

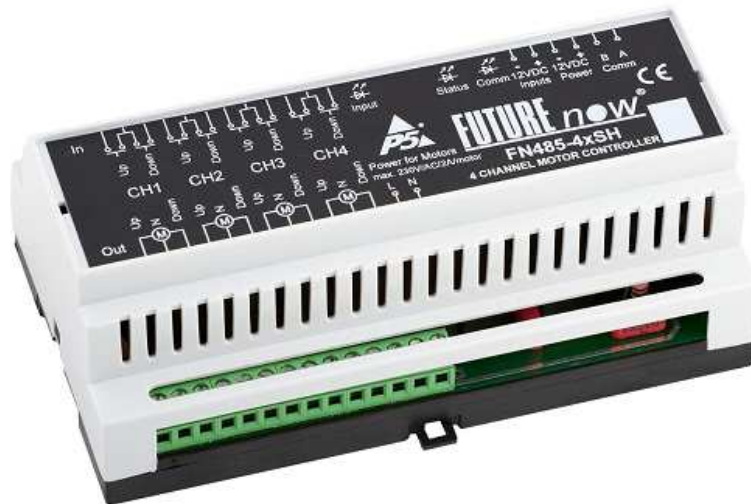
# FutureNow FNIP-4xSH-12 and FNIP-4xSH-24 Installation Manual rev 15.01.2014

TCP/IP and Web Controllable  
Four Channel DIN Rail Window Shading Controller with Local Inputs

## OVERVIEW

The FNIP-4xSH can be used for controlling four motorized window coverings, such as shades, shutters, blind, curtains, awnings or projection screens and any other devices equipped with four-wire bidirectional AC motors with built-in limit switches either via its local inputs, custom TCP protocol or via its built-in web interface.

The FNIP-4xSH can be controlled and monitored from standard network capable devices such as computers, smartphones, web-tablets, etc. either locally or via the Internet.



**Figure 1. The FNIP-4xSH Window Shading Controller**

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

In addition to the outputs, the FNIP-4xSH also provides local inputs for manual control, which give 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 outputs via the inputs do not rely on a controller or network components that are usually single points of failure.

The manual inputs are usually connected to momentary wall switches and function 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**

- Ideal for motorized window coverings, projection screens, awnings, etc.
- 4 outputs for controlling 4 four-wire (up/down/neutral) bidirectional AC motors
- 4x2 (up/down) galvanically isolated inputs for fully and partly open/close and stop commands
- Up, Down, Stop commands
- Delay when changing direction to protect the motor
- Mechanical and electronic latch preventing the motor from being driven in both directions at the same time

### **Ultimate Flexibility**

- Adjustable up and down motor running times
- Separate power inputs for powering motors with different voltage requirements
- "Motor in motion" indication
- Percentage indication of position
- Standard DIN rail mount
- Available in both 12V DC and 24V DC powered versions
- 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

### **Enhanced Connectivity**

- New TCP/IP interface offers remote control and advanced management
- Built-in web server for configuration, control and monitoring
- Remote control and monitoring from network enabled smartphones and tablets
- Multiple users with different user rights

- TCP communication with simple ASCII commands
- Automatic event reports about status changes of inputs and outputs
- Firmware upgrade via LAN

### **Industry-Wide Interoperability**

- Full Integration with home controllers from most major vendors (Control4, AMX etc.)
- Interoperable with any momentary contact switches available on the market

## **INSTALLATION**

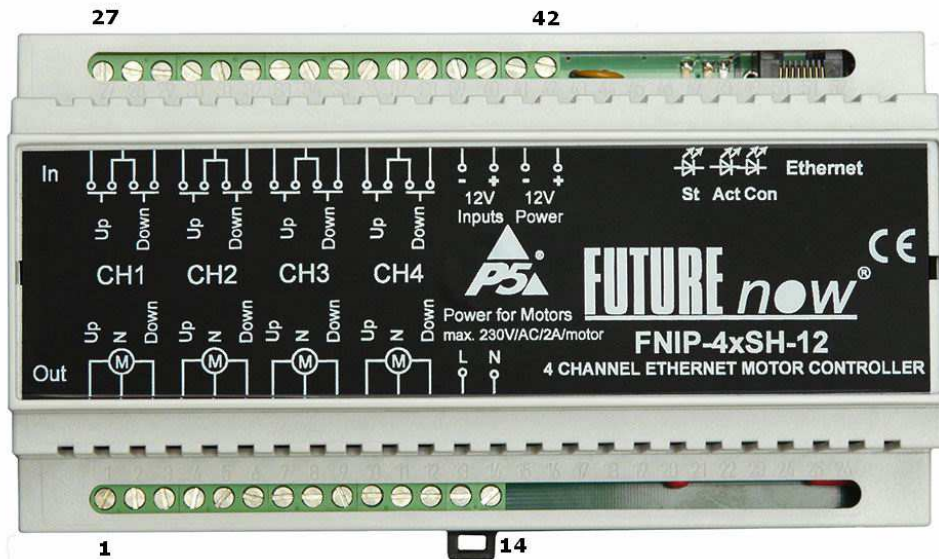
**WARNING!** Since the module is connected to line voltage, the installation must be performed by a qualified electrician in accordance with the local electrical codes!

