

# OPERATING MANUAL

FOR

Weight Indicator

SIPL: SMIT3016



Manufactured By:

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# CHAPTER 1

## ***1.1 INTRODUCTION***

This WEIGHING SYSTEM model-SMIT3016 is based on popular 8-bit micro controller.

## ***1.2 General specifications of the system are:***

1. Mains supply: 24VDC/230v ac +/- 10%
2. Key board: 4 keys keypad
3. Display: 6 digit 7-Segment 0.5" Red LED Display
4. Output: 4mA – 20mA (Compliance up to 500 Ohms)
5. Load Cell Excitation: +5V DC
6. Dimension: Outer: 96mm (W) x 48mm (H) x 120 mm (D)  
Cutout: 92mm (W) x 42mm (H)
7. Enclosure: General purpose  
Made up of Plastic  
Panel mounting type

## CHAPTER 2

### 2.1 SYSTEM DESCRIPTION:

The system is based on an 8-bit micro controller (8751series). It is to be used for measuring and displaying the Weight in Industrial Systems.

With the help of the keypad and display on front, the system allows to set and modify various parameters for

- Display and
- Calibration

The System gives Excitation Voltage to Load Cell and reads mV output from Load cell. The Weight Indicator converts it to Weight and display

Weight Indicator also generates current output corresponding to weight sensed from Load cell.

Output and Input both are calibrated using software hence reduces human interface with Hardware.

### 2.2 HARDWARE DESCRIPTION:

Connections details for 230VAC

TERMINAL DETAILS			
① C	DIGITAL OUTPUT	⑨ TARE	DIGITAL INPUT
② EK		⑩ 24V	
③		⑪ SENSE+	LOAD CELL
④ OUT +	⑫ SENSE-		
⑤ OUT -	⑬ EXC+		
⑥ D-/TxD	⑭ EXC-	POWER SUPPLY	
⑦ D+/RxD	⑮ N		
⑧ GND	⑯ L		
SERIAL RS 232/485		230V ~	
Sr. No.			

Connections details for 24VDC

TERMINAL DETAILS			
① C	DIGITAL OUTPUT	⑨ TARE	DIGITAL INPUT
② EK		⑩ 24V	
③		⑪ SENSE+	LOAD CELL
④ OUT +	⑫ SENSE-		
⑤ OUT -	⑬ EXC+		
⑥ D-/TxD	⑭ EXC-	POWER SUPPLY	
⑦ D+/RxD	⑮		
⑧ GND	⑯		
SERIAL RS 232/485		24V	
Sr. No.			

### **2.2.1 Back Panel:**

Refer See connections details for back panel connections.

### **2.2.5 Enclosure:**

The weight Indicator is packed in 96mm x 48 mm Panel Mountable Plastic Enclosure.

### **2.3 *INSTALLATION GUIDE:***

Unpack the instrument from the packing box carefully.

Mount the instrument in the panel cutout of 92mm \* 42mm. Fix the instrument with the panel using two nos. studs provided with the instrument

Make the connection as shown in connection Diagram.

## CHAPTER 3 OPERATING DETAILS:

The following paragraphs give detailed description of how to operate the unit. For efficient use of the instrument one must study and understand this section.

### 3.1 DISPLAY & KEYBOARD:

The system has Seven-digit 7-segment green display. The system has 4-key keypad organized as 4\*1 matrix. List of keys and their functions:

Keys	Function
Index /Enter	If in Edit Mode Save new data Else it will select new Menu
Select	Enter into data entry/verification mode. The Edit Mode is identified with Blinking of Selected Display.
Increment	When In Edit mode Selects Next Digit Increment selected parameter value
Esc Key	Cancel Selection and Terminate Edit mode

*Whenever mains is switched on to the unit:*

The system will display current weight

### 3.2 MENU LIST:

Parameter in Weight Indicator is divided in three Main Menu.

- Display “DISP”
  - Decimal Point Setting: “dEP”
  - Step width: “Svd”
  - Rounding: “rOUnd”
- Operation: “OPer”
  - Full-scale OUTPUT: “FS-O/P”
  - Average Time: “AvG”
  - Moving Average Time: “nAv”
  - Power on delay Time: “POn”
  - Setpoint: “SetPnt”
  - Clear Peak: “Clr Pek    Pass word 3210
  - Unit no: “unit”
  - Off set : “OFFSET
  - Capacity weight of over message: “CAP “

- Plant Name : To be entered through keyboard and will be displayed at power ON  
Maximum 18 characters can be entered

- Calibration: “CAL”

- Password “PASS”

- Calibration Zero:“CALZ”
- Calibration Span:“CAL S”
- Calibration Out Zero:“OUTZ”
- Calibration Out Span:“OUTS”

