ENCONNEX

Enconnex 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.

- The User Manual must be strictly complied with at the time of installation and throughout the life of the 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 are allowed to 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 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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1. Safety Precautions

1.1. General Safety Precautions

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.
- Equipment damage caused by natural disasters.
- To ensure personal and equipment safety, please follow all safety precautions on the equipment and in the manual during its installation, operation, and maintenance.

1.1.1 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.

1.1.2 Basic Installation Requirements

Personnel performing the RCU installation and maintenance must receive authorized training first to understand various safety attentions and the correct operation methods before equipment installation, operation, and maintenance.

- 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.

1.1.3 Grounding Requirements

⚠⚠CAUTION

The following requirements apply only to equipment that requires grounding:

- Grounding should be installed before any other cabling and should be removed last during equipment removal.
- RCU should not be operated without proper grounding.
- Before operating the RCU, check for proper grounding.

1.1.4 Equipment Safety

⚠WARNING

- Before operation, the RCU should be secured based on local regulatory requirements.
- Do not block the vent during system operation.
- Remove any packing material around the equipment after completing equipment installation.

1.2 Electrical Safety

Safety precautions for high voltage, high discharge of current, power cable, fuse, and electrostatic discharge.

1.2.1. High Voltage

⚠⚠DANGER

- Use proper PPE and OSHA guidelines when handling high voltage.
- Incorrectly handling high voltage can cause fire, electric shock/injury, or other damage.

1.2.2 High Current

⚠⚠CAUTION

Before connecting the power supply, all components requiring grounding must be grounded.

- Use proper PPE and OSHA guidelines when handling high voltage.
- Exposed or damaged wires and cables should be replaced immediately.

1.2.3 Power Cable

⚠⚠DANGER

Personnel should not install or remove live power cables. The moment a power cable core contacts a conductor, electric arc or spark can be generated causing a fire or injury.

- Power supply must be switched off before installing and removing power supply cable.
- Confirm the label and signage of the power supply cable are correct before connecting it.
- Any damaged power supply cable must be replaced.

1.3 Mechanical Safety

Safety precautions of drilling, sharp objects, fans, and heavy object handling.

1.3.1 Drilling

⚠WARNING

Drilling which does not meet requirements can damage internal components, pipelines, or cables in the equipment. When entering the cabinet, metal chips from drilling will clog the pipeline, or cause a short circuit of the circuit board.

- Any custom drilling should be approved by client, contractor and Enconnex in advance.
- Cables in the cabinet should be removed before drilling the cabinet.
- During drilling, appropriate PPE should be worn.
- Prevent metal chips from entering the cabinet. Metal chips should be cleaned and removed before operating the RCU.

- Wear appropriate PPE and follow OSHA guidelines when handling heavy objects.

1.4 Operation Safety

⚠CAUTION

- Pay attention to rotating components at high speeds: fan.
- Pay attention to high temperature components.
- Pay attention to high voltage components: interior components of electric control box.

1.5 Safe Disposal of the RCU

The signage indicates that 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 wastes to promote sustainable use of material resources. Please use a recycling system or contact a retailer purchasing the product to recycle used equipment. They can ensure safe and environmentally friendly recycling and use of the product.

2. Product Overview

2.1 Product Orientation

The EdgeRack by Enconnex is a fully self-contained unit, with a rack mounted system designed to cool up to 5kW of Compute power in a 10U top of rack footprint. 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, this all-in-one self contained system can be installed in almost every environment.

2.2 Product Characteristics

- Industry-leading cooling capacity up to 5kW
- Compact 10U footprint
- Integrated basic controls for monitoring the unit come standard, advanced control options are available
- Uses standard 208VAC - 220VAC

2.3 Product Composition

ECX Series Rack Cooling Unit consists of an indoor unit, controller, and outdoor unit. Its components are shown in Figure 2-2 and Figure 2-3.

