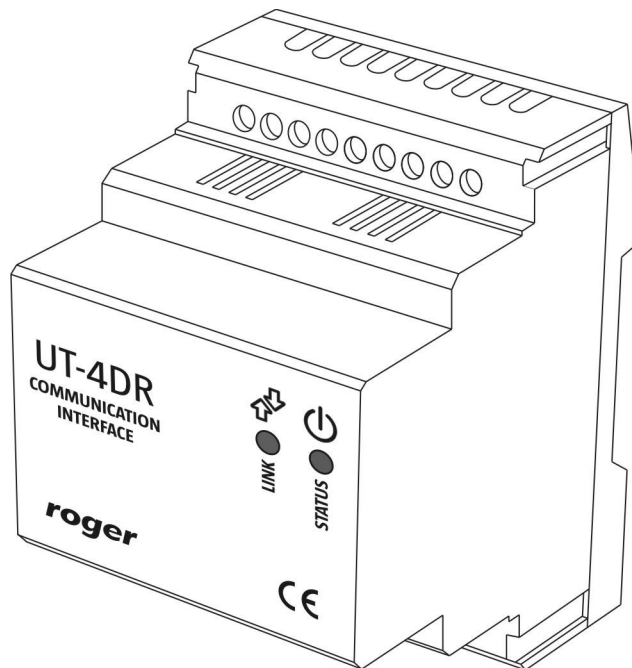


*Roger Access Control System*

## Communication interface UT-4DR

*Firmware version : 1.0.2*

*Document version: Rev. D*



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# 1. DESCRIPTION AND SPECIFICATION

## 1.1 Characteristics

UT-4DR interface is a device enabling communication with RACS 4 access control system through 10/100 BaseT Ethernet network. Apart from this main function, it is equipped also with 4 universal Input/Output lines which can be managed using web browser or by means of Telnet protocol. This feature gives possibility to use the device in other application (not in RACS 4 system) as a remote I/O port, managed by means of computer network.

UT-4DR electronic module is put into plastic enclosure dedicated for mounting onto standard DIN rail 35mm.

Main features of UT-4DR interface:

- TCP/IP communication interface for RACS 4 system
- LAN/WAN 100/10Mbit/s Ethernet
- 4 universal I/O lines managed by web browser or Telnet protocol
- 10-15VDC power supply
- Plastic enclosure for 35mm DIN rail
- CE mark

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Note: it is not possible to use UT-4DR interface as a virtual serial port in other applications requiring communication with a serial device connected to Ethernet network.

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## 1.2. Using the interface in RACS system.

UT-4DR can be used for programming single access controller of PR series, or for work with network access control system consisting of many controllers connected to RS485 communication bus. UT-4DR enables two way data transmission between access control devices and PR Master managing software.

RACS access control system software is ready to work with networks (subsystems) connected via computer network. During system configuration in PR Master software, both communication port type (TCP/IP) and communication interface device (UT-4DR) have to be chosen to establish communication. Basing on these settings the software will automatically set transmission time parameters to ensure efficient communication between managing PC computer and managed network of RACS system.

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Note: Using UT-4DR requires PR Master software in version 4.4.6.xxx or higher.

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Note: It is not recommended to use UT-4DR interface to connect with subsystems containing PR201 and PR301 access controllers. Any errors occurring in data transmission during configuration of these controllers will cause them to hang up and will require manual reset.

