EPND-2A

Gebruikershandleiding/Manual

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Introduction

This chapter provides basic information about device. Before starting please read this manual carefully.

EPND-2A two-channel current loop converter is designed to connect sensors with output 0-20mA/4-20mA into Ethernet network. Current can be recalculated to physical value measured by the connected sensor. Sensors can be powered directly from the EPND-2A Converter. EPND-2A has two current inputs. These inputs are not galvanically isolated.

General safety rules

The following summary is used to reduce the risk of injury or damage the device. To prevent injury, please follow instructions in this manual.

The device can be installed and repaired only by a qualified person. The device contains no serviceable parts inside standard means.

Don't use the device, if it doesn't work correctly. If you think, that the device is not working correctly, let check it by qualified service person.

It's forbidden to use the device without the cover. Inside the device can be a dangerous voltage and may be risk of electric shock.

Use only the appropriate power supply adapter according to manufacturer specifications and approved according to relevant standards. Make sure, that the adapter does not have damaged cables or covers.

Connect the device only to network parts approved according to relevant standards.

Connect and disconnect the device properly. Don't connect or disconnect Ethernet cable or current inputs, if the device is powered.

Do not short-circuit power supply terminals +U1 and +U2 to GND terminals.

The device may be installed only in prescribed areas. Never expose the device to higher or lower temperatures than is allowed. Protect device from dripping or splashing water and do not use in areas with condensation.

Don't use device in explosive environments.

Don't stress the device mechanically.

Device description and important notices

This chapter contains information about basic features. Also there are important notices concerning to functional safety.

Values from the device can be read using an Ethernet connection. The following formats are supported:

- Web pages with user changeable look and XML files

- Modbus TCP protocol

- SNMPv1 protocol

- SOAP protocol

The device can also be used to check measured values and if the limit is exceeded, device sends warning messages. Possible ways to sending warning messages:

- Sending e-mails up to 3 e-mail addresses

- Sending SNMP traps up to 3 configurable IP addresses

- Displaying the alarm status on web page

- Sending messages to Syslog server

The device setup can be made by the web interface. Latest firmware for your device you find at manufacturer's website. Do not upload to your device firmware which is not designed for it. Unsupported firmware can damage your device.

Reliability of warning messages delivering (e-mail, trap, syslog), depends on actual availability of necessary network services. The device should not be used for critical applications, where malfunction could cause to injury or loss of human life. For highly reliable systems, redundancy is essential. For more information please see standard IEC 61508.

Never connect the device directly to the Internet. If it is necessary connect the device to the Internet, properly configured firewall must be used. Firewall can be partially replaced with the NAT.

Getting started

Here you can find information necessary to put newly purchased equipment to operation. Read carefully information about current loop connection.

What is needed for operation

To install the unit you need to the following equipment. Before installation check if it's available.

- EPND-2A current loop converter

- screwdriver for removing cover

- power supply – according specification (commonly DC 24V/1.0A)

- RJ45 LAN connection with appropriate cable

- free IP address in your network

- sensor(s) with current loop output (4-20mA or 0-20mA)
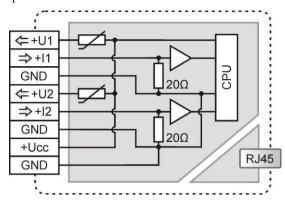
Mounting the device

- check if the equipment from previous chapter is available

- install the latest version of TSensor software. This software will help you find device on network and to change IP address of the device. Device configuration is made using web interface. TSensor software can be free downloaded from the manufacturer's website. Software can be also supplied on CD.

- contact your network administrator to obtain following information for the connection to the network:

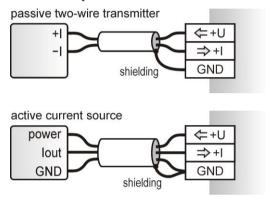| IP address:	_____._____._____._____
Gateway:	_____._____._____._____
Netmask:	_____._____._____._____

- check if there is no IP address conflict when you connect the device into network for the first time. The device has from factory set the IP address to **192.168.1.213**. This address must be changed according to information from the previous point. When you installing several new devices, connect them to the network one after another.

