SMART

INDICATOR

USER MANUAL

ver 1.0

ESIT

MDK-SMAE-R00-081003

CONTENTS

Congratulations

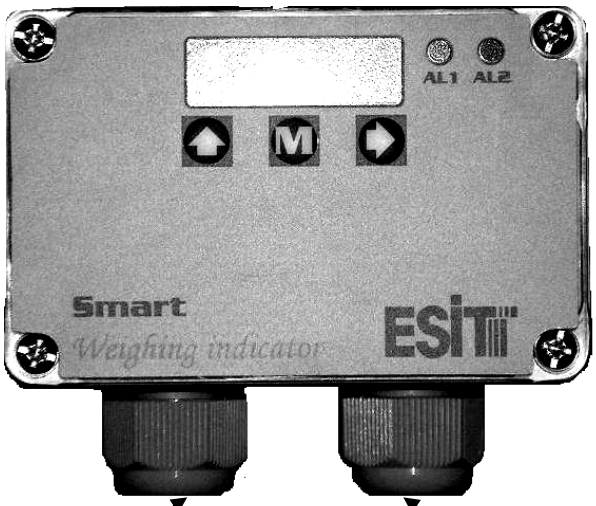
… and thank you for choosing SMART, a weighing indicator specially suited for weighing applications.

Apart from its unique toughness and extraordinary small size, SMART comes packed with features that will help you in industrial weighing applications. Like other indicators from ESIT, SMART is produced to meet highest quality standards.

This guide introduces you to SMART and shows how to get the most out of it. Please note that some of the functions described in this user's guide are depending on orders.

Should you need additional information on how to use them, contact www.esit.com.tr

GENERAL DESCRIPTION



load cell input

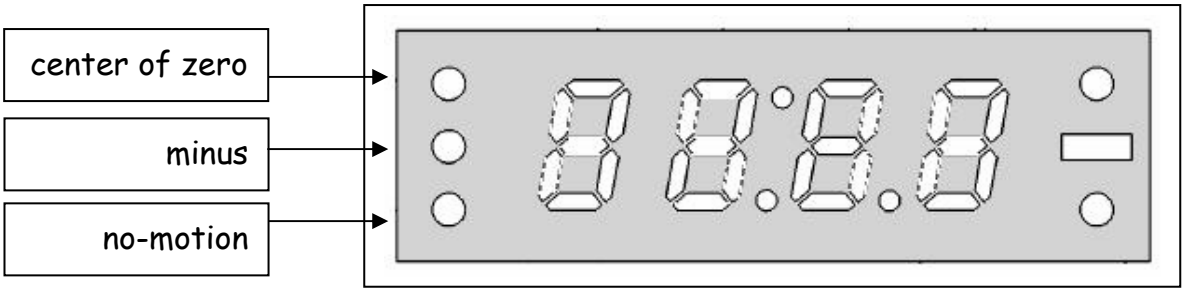
power, communication cables

Press... to...

Navigate (MENU access key)

Select a menu or transmit serial data

Go back one level in menu system or zeroise display value.



ANNOUNCIATORS

No motion: Lights when there is no motion and goes off when there is movement on the platform in the range of **±2e** within 2 seconds.

Center of zero: Lights when displayed weight is zero and the internal count is less than 1/4d. (d: The internal count which can increase the display by 1 step value.)

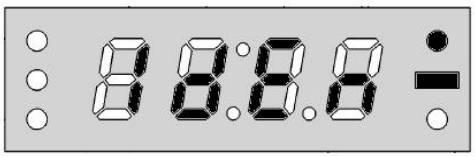
INDICATOR CONNECTIONS

The multi-positioned printed circuit terminal block connections as follows. #1 indicates the leftmost terminal.

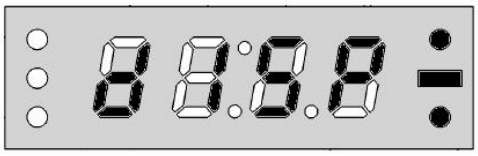
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
+Excitation	+LCinput	-LCinput	***	***	***	-Excitation	SHIELD	+DAC	-DAC	+V (9-36V)	0 Ground	Tx / B	Rx / A	***	RL1nopen	RL1comm	RL2nopen	RL2comm	RL3nopen	RL3comm

MENU SYSTEM

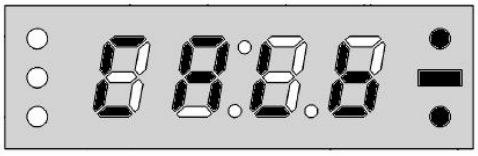
Press M key to navigate in menu system.