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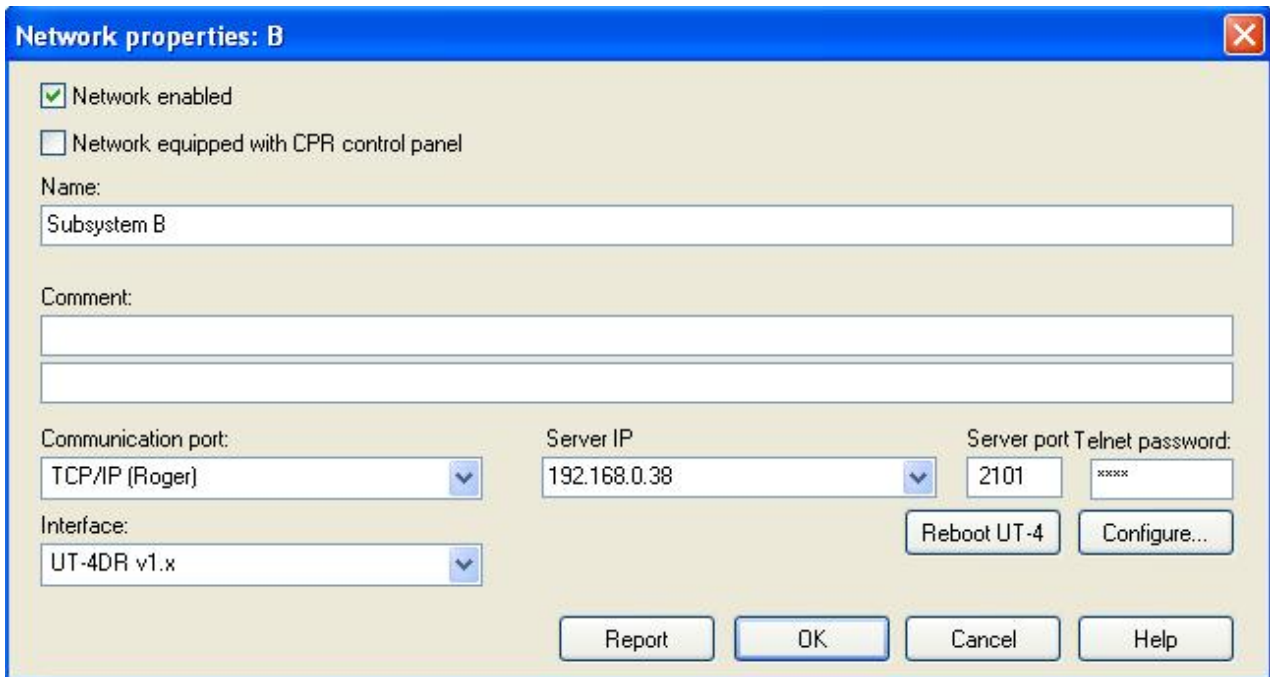


Fig.1 Configuration of RACS access control subsystem equipped with UT-4DR interface.

## 2. INSTALLATION

### 2.1 Terminals and connection diagram

The module is offered in plastic enclosure dedicated for mounting onto standard DIN rail 35mm. All electrical connections have to be made with disconnected power supply voltage.

<b>Table 1. UT-4DR terminals</b>	
<b>Terminal</b>	<b>Description</b>
+12V	Power supply
GND	Ground
A	RS485 bus, line A
B	RS485 bus, line B
GND	RS485 bus Ground
I04	I/O line #4
I03	I/O line #3
I02	I/O line #2
I01	I/O line #1

