



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 EPA242 PROGRAMMABLE AC/DC AMMETER

Thank you for choosing ENDA EPA242 Programmable AC/DC Ammeter

- ▶ 77 x 35mm sized
- ▶ 4 digits display
- ▶ Easy to use with front panel keypad
- ▶ 5A or 60mV, CT20/30 Current Transformer or 60mV input (Specify at Order)
- ▶ Programmable scale between 5A and 9999A
- ▶ Multifunctional alarm output (NO+NC) for upper and lower limits (Optional)
- ▶ Communication feature over isolated RS485, using ModBus RTU protocol (Optional)
- ▶ Measuring type can be selected as AC, DC or true RMS
- ▶ Key lock feature
- ▶ 0-20mA, 4-20mA, 0-10V or 1-5V Output selection (For only "A" type output devices)
- ▶ CE marked according to European Norms



CT20/30 Current Transformer must be ordered separately.

Order Code : EPA242 -

--	--	--	--

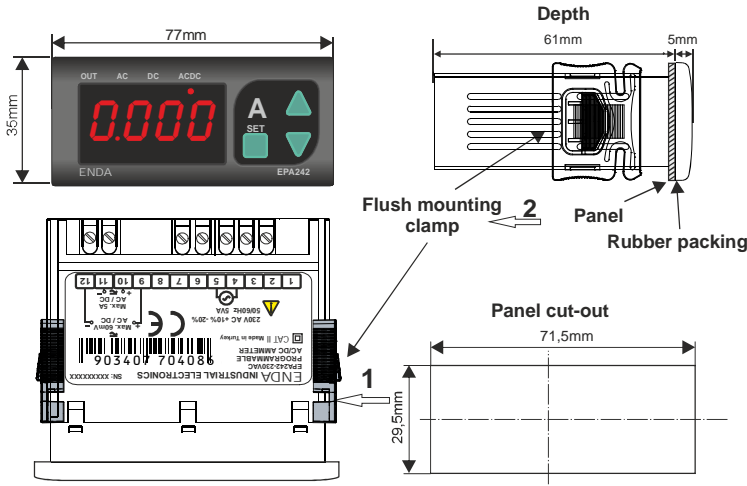
1 - Input	2 - Output	3 - Supply Voltage	4 - Isolated ModBus
CT.....CT20/30 Current Transformer Input or 60mV Blank.....5A or 60mV	R.....Relay A.....Analog Output Blank.....No Output	230VAC...230V AC 110VAC...110V AC 24VAC.....24V AC SM.....9-30V DC / 7-24V AC	RSI.....Isolated ModBus (Specify at Order).

