



EdgeRack 5M Series

USER MANUAL



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Notice

Enconnex is not responsible for damages to the unit or personal injury due to noncompliance with operation requirements as outlined in this document.

- This User Manual must be strictly complied with at the time of installation and throughout the life of the EdgeRack and the integrated Rack Cooling Unit (RCU).
- Operation of the RCU equipment must be completed by professionals who are familiar with this manual.
- Only technicians that have received professional training from Enconnex may service the system.
- Power to the RCU must be shut off if internal maintenance of the equipment is required.
- RCU should only be operated with the cabinet side panels installed.
- Warranty of the equipment is ensured only under the premise that the contents included in this manual are complied with.
- Parameters included in this manual are only to be used as a reference. Enconnex reserves the right to change the parameters without prior notice.
- In case of lost, damaged, or misplaced manual. A replacement copy can be requested from the Enconnex website, www.enconnex.com.

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Table of Contents

Legal Disclaimer	2
Copyright owned by Enconnex LLC	3
Notice	3
Table of Contents	4
1. General Safety Precautions	5
1.1. Overview	5
1.2. Local Rules and Regulations	5
1.3. Basic Installation Requirements	5
2. Product Overview	5
2.1 Product Orientation	5
2.2 Product Characteristics	6
2.3 Product Composition	6
2.3.1 Rack Cooling Unit Components	6
2.3.2 Controller	7
3. Installation Guide	8
3.1 Required Tools	8
3.2 Installation Site Preparation	8
3.3 Transportation	8
4. Controller	10
4.1 Controller Interface	10
4.2 Controller Operations	11
4.2.1 Cooling	11
4.2.2 Fan Speed	11
4.2.4 Timer Function	11
4.2.5 Critical Alarm Protection and Controls	12
5. SNMP Communication	13
6. Web GUI Controls	14
6.1 Status	14
6.2 System Settings	15
6.3 Serial Port Settings	16
6.4 Communication Settings	16
6.5 Custom Settings	17
6.6 Others	17
7. Maintenance	18

7.1	Condensate Tray	18
7.2	Filter	18

1. General Safety Precautions

1.1. Overview

Enconnex is not responsible for any of the following situations:

- Operation of equipment in adverse environments beyond the manual instructions.
- Any installation and operation environment beyond regulations of any relevant international standards.
- Altering of the product or changes in the software without prior approval.
- Failure to follow operational instructions and safety warnings of the product and manual. See the end of this manual for further details.
- Equipment damage caused by natural disasters.

1.2. Local Rules and Regulations

Local rules and regulations should be followed during equipment operation. Safety precautions in the manual serve as a supplementary guide to local safety specifications.

1.3. Basic Installation Requirements

Personnel performing the RCU installation and maintenance must receive authorized training.

- Equipment installation, operation and maintenance can only be conducted by qualified and trained people.
- Replacing and changing equipment or components (including software) must be completed by professionals with Enconnex certification or authorization.
- Operators should immediately report faults or errors which may cause safety issues.

2. Product Overview

2.1 Product Introduction

The EdgeRack by Enconnex is a self-contained unit, with an 11U Rack Cooling Unit (RCU) mounted at the top of the rack designed to cool up to 5 kW of heat load. The system is ready to deploy your IT equipment and is ideal for areas where space is limited. The EdgeRack is the perfect solution for your IT needs, with sound dampening material, plexiglass front and rear doors, and plenty of space for your equipment. This all-in-one self-contained system can be installed in controlled environments.

2.2 Product Characteristics

- Industry-leading cooling capacity up to 5kW
- Integrated basic controls for monitoring
- Uses standard 208VAC - 240VAC
- Ask about optional rack PDU and UPS

2.3 Product Composition

The EdgeRack 5M series cabinet consists of a pre-installed Rack Cooling Unit (RCU), standard moveable EIA vertical rails, two button-style vertical rack PDU mounts, sound-dampened and air-controlled construction, and 2.5" diameter heavy-duty casters. Accessories include top of rack output air duct, condensate drain hose, cage nuts, and floor-mount kit.

