

The IP Relay Controller
IP LAN WEB relay with 8 relays
Item No. 230188



Safety Instructions:

This device may connect to the LAN port of your computer or router. It can be used to control external devices connected to its onboard relays. Incorrect wiring or shorts on the board can potentially cause damage to the IP Relay Controller itself, your computer's LAN controller and/or your computer's motherboard if an external voltage makes its way to the LAN interface. Extreme care must be taken when using this device to avoid any damage to your equipment. In particular, make sure you always disconnect the device from the LAN port as well as any other power source when working with the device.

Disclaimer:

ALPHATECH TECHNOLOGIES s.r.o., its shareholders, employees, suppliers, distributors and/or resellers are not liable for any damage or loss of data as a result of the use of this device, including special, incidental, or consequential damages resulting from the use of this device, or under any legal theory, including lost profits, downtime, goodwill, damage to or replacement of equipment or property, and any costs of recovering or reproducing any data stored in computers connected to this device. Your use of this IP Relay Controller device indicates your acceptance of these terms.



Introduction:

The web-based **IP Relay Controller** module with 8 relays is a versatile product for controlling electrical and electronic devices remotely via a web browser or http commands. Ease of use and wider operating system compatibility are the primary goals behind the product's design. The simplicity of connection and settings allows users to control and manage relays via a web browser. For skilled users, this module can be controlled by writing programs in various programming languages and controlled via TCP/IP protocol using http commands.

Some of the possible uses of the module include:

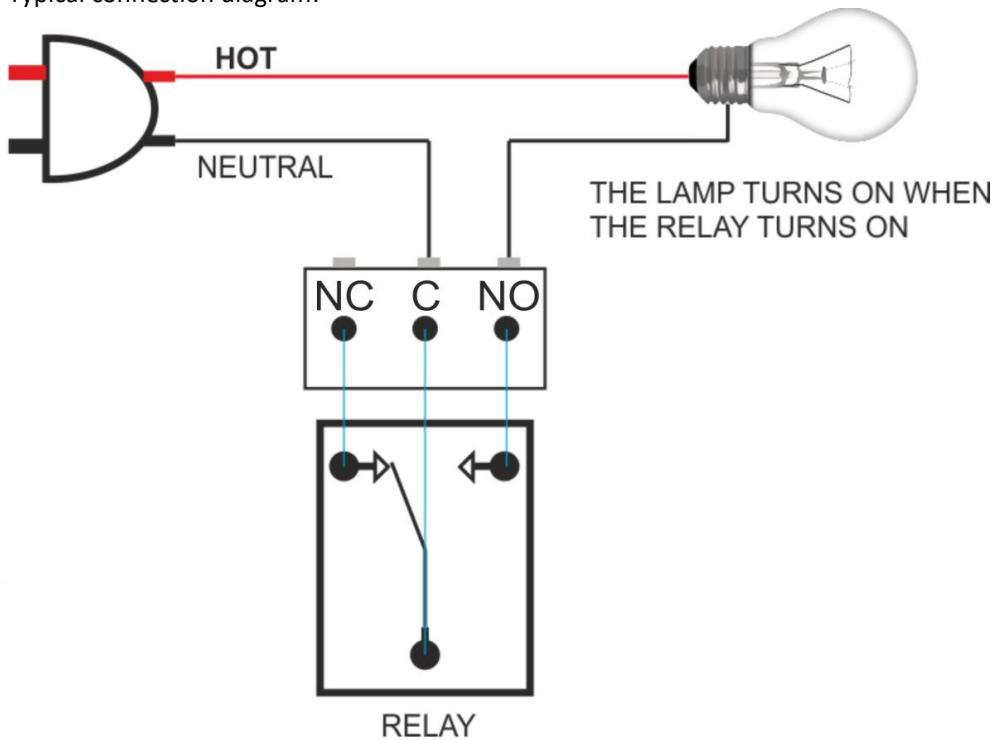
- Seamless remote control of its relays via the setup menu of IP intercoms of ALPHATECH TECHNOLOGIES using http commands
- Home Automation
- Lighting Control
- Garden Equipment Control
- Industrial Automation
- Test Fixtures
- DIY and Hobby

