

FutureNow FNIP-8x16A

Installation and Operations Manual

rev 04.12.2019

8 Channel Relay Switch with Local Inputs and IP communication
/DIN Rail and Surface Mountable/



Figure 1. The FNIP-8x16A relay module

OVERVIEW

The FNIP-8x16A is an eight channel relay module used for switching any type of load that doesn't exceed the specifications. Via its built-in web site and TCP/IP communication, the outputs and inputs can be controlled and monitored from standard network capable devices such as computers, smartphones, web-tablets, etc. either locally or via the network.

The module can be used independently or as part of a complex control system in residential and commercial installations.

In addition to the outputs, the FNIP-8x16A also provides local inputs for manual control, which gives the customer the ability of using the system even before a central controller is installed or the network is built, offering stand-alone operation. This also improves reliability since the operation of the relays via the inputs do not any other device.

The manual inputs are usually connected to momentary or standard wall switches and work similarly to traditional light switches.

The inputs can also be used as independent digital inputs, for example to monitor the status of different contact sensors or if connected to a programmed output of a security system, its status (armed/disarmed/in alarm) can be determined remotely.

Main features

Robust Operation

- 8 x 230V/16A SPDT general purpose dry contact relay outputs each with both NO and NC contacts
- 8 x galvanically isolated multi-purpose inputs for manual control or for connecting digital sensors

Ultimate Flexibility

- Monostable switching
- Standard DIN rail mount
- Easy control via the built-in web server
- Operation without a controller or network connection, via local inputs
- Digital inputs can also be used to monitor door/window contacts, motion, water leakage and any other sensor type
- Pre-defined scenes to control multiple outputs at once

Enhanced Connectivity

- TCP/IP interface offers remote control and advanced management
- Built-in web server for configuration, control and monitoring
- Control and monitoring via local computer network
- Android and iOS applications are also available.
- TCP communication with simple ASCII commands
- Automatic event reports of status changes of inputs and outputs
- Firmware upgrade via LAN

Industry-Wide Interoperability

- Full Integration with home controllers from most major manufacturers (Control4, AMX etc.)
- Compatibility with any momentary contact switch

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INSTALLATION

WARNING!

This equipment shall be installed in a closed cabinet with no access to live parts. Only the top enclosure of the equipment (where the label is affixed) is allowed to be accessed by the operator.

Since the module is connected to mains/line voltage, it must be installed by a qualified electrician in accordance with local electrical codes.

Turn off power (main circuit breaker) before installation.

Terminal connections

Each module has a wiring diagram on the front which can help the installer when connecting the modules at installation sites. See figure 2.

The terminal connections of the FNIP-8x16A are listed in Table 1.

