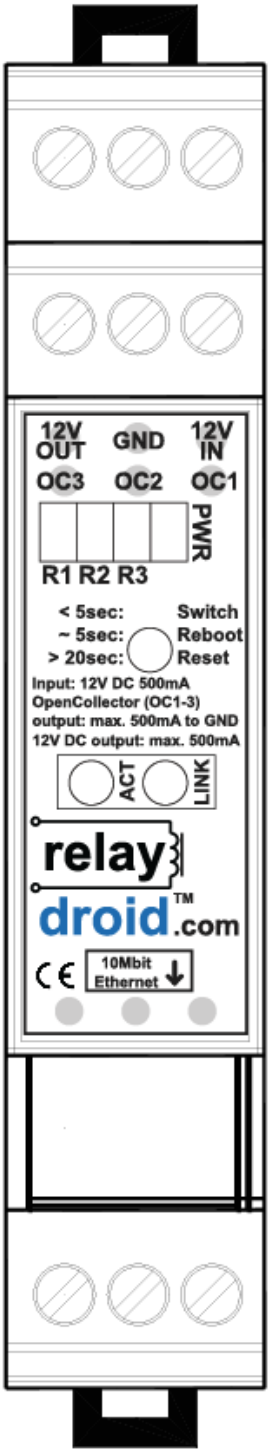
relaydroid™ User Manual

Contents



Please note: Connecting this device to a LAN network needs knowledge about Ethernet network configurations. If your 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**™ devices can be used to control relays through the Internet or LAN with a web user interface. With **relaydroid**™ 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
- **8-28V$_{DC}$ input power (the power adapter is not included)**
  - compatible with 12V$_{DC}$ and 24V$_{DC}$ 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:** 9 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 inputs, 3 analog inputs
  - **relaydroid-3D:** 3 digital inputs
  - **relaydroid-6D:** 6 digital inputs
  - **relaydroid-9D:** 9 digital inputs
  - **relaydroid-21D:** 21 digital inputs
  - **relaydroid-3R3D:** 3 open collector outputs, 3 digital inputs
  - **relaydroid-3R3A:** 3 open collector outputs, 3 analog inputs

  - open collector outputs can be used to control relays or as a remote "button" (max. 500mA)
  - output states are stored in non-volatile memory (in case of power failure)
  - can be switched on/off for a given time (switch 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, etc.)
  - with a PC browser (IE, Firefox, Chrome, Safari, 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

- **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
  - copy relay states to a remote location
- it is possible to control several **relaydroid** 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)
- **special functions can be implemented, e.g.:**
  - it is possible to use two relaydroids in pair (etc. relaydroid-3R and relaydroid-3D) to copy the state of a local relay to a remote relay[1]
  - it is possible to use the digital inputs as an impulse switch to control the local or remote relays[1]
  - it is possible to send status emails at the change of the inputs[1]
  - it is possible to PING servers and switch a relay if there is no response in the given time[1]
  - it is possible to use symmetric-key AES encryption or MD5 signature in the communication API[1]
  - it is possible to connect several devices to an Internet cloud server and control all devices from one place[1]
  - **[1]:** please ask for these special functions at the time of order!
- **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 digital inputs, 3 analog inputs (17.5mm narrow case)
- **relaydroid-3D:** 3 digital inputs (17.5mm narrow case)
- **relaydroid-6D:** 6 digital inputs (17.5mm narrow case)
- **relaydroid-9D:** 9 digital inputs (17.5mm narrow case)
- **relaydroid-21D:** 21 digital inputs (35mm wide case)
- **relaydroid-3R3D:** 3 open collector outputs, 3 digital inputs (17.5mm narrow case)
- **relaydroid-3R3A:** 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
- Recommended input voltage: 12VDC - 24VDC
- Operational input voltage ranges: min. 8VDC, (typ. 12VDC), max. 28VDC
- Input current requirements:
  - **relaydroid-3R, relaydroid-6R, relaydroid-9R, relaydroid-3R+COM, relaydroid-IO, relaydroid-xD, relaydroid-3R3D, relaydroid-3R3A:** 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 Mbit compatible, RJ-45 port, 10Mbit
- Implemented network protocols: TCP/IP, UDP, HTTP, NTP, NetBios, DHCP, DNS, ICMP (PING), SMTP (email)
- 4 LED: 1 power status + 2 Ethernet status + 1 OC1 output status LED
- 1 button, used to: switch outputs on/off, reboot, reset to factory settings
- Temperature rating min/max: -25/+60 Celsius

2.3. Layout and dimensions

17.5mm narrow case models

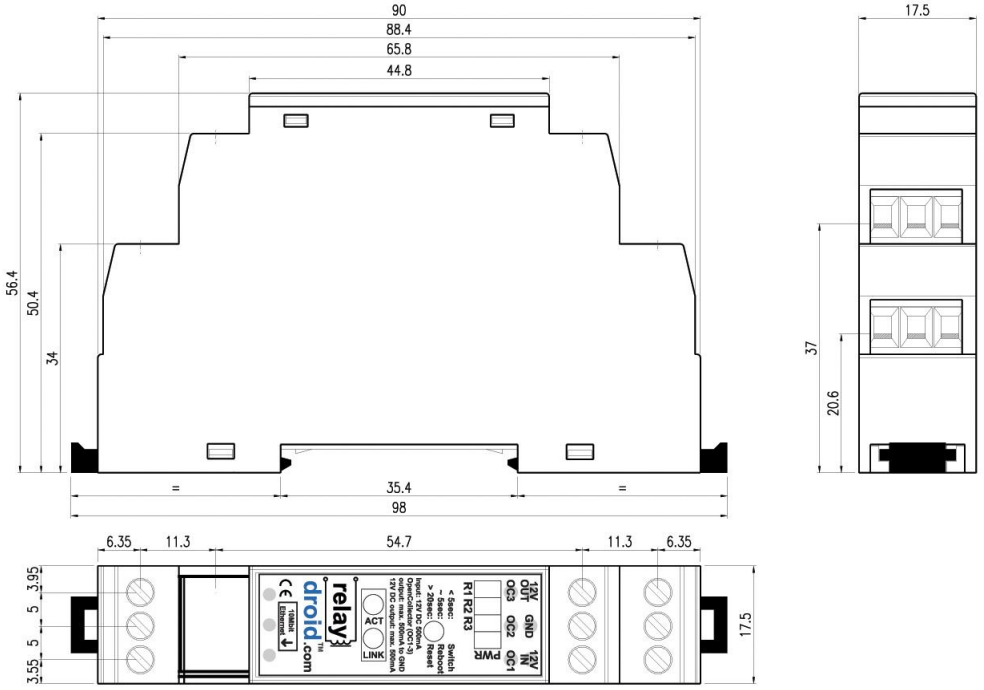


Figure 2-1: device dimensions (17.5mm wide)

