## PROCESS INDICATOR
## mL-PI8



CE EHC

### mL-PI8
### Universal Input Process Indicator

- 4 digit process (PV) display
- Universal process input (TC, RTD, mV DC, VDC, mA DC) -inputs Dual or multi point calibration for DC voltage & DC current
- Smart output module system
- Programmable Alarm functions
- Current output module Process control or re-transmission with 0/4...20 mA
- RS-485 serial communication with Modbus RTU protocol

### SPECIFICATIONS
### PROCESS INPUT

**Universal Input:** TC, RTD, ⎓ Voltage/Current
Thermocouple (TC): L(DIN 43710) ,J , K , R , S , T , B , E and N (IEC584.1)(ITS90) ,C (ITS90)
Thermoresistance (RTD): PT-100 (IEC751)(ITS90)

⎓ Input: mV, V, mA
**Measurement Range :** Please refer to Table-1 for selection of input type and scale
**Accuracy:**± 0.25% of full scale for thermocouple, thermoresistance, mV, V  and mA input.
**Cold Junction Compensation:**Automatically ±0.1°C/1°C
**Line Compensation:** Maximum 10 Ohm
**Sensor break protection:**Upscale
**Sampling Cycle:**3 samples per second
**Input Filter:** 0.0 to 900.0 seconds
### OUTPUT
**Standard Relay Output:** 5A@250V∼ (on resistive load)
**Analog Output :**
**-** 0/4...20 mA⎓ Current Output Module

### POWER SUPPLY
**Power Supply Voltage :**
100-240V ∼ 50/60 Hz (-%15;+%10) -6VA

### DISPLAY
**Process Display :**
20.3 mm   Red 4 digit LED Display

**LED Indicators :** °C /°F / V, OP1/2/3 (Output Status)  LED.

### ENVIRONMENTAL RATINGS and PHYSICAL SPECIFICATIONS
**Operating Temperature:** 0...50°C
**Humidity:** 0-90%RH (non condensing)
**Protection Class:**  IP65 at front, IP20 at rear
**Mounting:** Type-1 Enclosure Mounting
**Installation:** Fixed installation Category II
**Over Voltage Category:** II
**Pollution Degree:** II, office or workplace, none conductive pollution

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**Weight:**
260 gr.

**Dimensions:** (96 x 48mm, Depth:86.5 mm)

**Panel Cut-Out**: (92 x 46mm)

**Minimum Distance Between Panel Cut-Out Centers:**
X=129mm, Y=65mm


This symbol is used for safety warnings. User must pay attention to these warnings.
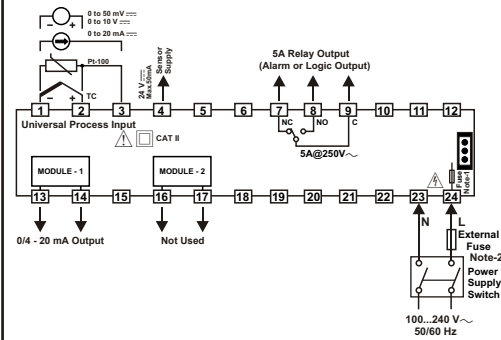

This symbol is used to determine the dangerous situations as a result of an electric shock. User must pay attention to these warnings definitely.


This symbol is used to determine the important notes about functions and usage of the device
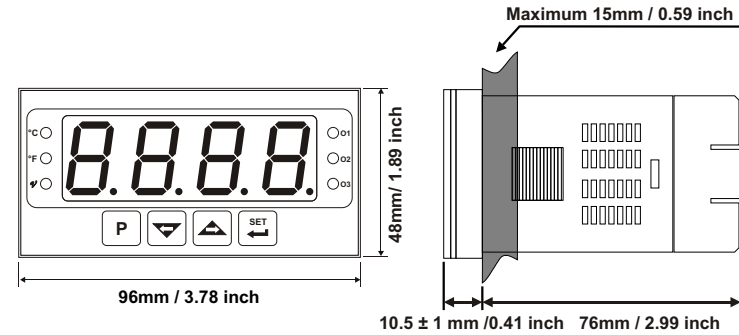
### Electrical Wirings



