FutureNow FNIP-12xMZT

12 Zone Programmable DIN-rail Thermostat

rev 22.10.2024

12 Zone Thermostat with Analog Inputs and IP communication

/DIN Rail and Surface Mountable/

Figure 1. The FNIP-12xMZT DIN-rail Thermostat

Overview

The FNIP-12xMZT module is used as 12 independent programmable thermostats within one DIN-rail enclosure, without the need for bulky boxes on the walls, allowing heating and cooling control directly from the GUI of your automation system or even a web browser. Temperatures can be retrieved, setpoints and schedules adjusted via the module's web interface or TCP/IP commands.

Main Features

- The unit is installed out of sight, no need for visible wall-mounted thermostats
- Supports a wide variety of industry-standard temperature sensors, including PT1000, PTC (1K-47K), and NTC (1K-47K)
- Provides 12 normally open (NO) relay outputs to control heating/cooling valves
- An additional programmable relay is available, ideal for boiler control
- Heating & Cooling Modes - each thermostat zone can be configured for heating or cooling. For simultaneous automatic control of both heating and cooling, two output channels are assigned to one thermostat
- Setpoints and schedules are stored within the module, ensuring uninterrupted operation even if the network or main controller is down
- Adjusting temperature setpoints and changing settings and programming via TCP/IP
- Support for scheduled heating and cooling programs
- Standalone Operation - the module works independently, storing setpoints and making decisions internally
- Both outputs and temperature inputs can be used independently for various control needs
- Power Requirements - operates on 12-24V power.

Functionality

The temperatures are measured through temperature sensors connected to the module's inputs. The FNIP-12xMZT supports a wide range of temperature sensors used in the industry. The relay outputs are designed to control heating or cooling valves, and each zone can be set to heating, cooling or automatic mode.

For automatic control of both heating and cooling, two output channels are assigned to a zone; one for heating and one for cooling.

The module works standalone, providing reliable temperature control even if the network or main controller is down.

Table of Content

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 site. See figure 2.
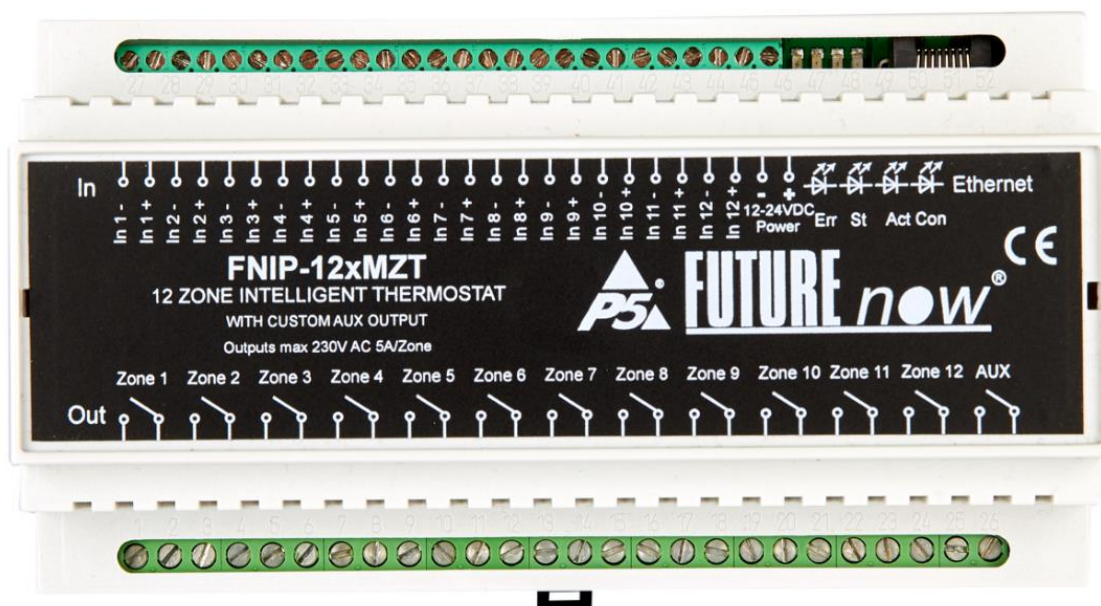