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-4xSH are listed in Table 1.



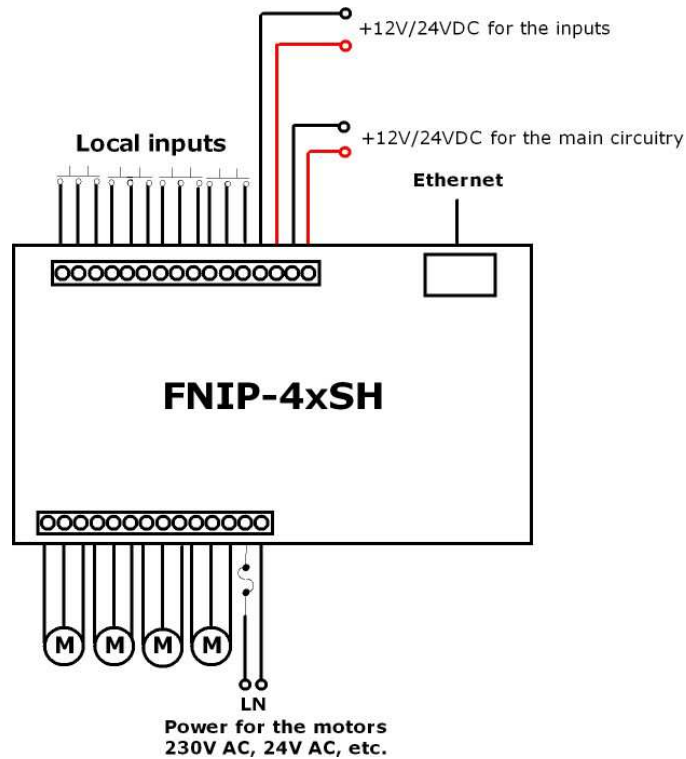
**Figure 2. FNIP-4xSH front view with terminal connectors**

No.	Description	No.	Description
1.	Motor 1. Up Out	27.	Motor 1. Up Input
2.	Neutral	28.	Inputs common
3.	Motor 1. Down Out	29.	Motor 1. Down Input
4.	Motor 2. Up Out	30.	Motor 2. Up Input
5.	Neutral	31.	Inputs common
6.	Motor 2. Down Out	32.	Motor 2. Down Input
7.	Motor 3. Up Out	33.	Motor 3. Up Input
8.	Neutral	34.	Inputs Common
9.	Motor 3. Down Out	35.	Motor 3. Down Input
10.	Motor 4. Up Out	36.	Motor 4. Up Input
11.	Neutral	37.	Inputs common
12.	Motor 4. Down Out	38.	Motor 4. Down Input
13.	Power for Motors Live	39.	Power for the Inputs GND
14.	Power for Motors Neutral	40.	Power for the Inputs +12V (FNIP-4xSH-12) or +24V (FNIP-4XSH-24)
		41.	Power for the Main Circuitry GND
		42.	Power for the Main Circuitry +12V FNIP-4xSH-12) or +24V (FNIP-4xSH-24)

**Table 1. FNIP-4xSH terminal connector**

## Wiring

A typical wiring diagram is shown in figure 3.



**Figure 3. Wiring diagram**

**All outputs in this example are used to control line voltage motors on the same phase. Providing different voltage across terminals 13 and 14 motors with different power requirements can also be used but all four motor has to be have the same power requirement.**

After making all connections, check if the outputs work via the inputs (only applicable if input power is connected across terminals 39-40.) The status LEDs will assist you in tracking the status of the outputs and see if the inputs work properly.

## Recommended wire types

- Ethernet cable: Twisted pair, CAT5 or better.
- Outputs: According to the loads attached to the outputs (current and voltage).
- Inputs: A pair of low or high voltage cables.

- The inputs use low voltage signals. 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 line voltage wiring physically separated from Ethernet and signal wiring.

## **Power requirements**

The module must be powered through terminals 41 and 42. by 12VDC (FNIP-4xSH-12) or 24VDC (FNIP-4xSH-24).

### **Please pay attention to the correct polarity.**

The galvanic isolation of the inputs is only effective when a separate power supply is used for powering the inputs. The FNIP-4xSH has separate power input terminals (39 and 40) for this purpose. If you choose not to use the extra protection the isolated inputs offer (not recommended), you can use the same power to supply both the main circuitry and the inputs. In that case, simply connect terminal 39 to terminal 41 and terminal 40 to terminal 42.

## **Ethernet connection**

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

## **Outputs**

The module has four motor driver outputs each allows for connecting 230V or lower voltage four-wire bidirectional AC motors. Note that all the four motors have to have the same power requirement. The power for all the motors is the same, provided across terminals 13 and 14. For example the module can't be used to drive two 230V AC and two 24V AC motors, but can drive four 230V AC or four 24V AC motors. In the latter case 24V AC voltage must be applied across terminals 13 and 14.

