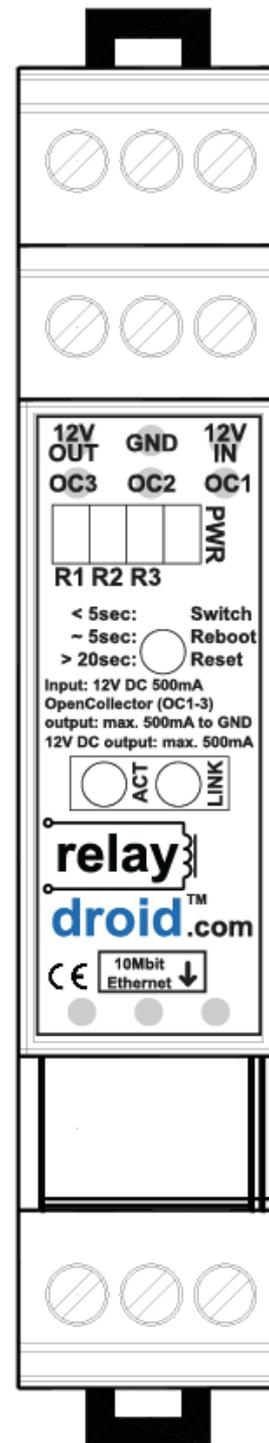


# relaydroid™

## User Manual

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**Please note: Connecting this device to a LAN network needs knowledge about Ethernet network configurations. If you are unfamiliar with setting up Ethernet networks please consult a network specialist!**

**DANGER! If you want to switch high voltages with your relays (like 230V AC) only a qualified electrician should connect the wires to avoid the risk of electric shock!**



## 1. Introduction and Product Highlights

The **relaydroid**<sup>TM</sup> devices can be used to control relays through the Internet or LAN with a web user interface. With **relaydroid**<sup>TM</sup> devices you can easily create a smart switch for any purpose.

- **DIN rail case for easy installation in distribution boards**
- **Compact size, only 17.5mm wide**
- **'State of the art' electric design**
  - microcontroller based embedded webserver
  - very fast startup time (<1sec)
  - high reliability
  - safe use
  - long life
- **12-24V DC input power (the power adapter is not included)**
  - compatible with 12V and 24V relays (the relays are not included)
- **10Mbit RJ-45 Ethernet port**
  - 10/100/1000 Mbit compatible
- **Different versions for different purpose:**
  - **relaydroid-3R**: 3 open collector outputs
  - **relaydroid-6R**: 6 open collector outputs
  - **relaydroid-9R**: 6 open collector outputs
  - **relaydroid-18R**: 18 open collector outputs (35mm wide case)
  - **relaydroid-21R**: 21 open collector outputs (35mm wide case)
  - **relaydroid-3R+COM**: 3 open collector outputs and RX/TX pins for remote serial communication
  - **relaydroid-IO**: 3 open collector outputs, 3 digital or analog inputs
  - open collector outputs can be used to control relays or as a remote "button" (max. 500mA)
  - the outputs can be switched separately
  - output states are stored in non-volatile memory (in case of power failure)
  - can be switched on for a given time (switch-off timer)
  - COM version: TTL or RS232 output, can function as a remote serial port through Ethernet TCP/IP!
- **control with a web-based user interface through LAN or Internet**
  - with a mobile phone (Android, iPhone, Symbian, etc.)
  - with a PC browser (IE, Firefox, Chrome, Opera, etc.)
- **multilingual user interface (eng, hun, etc.)**
- **embedded webserver**
- **fully configurable**
  - fix IP or DHCP client
  - NetBios name

- changeable MAC address
- multiple login users (username, password, privileges)
- the outputs can be named
- relay switching with a button on the device
- LED feedback about the status of the relays
- easy usage
- **application examples:**
  - intelligent home solutions
  - control heating systems remotely
  - control sprinkler systems remotely
  - control machines remotely
  - control lights remotely
  - remote programming of PLC controllers (e.g. programming of suncollector controllers through the Internet)
  - as a remote serial terminal without a PC
- it is possible to control several **relaydroid**<sup>TM</sup> devices simultaneously from a PC software, with a calendar-like automatic scheduling, e.g. on Monday 10:00 AM + Tuesday 12:30 PM and 1:00 PM (relaydroid-controller software)
- **Programmer API for custom solutions**
  - HTTP API (with HTTP GET requests)
  - TCP/IP API (text messages through TCP/IP)

## 2. Specifications

### 2.1. Models

- **relaydroid-3R:** 3 open collector outputs (17.5mm narrow case)
- **relaydroid-6R:** 6 open collector outputs (17.5mm narrow case)
- **relaydroid-9R:** 9 open collector outputs (17.5mm narrow case)
- **relaydroid-18R:** 18 open collector outputs (35mm wide case)
- **relaydroid-21R:** 21 open collector outputs (35mm wide case)
- **relaydroid-3R+COM:** 3 open collector outputs and RX/TX pins for remote serial communication (17.5mm narrow case)
- **relaydroid-IO:** 3 open collector outputs, 3 analog inputs (17.5mm narrow case)

### 2.2. Parameters

- Dimensions (W,H,D):
  - **17.5mm narrow case:** 17.5x90x56.4 mm
  - **35mm wide case:** 35.8x90x56.4 mm

- Holding: DIN-rail
- Input voltage: 12-24V DC
- Input current requirements:
  - **relaydroid-3R, relaydroid-6R, relaydroid-9R, relaydroid-3R+COM, relaydroid-IO:** recommended min. 500mA
  - **relaydroid-18R, relaydroid-21R:** recommended min. 1250mA
- Power consumption: max. 1W (@12VDC) with all outputs off
- Open collector outputs can drain max. 500mA to GND
- Ethernet: 10/100/1000 Mb compatible, RJ-45 port, 10Mbit
- Implemented network protocols: TCP/IP, UDP, HTTP, NTP, NetBios, DHCP, DNS, ICMP (PING)
- 6 LED: 1 power status + 2 Ethernet status + 3 output status LED
- 1 button, used to: switch outputs on/off, reboot, reset to factory settings

