PAPOUCH

D/A converter DA2ETH

16 bit D/A converter with two voltage or current outputs

(0 – 10 V, 0 – 5 V, ±10 V, ±5 V, 4 – 20 mA, 0 – 20 mA, 0 – 24 mA)

Ethernet communication

DA2ETH

Datasheet

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DESCRIPTION

DA2ETH is a universal converter with analog output used for control and regulation. Two independent analog outputs can be either voltage or current. Available ranges are: 0 - 10 V, 0 - 5 V, ±10 V, ±5 V, 4 - 20 mA, 0 - 20 mA, 0 - 24 mA. Values can be set using several ways:

- *Manually:* via the WEB interface
- *Automatically:* SNMP, Modbus TCP (client or server), HTTP GET, TCP/UDP (Spinel).

fig. 1 – device function principal

Application

- Process regulation and automation.
- Controlling analog input units.
- Working in tandem with AD4ETH module: extending two analog signals over a great distance using Ethernet.

Features

- Two analog outputs (independent settings for current or voltage). Available ranges: **0 – 10 V, 0 – 5 V, ±10 V, ±5 V, 4 – 20 mA, 0 – 20 mA, 0 – 24 mA**
- Output range divided to 10 000 divisions.
- Each output galvanically isolated.
- Active current outputs.
- Default output value is configurable.
  An interval can be set after which the output automatically reverts to the default value.
- **16 bit** D/A converter.
- **Ethernet** communication using **Modbus** TCP (server or client), **SNMP**, **HTTP GET**, TCP/UDP (Spinel).
- Wide power voltage range (8 to 30 V).

Block diagram

The device is divided into three completely galvanically isolated sections: (1) Power, processor unit and Ethernet, (2) output 1 a (3) output 2.

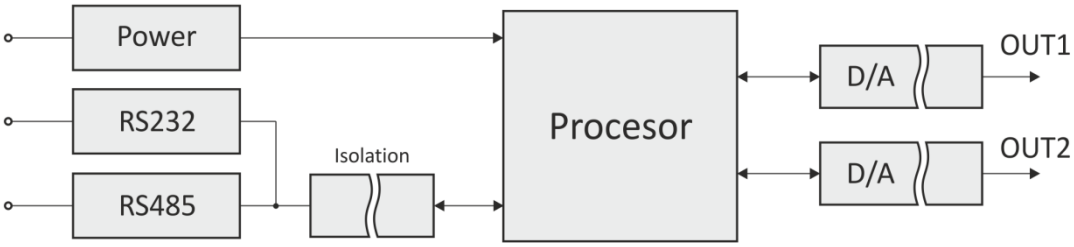
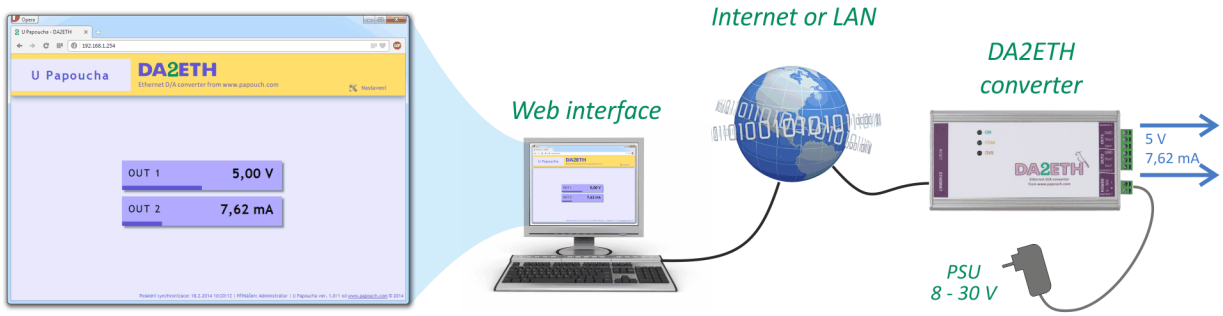


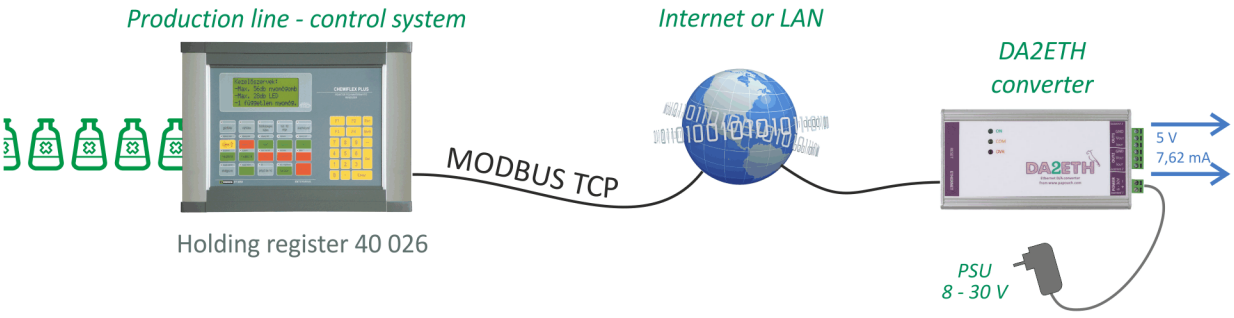
fig. 2 – block diagram DA2ETH

Output control options

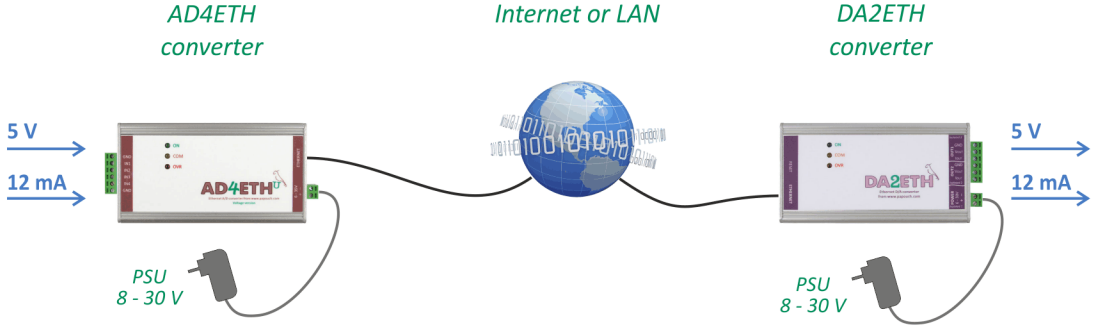
1) **Manual input** using the WEB interface. (Mode on page 22.)



2) Automated reading from a remote device using **ModBus TCP protocol (client mode)**. DA2 automatically reads ModBus registers from a remote device and sets the output parameters based on that. (More on page 27.)

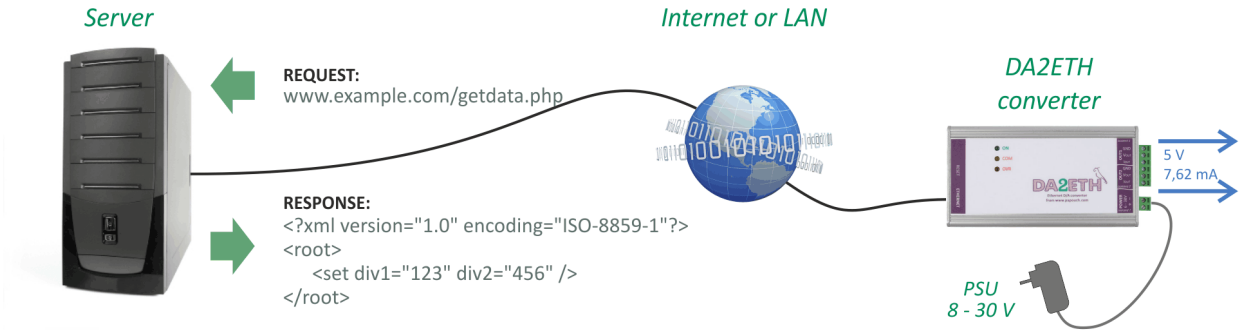


3) **Extend analog signals over a great distance** using Ethernet (Internet/Ethernet) working in tandem with AD4ETH module. (More on page 27.)

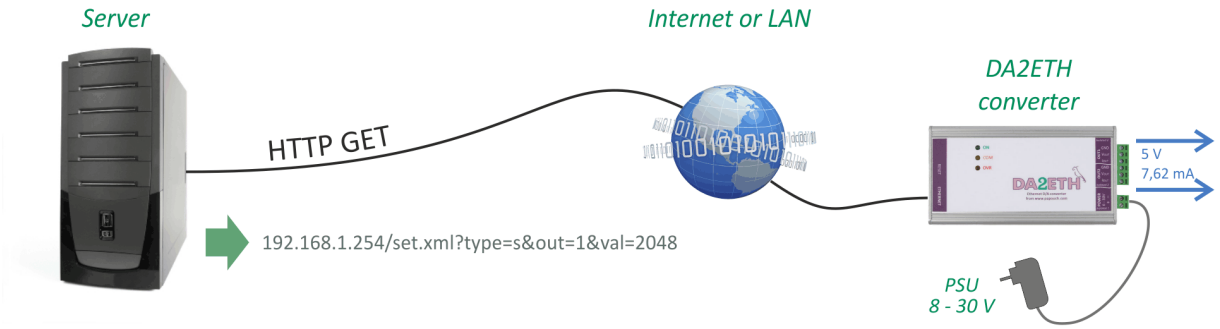


4) Changing outputs using **Modbus TCP (server mode)**. A remote client can set output values by writing them into ModBus register in DA2 unit. (More on page 28.)

