FutureNow FNIP-12xPWM
Installation Manual
draft version
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12 Channel DIN Rail Mountable Low Voltage Ethernet LED Dimmer with Local Inputs

OVERVIEW

The FNIP-12xPWM is used for switching and dimming low voltage LED lightings.

The outputs can be operated from standard network capable devices such as computers, smart phones or tablets either locally or via the Internet using TCP/IP commands or the module's built-in web interface.

In addition to the outputs, the FNIP-12xPWM module also provides local inputs for manual operation. The inputs can also be used as digital inputs for monitoring the status of different sensors.

Figure 1. The FNIP-12xPWM LED dimmer module

Main features

- Ideal for dimming single color or color LED strips
- 12 outputs for switching and dimming 12 single color, 3 RGB or 4 RGBW LEDs or low voltage halogens
- 12 galvanically isolated multi-purpose inputs for direct control or connecting digital sensors
- 255 dim levels
- 24 bit color depth
- Color picker to set output color easily
- Color fade with adjustable speed
- Input "gestures" for output toggle, recall preset colors and color fading
- Preset dim level – outputs will go to that level when turned on
- Dim level memory (if preset dim level is set to zero) - Modules remember their last dim level. When next turned on, lights will return to the last remembered value
- Adjustable minimum and maximum dim levels
- Adjustable ramp rates
- Overcurrent protection
- Standard DIN rail mount

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 smart phones, 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

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

Grouping of outputs

The outputs can be used individually or in groups of three or four depending on what types of LEDs are to be controlled. Low voltage single color LEDs or halogens are controlled by one

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output each. RGB LED strips take three outputs while RGBW LED strips need four outputs. The possible grouping of the outputs:

Output 1,2,3 – individual outputs or R,G,B
Output 4,5,6 – individual outputs or R,G,B
Output 7,8,9 – individual outputs or R,G,B
Output 10,11,12 – individual outputs or R,G,B or W1,W2,W3

where W1,W2,W3 are the white channels of RGB LEDs on outputs 1,2,3 4,5,6, 7,8,9 respectively if RGBW LED strips are used.

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.

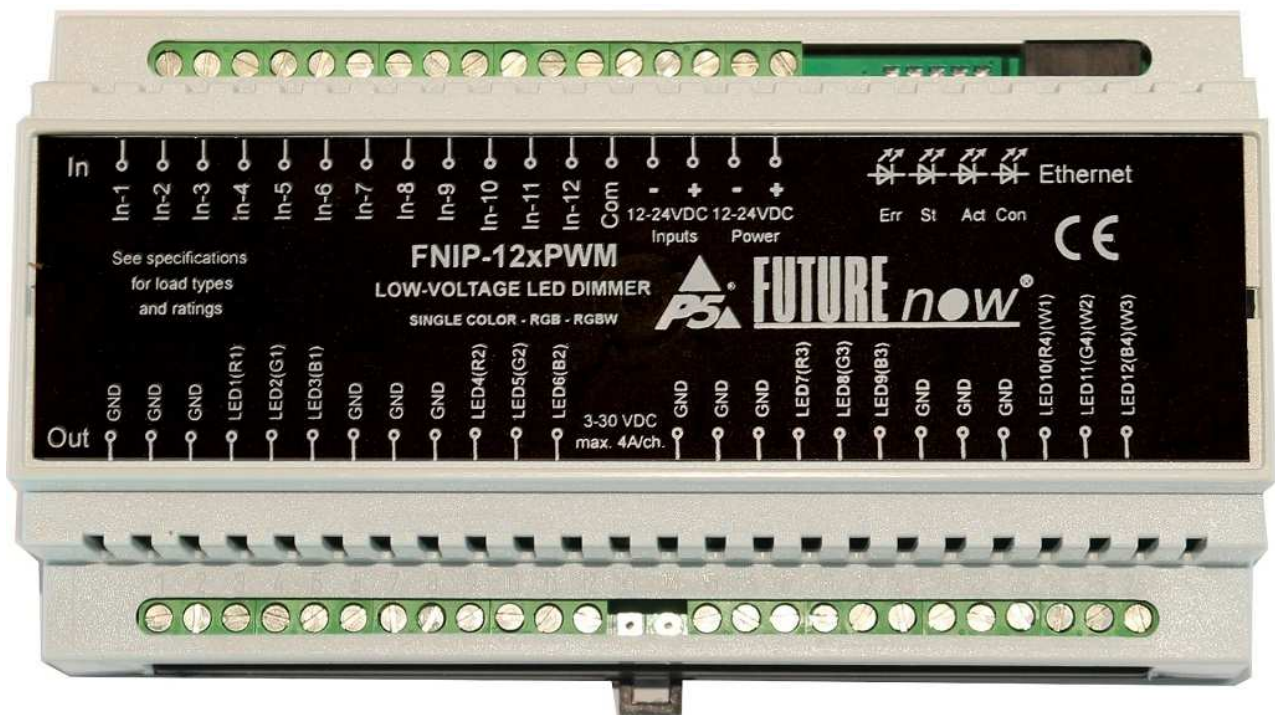The terminal connections of the FNIP-12xPWM are listed in Table 1.

