

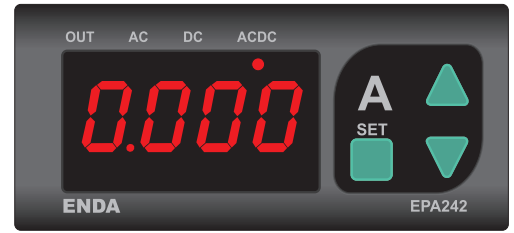


Read this document carefully before using this device. The guarantee will be expired by device damages if you don't attend to the directions in the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

# ENDA EPA242 PROGRAMMABLE AC/DC AMMETER

Thank you for choosing ENDA EPA242 programmable AC/DC ammeter.

- ▶ 77 x 35mm sized.
- ▶ 4 digits display.
- ▶ 5A/60 mV , CT20/30 current transformer or 1A input feature (Please Specify at Order). ⚠
- ▶ Measuring type can be selected as AC, DC or True RMS.
- ▶ Programmable scale range between 5A and 9999A.
- ▶ Multifunctional output (NO+NC) for upper and lower limits (Optional).
- ▶ 0-20mA, 4-20mA, 0-10V or 1-5V output selection (Optional - Specified devices with output type as 'A' only).
- ▶ Three-way isolation architecture between input, output and supply.
- ▶ Communication feature over isolated Modbus RTU protocol (Optional).
- ▶ Keylock feature.
- ▶ CE marked according to European Norms.



⚠ CT20/30 should be ordered separately when required.

Order Code : EPA242 - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>			
1 - Supply Voltage UV...90-250V AC  LV.....10-30V DC / 8-24V AC	2 - Input Type CT.....CT20/30 Current Transformer input OR 60mV. X1.....1A Default (Blank).....5A or 60mV.	3 - Output R.....08A Relay A.....Analog	4 - Modbus RSI..... RS485 Modbus Available (Specify at order)



RoHS  
Compliant

## INPUTS

Input Type	EPA242-UV : 5A or 60mV EPA242-UV-CT : CT20/30 current transformer or 60mV EPA242-UV-X1 : 1A	
Scale	AC and RMS	If input type is 5A / 60mV, scale 0A...9999A : ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...5A for <i>c.t.r.r</i> = 5 ) If input type is 1A, scale 0A...9999A : ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...1A for <i>c.t.r.r</i> = 1 ) If input type is CT20/30 / 60mV : If <i>i.t.y.p</i> = <i>Ct20</i> , 0A...300A or <i>Ct30</i> , 0A...120A ( Specified by <i>t.u.r.n</i> parameter. i.e : scale is 0A...300A / 0A...120A for <i>t.u.r.n</i> = 1 ) If <i>i.t.y.p</i> = <i>5Hnt</i> , 0A...9999A ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is 0A...5A for <i>c.t.r.r</i> = 5 )
	DC	If input type is 5A / 60mV, scale : -999A...9999A ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is -5A...5A for <i>c.t.r.r</i> = 5 ) If input type is 1A, scale : -999A...9999A ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is -1A...1A for <i>c.t.r.r</i> = 1 ) If input type is CT20/30 / 60mV : DC measurement can not be performed by using CT. If <i>i.t.y.p</i> = <i>5Hnt</i> , scale : 0A...9999A ( Specified by <i>c.t.r.r</i> parameter. i.e : scale is -5A...5A for <i>c.t.r.r</i> = 5 )
Sensitivity	0.002A x <i>c.t.r.r</i> ( i.e. : 0.01A for <i>c.t.r.r</i> = 5 )	
Accuracy	AC/RMS	±%1 (full scale) (± 2% For square wave form)
	DC	±%1 (full scale)
Input Range	Input type 60V : -60mV...60mV ⚠ ( Device may be damaged at 50V and above voltages ) Input type 1A : -1A...1A ⚠ ( Device may be damaged at 2A and above currents ) Input type 5A : -5A...5A ⚠ ( Device may be damaged at 10A and above currents ) Input type CT20/30 : 0 ... 150 mA	
Input Impedance	20kΩ for 60mV Input, 90mΩ for 1A Input, 12mΩ for 5A Input, 600mΩ for CT20/30 Input.	
Frequency Range	DC , 20Hz - 70Hz	