5) Automated reading from a remote server using **XML**. Remote server has the data in XML format, DA2 unit reads them periodically and sets output values. (More on page 24.)



6) Set output values using **HTTP GET**. Remote server calls script in DA2 unit and sends the output values as parameters. (More on page 25.)



7) Using **SNMP** (Simple Network Management Protocol). A standardized protocol used for network management. DA2 acts as an SNMP agent. (More on page 13.)

8) Using TCP communication with Spinel protocol. Available modes are **TCP server**, **TCP client**, **UDP**. This communication option cannot be combined with other options. (More on page 31.)

- All values from DA2 unit can also be read in **XML format**. (More on page 23.)

All above options 1 through 7 can be combined at any time. TCP/UDP communication from option 8 can only be used separately and cannot be combined with other options.

CONNECTIONS

Output terminals

Output connector is a 6 pin slip-on terminal (see fig. 3). Two analog outputs are available, these are individually galvanically isolated – unless you have a special reason to do so, do not connect the grounding pins together.

Wires are connected individually and are fixed by screwing a screw down (terminal requires a flat 2,5mm screwdriver).

Figure 1 shows output 1 connected as voltage output while output 2 is a current output (each output can be connected either way.) Current outputs are active.

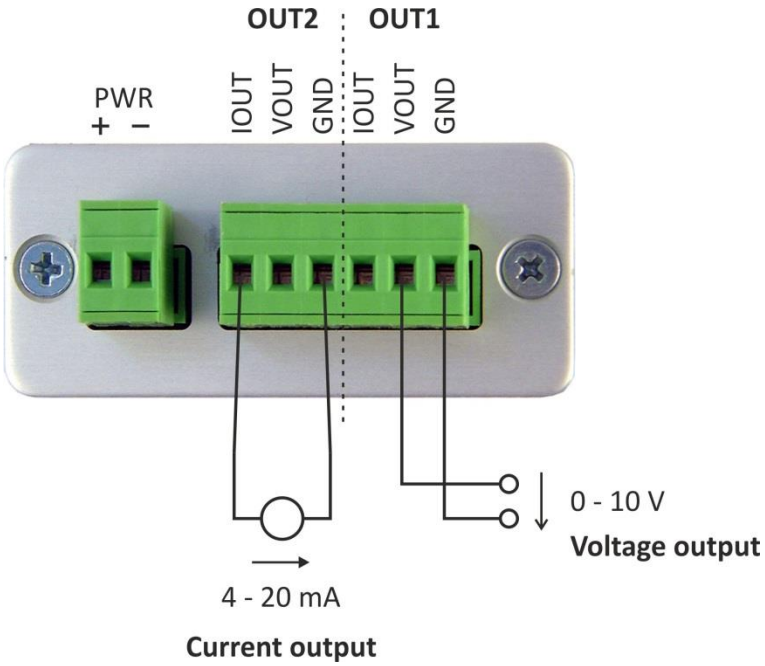


fig. 3 – terminals for connecting outputs and an example of the two ways of connection

Power

Power voltage 8 to 30 V DC is connected to a 2 pin terminal PWR. The device has a reverse polarity protection.

Wires are connected individually and are fixed by screwing a screw down (terminal requires a flat 2,5mm screwdriver).

Ethernet

The other side of the device hosts Ethernet connector and a Reset button next to it. Connect DA2ETH using a regular non-cross-wired patch cable. (If you need to connect DA2ETH directly to a PC, use cross-wired cable)

If your network range does not match the default IP Address (**192.168.1.254**) and subnet mask (255.255.255.0), set your IP address matching your network Ethernet configurator software available in the downloads section of DA2ETH product page on papouch.com.

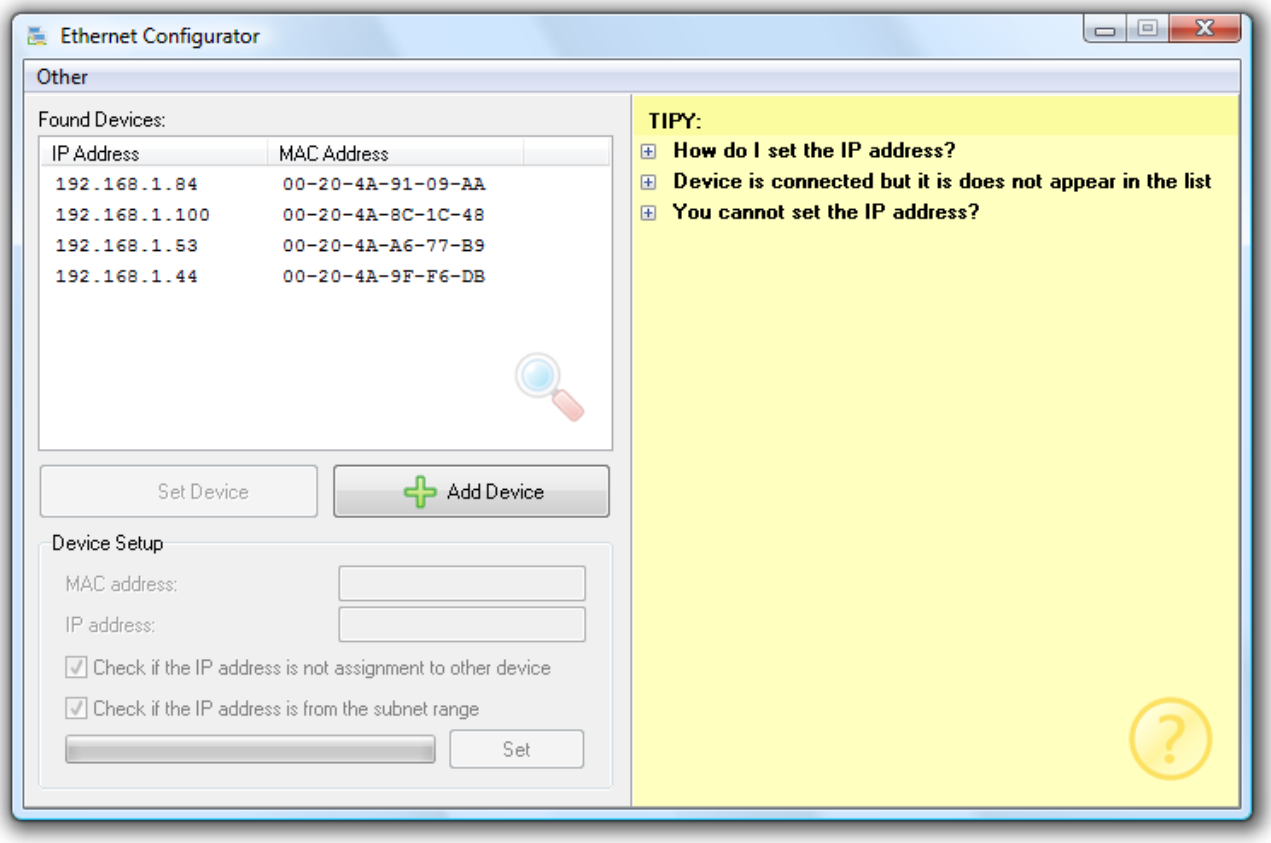


fig. 4 – Ethernet Configurator software to set the IP address

When your address is set, DA2ETH is accessible using any WEB browser. WEB interface is available directly on the DA2ETH IP address. Enter the IP address using following format: *http://192.168.1.254/* (example with the default IP address shown)

INDICATIONS

ON

Green indicator. Indicator is lit when the power is connected.

COM

Yellow indicator. Flashes briefly during power up and indicates that the device is running by flashing.

OVR

Red indicator. It is lit when any of the two channels is overloaded.

Link indicator

(Left indicator on the Ethernet connector.)

Off..... disconnected
Yellow ..... connected at 10 Mbps
Green..... connected at 100 Mbps

Connection type indicator

(Right indicator on the Ethernet connector.)

Off..... no communication
Yellow ..... half duplex communication
Green..... full duplex communication

SETTING UP THE DEVICE

Setting DA2ETH is best done using the **Web interface**. To set up the network configuration you can also use **Telnet** (see page 19). **Ethernet configurator** software is best used for the initial configuration of the IP.

Ethernet configurator

Ethernet configurator is used to change the devices IP address. Software is available for free on en.papouch.com.

(Connect your device before running the software. The device can be connected to hub, switch or to a PC directly. Use cross-wired cable when connecting it to PC directly.)

Software is in Czech and English and contains help tips for IP address settings. Example of the software is shown in fig. 4 on page 8.

SETTING UP THE DEVICE VIA WEB INTERFACE

To enter the settings, click the top right corner button on the main web page in DA2ETH. Settings are divided into following panels:

- *Network* – Ethernet interface configuration, IP address, mask, DNS server, mode, …
- *Security* – configuration of passwords to access the internal web server
- *SNMP* – SNMP protocol communication settings
- *Modbus* – Modbus TCP protocol communication settings
- *HTTP GET* – getting data from a remote server using HTTP GET and XML
- *Outputs* – output ranges settings etc.
- *Other* – device name, language, time settings, …
- *Info* – information about device

Tips for settings:

- The default language is English. Language settings are in panel *Other* – parameter *Language*.
- A pop-up help will appear on all items when you hover your mouse cursor over them. (Help will also appear when hovering over question mark at the end of selected titles.)