35mm wide case models

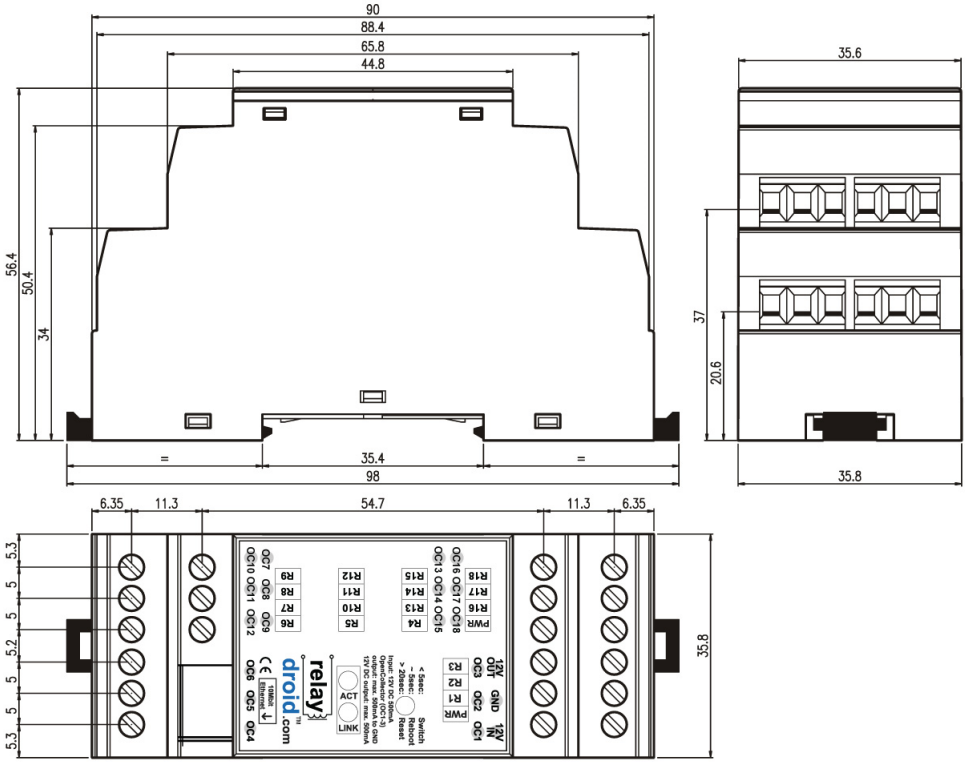
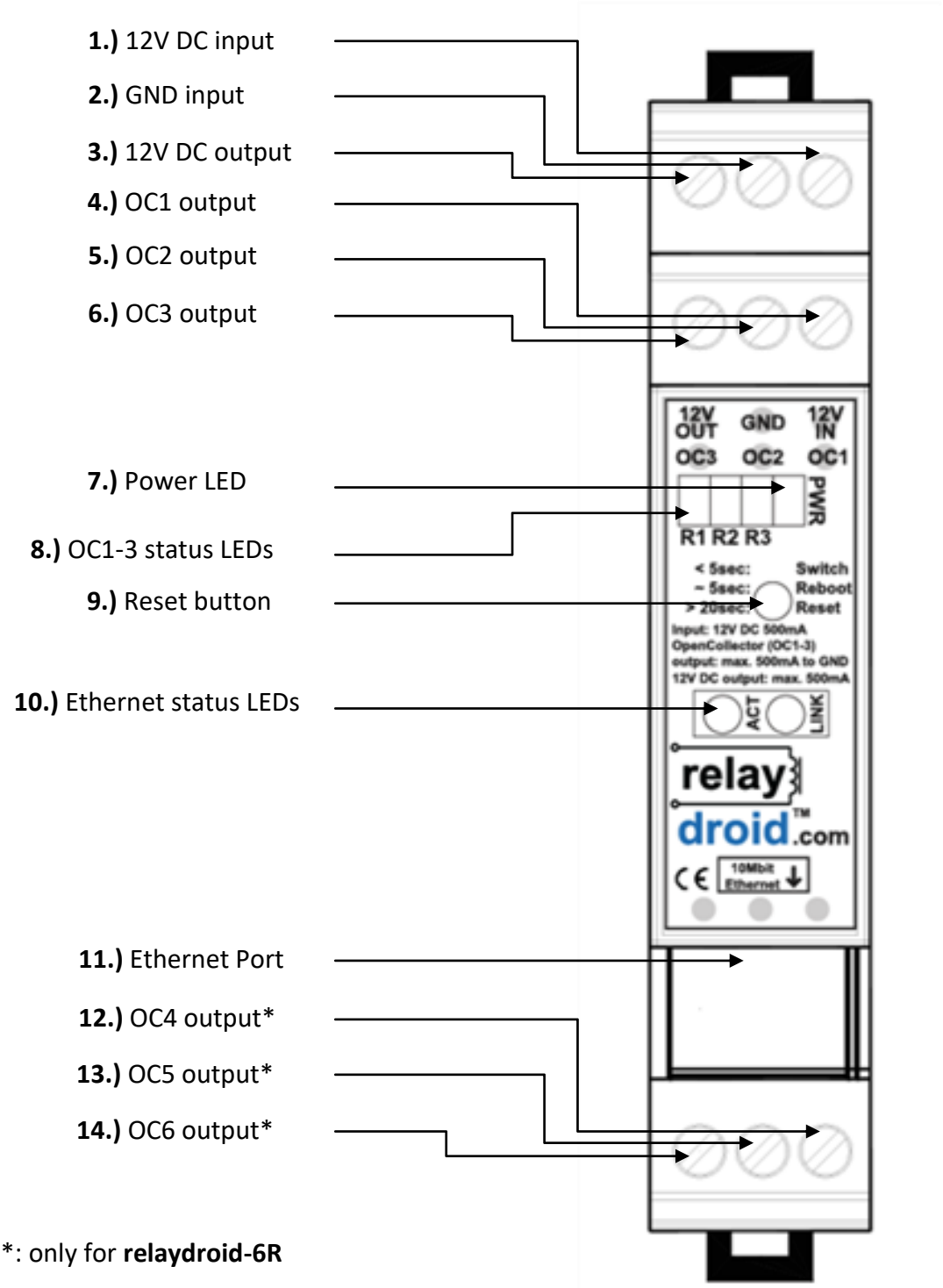


Figure 2-2: device dimensions (35mm wide)

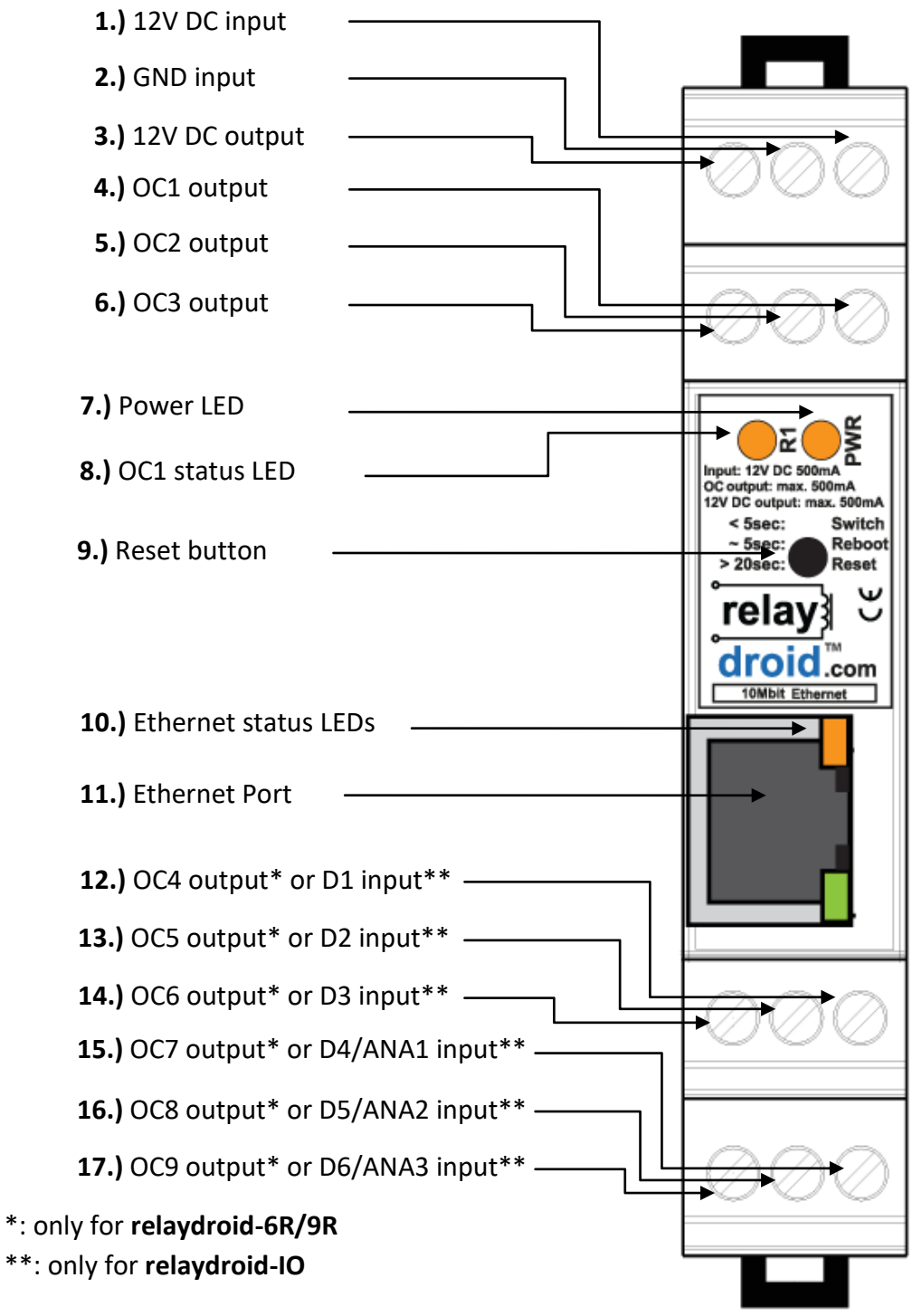
3. External connections, buttons, leds

NOTE: The layout, location and order of the connection PINs and LEDs can be rearranged without prior notice. Always refer to the labels on your device to determine a PIN or LED function!



