masibus

Operator's Manual

Low Cost Temperature Indicator

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Note:

Information in this manual is subject to change without prior notice or permission.

WARNING SYMBOL

The symbol calls attention to the operating procedure, practice or the like which if not correctly performed or adhered to , could result in personal injury or damage to or destruction of part or all of the product and system. Do not proceed beyond a warning symbol until the indicated condition are fully understood and met.

CLASS-2 TYPE OF INSTRUMENT

Note: Class-2 – Instrument is using Line & Neutral for Power Supply Input.

1. INTRODUCTION

1.1. Purpose of the Manual:

1.1.1. How to read this manual???

Installer: Read Chapters 1, 4, 5
System Designer and New User: Read All Chapters

1.1.2. Regarding This User's Manual

→ This manual should be provided to the end user. Keep an extra copy or copies of the manual in a safe place.
→ Read this manual carefully to gain a thorough understanding of how to operate this product before starting operation.
→ This manual describes the functions of this product. Masibus does not guarantee the application of these functions for any particular purpose.
→ Under absolutely no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without permission.
→ The contents of this manual are subject to change without prior notice.
→ Every effort has been made to ensure that the details of this manual are accurate. However, should any errors be found or important information be omitted, please contact your nearest Masibus representative or our sales office.

1.2. Product over View / Description:

Model LI4248 is a micro controller based Temperature Indicator, incorporate bright, 4 Digit Seven Segment Display indicating process value.

Relay output from the instrument will have output state either "ON" or "OFF" depending on PV (process value), set point value and set point type. *Refer figure 1* for relay operation.

Since the temperature crosses the set point to change the output stage, the process temperature will be cycling continuously, going from below set point to above, and back below. In cases where this cycling occurs rapidly, and to prevent damage to contactors and valves, an on-off differential, or "hysteresis," is added to the controller operations. This hysteresis assures, if temperature exceed set point by a certain amount before then only output will turn off or on again. On-Off hysteresis prevents the output from "chattering" or making fast, continual switches if the cycling above and below the set point occurs very rapidly.

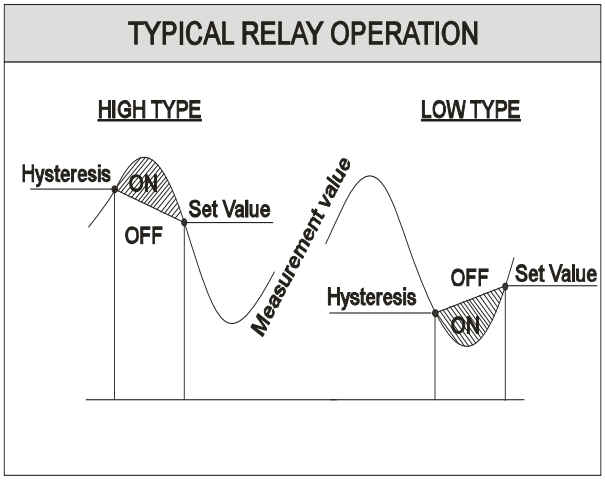

Figure 1: Typical Relay operation

High type:

For High type of set value, once process value reaches up to set point + Hysteresis value, relay will be ON after nearly 1.5 seconds and it will be ON until process value goes down to Set point.

Low type:

For Low type of set value, once process value reaches down to set point - Hysteresis value relay will be ON after nearly 1.5 seconds and it will be ON until process value goes up toward Set point.

1.3 Product Ordering Code:

Model LI4248									
Input Types		Relay		Aux Power Supply		Mounting		Aux output	
X		X		XX		XX		X	
1	J(W/1°C)	S	One	U1	85-265 VAC	PO	Panel	N	None
2	J(W/0.1°C)	D	Two	U2	18-30VDC			2	TPS-24VDC
3	K(W/1°C)								
4	K(W/0.1°C)								
9	PT-100, 3W								
C	4-20 mA								
D	0-20 mA								
E	1-5 VDC								
F	0-5 VDC								

X = Specify from table

1.4 List Of Accessories:

Sr. No.	Description Of Accessories	Quantity
1	Mounting Clamps	02

Mounting clamps should be of proper length and type according to the module of instrument.