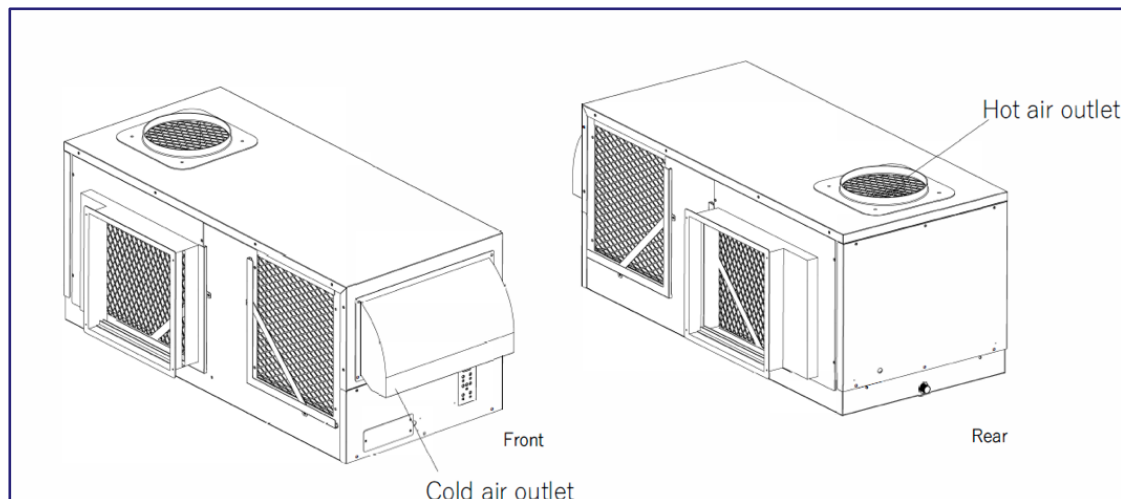


Figure 2.3-1 Sketch of unit system components (External)

NOTE: The above is a sketch. Please refer to the real object, pictures are for reference only.

2.3.1 Rack Cooling Unit Components

The RCU consists of the following: compressor, evaporator, fan, condenser, and liquid storage tray.

Compressor

- 65dB under normal operation conditions
- Compressor has built in protection to reduce startup and shutdown wear

Evaporator

- The evaporator has three fan speeds, high, low, or auto.

Condenser fan

- Condenser fan is one speed and synchronizes with the compressor

Humidity condensate tray

- Built-in condensate tray with a sensor that will shut the unit down when full. There is a valve in the rear of the unit to empty the tray which will clear the alarm.

2.3.2 Controller

Controller system consists of a main control panel, temperature sensors, compressor, and fan. Note that the temperature sensor ports are located behind the cover plate found on the display side of the RCU.

Functions of the controller:

- Schedule using a timer to turn the unit on, off, or to enter sleep mode.
- The temperature setting range: Cooling: 17 ~ 32 °C / 63 ~ 90 ° F.
- The compressor has a 3.5 minute delay of function during startup for self-protection.
- The evaporator fan has 2 speed levels, high or low; and can auto switch between high or low based on cooling demand.
- The condenser fan has only one speed that is synchronized with the compressor.
- Self-diagnostic error code display.
- Memory function during power shutdown.
- The default display is the ambient temperature.
- The temperature default setting is Fahrenheit and is interchangeable between Fahrenheit & Celsius.
- Audible alarms for alerts.

Characteristics of the controller:

- The normal operating voltage range: single-phase 208 - 240VAC.
- Operating temperature range: -10 °C ~ + 60 °C.
- Storage temperature range: -20 °C ~ + 70 °C.
- Relative humidity range: 35% to 98%.
- The temperature sensor: accuracy: ± 1 °C.
- 65dB under normal operating conditions

3. Installation Guide

3.1 Required Tools

The EdgeRack is intended for near plug-and-play installation.

- If permanent mounting to the floor is required, use proper precaution when drilling or bolting to the floor. Tools such as a drill-driver and wrenches may be required.
- Addition of the drain hose may require a wrench. Be careful not to cross-thread when installing the hose.
- Screwdrivers and other equipment may be needed for installation of third-party equipment. Review instruction manuals of that equipment for details.