*: only for **relaydroid-6R**

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



*: only for **relaydroid-6R/9R**
: only for **relaydroid-IO

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

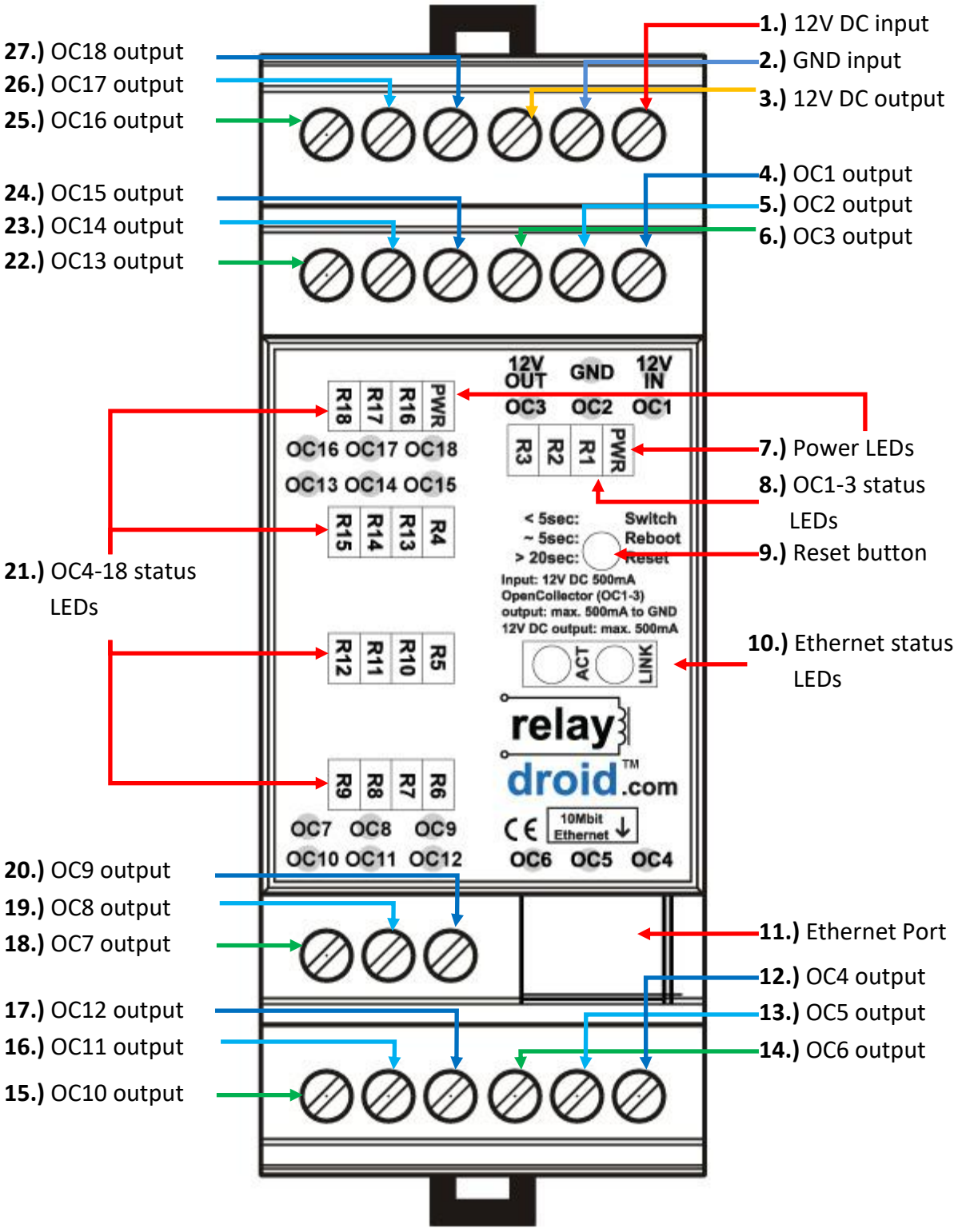


Figure 3-3: **relaydroid-18R** device layout

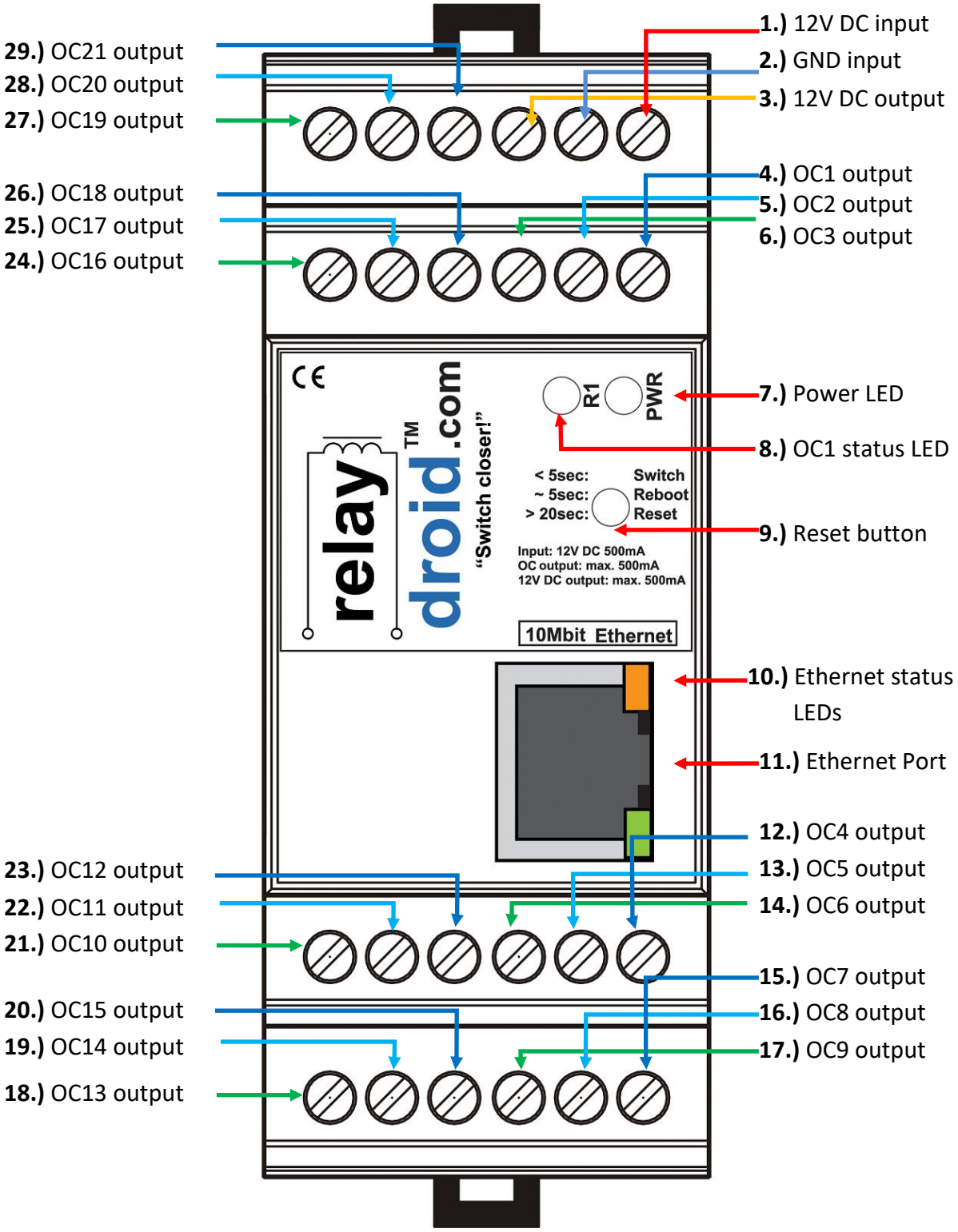


Figure 3-4: **relaydroid-21R FRONT-LAN** device layout

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 (OCx)

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 re-powering 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!

