



B2 Weighing Indicator

User Manual



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1 Introduction

The B2 is a universal digital weighing indicator for analog load cells, which incorporates:

- Delta-sigma analog to digital converter for accurate weighing.
- Internal alibi memory for recording weighing results.
- RS-232 ports for connections to printers, remote displays, computers or other digital terminal equipments.
- LED display.

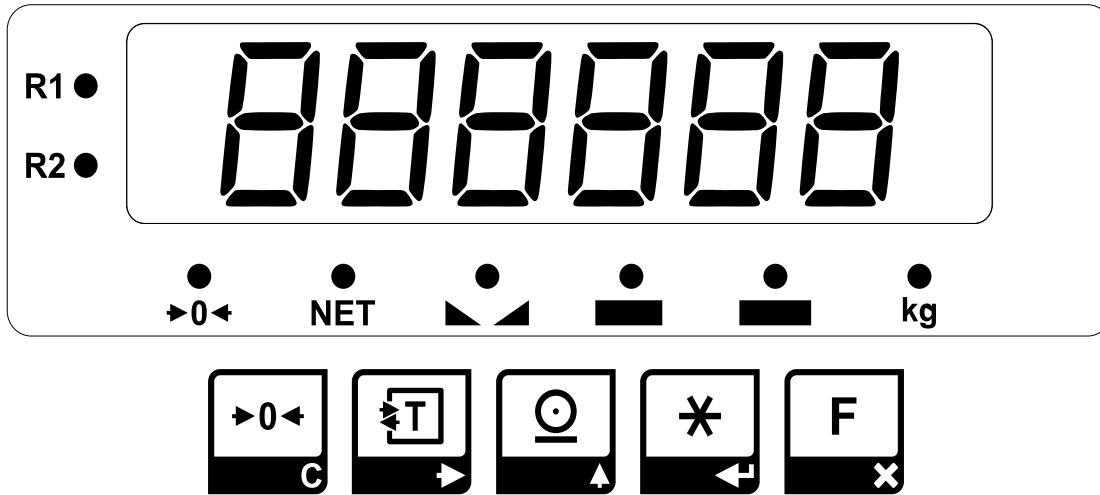
This manual contains the information needed to configure, adjust and operate the device. To ensure safe operation, the instructions in this manual shall be respected.

1.1 Attention Before Start

- Always use Earthed/Grounded Mains socket.
- Do not connect powerful electrical machines on the same mains plug.
- Disconnect mains connector before opening the enclosure.
- Recommended load cell cable cross section is 1 mm². If the cable length is too long, use multiple wires for \pm Excitation connections.
- If the sense inputs on the load cell connector are left empty, the device will display Err 3. Make sure all the pins are connected.
- Shielded twisted-pair cables must be used for load cell and communication.
- For best accuracy, the device shall be powered on at least 30 minutes before adjustment.
- Device setup shall be performed by authorized people.

2 Interface

2.1 Display




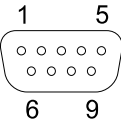
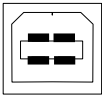
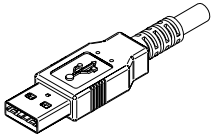
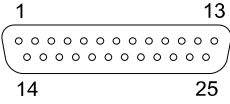
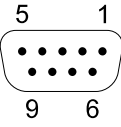
Weight display	6 digit 7-segment led display with decimal point (Negative values are displayed with a minus sign in the leftmost digit)
R1 , R2	Range indicator: If configured as a multi range instrument, indicates the current weighing range.
►0◄	Center-of-zero indicator: Indicates the deviation from zero is not more than $\pm 0.25 e$.
NET	Net indicator: Indicates that a tare device is in operation and the displayed weight value is a net weight.
▲▲	Stability (No-motion) indicator: Indicates that stability of equilibrium has been reached.
kg	Unit of weight: Indicates the unit of the weight, if a weight value is displayed.
BAT	Low battery indicator: If flashing, indicates a low battery condition.
F	Function indicator: Indicates that a function is in operation and the displayed value is a calculated value. A sticker identifying the displayed value (e.g. unit) shall be attached here for the configured function.