Figure 2. FNIP-12xPWM front view with terminal connectors

No.	Description	No.	Description
1.	GND	27.	Input 1
2.	GND	28.	Input 2
3.	GND	29.	Input 3
4.	LED1(R1)	30.	Input 4
5.	LED2(G1)	31.	Input 5
6.	LED3(B1)	32.	Input 6
7.	GND	33.	Input 7
8.	GND	34.	Input 8
9.	GND	35.	Input 9
10.	LED4(R2)	36.	Input 10
11.	LED5(G2)	37.	Input 11
12.	LED6(B2)	38.	Input 12
13.	-	39.	Input Common
14.	-	40.	Power for the Inputs GND
15.	GND	41.	Power for the Inputs +12V DC/+24V DC
16.	GND	42.	Power for the Main Circuitry GND
17.	GND	43.	Power for the Main Circuitry +12V DC/+24V DC
18.	LED7(R3)	44.	
19.	LED8(G3)	45.	
20.	LED9(B3)	46.	
21.	GND	47.	
22.	GND	48.	
23.	GND	49.	
24.	LED10(R4)(W1)	50.	
25.	LED11(G4)(W2)	51.	
26	LED12(B4)(W3)	52	

Table 1: FNIP-12xPWM terminal pinout

Wiring

A wiring diagram of an example where two RGB and a single color LED strip are controlled is shown in figure 3.
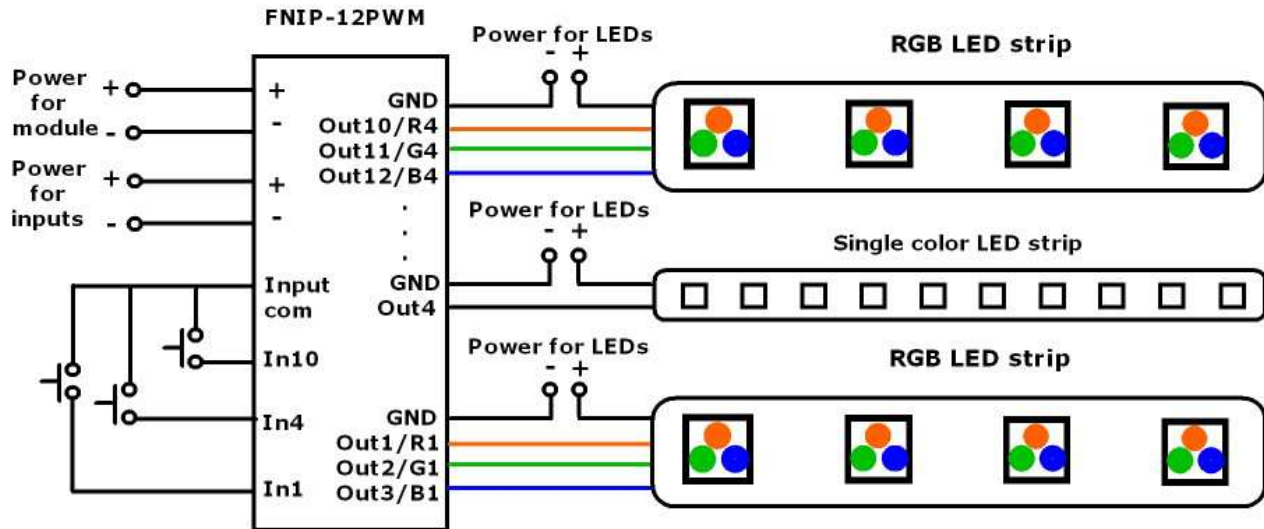
Figure 3. Sample wiring diagram

Power requirements

The module must be powered through terminals 42 and 43. by 12V-24V DC
In case the local inputs are used the inputs must also be powered by 12VDC -24VDC across terminals 40-41.