## 2.3. Layout and dimensions

### 17.5mm narrow case models

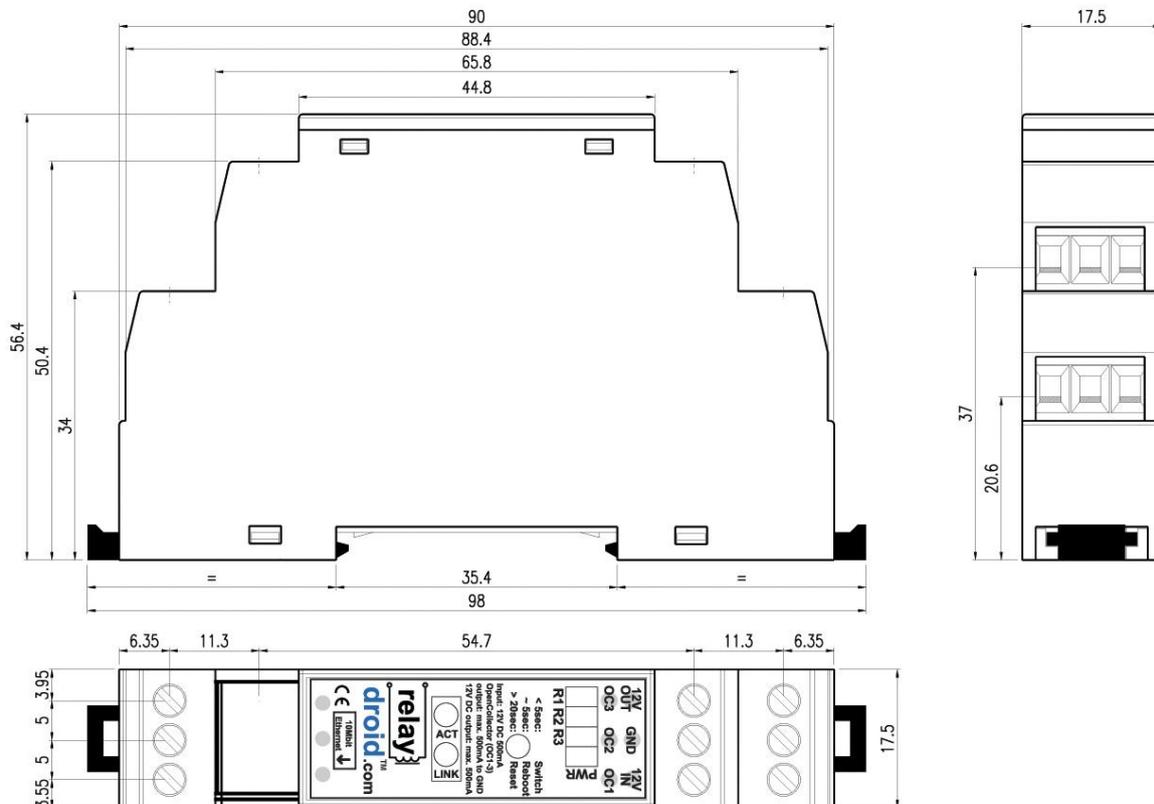


Figure 2-1: device dimensions (17.5mm wide)

## 35mm wide case models

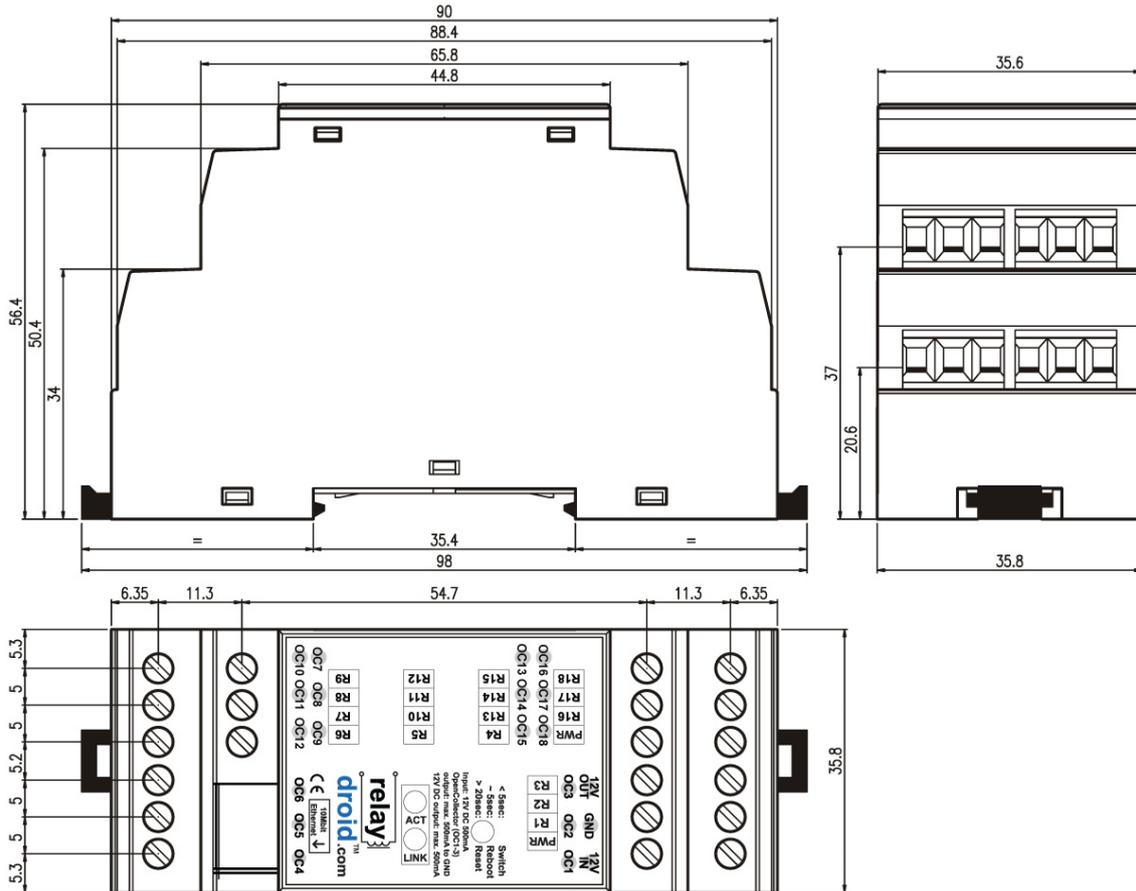


Figure 2-2: device dimensions (35mm wide)