## **Local Inputs**

For each output, there are two local inputs to allow for manual operations. If you do not wish to use local inputs, this section may be skipped.

Connect momentary switches across the appropriate input terminals and the input common terminal for both the 'up' and the 'down' directions.

**WARNING!** Avoid supplying voltage on these terminals!

All input ports are galvanically 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. The FNIP4xSH has separate power input terminals for this purpose. See section "Power Requirements" if you don't want to use two separate power supply units.

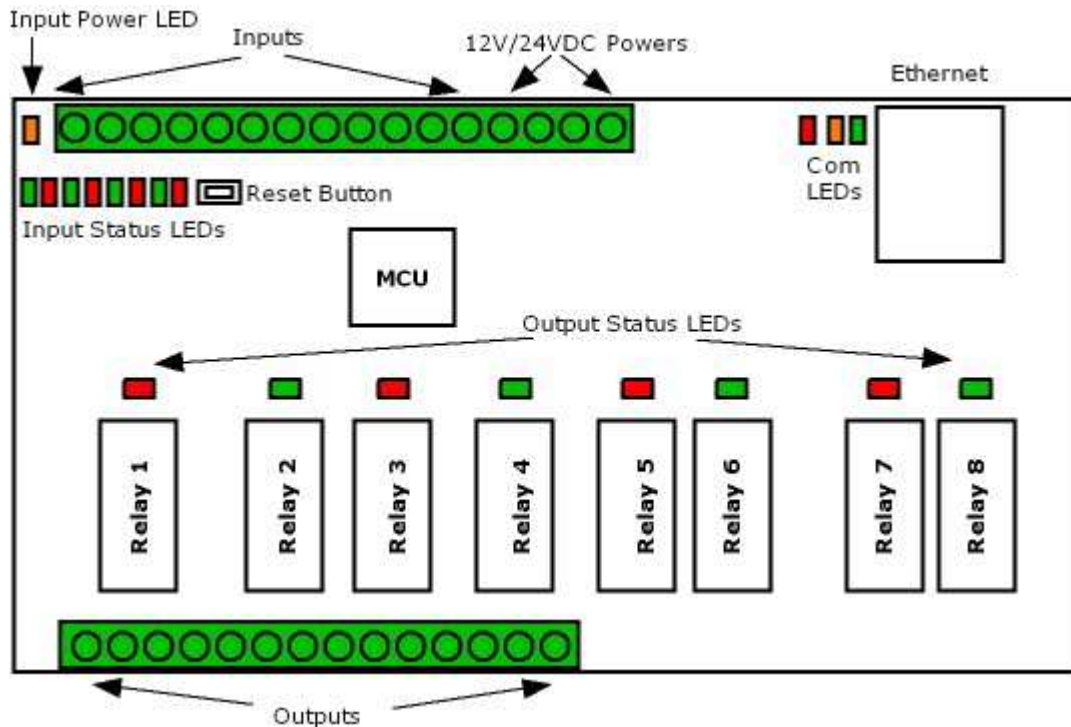
To assure an additional level of safe and reliable operation, the inputs are also software protected against the effects of noise spikes that usually occur when heavy inductive loads (motors, fans, etc.) are switched nearby. In most systems lacking this level of protection, these spikes may result in 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-4xSH**

### Output status LEDs

Each channel has two dedicated (red and green) output status LEDs. The green LED is on when the corresponding output is activated (the motor is powered). The red LED indicates the direction of the movement. It is off while the motor is moving up and on while the motor is moving down. If the motor is not in motion, this LED is off.

### Input status LEDs

Each channel has two dedicated (red and green) input status LEDs. The green LED is on while the "up" input is active and the red LED is on while the "down" input is active.

### Input power LED

When on, indicates that the input power is present.

### Communication LEDs

#### Con LED

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

#### Act LED

It indicates that communication via Ethernet is in progress.



### **St LED**

This status LED indicates that the bootloader 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 distributor!**

## **CONFIGURATION**

Configuration can be done either via the built-in website or via TCP/IP connection. In the latter case the configuration interface the 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 site**

After the scan is over you can click on one of the modules found to open its website in a browser.

You can also access the module's internal web pages from an Internet browser by typing **FNIP4xSH** (default hostname) or whatever the hostname has been changed to or the IP address in the URL window.

Each module automatically obtains an IP address from a DHCP server by default. In the lack of DHCP server the default IP address of 192.168.1.25 will be assigned. The same IP address will be assigned when connecting the module directly to your computer (not running a DHCP server) with an Ethernet cross cable.

