## ENDA EPV542 PROGRAMMABLE AC/DC VOLTMETER

Thank you for choosing ENDA EPV542 Programmable AC/DC voltmeter.
$>54 \times 94 \mathrm{~mm}$ sized

- 3 digits display

Selectable number of decimal point
Easy to use front panel keypad
$\Rightarrow$ Multi-function alarm output for lower and upper limits (NO + NC)
Multi-function alarm setpoints with alarm output (NO)
Communication feature over isolated RS485, using ModBus RTU protocol (Optional)
$>$ Keylock feature
$\rightarrow$ Measuring type can be selected as AC, DC or true RMS (ACDC)
$>$ CE Marked according to Europan Norms.


TECHNICAL SPECIFICATIONS

| ENVIRONMENTAL CONDITIONS |  |
| :--- | :--- |
| Ambient / Storage Temperature | $0 \ldots+50^{\circ} \mathrm{C} /-25 \ldots+70^{\circ} \mathrm{C}$ (with no icing) |
| Max. Relative Humidity | $80 \%$ Relative humidity for temperatures up to $31^{\circ} \mathrm{C}$, decreasing linearly to $50 \%$ at $40^{\circ} \mathrm{C}$. |
| Rated Pollution Degree | According to EN 60529 ; Front Panel : IP65, Rear Panel : IP20 |
| Height | Max. 2000 m |

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

| ELECTRICAL CHARACTERISTICS |  |
| :---: | :---: |
| Supply Voltage | 90-250V AC $50 / 60 \mathrm{~Hz}$; 10-30V DC / 8-24V AC SMPS |
| Power Consumption | Max. 5VA |
| Wiring | $2.5 \mathrm{~mm}^{2}$ screw-terminal connections |
| Scale |  |
| Sensitivity | $0,01 \mathrm{~V}$ ( If, ,t $4 P 100$ is selected) $0,1 \mathrm{~V}$ (If, i.t $4 P$ is selected and higher than -100 V , lower from 100 V for input values ) $1 \mathrm{~V} \quad$ (If, .5 SP is selected and lower than -100 V , higher from 100 V for input values ) |
| Accuracy | AC $\pm \% 1$ ( Full scale ) ( For square wave form $\pm 2 \%$ ) <br> DC $\pm \% 1$ ( Full scale )  <br> RMS $\pm \% 1$ ( Full scale ) ( For square wave form $\pm 2 \%$ ) |
| Input Range | $-500 \mathrm{~V} \ldots 500 \mathrm{~V}$ (If ,. .49500 is selected, device breaks down at more than $\pm 1250 \mathrm{DC}$ voltages ) <br>  |
| Input Impedance | 870k $\Omega$ |
| Frequency Range | DC, $10 \mathrm{~Hz}-200 \mathrm{~Hz}$ (For square wave form $10 \mathrm{~Hz}-70 \mathrm{~Hz}$ ) |
| EMC | EN 61326-1: 2013 |
| Safety Requirements | EN 61010-1: 2010 (Pollution degree 2, overvoltage category II) |
| OUTPUTS |  |
| Output | Relay: 250 V AC, 8 A (for resistive load), $\mathrm{NO}+\mathrm{NC}$ |
| Life Expectancy for Relay | Mechanical 30.000 .000 operation; 100.000 operation at 250 V AC, 10A resistive load. |
| HOUSING |  |
| Housing Type | Suitable for flush-panel mounting. (According to DIN 43 700) |
| Dimensions | W54xH94xD68mm |
| Weight | Approx. 250 g (after packing) |
| Enclosure Material | Self extinguishing plastics. |

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

## Dimensions



Push mounting the device to the panel; Push the device in direction $\mathbf{1}$, the rall
provide the key to keeping the rail.
For removing the device from rail; Push the rail lock in direction 2 with a Push the rail lock in direction 2 with
screwdriver and pull the device in direction 3 .

