
```

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
ON	OFF
OFF	

4.9. RS CONNECTION

This selects the scale's RS-232 connection type.
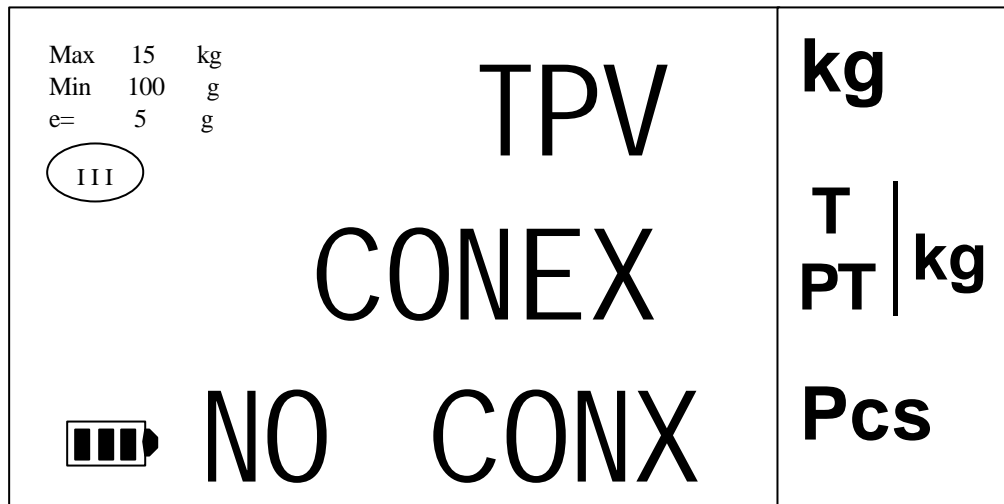
```
Max    15    kg
Min    100   g
e=     5     g
( III )
[III]  NO  CONX        TPV  CONEX        kg   T  PT | kg   Pcs
```

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[←] key. You will then be prompted to program the next parameter.

Possible values	Default value
NO CONX	NO CONX
TYPE 0	
TYPE 1	
TYPE 2A	
TYPE 2B	
TYPE 7	
TYPE 8	
TYPE 9	
TYPE 10	

4.10. TPV 0 TYPE (only if the connection type is 'TYPE 0')

This selects the type of communication when operating with a 'TYPE 0' connection.

```
  Max    15    kg                            TPV          kg
  Min   100     g
   e=     5     g
    ( I I I )                        TYPE  0            T    | kg
                                                       PT
    [███▶]                           TYPE  A            Pcs
```

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
TYPE A	TYPE A
TYPE B	

4.11. TRANSMISSION MODE (only if the connection type is 'TYPE 0')

This selects the data transmission mode when operating with a 'TYPE 0' connection.

```
  Max    15    kg                          SENDG          kg
  Min   100     g
   e=     5     g
    ( I I I )                                            T    | kg
                                          MODE           PT
    [███▶]                          WAITING              Pcs
```
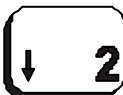
Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[←] key. You will then be prompted to program the next parameter.

Possible values	Default value
WAITING	WAITING
AUTOMAT	
MANUAL	

4.12. AUTOMATIC WEIGHT TRANSMISSION (only if the transmission mode is 'AUTOMAT')

This selects automatic weight transmission when operating with the 'AUTOMAT' transmission mode.

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[←] key. You will then be prompted to program the next parameter.

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Possible values	Default value
WAITING	WAITING
MANUAL	

4.13. TIME OUT (only if the transmission mode is 'MANUAL' and type of TPV is 'TYPE B')

This selects the Time Out value (time waited to receive an answer after transmitting the weight) operating with the 'MANUAL' transmission mode.
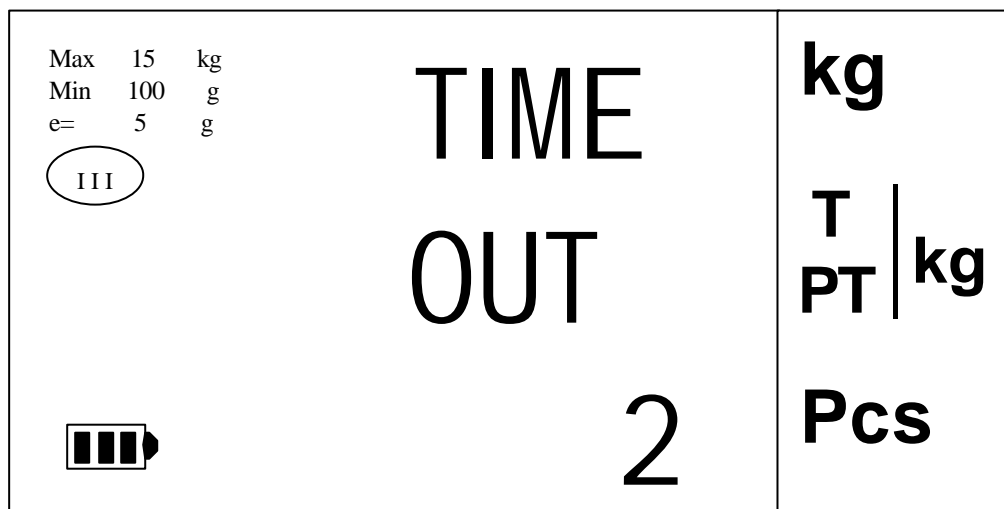
```
Max     15    kg
Min    100    g
e=       5    g
( I I I )

        TIME

        OUT

              2
```

kg

T
PT | kg

Pcs

Press the [↑ **8**] or [↓ **2**] keys to select the value and confirm with the

[←] key. You will then be prompted to program the next parameter.

Possible values	Default value
1 to 10	2

4.14. TIME LIMIT (only if the transmission mode is 'MANUAL')

This selects the Time Limit value (time waited for a stable weight) when operating with the 'MANUAL' transmission mode.

