Read this document carefully before using this device. The guarantee will be expired by device demages 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

ENDA EI SERIES PROGRAMMABLE INDICATOR

Thank you for choosing **ENDA EI SERIES** INDICATOR.



- 35 x 77mm and 72x72mm 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.

RoHS Compliant

CE



Order Code : EI - [1] - [2] - [3] - [4] - [5]

1 - Size	2 - Supply Voltage	3 - Relay Output	4 - Modbus	5 - Sensor Supply
2041.....37x77	UV.....90-250V AC	2R.....OUT and ALARM	RS....Modbus (Specify at order)	12....12V DC 50mA
7041.....72x72	LV.....10-30V DC / 8-24V AC			24....24V DC 50mA

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	90-250V AC 50-60Hz;10-30V DC / 8-24V AC SMPS
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). **EI Series cannot be used if measurement category II, III or IV is required.**

Input type	Measurement range		Measurement accuracy	Input empedance
	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 (for resistive load), NO; 1/2 HP 240V AC CosF = 0.4 (for inductive load).
Alarm	Relay: 250V AC, 8A (for resistive load), NO; 1/2 HP 240V AC CosF = 0.4 (for inductive load).
Life expectancy for relay	Mechanical 30.000.000 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.
Dimentions	EI2041 : W77xH35xD71mm, EI7041 : W72xH72xD97mm
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.

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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".



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.

In "Running Mode", indicates the maximum measured value.
Used for incrementing values in "Programming Mode".

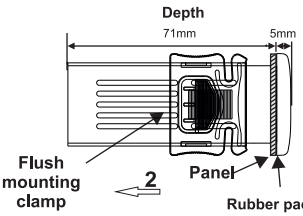
In "Running Mode", indicates the minimum measured value.
Used for decrementing values in "Programming Mode".

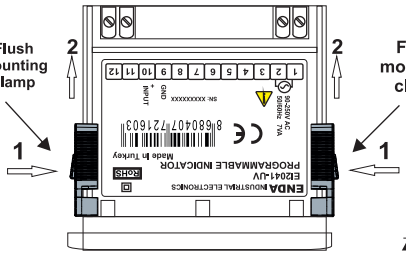
In "Running Mode", indicates the alarm set value

In "Running Mode", indicates output set value.
In "Programming Mode", indicates the selected parameter value.

DIMENSIONS



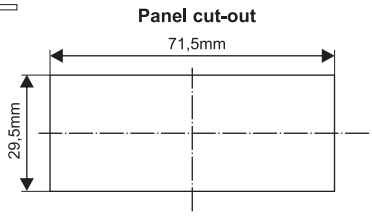




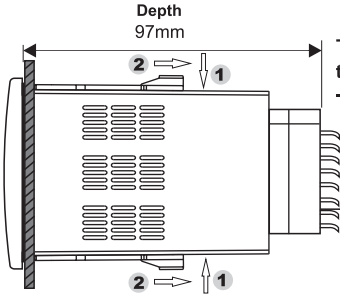
To removing the mounting clamps :

- Push the flush-mounting clamps in direction **1**
- Pull out the clamps in direction **2**.

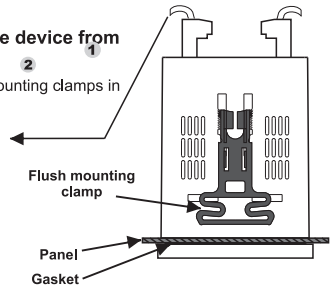
Note :
1) While panel mounting, additional distance required for connection cables should be

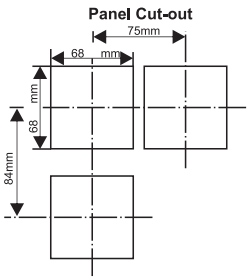






To removing the device from the panel:
- Push the flush-mounting clamps in





Note :
1) While panel mounting, additional distance required for connection cables should be considered.
2) Panel thickness should be maximum 10mm.
3) If there is no 90mm free space at back side of the device, it would be difficult to remove it from the panel.

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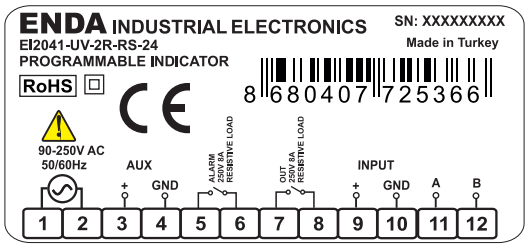
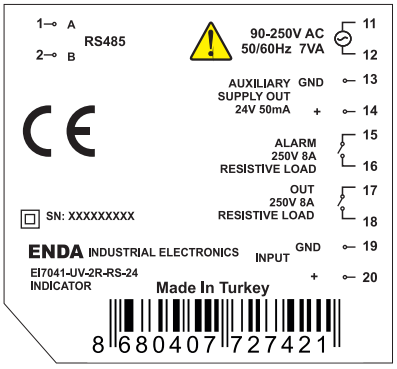
CONNECTION DIAGRAM

ENDA SERIES 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.