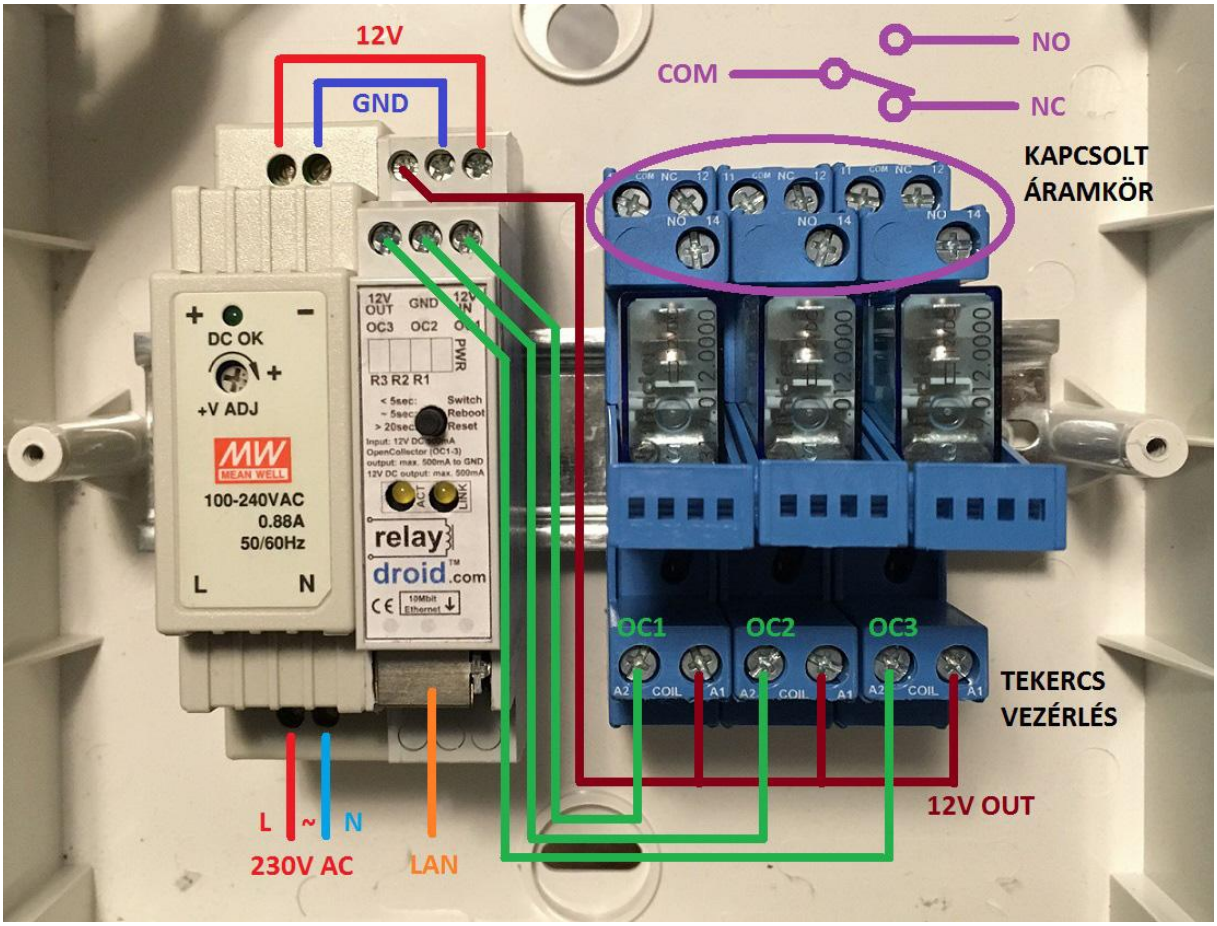


Figure 3-5: **relaydroid-3R** connections guide

The **relaydroid**™ device controls relays with open-collector outputs (**OC1-21** outputs) 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 if 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 **12VDC output** (**3.**).
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 **12VDC output**, but it is still recommended to connect A2 to OC and A1 to 12VDC.

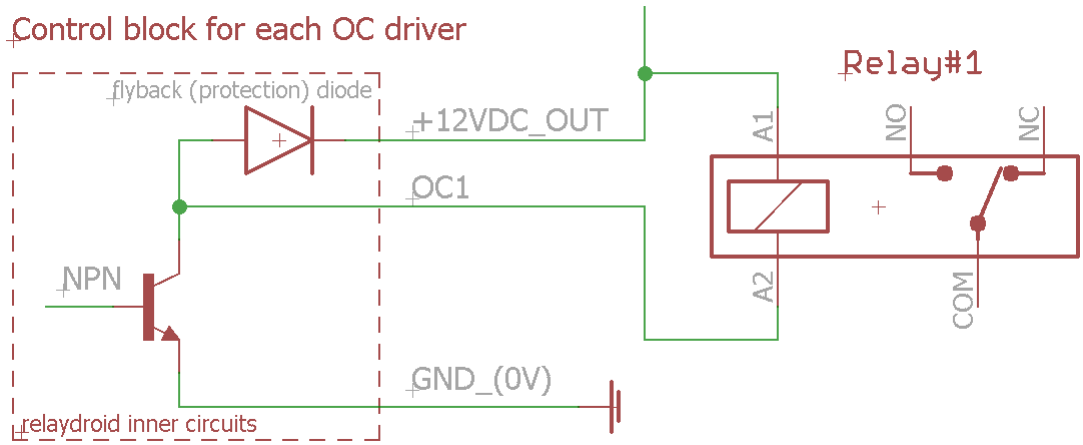


Figure 3-6: control block for each OC driver

3.3. Connecting the power adapter

Please note: It is recommended to use a 12VDC power adapter but the device can be operated with a 24VDC adapter too. If you use a 24VDC adapter the 12VDC output (3.) will be 24VDC too and you must connect relays with 24VDC coil voltage.
Connect the power adapter's +12VDC wire to the **relaydroid™ 12VDC 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 **12VDC output** port (**3.**) will be active, and the device will boot up.
BE ADVISED! Never EVER connect alternate current or higher than 28VDC voltage into the device (on ANY port). It will cause the immediate destruction of the device and can cause serious personal injuries.

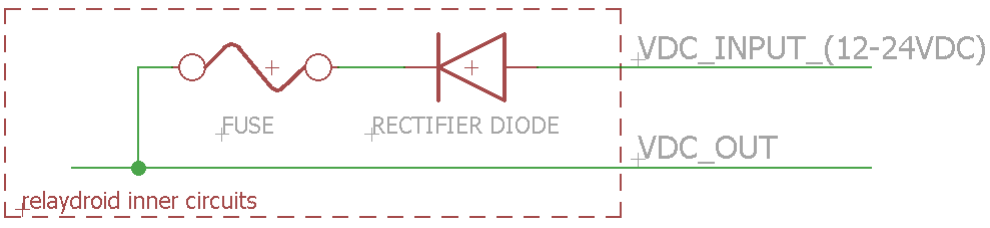


Figure 3-7: VDC input and output

3.4. Connecting the digital inputs (Dx)

Some relaydroid devices (like **relaydroid-3D**) have digital inputs. They can only be used to detect an open or closed circuit (e.g. a switch or a door sensor).

The digital inputs have a weak pull-up of about 2.5VDC 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 D1-9 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.

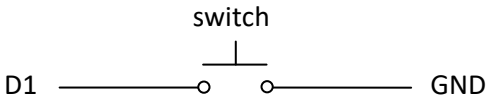


Figure 3-8: connecting **D1** to detect the state of a switch (open/closed)

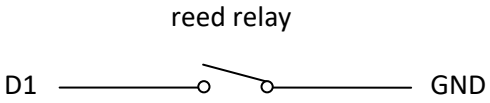


Figure 3-9: connecting **D1** to detect a reed relay state (open/closed)

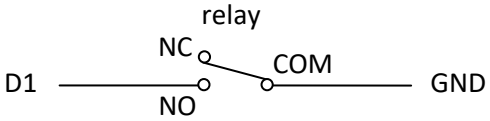


Figure 3-10: connecting **D1** to detect a relay state (NO/NC, default OFF)

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

3.5. Connecting the analog inputs (Ax)

Some relaydroid devices (like **relaydroid-IO**) have analog inputs. They can be used to measure the voltage between 0VDC and the connected wire. **The measured circuit must have the same common GND (0VDC) as the relaydroid and the voltage must not exceed 35VDC or the device can be destroyed!**

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 your 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:

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-*xx*-*yy* (the values of *xx* and *yy* are written on the device)

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, Safari, etc.).

4.) Type 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 RELAYDROID*xxyy* (values of *xx* and *yy* are written on the device), 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.

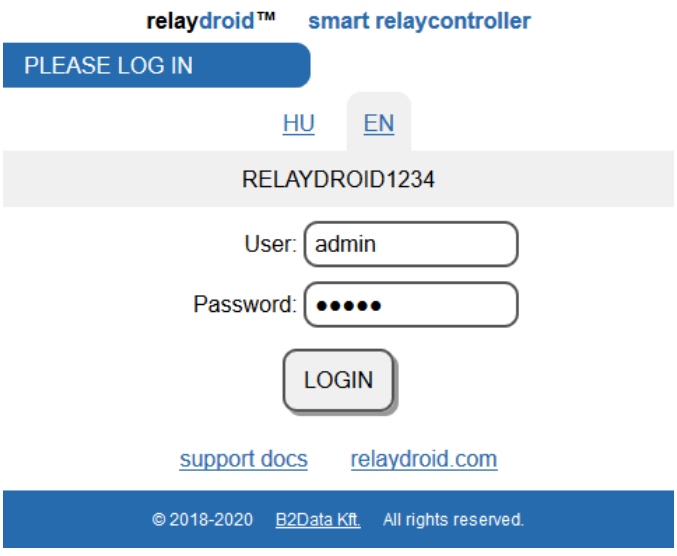


Figure 4-1: the login page

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 access 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, or create a VPN network.