## ELECTRICAL CHARACTERISTICS

Supply	90-250V AC 50/60Hz ; 10-30V DC / 8-24V AC SMPS
Power Consumption	Max. 7VA
Wiring	2.5mm <sup>2</sup> screw-terminal connections
EMC	EN 61326-1: 2013
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

## OUTPUTS

Output (Relay)	250V AC, 8A (for resistive load), NO+NC Mechanical 30.000.000; Electrical 100.000 operation. 250V AC, 8A (resistive load).
Analog Output	0-20mA DC, or 4-20mA DC ±0,5% ( Load resistance for current outputs Max. 300Ω ). 0-10V DC or 1-5V DC, Max. 10mA. ±0,5% ( Short circuit protected ).

## ENVIRONMENTAL CONDITIONS

Ambient/Storage Temperature	0 ... +50°C/-25 ... 70°C (should be no icing or condensation in the environment)
Max. Relative Humidity	80% Relative humidity for temperatures up to 31°C, decreasing linearly to 50% at 40°C (should be no icing or condensation in the environment).
Rated Pollution Degree	IP20 According to EN 60529
Height	Max. 2000m

⚠ KEEP AWAY device from exposed to corrosive, volatile and flammable gases or liquids and DO NOT USE the device in similar hazardous locations.

## HOUSING

Housing Type	Suitable for EN60715 Standards, TH35 rail type.
Dimensions	W77xH35xD61mm
Weight	Approx. 250g (after packing)
Enclosure Material	Self extinguishing plastics.

⚠ Avoid any liquid contact when the device is switched on.  
DO NOT clean the device with solvent (thinner, gasoline, acid etc.) and / or abrasive cleaning agents.

