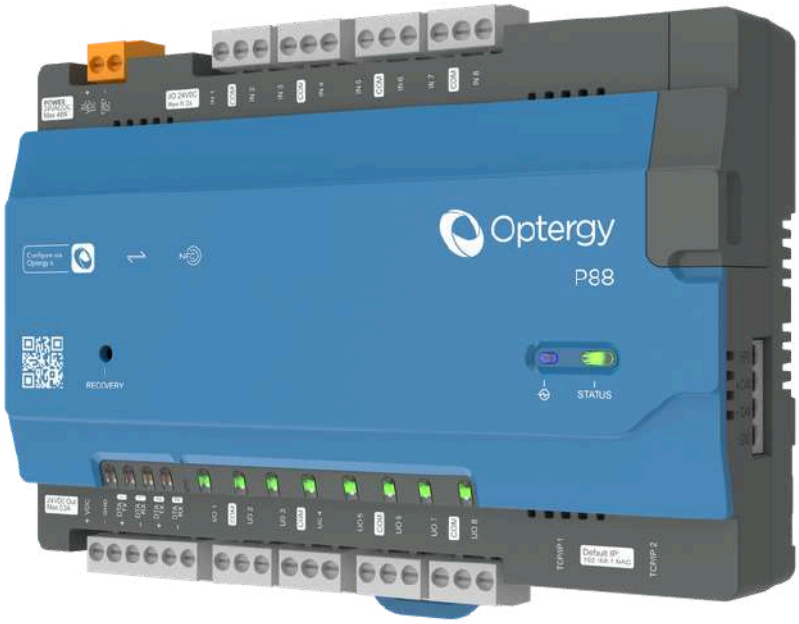
www.optergy.com
info@optergy.com
P88 (DC-158)

Optergy
Edge



P88 Controller

Installation Guide

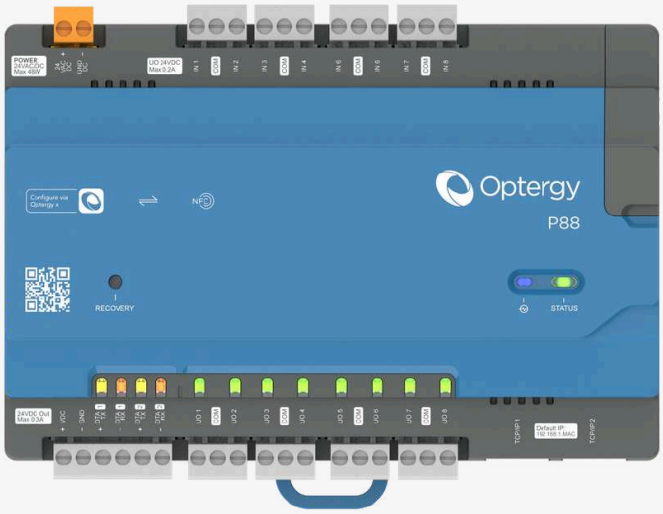
The P88 programmable controller offers Optergy's most powerful programmable controller yet for demanding plant and AHU applications. Modern, secure hardware delivers fully universal inputs and outputs plus a high-speed expansion bus, for uncompromising control that scales to the largest projects.

P88 Installation

The P88 is a BACnet programmable controller that is used in control applications.

Common applications include: HVAC, Lighting and Energy Management.

*Unlike the P864/P442 and P88 is does not include an option for Airflow sensor and is not suitable for VAV applications

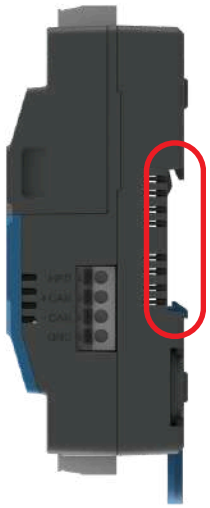


Installation: Mounting

Mount the P88 in one of two ways:

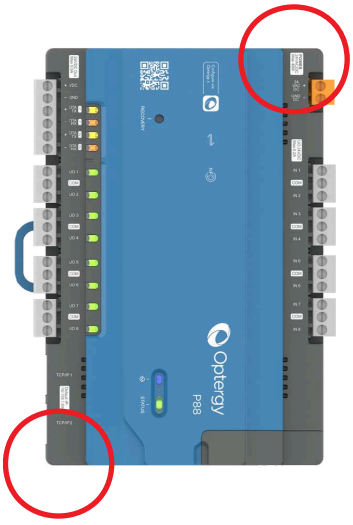
METHOD 1

Mount the controller to a DIN rail.



METHOD 2

Use the 2 slide out screw holes to fasten with self tapping screws.



Wiring Diagrams & Product Label

Wiring

All terminals are labeled on the cover. Refer to the wiring diagrams for details.

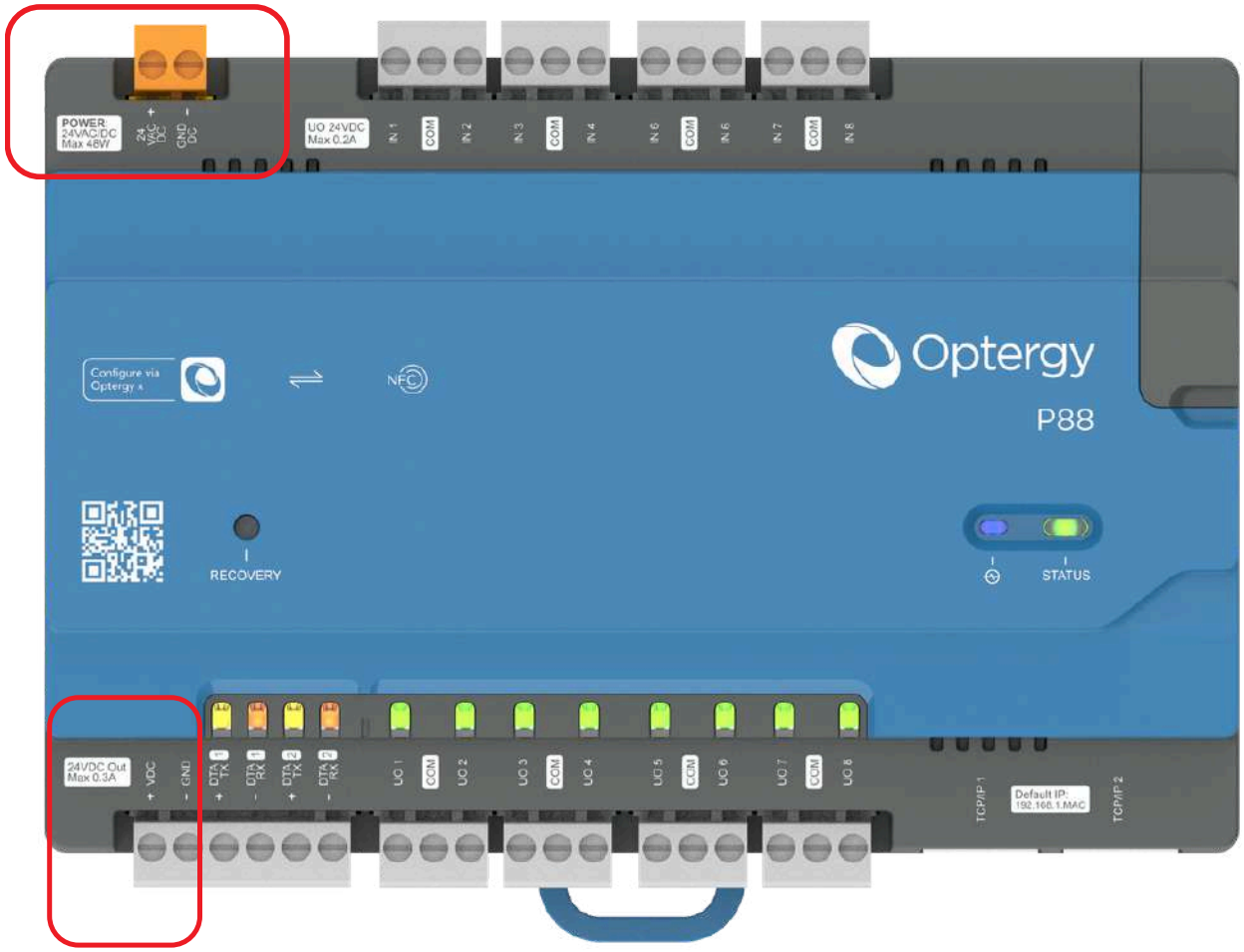
Power

P88 Power can be supplied by:

- 24 VAC ½ wave (grounded secondary)
- 12-24VDC Power Supply

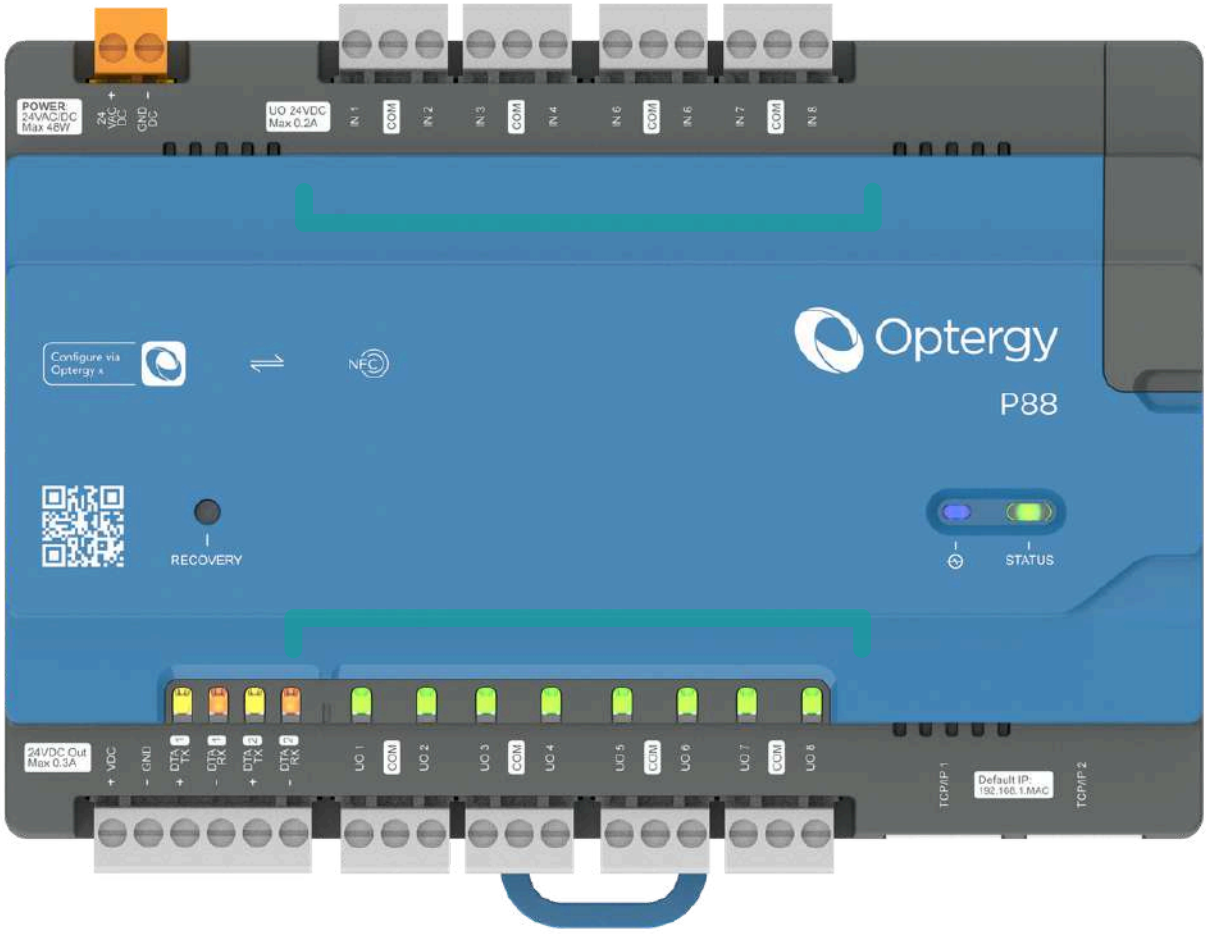
P88 has an onboard 24VDC power supply:

- Stay within power budget (6W).



Universal Input's / Output's

Universal Inputs
The P88 has 8 Universal inputs that are capable of being switched between Dry Contact, Raw Resistance, Pulse Count, 3K, 10K Type 2, 0-10V and 4-20mA types of inputs.



Universal Outputs
The P88 has 8 Universal outputs rather than separated Analog and Binary Outputs, they are capable of being switched between 24VDC Triac's, 0-10VDC variable outputs and 4-20mA variable outputs.

NFC / Bluetooth Setup

The P88 does not have mac switches to set the MAC Address and default IP address of the device, instead it ultilizes **NFC** in two modes in order to configure and communicate with the device.

To use NFC first **download** the Optergy App from the Play or Apple store and place your phone over the NFC Symbol on the device.

During Beta release of the P88 the standard App stores may not yet have the app and a direct download link from your Optergy rep may be required, see your Optergy rep for more details.

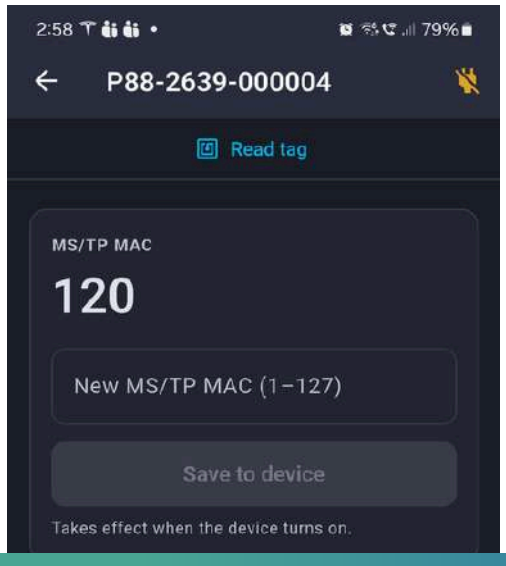


Offline / No Power Mode

When there is no power, the app will connect to the NFC chip and allow you to read and write basic configuration.

This includes:

- Setting the MAC Address
- Which also sets the default IP Address of the device



This is an **optional** configuration process and the default MAC is set to 120 with the default IP being 192.168.1.MAC

All settings including MAC can be accessed via the webserver if required.

Online / Powered Mode

When there is power, the app will initially connect via NFC to grab config details and will then connect via **Bluetooth**.

This Bluetooth connection enables you to control the device whilst you walk around the plantroom in close aproximately to the controller.



Mass NFC Setup

Mass NFC Configuration is still a work in process during Beta and functionality may vary depending on the firmware of the Optergy App and P88 device shipped to you!

NFC setup without powering the P88 device offers up real potential to your large site commissioning processes without needing to go through significant pre-site setup.

To use NFC first **download** the Optergy App from the Play or Apple store and place your phone over the NFC Symbol on the P88 Box **without even opening it up**.

You will then be able to set initial configuration settings via the system.





Mass Configuration Mode

In order to configure 100's of devices quickly you will be able to preset your Optergy App to configure MACs 1-127 one at a time.

Each time you place your phone next to the box it will communicate with the NFC chip to set the correct information and confirm this back to you on your phone.

You can then place a label or sticker on the box and move onto the next controller.

No powering up devices!
No connecting ethernet cables!
No setting MAC switches!