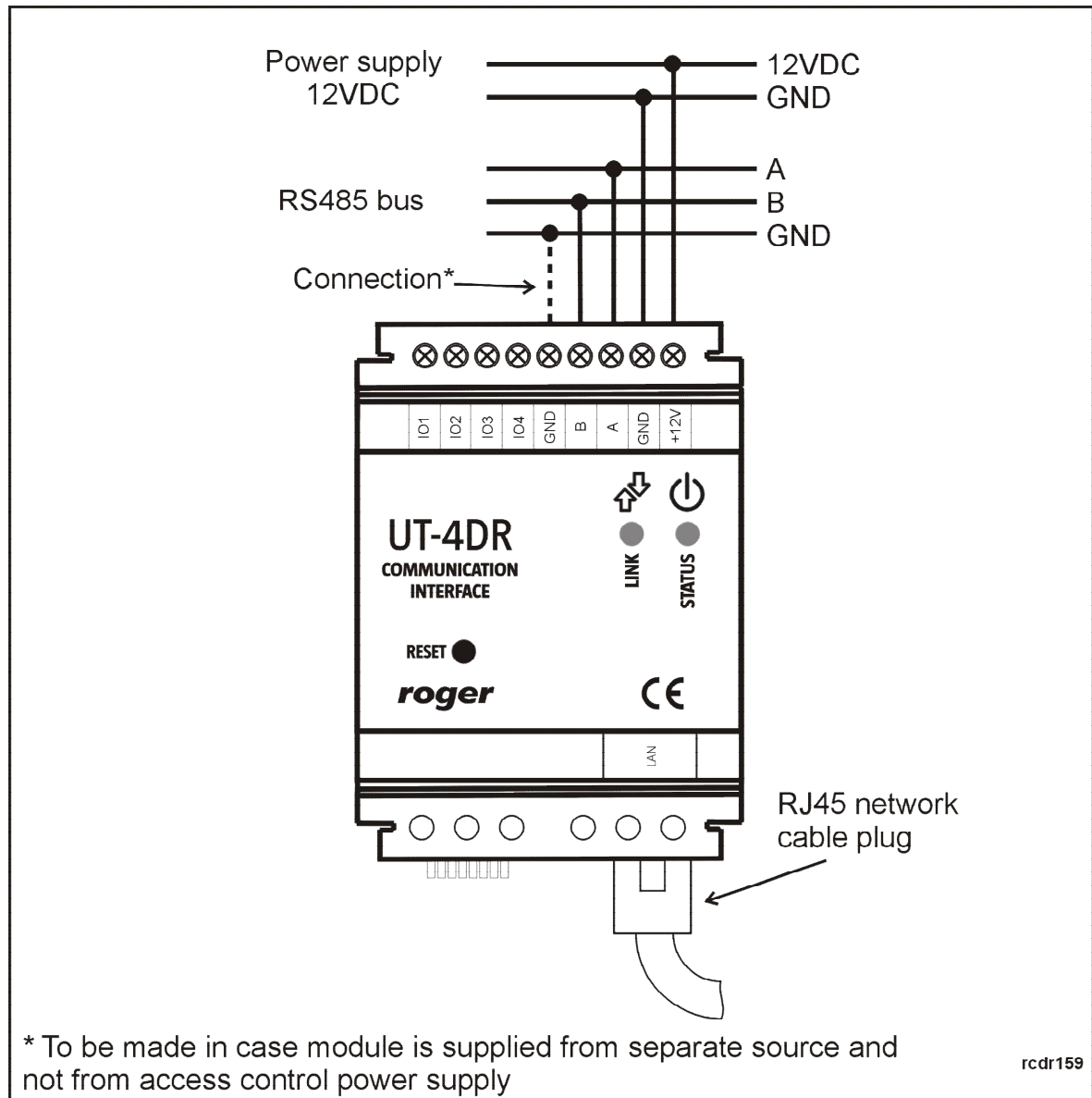


Fig.2 UT-4DR proposed connections diagram in RACS system.

## 2.2 LED indicators

UT-4DR is equipped with two LED diodes indicating actual state of a device (Fig.2). Bi-color LED LINK  $\text{⚡}$  informs about currently going transmission in RS485 bus, where green color means data sending, while red data receiving by a module.

LED STATUS  $\text{⏻}$  (orange) informs about current device state:

- On – normal work
- Blinks – memory or configuration error (memory reset required, see point 3.3)
- Off – lack of or error in LAN connection

## 2.3 Power supply

The device is supplied from 12VDC voltage (acceptable voltage range 10-15VDC) which can be taken from access control system or from separate power supply source. In this second case it is essential to make electrical connection between power supply ground and RACS system RS485 bus ground (Fig.2).

## 2.4 Input/Output lines

UT-4DR has 4 lines of general purpose indicated as IO1...IO4. These lines can be used individually as independent inputs or outputs. They can work with maximal voltage of 15VDC (in comparison to device's power supply ground) no matter if configured as input or output. Input lines are activated by low logical state (connecting the line to ground). Output lines in normal state represent high impedance while in active state short circuit connected voltage with ground. Maximal current which can be switched by output lines is limited to 0.5A. If this value is exceeded, an internal overload protection is activated, switching off all output lines. Protection is deactivated when source of overload is removed. In overload state UT-4DR stops its normal work. I/O lines electrical structure is shown on Fig.3.

