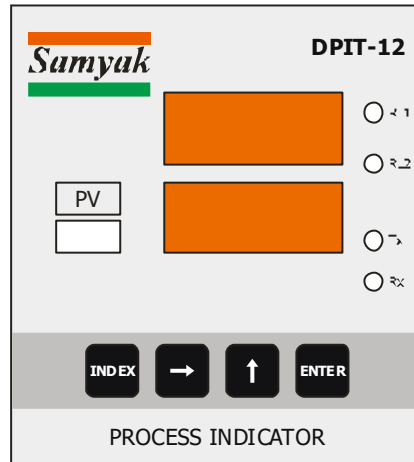




**OPERATING MANUAL
FOR
PROCESS INDICATOR CONTROLLER
MODEL : DPIT-12**



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INTRODUCTION:

This is a microcontroller based universal Process Indicator controller unit. It is highly versatile, accurate and different from the conventional indicators.

The set Parameters are stored in serial NVRAM. No battery back up is required.

General Specifications of this unit are:

- This is a Microcontroller based unit
- Power Supply: 24VDC from Terminals of unit.
- Indication: Four Digit Seven Segment Red LED
- Key board: Four keys membrane like
- Accuracy: 0.2% + +/- 1 digit
- Warm up time: 15 minutes
- Configuration Data are stored in serial NVRAM
- Mechanical data:

Mounting: Din Rail Mount

Dimension: 70mm (W) x 75mm (H) x 110mm (Depth)

SYSTEM DESCRIPTION:

With the help of the keypad and display, unit allows to set and modify various configuration parameters and calibration.

HARDWARE DESCRIPTION:

The unit consists of a CPU card, Relay card and KB/Display card.

The CPU and KB/Display card has necessary hardware for:

- Driving four digit multiplexed Display on CPU card.
- Watch dog circuit CPU card.
- RS232/RS485 circuit for serial on CPU card.
- Four key keypad interface on KB/Display card.
- DC regulated supply: +5V

The CPU card is connected with KB/Display card and Relay card through connectors.

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INSTALLATION GUIDE:

- ❖ Unpack the instrument from the packing box carefully.
- ❖ Mount the instrument in the panel.
- ❖ Refer the Connection details which are given on the unit.
- ❖ Make sure that no wire is connected loosely to avoid generation of spark and RFI. Before connecting the mains, check the mains configuration on the unit.

Applying Input:

- ❖ The instrument takes Load cell input from given Terminal.

OPERATING DETAILS:

The following paragraphs give detailed description of how to operate the unit. Before using the instrument, make sure to study and understand this section.

DISPLAY & KEYBOARD:

It displays Process variable/Flow.

Unit has 4 key membrane keypad organized as 4 x 1 matrix.

List of keys and their functions:

| Keys | Function |
|------------------|---|
| Index | Enter into data entry/verification mode Select parameter |
| Enter | Save New data and Terminate Edit mode. |
| Digit Select (→) | Select Next digit |
| Increment (↑) | Increment selected digit value |

EDIT MODE:

In this mode user can verify or modify various parameters. Entry into Edit mode is protected by Password.

Press 'Index' key to enter into edit mode. The display window will show 'PASS' for a moment and then it will start displaying '0000' with flashing Left most digit .The unit is prompting for Password. Password is a four digit no. There are two different passwords.

Operator's Password: **0101/ 1234**

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Enter any one of the above password using data entry keys. When 'Enter' key is pressed, the validity of Password is checked. If wrong password is entered the unit comes out of edit mode and displays engineering value.

Press 'Index' key again if you want to enter into edit mode.

If correct password is entered, then also the unit starts Indicating Engineering value of input. Now press 'Index' key, the display will show name of the parameter to be modified and its value after a moment.

Pressing the 'Index' key again will display next parameter. The various parameters that will appear on the display with successive depression of the 'Index' key are:

| PARAMETER DESCRIPTION | DISPLAY | PASSWORD | VALUE |
|---------------------------------|---------|-----------|-----------------|
| Zero Calibration | CALZ | 1234 | Zero Weight |
| Span Calibration | CALS | 1234 | Known Weight |
| Current output 4 Ma Calibration | OUTZ | 1234 | 0 to 4095 (Max) |
| Current output 20Ma Calibration | OUTS | 1234 | 0 to 4095 (Max) |
| ADC Counts | CONT | 1234 | |
| Output Zero | ZERO | 1234/0101 | 0000-9999 |
| Output Full Scale | FS | 1234/0101 | 0000-9999 |
| Decimal Point | DP | 1234/0101 | 0,0.1,0.01 |
| Unit NO | U-NO | 1234/0101 | 01-31 |
| LO Alarm | LO | 1234/0101 | 0000-9999 |
| Hysteresis | HYST | 1234/0101 | 0000-9999 |
| Resolution | ROND | 1234/0101 | 1,2,5,10 |
| Moving Average | NAV | 1234/0101 | 1-32,OFF |
| HIGH Alarm | HI | 1234/0101 | 0000-9999 |
| Baud Rate | BAUD | 1234/0101 | 4.8,9.6,19.2 |

Following the above process, one can select any of the above listed parameters. First two parameters listed in the table (CALS & CALZ) after Password are displayed in engineer's Password mode only. We will discuss about the same in calibration Procedure.

