

► PWR8VDC

User Manual

Thank you for purchasing this product.

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.



Surge Protection Device Recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.



Eco Friendly Packaging

This product has been packaged with fully recyclable materials, including compostable bags. Please help us to help the environment.

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Introduction

The PWR8VDC is an outlet-level metered and switched smart PDU. The unit features 1 x IEC C14 inlet for power, and 8 x variable voltage output outlets for controlled supply to low-power consumption devices.

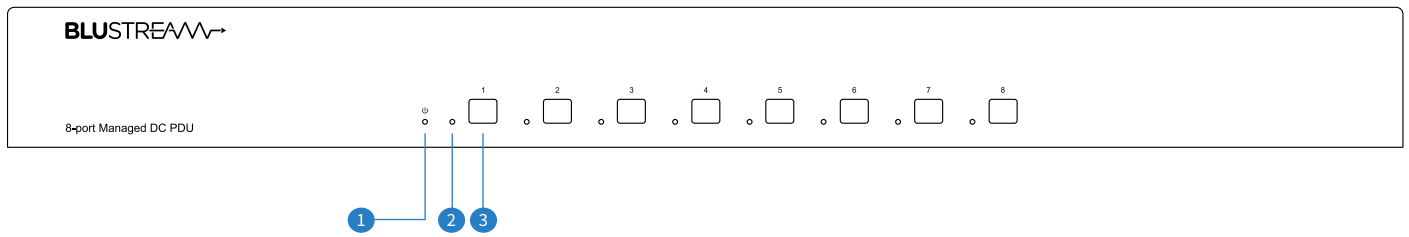
The PDU supports TCP/IP and RS-232 control, and a redundant TCP/IP port as a back-up. Front panel buttons for manual switching of power to individual outlets, and a single mains switch for overall system power. The PWR8VDC also includes 8x managed 5V USB-A ports that can be controlled independently to the variable voltage outputs, GPI connections (x8), and 2 x sensor ports can also be used for automatic control of power to both inlet and individual outlet stages when triggered from 3rd party control platforms or BMS systems. Remote access and monitoring can be set-up and achieved via the web-GUI.

FEATURES:

- Single C14 IEC inlet with 8x configurable voltage 2-pin Phoenix connector outlets
- Products supports 110-250V AC power input up to 10A (264V maximum overvoltage)
- Configurable multi-voltage outputs selectable between 5/9/12/18/24V supporting up to 30W power per outlet
- Supports 8x managed USB-A ports for powering 3rd party devices (ports 1-4 5V 1A, ports 5-8 5V 500mA)
- Monitoring and metering of Voltage, Current, Power, and Energy Consumption
- Overload Protection and Interference Filtering
- Advanced power management features including scheduling and power on/off sequencing
- Multiformat sensor ports for integration to 3rd party control sensors including temperature, humidity, air pressure, security etc
- Control via TCP/IP, RS-232, Front Panel buttons, or GPIs
- Dual TCP/IP network ports providing uninterrupted network service / access with SSL connectivity
- GPIs for automated switching of inlet, and individual power outlets
- Provides remote monitoring with password authentication through web-GUI
- Support multiple network and IoT protocols
- 1U design for 19" rack mount integration - Rack mounting kit included

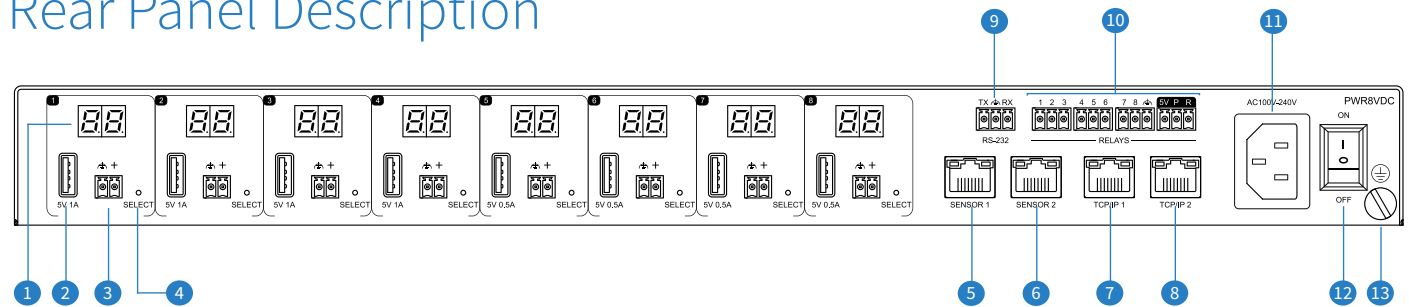
WARNING: Voltage standards vary by region. Before connecting any equipment to the PWR8VDC, select your region and configure the undervoltage and overvoltage thresholds for your local electrical standard. You can set these values on the System page of the Web-GUI (see page 35)..

Front Panel Description



- 1 Power LED - illuminated when unit is powered
- 2 Individual outlet power LED indicator - illuminated when corresponding outlet is powered
- 3 Individual outlet power toggle buttons - press to toggle outlet on or off, hold button 1 & 8 for 10 seconds to factory reset

Rear Panel Description



- 1 7 segment display - displays the selected voltage for the outlet
- 2 USB-A power outlet
- 3 2 x pin phoenix connector outlet
- 4 Select button - cycles through available voltages for that outlet
- 5 Sensor 1 - connection to external sensors for monitoring
- 6 Sensor 2 - connection to external sensors for monitoring
- 7 LAN1 - main TCP/IP - RJ45 connector for TCP/IP and web-GUI control of the PDU
- 8 LAN2 - redundant TCP/IP - RJ45 connector for redundant TCP/IP control of the PDU
- 9 RS-232 port - for control of the PDU from a 3rd party control processor or PC (phoenix block included)
- 10 Phoenix connector GPIs - individual triggers for automated switching of individual outlets, or mains power
- 11 Mains C14 IEC power inlet
- 12 Mains power switch
- 13 Ground / earth connection

Web-GUI - Initialisation and Log In

In order to operate the web-GUI of the PWR8VDC, you must connect the TCP/IP RJ45 socket to your local network, or connect directly to the LAN1 port.

By default the unit is set to use DHCP, however if a DHCP server (eg: network router) is not installed, the unit's IP address will revert to the following details:

Default IP Address: **192.168.0.200**

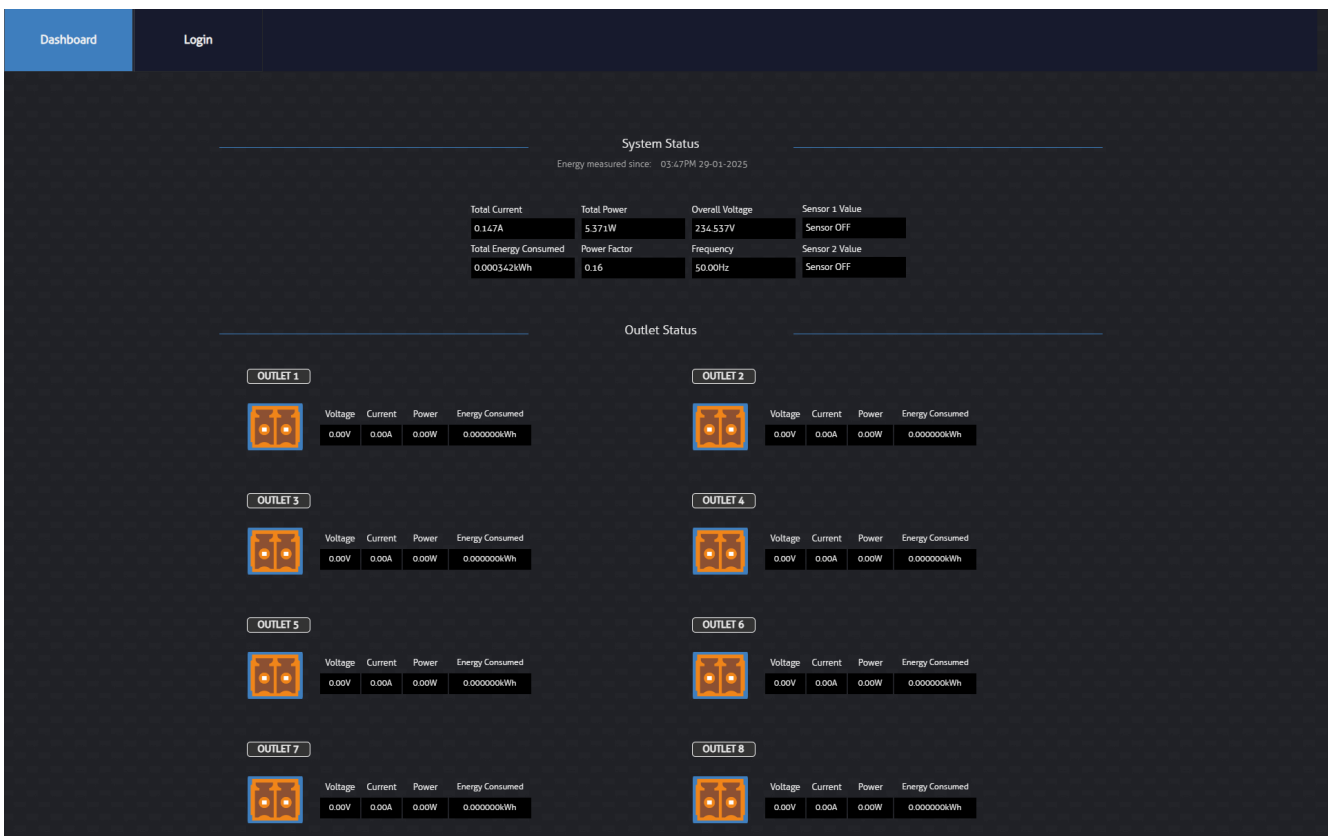
Default Username: **blustream**

Default Password: **@BlS1234**

Please note: New password regulations requires passwords being set for products to be a minimum of 8 characters and contain a minimum of: 1x uppercase letter, 1x lowercase letter, 1x symbol and 1x number. On first login to the user interface, a new password will be required to be set that complies with the above.

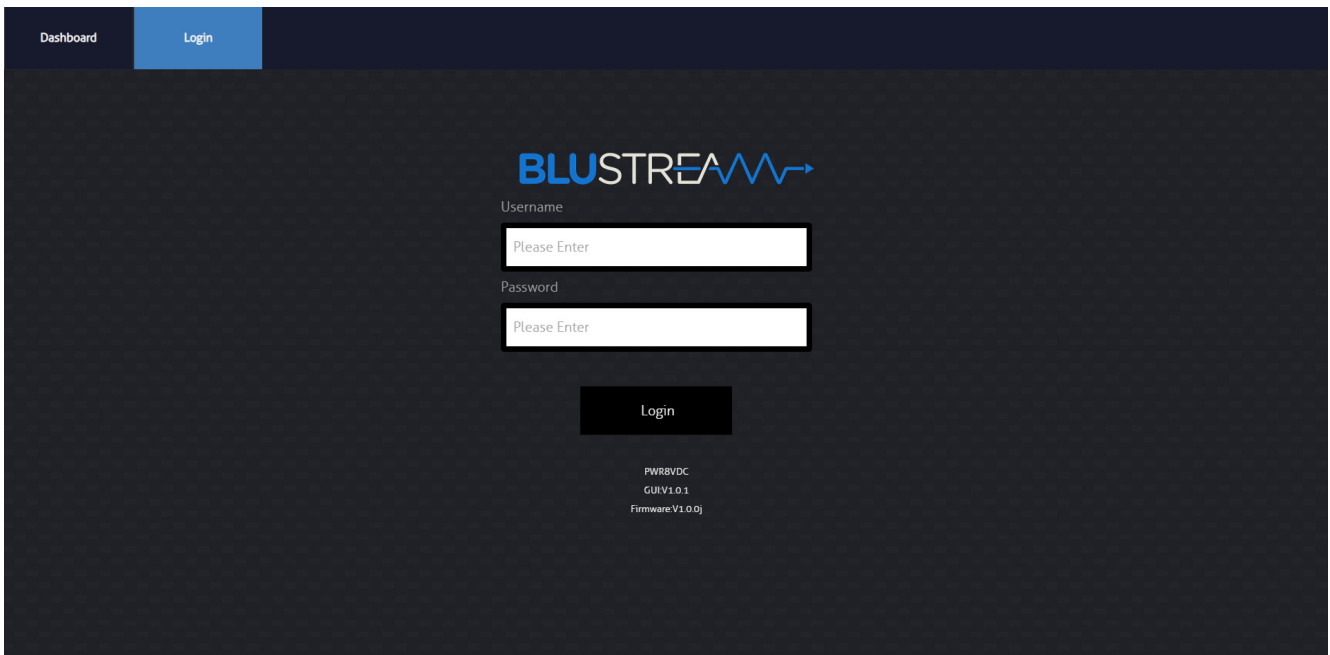
Dashboard - Guest Log In:

When initially accessing the Web-GUI of the PWR8VDC, the Dashboard page is shown as below. This page shows the current System Status and Outlet Status. Various metrics are displayed such as: Total Current, Power, Voltage, Consumption and Power Factor and Frequency, and Sensor Values. Each Outlet displays individual metrics for each device connected to corresponding outlet port.



Log In:

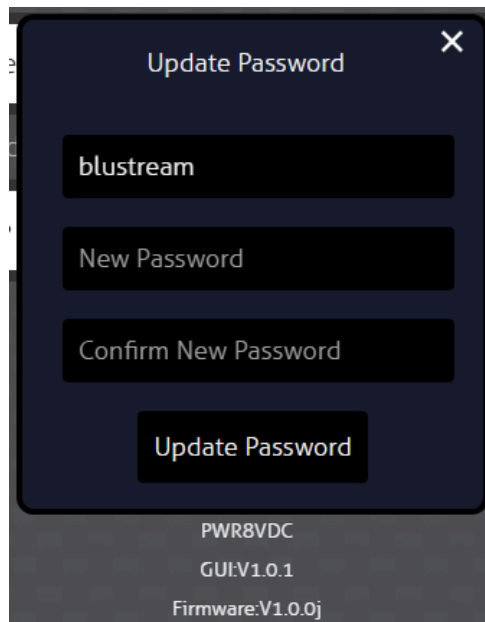
The Log In page allows for the Administrator to access the system configuration and control pages of the web-GUI. The default log in credentials are noted at the top of this page. The Log In page will also show the current firmware version running on the PWR8VDC unit.



The screenshot shows the login interface of the PWR8VDC web-GUI. At the top, there is a navigation bar with 'Dashboard' and 'Login' tabs. The 'Login' tab is active. Below the navigation bar is the BLUSTREAM logo. Underneath the logo, there are two input fields: 'Username' and 'Password', both containing the placeholder text 'Please Enter'. Below these fields is a 'Login' button. At the bottom of the page, the following information is displayed: PWR8VDC, GUI:V1.0.1, and Firmware:V1.0.0j.

Password Change:

On first login to the PWR8VDC, the default password as noted on the previous page must be updated to a new unique password for the product. The new password must be a minimum of 8 characters in length, and contain a minimum of: 1x uppercase letter, 1x lowercase letter, 1x symbol and 1x number. Please note the new password down, and store in a safe place as the system cannot be accessed without it. A factory reset must be carried out in the event of the Admin password being lost.

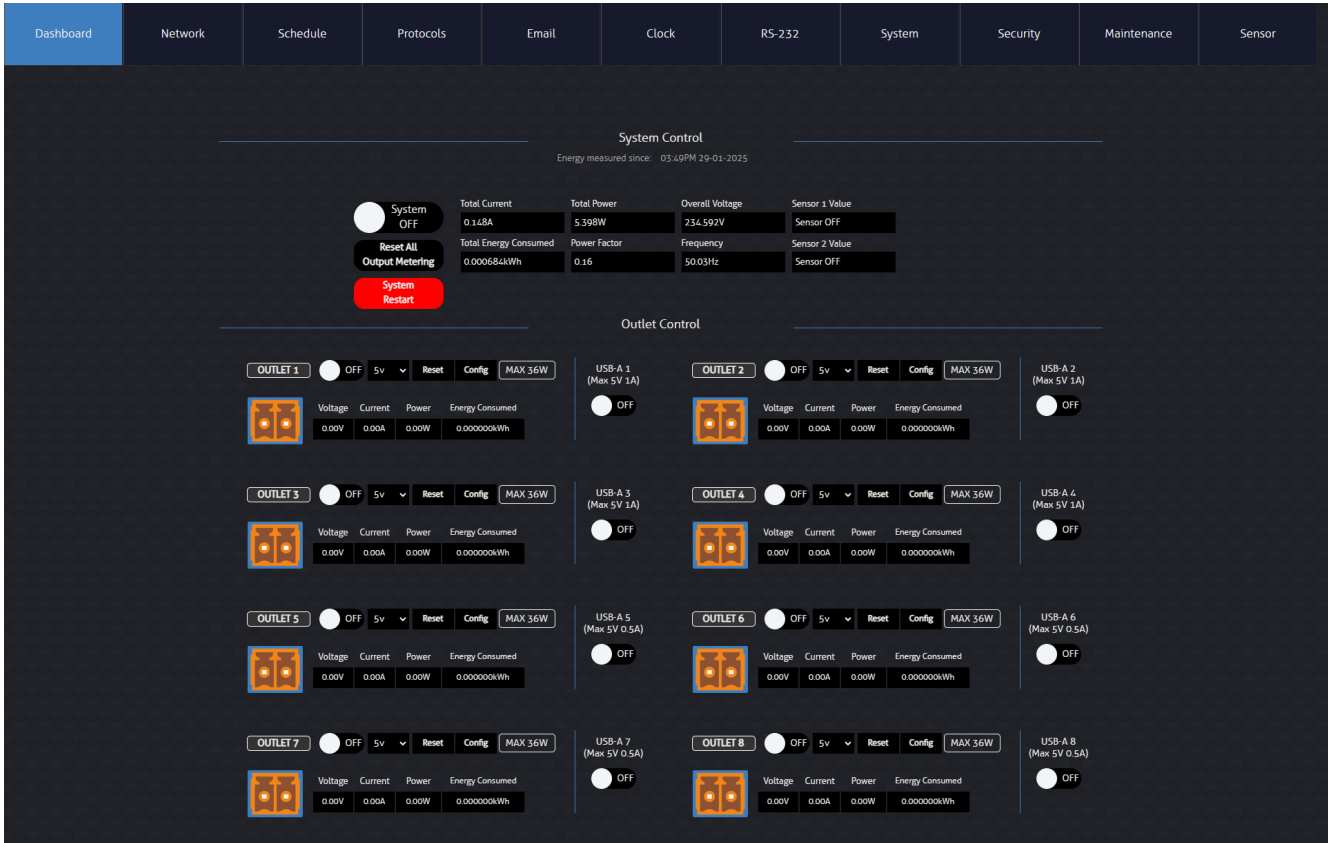


The screenshot shows a 'Update Password' dialog box. The dialog has a title bar with 'Update Password' and a close button (X). Inside the dialog, there are three input fields: the first contains 'blustream', the second is labeled 'New Password', and the third is labeled 'Confirm New Password'. Below these fields is an 'Update Password' button. At the bottom of the dialog, the following information is displayed: PWR8VDC, GUI:V1.0.1, and Firmware:V1.0.0j.

Web-GUI Control - Dashboard

Once logged in as the Administrator, additional control options become available from within the GUI.

The ability to power the unit on and off can be carried out from any page of the user interface using the power button in the bottom right hand corner of the GUI.



System Control:

- System ON / OFF will toggle power on and off on all outputs, but will not power down the unit.
- Reset All Output Metering will clear the adjacent fields.
- System Restart will cut the power to each output individually (output 1, then 2, then 3, then 4, etc), restarting each output once the power has been cut.

Outlet Control:

The 8 x outlets and the corresponding USB-A ports can be configured from here. Displayed next to each outlet is the energy consumption data. Each outlet has an ON / OFF Toggle, a Voltage Selector, a Reset and Config button. Additionally, each output can independently toggle the USB-A outlet on or off.

- The ON / OFF Toggle will switch the outlet on or off
- The Voltage Selector allows the output's voltage to be set to 5v, 9v, 12v, 18v or 24v
- The Reset button will reset all metering for that corresponding outlet
- The Config button will open sub menu for further configuration of the outlet:

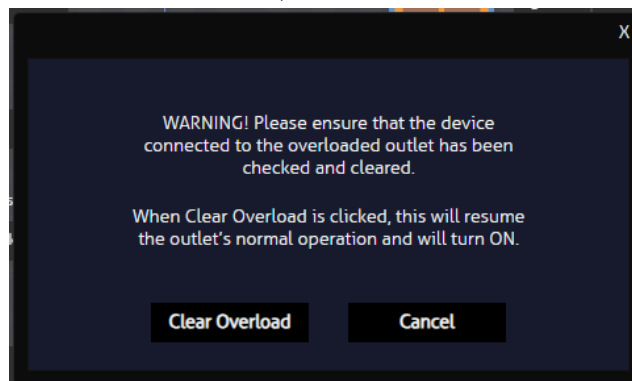
Outlet Control (continued)

Depending on the state of the outlet, the icon for the outlet will be highlighted in a different colour and, depending if you have set custom icons, the icon will change:

- Where an outlet is not drawing any power, the state will be set to idle and the icon will be highlighted blue
- Where a device is connected to an outlet and drawing power, the state will be set to connected and the icon will be highlighted green
- Where a device is connected and a warning has been triggered, the state will be set to warning and the icon will be highlighted red. This also occurs on the USB-A outlets:



When an outlet of the PWR8VDC enters a warning state, the outlet will be turned off and highlighted in red. This is triggered by abnormal voltage or current on the outlet. When attempting to power on the outlet, a warning dialog will be shown allowing for the warning to be cleared and the outlet to resume normal operation:



Additional logic to handle overloaded outlets can be set on the System page of the web-GUI.

