

## Overview / Technical Data

english



Read this document carefully before using this device. The guarantee will be expired by damaging of the device if you don't attend to the directions in the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

### ENDA EI2041 PROGRAMMABLE INDICATOR

Thank you for choosing **ENDA EI2041** INDICATOR.

- ▶ 35x77mm sized.
- ▶ 4 digits display.
- ▶ Display scale can be adjusted between -1999 and 4000.
- ▶ Decimal point can be adjusted between 1st. and 3rd. digits.
- ▶ Measurement unit can be displayed.
- ▶ Selectable four different standard input types (0-20mA, 4-20mA, 0-1V, 0-10V).
- ▶ User can calibrate the device according to specified input type.
- ▶ Sampling time can be adjusted in four steps.
- ▶ Stores maximum and minimum measurement values.
- ▶ Maximum and minimum values can be stored and displayed.
- ▶ Two relay output for control and alarm (Optional).
- ▶ Control option below and above set value.
- ▶ Selectable independent, deviation and band alarm.
- ▶ Sensor supply output (Optional).
- ▶ RS485 Modbus RTU communication protocol feature (Optional).
- ▶ CE marked according to European standards.



### TECHNICAL SPECIFICATIONS

#### ENVIRONMENTAL CONDITIONS

Ambient/storage temperature	0 ... +50°C / -25 ... +70°C (with no icing).
Max. relative humidity	80% Relative humidity for temperatures up to 31°C, decreasing linearly to 50% at 40°C.
Rated pollution degree	According to EN 60529      Front panel : IP65      Rear panel : IP20
Height	Max. 2000m.

Do not use the device in locations subject to corrosive and flammable gases.

#### ELECTRICAL CHARACTERISTICS

Supply	230V AC 110V AC +%10 -%20 , 12/24V AC ±%10, 50/60Hz or 9-30V DC / 7-24V AC ±%10 SMPS optional.
Power consumption	Max. 7VA.
Wiring	2.5mm² screw-terminal connections.
Date retention	EEPROM (Min. 10 years).
EMC	EN 61326-1: 2013.
Safety requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II, measurement category I).

EI2041 cannot be used if measurement category II, III or IV is required.

Input type	Measurement range		Measurement accuracy	Input impedance
	Min.	Max.		
0-1V DC voltage	0V	1.1V	±0,5% (of full scale)	Approx. 100kΩ
0-10V DC voltage	0V	12V	±0,5% (of full scale)	Approx. 100kΩ
0-20mA DC current	0mA	25mA	±0,5% (of full scale)	Approx. 10Ω
4-20mA DC current	0mA	25mA	±0,5% (of full scale)	Approx. 10Ω

While the current measuring mode, input impedance becomes 10Ω . Therefore, in current mode, the device must not be connected any voltage input. Otherwise, the device is broken. While the device is running in the voltage measurement mode and if required to change to current measurement mode, then firstly the voltage inputs must be removed and after that, input type must be changed to one of the current measurement modes.

#### OUTPUTS

Sensor power supply	All sensor supply outputs maximum 50 mA. (Regulated and isolated).
Out	Relay: 250V AC, 8A (resistive load), NO
Alarm	Relay: 250V AC, 8A (resistive load), NO
Life expectancy for relay	Mechanical 30. Mio. operation; 100.000 operation at 250V AC, 8A resistive load.

#### CONTROL

Control type	Double set-point and alarm control.
Control algorithm	On-Off control.
Hysteresis	Adjustable between 1 ... 200.

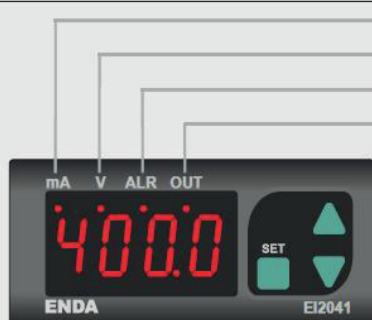
#### HOUSING

Housing type	Suitable for flush-panel mounting according to DIN 43 700.
Dimensions	W77xH35xD71mm.
Weight	Approx. 350g (after packaging)
Enclosure material	Self extinguishing plastics.