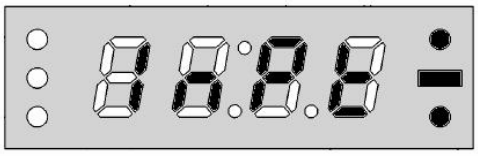
IDENTITY MENU identifies the serial number and version of the indicator.



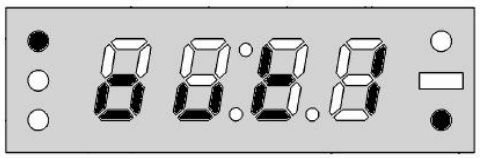
DISPLAY MENU: max. value, step (e) and decimal point in LED display are entered.



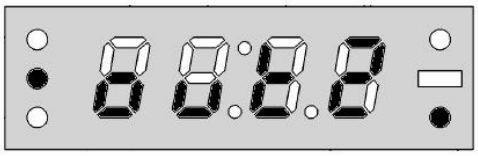
CALIBRATION MENU: set zero and load values.



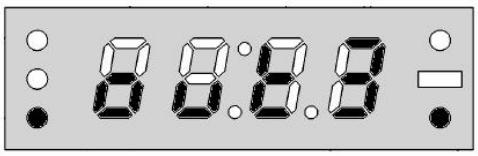
INPUT MENU: changes the conversion rate of the analog-to-digital converter.



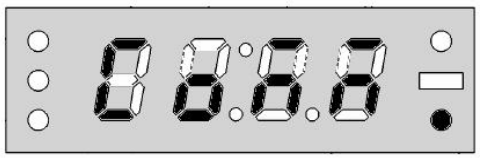
OUTPUT1 (RELAY#1) MENU: set point, set direction, hysteresis, and time delay are entered.



OUTPUT2 (RELAY#2) MENU: set point, set direction, hysteresis, and time delay are entered.



OUTPUT3 (RELAY#3) MENU: set point, set direction, hysteresis, and time delay are entered.



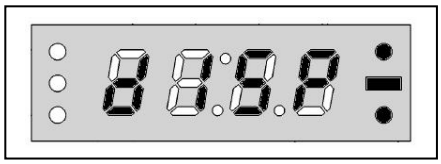
COMMUNICATION PARAMETERS MENU: comm. mode, scale number, parity, baud rate, bit and decimal point are entered.

DISPLAY SETTINGS

DECIMAL POINT SETTING

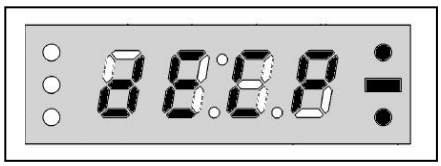
When the display resolution needs decimal point for fractional values, it is possible to show it on the display.

(1) Press the navigation key M until the 'display' menu appears



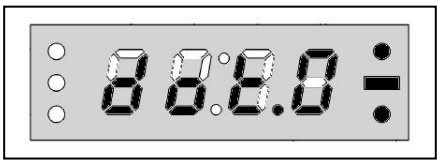
(2) Press ▶ to enter the 'display' menu

(3) Press the navigation key M until the 'decimal point' menu appears

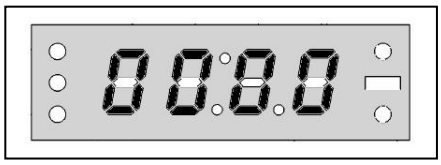


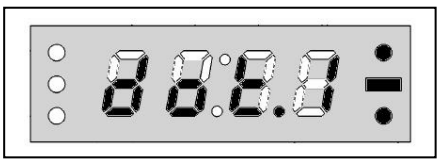
(4) Press ▶ to enter the 'decimal point' menu

(5) Scroll with the navigation key M until you find the decimal point you are looking for.