### 3. External connections, buttons, leds

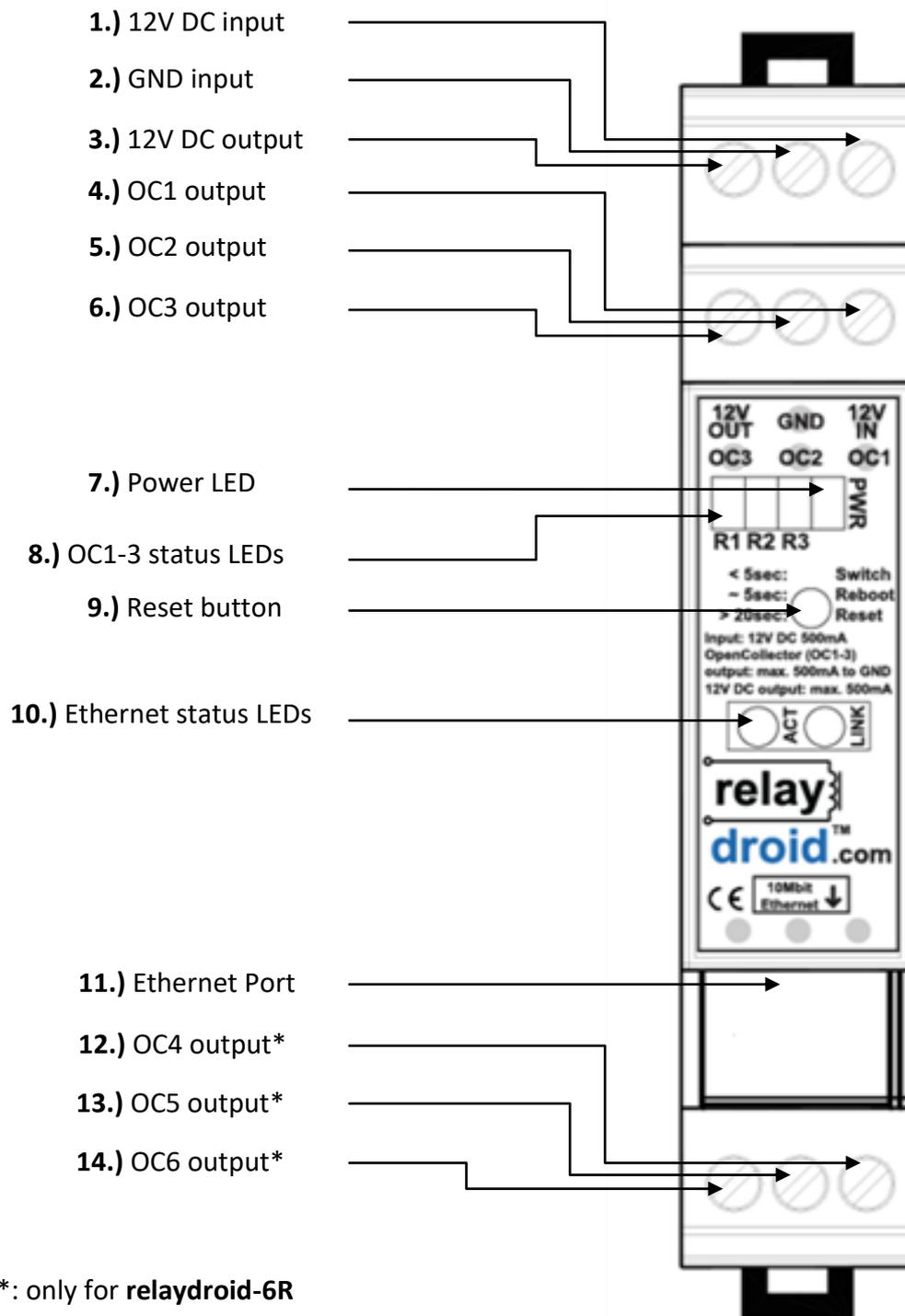


Figure 3-1: relaydroid-3R/6R device layout

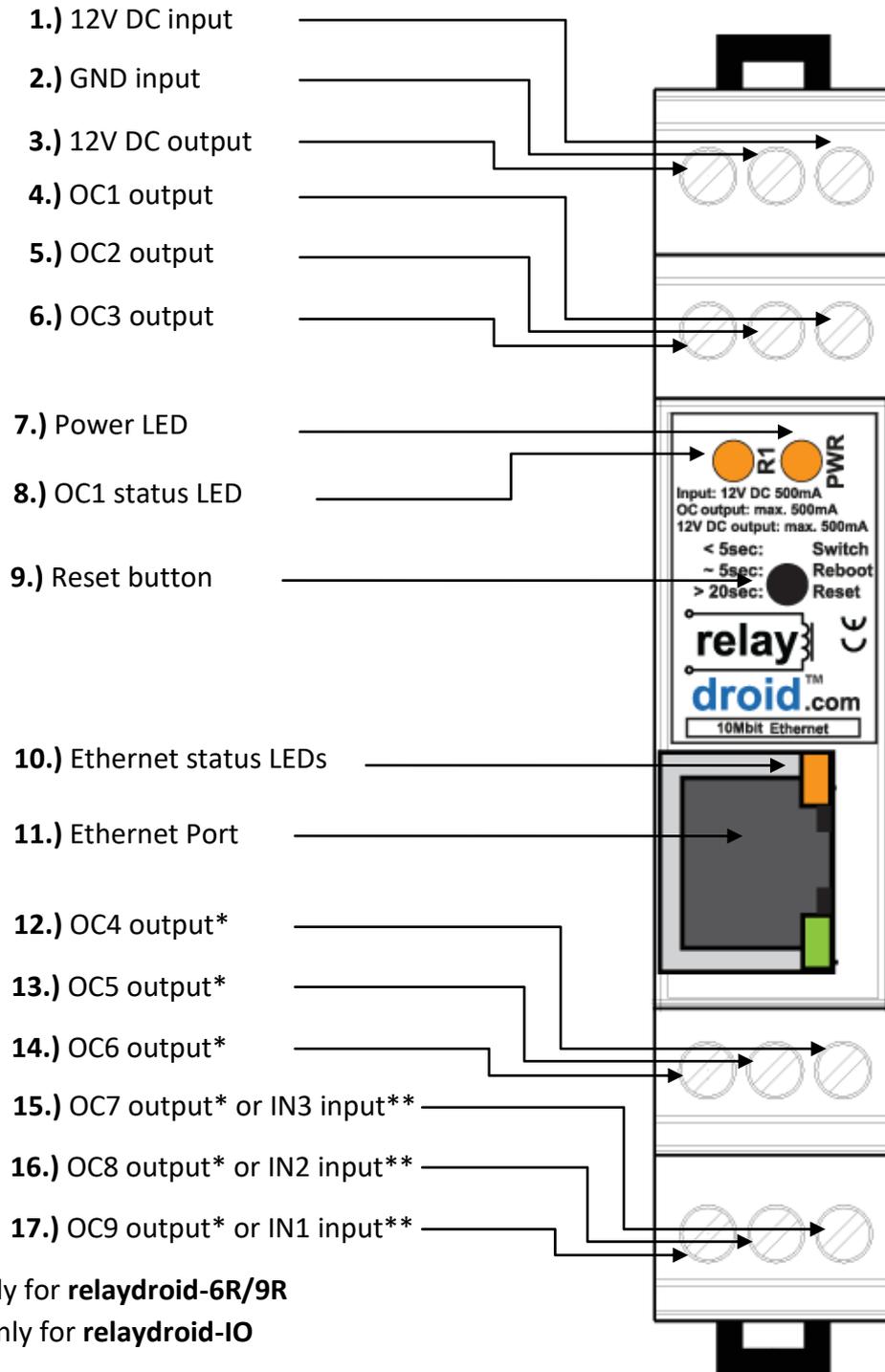


Figure 3-2: relaydroid-3R/6R/9R/IO FRONT-LAN device layout

# relay droid™

“Switch closer!”

User Manual  
v1.07  
2017.07.01.