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).

Some Internet providers do not give a personal WAN IP address at all. Instead, they might put you behind a local subnet and might not allow any direct incoming connections. Contact your Internet provider if you are not sure about your Internet accessibility.

4.2. Logging in

In the login page, 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 (see *SETTINGS > USERS AND PASSWORDS*).

At the login page, you can change the language of the user interface by clicking on 'HU' or 'EN'. The default language can be set in *SETTINGS > DEVICE SETTINGS*.

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 and watch the input states.

4.3. User menu

If you log in as admin, you will see the *CONTROL*, *NETWORK* and *SETTINGS* menus. If you log in as a simple user, you will only see the *CONTROL* page.

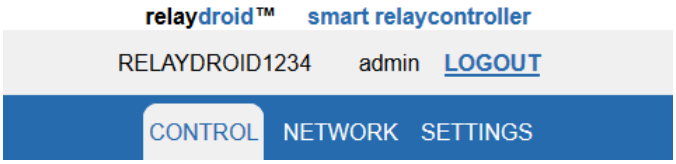


Figure 4-2: admin menu

4.3.1. CONTROL page

At the *CONTROL* page, you can:

- check the states of the OC outputs and switch them
- check the digital input states, clear events
- check the analog input states
- check the PING MONITOR function

Values are automatically refreshed every 30 seconds.

4.3.2. CONTROL - OC outputs

You can see the OC status boxes as shown below in **Figure 4-3-1**.

The status box is RED if the output is OFF, and GREEN if the output is ON. You can switch an output by pressing the SWITCH ON or SWITCH OFF buttons. You can set a time limit before switching. If a time limit was set, the remaining time can be seen below the SWITCH button.

a) 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.

b) 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 stay ON after the device reboots.

The OC names can be set in *SETTINGS > INPUTS/OUTPUTS*.

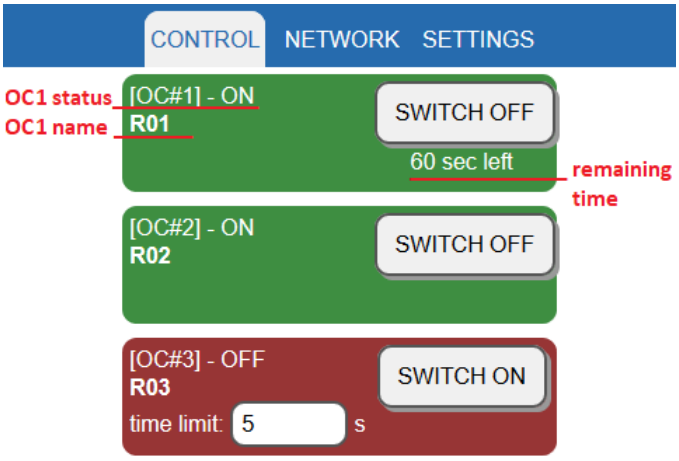


Figure 4-3-1: CONTROL page - OC outputs

4.3.3. CONTROL - Digital inputs

You can see the digital input status boxes as shown below in **Figure 4-3-2**.

The status box is GREY if the input is OFF (not connected to GND), and ORANGE if the input is ON (connected to GND).

The input names can be set in *SETTINGS > INPUTS/OUTPUTS*.

You can see if an unprocessed event occurred, and clear the event with the CLEAR button. Events are cleared automatically after they are processed by:

- impulse switches (see *SETTINGS > INPUTS/OUTPUTS*)
- status email sending (see *SETTINGS > SMTP SETTINGS*)
- a connected relaydroid (see *SETTINGS > CONNECTED RELAYDROID*)

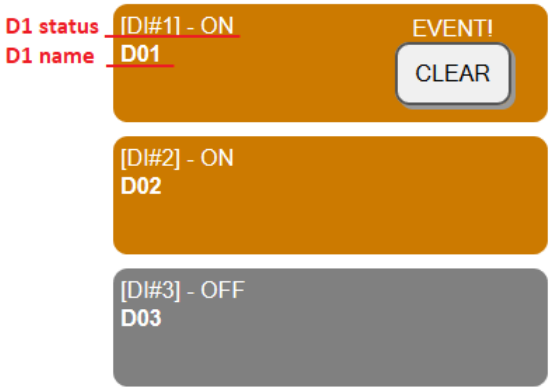


Figure 4-3-2: CONTROL page - digital inputs

4.3.4. CONTROL - Analog inputs

You can see the analog input status boxes as shown below in **Figure 4-3-3**.

The status bar can be RED, YELLOW or GREEN depending on the limits set in *SETTINGS > ANALOG CALIBRATION*.

The input names can be set in *SETTINGS > INPUTS/OUTPUTS*.

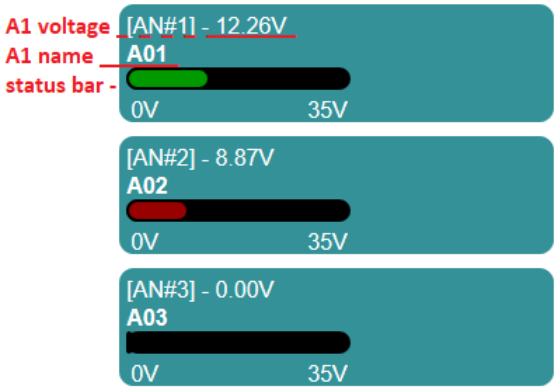


Figure 4-3-3: CONTROL page - analog inputs

4.3.5. CONTROL - PING MONITOR function

You can see the PING MONITOR status boxes as shown below in **Figure 4-3-4**.

You can read:

- how many seconds ago was the last successful ping (e.g: *"ok: 4 sec"*)
- what was the response time of the last ping:
  - *"2 msec"*: response time was 2 millisec
  - *"timed out"*: the last ping request timed out
  - *"startup"*: not pinging during startup time
  - "-": ping disabled

You can change the PING MONITOR parameters in *SETTINGS > PING MONITOR*.