Basic technical description:

- Number of Relays: 8
- Rated voltage: 9 -24V DC
- Relay switching power: 15A/24VDC (125VAC) 10A/250VAC
- Communication: LAN Interface
- Dimension: 149mm x 110mm x 25mm (connectors mounted)



Typical connection diagram:



The above image shows a basic connection diagram that can be used in most situations. The connection diagram is the same for both AC and DC loads. Please make sure to use a freewheeling diode or snubber circuit if the load is inductive. More details about using inductive loads are available later on in this document. It is important to make sure that the wires used to connect loads are sufficiently rated to handle the expected load current. Exercise caution while working with high voltages. Short circuits can cause damage to the IP Relays Controller module and also to your PC. The following sections identify individual connections in detail.

IMPORTANT NOTE

This IP Relays Controller circuit involves high voltage AC main power wiring when used to control high voltage AC devices. Please note that handling, testing, and operating high voltage AC-powered equipment can be dangerous and fatal when basic safety rules are not followed. ALWAYS disconnect the IP Relay Controller circuit from the AC line prior to performing any work on the IP Relay Controller circuit.

If you are inexperienced or not confident in working with high voltage AC powered circuits, we strongly recommend that you DO NOT attempt to use this IP Relay Controller circuit and seek the help of a licensed electrician.

Relay Contacts:

All contacts on each relay are available externally on screw terminals for easy user access. The relays are rated for AC and DC supply voltages. Please see the electrical parameters table at the end of this document for more details. Each relay has three contacts (C, NO and NC). C is the common terminal and it is used in both normally open and normally closed positions. The contacts NC and C will be connected when the relay is turned off and will be disconnected when the relay is turned on. And vice versa, contacts C and NO will be disconnected when the relay is turned off and will be connected when the relay is turned on. The table below summarizes possible relay contact.



Relay State	Connection between NC and C	Connection between NO and C
OFF	Close	Open
ON	Open	Close

DC Power Supply:

The IP Relay Controller unit requires a +12VDC power supply to function properly. The +12VDC power supply adapter is not part of the unit; it needs to be ordered separately. The +12VDC supply for the relay coils is not optional and the relay will not switch without this supply. Any off-the-shelf 12VDC/500mA or more power supply can be used for this purpose. Make sure to connect the power supply to the correct polarity. Connect the positive terminal of the power supply to the + terminal on the module. Connect negative terminal of the power supply to – terminal of the module.



Prepare your +12VDC power supply adapter, double check the correct polarity with a multimeter. If you have no experience in this field, we strongly recommend that you DO NOT attempt to use this IP Relay Controller circuit board and seek the help of a licensed electrician. When you are 100 % sure about the plus/positive and minus/negative polarity of the 12VDC power supply adapter, connect it to the IP Relay Controller board. However, make sure you connect it to the IP Relay Controller board before you connect it to the mains power socket. Then connect the LAN UTP cable. See images below.





Default settings of the IP Relay Controller:

IP address: 192.168.1.199

Subnet Mask: 255.255.255.0

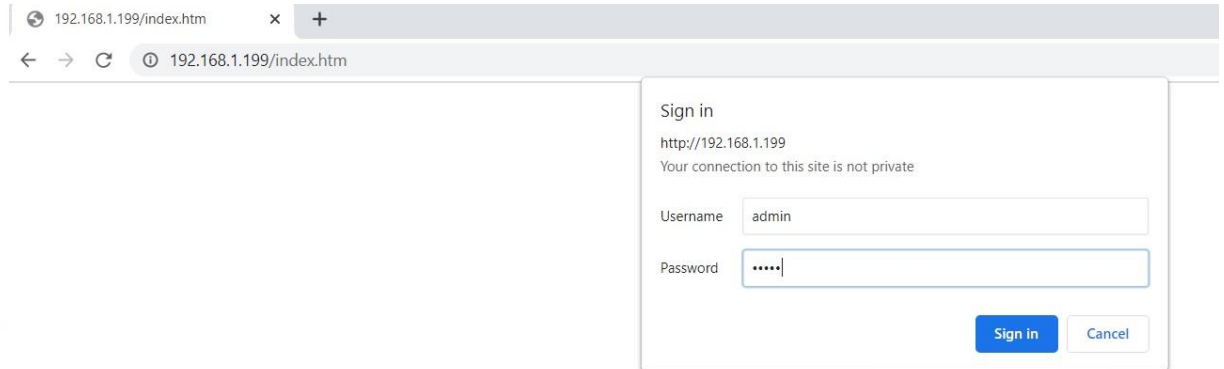
Default Gateway: 192.168.1.1

Username: admin

Password: admin

The first access via the web browser:

Setup in your PC a fixed IP address 192.168.1.xxx, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.1.1. Your computer and the IP Relay Controller need to be visible and accessible within the same network segment. Use any web browser, type 192.168.1.199, the following pop-up window should appear. Type admin as user name and admin as password and sign in.



You can change the configuration of the IP Relay Controller as needed. See some example images below. By clicking on the relay buttons, you can control them, i.e., switch on and switch off. Later in the document you can find a list of http commands for remote control. In Configuration, you can change the default relay and network settings. Authorization Configuration allows changing default Username and Password.



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Relay Control**Configuration****Authorization
Configuration**

Configuration

Enter the new settings for the board below:

Name:	<input type="text" value="ALPHA-TECH.CZ"/>	
Relay1 Name:1:	<input type="text" value="Relay1"/>	<input type="text" value="1"/>
Relay2 Name:	<input type="text" value="Relay2"/>	<input type="text" value="0"/>
Relay3 Name:	<input type="text" value="Relay3"/>	<input type="text" value="1"/>
Relay4 Name:	<input type="text" value="Relay4"/> Auto	<input type="text" value="0"/>
Relay5 Name:	<input type="text" value="Relay5"/> off in sec	<input type="text" value="0"/>
Relay6 Name:	<input type="text" value="Relay6"/>	<input type="text" value="0"/>
Relay7 Name:	<input type="text" value="Relay7"/>	<input type="text" value="0"/>
Relay8 Name:	<input type="text" value="Relay8"/>	<input type="text" value="0"/>
	<input type="checkbox"/> Enable DHCP	
IP Address:	<input type="text" value="192.168.1.199"/>	
Gateway:	<input type="text" value="192.168.1.1"/>	
Subnet Mask:	<input type="text" value="255.255.255.0"/>	
HTTP Port:	<input type="text" value="80"/>	
	<input type="button" value="Save Config"/>	