- remove device cover, connect current loops and power supply terminals according image below. **Inputs channels on the device are not galvanically isolated. Also power supply is not isolated from inputs!** Device is isolated only from communication line side. Carefully consider how connect sensor with current output into your EPND-2A.

- close device cover

- connect the Ethernet connector

- power on the power supply adapter

- LEDs on LAN connector should blink after connecting the power
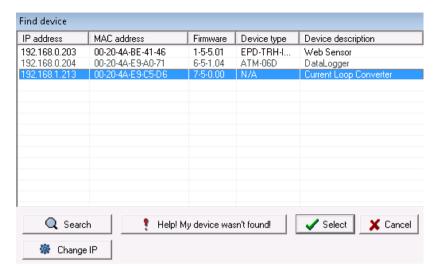
EPND-2A inputs schematic:

Sensor connection example:

Device settings

- run configuration software TSensor on your PC

- switch to an **Ethernet** communication interface

- press button **Find device...**

- the window shows all available devices on your network

Find device

IP address	MAC address	Firmware	Device type	Device description
192.168.0.203	00-20-4A-BE-41-46	1-5-5.01	EPD-TRH-I...	Web Sensor
192.168.0.204	00-20-4A-E9-A0-71	6-5-1.04	ATM-06D	DataLogger
192.168.1.213	00-20-4A-E9-C5-D6	7-5-0.00	N/A	Current Loop Converter

🔍 Search ❗ Help! My device wasn't found! ✔ Select ✖ Cancel

⚙ Change IP

- click to **Change IP address** to set new address according to network administrator instructions. If your device is not listed, then click **Help! My device wasn't found!** Then follow the instructions. MAC address is on product label. The device is factory set to IP **192.168.1.213**.

Change Device IP Address

Old device IP address:
192.168.1.115

Device MAC address:
00-20-4A-91-B3-DF

New device IP address:
192.168.1.46

✔ Set IP   ✖ Cancel

- gateway may not be entered if you want to use the device only in local network. If you set the same IP address which is already used, the device will not work correctly and there will be collisions on the network. If the device detects a collision of IP address then reboot is performed automatically.

- after changing IP address device is restarted and new IP address is assigned. Restart of the device takes about 10 seconds.

- connect to device using TSensor software. TSensor software will forward you to web interface. On the web interface you can set your device according requirements.
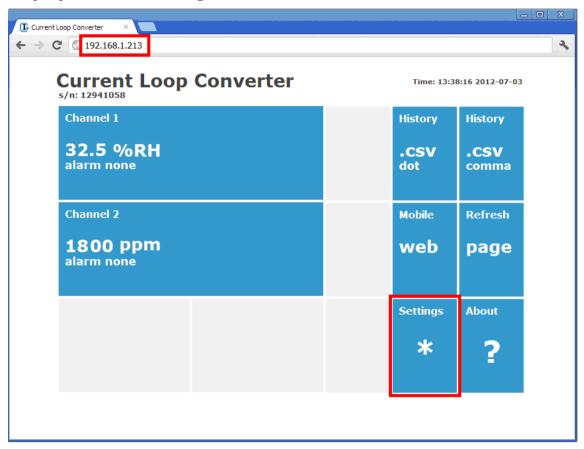
Device setup

This chapter describes basic device configuration. There is a description of settings using web interface.
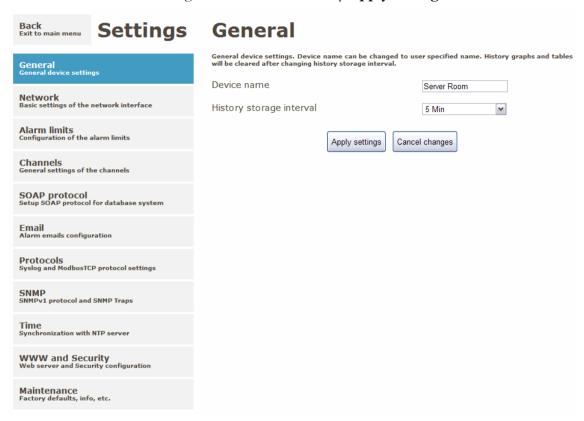
Setup using web interface

Web interface can be managed by the web browser. Main page will be shown when you insert device address into address bar of your web browser. There you find actual measured values. Page with history graphs is shown when you click to tile with actual values. Access to device setup is possible via tile **Settings**.