3.2 Installation Site Preparation

- A clearance of at least 2 ft (600 mm) is recommended on all sides of the installed EdgeRack. 2 ft (600 mm) is also recommended between adjacent EdgeRack units. Note that you may want even more space for access to the side panels or doors to access your racked equipment.
- It is recommended that the exhaust duct at the top of the EdgeRack be plumbed into the main HVAC return. A 200 mm diameter flexible tube is included; however, alternative longer or fixed metallic ducting may be required for your installation. Alternative ducting is best sourced from local establishments.
- Using a dedicated 16A or 20A breaker, based on the power cord rating, for the RCU's power source will prevent faults caused by other equipment in the room from affecting the RCU's power, and inrush current from the RCU's compressor affecting other equipment in the room.
- DO NOT Plug the RCU into a UPS. Most UPS systems are not designed to handle compressor surge current. Running the RCU on the battery backup will greatly reduce run-time for IT equipment also on the UPS.
- Ensure the floor is capable of supporting the total weight of your fully loaded EdgeRack.
- To ensure proper air flow, prepare to use blanking panels on the front in RU spaces not occupied by IT equipment.
- It is recommended that the EdgeRack be installed in a room that does not have employees working on a continual basis. The RCU runs at about 69 dba, in comparison to normal talking at 45 dba.

3.3 Transportation

Warning: After transporting the EdgeRack, like any refrigerant system, you must let it sit in its final location for 8 hours prior to applying power.

In the process of transporting and installing the EdgeRack, in order to avoid pipes from being damaged and compressor oil from leaking, the equipment should not be excessively jolted or tipped. The angle of incline of the equipment should not be more than $\pm 15^\circ$ in either direction.

WARNING

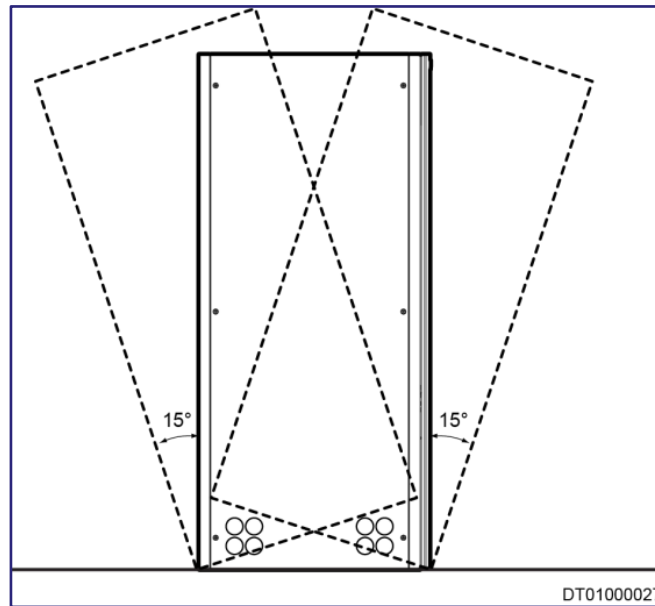


Figure 3.2-1: Transportation Diagram

Use mechanical handling tools such as forklifts or pallet jacks during the unloading and moving process. Place the crate in the middle to guarantee symmetry. It is important to move slowly and with care to prevent dents and scratches to the equipment.

Check the quantity and type of accessories based on the packing list. In case of missing accessories or nonconformity of models, please keep field records and immediately contact the Enconnex Customer Service Center or representative.

Moving the EdgeRack after it has been put into service requires care. The condensation tray may contain water which must be drained before moving the EdgeRack. Take similar care when moving the EdgeRack as was taken during initial installation.

4. Controller

4.1 Controller Interface



Figure 4.2-1: RCU Controller Interface

- **Power:** switch on / off; default standby
- **Temp+:** set cooling temperature by +1 °C / ° F or hold for three seconds to go to the highest value. Digital display shows the temperature setpoint by flashing.
- **Temp-:** set cooling temperature by -1 °C / ° F or hold for three seconds to go to the lowest value. Digital display shows the temperature setpoint by flashing.
- **Speed:** during cooling mode, switch between automatic, high, or low fan speed; (HI SPEED / LOW SPEED / AUTO will light up accordingly). During power on, you can hold the button for 3 seconds and switch the temperature unit between Fahrenheit (digital display shows "F" in 5 seconds) & Celsius (digital display shows "C" in 5 seconds)
- **Timer:** when the unit is switched on, shows the remaining time before it will turn off & enables the ability to change timer; selectable between 01-24 hours. When the unit is switched off, shows the remaining time before the unit will turn on & enables the ability to change the timer; selectable between -- or 01-24 hours. To reset the timer, press TIMER once when showing the remaining time.