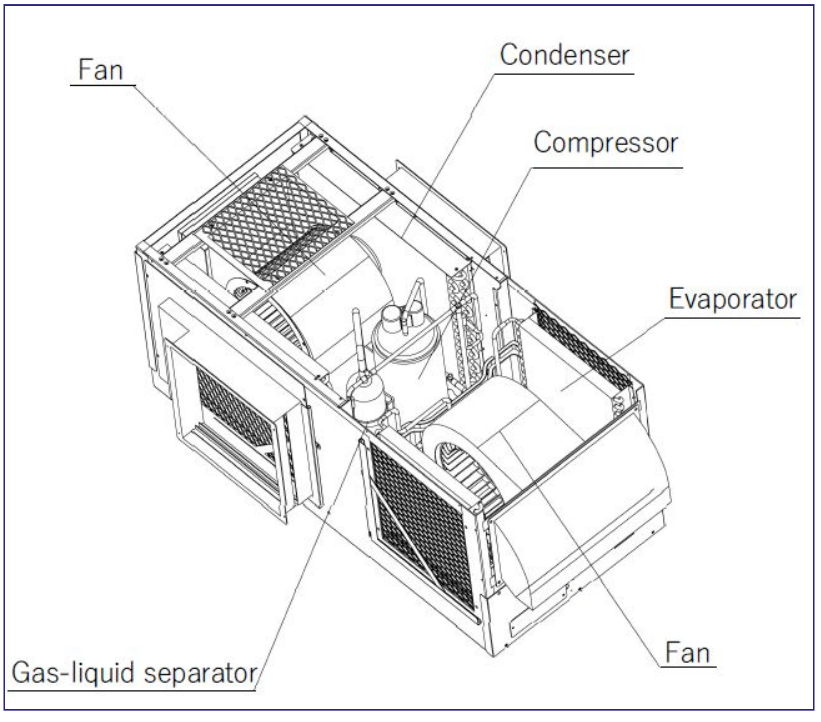


Figure 2.3-1: Sketch of the unit system components (Internal)

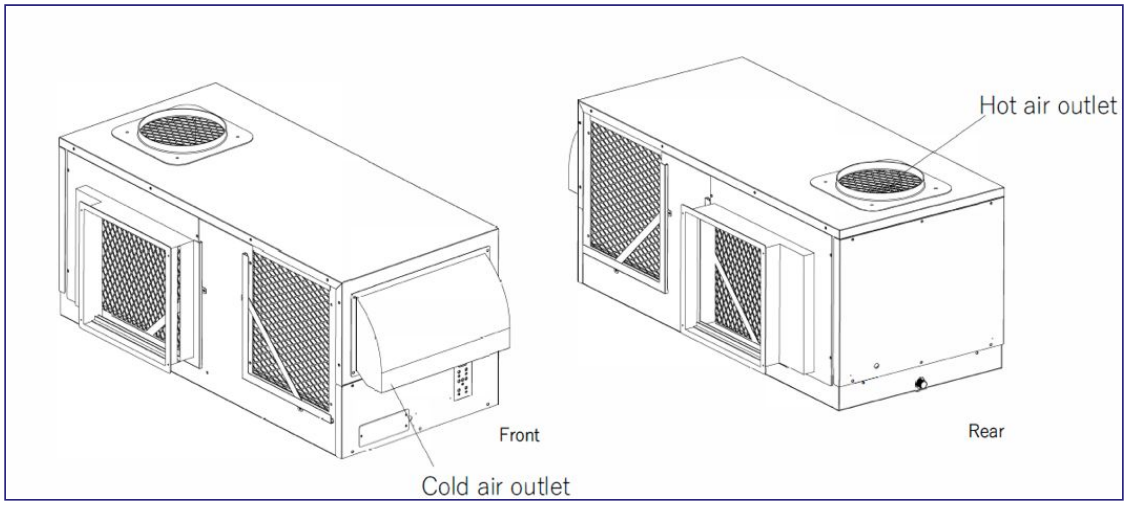


Figure 2.3-2 Sketch of unit system components (External)

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

2.3.1 Rack Cooling Unit Dimensions

Standard RCU dimension structure is shown in Figure 2-4.

(Please refer to the real object for details)