2.2 Keypad

	Zero key: Set the indication to zero. Zeroing can be established only if the gross weight is within $\pm 2\%$ of the maximum capacity.
	Tare In / Tare Out key: If the indicated value is positive and stable, it is saved as tare and net weight is indicated. If there is already a tare device in operation, it is cancelled and gross weight is indicated.
	Print key: If the indicated value is positive and stable it is saved as a weighing result and a print out is produced (if configured).
	Star key: Call up the configuration menu. Please refer to the configuration section.
	Function key: Activates and deactivates a configured function. For a complete explanation refer to the related section of this manual.

Note: For an explanation of the function of the keys while editing numerical values please refer to the configuration chapter.

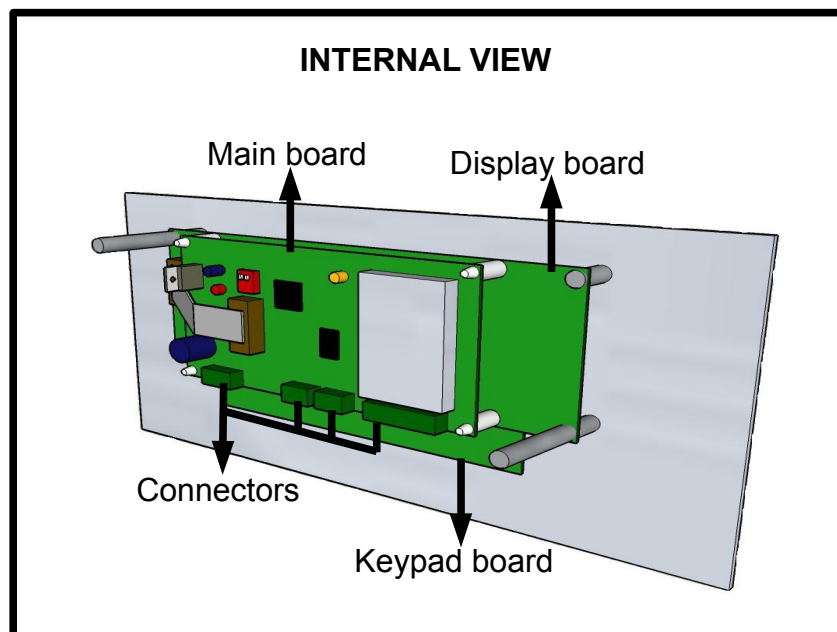
3 Connection Diagram

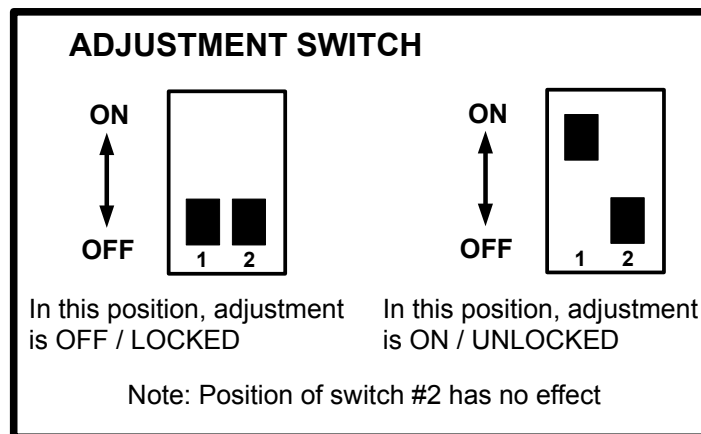