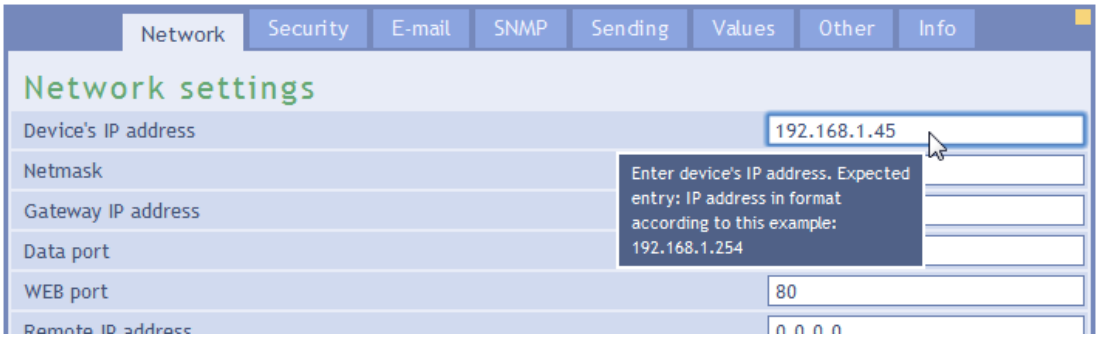


fig. 5 – pop-up help for the settings items (example from another device)

- Settings window can be moved by clicking top right corner of the window.
- Settings window can be closed by pressing Esc key when the browser window is active.

Network

Setting network parameters and device reset.

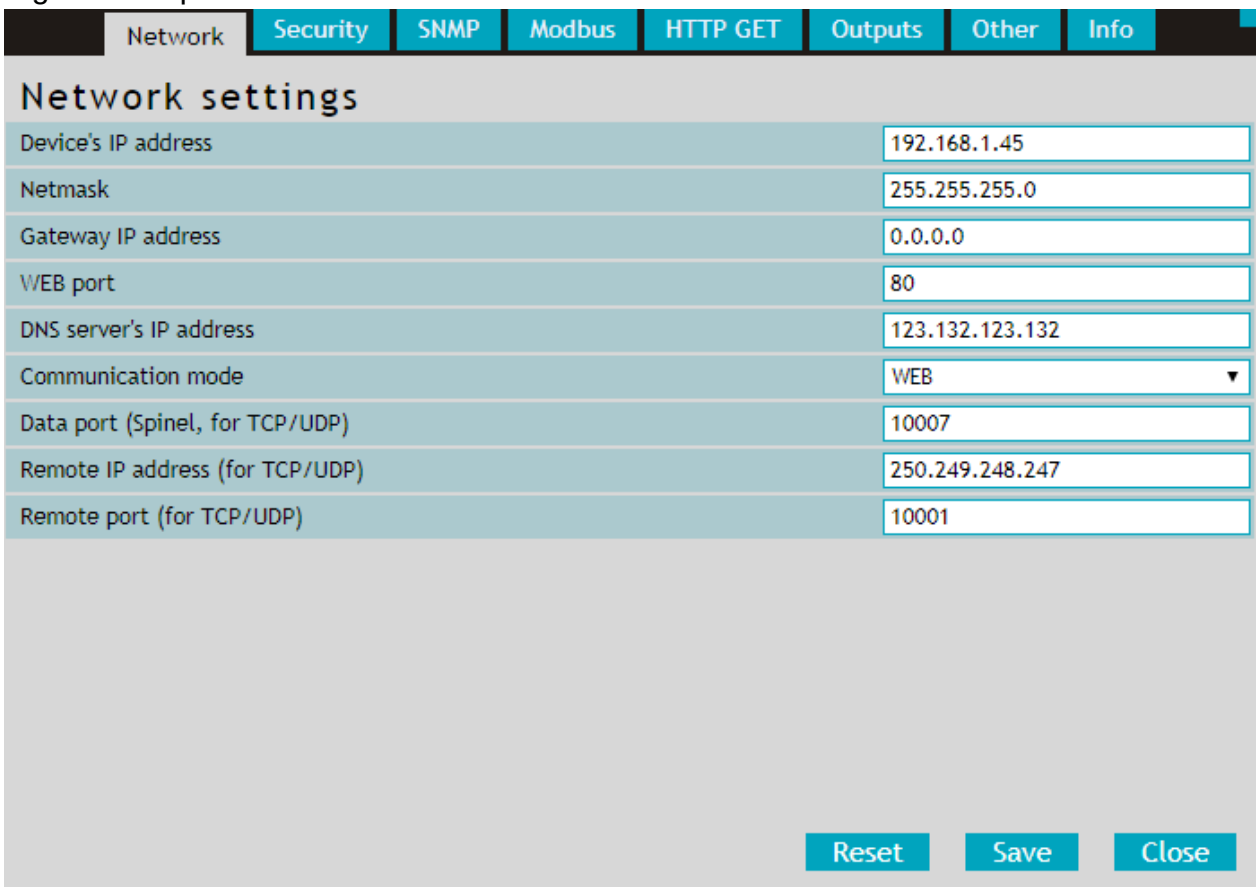


fig. 6 – network settings panel

IP address

Devices IP address. If you are unsure of what IP address to assign, consult your IT manager.

Subnet mask

Subnet mask of the network.

Gateway IP address

IP address of your gateway if you require an external connection.

Web interface port

Number of port where the web interface is accessible. 80 or 8080 are the most used port numbers.

DNS server IP address

IP address of your local DNS server

Communication mode

Following options are available:

- **Web** – this mode enables all communication options except for Spinel protocol via TCP/UDP communication.
- **TCP server** – this mode enables Spinel protocol communication. The device expects an incoming client connection on its IP Address and Spinel communication *Port*.

- **TCP client** – this mode enables Spinel protocol communication. The device tries to connect to a remote server on its *IP address* and *Port*.
- **UDP** – this mode enables Spinel protocol communication using UDP packets. These are sent to a *remote IP address* and *remote port*. Responses are expected on the *Spinel communication port*.

Device reset

This button sets all parameters into default. IP address will not be changed, web interface port will be changed to 80.

Security

Setting up passwords to access the Web interface.

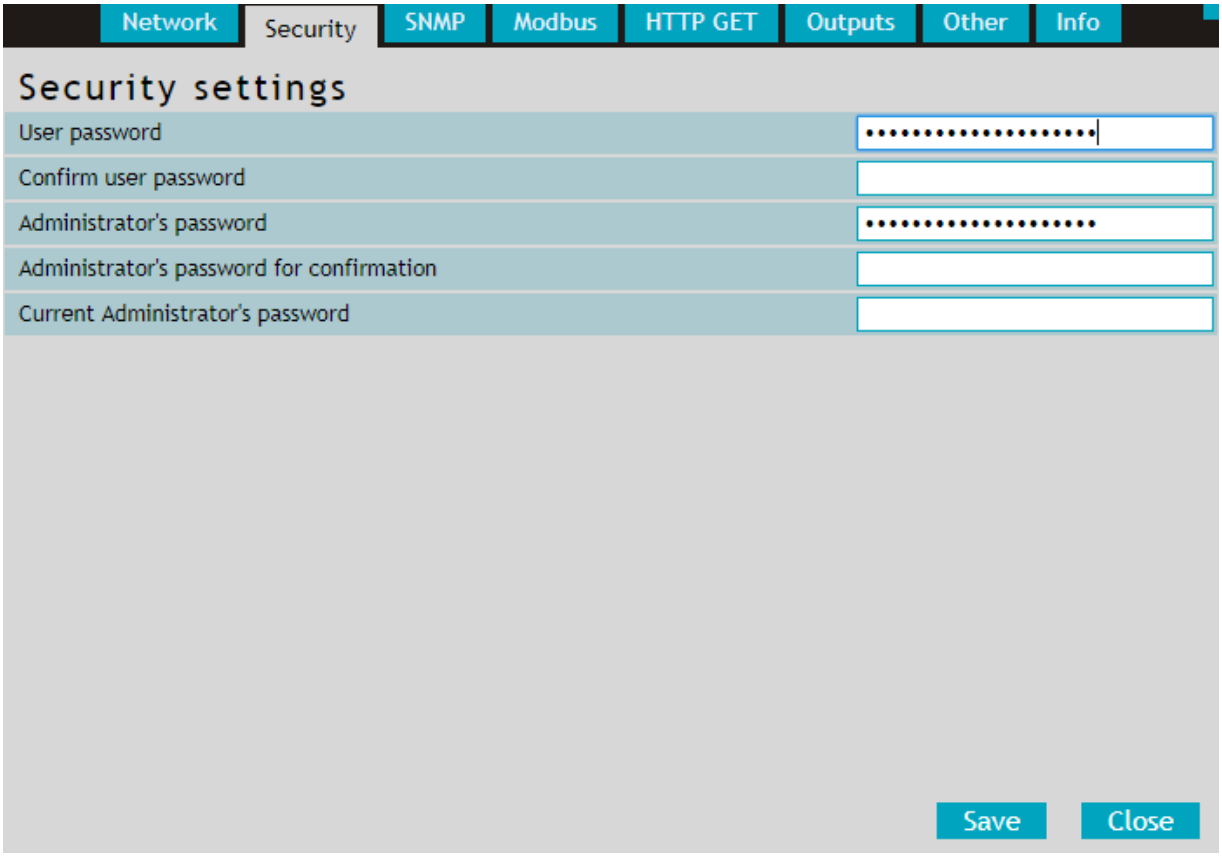


fig. 7 – security settings panel

User password and **User password for confirmation** [1]

Enter user access password. This security level only allows to access the main page. Settings are disabled.

