UC-8112-LX-STK User's Manual

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www.moxa.com/product

UC-8112-LX-STK User's Manual

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Technical Support Contact Information

www.moxa.com/support

Moxa Americas
Toll-free: 1-888-669-2872
Tel: +1-714-528-6777
Fax: +1-714-528-6778

Moxa China (Shanghai office)
Toll-free: 800-820-5036
Tel: +86-21-5258-9955
Fax: +86-10-6872-3958

Moxa Europe
Tel: +49-89-3 70 03 99-0
Fax: +49-89-3 70 03 99-99

Moxa Asia-Pacific
Tel: +886-2-8919-1230
Fax: +886-2-8919-1231

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Introduction

Moxa's UC-8112 Series Starter Kit is an ideal hardware and software package for system evaluation. Containing a UC-8100 computer, optional cellular and Wi-Fi modules, and various software packages, this compact Starter Kit helps users establish their system architecture in no time.

The following topics are covered in this chapter:

- **Overview**
- **Model Descriptions**
- **Package Checklist**
- **Product Features**
- **Hardware Specifications**
- **Hardware Block Diagram**

Overview

The UC-8112-LX Starter Kit offers a cellular or Wi-Fi module that users can easily install to establish wireless communication between the UC-8100 and the peripheral devices. In addition, system integrators can easily evaluate the result of remote management for some specific industrial tasks, such as data acquisition, and system integration.

Model Descriptions

The UC-8112-LX-STK series includes the following models:

- **UC-8112 Starter Kit with LTE-EU:** Compatible with LTE, HSPA, GPRS/GSM, GPS
- **UC-8112 Starter Kit with LTE-US:** Compatible with LTE, HSPA, GPRS/GSM, GPS
- **UC-8112 Starter Kit with Wi-Fi:** Compatible with IEEE 802.11b/g/n
- **UC-8112 Starter Kit**

Package Checklist

Before installing the UC-8112, verify that the package contains the following options:

UC-8112-LX Computer Kit

- UC-8112-LX computer x 1
- Console cable x 1
- GPS antenna x 1
- Cellular antenna x 1
- Wi-Fi antenna x 1
- DIN rail mounting kit x 1
- 1 GB SD x 1
- Power jack x 1
- Power adapter x 1

Wi-Fi module kit

- Wi-Fi module x 1
- Wi-Fi antenna cable x 1

Cellular Module Kit

- Cellular module x 1
- Cellular antenna cable x 1

NOTE: Notify your sales representative if any of the above options are missing or damaged.

Product Features

- ARMv7 Cortex-A8 300/600/1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- SD socket for storage expansion and OS installation
- Rich programmable LEDs and a programmable button for easy installation and maintenance
- Mini PCIe socket for cellular module
- Debian ARM 7 open platform
- Cybersecurity

Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 300/600/1000 MHz
USB: USB 2.0 host x 1 (type A connector)
DRAM: 256 MB DDR3 SDRAM (512 MB by request)
OS (pre-installed): Debian ARM 7 (Kernel 3.2)

Storage

Storage Expansion:

- SDHC/SDXC socket for storing OS and storage expansion
- 1 GB SD card with OS pre-installed
- MicroSD socket for storage expansion (UC-8112-LX/UC-8112-T-LX only)
- 2 GB MicroSD cards with OS pre-installed (UC-8112-LX/UC-8112-T-LX only)

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: 1 or 2 RS-232/422/485 ports, software-selectable (5-pin terminal block connector)
Console Port: RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: Max. 921600 bps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power x 1, USB x 1, SD x 1, signal strength x 3 (UC-8112/8162/8132 with cellular module)
LAN: 10M/100M on connector
Programmable: Diagnosis x 3

Switches and Buttons

Push Button: Initially configured to return a diagnostic report, and to reset the device to factory defaults

Physical Characteristics

Housing: Polycarbonate plastic
Weight: 224 g
Dimensions: 101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting: DIN rail, wall (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 80°C (-40 to 176°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Anti-Vibration: 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)
Anti-Shock: 20 g @ IEC 60068-2-27, half sine wave, 30 ms

Power Requirements

Input Voltage: 12 to 24 VDC (3-pin terminal block, V+, V-, SG)

Power Consumption: 5.4 W (without cellular module and external USB device attached)

- 450 mA @ 12 VDC
- 225 mA @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, EN 60950-1, CCC (GB9254, GB17625.1)

EMC: EN55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A

Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)

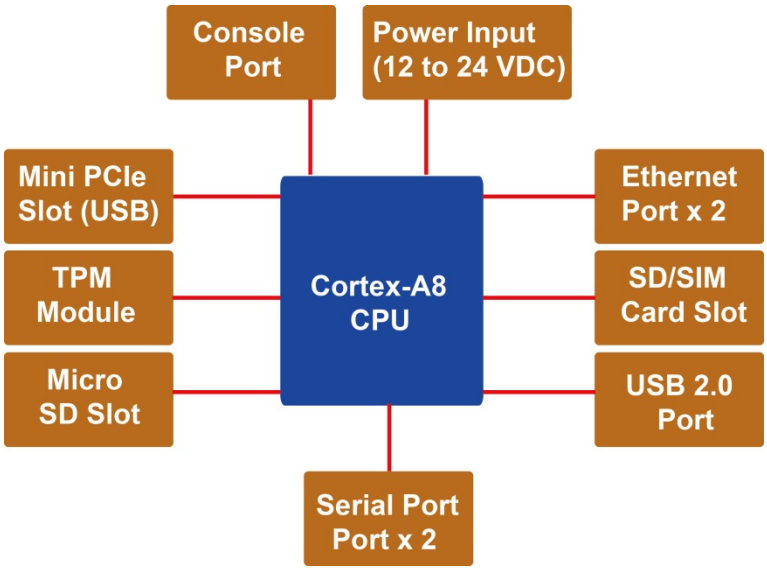
Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Hardware Block Diagram



2

Hardware Introduction

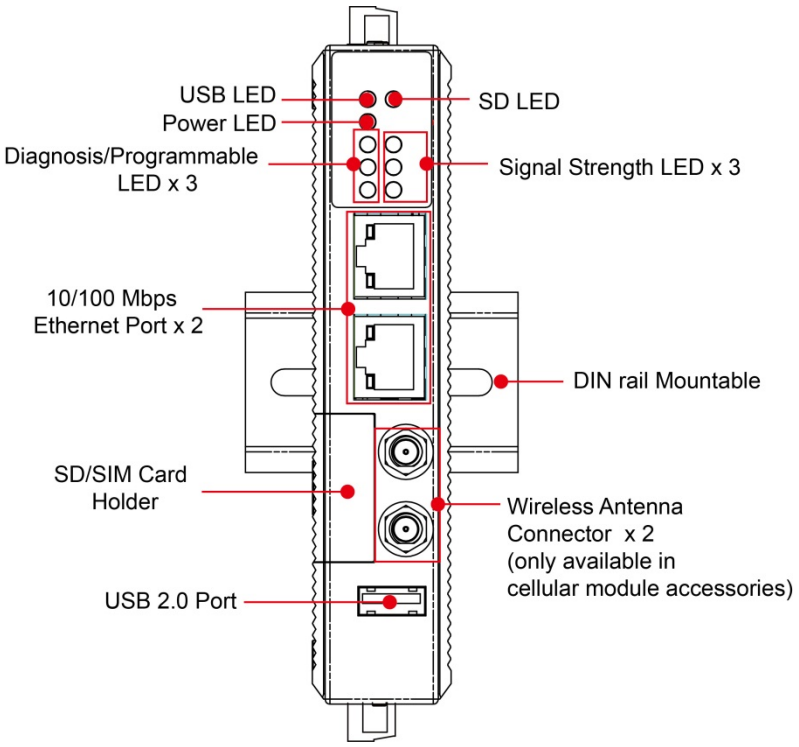
The UC-8112 embedded computers are compact and rugged, making them suitable for industrial applications. The LED indicators allow users to monitor performance and identify trouble spots quickly, and the multiple ports can be used to connect a variety of devices. The UC-8112 comes with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. In this chapter, we provide basic information about the embedded computer's hardware and its various components.

The following topics are covered in this chapter:

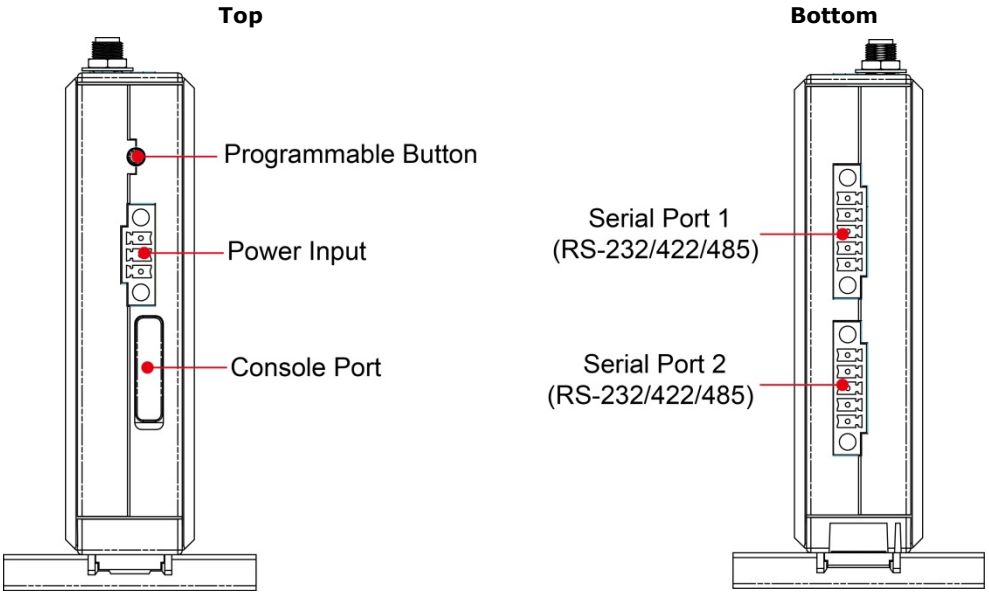
- **Appearance**
- **LED Indicators**
- **Default Programmable Button Operations**
- **Reset to Default Button**
- **Real Time Clock**
- **Placement Options**
  - DIN Rail Mounting
  - Wall or Cabinet Mounting

Appearance

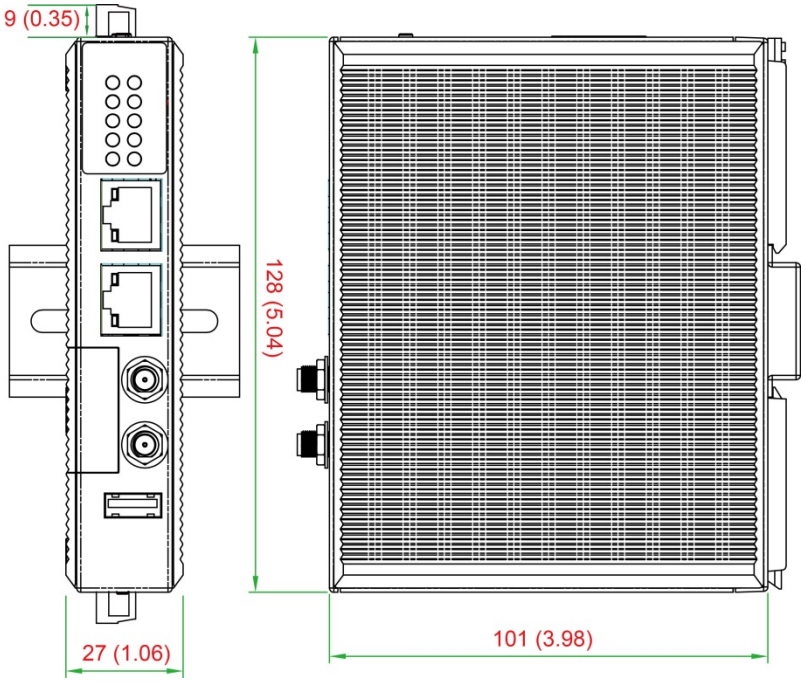
Front View



Top & Bottom Views



Dimensions



units: mm (in)

LED Indicators

Refer to the following table for information about each LED.

LED Name		Color	Function	
	USB	Green	Steady On	USB device is connected and working normally
			Off	USB device is not connected.
	SD	Green	Steady On	SD Card inserted and working normally
			Off	SD Card is not detected
	Power	Green	Power is on and the computer is working normally.	
		Off	Power is off.	
	LAN1/2 (On RJ45 connector)	Green	Steady On	100 Mbps Ethernet link
			Blinking	Data transmitting
		Yellow	Steady On	10 Mbps Ethernet link
			Blinking	Data transmitting
		Off	Ethernet is not connected	
	Wireless Signal Strength	Green Yellow Red	Number of glowing LEDs indicates signal strength 3 (Green + Yellow + Red): Excellent 2 (Yellow + Red) : Good 1 (Red) : Poor	
		Off	Wireless module not detected	
Diagnosis	Diagnosis	Green Yellow Red	These 3 LEDs can be programmed by the user (Refer to Chapter 3 in the Hardware Manual for details.)	

Default Operations for Programmable LEDs

Status of the 3 LEDs			
Green LED	**Yellow LED**	**Red LED**	**Status Description**
Off	Off	On	SD Card Error – Can't read from or write to the SD card
Off	On	On	WAN Ethernet Error – WAN Ethernet controller malfunction
On	Off	On	LAN Ethernet Error – LAN Ethernet controller malfunction
Off	Blinking	On	IP Address Error – IP Address conflict; re-configure the UC-8110's LAN IP address to solve this problem
Off	Off	Blinking	Power-Off Warning Power off may result in damage to the UC-8110 due to • Updating firmware • Saving configuration • Initialization process
On	On	On	RS-232 Interface Error
Blinking	Blinking	Blinking	Proceeding with Self Diagnosis
Blinking	Off	Off	Automatic Pairing (Button) • Press and hold the button for 2 seconds to enable automatic pairing mode. • Simply click the button "Smart Connect" on the software utility (Moxa Nexus for Windows, iOS, or Android) on any handheld device to seamlessly access this device via the Moxa Cloud Solution. • Automatic pairing mode will be disabled after X seconds. (X is configurable, default is 30.) • When automatic pairing mode is enabled, the green "Diagnosis" LED will keep blinking. • Any successful pairing will disable the automatic pairing mode immediately.
Off	Blinking	Off	Automatic Pairing (QR-Code) • Scanning the QR-Code on the UC-8110 from the software utility on a handheld device will enable automatic pairing mode • Refer to "Automatic Pairing (Button)" • The only exception is the Yellow "Diagnosis" LED, which will keep blinking when automatic pairing mode is enabled.
Off	On	Off	Reset to Factory Default

Reset to Default Button

Press and hold the **Reset Button** continuously for at least 5 seconds to load the **factory default configuration**. After the factory default configuration has been loaded, the system will reboot automatically. The **Ready** LED will blink on and off for the first 5 seconds, and then maintain a steady glow once the system has rebooted.

We recommend that you only use this function if the software is not working properly and you want to load factory default settings. The **Reset to Default** functionality is not designed to hard reboot the UC-8112.

ATTENTION

Reset to Default preserves user's data

The **Reset to Default** function will NOT format the user directory and erase the user's data. Using the Reset to default function will only load the configuration file. The rest of the user's data stored in the Flash ROM will remain intact.

Real Time Clock

The UC-8112's real time clock is powered by a lithium battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.

WARNING

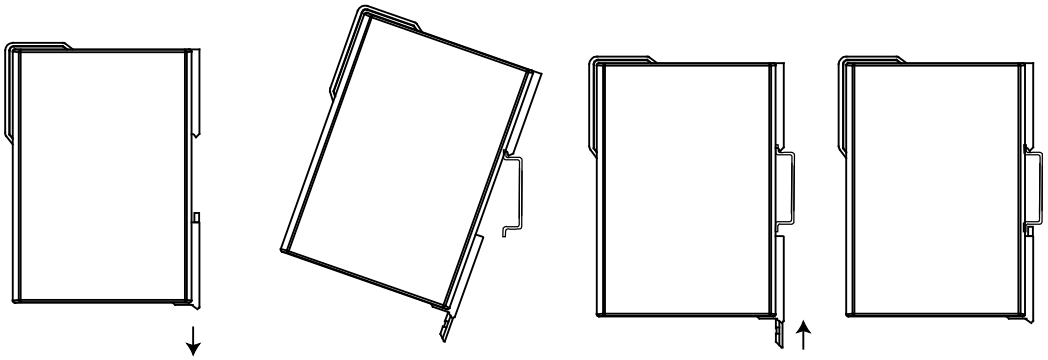
There is a risk of explosion if the battery is replaced by an incorrect type.

Placement Options

There are two sliders on the back of the unit for DIN rail and wall mounting.

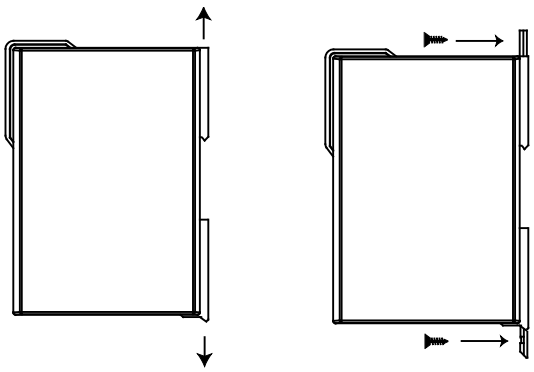
DIN Rail Mounting

Pull out the bottom slider, latch the unit onto the DIN rail, and push the slider back in.

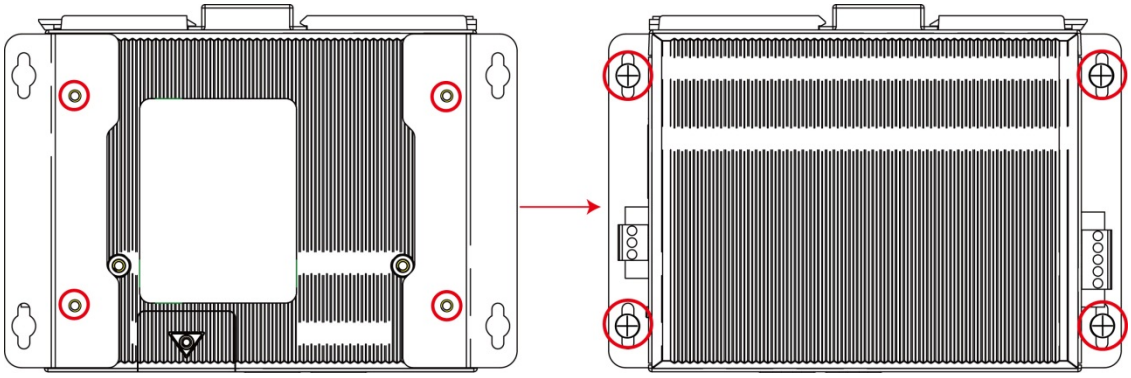


Wall or Cabinet Mounting

Pull out both the top and bottom sliders and align the screws accordingly.



Another method for wall mounting installation is to use the optional wall mounting kit. Attach two mounting brackets on the side panel of the computer, and fasten with screws. Install the computer on a wall or cabinet by fastening two screws for each bracket.



NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the wall mounting plates.

3

Hardware Connection Description

This chapter describes how to connect the UC-8112 to a network and various devices for first time testing purposes.

The following topics are covered in this chapter:

- **Wiring Requirements**
  - Connecting the Power
  - Grounding the Unit
- **Connecting to the Console Port**
- **Connecting to the Network**
- **Connecting to a Serial Device**
- **Inserting the SD and SIM Card**
- **USB Port**
- **Inserting a Micro SD Card**
- **Installing the Cellular Module**
- **Installing the Wi-Fi Module**

Wiring Requirements

In this section, we describe how to connect various devices to the embedded computer. You should heed the following common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.

ATTENTION

Safety First!

Be sure to disconnect the power cord before doing installations and/or wiring.

Electrical Current Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

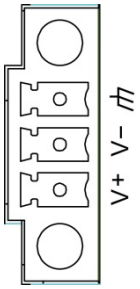
Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

The UC-8112 has a 3-pin terminal block for a 12 to 24 VDC power input.

The following figure shows how the power input interface connects to external power sources. If the power is properly supplied, the Power LED will light up. The Ready LED will glow a solid green color when the operating system is ready (it may take 30 to 60 seconds for the operating system to boot up).

Terminal Block



ATTENTION

The power for this product is intended to be supplied by a Listed Power Supply Unit that is rated to deliver 12 to 24 VDC at a minimum of 450 mA @ 12 VDC, and 225 mA @ 24 VDC.

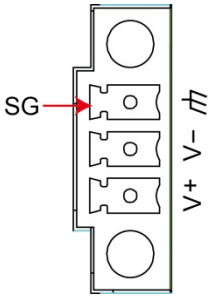
Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

SG: The Shielded Ground (sometimes called Protected Ground) contact is the bottom contact of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.



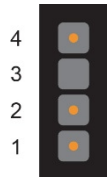
ATTENTION

A shielded power cord is required to meet FCC emission limits and also to prevent interference with nearby radio and television reception. It is essential that only the supplied power cord be used.
You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Connecting to the Console Port

The UC-8112's console port is a 4-pin pin-header RS-232 port located on the top panel of the case. It is designed for serial console terminals, which are useful for identifying the boot up message, or for debugging when the system cannot boot up.