**Note-1 :** There is an internal fusible flameproof resistor.
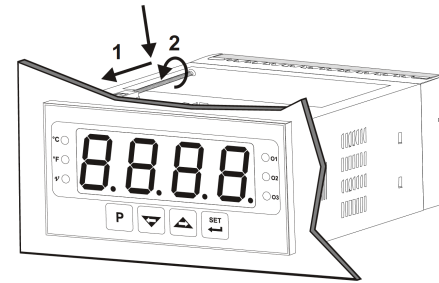**Note-2 :** External fuse is recommended.
   1A∼T for power supply 100...240 V∼ or 24V∼
   1A⎓T for power supply 24V ⎓

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### Dimensions



**Maximum 15mm / 0.59 inch**

48mm / 1.89 inch

**96mm / 3.78 inch**

**10.5 ± 1 mm /0.41 inch**   **76mm / 2.99 inch**

## PANEL MOUNTING



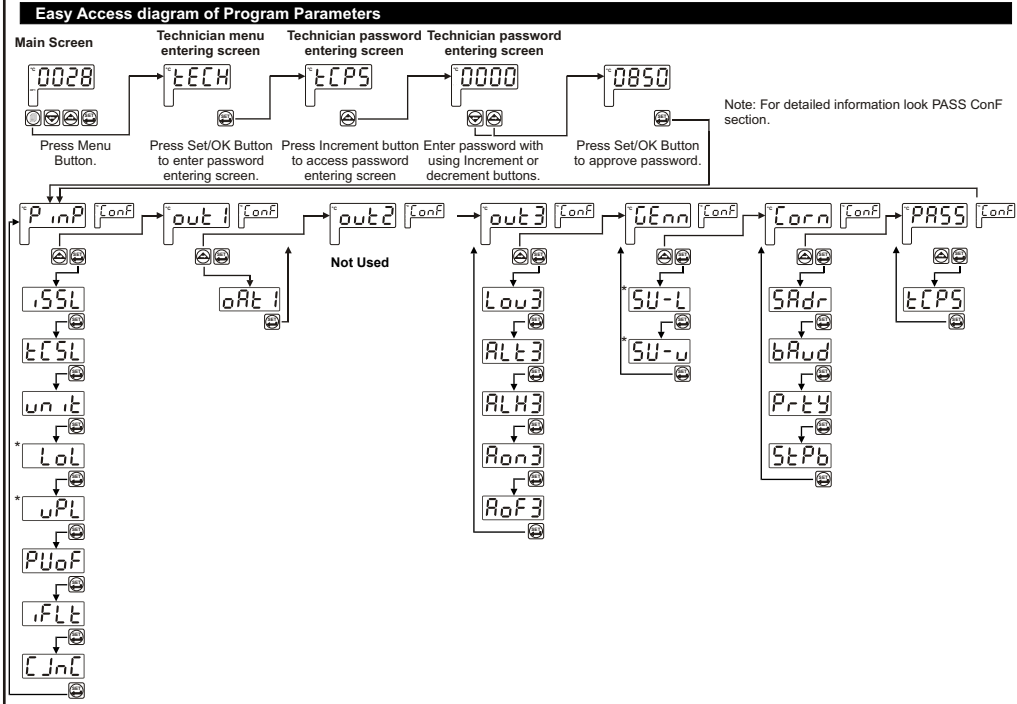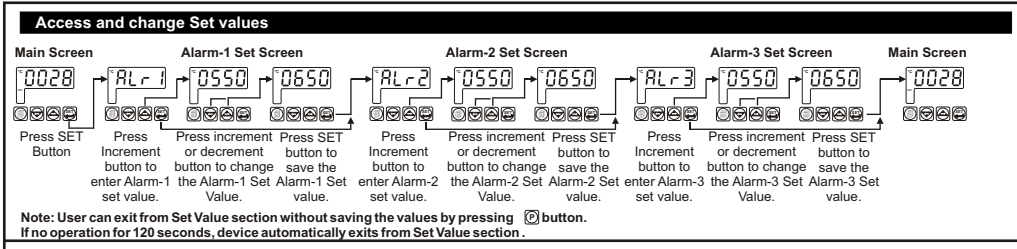This unit is designed for panel mounting.

1. Insert the unit into the panel cut-out from the front side. Insert the mounting clamps into the holes located on top and bottom sides of the case.

2. Tighten the screws until the unit is completely immobile in the panel.


When mounting the unit only use the mounting clamps that are provided. Be sure the unit does not fall while performing the mounting process.