```
Max     15    kg                              kg
Min    100     g        TIME
e=       5     g
  ( I I I )              LIMIT                  T
                                              PT | kg
  [▮▮▮▶]                  2                   Pcs
```
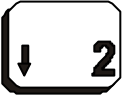
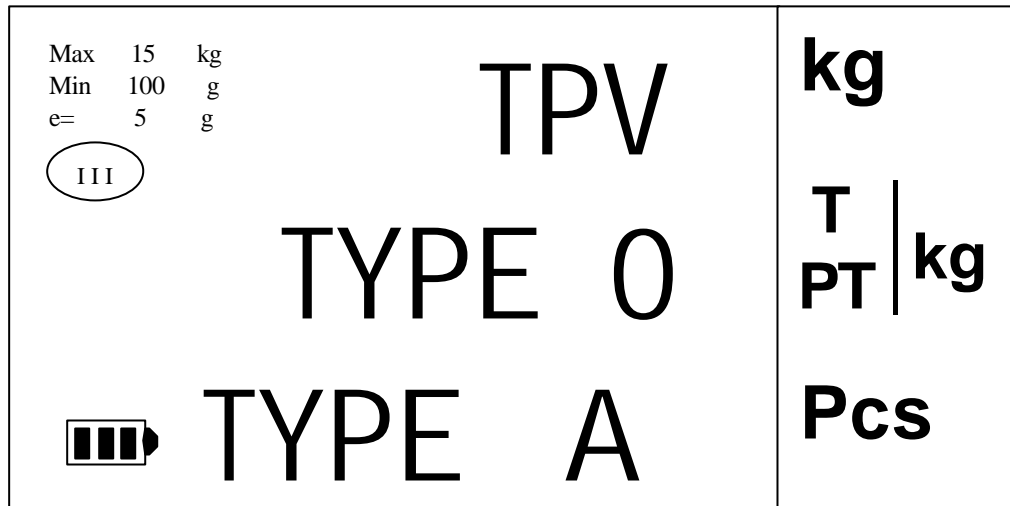Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the [←] key. You will then be prompted to program the next parameter.

Possible values	Default value
1 to 5	2

4.15. PROTOCOL TYPE (only if the connection type is 'TYPE 9')

This selects the active protocol type when operating with the 'TYPE 9' connection.
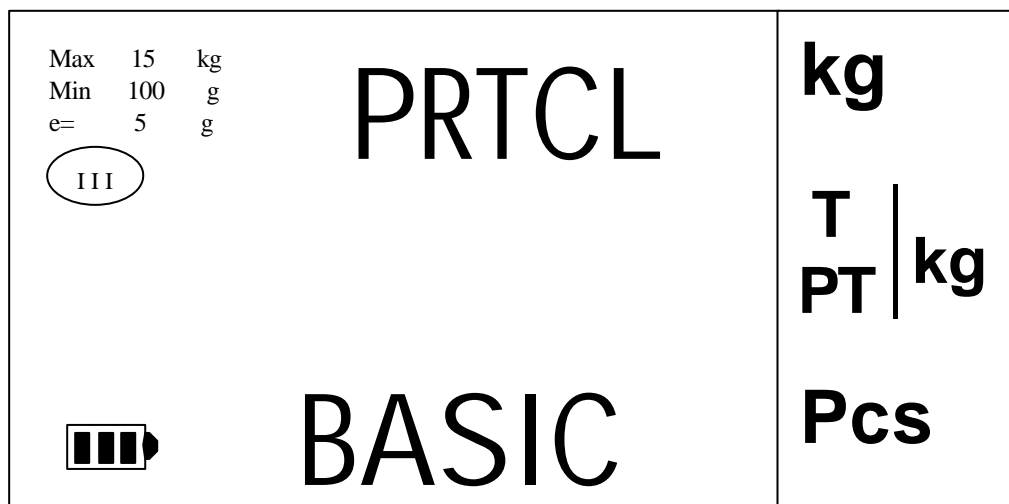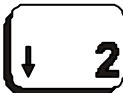
```
Max     15    kg                              kg
Min    100     g        PRTCL
e=       5     g
  ( I I I )                                     T
                                              PT | kg
  [▮▮▮▶]                 BASIC                Pcs
```

15

Press the ⬆8 or ⬇2 keys to select the value and confirm with the ⏎ key. You will then be prompted to program the next parameter.

Possible values	Default value
BASIC	BASIC
EXTEND	

4.16. BAUD RATE (only if the connection type is different from 'NO CONX')

This selects the communication speed of the RS-232 channel.

```
Max    15    kg
Min    100   g
e=     5     g
( I I I )

        BAUD
        RATE
        9600

[▮▮▮▯]
```
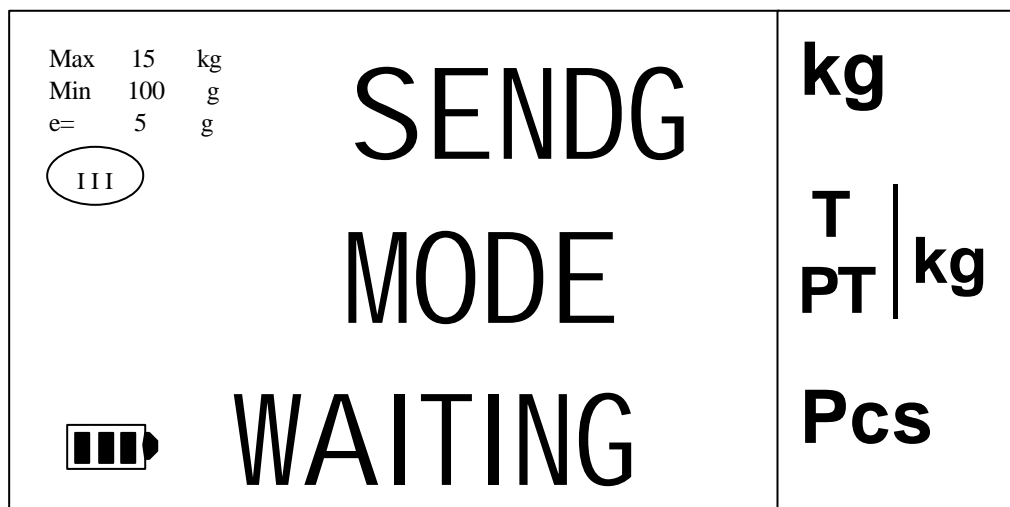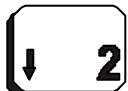
kg

T | kg
PT

Pcs

Press the ⬆8 or ⬇2 keys to select the value and confirm with the ⏎ key. You will then be prompted to program the next parameter.

Possible values	Default value
2400	9600
4800	
9600	
19200	

4.17. PARITY (only if the connection type is different from 'NO CONX')

This selects the communication's parity type.

```
Max    15    kg
Min    100   g
e=     5     g

  ( I I I )

            PARITY

            NO
  (battery)
```

kg

T
PT | kg

Pcs

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
NO	NO
EVEN	
ODD	

4.18. NUMBER OF BITS (only if the connection type is different from 'NO CONX')

This selects the number of bits of the data transmitted and received.

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```
Max    15    kg
Min   100    g
e=      5    g
  ( I I I )
                    BITS
                  NUMBER
                      8
  ▮▮▮▯
```
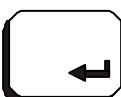
kg

T | kg
PT

Pcs

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
7	8
8	

4.19. NUMBER OF STOP BITS (only if the connection type is different from 'NO CONX')

This selects the communication's number of stop bits.

```
Max    15    kg
Min   100    g
e=      5    g
  ( I I I )
                    STOP
                    BITS
                      1
  ▮▮▮▯
```
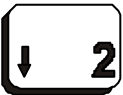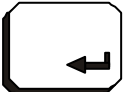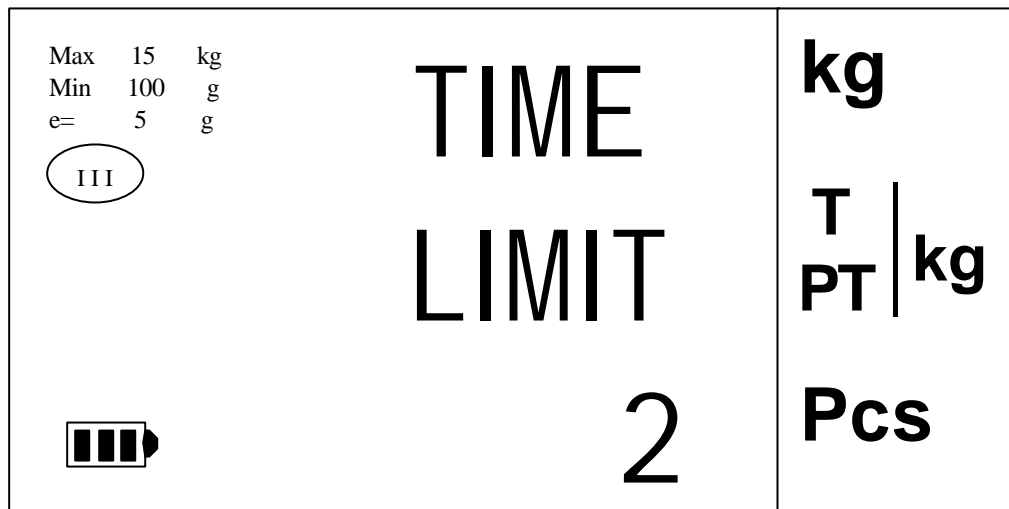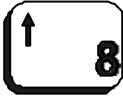
kg

T | kg
PT

Pcs

Press the [↑ 8] or [↓ 2] keys to select the value and confirm with the

[↵] key. You will then be prompted to program the next parameter.