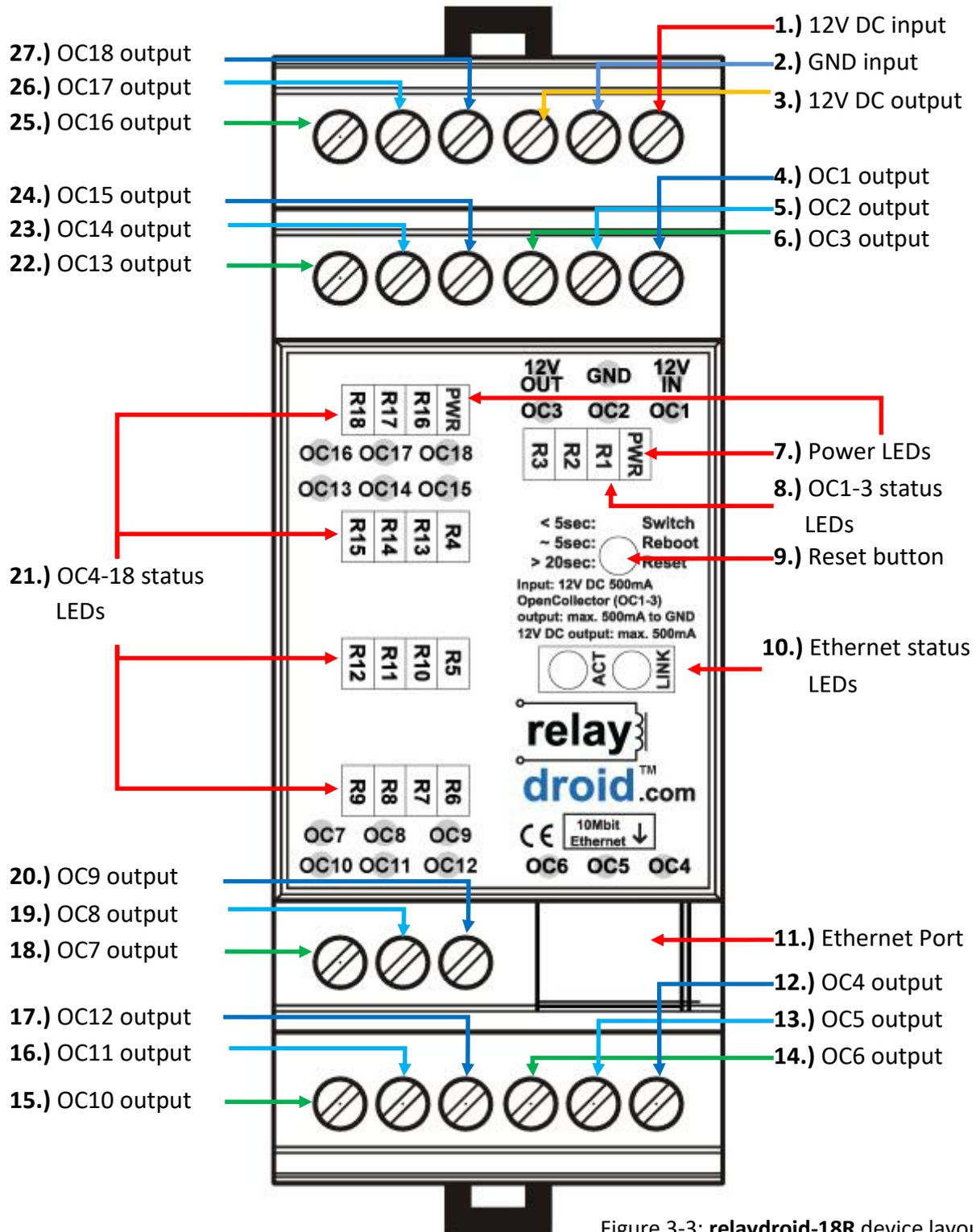


Figure 3-3: relaydroid-18R device layout

# relay droid™

“Switch closer!”

User Manual  
v1.07  
2017.07.01.

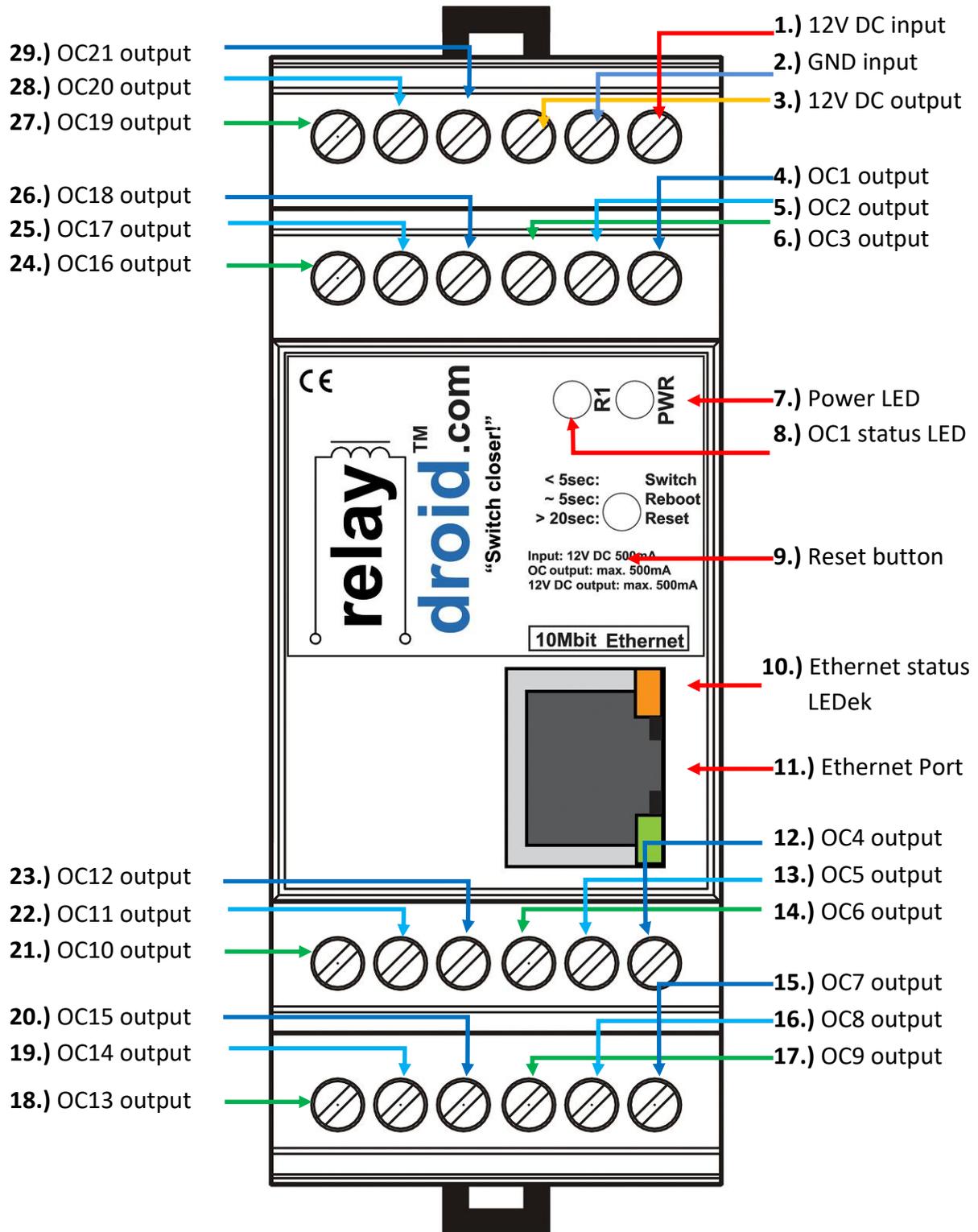


Figure 3-4: relaydroid-21R FRONT-LAN device layout

### 3.1. Connecting the LAN cable

Connect your **relaydroid™** device to a router/switch or PC Ethernet port with a common LAN cable (not included) by plugging the LAN cable into the **Ethernet Port (11.)** of the device.

### 3.2. Connecting the relays

Please note: Wrong wiring can damage the device. Always connect the relays with care. It is recommended to disconnect the power before this operation and check the wires before repowering to avoid damaging.

Please note: always use relays with the same coil voltage as the power adapter connected to the device (typically 12VDC).

**DANGER!** if you want to switch high voltages with your relays (like 230V AC) only a qualified electrician should connect the wires to avoid the risk of electric shock!