TCP/IP Communication

Both TCP/IP 1 and TCP/2 2 can be used for BACnet/IP and user interface via HTTPS web browser.

Or

It can be looped to another P88 on TCP/IP 1 or 2. (No limit to number of devices.)

Default IP address is 192.168.1.MAC

MAC address is by default 120 and can be set either by the Webserver or the NFC chip.

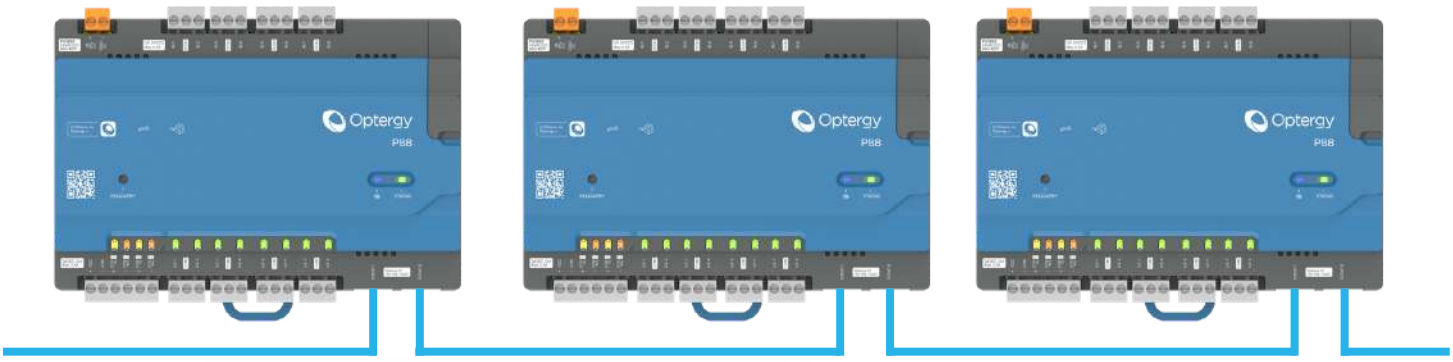


To Reset the P88, hold down the recovery button for 5 seconds or until you will see the status light begin to flash yellow.

Once the lights flash yellow release the Recovery button and the controller will reboot.

Once rebooted the IP Address will be reset to 192.168.1.MAC and the credentials will have defaulted to user: admin and pass: admin





P88 now has an Ethernet Failover Relay, this means when the controller loses power the Ethernet cable bypasses the controller and continues the signal onto the next controller

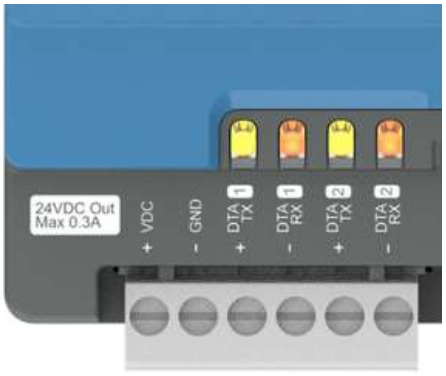
IP cable can be looped in and looped out

MS/TP Communication Wiring

The P88 can be configured as either an IP or an MSTP device, when placed in MSTP mode it is a 2 wire + shield MS/TP device and operates via the Data 1 port (The Data 2 port is strictly for routing external devices to the IP Layer).

For correct operation you must ensure:

1. Shield must be carried through and single point to earth ground.
2. Use low capacitance cable in accordance with BACnet specification.
3. Install 120 ohm end of line resisters at each beginning and end of the MSTP circuit.
4. Do not exceed the recommended distance set out in the RS-485 standard (typically 300m for 115.2K baud and 1km for 9600 baud)



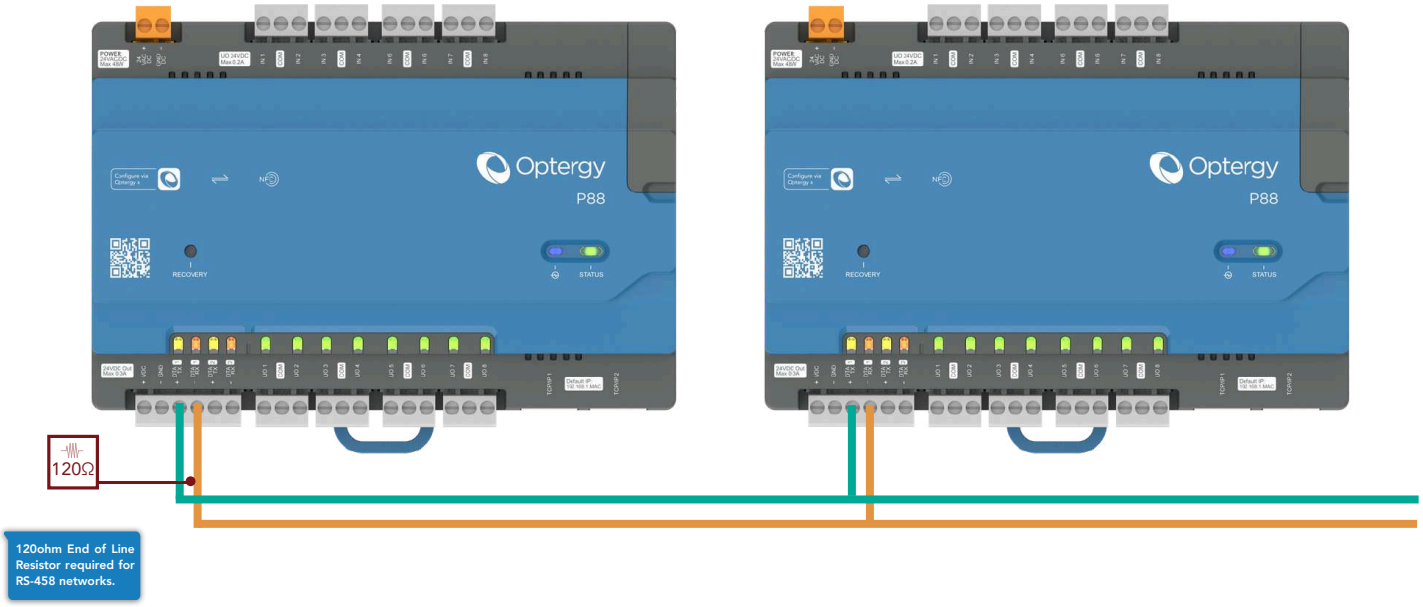
Green and Orange flashing lights indicates the communications back and forth across the bus

Default MAC address is **120** unless set by NFC or the Webserver.

Default Device Instance is 88+MAC **(88120)**

BACnet MS/TP controllers

Use Data 1 Port



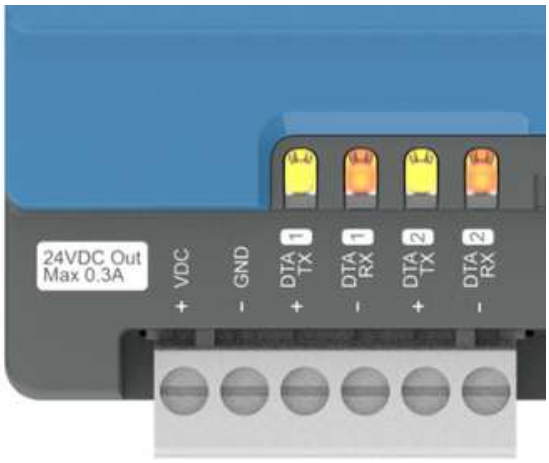
DATA-2 Bus (RS-485)

The P88 DTA-2 bus has 3 modes:

1. BG-1000 Integration for Optergy Wireless Sensor (up to 7 sensors) **(still in progress)**

2. Modbus RTU > TCP Routing

3. BACnet/MSTP > BACnet/IP Routing



Biasing: *Biasing is used to control network communication, many devices use a local bias resistance or have selectable in or out of circuit. Routers or router/controllers use a network bias. The Optergy 2nd RS-485 expansion network has the network bias, it should be used when routing or connecting to sensor network.*

Example 1 - P88 configured with Modbus RTU > Modbus TCP



Example 2 - P88 configured with BG-1000-M Transceiver and wireless Optergy Air Sensors



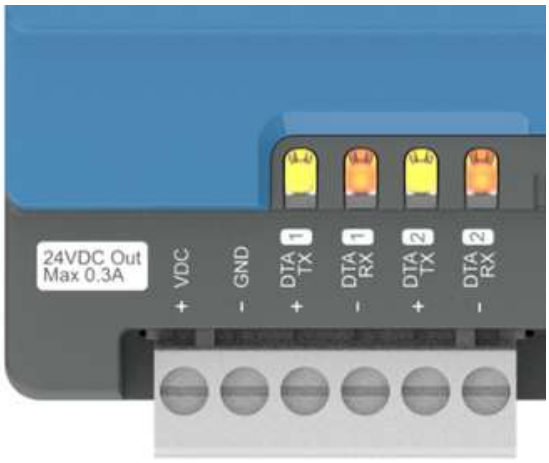
CAN Bus (Expansion Modules)

The P88 DTA-2 bus has 3 modes:

1. BG-1000 Integration for Optergy Wireless Sensor (up to 7 sensors) **(still in progress)**

2. Modbus RTU > TCP Routing

3. BACnet/MSTP > BACnet/IP Routing



Biasing: *Biasing is used to control network communication, many devices use a local bias resistance or have selectable in or out of circuit. Routers or router/controllers use a network bias. The Optergy 2nd RS-485 expansion network has the network bias, it should be used when routing or connecting to sensor network.*

Example 1 - P88 configured with Modbus RTU > Modbus TCP



Example 2 - P88 configured with BG-1000-M Transceiver and wireless Optergy Air Sensors



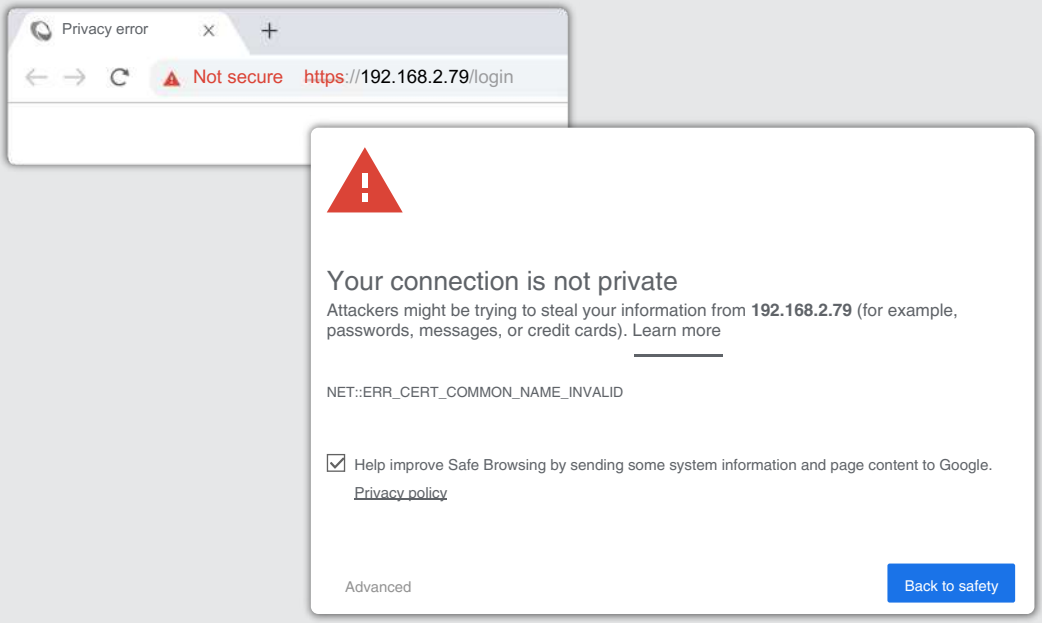
P88 Web User Interface

Access and Login

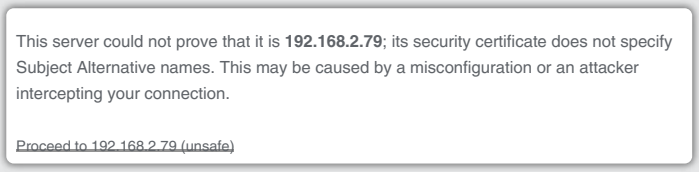
The P88 uses https or SSL encryption to assure secure communication to the web server. Optergy has issued a self signed certificate which is one that is published by Optergy. Most browsers will flag this as a security concern asking the user if this is a known and trusted publisher. The user should answer yes. While Optergy is not a known trusted publisher of certificates, like Truste, Verisign, Comodo etc. it is highly preferable to use encryption rather than not using any security. For this reason any requests made to http://<IP address> will be redirected to https://<IP address>.

To access the user interface for configuration purposes, follow these steps:

1. Plug local PC into TCP/IP port 1 or 2 on the P88.
2. Set local PC to the same IP range as the P88.
3. Open web browser on local PC and navigate to the P88 using https://IP address (192.168.1.MAC) for example https://192.168.1.120.
4. You will be confronted with a message that looks like the following:



> Press the Advanced button

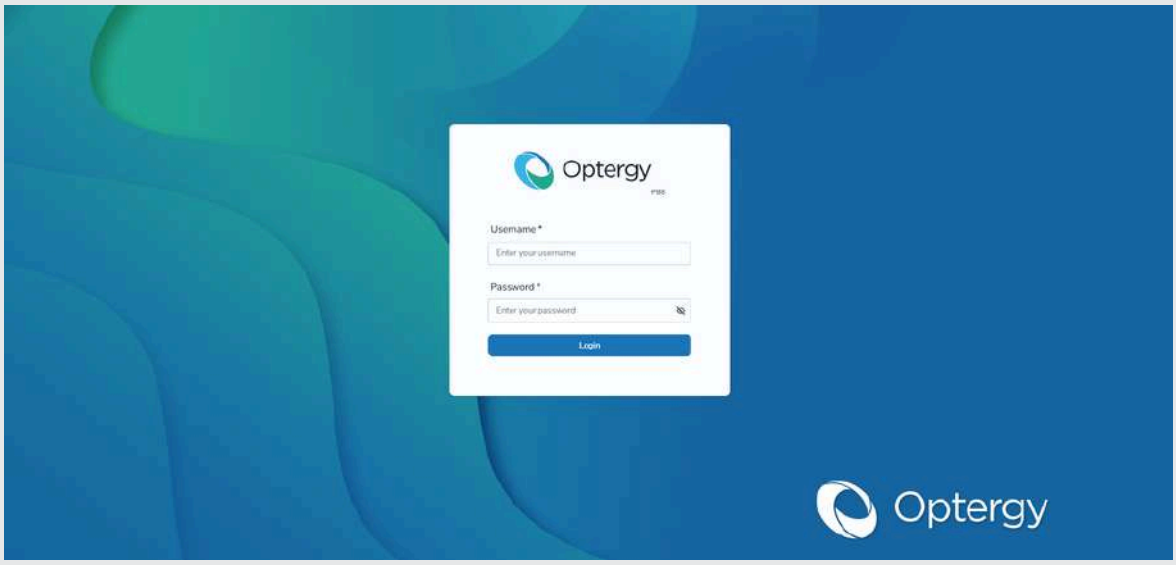


> Click proceed to <ip address>(unsafe)

P88 Web User Interface

Access and Login

5. When prompted by the login screen, login with username - "admin", password - "admin".
a. The User will be prompted to change the password upon initial login.