Possible values	Default value
1	1
2	

After confirming this parameter with the ⏎ key, all the parameters will be considered confirmed and the scale will restart, performing the cycle test.

5. TABLE OF METROLOGICAL SPECIFICATIONS

Max	Min	e	n	Tare
6 kg	40 g	2 g	3000	- Max
12 kg	100 g	2 g	6000	- 6 kg
15 kg	100 g	5 g	3000	- Max
30 kg / A	200 g	10 g	3000	- Max
30 kg / B	200 g	5 g	6000	- 15 kg
3 / 6 kg	20 g	1 / 2 g	3000 / 3000	- 1 kg
6 / 15 kg	40 g	2 / 5 g	3000 / 3000	- 3 kg
15 / 30 kg	100 g	5 / 10 g	3000 / 3000	- 6 kg

6. SETTING THE ZERO AND THE WEIGHT

In order to make the scale's settings, press the internal setting key on the scale's main board, which is accessed from the scale bottom (as shown in the section 'Connections'), when the scale is in the basic work mode or when it is displaying dashes during the initial zero.
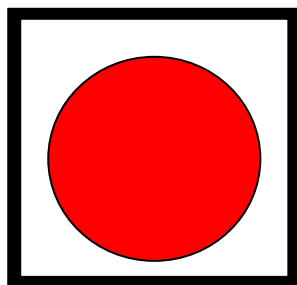
If you press the calibration button at this time, the scale zeroes the scale with the deadweight currently on the platform. This process may be instant or it may

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take several seconds if the weight is not stable at that time. During the time that the scale takes to zero, the reading of the zero's value in internal points is displayed. The scale then automatically sets a known weight value and shows the following display:

```
┌─────────────────────────────────────────┬──────────┐
│ Max   15   kg                            │   kg     │
│ Min   100  g        0.000                │          │
│ e=    5    g                             │          │
│  ╭─────╮                                 │   T      │
│  │ III │                                 │  ──┤ kg  │
│  ╰─────╯                                 │  PT      │
│  →0←              WE ADJ                 │          │
│                                          │          │
│   ▽                                      │          │
│  ▐███▶              0.000                │  Pcs     │
└─────────────────────────────────────────┴──────────┘
```
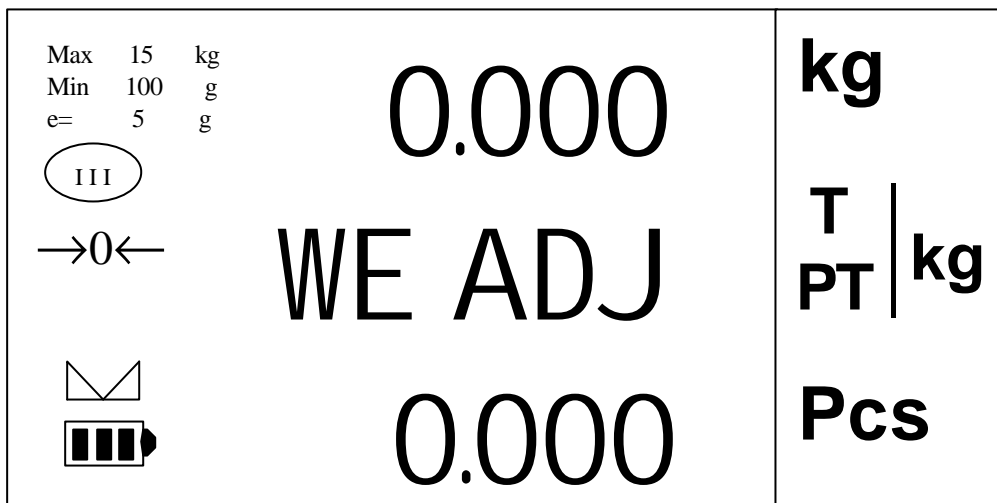
At this time, the weight value detected by the scale is shown, even if it is an incorrect value because it has not been adjusted (in this case '0.000', there is no weight on the platform).

Place the known weight on the platform and enter the value of the known standard weight (2/3 of the full-scale value is recommended). After entering the

value, press the [↵] key. It is possible to correct the weight by pressing the

[C] key. The scale displays the reference values and the reference zero for several seconds, which it will save as references of the setting time. It will then show the real value of the weight set:

```
┌─────────────────────────────────────────┬──────────┐
│ Max   15   kg                            │   kg     │
│ Min   100  g       10.000                │          │
│ e=    5    g                             │          │
│  ╭─────╮                                 │   T      │
│  │ III │                                 │  ──┤ kg  │
│  ╰─────╯                                 │  PT      │
│  →0←              WE ADJ                 │          │
│                                          │          │
│   ▽                                      │          │
│  ▐███▶             10.000                │  Pcs     │
└─────────────────────────────────────────┴──────────┘
```
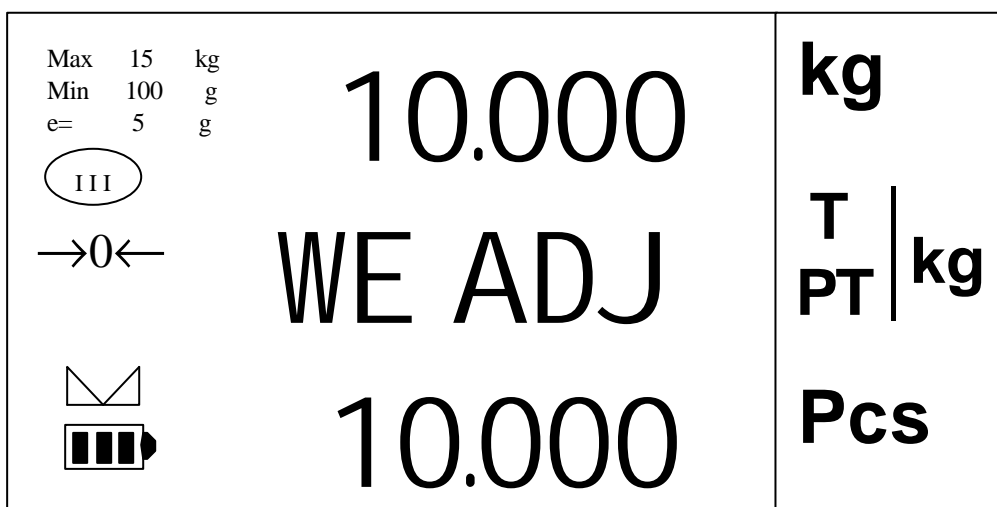
To return to the basic work mode, press the calibration button again. The scale's zero and weight will now be set.