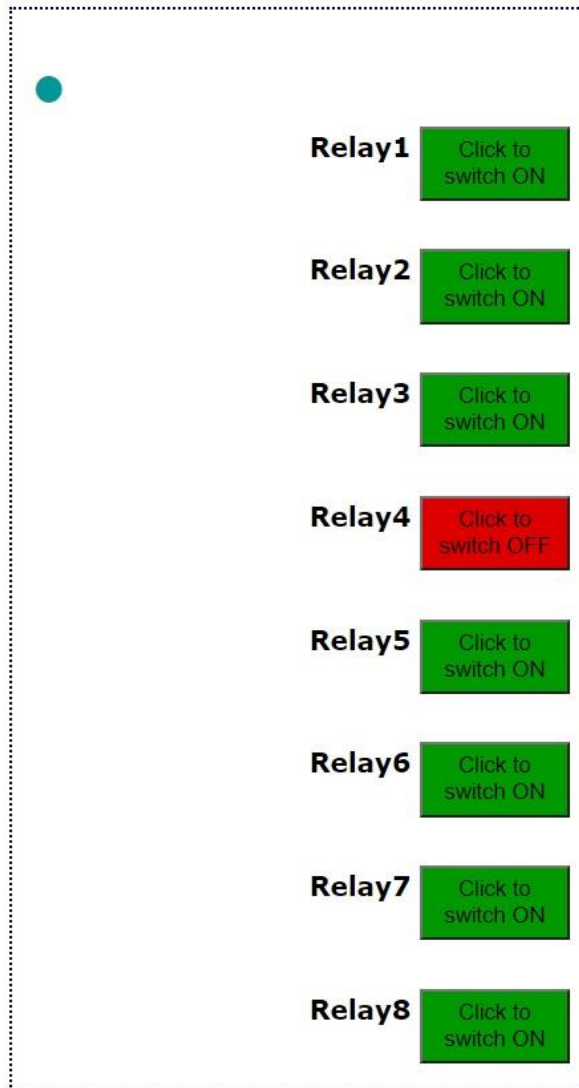
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- Relay Control
- Configuration
- Authorization Configuration

Relay Control



The interface displays a list of 8 relays, each with a corresponding control button. A small teal dot is visible in the top-left corner of the dashed box. Relay 4's button is red and labeled 'Click to switch OFF', while all other buttons are green and labeled 'Click to switch ON'.

Relay	Action
Relay1	Click to switch ON
Relay2	Click to switch ON
Relay3	Click to switch ON
Relay4	Click to switch OFF
Relay5	Click to switch ON
Relay6	Click to switch ON
Relay7	Click to switch ON
Relay8	Click to switch ON

192.168.1.199/relays.cgi?relay=2 x ALPHATECH TECHNOLOGIES s.r.o. x

← → ↻ ⚠ Not secure | 192.168.1.199/relays.cgi?relay=2

Relay1 0

Relay2 1

Relay3 0

Relay4 0

Relay5 0

Relay6 0

Relay7 0

Relay8 0

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Relay Control

Configuration

**Authorization
Configuration**

Authorization Configuration

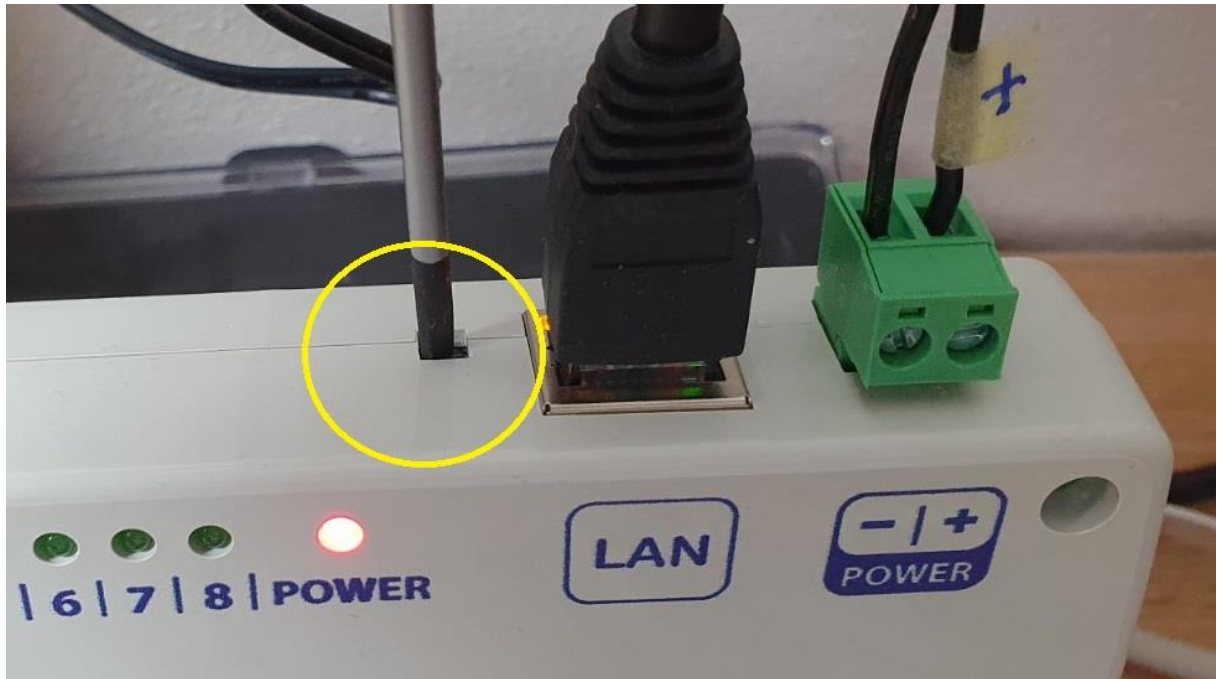
Enter the new username and password below(up to 23 characters each):