When a parameter is selected, its name will be first displayed for a moment and then current value is displayed in the same field of display. The left most digit will start flashing.

Use Increment (Up arrow) key, if you want to modify the flashing digit.

Press increment key, flashing digit will increment up to 9 and rolls back to 0 when it reaches at 9.

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Once desired digit is set, press digit select key (Right arrow) to select next digit. The next selected digit will flash. Set it to desired value as per the above step.

Once all the four digits are set, press 'Enter' key. The parameter value will be modified as per new set value. Display will start indicating Input.

When in data entry/EDIT mode, if no key is pressed for 30 Seconds, the unit will terminate data entry mode automatically and start indicating Process value.

Press 'Index' key to go to next parameter. If 'Index' key is not pressed for more than 30 seconds, the unit will terminate 'Edit' mode automatically and start indicating Process value. To enter into 'Edit' mode, one has to enter Password again.

Note: For parameter 'CALZ' and 'CALZ', the unit will not terminate 'Edit' mode automatically. To terminate the Edit Mode, press **ENTER** key.

CALIBRATION PROCEDURE:

The Instrument is duly calibrated at the factory. For any reason, if re-calibration is required follow the procedure as defined below.

As explained earlier, One can do calibration thro' the keyboard itself, no trimming of potentiometer is required. The Zero and Full-scale values are stored in NVRAM. The calibration is allowed only in Engineer's Password mode.

LOADCELL CALIBRATION:-

1. Switch on the instrument and allow 15 minutes of warm up time before starting calibration.
2. Connect load cell to input terminals (18, 19, 20 & 21) of the indicator.
3. Calibration of ZERO (CALZ)
Press Index key.
Now enter engineers; Password '1234'.
Press INDEX key after entering this Password.
The parameter 'CALZ ' for Zero will be displayed.
This parameter is use for calibration of zero. At that time Platform of load cell was empty.
Now enter value 0000 in this parameter and press 'Enter' Key.
This value will be stored as ZERO reading.
4. Calibration of SPAN (CALZ)
The parameter 'CALZ ' for Span will be displayed.
This parameter is use for calibration of Span. At that time Put Some weight on platform of load cell .if this weight is 100kg
Now enter value 0100 in this parameter and press 'Enter' Key.
This value will be stored as SPAN reading.

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Now the instrument is calibrated.

For again entering into calibration mode, you have to wait till the instruments go to normal mode. After that go to EDIT mode thro' Engineers' Password and perform calibration.

DIGITAL INPUT:

- For digital inputs connect push button between 23 & 24 (For TARE)

TERMINAL DETAILS:

| TERMINAL DETAILS : DPIT-12 | | | | |
|----------------------------|----------------------|----------|------------------|----------------|
| ① RXD/D+ | SERIAL RS-232/485 | ⑬ ---- | SERIAL NO. | |
| ② TXD/D- | | ⑭ ---- | | |
| ③ GND | | ⑮ ---- | | |
| ④ ---- | | ⑯ ---- | | |
| ⑤ ---- | | ⑰ EARTH | | LOADCELL INPUT |
| ⑥ ---- | | ⑱ SENCE+ | | |
| ⑦ COMMON | ⑲ SENCE- | | | |
| ⑧ NO | ⑳ EXC+ | | | |
| ⑨ NC | ㉑ EXC- | | | |
| ⑩ 24VDC(+) | RELAY OUTPUT | ⑳ EXC+ | DIGITAL INPUT | |
| ⑪ GND(-) | | ㉒ COMMON | | |
| ⑫ EARTH | | ㉓ COMMON | | |
| | | ㉔ TARE | | |
| | SUPPLY 24VDC | | | |

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SERIAL COMMUNICATION DETAILS

Refer Terminal Details for Serial Cable Connection.

How to Test:

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

Settings:

- Set Device Address = 1
- Set Data type= Holding Register
- Set Start Address=1
- Set Length = 5
- BAUD RATE = 9600
- Set Proper COM Port
- Set Data Format= Decimal
- Now click on 'Connect' button.

| Register NO | Parameter | Function |
|-------------|----------------|---------------------------------|
| 40001 | Current Weight | Read |
| 40002 | DP Value | Read/Write the DP Value |
| 40003 | CAL Zero | Read/Write the Calibration Zero |
| 40004 | CAL Span | Read/Write the Calibration Span |
| 40005 | Tare Flag | Read/Write (Enter 1 For Tare) |

SALES & SERVICE

When you face any issue while installation, calibration or using the Indicator, you may contact:

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