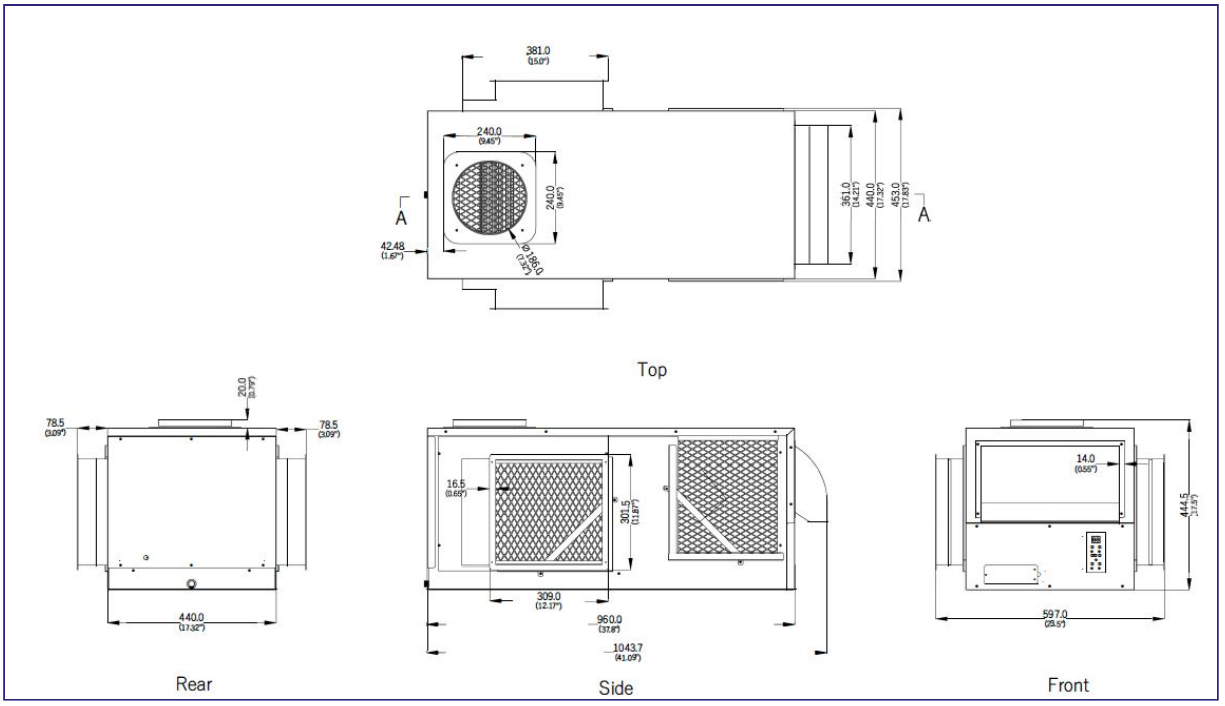


Figure 2.3-3: Structure of Rack Cooling Unit

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

Evaporator

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

Condenser fan

- Condenser fan is one speed and synchronizes with the compressor

Liquid storage tray

- Built-in condensate tray that will shut the unit down when full. There is a valve in the rear of the unit to empty the tray and the unit will stop alarming and start back up.

2.3.2 Controller

Controller system consists of a main control panel, temperature sensors, compressor, and fan.

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 minutes 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 upon request.
- The condenser fan has only one speed that is synchronized with the compressor.
- Self-diagnostic error code display.
- Memory function during power shutdown (or unplug).
- The default display is the ambient temperature.

- The temperature default setting is Fahrenheit and is interchangeable between Fahrenheit & Celsius.
- The controller buttons do not emit sound but there are audible alarms for alerts.

Characteristics of the controller:

- The normal operating voltage range: single-phase 208 - 220VAC.
- Operating temperature range: -10 °C ~ + 60 °C.
- Storage temperature range: -20 °C ~ + 70 °C.
- Relative humidity range: 35% to 98%.
- The temperature sensor: R25 / 50 = 5K, B = 3470, accuracy: ± 1 °C.
- 65dB under normal operating conditions

3. Installation Guide

3.1 Installation Notice

In order for the RCU to achieve the most effective operation and the longest service life, please install it according to the following requirements:

- Before equipment installation, first confirm whether the installation environment conforms to the installation requirements (See 3.1.4 Installation requirements for details) and whether the building needs to be modified for pipe installation, wiring or ventilation ducts.
- Strictly follow the design drawing and reserve maintenance space when installing.

3.1.1 Required Tools

The main installation tools for the RCU are screwdriver (Philips) and server lift.