The PWR8VDC also features input filtering and is able to detect under voltage and over voltage. If either is detected, all outlets will be put into a warning state and switched off to prevent any damage to the connected devices.

Critical: Warning! Overvoltage detected.
System voltage is too HIGH, all outlets will be turned OFF.

Critical: Warning! Undervoltage detected.
System voltage is too LOW, all outlets will be turned OFF.

Web-GUI Control - Network

The Network tab allows for customizable network configuration of the PWR8VDC for both LAN ports of the unit, IPvX settings, and security functions.

The screenshot shows the Network configuration page with the following sections:

- TCP/IP 1 (MAC Address: 34:D0:B8:23:0AF2):**
 - Enable TCP/IP 1: ON
 - Use IPv4 DHCP: Yes / Use Static IP
 - IPv4 Address: 10.0.0.91
 - IPv4 Netmask: 255.255.255.0
 - IPv4 Gateway: 10.0.0.1
 - IPv4 DNS: 8.8.8.8
 - Save Changes
- TCP/IP 2 (MAC Address: 34:D0:B8:23:0AEF):**
 - Enable TCP/IP 2: OFF
 - Use IPv4 DHCP: Yes / Use Static IP
 - IPv4 Address: 169.254.2.225
 - IPv4 Netmask: 255.255.0.0
 - Save Changes
- IPv6 settings:**
 - Use IPv6 Protocol: Yes / No
 - Use IPv6 Router Advertisement: Yes / No
 - IPv6 settings: DHCP v6 / Manual
 - IPv6 Address: /64
 - IPv6 DNS address 1: 114.114.114.114
 - IPv6 DNS address 2: 114.114.114.114
 - IPv6 Gateway address 1:
 - IPv6 Gateway address 2:
 - Save Changes
- HTTP/HTTPS Server:**
 - HTTP Server Port: 80
 - HTTPS Server Port: 443
 - TLS Versions: TLS 1.2 only
 - HTTP Server: HTTP ONLY / HTTPS ONLY
 - Reply ICMP PING: Yes / No
 - Save Changes
- mDNS:**
 - mDNS: ON
 - Hostname: PWR8VDC_LOCAL (1-14 chars)
 - Save

TCP/IP:

Individual settings for the Main (LAN1) and Redundant (LAN2) ports can be configured for TCP/IP control, DHCP or Static IP addressing as required. IPv6 settings are also configurable, updating both LAN connections into an IPv6 addressing connection. A Save Changes button is located at the bottom of each section; please ensure that the relevant button is clicked to update the corresponding section.

HTTP/HTTPS Server:

Secure access to the Web GUI can be configured by setting network connectivity options, including the HTTP and HTTPS ports and supported TLS versions. For basic network reachability and diagnostics, ICMP ping responses can also be enabled or disabled as required.

mDNS:

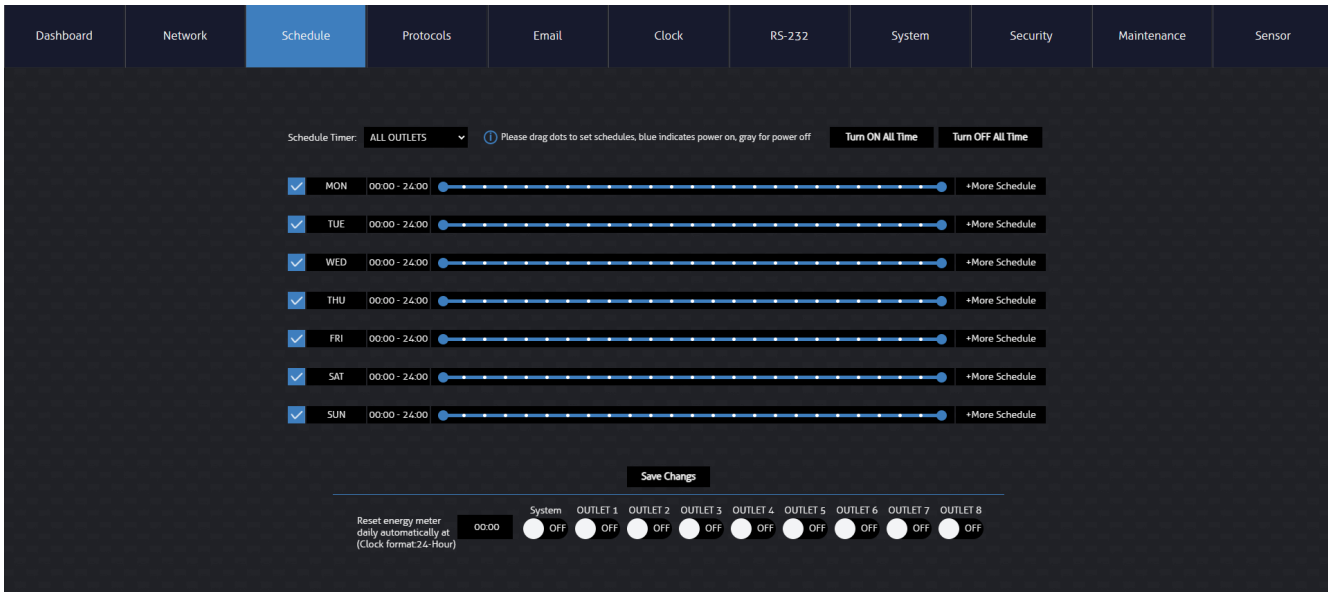
mDNS is a protocol used in network environments to resolve hostnames to IP addresses within local networks without the need for a dedicated DNS server. The PWR8VDC is able to be accessed via the hostname if the IP address is not known.

This is set to pwr8vdc.local by default, but can be changed (if required).

Web-GUI Control - Scheduling

The PWR8VDC contains the ability to configure schedules to suit the needs of an installation. This can be used for power saving, when the equipment is not in use, or as a way to schedule a reboot for devices that may lock up after long periods of inactivity (e.g: satellite receivers).

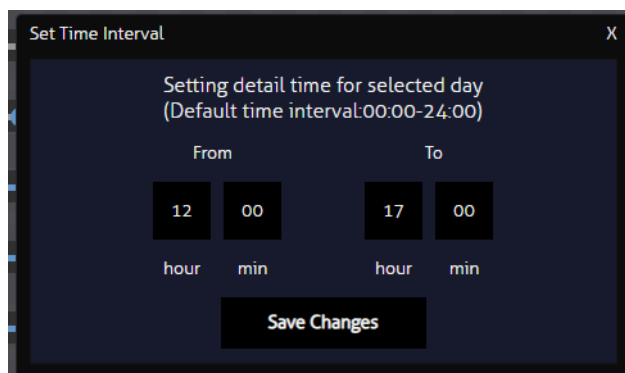
The scheduling operates over a 24 hour period across a 7 day window. Individual time periods can be set where the product/s attached to the individual outlets (or all outlets) can be powered on and off without the need for a 3rd party control system to issue power commands. Select the schedule to edit from the Schedule Timer dropdown menu. To quickly edit schedules, use the Turn ON All Time button to set the schedule every day always on, and the Turn OFF All Time button to set the schedule every day always off. To disable specific days, press the check icon next to the desired day label.



To adjust the logic for any given day, move the blue dots along the timeline to create a highlighted selection: this is when the device will power on. In order to add additional logic (i.e multiple on and off periods), press the + More Schedule button. You can now add additional logic by repeating the steps above. Press the - Delete Schedule button to remove unwanted logic.



Alternatively, clicking on the time, next to the day label, will allow for manual time input.



Additionally, the energy meter on the dashboard can be automatically reset at a specified time for a unique selection of outputs. Input a desired time at the bottom of the page and select the output meters to be reset daily at that time.

Once the schedule has been set, use the 'Save Changes' button at the bottom of the page.

Please note: The ALL OUTLETS schedule will override the individual schedules in the event of a conflict.

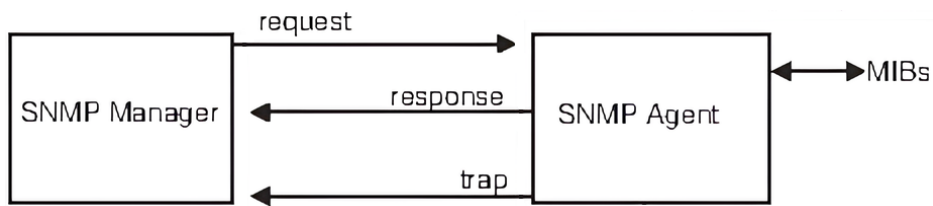
Web-GUI Control - Protocols

The PWR8VDC has the ability to communicate over multiple different protocols. These can be accessed by clicking on the corresponding tab: SNMP, Telnet, MQTT, SSH and Modbus. Each tab displays configuration options allowing for fine-tuning of these communication methods to the PWR8VDC. See below for the configuration of these options:

SNMP - Simple Network Management Protocol:

SNMP is described by a series of Request for Comments (RFCs) that specifies and structures the information that is exchanged between managing and managed systems.

An SNMP agent is a process that runs on a system being managed and maintains the MIB database for the system. An SNMP manager is an application that generates requests for MIB information and processes the responses. The manager and agent communicate using the Simple Network Management Protocol.



The PWR8VDC acts as an SNMP agent and can be configured to communicate with an SNMP manager of your choice.

SNMP	Telnet	MQTT	SSH	Modbus
Enable SNMP V1 options	<input type="checkbox"/> SNMP GET <input type="checkbox"/> SNMP SET			
SNMP UDP port	161			
sysContact				
sysName				
sysLocation				
Enable SNMP V2C	<input type="radio"/> OFF			
SNMP v2 public community	public		(Max 16 Chars)	
SNMP v2 private community	private		(Max 16 Chars)	
Enable SNMP V3	<input type="radio"/> OFF			
SNMP V3 username	standard		(Max 32 Chars)	
SNMP V3 authorization algorithm	None			
Set new authorization password	*****		(8-32 Chars)	
Repeat new authorization password	*****		(8-32 Chars)	
SNMP v3 private algorithm	None			
Set new privacy password	*****		(8-32 Chars)	
Repeat new privacy password	*****		(8-32 Chars)	
Enable SNMP Trap	Disable SNMP Trap			
Save Changes		Download MIB		

SNMP (continued)

Enable SNMP V1 options

SNMP GET	GET requests will retrieve information from the PWR8VDC’s MIB
SNMP SET	SET requests will change information in the PWR8VDC’s MIB
SNMP UDP port	SNMP uses UDP port 161 and port 162

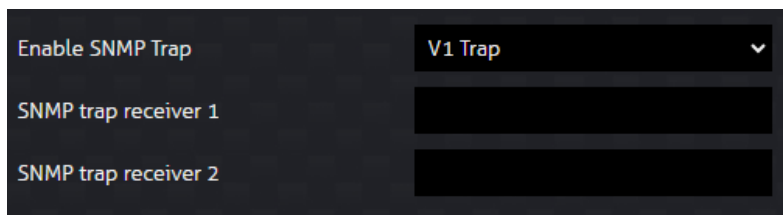
sysConact, sysName, and sysLocation can be set to a user defined string (0-255 characters)

Enable SNMP V2C	ON / OFF
SNMP v2 public community	The default read-only community string is commonly set to “public”
SNMP v2 private community	The read-write string is commonly set to “private”

Enable SNMP V3	ON / OFF
SNMP V3 username	Up to 32 alphanumeric characters (no spaces)
SNMP v3 authorization algorithm	MD5, SHA1, SHA2-256, SHA-2-384, SHA2-512
Set new authorization password	Required when an authorization algorithm has been selected, enter a case sensitive password using alphanumeric characters
SNMP v3 privacy algorithm	DES, AES, AES-128
Set new privacy password	Required when a privacy algorithm has been selected enter a case sensitive password using alphanumeric characters

Enable SNMP Trap

An SNMP Trap Receiver captures, displays and logs SNMP Traps. Traps are unrequested notices of events that are sent immediately by the device to the SNMP manager.



V1 Trap / V2C Trap / V3 Trap

SNMP trap receiver 1	The IP address of a trap receiver (V2C & V3 will be populated with this address)
SNMP trap receiver 2	The IP address of an additional trap receiver (V2C & V3 will be populated with this address)

Press the Save Changes button at the bottom of the page to apply any changes.

The MIB for the PWR8VDC can also be downloaded as a .txt file by pressing the Download MIB button

An SNMP setup example has been provided on the following pages:

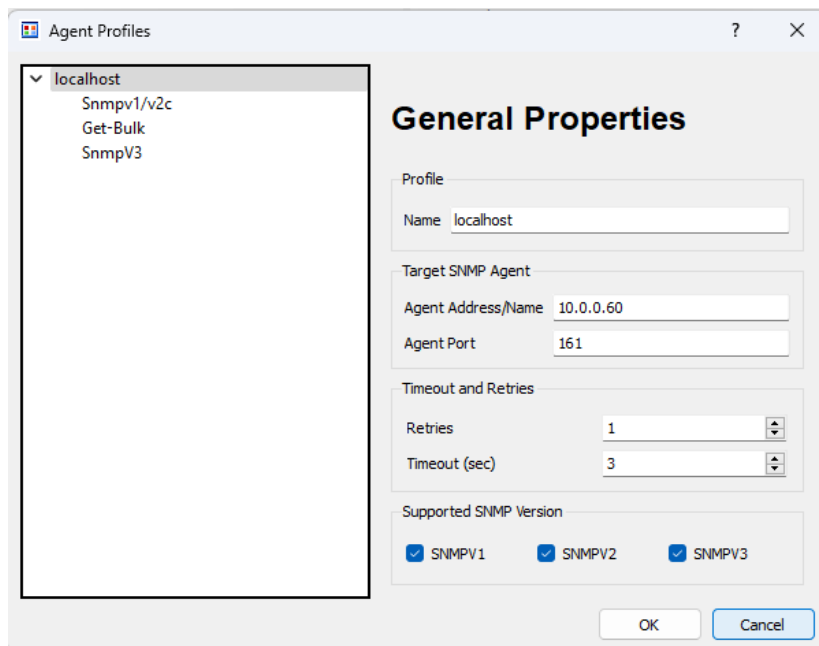
In this example, the snmpb software will be used.

1. Complete the SNMP settings in the web-GUI. Ensure that the SNMP trap receiver is set to the IP address of the device running the snmpb software.

SNMP (continued)

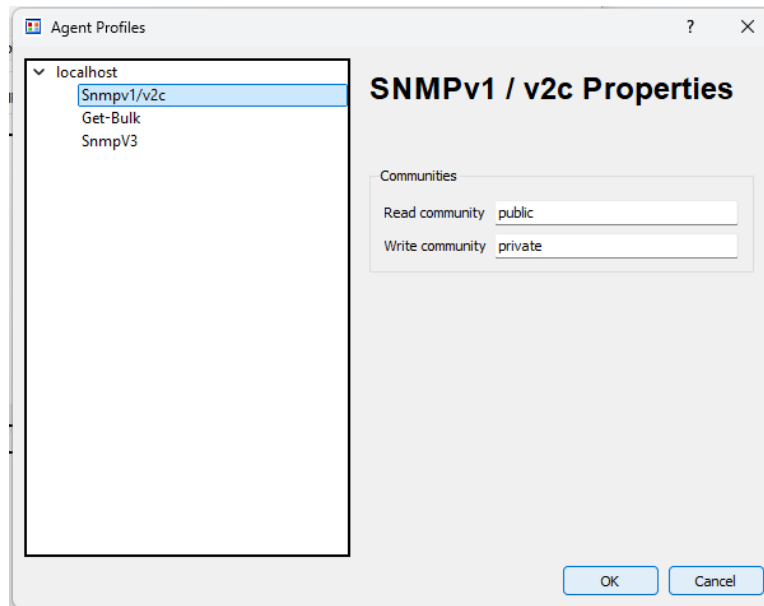
Enable SNMP V1 options	<input checked="" type="checkbox"/> SNMP GET	<input checked="" type="checkbox"/> SNMP SET
SNMP UDP port	161	
sysContact	test_sysContact	
sysName	test_sysName	
sysLocation	test_sysLocation	
Enable SNMP V2C	<input checked="" type="checkbox"/>	
SNMP v2 public community	public	(Max 16 Chars)
SNMP v2 private community	private	(Max 16 Chars)
Enable SNMP V3	<input checked="" type="checkbox"/>	
SNMP V3 username	test	(Max 32 Chars)
SNMP V3 authorization algorithm	MD5	
Set new authorization password	(8-32 Chars)
Repeat new authorization password	(8-32 Chars)
SNMP v3 private algorithm	DES	
Set new privacy password	(8-32 Chars)
Repeat new privacy password	(8-32 Chars)
Enable SNMP Trap	V1 Trap	
SNMP trap receiver 1	10.0.0.63	
SNMP trap receiver 2		

- Open the snmpb software and navigate to Options/Manage Agent Profiles... and create a new user. Set the Agent Address to the IP address of the PWR8VDC and the port to the SNMP UDP port set in the Web-GUI.

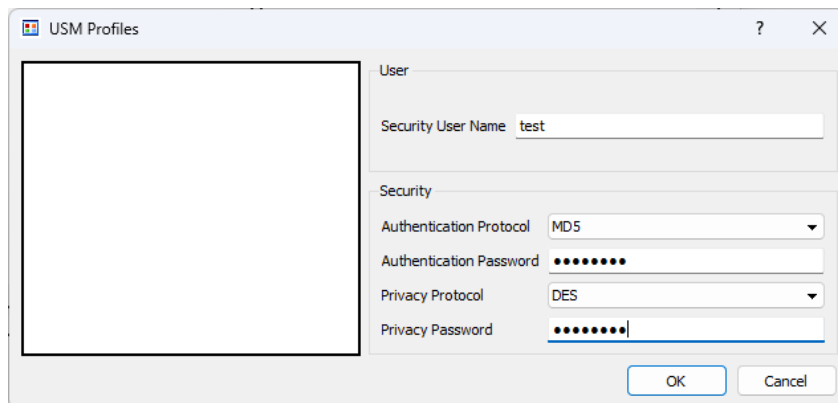


SNMP (continued)

3. Set the Snmpv1/v2c public and private communities to SNMP v2 public and private communities set in the Web-GUI.



4. Navigate to Options/Manage SNMPv3 USM Profiles... and fill in the fields to match what was set under SNMP V3 in the Web-GUI.

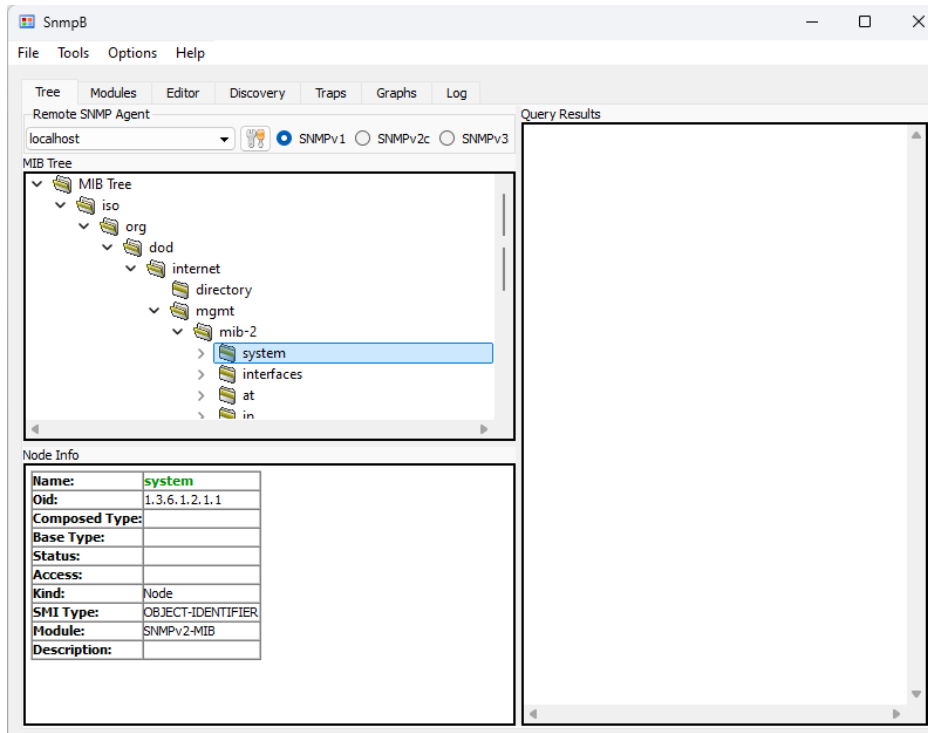


5. You can now verify if the software can communicate with the PWR8VDC.

On the main screen, with SNMPv1 selected, navigate through the MIB tree to find the system folder:

- iso
 - org
 - dod
 - internet
 - mgmt
 - mib-2

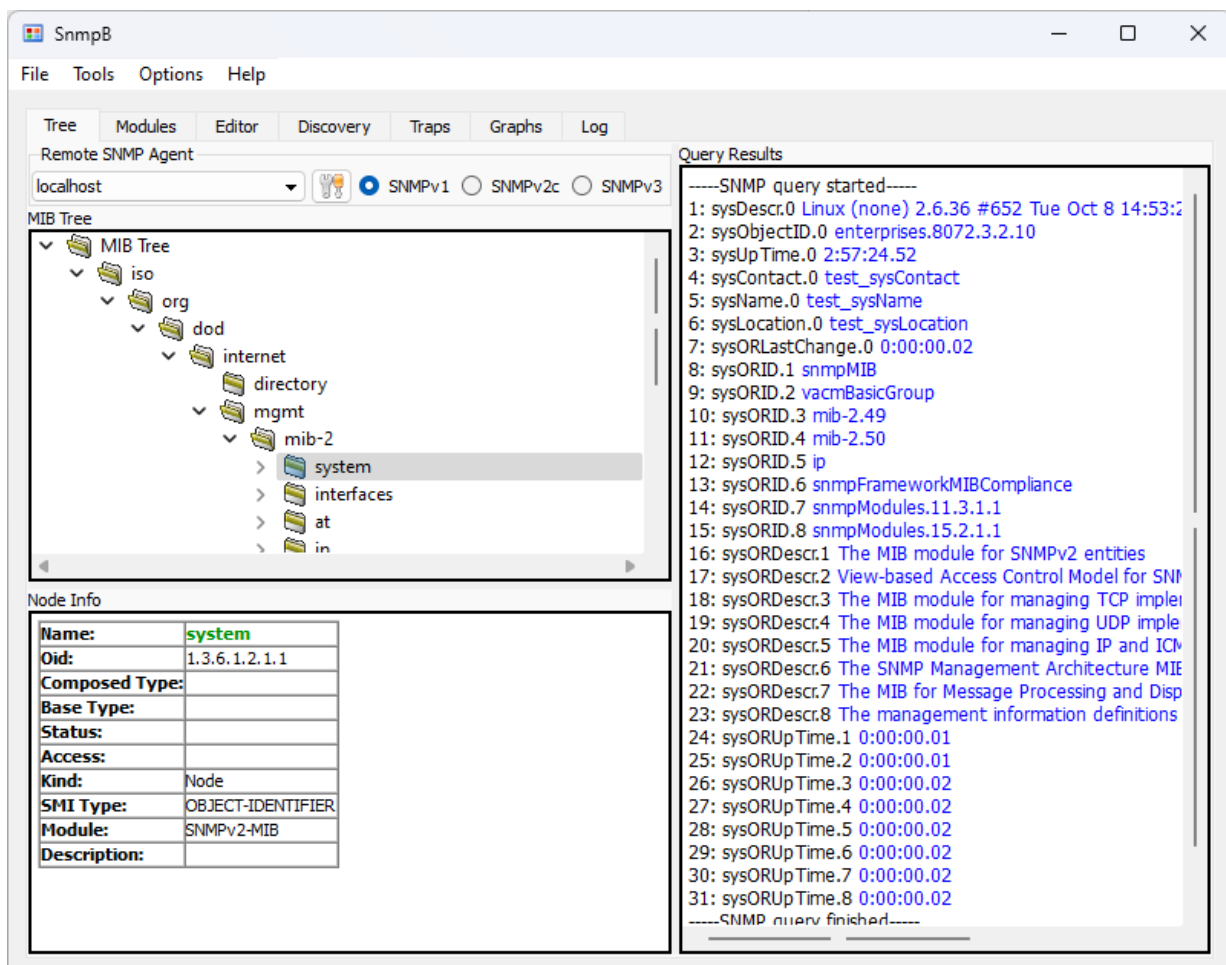
SNMP (continued)



6. Right click on system and press 'Walk'.

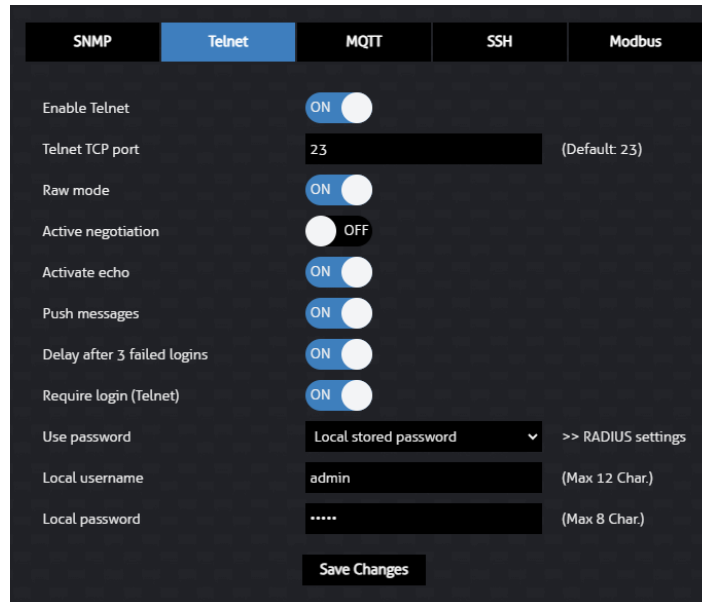
Under Query Results, look for the custom labels set for sysContact, sysName, sysLocation in the Web-GUI.

If they appear with the correct labels, then the SNMP protocol is working.



Telnet

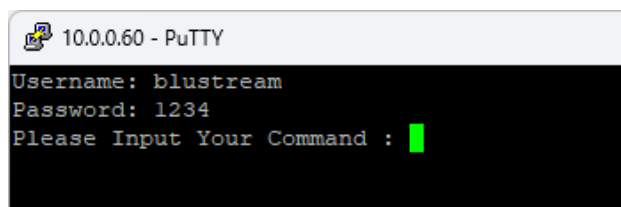
Telnet (telecommunications network) is a client/server application protocol that provides access to virtual terminals of remote systems on local area networks or the Internet.



Telnet (continued)

Enable Telnet	ON / OFF
Telnet TCP port	Default port number is 23
Raw mode	In this mode, data is sent and received directly without the negotiation and control sequences typically associated with the Telnet. In general, you will use Telnet mode if you're communicating with a standard Telnet compatible client, and raw mode if you're communicating through a custom script or application.
Active negotiation	The Telnet-negotiated setting determines if the Transport Layer Security (TLS) negotiation between the client and the server is done on the established Telnet connection or on a TLS connection prior to the Telnet negotiations
Activate echo	Used to display text on the terminal or console
Push messages	Send notifications when logging in
Delay after 3 failed logins	If enabled, the connection will close after 3 failed login attempts
Require Login (Telnet)	ON / OFF
Use password	When Require Login is enabled, the user will be prompted to enter credentials when connecting via Telnet Local stored password; set a local username and password for Telnet access RADIUS Server password; use stored RADIUS username and password (set under Security tab)

Once Telnet has been configured and enabled, connection can be established with any Telnet client.



MQTT - Message Queuing Telemetry Transport:

MQTT is a lightweight, publish-subscribe, machine to machine network protocol for message queue/message queuing service.

The MQTT protocol defines two types of network entities: a message broker and a number of clients:

An MQTT broker is the back end system which coordinates messages between the different clients.

An MQTT client is any device that runs an MQTT library and connects to an MQTT broker over a network.

Clients and brokers begin communicating by using an MQTT connection. Clients initiate the connection by sending a CONNECT message to the MQTT broker. The broker confirms that a connection has been established by responding with a CONNACK message. Both the MQTT client and the broker require a TCP/IP stack to communicate. Clients never connect with each other, only with the broker.

SNMP	Telnet	MQTT	SSH	Modbus
Enable MQTT		<input type="checkbox"/> OFF		
Broker Status		Broker DNS ready, connected since 761s Last publish 8s ago, last incoming subscription 0s ago		
Broker Host		<input type="text"/>		
Broker TCP Port		<input type="text" value="1883"/>	(Default:1883.)	
Enable SSL/TLS		<input type="checkbox"/> OFF		
SSL CA file		<input type="text" value="C://"/>	<input type="button" value="Browse"/>	
SSL certificate file		<input type="text" value="C://"/>	<input type="button" value="Browse"/>	
SSL Key file		<input type="text" value="C://"/>	<input type="button" value="Browse"/>	
Use credentials		<input type="checkbox"/> OFF		
Username		<input type="text"/>		
Password		<input type="text"/>		
Client ID status		<input type="text" value="1"/>	Specify Client ID for monitoring status.	
Topic status		<input type="text"/>	Use topic to monitor status.	
Client ID control		<input type="text" value="2"/>	Specify Client ID for 3rd-party control	
Topic control		<input type="text"/>	Use topic to send commands using 3rd party control.	
Client ID feedback of control commands		<input type="text" value="3"/>	Specify Client ID for control feedback.	
Topic feedback of control commands		<input type="text"/>	Use topic to monitor control feedback using 3rd party control.	
Quality of Service (QoS)		<input checked="" type="radio"/> QoS 0 (at most once) <input type="radio"/> QoS 1 (At least once)		
Keep-alive ping interval		<input type="text" value="60"/>	seconds (Min.10 seconds)	
Publish device data summary interval		<input type="text" value="10"/>	seconds (0 for disabled)	
<input type="button" value="Save Changes"/>				

MQTT (continued)

Enable MQTT	ON / OFF
Broker Status	Displays current information about the broker
Broker Host	Broker host address
Broker TCP Port	TCP/IP port 1883 & 8883 are reserved for use with MQTT. Managed hosts may use their own port
Enable SSL/TLS	Upload SSL/TLS files for MQTT secure connections
<ul style="list-style-type: none"> - SSL CA file - SSL certificate file - SSL key file 	

Create Log In Credentials:

Username

Password

Client ID

- Client IDs identify a connection from a specific device or client to an MQTT broker.

Topics and Client IDs

- Topics are keywords that the MQTT broker uses to filter messages for the MQTT clients. Topics are organised in a hierarchy, akin to a folder or directory. For example, a broker may organise topics as:
 - home/groundfloor/livingroom/light | home/firstfloor/kitchen/temperature
- When a publisher has a new item of data to distribute, it sends a control message with the data to the connected broker. The broker then distributes the information to any clients that have subscribed to that topic.

Quality of Service (QoS)

Quality of Service (QoS) in MQTT messaging is an agreement between sender and receiver on the guarantee of delivering a message. The PWR8VDC can choose between two levels of QoS:

- QoS Level 0
 - The client simply publishes the message, and there is no acknowledgement by the broker (no response is required).
- QoS Level 1
 - The broker sends an acknowledgement back to the sender once the message is received; in the event that the acknowledgement is lost, the sender will realise the message hasn't got through and will send the message again. The client will re-send until it gets the broker's acknowledgement. This means that sending is guaranteed, although the message may reach the broker more than once.

Keep -alive ping interval

- Keep Alive is a feature of the MQTT protocol that allows an MQTT client to maintain its connection with a broker by sending regular control packets to the broker. The MQTT client is responsible for setting an appropriate keep-alive interval, for example: basing it on it's current signal strength, optimizing the connection for it's specific circumstances.
- The maximum interval is 18h 12m 15s
- The minimum interval is 0s, effectively deactivating the mechanism

Publish device summary data interval

- Interval the PWR8VDC will publish it's data

MQTT (continued)

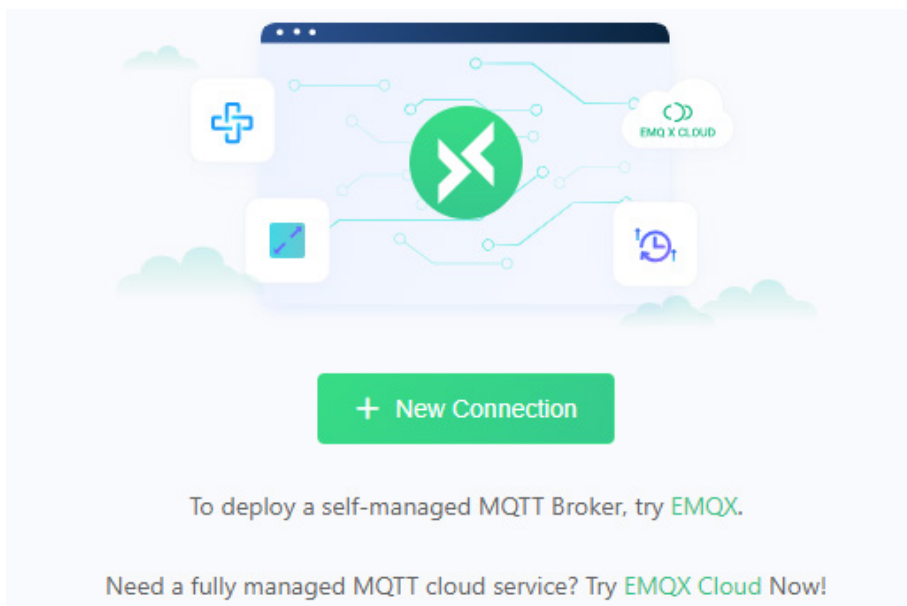
An MQTT setup example has been provided on the following pages:

In this example, we will be using the MQTTX software and HiveMQ, a free public MQTT broker.

1. Setup the MQTT tab with a username, password, and topic IDs:



2. Open the MQTTX software and setup a new connection to the HiveMQ broker



MQTT (continued)

3. Fill in the appropriate fields from the PWR8VDC settings:
4. Click connect and once connected, create a new subscription
5. Enter the topic that you want to subscribe to; we have three topics:

Topic Status

- Generates the product status

Topic Control

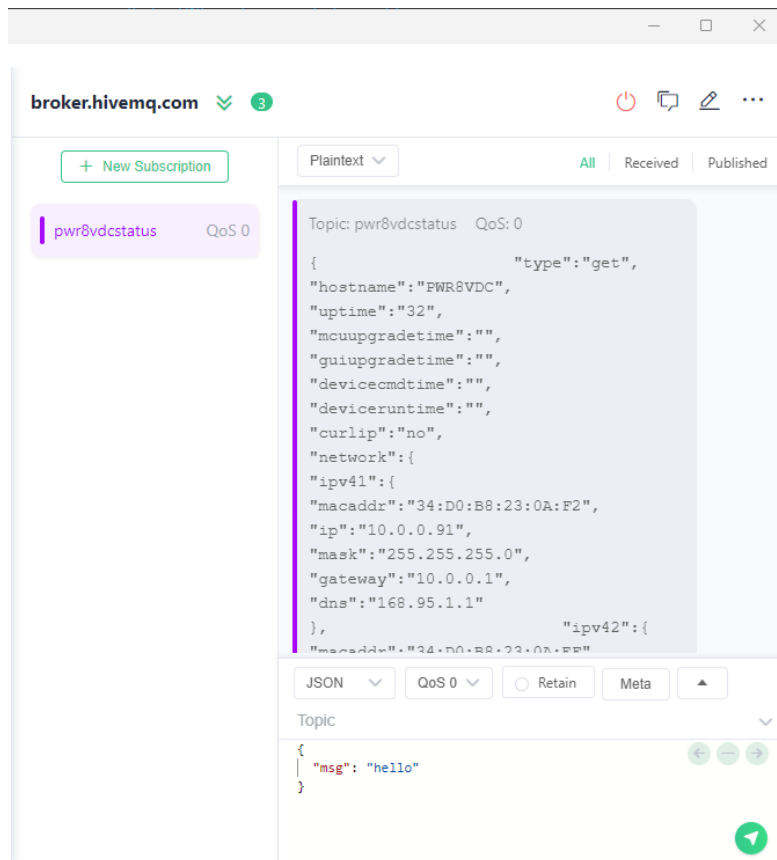
- Sends API commands to control the PWR8VDC

Topic Feedback

- This will send [Success] feedback per API command sent

In this example, we will subscribe to the PWR8VDC status update
 Enter the Client ID status that was set in the Web-GUI

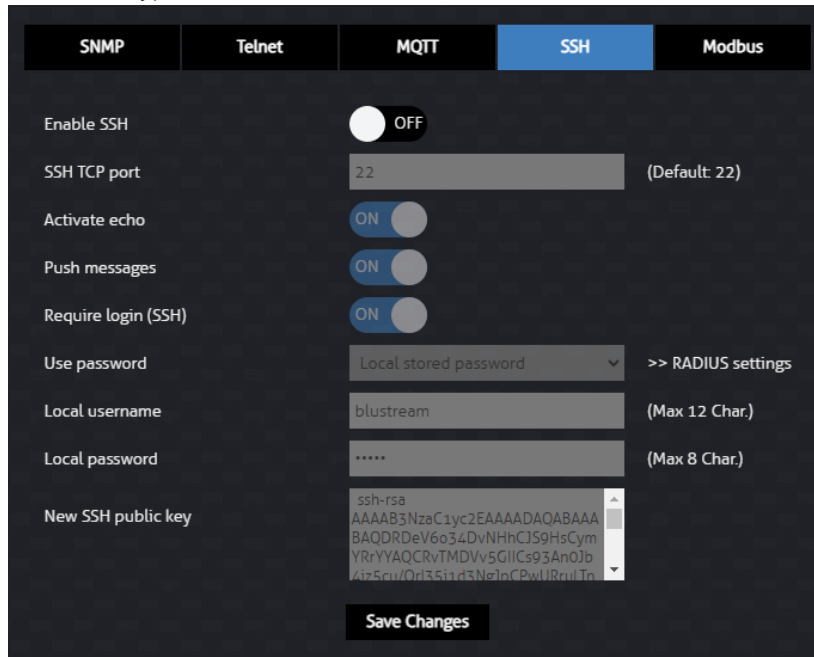
6. If successful, the PWR8VDC status line will start publishing data



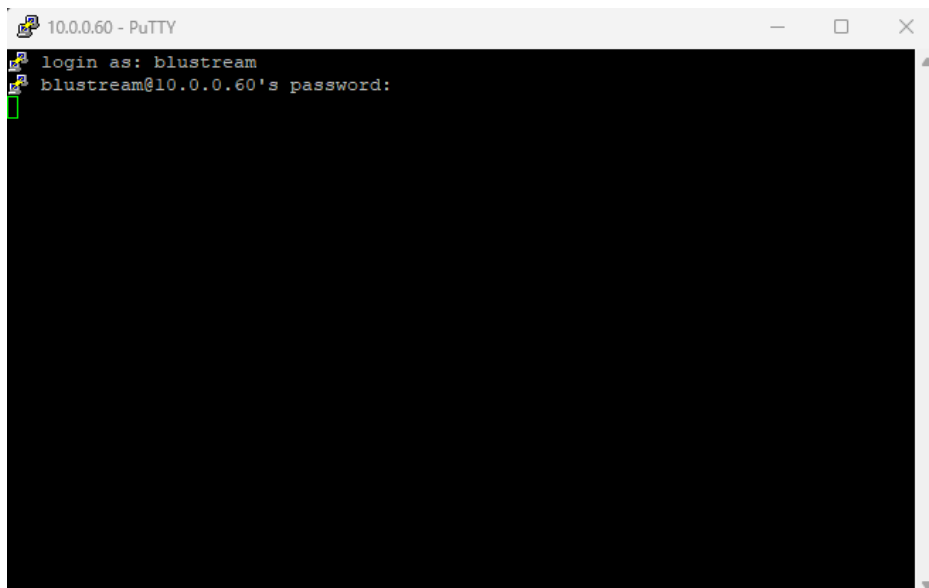
Please note: Not all APIs are available for MQTT control. At the moment we are limited to one line of feedback, therefore control options are mainly intended for outlet settings. Controls which apply network changes, resets, or reboots are not available for MQTT control as this could break communication and compromise functionality. The APIs can be found at the back of manual.

SSH - Secure Shell Protocol:

The Secure Shell (SSH) protocol is a method for securely sending commands to a computer over an unsecured network. SSH uses cryptography to authenticate and encrypt connections between devices.



- Enable SSH ON / OFF
- SSH TCP Port Default port number is 22
- Activate echo Set text to be displayed on the terminal or console
- Push messages Send log in notifications
- Require log in (SSH) ON / OFF
- Use password The PWR8VDC can utilise SSH with a locally stored password or with a RADIUS setup
 - To use a locally stored password, select 'Local stored password' from the drop down, enter a local username and password and Save changes (New SSH public key field will be disabled)
 - You can then connect using your terminal of choice to the IP address of the unit with the local credentials that were set:



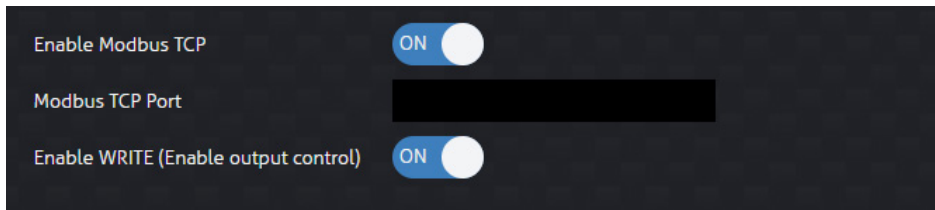
SSH (continued)

- To use a RADIUS setup, select 'RADIUS server password' from the drop down (local username and Local password fields will be disabled)
- After generating your own public/private key pair, paste the public key into the New SSH public key field
- Log in using your terminal of choice to send commands and received feedback

Please note: When generating a public/private key pair, use .ppk file version 2. RADIUS set up is covered in full detail in the Security section of this manual.

Modbus

Modbus TCP/IP is an industrial communication protocol that extends the traditional Modbus protocol to Ethernet networks using the TCP/IP suite. It allows Modbus-compatible devices to communicate efficiently over modern IP-based networks.