Username:	<input type="text"/>
Password:	<input type="password"/>
Re-enter Password:	<input type="password"/>
	<input type="button" value="Save"/>

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Reset defaults settings:




- Hold the Reset button for 10 seconds, see the image above.
- Connect the 12VDC power supply adapter and the LAN cable to the IP Relay Controller. Open any internet browser and type: 192.168.1.199. If your browser opens a new window with a request for USER and PASSWORD, enter the default Username admin and Password admin. That's all and you are ready to control and manage the relays. If you cannot open the default IP address, follow the next steps:
 - ✓ Check that the IP of your LAN router is 192.168.1.1. If you are unsure about this process, on google you can find a guide „how to find your local IP address “.
 - ✓ If the LAN IP of your router is different than 192.168.1.1 (for example 192.168.0.1 or 192.168.10.1), you need one-time access to the network 192.168.1.1 to change default settings.
 - ✓ Open again the web browser and type: 192.168.1.199.
 - ✓ The above images on previous pages show the first steps of installing the IP Relay Controller. By clicking on the relay buttons, you can control them – switch on and switch off. In Configuration, you can change the default relay and network settings. Authorization Configuration allows changing default Username and Password.

MAC address:

At the back of the unit, you can find the MAC address of the device. With a computer IP scanner tool, which you can freely download at internet, you can find the device in your network, see an example below.