Figure 2. The FNIP-12xMZT DIN-rail Thermostat

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

Pos.	Description	Pos.	Description
1.	Zone 1	27.	Input 1 -
2.	Zone 1	28.	Input 1 +
3.	Zone 2	29.	Input 2 -
4.	Zone 2	30.	Input 2 +
5.	Zone 3	31.	Input 3 -
6.	Zone 3	32.	Input 3 +
7.	Zone 4	33.	Input 4 -
8.	Zone 4	34.	Input 4 +
9.	Zone 5	35.	Input 5 -
10.	Zone 5	36.	Input 5 +
11.	Zone 6	37.	Input 6 -
12.	Zone 6	38.	Input 6 +
13.	Zone 7	39.	Input 7 -
14.	Zone 7	40.	Input 7 +
15.	Zone 8	41.	Input 8 -
16.	Zone 8	42.	Input 8 +
17.	Zone 9	43.	Input 9 -
18.	Zone 9	44.	Input 9 +
19.	Zone 10	45.	Input 10 -
20.	Zone 10	46.	Input 10 +
21.	Zone 11	47.	Input 11 -
22.	Zone 11	48.	Input 11 +
23.	Zone 12	49.	Input 12 -
24.	Zone 12	50.	Input 12 +
25.	AUX	51.	Power for the Main Circuit
26.	AUX	52.	Power for the Main Circuit (12V – 24V DC)

Table 1: FNIP-12xMZT terminal connectors

Wiring diagram

Wiring diagram

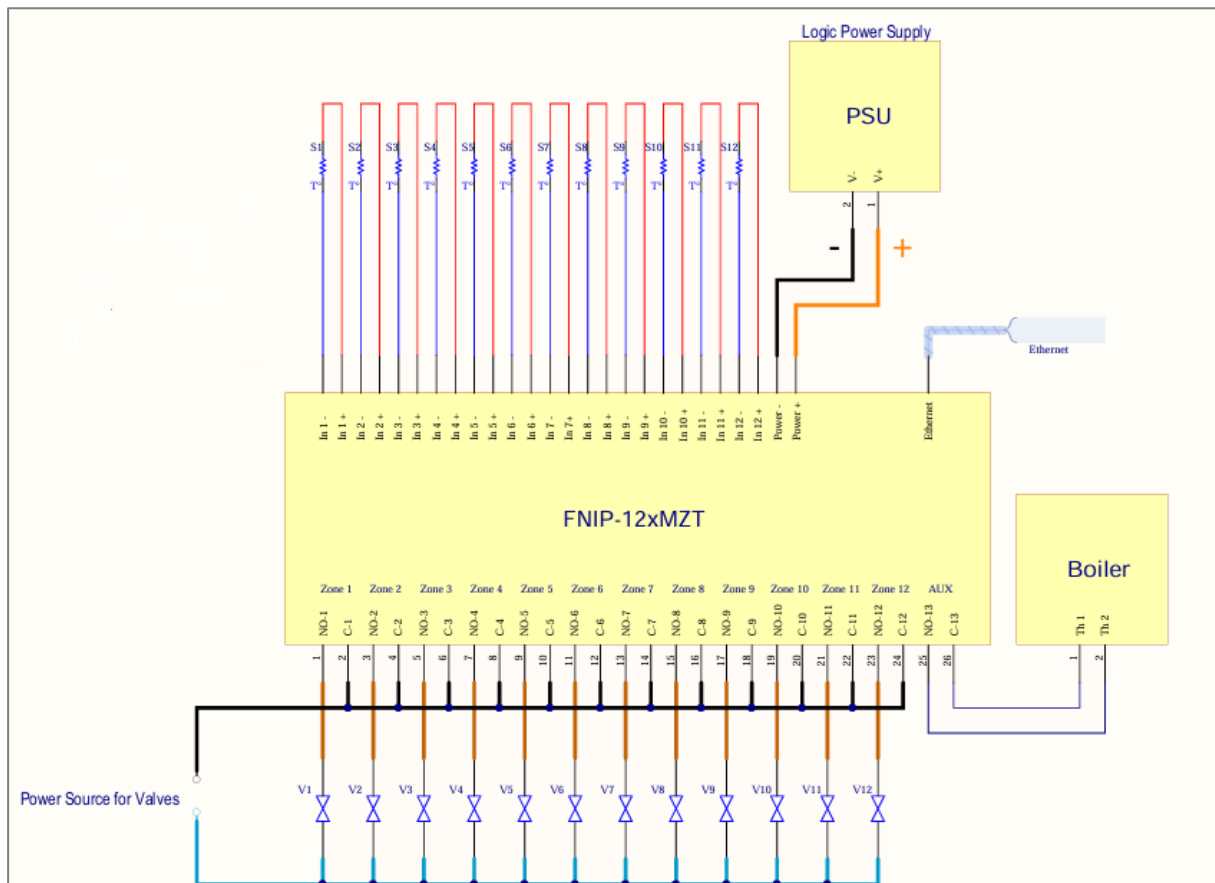Figure 3. shows the connections of the FNIP-12xMZT.