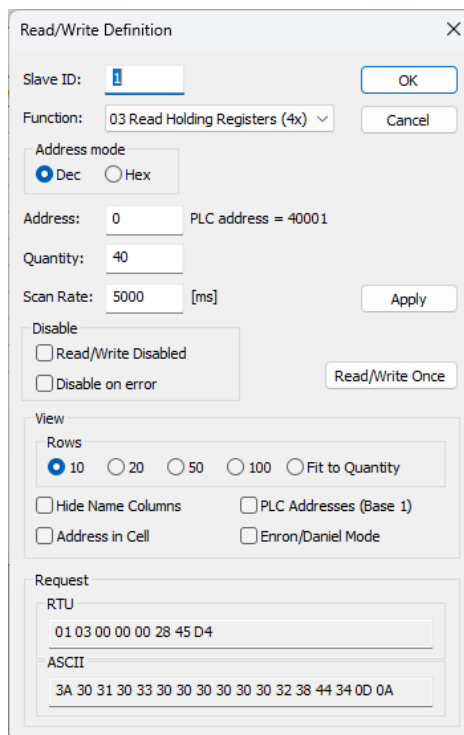
- Enable Modbus TCP ON / OFF
- Modbus TCP Port Default port number is 601
- Enable WRITE Enables writing on the Modbus registers of the transmitter and devices connected to it

Please note: Only enable WRITE when you need to write on the Modbus registers. Disable WRITE when you don't need to write anymore. Do not enable WRITE in an open network

A Modbus setup example has been provided on the following pages:

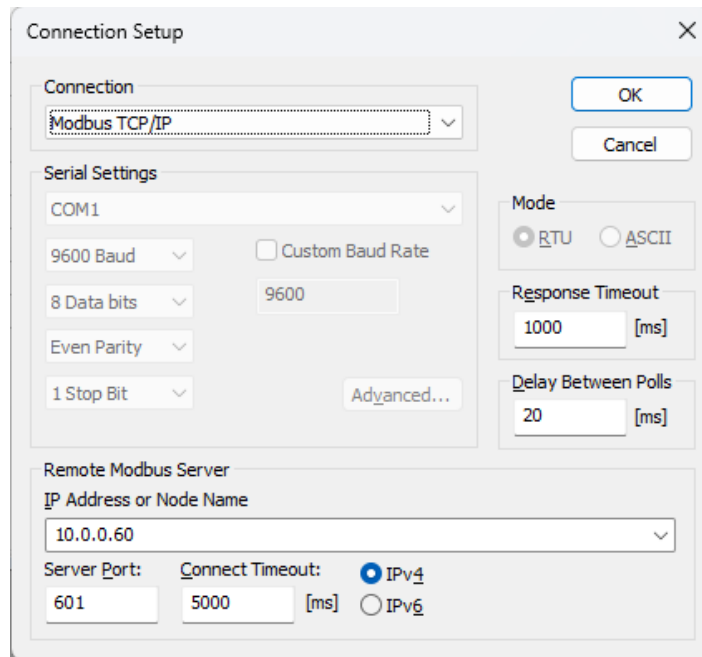
In this example, we will be using the Modbus Poll software.

1. Open the Modbus Poll software
2. Under Setup, Read/Write Definition..., Set Quantity to 40 and Scan Rate to 5000



Modbus (continued)

- Under Connection, Connect..., Set the IP Address to that of the PWR8VDC's, set the server port to the Modbus TCP Port set in the Web-GUI and set the Connect Timeout to 5000



- Once the connection is established, data will start being received into the table. This corresponds to data of each outlet

Modbus Poll - Mbpoll3

File Edit Connection Setup Functions Display View Window Help

05 06 15 16 17 22 23 TC

Mbpoll5
Tx = 614 Err = 4 ID = 1 F = 03 SR = 5000ms

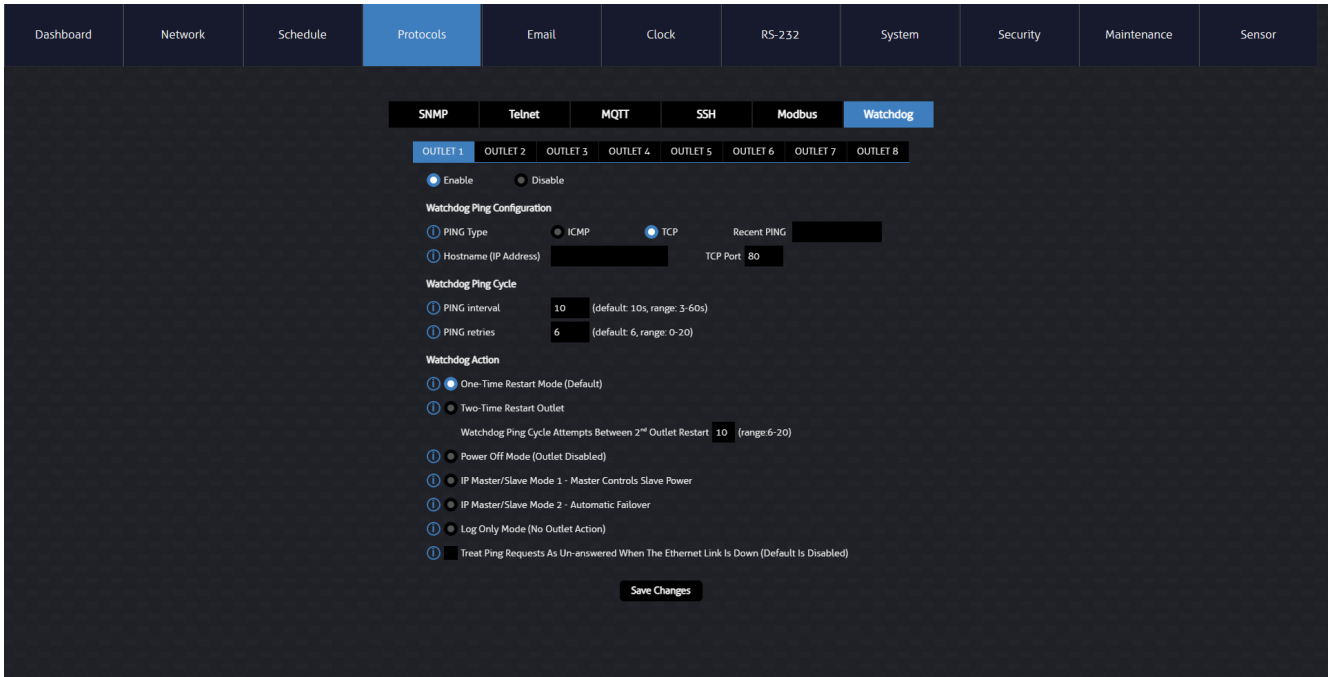
	Alias 00120	Alias 00130	Alias 00140	Alias 00150	Alias 00160	Alias 00170	Alias 00180	Alias 00190	Alias 00200
0	OUTLET2 Energy Consumed	0	OUTLET7 Energy Consumed	0	OUTLET2 PF	0	OUTLET7 PF	0	0
1	--	--	--	--	--	--	--	--	--
2		OUTLET5 Energy Consumed	0	Power Factor	690	OUTLET5 PF	0	Frequency	50540
3	--	--	--	--	--	--	--	--	--
4	OUTLET3 Energy Consumed	0	OUTLET8 Energy Consumed	0	OUTLET3 PF	0	OUTLET8 PF	0	0
5	--	--	--	--	--	--	--	--	--
6	OUTLET1 Energy Consumed	0	OUTLET6 Energy Consumed	201621	OUTLET1 PF	0	OUTLET6 PF	690	0
7	--	--	--	--	--	--	--	--	--
8	OUTLET4 Energy Consumed	0	OUTLET9 Energy Consumed	0	OUTLET4 PF	0	OUTLET9 PF	0	0
9	--	--	--	--	--	--	--	--	--

Watchdog:

A Watchdog (IP Watchdog) is an automated monitoring tool that periodically sends network packets (pings) to a specific IP address to check if a device or network connection is operational. If the monitored target fails to respond within a set time or number of attempts, the Watchdog can take a specified action.

Each Outlet can have a separate Watchdog enabled.

The Recent Ping field will display the time in milliseconds it took the host to respond to the most recent ping.



- Enable Enable the Watchdog for the selected Outlet
- Disable Disable the Watchdog for the selected Outlet

Watchdog Ping Configuration

- Ping Type ICMP: Standard network PING using ICMP echo requests. Used to verify basic connectivity (e.g., to a router, switch, or server)
 * **Please note:** ICMP must be enabled on the target
 TCP: Tests whether a specific TCP port on the target device is accepting connections. Useful for verifying service availability (e.g., port 80 for HTTP, port 22 for SSH, port 25 for SMTP) (Recommended when ICMP is blocked but the service port is open)

Hostname (IP Address) The IP address or DNS hostname of the monitored device

TCP Port Required when TCP is selected as ping type

Watchdog Ping Cycle

Ping Interval The frequency (in seconds) between each ping attempt
 Default 10 seconds, range 3 seconds to 60 seconds

Ping Retries Number of consecutive failed ping before declaring the host down
 Default 6 retries, range 0 retries to 20 retries

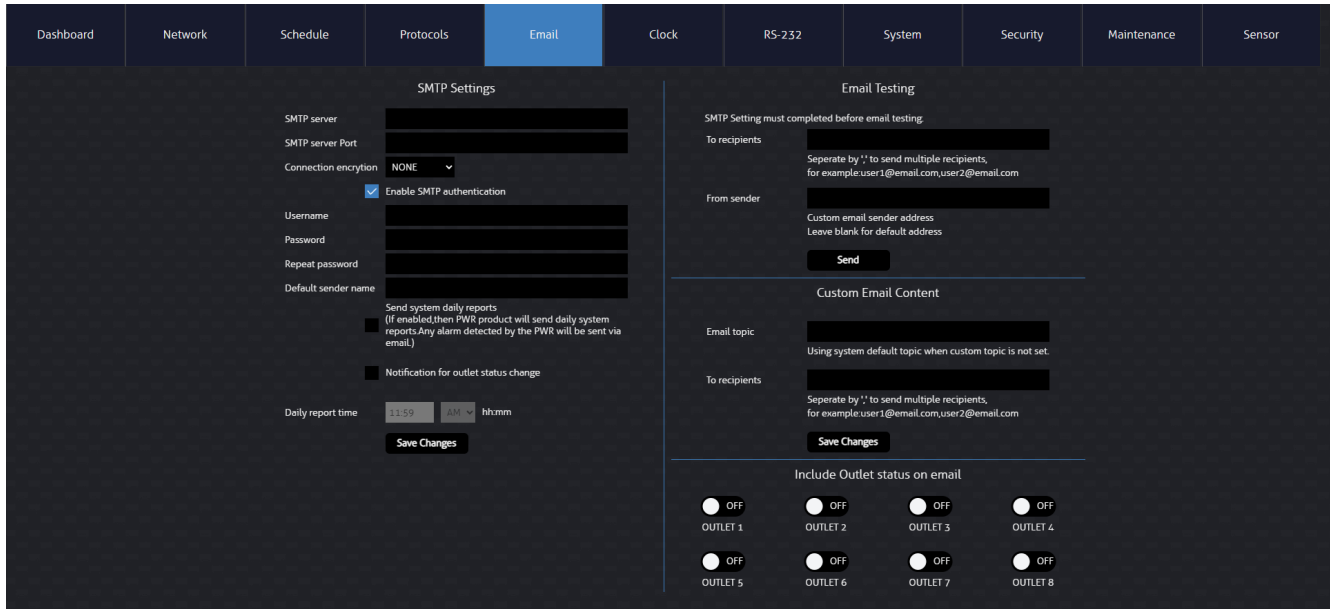
Watchdog Action

One-Time Restart Mode	Restart the power outlet when the host stops responding to pings
Two-Time Restart Outlet	<p>Restart the power outlet up two times when the host host stops responding to pings No further outlet restarts occur until host is reachable again (to prevent possible damage to the host device)</p> <p>Please note: Ensure the ping interval and retry values allow sufficient time for host device to fully restart</p> <p>Watchdog Ping Cycle Attempts Between 2nd Outlet Restart: Set the number of times the ping cycle (ping retries+interval) is attempted before the power outlet is restarted Range 6 cycles to 20 cycles</p>
Power Off Mode	<p>When host is down, power off the outlet entirely Remains off until manually turned on (Use for controlled shutdown or manual recovery scenarios)</p>
IP Master/Slave Mode 1	<p>The outlet follows the host's availability: When the host responds to pings, the outlet powers on When the host stops responding to pings, he outlet powers off (e.g.: load balancing, cold standby)</p>
IP Master/Slave Mode 2	<p>The outlet acts opposite to the host's availability: When the host responds to pings, the outlet powers off When the host stops responding to pings, the outlet powers on (e.g.: backup failover power)</p>
Log Only Mode (No Outlet Action)	<p>No outlet action Events are logged and alerted according to the user's notification setup (Useful for passive monitoring without affecting power state)</p>
Treat Ping Requests As Un-answered When The Ethernet Link Is Down (Default Is Disabled)	<p>If enabled, watchdog triggers actions even when the physical network link is lost (not just unresponsive ping) If disabled, watchdog is paused when the Ethernet link is inactive (default). This is recommended for robust detection of cable or switch failure</p>

Web-GUI Control - Email

The PWR8VDC is capable of generating and sending daily email reports, or only when an outlet enters a warning state (i.e. power overload, undervoltage / overvoltage). The email can be customized with unique topic headers, and content can be customized to include individual outlet statuses, and then tested from this page.

SMTP Settings must be configured for emails to be generated.



SMTP:

SMTP (Simple Mail Transfer Protocol) is a communication protocol used for sending and receiving email messages over the Internet. Mail servers and other message transfer agents use SMTP to send, receive and relay mail messages.

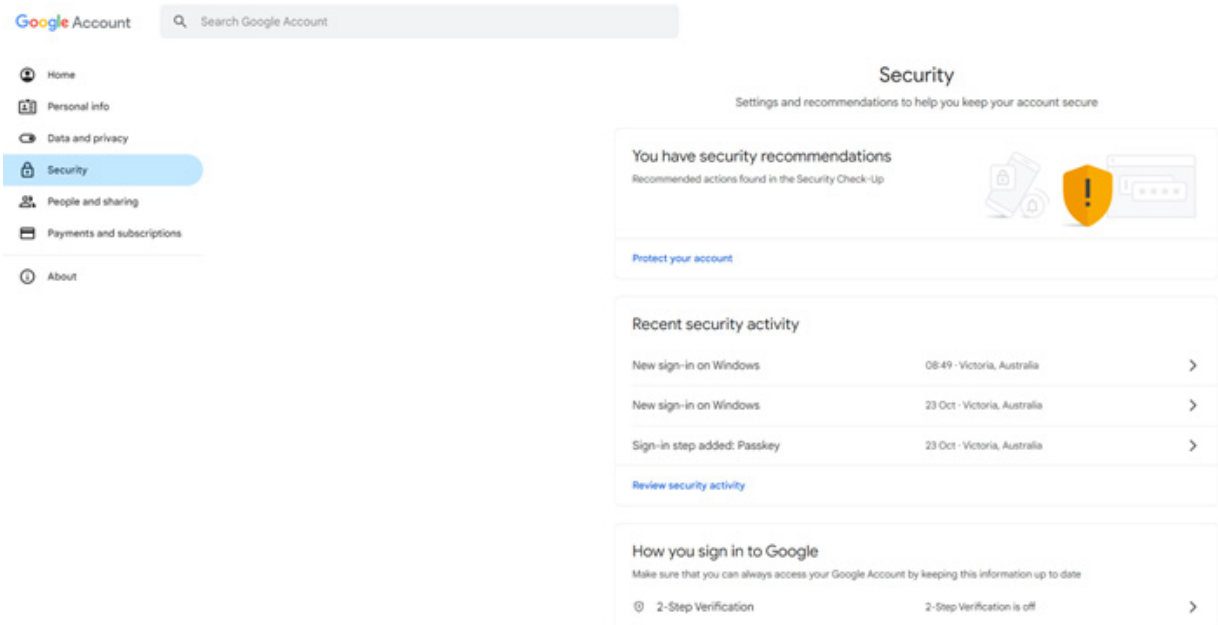
SMTP server	Server address of SMTP host
SMTP server port	Ensure correct port is set for specified host
Connection encryption	None / SSL/TLS / STARTTLS
Enable SMTP authentication	Log in using the authentication method provided by the server
Username	Enter username
Password	Enter password
Default sender name	Email address that will be displayed as sender
Send system daily reports	Daily system reports will include the statuses of the outlets selected in 'Include Outlet Status on Email'
Notification for outlet status change	Include status of outlets on daily report
Daily report time	Specify at which time the daily report will be sent (clock tab should be set)

An example of SMTP server set up using gmail has been provided on the following pages:

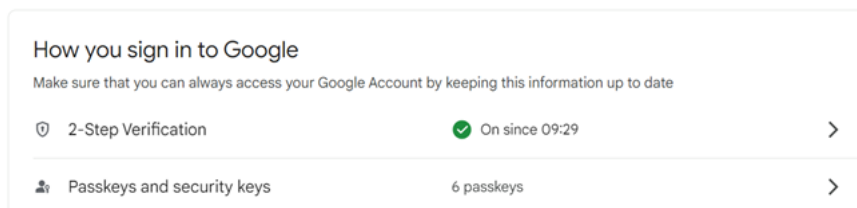
You can set up a free Google account and configure it to act as a SMTP server to send report emails from the PWR8VDC.

SMTP (continued)

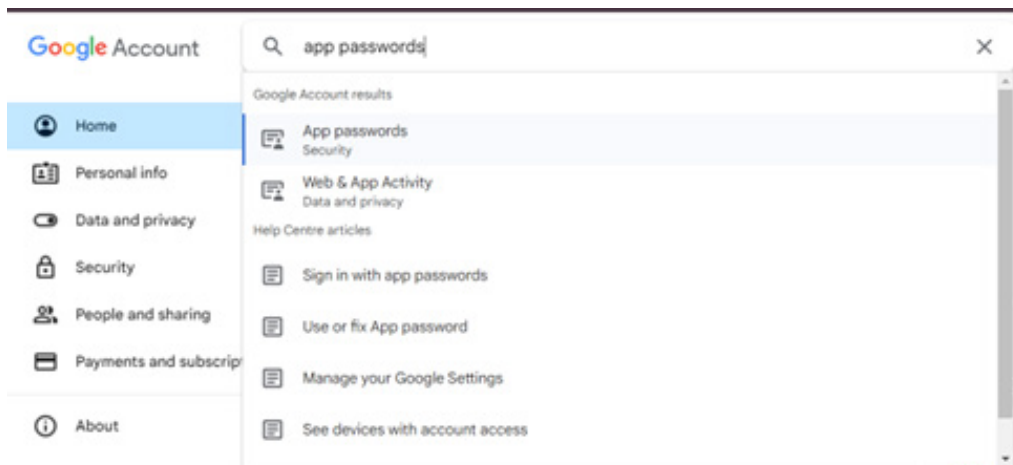
1. Log into your Google account and go to Security.



* Please note: Ensure 2-Step verification is enabled as this is required for this feature to function as intended.

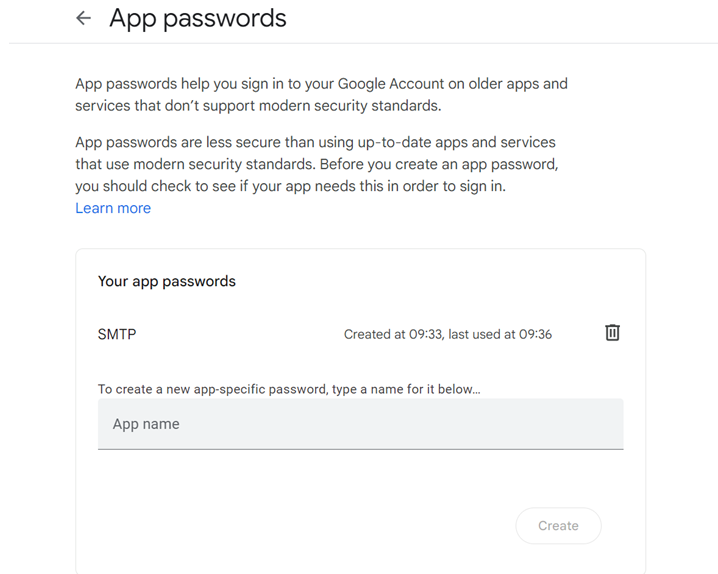


2. In the Security tab, use the search bar to find “App passwords”.

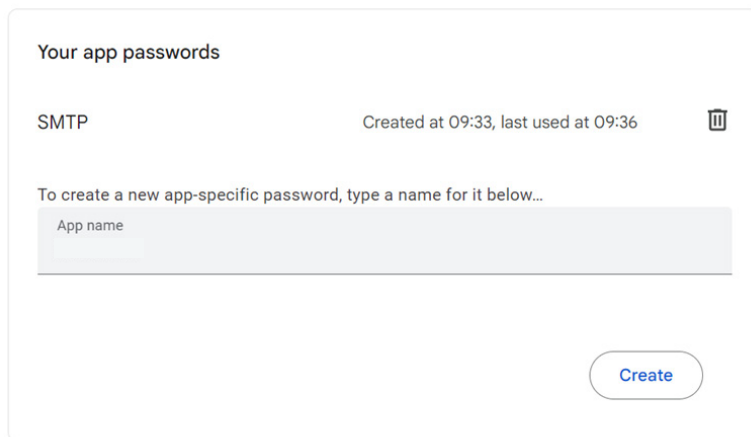


SMTP (continued)

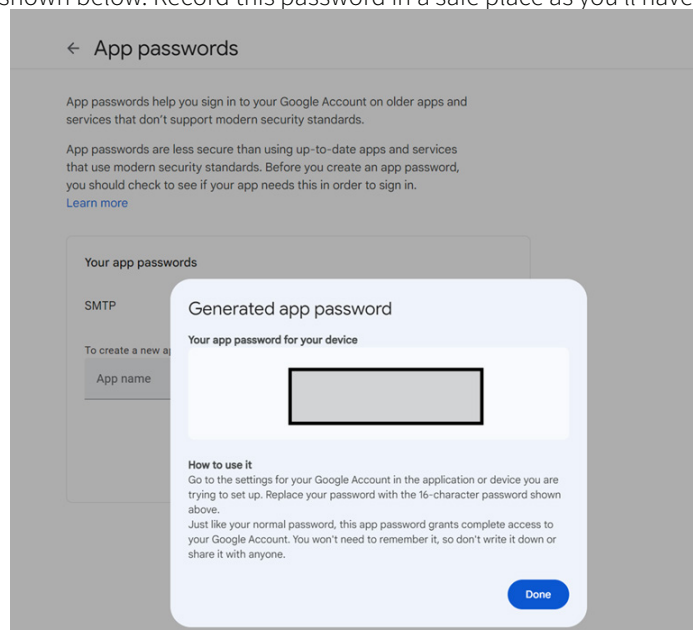
- 3. Create an app by clicking the box titled "App name".