7.   COMMUNICATION PROTOCOL

TPV 0 (Protocol $):

To operate with this protocol, the value **TYPE 0'** must be selected in the '**TPV CONEX**' option. The possible values in this option are '**TYPE A**' and '**TYPE B**'. The next step is to select the transmission mode: '**WAITING**' (awaiting request), '**AUTOM**' (automatic) or '**MANUAL**'.

TYPE A:

Awaiting request

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting.

Communication format:

Computer request	Scale answer
<$>(0x24, 36d) ⟶	
⟵	<STX><ST><PPPP.PPP><CR><ETX>

Scale answer:

<STX>	- Character 0x02, 2d
<ST>	- Status byte whose value is obtained by adding the weight flags' status (0x08 if zero weight, 0x20 if stable weight, 0x02 if net weight, and 0x01 if gross weight) to 0x20.
<PPPP.PPP>	- Value of the weight in ASCII and with 8 bytes, including the weight's decimal point and the '-' sign when the net weight is negative. The weight field is left-justified with blank spaces (0x20, 32d). When the weight is out of range, dashes are sent (character 0x2d, 45d) occupying all 8 bytes of the weight field.
<CR>	- Character 0x0d, 13d.
<ETX>	- Character 0x03, 3d.

<u>Automatic</u>

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting.

The scale automatically sends the weight with the trace described in the section '**Awaiting request**'.

<u>Manual</u>

This communication mode is compatible with the basic work mode Weight-Tare.

When the [**F**] key is pressed, if the weight is stable, the scale sends the weight with the trace described in the section '**Awaiting request**'. If the weight is not stable, the scale starts a stable weight capture sequence. When the weight becomes stable, the scale sends the weight. If the weight does not stabilize within a preset time (2 seconds), the weight is not sent and the scale will display an unstable weight error (Error 14).

TYPE B:

<u>Awaiting request</u>

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting.

The scale can perform a series of functions if it receives a certain request:

a.-] Scale reset:

Communication format:

Computer request	Scale answer
<#>(0x23, 35d) ⟶	
	The scale restarts and, upon completing the process, sends the string: 0000000<CR>

Scale answer:

0000000	- 0x30, 48d
<CR>	- Character 0x0d, 13d.

b.-] Autozero request:

Communication format:

Computer request	Scale answer
<%>(0x25, 37d) ⟶	
⟵	The scale performs an autozero, and, upon completing the process (with or without carry out autozero), sends the string: 0000000<CR>
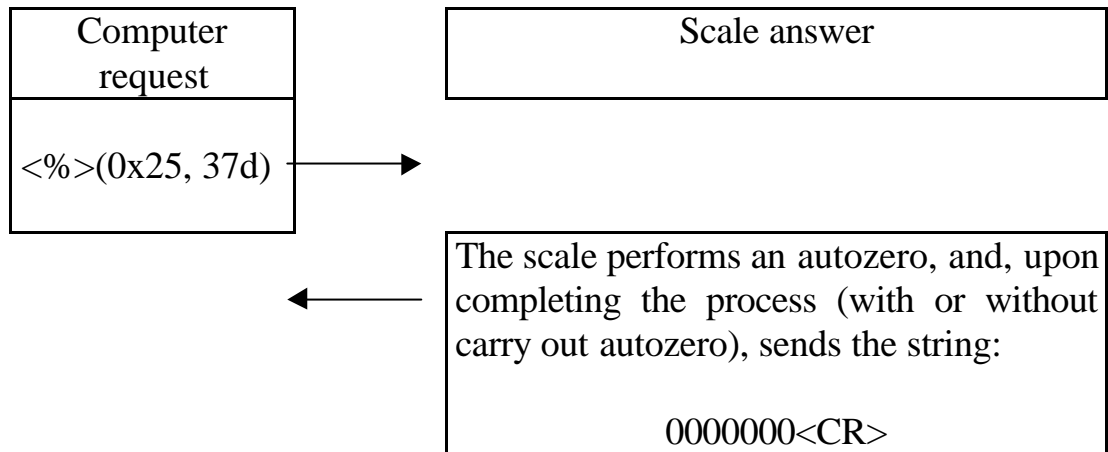
Scale answer:

0000000	- 0x30, 48d
<CR>	- Character 0x0d, 13d.

c.-] Disabling / enabling the transmission beep:

Communication format:

Computer request	Scale answer
<'>(0x27, 39d) ⟶	
	The scale enables or disables the beep each time it sends a trace. The scale does not answer this request. When the scale is turned on, the beep process is disabled by default.
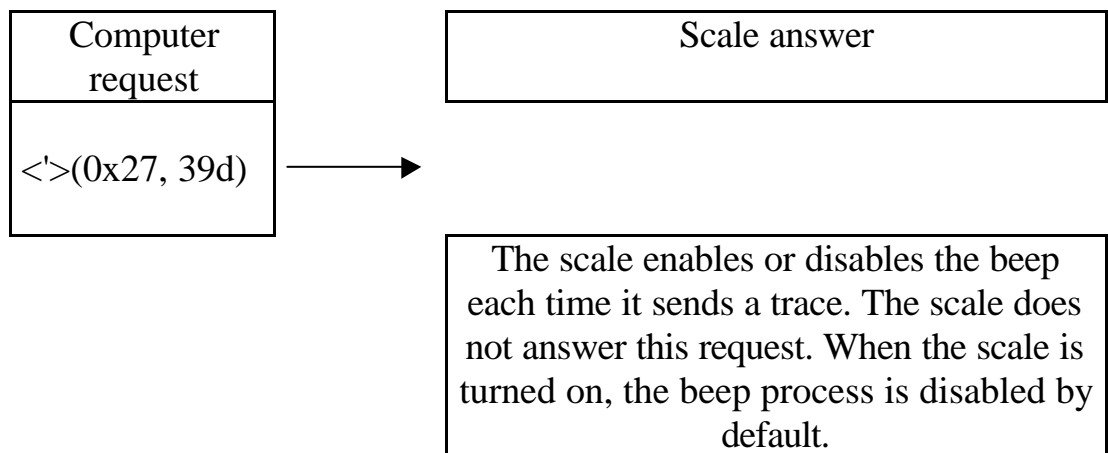
d.-] Weight request:

Communication format:

Computer request	Scale answer
<$>(0x24, 36d) ⟶	

| | The scale transmits the weight with the following trace:

 <PPP.PPP><CR> |
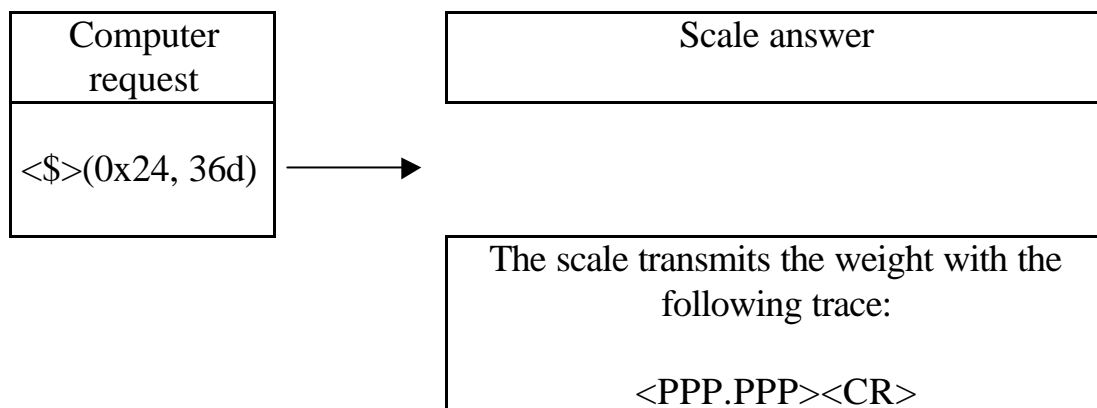
Scale answer:

<PPP.PPP>	- Value of the net weight with 7 bytes including the decimal point and left-justified with zeros (0x30)
<CR>	- Character 0x0d.