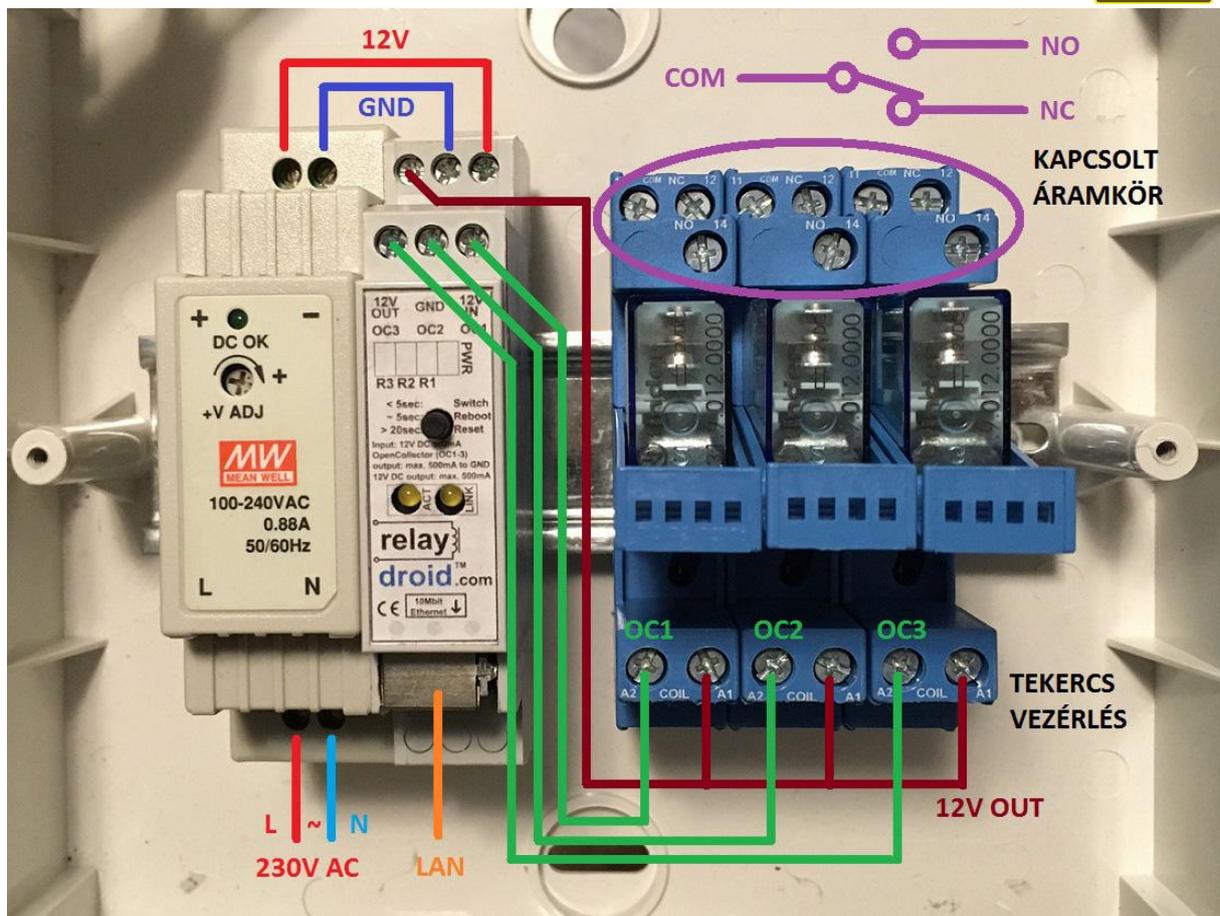


Figure 3-5: **relaydroid-3R** connections guide

The **relaydroid™** device controls relays with open-collector outputs (**OC1-21** outputs: **4-6. 12-29.**) connected to GND. This means that the output drains the current to GND if the output is ON, but does not drain any current if the output is OFF. You can use this to control the current flow over the coil of the connected relays. The corresponding **OC1-3 status led (8.)** glows if an OC output is ON.

A typical relay has two coil connection ports, commonly named as **A1+** and **A2-**. **You must always connect the negative (A2-) coil port to the OC outputs of your relaydroid™** (otherwise you damage the device). The positive port (**A1+**) can be connected to the **12V DC output (3.)** or directly to the power adapter's positive wire.

Relays without any coil protection circuits have no specific positive or negative ports (just A1 and A2) so you can choose which port to connect to the **OC output** and the **12V DC output**, but it is still recommended to connect A2 to OC and A1 to 12V DC.

### 3.3. Connecting the power adapter

Please note: It is recommended to use a 12V DC power adapter but the device can be operated with a 24V DC adapter too. If you use a 24V DC adapter the 12V DC output (3.) will be 24V DC too and you must connect relays with 24V DC coil voltage.

Connect the power adapter's +12V DC wire to the **relaydroid™ 12V DC input** port (1.), and the Ground wire (a.k.a. 0V, GND or (-)) to the **GND input** port (2.).

After you connect the power, the **12V DC output** port (3.) will be active, and the device will boot up.

**BE ADVISED! Never EVER connect alternate current or higher than 24V voltage into the device (on ANY port). It will cause the immediate destruction of the device and can cause serious personal injuries.**

### 3.4. Connecting the IN1-3 inputs (only for relaydroid-IO)

The **relaydroid-IO** device has 3 digital inputs by default. They can only be used to detect an open or closed circuit (e.g. a switch or a door sensor). **If you want to use analog inputs (e.g. to measure temperature with a sensor), please contact us \_before\_ buying the device, and we make the necessary hardware adjustments before shipping. These adjustments cannot be made remotely.**

**The digital inputs have a weak pull-up of about 2.5V DC and they can only be connected to GND or left open.** They have 2 states: ON and OFF. To detect an open or closed circuit, connect one end of the circuit to the IN1-3 input, and the other end of the circuit to GND (2.). If the circuit is closed (the input is connected directly to GND) the input state is ON. If the circuit is not closed (e.g. opened with a switch or a reed relay) the input state is OFF.