- 4. Enter an app name and click create.

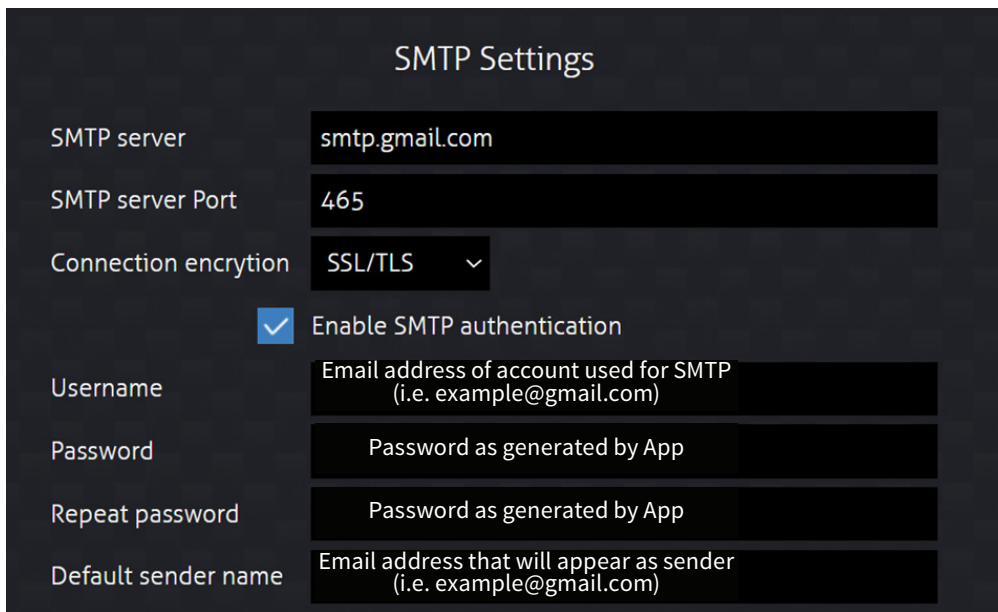


This generates a password as shown below. Record this password in a safe place as you'll have to repeat these steps if you lose it.



SMTP (continued)

5. Use the generated credentials to fill in the SMTP Settings in the PWR8VDC's Web-GUI.



SMTP Settings

SMTP server: smtp.gmail.com

SMTP server Port: 465

Connection encryption: SSL/TLS

Enable SMTP authentication

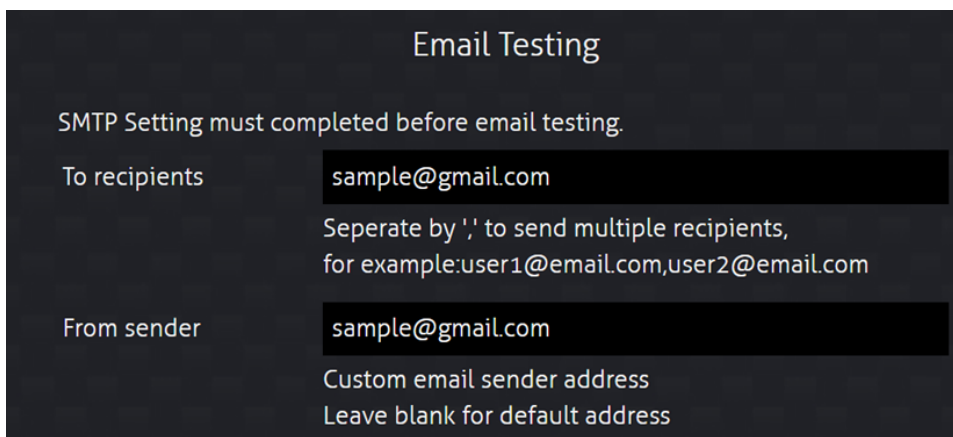
Username: Email address of account used for SMTP (i.e. example@gmail.com)

Password: Password as generated by App

Repeat password: Password as generated by App

Default sender name: Email address that will appear as sender (i.e. example@gmail.com)

To validate the email functionality, we will use the email testing section on the Web-GUI.



Email Testing

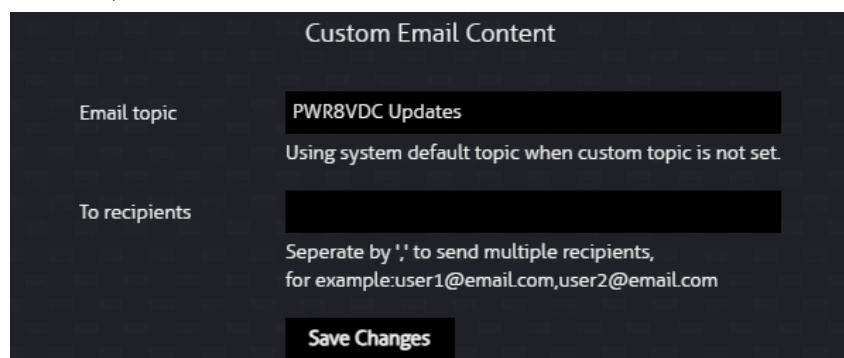
SMTP Setting must completed before email testing.

To recipients: sample@gmail.com
Seperate by ',' to send multiple recipients,
for example:user1@email.com,user2@email.com

From sender: sample@gmail.com
Custom email sender address
Leave blank for default address

You can set custom email topics and choose recipients through the below settings.

If no topic is defined, the default topic "Machine status email for PWR8VDC" will be used.



Custom Email Content

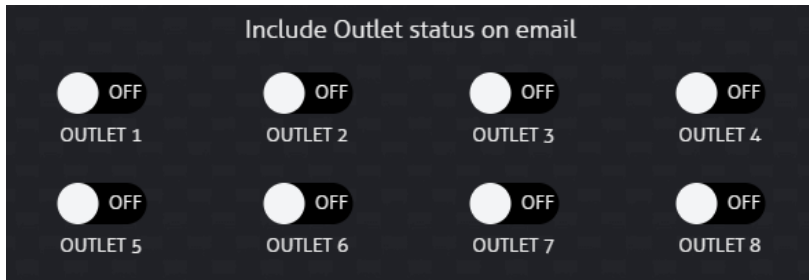
Email topic: PWR8VDC Updates
Using system default topic when custom topic is not set.

To recipients: [Empty field]
Seperate by ',' to send multiple recipients,
for example:user1@email.com,user2@email.com

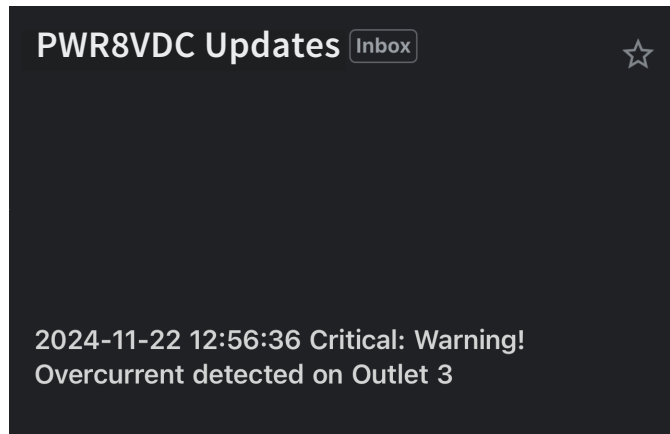
Save Changes

SMTP (continued)

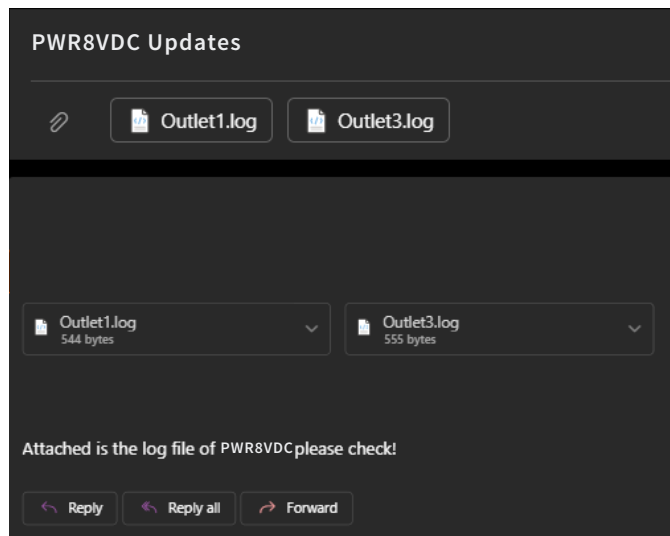
Outlets can be configured to be included or excluded from email reports. By default, every outlet is set to OFF.



An example warning email with the default topic is shown below:

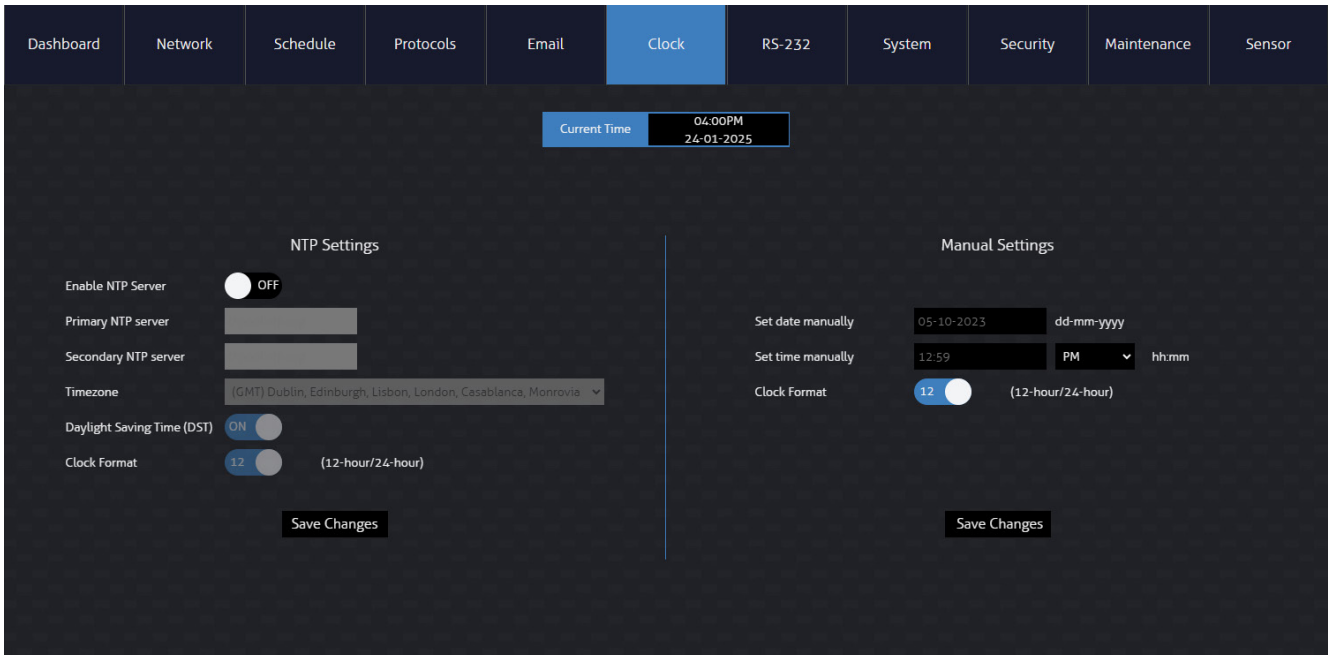


An example daily log email with the default topic is shown below. The logs for each output are attached:



Web-GUI Control - Clock

For warning alerts, scheduling and other daily functions to work as intended, the internal clock of the PWR8VDC must be set accurately. This may be done manually, or taken from an NTP server. The PWR8VDC contains an internal battery for times where the unit may not be powered directly, or during a mains power outage, to keep the clock in sync.



NTP (Network Time Protocol) Settings:

Enable NTP Server	Enable Manual Settings / Disable NTP Settings
Primary NTP Server	Set the Primary NTP Server Address
Secondary NTP Server	Set the Secondary NTP Server Address
Timezone	Set the Timezone offset
Daylight Saving Time (DST)	ON / OFF (DST must be set manually)
Clock Format	12 Hour / 24 Hour

Please note: NTP servers operate in UTC (Universal Coordinated Time) so DST must be set manually according to your locale. Ensure the PWR8VDC can access the internet through the LAN ports for NTP functionality.

Manual Settings:

Please note: In order to change Manual Settings, 'Enable NTP Server' under NTP Settings must be turned off.

Set Date Manually	Enter the date (dd-mm-yyyy)
Set Time Manually	Enter the time (hh:mm)
Clock Format	12 Hour / 24 Hour

Web-GUI Control - RS-232

The PWR8VDC is able to be controlled via the RS-232 port on the back on the unit. The APIs can be found at the back of this manual.

The PWR8VDC is also able to send commands via the TX pin on the RS-232 port to other 3rd party products.

The RS-232 page allows for a test command to be sent to a linked product connected to the RS-232 port to test if serial communication is working as intended.

Communication parameters such as character set (ASCII or HEX), baud rate, command termination (LF, CR, or both), and parity can be configured for integration with a third-party control system.

Once confirmed, you can proceed to integrate this with a third-party control system and issue commands to external products.

The screenshot shows the 'RS-232' configuration page in the PWR8VDC Web-GUI. The page has a dark theme with a navigation bar at the top containing the following tabs: Dashboard, Network, Schedule, Protocols, Email, Clock, RS-232 (highlighted), System, Security, Maintenance, and Sensor. The main content area is titled 'RS-232' and contains the following configuration options:

- Character Set: Dropdown menu set to 'ASCII'
- Baud Rate: Dropdown menu set to '57600'
- Command Ending: Dropdown menu set to 'NULL'
- Parity: Dropdown menu set to 'None'
- RS-232 Command: A text input field (currently empty)
- Test: A red button located below the command field

Web-GUI Control - System

The System allows the user to configure, enable and disable certain features of the PWR8VDC, as well controlling whether actions and information are visible on the dashboard.

The screenshot displays the following configuration sections:

- Panel Lock:**
 - Lock All Front Panel Buttons: Lock Unlock
 - Lock All Voltage Select Buttons: Lock Unlock
- Relay Setting:**
 - Relay Enable: ON OFF
 - Relay Application mode: Push Button mode (dropdown)
 - Toggle by HIGH voltage (dropdown)
 - Save Changes
- System Setting:**
 - Device Name: PWR8VDC
 - Login Timeout: 15 min (Default: 15 mins)
 - Warning Beeper Time: 10 seconds (Default: 10 seconds)
 - 7-Segment Display: ON OFF
 - Standby mode: All standby mode Sleep mode
 - Save Changes
 - Show Total Current: ON OFF
 - Show Total Power: ON OFF
 - Show Overall Voltage: ON OFF
 - Show Energy Consumed: ON OFF
 - Show PF(Power Factor): ON OFF
 - Show Frequency: ON OFF
 - System Power Switch: ON OFF
 - Meter Reset Switch: ON OFF
 - System Restart Switch: ON OFF
 - Guest Control: OFF (Switch of System Power/Reset/Restart)
 - Sensor 1: ON OFF
 - Sensor 2: ON OFF
- Outlets Setting:**
 - Power Mode: Full 30W Half 36W Full 36W
 - Save Changes
 - Overload processing: Power off the overloaded outlet Power off all outlets and set system to standby mode Auto recover 1 retries, in 3 mins (Default: 3 mins)
 - Overvoltage and Undervoltage processing: Power off all outlets Outlets automatically recover 3 mins (Default: 3 mins) after the voltage input stabilises
 - Save Changes
 - Show Voltage: ON OFF
 - Show Current: ON OFF
 - Show Power: ON OFF
 - Show Energy Consumed: ON OFF
 - Guest Control: OFF (Power/Reset/Config/Restart)
- Inlet Setting:**
 - Undervoltage Threshold: 189 V (Default: 189V, Min.: 189V)
 - Overvoltage Threshold: 250 V (Default: 250V, Max.: 264V)
 - Save Changes

Panel Lock:

The panel lock function contains options to independently enable / disable the front panel power buttons, and the rear panel voltage select buttons.

When enabled, the power buttons can be pressed to toggle the outlet on or off, and the voltage select can be pressed to cycle through the available voltages for that outlet.

Please note: the mains power switch on the left of the front of the unit cannot be disabled.

GPI Settings:

On the back panel are 9 x GPIs with phoenix pin connectors: GPIs 1-8 for the corresponding outlet, and a ninth GPI, 'P', for the mains inlet. The GPIs can operate in one of two modes, allowing for a high or low voltage to act as the trigger:

Dry Contact Mode:

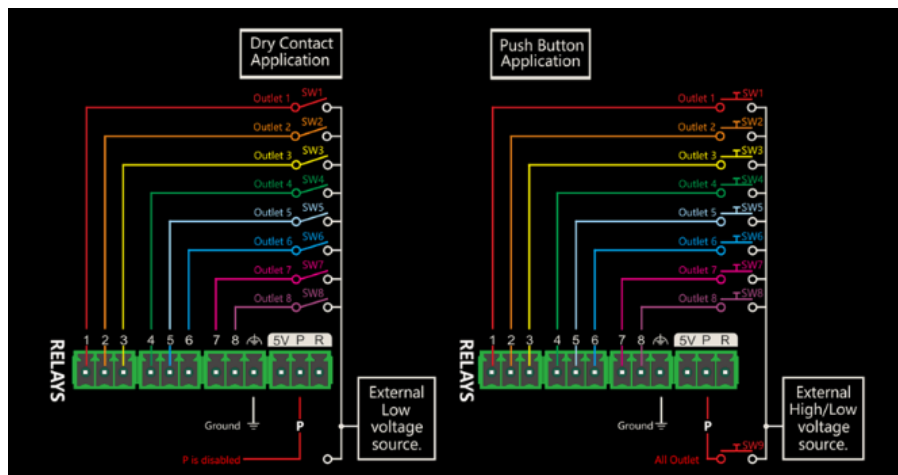
In this mode, the PWR8VDC will only be controlled by the state on the contact GPIs for 1-8 and P is disabled, as this could conflict current state of the GPIs and actual control on GUI, API, and/or front panel.

- Low Voltage to Power ON Outlets:
 - Outlet turns ON when a closed circuit is achieved (external switched closed) connecting Outlet(1-8) GPI port to 0V-2.5V or GND or LOW.
 - Outlet turns OFF when an open circuit is achieved (external switched opened) disconnecting Outlet(1-8) GPI port to 0V-2.5V or GND or LOW.
- Low Voltage to Power OFF Outlets:
 - Outlet turns OFF when an open circuit is achieved (external switched opened) disconnecting Outlet(1-8) GPI port to 0V-2.5V or GND or LOW.
 - Outlet turns ON when a closed circuit is achieved (external switched closed) connecting Outlet(1-8) GPI port to 0V-2.5V or GND or LOW.

Push Button Mode: Default (Recommended)

In this mode, the PWR8VDC has an additional mode of control for each port. The external push button will toggle the state of the selected Outlet(1-8). In this mode control on GUI, API, and/or Front panel is available for users.

- Toggle by LOW voltage:
 - External push button switch will act as a toggle switch for Outlet(1-8) when a closed circuit is achieved connecting to 0V-2.5V or GND or LOW.
- Toggle by HIGH voltage:
 - External push button switch will act as a toggle switch for Outlet(1-8) when a closed circuit is achieved connecting to external voltage 2.6V-12V or HIGH.



System Settings:

- Device Name Sets the name of the device on the GUI
- Login Timeout Sets the inactivity period (in minutes) until the Web-GUI will log the user out
- Warning Beeper Time Sets the duration for the audible warning tone when a warning is triggered (i.e. power surge, overload, over voltage, under voltage)
- 7-Segment Display Toggles every outlet's 7-segment display on the rear of the unit on or off
- Standby Mode Changes how the power button on the Web-GUI and outlet reacts
 - All standby mode: pressing the power button will turn all outlets off and will disable Web-GUI access
 - Sleep mode: pressing the power button will turn all outlets off but will maintain Web-GUI access

Individual toggles can be set to show/hide specific system information under the System Control section on the Dashboard page.