- Special cases of this protocol:

  d.1.-] Net weight zero and stable: Sends '0000000<CR>'

  d.2.-] Net weight over or under: Sends 'AAAAAAA<CR>'

  d.3.-] Net weight in range and stable: Sends 'PPP.PPP<CR>' (the value of the weight with 7 bytes including the decimal point and justified with zeros on the left.

  d.4.-] Net weight in range, stable and negative: Sends the string described in section 'd.2.-]'.

  d.5.-] Net weight in range and unstable: The scale retains the weight request indefinitely until it becomes stable, when the scale operates as described in section 'd.3.-]'.

- Transmission started by the scale at the beginning

a.-] When the scale is powered on and the initial sequence is completed, it indicates that it is ready by sending the sequence: '0000000<CR>', described previously.

Automatic

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting.

After selecting this option, the automatic transmission protocol type is chosen. The possible values are: '**Await request**' or '**Manual**'. The scale automatically sends the weight depending on the trace selected:

Await request trace: <PPP.PPP><CR>

<PPP.PPP>	- Value of the weight with 7 bytes including the decimal point and justified with zeros (0x30) on the left. If the weight is out of range (over or under) or there is a negative net weight, a string composed of 7 characters 'A' (0x41, 65d) is sent.
<CR>	- Character 0x0d.

Manual transmission trace: <STX><ST><PPP.PPP><CR>

<STX>	Character 0x02, 2d.
<ST>	Tare status. The possible values are: '**blank**' (0x20, 32d) if the weight is gross, '**T**' (0x54, 84d) there is a tare, and '**F**' (0x46, 70d) if there is a fixed tare.
<PPP.PPP>	- Value of the weight with 7 bytes including the decimal point and justified with (0x30) on the left. If the weight is High, Low or negativ, it sends: <AAAAAAA>.
<CR>	- Character 0x0d, 13d.

Manual

This communication mode is compatible with the basic work mode Weight-Tare.

When the ⌷**F**⌷ key is pressed, if the weight is stable, the scale sends the weight with the corresponding trace. If the weight is not stable, the scale starts a stable weight capture sequence. When the weight becomes stable, the scale sends the weight. If the weight does not stabilize in a preset time (TIME LIMIT), the weight is not sent and the scale displays an unstable weight error (Error 14).

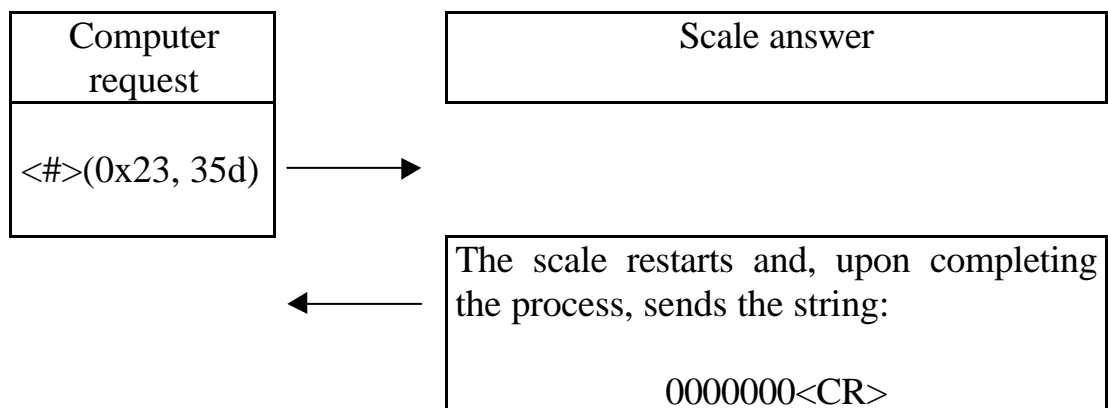The trace used in this format is that described in the Automatic transmission format with Manual transmission trace.

After sending the weight, the scale waits for an answer before the end of the preset time (TIME OUT). If no answer is received when this time expires, the scale displays '**Error 9**'. If the character '**ACK**' is received before the time has elapsed (TIME OUT), the scale beeps, displays the indication **TXD OK**' for 2 seconds and finally beeps again, returning to the weight mode. If a negative answer is received, '**NAK**', the scale displays '**Error 10**'.

TPV 1 (IBM Protocol):

In order to operate with the IBM protocol, you must select the value "**TYPE 1**" in the "**CONEX TPV**" option.

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting.

There are 2 control functions from the TPV, Weight Request and Autozero Request. The scale only has 2 possible answers: Weight Transmission and Invalid Result.

Weight request

TPV	Scale
<S><CR><LF>	
	Weight Transmission trace: <S><SP><SP><PPPPPPPPP><UU><CR><LF>
	Invalid Result trace: <S><I><SP><CR><LF>
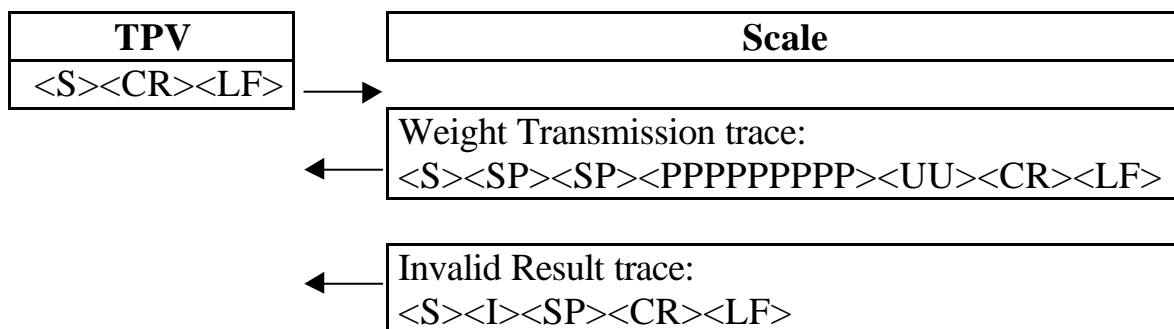
The scale must answer in less than 5 s. The weight trace if the weight is stable, has varied since the last request, the weight is in range, and the scale is not autozeroing. If these conditions are not met, the scale returns the Invalid Result trace.

If the weight is unstable, it waits a maximum time of 3 seconds. If after this time it is not stable it sends invalid result.

Weight Transmission trace:

<S>	- Character 0x53, 83d.
<SP>	- Character 0x20, 32d.
<PPPPPPPPP>	- Weight with 9 bytes, without decimal point and left-justified with zeros (0x30).
<UU>	- Units. The possible values are: (G_), (KG), (OZ), and (LB). The scale always sends (G_).
<CR>	- Character 0x0d, 13d.
<LF>	- Character 0x0a, 10d.