3.1.2 System Installation Layout

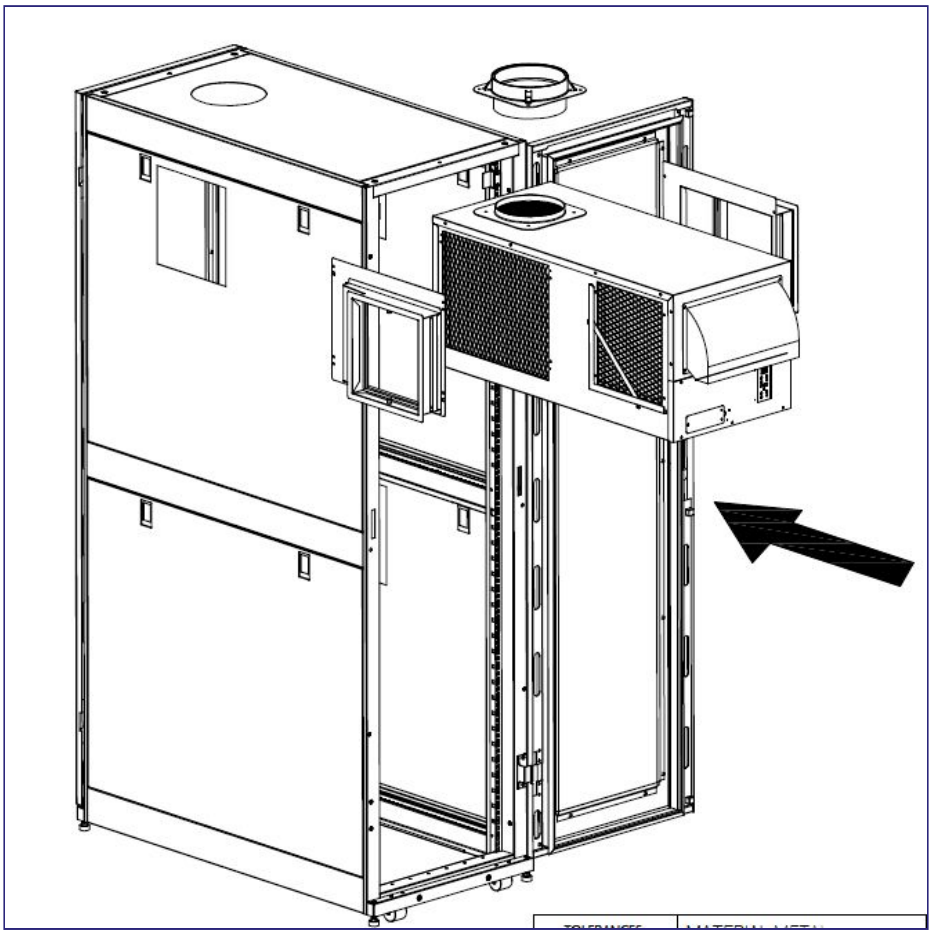


Figure 3.1-1: RCU installation into EdgeRack Cabinet

3.1.3 Installation Requirements

Installation Requirements for EdgeRack and RCU

- During system operation, all doors and windows of the server room or equipment room should be closed, and the external gap should be as small as possible so as to reduce additional loads to the RCU and to keep the cleanliness of the server room.
- When installing the EdgeRack, a service area of greater than 600mm is recommended.
- The assembly floor for the EdgeRack should be capable of bearing the weight of the units.

3.2 Installation Recommendations

- Using a dedicated 20A breaker for the RCU's power source will prevent:
  - Faults caused by other equipment in the room and their ability to affect the RCU's power.
  - Surge current from the RCU's compressor affecting other equipment in the room.
- DO NOT Plug 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.

3.3 Installation Procedure

The installation procedure for the EdgeRack Cabinet and RCU is as follows:

- Transport and unboxing of the products.
- Removing the RCU and rails.
- Installing Rails and RCU.
- Removing the side panels.
- Installing baffles and side panels.

3.3.1 Transportation and Unboxing

In the process of transporting RCUs, 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 ±15° in either direction in the process of loading and unloading.

⚠WARNING

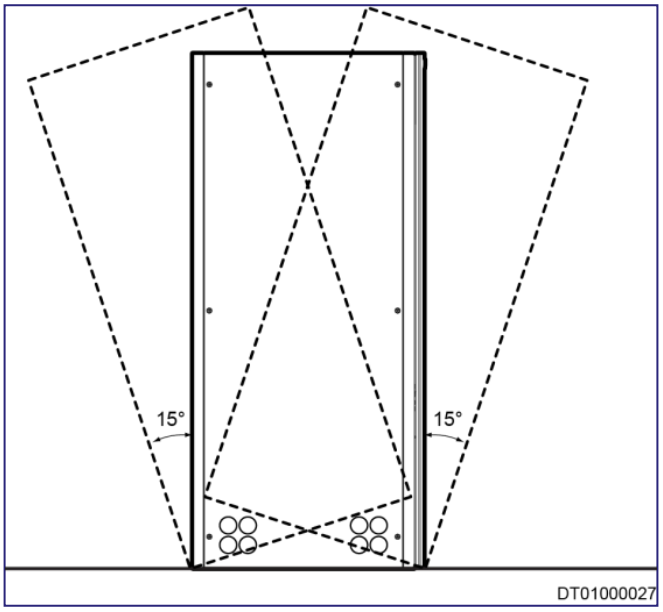


Figure 3.2-1: Transportation Diagram

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.

Precondition

Try to move the RCUs to the place which is the nearest to the installation position and then remove wooden cases and pallets so as to be convenient for the cabinet to move and to avoid damage.

Operation Procedure

Step 1: Confirm no damage on external packing of the cabinet. If there is any damage, please immediately contact the carrier.

Step 2: Unboxing

- Remove the head cover.
- Remove the external packing.
- Remove the packing buffer materials.
- Remove the plastic packing.
- Clear surrounding area.