General

Device name can be changed using item **Device name**. Measured values are stored into memory according **History storage interval** field. After changing of this interval all history values will be cleared. Changes must be confirmed by **Apply settings** button.
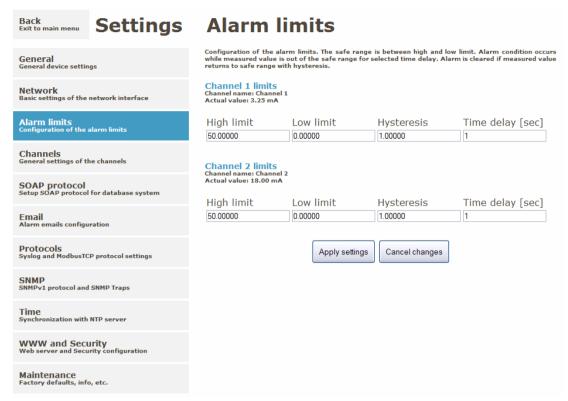
Network

Network parameters can be obtain automatically from DHCP server using option **Obtain an IP address automatically**. Static IP address is configurable via field **IP address**. It is not necessary setup **Default gateway** while you use device inside one subnet only. Option **Standard subnet mask** sets network mask automatically according A, B or C network class. **Subnet mask** field must be set manually, when network with nonstandard range is used. **Periodic restart interval** enables to restart device after selected time since device started.
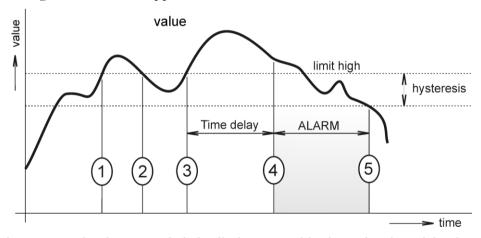
Alarm limits

For each measurement channel is possible to set upper and lower limits, time-delay for alarm activation (0 – 65535s) and hysteresis for alarm clearing.

Example of setting the limit to the upper alarm limit:

In Point 1 the measured value exceeded the limit. From this time, the time-delay is counting. Because at point 2 the value dropped below the limit value before the time delay expired, alarm was not set.

In Point 3 the value has risen over limit again. During the time-delay the value does not drop below the set limit, and therefore was in Point 4 caused alarm. At this moment were sent e-mails, traps and set alarm flag on website, SNMP and Modbus.
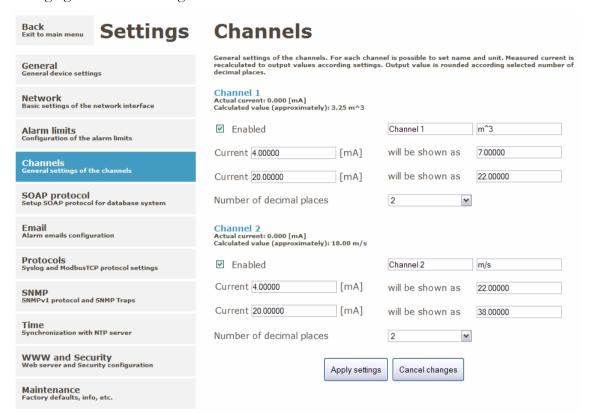
The alarm lasted up to Point 5, when the measured value dropped below the set hysteresis (high limit – hysteresis). At this moment was active alarm cleared and e-mail send.

When alarm occurs, alarm messages will be sent. In case of power failure or device reset (e.g. changing the configuration) will new alarm state evaluated and new alarm messages will be send.

Channels

Channel can be enabled or disabled for measuring using item **Enabled**. Channel can be renamed and unit of channel can be changed. Measured current is recalculated to physical representation according selected linear equation. Number of decimal places is selectable. All changes must be confirmed using **Apply settings** button. History values are cleared after changing of channel settings.