Equipment is protected throughout by DOUBLE INSULATION

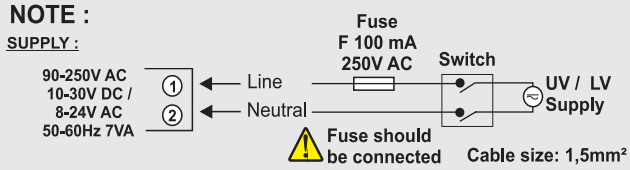
Holding screw 0.4-0.5Nm.



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.

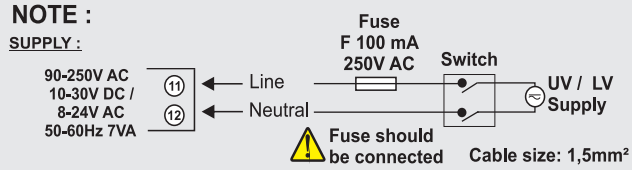
NOTE :

SUPPLY :



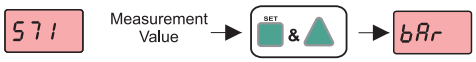
NOTE :

SUPPLY :



EI2041 PROGRAMMING DEVICE

Displaying the Measurement Unit



In “Running Mode”, if SET + ▲ 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



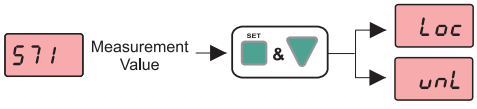
In “Running Mode”, if ▲ key is pressed for 3 seconds, maximum measurement value appears.

Resetting Maximum and Minimum Measurement Values



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

Locking and Unlocking



If SET + ▼ keys are pressed together for 2 seconds, Loc message appears and keys are locked. For unlocking, SET + ▼ 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. CALt Parameter should be set as U.inP if no standard input used.
In user menu, if ▲ key is pressed for 7 seconds, L.inP message appears on display and calibration menu is entered.

Voltage or current which are corresponds to LSCL parameter is applied to device input and SET key is pressed. If operation is success, Succ 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 LSCL parameter is applied to device input and SET key is pressed. If operation is success, Succ then CEnd 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 CErr 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.

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Changing Parameters

If ▲▼ keys are pressed together for 2 seconds, P1 message appears and user menu entered. Then in user menu, first parameter's is displayed.
When a parameter selected, if SET 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 SET 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

Hidden Menu

If ▼ key is pressed for 7 seconds P2 message appears on the display and hidden menu is entered. Selected parameter values can be displayed with SET key and canged with ▲▼ keys. Accessing to the parameters and storing functions are as in the user menu. All parameters can be accessed from this menu.

Parameter Transfer Between Menus

If SET▼ keys are pressed together for 2 seconds, parameter transferred to user menu. In this way up to 12 parameters can be transferred to the user menu.
In user menu, if SET▼ keys are pressed together for 2 seconds, parameter is removed from user menu. When a parameter is displayed in the user menu, mA LED lights up in the hidden menu.

Setting Up Measurement Unit (Un it) Parameters

If pressed SET key in Un it 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 SET key or no key is pressed for 3 seconds without pressing any key, parameters can be saved.

Factory Defaults

▼ Key is held down while the device is powered up, dPAr message will see and restore the factory parameters

Viewing the Revision

In "Running Mode", if SET & ▲ & ▼ keys are pressed together for 3 seconds, r.001 revision information appears on display.

Running Mode Error Messages

L. inP.	H. inP.	Err.1	Err.2	C.Err
Input voltage or input current below zero.	Input voltage higher then 15V or input current higher than 25mA.	L. inP calibration error	H. inP calibration error	Calibration failed

EI7041 PROGRAMMING DEVICE

Displaying the Measurement Unit

571 Measurement Value → SET & ▲ → bAr

In "Running Mode", if SET & ▲ keys are pressed together for 3 seconds, measurement unit appears. See Un it parameter for programming.

Displaying the Minimum Measurement Unit

571 Measurement Value → ▼ → 240

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

Displaying the Maximum Measurement Unit

571 Measurement Value → ▲ → 1453

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

Resetting Maximum and Minimum Measurement Values

571 Measurement Value → SET → rES

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

Locking and Unlocking Keypad

571 Measurement Value → SET & ▼ → Loc (Locked) / unL (Unlocked)

If SET & ▼ keys are pressed together for 2 seconds, Loc message appears and keys are locked. For unlocking, SET & ▼ 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.t Parameter should be set as U. inP if no standard input used.
In user menu, if ▲ key is pressed for 7 seconds, L. inP message appears on display and calibration menu is entered.

Voltage or current which are corresponds to LSCL parameter is applied to device input and SET key is pressed. If operation is success, Succ 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 LSCL parameter is applied to device input and SET key is pressed. If operation is success, Succ then CEnd 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, Err 1 message appears on display.
* If an error occurs during H. inP calibration, Err2 and C.Err 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 SET 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 SET 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

`LP17` → `LP27`

Hidden Menu

If ▼ key is pressed for 7 seconds `P2` message appears on the display and hidden menu is entered. Selected parameter values can be displayed with SET key and canged with ▲ ▼ keys. Accessing to the parameters and storing functions are as in the user menu. All parameters can be accessed from this menu.