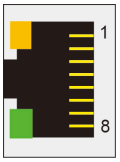
Serial Console Port & Pinouts	Serial Console Cable



Pin	Signal
1	TxD
2	RxD
3	NC
4	GND

Connecting to the Network

Connect one end of the Ethernet cable to one of the UC-8112's 10/100M Ethernet ports (8-pin RJ45) and the other end of the cable to the Ethernet network. If the cable is properly connected, the UC-8112 will indicate a valid connection to the Ethernet in the following ways:



The LED indicator in the lower right corner glows a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

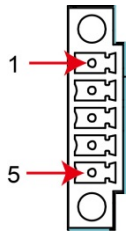
The LED indicator in the upper right corner glows a solid orange color when the cable is properly connected to a 10 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	Signal
1	ETx+
2	ETx-
3	ERx+
4	–
5	–
6	ERx-
7	–
8	–

Connecting to a Serial Device

Use properly wired serial cables to connect the UC-8112 to serial devices. The serial ports of the UC-8112 use the 5-pin terminal block. The ports can be configured by software for RS-232, RS-422, or 2-wire RS-485. The precise pin assignments are shown in the following table:

Terminal Block



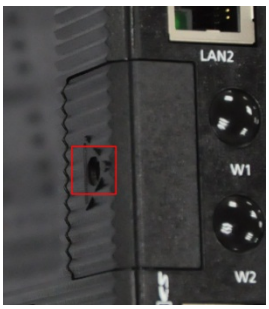
RS-232/422/485 Pinouts

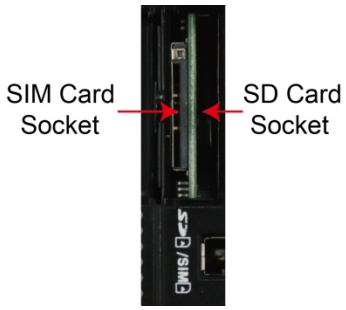
Pin	RS-232	RS-422	RS-485
1	TXD	TXD+	–
2	RXD	TXD-	–
3	RTS	RXD+	D+
4	CTS	RXD-	D-
5	GND	GND	GND

Inserting the SD and SIM Card

The UC-8112 comes with an SD socket for storage expansion, and a SIM card socket that can be installed with a SIM card for cellular communication. The SD card/SIM card sockets are located on the lower part of the front panel. To install them, remove the screw and the protection cover to access the socket, and then plug the SD card and the SIM card into the sockets directly. Remember to push in on the SD card or SIM card first if you want to remove them.

The SD card will be mounted at /mnt/sd.





ATTENTION

The UC-8112 does not support SD hot swap and PnP (Plug and Play) functionality. It is necessary to remove power source first before inserting or removing the SD card.

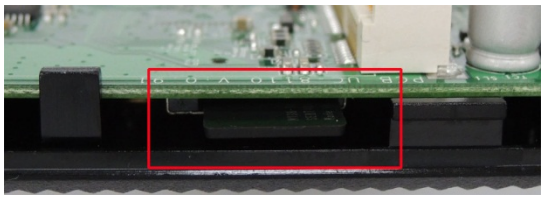
USB Port

The UC-8112 provides 1 USB 2.0 full speed port (OHCI), type A connector, which supports a keyboard or mouse, as well as an external flash disk for storing large amounts of data.

Inserting a Micro SD Card

The UC-8112 comes with a micro SD card socket for storage expansion. Follow these steps:

1. Remove the screws on the side panel, and take off the cover.
2. Insert the micro SD card into the socket. Make sure you insert the card in the correct direction.



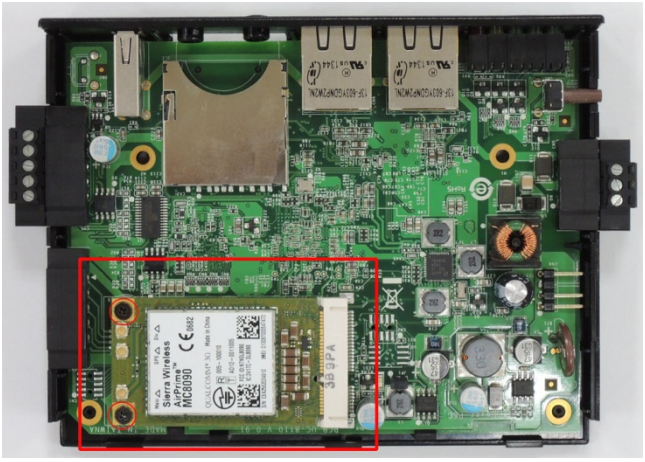
3. Replace the cover to complete the installation.

Installing the Cellular Module

The UC-8112 provides a PCIe socket for installing a cellular socket. Follow these steps:

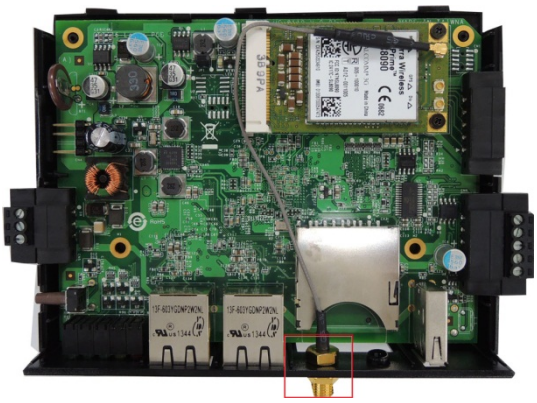
1. Remove the screws on the side panel, and take off the cover.

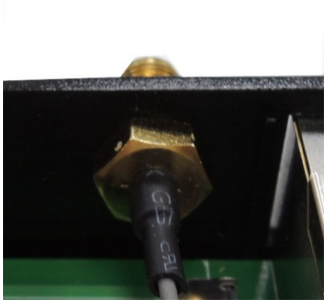
2. Find the location of the PCIe socket. Insert the cellular module into the socket, and then tighten the screws to fasten the socket.



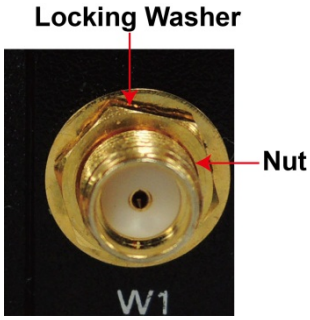
3. Next, you need to install the antenna cable. There are two antenna connectors on the cellular module. Connect the cable to either connector.

4. Plug the other end of the cable into the connector on the front panel of the UC-8112. Remove the black plastic cover first.





5. Install the connector; place the locking washer first, and then tighten the nut.



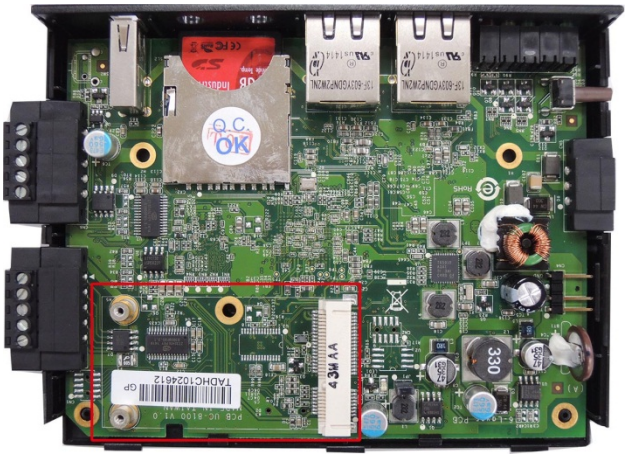
6. Connect the antenna to the connector.

Installing the Wi-Fi Module

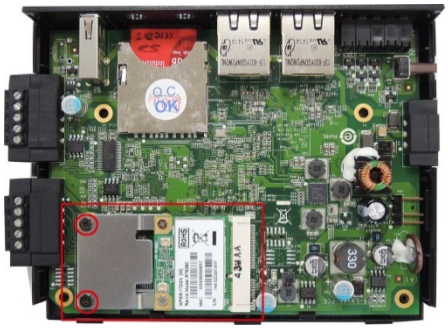
Follow these steps to install the Wi-Fi Module to the UC-8112-LX computer.

1. Remove the screws on the side panel, and take off the cover.

2. Find the location of the PCIe socket. Insert the cellular module into the socket, and then tighten the screws to fasten the socket.

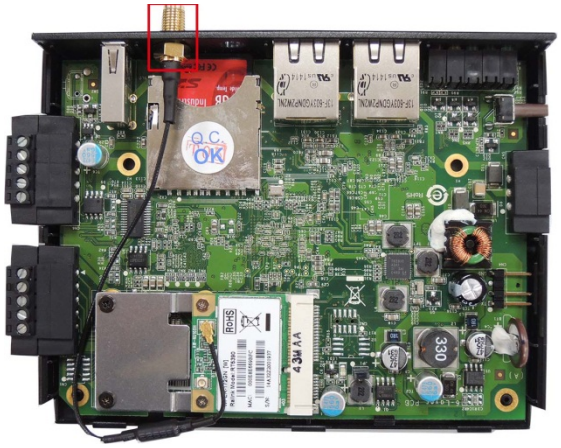


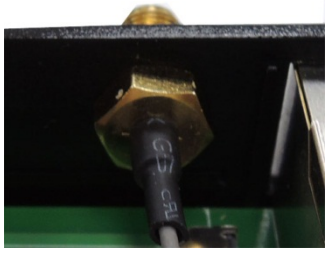
3. Use the two silver screws to fasten the stabilization bracket to the Wi-Fi module. Make sure you connect the bracket in the correct direction. Insert the Wi-Fi module into the PCIe socket, and then fasten with the bracket into place using the two black screws.



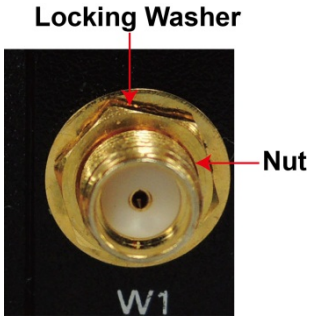
4. Next you need to install the antenna cable. There are two antenna connectors on the Wi-Fi module. Connect the cable onto either connector.

4. Install the other end of the cable onto the connector on the front panel of the UC-8112. Remove the black plastic cover first.





5. Install the connector; place the locking washer first, and then tighten the nut.



6. Connect the antenna to the connector.

4

Remote Configuration and Management

This chapter describes how to use the web-based tool, Webmin, to remotely configure and management the UC-8112-LX computer. Webmin is a web-based system configuration tool that helps users to configure various functions, such as user management, disk quota setting, services or configuration files, as well as modify and control open source apps, such as Apache HTTP Server, PHP orMySQL.

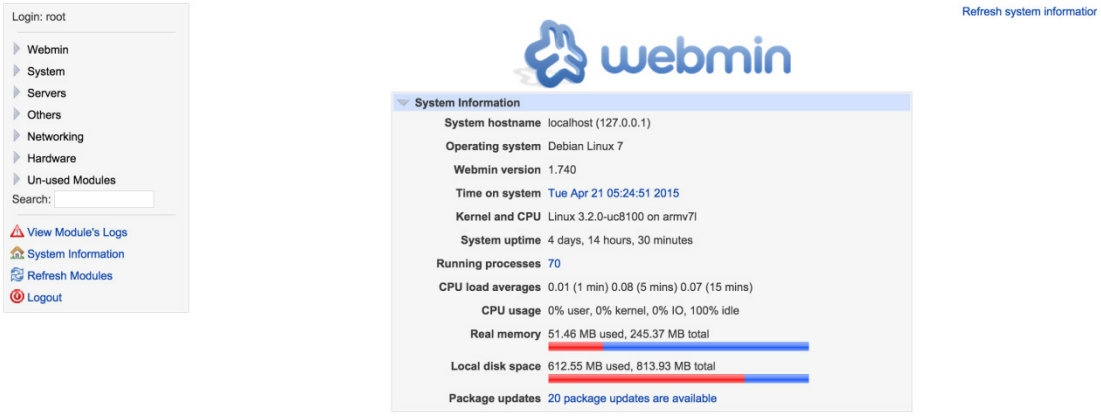
The following topics are covered in this chapter:

Connecting to the UC-8112 via Webmin

Use an Ethernet cable to connect to your laptop or computer to the LAN1 port of the UC-8112 computer. Use a browser and connect with the following address:

https://192.168.3.127:10000

When successfully connected to the UC-8112, the following figure will appear:



Provide the following information for Username and Password:

Username: root
Password: root

The main menu options will be displayed on the left, and the main information of the UC-8100 will be shown in the middle.

Check all of the information for the UC-8112 computer, and then configure the UC-8112 using the menu options on the left.

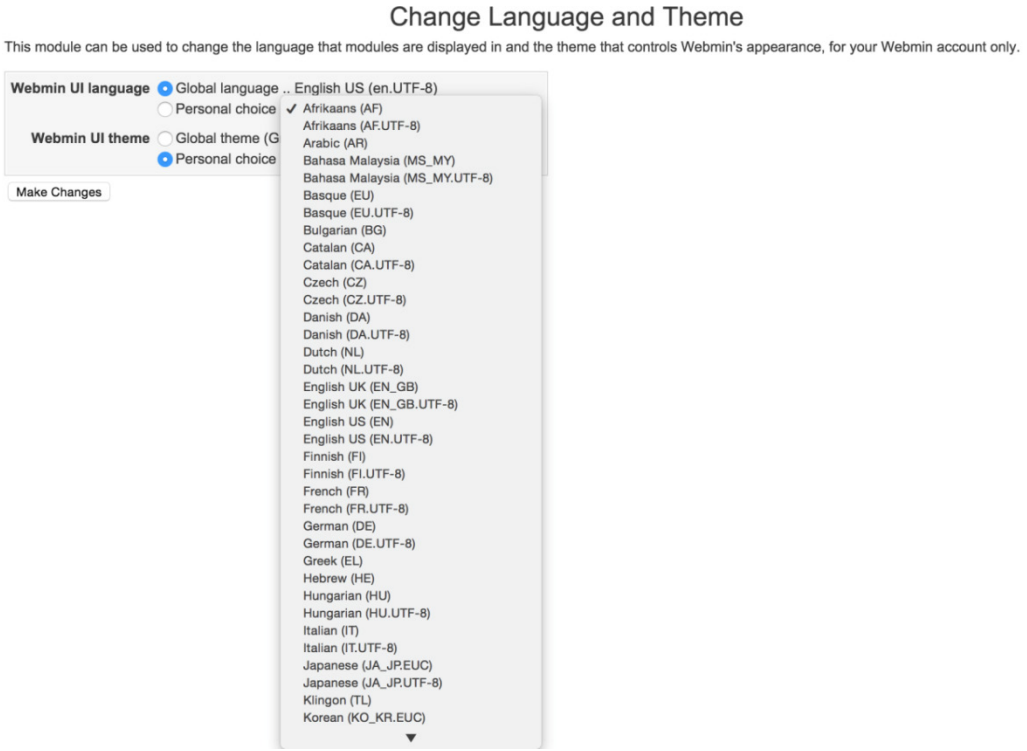
You may also connect the UC-8112 computer to the network, and remotely connect to the IP address of the UC-8112 computer.

Configuring Webmin

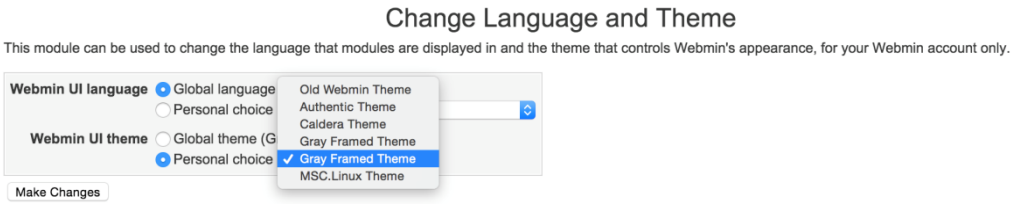
When you click **Webmin**, four options will be displayed. Click the option related to the item or items you would like to configure.

Change Language and Theme

You may change the language from the Personal choice drop-down list, or use the default value, Global language, English as the Webmin UI language.

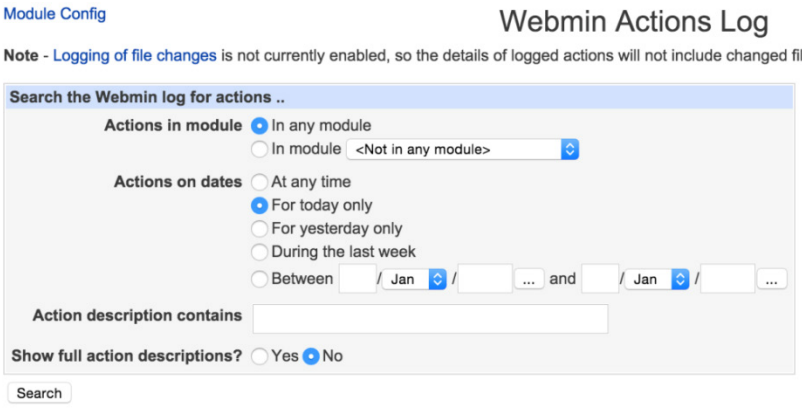


You may also change the theme of the Webmin UI from the Personal choice drop-down list.



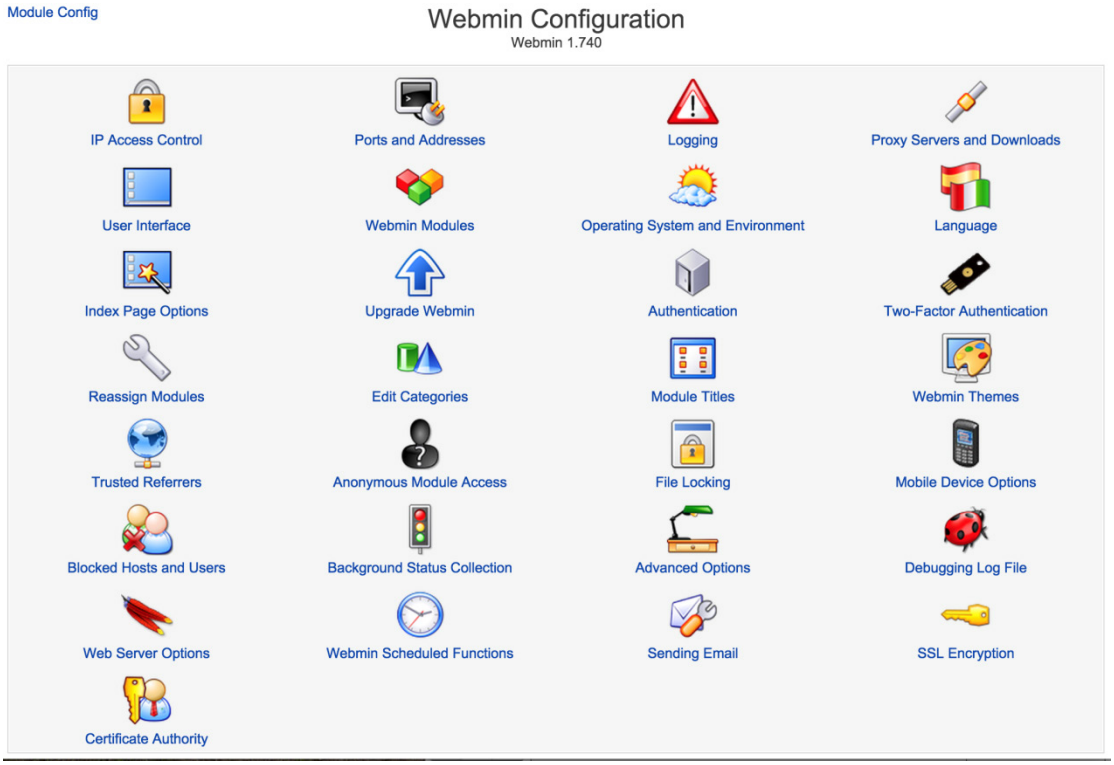
Webmin Action Logs

When the file log function has been enabled, you may find the action log here. If you wish to search the logs in all modules, select **In any module**; if you wish to search the logs in the specific module, select the module in the drop-down list of **In module**. In addition, you may also search the logs by date; select from **Actions on dates** option. You may also search the logs that contain a specific description; provide the description in the **Action description contains** field. When finished, click **Search** to start searching.



Webmin Configuration

This option contains various configuration tools that help users to configure the UC-8112 computer.

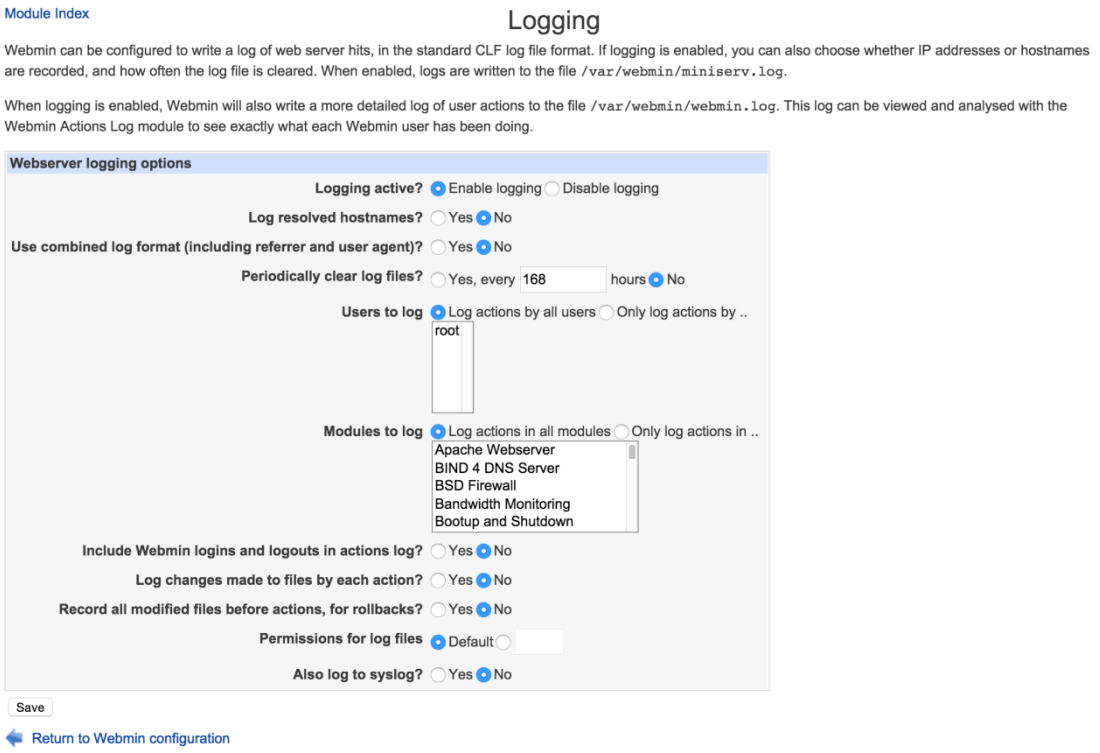


IP Access Control

This option helps you configure the IP address control for the UC-8100 computer. You may allow or deny the specific IP addresses. You may also decide whether or not to resolve the hostname on every request, or use the remote IP address provided by proxy server. When finished, click Save. For other configurations, click **Return to Webmin configuration**.