While cleaning the device, solvents (thinner, gasoline, acid etc.) or corrosive materials must not be used.

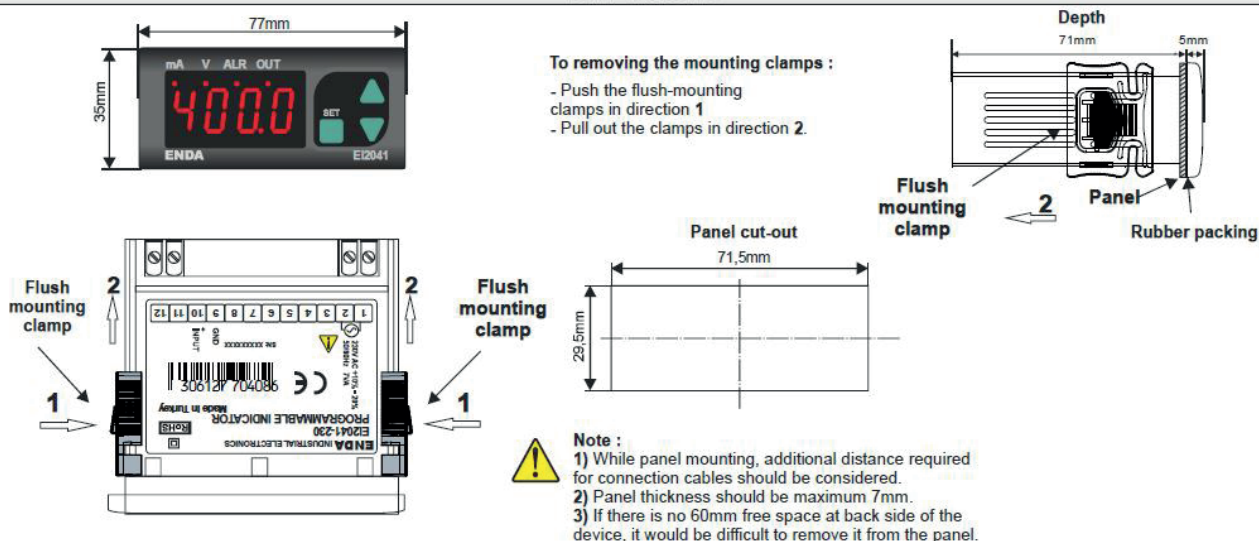
## Technical Data

### FRONT PANEL



- mA LED** : If input type is selected as 0-20mA or 4-20mA, **mA LED** lights up.
- V LED** : If input type is selected as 0-1V or 0-10V, **V LED** lights up.
- ALR LED** : If alarm output is active, **ALR LED** lights up. During delay time, LED flashes.
- OUT LED** : If "OUT" is active, **OUT LED** lights up. During delay time, LED flashes.
- SET** : In "Running Mode", indicates output set value.  
In "Programming Mode", indicates the selected parameter value.
- ▲** : In "Running Mode", indicates the maximum measured value.  
Used for incrementing values in "Programming Mode".
- ▼** : In "Running Mode", indicates the minimum measured value.  
Used for decrementing values in "Programming Mode".

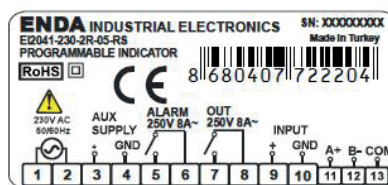
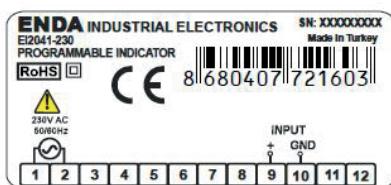
### DIMENSIONS



### CONNECTION DIAGRAM

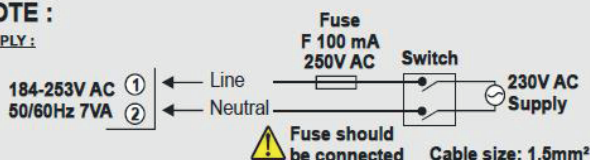


**ENDA EI2041** is intended for installation in control panels. Make sure that the device is used only for intended purpose. The shielding must be grounded on the instrument side. During an installation, all of the cables that are connected to the device must be free of energy. The device must be protected against inadmissible humidity, vibrations, severe soiling. Make sure that the operation temperature is not exceeded. All input and output lines that are not connected to the supply network must be laid out as shielded and twisted cables. These cables should not be close to the power cables or components. The installation and electrical connections must be carried on by a qualified staff and must be according to the relevant locally applicable regulations.