4.2 Controller Operations

4.2.1 Cooling

Cooling mode – cooling is the default mode. The temperature setting range is 17 ~ 32 °C / 63 ~ 90 ° F. The default temperature setpoint is 25 °C (77 ° F)

Compressor run command:

- When $\text{Temp} \geq \text{Temp setpoint} + 1^{\circ} \text{C}$ ($+2^{\circ} \text{F}$), the compressor and the condenser fan are both running.
- When $\text{Temp} \leq \text{Temp setpoint} - 1^{\circ} \text{C}$ (-2°F), the compressor and the condenser fan stop.
- When $\text{Temp} = \text{Temp setpoint}$, the compressor and condenser fan keep the previous state

NOTE: When the compressor is stopped, “COOLING” indicator flashes; otherwise it lights up.

4.2.2 Fan Speed

Fan speed of the evaporator can be switched between automatic, high, and low fan speed. Low fan speed is the default mode. During cooling mode, the fan can be set among all 3 modes.

Automatic Mode:

$\text{Temp} \geq \text{Temp setpoint} + 3^{\circ} \text{C}$ (or 6°F), set at high speed; otherwise low speed will be set.

NOTE: During automatic mode, the AUTO indicator lights up and high or low speed (HI SPEED / LOW SPEED indicator lights up according to the actual fan speed) wherein there will be 2 indicators.

4.2.3 Pressing the **Reset** Button, located in the GUI, only reboots the Intelligent Network Controller. It does not change the Energy (kWh) value and does not affect the output voltage.

4.2.4 Timer Function

- The timer can be set between 01-24 hours.
- If the unit is running, setting the timer will make the unit shut down when the timer is up; otherwise, it will switch the unit on from standby condition.
- By pressing POWER once, the timer will be reset.

- The TIMER indicator will light up after setting the time. And the TIMER indicator flashes when the timer is ready to be set.

4.2.5 Critical Alarm Protection and Controls

During the event of a critical alarm, the RCU shuts down to protect internal components.

- **Condensate Tray Full Alarm:**

The digital display shows "E1" & ALARM indicator flashes.

When the water tray switch is closed due to water full for 3 seconds, the unit shuts down. Reset the alarm by draining the water. The unit returns to normal operation by pressing power on (**POWER** button) again.

- **Temperature Sensor T1 Fault:**

The digital display shows "E2" & ALARM indicator flashes. After troubleshooting, the unit cannot return to normal operation until the **POWER** button is pressed.

- **Temperature Sensor T2 Fault:**

The digital display shows "E3" & ALARM indicator flashes. After troubleshooting, the unit cannot return to normal operation until the **POWER** button is pressed.

- **Filter Maintenance Reminder:**

After the unit runs for a total of 4,000 hours, the ALARM indicator flashes, but the unit keeps on running. By holding both the **TEMP+** and **TEMP-** buttons for 3 seconds, turn off the alert and reset the internal timer to zero. This helps keep track of runtime.

- **Compressor Delay Protection:**

During initial power on there is no delay protection. When the compressor stops and starts again, it has a startup delay of minimum 3.5 minutes.

- **Defrost Protection:**

Digital display shows "dF". If the coil temperature is under or equal to -2°C , the anti-icing process will be activated, the evaporator fan speed is operated in high-speed, while both the compressor & the condenser fan stop running. RCU will exit the defrost protection when the value of the coil temperature is continuously over 2°C for 1 minute.

5. SNMP Communication

The unit supports SNMP v2 communication. Any SNMP walk software will work. ManageEngine MibBrowser Free Tool is shown below. The submittal package with the unit comes with the MIB file required to read all the points correctly.