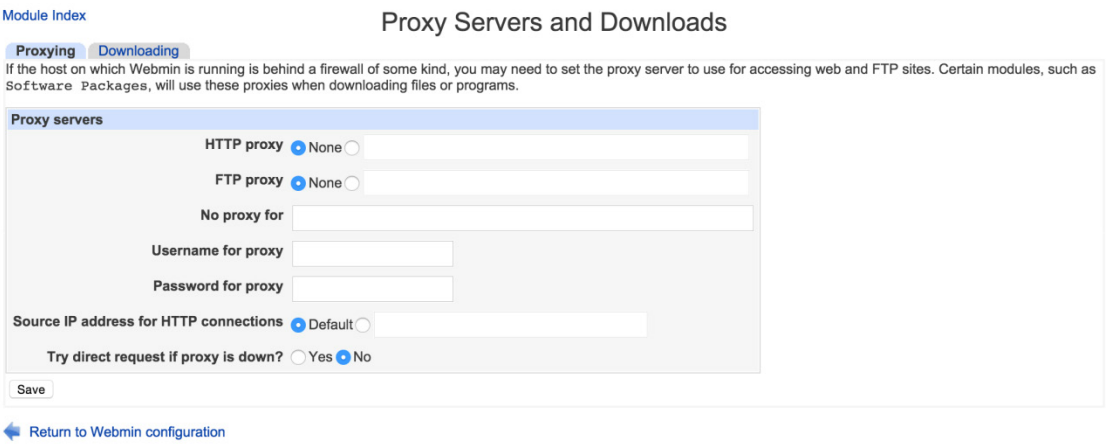
Logging

This option allows you to configure the log functions. You may decide to enable or disable logging function. Other functions are also provided. Users may configure all settings on this page. When finished, Click **Save**. For other configurations, click **Return to Webmin configuration**.



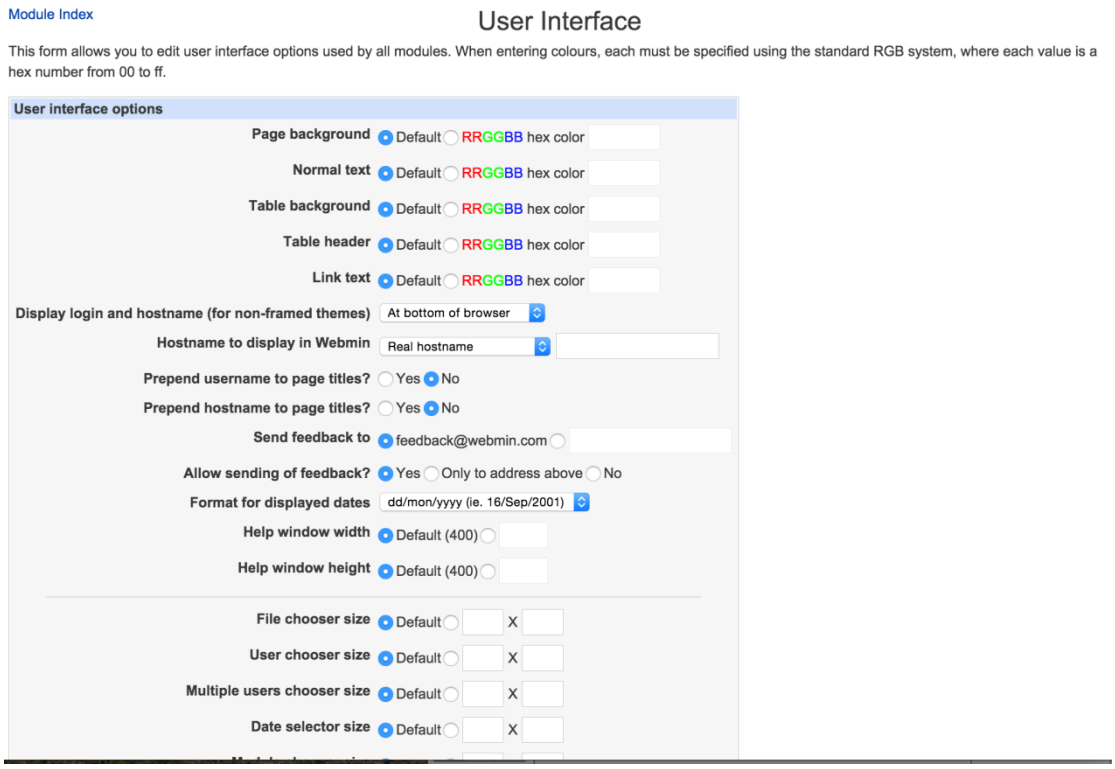
Proxy Servers and Downloads

This option allows users to configure the HTTP proxy and FTP proxy. Fill in the specific fields. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



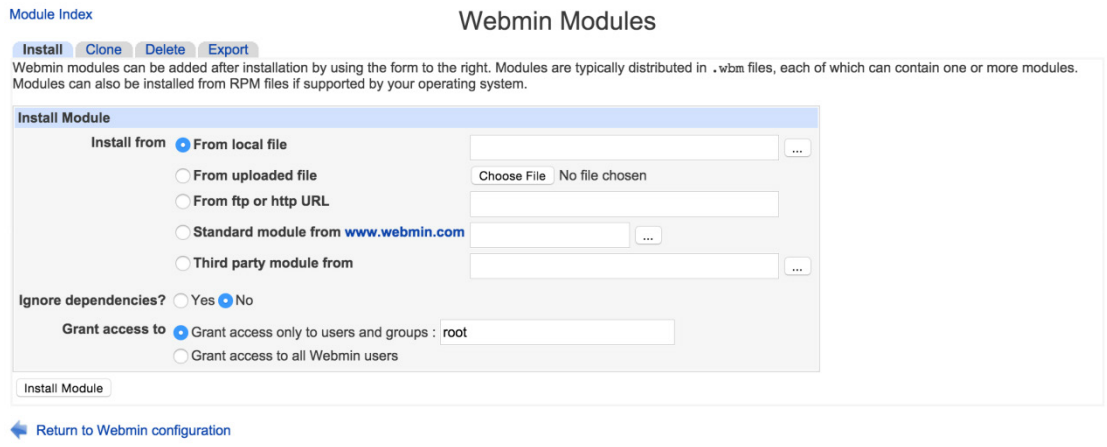
User Interface

This option allows users to configure the user interface settings, such as background color, text color, and link color, etc. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



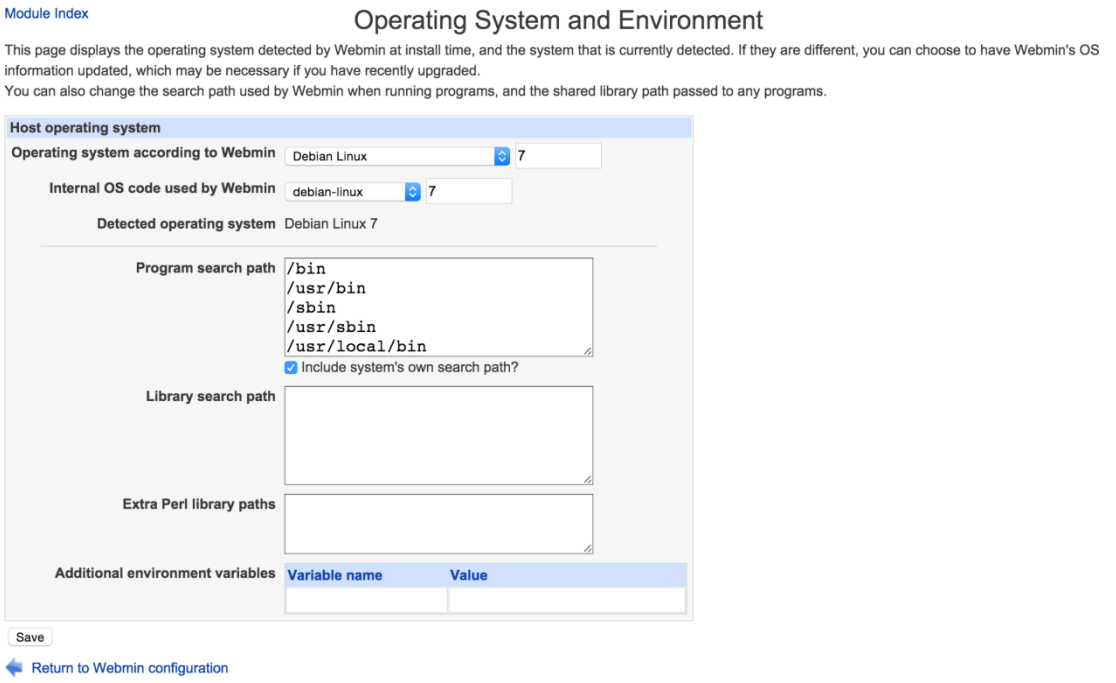
Webmin Modules

This option allows users to install modules on the UC-8100 by retrieving the module files from the specific locations. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



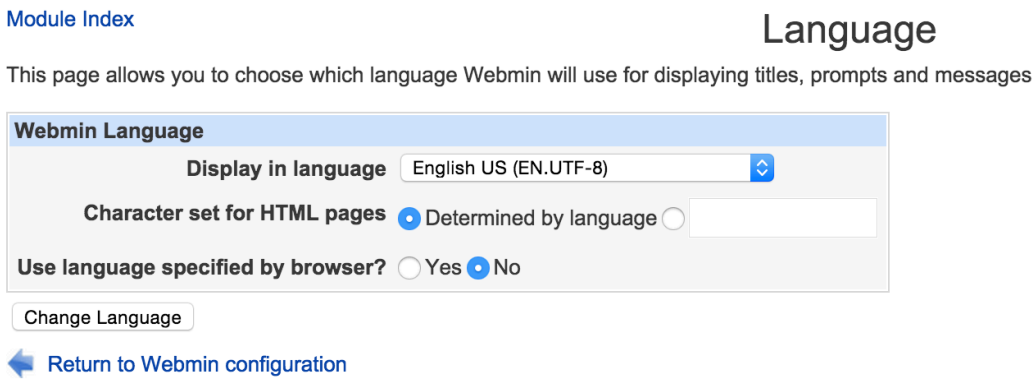
Operating System and Environment

This option allows users to display the operating system and environment detected by Webmin. When necessary, you may update or upgrade the operating system and environment from this option. When finished, click Save. For other configurations, click Return to Webmin configuration.



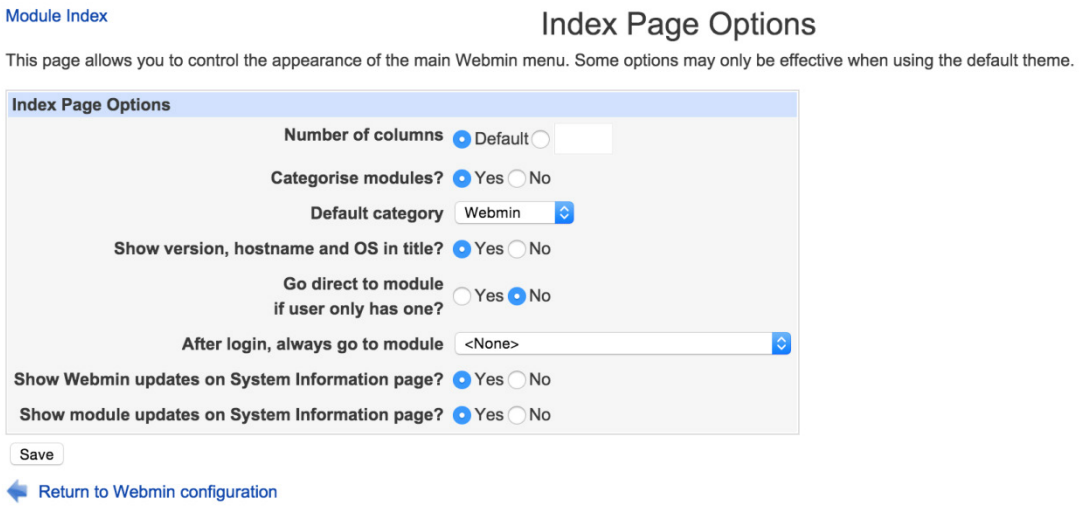
Language

This option allows users to view the language of the Webmin. You may change the language from the drop-down list of Display in language. When finished, click Save. For other configurations, click Return to Webmin configuration.



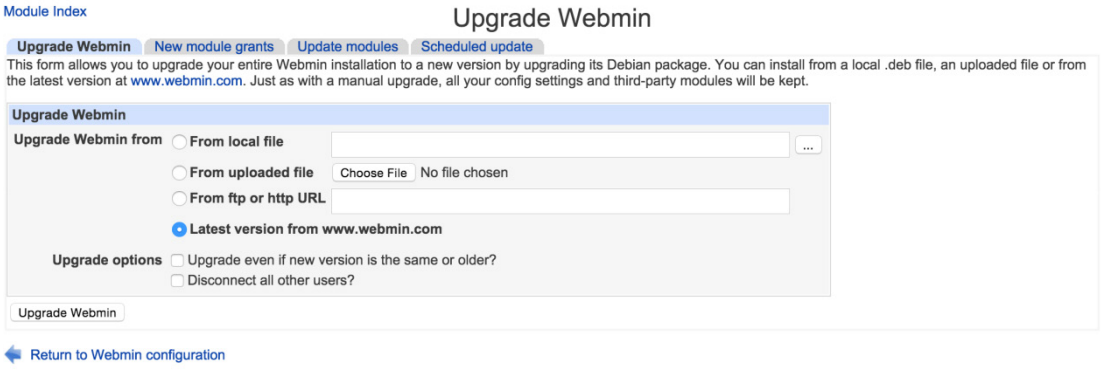
Index Page Options

This option allows users to configure the index page appearance of the Webmin. Select the options from the following figure. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



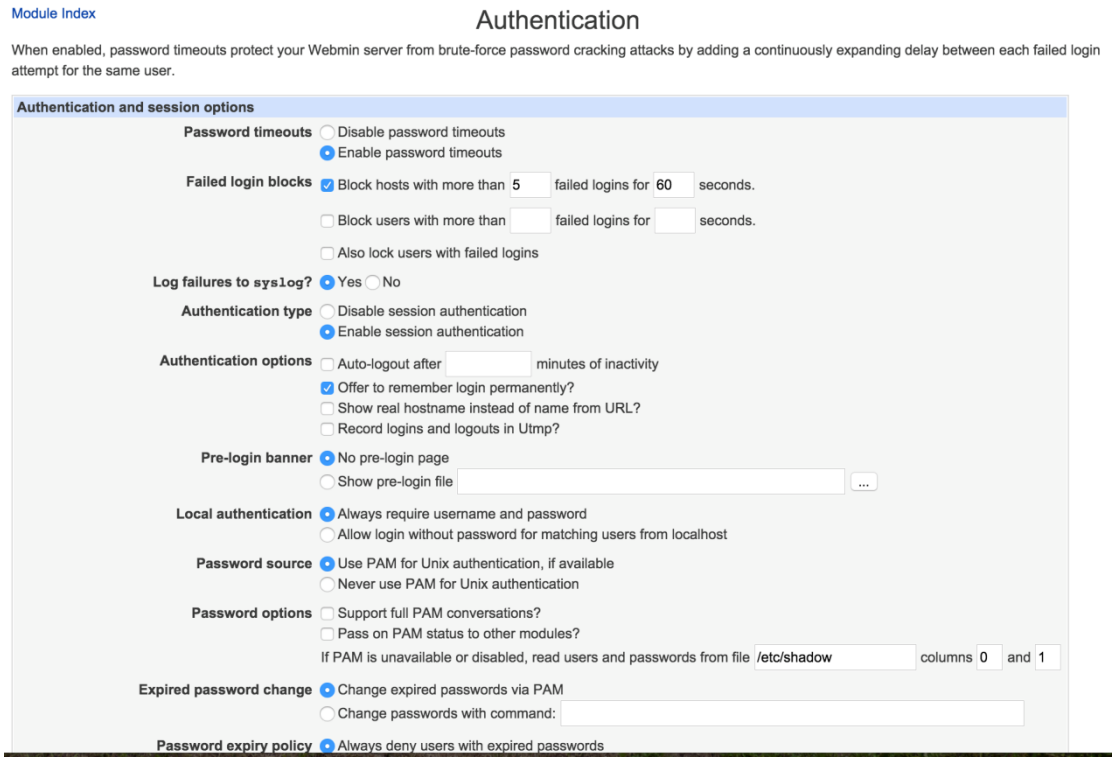
Upgrade Webmin

This option allows users to upgrade the Webmin version. You may upgrade from files in different locations. When finished, click **Upgrade Webmin**. For other configurations, click **Return to Webmin configuration**.



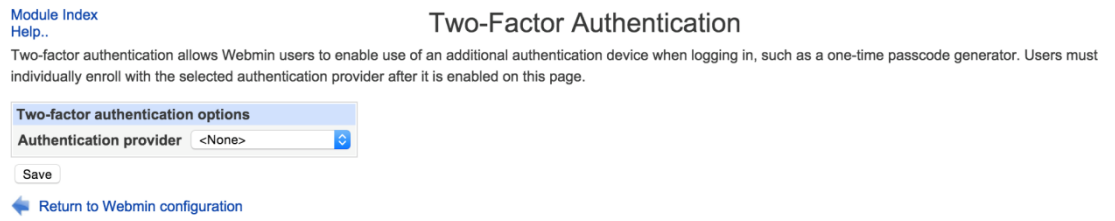
Authentication

This option allows users to configure the authentication settings. You may configure all settings in this figure. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



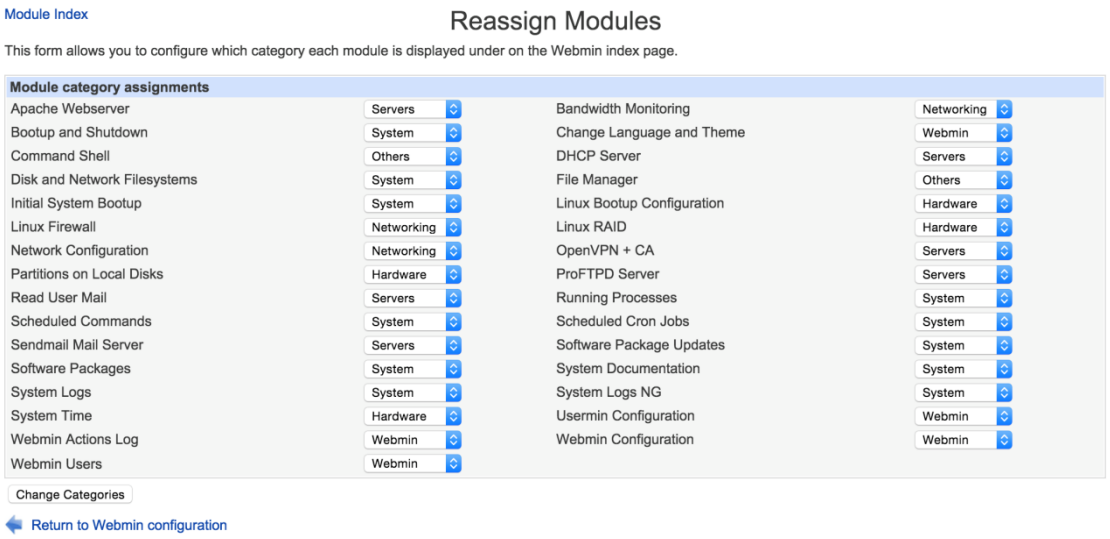
Two-Factor Authentication

This option allows users to enable the addition device when logging. Select from the drop-down list in Authentication provider. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



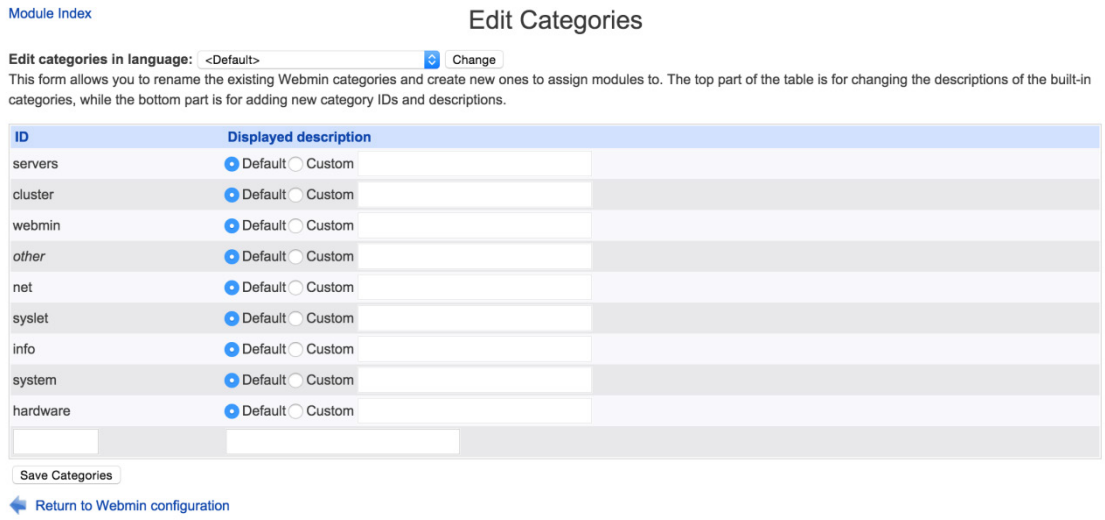
Reassign Modules

This option allows users to configure the category to which each module is assigned. You may reassign these modules to different categories. When finished, click **Change Categories**. For other configurations, click **Return to Webmin configuration**.