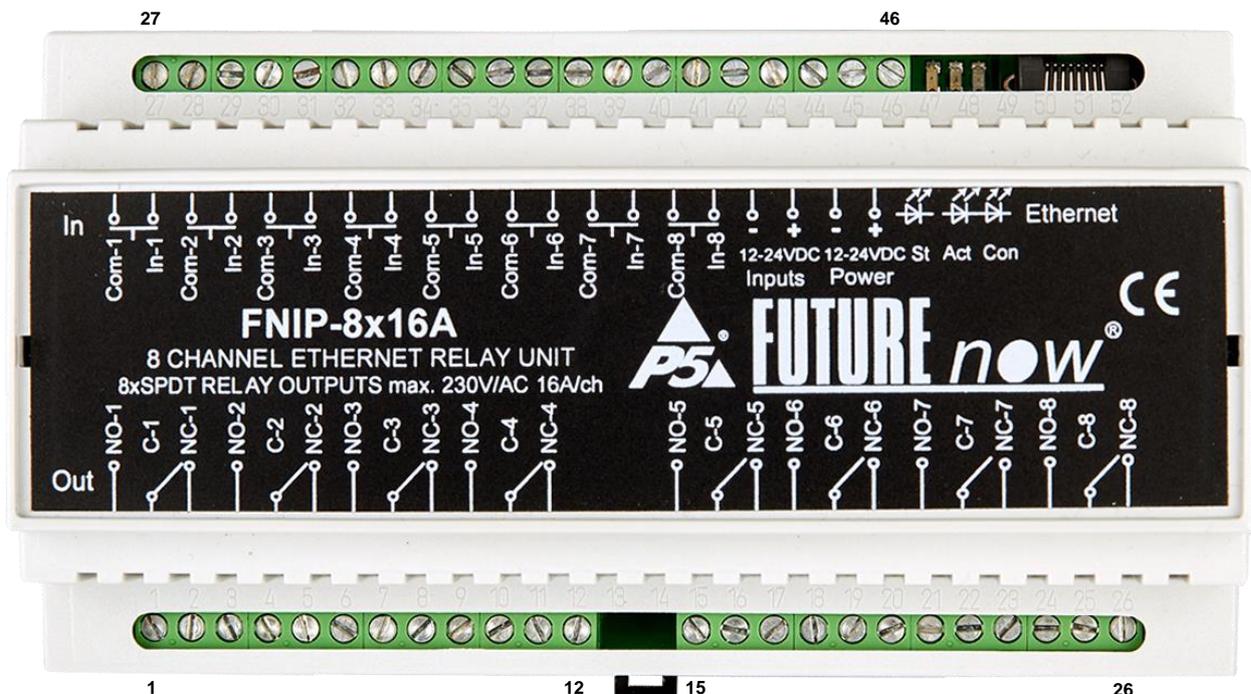


Figure 2. FNIP-8x16A front view with terminal connectors

No.	Description	No.	Description
1.	Output 1 N.O.	27.	Inputs Common
2.	Output 1 C.	28.	Input 1
3.	Output 1 N.C.	29.	Inputs Common
4.	Output 2 N.O.	30.	Input 2
5.	Output 2 C.	31.	Inputs Common
6.	Output 2 N.C.	32.	Input 3
7.	Output 3 N.O.	33.	Inputs Common
8.	Output 3 C.	34.	Input 4
9.	Output 3 N.C.	35.	Inputs Common
10.	Output 4 N.O.	36.	Input 5
11.	Output 4 C.	37.	Inputs Common
12.	Output 4 N.C.	38.	Input 6
13.	-	39.	Inputs Common
14.	-	40.	Input 7
15.	Output 5 N.O.	41.	Inputs Common
16.	Output 5 C.	42.	Input 8
17.	Output 5 N.C.	43.	Power for the Inputs GND
18.	Output 6 N.O.	44.	Power for the Inputs +9V – 36V DC
19.	Output 6 C.	45.	Power for the Main Circuit GND
20.	Output 6 N.C.	46.	Power for the Main Circuit +10.8V – 36V DC
21.	Output 7 N.O.	47.	-
22.	Output 7 C.	48.	-
23.	Output 7 N.C.	49.	-
24.	Output 8 N.O.	50.	-
25.	Output 8 C.	51.	-
26.	Output 8 N.C.	52.	-

Table 1: FNIP-8x16A terminal connectors

Wiring

A typical wiring diagram is shown in figure 3.

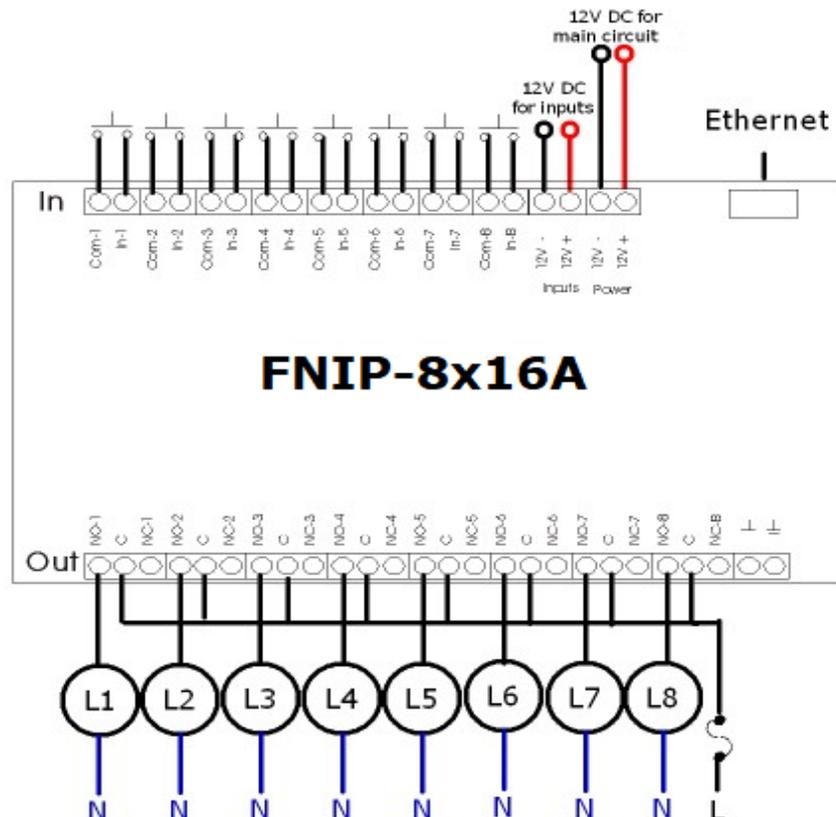


Figure 3. Wiring diagram. All outputs in this example are used to switch line voltage on the same phase. Since the outputs provide dry contacts, any voltage that doesn't exceed the specifications can be switched.