The screenshot shows the ManageEngine MibBrowser Free Tool interface. The main window displays the following configuration and results:

- Host:** 10.36.8.22
- Port:** 161
- Community:** *****
- Write Community:** (empty)
- Set Value:** (empty)
- Device Type:** Device Type Identified: Not Available
- Suggested OIDs:** None
- Object ID:** .1

The main pane shows the following output:

```

Loading MIBs "C:\Users\Robert Faulkner\Downloads\Enconnex-RCU.mib"
Done.
Sent GET request to 10.36.8.22 : 161
racPower.0                off(3)
racFanSpeedMode.0         autoLow(9)
racTempCelsius.0          22
racTempFahrenheit.0       71
racTempUnit.0             fahrenheit(0)
racTimerModeOn.0          0
racTimerModeOff.0         0
racTimerReset.0           reset(1)
racTempAmbC.0             21
racTempAmbExtC.0          22
racTempEvaporatorC.0      21
racTempAmbF.0             70
racTempAmbExtF.0          71
racTempEvaporatorF.0      70
racWorkTime.0             37
racCompressorStatus.0     off(1)
racThermostatT1.0         normal(0)
racThermostatT2.0         normal(0)
racDefrost.0              normal(0)
racWaterFull.0            normal(0)
racAccTime.0              normal(0)
Request Failed: Get Response PDU received from 10.36.8.22 Error Indication in response: There is no such variable name in this mib. Errindex: 1
  
```

At the bottom, there is a table with the following structure:

Description	MultiVar	Status	Reference
Syntax			
Access			
Index			
Object ID			
Description			

6. Web GUI Controls

To access the Web GUI for the RCU, plug a computer into the front of the unit via an ethernet cable. The network port is located behind the cover plate found on the display side of the RCU. Default address is 169.254.173.207 with login and password being admin.

6.1 Status

The screenshot displays the 'Status' page of the RCU Web GUI. The page is titled 'Status' and includes a subtitle 'System running status overview'. On the left, there is a navigation menu with options: STATUS, SYSTEM SETTINGS, SERIAL PORT SETTINGS, COMMUNICATION SETTINGS, CUSTOM SETTINGS, and OTHERS. The main content area is divided into several sections:

- System State:** A table showing various system parameters.

Product Name EP20	MAC F0F6B0533B7
DHCP Disable	IP 169.254.173.207
Subnet Mask 255.255.255.255	Gateway 0.0.0.0
DNS 10.10.100.254	Firmware Version 1.30k
System Time NTP Disabled	Total Running Time 0-Day 0:8:51
Remaining RAM 18075648	Max Block Size 30498816
- Configuration Protected:** A single row with the value 'Disable'.
- Serial Port State:** A table showing serial port statistics.

Received Bytes 0	Received Frames 0
Sent Bytes 0	Sent Frames 0
Failed Bytes 0	Failed Frames 0
Config 9600,8,1,NONE	
- Communication State - 'netp':** Two identical tables showing network statistics.

Received Bytes 0	Received Frames 0
Sent Bytes 0	Sent Frames 0
Failed Bytes 0	Failed Frames 0
Protocol TCP-SERVER	State Server Created
Client Ip	

At the bottom of the page, there is a footer with the text: 'build1808171357333996' and 'Recommend using Google Chrome, Mozilla Firefox, Internet Explorer 11+'.

6.2 System Settings

The primary authentication and network settings may be changed here.

English v

System Settings
Change the device system settings

Authentication

User Name: admin

Password: *****

Basic Settings

Host Name: Eport-EP20

WAN Settings

DHCP: OFF

WAN IP: 169.254.173.207

Subnet Mask: 255.255.255.255

Gateway: 0.0.0.0

DNS: 10.10.100.254

Telnet Settings

Enable: ON

Telnet Port: 23

Echo: ON

Web Settings

Enable: ON

Web Port: 80

NTP Settings

Enable: OFF

Submit Reset

build1808171357333996
Recommend using Google Chrome, Mozilla Firefox, Internet Explorer 11+