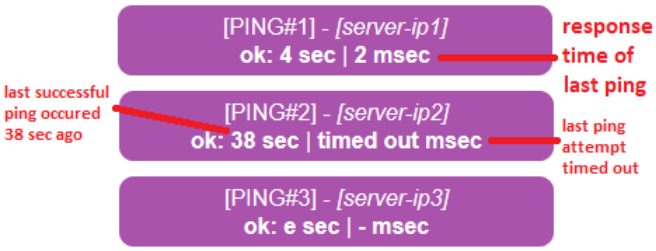


Figure 4-3-4: CONTROL page - PING MONITOR

4.3.6. NETWORK page

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

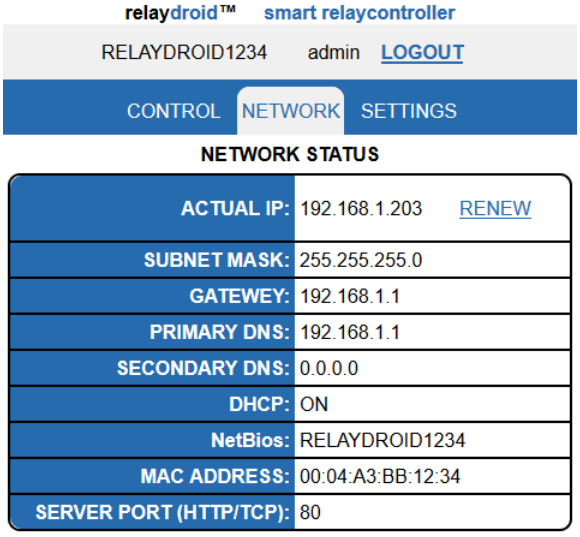


Figure 4-4: actual network parameters

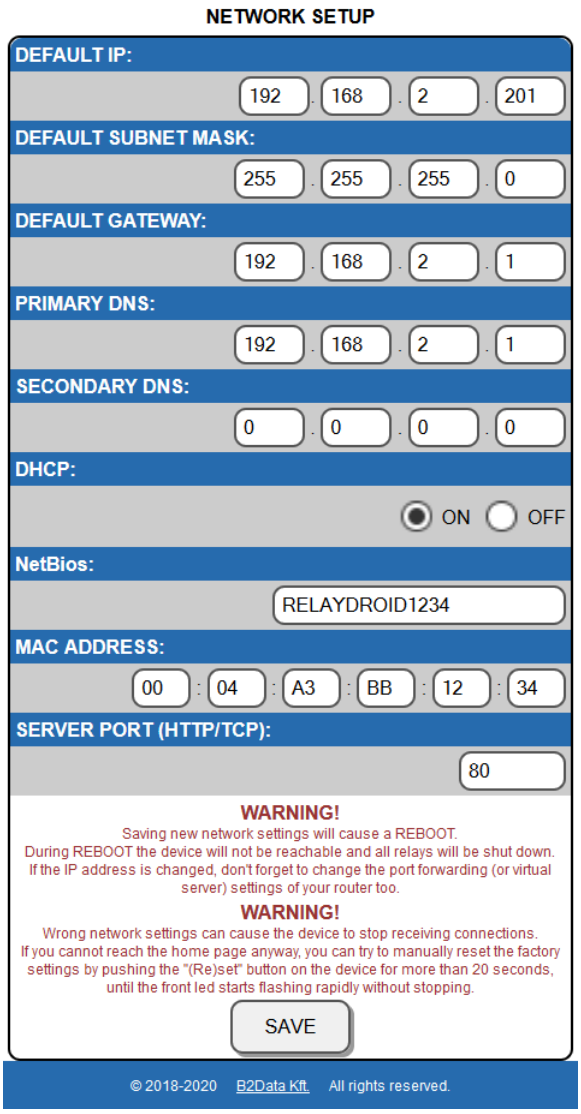


Figure 4-5: setting up the network

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 functions - Using the Reset button).

4.3.7. SETTINGS page

At the *SETTINGS* page you can set device and module parameters.

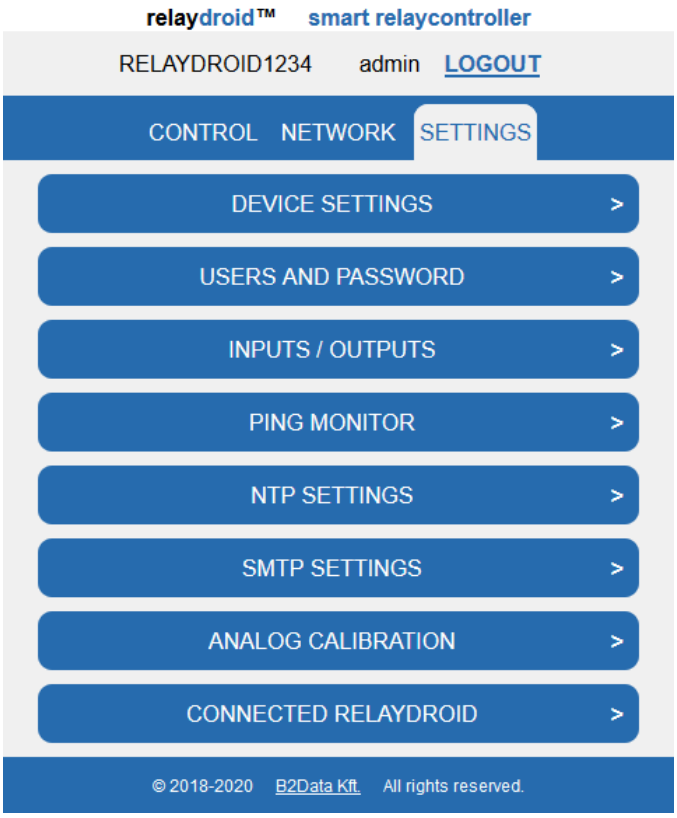


Figure 4-6: SETTINGS page

4.3.8. SETTINGS > DEVICE SETTINGS

- **TIME:** NTP local time (see *SETTINGS > NTP SETTINGS*). NTP is disabled by default.
- **DEVICE TYPE**
- **FIRMWARE VERSION**
- **EMBEDDED WEBPAGE:** the version of the embedded webpage. Here you can upload a new version.
- **SERIAL NO.:** the unique serial number of the device
- **LAST REBOOT:** here you can see how many seconds have passed since the last reboot, and you can *REBOOT NOW* the device by pressing the button.
- **STATION NAME:** this name is shown on the login page to identify the relaydroid.
- **DEFAULT LANGUAGE:** you can change the default language here.

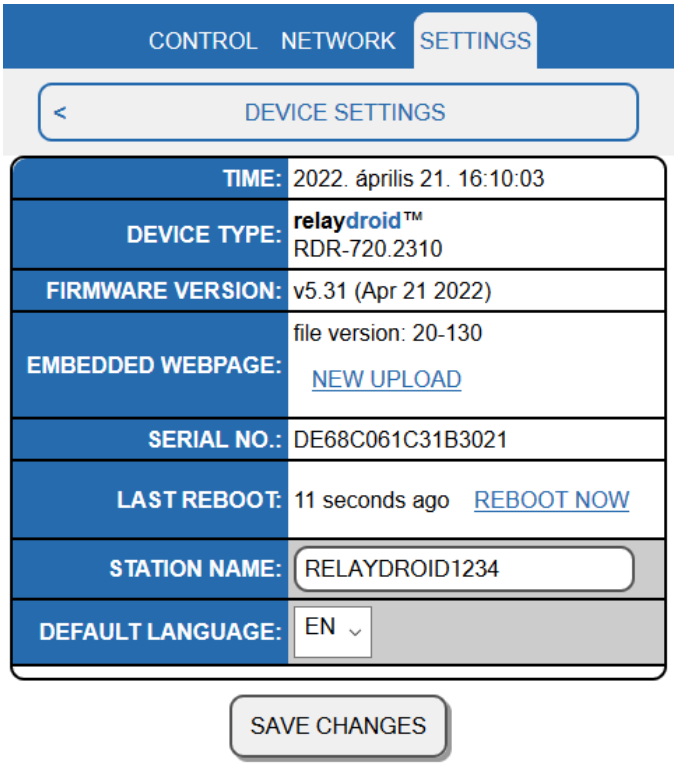


Figure 4-6-1: SETTINGS > DEVICE SETTINGS

4.3.9. SETTINGS > USERS AND PASSWORDS

There are 4 users:

- **admin# (only web):** the admin has full access to the entire embedded interface including the *CONTROL*, *NETWORK* and *SETTINGS* pages. It cannot be disabled. Strong password must be set. If you forget the password you lose access to the device, and you must reset the device to factory settings.
- **user#1 (web+API):** this user has full access to the *CONTROL* page and it can be used to control the device through the programming API. If the name is empty, this user and the programming API are disabled. Using strong password is recommended.
- **user#2 (only web):** this user has limited access to the *CONTROL* page. If the name is empty this user is disabled. You can set which inputs/outputs this user can see or control.
- **user#3 (only web):** *see user#2 description*.