Invalid Result trace:

<S>	- Character 0x53, 83d.
<I>	- Character 0x49, 73d.
<SP>	- Character 0x20, 32d.
<CR>	- Character 0x0d, 13d.
<LF>	- Character 0x0a, 10d.

Autozero request

TPV	Scale
<T><CR><LF> ⟶	
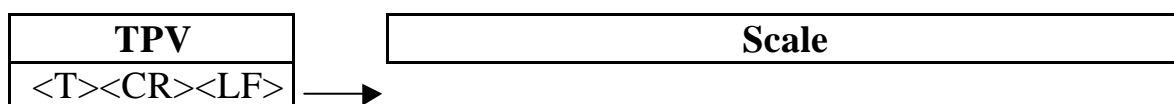
<T>	- Character 0x55, 85d.
<CR>	- Character 0x0d, 13d.
<LF>	- Character 0x0a, 10d.

When the scale receives this request, it performs an Autozero request. At the end of the sequence, irrespective of whether or not the scale has been able to Autozero, it sends the 'Invalid Result' trace in reply.

TPV 2A (UNIWELL-ICL Protocol):

In order to operate with the Uniwell-ICL protocol, you must select the value "**TYPE 2A**" in the "**CONEX TPV**" option.

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting:

TPV	Scale
ENQ →	

NAK, if there is an error in the reception.
← NULL, if the weight is unstable.
ACK, if the weight is zero or is not zero but has varied since the last request.
CAN, if the weight has not varied since the last request.
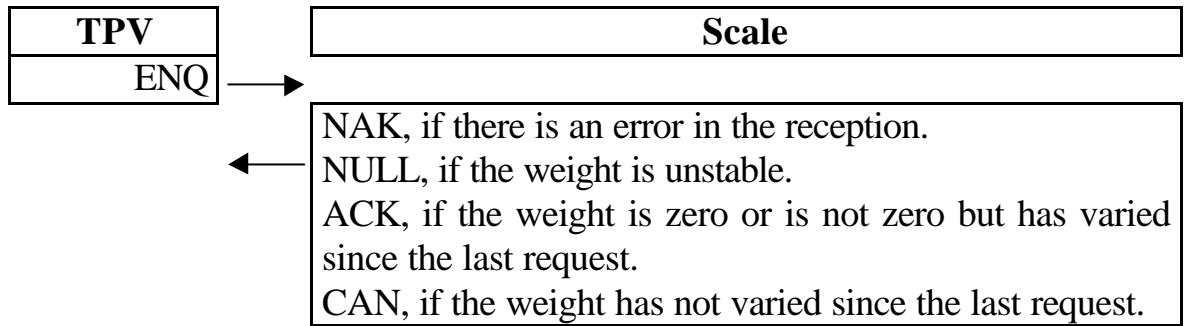
ENQ	- Character 0x05, 5d.
NACK	- Character 0x15, 21d.
NULL	- Character 0x00, 0d.
ACK	- Character 0x06, 6d.
CAN	- Character 0x18, 24d.

When the scale sends 'ACK' to the TPV:

TPV	Scale
DC1 →	

NAK, if there is an error in the reception.
← <STX><ID><PPPPP><BCC><ETX>, if the weight is in range.
<STX><ID><00000><BCC><ETX>, if the weight is not in range.

DC1	- Character 0x11, 17d.
NACK	- Character 0x15, 21d.
STX	- Character 0x02, 2d.
ID (weight in range)	- Scale type depending on the full-scale value. The scale always sends (0x69).
ID (weight not in range)	- Scale type depending on the OR full-scale value with 0x10. The scale always sends (0x79).
PPPPP	- Value of the weight in ASCII without decimal point and left-justified with zeros (0x30).
00000	- Five zeros in ASCII (0x30).
BCC	- XOR of all of the frame's characters except STX and ETX.
ETX	- Character (0x03, 3d).

ID value:

HEXADECIMAL	BINARY	ASCII	SCALE TYPE
0X68	011X1000	h	25 lb 1/8 oz
0X69	011X1001	i	15 kg 5 g
0X6a	011X1010	j	30 lb 0.01 g
0X6b	011X1011	k	6 kg 2 g
0X6c	011X1100	l	50 lb 0.01 lb

If the TPV receives the frame <STX><ID><PPPPP><BCC><ETX> (weight in range), it resends the same frame to the scale so that it can compare the frame sent and received.

When the scale has received the frame for comparison, it returns:

- NAK (0x15, 21d), if there is an error in the reception.
- ACK (0x06, 6d), if the frame received does not match the frame sent.
- CR (0x0d, 13d), if the frame received matches the frame sent.
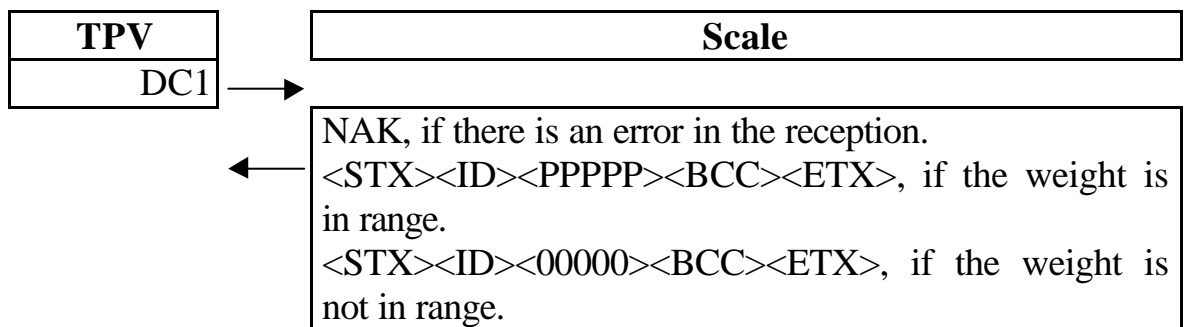
End of sequence.

TPV 2B (UNIWELL-W Protocol):

In order to operate with the Uniwell-W Protocol, you must select the value "**TYPE 2b**" in the "**CONEX TPV**" option.

This communication mode is compatible with the basic work modes Weight-Tare, Levels and Part Counting:

TPV	Scale
W →	
←	<STX><PPPPP><CR>, if the weight is in range, is stable and has varied since the last request.
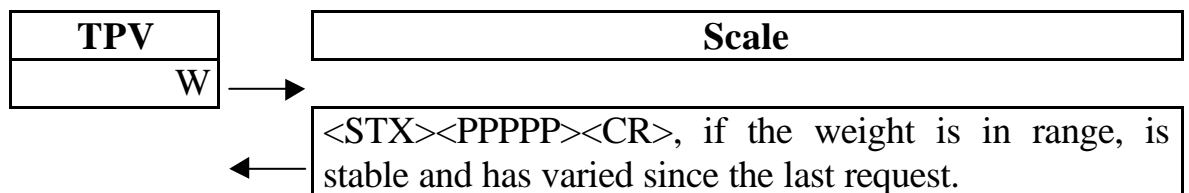
W	- Character 0x57, 87d.
STX	- Character 0x02, 2d.
PPPPP	- Value of the weight in ASCII without decimal point and left-justified with zeros (0x30).
CR	- Character (0x0d, 13d).