Outlet Settings:

Power Mode sets the maximum watts each outlet can output:

- Full 30W allows all VDC outlets to operate up to a maximum of 30W, and all USB outlets can be used
- Half 36W allows VDC outlets 1-4 to operate up to a maximum of 36W VDC outlets 5-8 to operate up to a maximum of 30W, and all USB outlets can be used
- Full 36W allows all VDC outlets to operate up to a maximum of 36W, and all USB outlets are disabled

Overload Processing changes how the unit will behave when an overload has been triggered:

- Power off the overloaded outlet
- Power off all outlets and set system to standby mode
- Auto recover 1-3 retries, in 1-10 mins
 - When an overload is detected, the system will try to recover the affected outlet attempting to power it up (max: 3), every specified delay interval (max: 10mins)

Overvoltage and Undervoltage Processing allows logic to be set and applied when an overvoltage or undervoltage event is triggered:

- Power off all outlets
- Outlets automatically recover x mins after the voltage input stabilises
 - Set time for outlets to automatically recover once the input voltage has stabilized

Inlet Settings:

Undervoltage Threshold

- Set the inlet undervoltage threshold. This can be decreased to a minimum of 189V in 230/240V regions
- The PWR8VDC undervoltage protection will trigger once the inlet voltage drops below the undervoltage threshold, shutting off all inputs and triggering an undervoltage event/alarm

Overvoltage Threshold

- Set the inlet overvoltage threshold. This can be increased to a maximum of 264V in 230/240V regions
- The PWR8VDC overvoltage protection will trigger once the inlet voltage exceeds the overvoltage threshold, shutting off all inputs and triggering an overvoltage event/alarm

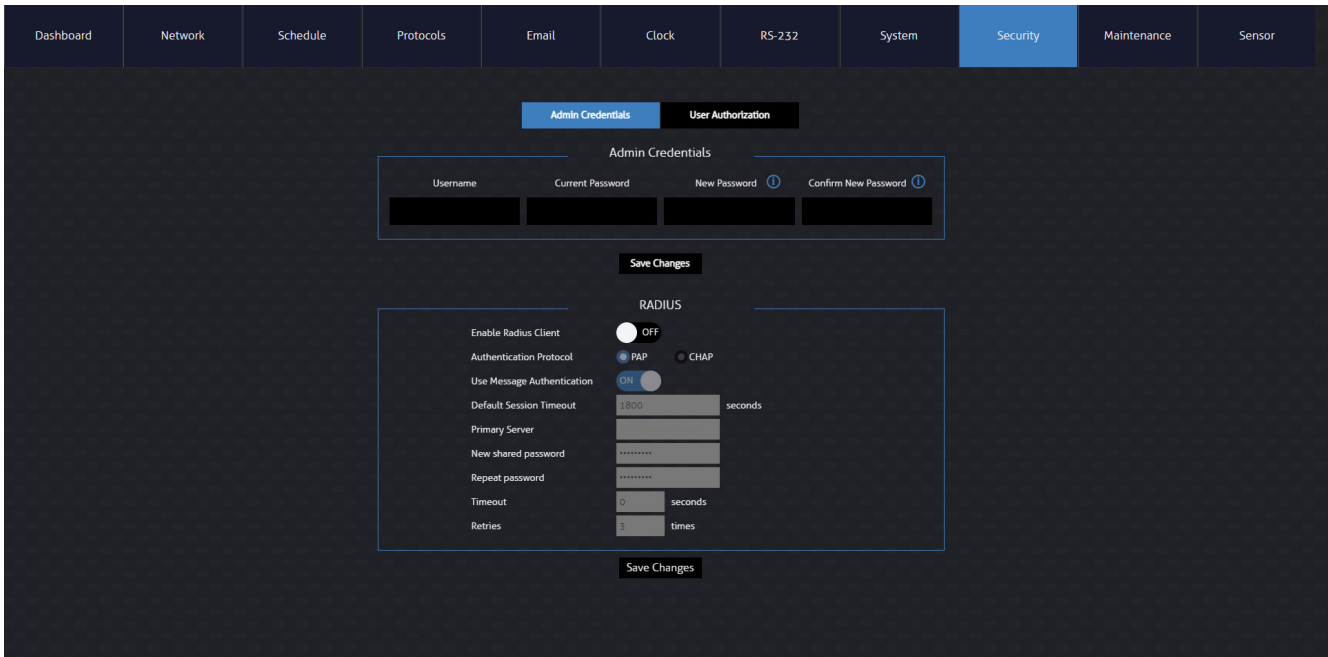
Please note: The undervoltage and overvoltage ranges (minimums and maximums) will automatically change depending on the voltage of your region. These limitations are set based on the regional recommendations for minimum and maximum voltages. Changing these settings to outside of recommended limitations may risk in damage to connected devices.

Individual toggles can be set to show/hide specific system information under the System Control section on the Dashboard page.

If Guest Control is enabled, control and configuration of the outlets can be achieved without logging into the unit. It is recommend to keep this off to prevent unauthorized changes to the PWR8VDC.

Web-GUI Control - Security

The Security page is split into two sub pages, toggled by the Admin Credentials or User Authorization tabs at the top of the page:



Admin Credentials:

The Admin username and password that was set on first log-in to the GUI is able to be changed from this section.

RADIUS:

Remote Authentication Dial-In User Service (RADIUS) is a networking protocol that can be used to authorize and authenticate remote access users.

A RADIUS client (or Network Access Server) can be set up for 3rd party access with authentication to the PWR8VDC:

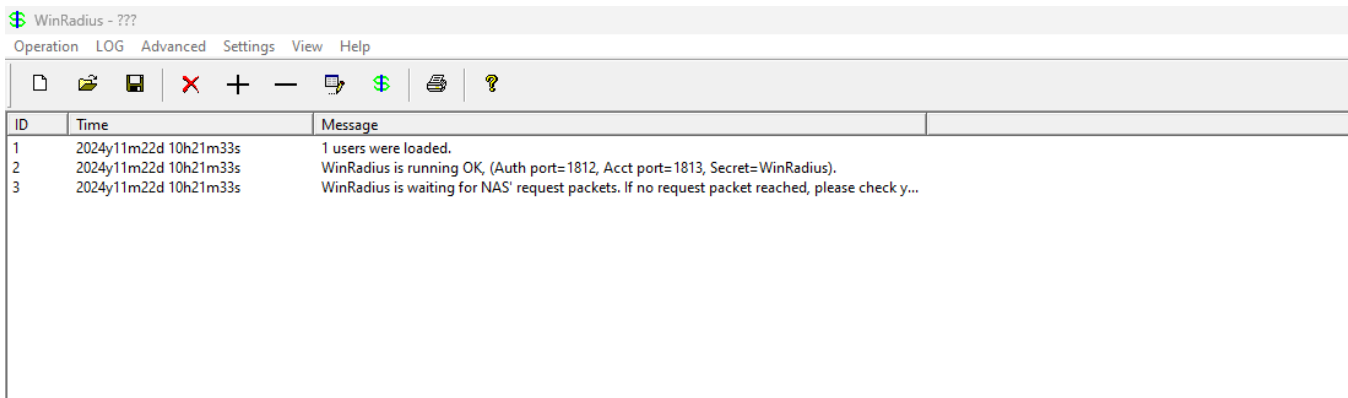
Enable RADIUS Client	ON /OFF
Authentication Protocol	PAP / CHAP
Use Message Authentication	This option can be used to sign Access-Requests to prevent spoofing Access-Requests
Default Session Timeout	Maximum connect time for the user
Primary Server	IP address of the RADIUS server
New shared password	Used as the key for signing hashes
Timeout	Delay between each sign on attempt
Retries	Amount of sign on attempts allowed

A Radius setup example has been provided on the following pages:

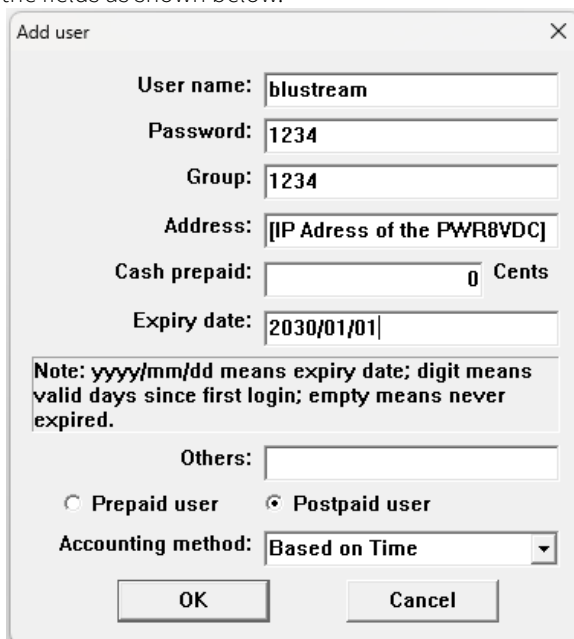
In this example, we will be using the WinRadius software.

1. Open the WinRadius software

RADIUS (continued)



2. Under Operation/Users..., fill in the fields as shown below.

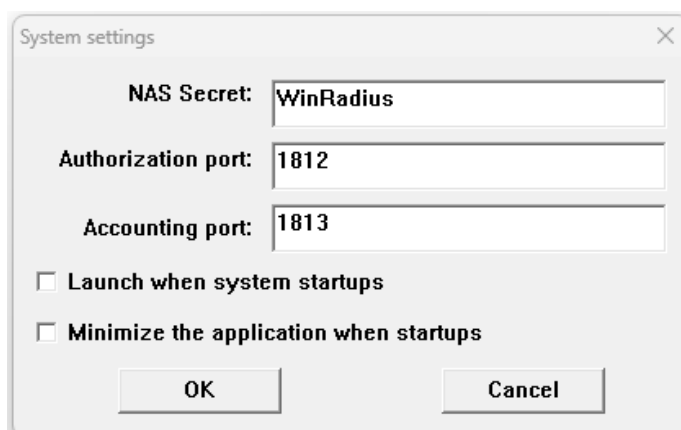


Use the IP address of the PWR8VDC in the address field. Click confirm to add the account

3. Under Operation/Query..., verify the user has been added

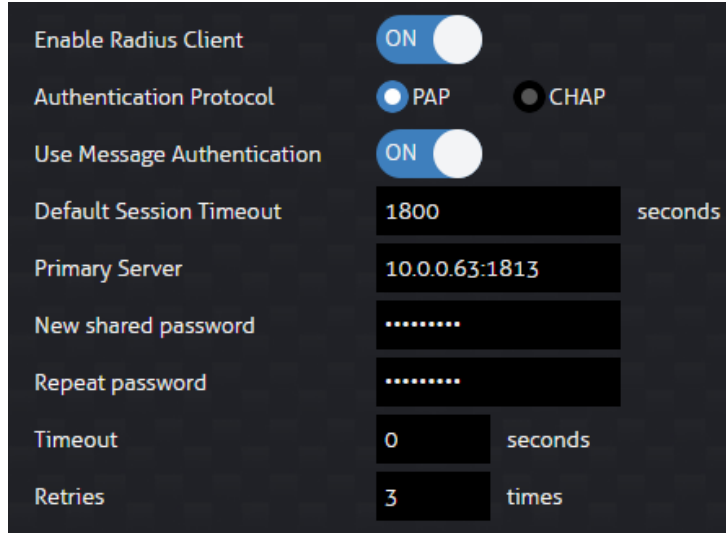
ID	username	status	password	groups	addr	cash	expiry
1	blustream	offline	1234	1234	10.0.0.63	0	2025/01/01

3. Under Settings/System..., set up the shared key, and the accounting port.

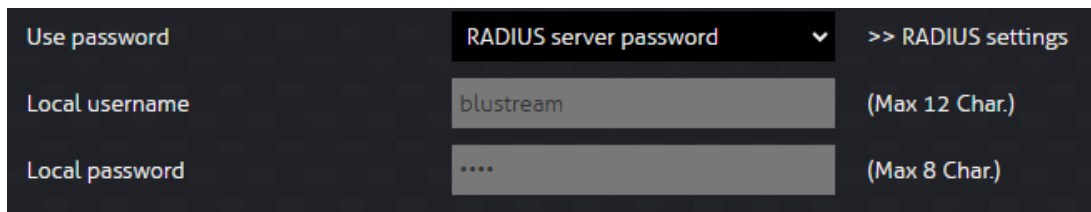


RADIUS (continued)

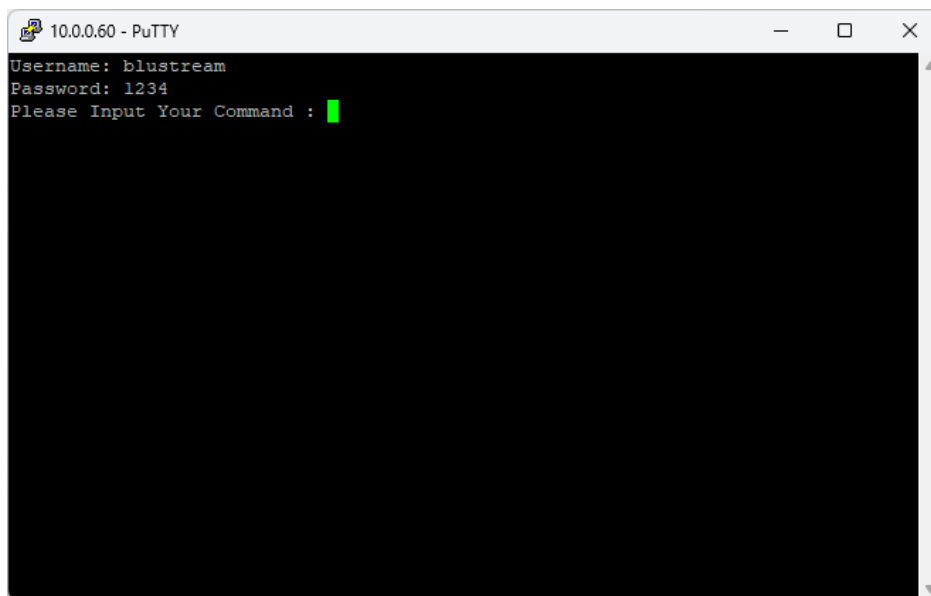
- 4. Complete the Radius settings on the Web-GUI.
 - The Authentication Protocol should be set to PAP
 - The primary server should be set to the device running the RADIUS server and the accounting port.
 - The shared password should be set to the NAS Secret defined in WinRadius



- 5. Turn on Telnet under Protocols in the Web-GUI and set 'Use password' to use the 'RADIUS server password'

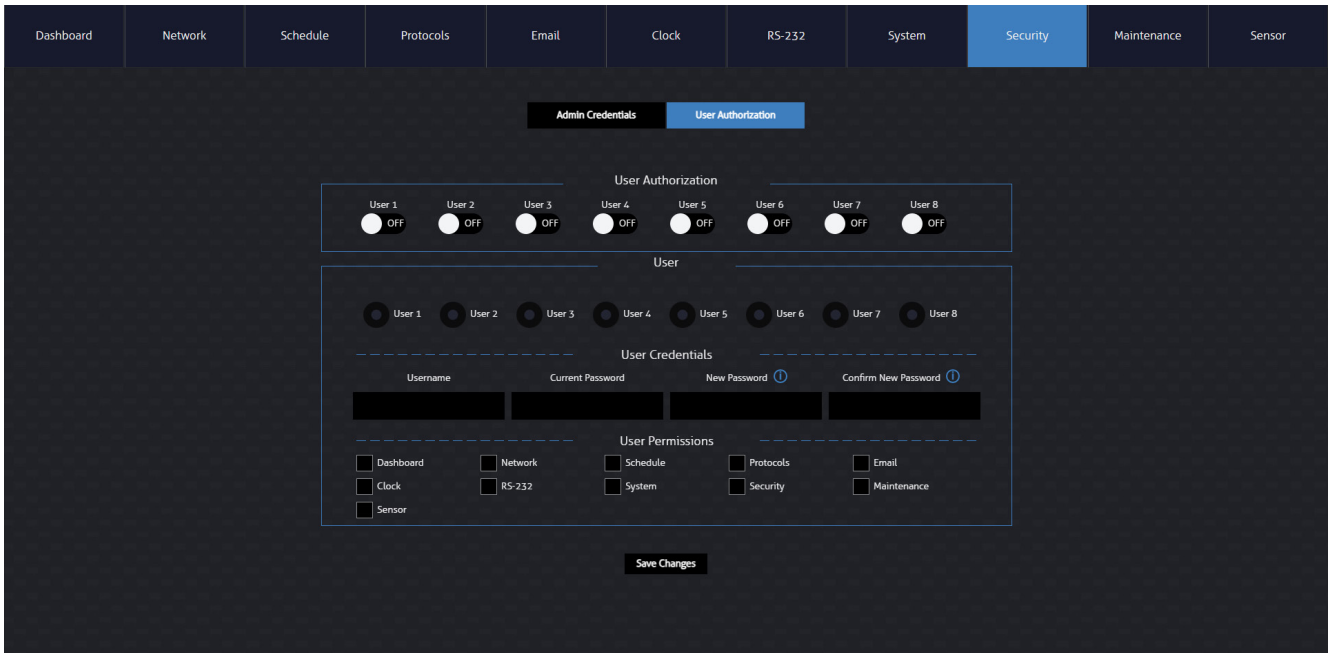


- 6. Log in using Telnet on the terminal of your choice with the user credentials set in WinRadius



User Authorization:

Up to 8 x individual users can be created to allow for individual access to the PWR8VDC web-GUI, with varying levels of access permissions.

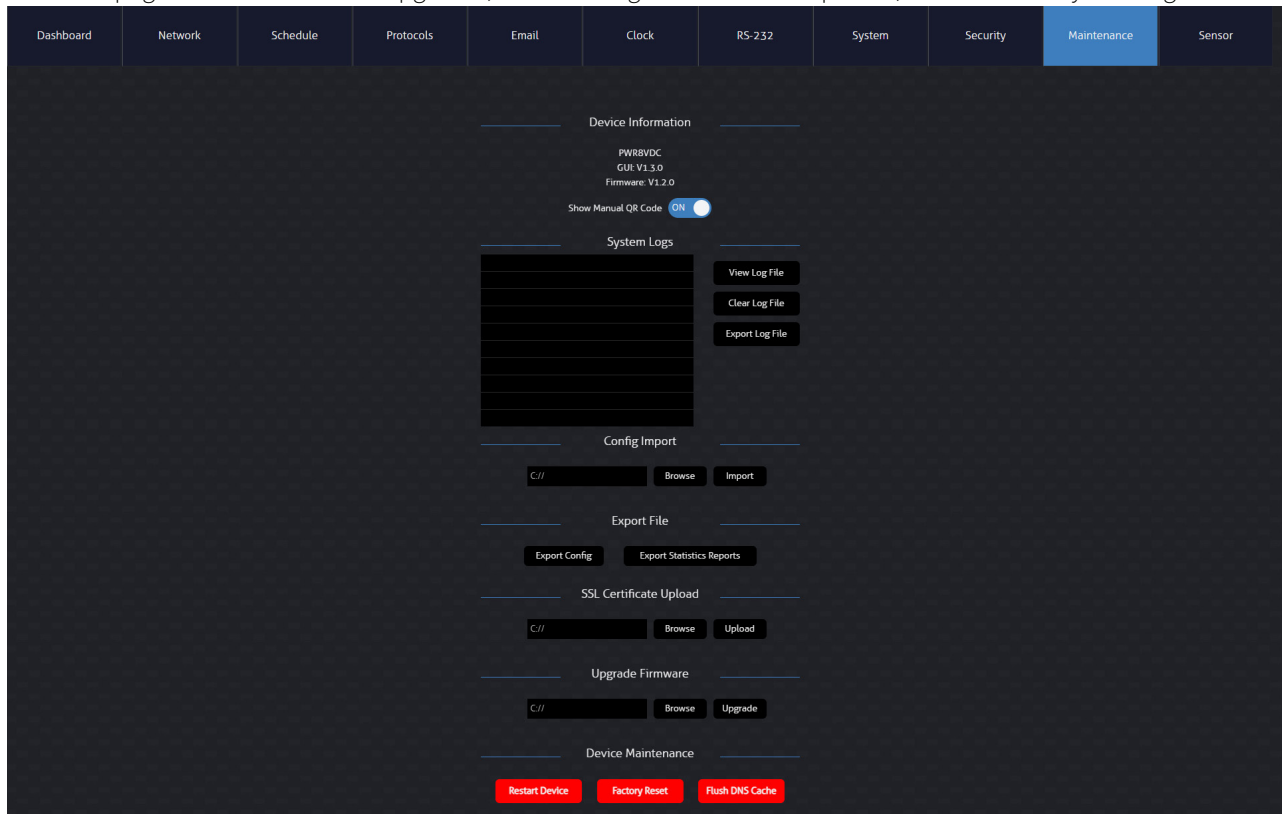


To set up a new user:

- Toggle the desired User # to ON and select that user in the box below
- Enter a unique username
- Create a password (must adhere to the password guidelines in the web-GUI Initialisation and Log In page)
- Set access permissions by ticking the boxes corresponding to the web-GUI pages
- Press the Save Changes button to apply any changes

Web-GUI Control - Maintenance

The Maintenance page allows for firmware upgrades, device configurations to be exported, and to access system log.



Device Information:

View the current firmware for both the Web-GUI (labelled GUI) and MCU (labelled Firmware) running on the device.

The QR Code to the manual, displayed on the bottom right of the GUI, can be toggled on or off.

System Logs:

All changes to the unit are logged in this section of the Web-GUI. The log can be viewed, cleared, or exported to your laptop / computer.

Config Import:

Allows for the configuration settings to be imported to the unit, overwriting all previously configured settings on the unit.

Export File:

Export Config

- Export the configuration file of the unit to a file for back-up, or for copying over to a new unit.

Export Statistic Report

- Export a snapshot report of the outlet and system statuses.

SSL Certificate Upload:

Upload a SSL Certificate for the product to self authenticate on your network.

Upgrade Firmware:

The MCU firmware can be downloaded from the product page on the Blustream website. Please navigate to the Firmware tab to download the most recent firmware package. Press the browse button to locate the MCU firmware file, and then press the Upgrade button to begin the process.

Restart Device: restarts the device, does not affect any previously configured settings on the unit.

Factory Reset: resets the unit back to factory default, including network settings.

Flush DNS Cache: clears any IP addresses, or other DNS records from the cache.

Contact: support@blustream.com.au | support@blustream-us.com | support@blustream.co.uk

Upgrade Firmware (GUI):

To upgrade the GUI firmware, navigate to the following IP address: `xxx.xxx.xxx.xxx:100` where xxx is the IP address of the PWR8VDC.