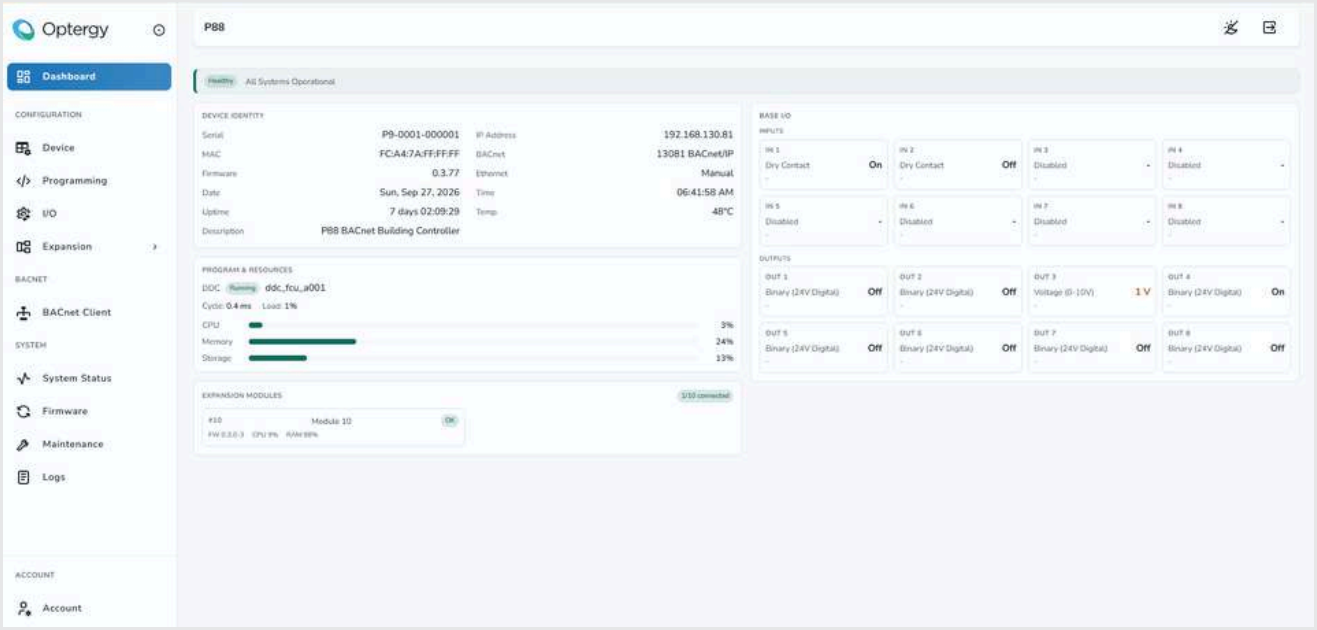
Note: If the user forgets the login credentials, the recovery button can be used to reset the user back to admin/admin and 192.168.1.MAC (MAC default is 120)

Press and hold the recovery button for more than 5 seconds, after 5 seconds lights will begin flashing and you can let go, the system will take 30 seconds to complete the recovery sequence.

P88 Web User Interface

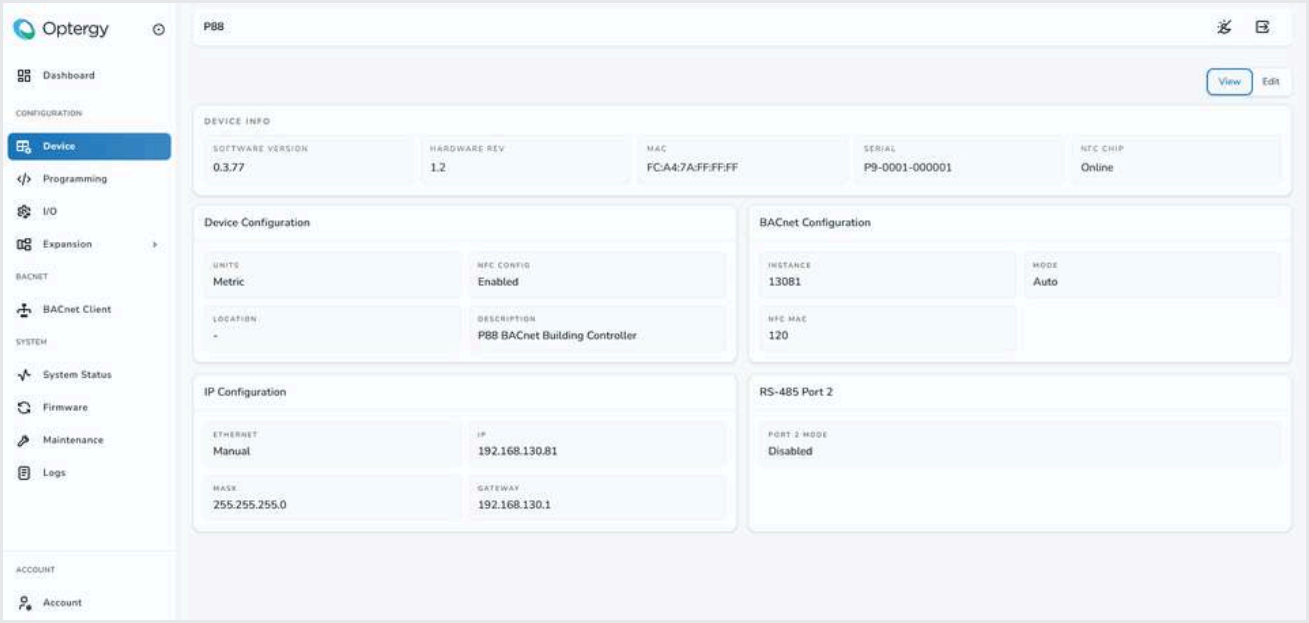
Dashboard

The Dashboard page provides an overview of basic configuration, health and Input/Output Status



Device

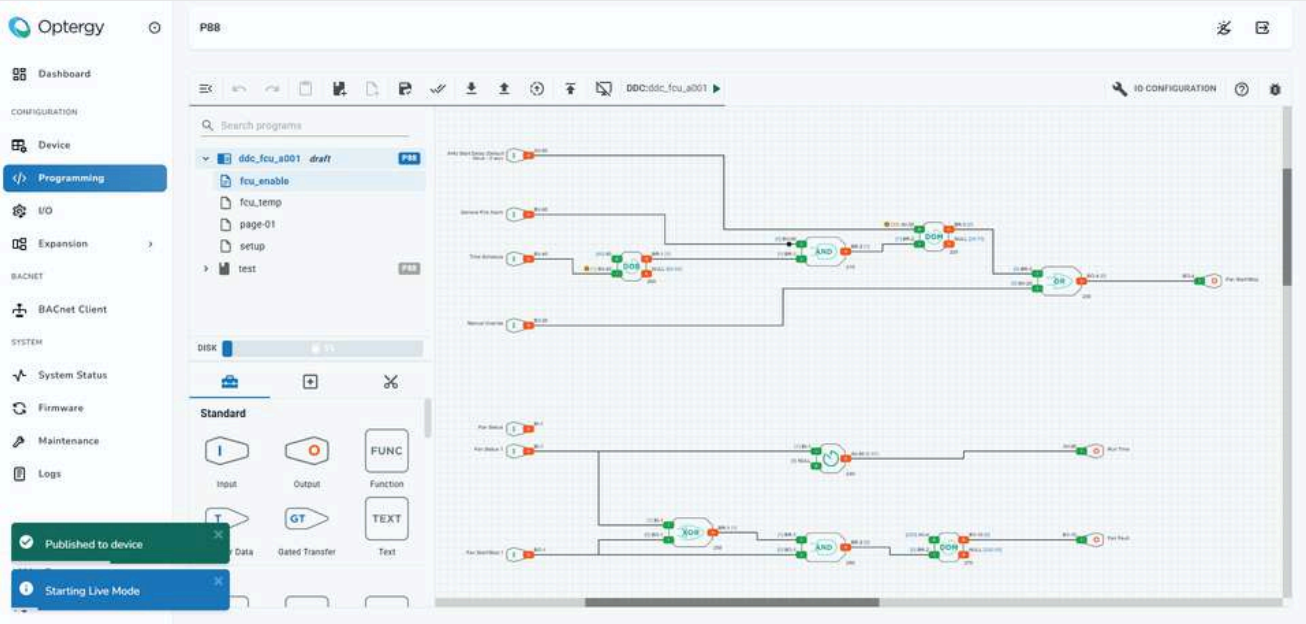
The Device page provides common configuration settings like Units, BACnet, IP and RS-485 settings