Figure 3. The wiring diagram of the FNIP-12xMZT

Recommended wire types

- Ethernet cable: Twisted pair, CAT5 or better.
- Outputs: According to the load attached to the outputs (current and voltage ratings).
- Inputs: Temperature sensor cables.

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

Please note that no voltage should be connected to the input terminals because it may damage the input circuitry.

Outputs

The FNIP-12xMZT has 12+1 relay outputs. Since the outputs provide dry contacts, any voltage that doesn't exceed the specifications can be switched. The outputs of the FNIP-12xMZT are potential-free normally open relays, therefore both AC or DC, low or high voltage valves can be controlled.

The AUX output will be activated if one or more (configurable) outputs are on. It can be used to control the boiler (or central air conditioner).

CONFIGURATION

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

Configuration via the web interface

Use the FNIP Manager or 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 (FNIP12XMZT 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 6.
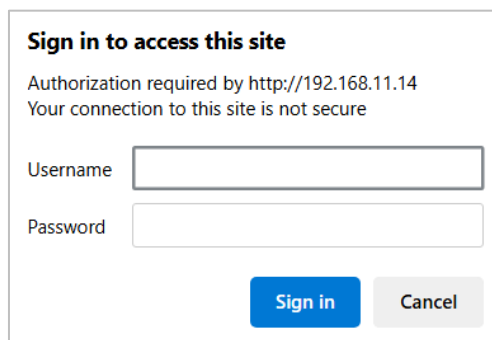

Sign in to access this site

Authorization required by http://192.168.11.14
Your connection to this site is not secure
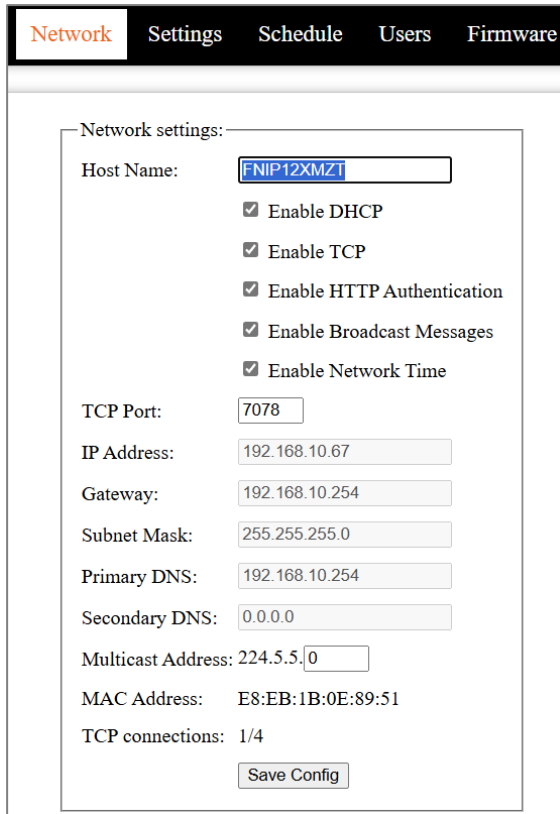
Username