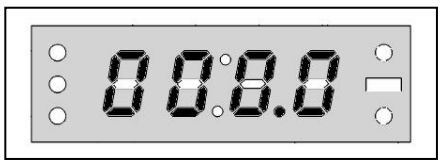


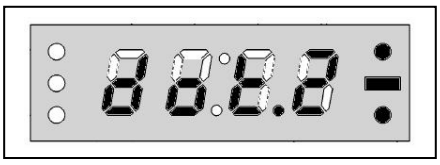
Implies



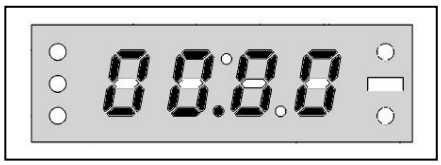


Implies





Implies

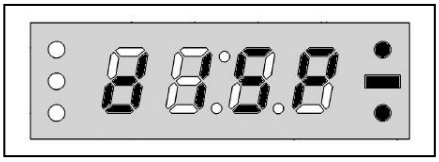


(6) Press ▶ in order to save the place of decimal point

(7) Press ⌂ until normal operation menu appears

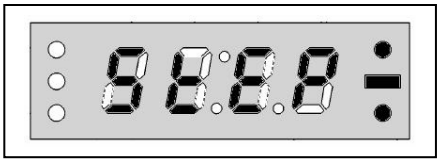
STEP VALUE SETTING

(1) Press the navigation key M until the 'display' menu appears



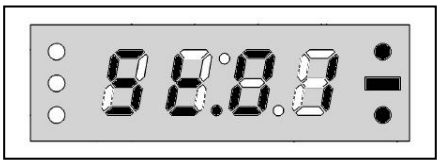
(2) Press ▶ to enter the 'display' menu

(3) Press the navigation key M until the 'step value' menu appears

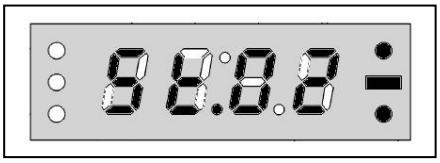


(4) Press ▶ to enter the 'step value' menu

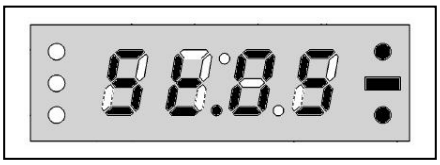
(5) Scroll with the navigation key M until you find the step value you are looking for.



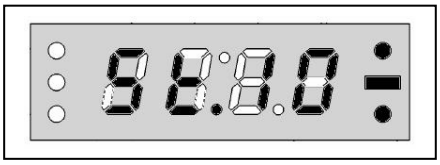
Implies e = 1



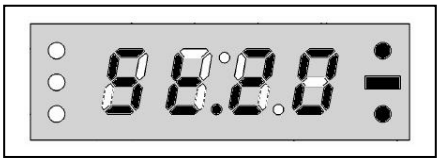
Implies e = 2



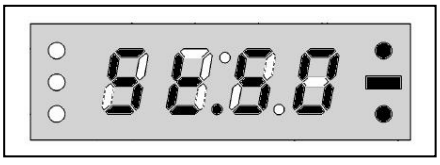
Implies e = 5



Implies e = 10



Implies e = 20



Implies e = 50

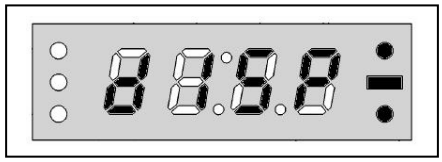
(6) Press in order to save the step value

(7) Press until normal operation menu appears

MAXIMUM ALLOWABLE WEIGHT SETTING

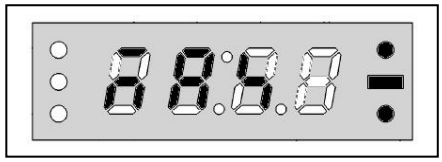
This value determines the maximum weighing range of the indicator. The indicator will produce an error code when the weight value on the platform exceeds MAX+ (9e).

(1) Press the navigation key until the 'display' menu appears



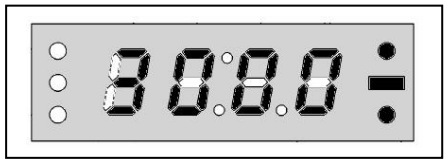
(2) Press to enter the 'display' menu

(3) Press the navigation key until the 'max value' menu appears



(4) Press to enter the 'max value' menu

(5) Press to enter the maximum allowable weight value. Last stored value appears with leftmost digit blinking.