After installation, check if the outputs can be toggled via the inputs (only applicable if input power is connected across terminals 43-44.) The status LEDs will assist you in tracking the status of the outputs and see if the inputs are working properly.

Recommended wire types

- Ethernet cable: Twisted pair, CAT5 or better.
- Outputs: According to the load attached to the outputs (current and voltage ratings).
- Inputs: A pair of low or high voltage cable. The inputs use low voltage signals.

All wires used and the way they are run must be in accordance with the local electrical codes.

Keep mains/line voltage wiring physically separated from Ethernet and signal wiring.

Power requirements

The module must be powered through terminals 45 and 46 by 10.8V - 36V DC.

Please pay attention to the correct polarity.

The galvanic isolation of the inputs is only effective if a separate power supply is used for powering the inputs. The FNIP-8x16A has separate power input terminals (43 and 44) for this purpose. If you choose not to use the extra protection the isolated inputs offer, you can use the same power supply for both the main circuit and the inputs. In that case, simply connect terminal 43 to terminal 45 and terminal 44 to terminal 46.

Ethernet connection

Connect the module to the LAN via the RJ45 Ethernet socket.

Outputs

The FNIP-8x16A has eight heavy duty relay outputs. Almost any equipment used in households or offices can be switched directly with the output relays. However, if the load exceeds the specifications, an additional relay must be connected between the output and the load. (for example in case of saunas, three-phase equipment, driveway heaters, industrial machines, etc.)

All outputs have dry contacts, no power is provided for the connected circuits.

Use the outputs the exact same way as if they were mechanical contact switches.

The outputs can be used everywhere where mechanical switches are used, simply by connecting the output in series, the same way the switch is.

Local Inputs

For each output, there is a local input to allow for manual operation. If you do not wish to use local inputs, this section may be skipped.

Connect dry contacts (pushbuttons, standard or momentary switches, relay contacts, etc.) or open collector transistor outputs across the appropriate input terminals and the input common terminal.

WARNING! Avoid supplying external voltage to these terminals!

All input ports are optically isolated to protect the module against unwanted effects of ground loops, overvoltage or misconnections.

It should be noted that the galvanic isolation is only effective when an independent power supply is used for powering the inputs. See section “Power Requirements” if you don’t want to use two separate power supply units.

To assure an additional level of safe and reliable operation, the inputs are also software protected against the effects of noise spikes that usually occur when heavy inductive loads (motors, fans, etc.) are switched nearby. In most systems lacking this level of protection, these spikes may result in unwanted operation.

Three-way switches can be implemented by simply connecting multiple momentary switches in parallel.

Status LED Indicators

In order to make installation and debugging easier, communication and channel status are displayed via LEDs.

Use the board layout drawing in Figure 4. to locate the status LEDs.