Parameter Transfer Between Menus

If SET & ▼ keys are pressed together for 2 seconds, parameter transferred to user menu. In this way up to 12 parameters can be transferred to the user menu.

In user menu, if SET & ▼ keys are pressed together for 2 seconds, parameter is removed from user menu. When a parameter is displayed in the user menu, mA LED lights up in the hidden menu.

`InTYP` ▲ ▲ `bAUd`

Setting Up Measurement Unit (`Un it`) Parameters

If pressed SET key in `Un it` 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 SET key or no key is pressed for 3 seconds without pressing any key, parameters can be saved.

Factory Defaults

▼ Key is held down while the device is powered up, `dPAr` message will see and restore the factory parameters

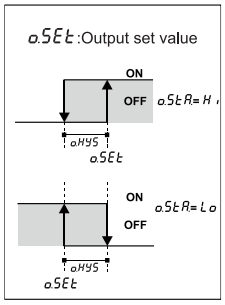
Viewing the Revision

In "Running Mode", if SET & ▲ & ▼ keys are pressed together for 3 seconds, `r.001` revision information appears on display.

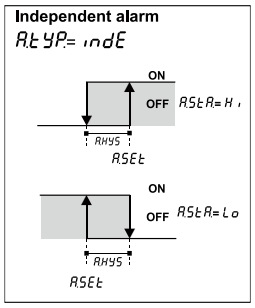
Running Mode Error Messages

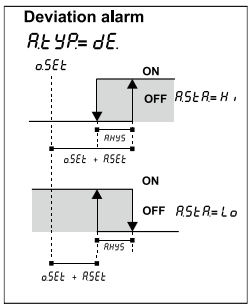
`L.inP.`	`H.inP.`	`Err.1`	`Err.2`	`C.Err`
Input voltage or input current below zero.	Input voltage higher then 15V or input current higher than 25mA.	`L.inP` calibration error	`H.inP` calibration error	Calibration failed

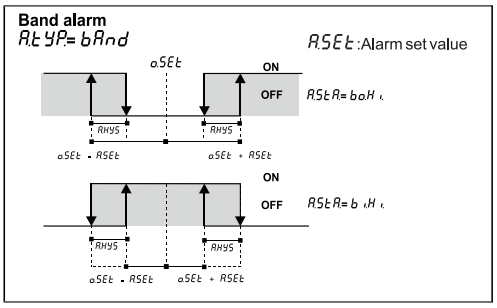
OUTPUT CONDITION



ALARM CONDITIONS







PARAMETER LIST

CONFIGURATION PARAMETERS		Initial Value
`inTYP`	Input type selection. (`0-20`mA, `4-20`mA, `0- 1`V, `0- 10`V)	`0- 10`
`dSPC`	Indicator configuration. (`PrcS` : Process value, `Pr.Un` : 4 Seconds process value, 2 Seconds `Un it` value.)	`PrcS`
`rAtE`	Measurement ranges. `FASt` : Average of 1 measurement value is gathered in 200msec. `SLo.1` : 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.	`SLo.1`
`HoLd`	Indicator holding parameter. (`nonE` : instant measurement value, `Lo.` : minimum value, `Hi` : maximum value is displayed.)	`nonE`
`Un it`	Measurement value. (Desired measurement value for unit selection).	`nonE`
`CALt`	Calibration type. (`S. inP` : Standard input type, `U. inP` : User defined input type selection).	`S. inP`
`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
`oSEt`	Output set value. (Adjustable between `LSCL` and `HSCL`).	`2000`
`oHYS`	Output hysteresis value. (Adjustable between `1` and `200`).	`2`
`oStA`	Output status. (`oFF`: Output not active, `Lo`: Becomes active below the setpoint output value, `Hi`:Becomes active above the setpoint output value).	`oFF`
`oPon`	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`
`oton`	Output relay-on delay time. (Adjustable between 0 and 99 minutes).	`0 1:00`
`otoF`	Output relay-off delay time. (Adjustable between 0 and 99 minutes).	`0 1:00`

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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. (ndE : Independent alarm, dE: Deviation alarm, bAnd: Band alarm)	ndE
RStA	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, bIn: Activated in "in-band", boH: 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).	01:00
Rton	Alarm output relay-on delay time. (Adjustable between 0 and 99 minutes).	01:00
RtoF	Alarm output relay-off delay time. (Adjustable between 0 and 99 minutes).	01:00
RS485 MODBUS COMMUNICATION PARAMETERS		**Initial Value**
AdrS	Slave device address. (Adjustable between 1 and 247)	1
bAUd	Baudrate. (Can be adjusted as ; oFF, 1200, 2400, 4800, 9600, 19200 kbps)	9600