User name is always *user*

Once the user password is set, administrator's password must also be set.

If only administrator's password is set, the user login dialog can be confirmed without entering credentials.

[1] Field is only meant to enter passwords. No text is displayed after the password has been saved for Security reasons.

If you want to cancel any password, leave the field empty.

Administrator password and **administrator password for confirmation** [1]

Enter administrator (full) access password. This security level only allows to access the main page as well as settings.

Administrator's name is always *admin*

If you want to cancel any password, leave the field empty.

Current administrator password [1]

If the administrator already has a password, enter it here. New password sill not be saved without the old password.

SNMP

These settings configure the SNMP protocol configuration.

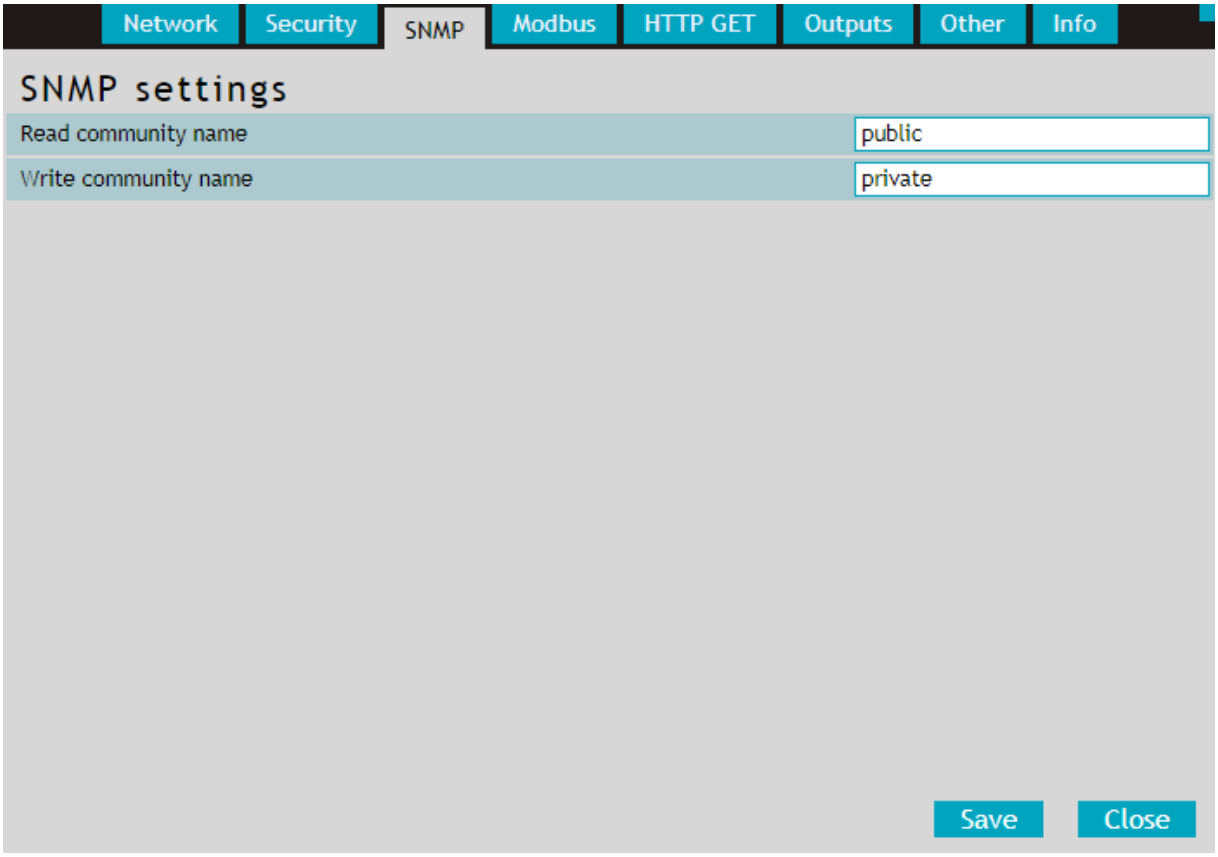


fig. 8 – SNMP settings panel

Read community name

Name of the SNMP community for reading.

Write community name

Name of the SNMP community for writing.

MODBUS

This is where ModBus TCP protocol parameters are set.

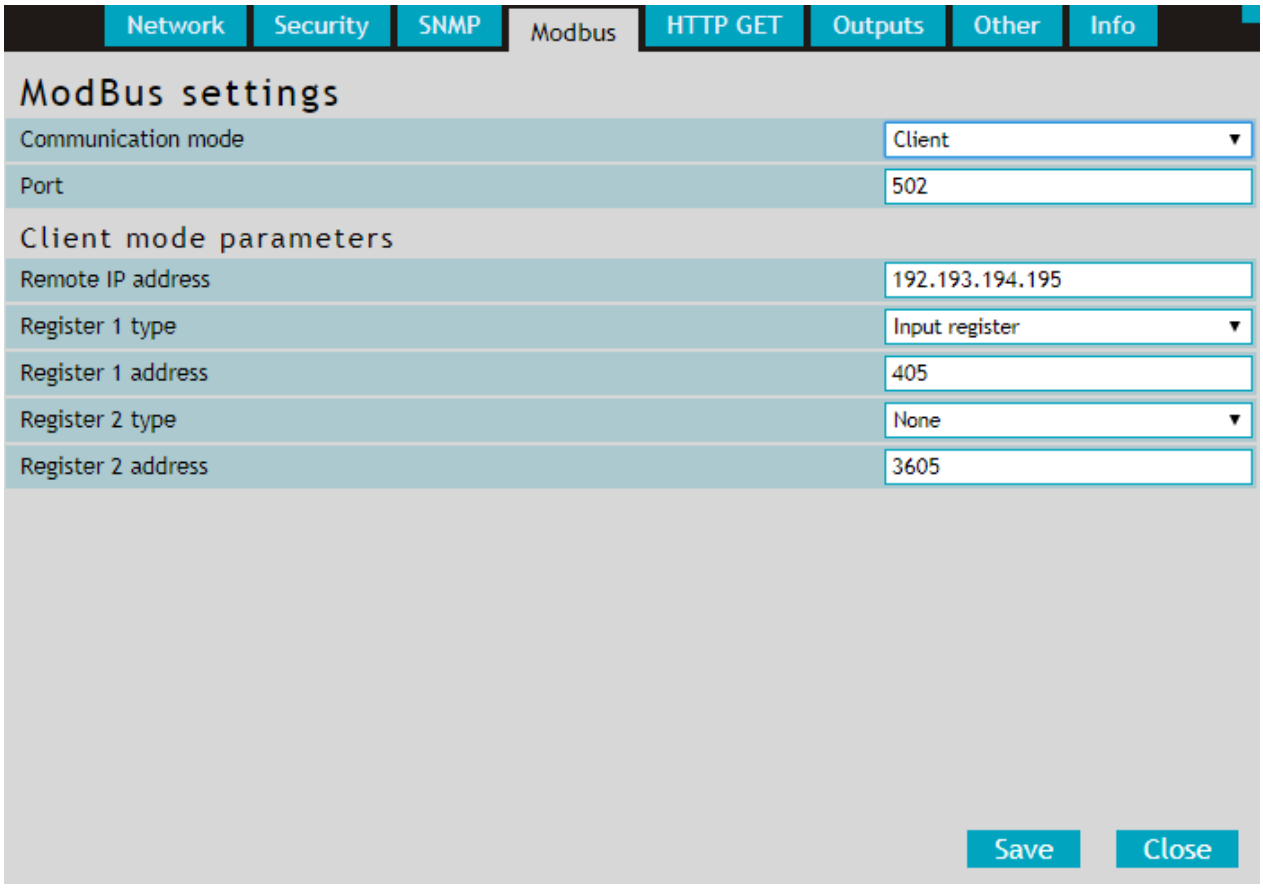


fig. 9 – ModBus TCP settings panel

Tip: *To ensure proper function of ModBus TCP, gateway IP address and DND server address in Network panel may have to be filled in.*

Communication mode

This is where communication mode can be switched between client and server.

- **Client:** DA2 connects to a remote device and reads values from set registers. Then it sets its outputs accordingly.
- **Server:** DA2 expects connection on a set *Port*. When the connection is established and values are written in registers, DA2 sets its outputs accordingly.

Port

Enter port number to be used for ModBus TCP. If **Client** mode is selected, it is a remote port. If a **Server** mode is selected, it is the port on which DA2 expects the connection. Port number can range from 1 to 65535.

Client mode parameters

Remote IP address

Enter IP address of the remote device from which ModBus data are to be obtained. IP Address is expected in the following format: 192.168.1.254

Register type 1, **Register type 2**

Choose whether the data should be read from Holding or Input register. Order number is assigned to the number of DA2 output. Register can store values from 0 to 65535.

Output register 1 address, Output register 2 address

Choose an address from which the data is to be read. (Registers are numbered from zero.)

Http GET

Parameters and settings for automated reading of values from a remote server using HTTP GET and XML.