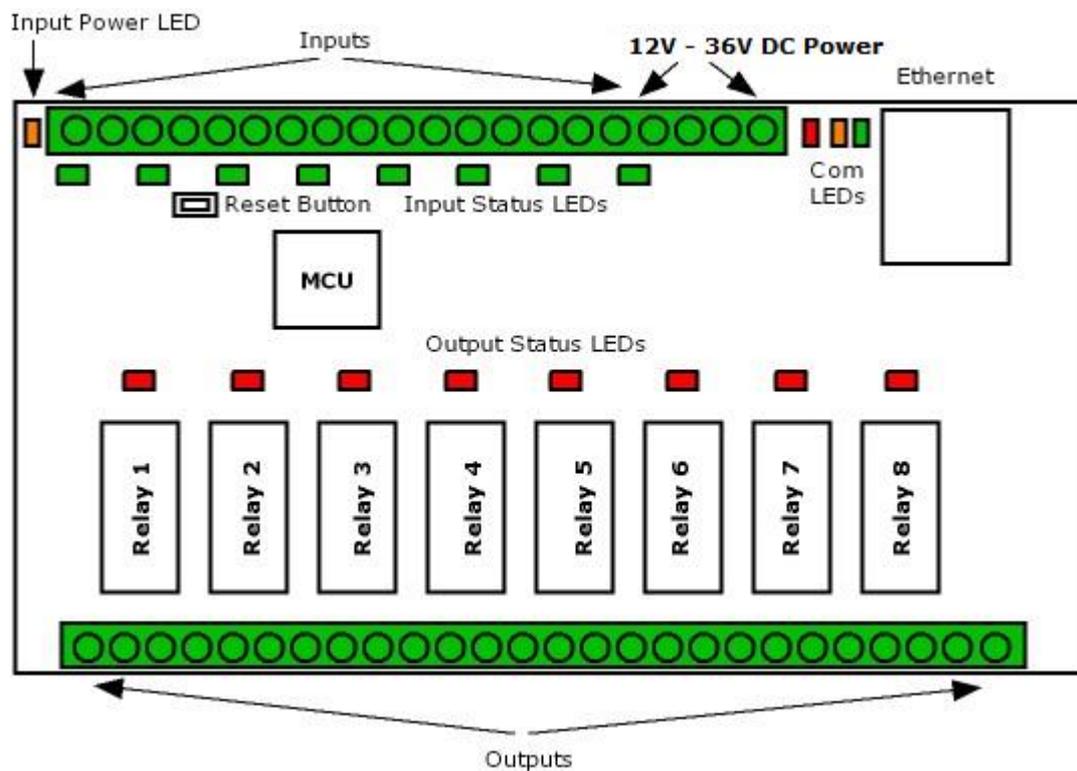


Figure 4. The board layout of the FNIP-8x16A

Output status LEDs

Each output has a dedicated status LED that illuminates solid red when the corresponding output is on.

Input status LEDs

Each input has a dedicated status LED that illuminates solid green when the corresponding input is activated.

Input power LED

Indicates whether the input power is present.

Communication LEDs

Con LED - green

The Con LED is on when the module is connected to the Ethernet network.

Act LED - yellow

The Act LED indicates that communication via Ethernet is in progress.

St LED - red

The status LED indicates that the boot loader of the module is active. This should only happen during firmware update.

Please never disconnect power from the module while this LED is on!

If this LED stays on after the firmware update, please contact your dealer!

CONFIGURATION

Configuration can be done either via the built-in website or via TCP/IP connection. In the latter case the configuration interface the third party controller provides is used.

Configuration via the web interface

Use the FNIP Network Discovery Utility software to find all FutureNow IP devices on your network.

Connecting to the module's web server

After the modules are found you can click on one of them to open its website in a browser.

You can also access the module's internal website from an Internet browser using the host name (FNIP8x16A by default) or the IP address.

By default, each module obtains an IP address from a DHCP server automatically.

If there's no DHCP server available on the network, 192.168.1.25 will be assigned to the module. The same IP address will be used when connecting the module directly to your computer with an Ethernet cross cable.

Authentication

Once connected to the module's website, you will be asked to identify yourself, as seen in figure 5.

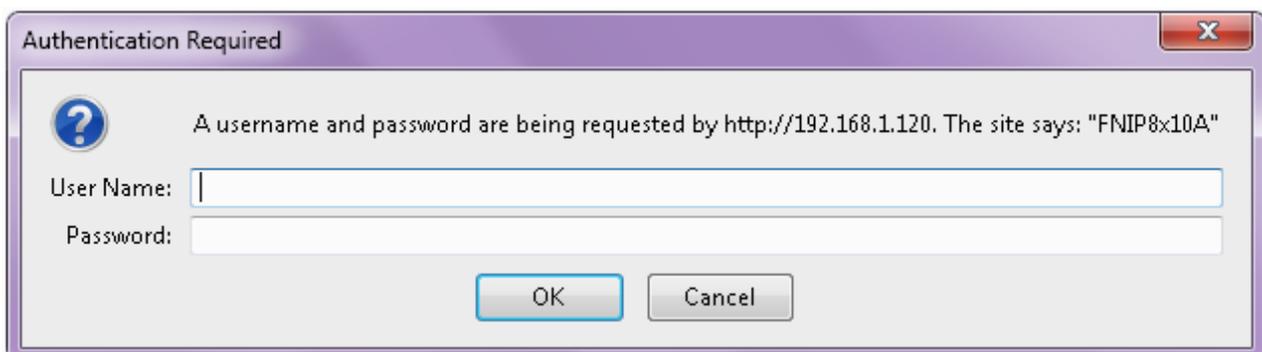


Figure 5. Authentication Window

The default user name: **admin**

The default password: **futurenow**

The default user has administrator rights and offer access to all settings and functions.