(6) Blinking digit value can be incremented with key; blinking digit can be changed with key.

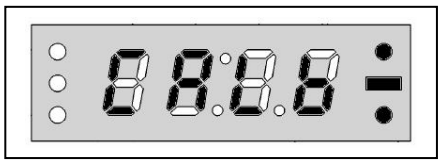
(7) To store the load calibration value press key.

(8) Press until normal operation menu appears

WEIGHT CALIBRATION

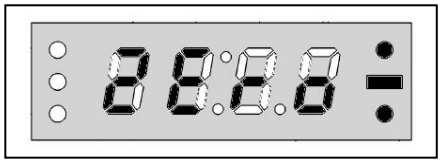
ZERO CALIBRATION

(1) Press the navigation key M until the 'calibration' menu appears



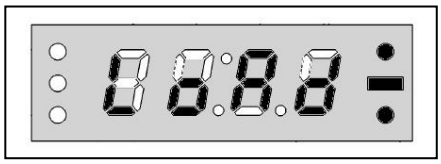
(2) Press ▶ to enter the 'calibration' menu

(3) 'Zero' menu appears (blinking)



(4) After the platform is emptied, press M to calibrate.

(5) 'Load' menu appears

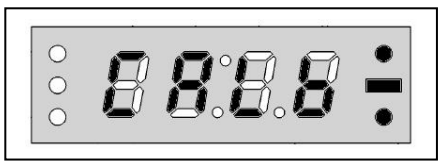


(6) Press ⌂ until normal operation menu appears or jump step (4) in load calibration in order to make load calibration

"NORMAL OPERATION" means the indicator will start showing the weight on the platform unless any key is pressed.

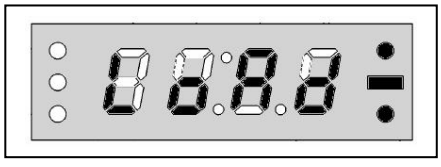
LOAD CALIBRATION

(1) Press the navigation key M until the 'calibration' menu appears



(2) Press ▶ to enter the 'calibration' menu

(3) Press M until the 'load' menu appears

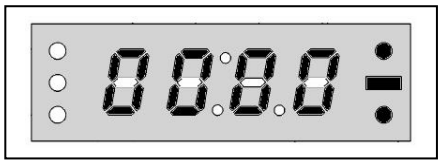


(4) Press ▶ to enter the 'load' menu

(5) You can zeroise the platform by pressing in 'load' menu if needed

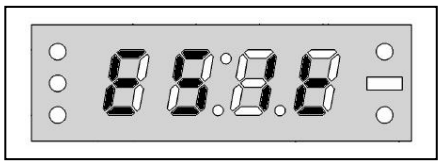
(6) LOAD THE PLATFORM WITH THE REFERENCE WEIGHT. THE REFERENCE WEIGHT SHOULD BETTER BE AT LEAST HALF OF THE LOAD CELL CAPACITY.

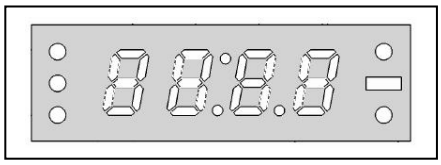
(7) Press to enter the load calibration value. '0000' appears with leftmost digit blinking.



(8) Blinking digit value can be incremented with key; blinking digit can be changed with key.

(9) To store the load calibration value and finish calibration, press key. Indicator resets itself and restarts with new calibration value.



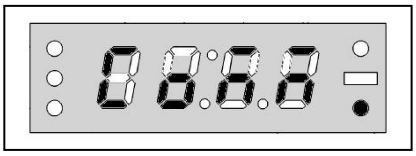


ATTENTION: **CALIBRATION VALUES CANNOT BE CHANGED UNLESS THE CALIBRATION PLUG, PLACED BETWEEN AND KEYS, IS REMOVED FROM THE BOARD.**