## Access and change Set values

| Main Screen | Alarm-1 Set Screen | Alarm-2 Set Screen | Alarm-3 Set Screen | Main Screen |
|---|---|---|---|---|
| `0028` | `ALr1` `0550` `0650` | `ALr2` `0550` `0650` | `ALr3` `0550` `0650` | `0028` |

Press SET Button · Press Increment button to enter Alarm-1 set value. · Press increment or decrement button to change the Alarm-1 Set Value. · Press SET button to save the Alarm-1 Set value. · Press Increment button to enter Alarm-2 set value. · Press increment or decrement button to change the Alarm-2 Set Value. · Press SET button to save Alarm-2 Set value. · Press Increment button to enter Alarm-3 set value. · Press increment or decrement button to change the Alarm-3 Set Value. · Press SET button to save Alarm-3 Set value.

**Note: User can exit from Set Value section without saving the values by pressing ℗ button.**
**If no operation for 120 seconds, device automatically exits from Set Value section .**

## Easy Access diagram of Program Parameters

| Main Screen | Technician menu entering screen | Technician password entering screen | Technician password entering screen |
|---|---|---|---|
| `0028` | `tECH` | `tCPS` | `0000` → `0850` |

Press Menu Button. · Press Set/OK Button to enter password entering screen. · Press Increment button to access password entering screen · Enter password with using Increment or decrement buttons. · Press Set/OK Button to approve password.

Note: For detailed information look PASS ConF section.

`PinP` `ConF` → `out1` `ConF` → `out2` `ConF` → `out3` `ConF` → `GEnn` `ConF` → `Corn` `ConF` → `PASS` `ConF`

Not Used

- PinP: `iSSL`, `tCSL`, `unit`, *`LoL`, *`uPL`, `PUoF`, `iFLt`, `CJnC`
- out1: `oАt1`
- out3: `Lou3`, `ALt3`, `ALH3`, `Aon3`, `AoF3`
- GEnn: `SU-L`, *`SU-u`
- Corn: `SAdr`, `bAud`, `PrtY`, `StPb`
- PASS: `tCPS`

## PinP ConF: Process Input Type and Relevant Parameters

**`iSSL` Process Input Type**
- `0000` TC input type selection
- `0001` RTD input type selection
- `0002` ===Voltage / Current input type selection.

**`tCSL` TC Input Selection**
This parameter is active if TC input type is selected.
- `0000` L (-100°C;850°C) or (-148°F;1562°F)
- `0001` L (-100.0°C;850.0°C) or (-148.0°F;999.9°F)
- `0002` J (-200°C;900°C) or (-328°F;1652°F)
- `0003` J (-199.9°C;900.0°C) or (-199.9°F;999.9°F)
- `0004` K (-200°C;1300°C) or (-328°F;2372°F)
- `0005` K (-199.9°C;999.9°C) or (-199.9°F;999.9°F)
- `0006` R (0°C;1700°C) or (32°F;3092°F)
- `0007` R (0.0°C;999.9°C) or (32.0°F;999.9°F)
- `0008` S (0°C;1700°C) or (32°F;3092°F)
- `0009` S (0.0°C;999.9°C) or (32.0°F;999.9°F)
- `0010` T (-200°C;400°C) or (-328°F;752°F)
- `0011` T (-199.9°C;400.0°C) or (-199.9°F;752.0°F)
- `0012` B (44°C;1800°C) or (111°F;3272°F)
- `0013` B (44.0°C;999.9°C) or (111.0°F ; 999.9°F)
- `0014` E (-150°C;700°C) or (-238°F;1292°F)
- `0015` E (-150.0°C;700.0°C) or (-199.9°F;999.9°F)
- `0016` N (-200°C;1300°C) or (-328°F;2372°F)
- `0017` N (-199.9°C;999.9°C) or (-199.9°F;999.9°F)
- `0018` C (0°C;2300°C) or (32°F;3261°F)
- `0019` C (0.0°C;999.9°C) or (32.0°F;999.9°F)

**`rtdS` RTD Input Selection**
This parameter is active if RTD input is selected.
- `0000` PT-100 ( -200°C ; 650°C ) or ( -328°F ; 1202°F)
- `0001` PT-100 ( -199.9°C ; 650.0°C ) or ( -199.9°F ;999.9°F)

**`uASL` ===voltage / Current Input Selection**
This parameter is active if ===Voltage / Current is selected.
- `0000` 0...50mV === ( -1999 ; 9999 )
- `0001` 0...5V === ( -1999 ; 9999 )
- `0002` 0...10V === ( -1999 ; 9999 )
- `0003` 0...20mA === ( -1999 ; 9999 )
- `0004` 4...20mA === ( -1999 ; 9999 )