#### **Authentication**

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



**Figure 5. Authentication Window**

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

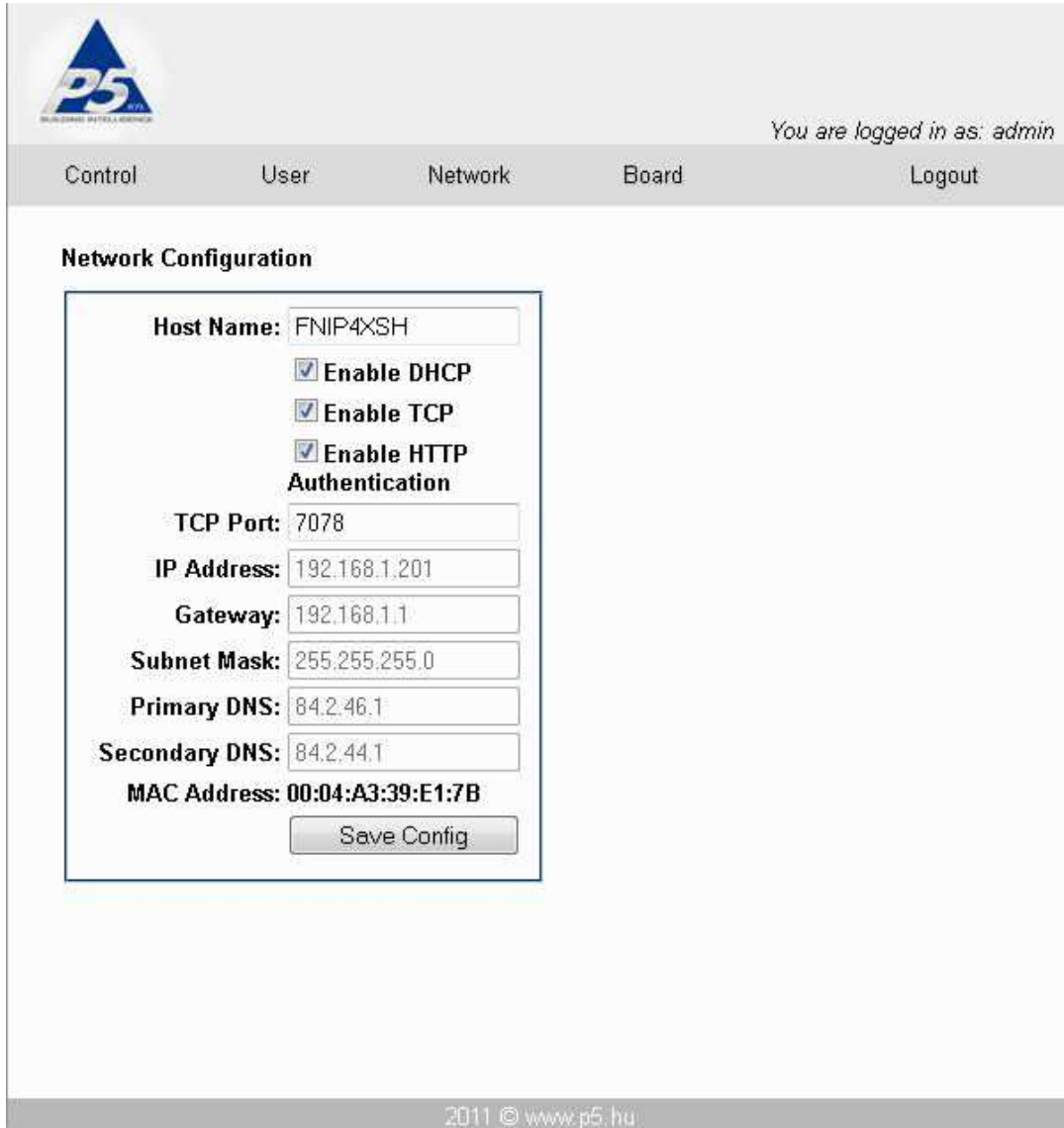
The default user name is: **admin**

The default password is: **futurenow**

Once logged in, you will automatically be directed to the control page. There is a menu on the top of each web page to navigate between the different control and configuration pages.

### **Configuring the network settings**

To make basic network settings click **Network** in the top menu. You can choose between using DHCP or static IP address and make all necessary network settings on this page, as shown in Figure 6.



Control User Network Board Logout

You are logged in as: admin

### Network Configuration

Host Name: FNIP4XSH

Enable DHCP

Enable TCP

Enable HTTP Authentication

TCP Port: 7078

IP Address: 192.168.1.201

Gateway: 192.168.1.1

Subnet Mask: 255.255.255.0

Primary DNS: 84.2.46.1

Secondary DNS: 84.2.44.1

MAC Address: 00:04:A3:39:E1:7B

Save Config

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**Figure 6. Network Configuration Page**