SOAP protocol

SOAP protocol can be enabled by option **SOAP protocol enabled**. IP address of the destination http server is configurable via **SOAP server IP address** filed. For setup of destination server port can be used option **SOAP server port**. Target place of the http server can be set via **SOAP server target place**. Device send SOAP message according selected **Sending interval**. Option **Send SOAP message when alarm occurs** sends message when an alarm on channel occurs or alarm is cleared. These SOAP messages are sent asynchronously to selected interval.

Email

Email sending enabled option allows email features. It is necessary set address of the SMTP as IP address into **SMTP server IP address** field. Default port of the SMTP server can be changed using item **SMTP server port**. SMTP authentication can be enabled using **SMTP authentication** option. When authentication is enabled **Username** and **Password** must be set.

For successfully email sending it is necessary insert **Email sender address**. This address is usually same as username of the SMTP authentication. Into fields **Recipient 1** to **Recipient 3** it is possible set address of email recipients. Option **Short email** enable sending emails in short format. This format is usable when you need to forward emails into SMS messages.

When option **Alarm email repeat sending interval** is enabled and there is active alarm on channel, then emails with actual values are sent repeatedly. **Info email sending interval** option enables sending emails at selected time interval. CSV history file can be sent together with the repeat/info emails. This feature can be enabled by **Alarm and Info emails attachment** option.
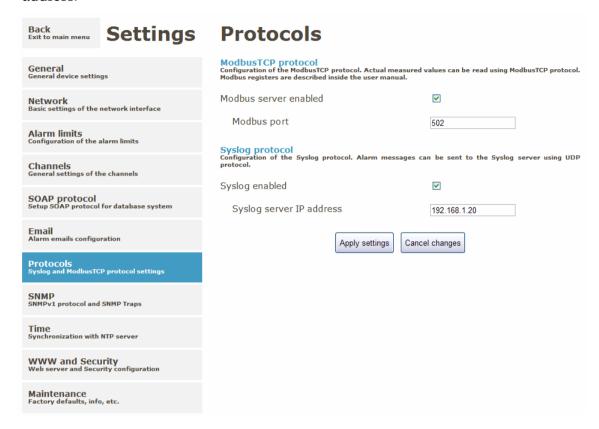
It is possible to test email function using button **Apply and test**. This button save a new settings and send a testing email immediately.

Modbus a Syslog protocols

ModbusTCP and Syslog protocol settings are configurable via menu **Protocols**. Modbus server is enabled by default. Deactivation is possible via **Modbus server enabled** option. Modbus port can be changed via **Modbus port** field. Syslog protocol can be enabled using item **Syslog enabled**. Syslog messages are sent to IP address of the Syslog server - field **Syslog server IP address**.

SNMP

For reading values via SNMP it is necessary to know password - **SNMP read community**. SNMP Trap can be delivered up to three IP address - **IP address of the Trap recipient**. SNMP Traps are sent at alarm or error state on the channel. Trap feature can be enabled by option **Trap enabled**.

Time

Time synchronization with SNTP server can be enabled by **Time synchronization enabled** option. IP address of the SNTP is necessary to set into **SNTP server IP address** item. SNTP time is synchronized at UTC format, and due to be necessary set corresponding time offset – **GMT offset [min]**. Time is synchronized every 24 hours by default. Option **NTP synchronization every hour** decrease this synchronization interval to one hour.

WWW and security

Security features can be enabled by the **Security enabled** option. When security is enabled it is necessary to set administrator password. This password will be required for device settings. When secured access is required even to actual values reading it is possible to enable **User account only for viewing**. Port of the www server can be changed from the default value 80 using filed **WWW port**. Web pages with actual values are refreshed according to **Web refresh interval** field.

Factory defaults

Factory defaults button set the device into factory configuration. Network parameters (IP address, Subnet mask, Gateway) are left without changes.

Network parameters are changed while you press button inside the device. For more information please read chapter Factory defaults.