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL CONDITIONS					
Ambient/stroge temperature	0 ... +50°C/-25 ... 70°C				
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 +10% -20%, 50/60Hz or 24V AC ±10% , 50/60Hz or optional 9-30V DC / 7-24V AC ±10% SMPS				
Power consumption	Max. 5VA				
Wiring	2.5mm ² screw-terminal connections				
Scale	AC and RMS While input type in 5A / 60mv ; 0A...9999A (Determined by <i>c.t.r.r</i> parameter. e.g ; If <i>c.t.r.r</i> = 5 , scale is 0A...5A) While input type in CT20/30 / 60mV ; If <i>i.t.y.p</i> = <i>l.t.z</i> , input range is 0A...300A (Determined by <i>t.u.r.n</i> parameter. e.g ; If <i>t.u.r.n</i> = 1 , scale is 0A...300A) If <i>i.t.y.p</i> = <i>l.t.z</i> , input range is 0A...120A (Determined by <i>t.u.r.n</i> parameter. e.g ; If <i>t.u.r.n</i> = 1 , scale is 0A...120A) If <i>i.t.y.p</i> = <i>S.H.n.t</i> , input range is 0A...9999A (Determined by <i>c.t.r.r</i> parameter. e.g ; If <i>c.t.r.r</i> = 5 , scale is 0A...5A)				
	DC While input type in 5A / 60mv ; -999A...9999A (Determined by <i>c.t.r.r</i> parameter. e.g ; If <i>c.t.r.r</i> = 5 , scale is -5A...5A) While input type in CT20/30 / 60mV ; DC Measurement can not be performed by using current transformer. If <i>i.t.y.p</i> = <i>S.H.n.t</i> , input range is 0A...9999A (Determined by <i>c.t.r.r</i> parameter. e.g ; If <i>c.t.r.r</i> = 5 , scale is -5A...5A)				
Sensitivity	0.002A x <i>c.t.r.r</i> (e.g ; For <i>c.t.r.r</i> = 5 , sensitivity is 0.01A)				
Accuracy	AC ±%1 (full scale) (± 2% For square wave form) DC ±%1 (full scale) RMS ±%1 (full scale) (± 2% For square wave form)				
Input Range	<table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td style="width: 15px; height: 15px; text-align: center;">10</td><td style="width: 15px; height: 15px; text-align: center;">11</td></tr><tr><td style="width: 15px; height: 15px; text-align: center;">9</td><td style="width: 15px; height: 15px; text-align: center;">12</td></tr></table> -5A...5A or CT20/30 input devices 0...150mA (Device may be damaged at 10A and above currents) -60mV...60mV (Device may be damaged at 50V and above voltages)	10	11	9	12
10	11				
9	12				
Input Impedance	<table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td style="width: 15px; height: 15px; text-align: center;">10</td><td style="width: 15px; height: 15px; text-align: center;">11</td></tr><tr><td style="width: 15px; height: 15px; text-align: center;">9</td><td style="width: 15px; height: 15px; text-align: center;">12</td></tr></table> 12m 40k	10	11	9	12
10	11				
9	12				
Frequency Range	DC , 10Hz - 200Hz (10Hz - 70Hz For square wave form)				
EMC	EN 61326-1: 2013				
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)				
OUTPUTS					
Analog output	0-20mA DC, 4-20mA DC, 0-10V DC or 1-5V DC selection. (Load resistance for current outputs are max. 500)				
Alarm output	Relay: 250V AC, 8A (for resistive load), NO+NC				
Life expectancy for relay	Mechanical 30.000.000 ; Electrical 100.000 operation.				
HOUSING					
Housing type	Suitable for flush-panel mounting. (According to DIN 43 700)				
Dimensions	W77xH35xD61mm				
Weight	Approx. 250g (after packing)				
Enclosure material	Self extinguishing plastics.				
While cleaning the device, solvents (thinner, gasoline, acid etc.) or corrosive materials must not be used.					

Up to date: 29.03.2019, modification reserved and can be change any time previous notice !

DIMENSIONS



For removing mounting clamps :

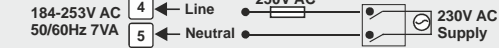
- Push the flush-mounting clamp in direction 1 as shown in the figure left.
- Then, pull out the clamp in direction 2.

Note :

- 1) Panel thickness should be maximum 7mm.
- 2) There must be at least 60mm free space behind the device, otherwise 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: 1,5mm²



Equipment is protected throughout by DOUBLE INSULATION



Holding screw 0.4-0.5Nm.

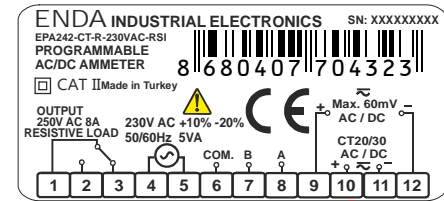
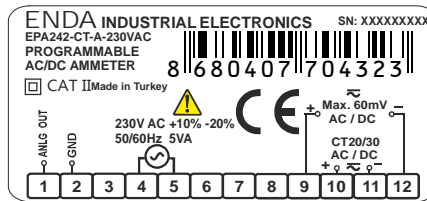
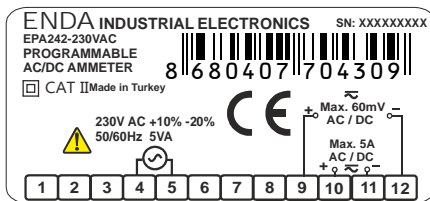
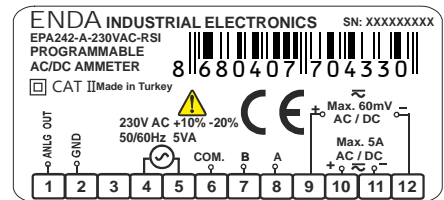
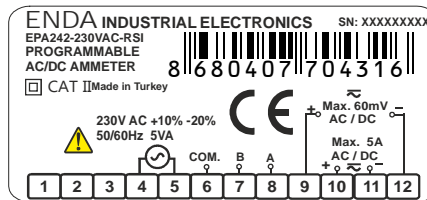
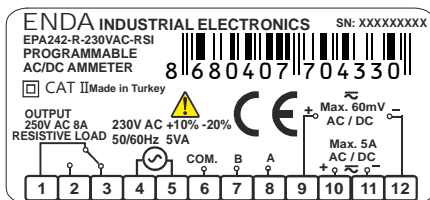
CONNECTION DIAGRAM