Step 3: Check whether the cabinet surface is intact, without damage or scratch marks. If there is any damage, please immediately contact the carrier.

Step 4: 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.

3.3.2 Removing RCU and Rails

The RCU comes installed at the bottom of the rack for shipping purposes. Remove the RCU using a server lift. Using a screwdriver or power drill, remove the rails that were supporting the RCU.

3.3.3 Installing RCU and Rails

Install the rails 10U from the top to support the RCU. Using the server lift, lift the RCU and install it on the top of the rack.

3.3.4 Remove Side Panel

Removal of both top side panels is necessary to access the side vents of the RCU.

3.3.5 Install Baffles and Side Panels

For the side vent, there are two pieces to the baffle. One attaches to the RCU vent itself while the other attaches to the side panel as shown in the general system layout drawing. After installing the first piece, reinstall the side panel and install the second piece of the baffle. There is another baffle/vent that attaches to the front of the RCU. Install the baffle with the vent pointing down so it can send cool air down the front of the rack. Finally, install the duct on top of the rack to exhaust the heat from the rack. We recommend connecting the exhaust to an HVAC return-air line duct.

4. Controller

4.1. Controller Panel

2 x 7-segment LED digital display in blue & 6 x LED indicators:

- Cooling
- Fan Speed Hi
- Fan Speed Low
- Auto
- Alarm
- Timer

4.2 Operation Instructions

Figure 4.2-1: RCU Controller - Operation Instructions

5 Inputs:

- **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 temp. 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.

Figure 4.2-2: Operation Controller 2

4.3 Sequence of Operations

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.

4.3.1 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 Temp ≥ Temp setpoint +1°C (+2°F), the compressor and the condenser fan are both running.
- When Temp ≤ Temp setpoint - 1 °C (-2 ° F), the compressor and the condenser fan stop.
- When Temp = Temp setpoint, the compressor and condenser fan keep the previous state

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

4.3.2 Fan Speed

Fan speed of the evaporators 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:

Temp ≥ Temp setpoint + 3 °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 light up.

4.3.3 Self-Evaporating Motor

In cooling or dehumidifying mode, after the compressor starts up, the self-evaporating motor will start up 5 seconds later and turn off when the compressor stops.

4.3.4 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.

4.3.5 Critical Alarm Protection and Controls

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

- **Water 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 T1 Fault:**

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

  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.

  When the “ALARM” indicator flashes, the beeper will be activated to alert the end user until troubleshooting.

- **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.