Password

Sign in   Cancel

Figure 4. 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.

Network settings

Figure 5. Network Configuration Page

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 disable the Discovery Tool and the mobile applications from finding the modules on the network.

Control page

On the Control page, you can activate or turn off the zones, set the operation mode (heating, cooling, auto), adjust the heating and cooling setpoints, and view the current temperature for each zone.

The Operation modes are described below.

- **Off:** The zone is disabled.
- **Heating:** Heating is enabled. If the temperature drops below the setpoint by more than the hysteresis and the off time has expired then the output will turn on. For this Channel Mode the mode in Settings must be set to Single.
- **Cooling:** Cooling is enabled. If the temperature goes above the setpoint by more than the hysteresis and the off time has expired then the output will turn on. For this Channel Mode the mode in Settings must be set to Single.
- **Auto:** Heating and Cooling are enabled. This mode requires two outputs. Based on the temperature reading of the first channel the first (heating) output will be activated if it's too cold. If it's too warm the cooling relay on the next channel will turn on. For this mode the Channel Mode in Settings must be set to Dual.
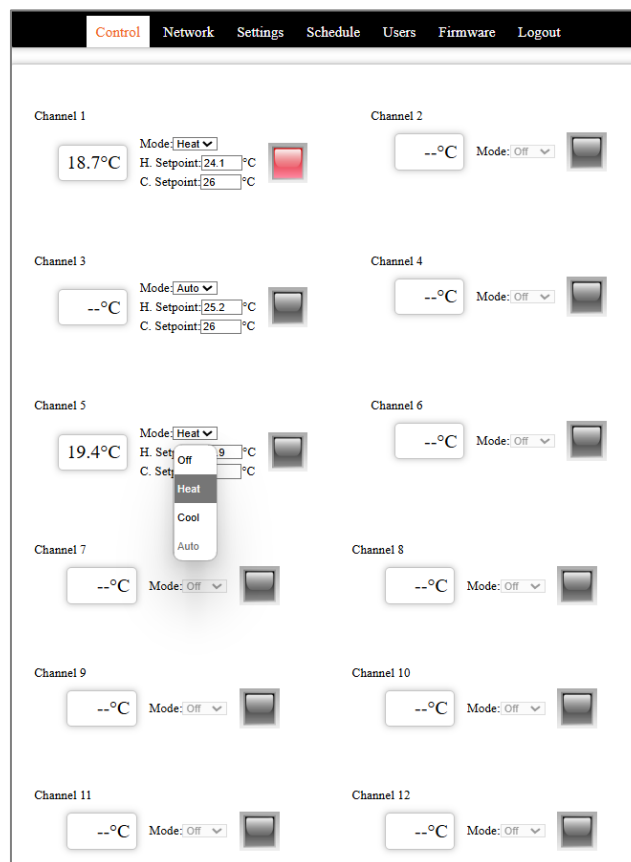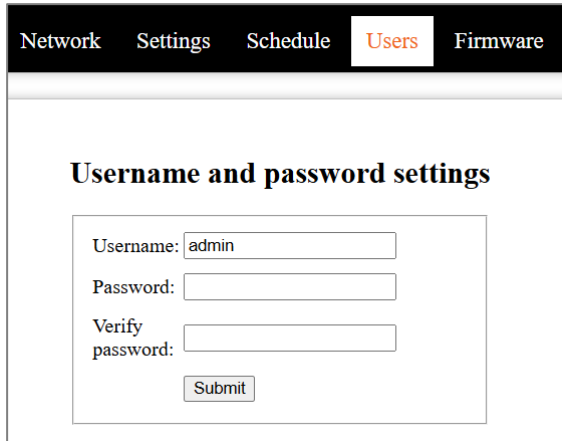

Figure 6. Control Page

Users

Figure 7. User Configuration Page

The default User is the **Admin.**

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

Change the **Admin** password here.