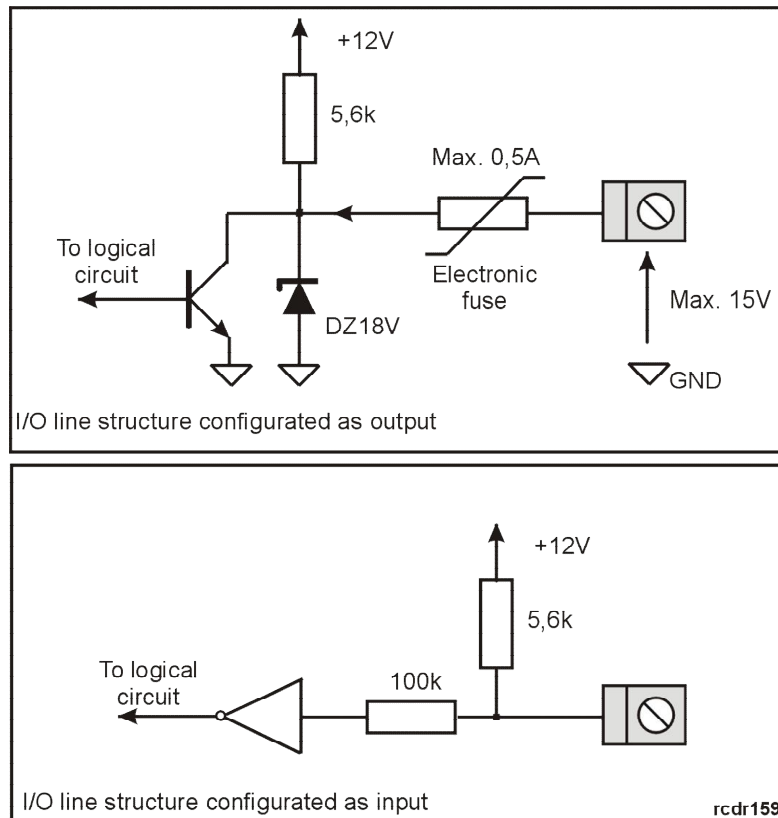


Fig.3 UT-4DR module Input/Output lines electrical structure.

Output managing and input state reading is possible by means of device's WWW page (GPIO tab) which contains the following elements:

**IO#**

Line number

**Custom Name**

Each line can be given a name (comment)

**Custom Direction**

Enables choice between input and output function for a certain line

**Current Input State**

Visualization of input lines state (activation makes the lines checkbox marked)