P88 Web User Interface

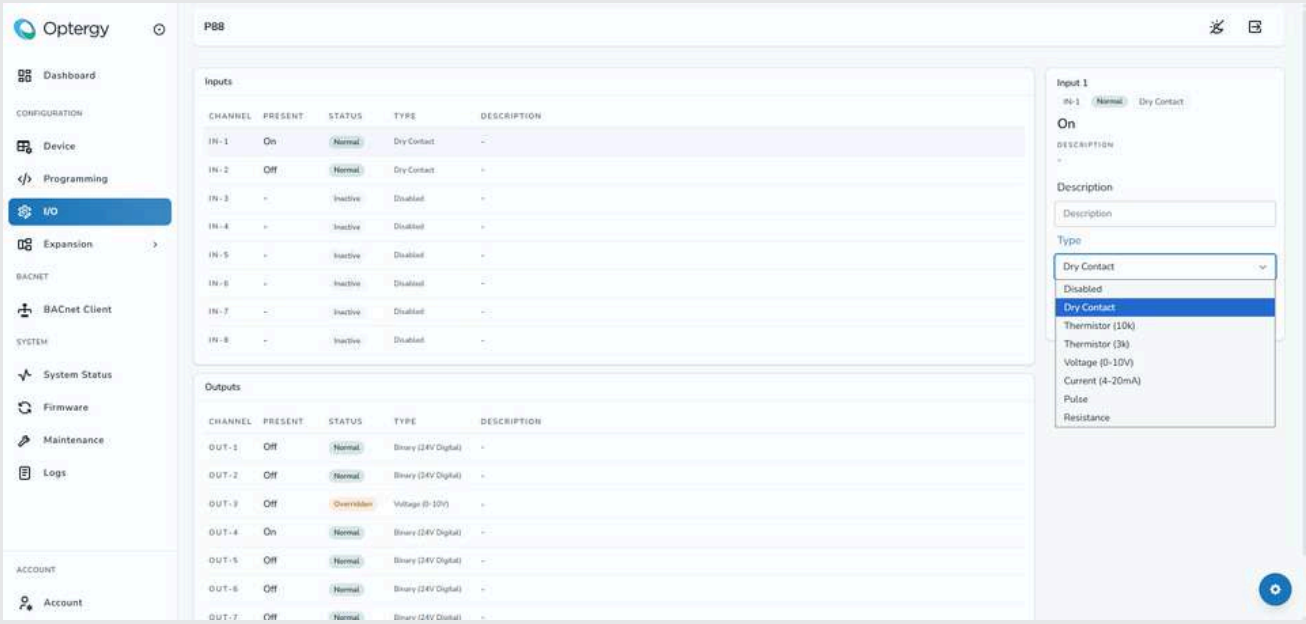
Programming

The P88 has an inbuilt Programming Engine identical to Optergy Studio so can be written, published and live mode tested directly within the controller itself.



IO

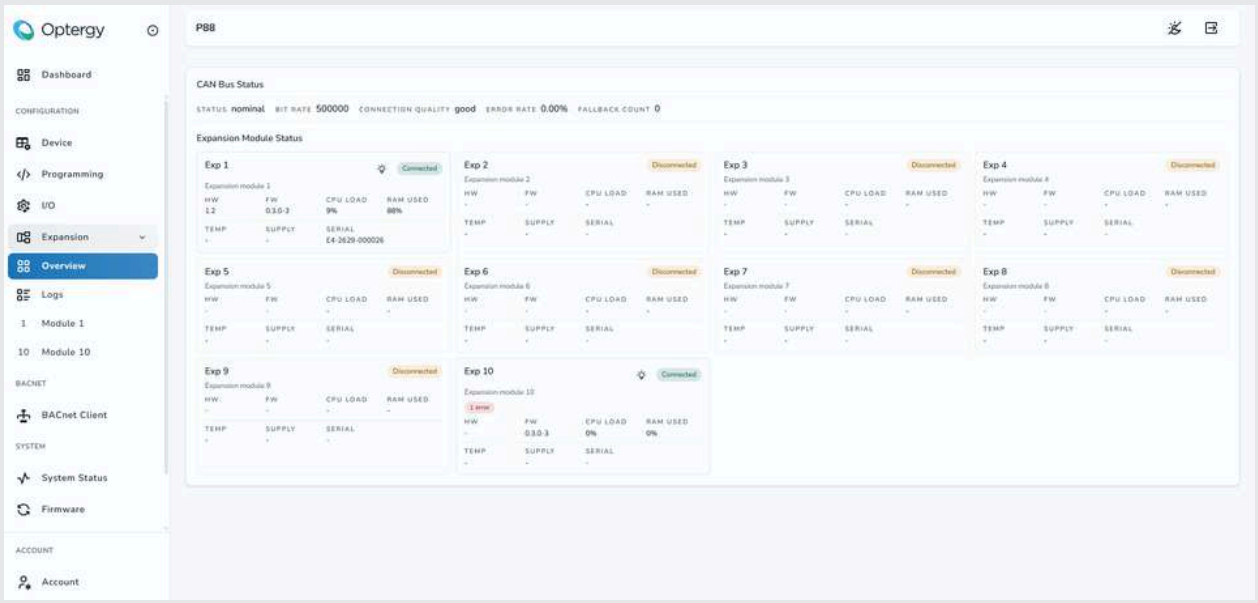
The IO page provide Input and Output Configuration, Status and Override options for each IO.



P88 Web User Interface

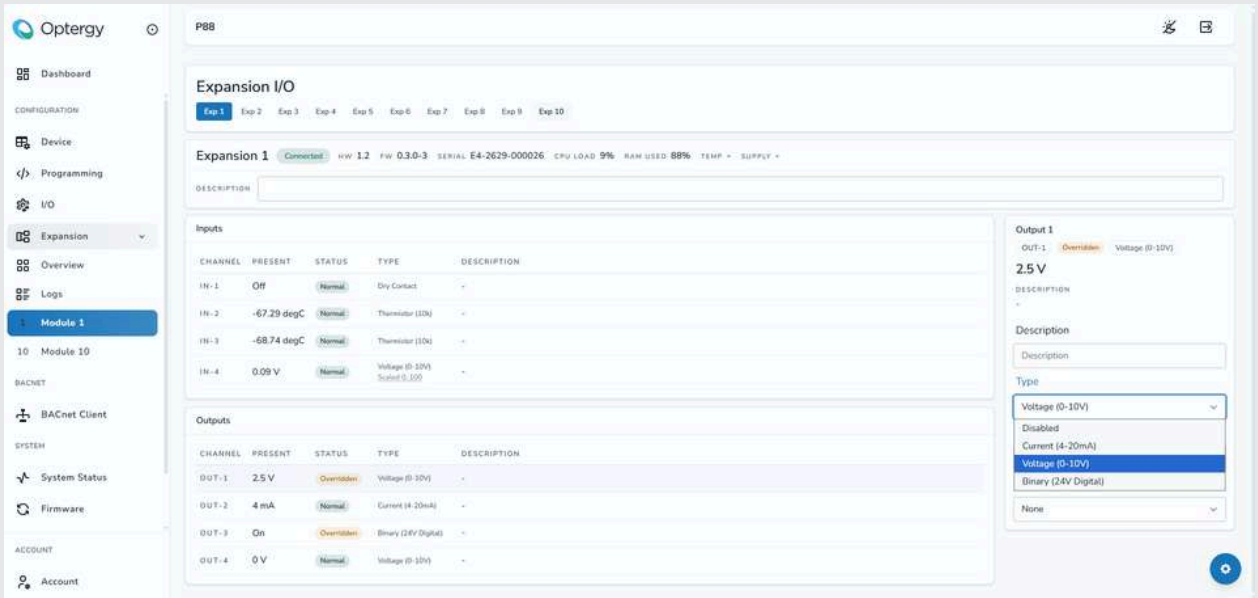
Expansion Menu

The Expansion menu provides an overview of which expansion modules are connected, as well as their health, version and serial number, clicking on any expansion takes you to the specific page for that module