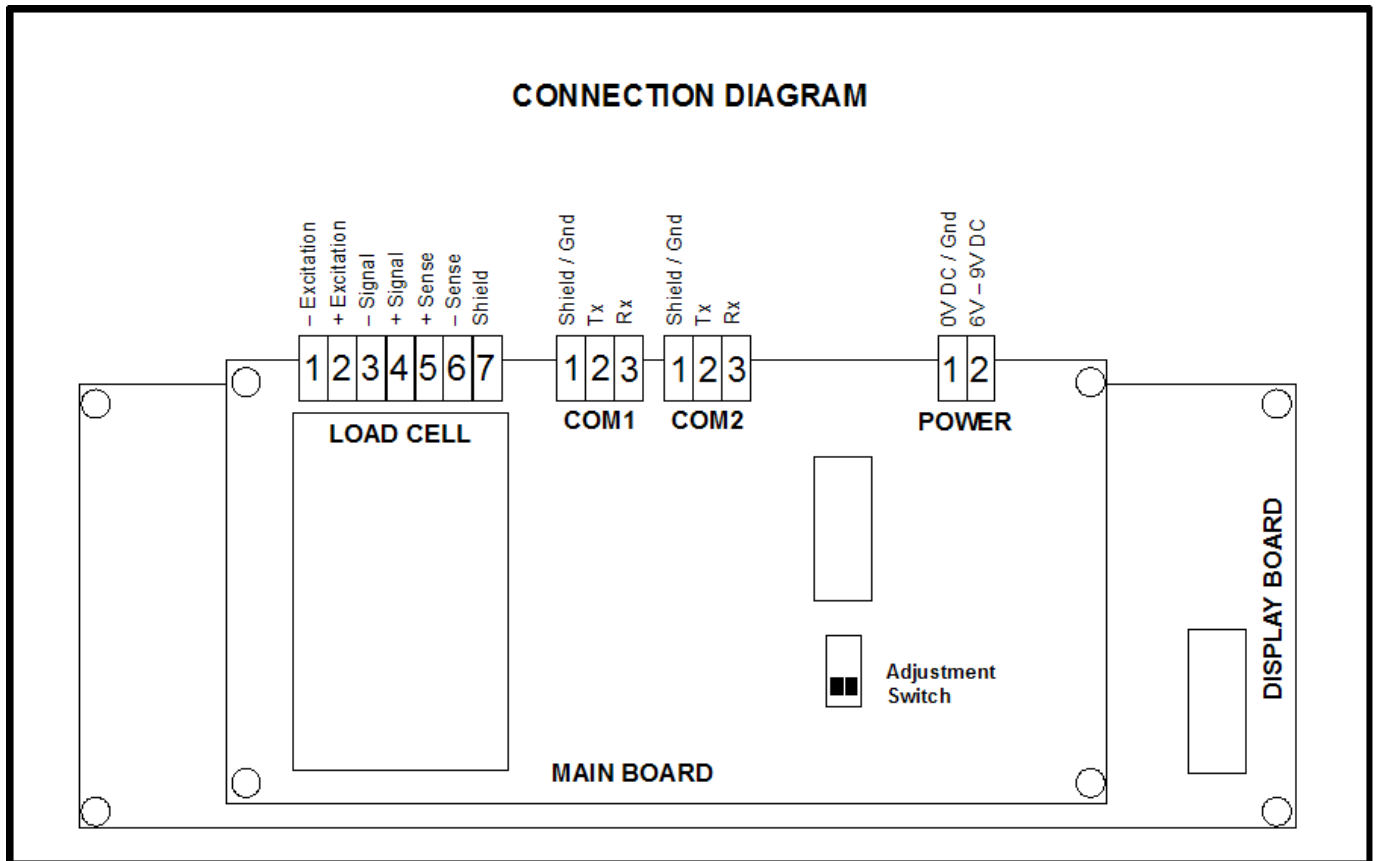
Power	 85 – 264 VAC, 0.45 A, 50/60 Hz Note: Always use Earthed/Grounded Mains socket.		
Load Cell 	Pin	Value	
	1	- Signal	
	2	+ Signal	
	3	- Sense (Note: If load cell is 4-wire connect -Excitation here)	
	4	+ Sense (Note: If load cell is 4-wire connect +Excitation here)	
	5	Ground - Shield	
	6	+ Excitation	
7	- Excitation		
USB 			
RS-232 	Pin	Signal	PC Connection (Type-D 9-Pin Male)
	2	Tx	2 (Rx)
	3	Rx	3 (Tx)
7	Gnd	5 (Gnd)	
Remote Display 	Pin	Signal	ERTE HG57 Remote Display Connection (Type-D 9-Pin Female)
	1, 2, 3	NC	No connection
	4, 5, 6, 7, 8, 9		4, 5, 6, 7, 8, 9 one-to-one

4 Configuration


4.1 Adjustment (Calibration) switch

A toggle switch located on main pcb determines the mode of configuration. If the switch is in “LOCKED” position, it is not possible to alter weighing related settings. If the switch is in “UNLOCKED” position, it is possible to edit weighing parameters and adjustment data.