$\square$ Equipment is protected throughout by DOUBLE INSULATION
( $\begin{gathered}\text { Holding screw } \\ 0.4-0.5 \mathrm{Nm} \text {. }\end{gathered}$

## Connection Diagram

$\triangle$
ENDA EPV542 series voltmeters are rail mounted devices. Make sure that the device is used only for intended purpose. The electrical connections must be carried out 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, severe soiling. Make sure that the operation temperature is not exceeded. The cables should not be close to the power cables or components

If " $5 P$ P input type " 500 " is selected, the measurement terminals $\mathbf{1}$ and $\mathbf{4}$ of the terminals must be connected. Otherwise, measurement will be incorrect.
If " $4 P$ input type " $100^{\text {" }}$ is selected, the measurement terminals $\mathbf{2}$ and $\mathbf{3}$ of the terminals must be connected. Otherwise, measurement will be incorrect.


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ENDA industrial electronics
EPV542-LV-R-RSI EPV542-LV-R-RSI ROHS





|  | Re | de | Re.de (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 $\frac{1}{\sqrt{2}}$ |
|  | $A \sqrt{\frac{d}{T}-\frac{d^{2}}{T^{2}}}$ | $A \frac{d}{T}$ | $A \sqrt{\frac{d}{T}}$ |
|  | A $\frac{1}{\sqrt{3}}$ | 0.000 | A $\frac{1}{\sqrt{3}}$ |

 for a few seconds, configured numeric value increases faster keylock.

Mode", pressed for 3 seconds continuously, activates or deactivates Used for for a few secondsing the setpoint value and changing parameters. When held down used for

Decrement
Key Programming Key

## SETTING UP THE PARAMETERS

(ㅂI) $\qquad$ (V) $\qquad$ (4) ACdC
If (sil) key is pressed, the current value of the parameter appears by flashing on the display.
(a) By using "UP" or "DOWN" navigation keys, selected parameter can be adjusted to the desired value.
(si7) After the setting up the parameters, if set key is pressed again, adjusted parameter name appears on display.



Input Type Selection
If $U 100$ is selected ; By using Max. 100 V input (2nd. and 3th. terminals), Lt.r.r. is hiden in the menu
If $U 500$ is selected ; By using Max. 500 V input (1st. and 4th. terminals), u.t.r.r. is hiden in the menu.If u.t.r.r. is selected ; By using Max. 500 V input (1st. and 4th. terminals), u.t.r.r. value appears in the menu and it can be adjusted between 1 and 9999.

oltage Conversion Rate
Can be adjusted between I (100) and 9999 (/100).
If parameter is changed, upper limit value set to the upper scale value, the the init value set to the lower scale value and hysteresis values are set

( $)$

(4) (-)

## $\triangle$

## Measurement Method

Can be set as $A C$, $d[$ or $A C d[$. Adjusted measurement method indicated by top of the display LEDs.

Decimal Indicator
If measured value is lower than 10 , it can be shown as (0.000), (0.00), (0.0) or (0).

If measured value between 10 and 100 , it can be shown as ( 0.00 ) (0.0) or (0).
measured value between 100 and 1000 , it can be shown as (2.0) or (D).
$d P_{n} t$ value, depending on the measured values and relay parameters can change instantly.

| opnt |
| :---: |
| ( ) ( |
| 8dr 5 |
| (1) |
| 6Rid |

Samping Time
If $1(i)$ is selected ; sampling time of the measurement is 250 ms , If $2(2)$ is selected, it is 500 ms . If 3 ( 3 ) is selected, it is 750 ms . If $4(4)$ is selected, it is 1 second.
Device Address
It can be adjusted between 1-247.

Baud Rate
It can be adjusted as ofF, $1200,2400,4800,9600,19200$ 38400, 57600 and 115200

Out1 Output
It can be adjusted as n.o. or n.c. If n.o is selected, incase of alarm, out relay is activated.