The galvanic isolation of the inputs is only effective when a separate power supply is used for powering the inputs. The FNIP-12xPWM 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 41 to terminal 43 and terminal 40 to terminal 42.

The LEDs are powered from external power supplies. See Figure 3.

If you prefer powering the LEDs from the same power supply that powers the module itself, connect the GND of that power (terminal 42) to one of the GND terminals at the bottom of the module. Missing to do so may damage the module.

Ethernet Connection

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

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, momentary switches, relay contacts, etc.) across the appropriate input terminals and the input common terminal.

WARNING! Avoid supplying voltage on these terminals!

All input ports are galvanically isolated to protect the unit 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 on terminals 40, 41.

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

If RGB or RGBW LEDs are controlled only the first channel of each RGB group will be active.

Active inputs when RGB LEDs are controlled

Input 1 for RGB LEDs connected to output 1,2,3
Input 4 for RGB LEDs connected to output 4,5,6
Input 7 for RGB LEDs connected to output 7,8,9
Input 10 for RGB LEDs connected to output 10,11,12

The inputs will work as follows:

Short press - toggles the output
Long press - dims the output
Double tap – output toggles between color presets
Double tap and hold – output fades through all colors and stays at the color when the input is released.

If the input mode is set to independent the input will have no effect on the output and can be used to connect digital sensors to the system.

Status LED Indicators

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

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

Power LED
When on, indicates that the DC power for the main circuitry is present.

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.

## Configuration and Operation via the built-in website

Log in to the module's built-in web site.

Default user name: admin
Default password: futurenow

Configuration of network settings, users, channel settings, inputs, RGB and dimming modes are possible via the web pages of the built-in website.

Operation of the outputs is also possible via the same website by toggling an output, dimming an output with a slider or changing color using a color picker:

Channel1:
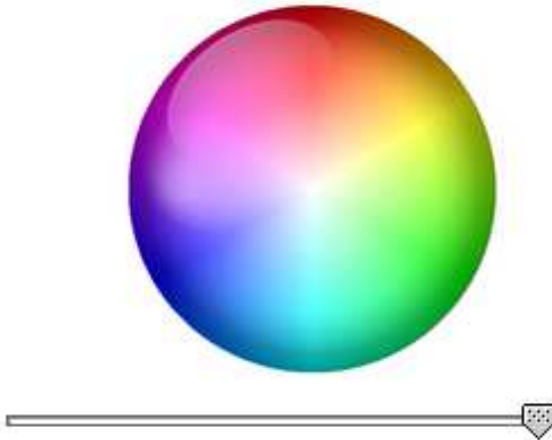
TECHNICAL SPECIFICATIONS

Power requirements
Main circuitry**:** 9-28V DC
Inputs: 9-28V DC

Outputs
Load**:** 3-30V DC, max. 4A/channel

Inputs
Type: 12 x galvanically isolated, noise protected common GND digital inputs for dry contacts or open collector transistor outputs
Functions: Assigned to the corresponding output (Toggle, Follow, Monostable, RGB) or Independent

Terminals
Type: Screw terminals for max. 2.5 mm^2 wires

Communication
10Mb/s Ethernet via RJ45 Ethernet connector
Simple ASCII based TCP commands, number of socket connections that are allowed to be opened simultaneously: 4
HTTP via built-in web server

Other parameters

Dimensions: W x H x D = 157 mm x 86 mm x 57 mm (9 DIN unit width)
Color: Light grey with black cover plate

Standards
EN 60669-2-1
EN 55015:2013
EN 61547:2009
EN 61347-1
EN 61347-2-13
RoHS

Test methods
EN 55016-2-3:2010
EN 55022:2010/AC:2011
EN 61000-4-3:2006/A1:2008/A2:2010
EN 61000-4-6:2009
EN 61000-4-4:2005/A1:2010
EN 61000-4-2:2009

CONTACT DETAILS

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