2. SAFETY / WARNING PRECAUTIONS

2.1. Safety Precautions:

Dangerous voltages capable of causing death are sometimes present in this instrument. Before installation or beginning of any troubleshooting procedures the power to all equipment must be switched off and isolated. Units suspected of being faulty must be disconnected and removed first and brought to a properly equipped workshop for testing and repair. Component replacement and interval adjustments must be made by a company person only.

2.2. Warning Precautions:

→ Before wiring, verify the label for correct model no. and options.
→ Wiring must be carried out by personnel, who have basic electrical knowledge and practical experience.
→ It is recommended that power of these units to be protected by fuses, circuit breakers or external over current rated at the minimum value possible.
→ All wiring must confirm to appropriate standards of good practice and local codes and regulations. Wiring must be suitable for voltage, current, and temperature rating of the system.
→ Beware not to over-tighten the terminal screws.
→ Unused control terminals should not be used as jumper points as they may be internally connected, causing damage to the unit.
→ Verify that the ratings of the output devices and the inputs as specified in Chapter 7 are not exceeded.
→ Upon receipt of the shipment remove the unit from the carton and inspect the unit for shipping damage. If any damage due to transit, report and claim with the carrier. Write down the model number and serial number for future reference when corresponding with our *Customer Support Division*.
→ Do not use this instrument in areas such as excessive shock, vibration, dirt, moisture, corrosive gases or rain. The ambient temperature of the areas should not exceed the maximum rating specified.
→ Provide power from a single-phase instrument power supply. If there is a lot of noise in the power line, insert an insulating transformer into the primary side of the line and use a line filter on the secondary side. As counter measures against noise, do not place the primary and secondary power cables close to each other.

3. SPECIFICATION

3.1 DISPLAYS:

- **Process Value and Parameter display:** 4 digits 0.56" Seven Segment Red LED's For Process Variable in **degree Celsius**.
- **Status Display:** Individual discrete Red LED's to Indicate relay status.
- **Operation Keys:** INC, DEC (For increment and decrement of various parameters and setpoint).

SET1 and SET2(set parameters and setpoints).

3.2 INPUTS:

- RTD - PT100 3-wire, PT-100 (0.1ºC)(Automatic 3 wire compensation)
- Thermo-couple types J, K, J (0.1ºC), K(0.1ºC) (ANSI standard)
- 4-20mA/1-5 V dc linear
- 0-20mA/0-5 V dc linear
- Burn out Current : 0.25 uA
- CMRR : > 120dB
- NMRR : > 40dB
- Input Impedance : > 1MΩ
- Resolution : 15 bits
- Sampling Period : 55mS

3.3 INPUT RANGE:

PT100 :-200 to 850 ºC
PT100 (0.1ºC) :-199.9 to 850.0 ºC
J :-200 to 1200ºC
K :-200 to 1372ºC
J, K (0.1ºC) :-199.9 to 999.9ºC
4-20mA/1-5VDC, 0-20mA/0-5VDC:-1999 to 9999 (Field Scalable)
(For Current Input Use Resistor 250Ω 0.1% Externally).

3.4 ACCURACY:

- **Linear**:
  ±*0.25 % Full Span ± 1 Count

- **RTD ,T/C:**
  For >0°C ±*0.25% Full Span ± 1 Degree
  For <0°C ±*0.5% Full Span ± 1 Degree

3.5 OUTPUT:

- **Relay O/P(Optional):**
  Rating**:** 2A/230VAC
  Life cycle Mechanical**:** 10^5 times
  Life Cycle Electrical**:** 10^5 times
- **TPS:** +24VDC ± 5% @ 30mA

3.6 CALIBRATION:

- Zero and Span calibration for input using front panel keypad.
- CJC for T/C type input and 3-wire lead compensation for RTD sensor is automatic.
- Instrument Warm-up Time approx. 30 Min.