## Upper Limit Value

If It $4 P$ parameter is selected as u.t.r.r. , can be increased up to u.t.r.r. value. If selected as $U 100$, can be increased up to 100 value. If selected as $U 500$, can be increased up to 500 value.
This parameter value can not be less than ( LOLL - HYS.L HYSU).
Hysteresis Value for Upper Limit
It can be adjusted between 0 and 20 value. This parameter can't be higher than (UPL $1-L O L 1-H Y S L$ ). When $c t r r$ changed, $H Y S U$ gets the value of 0.1

Delay

$$
\text { It can be adjusted between } 0 \text { and } 900 \text { seconds. }
$$

## Lower Limit Value

It can be adjusted between lower scale and upper scale that is specified with c.t r.r parameter
This parameter can't be higher than (UPLL - HYSU-HYSL) value.

## Hysteresis Value for Lower Limit

It can be adjusted between 0 and $\operatorname{Ctrr} 15$. This parameter can't be higher than (UPLL - LOLL - HY5U) value. When ctrr is changed, $H 45 U$ gets the value of 0.1

Delay Time for Lower Limit Alarm It can be adjusted between 0 and 900 seconds.

## LOCKING \& UNLOCKING KEYPAD



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


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

## REVISION NUMBER

(3i7) \& ( ) 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.

## DEFAULT SETTINGS

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

## ERROR MESSAGES

(*) There are only it $Y P$, ut.r.r , $t Y P E, d P \cap L, O P L \cap$ parameters in the devices those have no relay.
${ }_{(* *)}$ The $R d r \zeta$ and $b$ Ru $d$ parameters are only in the devices those have modbus.


Measured current value is lower than minimum scale.

ENDA EPV542 DIGITAL VOLTMETER MODBUS PROTOCOL ADDRESS MAP HOLDING REGISTERS FOR R EXTENSION DEVICES

| Holding Register Addresses |  | Data <br> Type | Data Content | Parameter Name | Read／Write Permission | Status Value |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Decimal | Hex |  |  |  |  |  |
| 0000d | 0x0000 | word | Alarm output status | DL 3 P | Readable／Writable | no |
| 0001d | 0x0001 | word | Input type selection | ルソP | Readable／Writable | u．t．r．r |
| 0002d | 0x0002 | word | Voltage Conversion Rate | u．t．r．r | Readable／Writable | 100 |
| $\begin{aligned} & \text { 0003d } \\ & 0004 d \end{aligned}$ | $\begin{aligned} & 0 \times 0003 \\ & 0 \times 0004 \end{aligned}$ | word <br> word | $\begin{aligned} & \text { LSW = Low Significant Word Upper limit of the setpoint } \\ & \text { MSW = Most Significant Word } \\ & \text { (Hex. format must be sent 32bit MSW and LSW) } \end{aligned}$ | UPLL | Readable／Writable | 100.0 |
| 0005d 0006d | $\begin{aligned} & 0 \times 0005 \\ & 0 \times 0006 \end{aligned}$ | word word | $\begin{aligned} & \text { LSW = Low Significant Word Lower limit of the setpoint } \\ & \text { MSW = Most Significant Word } \\ & \text { (Hex. format must be sent 32bit MSW and LSW) } \end{aligned}$ | LOLL | Readable／Writable | 0 |
| 0007d | 0x0007 | word | Upper limit of the hysteresis value | HS5U | Readable／Writable | 0.1 |
| 0008d | $0 \times 0008$ | word | Delay time for the upper limit alarm | dL UU $^{\text {d }}$ | Readable／Writable | $\square$ |
| 0009d | 0x0009 | word | The lower limit of the hysteresis value | H35i | Readable／Writable | 0． 1 |
| 0010d | 0x000A | word | Delay time for the lower limit alarm | dLSL | Readable／Writable | 0 |
| 0011d | 0x000B | word | Measurement method（ $\square=R L, \quad 1=d L, ~ 己=R L d L)$ | LSPE | Readable／Writable | RL $d[$ |
| 0012d | 0x000C | word | Decimal point．（ $0=X, 1=X . X, 2=X . X X, 3=X . X X X)$ | dPnt | Readable／Writable | 0.0 |
| 0013d | 0x000D | word | Sampling time of the measurement value．If 1 is selected，it is 250 ms ．If 2 is selected，it is 500 ms ．If 3 is selected，it is 750 ms ． If 4 is selected，it is 1 second． | －PLn | Readable／Writable | 4 |
| 0014d | 0x000E | word | Device address for RS485 network connection． Adjustable between 1－247． | Rdr 5 | Readable／Writable | 1 |
| 0015d | 0x000F | word | $\begin{aligned} & \text { Baudrate }(0=\mathrm{Off} ; 1=1200 ; 2=2400 ; 3=4800 ; 4=9600 ; 5=19200 \\ & 6=38400 ; 7=57600 ; 8=115200) \end{aligned}$ | bRUd | Readable／Writable | －FF |
| ＊Holding Register Parameter Table（No Relay Models） |  |  |  |  |  |  |
| 0000d | 0x0000 | word | Input type selection | ル リP | Readable／Writable | u．t．r．r |
| 0001d | 0x0001 | word | Voltage Conversion Rate | u．t．r．r | Readable／Writable | 100 |
| 0003d | 0x0003 | word | Measurement method（ $\square=R[, \quad 1=d L, ~ 己=R[d L)$ | LSPE | Readable／Writable | RLdL |
| 0004d | 0x0004 | word | Decimal point．（ $0=X . X X, 1=X . X, 2=X$ ） | $\square P \cap t$ | Readable／Writable | 0.0 |
| 0005d | 0x0005 | word | Sampling time of the measurement value | －Ptn | Readable／Writable | 4 |
| 0006d | 0x0006 | word | Device address for RS485 network connection． Adjustable between 1－247． | Rdr 5 | Readable／Writable | 1 |
| 0007d | 0x0007 | word | $\begin{aligned} & \text { Baudrate }(0=\text { Off } ; 1=1200 ; 2=2400 ; 3=4800 ; 4=9600 ; 5=19200 \\ & 6=38400 ; 7=57600 ; 8=115200) \end{aligned}$ | bridd | Readable／Writable | of F |