#### NOTE :

##### SUPPLY :



Equipment is protected throughout by  
**DOUBLE INSULATION**

- Note :**
- 1) Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
  - 2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.

## Programming example

### Setting the display in the programming mode P2

The following example sets the display to indicate 4 mA = 0 tons and 20 mA = 60.0 tons.

After connecting the supply voltage, the display indicates the number 0. The settings are made in programming mode P2. First the [↓] [↑]-keys must be pressed for approx. 3 seconds. The display now switches to programming mode P1 and in the first menu item [i.Type]. Then hold down the [↓]-key for approx. 10 seconds. The display now changes to programming mode P2 and to the first menu item [i.Type].

Attend:

If the keys are not activated for ca. 20 sec, the device automatically switches back to the standard display "measure value".

Main menu	Submenu	Description	Setting
<b>P2</b>	i.Type	<ul style="list-style-type: none"> <li>- Press the [SET]-button</li> <li>- With the arrow key ↓ enter 4-20</li> <li>- Pressing the [SET] button sets the input saved</li> </ul>	4-20 mA



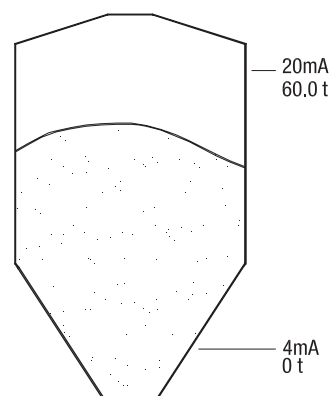
<b>P2</b>	d.Pnt	<ul style="list-style-type: none"> <li>- Change from parameter [i.Type] with the arrow key ↓ to parameter [d.Pnt]</li> <li>- Press the [SET] button and set the decimal point with the arrow key ↑ to the first digit from the right</li> <li>- The display shows [0.0]</li> <li>- Pressing the [SET] button sets the input saved</li> </ul>	Decimal dot on first digit from right side 0.0
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<b>P2</b>	L.SCL	<ul style="list-style-type: none"> <li>- Change from parameter [d.Pnt] with the arrow key ↑ to parameter [L.SCL]</li> <li>- Press the [SET]-key, then set the lower scale value to 0.0 with the arrow keys</li> <li>- Pressing the [SET] button sets the input saved</li> </ul>	Lower scale value 0.0 tons at 4 mA
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<b>P2</b>	H.SCL	<ul style="list-style-type: none"> <li>- Change from parameter [L.SCL] with the arrow key ↑ to parameter [H.SCL]</li> <li>- Press the [SET]-key, then set the higher scale value to 60.0 with the arrow keys</li> <li>- Pressing the [SET] button sets the input saved</li> <li>- Wait 20 sec. until the indication changes to the measure value (indication is now depending on the actual current; if no current is present, the device indicates 0.0)</li> <li>- The programming is finished</li> </ul>	Upper scale value 60.0 tons at 20 mA
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\*Note: By pressing the arrow keys for a longer time, the speed of the value change increases.  
 The arrow key ↑ increases the value, the arrow key ↓ decreases the value.



## Programming menu

## PROGRAMMING DEVICE

### Displaying the Measurement Unit



In "Running Mode", if   keys are pressed together for 3 seconds, measurement unit appears. See *Unit* parameter for programming.

### Displaying the Minimum Measurement Unit



In "Running Mode", if  key is pressed for 3 seconds, minimum measurement value appears.

### Displaying the Maximum Measurement Unit



In "Running Mode", if  key is pressed for 3 seconds, maximum measurement value appears.



### Resetting Maximum and Minimum Measurement Values



In "Running Mode", if  key pressed for 2 seconds, maximum and minimum measurement values become equal to the measured value at current time and the  message appears on display.