TPV 7 (SAMSUNG Protocol):

This accepts 4 commands:

TPV	Scale
W<CR>	
	Weight: returns the weight with units and the scale's status: <LF><PP.PPP><UU><CR><LF><'S'hh><CR><ETX>

TPV	Scale
S<CR>	
	Scale status: <LF><'S'hh><CR><ETX>

TPV	Scale
Z<CR>	
	Returns the scale's status after performing an autozero: <LF><'S'hh><CR><ETX>

TPV	Scale
H<CR>	
	Weight in high resolution: returns the scale's status: <LF><'S'hh><CR><ETX>

TPV	Scale
Others	
	Unrecognized command: <LF>?<CR><ETX>
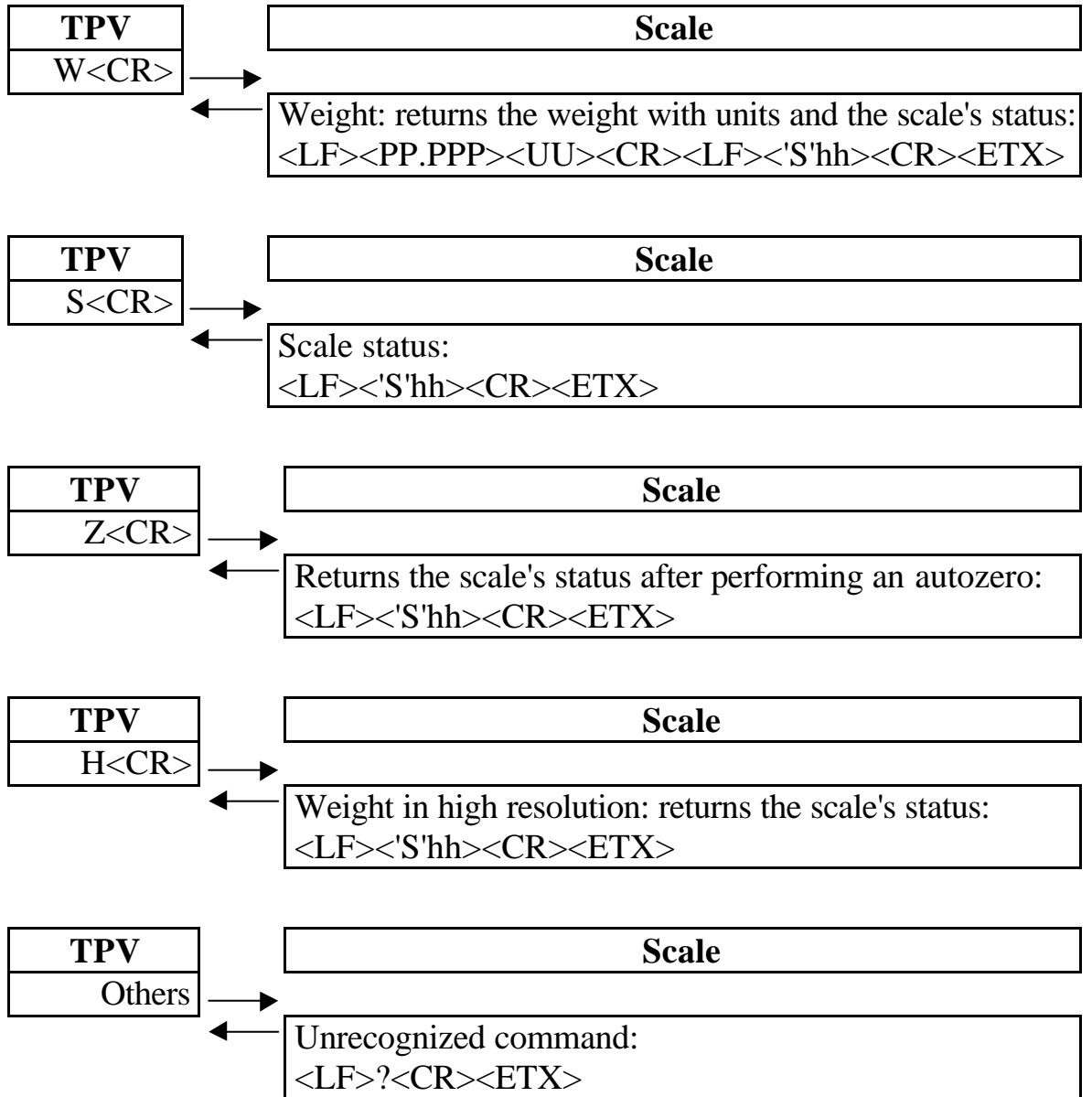
ETX	- Character (0x03, 3d).
LF	- Character 0x0a, 10d.
CR	- Character (0x0d, 13d).
PP.PPP	- Value of the weight with decimal point and left-justified with zeros (0x30).
UU	- Measuring units in upper case (kg, oz, lb...).
'S'hh	- Character 'S' + 2 status bytes.
?	- Character 0x3F.

Coding of the status bytes:

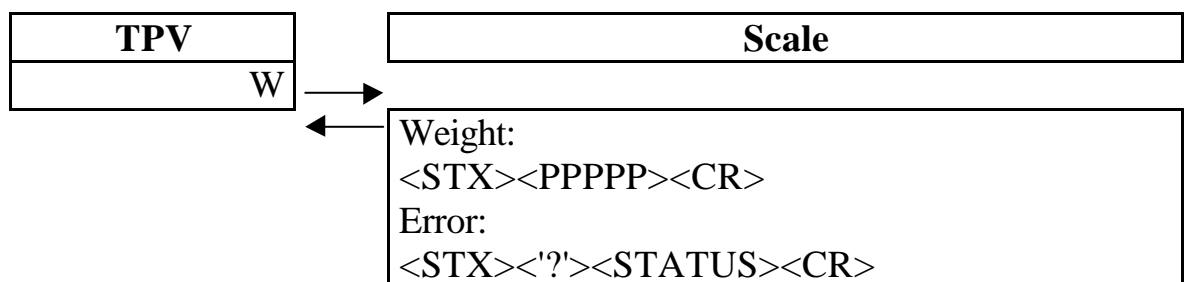| Bit	First status byte	Second status byte
0	1 – Scale in movement 0 – Weight stable	1 – Weight under 0 – No Weight under
1	1 – Scale at zero 0 – Weight <> zero	1 – Weight over 0 – No Weight over
2	1 – Ram Error 0 – No Ram error	1 – Rom Error 0 – No Rom error
3	1 – Eeprom Error 0 – No Eeprom error	1 – Calibration failure 0 – Calibration OK
4	Always 1	Always 1
5	Always 1	Always 1
6	Always 0	1 – There is a third status byte 0 – Last byte
7	Always 0	Always 0

TPV 8 (DICENTRO Protocol):

TPV	Scale
W	
	Weight: <STX><PPPPP><CR> Error: <STX><'?'><STATUS><CR>

W	- Character 0x57, 87d.
STX	- Character 0x02, 2d.
PPPPP	- Value of the weight (5 bytes) in ASCII without decimal point, without sign and justified with zeros (0x30d).
CR	- Character (0x0d, 13d).
'?'	- ASCII character (question mark, 3F Hex.).

STATUS	- 1 status byte:
	   - Bit 7: 1 if in key zero.
	   - Bit 2: 1 weight under.
	   - Bit 1: 1 weight over.
	   - Bit 0: 1 weight not stable.