4.2 Configuration menu

The position of the adjustment switch determines the method of entering the configuration menu and its contents. If the adjustment switch is in "UNLOCKED" position, press  key to enter configuration menu. Contents of the menu:

pAR	Weighing parameters
AyAr	Adjustment (Calibration)
tFon	Miscellaneous Application Settings
Ser	RS232 Serial Port Settings
Ser2	Usb Settings
Fab_aY	Reset All Settings

The function of the keys inside the menu are:



Exit: Return to the weighing display.



Previous: Display the previous entry.



Nest: Display the next entry.



Enter: Enter the displayed sub-menu.



Cancel: Return to a higher menu level.

When user input is needed while changing a device setting, you are prompted to edit a numerical value. For this purpose, a numerical value is displayed with a flashing digit. During the edit procedure the function of the keys are:



Clear: The whole value is reset to zero.



Next digit: The flashing moves to the next digit at right. If the rightmost digit is flashing, the flashing moves to the leftmost digit.



Increment digit value: Increments the value of the flashing digit by one. If the digit has a value of 9 the value becomes 0.








Accept: Finish edit procedure by accepting the new value. If the new value is not acceptable (e.g. out of limits) the edit procedure re-starts with the last value.

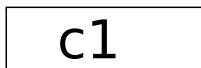


Cancel: Cancel current edit procedure, return to previous parameter editing (if any).

4.3 Weighing parameters

Press  key while “PAR” message is on display. Weighing parameters are edited one at a time. Edit each value by using  and  keys; press  to accept and proceed with the next parameter. You may press  and go back to the previous parameter while editing. When all the parameters are accepted, the device saves the changes automatically. The parameters are:

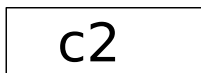
1. Capacity 1



In single range instruments, this is the maximum capacity.

In multi (two) range instruments, this is the maximum capacity of the first range (smaller range).

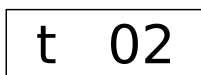
2. Capacity 2



In single range instruments, this value have to be entered as 0 (zero).

In multi (two) range instruments, this is the maximum capacity of the second range (greater range).

3. Scale interval (e)



This value is the difference between two consecutive indicated values (e).

In multi range instruments, this is the interval of the smaller range (e1). The device selects e2 automatically.

(Accepted values: 1,2,5,10,20,50)

4. Decimal places



This value determines the place of the decimal dot while indicating weight values.

(Accepted values: 0,1,2,3)

5. Stability range

Stability of equilibrium is said to be reached, when the rate of change in displayed weight values falls below a predetermined rate. This predetermined rate depends on 'Stability range' (SR) and 'Stability delay' (SD). If the difference of the maximum and the minimum weight values calculated in a period of SD is less than or equal to SR, stability condition is satisfied.



The range for displayed weight values, for determination of the stability.

(Accepted values: 0 .. 5 interval(s))

Note: A value of zero means 0.5 interval

6. Stability delay

hc 1

The time period for displayed weight values, for determination of the stability.

(Accepted values: 1 .. 5 second(s))

7. Filter

Fb 3

This value determines the interpretation of the changes in weight. A lower value causes fast reactions to weight changes and is suitable in relatively stable conditions. A higher value causes slow reactions but the vibrational flickers are eliminated.

(Accepted values: 1 .. 5)


8. Zero at power-on

A 0



This setting determines if the indication is set to zero automatically at power on. (initial zero setting)

(Accepted values: 0 (off) , 1 (on))



4.4 Adjustment (Calibration)

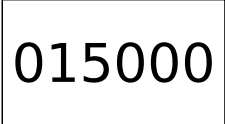

Press  key while “ AyAr “ message is on display. There are 3 options for proceeding.