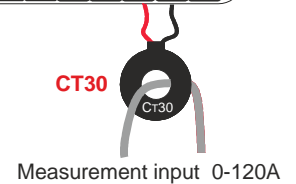
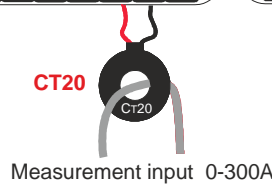
ENDA EPA242 is intended for installation in control panels. Make sure that the device is used only for intended purpose. The electrical connections must be carried on by a qualified staff and must be according to the relevant locally applicable regulations. During an installation, all of the cables that 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 :

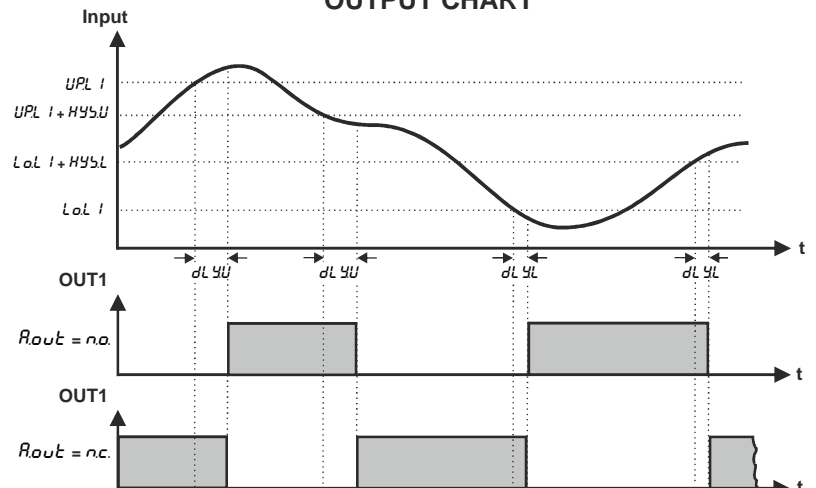
If 5A / CT20-30 and 60mV inputs are connected at the same time, the measurement will be incorrect.



	R_c	d_c	$R_c d_c$ (rms)
	$A \frac{1}{\sqrt{2}}$	0.000	$A \frac{1}{\sqrt{2}}$
	0.308 A	$A \frac{2}{\pi}$	$A \frac{1}{\sqrt{2}}$
	0.386 A	$A \frac{1}{\pi}$	$A \frac{1}{2}$
	A	0.000	A
	$A \frac{1}{2}$	$A \frac{1}{2}$	$A \frac{1}{\sqrt{2}}$
	$A \sqrt{\frac{d}{T} - \frac{d^2}{T}}$	$A \frac{d}{T}$	$A \sqrt{\frac{d}{T}}$
	$A \frac{1}{\sqrt{3}}$	0.000	$A \frac{1}{\sqrt{3}}$