**ENDA**<sup>TM</sup>

EPA242-EN-07-221208

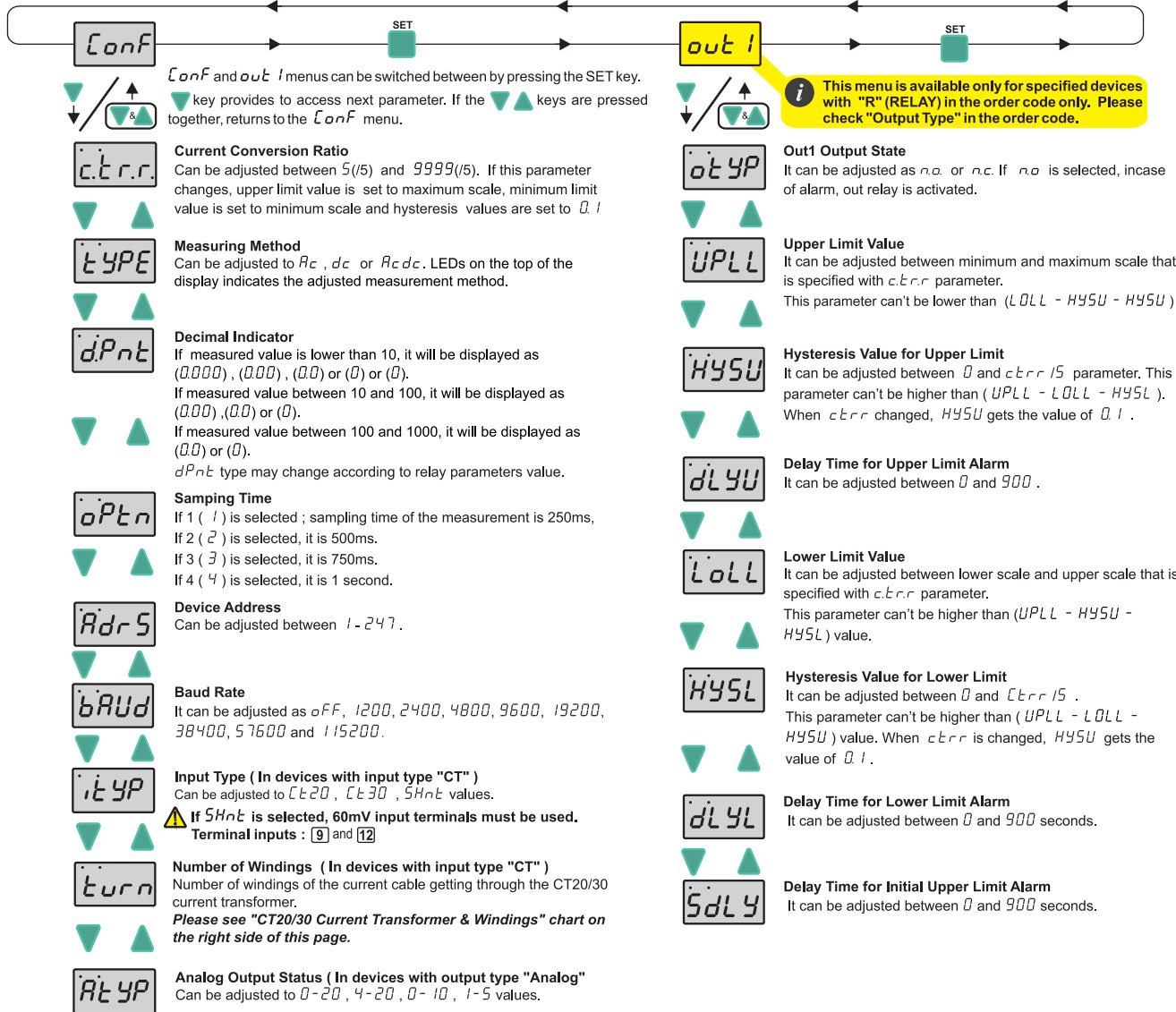


## EPA242 PROGRAMMING DIAGRAM

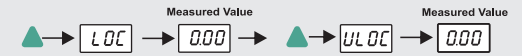
- Increment key** Used for increasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value increases faster.
- Decrement key** Used for decreasing the setpoint value and changing parameters. When held down for a few seconds, configured numeric value decreases faster.
- Programming key** Used for displaying and configuring the selected parameter value.

By pressing to keys together for 3 seconds, `xcxcxc` message appears and the "Programming Mode" is entered. If the keys are pressed during "Programming Mode" or no operation is performed for 3 seconds, returns to the "Running Mode".

### PROGRAMMING MODE



### LOCKING & UNLOCKING KEYPAD



In "Running Mode", by pressing to key for 3 seconds, keypad locked or unlocked.

### QUICK MENU



By pressing to key for 3 seconds, quick menu is entered.

### REVISION NUMBER



If these keys are pressed and held together, revision date appears as day, month and year. While revision information displayed and if one of the pressed key is released, measured value is displayed again.

### SETTING UP THE PARAMETERS



If key is pressed, the current value of the parameter appears by flashing on the display. By using "UP" or "DOWN" navigation keys, selected parameter can be adjusted to the desired value. After the setting up the parameters, if set key is pressed again, adjusted parameter name appears on display.

### DEFAULT SETTINGS



Powered on device by pressing key. `dPRr` message appears on display and device resets to default settings.

### ERROR MESSAGES



Measured current value is higher than maximum scale.



Measured current value is lower than minimum scale.