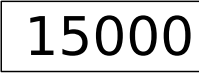

Dead load adjustment: This option may be used when only dead load (zero point) adjustment is needed.

 While this message is displayed, unload the platform and press  key when there is no motion. The display will become blank until the device calculates and saves the calibration data. After that, the device exits the menu and returns to the weight display.



Span adjustment: This option may be used when a dead load adjustment is not needed, but a span adjustment is needed. (The device assumes the last zero point for a reference for the adjustment weight.)



 While this message is displayed, press  key. The dead load adjustment (zero calibration) is skipped.



 Enter (edit) the value of the weight which will be used for adjustment. Accept with  key.

 The value you entered will be displayed constantly. Load the platform with the adjustment weight you entered and press  key when there is no motion. The display will become blank until the device calculates and saves the calibration data. After that, the device exits the menu and returns to the weight display.

Full calibration: This option is performing the dead load adjustment and the span calibration consecutively.

 While this message is displayed, unload the platform and press  key when there is no motion. The display will become blank until the device calculates and saves the calibration data.

 Then Enter (edit) the value of the weight which will be used for calibration. Accept with  key.

 The value you entered will be displayed constantly. Load the platform with the calibration weight you entered and press  key when there is no motion. The display will become blank until the device calculates and saves the adjustment data. After that, the device exits the menu and returns to the weight display.

4.5 Miscellaneous Application Settings

This setting is used to configure miscellaneous application settings like automatic tare, automatic printing etc.

Press  key while “ tFon “ message is on display.

od 0 Automatic Tare
0 – Off
1 – On






di 0 Automatic Tare Cancel
0 – Off
1 – On

oy 0 Automatic Printing
(This option is only for indicators with integrated mini printer)
0 – Off
1 – On

dL 0 Automatic Tare Limit (e)
0 – Off or
of e divisions

yL 0 Automatic Printing Limit (e)
(This option is only for indicators with integrated mini printer)
0 – Off or
of e divisions

4.6 Serial Output Settings

Press  key while “ser” or “ser2” message is on display. Device parameters are edited one at a time. Edit each value by using  and  keys; press  to accept and proceed with the next parameter. You may press  and go back to the previous parameter while editing. When all the parameters are accepted, the device saves the changes automatically.

f 0

RS232 Output Mode

- 0 – Continuous Output Mode
- 1 – Terminal Mode

* See below for details on Continuous and Terminal Mode protocols.

baud 0

Baud Rate

- 0 – 9600
- 1 – 4800
- 2 – 2400
- 3 – 1200
- 4 – 19200

tip 0

Output Mode Type

(If you don't need different serial output format, don't change the defaults)

- 0 – ERTE B2 series output format

*** Continuous Mode Output Format**

Protocol: 9600 baud, 8 data bits, 1 stop bit, no parity (9600-8-N-1) (Default)

Data: (8 characters)

Character	Açıklama						
1. character	A	stable, no tare					
	B	stable, have tare					
	C	no stability, no tare					
	D	no stability, have tare					
	E	underload / overload					
2-7. characters	1	2	3	4	5	6	display value with 6 digits ASCII, no decimal point, no unit (e.g. ' 1500')
8. character	←	Carriage Return (ASCII 13)					

*** Terminal Mode Output Format**

9600 baud, 8 data bit, 1 stop bit, no parity (9600-8-N-1)

In this mode, the indicator responds to specific commands via the serial interface. The commands and the responses are as below :





Command			Response
d	←		Sends the indication value as seen in the display in the form of continuous mode protocol
z	←	Zero Key	No response
t	←	Tare Key	No response
p	←	Print Key	Outputs weighing result in COM1 alibi record output format if saving is successful.

5 Operation

After applying power to a properly installed and configured device, the power-on tests are performed. During these tests all the segments (indicating devices) on the display are turned on. After completion of these tests the device performs initial zero setting, if configured. At the end, the weight display appears.



The weight display is the primary display of the device. The measured weight values are displayed with the unit of weight sign turned on (e.g. kg indicator). Other indicating devices which accompany the weight value are explained in the introduction chapter of this manual.