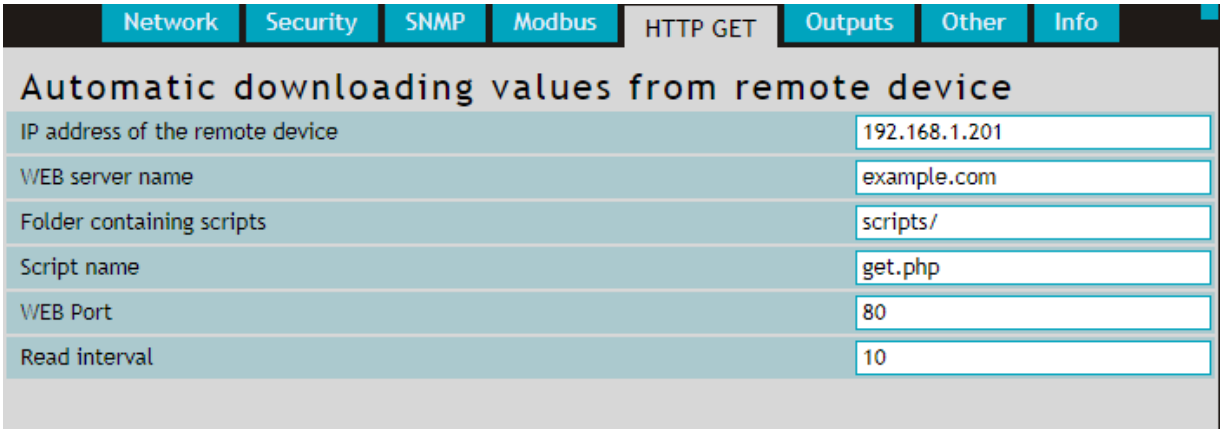


fig. 10 – HTTP GET and XML communication settings

***Tip:** To ensure proper function of HTTP GET and XML sending, gateway IP address and DND server address in Network panel may have to be filled in.*

Remote device IP address

Enter IP Address of your WEB server. IP address can be found using ping in Windows command line. If you are unsure of the IP address, please contact your server manager.

WEB server name

Domain name of your WEB server. If it is local server, the address does not have to be filled.

Script folder on the server

Enter a local path to the folder containing scripts. For example when the full path is *www.server.net/scripts/get.php*, enter just this part in the field: *scripts/*

Script name

Name of the script receiving the HTTP GET and generating XML response.

WEB port

Number of the WEB port on the server. Mostly 80 or 8080 is used.

Read interval

Ether the period of reading values from the remote server. Time in seconds is expected.

Outputs

This is where output ranges and default values are set. You can also set the time from last value received before the outputs switches to default value.

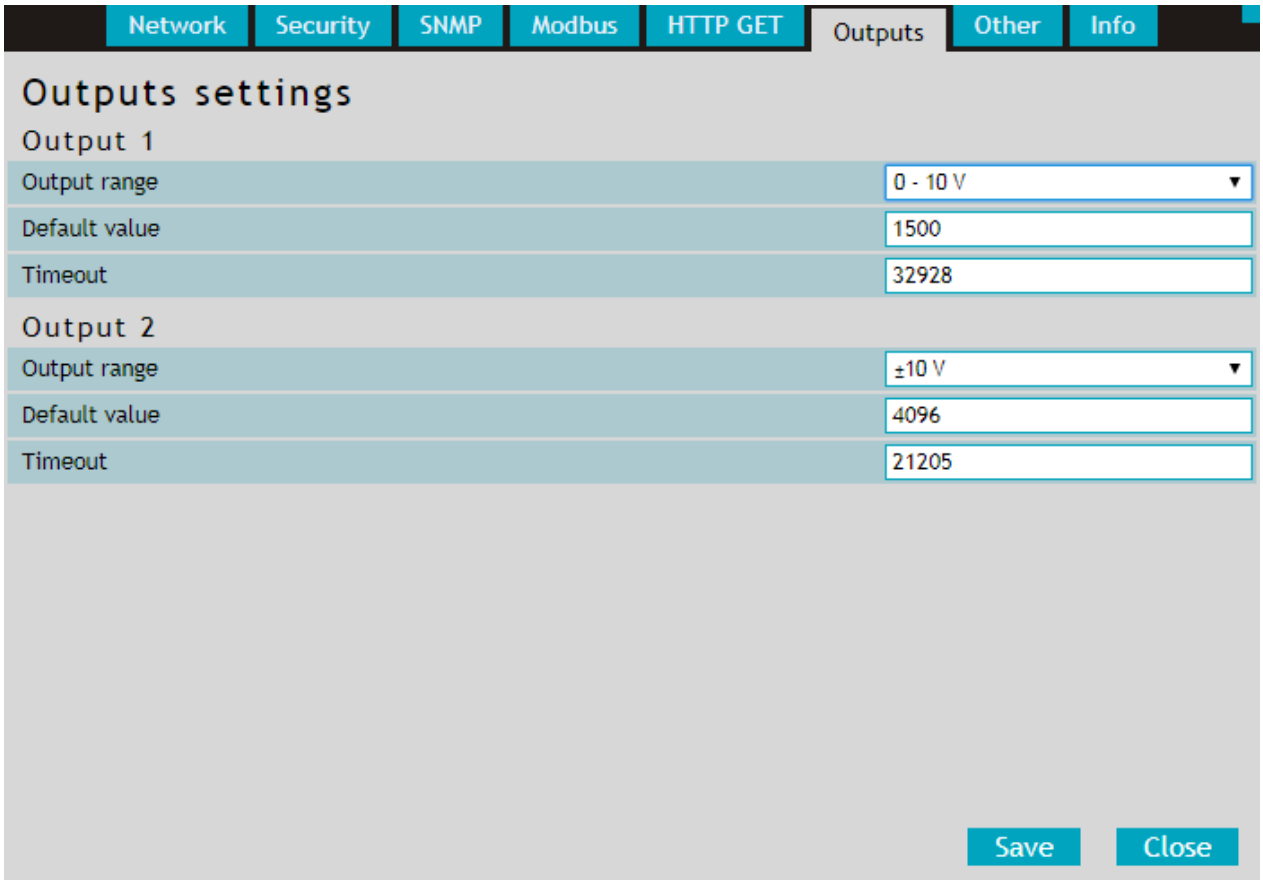


fig. 11 – outputs settings panel

Output range

Sets range of the given output. Each output can have different range and type. Available ranges are: 0 – 10 V, 0 – 5 V, ±10 V, ±5 V, 4 – 20 mA, 0 – 20 mA, 0 – 24 mA

Default value

Enter value from 0 to 65535 representing the default value. Output state will be changed to this value when the device is powered up or when the *Timeout* runs out.

Timeout

This watches the time from last received data containing the given output value. After this the *Timeout* runs and once it runs out, the given output will be set to *Default value*. Timeout is a time from 0 to 86400 seconds (54 hours). If the Timeout is 0, the last set value on the given output stays set indefinitely.

Other

This is where the device name and WEB interface language is set.

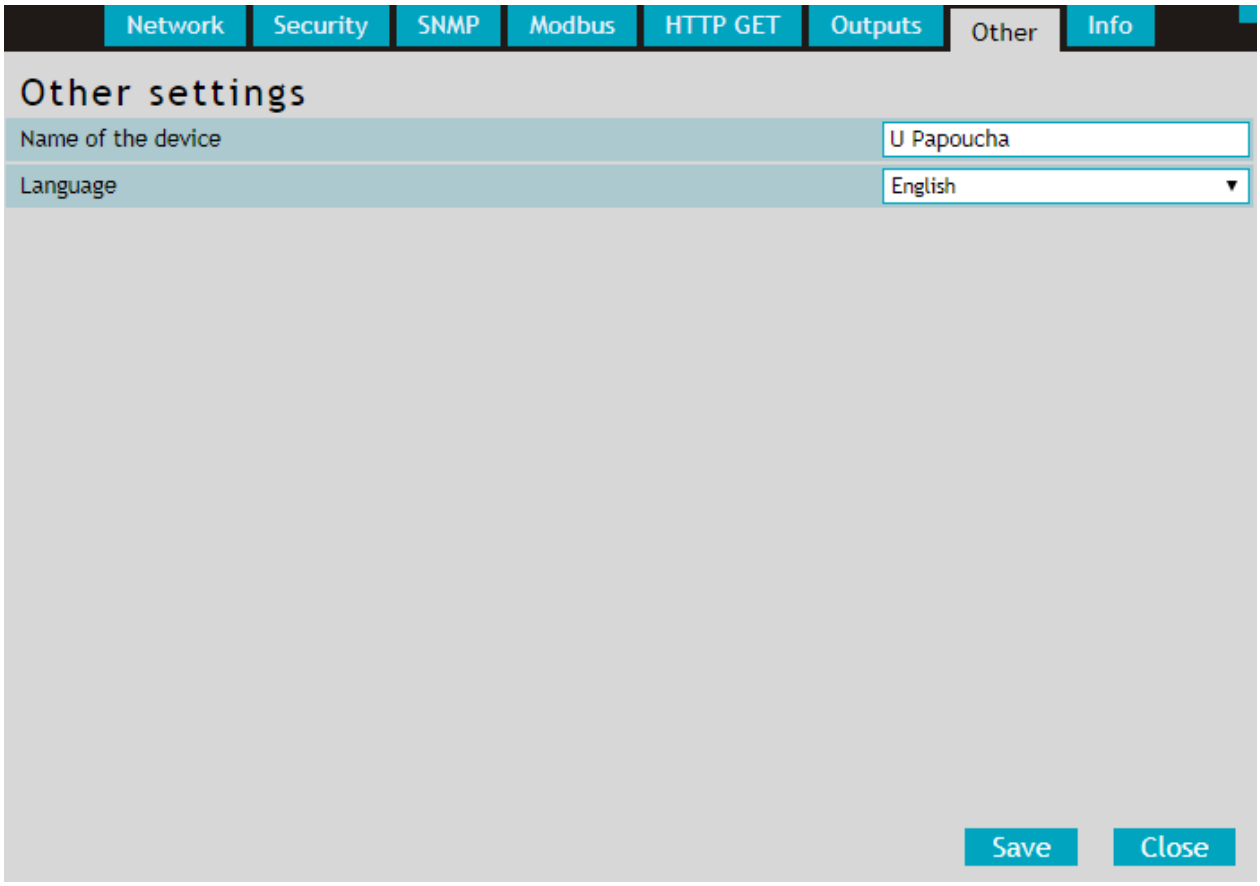


fig. 12 – other parameters settings panel

Device name

This string is used to name the device based for example on its location, function, etc. … (No national characters allowed.)