COMMUNICATION SETTINGS

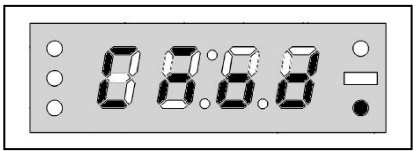
COMMUNICATION MODE SETTING

(1) Press the navigation key M until the 'communication' menu appears



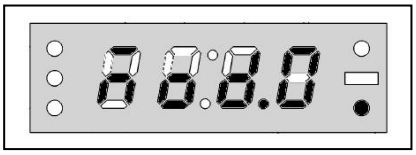
(2) Press ▶ to enter the 'communication' menu

(3) Press the navigation key M until the 'communication mode' menu appears

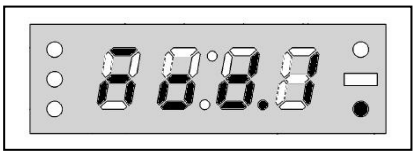


(4) Press ▶ to enter the 'communication mode' menu

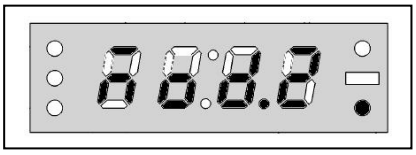
(5) Scroll with the navigation key M until you find the communication mode you are looking for



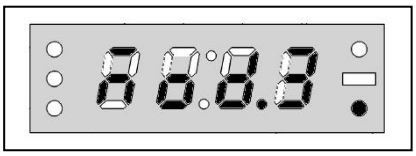
NO COMMUNICATION



CONTINUOUS TRANSMISSION OF 4 DIGIT WEIGHT VALUE



NOT AVAILABLE



ADDRESSED COMMUNICATION

(6) Press ▶ in order to save the communication mode

(7) Press ⌂ until normal operation menu appears

Notes for MOD3 communication:

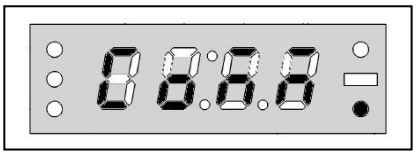
The transmission of weight value is performed when the indicator realizes the code from the other side. By this way more than one indicator can be connected to the same communication line. The data format is the same as COMM 1.

For a PC to communicate with more than one indicator, this parameter should be COMM3, and the communication hardware should be RS-485.

SCALE IDENTITY NUMBER SETTING

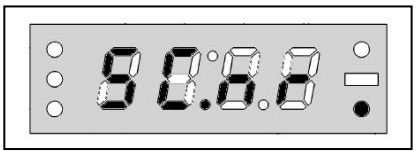
ONLY AVAILABLE IN COMMUNICATION MODE3

(1) Press the navigation key M until the 'communication' menu appears



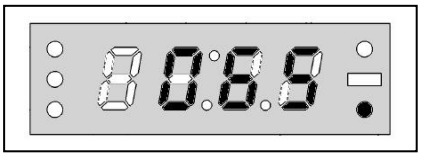
(2) Press → to enter the 'communication' menu

(3) Press the navigation key M until the 'scale number' menu appears



(4) Press → to enter the 'communication' menu

(5) Last stored scale number value appears with leftmost digit blinking



065 = hex41= "A"

NOTE: **SCALE IDENTITY NUMBER RANGE IS FROM 0 TO 255**

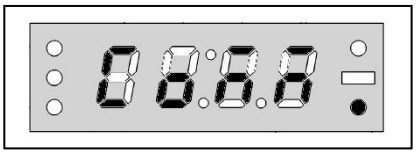
(6) Blinking digit value can be incremented with ↑ key, blinking digit can be changed with M key

(7) To store the scale identity number press → key

(8) Press ↑ until normal operation menu appears

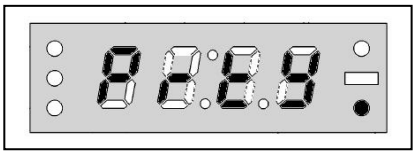
COMMUNICATION PARITY SETTING

(1) Press the navigation key M until the 'communication' menu appears

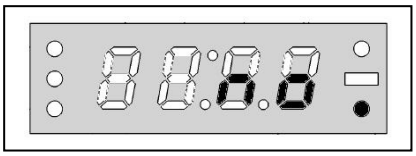


(2) Press ➔ to enter the 'communication' menu

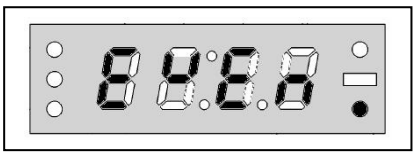
(3) Press the navigation key M until the 'parity' menu appears