Login with the default username and password:

Sign in
 http://192.168.7.142:100
 Your connection to this site is not private

Username

Password

Sign in **Cancel**

Under the Administration folder, press Upload Firmware:

The screenshot shows the 'WEB SERVER' interface. On the left, a navigation menu includes 'MediaTek', 'Operation Mode', 'Internet Settings', and 'Administration'. The 'Administration' folder is expanded, showing 'Upload Firmware'. The main content area displays 'MediaTek APSoC' with 'U-Boot's Version' and 'Compile by: Jun 27 2024 - 20:35:44'. Below this are two sections for 'Status', 'Statistic', and 'Management'. At the bottom, there are logos for 'WiFi CERTIFIED', 'Wi-Fi PROTECTED SETUP', 'Compatible with Windows 7', and 'R6 READY'.

Press Choose File to locate the GUI firmware file. Once uploaded, press Apply to begin the update:

The screenshot shows the 'Upgrade Firmware' page. It includes a warning: 'Upgrade the MediaTek SoC firmware to obtain new functionality. It takes about 1 minute to upload & upgrade flash and be patient please. Caution! A corrupted image will hang up the system.' Below the warning is a table with the following content:

Update Firmware	
Location:	<input type="button" value="Choose File"/> No file chosen
<input type="button" value="Apply"/>	

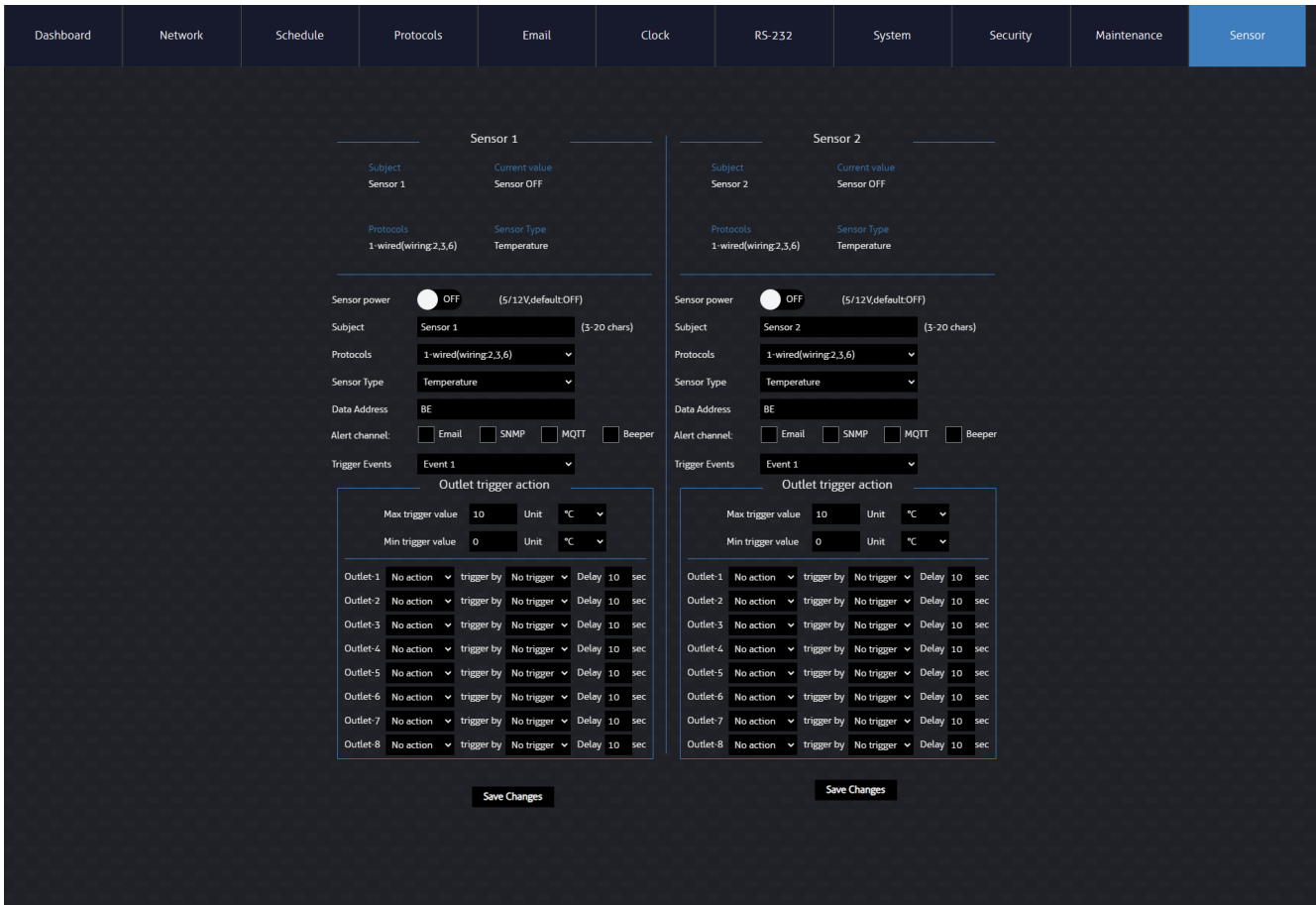
The update takes approximately 3-5min and will disable access to the web-GUI.

Once the web-GUI is accessible again, power cycle the unit.

To confirm the update was successful, please check the GUI version number from the login page or from the Maintenance Page.

Web-GUI Control - Sensors

The Sensor page allows for configuration of external third party sensors to be used with the PWR8VDC.



Sensor 1 and Sensor 2:

View the current configuration for Sensor 1 and Sensor 2 including the name, type and current value.

Sensor Power:

- Enable or disable the 5V/12V power for this sensor port.

Subject:

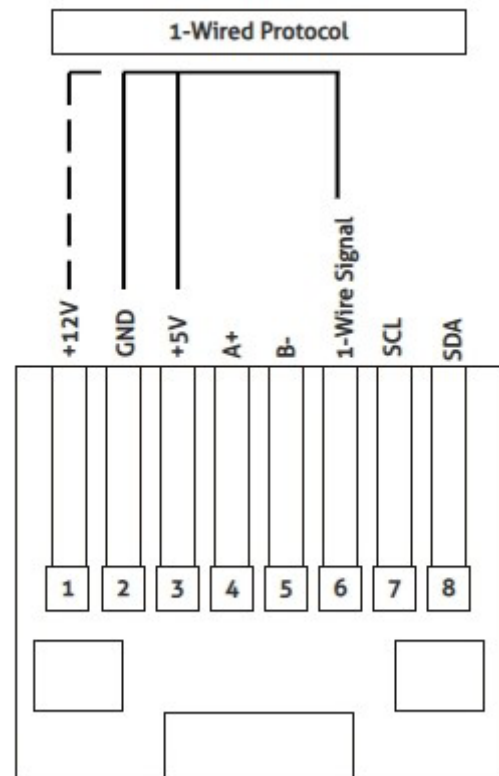
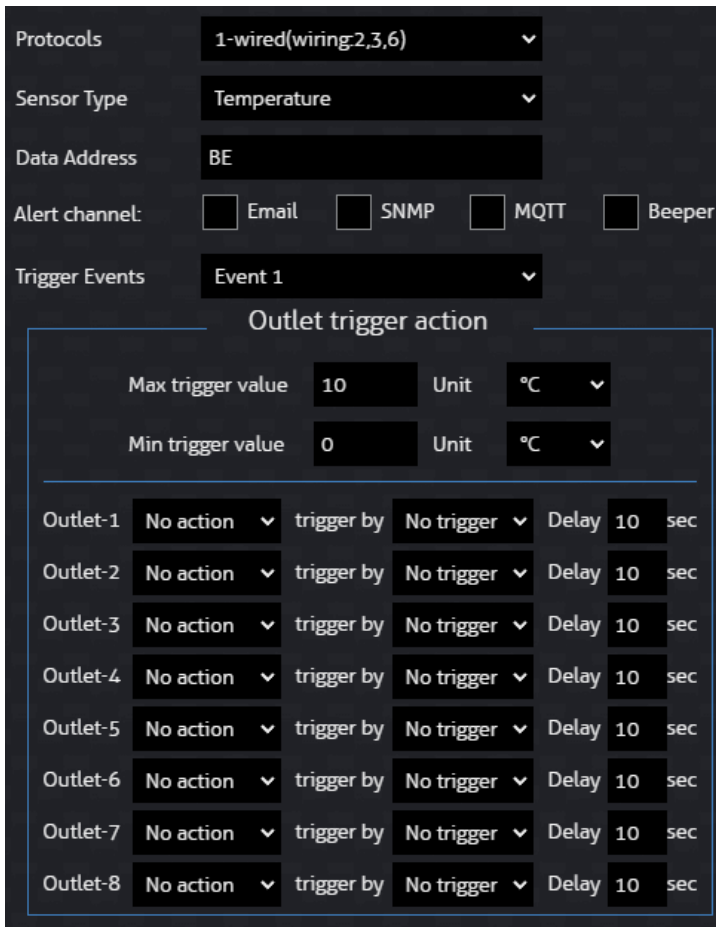
- Enter a name for this sensor value (3-20 characters).

Protocols:

- The sensor port supports various types of sensors which are all wired to an 8 pin RJ45 connector, these should be connected to the Sensor 1 and Sensor 2 ports on the PWR8VDC. The protocols and wiring for these connections are detailed on the following pages.

1-Wire Protocol:

A common sensor type that might use this protocol is a temperature sensor (For example the DS18B20 temperature sensor).



*Note that usually this type of sensor will require 5V power but 12V is available, please use pin 1 when 12V is required.

Protocols:

- Select the protocol required: 1-Wired, I2C, Modbus, Relay switch or Door

Sensor type:

- Select the sensor type: Temperature, Humidity, Temperature + Humidity, Air Pressure, Other Data.

Data Address:

- Enter the data address for the sensor being used, this will usually be found in the sensors user manual and will be a hex code.

Alert Channel:

- Select the type of notifications to receive if this sensor is triggered: Email, SNMP, MQTT, Beeper.

Trigger Events:

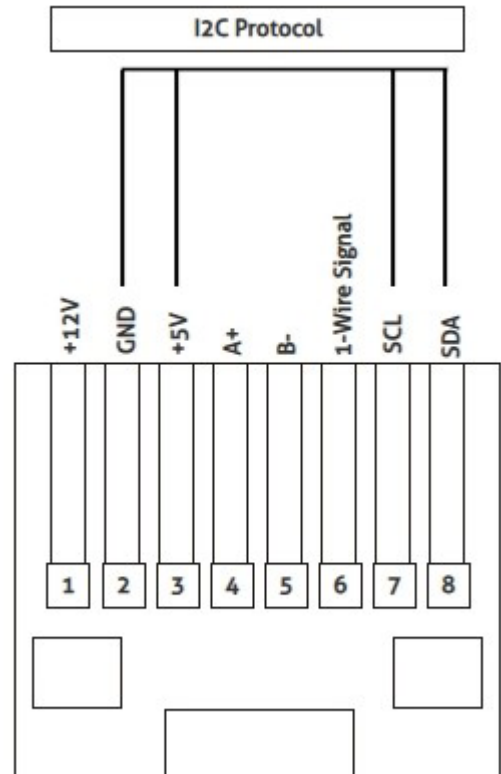
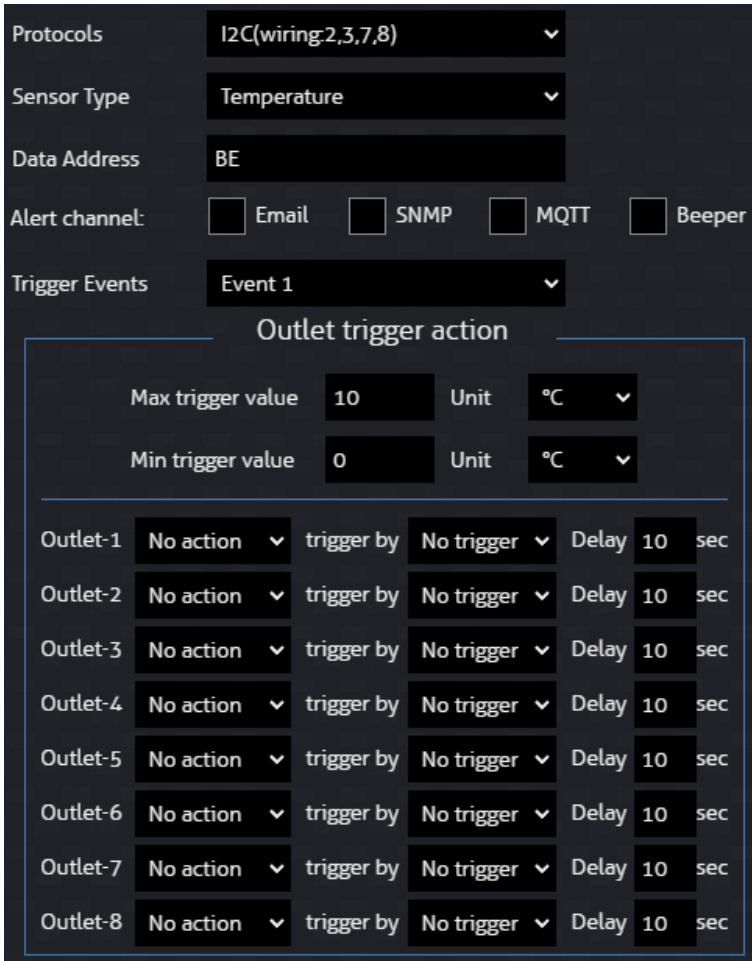
- Up to 3 events can be configured for the sensor, this allows a different event to be triggered if the sensor reaches the min value, max value, or either min or max value. Select Event 1, 2 or 3 to configure each outlets action when one of these events is triggered.
- Min/Max Trigger Value & Unit Type:
- Enter the minimum and maximum values for the trigger and select the unit type: °C, %RH, hPa.

Outlet Action:

- For each outlet, select the action that should be taken: No Action, Power On, Power Off, Restart
- Then select what this action is triggered by: No Trigger, Min Trigger Value, Max Trigger Value, Min OR Max Trigger Value.
- Now enter the delay in seconds before this action takes place once the trigger condition is met.

I2C:

A common sensor type that might use this protocol is a humidity and temperature combo sensor, or an air pressure sensor.



Protocols:

- Select the protocol required: 1-Wired, I2C, Modbus, Relay switch or Door

Sensor type:

- Select the sensor type: Temperature, Humidity, Temperature + Humidity, Air Pressure, Other Data.

Data Address:

- Enter the data address for the sensor being used, this will usually be found in the sensors user manual and would be a hex code.

Alert Channel:

- Select the type of notifications to receive if this sensor is triggered: Email, SNMP, MQTT, Beeper.

Trigger Events:

- Up to 3 events can be configured for the sensor, this allows a different event to be triggered if the sensor reaches the min value, max value, or either min or max value. Select Event 1, 2 or 3 to configure each outlets action when one of these events is triggered.
- Min/Max Trigger Value & Unit Type:

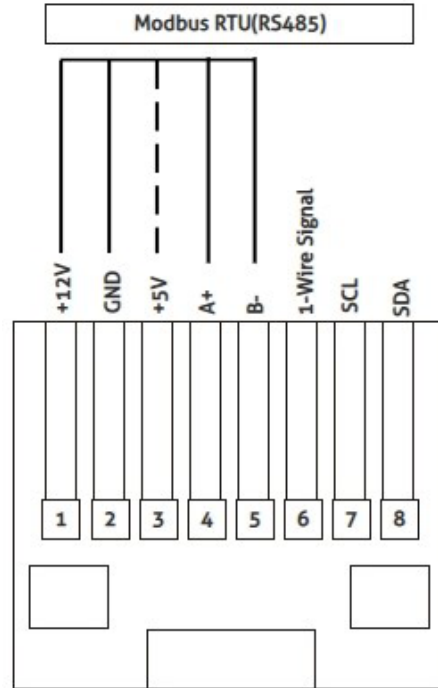
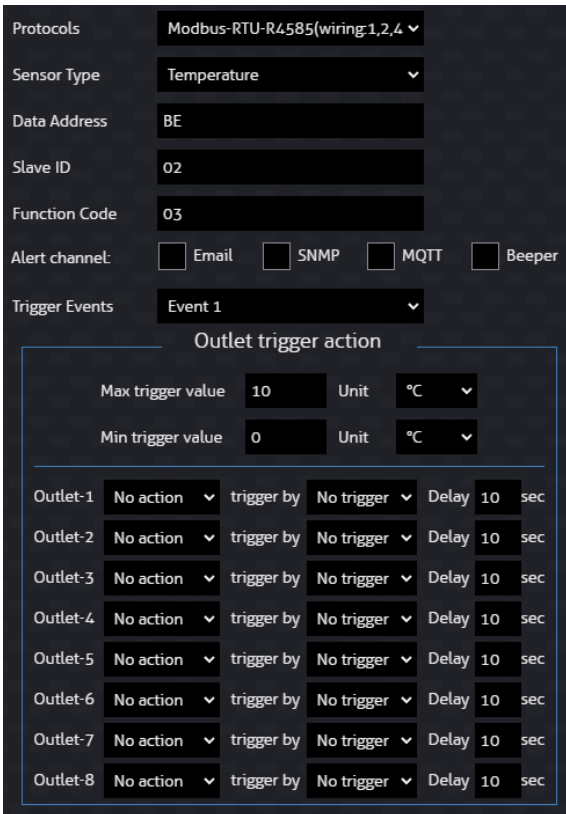
Enter the minimum and maximum values for the trigger and select the unit type: °C, %RH, hPa.

Outlet Action:

- For each outlet, select the action that should be taken: No Action, Power On, Power Off, Restart
- Then select what this action is triggered by: No Trigger, Min Trigger Value, Max Trigger Value, Min OR Max Trigger Value.
- Now enter the delay in seconds before this action takes place once the trigger condition is met.

Modbus-RTU on RS-485:

A common sensor type that might use this protocol is a humidity and temperature combo sensor, or an air pressure sensor.



*Note that usually this type of sensor will require 12V power but 5V is available, please use pin 3 when 5V is required.

Protocols:

- Select the protocol required: 1-Wired, I2C, Modbus, Relay switch or Door

Sensor type:

- Select the sensor type: Temperature, Humidity, Temperature + Humidity, Air Pressure, Other Data.

Data Address:

- Enter the data address for the sensor being used, this will usually be found in the sensors user manual and would be a hex code.

Slave ID:

- Enter the Slave ID for the sensor being used, this will usually be found in the sensors user manual

Function Code:

- Enter the Function Code for the sensor being used, this will usually be found in the sensors user manual

Alert Channel:

- Select the type of notifications to receive if this sensor is triggered: Email, SNMP, MQTT, Beeper.

Trigger Events:

- Up to 3 events can be configured for the sensor, this allows a different event to be triggered if the sensor reaches the min value, max value, or either min or max value. Select Event 1, 2 or 3 to configure each outlets action when one of these events is triggered.

Min/Max Trigger Value & Unit Type:

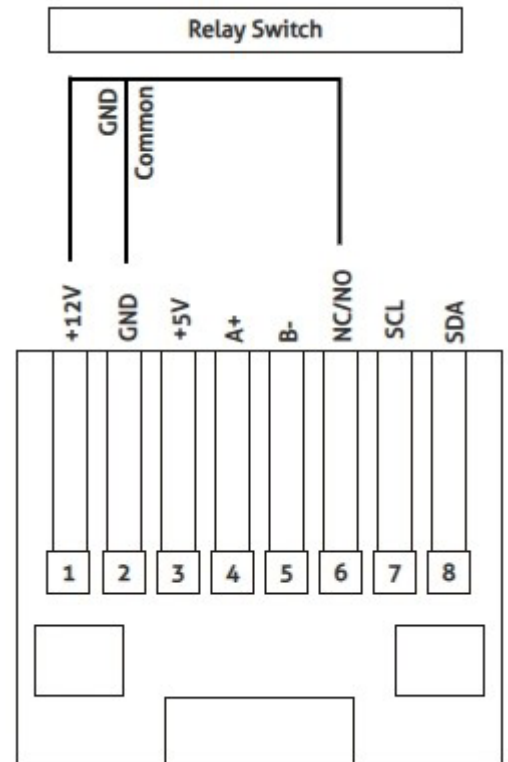
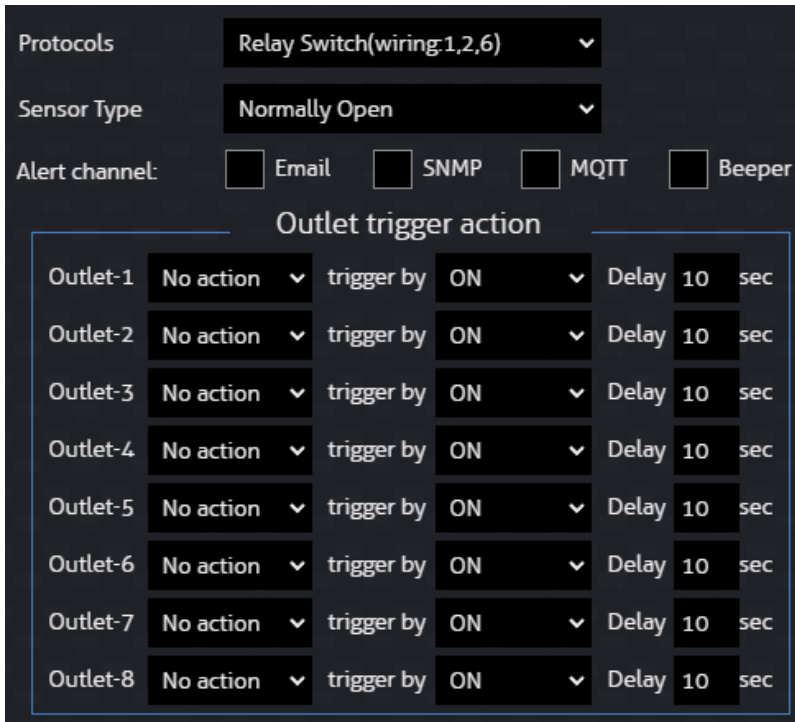
- Enter the minimum and maximum values for the trigger and select the unit type: °C, %RH, hPa.