*** Change of Input type is Subject to recalibration.**

3.7 TYPES OF SET POINT:

- Set point types are configurable to energize relays for actual value below or above set point with delay time for individual Relay.
- Hysteresis setting 0 to 100 Counts.

3.8 POWER SUPPLY:

- **Operating Supply:**
  85-265VAC @ 50Hz / 120-290 VDC
  Or 18-30VDC(optional)
- **Power consumption:**
  < 5VA

3.9 ENVIRONMENTAL CONDITION:

- **Insulation Resistance:**
  >200MΩ @ 500VDC
- **Molding type:** ABS Plastic
- **Weight:** 187 Gms.
- **Ambient Temperature:** 0 to 55 °C
- **Humidity:** 30 to 95% RH non-condensing
- **Storage Temperature:** 0-80 °C

4. INSTALLATION GUIDELINE

4.1 Mounting Details

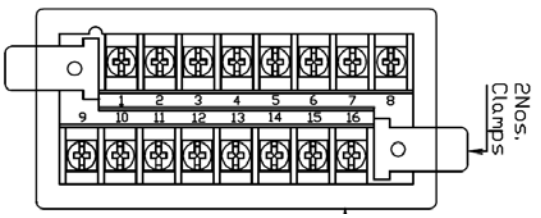

Figure 2: Mounting Details

FRONT BEZEL: 48 x 96 mm
PANEL CUTOUT: 92+0.8 x 45+0.8 mm
DEPTH BEHIND THE PANEL: 75mm

Note:

UNPACKING: Upon receipt of the shipment remove the unit form the carton and inspect the unit for shipping damage. If any damage due to transit, report and claim with the carrier. Write down the model number, serial number, and date code for future reference, when communicating with our *Customer Support Division.*

Use external switch or circuit breaker and external over current protection devices to protect whole panel or instrument in hazardous condition.

Do not use this instrument in areas such as excessive shock, vibration, dirt, moisture, corrosive gases or rain. The ambient temperature of the areas should not exceed the maximum rating specified.

4.2 Terminal Connection

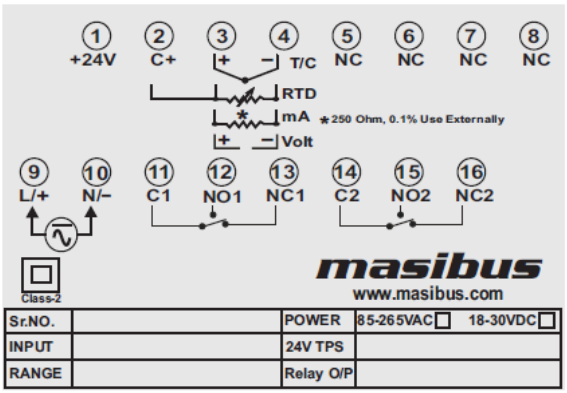

Figure 3: Terminal connection

1. Terminal 9 & 10:

Power Supply Input(85-265VAC @ 50Hz /120-290VDC).

Note:

a. Use>250V-1Amp Cable for Power Supply.
b. If cable has two parallel wires inside then Isolation between the wires should be 2.5 KV.