### Adding users and setting up user rights

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

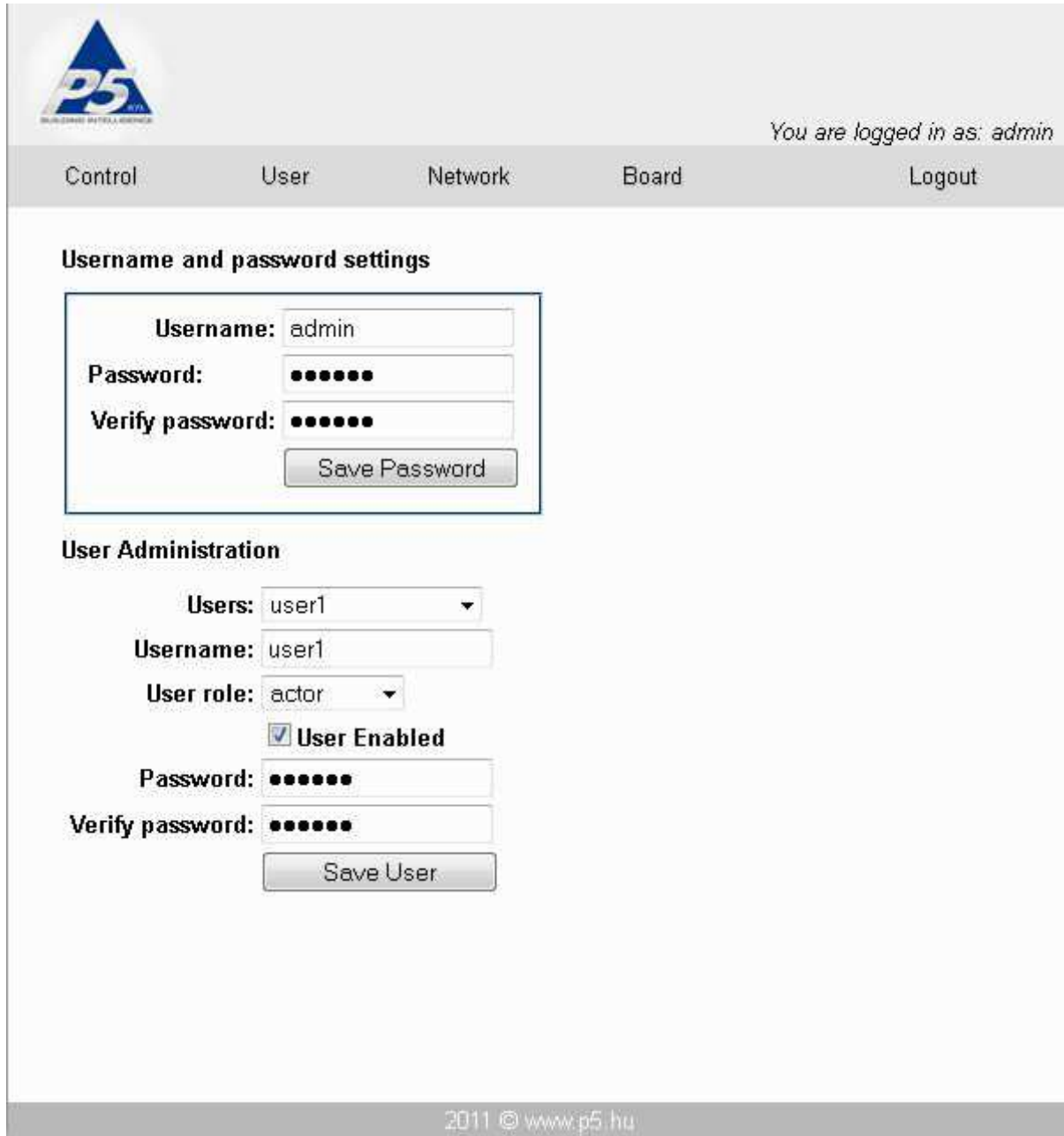
**Admins** have access to all functionality, including control of the outputs, monitoring the status of the inputs and outputs and changing all the settings.

**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 modify user settings click on **User** in the top menu. The user configuration page is shown in Figure 7.

The name of the currently logged-in user is displayed at the top right corner of the page.

