# URL API / HTTP(s) GET

# NETIO M2M API protocols docs

**1.12.2018**

## Short summary

URL API protocol is one way – control only, command based M2M API protocol, where NETIO device is HTTP(s) server accepting commands sent over HTTP(s) GET to control NETIO power outputs (power sockets 230V or power outlets IEC-320 110/230V).

- URL API protocol must be enabled first in the WEB configuration of the device.
  For details, see the "NETIO WEB configuration" chapter.
- This protocol is HTTP or HTTPs based. All M2M API protocols running in one NETIO 4x device share the same one HTTP(s) port. Details are shown later in this documentation.

## Supported devices

- NETIO 4All
- NETIO 4
- NETIO 4C

*Note: NETIO 4x means all NETIO 4 devices (NETIO 4 / 4All / 4C)*

## Supported devices and firmware

NETIO 4x firmware – 3.0.1 and later

### URL API integration in NETIO 4x products

URL API as protocol in NETIO can be processed by device in a two different ways:

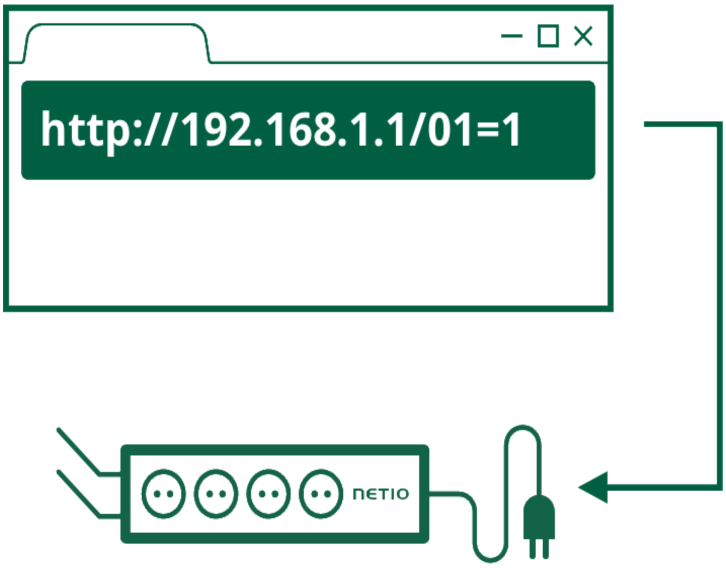
1) **M2M API Protocol** – fixed commands, described in this document.
   You can find application examples in the "**NETIO AN19** URL M2M API (http GET) protocol to control NETIO power sockets/outlets"

2) **URL request processed in Lua** script – user definable commands interacting with Lua scripts. Parameters can be modified and user script can be programmed. URL request managed in Lua use the same http port as web administration.
   *URL in Lua is not described in this document - check the "**NETIO AN04** Remote power socket control by URL (http get handled in Lua script)" for more details.*

## General protocol info

URL API offers very easy protocol to control NETIO outputs by calling defined address.

*NOTE:* *This document provides basic info about the M2M API protocol.*
*Other device functions are described in the product manual.*



## Quick start with URL API & NETIO

**There is no read function available in URL API M2M Protocol.**

### URL API Control commands (HTTP GET)

```
http://<netioIP>/netio.cgi?pass=<Passphrase>&output<X>=<action>
```

***X*** is number of output
**output*X*=** value of supported action: 0 - off, 1 - on, 2 - short off, 3 - short on, 4 - toggle, 5 - no change

Example: Switch Power output 1 to ON:

```
http://192.168.120.136/netio.cgi?pass=01234567890AB&output1=1
```

## HTTP(s) port

There are 2 different HTTP(s) ports:

1) The web administration of the device - HTTP(s).
   Web administration is in the Settings/System (HTTP) or System/Security Settings (HTTPs).

2) Separated HTTP(s) port for the M2M API protocols (XML, JSON, URL API).
   Web administration is in each M2M API protocol settings.

All HTTP(s) protocols (XML / JSON / URL) share one HTTP(s) port.

| Web Configuration | M2M API | |
|---|---|---|
| HTTP | HTTP | Possible |
| HTTPs | HTTPs | Possible |
| HTTP | HTTPs | Not possible today |
| HTTPs | HTTP | Not possible today |

## General NETIO 4x output functions

### Output actions – “write” function

- **0 –** Turn **OFF**
- **1 –** Turn **ON**
- **2 –** Short OFF delay (restart)
- **3 –** Short ON delay
- **4 –** Toggle (invert the state)
- **5 –** No change

### Short ON / OFF delay

This command switches a power output On / Off for a defined time. It is useful for example to power-cycle a server with a defined switch-off time, or to switch on a pump for a defined time.