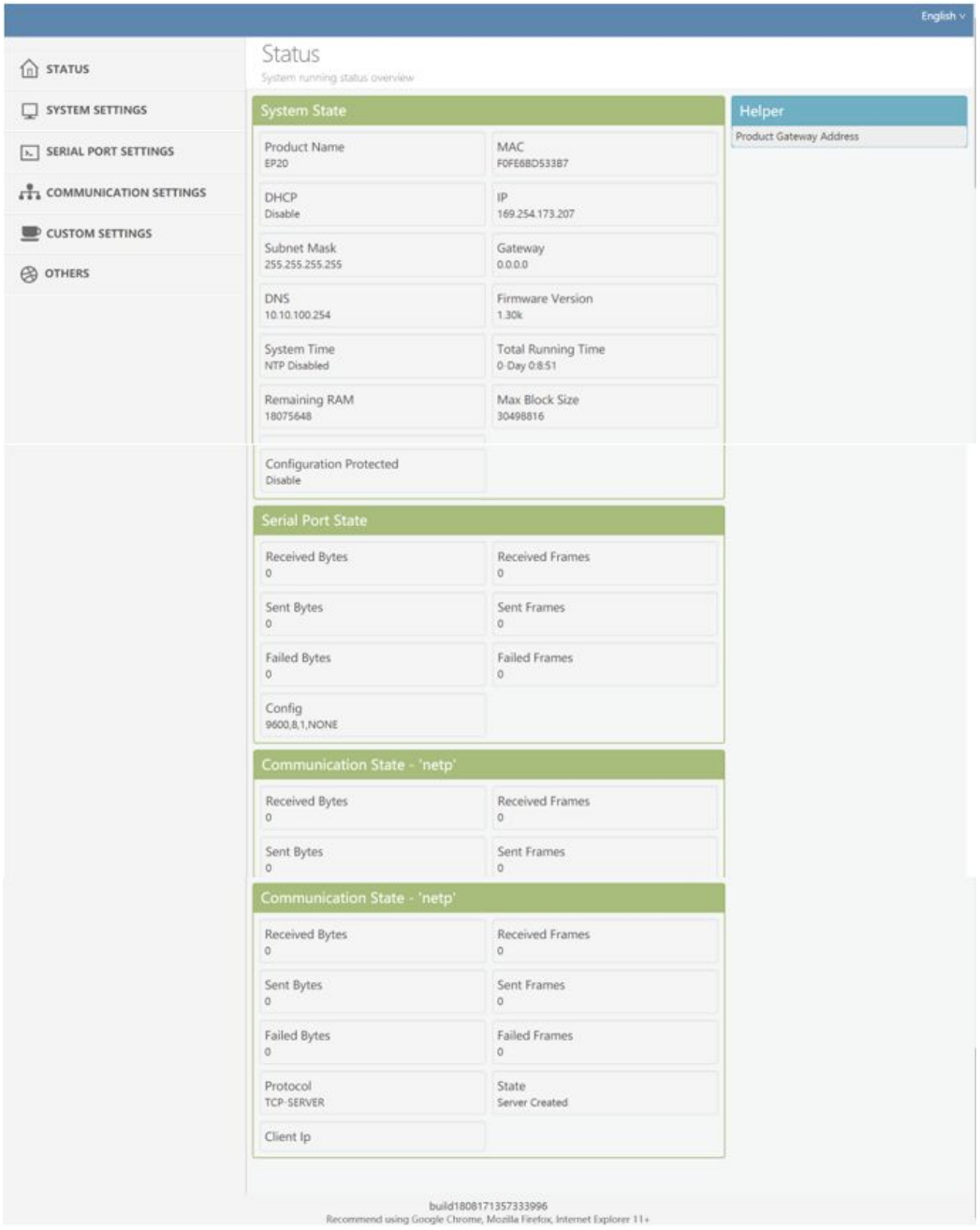
5. SNMP Communication

The unit supports SNMP communication. Any SNMP walk software will work. MIB browser is recommended. The submittal package with the unit comes with the MIB file required to read all the points correctly.