Once logged in, you will automatically be directed to the control page. you can see the details in the OPERATION section.

You can use the tabs on the top of the screen to navigate between the different control and configuration pages.

Network settings

To make basic network settings click the **Network** tab. The network configuration page is shown in Figure 6.

You can choose between using DHCP or static IP address here.

Enable HTTP authentication

HTTP authentication can be disabled to make HTTP communication easier for third party applications.

Enable broadcast messages

FNIP modules periodically send out heartbeat broadcast messages with basic information about themselves. This helps discovery tools and mobile apps to find them. These broadcasts can be disabled if constant traffic on the network is not desirable.

Please note that disabling broadcast messages will stop the Discovery Tool and the mobile applications from finding the modules on the network.

Multicast address

Used to create groups of FNIP modules that react to scene activation commands received from a module with the same multicast address.

More information about scenes can be found in the Scenes chapter.

Control
Input
Network
Channel
Scenes
Users
Firmware
Logout

Network settings:

Host Name:

Enable DHCP

Enable TCP

Enable HTTP Authentication

Enable Broadcast Messages

TCP Port:

IP Address:

Gateway:

Subnet Mask:

Primary DNS:

Secondary DNS:

Multicast Address:

MAC Address: 54:10:EC:99:B8:4E

Figure 6. Network Configuration Page

Users and user rights

Three different users can be defined, each with three different user rights: **admin**, **actor** and **observer**.

Admins have access to all functions, including control of the outputs, monitoring the status of the inputs and outputs and changing all the settings.

Actors are allowed to control the outputs and monitor the status of the inputs and the outputs, but are not allowed to change any settings.

Observers are allowed to monitor the status of inputs and outputs but not allowed to control the outputs, nor can they change any settings.

To change user settings, click on the **User** tab in the top menu. The user configuration page is shown in Figure 7.



Username and password settings

Username:

Password:

Verify password:

User Administration

Users:

Username:

User role:

User Enabled

Password:

Verify password:

Figure 7. User Configuration Page

Channel settings

On the **Channel** page the outputs and inputs can be renamed. Input modes can also be chosen here. The input mode determines the logical connection between the input and the output of the same channel. For details on possible input modes and how they work, see **Operation via the local inputs** section of this document.

Control
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Output labels:	Input labels:	Input modes:	Monostab. duration:	Scene no.
<input type="text" value="Channel1"/>	<input type="text" value="Input1"/>	Scene on close ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel2"/>	<input type="text" value="Input2"/>	Scene on close ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="2"/> ▼
<input type="text" value="Channel3"/>	<input type="text" value="Input3"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel4"/>	<input type="text" value="Input4"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel5"/>	<input type="text" value="Input5"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel6"/>	<input type="text" value="Input6"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel7"/>	<input type="text" value="Input7"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼
<input type="text" value="Channel8"/>	<input type="text" value="Input8"/>	Toggle ▼	<input type="text" value="10"/>	<input style="width: 20px; text-align: center; border: none; border-bottom: 1px solid black; border-right: none; border-left: none; border-top: none;" type="text" value="1"/> ▼

Other settings:

Resume light levels after power outage:

Figure 8. Channel Settings Page

Scenes

Scenes are predefined states of the outputs on the module.