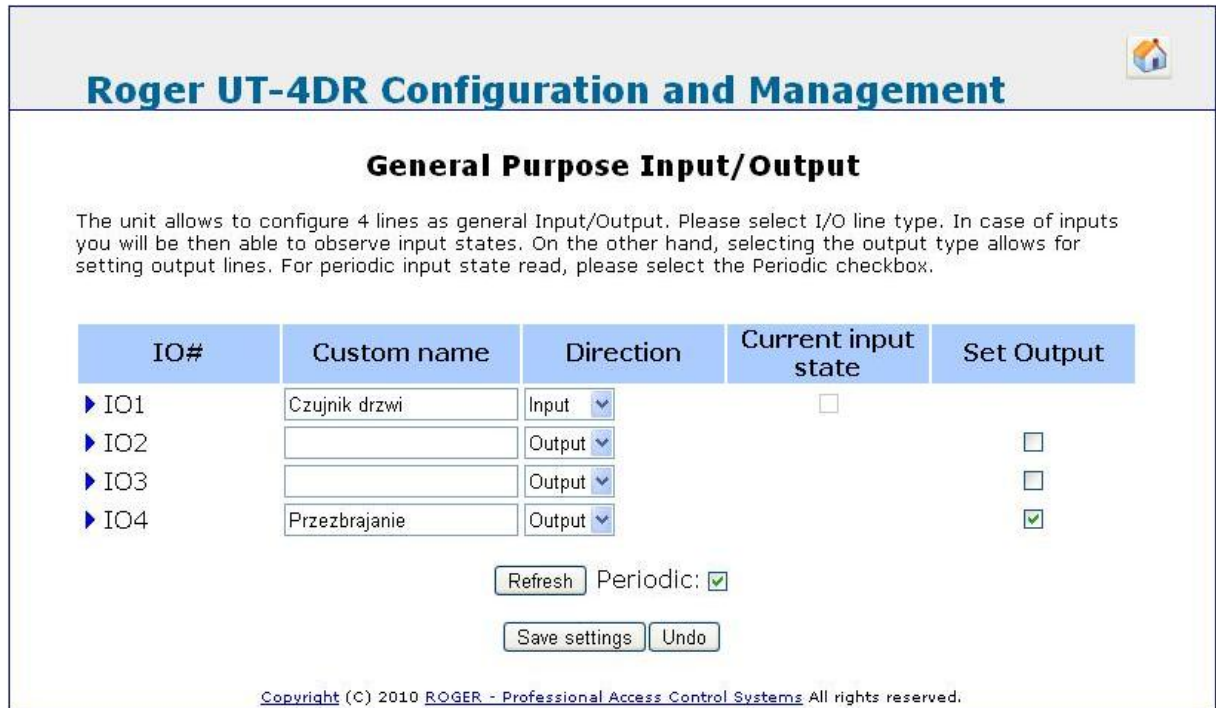
**Set Output**

Enables to switch on and off an output line.

### Periodic

Option causing automatic web page refreshing in case of any settings or I/O lines state changing, without a need of manual refresh. Without this option checked, page refreshing can be done manually with button Refresh or with adequate web browser's option.

Any changes made in Input/Output configuration should be saved in module's memory using **Save settings** button.



**Roger UT-4DR Configuration and Management**

### General Purpose Input/Output

The unit allows to configure 4 lines as general Input/Output. Please select I/O line type. In case of inputs you will be then able to observe input states. On the other hand, selecting the output type allows for setting output lines. For periodic input state read, please select the Periodic checkbox.

IO#	Custom name	Direction	Current input state	Set Output
▶ IO1	Czujnik drzwi	Input	<input type="checkbox"/>	
▶ IO2		Output		<input type="checkbox"/>
▶ IO3		Output		<input type="checkbox"/>
▶ IO4	Przezbijanie	Output		<input checked="" type="checkbox"/>

Refresh Periodic:

Save settings Undo

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Fig.4 I/O lines configuration tab in module's embedded web page.

## 2.5 RS485 communication bus

RS485 bus consists of two signal wires (A and B) and of power supply ground GND. In RACS 4 system topology of RS485 communication bus is fairly flexible and it is allowed to make tree structures, star topologies as well as combination of these two. It is also not required to apply termination resistors at any end of communication bus. In most cases communication will work without any problems for any types of cables applied (telephone pair, twisted pairs shielded or unshielded). It is however recommended to use unshielded twisted pair computer cable (UTP). Using shielded cables is recommended only in case of strong electro-magnetic fields presence causing noise in transmission line. RS485 communication standard applied in RACS 4 system guarantees proper communication for up to 1200 meters long bus (measured between two most distant devices) and is very resistant to noise.

## 2.6 Ethernet interface

UT-4DR works with Ethernet computer networks of 100 and 10Mbit/s speed. In most cases unshielded twisted pair cable (UTP) is good enough as physical communication medium, however in case of strong E-M noise presence it is recommended to use shielded cable (FTP).

By default every UT-4DR interface is in DHCP mode. In case of direct connection between PC computer and UT-4DR module (such situation takes place usually for local module configuration before connecting it to LAN network) there is a possibility to deactivate DHCP in the module. To do that, it is required to put jumper as shown in Fig.5. In this setting the module will only use static IP address stored in memory (factory default 192.168.0.38). If in final configuration the module is to use DHCP the jumper has to be removed. If module's IP address has to be changed it can be done using module's configuration panel available via web browser (see point 4.1).

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Note: Depending on Ethernet network settings, it may take up to 2-3 minutes until UT-4DR obtains DHCP configuration data. In case of lack of communication with the module, wait several minutes and try again.

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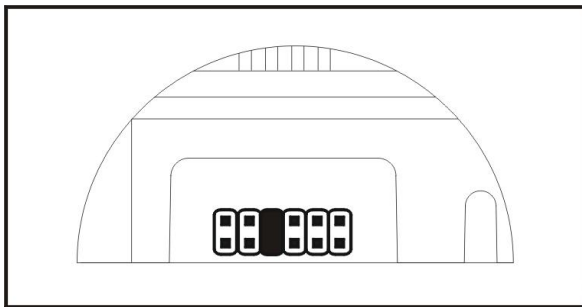


Fig.5 The way of placing jumper for DHCP deactivation.