Language

The WEB interface has English and Czech language available out of the box.[2]

[2] Any other language can be added if the Customer needs it. This will be subject to a translation fee.

Info

This panel is not a settings panel. It contains device information such as MAC address, firmware versions etc.

fig. 13 – device information panel

CONFIGURATION USING TELNET

Telnet configuration is only available with the Ethernet version.

Connection

IP address is not known

It is recommended that the IP address should be set using the Ethernet Configurator software (for more information see page 8).

1) Open the window of the cmd command. (In the Windows OS select Start/Run, enter `cmd` in the provided line and click Enter.)
2) Make the following entries into the ARP table:
   a. Type `arp –d` and confirm by Enter. This will delete the current ARP table.
   b. Use the following command to assign 192.168.1.254 to the module MAC address:

      `arp –s [new_ip_address] [MAC_address_of_device]`

      example: `arp -s 192.168.1.254 00-20-4a-80-65-6e`
3) Now open Telnet. (Type in `telnet` and click Enter. [3])
4) Enter `open [new_ip_address] 1` and confirm.
5) After a while, the terminal will display an error message saying that connection failed. However, this step is necessary for the module to enter the IP address into its ARP table.
6) Connect to the IP address of the module. (Type in `open [IP address in dotted format] 9999` and click Enter.)
7) So far you have only entered the configuration mode of the module. The IP address has not yet been set. It must be set in the menu Server Configuration > IP Address. If you close the configuration mode without saving the settings and IP address configuration, the whole procedure must be repeated!
8) If the entered IP address is valid, the device displays an introductory text ending with:

   `Press Enter for Setup Mode`

   Press Enter within 3 seconds, otherwise the configuration mode will close.
9) The device will display a preview of its settings.
10) The preview ends with a paragraph called “Change setup:” which lists the groups of parameters that can be configured. Network parameters can be changed in the “Server” section where you can set a new network address and other parameters.

[3] In OS Windows Vista or higher, the client for Telnet is not a standard part of the system. Install it using the following procedure:

a) Open the “Control Panels/Programs and Features” menu.
b) On the left, click “Enable or disable features of Windows system” (this option requires the administrator to log in).
c) The “Features of Windows system” window displays. Here tick the “Telnet service Client” field and click Ok. The client for Telnet will be installed.

IP address is known

1) In OS Windows choose Start/Run, enter `telnet` in the provided line and press Enter. [3]
2) Connect to the IP address of the module. (Type in `open [IP address in dotted format] 9999` and press Enter.)
3) If the entered IP address is valid, the device displays an introductory text ending with:

   Press Enter for Setup Mode

   Press Enter within 3 seconds, otherwise the configuration mode will close.
4) The device will display a preview of its settings.
5) The preview ends with a paragraph called “Change setup:” which lists the groups of parameters that can be configured. Network parameters can be changed in the “Server” section.

Telnet main menu

Individual items can be chosen using the numbers written next to them. Choose the required number and press Enter.

The menu structure is as follows:

```
Change Setup:
  0 Server
    ...
  7 Defaults
  8 Exit without save
  9 Save and exit              Your choice ?
```

Server

Basic Ethernet settings.

This section contains the following parameters:

```
IP Address : (192) .(168) .(001) .(122)
Set Gateway IP Address (N) ?
Netmask: Number of Bits for Host Part (0=default) (16)
Change telnet config password (N) ?
```

IP Address
(IP address)

IP address of the module. The digits must be entered one by one and separated by Enter.

Default value: 192.168.1.254

Set Gateway IP Address
(set the IP address of the gateway)

Gateway IP addr
(IP address of the gateway)

In "Set Gateway IP Address" enter "Y" to change the IP address. The system then prompts you to change the Gateway IP address. The digits must be entered one by one and separated by Enter.

Netmask
(network mask)

Here you specify the number of bits of the IP address that make up the network part.

The Netmask is set as a number of bits determining the range of available IP addresses of the local network. If, for example, value `2` is entered, the structure of the Netmask is `255.255.255.252` . The entered value specifies the number of bits from the right. The maximum is 32.

Default value: 8

Example:
The mask 255.255.255.0 (binary form: 11111111 11111111 11111111 00000000) =. number 8.
The mask 255.255.255.252 (binary form: 11111111 11111111 11111111 11111100) = number 2.

Change telnet config password
(Set the password for Telnet)

Enter new Password
(Enter the password for Telnet)

This parameter is used to set a new password which is required prior to any configuration via Telnet or via WEB interface (admin password).

For item "Change telnet config password", enter "Y" to change the password. The system then prompts you to change the password.

Factory Defaults

By pressing number 7 the device restores the default settings.

The default setting means that all parameters will return to their initial factory settings. The IP address remains unchanged; the web interface port is set to 80.

Exit without save

To close the configuration mode without saving the changed parameters.

Save and exit

This option saves the changes. If any parameter has been changed, the device is restarted. The restart takes several tens of seconds.

COMMUNICATION OPTIONS

Web interface

An internal WEB page (see fig. 14) [4] can be viewed by entering the devices IP address to an internet browser[5]. The page shows currently set values on both outputs and these can be changed manually. Top right corner hosts a Settings button which shops the configuration part of the device. WEB interface can be switched between Czech and English.

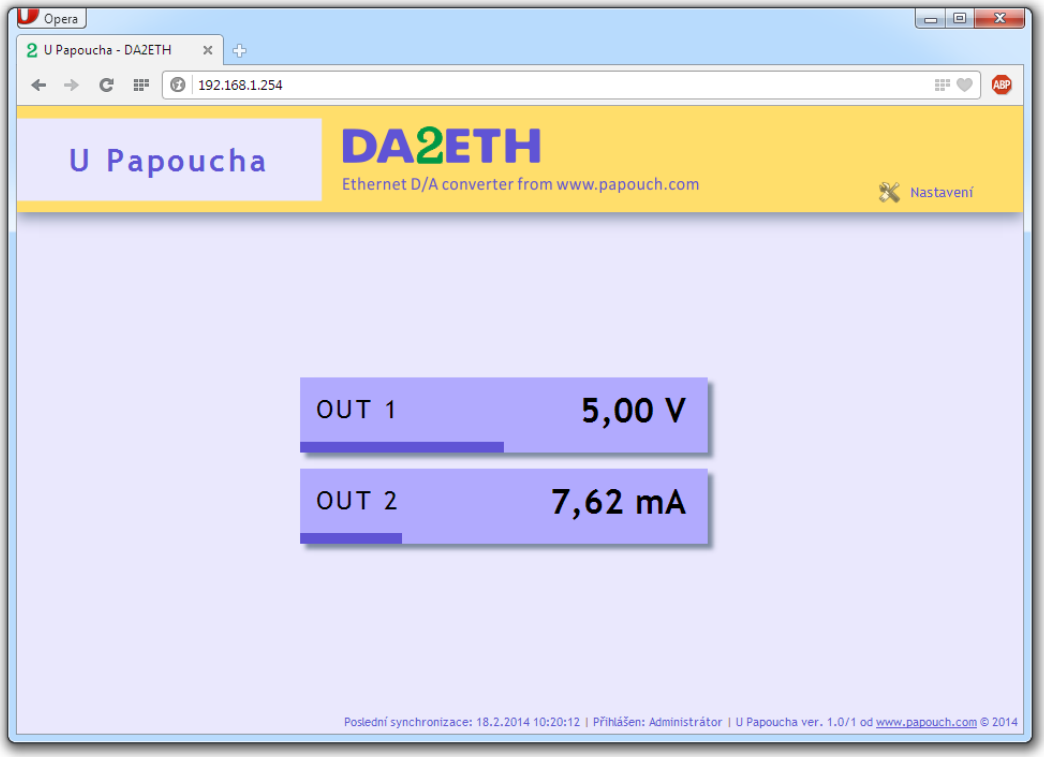


fig. 14 – internal WEB interface

Entering the values manually

Hover over the frame showing output value to show manual entry field.

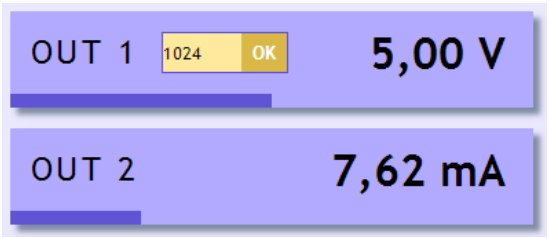


fig. 15 – changing the output values manually

Enter number 0 to 10000 or a letter r followed by value from 0 to 65535 – r65535 represents the maximal value of range.

[4] In case you require a custom logo or appearance of the internal WEB interface, please contact us..