This “short” delay is protected: the power output will remain in the defined state regardless of any other M2M requests received. During this time, the output state can only be changed by pressing the button on the NETIO device and this action cancel M2M short ON/OFF command for the particular output. Other requests to control the particular output are simply ignored and an ERROR logged with reason rejected in a device Log.

The short ON / OFF delay interval can be defined in the device web administration. It is specified in ms (milliseconds) and rounded up to hundreds of milliseconds (0,1s).

This interval can be also defined using some M2M API protocol commands. In that case, it is valid only for a single protocol session (the following short ON / Short OFF command). When the connection is closed or restarted, the interval is reset to the device default value (defined in the web administration for each output).

## Security issues

Do not use default usernames and passwords! Keep your Ethernet and WiFi networks secured.

## Power-Up outputs state

All outputs are Off during the first 25 to 30 seconds after power-up.
After this time, all outputs are set to the selected state:

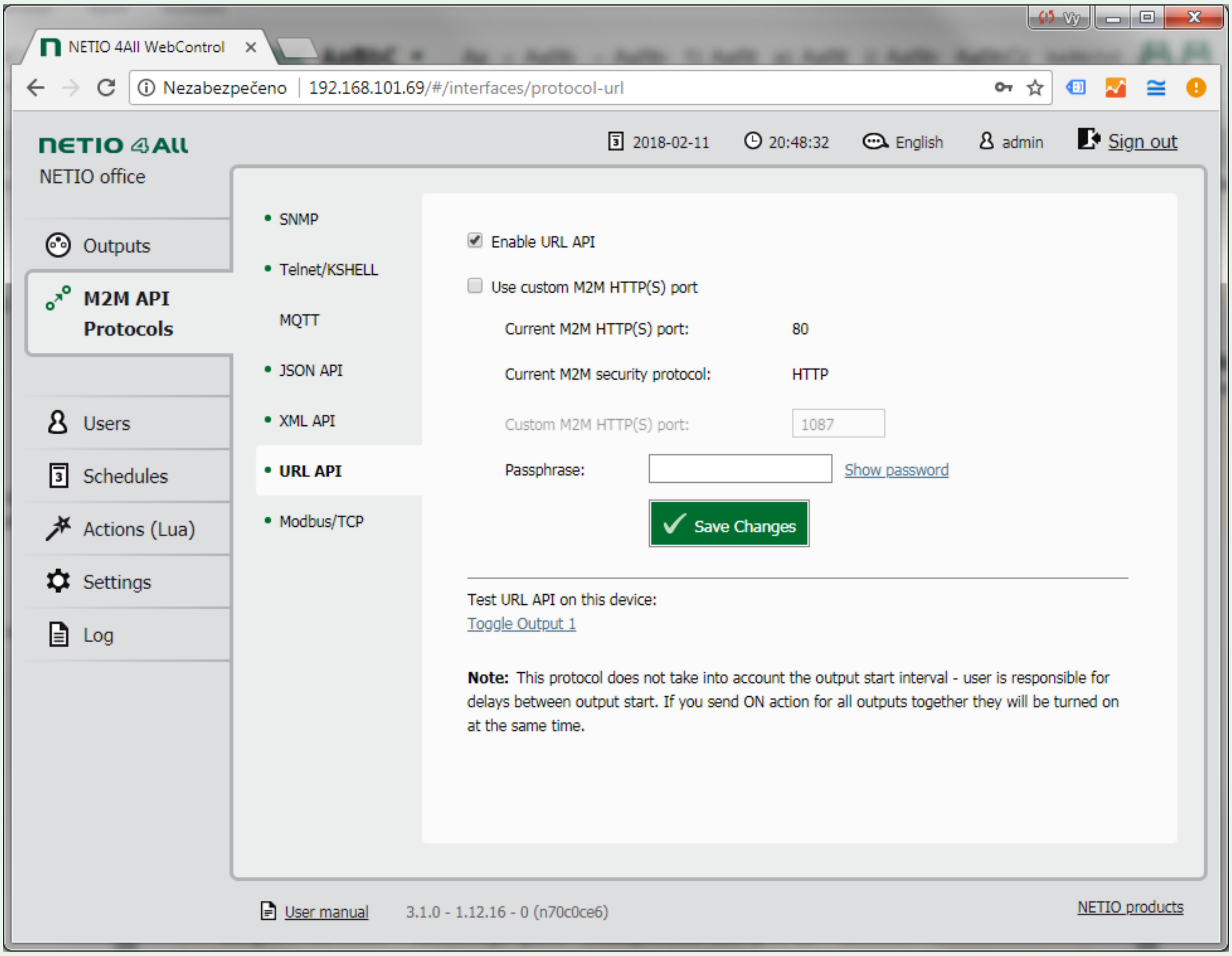
- **Last Output state**
  After a power outage, the NETIO device sets each power output to the last stored state of this one output. The current state of each power output (socket/power outlet) is internally stored every 8 seconds.