TPV 9 (ELZAB Protocol):

The trace format is the following:

TPV	Scale
<ESC><M><ETX> <'-'><LF> →	
←	Answer in Basic Protocol: <S><SP><PP.PPP><CR><LF>
←	Answer in Extended Protocol (await request): <ESC><E><S><PP.PPP<CR><LF>
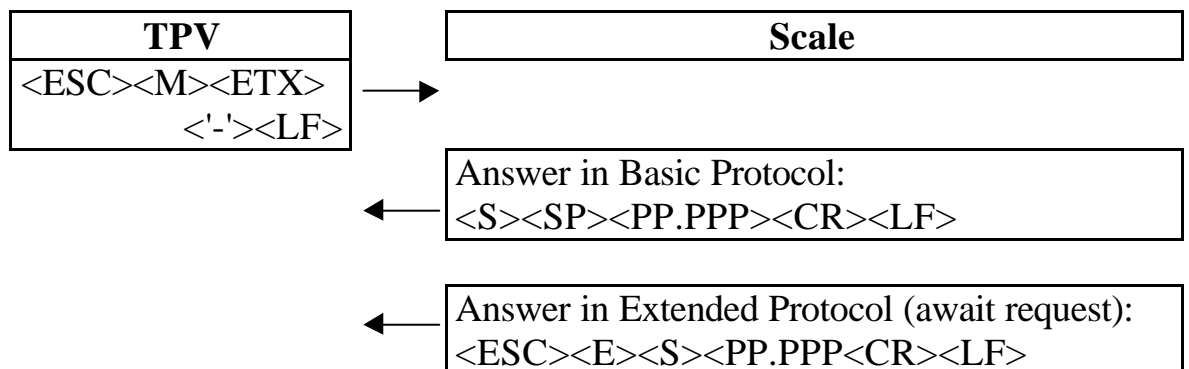
1. Request from the TPV to the scale:

ESC	- Character 0x1B.
M	- Character 0x4D.
ETX	- Character (0x03, 3d).
'-'	- Character 0x82.
LF	- Character 0x0a, 10d.

2. Answer from the scale in Basic Protocol and pulsator:

S	- Sign: blank space (20h) if the result is zero, and 'minus' (2Dh) if the result is less than 0.
SP	- Blank space: 20h.
PP.PPP	- Value of the weight (6 bytes) with decimal point, no sign and justified with blank spaces (0x20d).
CR	- Character (0x0d, 13d).
LF	- Character (0x0a, 10d).

3. Answer from the scale in Extended Protocol (await request) and pulsator:

ESC	- Character 0x1B.
E	- Stability: 'S' if the result is stable, and 'U' if the result is unstable (weight negative, over or under, always 'U').
S	- Sign: blank space (20h) if the result is zero, and 'minus' (2Dh) if the result is less than 0.
PP.PPP	- Value of the weight (6 bytes) with decimal point, no sign and justified with blank spaces (0x20d).
CR	- Character (0x0d, 13d).
LF	- Character (0x0a, 10d).

TPV 10 (VECTRON Protocol):

The scale continuously sends the weight when the TPV enables (set) the DTR signal. As the Eco Multifunction scale does not have DSR, the TPV's DTR is input through RxD of the scale's RS-232 communication connector. This requires a special cable.

The trace of the message sent by the scale to the TPV is the following:

<ID (2 bytes)><SEPARATOR (2 bytes)><DATA (6 bytes)><Units (2 bytes)><CR><LF>

ID	- 'IF' (0x53, 0x49), if the weight is out of range, over or under. - 'S ' (0x53, 0x20), if the weight is stable. - 'SD' (0x53, 0x44), if the weight is unstable.
SEPARATOR	- ' ' (0x20, 0x20), two blank spaces.
DATA	- Weight in grams, with max. 6 characters, right-justified and filled with zeros to complete all 6 spaces. If the weight is out of range, 6 dashes are sent.
UNITS	- 'g ' (0x67, 0x20), grams.
CR	- Character (0x0d, 13d).
LF	- Character 0x0a, 10d.

8. LIST OF POSSIBLE ERRORS

ERROR NUMBER	CAUSE
9	TIMEOUT – Zero and reference capture time exceeded.
10	NAK reception in comunications 'TYPE 0', 'TYPE B' and key.
14	UNSTABLE WEIGHT.
35	INCORRECT CHECKSUM– Series E2prom read error.
51	EEPROM WRITE.
60	INVALID DATA.
61	DATA TOO LARGE – If the set weight is less than 20000 net points. If a Plu greater than 100 is requested. If an item is programmed with a value greater than that allowed.
62	DATA TOO SMALL – If the set weight is greater than 85000 net points. If Plu 0 is requested. If there is any scale parameter with an incorrect value.
63	NULL DATA – If the set weight entered is 0.
64	WEIGHT OUT OF RANGE – Tare out of range.
65	INCORRECT WEIGHT – If the set weight entered is not a multiple of the step.

9.   CONNECTIONS

RS-232 CONNECTOR

1 -   4 -
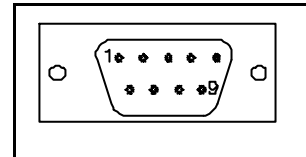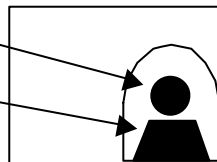2 – Rx+   5 – GND
3 – Tx+
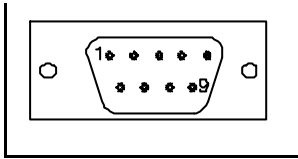
Scale ON/OFF switch

Positive

Ground

External supply
connector

RS-232 connector

Calibration button access hole

The scale can be powered from an external power supply through its external connector (using the car battery, for example) as it operates with a voltage of 12Vdc.

GBS-ECO-MF-V02

Lift the scale platform to access the non-rechargeable or rechargeable battery (optional) compartment.

Non-rechargeable battery conector (5 batteries 1.5V R-20).

Internal battery connector (6V, 10A, rechargeable).
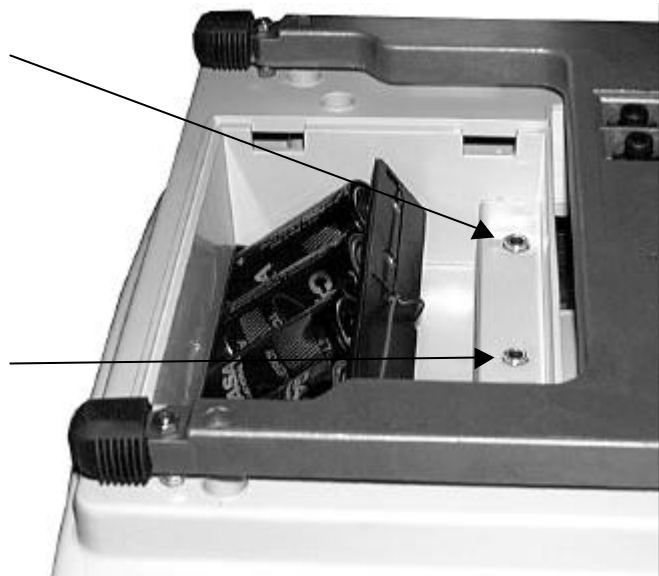
10. BATTERY LIFE

ECO MULTIFUNCTION Model

- With 5 alkaline batteries: up to **150 h**.
- With the internal battery: **150 h**.
- With the automatic Back Light option (25% of the time lit): up to **120 h**.

Note: The manufacturer reserves the right to modify this unit's operation and specifications without prior notice.

GRUPO EPELSA S.L.