Settings

On the **Settings** page the outputs (zones) can be renamed.

Channel Mode: There are three channel modes each zone can work in:

- **Independent:** The output and the input can be used independently. Sensor readings can be processed and the output relay can be enabled/disabled via TCP/IP For this mode the Channel Mode in Settings must be set to Independent
- **Single:** It is used when either heating or cooling mode is required
- **Dual:** It is used when both heating and cooling modes are required at the same time. In this mode two output channels will be assigned to a single thermostat; one output channel for heating and one for cooling.

Calibration value: It will be added to the measured temperature to compensate for offset error

Minimum ON/OFF time: To avoid oscillation and take the thermal inertia of different heating/cooling methods into account there's a minumum time during which the status of the output won't change

Hyteresis: To avoid oscillation there is a deadband between turn on and turn off temperatures

Sensor Type: A variety of industry-standard temperature sensors, including PT1000, PTC (1K-47K), and NTC (1K-47K)

Lowpass filter: It is used to smooth out quick fluctuations

AUX relay: It will be activated if one or more of outputs the AUX relay is bound to is on. It can be used to control the boiler (or central air conditioner).

Label	Channel mode	Calibration value		Minimum off time hr:min		Minimum on time hr:min		Hysteresis		Sensor type	Lowpass filter
Channel 1	Single	6	°C	0	:5	0	:5	0.5	°C	NTC10K/3934	☑
Channel 2	Indep.	0	°C	0	:5	0	:5	0.5	°C	NI10000/5000	☑
Channel 3	Dual	10	°C	0	:2	0	:2	0.3	°C	NTC10K/3934	☑
Channel 4	Indep.	0	°C	0	:0	0	:0	0	°C	NTC2K2/3900	☑
Channel 5	Single	0	°C	0	:0	0	:0	0	°C	NTC10K/3934	☑
Channel 6	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 7	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 8	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 9	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 10	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 11	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑
Channel 12	Indep.	0	°C	0	:5	0	:5	0.5	°C	PT1000	☑

Aux Relay is bound to:

☑ Channel 1 ☐ Channel 2 ☑ Channel 3 ☑ Channel 4 ☑ Channel 5 ☑ Channel 6 ☑ Channel 7
☑ Channel 8 ☑ Channel 9 ☑ Channel 10 ☐ Channel 11 ☐ Channel 12

☐ Legacy mode

Save Settings

Figure 9. Settings Page

Scheduling

On the Schedule page, you can configure the scheduling settings, with up to 6 different schedules per channel.

Figure 10. Schedule page

OPERATION

Operation via the Control page

Once logged in, you will be automatically directed to the Control page, where you can manage the zones. Here, you can activate heating or cooling modes and adjust the temperature setpoints.
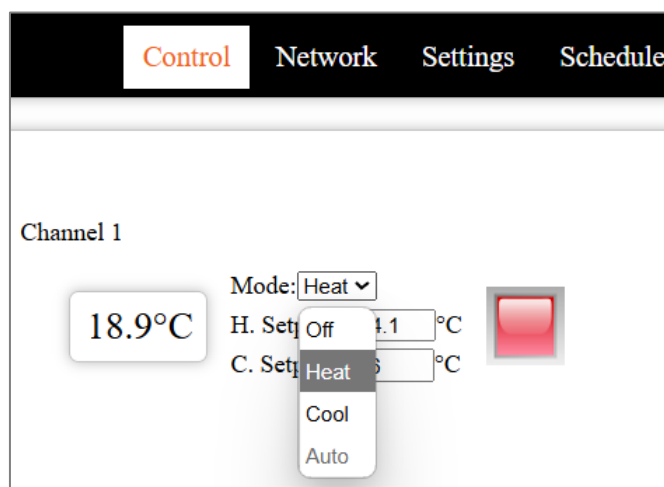