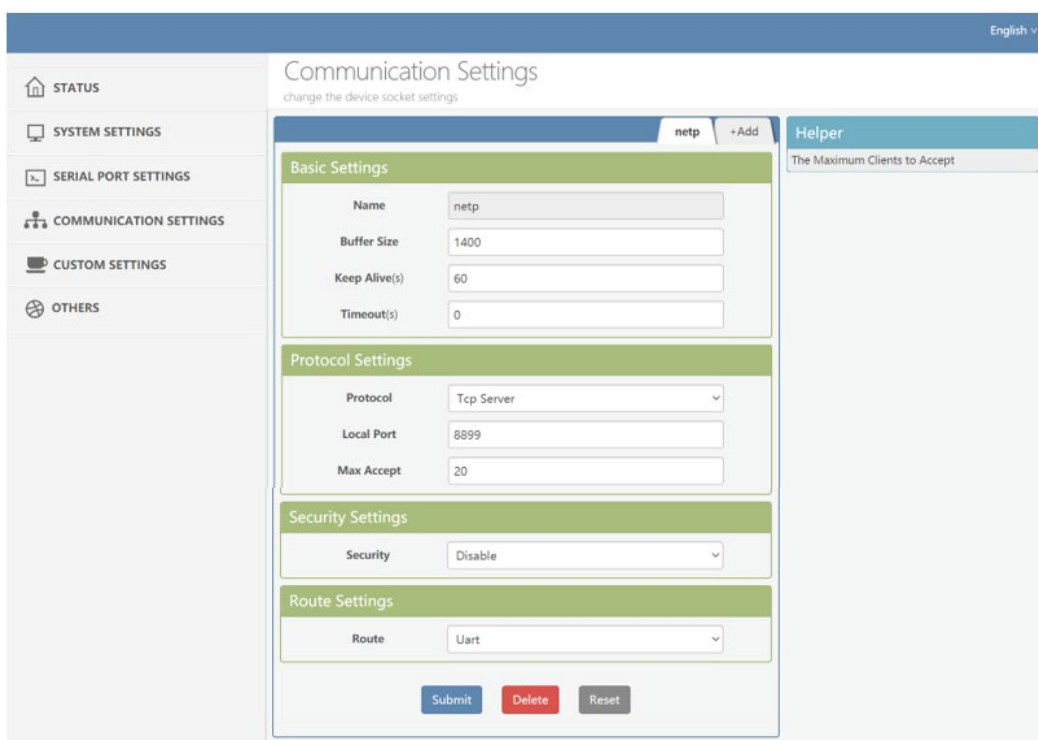
Helper
Static gateway config

6.3 Serial Port Settings

Note that the Serial Port Settings page is not applicable to this hardware. The system is running a shared firmware for other hardware that may have a serial port.

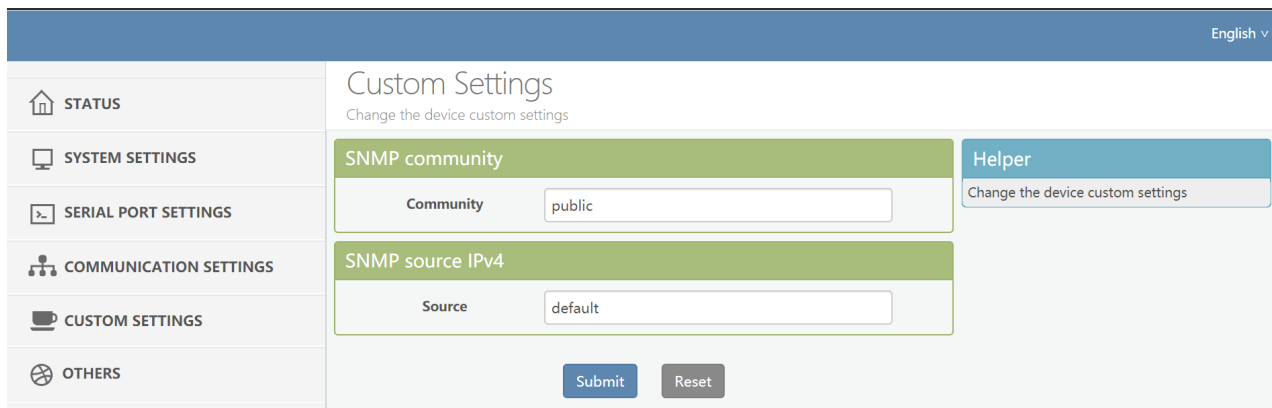
6.4 Communication Settings

Security and Route Settings may be changed here per your network requirements. Enconnex discourages changes to the Basic and Protocol Settings without a need by Technical Support.