### CT20/30 Current Transformer & Windings Chart

	turn	1	2	3	4	5	6	7	8	9	10
CT20	I <sub>in</sub> max(A)	300	150	100	75	60	50	42,8	37,5	33,3	30
CT30	I <sub>in</sub> max(A)	120	60	40	30	24	20	17,1	15	13,3	12

#### Note :

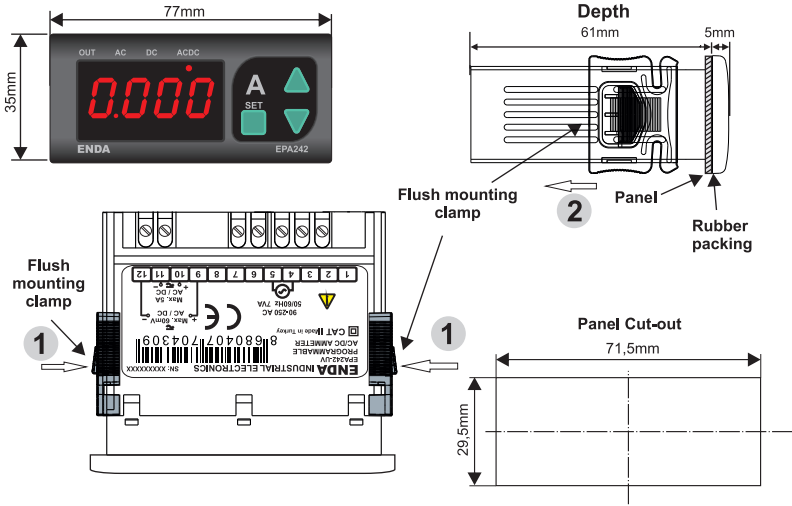
If `ityp` parameter set to `Shnt`, `turn` parameter is not appears. If `ityp` parameter set to `ct20` or `ct30`, `ctrr` parameter is not appears.



#### Note :

Before setting the relay parameters, the operating scale must be determined from `dpnt` parameter. If `dpnt`, `type` and `ityp` parameters are changed (if applicable), `UPLL`, `LoLL`, `HYSU` and `HYSL` values must be checked.

## DIMENSIONS & CONNECTION DIAGRAM



**To removing mounting clamps :**  
 - Push the flush-mounting clamps in direction **1** as shown in the figure below. Then, pull out the clamp in direction **2**.

**Note :**  
 1) Panel thickness should be maximum 7mm.  
 2) If there is no 60mm free space at the back side of the device, it would be difficult to remove it from the panel.

**NOTE :**  
**SUPPLY:**



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.

**⚠ Fuse should be connected. Cable size: 1,5mm<sup>2</sup>**



Equipment is protected throughout by **DOUBLE INSULATION**

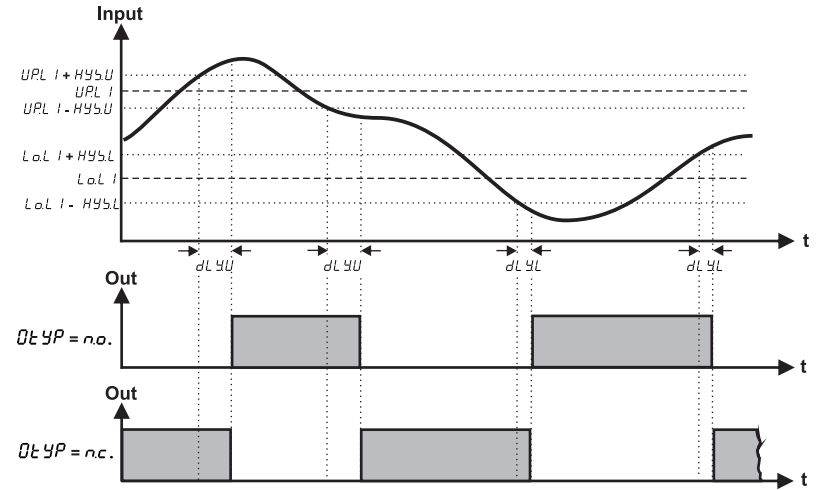
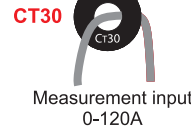
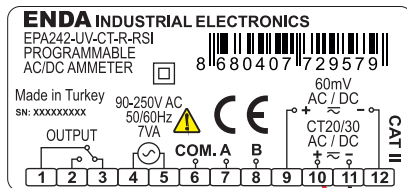
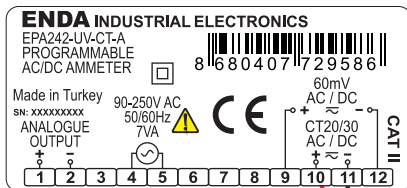
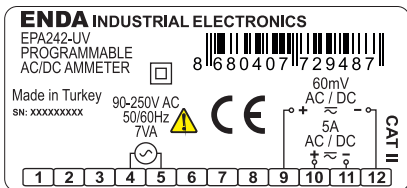
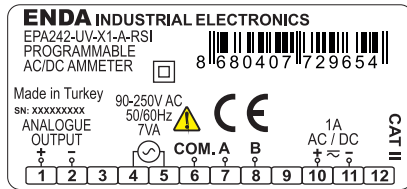
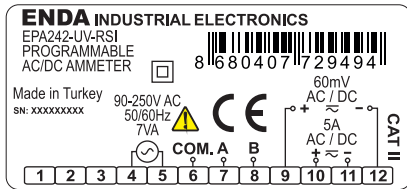
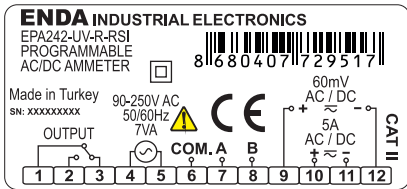
Holding screw 0,4-0,5Nm.