[5] Web interface requires JavaScript on to work properly. Enter the IP address in format: *http://[IP_address]/* so for example http://192.168.1.254/ for device in default settings.

XML file

All values from the converter can also be obtained as a text fil in XML format. That is one of the easiest ways to automatically read data from any converter. The file is accessible on address *http:///[converter_IP_address]/fresh.xml* – for example at http://192.168.1.254/fresh.xml for a device in default settings.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<root xmlns="http://www.papouch.com/xml/da2/act">
  <out id="1" status="0" range="2" value="5.00" divs="5000" />
  <out id="2" status="0" range="4" value="7.62" divs="2450" />
  <status location="U Papoucha" />
</root>
```

fig. 16 – XML file example

The file contains tags *out* and *status*:

out

id

Output number – either 1 or 2.

status

Output status. If all is OK, it shows number 0.

range

Code number assigned to output range. One of following values:

- 1 … 0 – 10 V
- 2 … 0 – 5 V
- 3 … ±10 V
- 4 … ±5 V
- 5 … 4 – 20 mA
- 6 … 0 – 20 mA
- 7 … 0 – 24 mA

value

Actual output value as a decimal number.

divs

Actual output value as a whole number from 0 to 10 000.

status

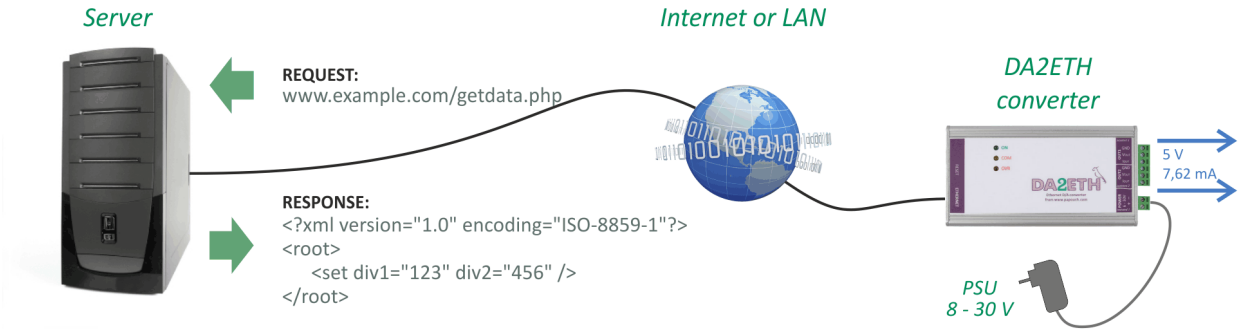
location

User defined name of the device.

HTTP GET

Using HTTP GET it is possible to send **actual state of the DA2 converter** as well as **request data to set outputs from a remote server**. Alternatively HTTP GET can be used to **directly control outputs** (page 25).

Read data from a remote server



Converter can call a script from a remote server periodically. The script reads received values and sends them as an XML response to the converter to set outputs.

Converter settings contain script path and calling interval in seconds.

Along with the request a MAC address is sent to the server to identify the converter (in case the script receives data from multiple units.)

Request format and parameters

Request is sent as a standard HTTP GET. Example:

```
www.example.com/script.php?mac=00204AB48DF7&stat1="0"&div1="1354"
&raw1="555"&stat2="0"&div2="7000"&raw2="2867"
```

As seen from the example, the format is very well known to WEB programmers from standard sending data from WEB forms. No new programming methods are necessary to be learned, simple web form method is sufficient: (`<form name="my-form" action=…`).

HTTP GET is sent periodically according to settings in *HTTP GET* panel (up to 3600 seconds can be set.)

Request parameters

HTTP GET parameters are following:

`mac`..... MAC address of the device to identify the given device

`statX` ..... Describes the state of a given channel X (1 or 2). It can have these values:

0 ....following values are valid and are currently set on outputs
1 ....values are invalid due to device initialization
4 ....values are invalid due to device error

`divX`..... Value from channel X (1 or 2) as a number from 0 to 10000.

`rawX`..... Value from channel X (1 or 2) as a number from 0 to 65535.

XML response format

The XML formatted response is expected to have parameters setting the DA2 output parameters. Response is structured as an XML and looks like this:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<root>
    <set div1="123" div2="456" raw1="300" raw2="1113" />
</root>
```

set tag contains parameters to set output values. No other information than shown in the example above should be contained in the XML response. The XML should contain only the parameters you want to change in a given period. XML should not contain all the parameters at once, either div or raw for one or both outputs.

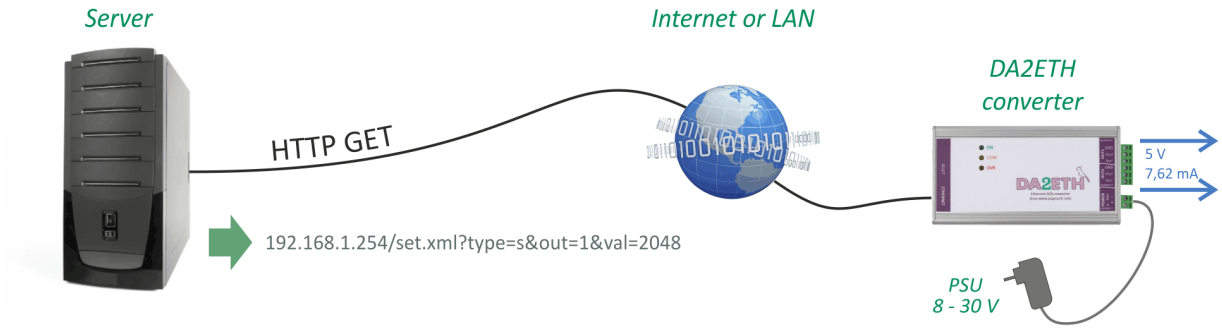
divX

Value for channel X (1 or 2) as a number from 0 to 10000.

rawX

Value for channel X (1 or 2) as a number from 0 to 65535.

Controlling the DA2 via HTTP GET



Following commands can be used to directly set outputs on DA2 unit. DA2 uses set.xml script co receive HTTP GET requests. For a converter in default settings, the complete script address is: *http://192.168.1.254/set.xml*. User name and password is required to run this script, if it has been set.

Set value – divisions

Example: *set.xml?type=**s**&out=1&val=7321*

Sets output *out* value using a number from 0 to 10000; *out* represents output number 1 or 2.

Set value – raw

Example: *set.xml?type=**r**&out=2&val=125*

Sets output *out* value using a number from 0 to 65535; *out* represents output number 1 or 2.