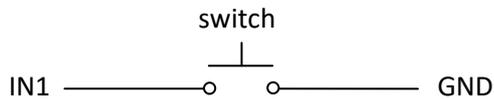


Figure 3-6: connecting **IN1-3** to detect the state of a switch (open/closed)

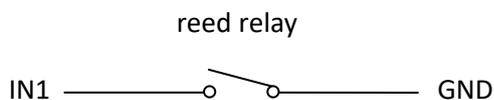


Figure 3-7: connecting **IN1-3** to detect a reed relay state (open/closed)

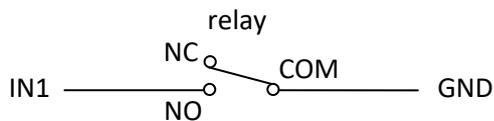


Figure 3-8: connecting **IN1-3** to detect a relay state (NO/NC, default OFF)

**BE ADVISED! Never EVER connect live wires with any voltage directly into the digital inputs. The digital inputs can only be connected to GND (0V DC) directly. Any other connections over 2.5V DC may cause the immediate destruction of the device.**

## 4. User Interface

The device has an embedded webserver with a graphical user interface that you can open with a common web browser.

### 4.1. Connecting to the device

**Please note: Connecting this device to a LAN network needs knowledge about Ethernet network configurations. If you are unfamiliar with setting up Ethernet networks please consult a network specialist!**

In order to connect to the device you must set up your network first:

- 1.) Connect the device with a common LAN cable to your router/switch or PC
- 2.) The device uses DHCP to automatically obtain an IP address.
  - 2.a) If there is no DHCP provider in your network, the device uses the following configuration by default:

Default IP: 192.168.2.201  
Default Gateway: 192.168.2.1  
Default Mask: 255.255.255.0  
Default Primary DNS: 192.168.2.1  
Default MAC address: 00-04-A3-BB-00-01

2.b) If there is a DHCP provider (e.g. a router), you must look for the given IP address in the provider. It is a good practice to set a static IP address in your DHCP provider for the device's MAC address.

2.c) If you connect directly to your PC, you must manually set the PC's IP address to the same subnet as the device.

3.) Open a web browser (e.g. Internet Explorer, Firefox, Chrome, etc.).

4.) Type in the following into the address bar and press ENTER:

`http://relaydroid_address/`

The *relaydroid\_address* is either

- the IP address (LAN or WAN)
- NetBios name (if NetBios is enabled) (only LAN)
- or the domain name (only WAN) of the device.

The default NetBios name is RELAYDROID01, and the default IP address is 192.168.2.201 on the LAN (but it can change if there is a DHCP provider). The WAN address is given by your Internet provider if your network is connected to the Internet.

5.) The login page will appear in your browser:

**relaydroid™ relay controller with web interface**

**PLEASE LOG IN**

RELAYDROID01 (RDR-401, v1.02 2015.12.01)

User:  [HUN](#) [ENG](#)

Password:

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Figure 4-1: the login page

#### 4.1.1. Connecting through the Internet

Please note: If you are unfamiliar with WAN network settings please consult a network specialist. Setting up a remote Internet connection step-by-step exceeds the limits of this manual.

In order to use the device through the Internet you must:

1. know your actual WAN IP address or use a dynamic DNS solution
2. set up a virtual server or port forwarding in your router

If you have a static WAN IP address you can simply use that to reach the device any time. If you have a dynamic WAN IP it is recommended to use a dynamic DNS solution (most routers implement some free DDNS providers).

#### 4.2. Logging in

In the login page, just type in your username and password. The default username/password is admin/admin. It is a good practice to change the default password after you first log in.

At the login page, you can change the language of the user interface by clicking on 'HUN' or 'ENG'.

You can log in as administrator using the admin username, or as a simple user using a different username. Only the admin user can change setting and set other users. Simple users can only switch the OC outputs.

If you do not press any button you will be automatically logged out after 5 minutes.

#### 4.3. User menu

If you log in as admin, you will see the *Status*, *Network*, *Settings* and *Info* menus. If you log in as a simple user, you will only see the *Status* page.



Figure 4-2: admin menu

##### 4.3.1. Status

At the Status page, you can check the states of the OC output and switch them.

The STATE column shows whether an output is ON or OFF.

You can switch an output by pressing the SWITCH ON or SWITCH OFF buttons in the CONTROL column. You can set a time limit before switching an output.

## relaydroid™ relay controller with web interface

Station: RELAYDROID01

User: [admin] [LOGOUT](#)

[STATUS](#) | [NETWORK](#) | [SETTINGS](#) | [INFO](#) | [HELP](#)

### STATUS

RELAY		STATE	CONTROL
[Relay#1]	Heating	ON	SWITCH OFF 175 sec left
[Relay#2]	Garage door	OFF	SWITCH ON for <input type="text" value="1"/> sec 0: unlimited time
[Relay#3]	Garden lights	ON	SWITCH OFF
[Relay#4]	Sprinkler	OFF	SWITCH ON for <input type="text" value="1"/> sec 0: unlimited time

[REFRESH PAGE](#)

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Figure 4-3: Status page

- If you set a positive time limit the output will be OFF automatically after the given seconds. This state is not stored in a non-volatile memory so in case of a reboot or power failure, the output will be OFF.
- If you set 0 as the time limit, the output will be ON without a time limit. This state is stored in a non-volatile memory so in case of a reboot or power failure the output will be ON after the device reboots.

#### 4.3.2. Network

You can see the actual network parameters in use and change the default network parameters at this page.