**ENDA EPA242** is intended for installation in control panels. Device must be used according to instructions. Mounting and electrical connections must be carried on by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that are connected to the device must be free of electrical power. The device must be protected against inadmissible humidity, vibrations and severe soiling. Make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components.



**CAUTION :**  
 Only one of the 60mV or 5A/CT20-30 inputs can be used.



	$R_c$	$d_c$	$R_c.d_c$ (rms)
	$A \frac{1}{\sqrt{2}}$	0.000	$A \frac{1}{\sqrt{2}}$
	A	0.000	A
	$A \frac{1}{\sqrt{3}}$	0.000	$A \frac{1}{\sqrt{3}}$

**Please see page 5 for Modbus Connection Diagram**

**ENDA EPA242-xx-x-xx DIGITAL AMMETER WITH ANALOGUE OUTPUT MODBUS PROTOCOL ADDRESS MAP**

Holding Register Adresleri		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	Current Conversion Ratio	<i>ctrr</i>	R / W	5
0001d	0x0001	word	Measurement method (0=AC, 1=dC, 2=ACdC)	<i>type</i>	R / W	ACdC
0002d	0x0002	word	Decimal point ( 0 = 0 , 1 = 0.0 , 2 = 0.00 , 3 = 0.000 )	<i>dpnt</i>	R / W	0.00
0003d	0x0003	word	Sampling time of the measurement value	<i>optn</i>	R / W	4
0004d	0x0004	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>adr5</i>	R / W	1
0005d	0x0005	word	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200)	<i>baud</i>	R / W	off
*0006d	0x0006	word	Input Type ( 0 = CT20 , 1 = CT30 , 2 = SHnt )	<i>ityp</i>	R / W	CT20
*0007d	0x0007	word	Number of windings for transformer (Can be set between 1 and 10).	<i>turn</i>	R / W	1
**0008d	0x0008	word	Analog output type. (0 = 0 - 20 , 1 = 4 - 20 , 2 = 0 - 10 , 3 = 1 - 5 )	<i>atyp</i>	R / W	0-20