Edit Categories

This option allows users to edit the name of the categories shown in Webmin. You may use the default ID name or provide a new name. When finished, click **Save Categories**. For other configurations, **click Return to Webmin configuration**.

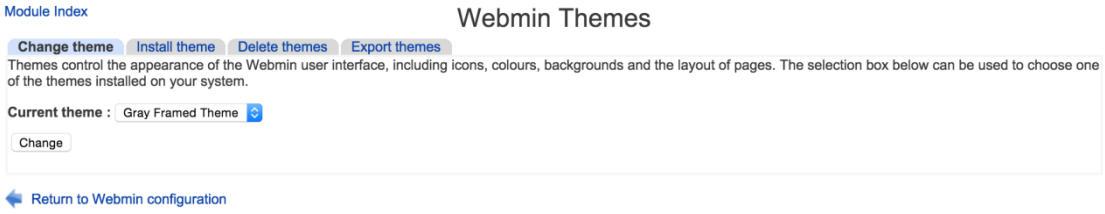


Module Titles

This option allows users to specify additional titles for the modules. Select the module from the Module drop-down list, and then provide a new title in the **New title** field. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.

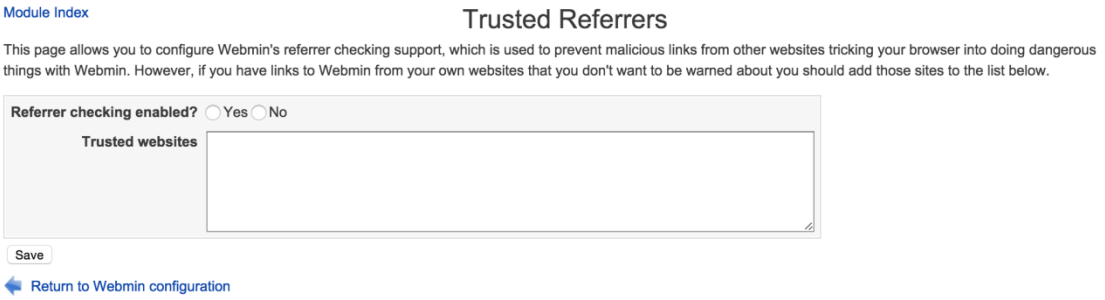
Webmin Themes

This option allows users to select the Webmin themes from the drop-down list. When finished, click **Change**. For other configurations, click **Return to Webmin configuration**.



Trusted Referrers

This option allows users to configure the trusted referrers list. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.

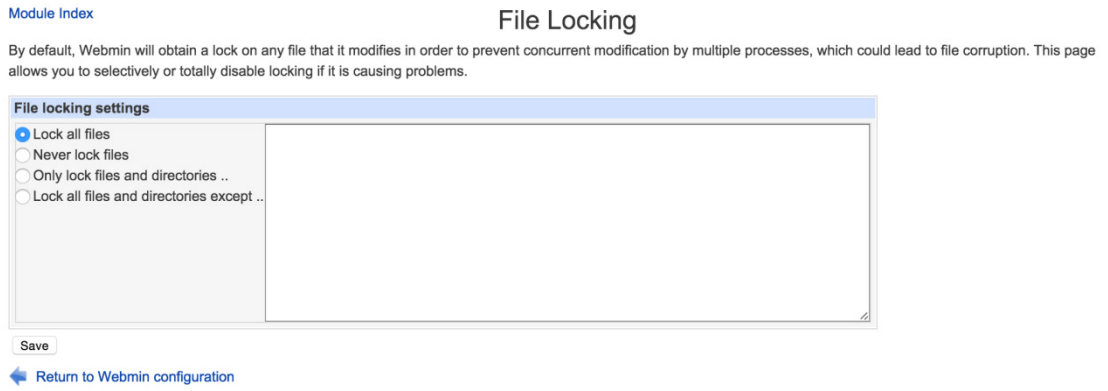


Anonymous Module Access

This option allows users to grant the access to the specific modules for the clients that do not need to log in. Provide the information for the specific fields. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.

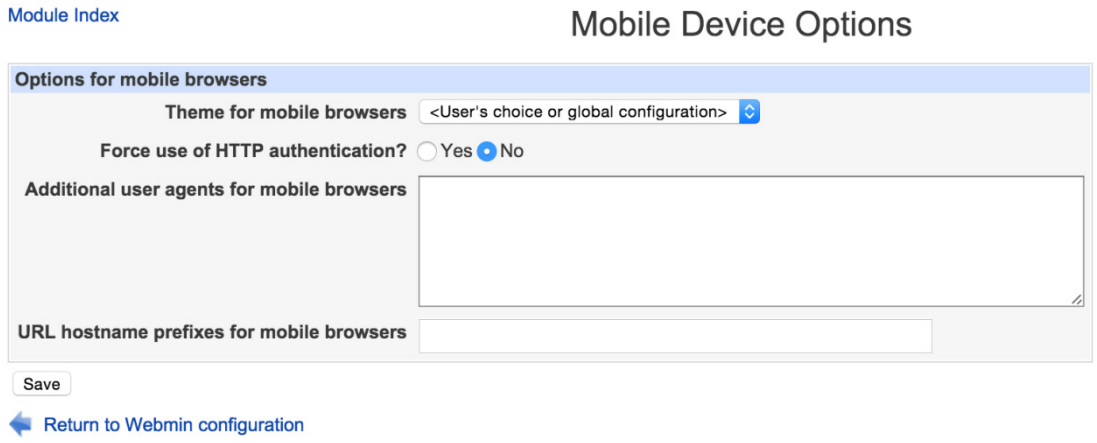
File Locking

This option allows users to lock specific files to prevent concurrent modification, which could lead to file corruption. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



Mobile Device Option

This option allows users to select the theme for the mobile device. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.

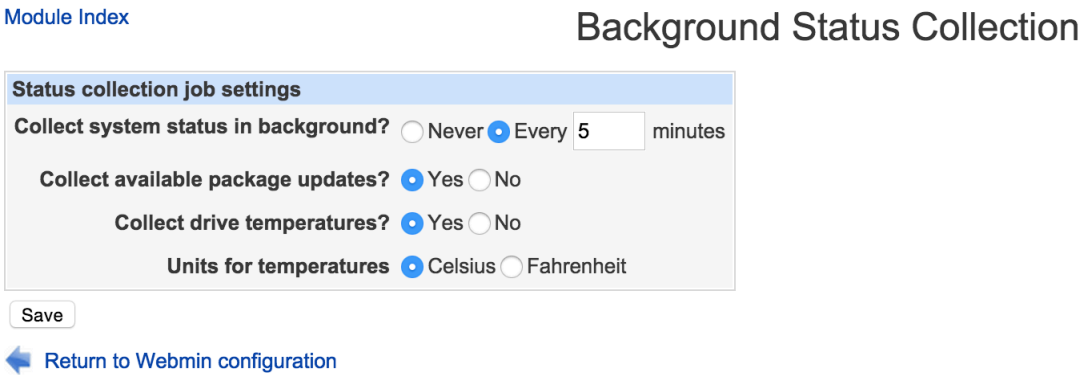


Blocked Hosts and Users

If you have blocked hosts and users, you may view the list here. For other configurations, click **Return to Webmin configuration**.

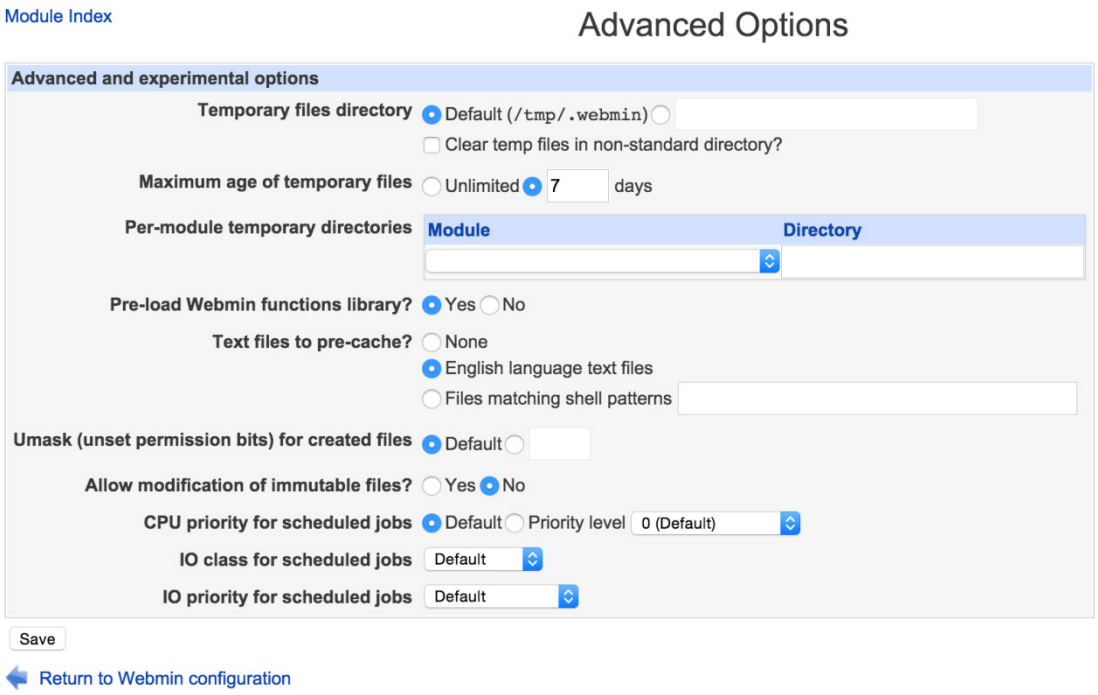
Background Status Collection

This option allows users to decide if they want to collect the status in the system background. When finished, click Save. For other configurations, click Return to Webmin configuration.



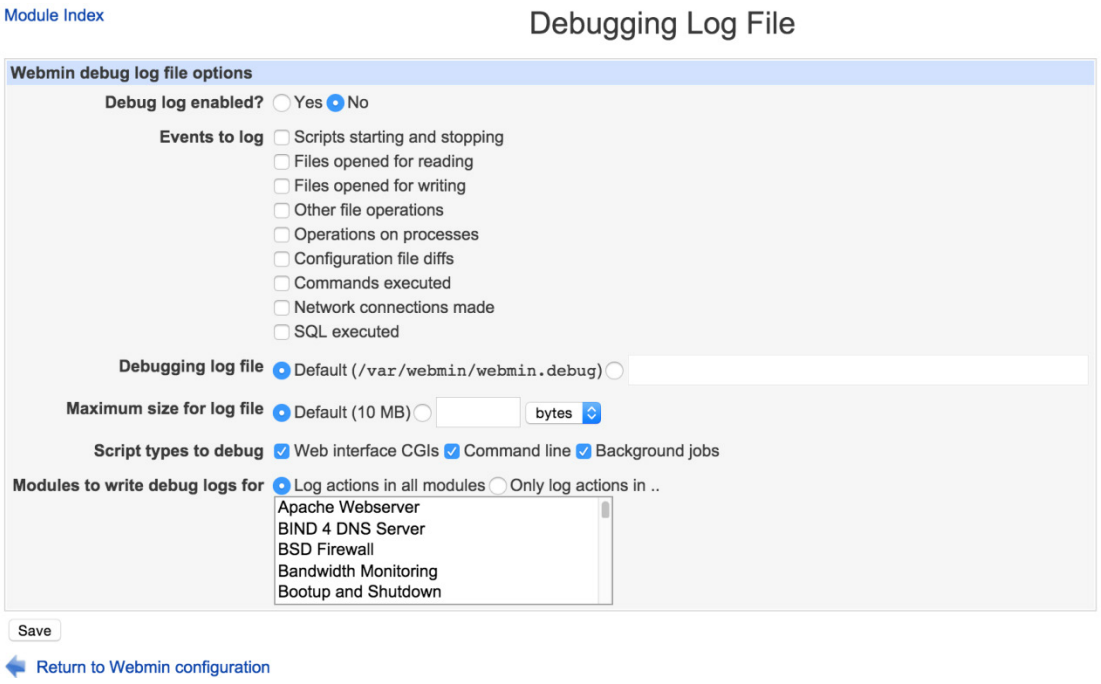
Advanced Options

This option provides the advanced options for Webmin. Users may configure these settings with their needs. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



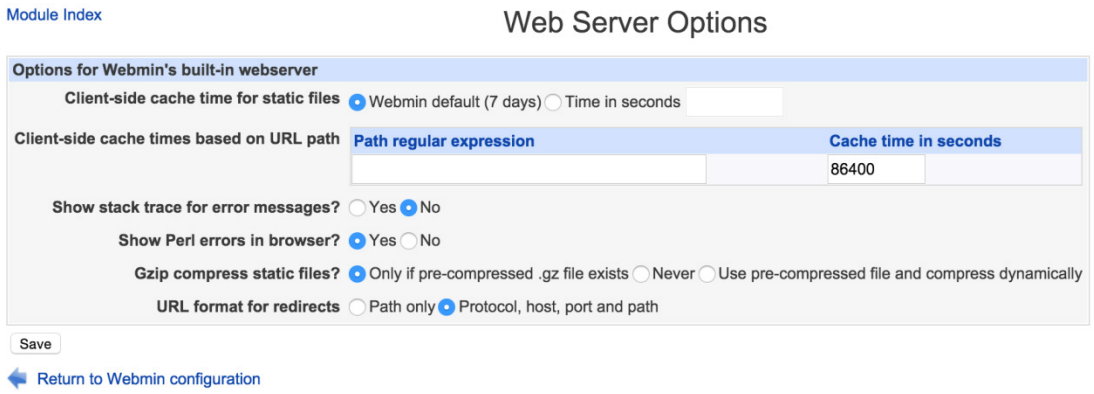
Debugging Log Files

This option allows users to debug log files. Users may configure the settings to debug log files. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



Web Server Options

This option allows users to configure the web server settings. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.

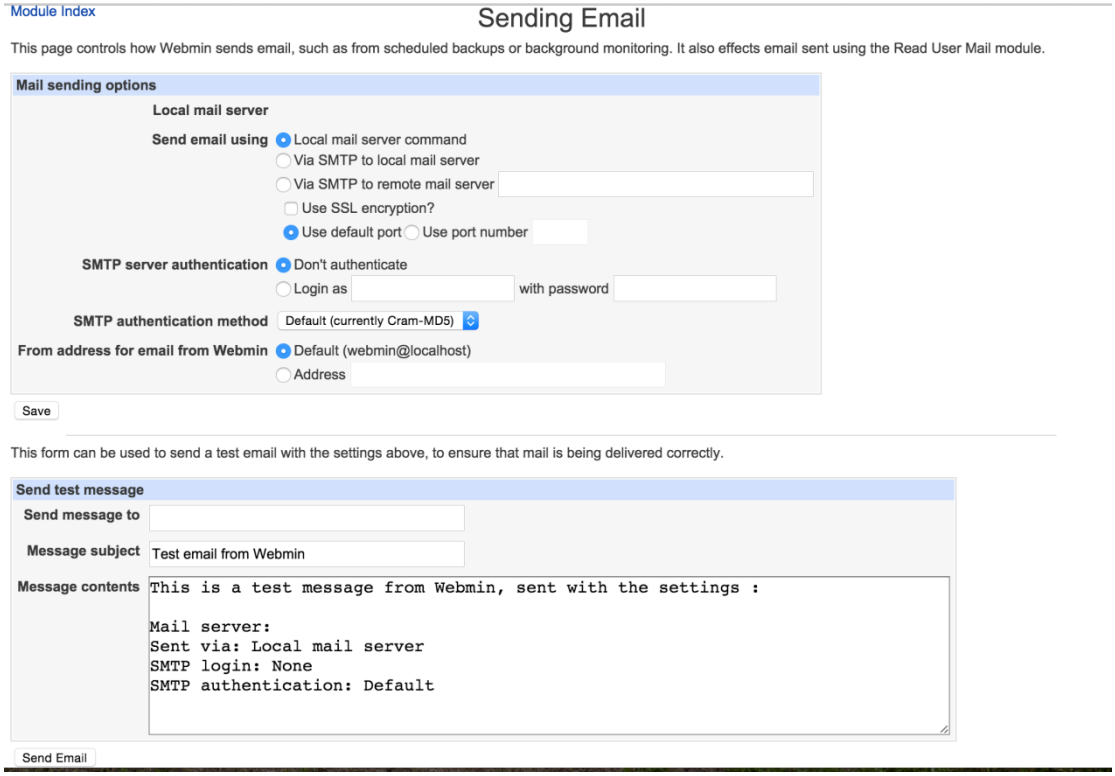


Webmin Scheduled Functions

This option allows users to view the current scheduled jobs on the modules. You may select to delete or run these functions. For other configurations, click **Return to Webmin configuration**.

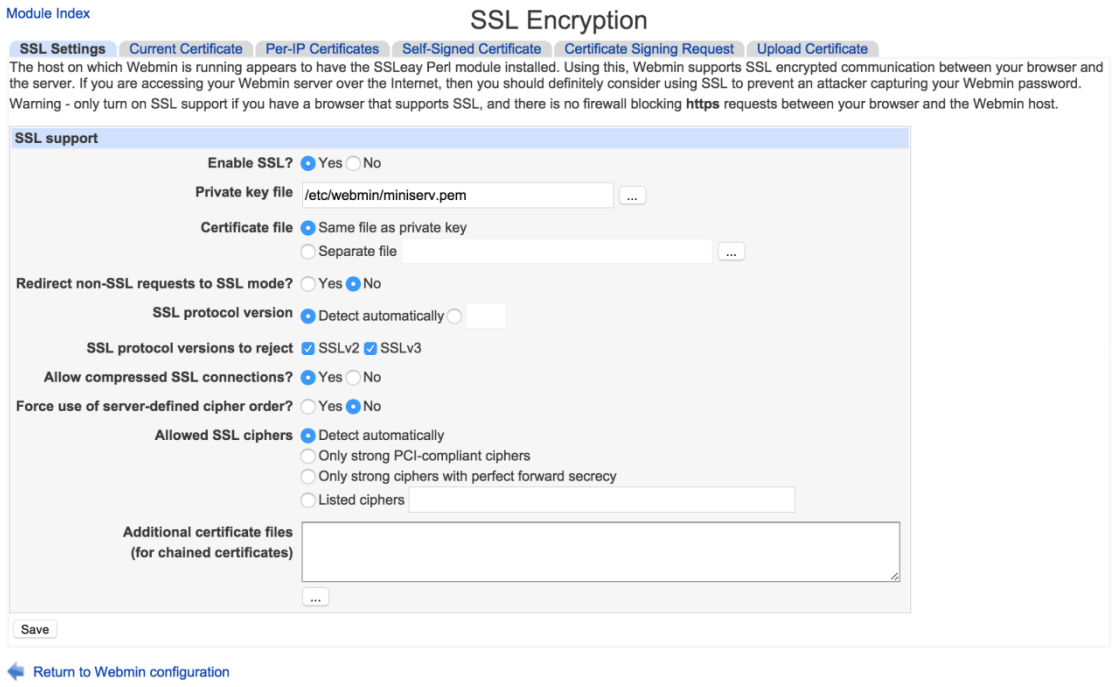
Sending Email

This option allows users to configure the setting for sending emails, and the text for email content. When finished, click **Save**. If you want to send the email immediately, click **Send Email**. For other configurations, click **Return to Webmin configuration**.



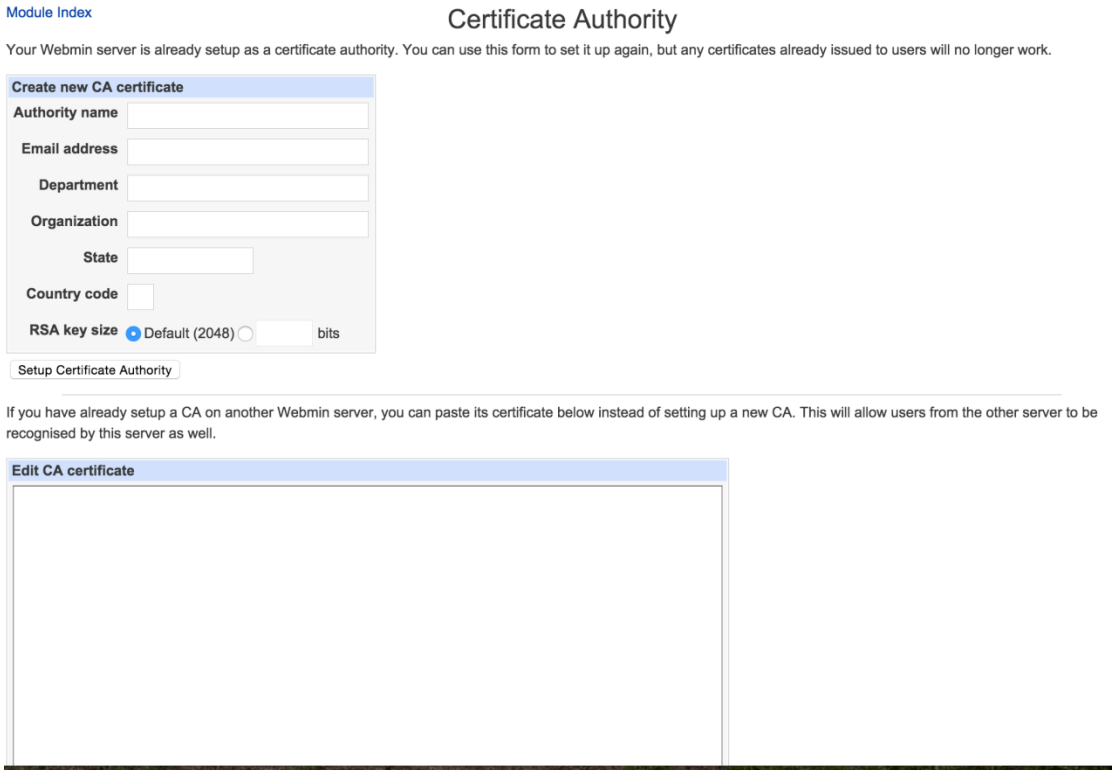
SSL Encryption

This option allows users to configure the SSL encryption settings. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



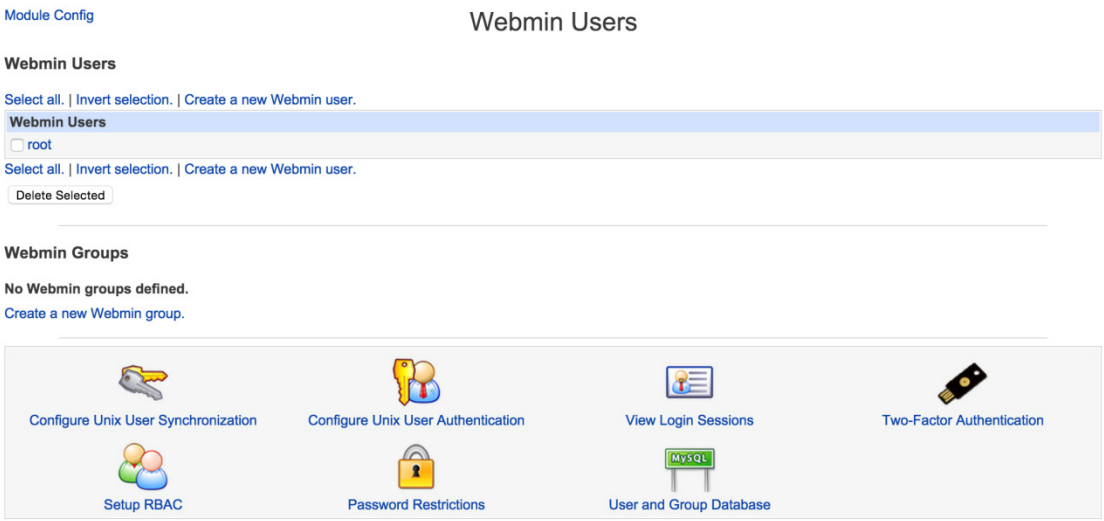
Certificate Authority

This option allows users to configure the certificate authority. All detailed descriptions are displayed on this page. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



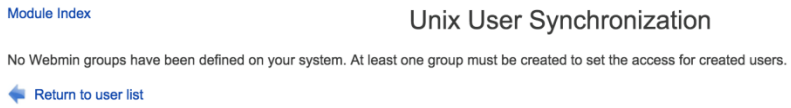
Webmin Users

This option allows users to check, delete or create a new user for Webmin. In addition, you may create new Webmin Groups for different purposes.