## 2.7 Installation guidelines

- The module should be installed in a way ensuring easy access to terminals and cables
- All electrical connections should be made without power supply voltage
- All devices connected to access control system communication bus (readers, extension modules, access controllers, interfaces) should have common ground
- In case of strong E-M noise presence it is recommended to use shielded twisted pair cable FTP
- If UT-4DR module is supplied from an independent power source (separate from RACS system) it is strongly suggested to make a connection between RS485 and UT-4DR module grounds (Fig.2)

## 3. CONFIGURATION

### 3.1 Configuration using web browser

It is possible to configure UT-4DR interface using its embedded WWW page. To do this, please type module's IP address (ex.192.168.0.38) in web browser address field, and log in as a default user with the following parameters:

- User: root
- Password: dbps

After logging in, the following configuration options are available :

#### **Network**

Enables changing UT-4DR module's network settings. Activating an option **Obtain LAN IP Address from DHCP Server** causes automate awarding IP address to the module. When option deactivated, it is possible to set manually static IP address, subnet mask, default gateway, DNS server address and TCP port for communication with UT-4DR.

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Note: improper network settings can cause lack of communication with UT-4DR module. In this case memory reset procedure has to be made.

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#### **Password**

Enables changing user password, requires introducing new password and confirming it.

#### **GPIO**

Enables configuration and managing of universal I/O lines (see point 2.4).

#### **TCP Stat**

Tab containing statistical data regarding connection with UT-4DR interface

#### **FW Upgrade**

Enables UT-4DR module's firmware upgrade (see point 3.4)



### Mobile Web GUI

This option enables to switch from standard module's web site view to mobile devices view (tablets, smartphones). The website for mobile devices contains analogical set of functions but without TCP statistics (TCP Stat) and possibility to module's firmware change (FW Upgrade). The view of mobile devices website is shown below in Fig.6.

### Restart

This option includes **Reboot** button which allows to restart UT-4DR remotely.

To go back to main configuration window use button with house picture placed in top right corner of each configuration window.

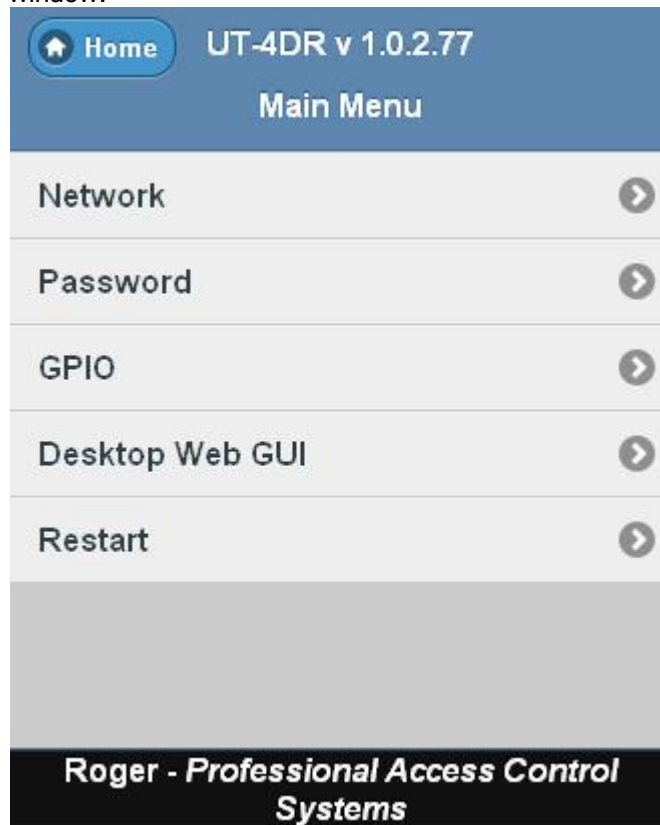


Fig.6 Mobile devices website view in UT-4DR

## 3.2 Configuration using Telnet protocol

In order to log in to the module, please type in command line : telnet <module's IP address>, ex. telnet 192.168.0.38. Then please log in as a default user (user: root, password: dbps). While logged in, after typing **help** command, a list of available commands with description will appear (Fig.7).

```

*****
* Roger UT-4DR Configuration and Management v1.0.2.77 *
*****

Roger UT-4DR> help

Available Commands:
-----
tcpstat                - display a tcp status
rinfo                 - display remote machine info
set serial baudrate = <9600|19200|38400> - set serial speed to 9600|19200|38
400
set output <1|2|3|4> <ON|OFF>          - set output 1..4 to on/off state
get input <1|2|3|4>                    - get current state of input 1..4
restart device          - restart UT-4DR
reinit port to <2101|2102|2103|2104>    - reinitialize UT-4DR TCP port to 2
101|2102|2103|2104
passwd [new]           - change system password
passwd                 - display current password
help, ?               - display this help
bye                   - disconnect

<ESC>,<^C>           - disconnect
<BS>                 - delete Character left
<UP><DOWN>           - recall Command History

Roger UT-4DR>

```

Fig.7 Configuration using Telnet.