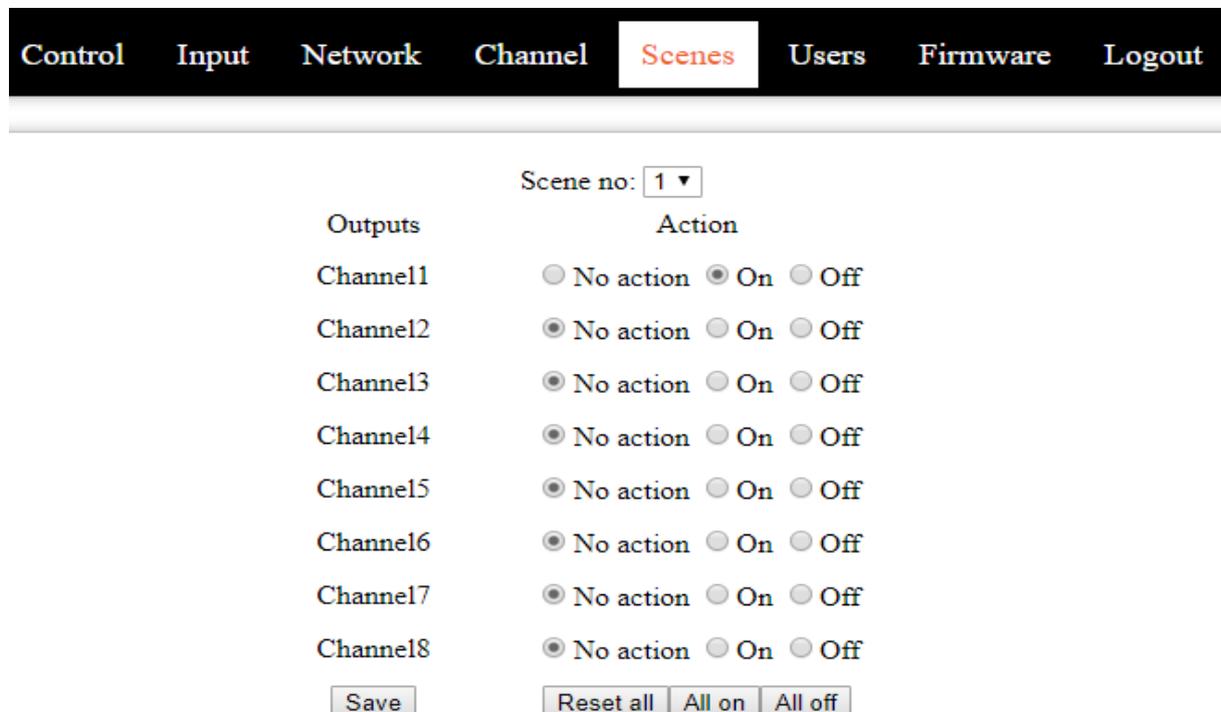
FNIP scenes can be used in standalone applications without any third-party controller. FNIP modules (module groups) support 9 scenes.

If a module receives a **Scene Activation Command (SAC)**, the designated outputs will go to a pre-defined state. Any module in the group can send and receive this command. SAC can be triggered by an input change on the same module or on any module in the group.

Each module in the group must have the same **Multicast address** set on the Network page. Modules in other groups will not react to the SAC.

Definition of the scenes can be done on the Scene setting page using the following steps:

1. Select a scene using the Scene no scroll-down selection box
2. Define the action of the desired outputs by ticking the desired option
3. Save the setting



Outputs	Action
Channel11	<input type="radio"/> No action <input checked="" type="radio"/> On <input type="radio"/> Off
Channel12	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel13	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel14	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel15	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel16	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel17	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off
Channel18	<input checked="" type="radio"/> No action <input type="radio"/> On <input type="radio"/> Off

Figure 9. Scene setting page

Firmware Upgrade



Control Input Network Channel Dimming Scenes Users **Firmware** Logout

Firmware Upgrade: No file selected.

Current firmware version:
1.1.9r2

Time elapsed since last reset:
0 d 00:06

Figure 10. Firmware upgrade page

Upgrading the firmware in the module is possible via the network.

On the **Firmware** page click browse and find the new firmware on your PC. The latest firmware versions are always downloadable from P5's website. Then click **Upload**. The **St** LED turns on and stays on or blinks during firmware update. After uploading the new firmware – which takes about a minute – the module will automatically restart.

The current firmware version and the time since the last reset are also displayed on this page.

Resetting to factory defaults

Holding the reset button for at least 2 sec while powering up the module will set all the settings to factory defaults. **Please make sure you release the button when the red LED comes on or the unit will go into re-flash mode.**

OPERATION

Operation via the local inputs

The inputs can be activated by shorting (or opening) the appropriate input terminal to the input common terminal.

Input modes

The inputs are factory defaulted to toggle mode and can be changed via the web interface of the dimmer or by TCP/IP commands. The input modes work as follows.

1. Toggle mode (factory default)

Each short button press toggles the corresponding output

2. Independent inputs

Inputs can be detached from their corresponding outputs, in which case they will have no effect on them. However, the status changes of the digital inputs will still be reported via the open TCP/IP sockets and on the **Control** page of the built-in website. This can be used for monitoring the status of digital sensors connected to the inputs or to activate lighting scenes or macros whenever the input gets triggered.

3. Input follow mode

The status the outputs will follow the state of the corresponding input. The output will be on while the momentary switch is pressed and off while it is released.