Factory parameters settings:

Parameter	Value
SMTP server IP address	0.0.0.0
SMTP server port	25
Alarm email repeat sending interval	off
Info email sending interval	off
Alarm and Info emails attachment	off
Recipients addresses	cleared
Email sender address	sensor@IP
SMTP authentication	off
SMTP user/SMTP password	cleared
Email sending enabled	off
IP addresses SNMP traps recipients	0.0.0.0
SNMP read community	public
Sending SNMP Trap	off
Web refresh interval [sec]	10
Web server enabled	yes
WWW port	80
Security	off
Administrator password	cleared
User password	cleared

Modbus port	502
Modbus server enabled	yes
History storage interval [sec]	60
SOAP server IP address	0.0.0.0
SOAP server port	80
SOAP server target place	cleared
SOAP sending interval [sec]	60
SOAP protocol enabled	off
Syslog server IP address	0.0.0.0
Syslog protocol enabled	off
SNTP server IP address	217.31.205.226
GMT offset [min]	0
NTP synchronization every hour	off
Time synchronization enabled	off
MTU	1400
Periodic restart interval	off
Demo mode	off
Turn on all channels	yes
High limit	15.0
Low limit	10.0
Hysteresis – hysteresis for alarm clearing	1.0
Time delay – time-delay of alarm activation [sec]	30
Unit on the channel	mA
Channel name	Channel X (where X is 1 and 2)
Current low	4.0
Current high	20.0
Readings value low	4.0
Readings value high	20.0
Number of decimal places	1
Device name	Current Loop Converter

Communication protocols

Short introduction to communication protocols of the device. To use some communication protocols is necessary software, which can use the protocol. This software is not included. Detailed description of protocols and application notes can be found in the manual appendix.

Website

The device supports displaying of measured values, history graphs and configuration using web browser. History graphs are based on HTML5 canvas. Web browser must support this feature for proper function of graphs. Firefox, Opera, Chrome or Internet Explorer 9 can be used. If the device has IP address **192.168.1.213** type into your browser **http://192.168.1.213**. Actual measured values can be obtained using XML file **values.xml**.

Values from history can be exported in CSV format. History storage interval can be set using web interface. History is erased after every reboot of the device. Reboot of the device is performed when the power supply is disconnected and also after configuration change.

The device allows you to customize the design of web pages. Details of how to change the design, you can find in the manual appendix. Manual appendix can be obtained from the manufacturer's website.

SMTP – sending e-mails

When measured values are over the set limits, the device allows send e-mail to a maximum of 3 addresses. E-mail is send when alarm condition on the channel is cleared or a measuring error occurs. It is possible to set repeat interval for email sending. For correct sending of e-mails it is necessary to set IP address of SMTP server. SMTP authentication is supported but SSL not. Standard SMTP port 25 is used by default. SMTP port can be changed. Contact your network administrator to obtain configuration parameters of your SMTP server. E-mail sent by the device cannot be answered.

SNMP

Using SNMP protocol you can read actual measured values, alarm status. Writing via SNMP protocol is not supported. It is supported **SNMPv1** protocol version only. SNMP used **UDP port 161**. OID keys description can be found in the MIB table, which can be obtained from device website or from your distributor. The password for reading is factory set to **public**. OID keys:

OID	Description	Type
.1.3.6.1.4.1.22626.1.6.1	Device information	
.1.3.6.1.4.1.22626.1.6.1.1	Device name	String
.1.3.6.1.4.1.22626.1.6.1.2	Serial number	String
.1.3.6.1.4.1.22626.1.6.1.3	Device type	Integer
.1.3.6.1.4.1.22626.1.6.2.ch	Measured value (where ch is channel number)	
.1.3.6.1.4.1.22626.1.6.2.ch.1	Channel name	String
.1.3.6.1.4.1.22626.1.6.2.ch.2	Unit	String
.1.3.6.1.4.1.22626.1.6.2.ch.3	Value	String
.1.3.6.1.4.1.22626.1.6.2.ch.4	Actual value – 16bit (12dgrC=12)	Integer
.1.3.6.1.4.1.22626.1.6.2.ch.5	Actual value – 16bit (12.5dgrC=125)	Int*10
.1.3.6.1.4.1.22626.1.6.2.ch.6	Actual value – 16bit (12.53dgrC=1253)	Int*100
.1.3.6.1.4.1.22626.1.6.2.ch.7	Actual value – 16bit (12dgrC=12)	Integer
.1.3.6.1.4.1.22626.1.6.2.ch.8	Actual value – 32bit (12.5dgrC=125)	Int*10
.1.3.6.1.4.1.22626.1.6.2.ch.9	Actual value – 32bit (12.53dgrC=1253)	Int*100
.1.3.6.1.4.1.22626.1.6.2.ch.10	Actual current [mA]	String
.1.3.6.1.4.1.22626.1.6.2.ch.11	Actual current [uA] (120uA=120)	Integer
.1.3.6.1.4.1.22626.1.6.2.ch.12	Alarm on channel (0, 1, 2)	Integer
.1.3.6.1.4.1.22626.1.6.2.ch.13	Alarm on channel (none, high, low)	String
.1.3.6.1.4.1.22626.1.6.3.1	SNMP Trap text	String