Note: **Function Scheduler** is checked in Power-Up initialization. When enabled, it can affect one or more power output stated based on current time and date.

Custom based **Lua scripts** can affect output stated too.

## NETIO WEB configuration

M2M API protocols can be enabled and configured only over the web administration – select “M2M API Protocols” in the left-hand side menu and then select the “URL API” tab.



☑ Enable URL API

□ Use custom M2M HTTP(S) port

Current M2M HTTP(S) port: 80

Current M2M security protocol: HTTP

Custom M2M HTTP(S) port: 1087

Passphrase:

Test URL API on this device:
Toggle Output 1

**Note:** This protocol does not take into account the output start interval - user is responsible for delays between output start. If you send ON action for all outputs together they will be turned on at the same time.

*Picture 1 –M2M API Protocols / URL API settings GUI*

- **Enable URL API** – Enable/disable the M2M API protocol
- **Use custom port** – Check to enable custom port setting
    - **Current port** –Currently used port
    - **Custom port** – Custom port set for XML / JSON / URL API protocols
- **Passphrase** – Password for commands (default: MAC address without colons, small letters)

## Notes

- **The device webserver is restarted after Saving of URL API settings.**
- Empty Passphrase means no authorization and any passphrase is accepted in URL command.

## NETIO URL API protocol structure

**There is no read function available in the NETIO URL API M2M Protocol.**

## URL Control command – HTTP(s) GET request

```
http://<netioIP>/netio.cgi?pass=<Passphrase>&output<X>=<action>
```

***X*** is number of output

- **output*X*=** value of supported action:
  0 - off, 1 - on, 2 - short off, 3 - short on, 4 - toggle, 5 - no change
- **delay*X*=** value (ms) of delay for a short off/on action. If a delay parameter is not listed along with a short off/on action command then a delay defined in web administration is used.

**Switch Power output 1 to ON:**

```
http://<netioIP>/netio.cgi?pass=<Passphrase>&output1=1
```

**Switch Power output 2 to OFF for 15 second, then switch it ON.**

```
http://<netioIP>/netio.cgi?pass=<Passphrase>&output2=2&delay2=15000
```

**More outputs control command:**
Switch Power output 1 to OFF, Invert state of Output 2 and Switch Output 3 to ON for 900 ms:

```
http://<netioIP>/netio.cgi?pass=<Passphrase>&output1=0&output2=4&output3=3&
delay3=900
```

## Status codes

| Status code | Response content (plain text) | Description |
|---|---|---|
| 200 OK | OK | Authorized and command executed |
| 302 Moved Temporarily | *See note 1 below table* | HTTP request sent while HTTPS is enabled on NETIO device |
| 400 Bad Request | Bad Request | Control command syntax error |
| 401 Unauthorized | Unauthorized | Invalid Passphrase |
| 403 Forbidden | Forbidden | URL API is not enabled |