Module 1-10

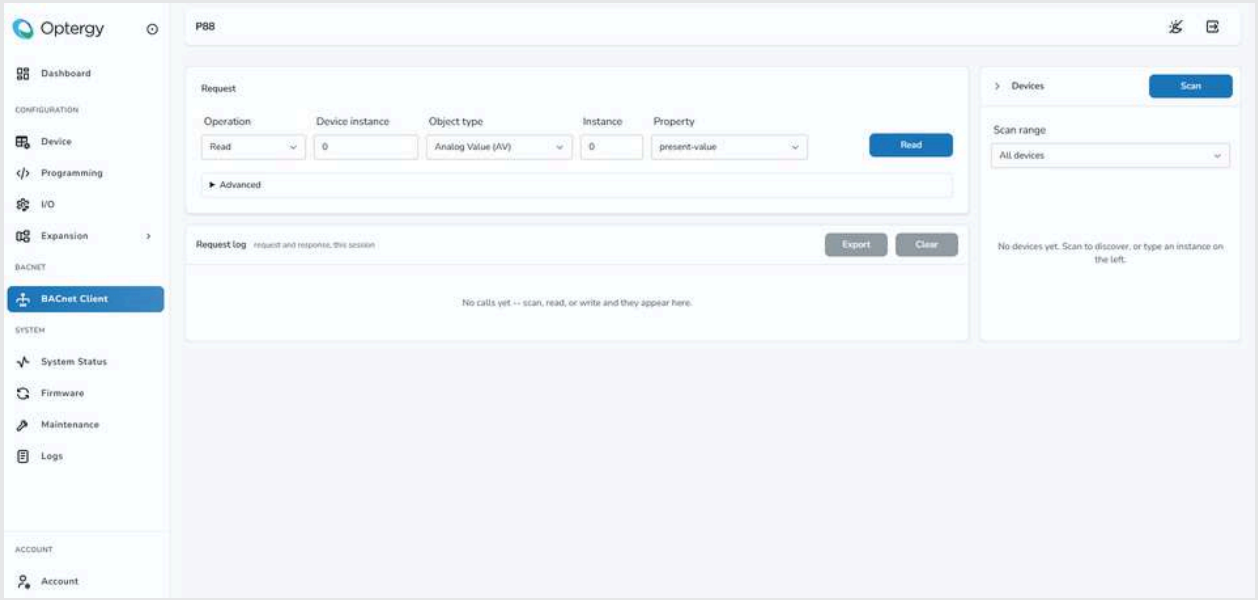
Individual Module pages appear depending on the number of modules connected, there status and the ability to configure the different IO configuration is available here or through your DDC Program



P88 Web User Interface

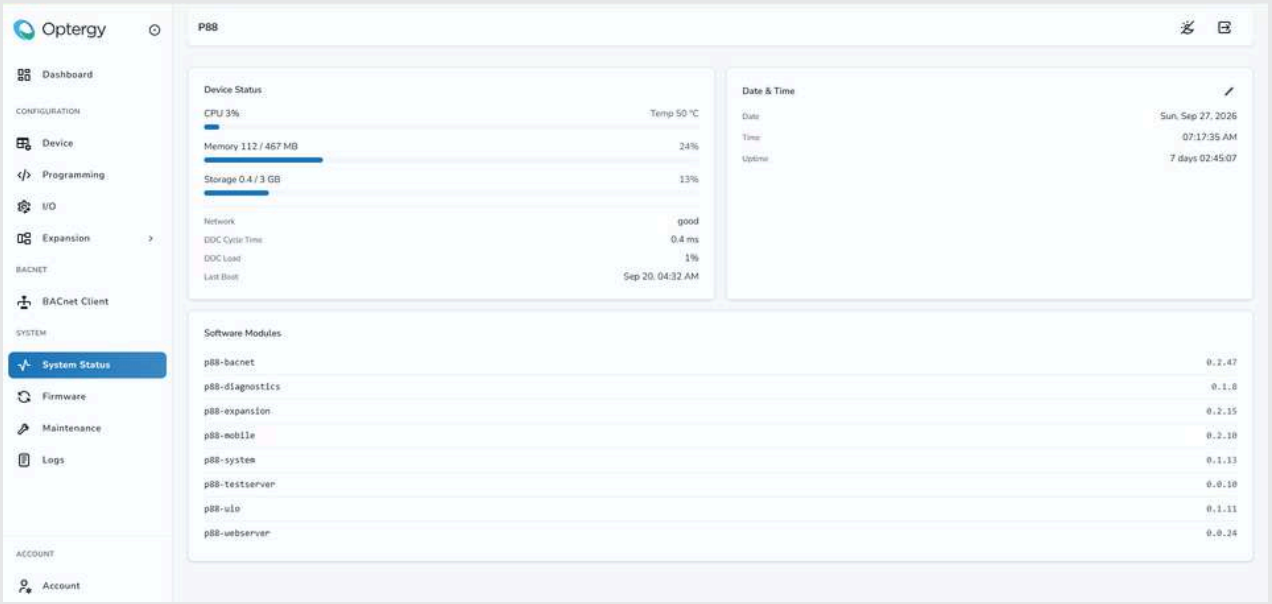
BACnet Client

The BACnet Client provides the ability to read other BACnet devices on the network including via the P88's DTA-2 routing port for onsite diagnostic analysis.



System Status

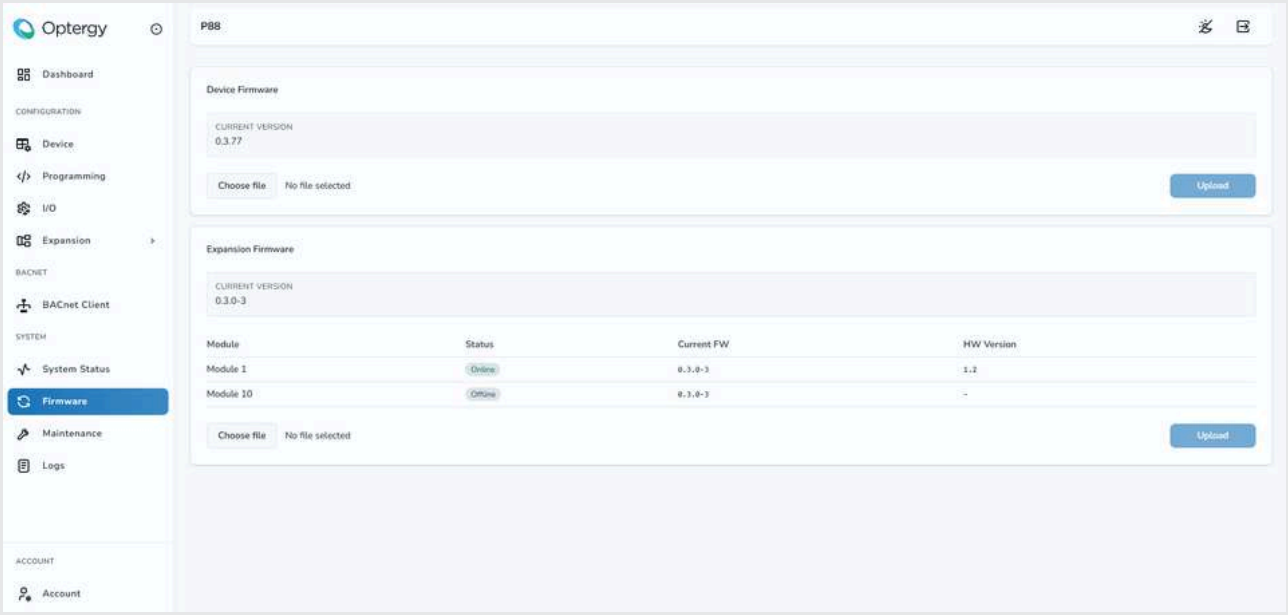
Status Status provides Health, Software Module versions and Date & Time Configurations