2. Terminal 11 & 12 & 13:
For Relay-1 potential free Contacts (Use 230V -2A load)

3. Terminal 14 & 15 & 16:
For Relay-2 potential free Contacts (Use 230V -2A load)

4. Terminal 1:
+24V Transmitted power supply Output and the respective ground is given on Terminal number.

5. Terminal 2:
For RTD Input Only

6. Terminal 3 & 4:
For T/C & Linear Input (For Current Input – Use Resistor 250Ω 0.1% externally).

4.3 FRONT PANEL DESCRIPTION

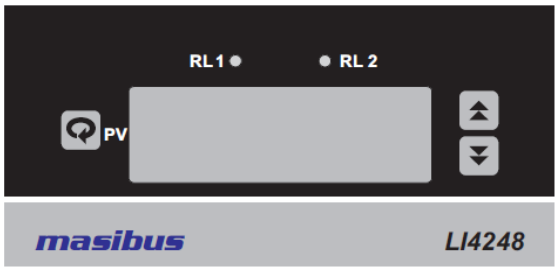

Figure 4: Details of Front Panel

1. Ent Key:
- By pressing increment-Decrement key, Increment & Decrement value in PV window respectively.
- On pressing ENT Key, the Respective value is stored and Displayed on PV window in CONF, PROG and CAL mode.

2. Increment key & Decrement Key :
-On pressing this both key Shows PASS in PV windows.

3. PV window:

- 4 digital 0.56 inch RED Display.

4. Relay-1 Indication:

- ON when relay-1 is energized.

5. Relay-2 Indication:

- ON when relay-2 is energized.

5. OPERATION GUIDELINE

5.1 Run Mode:

Ambient will be displayed when decrement key is pressed in run mode. (Only if T/C type input is selected).

Press  **30.0**

if enter key pressed, then setpoint-1 will appear on PV window.

Press  **st-1**

Press  OR  **00**

(By inc/dcr key value of setpoint-1 can be changed in PV window)

Press  **st-2**

(This will save the changed or unchanged setpoint1 value.)

Press  OR 
200

(By inc/dcr key value of setpoint-2 can be changed in PV window)

When enter key  pressed, changed or unchanged value of SETPOINT-2 will be saved as in PV window and unit will come in run mode.

5.2 Password Mode:

Press  Key together to enter password mode.

Display **PASS.**

Press  **0**

Press  OR  **1**

Press  **ConF**

Once correct password is entered, then configuration will be displayed. if user does not change the password from "change password" submenu then initial password would be 1, else the user can change the password by entering into "configure mode" and going to "pass" submenu.

Press  Key together to come out of password mode.

5.3 CONFIGURATION MODE

Press  and then it will show "PASS", enter correct password and then press  key to enter configure mode.

5.3.1 CONFIGURE INPUT TYPE

Display **ConF**

Press  **InPt**

Press  OR  **K.tC**

Press  **InPt**

(To save changed or unchanged value of ZERO as in PV window)

Press  to configure ZERO,

5.3.2 CONFIGURE ZERO

Display **zErO**

Press  **-100**

Press  OR  **-150**

(By inc/dcr key value of zero can be changed in PV window)

Press  **zErO**

(To save changed or unchanged value of ZERO as in PV window)

Press  to configure SPAN,

Press  to configure INPT

5.3.3 CONFIGURE SPAN

Display **span**

Press  **1200**

Press  OR  **1372**

(By inc/dcr key value of span can be changed in PV window)

Press **SPAN**

(To save changed or unchanged value of SPAN as in PV window)

Press to configure SET POINT1 type, **Press** to configure ZERO

5.3.4 CONFIGURE SET POINT1 TYPE

Display **tSP1**

Press **H on**

Press OR **L on**

(By inc/dcr key value of setpoint-1 can be changed in PV window)

Press **tSP1**

(To save changed or unchanged value of SETPOINT-1 type as in PV window)

Press to configure Hysteresis-1,

Press to configure SPAN

5.3.5 TO SET VALUE OF HYSTERESIS 1

Display **Hy-1.**

Press **10**

Press OR **20**

(By inc/dcr key value of hysteresis -1 can be changed in PV window)

Press **Hy-1.**

(To save changed or unchanged value of HYSTERESIS-1 as in PV window)

Press to configure setpoint-2 type,

Press to configure setpoint-1 type

5.3.6 CONFIGURE SET POINT2 TYPE

Display **tSP2**

Press **H on**

Press OR **L on**

(By inc/dcr key value of setpoint-2 can be changed in PV window)

Press **tSP2**

(To save changed or unchanged value of SETPOINT-2 type as in PV window)