Note: Described above procedure of connecting to UT-4DR module using Telnet protocol may vary depending on used Telnet client application. In Windows Vista and Windows 7 operations systems Telnet client is deactivated as a default. It has to be activated manually before first attempt of connection with UT-4DR.

### 3.3 Memory reset

In order to restore UT-4DR module's factory settings it is required to stop any communication with module (web browser and/or Telnet), put jumper as shown in Fig.8 and press **RESET** button in the front panel. Reset procedure lasts about 5 seconds and when it is finished LED STATUS  $\odot$  indicator blinks 3 times indicating success of the operation. The jumper has to be removed after that. The device is ready to work in DHCP mode. In worst case (e.g. wrong configuration of network) restoring of default configuration may extend even to approximately 40 sec.

Note : After memory reset IO lines configuration remains unchanged. In order to reconfigure them it is required to establish connection with the module and change IO lines configuration manually.

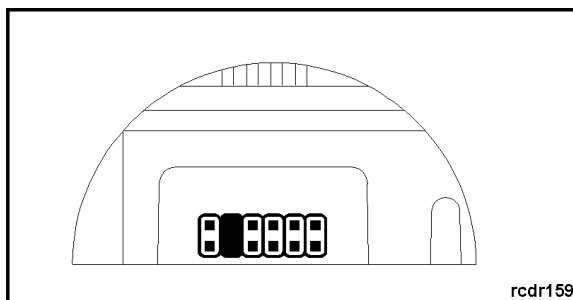


Fig.8 Jumper setting in memory reset procedure.

### 3.4 Firmware update procedure

To make UT-4DR module's firmware upgrade, please log into embedded web page of the module, using web browser. In **Firmware Upgrade** tab, press **Select** button to choose on your computer a file containing new firmware. Press **Send** button to send file to the UT-4DR module and change its firmware. During firmware modification all I/O lines are deactivated. After sending new firmware to module, please reset it by pressing **Reboot** button in the web page. During firmware actualization process the device can stop answering to any attempt of communication, which does not mean troubles in functioning. If however lack of communication lasts longer than 5 minutes, please reset the device by pressing **Reset** button on its front panel and try again whole procedure. After successful firmware update the module is ready to work with settings saved in memory before firmware update procedure.

## 4. TECHNICAL SPECIFICATION

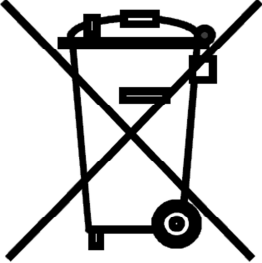

Parameter	Value
Supply voltage	10...15 VDC
Current consumption	Average 55 mA @ 12V DC,
Environmental class	Class II, indoor conditions, temp.: - 10°C +40°C, relative humidity: 0 - 75% (no condensation)
Dimensions	62x85x73mm (WxHxD); 3,5 DIN rail unit
Weight	Approx. 110g
Certificates	CE

## 5. ORDERING INFORMATION

Product	Description
UT-4DR	Ethernet – RS485 communication interface

## 6. PRODUCT HISTORY

Version	Firmware	Data	Description
UT-4DR v1.0	1.0.0	09/2011	First commercial version of the product
UT-4DR v1.0	1.0.2	07/2012	Remote reset added, mobile GUI added

 	<p>This symbol placed on a product or packaging indicates that the product should not be disposed of with other wastes as this may have a negative impact on the environment and health. The user is obliged to deliver equipment to the designated collection points of electric and electronic waste. For detailed information on recycling, contact your local authorities, waste disposal company or point of purchase. Separate collection and recycling of this type of waste contributes to the protection of the natural resources and is safe to health and the environment. Weight of the equipment is specified in the document.</p>
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