>		192.168.1.199	192.168.1.199	00:56:35:02:00:1A
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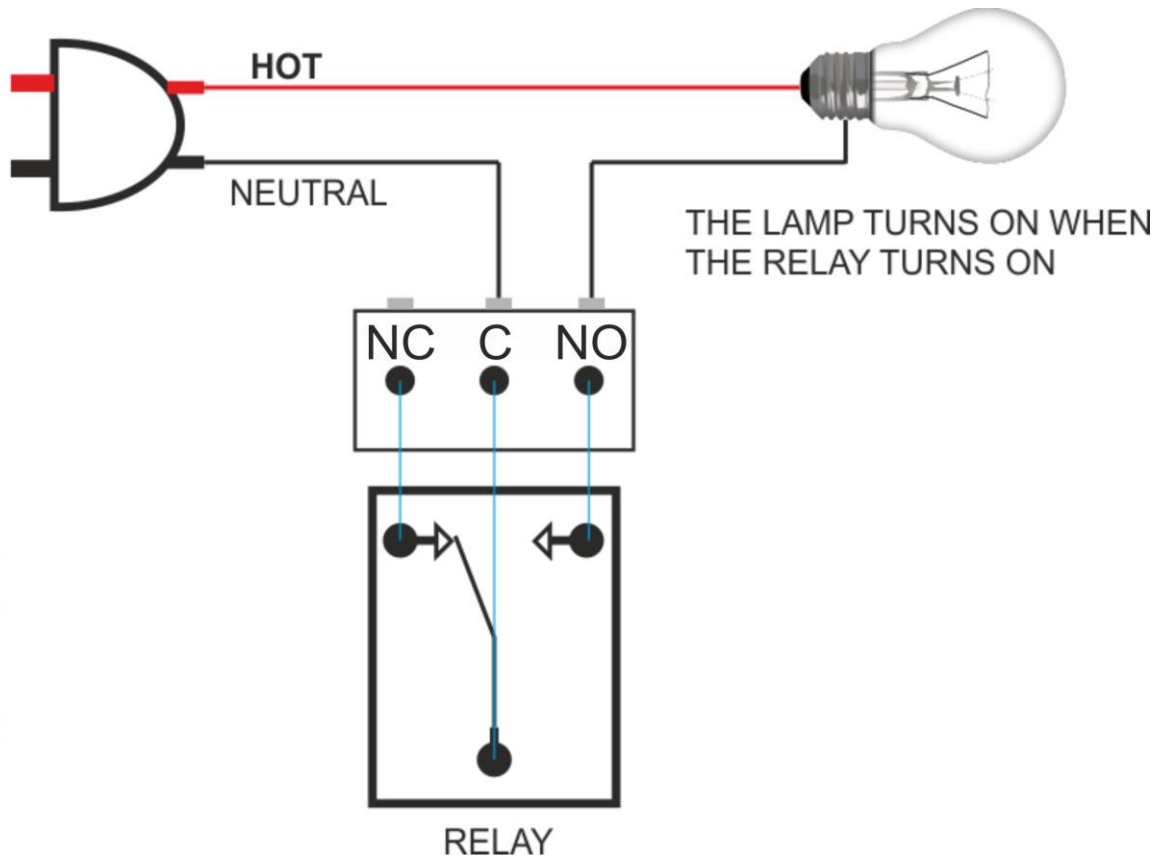
List of http commands:

No.	Command	Format	Description
1	/relays.cgi?relay=1	ASCII	Toggle relay 1
2	/relays.cgi?relay=2	ASCII	Toggle relay 2
3	/relays.cgi?relay=3	ASCII	Toggle relay 3
4	/relays.cgi?relay=4	ASCII	Toggle relay 4
5	/relays.cgi?relay=5	ASCII	Toggle relay 5
6	/relays.cgi?relay=6	ASCII	Toggle relay 6
7	/relays.cgi?relay=7	ASCII	Toggle relay 7
8	/relays.cgi?relay=8	ASCII	Toggle relay 8
9	/FF0101	ASCII	Turn ON relay 1
10	/FF0201	ASCII	Turn ON relay 2
11	/FF0301	ASCII	Turn ON relay 3
12	/FF0401	ASCII	Turn ON relay 4
13	/FF0501	ASCII	Turn ON relay 5
14	/FF0601	ASCII	Turn ON relay 6
15	/FF0701	ASCII	Turn ON relay 7
16	/FF0801	ASCII	Turn ON relay 8
17	/FF0100	ASCII	Turn OFF relay 1
18	/FF0200	ASCII	Turn OFF relay 2
19	/FF0300	ASCII	Turn OFF relay 3
20	/FF0400	ASCII	Turn OFF relay 4
21	/FF0500	ASCII	Turn OFF relay 5
22	/FF0600	ASCII	Turn OFF relay 6
23	/FF0700	ASCII	Turn OFF relay 7
24	/FF0800	ASCII	Turn OFF relay 8
HTTP command example: http://username:password@192.168.1.199/FF0101			

Handling inductive loads:

General-purpose relays are typically designed to drive resistive loads, not inductive loads. This is why electromechanical life ratings are published for resistive loads and not inductive loads. Inductive loads can be defined as anything with a magnetic coil, such as a motor, solenoid, or transformer. Please see the image below. The purpose of the used capacitor is to absorb the high voltages generated by inductive loads. Unlike resistive loads, inductive loads love power, and they will do everything they can to hold on to it. The unpleasant result of this power hunger is inductive kickback, and it has a devastating effect on the contact life of most general-purpose relays. This is true of both AC and DC inductive loads, although the inductive kickback is far worse with DC loads due to the constant current characteristic of DC power. How bad is the kickback? A 24VDC solenoid with current consumption as low as a quarter of an amp will create a negative inductive kickback of more than 300 V. Adding a suspension capacitor could easily reduce the problems. It has to be installed as close as possible to the IP Relay Controller board.