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**`dPnt` Display Point Position**
This parameter is active if ===Voltage/Current input is selected.
- `0000` No point
- `0001` Between first and second digits "0.0"
- `0002` Between second and third digits "0.00"
- `0003` Between third and fourth digits "0.000"

**`uCAL` Display Value Adjustment Type**
This parameter is active if ===Voltage/Current input is selected.
- `0000` Fixed dual point display adjustment. Display adjustment low point value is fixed to -1999, display adjustment high point value is fixed to 9999.
- `0001` User can do defined dual point display adjustment with tPoL and tPoH.
- `0002` User can do defined 16 display adjustment points.

*`tPoL` Low Point Display adjustment (-1999, 9999)Unit
This parameter is active if ===Voltage/Current input is selected.

*`tPoH` High Point Display adjustment (-1999, 9999)Unit
This parameter is active if ===Voltage/Current input is selected.

**`Po00` Display adjustment points (-1999, 9999)Unit**
**`Po16`** This parameter is active if ===Voltage/Current input is selected.
In multi point display adjustment operation, defined scale is divided into 16 adjustment points.

**For example :** `uASL` is `0000` (0-50 mV===).

0-50 mV=== range are divided into 16 equal parts. Every "Poxx" SET value is defined 50 / 16 = 3.125 mV=== range.

**`CoEF` Coefficient value (1.000, 9.999)**
Process value is multiplied with this value.
This parameter is active if ===Voltage/Current input is selected.

**`unit` Unit selection**
- `°C` Unit is °C
- `°F` Unit is °F
- `U` Unit is Voltage. This selection is active if ===Voltage/Current input is selected
- `-` No unit. This selection is active if ===Voltage / current input is selected

*`LoL` Operating Scale Minimum Value (Scale Low Point, Scale High Point)Unit
Used for Proportional band calculation and display blink.

*`uPL` Operating Scale Maximum Value (Scale Low Point, Scale High Point)Unit
Used for Proportional band calculation and display blink.

**`PUoF` Display offset for process value (Scale -10%, Scale +10%)Unit**
This parameter value is added to the process value.

**`iFLt` Filter Time (0.0, 900.0)Second**
Defines filter time for display value.

**`CJnC` Cold Junction Compensation**
This parameter is active if process input is selected TC input.
- `YES` Cold junction compensation is active.
- `no` Cold junction compensation is not active.

**Scale:** The difference, between high point and low point of the process input type. Example: If tCSL = 2 (low point is -200, high point is 900), then scale is 1100. If input type is Voltage/Current, then the scale is difference between tPoH and tPoL parameters.

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## out1 ConF: MODULE-1 0/4 - 20mA

**`oАt1` MODULE-1 analog output module configuration**
- `0000` 0...20mA=== output
- `0001` 4...20mA=== output

## out2 ConF: MODULE-2 parameters

Not Used

## * NOTES

- `tPoL` is analog input zero process variable
- `tPoH` is analog input full scale process variable
- `LoL` is analog output zero process variable and below which the blinking warning display UUUU appears
- `uPL` is analog output full scale process variable and above which the blinking warning display ∩∩∩∩ appears
- `SU-L` defines the operators minimum permitted setpoint value for the process variable
- `SU-u` defines the operators maximum permitted setpoint value for the process variable

## out3 ConF: 5A Relay Output

**`Lou3`** **Output-3 Logic output function**

  **`0000`** Alarm output

  **`0001`** Sensor break alarm output

  **`0002`** Output is active when the process value is out of the band which is defined with minimum value of operating scale **`LoL`** and maximum value of operating scale **`uPL`**

**`ALt3`** **Alarm-3 Type**

  **`0000`** Process high alarm

  **`0001`** Process low alarm

**`ALH3`** **Alarm-3 hysteresis value (0% of scale, 50% of scale)Unit**

  This parameter is active, if the Logic-3 output function is Alarm output.

**`Aon3`** **Alarm-3 On delay time (0, 9999)Second**

  This parameter is active, if the Logic-3 output function is Alarm output.

**`AoF3`** **Alarm-3 Off Delay Time (0, 9998)Second**

  When the value is greater than 9998, **`LtCH`** is seen on the screen. It means alarm latching output is selected. This parameter is active if logic-3 output function of Alarm-3 Output is alarm output.