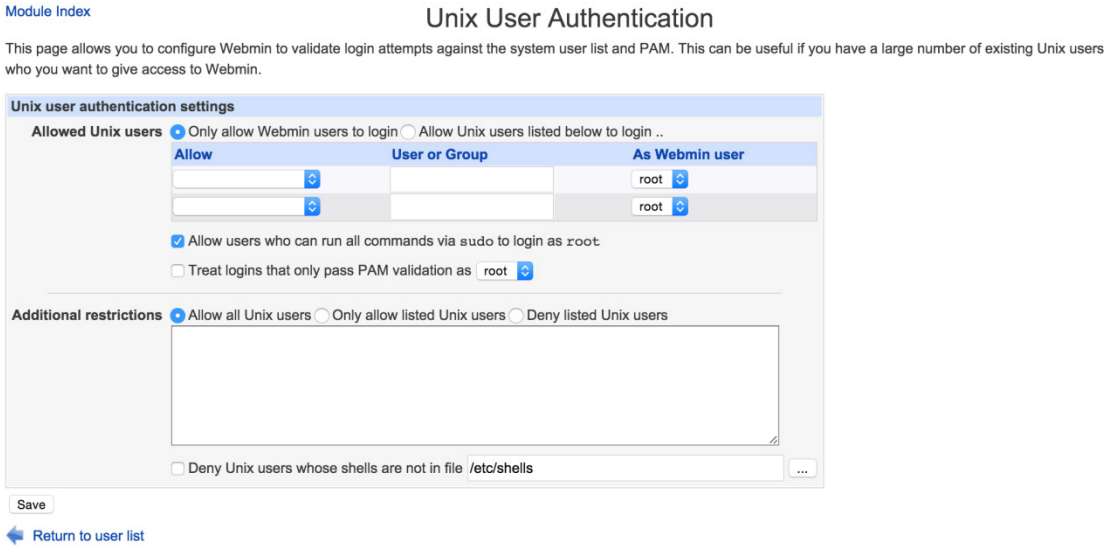
Configuring Unix User Synchronization

If you have created a new Webmin group, you may check the users on this page.



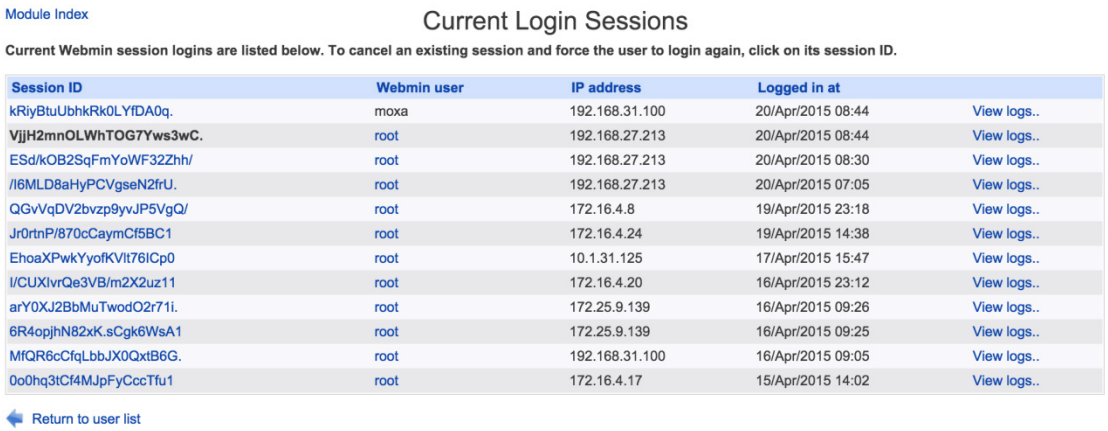
Configuring Unix User Authentication

This option allows users to manage user authentication. Users may decide or deny access for specific Unix users. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



View Login Sessions

This option allows users to check the current user login status. You may also cancel access to specific users and force them to log in again.

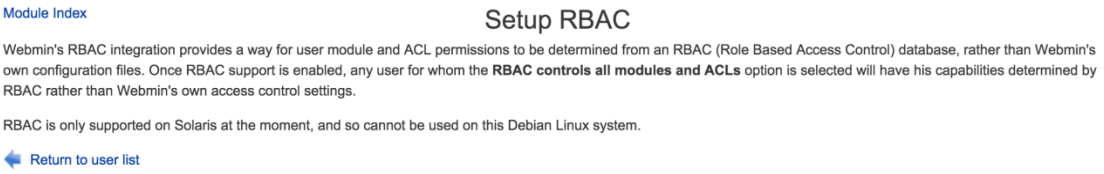


Two-Factor Authentication

If you have enabled two-factor authentication, you may check the status of the two-factor authentication on this page.

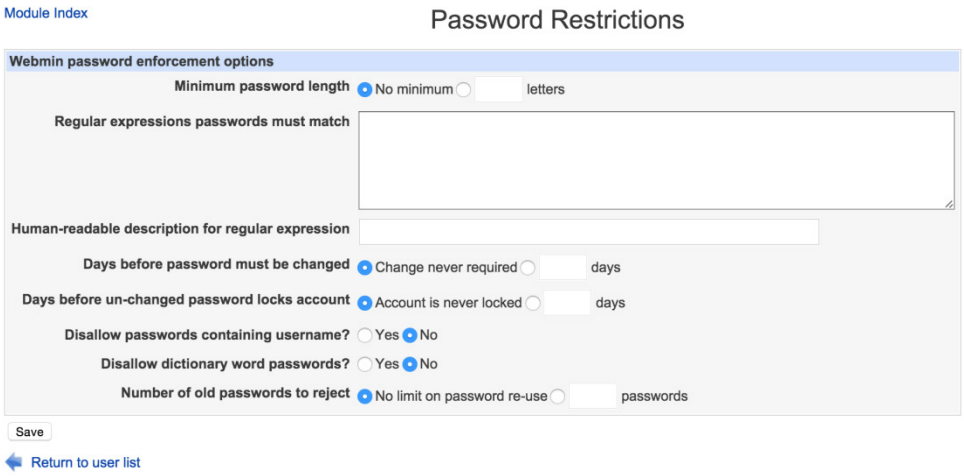
Setup RBAC

This option allows users to set up RBAC.



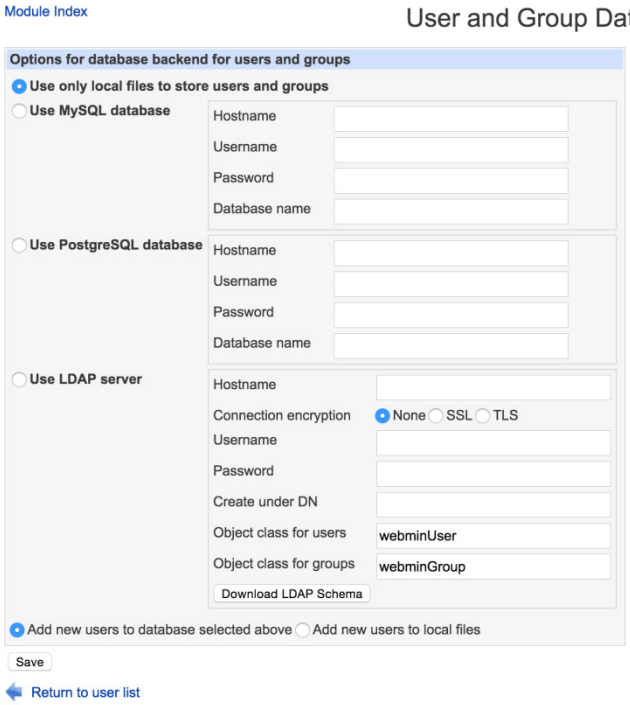
Password Restrictions

This option allows users to configure the password settings. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



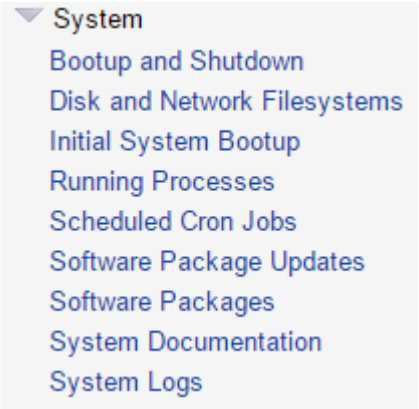
User and Group Database

This option allows users to configure the user and group database settings. When finished, click **Save**. For other configurations, click **Return to Webmin configuration**.



Configuring System

When you click **System**, nine options will be displayed. Click an option to proceed with configuration.

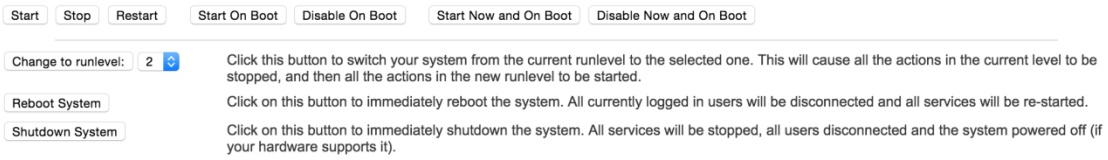


Bootup and Shutdown

This function allows users to enable specific actions when the system boots up or shuts down.

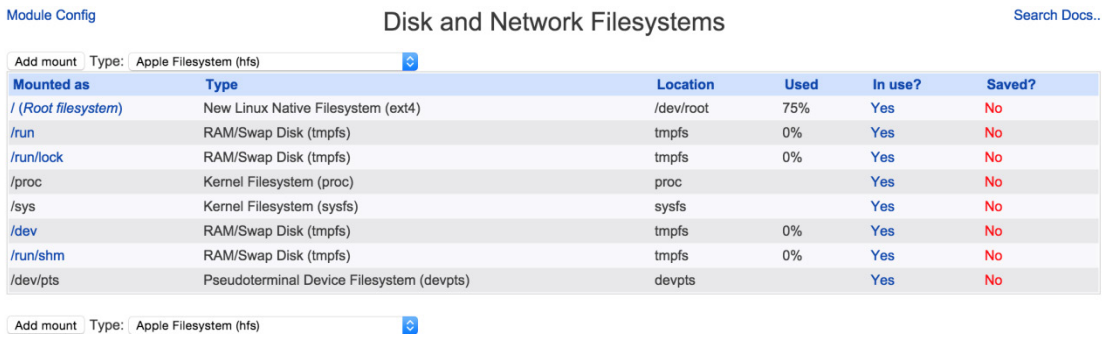
Action	At boot?	Description
apache2	No	Start/stop apache2 web server
boot_scripts.sh	No	Enable service provided by daemon.
bootlogs	Yes	Various things that don't need to be done particularly
bootmisc.sh	No	Some cleanup. Note, it need to run after mountnfs-bootclean.sh.
checkfs.sh	No	Check all filesystems.
checkroot-bootclean.sh	No	Clean temporary filesystems after
checkroot.sh	No	Check to root file system.
cron	Yes	cron is a standard UNIX program that runs user-specified
dbus	Yes	D-Bus is a simple interprocess messaging system, used
halt	No	
heartbeat	Yes	High-availability services.
hostname.sh	No	Read the machines hostname from /etc/hostname, and
hwclock.sh	No	
isc-dhcp-server	Yes	Dynamic Host Configuration Protocol Server
killprocs	No	executed by init(8) upon entering runlevel 1 (single).
kmod	No	Load the modules listed in /etc/modules.
logd	Yes	ha_logd logging daemon
motd	Yes	/etc/motd is user-editable and static. This script
mountall-bootclean.sh	No	Clean temporary filesystems after
mountall.sh	No	
mountdevsubfs.sh	No	Mount the virtual filesystems the kernel provides
mountkernfs.sh	No	Mount initial set of virtual filesystems the kernel
mountnfs-bootclean.sh	No	Clean temporary filesystems after
mountnfs.sh	No	Network file systems are mounted by
mtab.sh	No	Update the mount program's mtab file after
	Yes	Run /etc/init.d/mx_uc8100 if it exist

Click a button to perform the associated function.



Disk and Network Filesystems

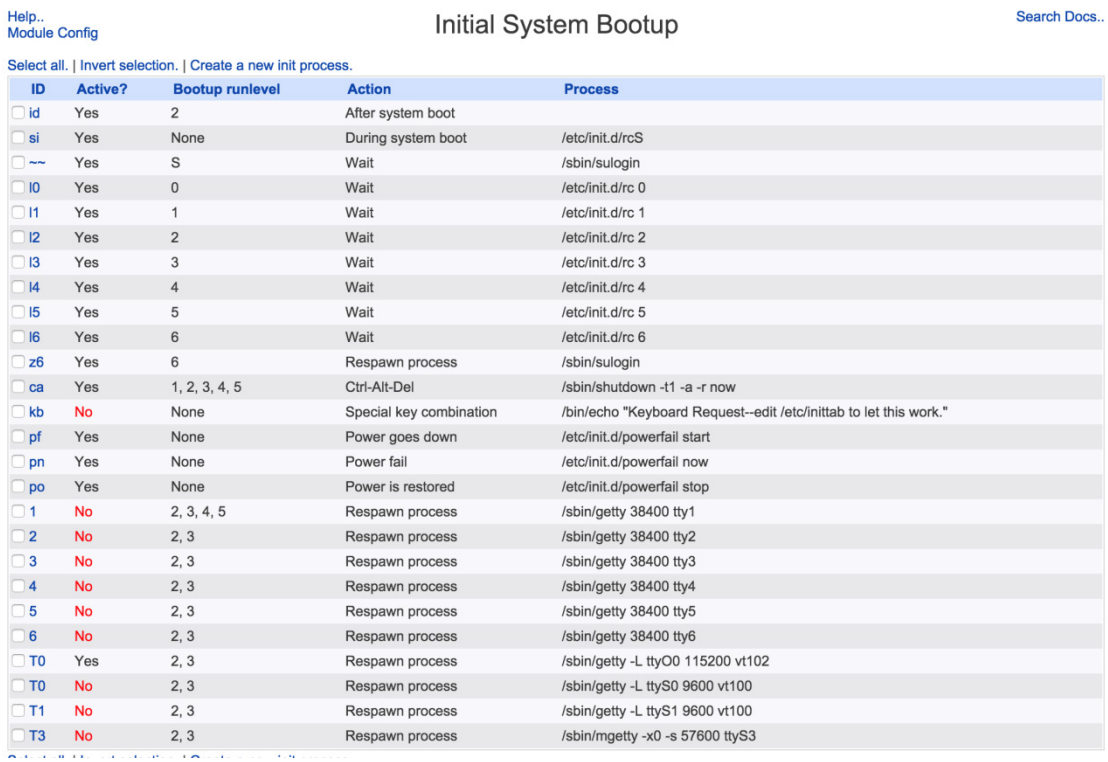
This option allows users to mount the system files to the UC-8100 computer. Select the file from the Type drop-down list, and then click Add mount.



Mounted as	Type	Location	Used	In use?	Saved?
/ (*Root filesystem*)	New Linux Native Filesystem (ext4)	/dev/root	75%	Yes	No
/run	RAM/Swap Disk (tmpfs)	tmpfs	0%	Yes	No
/run/lock	RAM/Swap Disk (tmpfs)	tmpfs	0%	Yes	No
/proc	Kernel Filesystem (proc)	proc		Yes	No
/sys	Kernel Filesystem (sysfs)	sysfs		Yes	No
/dev	RAM/Swap Disk (tmpfs)	tmpfs	0%	Yes	No
/run/shm	RAM/Swap Disk (tmpfs)	tmpfs	0%	Yes	No
/dev/pts	Pseudoterminal Device Filesystem (devpts)	devpts		Yes	No

Initial System Bootup

This option allows users to create or delete the initial process file when the computer is booting up.



Help..
Module Config

Initial System Bootup

Search Docs..

Select all. | Invert selection. | Create a new init process.

ID	Active?	Bootup runlevel	Action	Process
id	Yes	2	After system boot	
si	Yes	None	During system boot	/etc/init.d/rcS
~~	Yes	S	Wait	/sbin/sulogin
l0	Yes	0	Wait	/etc/init.d/rc 0
l1	Yes	1	Wait	/etc/init.d/rc 1
l2	Yes	2	Wait	/etc/init.d/rc 2
l3	Yes	3	Wait	/etc/init.d/rc 3
l4	Yes	4	Wait	/etc/init.d/rc 4
l5	Yes	5	Wait	/etc/init.d/rc 5
l6	Yes	6	Wait	/etc/init.d/rc 6
z6	Yes	6	Respawn process	/sbin/sulogin
ca	Yes	1, 2, 3, 4, 5	Ctrl-Alt-Del	/sbin/shutdown -t1 -a -r now
kb	No	None	Special key combination	/bin/echo "Keyboard Request--edit /etc/inittab to let this work."
pf	Yes	None	Power goes down	/etc/init.d/powerfail start
pn	Yes	None	Power fail	/etc/init.d/powerfail now
po	Yes	None	Power is restored	/etc/init.d/powerfail stop
1	No	2, 3, 4, 5	Respawn process	/sbin/getty 38400 tty1
2	No	2, 3	Respawn process	/sbin/getty 38400 tty2
3	No	2, 3	Respawn process	/sbin/getty 38400 tty3
4	No	2, 3	Respawn process	/sbin/getty 38400 tty4
5	No	2, 3	Respawn process	/sbin/getty 38400 tty5
6	No	2, 3	Respawn process	/sbin/getty 38400 tty6
T0	Yes	2, 3	Respawn process	/sbin/getty -L ttyO0 115200 vt102
T0	No	2, 3	Respawn process	/sbin/getty -L ttyS0 9600 vt100
T1	No	2, 3	Respawn process	/sbin/getty -L ttyS1 9600 vt100
T3	No	2, 3	Respawn process	/sbin/mgetty -x0 -s 57600 ttyS3

If you want to delete something, select the ID and click **Delete Selected Processes** at the bottom of this page.

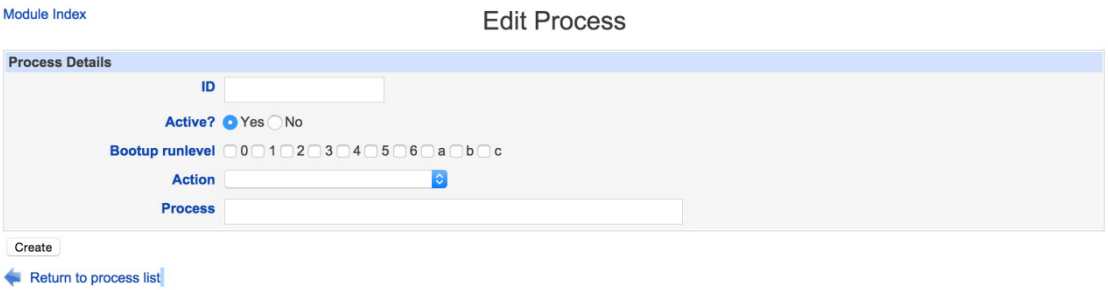
6	No	2, 3	Respawn process	/sbin/getty 38400 tty6
T0	Yes	2, 3	Respawn process	/sbin/getty -L ttyO0 115200 vt102
T0	No	2, 3	Respawn process	/sbin/getty -L ttyS0 9600 vt100
T1	No	2, 3	Respawn process	/sbin/getty -L ttyS1 9600 vt100
T3	No	2, 3	Respawn process	/sbin/mgetty -x0 -s 57600 ttyS3

Select all. | Invert selection. | Create a new init process.

Delete Selected Processes

Apply Init Configuration Click this button to apply the current SysV Init Configuration by running the command `telinit q`. Be aware that any mistakes in your configuration may make the system unusable when this command is run.