INPUT REGISTERS FOR EPV542－x－xxx－RSI DEVICES

| Input Register <br> Addresses | Data <br> Type | Data Content | Parameter <br> Name | Read／Write Permission |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Decimal | Hex |  | -- | Only Readable |
| 0000d | $0 x 0000$ | word | Measured voltage value |  |

DISCRETE INPUTS FOR R EXTENSION DEVICES

| Discrete Input Addresses |  | Data Type | Data Content | Parameter Name | Read／Write Permission |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Decimal | Hex |  |  |  |  |  |
| 0000d | 0x0000 | Bit | Relay output state（0＝oFF；1＝0n） | －－ | Only Read |  |
| COILS FOR R EXTENSION DEVICES |  |  |  |  |  |  |
| Coil Addresses |  | Data <br> Type <br> Bit | Data Content <br> Alarm output state（ $0=\cap \circ ; 1=\cap \subset$ ） | Parameter Name DLYP | Read／Write Permission <br> Readable／Writable | Status |
| Decimal 0000d | $\begin{aligned} & \text { Hex } \\ & 0 \times 0000 \end{aligned}$ |  |  |  |  | Value no |

＊Coil and Discrete input parameters are not available in the devices those have no relay
Note 1：DL SP menu parameters can be used as＂Holding Register＂or＂Coil．
Note 2 ：Received＂ModBus input register value＂is multiplying by 1000 （based on $d . P \cap t$ ）and mV value reached．
For example ；
if modbus value is 2842 ，（for $d . P n t=2(0.00)$ ） $28.42 \times 1000=28420 \mathrm{mV}$ ，ie 28.42 V
if modbus value is 2842 ，（for $d . P \cap t=3(0.000)$ ） $2.842 \times 1000=2842 \mathrm{mV}$ ，ie 2.842 V
Note 3 ： $\mathrm{UP} L \mathrm{~L}$ and $L O L L$ value should be written and read in 2 bytes．Calculations in the input register is also valid for that value．
For example ；Read value（for $U P L L$ ）is 150200 and if $d P \cap L=1$ ，this value is actually（150．2）．
It is，150200d（24A88h）；LSW＝4A88h ，MSW＝0002h．