6.5 Custom Settings

Note that the SNMP community string is read/write and may be changed as appropriate per your security policy.

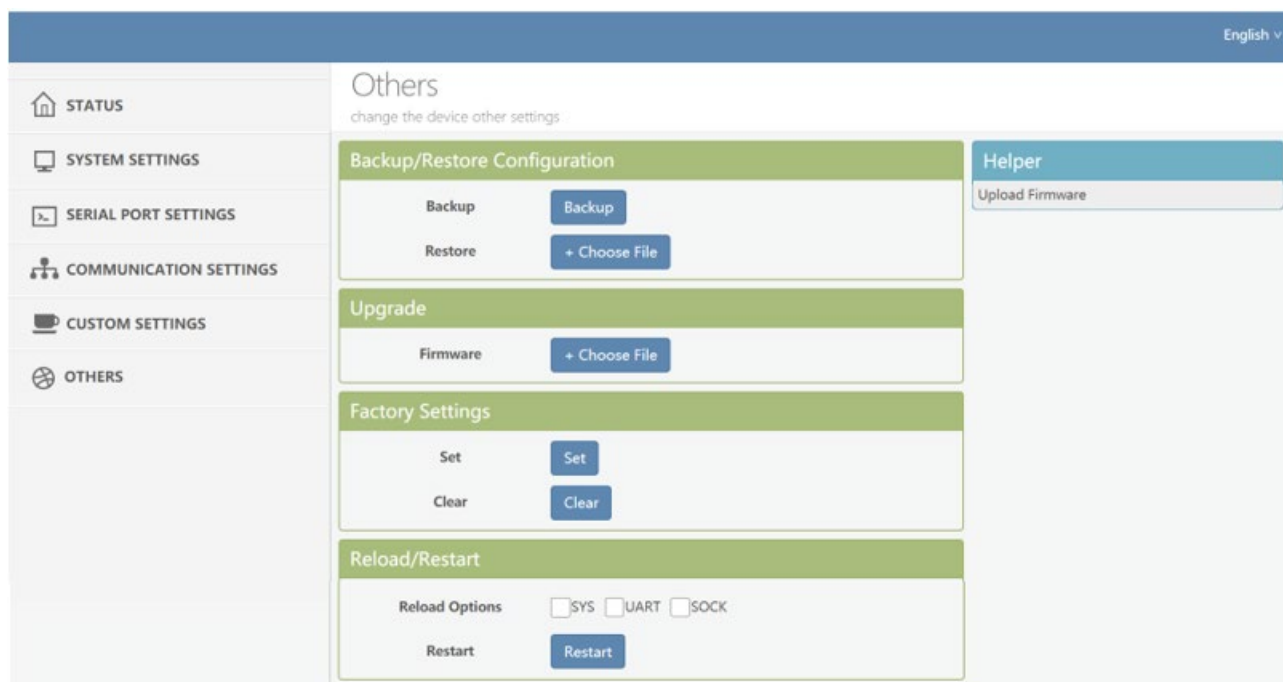


The screenshot shows the 'Custom Settings' page of a device's web interface. The page has a blue header with 'English v' in the top right. A left sidebar contains navigation links: STATUS, SYSTEM SETTINGS, SERIAL PORT SETTINGS, COMMUNICATION SETTINGS, CUSTOM SETTINGS, and OTHERS. The main content area is titled 'Custom Settings' with the subtitle 'Change the device custom settings'. It features two main sections: 'SNMP community' with a text input field containing 'public', and 'SNMP source IPv4' with a text input field containing 'default'. At the bottom of the main area are 'Submit' and 'Reset' buttons. On the right side, there is a 'Helper' box with the text 'Change the device custom settings'.

6.6 Others

The Backup function will create an XML file that can be Restored to the RCU in the future. When Upgrade firmware is available, this is where it can be loaded.