### Alarm Types
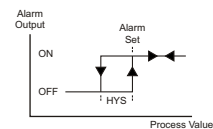
**Process High Alarm**   **Process Low Alarm**
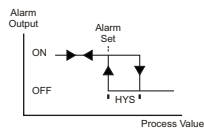


### Gen ConF: General Parameters

**`SU-L`** **Alarm Set value Low limit ( `LoL` , `SU-u` )Unit**

**`SU-u`** **Alarm Set value High limit ( `SU-L`, `uPL` )Unit**

### Com ConF: Serial Communication Configuration Parameters

**`SAdr`** **Communication Accessing Address (1,247)**

  Communication accessing address of device. Communication accessing address can be adjusted from 1 to 247.

**`bAud`** **Communication Baud Rate**

  **`0000`** 1200 Baud Rate.

  **`0001`** 2400 Baud Rate .

  **`0002`** 4800 Baud Rate

  **`0003`** 9600 Baud Rate

  **`0004`** 19200 Baud Rate

**`Prty`** **Parity Selection for Communication**

  **`0000`** No parity.

  **`0001`** Odd parity.

  **`0002`** Even parity.

**`StPb`** **Stop Bit Selection for Communication**

  **`0000`** 1 stop bit

  **`0001`** 2 stop bit

## PASS ConF: Password Parameter

**`tCPS`** **T          Passwords(0, 9999)**

It is used for accessing to the technician parameters.
If it is **`0000`** no password protection while entering to the technician Parameters.
**If it is different from " 0" and user wants to access to the technician parameters;**
**1-** If user does not enter **`tCPS`** password correctly :It turns to operation screen without accessing to parameters.:
When **`tCPS`** in top display **`0000`** and in bottom display are seen, if user presses SET button without entering **`tCPS`** Password (For observing the parameters):
Operator can see operator menus and parameters but operator can not change the parameters

## mL-PI8 Process Indicator Error Messages
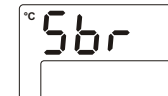


**1 -** Sensor failure in analog inputs. Sensor connection is wrong or there is no sensor connection.
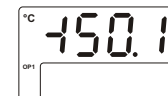


**2-** If top display blinks : If analog input value is less than minimum value of operating scale **`LoL`** top display starts to blink.



**3-** If top display blinks : If analog input value is greater than maximum value of operating scale **`uPL`** top display starts to blink.
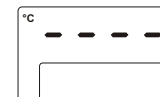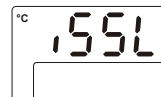


**4-** If technician password is different from "0" and user accesses to the parameter by Set button without entering the technician password and wants to change a parameter, the warning message is shown on the display as shown on the right. Device does not allow to do any changes without entering the password correctly.

## Installation

⚠ **Before beginning installation of this product, please read the instruction manual and warnings below carefully.**

In package ,
- One piece unit
- Two pieces mounting clamp
- One piece instruction manual

A visual inspection of this product for possible damage occured during shipment is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of serious accident resulting from a failure or defect in this unit, power off the system and separate the electrical connection of the device from the system.
The unit is normally supplied without a power switch or a fuse. Use power switch and fuse as required.
Be sure to use the rated power supply voltage to protect the unit against damage and to prevent failure.
Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevented.
Never attempt to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.
Do not use the unit in combustible or explosive gaseous atmospheres.
During the equipment is putted in hole on the metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.
Montage of the product on a system must be done with it's mounting clamp. Do not do the montage of the device with inappropriate mounting clamp. Be sure that device will not fall while doing the montage.
It is your responsibility if this equipment is used in a manner not specified in this instruction manual.

### Warranty

Kessler-Ellis Products warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manual performs by the customer completely.

### Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing internal parts.
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

### Other Informations

**Company Information:**
Kessler-Ellis Products
10 Industrial Way East
Eatontown, NJ 07724

Phone:      800-631-2165 or 732-935-1320
Fax:          732-935-9344
Email:       info@kep.com
Web:         www.kep.com

## Ordering Information

**Model Number**
mL-PI8

**Description**

Process Indicator
1/8 DIN Case
Universal Input. Selectable: TC, RTD, mV, VDC, or mA
100 to 240VAC (-15%; +10%) 50/60Hz
Relay Output (5A @ 250VAC with Resistive Load) (1 NO; 1NC)
RS-485 Serial Communication with Modbus RTU Protocol
Analog Output 0/4 - 20mA

**KEP**m LINE