*Note 1 – status 302 response content:*

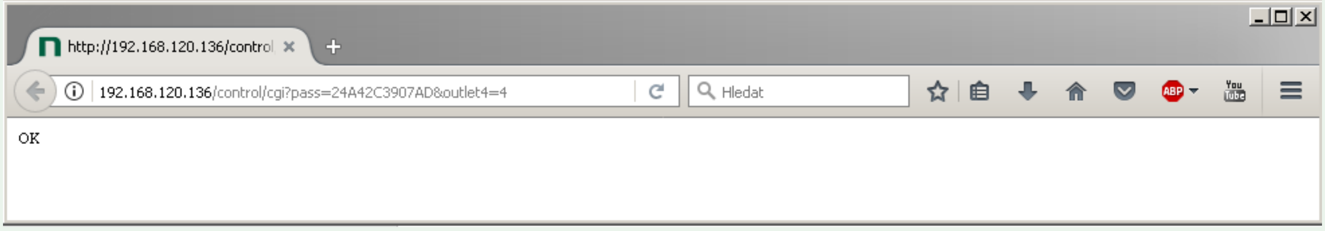
*<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd"><html><head><title>Document not found</title></head><body><p>Web interface moved to HTTPS.</p></body></html>*

*Request in Web Browser -> redirection to https web administration*

### Response content – interpretation by Web Browser:

```
<html>
  <head></head>
  <body>
    <pre>OK</pre>
  </body>
</html>
```

### Response content example:



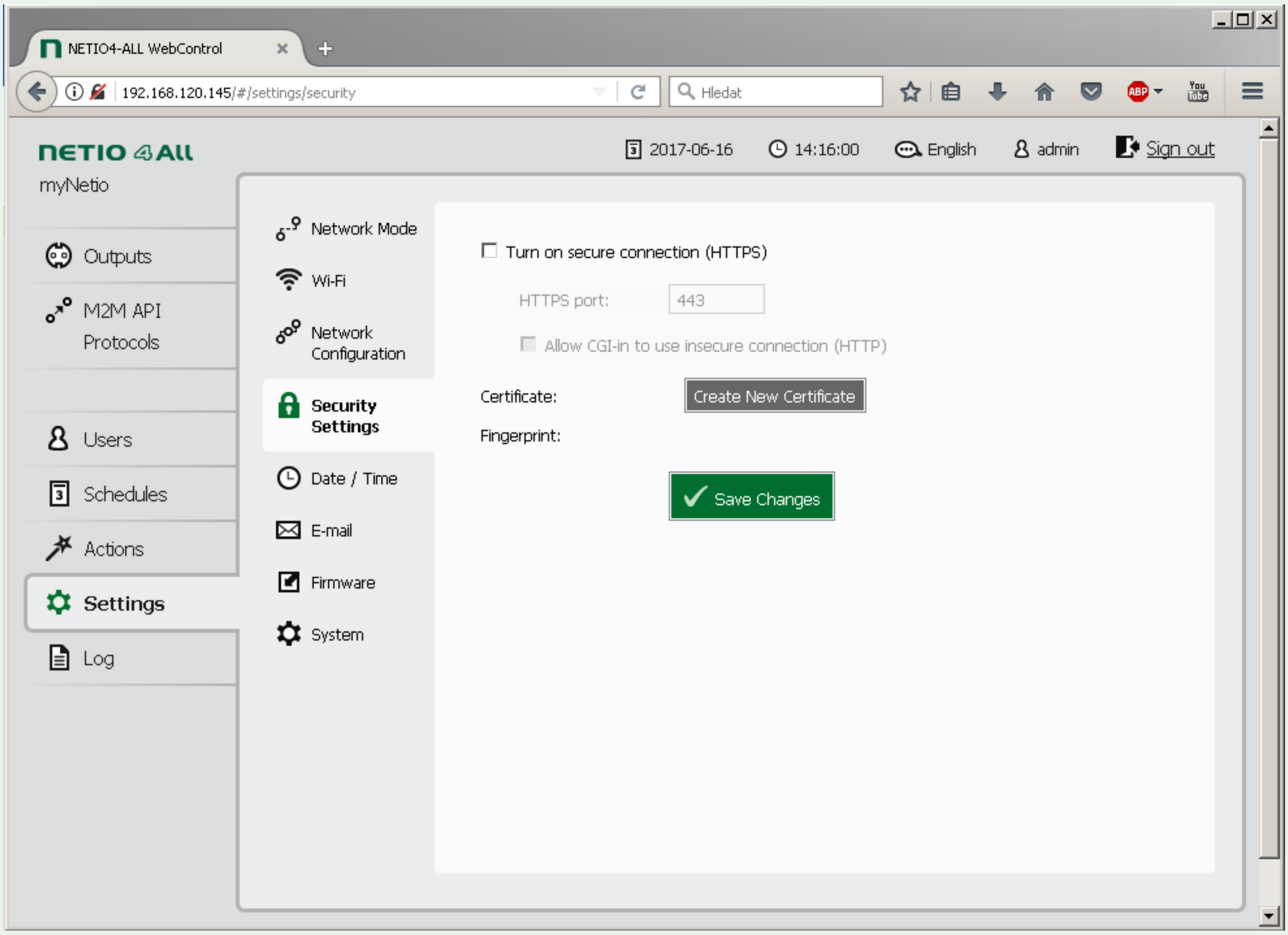
192.168.120.136/control/cgi?pass=24A42C3907AD&outlet4=4

```
OK
```