[DME Polyester Film Capacitors](https://www.cde.com/resources/catalogs/DME.pdf) are suitable for this job with capacitance around 0.47uF – 0,68uF will be satisfied. Choose a larger voltage rating than your power supply.

<https://www.cde.com/resources/catalogs/DME.pdf>

Search it at [digikey.com](https://www.digikey.com):

<https://www.digikey.com/en/products/filter/film-capacitors/62?FV=ffec2aa9%2Cfff40002%2Cfff80010%2Ce340003&PV13=46&PV13=47&PV13=49&fid=0&mnonly=0&ptm=0&quantity=0&s=N4lgjCBcoLQExVAYygFwE4FcMaaEA9IANogDslAugL7X4KSkAKBANgJ7YDOq26ABADEAlqwC2-AMIBDAA7Skw1AXRVqQA&vendor=0>

If you can't find it, you can use another Metalized Polyester Film Capacitor.

Use with IP door intercoms of ALPHATECH TECHNOLOGIES:

In the setup menu of the IP intercom, define http command(s) to control the web relays remotely. List of http commands can be found in the above table.



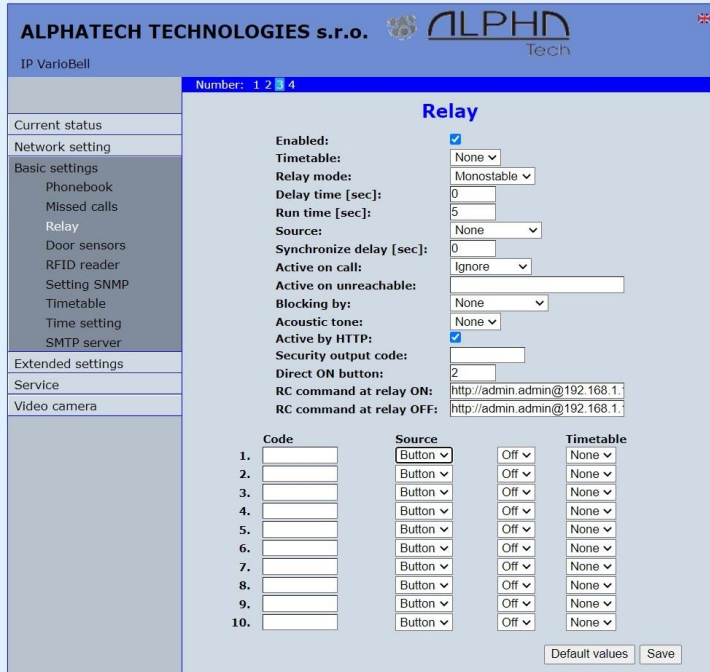
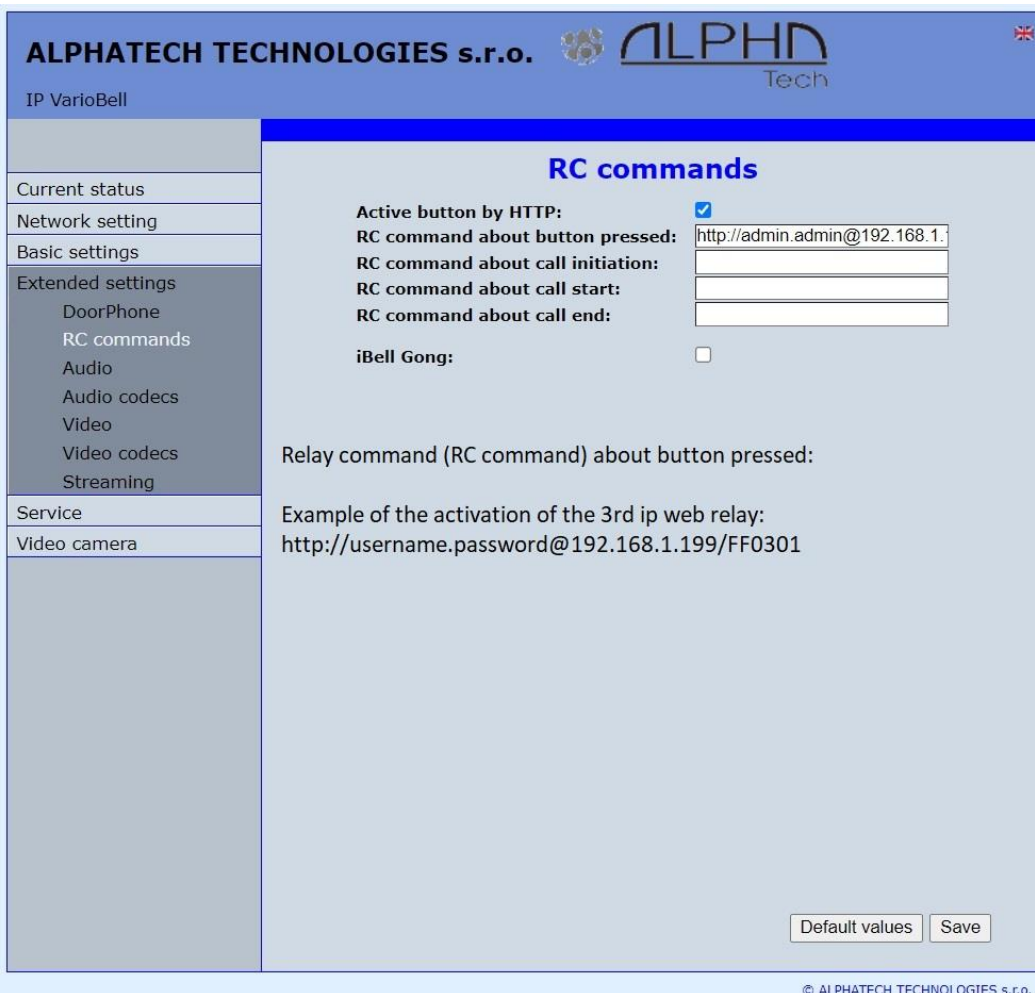
Control of Relay No. 3 - example:

Relay command
 (RC command) at
 relay ON:

<http://username.password@192.168.1.199/FF0301>

Relay command
 (RC command) at
 relay OFF:

<http://username.password@192.168.1.199/FF0300>


Technical parameters:

Parameter *	Value	Unit
Basic Specification		
Number of relays	8	
Digital circuit power supply voltage	9 - 24	V
Standby current at 12V	100	mA
Maximum current drawn by digital circuitry at 9V	500	mA
Maximum current drawn by digital circuitry at 12V	370	mA
Maximum current drawn by digital circuitry at 24V	200	mA
Output Electric Specification		
Relay brand	Sun Hold	
Relay series	RAS-05-15	
Relay contact material	Ag alloy	
Maximum switching capability – single output	AC 240V / 10A DC 24V / 10A	
Maximum total switching current for all outputs	50	A
Contact resistance (initial)	50	mΩ
Life expectancy (Electrical)	100,000 ops	
Life expectancy (Mechanical)	10,000,000 ops	
Nominal insulation resistance	100MΩ (DC500V)	
Maximum switching on response time	10	ms
Maximum switching off response time	5	ms

* All parameters considered nominal. ALPHATECH TECHNOLOGIES s.r.o. reserves the right to modify products without notice.