4. Monostable mode

The outputs can be programmed to turn on for an adjustable amount of time when the corresponding input is triggered (e.g: staircase lighting).

5. Switch mode

This mode makes it possible to use maintained (standard light switches) instead of momentary switches on the inputs. Each trigger of the switch (On or Off) will

toggle the outputs. Please note that the position of the switch – similarly to three-way switches – will not determine the status of the output.

6. Scene on open mode

If an input gets opened the scene assigned to the input on the channel configuration page will be executed.

7. Scene on close mode

If an input gets closed the scene assigned to the input on the channel configuration page will be executed.

Operation via the built-in web server

Control page

Once logged in, you will automatically be directed to the control page, where you can control the **outputs** directly.

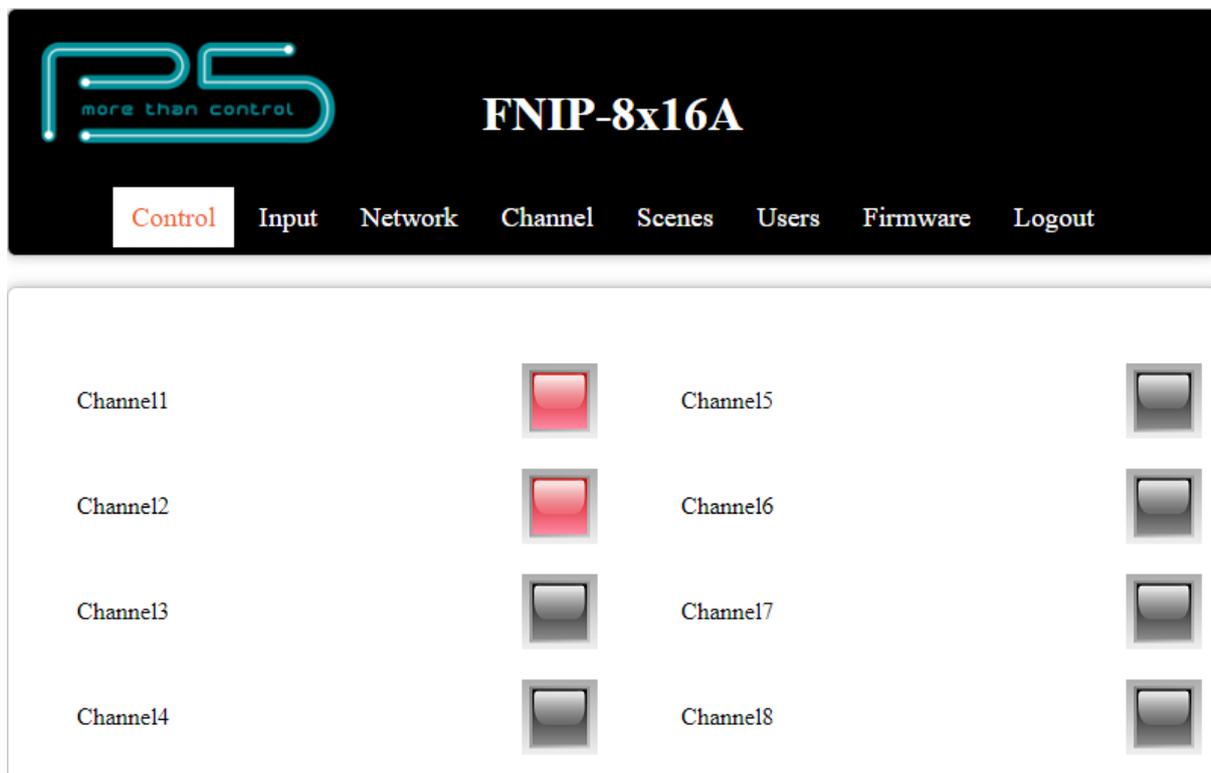


Figure 11. Control Page

Input page:

This page displays the actual status of the inputs.