OUTPUT CHART

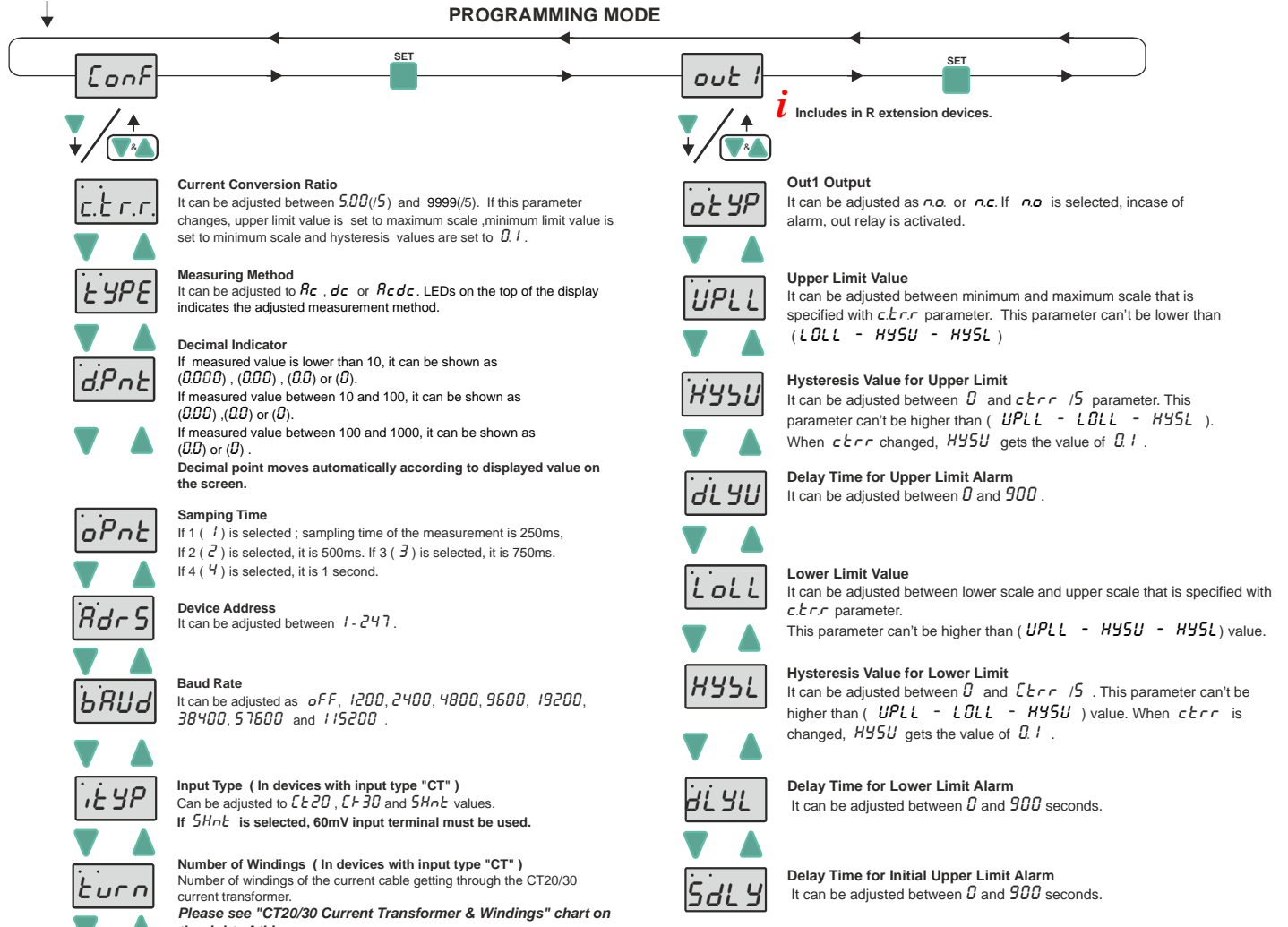




PROGRAMMING DIAGRAM

- 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 increases faster.
- Programming key** Used for displaying and configuring the selected parameter value.

If these keys are pressed and held for 3 seconds, "Programming Mode" is entered or it returns to "Running Mode". If and keys are pressed while parameter names are displayed, than it returns to measured value.



DEFAULT SETTINGS



Powered on device by pressing key. dPAr message appears on display and device reset to default settings.

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.

ERROR MESSAGES

Measured current value is higher than maximum scale. Measured current value is lower than minimum scale.

CT20/30 Current Transformer & Windings Chart

	t _{urn}	1	2	3	4	5	6	7	8	9	10
CT20	I _{in} max(A)	300	150	100	75	60	50	42,8	37,5	33,3	30
CT30	I _{in} max(A)	120	60	40	30	24	20	17,1	15	13,3	12



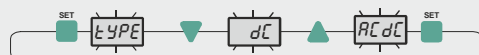
Note :

If iTYP = SHnt, t_{urn} parameter is not appears.
If iTYP = Ct20 or Ct30, c.t.r.r. 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, UPLL, LoLL, HYSU and HYSL values must be checked.

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.