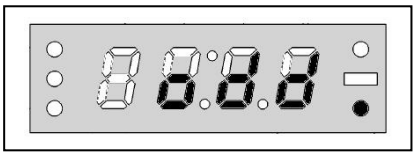
(4) Scroll with the navigation key M until you find the parity you are looking for



Implies NO PARITY



Implies EVEN PARITY



Implies ODD PARITY

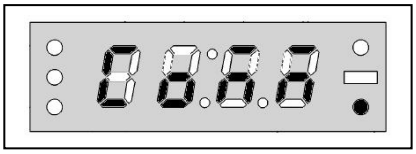
(5) Press ➔ in order to save the communication parity

(6) Press ⌂ until normal operation menu appears

COMMUNICATION SPEED (BAUD RATE) SETTING

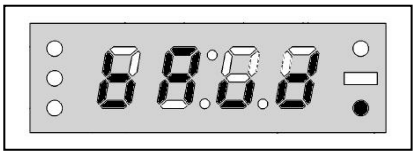
The number of communication bits sent per second is called BAUDRATE. The allowable values are: 1200, 2400, and 4800.

(1) Press the navigation key M until the 'communication' menu appears



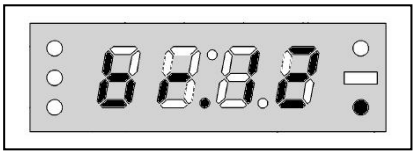
(2) Press ▶ to enter the 'communication' menu

(3) Press the navigation key M until the 'baud rate' menu appears

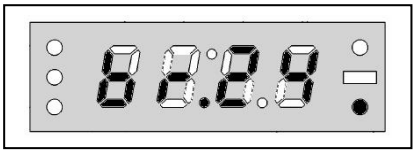


(4) Press ▶ to enter the 'baud rate' menu

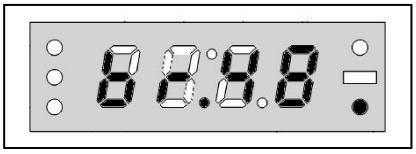
(5) Scroll with the navigation key M until you find the baud rate you are looking for



Implies 1200 baud communication



Implies 2400 baud communication



Implies 4800 baud communication

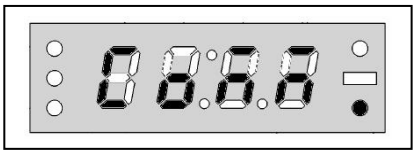
(6) Press ▶ in order to save the baud rate

(7) Press ⌂ until normal operation menu appears

COMMUNICATION BIT SETTING

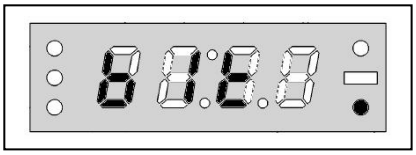
This parameter gives the number of bits in a communication byte. With 7 bits communication 128 different characters can be coded. On the other hand 256 different characters can be coded with 8 bits communication.

(1) Press the navigation key M until the 'communication' menu appears



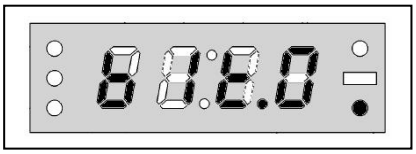
(2) Press ▶ to enter the 'communication' menu

(3) Press the navigation key M until the 'communication bit' menu appears

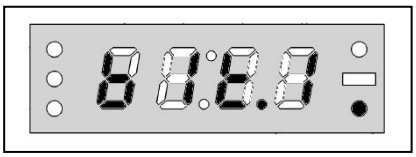


(4) Press ▶ to enter the 'communication bit' menu

(5) Scroll with the navigation key M until you find the communication bit you are looking for



Implies 7 bits communication



Implies 8 bits communication

(6) Press ▶ in order to save the communication bit

(7) Press ⌂ until normal operation menu appears

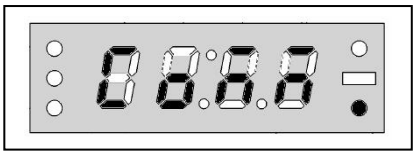
Notes: The ASCII code for character 'A' is hexadecimal 41;
This is shown as:

	7. 6. 5. 4. 3. 2. 1. 0.
7 bit	x 1 0 0 0 0 0 1
8 bit	0 1 0 0 0 0 0 1

DECIMAL POINT COMMUNICATION SETTING

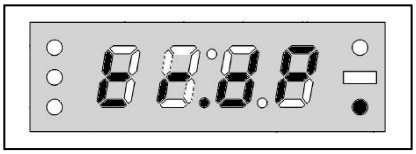
Communication with decimal point is available only in 8 bits communication.
Decimal point is sent in the most significant digit of the transmitted byte.