## Locking and Unlocking





Keys are locked. If  keys are pressed together for 2 seconds, **Loc** message appears and keys are locked. For unlocking,  keys are pressed together for 2 seconds, **unL** message appears and keys are unlocked. If one of the keys is pressed while the device locked, **Loc** message appears on display.

## Setting Up User Calibration Values

No calibration required if the standard inputs (0-20mA, 4-20mA, 0-1V and 0-10V) are used.  $CAL$  Parameter should be set as  $U_{inP}$  if no standard input used.

In user menu, if  key is pressed for 7 seconds,  message appears on display and calibration menu is entered.

Voltage or current which corresponds to `LSCL` parameter is applied to device input and  key is pressed. If operation is success,  message appears on display and proceeding to the next step.

In this step, while **H.inP** message displayed, voltage or current which are corresponds to **L5CL** parameter is applied to device input and **SET** key is pressed. If operation is success, **Succ** then **End** message appears on display, calibration process is completed and the device will start running according to the new calibration values.






## ERROR MESSAGES & DESCRIPTIONS

Error conditions and descriptions are listed below.

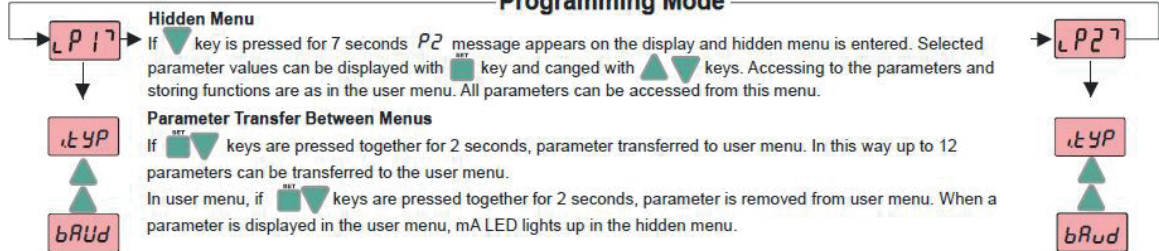
- \* If voltage or current is difference and lower than half of full scale between  $H_{inP}$  and  $L_{inP}$  voltage or current.
- \* If excessive high-low input current or voltage is applied.
- \* If an error occurs during  $L_{inP}$  calibration,  $Err1$  message appears on display.
- \* If an error occurs during  $H_{inP}$  calibration,  $Err2$  and  $LErr$  message appears on display.
- \* If user calibration **is not applied** before and an error occurs during calibration process, device runs according to standard calibration values.
- \* If user calibration **is applied** before and an error occurs during calibration process, device runs according to previous user calibration values.

## Changing Parameters

If  keys are pressed together for 2 seconds,  $P$  message appears and user menu entered. Then in user menu, first parameter's is displayed.

When a parameter selected, if  key is pressed selected parameter value appears and displayed parameter can be changed by   keys. If no operation is performed for 3 seconds after the parameter value is being displayed or  key is pressed, parameter name will be shown again. While parameter name displayed,   keys are pressed together, returned to "Running Mode" without waiting period.

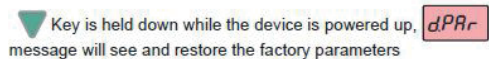
## Programming Mode




### Setting Up Measurement Unit (Unit) Parameters

If pressed  key in Un  parameter, related digit blinks on display. For desired number, letter or symbol is adjusted by pressing the  key for related digit. For setting up other digits  key is pressed. When parameter setting process is completed, by pressing  key or no key is pressed for 3 seconds without pressing any key, parameters can be saved.