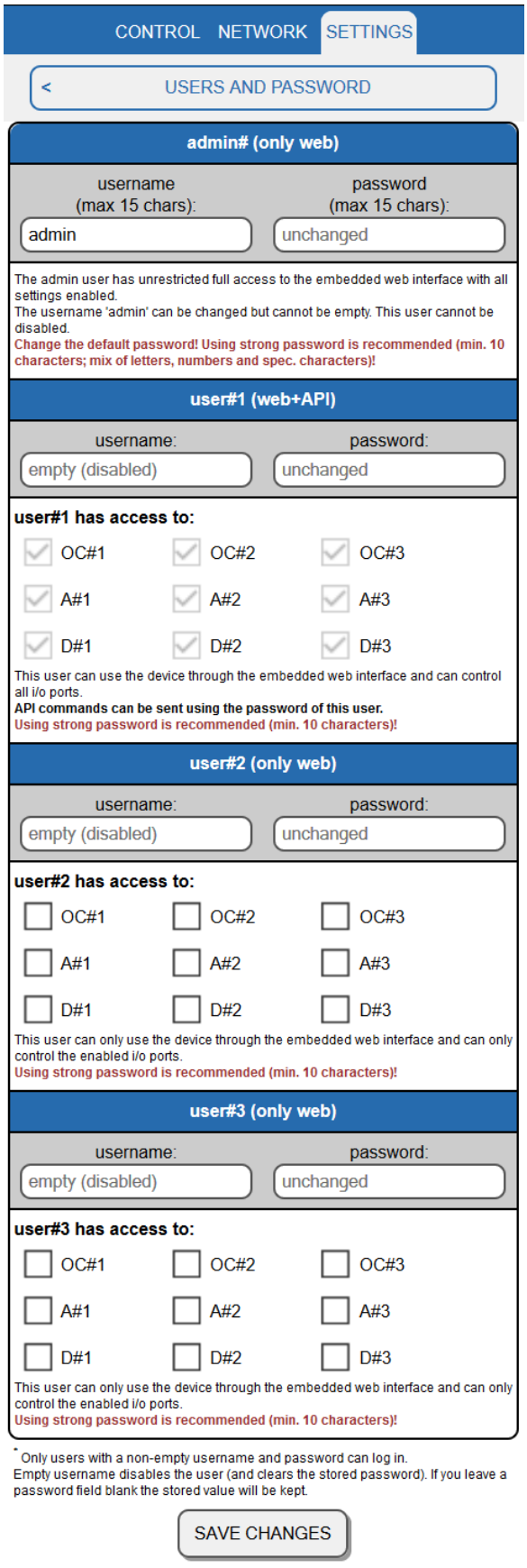


Figure 4-6-2: SETTINGS > USERS AND PASSWORDS

4.3.10. SETTINGS > INPUTS / OUTPUTS

- **OC section:** you can set the name of the OC outputs and the default timeout when switching ON from the *CONTROL* page. DEF.TIME=0 means there is no timeout.
- **IN section:** you can set the name of the digital/analog inputs and you can read the actual raw values. Digital inputs can be 0 or 1, analog inputs can have a raw value between 0 and 4095. The analog input raw value can be used for calibration (see *SETTINGS > ANALOG CALIBRATION*)
- **IMPULSE SWITCHES:** By checking the IMPULSE SWITCHES the selected inputs work as an impulse switch for the same OC output. This function can be used to control the relays with a push-button. Pushing a connected push-button causes a state-change for the same OC output (ON⇒OFF, OFF⇒ON)
- **HEARTBEAT FUNCTION:** you can set up heartbeat monitoring for the OC outputs. If heartbeat is enabled, switching the selected OC is disabled from any other source, and if no heartbeat is received through the API for the given TIMEOUT, the selected OC will be switched according to MODE.

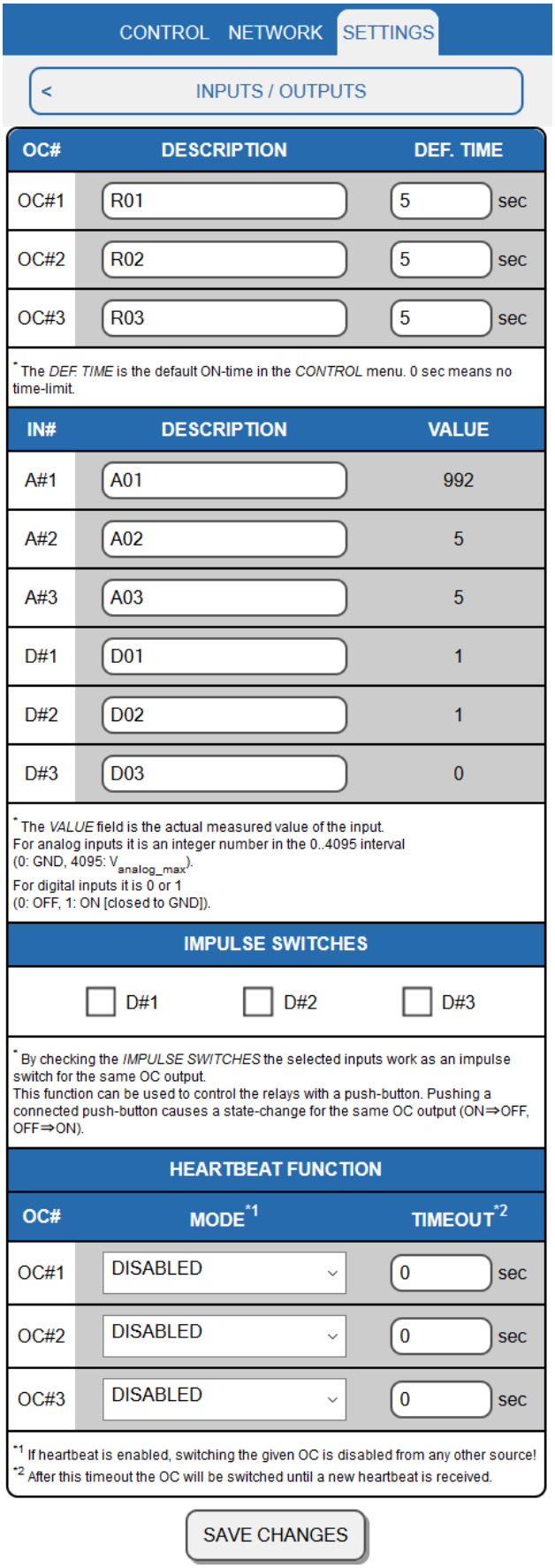


Figure 4-6-3: SETTINGS > INPUTS / OUTPUTS

4.3.11. SETTINGS > PING MONITOR

The *PING MONITOR* sends echo requests to the given addresses. If there is no answer from any location before the timeout (set in *OC1# ACTIVATION*), the *OC#1* port activates for *OC#1 ON-TIME* sec. After activation (or on device restart) the monitor start only after *PING START* sec. This way if the *OC#1* activation results in rebooting a router/modem, the router has enough time to rebuild the Internet connection before the *PING MONITOR* starts again.

The *PING RATE* sets the time between echo requests, the *ECHO TIMEOUT* sets the waiting time for an answer.

The ping of the addresses are not concurrent, they are pinged one after another.

PING ADDRESS can be a domain name (max. 15 characters) or and IP address.

The manual activation of *OC#1* also restarts the *PING START* timer.

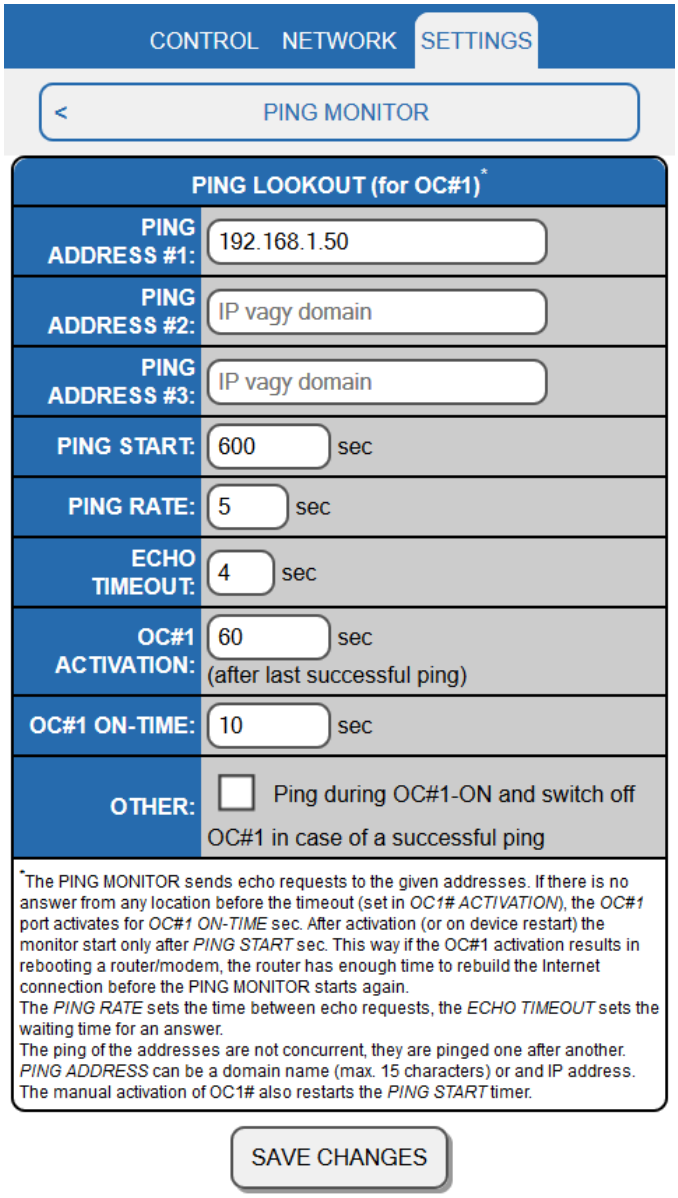


Figure 4-6-4: SETTINGS > PING MONITOR

4.3.12. SETTINGS > NTP SETTINGS

If you enter a valid *NTP URL*, the internal clock of the device will be synchronized with the Internet time periodically (the period is set by the *NTP INTERVAL* value). You can disable NTP by leaving the *NTP URL* empty or by setting the *NTP INTERVAL* to 0.

NTP is disabled by default. You need to enable NTP only if you want to send emails with SMTP (see *SETTINGS > SMTP SETTINGS*).