You may also click **Create a new init process** to create a new one.



Module Index

Edit Process

Process Details

ID

Active? Yes No

Bootup runlevel 0 1 2 3 4 5 6 a b c

Action

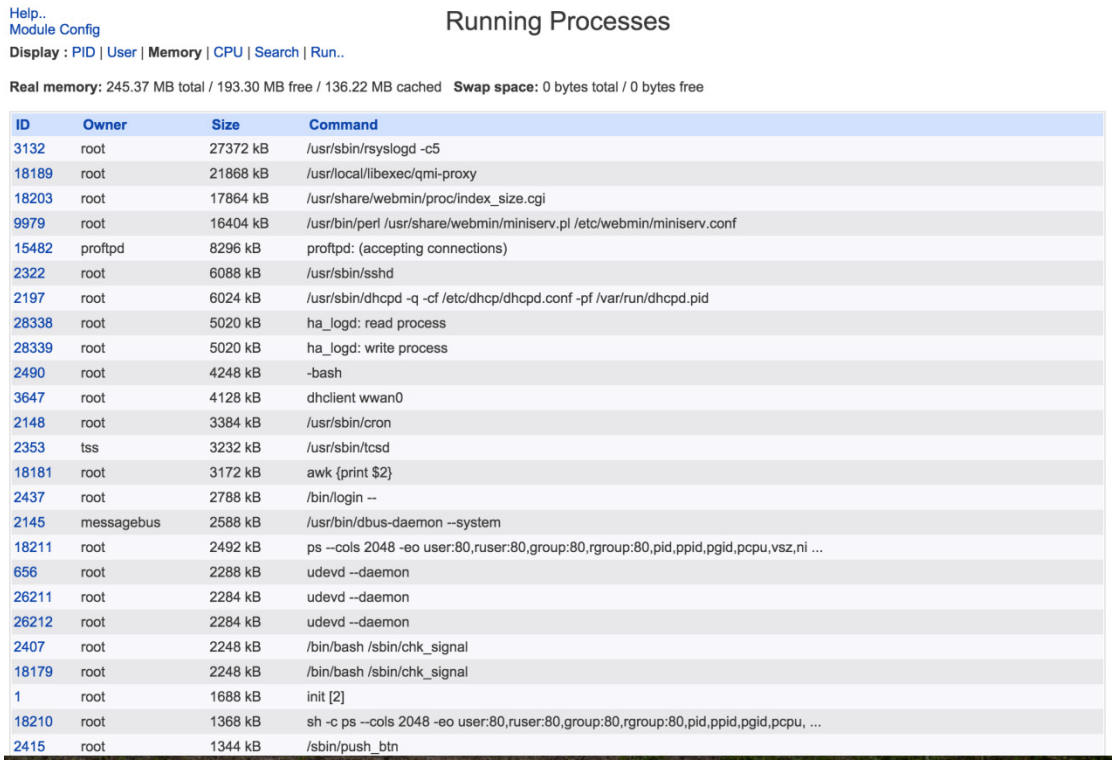
Process

Create

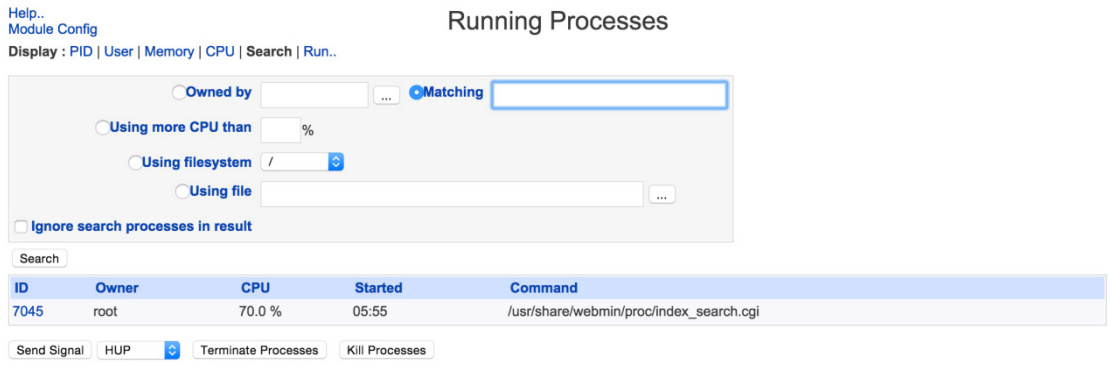
Return to process list

Running Processes

This option allows users to view the current running processes.



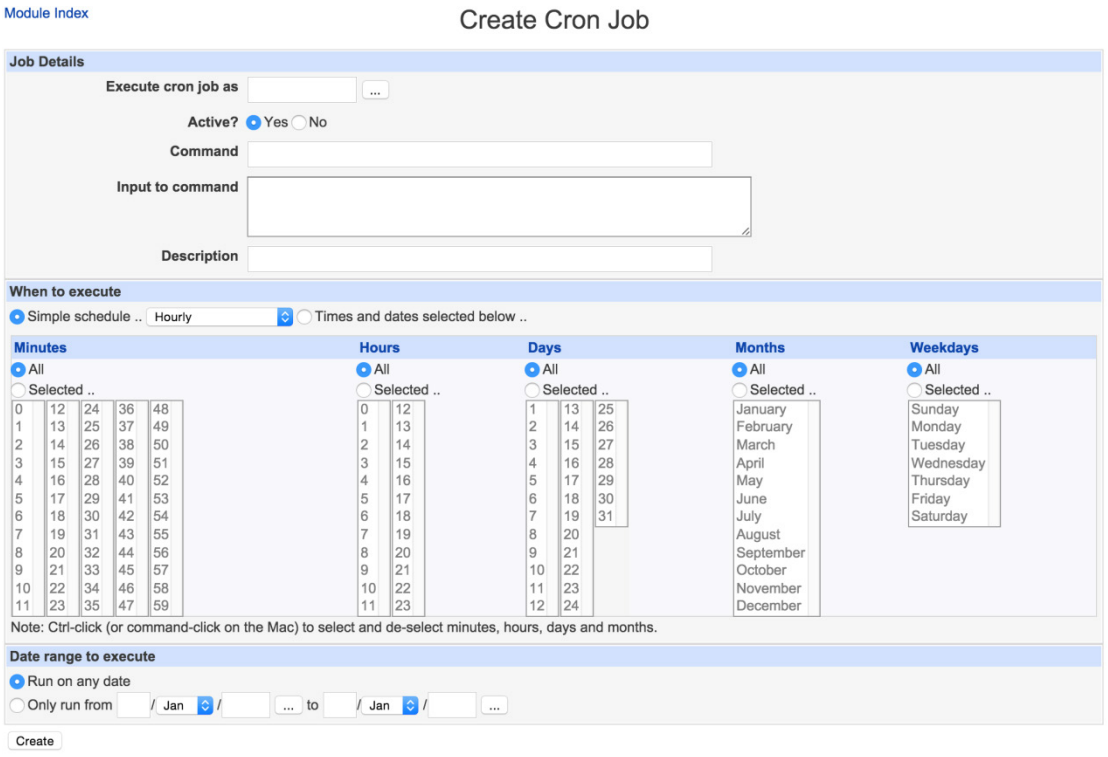
Click Search to search for a the specific process. You can also terminate or kill a process by clicking the specific buttons.



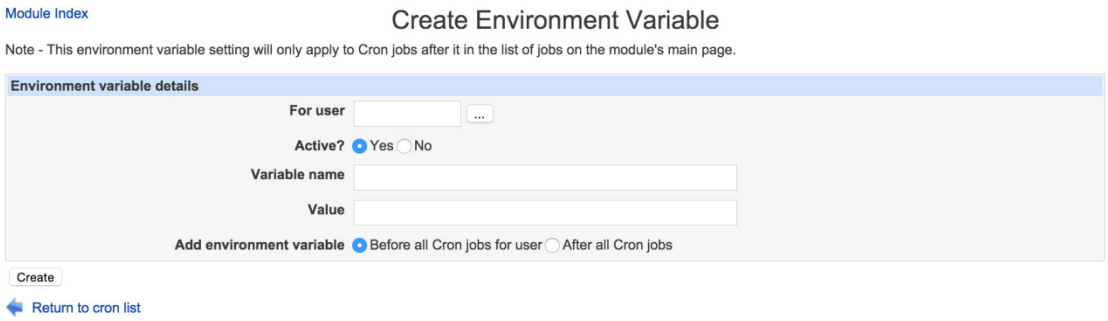
Scheduled Cron Jobs

This option allows users to view the current scheduled cron jobs, or create a new scheduled cron job.

To create a new cron job, click the **Create a new scheduled cron job** button, and enter the information in the fields as required. When finished, click **Create**.



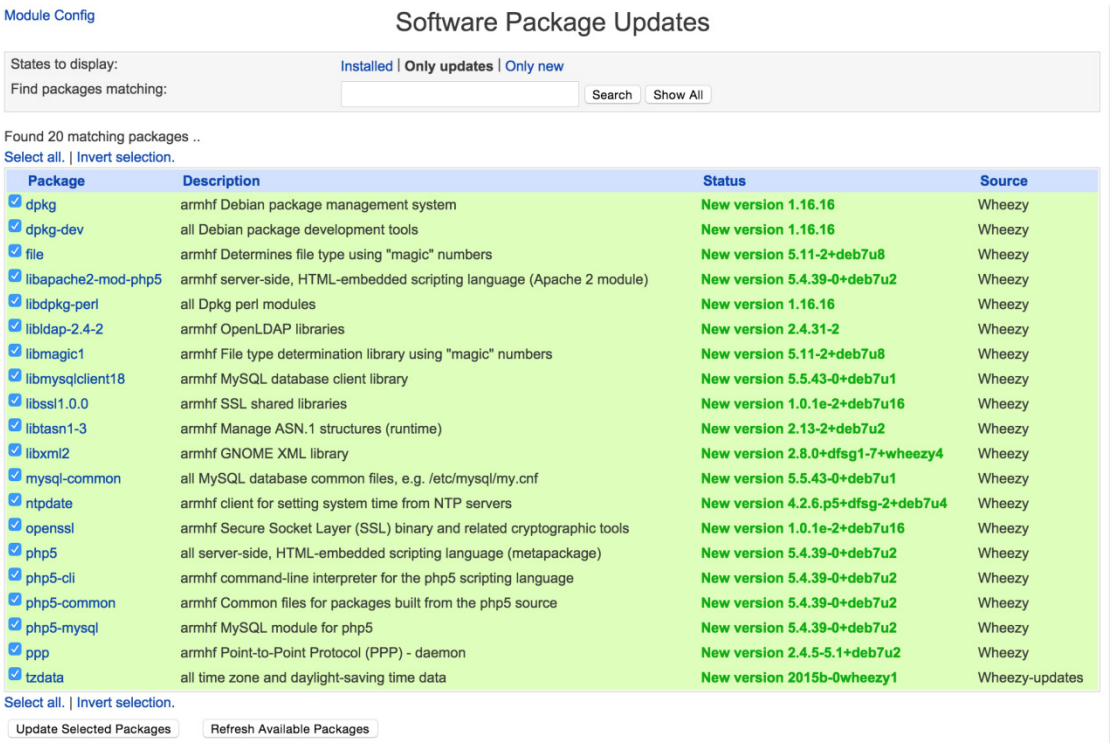
You may also create a new environment variable by clicking the **Creating a new environment variable** button. When finished, click **Create**.



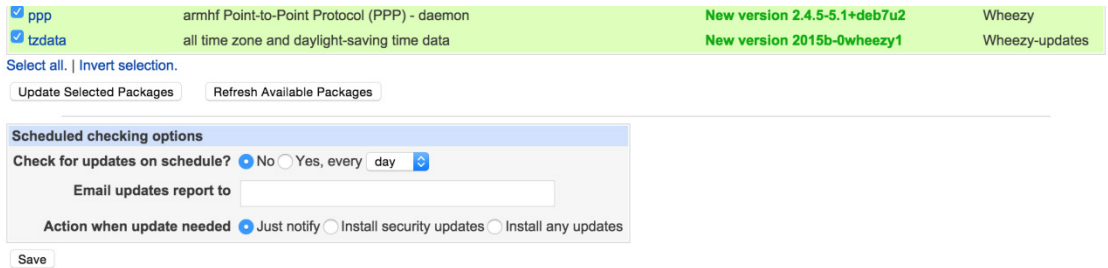
If you want to allow some users to access the cron jobs, click the **Control user access to cron job** button. When finished, click **Save**.

Software Package Updates

This option allows users to update the software package on the UC-8100 computer. Select the package, and then click Update Selected Packages. You may also click Refresh Available Packages to view the packages to be updated.

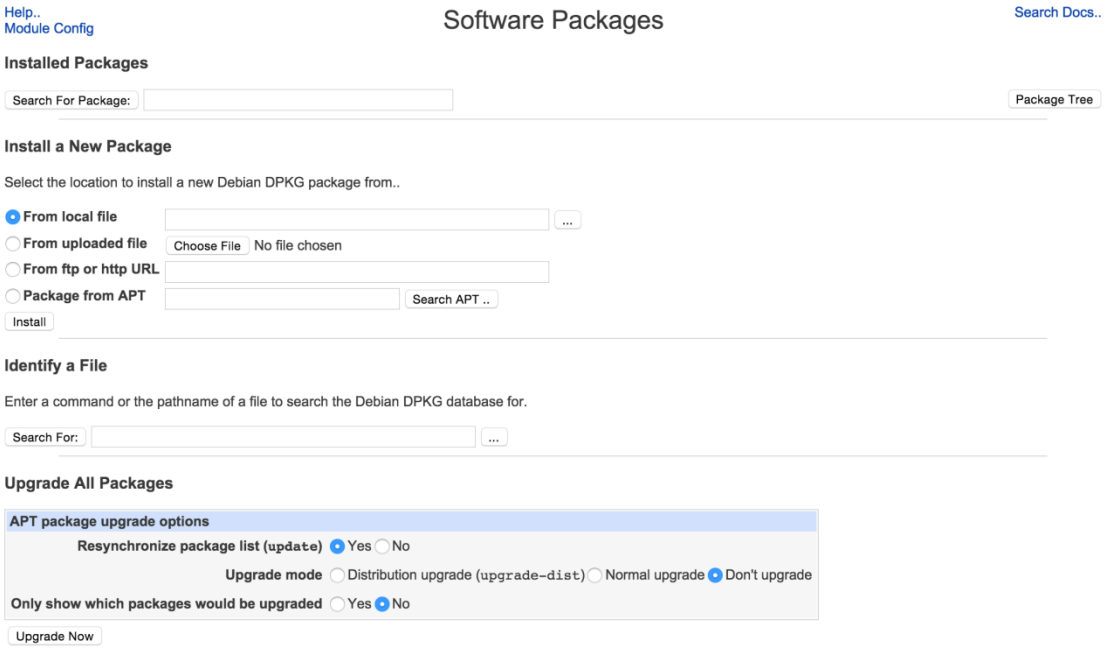


You may also perform the scheduled checking options at the bottom of this page. When finished, click **Save**.



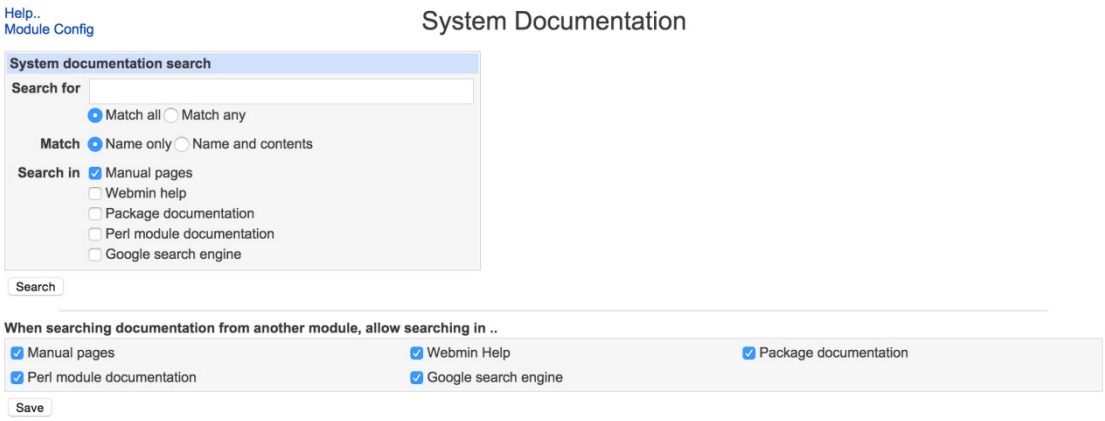
Software Packages

This option allows users to search for installed packages, or install a new package. You may also upgrade all packages on this page.



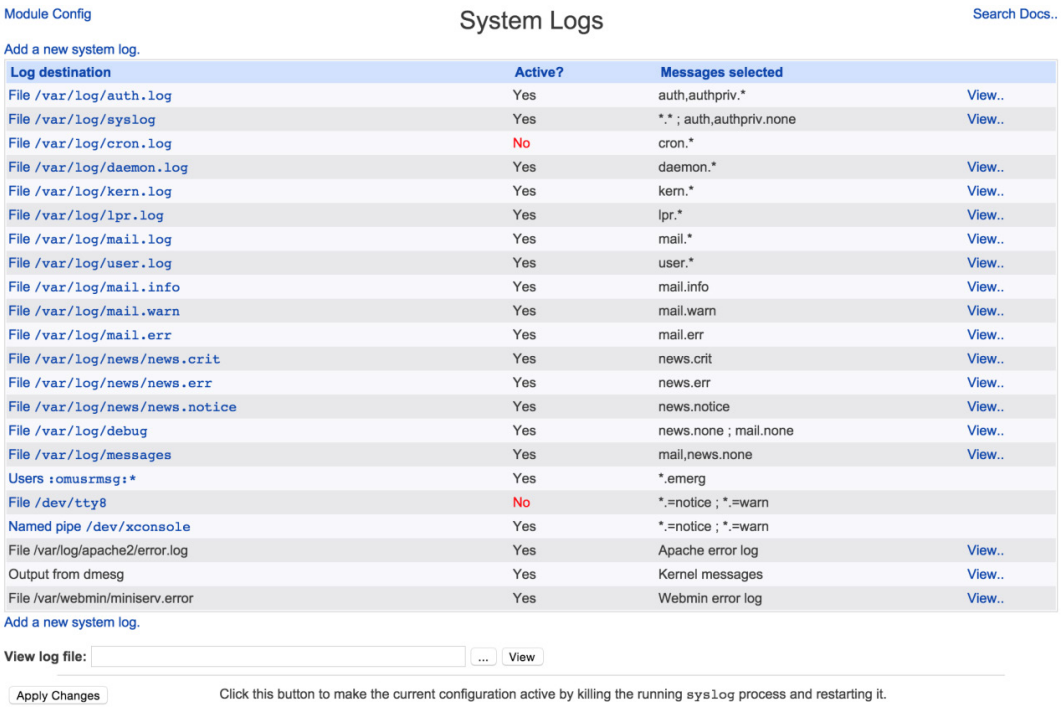
System Documentation

This option allows users to search the system documentation. Type key words in the **Search for** field, and then click **Search**.

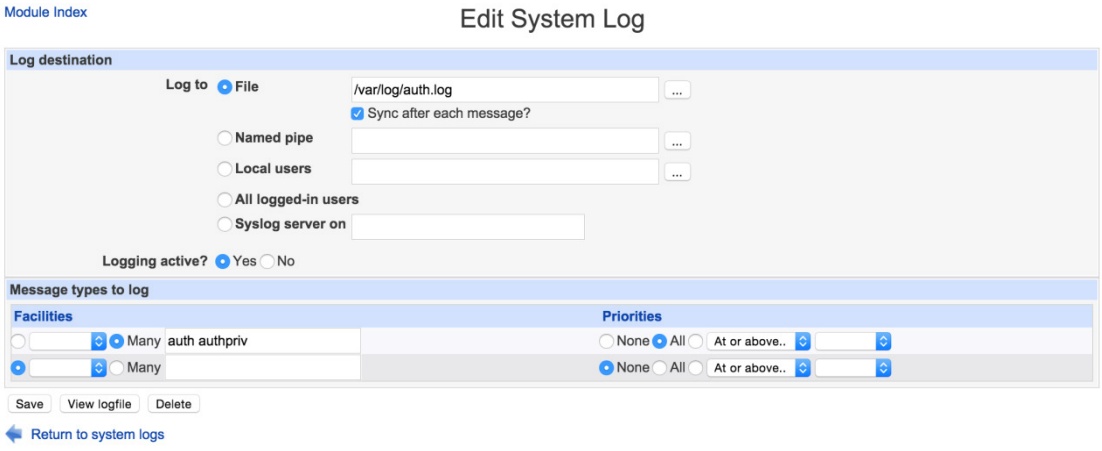


System Log

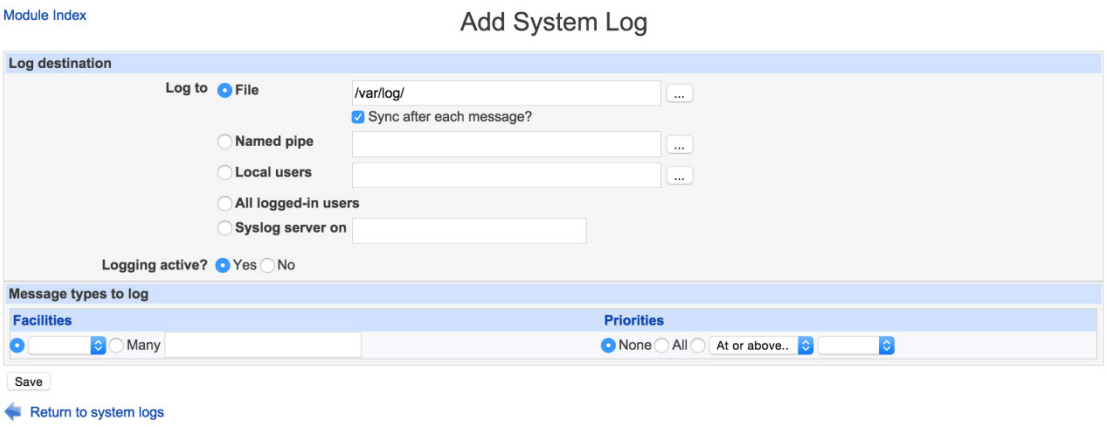
This option allows users to view and edit the current system log, or create a new system log.