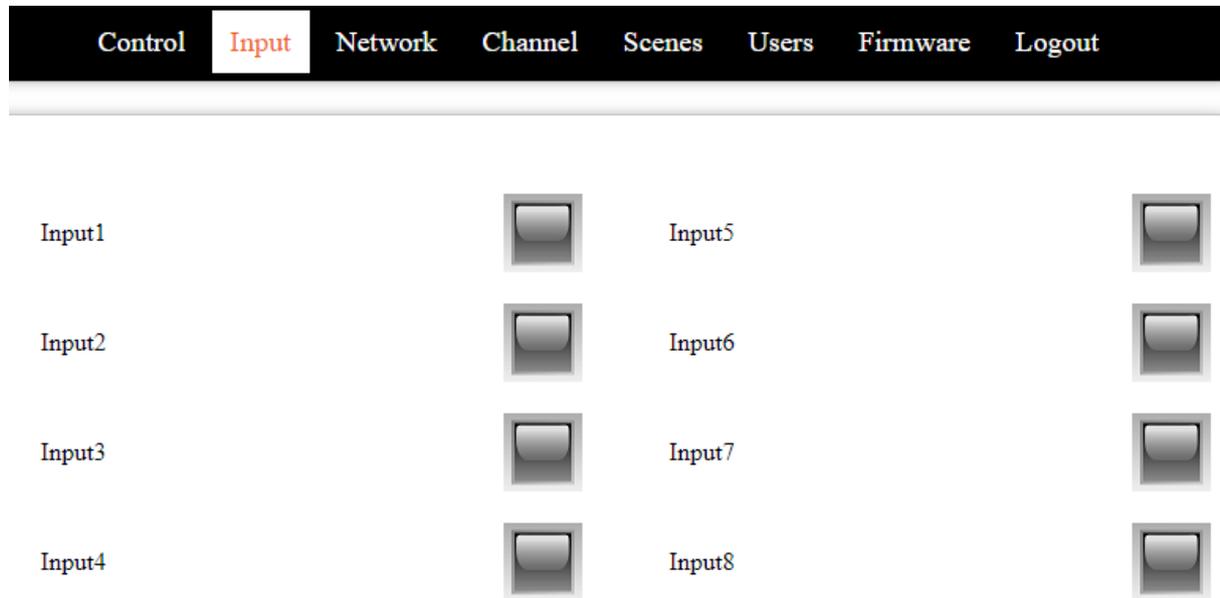


Figure 12. Input Page

Operation via TCP

To achieve the easiest integration with most controllers used in home and commercial applications, the module can be controlled by raw TCP protocol using simple ASCII based commands.

The TCP/IP communication can be enabled/disabled via the Network settings screen.

The TCP Communication Protocol Description is available upon request.

Event notifications

Automatic event notifications are sent to clients via the open socket connections whenever the status of an input or output changes.

Basically, any third party controller that can implement the FNIP-8x16A's simple communication protocol can control the FutureNow FNIP-8x16A. The following controllers are the most widely used:

- AMX
- Control4
- Crestron
- RTI
- Savant
- ExtronNeets

Software modules/plugin-ins for controllers are either available or P5 will provide full assistance in creating them.

Besides these special-purpose controllers, there have been many applications for embedded industrial PC boards, PCs and smartphones running Linux, Windows, Mac OS.

TECHNICAL SPECIFICATIONS

Power Requirements	
Main Circuit	10.8 – 36 VDC max. 340mA @ 12V max. 170mA @ 24V
Inputs	9 – 36 VDC max. 20mA @ 12V max. 45mA @ 24V
Outputs	
Type	8 x SPDT NO, NC, dry contacts
Load	max. 16A@250VAC or 24VDC for resistive (cos(fi)=1) loads max. 8A@250VAC or 24VDC for inductive (cos(fi)=0.4) loads
Inputs	
Type	8 x optically isolated, noise protected, common GND digital inputs
Communication	
Control	TCP (simple ASCII TCP commands) Build-in web server Local inputs (dry contacts, momentary switches)
Input modes	Toggle, monostable, input follow, independent
iOS/Android app	P5 iOS/Android apps
Interoperability	Drivers available for most systems
Connectors	
Terminals	2.5mm ²² screw terminals for both inputs and outputs
Ethernet	RJ45 Ethernet Connector
Environmental	
Operating Temperature	0 °C – 40 °C (32 °F – 104 °F)
Storage Temperature	-20 °C – 60 °C (-4 °F – 140 °F)
Humidity	Up to 93%
Physical	

Dimensions (H x W x D) 157 mm x 86 mm x 57 mm (9 DIN unit width)
Weight 0.38Kg
Installation Standard DIN Rail Mount

Approvals

CE

Package Content

FNIP-8x16A
Quick Installation Guide

Warranty

2 years

REFERENCES

FNIP Search Utility: [FNIP Discovery Tool](#) (Registration needed on www.p5.hu)

FNIP-8x16A TCP Communication Protocol Description

(Please send an email to support@p5.hu)

CONTACT DETAILS

support@p5.hu

<http://p5.hu/index.php/support/contact-technical-support>