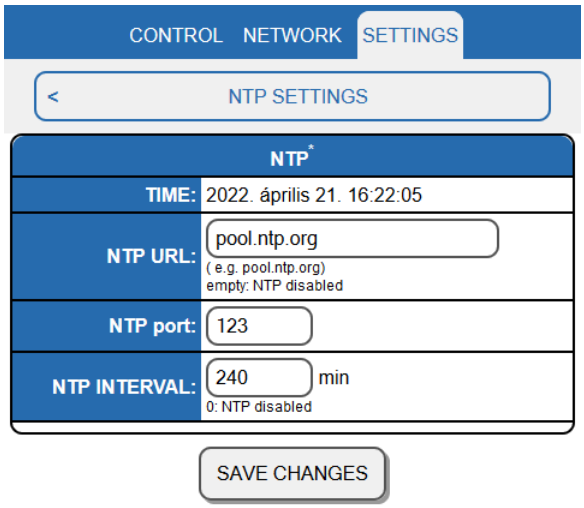


Figure 4-6-5: SETTINGS > NTP SETTINGS

4.3.13. SETTINGS > SMTP SETTINGS

If you set up an SMTP server, the device can send an email every time a digital input changes.

- **SERVER:** the address of the SMTP server (IP or domain)
- **PORT:** the port of the SMTP server (SSL is NOT supported!)
- **USER and PASSWORD:** the authentication values for connecting to the SMTP server
- **FROM:** the email address of the sender
- **TO:** the email address of the recipient
- **SUBJECT:** the subject of the email
- **TRIGGERED INPUTS:** which inputs should trigger the sending
- **MIN. TIME BETWEEN SEND:** the minimum time that must be elapsed before sending a new email. If an input changes more than once during this time, only the latest state will be sent after the min. time elapsed.

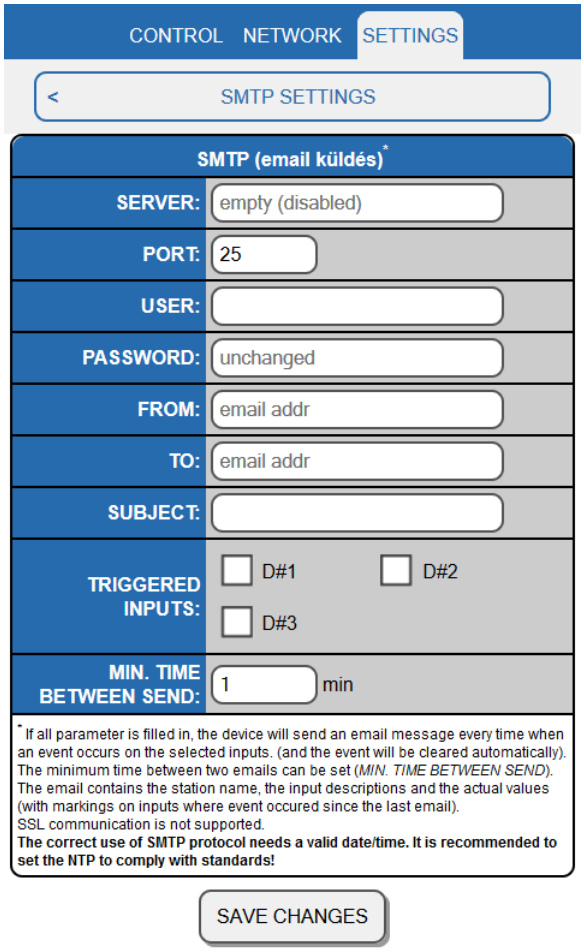


Figure 4-6-6: SETTINGS > SMTP SETTINGS

4.3.14. SETTINGS > ANALOG CALIBRATION

Here you can calibrate the analog sensor and set the color ranges of the status bar in the *CONTROL* page.

You can read the RAW values in *SETTINGS > INPUTS/OUTPUTS*.

To calibrate the sensor:

1. connect GND to the analog pin.
2. read the measured raw analog value of GND in *SETTINGS > INPUTS/OUTPUTS*
3. enter this value to the *0V RAW VALUE* field.
4. disconnect GND from the analog pin
5. connect 12VDC to the analog pin
6. read the measured raw analog value of 12VDC in *SETTINGS > INPUTS/OUTPUTS*
7. enter this value to the *12V RAW VALUE* field.

Status bar color settings:

- RED: if the measured Voltage is below this value, the status bar will be RED.
- YELLOW: if the measured Voltage is below this value but over the RED value, the status bar will be YELLOW
- GREEN: the stats bar will be GREEN if the measured Voltage is over the YELLOW value. The GREEN value sets the maximum value of the status bar

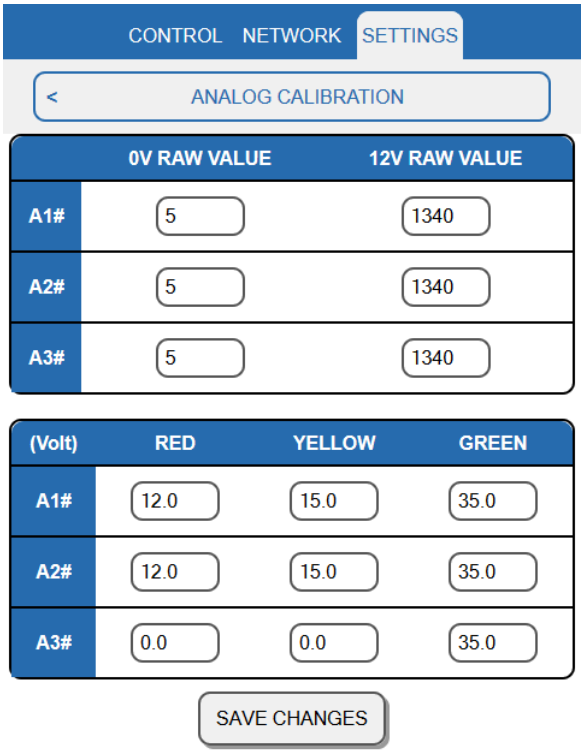


Figure 4-6-7: SETTINGS > ANALOG CALIBRATION

4.3.15. SETTINGS > CONNECTED RELAYDROID

This function can be used to copy the states of the digital inputs to the relays of a remote relaydroid or send the states to your own server.

The local relaydroid will send API messages to the remote relaydroid (or server) immediately when a digital input changes state, and the last message will be repeated periodically to indicate that the sender is up and running (see **RATE** parameter).

- **IP:** the address of the remote relaydroid (or server)
- **PORT:** the port where the relaydroid (or server) accepts connections
- **SHIFT:** the digital inputs will be shifted with this value on the remote side. D(x) will be copied to OC(x+SHIFT) on the remote relaydroid. This parameter is useful if you want to copy the inputs of several relaydroids to one remote relaydroid (e.g. copy 3pcs of relaydroid-3D to one remote relaydroid-9R) or if you do not want all of the remote relays to be controlled from here (e.g. if you set SHIFT=2 and use a relaydroid-3R + relaydroid-3D pair, you will copy only D1 to the remote relaydroid OC3 and leave OC1/OC2 intact).
- **RATE:** the last message is repeated periodically at this rate to indicate that the sender is working.

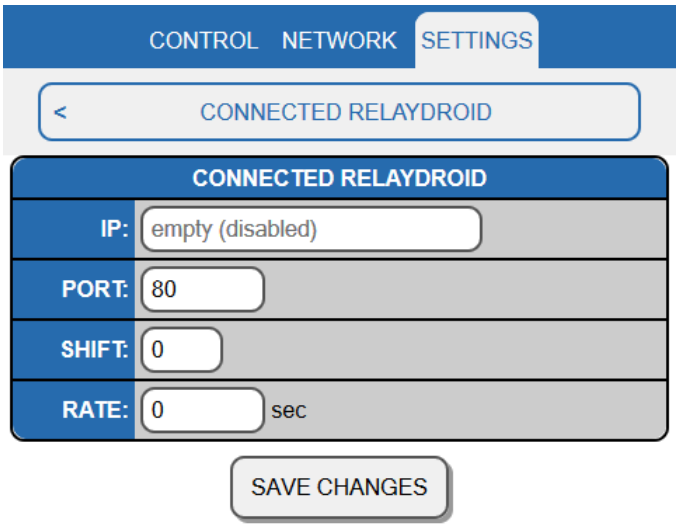


Figure 4-6-8: SETTINGS > CONNECTED RELAYDROID

4.4. Smartphone usage

You can reach the device with your smartphone browser. No additional app is needed.

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 1-9 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™ devices can be controlled externally from a custom program via HTTP or TCP commands. Please read the corresponding API manuals for details.