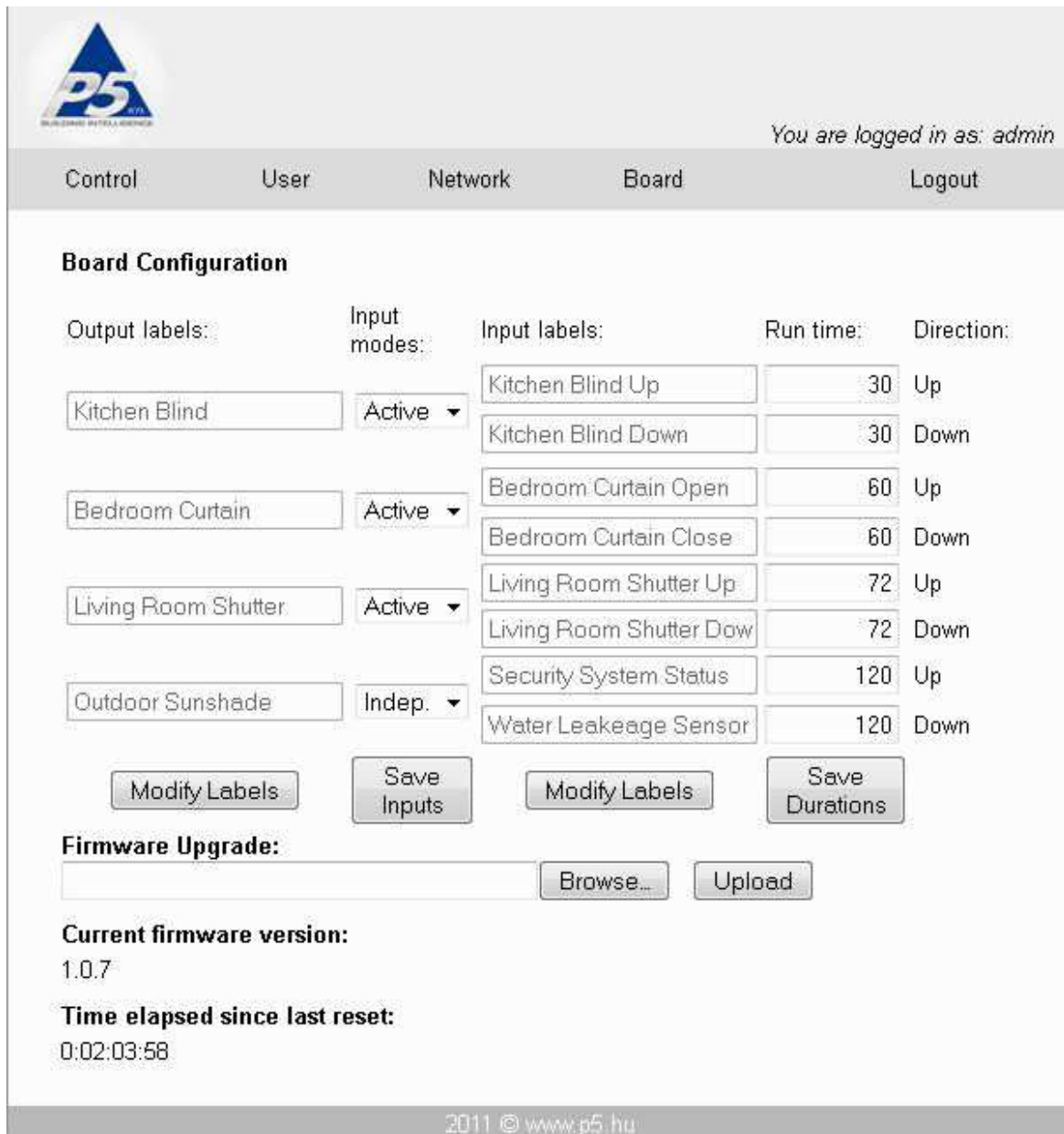


The screenshot shows the P5 Kft. web interface. At the top left is the P5 Kft. logo. At the top right, it says "You are logged in as: admin". Below this is a navigation menu with "Control", "User", "Network", "Board", and "Logout". The "User" menu item is selected. The main content area is titled "User Administration" and contains two sections: "Username and password settings" and "User Administration". The "Username and password settings" section has a "Username:" field with "admin", a "Password:" field with seven dots, a "Verify password:" field with seven dots, and a "Save Password" button. The "User Administration" section has a "Users:" dropdown menu with "user1", a "Username:" field with "user1", a "User role:" dropdown menu with "actor", a checked "User Enabled" checkbox, a "Password:" field with seven dots, a "Verify password:" field with seven dots, and a "Save User" button. At the bottom of the page, it says "2011 © www.p5.hu".

**Figure 7. User Configuration Page**

### Board configuration

Clicking on **Board** in the top menu takes you to the board configuration page, where the following settings can be configured:



**Board Configuration**

You are logged in as: admin

Control    User    Network    **Board**    Logout

Output labels:	Input modes:	Input labels:	Run time:	Direction:
<input type="text" value="Kitchen Blind"/>	Active ▾	<input type="text" value="Kitchen Blind Up"/>	<input type="text" value="30"/>	Up
		<input type="text" value="Kitchen Blind Down"/>	<input type="text" value="30"/>	Down
<input type="text" value="Bedroom Curtain"/>	Active ▾	<input type="text" value="Bedroom Curtain Open"/>	<input type="text" value="60"/>	Up
		<input type="text" value="Bedroom Curtain Close"/>	<input type="text" value="60"/>	Down
<input type="text" value="Living Room Shutter"/>	Active ▾	<input type="text" value="Living Room Shutter Up"/>	<input type="text" value="72"/>	Up
		<input type="text" value="Living Room Shutter Dow"/>	<input type="text" value="72"/>	Down
<input type="text" value="Outdoor Sunshade"/>	Indep. ▾	<input type="text" value="Security System Status"/>	<input type="text" value="120"/>	Up
		<input type="text" value="Water Leakage Sensor"/>	<input type="text" value="120"/>	Down

**Firmware Upgrade:**

**Current firmware version:**  
1.0.7

**Time elapsed since last reset:**  
0:02:03:58

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**Figure 8. Board Configuration Page**

### **Setting the motor running time**

Set the motor running time to the length of time it takes for the shutter/blind to go from one of the extreme positions to the other. Since the time may be different in the two directions it is possible to set a different value for each direction.