When alarm occurred a warning messages (trap) can be sent to selected IP addresses. Addresses can be set using web interface. Traps are sent via **UDP** protocol on **port 162**. The device can send following traps:

Trap	Description	
0/0	Reset of the device	
1/0	Settings was changed	
6/0	Testing Trap	
6/1	NTP synchronization error	
6/2	E-mail sending error	SMTP server login error
6/3		SMTP authentication error
6/4		Some error occurred during SMTP communication
6/5		TCP connection to server cannot be opened
6/6	SOAP message sending error	SOAP file not found inside web memory
6/7		MAC address can't be obtained from IP address
6/8		TCP connection to server cannot be opened
6/9		Wrong response code from the SOAP server
6/11, 6/12	Upper alarm on channel	
6/21, 6/22	Lower alarm on channel	
6/31, 6/32	Clearing alarm on channel	
6/41, 6/42	Measuring error	

Modbus TCP

Device supports Modbus protocol for communication with SCADA systems. Device use Modbus TCP protocol. **TCP port** is set to **502** by default. Port can be changed using web interface. Only two Modbus clients can be connected to device at one moment. Modbus device address (Unit Identifier) can be arbitrary. Modbus write command is not supported. Specification and description of the Modbus protocol is free to download on: www.modbus.org.

Supported Modbus commands (functions):

Command	Code	Description
Read Holding Register (s)	0x03	Read 16b register(s)
Read Input Register(s)	0x04	Read 16b register(s)

Modbus device registers. Address could be by 1 higher, depending on type used communication library:

Address [DEC]	Address [HEX]	Description	Type
39970	0x9C22	1st two digits from serial number	BCD
39971	0x9C23	2nd two digits from serial number	BCD
39972	0x9C24	3rd two digits from serial number	BCD
39973	0x9C25	4th two digits from serial number	BCD
39974	0x9C26	Device type	Int16b
39975, 39976	0x9C27, 0x9C28	Current on channel [uA]	Int16b
39977 – 39978	0x9C29 – 0x9C2A	Actual value channel1	Float32b
39979 – 39980	0x9C2B – 0x9C2C	Actual value channel2	
39981, 39982	0x9C2D, 0x9C2E	Actual value	Int16b
39983, 39984	0x9C2F, 0x9C30	Actual value	Int16b*10
39985, 39986	0x9C31, 0x9C32	Actual value	Int16b*100
39987, 39988	0x9C33, 0x9C34	Unit on the channel	Ascii
39989, 39990	0x9C35, 0x9C36	Channel alarm state	uInt16b
39991 – 39999	0x9C37 – 0x9C3F	Unused	n/a
40000	0x9C40	Channel 1 actual value	Int16b*10
40001	0x9C41	Channel 1 alarm status	Ascii
40002	0x9C42	Channel 1 current [uA]	Int16b*10
40003 – 40004	0x9C43 – 0x9C44	Channel 1 Actual value	Int32b*100
40005	0x9C45	Unused	n/a
40006	0x9C46	Channel 2 actual value	Int*10
40007	0x9C47	Channel 2 alarm status	Ascii
40008	0x9C48	Channel 2 current [uA]	Int16b*10
40009 – 40010	0x9C49 – 0x9C4A	Channel 2 Actual value	Int32b*100
40011	0x9C4B	Unused	n/a