**⚠** \* 6d and 7d addresses are available for only in EPA242-xx-CT-x-RSI CT20/30 input type devices.

**⚠** \*\* Address 8d is available for only in "A" (Analog) input type devices (EPA242-xx-xx-A-RSI).

**ENDA EPA242-xx-xx-R-RSI DIGITAL AMMETER WITH ALARM RELAY OUTPUT MODBUS PROTOCOL ADDRESS MAP**

Holding Register Adresleri		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
0000d	0x0000	word	Alarm output status	<i>otyp</i>	R / W	no
0001d	0x0001	word	Current replacement rate	<i>ctrr</i>	R / W	5
0002d	0x0002	word	The upper limit of the setpoint	<i>upll</i>	R / W	5.00
0003d	0x0003	word	The upper limit of the hysteresis value	<i>hysu</i>	R / W	0.10
0004d	0x0004	word	Delay time for the upper limit alarm	<i>dlYu</i>	R / W	0
0005d	0x0005	word	The lower limit of the setpoint	<i>ldll</i>	R / W	0.00
0006d	0x0006	word	The lower limit of the hysteresis value	<i>hysl</i>	R / W	0.10
0007d	0x0007	word	Delay time for the lower limit alarm	<i>dlYl</i>	R / W	0
0008d	0x0008	word	Measurement method (0=AC, 1=dC, 2=ACdC)	<i>type</i>	R / W	ACdC
0009d	0x0009	word	Decimal point. ( 0 = 0 , 1 = 0.0 , 2 = 0.00 , 3 = 0.000 )	<i>dpnt</i>	R / W	0.00
0010d	0x000A	word	Sampling time of the measurement value. If 1 is selected, it is 250ms. If 2 is selected, it is 500ms. If 3 is selected, it is 750ms. If 4 is selected, it is 1 second.	<i>optn</i>	R / W	4
0011d	0x000B	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>adr5</i>	R / W	1
0012d	0x000C	word	Baudrate (0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200)	<i>baud</i>	R / W	off
0013d	0x000D	word	Delay Time for Initial Upper Limit Alarm	<i>sdly</i>	R / W	0
*0014d	0x000E	word	Input Type (0 = CT20 , 1 = CT30 , 2 = SHnt )	<i>ityp</i>	R / W	CT20
*0015d	0x000F	word	Number of windings for transformer	<i>turn</i>	R / W	1

**⚠** \*14. and \*15. addresses are only used in devices with EPA242-xx-xx-R-RSI, input type CT20/30 current transformer.

### ENDA EPA242-xx-xx-x-RSI INPUT REGISTERS FOR OUTPUT DEVICES

Input Register Addresses		Data Type	Data Content	Parameter Name	Read / Write Permission
Decimal	Hex				
0000d	0x0000	word	Measured current value	--	Read Only
0001d	0x0001	word	Decimal point of measured current value	--	Read Only
0002d	0x0002	word	Specified analog output value	--	Read Only

### ENDA EPA242-xx-xx-R-RSI DIGITAL AMMETER WITH ALARM RELAY OUTPUT DISCRETE INPUTS

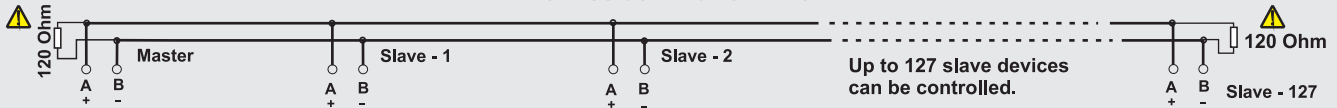
Discrete Input Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission
Decimal	Hex				
00d	0x00	Bit	Relay output state (0=OFF; 1=ON)	--	Read Only

### ENDA EPA242-xx-xx-R-RSI DIGITAL AMMETER WITH ALARM RELAY OUTPUT COILS INPUTS

Coil Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Default Value
Decimal	Hex					
00d	0x00	Bit	Output state (0=NO; 1=NC)	OLYP	R / W	NO

- Note 1** : Coil and Discrete input parameters are not available in the devices those have no relay
- Note 2** : OLYP menu parameters can be used as "Holding Register" or "Coil."
- Note 3** : Value read in 0th address of input register gives the measured value. Also, the 1st address of the input register specifies the decimal part of the measured current value.  
For example ;  
Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 1, it is 284.2  
Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 2, it is 28.42  
Value read in 0th address of input register is 2842 , if value read in 1st address from input register as 3, it is 2.842

#### \* MODBUS CONNECTION DIAGRAM



**!** Termination should be accomplished by attaching 120 Ohm resistors to the start and at the end of the communication line.

\* Applies to devices with Modbus function.