**relaydroid™** relay controller with web interface

Station: RELAYDROID01

User: [admin] [LOGOUT](#)

[STATUS](#) | [NETWORK](#) | [SETTINGS](#) | [INFO](#) | [HELP](#)

**NETWORK STATUS**

<b>ACTUAL IP:</b>	192.168.1.175 <a href="#">RENEW</a>
<b>SUBNET MASK:</b>	255.255.255.0
<b>GATEWEY:</b>	192.168.1.1
<b>PRIMARY DNS:</b>	192.168.1.1
<b>SECONDARY DNS:</b>	0.0.0.0
<b>DHCP:</b>	ON
<b>NetBios:</b>	RELAYDROID01
<b>MAC ADDRESS:</b>	00:04:A3:BB:00:01
<b>NTP* URL:</b>	pool.ntp.org
<b>NTP INTERVAL:</b>	120 min

Figure 4-4: actual network parameters

### NETWORK SETUP

<b>DEFAULT IP:</b>	192 . 168 . 2 . 201
<b>DEFAULT SUBNET MASK:</b>	255 . 255 . 255 . 0
<b>DEFAULT GATEWAY:</b>	192 . 168 . 2 . 1
<b>PRIMARY DNS:</b>	192 . 168 . 2 . 1
<b>SECONDARY DNS:</b>	0 . 0 . 0 . 0
<b>DHCP:</b>	<input checked="" type="radio"/> ON <input type="radio"/> OFF
<b>NetBios:</b>	RELAYDROID01
<b>MAC ADDRESS:</b>	00 : 04 : A3 : BB : 00 : 01
<b>NTP URL:</b>	pool.ntp.org
<b>NTP INTERVAL:</b>	120 min
<p style="text-align: center;"><b>WARNING!</b> Saving new network settings will cause a REBOOT. During REBOOT the device will not be reachable and all relays will be shut down. If the IP address is changed, don't forget to change the port forwarding (or virtual server) settings of your router too.</p> <p style="text-align: center;"><b>WARNING!</b> Wrong network settings can cause the device to stop receiving connections. If you cannot reach the home page anyway, you can try to manually reset the factory settings by pushing the "(Re)set" button on the device for more than 20 seconds, until the front led starts flashing rapidly without stopping.</p> <p style="text-align: center;">SAVE</p>	

Figure 4-5: setting up the network

To renew a DHCP given IP click on the RENEW button. This button has no effect if DHCP is OFF.

---

To change the default network configuration, change the values at the NETWORK SETUP section and click on the SAVE button.

Please note: clicking on the SAVE button causes a device reboot and time limited OC outputs will switch OFF.

WARNING: wrong network configuration can make the device unreachable. If you can no longer connect to the device, try resetting it to the factory default settings by pressing the **Reset button (9.)** on the device for more than 20 seconds (see below: 5.1. Advanced function - Using the Reset button).

#### 4.3.3. Settings

At the Settings page you can manage users, passwords and change the relay descriptions.

There is only one user with admin privileges: admin. You cannot change the admin name, but you can change the password for it.

- To create a new user, type in the name and password into a blank row.
- To change an existing user, type over the existing name with a new one and type in the new password.
- To delete a user, clear the name field.
- To change a relay description, type over the existing values. This description will appear at the *Status* page. It is a good practice to name the relays well to know what you switch.

If you leave an existing user's password field empty, the password will not be changed at save.

After you typed in the new values you must click on the SAVE CHANGES button to store them.

**relaydroid™** relay controller with web interface

Station: RELAYDROID01

User: [admin] [LOGOUT](#)

STATUS | NETWORK | **SETTINGS** | INFO | HELP

**USERS**

USER*	PASSWORD*	TYPE
admin		admin
user		user
		user
		user

\* Only users with a non-empty username and password can log in.

\* If you leave a password field blank the stored value will be kept.

**RELAYS**

RELAY #	DESCRIPTION
Relay#1	Heating
Relay#2	Garage door
Relay#3	Garden lights
Relay#4	Sprinkler

SAVE CHANGES

Figure 4-6: Settings page

#### 4.3.4. Info

Here you can see the device version, change the station name (which appears on the login screen) or reboot the device.

**relaydroid™ relay controller with web interface**

Station: RELAYDROID01      User: [admin] [LOGOUT](#)

[STATUS](#) | [NETWORK](#) | [SETTINGS](#) | [INFO](#) | [HELP](#)

**DEVICE**

<b>TIME:</b>	2015. 12. 17. 7:40:23	
<b>STATION NAME:</b>	<input type="text" value="RELAYDROID01"/>	<input type="button" value="SAVE"/>
<b>DEVICE TYPE:</b>	relaydroid RDR-401	
<b>FIRMWARE VERSION:</b>	actual: v1.02 (2015.12.01)	
<b>LAST REBOOT:</b>	18312 seconds ago	<a href="#">REBOOT NOW</a>

[REFRESH PAGE](#)

Figure 4-7: Info page

#### 4.4. Smartphone usage

You can reach the device with your smartphone browser.

Open your browser, type in the device's address and the login screen will appear. For easy access you can create a homepage icon or bookmark the address.

---

## 5. Advanced functions

### 5.1. Using the Reset button

The device has a **Reset button (9.)** which has 3 functions:

1. Switch OC outputs:

Pressing the button for a short time (<5 sec) starts the manual switching cycle and you can switch the OC outputs one after another (in order). Every time the **Power LED (7.)** blinks 1-6 times showing which OC output is the actual. After the blinking, you have 2 seconds to press the Reset Button before the next OC output follows. If you press it, the actual OC output will be switched ON (without a time limit!), if you do not press it, the actual OC output will be switched OFF. After all outputs are switched ON or OFF the device continues with its normal operation.

2. Reboot the device:

Pressing the button for about 5-6 seconds the device reboots. The reboot is indicated with 2 blinks of the Power LED. All time limited OC ON states will be OFF.

3. Reset to factory settings:

Pressing the button for a long time (>20 sec) will reset the device to the factory settings. The reset is indicated by the Power LED blinking continuously after 20 seconds of pressing. All OC outputs will be OFF.

### 5.2. Programmer API

**relaydroid**<sup>TM</sup> devices can be controlled externally from a custom program via HTTP or TCP commands. Please read the corresponding API manuals for details.