Click the system log you want to edit, and then provide the relevant information. Click **Save**. You may also delete this log by clicking **Delete**.



Click **Add a new system log**, and find the log you want to add in the specific field. When finished, click **Save**.

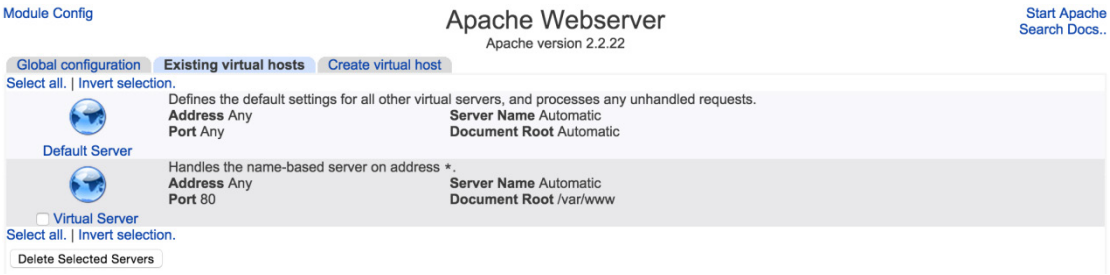


Configuring Server

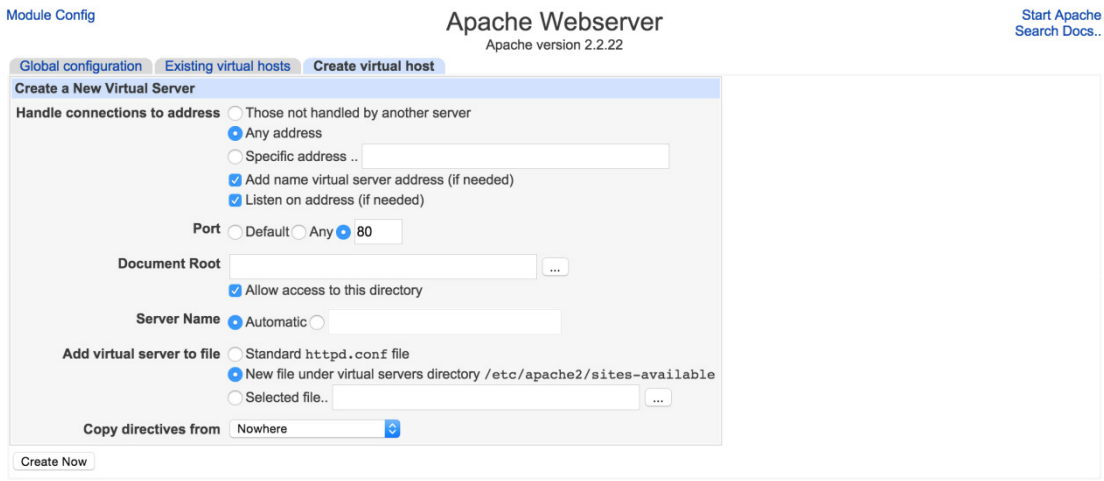
Click **Sever**. Three options will be displayed. Click the appropriate option to continue the configuration you would like to take care of.

Apache Webserver

This option allows users to view or delete the current Apache Webservers. You may also create a virtual host on this page.

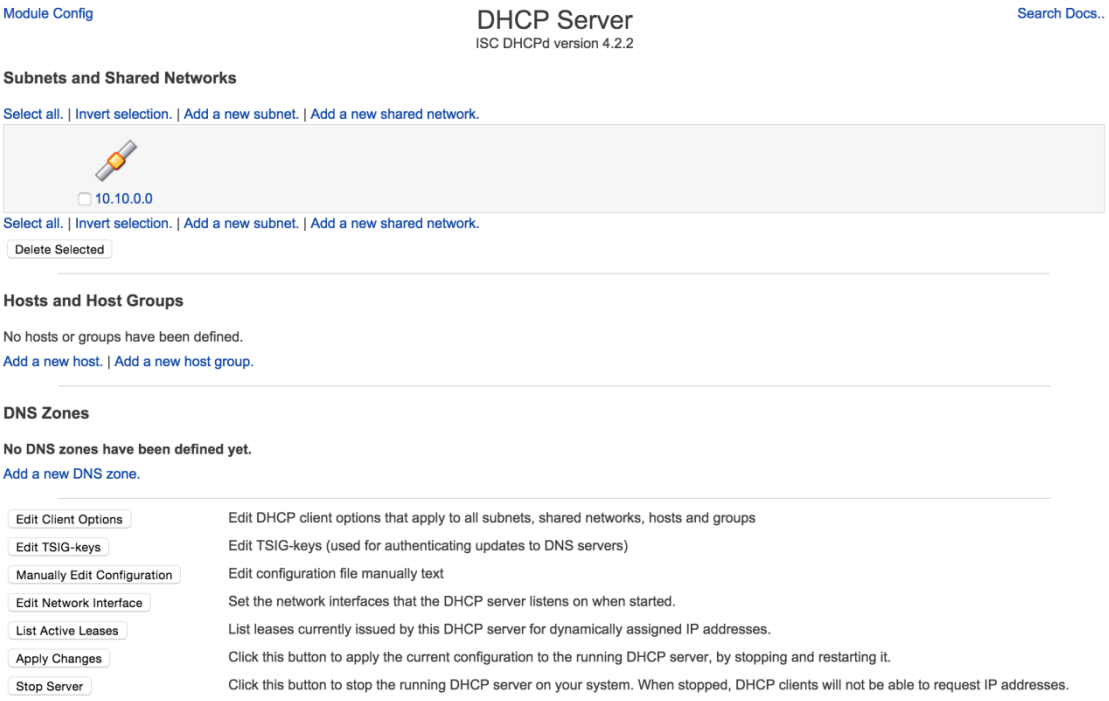


Click **Create virtual host**. You may configure the settings of the virtual host. When finished, click **Create Now**.

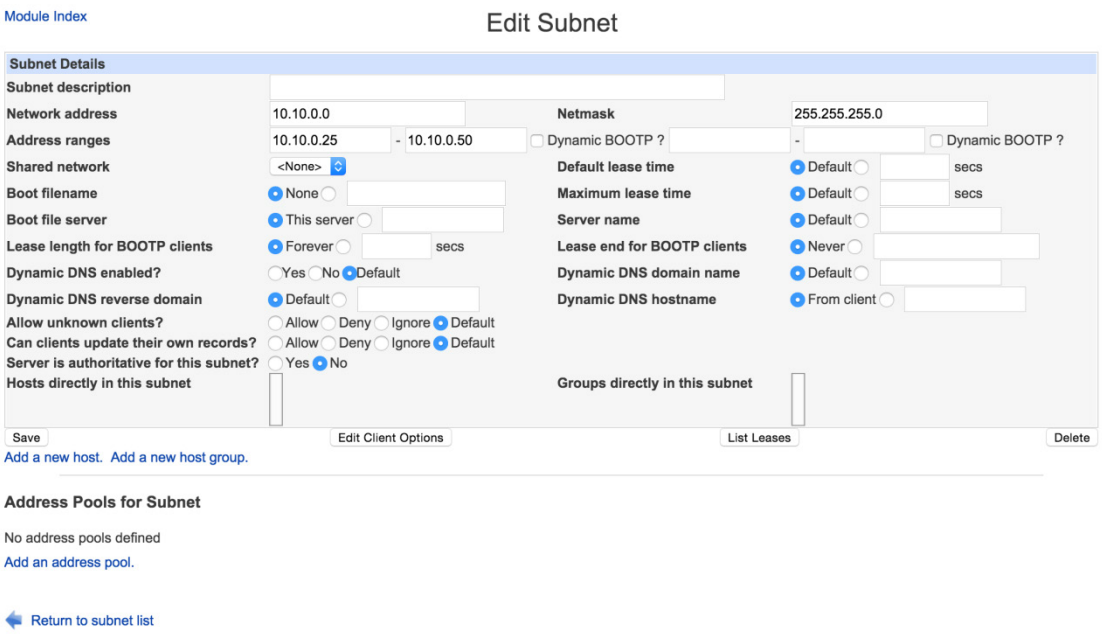


DHCP Server

This option allows users to configure the DHCP server settings. Various functions are also provided, including Edit Client Options, Edit TSIG-keys, Manually Edit Configuration, List Active Leases.

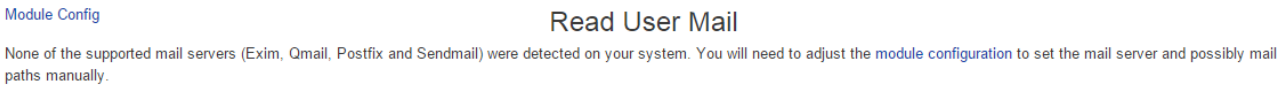


To edit the subnet settings of the current DHCP server, click the icon and then start configuring. When finished, click **Save**.

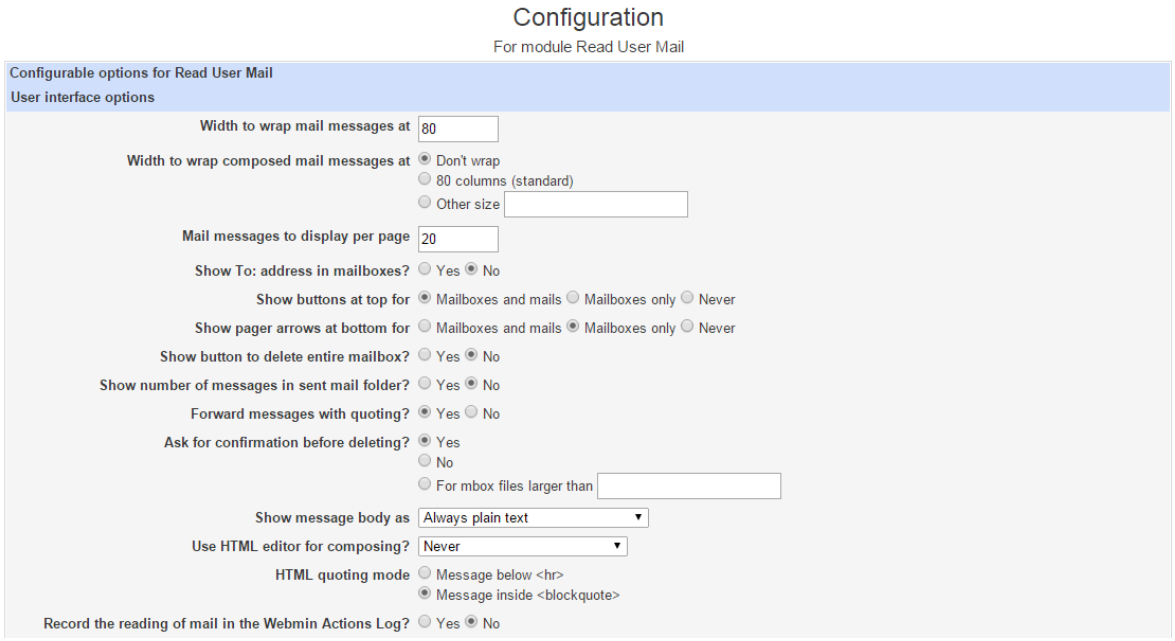


Read User Mail

You can read user's email here.



To configure the email settings, click module configuration. When finished, click **Save**.

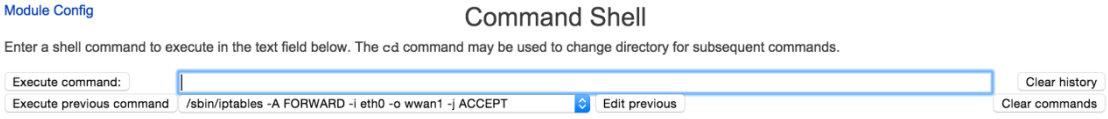


Configuring Others

Click **Others**. Two options will be displayed. Click the appropriate option to take further action.

Command Shell

This option allows users to manually execute the command shell from the system. Type the command in the field, and then click **Execute command**.



File Manager

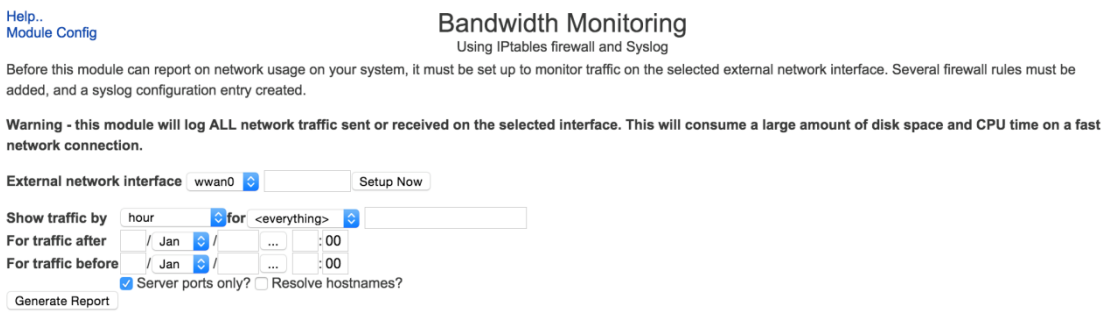
This is an additional plug-in function.

Configuring Networking

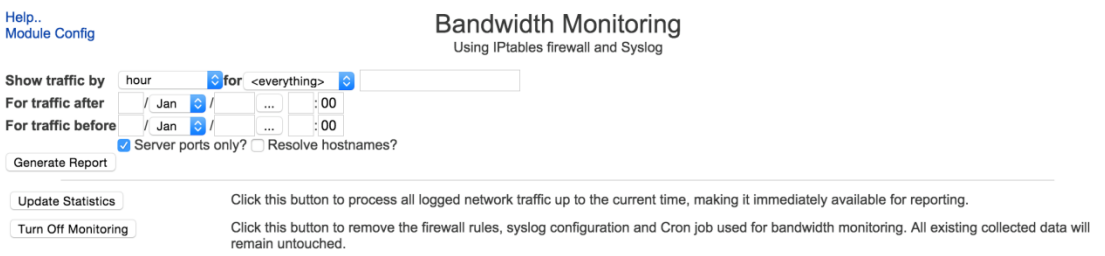
Click **Networking**. Three options will be displayed. Click the appropriate option to take further action.

Bandwidth Monitoring

This option allows users to configure the network interface and the bandwidth condition.

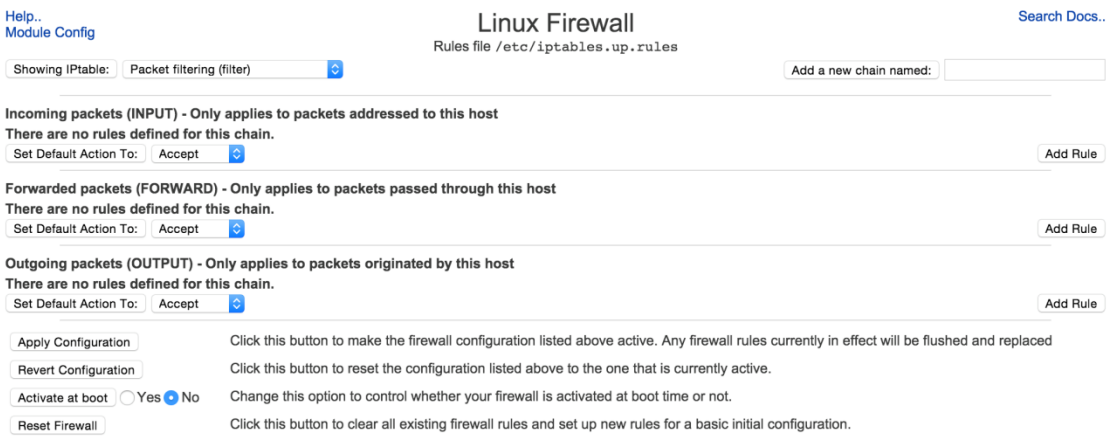


Select the network interface, and then click **Setup Now** for additional configuration. When finished, click **Save**.



Linux Firewall

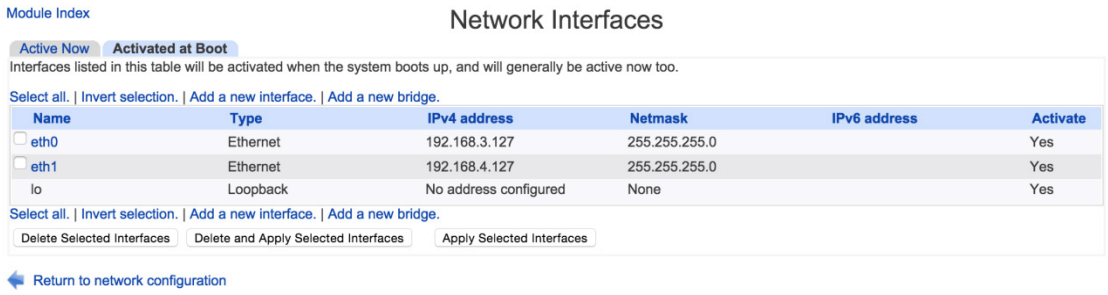
This option allows users to configure the firewall settings. You may also reset the firewall configuration on this page.



Network Configuration

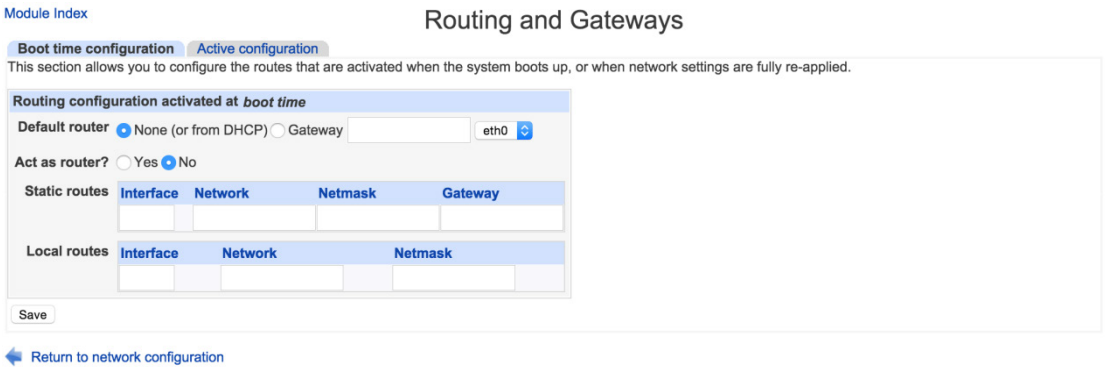
Network Interfaces

This option allows users to activate, view, or apply the current network interfaces. Select the functions you wish to use.



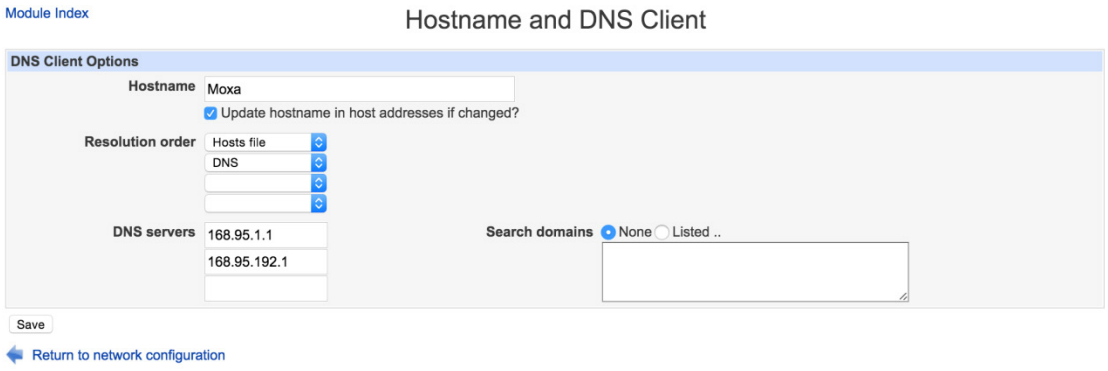
Routing and Gateways

This option allows users to configure the routing and gateways configurations. When finished, click **Save**.



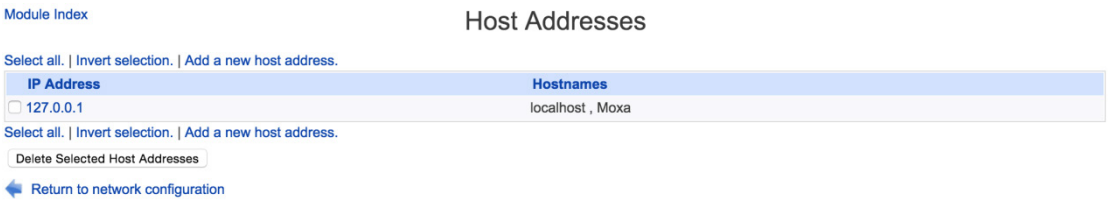
Hostname and DNS Client

This option allows users to configure the hostname and DNS client configuration. When finished, click **Save**.



Host Addresses

This option allows users to add a new host address or delete the existing one.