5.1 Weighing with tare


In order to tare the weight on the platform, press the  key. The indicated weight value is saved as tare value and the indication switches to net mode. The "NET" symbol indicates this situation. To save the weighing result and get a printout press the  key. To cancel the tare and return to gross weighing mode press the  key again or unload the platform and press the  key. Unstable and negative weight values can not be tared.

5.2 High resolution display

This function needs the function key configured for high resolution display.

It is possible to temporarily display measured weight values in 10-fold increased resolution. To perform this function press the  key. The indicated weight value is displayed in high resolution for 5 seconds. At the end of this period, the indication returns to normal resolution mode automatically. It is also possible to turn off high resolution mode by pressing the  key without waiting for 5 seconds.

5.3 Multi range weighing

If the device is configured as a multi-range instrument, the range which is currently active is indicated on the display by "R1" or "R2" indicators. Range selection from the smaller range (R1) to the greater range (R2) is performed automatically when the indicated load exceeds the maximum capacity of the smaller range. Range selection from the greater range (R2) to the smallest range (R1) is performed automatically when indication is zero or at a negative net value equal to gross zero, or manually when the  key is pressed when there is no load. Tare is cancelled automatically.

6 Appendix


6.1 Error messages

Message	Meaning	Solution
#****\$	Overload. Platform is loaded beyond maximum capacity + 9e.	Unload platform.
% ___ &	Underload. Weight is less than zero setting limit. Deadload may be changed.	Check the platform.
hata 1	Error in non-volatile parameter memory. Weighing parameters/adjustment data are missing or corrupted.	Configure the indicator. If the error repeats call service.
hata 2	Possible hardware failure in analog circuit.	Call service.
hata 3	Signal error. Possible disconnection or erroneous connection of load cell cable.	Check load cell connection.
hata 4	Initial zero setting error. Weight value is above or below zero setting range.	Check the platform.
hata 92	(when performing an adjustment) Calculations show that load cell signal may be out of range for weighings near capacity (max).	The adjustment will be accepted, this is just a warning.
hata 99	(when performing an adjustment) Calculated load cell signal per scale interval is too low.	Check weighing parameters and/or adjustment weight.

Press any key to close error message displays.

Note: Some errors can not be cancelled until the cause of error disappears. (e.g. hata 3)

6.2 Specifications

Power Supply	85 – 264 VAC, 50/60 Hz, maximum 15 Watt
Enclosure	Stainless Steel
Display	6 digit, 25 mm bright red display Interval, zero, stability, net, unit and function indications
Keypad	5 mechanical keys (Zero, tare / tare cancel, print and function keys)
Loadcell	4 or 6 wires Excitation Voltage: 5V DC Impedance : 43 ... 1100 Ω (Ex: 8 x 350 Ω) Cable Length : Maximum 350m ($\geq 0.75\text{mm}^2$, 6 wire cable)
Analog Specifications	OIML Class III 3000e, Class III 1000e, single range / multi range Industrial applications 40000e Minimum input-voltage per verification scale interval: $\geq 0.8\mu\text{V/e}$ (approved) $\geq 0.2\mu\text{V/e}$ (industrial) Input Signal Range: 0 ... 20 mV Measurement Method: Delta-sigma A/D, 20ms ... 1s update rate Internal Resolution: 6,700,000 adm Linearity: $< 0.007\%$
Interfaces	RS-232 serial port USB connection (PC) ERTE HG External Display
Environmental	Operating Temperature: $-10^\circ\text{C} \dots +40^\circ\text{C}$ Storage Temperature: $-30^\circ\text{C} \dots +80^\circ\text{C}$ Electromagnetic Compatibility: IEC 61000-4-2 (Electrostatic discharge) IEC 61000-4-3 (Radiated radio frequency field) IEC 61000-4-4 (Electrical fast transient burst) EN 55011 (Emmision)
Dimensions	210mm (width) x 185mm (length) x 110mm (height)
Approvals	 EU Directive EN45501 , EMC - EN 61326-1:2006 and EN 55011:2007