HTTP GET response

Response to the setting in XML format. Response example is shown here:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<root>
   <result status="1" />
</root>
```

Meaning of XML parameters is following:

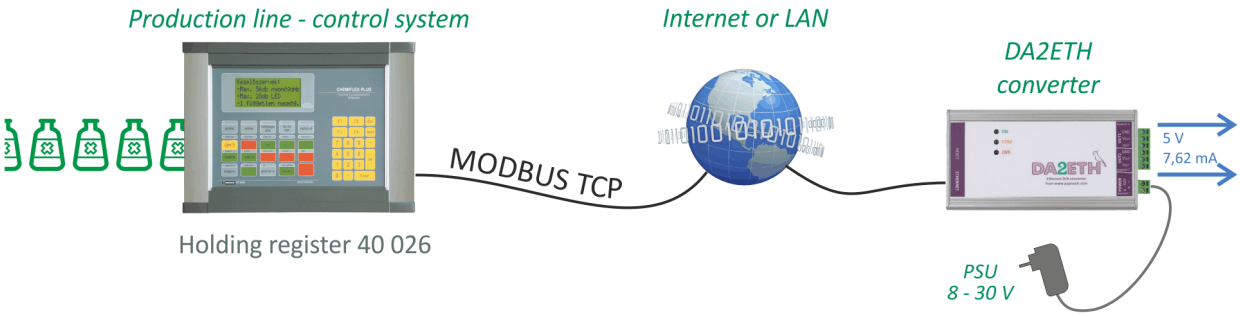
- Tag **result** is only one.
- Attribute **status** contains number 1 (command was executed) or number 0 (command was not executed).

MODBUS TCP

DA2 converter can communicate via ModBus TCP protocol either in client or server mode.

Client: The converter connects to a remote device, reads a set register containing output values and sets outputs to match those values.

Server: The converter is awaiting connection on its set port. After the connection is established, and its registers are rewritten with desired values, it sets those values on its outputs.



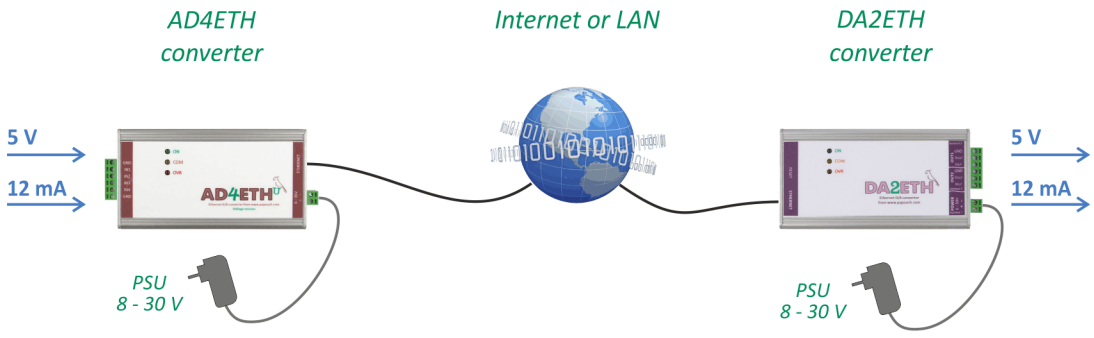
Modbus TCP (client)

This way of getting output values is ideal for measuring devices, process indicators and such devices communicating via ModBus TCP. It is a very easy way of setting another's device value to the DA2 output. **DA2 connects to a remote device, reads its registers and sets its own outputs to match those values.**

DA2 configuration allows for independent register type and address settings for each input. One or both outputs can be set.

The given register must contain a value of *unsigned integer* type, e.g. a whole number with no sing ranging from 0 to 10000.

Example – how to transfer analog value over the Ethernet



A/D converter AD4ETH stores measured value from channel 1 in a register with address 1. Value in this register represents value from 0 to 10000 – exactly in the format DA2 needs. DA2 must be set to the following parameters:

- Communication mode to Client.
- Port number 502 (For AD4ETH in default settings.)
- IP address of the AD4ETH
- Register type 1 to input register.
- Address to number 1.

- If the second channel is needed as well, set the channel 2 likewise.

After the settings are stored, DA2ETH starts to read values from AD4ETH periodically and set those values on its outputs.

Modbus TCP (server)

Instruction list

Device allows a client to access its memory – depending on the register type – using these instructions:

- 0x03 .....read holding register
- 0x10 .....set multiple holding registers at once

Holding Register

Address	*Access*	*Function*	*Name*
40	read	0x03	**Channel 1 status** Number representing the actual output state: 0 … OK 1 … Initialization 4 … Error
41	read, write	0x03, 0x10	**Channel 1 value – RAW** Number from 0 to 65535 representing the actual output value.
42	read, write	0x03, 0x10	**Channel 1 value – divisions** Number from 0 to 10000 representing the actual output value.
43, 44	read, write	0x03, 0x10	**Channel 1 value – float** Decimal number representing the actual output value.
45	read	0x03	**Channel 2 status** Number representing the actual output state: 0 … OK 1 … Initialization 4 … Error
46	read, write	0x03, 0x10	**Channel 2 value – RAW** Number from 0 to 65535 representing the actual output value.
47	read, write	0x03, 0x10	**Channel 2 value – divisions** Number from 0 to 10000 representing the actual output value.
48, 49	read, write	0x03, 0x10	**Channel 2 value – float** Decimal number representing the actual output value.

SNMP

Introduction

DA2 is an SNMP agent. It receives requests on UDP port 161. The administrator requests fata from the local MIB database (Management Information Base, one of the standards of Internet), composed of a hierarchic tree of managed data. The device does not contain the usual complex database, only the portion necessary to get data from and to the converter.

Description of the MIB table structure (Structure of management information) is added to every device as an MIB file. It is necessary that the network administrator enters this information to your SNMP administration structure. (SNMP version 1).

Advice: If you need to get all the OID objects with the tool SNMPWALK (Linux), then it is necessary to specify the start OID position, for example: *snmpwalk -v1 -c public 192.168.1.254 1.3.6.1.4.1.18248* . In case of reading only with the IP address, you will get only basic system OID objects from the ethernet module.

SNMP usage

Implement the MIB table description to your SMNP manager from the *DA2.mib* file.[6]

Then it is necessary to set the Read community to public (for default DAT settings).

SNMP objects

Status

Name: *outStatus*
ID: *1.3.6.1.4.1.18248.29.2.1.1.1.1 to number of outputs*
Type: *Integer*
Action: *Read*

Number representing the actual states of objects containing channels' values:

- 0 … All is OK, values are valid
- 1 … Waiting for initialization
- 4 … Error

Channel 1 value – RAW

Name: *outRaw*
ID: *1.3.6.1.4.1.18248.29.2.1.1.2.1 to number of outputs*
Type: *Integer*
Action: *Read, Write*

Number from 0 to 65535 representing the value on the output.

Channel 1 value – divisions

Name: *outDiv*
ID: *1.3.6.1.4.1.18248.29.2.1.1.3.1 to number of outputs*
Type: *Integer*
Action: *Read, Write*

Number from 0 to 10000 representing the value on the output.

[6] The file is available at a given product page on www.papouch.com .

Channel 1 value – string

Name: *outStr*
ID: *1.3.6.1.4.1.18248.29.2.1.1.4.1 to number of outputs*
Type: *DisplayString*
Action: *Read*

Current output value as a string.

TCP/UDP

The converter can also communicate via Spinel protocol over a data connection.

To debug spinel protocol communication we recommend using Spinel terminal software available at www.papouch.com.

There are four types of communication over TCP/UDP:

- **TCP server** – In this mode DA2 communicates via Spinel protocol over a TCP port. It awaits connection request on its *IP address* and *Port*.
- **TCP client** – DA2 establishes a connection to a *remote IP address* and *remote port*. It then communicates via Spinel protocol.
- **UDP** – DA2 send spinel packets using UDP packets to a *remote IP address* and a *remote port*. These packets are Spinel based and it expects responses on a *Spinel port*.

Important:

- No other configuration options (XML, SNMP, Modbus, HTTP GET, view of the output values on the WEB interface) are available in TCP/UDP communication mode.
- Other communication mode disables TCP/UDP communication.

FAQ

What do I need to set for the DA2 to work in my network?

Just set the AD2 parameters to match your network parameters. (IP address and subnet mask.) Settings are described for Windows OS.

1) Connect DA2 to your network and run Ethernet Configurator (see fig. 4).[7]
2) Click on *Add device* and enter MAC address of your converter and desired IP address.
3) Confirm by clicking *Set IP address*.
4) Now you can open the WEB interface using your internet browser.

How do I find out the converters IP address?

1) The default Address is always 192.168.1.254. If you have changed it or you can't reach the device, follow these steps.
2) Run Ethernet Configurator (see fig. 4).[7] If the converter has a compatible IP address, it will be shown in the *Found devices list*.
3) If you can't see the converter in the device list, make sure it is connected and assign a new IP address to it based on the previous FAQ article.

[7] The software is also available for download at www.papouch.com.

DEVICE RESET

Using the following procedure you will reset the device to the default state. Unlike the reset made from the WEB interface (see page 12) or Telnet protocol (see page 21), this reset also sets the default IP address to 192.168.1.254.

1) Disconnect the device power.
2) Push the Reset button (next to the Ethernet connector) and hold it.
3) Power the device up and wait for 10 seconds.
4) Release the button.
5) The device is reset now.

TECHNICAL PARAMETERS

Analog outputs:

Number of analog outputs 2

Outputs type ..... voltage or current (active)

D/A converter resolution ..... 16 bit

Nonlinearity ..... max. ±0,032% from range

Stabilization period ..... 25 µs

Range division ..... 10 000 divisions

Voltage output:

Output ranges ..... 0 – 10 V, 0 – 5 V, ±10 V, ±5 V

Minimum load ..... > 1 kΩ

Conversion accuracy ..... typ. 0,05 % from range at 25 °C

Current output:

Output ranges ..... 4 – 20 mA, 0 – 20 mA, 0 – 24 mA

Maximum load (0 – 24 mA) ..... < 400 Ω

Maximum load (other ranges) ..... < 500 Ω

Conversion accuracy ..... typ. 0,15 % from range at 25 °C

Control interface:

Type ..... TBase 10/100 Ethernet

Connector RJ45

Configuration ..... WEB interface

Communication protocols ..... XML, SNMP, Modbus TCP, HTTP Get, Spinel (TCP/UDP)

DEFAULT SETTINGS

IP address 192.168.1.254

Subnet mask ..... 255.255.255.0 (8 bits; mask C)

Gateway IP address 0.0.0.0

Power:

Power voltage ..... DC 8 to 30 V (with reverse polarity protection)

Current consumption ..... typically 90 mA at 12 V

Other:

Operation temperatures ..... -20 °C to +70 °C

Dimensions ..... 104 mm × 55 mm × 24 mm

Dimensions with connectors ..... 121 mm × 55 mm × 24 mm

Dimensions with DIN rail holder ..... 104 mm × 55 mm × 33 mm

Weight .....140 g

Available makes

Montage:

- No holder *(default make)*
- DIN rail holder make

fig. 17 - DA2ETH with a DIN rail holder

- Wall holder make

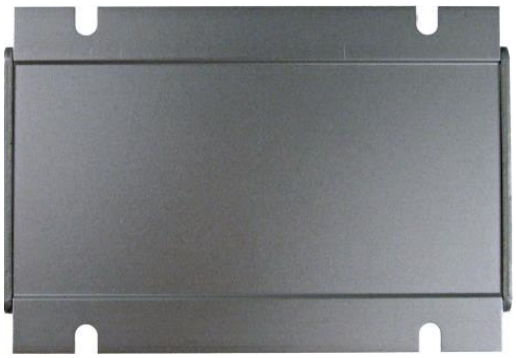


fig. 18 – Wall holder (bottom view)

Output ranges:

- 0 – 10 V, 0 – 5 V, ±10 V, ±5 V, 4 – 20 mA, 0 – 20 mA, 0 – 24 mA
- We can supply unit with another current or voltage range if requested; combination of multiple ranges in one unit is also available

Please do not hesitate to contact us if you require any other specific functions or features in DA2ETH unit.

Papouch s.r.o.

Data transmission in industry, line and protocol conversions, RS232/485/422/USB/Ethernet/GPRS/WiFi, measurement modules, intelligent temperature sensors, I/O modules, and custom-made electronic applications.

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