Here you can also change the fallback “factory” settings. Clicking the Set button will force your current settings to be the fallback settings whenever a restart occurs. Clicking the Clear button will restore the original factory default settings. Upon clicking the Restart button, it will also reload the SYS, UART, and/or SOCK settings per the checkboxes you select.



The screenshot shows the 'Others' page of the device's web interface. The page has a blue header with 'English v' in the top right. A left sidebar contains navigation links: STATUS, SYSTEM SETTINGS, SERIAL PORT SETTINGS, COMMUNICATION SETTINGS, CUSTOM SETTINGS, and OTHERS. The main content area is titled 'Others' with the subtitle 'change the device other settings'. It features four main sections: 'Backup/Restore Configuration' with 'Backup' and '+ Choose File' buttons; 'Upgrade' with a '+ Choose File' button; 'Factory Settings' with 'Set' and 'Clear' buttons; and 'Reload/Restart' with 'Reload Options' (checkboxes for SYS, UART, and SOCK) and a 'Restart' button. On the right side, there is a 'Helper' box with the text 'Upload Firmware'.

7. Maintenance

The EdgeRack has suggested maintenance intervals of 6 months. This routine maintenance does not require downtime.

7.1 Condensate Tray

The internal condensate tray may be drained through the rear tap. The tray should be emptied every 6 months, or as needed. Note that a full tray will result in an alarm that triggers shutdown of the cooling system. **Caution: Moving the EdgeRack with water in the condensate tray may lead to spillage and damage to racked equipment. Always drain the condensate tray prior to moving the EdgeRack.**

7.2 Filter

The internal air cycle has two filters that are accessible, one on either side, when removing the top side panels. This filter may accumulate dust that can lead to reduced performance. The filters should be rinsed in water and left to dry prior to returning to the unit. Note that with the side panels off, there will be reduced performance of the cooling system.

Important Safety Information

Read the instructions carefully to become familiar with the equipment before trying to install, operate, service, or maintain. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

 **DANGER**

DANGER indicates an imminently hazardous situation which can result in death or serious injury.

 WARNING

WARNING indicates a potentially hazardous situation which can result in death or serious injury.

 CAUTION

CAUTION indicates a potentially hazardous situation which can result in minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage, or loss of data.

Read the handling information before trying to install, operate, service, or maintain equipment. Comply with local regulations and law when handling refrigerant.

 DANGER

Hazard of electric shock, explosion, or arc flash

- **Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.**
- **This equipment must be installed and serviced by qualified personnel only.**
- **Turn off all power supplying this equipment before working on or inside the equipment.**
- **Always use a properly rated voltage sensing device to confirm power is off.**
- **Replace all devices, doors, and covers before turning on power to this equipment.**
- **Ensure proper grounding to earth prior to power up.**
- **Do not apply power if the power cable is damaged.**

Or can result in death or serious injury.

 WARNING

Hazard from moving parts

- Keep hands, clothing, and jewelry away from moving parts. Check the equipment for foreign objects before closing the doors and starting the equipment.

Or can result in death or serious injury.

 CAUTION

Hazard to equipment or personnel

- All work must be performed by company qualified personnel.
- Do not impede air flow for the condenser path or the evaporator path.
- Do not modify the equipment in any way.

Or can result in serious injury or equipment damage.

 WARNING

Hazard of equipment falling over

- Use two or more people at all times to move or turn this equipment.
- Always push, pull, or turn while facing the front and rear of this equipment. Never push pull or turn while facing the sides of this equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower leveling feet to floor when this equipment is at rest.
- Lower leveling feet and attach joining brackets to adjacent racks when this equipment is in final position.

Or can result in serious injury or equipment damage.

 CAUTION

Hazard to equipment or personnel

- Make sure no spare part or tool in equipment before handle equipment.

Or can result in serious injury or equipment damage.

 **CAUTION**

Refrigerant high pressure and hazard to equipment

- The equipment is to be charged with R-410A only.
- Copper pipe must support minimum 55bar pressure.

Or can result in serious injury or equipment damage.

NOTICE

This product cannot be classified and disposed of with other wastes in EU areas. To prevent potentially harmful substances from being introduced to the environment, please recycle waste.