3.3 How to Enter/Modify parameter value:  
Pressing Menu key will display three main menus one by one.

- Use Digit select (→) key select the Menu. And Now it will display Parameter in Selected Menu
- Use Menu Key to scroll the List of Parameter.
- Use Digit select (→) key select the Parameter. And now it will display Value of selected Parameter and First Digit will start Blinking.
- Use Digit select (→) key and Increment (↑) to modify the Value of the parameter.
- Press Menu Key to save the Data in EEPROM and go to next Parameter. And Blinking is stopped

Example 1:

Set Decimal Point to: 0.01

Operation	Display
1. Press Menu/Enter Key	“dISP”
2. Press Select Key	“dEP”
3. Press Select Key	“0.1” (Display Present Value)
4. Press Incr Key	“0.01” (Display Present Value)
5. Press Menu/Enter Key	“Svd” (Saves Value and Display Next)

Example 2:

Perform Calibration:

Operation	Display
1. Press Menu/Enter Key Display is	“CALI”
2. Press Select Key	“PASS”
3. Press Select Key	“0000”
4. Using “Select” Key and “Incr” Key enter the value	“1234”
5. Press Menu/Enter Key	“CALZ” (Saves Value and Display Next)
6. Press Select Key	“0000” (Value Set for Zero)

7. Using "Select" Key and "Incr" Key enter the value	Set Value as required (For Zero Normally it should be kept Zero.
8. Press Menu/Enter Key	ADC Count And Zero Weight is saved in EEPROM for future use and "CALZ" is displayed
9. Press Select Key	"xxxx" (Value Set for Span)
10. Using "Select" Key and "Incr" Key enter the value	Set Value as required.
11. Press Menu/Enter Key	ADC Count And Span Weight is saved in EEPROM for future use and "OUTZ" is displayed
12. Press Select Key	"xxxx" (Value Set for Out zero is displayed)
13. Using "Select" Key and "Incr" Key enter the value and Set the Current to 4.00 mA	Set Value as required.
14. Press Menu/Enter Key	Count Entered are saved as Out Zero Count and "OUTS" is displayed
15. . Using "Select" Key and "Incr" Key enter the value and Set the Current to 20.00 mA	Set Value as required.
16. Press Menu/Enter Key	Count Entered are saved as Out Span Count and again "CALZ" is displayed
17. Press ESC Key to exit from edit calibration mode	Weight is displayed

Example 3 :

Set Operation menu parameter:

Operation	Display
1. Press Menu/Enter Key	"OPER"
2. Press Select Key	"FS"
3. Press Select Key	"xxxx" (Display Present Value)
4. . Using "Select" Key and "Incr" Key set the value as required	Set Value as required.(Output current 20.00 mA when weight is equal to Fullscale value)
5. Press Menu/Enter Key	"AvG" (Saves Value and Display Next)



### 3.4 Output:

Weight Indicator generates the Output current 4mA – 20mA corresponding to the Input weight using following Equations: Output Current = (Actual Weight \* 16 / FS Weight) + 4 Ma

### 3.5 Tare:

A Tare Input is provided on Back panel. While closing the contact the Weight Displayed goes to tare and Display becomes 0.0

### 3.6 Serial communication:

#### **MODBUS REGISTERS**

SR. NO.	Register No	Parameter	Function
1	40001	Weight	LSB of displayed weight (16-bits)R
2	40002	Weight	MSB of displayed weight (16-bits)R
3	40003	Adc count	LSB of displayed weight (16-bits)R
4	40004	Adc count	MSB of displayed weight (16-bits)R
5	40005	Decimal point	0-3 R,W
6	40006	Svd	1,2,5 R,W
7	40007	Rounding value	1,2,5 R,W
8	40008	Full-scale lower byte	LSB of displayed weight (16-bits)R,W
9	40009	Full-scale higher byte	MSB of displayed weight (16-bits)R,W
10	40010	Moving Average time	1-32 R,W
11	40011	Power on delay	0-30sec R,W
12	40012	Set point lower byte	LSB of displayed weight (16-bits)R,W
13	40013	Set point higher byte	MSB of displayed weight (16-bits)R,W
14	40014	Unit No.	1-99 R,W
15	40015	Offset	1-65534 R,W
16	40016	Capacity lower byte	LSB of displayed weight (16-bits)R,W
17	40017	Capacity higher byte	MSB of displayed weight (16-bits)R,W
18	40018	Tare, zero	1,2 W

Refer back details for Serial Connection.

#### **How to Test: -**

To test serial interface, you may use MODSCAN32.EXE utility. Settings:

1. Set **Device Id = 1**
2. Set **Length = 18**
3. **BAUD RATE = 9600**
4. Set **MODBUS point Type to 'Holding' to read weight**  
**Select Address from 0001 to 0018 in Modbus application. Use 'Connect' button.**