(1) Press the navigation key M until the 'communication' menu appears



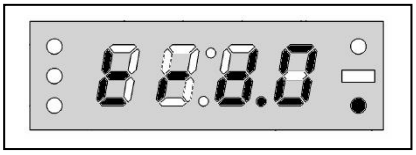
(2) Press ▶ to enter the 'communication' menu

(3) Press the navigation key M until the 'communication decimal point' menu appears

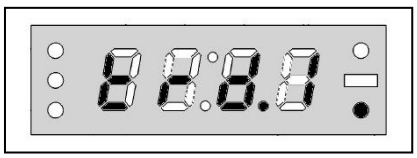


(4) Press ▶ to enter the 'communication decimal point' menu

(5) Scroll with the navigation key M until you find the decimal point communication settings you are looking for



COMMUNICATION WITHOUT DECIMAL POINT



COMMUNICATION WITH DECIMAL POINT

(6) Press ▶ in order to save the decimal point communication settings

(7) Press ⌂ until normal operation menu appears

Example data stream for mod1 in 8 bits and decimal point included communication:

Display		'+'	'1'	'2'	'3'	'4'	CR
+1234	Hex	2B	31	32	33	34	0D
+123.4	Hex	2B	31	32	B3	34	0D
-12.34	Hex	2D	31	B2	33	34	0D

If there is a decimal point on the display, then the corresponding digit is sent with hex80 added to the ASCII value.

Character	HEX		Character	HEX	
0.	B0	(30+80)	5.	B5	(35+80)
1.	B1	(31+80)	6.	B6	(36+80)
2.	B2	(32+80)	7.	B7	(37+80)
3.	B3	(33+80)	8.	B8	(38+80)
4.	B4	(34+80)	9.	B9	(39+80)

Example data stream for mod3 (addressed communication):

If address (scale identity number) is set as 65 (41h), the indicator will send the weight data after receiving

	(Wake-up)	Address
HEX	FFh	41h

If the address is set to **0** then the indicator will send the weight data after receiving any character from the serial receive line. The address may take any value from **0** to **255.**

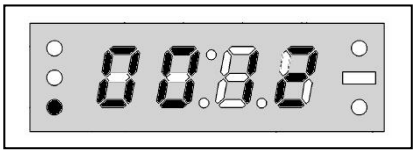
When more than one SMART indicator is connected to the same transmission line, then the devices should have RS 485 communication hardware and all should have unique addresses.

TRANSMITTING WEIGHT VALUE FROM SERIAL LINE WITH KEY

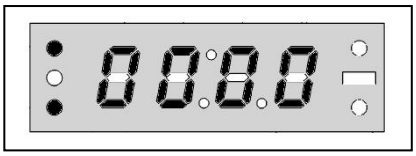
If in the communication menu, the **comm-3** was set the weight value can be transmitted by pressing key from the serial line. In order to transmit the data, no-movement state must be achieved.

RESETTING DISPLAY VALUE TO ZERO (ZEROISE) WITH KEY

To reset the weight value to zero, press key. In order to perform this function, the indicator should be in no-movement state appears as



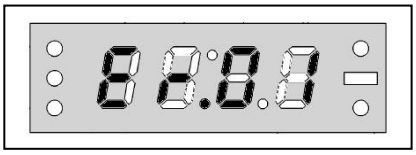
After key is pressed, the value turns to zero and center-of-zero symbol is lit.



ERROR CODES

During weight measurement in some cases the SMART indicator produces some error codes. These codes and their probable reasons are as follows:

Error 01: Over range
More than MAX+ (9*e) of capacity



ESIT ELEKTRONIK LTD.
http://www.esitscale.com
esit@esitscale.com