ENDA EPA242 DIGITAL AMPERMETER MODBUS PROTOCOL ADDRESS MAP

HOLDING REGISTERS FOR R EXTENSION DEVICES

Holding Register Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
0000d	0x0000	word	OUT1 output status	<i>OUTYP</i>	Read / Write	<i>no</i>
0001d	0x0001	word	Current conversion ratio	<i>CTRR</i>	Read / Write	<i>5</i>
0002d	0x0002	word	The upper limit of the setpoint	<i>UPLL</i>	Read / Write	<i>500</i>
0003d	0x0003	word	The upper limit of the hysteresis value	<i>HYSU</i>	Read / Write	<i>0.10</i>
0004d	0x0004	word	Delay time for the upper limit alarm	<i>DLYU</i>	Read / Write	<i>0</i>
0005d	0x0005	word	The lower limit of the setpoint	<i>LOLL</i>	Read / Write	<i>0.00</i>
0006d	0x0006	word	The lower limit of the hysteresis value	<i>HYSL</i>	Read / Write	<i>0.10</i>
0007d	0x0007	word	Delay time for the lower limit alarm	<i>DLYL</i>	Read / Write	<i>0</i>
0008d	0x0008	word	Measurement method (<i>0=RC, 1=dC, 2=RCdC</i>)	<i>TYPE</i>	Read / Write	<i>RCdC</i>
0009d	0x0009	word	Decimal point. (<i>0=0, 1=00, 2=000, 3=0000</i>)	<i>dPnt</i>	Read / Write	<i>000</i>
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>	Read / Write	<i>4</i>
0011d	0x000B	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>AdRS</i>	Read / Write	<i>1</i>
0012d	0x000C	word	Baudrate (<i>0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200</i>)	<i>bAUD</i>	Read / Write	<i>off</i>
0013d	0x000D	word	Delay Time for Initial Upper Limit Alarm	<i>SDLY</i>	Read / Write	<i>0</i>
* 0014d	0x000E	word	Input type (<i>0=CT20, 1=CT30, 2=SHnt</i>)	<i>ITYP</i>	Read / Write	<i>ct20</i>
* 0015d	0x000F	word	Number of windings for transformer	<i>tURN</i>	Read / Write	<i>1</i>

* 14 and 15 Addresses are used only in devices with input type CT20/30.

Holding Register Parameter Table (For devices with "No Relay" and "A" type output models)

0000d	0x0000	word	Current conversion ratio	<i>CTRR</i>	Read / Write	<i>5</i>
0001d	0x0001	word	Measurement method (<i>0=RC, 1=dC, 2=RCdC</i>)	<i>TYPE</i>	Read / Write	<i>RCdC</i>
0002d	0x0002	word	Decimal point. (<i>0=0, 1=00, 2=000, 3=0000</i>)	<i>dPnt</i>	Read / Write	<i>000</i>
0003d	0x0003	word	Sampling time of the measurement value	<i>oPtn</i>	Read / Write	<i>4</i>
0004d	0x0004	word	Device address for RS485 network connection. Adjustable between 1-247.	<i>AdRS</i>	Read / Write	<i>1</i>
0005d	0x0005	word	Baudrate (<i>0=Off;1=1200;2=2400; 3=4800; 4=9600; 5=19200 6= 38400; 7= 57600; 8= 115200</i>)	<i>bAUD</i>	Read / Write	<i>9600</i>
* 0006d	0x0006	word	Input type (<i>0=CT20, 1=CT30, 2=SHnt</i>)	<i>ITYP</i>	Read / Write	<i>ct20</i>
* 0007d	0x0007	word	Number of windings for transformer	<i>tURN</i>	Read / Write	<i>1</i>
** 0008d	0x0008	word	Analog output type (<i>0=0-20, 1=4-20, 2=0-10, 3=1-5</i>)	<i>AEYP</i>	Read / Write	<i>0 - 20</i>

* 6 and 7 Addresses are used only in devices with input type CT20/30.

** 8 Address is used only in devices with output type "A".

In devices with input type CT20/30, following parameter settings will change automatically if the *ITYP* parameter is changed.

If *ITYP* = *CT20*; *UPLL* = *3000*, *LOLL* = *0*, *HYSU* = *0.10*, *HYSL* = *0.10*

If *ITYP* = *CT30*; *UPLL* = *1200*, *LOLL* = *0*, *HYSU* = *0.10*, *HYSL* = *0.10*

INPUT REGISTERS FOR R EXTENSION 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

DISCRETE INPUTS FOR R EXTENSION DEVICES

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

COILS FOR R EXTENSION DEVICES

Coil Addresses		Data Type	Data Content	Parameter Name	Read/Write Permission	Status Value
Decimal	Hex					
00d	0x00	Bit	Output state (<i>0=no; 1=nc</i>)	<i>OUTYP</i>	Read / Write	

Note 1 : Coil and Discrete input parameters are not available in the devices those have no relay

Note 2 : *OUTYP* 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