Description:

Int16b   registry range is -31999 to 32767, error value <= -32000

Int16b*10   registry is in format integer*10 – 16 bits, 12.5dgrC = 125, error value <= -32000

Int16b*100   registry is in format integer*100 – 16 bits, 12.53dgrC = 1253, error value <= -3200

Float32b   two Modbus registers containing IEEE754 float, lower 16bits first, error value = -inf

Int32b*100	two Modbus registers containing 32bit signed integer*100, 12.53dgrC = 1253, lower 16bits first, error value <= -320000000
Ascii	two ASCII character in register
BCD	registry is coded as BCD
n/a	item is not defined, should be read

SOAP

The device allows you to send currently measured values via **SOAP v1.1** protocol. The device sends values in XML format to the web server. The advantage of this protocol is that communication is initialized by the device side. Due to it is not necessary use port forwarding. If the SOAP message cannot be delivered, warning message via SNMP Trap or Syslog protocol is sent. SOAP message example:

```
Host: 192.168.001.132
Content-Type: text/xml; charset=utf-8
Content-Length: 656
SOAPAction: "http://tempuri.org/InsertEPND-2ASample"

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">

<soap:Body>
  <InsertEPND-2ASample xmlns="http://cometsystem.cz/schemas/soapEPND-2A.xsd">

    <name>Current Loop Converter</name>
    <sn>11940986</sn>
    <tmr>60</tmr>
    <kind>4357</kind>

    <c1>
      <n>Channel 1</n>
      <v>3.25</v>
      <f>00005040</f>
      <u>mA</u>
      <a>no</a>
      <p>2</p>
      <e>1</e>
    </c1>

    <c2>
      <n>Channel 2</n>
      <v>18.00</v>
      <f>00009041</f>
      <u>mA</u>
      <a>no</a>
      <p>2</p>
      <e>0</e>
    </c2>

    </InsertEPND-2ASample>
  </soap:Body>

</soap:Envelope>
```

Syslog

The device allows sending text message to selected Syslog server. Events are send using **UDP** protocol on **port 514**. Syslog protocol implantation is according to RFC5424 and RFC5426. Events when Syslog messages are send:

Text	Event
Sensor - fw 7-5-x.x	Reset of the device
Settings changed	Settings was changed
NTP synchronization error	NTP synchronization error
Testing message	Test Syslog message
Email login error	E-mail sending error
Email auth error	
Email some error	
Email socket error	
SOAP file not found	SOAP message sending error
SOAP host error	
SOAP sock error	
SOAP delivery error	
High alarm CHx	Upper alarm on channel
Low alarm CHx	Lower alarm on channel
Clearing CHx	Clearing alarm on channel
Error CHx	Measuring error

SNTP

The device allows time synchronization with NTP (SNTP) server. SNMP protocol version 3.0 is supported (RFC1305). Time synchronization is made every 24 hours. Time synchronization every hour can be enabled. For time synchronization it is necessary set IP address to the SNTP server. It is also possible set GMT offset for correct time zone. Time is used in graphs and history CSV files. Maximum jitter between two time synchronization is 90sec at 24 hours interval.

Troubleshooting

The chapter describes the common problems with EPND-2A and methods how to fix these problems. Please read this chapter before you will call technical support.

I forgot the device IP address

IP address is factory set to **192.168.1.213**. If you had changed it and forgot new IP address, run the TSensor software and press **Find device...** In the window are displayed all available devices.

I cannot connect to the device

In search window is only IP and MAC address displayed

Other details are marked **N/A**. This problem occurs if IP address of the device is set to another network.

Select the window **Find device** in TSensor software and press **Change IP address**. Follow the software instructions. To assign IP address automatically using DHCP server, set the device IP address to **0.0.0.0**.

Device IP address is not displayed in window Find device

In TSensor software menu press **Help! My device was not found!** in window **Find device**. Follow the software instructions. MAC address of the device can be found on product label.

The device is not found even after manually setting MAC address

This problem occurs especially in cases when the IP address of the device belongs to another network and also Subnet mask or Gateway are incorrect.