P88 Web User Interface

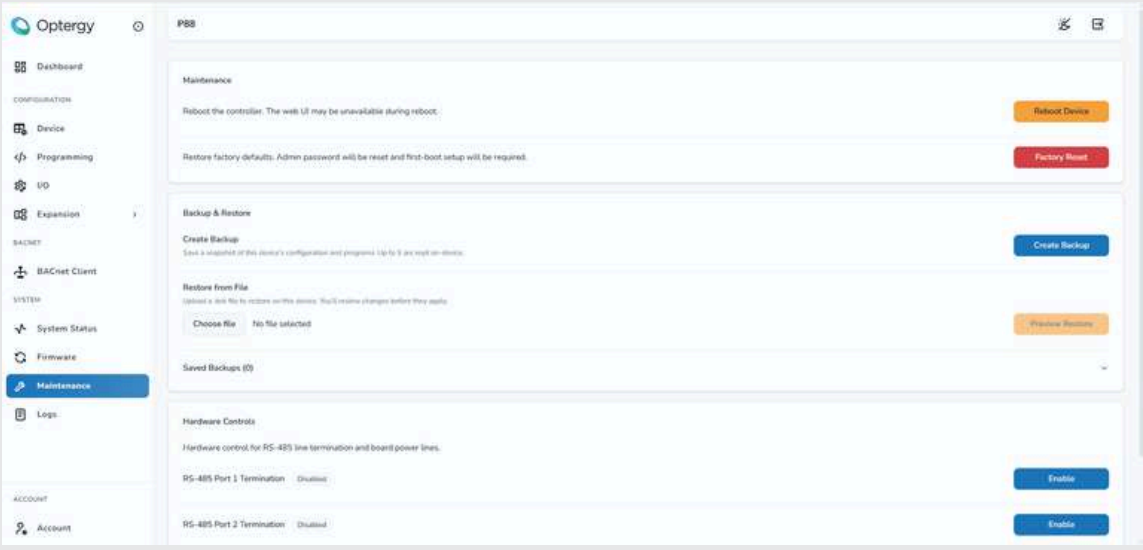
Firmware

Firmware page provides the current firmware version for the P88 and any 44E expansion modules as well as the ability to update the firmware via the Websever (alternatively you can mass update devices via Studio)



Maintenance

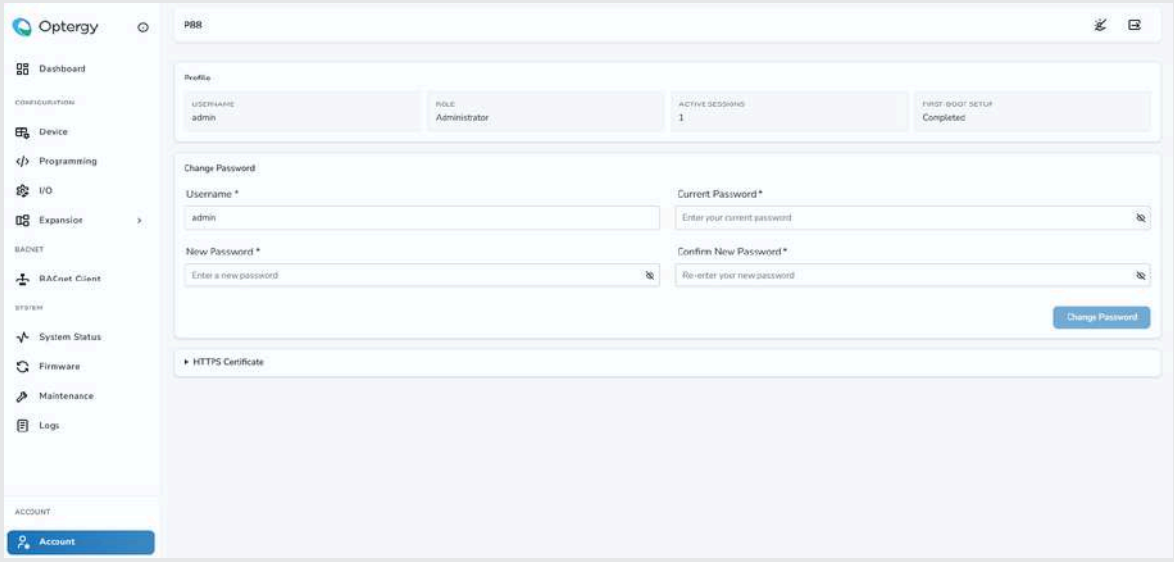
The Maintenance page provides the ability to reboot, factory reset, backup and restore the P88 device. It also allows you to enable/disable DTA-1 or DTA-2 120ohm resister or enable/disable power to the expansion bus and 24VDC output terminals.



P88 Web User Interface

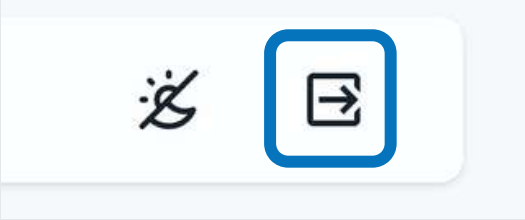
Account

The Account page provides the ability to change your password and provides information on the CA Certificate embeded in the device for HTTPS (SSL) connections.

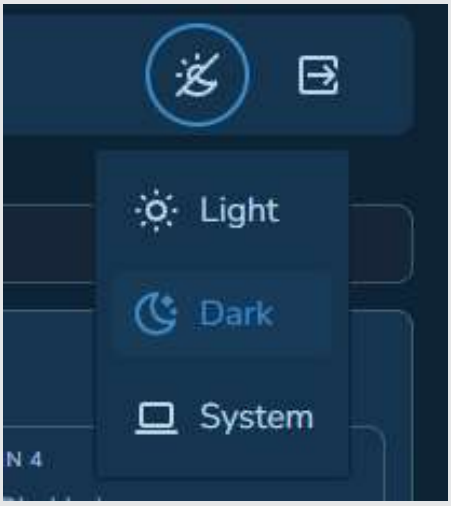


Top Banner (top right corner)

To Logout you can use the Logout Button on the top right hand corner of any page.



You can switch between Light and Dark mode in the top right hand corner of any page



Status LED

Status LED	pattern over 1.5 s	
Blinking green		Starting up
Steady green		Normal operation
Fast blinking blue		Firmware update in progress — do not power off
Steady red		The controller failed to start
Fast blinking red		Control fault — BACnet / DDC or I/O stopped
Red double flash		A support function stopped, or a firmware update failed — control continues
Blinking yellow		Recovery button held — release now to reset

Expansion LED	pattern over 1.5 s	
Off		No expansion modules configured
Steady blue		All expansion modules OK
Steady red		An expansion module is not detected
Blinking red		An expansion module reports a fault
Fast blinking blue		Expansion firmware update — do not power off