*Picture 2 – Response content example “OK”*

## HTTPs = secure connection

NETIO can use secure connection (HTTPs) for web administration and HTTP-based M2M API Protocols (JSON, XML, URL). This security feature can be enabled in the web administration: Settings / Security Settings. After checking “Turn on secure connection (HTTPS)” and saving the changes, only secured (HTTPS) communication will be available for web and HTTP-based protocols. The port for HTTP-based M2M API protocols remains the same as already set.



□ Turn on secure connection (HTTPS)

HTTPS port: 443

□ Allow CGI-in to use insecure connection (HTTP)

Certificate: Create New Certificate

Fingerprint:

✓ Save Changes

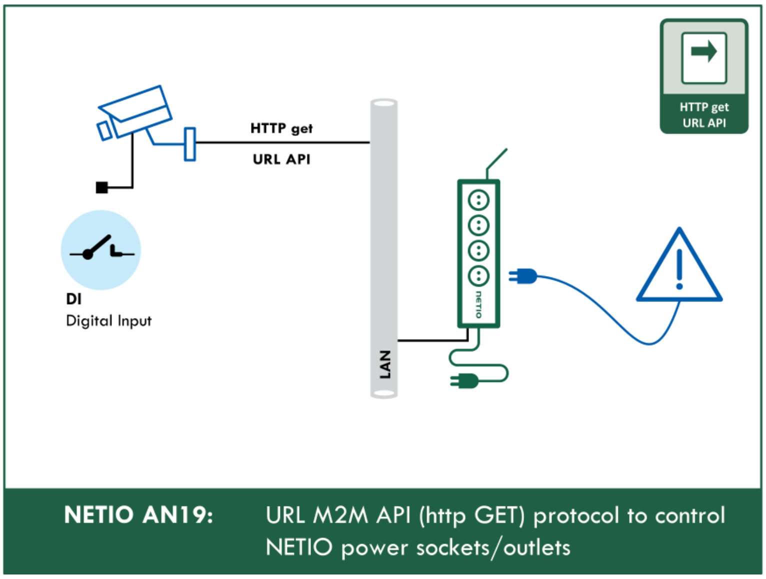
*Picture 3 –Security settings GUI*

- **Turn on secure connection (HTTPS)** – Enable/disable secure connection for web administration and HTTP-based M2M API protocols (JSON, XML, URL)
- **HTTPS port** – Port used for the web administration (M2M API protocols use the port set in M2M Protocol settings)
- **Allow URL-in to use insecure connection (HTTP)** – Enable unsecure connection **for URL-in - Lua only!**
- **Create New Certificate** – Generates and immediately installs a new certificate.
- **Certificate** – Info about certificate validity (certificate is generated with one year validity)
- **Fingerprint** – Certificate fingerprint

## NETIO AN (Application Note)

### AN19 URL API (http GET) protocol to control NETIO 4x power sockets/outlets 110 / 230V

The AN19 Application Note demonstrates the use of the “URL API” or “http get” M2M API protocol. By invoking a certain URL, one of electrical outputs 110/230V can be switched On / Off / Toggle / Short pulse. This protocol is supported by all NETIO 4x devices (NETIO 4 / 4All / 4C).


HTTP get
URL API
HTTP get
URL API
DI
Digital Input
LAN
NETIO
NETIO AN19:
URL M2M API (http GET) protocol to control NETIO power sockets/outlets

*>> Read the AN19 on [www.netio-products.com](www.netio-products.com)*

## Document history

| Document Revision | Publication Date | Description |
|---|---|---|
| 1.0 | 14.11.2017 | Initial release for FW 3.0.1 |
| 1.1 | 18.2.2018 | Few updates for FW 3.1.0 |
| 1.2 | 30.11.2018 | AN19 description added |