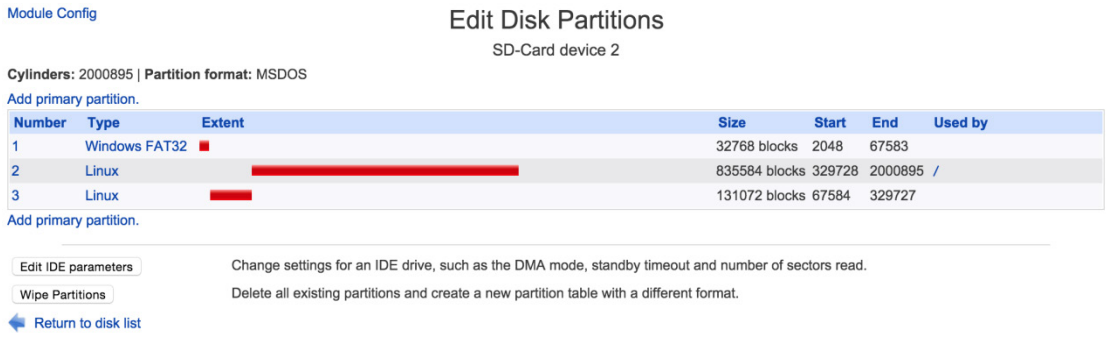


Hardware

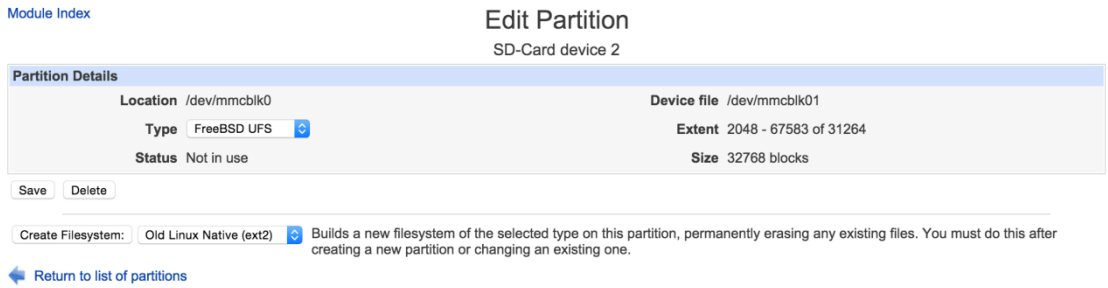
Click **Hardware**. Two options will be displayed. Click the appropriate option to take further action.

Partitions and Local Disks

This option allows users to edit the disk partitions. You may edit IDE parameters, or erase all partitions on the existing disks.

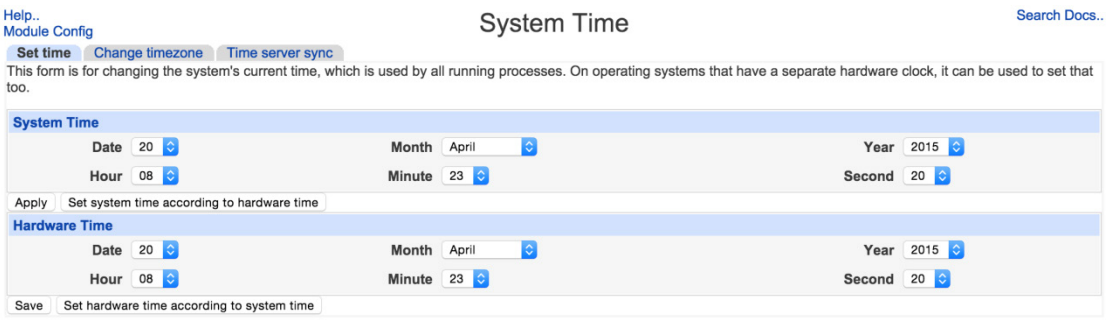


Click the partition you want to edit, and then configure the settings. When finished, click Save.



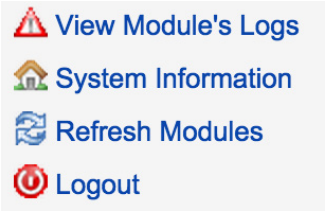
System Time

This option allows users to configure system time and hardware time. When finished, click **Apply** or **Save**.



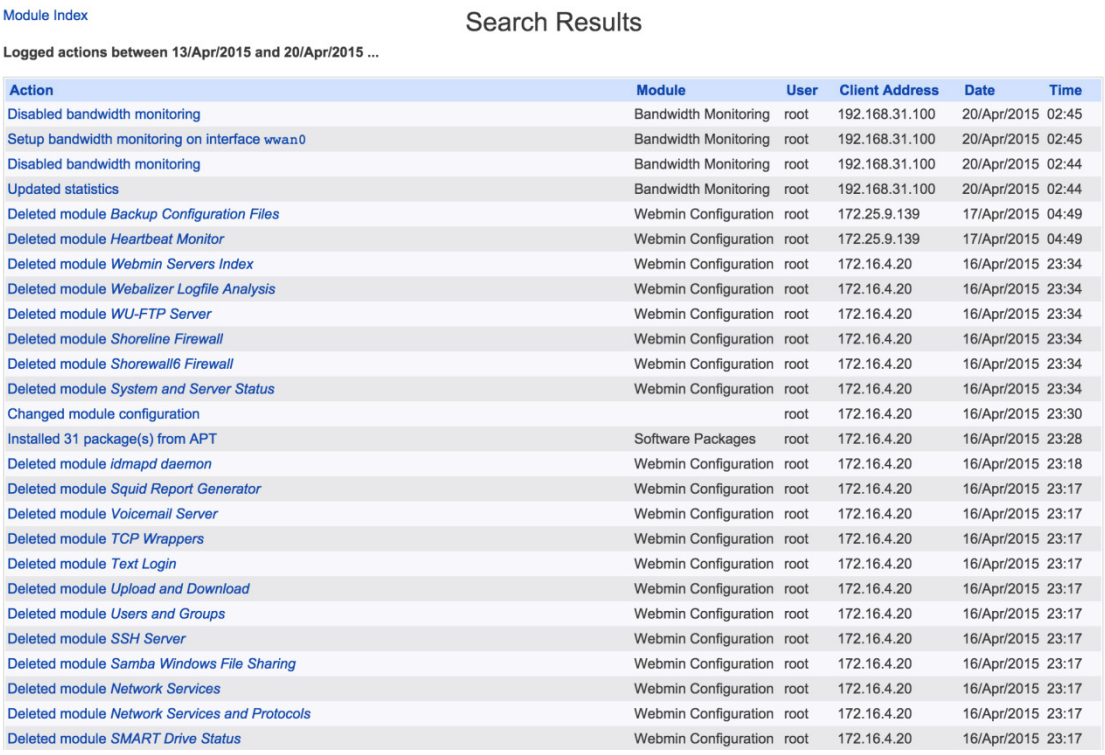
Viewing More Options

Four more options can be found in the left lower corner of the Webmin window. Click an option for details.



View Module Logs

This option allows users to view the log files.



Action	Module	User	Client Address	Date	Time
Disabled bandwidth monitoring	Bandwidth Monitoring	root	192.168.31.100	20/Apr/2015	02:45
Setup bandwidth monitoring on interface wwan0	Bandwidth Monitoring	root	192.168.31.100	20/Apr/2015	02:45
Disabled bandwidth monitoring	Bandwidth Monitoring	root	192.168.31.100	20/Apr/2015	02:44
Updated statistics	Bandwidth Monitoring	root	192.168.31.100	20/Apr/2015	02:44
Deleted module *Backup Configuration Files*	Webmin Configuration	root	172.25.9.139	17/Apr/2015	04:49
Deleted module *Heartbeat Monitor*	Webmin Configuration	root	172.25.9.139	17/Apr/2015	04:49
Deleted module *Webmin Servers Index*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Deleted module *Webalizer Logfile Analysis*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Deleted module *WU-FTP Server*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Deleted module *Shoreline Firewall*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Deleted module *Shorewall6 Firewall*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Deleted module *System and Server Status*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:34
Changed module configuration		root	172.16.4.20	16/Apr/2015	23:30
Installed 31 package(s) from APT	Software Packages	root	172.16.4.20	16/Apr/2015	23:28
Deleted module *idmapd daemon*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:18
Deleted module *Squid Report Generator*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Voicemail Server*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *TCP Wrappers*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Text Login*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Upload and Download*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Users and Groups*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *SSH Server*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Samba Windows File Sharing*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Network Services*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *Network Services and Protocols*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17
Deleted module *SMART Drive Status*	Webmin Configuration	root	172.16.4.20	16/Apr/2015	23:17

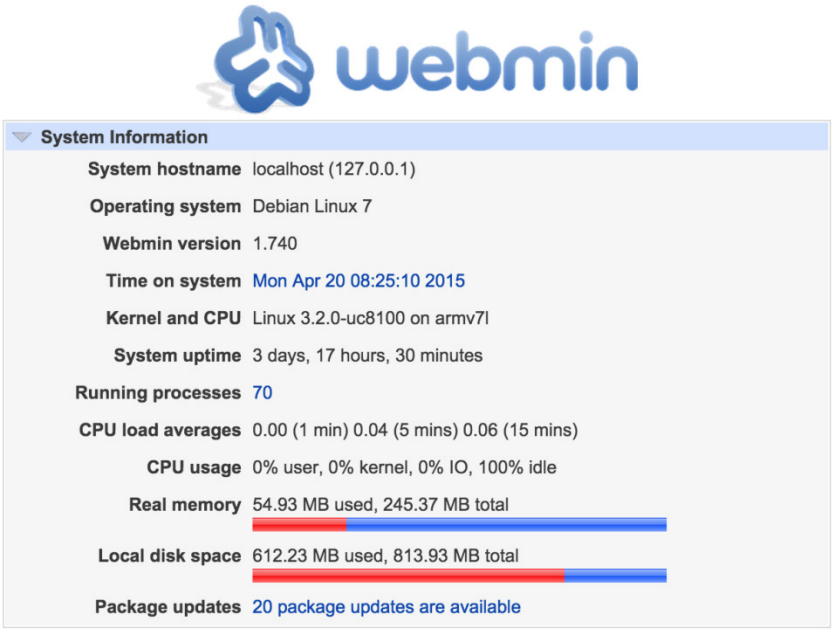
You may also export the files in CSV format. Select the file and then click **Export as CSV**.

Ran command `cell_mgmt start`	Command Shell	root	172.25.9.139	16/Apr/2015 10:02
Ran command `cell_mgmt stop`	Command Shell	root	172.25.9.139	16/Apr/2015 10:02
Ran command `ls`	Command Shell	root	172.25.9.139	16/Apr/2015 06:00
Ran command `/sbin/iptables -A FORWARD -i eth0 -o wwan0 -j ACCEPT`	Command Shell	root	172.25.9.139	16/Apr/2015 06:00
Ran command `/sbin/iptables -t nat -A POSTROUTING -o wwan0 -j MASQUERADE`	Command Shell	root	172.25.9.139	16/Apr/2015 05:59
Ran command `echo 1 > /proc/sys/net/ipv4/ip_forward`	Command Shell	root	172.25.9.139	16/Apr/2015 05:58

Export as CSV.

System Information

This item allows users to view the current system information.

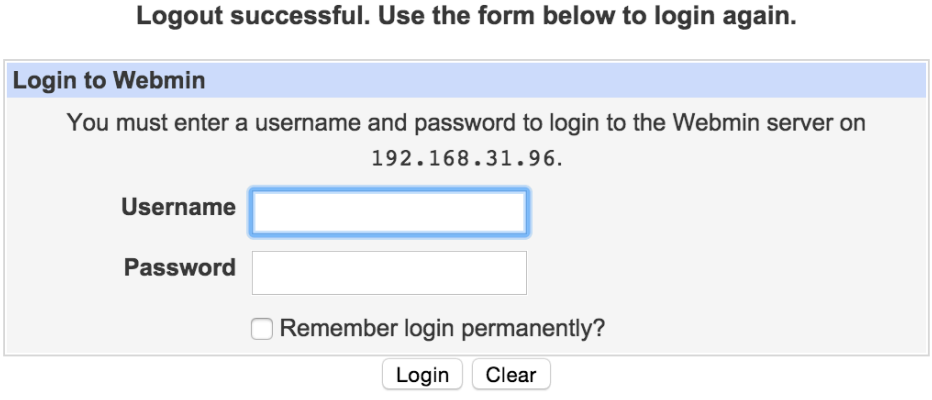


Refresh Modules

This item allows users to refresh the current modules on the UC-8112 computer.

Logout

Click Logout to exit Webmin. You may log in again or close your browser to exit the system.



5

Wireless Module Settings

This chapter describes how to configure the Wi-Fi and cellular modules for the UC-8112-LX computer.

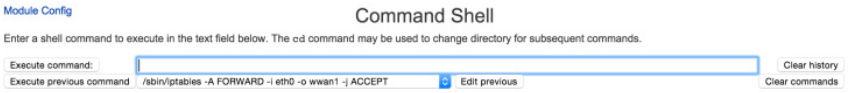
The following topics are covered in this chapter:

- **Enabling Cellular Module**
  - Configuring the Cellular Module
- **Configuring the Wi-Fi Module**
- **Bridging the Cellular to Serial Interface**
  - UDP Server to Serial Device
  - UDP Client to Serial Device
  - TCP Server to Serial Device
  - TCP Client to Serial Device
- **Configuring the IPSec Settings**

Enabling Cellular Module

Locate **Command Shell** in the **Others** drop-down list.

Provide the required commands in the Command Shell field.



Configuring the Cellular Module

To enable and dial up the cellular module, type the following command:
cell_mgmt start

To disable and disconnect the cellular module, type the following command:
cell_mgmt stop

To power off the cellular module, type the following command:
cell_mgmt power_off

To power on the cellular module, type the following command:
cell_mgmt power_on

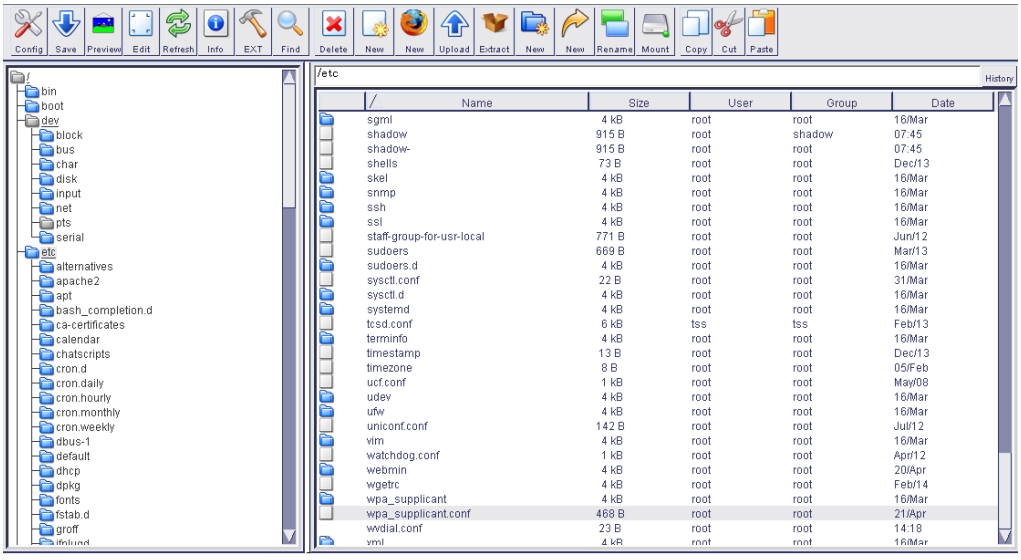
To keep the UC-8112 computer constantly connecting to the network, type the following command.
keep_alive

To enable the routing function of the cellular module, type the following command.
lte_router

Note that once the routing function has been enabled, the device connecting to the LAN 2 port of the UC-8112 computer can connect to the network via the cellular module. Remember to enable the device's DHCP function.

Configuring the Wi-Fi Module

You need to edit the Wi-Fi configuration file to enable the Wi-Fi module on the UC-8112. Connect to the UC-8112 computer and locate the configuration file at this path: **/etc/wpa_supplicant.conf**.



Configuring SSID and Password

To configure the SSID and password, edit the following content:

```
### Open system ###
#network={
#     ssid="Open"
#     key_mgmt=NONE
#}
####################
```

Configuring the WEP SSID and WEP key

To configure the WEP SSID and WEP key, edit the following content:

```
##### WEP #####
#network={
#     ssid="WEP-ssid"
#     bssid=XX:XX:XX:XX:XX:XX
#     key_mgmt=NONE
#     wep_key0=KEY
#}
################
```

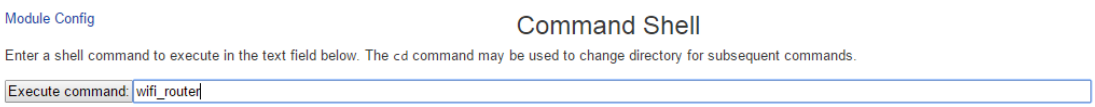
Configuring WPA/WPA2 SSID/Password/PSK

To configure the SSID and password for WPA/WPA2, edit the following content:

```
##### WPA/WPA2 PSK #####
#network={
#     ssid="WES_AP"
#     proto=WPA WPA2 RSN
#     key_mgmt=WPA-PSK
#     pairwise=TKIP CCMP
#     group=TKIP CCMP
#     psk="123456789"
#}
########################
```

Connecting to the Wi-Fi AP

To connect to the Wi-Fi AP you have just configured, type the following command in the Command shell field: **wi-fi_router**



When the UC-8100 computer has successfully connected to the Wi-Fi AP, you may connect your computer to the LAN2 port on the UC-8100, so that your computer can connect to the network.

Bridging the Cellular to Serial Interface

This section describes how to enable the UC-8112 to communicate with peripheral devices.

UDP Server to Serial Device

Type the following command in the Command Shell so that the signal between the DUP server and serial device can be transmitted:

socat UDP-SENDTO:REMOTE IP:REMOTE PORT
file:/dev/ttyM0,nonblock,raw,echo=0,waitlock=/var/run/ttyM0,b115200

UDP Client to Serial Device

Type the following command in the Command Shell so that the signal between the DUP client and serial device can be transmitted.

socat UDP-SENDTO:REMOTE IP:REMOTE PORT
file:/dev/ttyM0,nonblock,raw,echo=0,waitlock=/var/run/ttyM0,b115200

TCP Server to Serial Device

Type the following command in the Command Shell so that the signal between the TCP server and serial device can be transmitted.

socat -v TCP-LISTEN: LISTEN PORT,reuseaddr,fork
file:/dev/ttyM0,nonblock,raw,echo=0,waitlock=/var/run/ttyM0,b115200

TCP Client to Serial Device

Type the following command in the Command Shell so that the signal between the TCP client and serial device can be transmitted:

socat TCP:REMOTE IP:REMOTE PORT
file:/dev/ttyM0,nonblock,raw,echo=0,waitlock=/var/run/ttyM0,b115200

Configuring the IPSec Settings

To set up the IP address of the IPSec server, edit the following file: **/etc/ipsec-tools.conf**

```
## Flush the SAD and SPD
#
flush;
spdflush;
## Some sample SPDs for use racoon
#
spdadd 10.10.10.78 10.10.10.10 any -P out ipsec
esp/transport//require;
#
spdadd 10.10.10.10 10.10.10.78 any -P in ipsec
esp/transport//require;
```

Note that 10.10.10.10 is the IP address of the remote host.

To configure the setup key, edit the following file: **/etc/racoon/racoon.conf**

```
log notify;
path pre_shared_key "/etc/racoon/psk.txt";
path certificate "/etc/racoon/certs";
remote anonymous {
        exchange_mode main,aggressive;
        proposal {
                encryption_algorithm aes_256;
                hash_algorithm sha256;
                authentication_method pre_shared_key;
                dh_group modp1024;
        }
        generate_policy off;
}
sainfo anonymous{
        pfs_group 2;
        encryption_algorithm aes_256;
        authentication_algorithm hmac_sha256;
        compression_algorithm deflate;
}
```

To configure the pre-shared key, edit the following file: **/etc/racoon/psk.txt.**

- 10.10.10.10 1234567890
- /etc/init.d/setkey restart

/etc/init.d/racoon restart

Note: Authentication Mode

- Pre-shared key
- X.509

In this example, 10.10.10.10 is the IP address of the host, while 1234567890 is the pre-shared key.

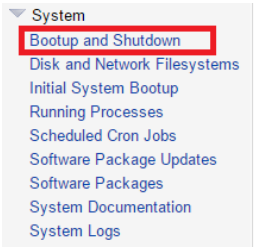
To start the IPSec configuration, run the following commands:

/etc/init.d/setkey restart

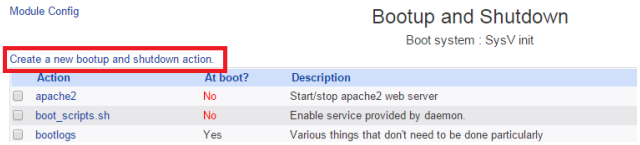
/etc/init.d/racoon restart

Take the following steps to enable the IPSec function when the system starts up:

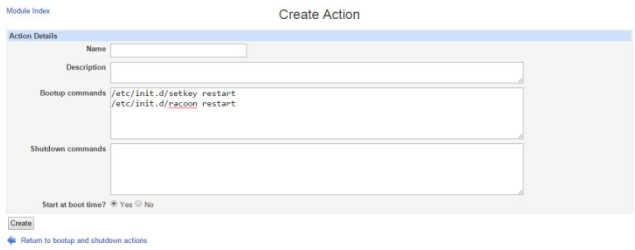
1.
2. Locate the **Bootup and Shutdown** option in Webmin.



3. Click **Create a new bootup and shutdown action**.



4. Enter the following commands in the Bootup commands field:
   /etc/init.d/setkey restart
   /etc/init.d/racoon restart



5. When finished, click **Create**.

6

Data Acquisition

This chapter describes how to use the UC-8112 computer to acquire data from an ioLogik E1242 RTU controller.

The following topics are covered in this chapter:

- **Acquiring Data**

Acquiring Data

The UC-8112-LX Start Kit comes with an ioLogik E1242 RTU controller. To acquire data from the controller, use the following commands in the Command Shell field.

To read the value from Digital Input 0:
Em2240 –d 192.168.31.66 –i 0

To read the value from Analog Input 0:
Em2240 –d 192.168.31.66 –i 1

To set Digital Input to high level:
Em2240 –d 192.168.31.66 –o 1 –s 1

A

Regulatory Approval Statements

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A: FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense.

European Community

WARNING

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.