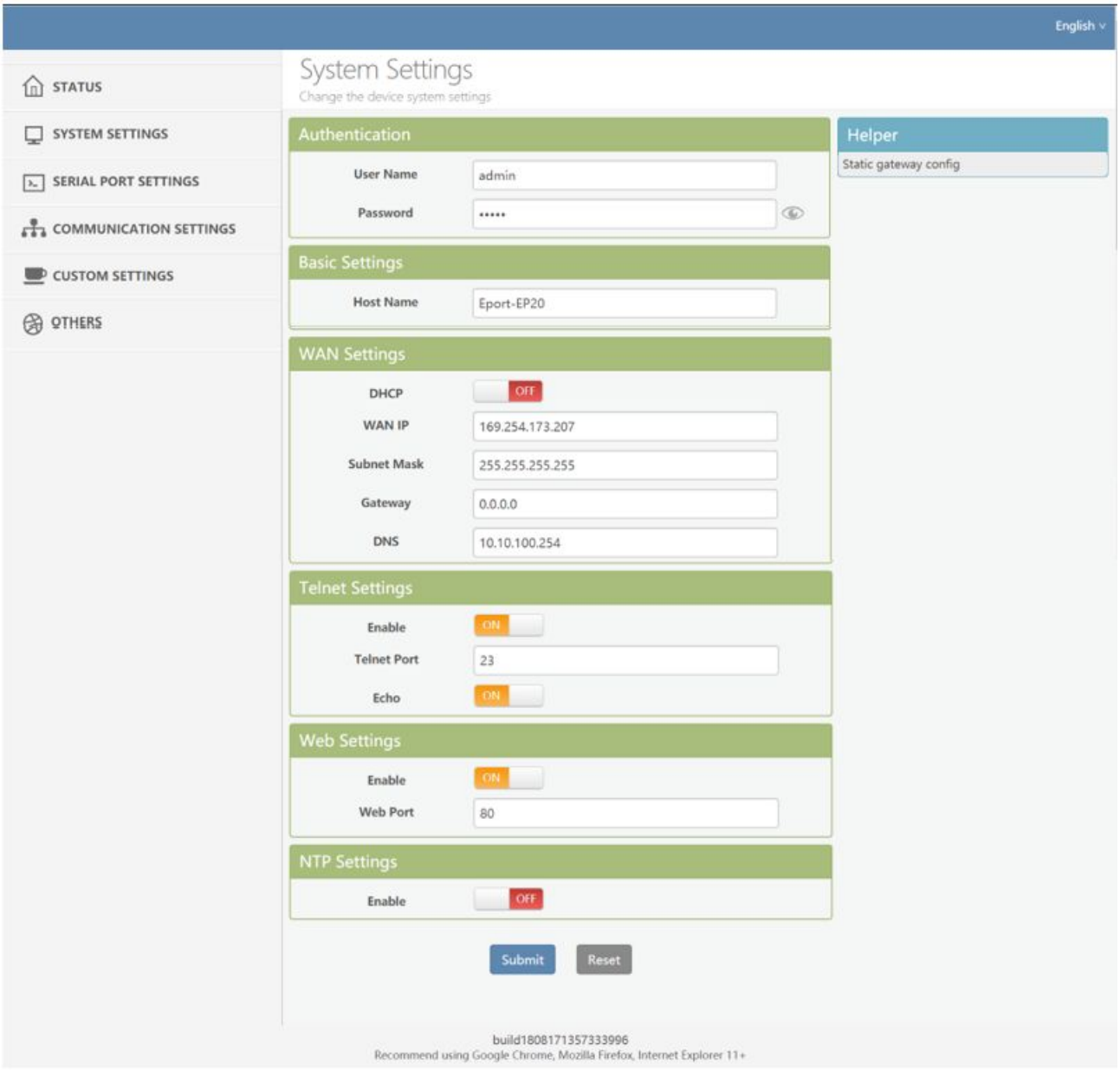
6. Web GUI Controls

- To access the Web GUI for your RCU plug a computer into the front of the unit via an ethernet cable.