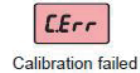
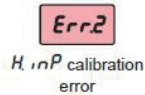
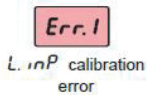
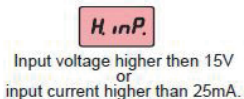
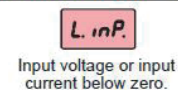
### Factory Defaults



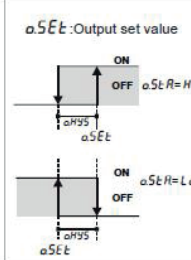
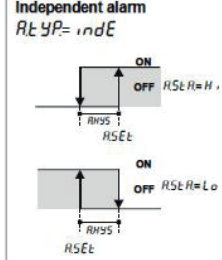
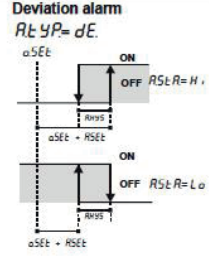
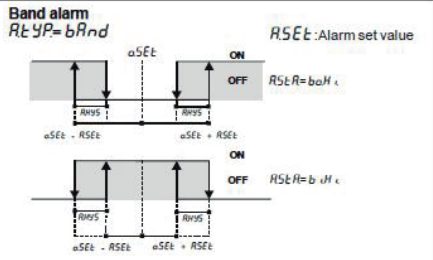
### Viewing the Revision

In "Running Mode", if  &  &  keys are pressed together for 3 seconds,  revision information appears on display.

### Running Mode Error Messages



## Programming menu

OUTPUT CONDITION		ALARM CONDITIONS	
			
PARAMETER LIST			
CONFIGURATION PARAMETERS			Initial Value
ItYP	Input type selection. (0-20mA, 4-20mA, 0-1V, 0-10V)		0-10
dSPC	Indicator configuration. (PrCS : Process value, PrUn : 4 Seconds process value, 2 Seconds Unit value.)		PrCS
rRtE	Measurement ranges. FRSE : Average of 1 measurement value is gathered in 200msec. SLo1 : Average of 4 measurement value is gathered in 200msec. SLo2 : Average of 8 measurement value is gathered in 200msec. SLo3 : Average of 16 measurement value is gathered in 200msec.		SLo1
Hold	Indicator holding parameter. (nonE : instant measurement value, Lo : minimum value, Hi : maximum value is displayed.)		nonE
Unit	Measurement value. (Desired measurement value for unit selection).		nonE
CLL	Calibration type. (SLnP : Standard input type, ULnP : User defined input type selection).		SLnP
dPnt	Decimal point selection. (Adjustable between the 1th. and 3rd digits).		0
LSCL	Lower scale value. (Adjustable between -1999 and HSCL value).		0
HSCL	Upper scale value. (Adjustable between LSCL and 4000 value).		2000
OUTPUT CONTROL PARAMETERS			Initial Value
aSEt	Output set value. (Adjustable between LSCL and HSCL).		2000
aHYS	Output hysteresis value. (Adjustable between 1 and 200).		2
aSEtR	Output status. (oFF : Output not active, Lo : Becomes active below the setpoint output value, Hi : Becomes active above the setpoint output value).		oFF
aPon	Required relay-on delay time in order to set output to active state after power-up. (Adjustable between 0 and 99 minutes).		0 1:00
aTon	Output relay-on delay time. (Adjustable between 0 and 99 minutes).		0 1:00
aToF	Output relay-off delay time. (Adjustable between 0 and 99 minutes).		0 1:00
ALARM CONTROL PARAMETERS			Initial Value
RSEt	Alarm set value. (Adjustable between LSCL and HSCL).		2000
RHYS	Alarm hysteresis value. (Adjustable between 1 and 200).		2
RtYP	Alarm type. (indE : Independent alarm, dE : Deviation alarm, bRNd : Band alarm)		indE
RSEtR	Alarm condition. (oFF : Alarm not active. For independent or deviation alarm, Lo : Alarm is active below the set value, Hi : Alarm is active above the set value. For band alarm, b iH : Activated in "in-band", b oH : Activated in "out-band".)		oFF
RPon	Required relay-on delay time in order to set alarm output to active state after power-up. (Adjustable between 0 and 99 minutes).		0 1:00
Rton	Alarm output relay-on delay time. (Adjustable between 0 and 99 minutes).		0 1:00
RtoF	Alarm output relay-off delay time. (Adjustable between 0 and 99 minutes).		0 1:00
RS485 MODBUS COMMUNICATION PARAMETERS			Initial Value
RdS	Slave device address. (Adjustable between 1 and 247)		1
bRud	Baudrate. (Can be adjusted as ; oFF, 1200, 2400, 4800, 9600, 19200 kbps)		9600