Outlet Action:

- For each outlet, select the action that should be taken: No Action, Power On, Power Off, Restart
- Then select what this action is triggered by: No Trigger, Min Trigger Value, Max Trigger Value, Min OR Max Trigger Value.
- Now enter the delay in seconds before this action takes place once the trigger condition is met.

Relay Switch Sensor:

A common sensor type that might use this protocol is a PIR sensor.



Protocols:

- Select the protocol required: 1-Wired, I2C, Modbus, Relay switch or Door

Sensor type:

- Select the sensor type Normally Open or Normally Closed based on the logic of the sensor being used.

Alert Channel:

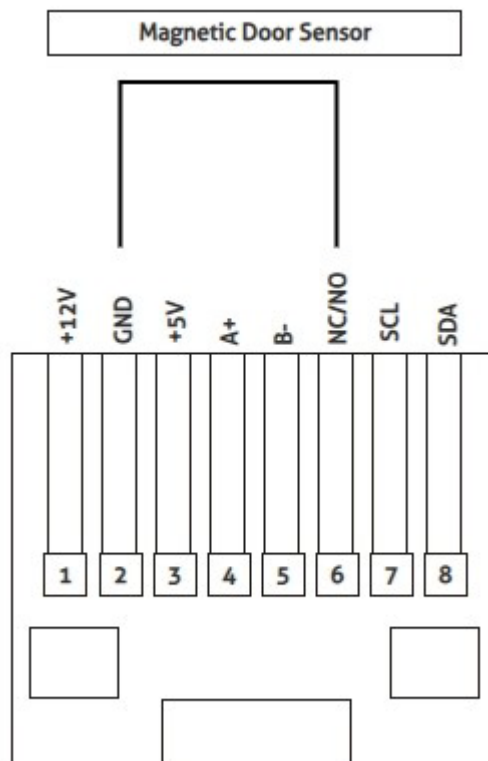
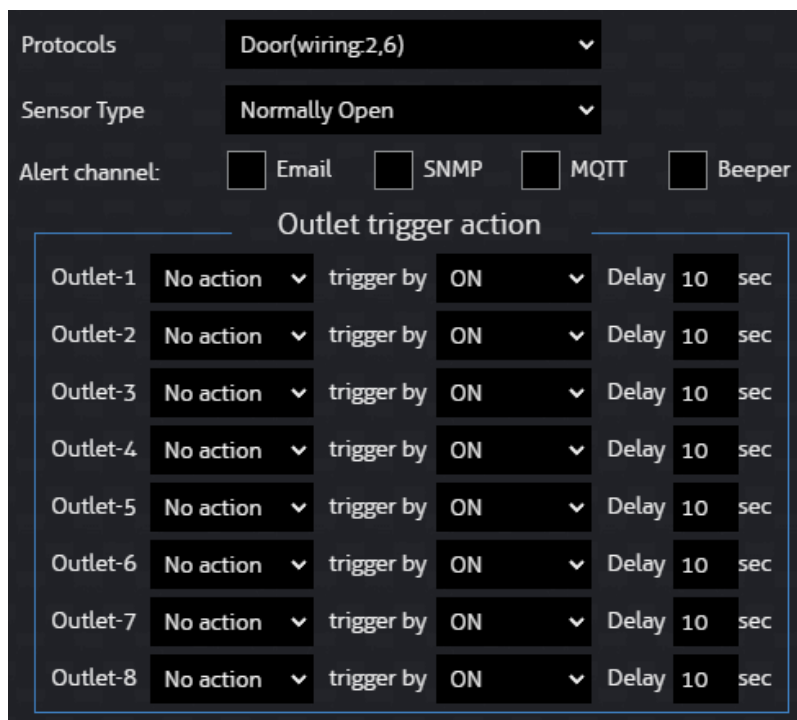
- Select the type of notifications to receive if this sensor is triggered: Email, SNMP, MQTT, Beeper.

Outlet Action:

- For each outlet, select the action that should be taken: No Action, Power On, Power Off, Restart
- Then select what this action is triggered by: No Trigger, ON or OFF.
- Now enter the delay in seconds before this action takes place once the trigger condition is met.

Magnetic Door Sensor

A common sensor type that might use this protocol is a door sensor.



Protocols:

- Select the protocol required: 1-Wired, I2C, Modbus, Relay switch or Door

Sensor type:

- Select the sensor type Normally Open or Normally Closed based on the logic of the sensor being used.

Alert Channel:

- Select the type of notifications to receive if this sensor is triggered: Email, SNMP, MQTT, Beeper.

Outlet Action:

- For each outlet, select the action that should be taken: No Action, Power On, Power Off, Restart
- Then select what this action is triggered by: No Trigger, ON or OFF.
- Now enter the delay in seconds before this action takes place once the trigger condition is met.

Specifications

- **Power Input ports:** 1 x C14 IEC 10A
- **Power Output ports:** 8 x 2-Pin Phoenix connector, 8 x USB-A
- **GPI Control:** 4x 3-Pin Phoenix connector
- **RS-232 serial port:** 1 x 3-Pin Phoenix connector
- **TCP/IP Control:** 2 x RJ45, female
- **Sensor Ports:** 2 x RJ45, female
- **Rack-Mountable:** 1U rack height, rack ears included
- **Casing Dimensions (W x D x H):** 437mm x 245mm x 44mm
- **Dimensions Including Connections (W x D x H):** 437mm x 252mm x 44mm
- **Shipping Weight:** 3.5kg
- **Operating Temperature:** 32°F to 104°F (0°C to 40°C)
- **Storage Temperature :** -4°F to 140°F (-20°C to 60°C)
- **Power Supply:** Internal 110-250V AC (264V maximum overvoltage)

NOTE: Specifications are subject to change without notice. Weights and dimensions are approximate.

Package Contents

- 1 x PWR8VDC
- 1 x Serial cable - DB9 to 3 pin Phoenix connector
- 4 x 3 pin 3.5mm Phoenix connector
- 1 x 19" Rack Mounting kit
- 4 x Mounting feet
- 1 x Quick Reference Card
- IEC Power Cable(s)

Please note: Outlet cabling is not supplied for this product

Maintenance

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

RS-232 Configuration and Telnet Commands

The PWR8VDC can be controlled via serial and TCP/IP.

The default RS-232 communication settings are:

Baud rate:	57600
Data bits:	8
Stop bits:	1
Parity bit:	none
Control Character:	CR + LF (Carriage Return + Line Feed) 0x0D + 0x0A \r + \n

The following pages list all available serial / IP commands.

Commonly Used Serial Commands

There are several commands that are commonly used for control and testing:

STATUS	Status will give feedback on the switcher such as outputs on, type of connection, etc.
PON	Power on
POFF	Power off
OUTON/OFF	Toggling the main output ON or OFF as required Example: OUTON (This would turn the main output on)
OUT FRyy	(yy is the input) Example: OUT FR04 (This would switch the main output to source input 4)

Common Mistakes

- Control Character: Serial terminal applications and control software vary in how they handle command termination. Some applications automatically append a Carriage Return CR and/or Line Feed LF character when transmitting a command. Other applications transmit the command string exactly as entered, requiring control characters to be added manually.
Blustream products require a Carriage Return + Line Feed control character at the end of each serial command. Commands that are not terminated correctly will not be recognized.
Before troubleshooting serial communication issues, confirm how the application handles command termination and ensure a CR and LF character is appended to every transmitted command.
- Spaces: Blustream commands do not require space between commands unless specified. There may be some programs that require spacing in order to work.
 - How the string should look is as follows: OUTON
 - How the string may look if spaces are required: OUT{Space}ON
- Baud rate or other serial protocol settings not correct

RS-232 Configuration and Telnet Commands

COMMAND	ACTION
?/HELP	Print Help Information
STATUS	Print System Status And Port Status
OUTLETSTATUS xx	"Print Outlet xx ON/OFF xx = 0 All, 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8"
CONNSTATUS xx	"Print Outlet xx Idle/Connected/Overload/Abnormalvolt xx = 0 All, 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8"
GETSENSORCFG xx	"Print Sensor Configuration Information xx = 0 All Event, 1 Event1, 2 Event2, 3 Event3"
ELESTA	Print All Outputs Electricity Level Information
FWVERSION	Print FW Version And GUI Version
DEVICENAME:xx	Set Device Name To xx
PON/OFF	Set Standby Mode ON or OFF
STANDBYMODE xx	"Set The System Standby Mode To xx xx = 0 All_Standby_Mode, 1 Sleep_Mode"
KEY ON/OFF	Set System Key Control ON Or OFF
RELAY ON/OFF	Set Relay Switch Key Control ON Or OFF
SELECTKEY ON/OFF	Set Voltage Select Key Control ON Or OFF
RESET	Reset System To Default Setting(Type "Yes" To Confirm, "No" To Discard)
REBOOT	Set System Reboot And Apply New Config!!
RESTA	Set System Restart
SETOVERVOLTAGE-ETHRESHOLD xx	"Set The System OverVoltage Threshold To xxV(Default: 250V) xx = 198 : 264"
SETUNDERVOLTAGE-ETHRESHOLD xx	"Set The System UnderVoltage Threshold To xxV(Default: 189V) xx = 189 : 249"
SAFEMODE xx	"Set The System Safe Mode To xx When Overloaded xx = 0 Outlet_Shutdown, 1 System_Shutdown, 2 Auto_Retry"
OVERLOADRETRYCNT xx	"Set The System Retry Number To xx When Overloaded(Default: 1) xx = 1 : 3"
OVERLOADRETRY-TIME xx	"Set The System Retry Delay Time To xxmins When Overloaded(Default: 3mins) xx = 1 : 10"
VOLTMONITORMODE xx	"Set The System Voltage Monitor Mode To xx When Overvoltage Or Undervoltage xx = 0 All_Outlets_Shutdown, 1 Auto_Retry"
VOLTMONITORRETRY-TIME xx	"Set The System Retry Delay Time To xxmins After the Voltage Input Stabilises(Default: 3mins) xx = 1 : 10"
RELAYMODE xx	"Set The System Relay Mode To xx xx = 0 Dry_Contact, 1 Push_Button"
RELAYVOLTAGE xx	"Set The System Relay Toggle Voltage To xx xx = 0 Low_Voltage, 1 High_Voltage"
BEEPERTIME xx	"Set The Buzzer Sound Time To xxs When Alarming(Default: 10 Second) xx = 0 : 9999"
OUTLETTIMEON xx:yy	"Set Outlet xx Power_ON Delay To yys xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 2 : 9999"
OUTLETTIMEOFF xx:yy	"Set Outlet xx Power_OFF Delay To yys xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 0 : 9999"

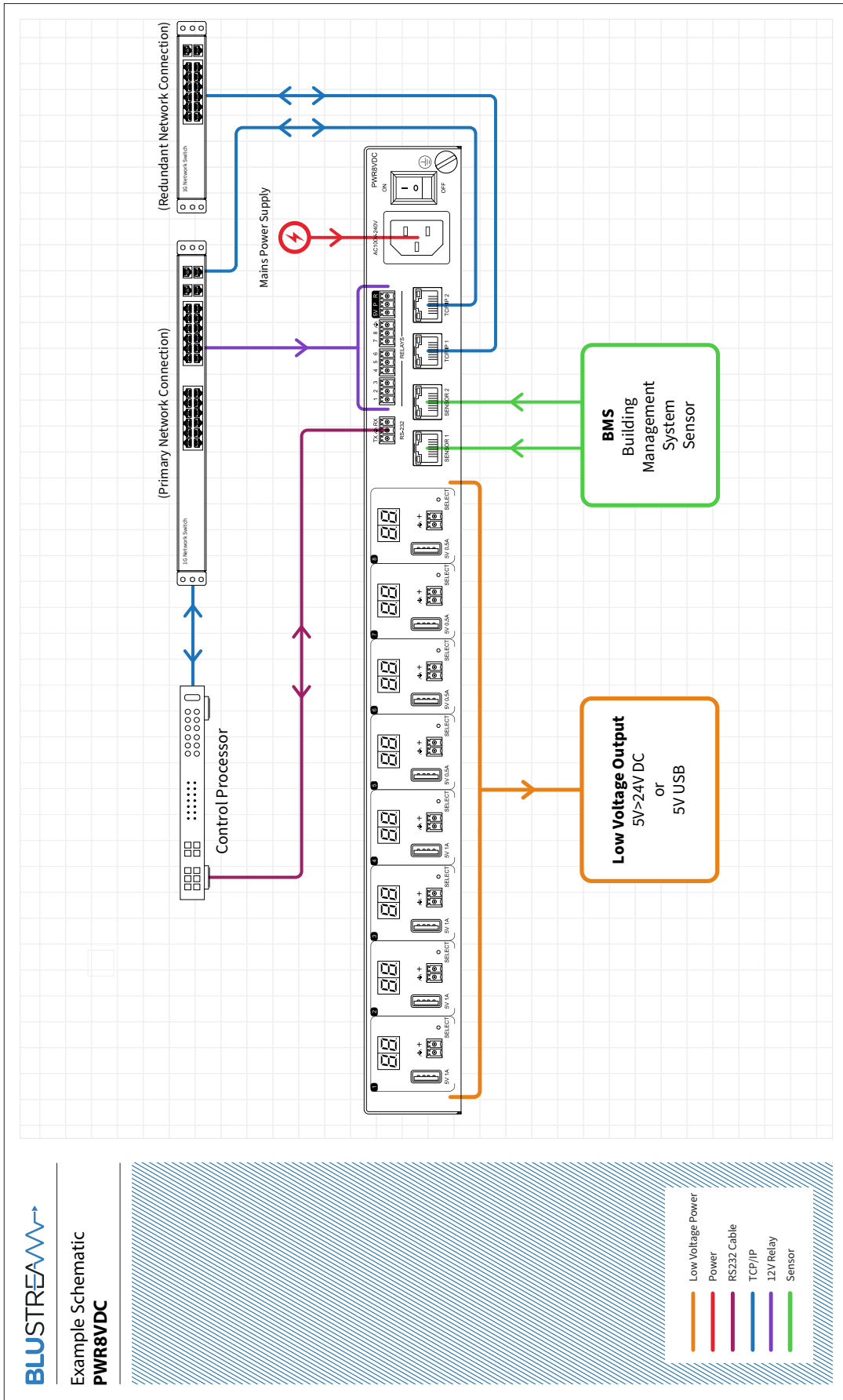
COMMAND	ACTION
RESTADELAY xx:yy	"Set Outlet xx Power_RESTA Delay To yys xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 2 : 9999"
OUTLELETERESET xx:yy	"Set Outlet xx Electrical Work Reset Duration To yys(Default: 10 Second) xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 0 : 9999"
ALLOUT ON/OFF	Set All Outlets State ON or OFF
OUTLET xx ON/OFF/RESTA	"Set Outlet xx ON/OFF/RESTA xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8"
ALLVOLT xx	"Set All Outlets Voltage Status xx xx = 5 5V, 9 9V, 12 12V, 18 18V, 24 24V"
OUTVOLT xx:yy	"Set Outlet xx Voltage Status yyV xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 5 5V, 9 9V, 12 12V, 18 18V, 24 24V"
VOLTOFFSET xx:yy	"Set Outlet xx Voltage Offset To yy xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8 yy = 0-20 depend on different voltage"
PLIMIT xx	"Set Power Limit Mode To xx xx = 0 8x30W, 1 4x36W & 4x30W, 2 8x36W & USB OFF"
ALLUSB ON/OFF	Set All USB ON/OFF
USB xx ON/OFF	"Set USB xx ON/OFF xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8"
7SEG ON/OFF	Set 7-Segment Display ON/OFF
RSALLOUTELE	Clean Up All Outlets Electrical Work
RSOUTELE xx	"Clean Up The Outlet xx Electrical Work xx = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Outlet5, 6 Outlet6, 7 Outlet7, 8 Outlet8"
SYSTIME	Get The Time For The System
RESYSTIME yyyy-mm-dd;hh:mm:ss	"Set The Time For The System yyyy = Year, mm = Month, dd = Day, hh = Hour, mm = Minutes, ss = Seconds"
RS232OUT y:z:c:a	"Send y Type Of Command a With Baud Rate z, Parity c To Output y=a: ASCII y=h: HEX z=1: 2400 z=2: 4800 z=3: 9600 z=4: 19200 z=5: 38400 z=6: 57600(Default) z=7: 115200 c=1: None c=2: Even c=3: Odd a=RS232 Command"
RS232BAUD z	"Set RS232 Baud Rate To xx z = 1 - 2400, 2 - 4800, 3 - 9600, 4 - 19200, 5 - 38400, 6 - 57600(Default), 7 - 115200"
SENSOR1/SENSOR2 POWER xx	"Set Sensor1/Sensor2 Power To xx xx = 0 OFF, 1 ON"
SENSOR1/SENSOR2 PROTOCOLS xx	"Set Sensor1/Sensor2 Protocols To xx xx = 1 1-wire(wiring2,3,6), 2 I2C(wiring2,3,7,8), 3 Modbus-RTU-RS485(wiring1,2,4,5), 4 Door(wiring2,6), 5 Relay Switch(wiring1,2,6)"
SENSOR1/SENSOR2 TYPE xx	"Set Sensor1/Sensor2 Type To xx xx = 1 Temperature, 2 Humidity, 3 Temperature And Humidity, 4 Air Pressure, 5 Other Data, 6 Normally Open, 7 Normally Close"
SENSOR1/SENSOR2 ADDRESS xx	"Set Sensor1/Sensor2 Data Address To xx xx = 00 : FF or 0000 : FFFF"

RS-232 Configuration and Telnet Commands

COMMAND	ACTION
SENSOR1/SENSOR2 VALUEMAX xx	"Set Sensor1/Sensor2 Max Value To xx xx = -9999 : 9999"
SENSOR1/SENSOR2 VALUEMIN xx	"Set Sensor1/Sensor2 Min Value To xx xx = -9999 : 9999"
SENSOR1/SENSOR2 UNIT xx	"Set Sensor1/Sensor2 Unit Value To xx xx = 1 jæ, 2 %RH, 3 hPa"
SENSOR1/SENSOR2 BEEPER ON/OFF	Set Sensor1/Sensor2 Beeper ON/OFF
SENSOR1/SENSOR2 OUTLETMODE xx:yy:zz	"Set Event xx Outlet yy Response Sensor1/Sensor2 Mode To zz xx = 1 Event1, 2 Event2, 3 Event3 yy = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Out- let5, 6 Outlet6, 7 Outlet7, 8 Outlet8 zz = 1 NoAction, 2 Power ON, 3 Power OFF, 4 Restart"
SENSOR1/SENSOR2 OUTLETTRIGGER xx:yy:zz	"Set Event xx Outlet yy Response Sensor1/Sensor2 Trigger To zz xx = 1 Event1, 2 Event2, 3 Event3 yy = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Out- let5, 6 Outlet6, 7 Outlet7, 8 Outlet8 zz = 1 No Trigger, 2 Max Trigger, 3 Min Trigger, 4 Min- Max, 5 ON, 6 OFF"
SENSOR1/SEN- SOR2 OUTLETDELAY xx:yy:zz	"Set Event xx Outlet yy Response Sensor1/Sensor2 Delay To zzs xx = 1 Event1, 2 Event2, 3 Event3 yy = 1 Outlet1, 2 Outlet2, 3 Outlet3, 4 Outlet4, 5 Out- let5, 6 Outlet6, 7 Outlet7, 8 Outlet8 zz = 0 : 9999"
GET SENSOR1/SEN- SOR2 CURRENT	Get Sensor1/Sensor2 Current Value
SENSOR1/SENSOR2 MSADDRESS xx	"Set Sensor1/Sensor2 Modbus Slave Station Address To xx xx = 00 : FF"
SENSOR1/SENSOR2 MFUNCCODE xx	"Set Sensor1/Sensor2 Modbus Function Code To xx xx = 03 or 04"
NET TCP/IP LIST	List Current TCP/IP Address
NET TCP/IP ENABLE xx	"Set TCP/IP xx Enalbe(Only One Can Be Enabled) xx = 1 TCP/IP1, 2 TCP/IP2"
NET TCP/IP1 DHCP ON/OFF	Set TCP/IP1 Auto IP(DHCP) ON Or OFF
NET TCP/IP1 IP xxx. xxx.xxx.xxx	Set TCP/IP1 IP Address
NET TCP/IP1 GW xxx.xxx.xxx.xxx	Set TCP/IP1 Gateway Address
NET TCP/IP1 SM xxx.xxx.xxx.xxx	Set TCP/IP1 Subnet Mask Address
NET TCP/IP2 DHCP ON/OFF	Set TCP/IP2 Auto IP(DHCP) ON Or OFF
NET TCP/IP2 IP xxx. xxx.xxx.xxx	Set TCP/IP2 IP Address
NET TCP/IP2 GW xxx.xxx.xxx.xxx	Set TCP/IP2 Gateway Address
NET TCP/IP2 SM xxx.xxx.xxx.xxx	Set TCP/IP2 Subnet Mask Address
NET RB	Set Network Reboot And Apply New Config
NET MDNS ON/OFF	Set mDNS ON/OFF

Please note: Only highlighted commands are available in MQTT API Control.

Schematic



BLUSTREAM

Example Schematic
PWR8VDC

- Low Voltage Power
- Power
- RS232 Cable
- TCP/IP
- 12V Relay
- Sensor

Certifications

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION - changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CANADA, INDUSTRY CANADA (IC) NOTICES

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CANADA, AVIS D'INDUSTRY CANADA (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003.

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

CORRECT DISPOSAL OF THIS PRODUCT

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.



Installer Notes



www.blustream.com.au

www.blustream-us.com

www.blustream.co.uk