### **Other configuration settings**

On the Board configuration page custom names can be created and modified for each of the four outputs and eight inputs.

The input modes can also be defined 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 local inputs" paragraph of this document below. Updating the firmware is also possible via this page.

### **Logging out**

You can log out from the module's web pages by clicking on the "Log Out" tab.

### **Resetting to factory defaults**

Holding the reset button for more than 5 sec while powering up the module will set all the settings to factory default.

## **OPERATION**

### **Operation via the local inputs**

The inputs can be activated by shorting the appropriate input terminal to the input common terminal.

Throughout this section it is assumed that momentary switches are connected to the local inputs.

In order to power the circuitry for the local inputs, an input power of 8-16V must be applied across terminals 39 and 40. In case local inputs are not needed, this power connection is not necessary.

### **Input Modes**

There are two inputs modes. Setting the input modes is possible via the web interface or by TCP commands. The meaning of the input modes is as follows:

### **Active inputs (input mode 1/factory default)**

There are separate directional inputs for the two possible motor directions. If the motor is inactive (off) and an input is activated, then the motor will start moving in one direction. If the same input is activated again while the motor is still running, it will stop. Activating the other input while the motor is stopped will cause the motor to move in the other direction. The motor will continue running until the motor running timer expires (factory default is 1min.) or the built-in limit switch in the motor turns the power off.

In this way, you only have to activate one of the directional inputs briefly to move the motor to one of its directional limits. Activating it again will cause the motor to stop at any intermediate position.

Activating the input for the opposite direction while the motor is still moving will cause the motor to change its direction after a short delay.

You can also move the motor to the desired position by holding the button until the required position is reached. Then the button should be released.

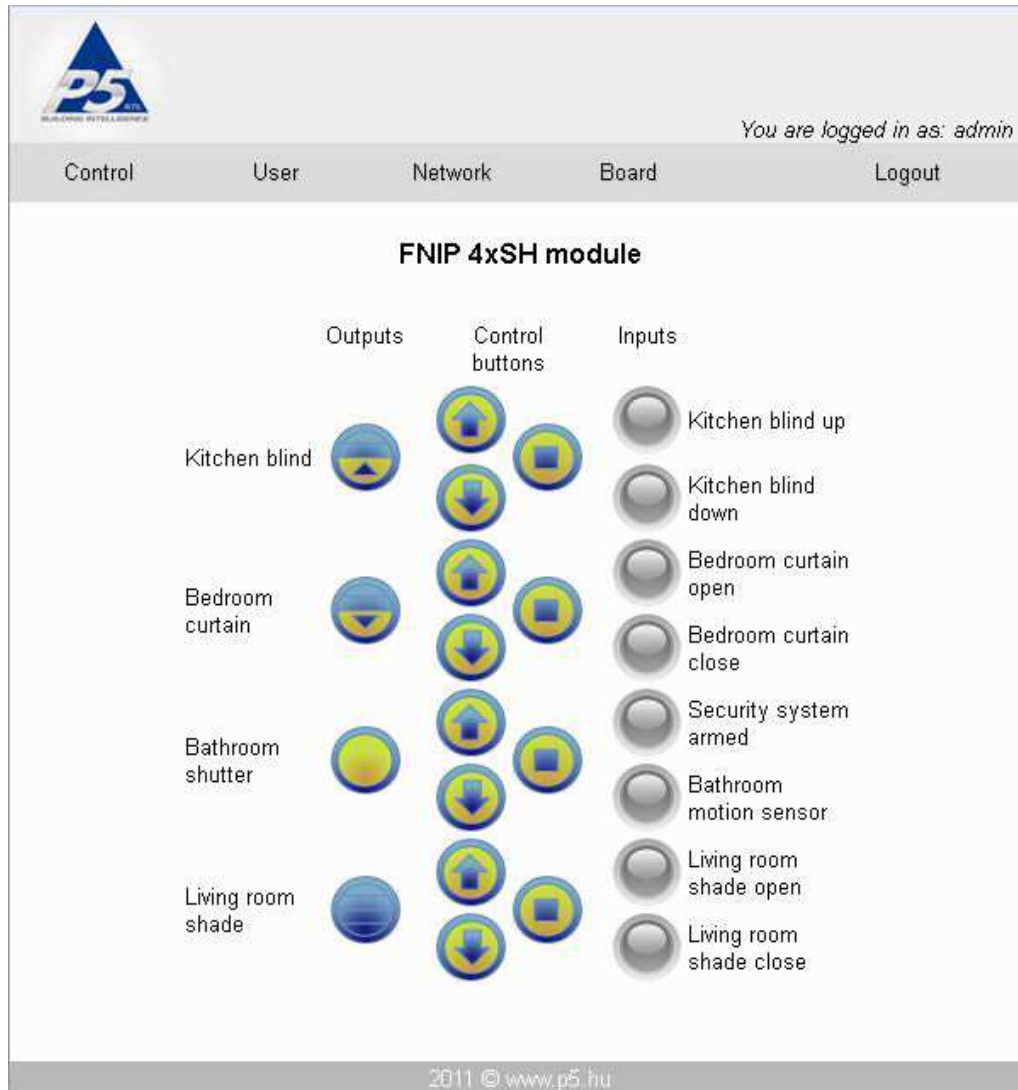
### **Independent inputs (input mode 0)**