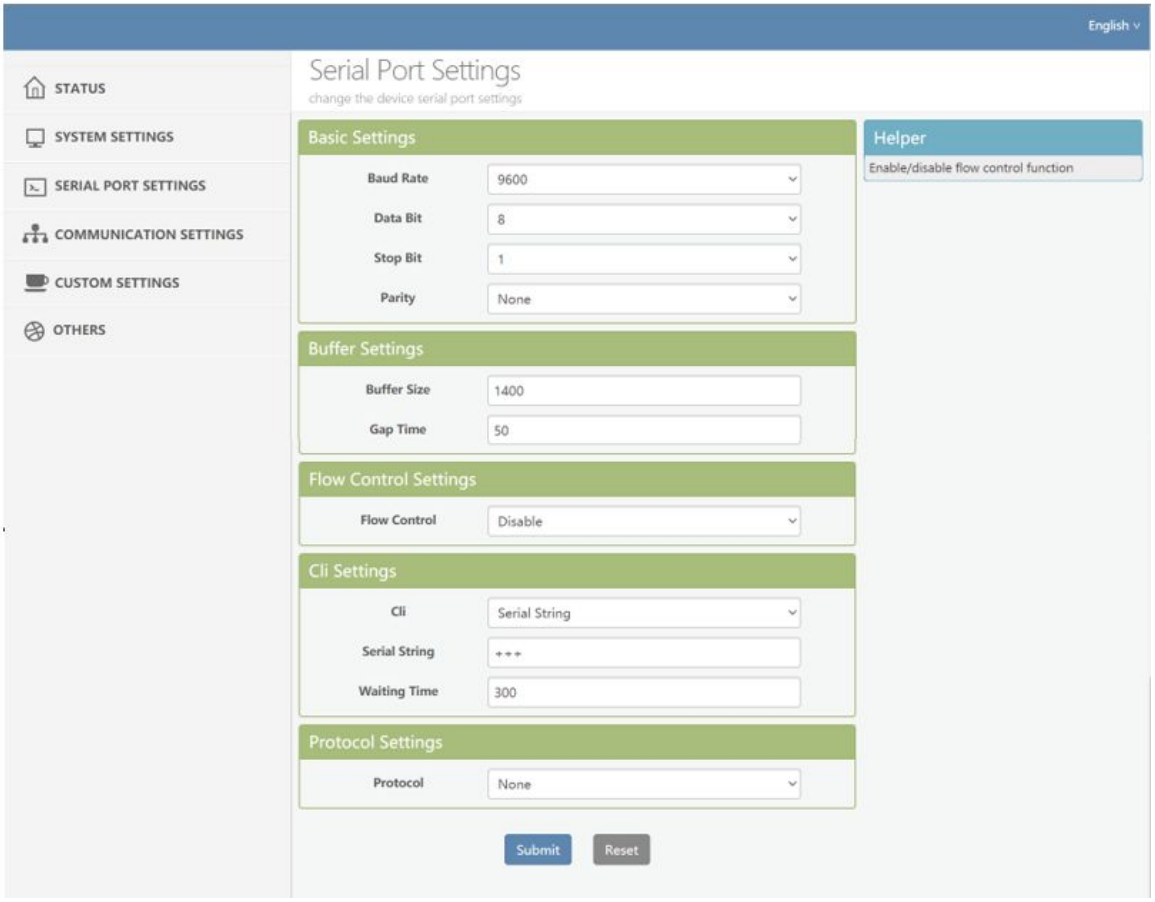
6.1 Status



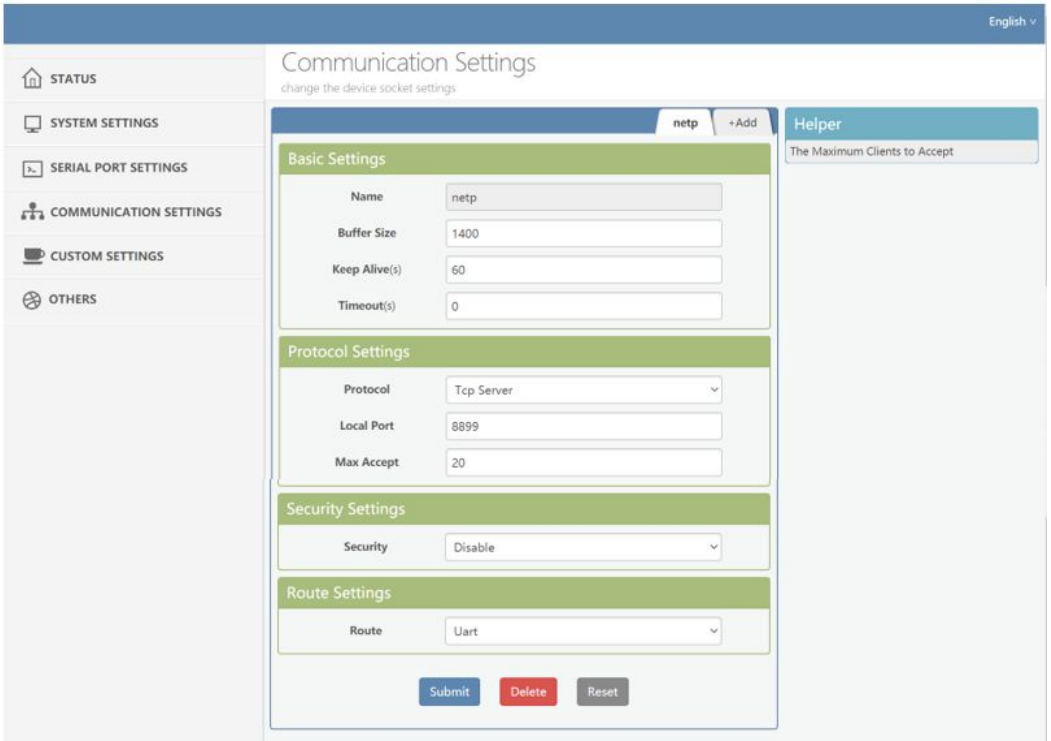
6.2 System Settings



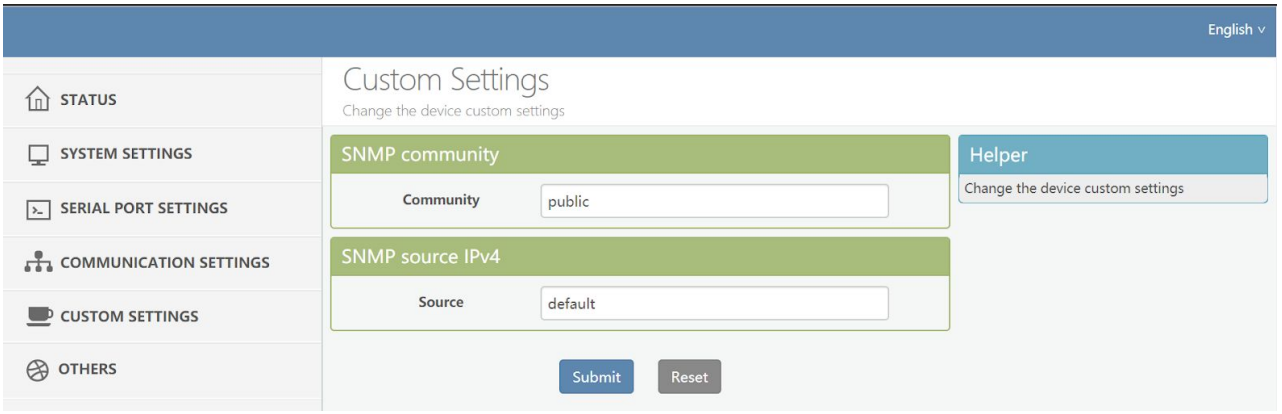
6.3 Serial Port Settings



6.4 Communication Settings



6.5 Custom Settings



6.6 Others

Safety

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 handle 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.

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.

Or can result in serious injury or equipment damage.

⚠WARNING

Hazard of equipment falling over

- **Use two or more persons 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.