In this case is DHCP server in the network necessary. In TSensor software press **Help! My device was not found!** in window **Find device**. As new IP address set **0.0.0.0**. Follow the software instructions. An alternative is to reset device to factory defaults using factory-defaults button.

Error codes

Table below describes common error codes from the device:

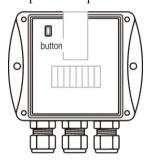| Error code	Description	How to resolve problem
n/a	Value is not available	Value n/a is shown a shortly after device restart. If the error code or n/a is displayed permanently, then channel is not enabled.
Error 1	Value can't be converted to string	Constants for recalculation are wrongly set, change it.
Error 2	Internal Error – communication	Please contact technical support.
Error 3	Register overflow	Measured value cannot be shown at register (16bit). Please use 32bit register or change constants for recalculation.
Error 4	Undocumented error	Please contact technical support.
Error 5	Internal Error – CRC	Please contact technical support.
Error 6	Current is under low limit	Please contact technical support.
Error 7	Current is over high limit	Measure current is over the maximum limit. Check if there is not short-circuit of current loop. Check function of current transmitter.

I forgot the password for setup

Please reset device to factory defaults. Procedure is described at following point.

Factory defaults

This procedure restore device to factory settings including network parameters (IP address, Subnet mask, etc.). For factory-defaults follow these steps:

- disconnect the power supply, unscrew upper cover of the device case

- press factory-defaults button and connect the power
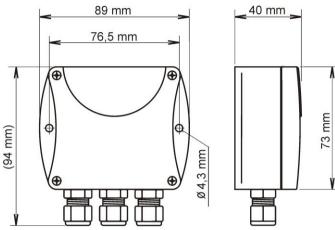
- keep button pressed for 10sec

- close the device

Technical specifications

Information about technical specifications of the device.

Dimensions

Basic parameters

Supply voltage:

DC voltage from 9V to 30V

Consumption:

~ 1W device without powering connected sensors

Protection:

IP30

Measuring interval:

1sec, faster readings is available via ModbusTCP protocol, for more information please contact technical support

Accuracy:

±0.1%FS from 0°C to +50°C

±0.3%FS from -30°C to +80°C

Measuring range:

0 to 25mA

Resolution:

1uA

A/D converter resolution:

24bit sigma-delta

Input Impedance:

20Ω

Maximum overload current:

30mA

Current load for +U1 and +U2 terminals:

max. 40mA each

terminals are connected to supply voltage via PTC thermistors (overload protection). Output voltage depends on actual current load, it is approximately about 1.2V lower than supply voltage.

Communication port:

RJ45 connector – galvanically isolated from communication line, 10Base-T/100Base-TX Ethernet (Auto-Sensing)

Recommended Connector Cable:

for industrial use there is recommended Cat5e STP cable, in less demanding applications can be replaced by Cat5 cable, maximum cable length 100m

Supported protocols:

TCP/IP, UDP/IP, ARP, ICMP, DHCP

HTTP, SMTP, SNMPv1, ModbusTCP, SNTP, SOAPv1.1, Syslog

Supported web browsers:

Internet Explorer 9, Mozilla Firefox 12 and later, Google Chrome 18 and later, Opera 11 and later, Safari 5 and later. Device should be also compatible with other browsers. Functionality wasn't tested with other web browsers.

Recommended minimum screen resolution:

1024 x 768

Memory:

1000 values for each channel inside non-backup RAM memory

Case material:

ABS

Mounting the device:

With two holes at the bottom of the unit

Weight:

~ 150g

EMC:

EN 61326-1, EN 55011, EN 55022

Operating terms

Temperature and humidity range:

-30°C to +80°C, 0 to 100%RH (no condensation)

Working position:

arbitrary

End of operation

Disconnect the device and dispose it according to current legislation for dealing with electronic equipment. Electronic devices must be professionally destroyed in accordance with EU Directive 2002/96/ES of 27th January 2003.

Technical support and service

Technical support and service is provided by distributor. Contact is included in warranty certificate.

Preventive maintenance

Make sure the cables are not damaged periodically. Recommended calibration interval is 2 years.