Press to configure Hysteresis-2,

Press to configure Hysteresis-1

5.3.7 TO SET VALUE OF HYSTERESIS 2

Display **Hy-2.**

Press **10**

Press OR **20**

(By inc/dcr key value of hysteresis -1 can be changed in PV window)

Press **Hy-2.**

(To save changed or unchanged value of HYSTERESIS-1 as in PV window)

Press to configure open sensor,

Press to configure setpoint2 type

5.3.8 CONFIGURE OPEN SENSOR

Display **OPES.**

Press **UP**

Press OR **dn**

(By inc/dcr key value of open sensor can be changed in PV window)

Press **dn**

(To save changed or unchanged value of Open sensor as in PV window)

Up scale: Under Open condition PV is treated above set point.

Down scale: Under Open Condition PV is treated below set point.

Table-1:

Relay type	PV	Relay	Led
Hi-On	PV > SP	On	On
	PV < SP	Off	Off
Open sensor	Up scale	On	On
	Down scale	Off	Off
Low-On	PV > SP	Off	Off
	PV < SP	On	On

Open sensor	**Up scale**	**Off**	**Off**
	Down scale	**On**	**On**

Where SP = Set Point.
PV = Process value

Press to configure BRIGHTNESS (**If linear input type is not selected**) or DP (**If linear input type is selected**)

Press to configure Hysteresis-2.

5.3.9 CONFIGURE DECIMAL POINT

Display **dP**

Press **000.0**

Press OR **00.00**

(By inc/dcr key value of decimal point can be changed in PV and PV window)

Press **dP**

(To save changed or unchanged value of DECIMAL POINT as in PV and PV window)

Press to configure Brightness,

Press to configure OPENSENSOR,

Note:

1. Decimal Point is only available with 0-5V (0-20mA) or 1-5V (4-20mA) input.

5.3.10 CONFIGURE BRIGHTNESS

Display **BRhT**

Press **10**

Press OR **50**

(By inc/dcr key value of brightness can be changed in PV window)

Press **50**

(To save changed or unchanged value of BRIHTNESS as in PV window)

Press to configure DP (if linear input type) or open sensor

Press to configure PASSWORD,

5.3.11 CONFIGURE PASSWORD

Display **PASS.**

Press **0**

Press OR **1**

(By inc/dcr key value of password can be changed in PV window)

Press **1**

(To save changed or unchanged value of password as in PV window)

Press to configure BRIGHTNESS.

Press + Key together to come out of configuration mode.

Press + Key together to enter in run mode.

5.4 CALIBRATION MODE

Here one-shot calibration is implemented. Press + and then it will show “PASS” i.e. password mode, enter correct password and then press and then Key to enter calibration mode.

5.4.1 CALIBRATION AMBIENT

Display **Cal**

Press **Amb**

Press **30.0**

Press OR **31.0**

(By inc/dcr key value of ambient can be changed in PV window)

Press **Amb**

(To save changed or unchanged value of AMBIENT as in PV window)

Press to configure ZERO,

5.4.2 CALIBRATION OF ZERO

Display **CALZ**

Press **-099**

Press OR **-100**

(By inc/dcr key value of calz can be changed in PV window)

Press  **CALZ**
(To save changed or unchanged value of CALZ as in PV window)

Press  to calibrate SPAN,

Press  to configure AMB,

5.4.3 CALIBRATION OF SPAN

Display **CALS**

Press  **1099**

Press  OR  **1200**
(By inc/dcr key value of cals can be changed in PV window)

Press  CALS
(To save changed or unchanged value of CALS as in PV window)

Press  to configure ZERO,

Note:

1.Amb calibration is only available with J,K - T/C input.

Press  Key together to come out of calibration mode.

6 Maintenance:

 **As a precautionary step, please switch off the units before troubleshooting. Disconnect the Unit suspected of being faulty and bring it to workshop for testing and repair. Component replacement or any other change must be made by a company person only.**