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 to monitor the status of digital sensors connected to the inputs or to activate lighting scenes or macros whenever the input gets triggered.

## **Operation via the built-in web server**

Clicking on **Control** in the top menu the control page in Figure 9. will open. Via this page the outputs can be controlled and the status of both the inputs and the outputs are displayed.

For simplicity, throughout this section the word "blind" will be used for all the motorized window coverings and other devices that can be controlled by the FNIP-4xSH.



**Figure 9. Control Page**

Each input can either be active (input terminals shorted) or inactive (input terminals open) A grey icon means that the corresponding input is inactive. An active input is indicated by a green icon.

The outputs can be in different states indicated by the following icons.



The blind is fully open



The blind is fully closed





The blind is moving up (opening)



The blind is moving down (closing)



The blind is partly open. With the new firmware version the position is also displayed. (e.g. 52% open)

Controlling the blinds is also possible via this web page:



Clicking on the "up arrow" icon will start moving the blind up (opening).



Clicking on the "down arrow" icon will start moving the blind down (closing).



Clicking on this icon will stop the blind at the current position.

## 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.

There are TCP commands for:

Turning an output On/Off, Toggling an output, turning an output on for a certain time, querying the status of the inputs and outputs, setting and retrieving the mode of inputs, etc.

There are commands for:

Starting the motor to move up/down, toggle the motor's direction, stopping the motor, retrieve the motor's (blind's) position, retrieve if the motor is in motion, query the status of the inputs, set and query the mode of inputs, set and query the motor running time in both directions, move the motor up/down by a certain amount (%) or for a certain duration, etc.

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-4xSH's simple communication protocol can control the FutureNow FNIP-4xSH. The following controllers are the most widely used:

- AMX
- Control4
- Crestron
- RTI

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

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

### **Firmware upgrade**

Upgrading the firmware of the module is possible via LAN or WAN.

On the Board Configuration page of the module's internal website, navigate to the location on your PC where the new firmware file is saved. Then click **Upload**. The St LED turns on and stays on during firmware update. After uploading the new firmware –which takes no more than a few seconds- the module will automatically restart.

The version of the currently running firmware is displayed at the bottom left corner of the Board Configuration page.

## **TECHNICAL SPECIFICATIONS**

### **Power requirements**

#### **FNIP-4xSH-12:**

Main circuitry: 9-13.8V DC max. 330mA@12V (when all motors are moving down and communication is in progress)

Inputs: 8-16V DC, max. 80mA@12V

#### **FNIP-4xSH-24:**

Main circuitry: 18-27V DC max. 250mA@24V (when all motors are moving down and communication is in progress)

Inputs: 10-25V DC, max. 90mA@24V

### **Outputs**

Type: 4 x Up/Down relay outputs

Load: max. 4x2A@230V AC for inductive (cos(fi)=0.4) loads

### **Inputs**

Power: 8-16V DC

Current: Approx. 15 mA@12V per closed inputs

Type: 4x2 galvanically isolated, noise protected common GND digital inputs for dry contacts

Functions: Assigned to the corresponding outputs (up/down/stop) or independent

### **Terminals**

Type: Screw terminals for max. 2.5 mm<sup>2</sup> wires

### **Communication**

10Mb/s Ethernet via RJ45 Ethernet connector

Simple ASCII based TCP commands via port 7078 by default

Number of socket connections that are allowed to be opened simultaneously:2

or

via its built-in web page (http)

### **Supported web browsers**

Mozilla Firefox, Google Chrome, Safari, Internet Explorer 7 or greater, Opera

### **Other parameters**

Operating temperature: 0 °C – 40 °C (32-104 °F)

Dimensions: W x H x D = 157 mm x 86 mm x 57 mm (9 DIN unit width)

Weight: 0,38 kg

Color: Light grey with black cover plate

### **Standards**

EN 61000-6-1:2007

EN 61000-6-3:2007

EN 60669-2-1

RoHS

### **Test methods**

EN 55022:2010

EN 61000-4-3:2006/A1:2008/A2:2010

EN 61000-4-4:2005/A1:2010

EN 61000-4-6:2007

EN 61000-4-2:2009

## **REFERENCES**

FNIP Search Utility  
FNIP-4xSH TCP Communication Protocol Description

## **CONTACT DETAILS**

support@p5.hu