Figure 11. Schedule page

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 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-12xMZT simple communication protocol can control the module. The following controllers are the most widely used:

- AMX
- Control4
- Crestron
- RTI
- Savant
- Fibaro (Nice)
- Extron
- Neets (biamp)
- Home Assistant
- QSYS

Software modules/plug-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.
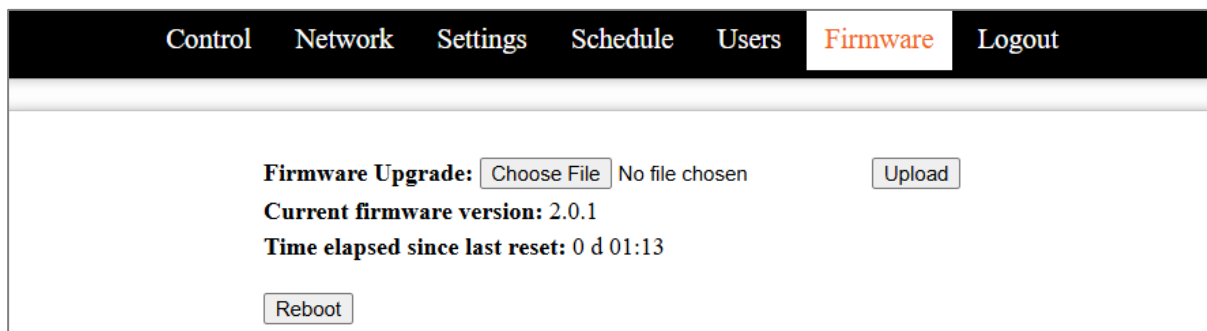
Firmware Upgrade

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. **Make sure you release the button when the red LED comes on.**

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, contact your dealer!

TECHNICAL SPECIFICATIONS

Power Requirements	
Main circuitry	10.8 36 VDC max. 280mA @ 12V max. 150mA @ 24V
Inputs	
Type	12 x analog temp sensors (PT100-1000, NI1000-10000, PTC 1K-47K, NTC 1K-47K, KTY)
Outputs	
Type	13 x SPST NO, dry contacts
Load	max. 5A@250 VAC or 30 VDC for resistive (cos(fi)=1) loads max. 2A@250 VAC or 30 VDC for inductive (cos(fi)=0.4) loads
Communication	
Control	TCP (simple ASCII TCP command) Built-in web server
Operation modes	Heating, Cooling, Auto, Independent
Interoperability	Drivers available for most systems
Connectors	
Input Terminals	1.5mm² screw terminals
Output Terminals	2.5mm² screw terminals
LAN (10Mb/s)	RJ45 Ethernet Connector
Environmental	
Operating Temperature	0 ºC – 40 ºC (32 ºF – 104 ºF)
Storage Temperature	-20 ºC – 60 ºC (-4 ºF – 140 ºF)
Humidity	Up to 93% (Non condensing)
Physical	
Dimensions (H x W x D)	157 mm x 86 mm x 57 mm (9 DIN unit width)
Weight	0.28Kg
Installation	Standard DIN Rail Mount

Approvals	Package Content	Warranty
CE	FNIP-12xMZT	2 years

REFERENCES

FNIP Search Utility: FNIP Manager (Registration needed on www.p5.hu)

FNIP-12xMZT TCP Communication Protocol Description

(Please email us at support@p5.hu to request the Communication Protocol Description)

CONTACT DETAILS

support@p5.hu

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