MediaKind
everyone. everywhere.

Off-the-shelf Hardware

M1 1000 Series (RX1)

Installation Guide

P/N S16797 RI

Contents

Chapter 1
Safety Information

1.1 General safety information

This document applies to Advantech Vega 7010 chassis. To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your M1 chassis.

In the event of a conflict between the information in this document and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your server should be integrated and serviced only by technically qualified persons.

You must adhere to the guidelines in this guide and the assembly instructions in your server manuals to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL Listing and other regulatory approvals of the product, and may result in noncompliance with product regulations in the region(s) in which the product is sold.

1.2 Safety Warnings & Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

CAUTION	Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
WARNING	Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.
	Indicates potential hazard if indicated information is ignored.
	Indicates shock hazards that result in serious injury or death if safety instructions are not followed.
	Indicates hot components or surfaces.
	Indicates do not touch fan blades, may result in injury.
	Indicates to unplug all AC power cord(s) to disconnect AC power.
	Please recycle battery.

1.3 Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

1.4 Site Selection

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean, dry, and free of airborne particles (other than normal room dust).
- Well-ventilated and away from sources of heat including direct sunlight and radiators.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppresser and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

1.5 Equipment Handling Practices

Reduce the risk of personal injury or equipment damage:

- Conform to local occupational health and safety requirements when moving and lifting equipment.
- Use mechanical assistance or other suitable assistance when moving and lifting equipment.
- To reduce the weight for easier handling, remove any easily detachable components.

1.6 Power and Electrical Warnings

⚠⚠ CAUTION

- The power button, indicated by the stand-by power marking, DOES NOT completely turn off the system AC power, 5V standby power is active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Your system may use more than one AC power cord. Make sure all AC power cords are unplugged. Make sure the AC power cord(s) is/are unplugged before you open the chassis, or add or remove any non hot-plug components.
- Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each system power supply.
- Some power supplies use Neutral Pole Fusing. To avoid risk of shock use caution when working with power supplies that use Neutral Pole Fusing.
- The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.
- When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.
- To avoid risk of electric shock, turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it.

1.6.1 Power Cord Warnings

⚠⚠ CAUTION

NOTE If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:

- Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets.
- The power cord(s) must meet the following criteria:
  - The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.
  - The power cord must have safety ground pin or contact that is suitable for the electrical outlet.
- The power supply cord(s) is/are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.
- The power supply cord(s) must be plugged into socket-outlet(s) that is /are provided with a suitable earth ground.

Connection to line to line mains supplies

Where the supply connection used is line to line rather than line to neutral (example: 208 V supplies used in North America) suitable double pole protection, as detailed below, must be provided in the building installation to provide the appropriate short circuit and overload protection.

The following double pole circuit breaker values are recommended:

Product Current Rating	Recommended Double Pole Circuit Breaker
Up to 6 A	10 A
6 A to 10 A	16 A
10 A to 16 A	20 A

1.7 System Access Warnings

⚠⚠ CAUTION

To avoid personal injury or property damage, the following safety instructions apply whenever accessing the inside of the product:

- Turn off all peripheral devices connected to this product.
- Turn off the system by pressing the power button to off.
- Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the system.
- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.
- Do not access the inside of the power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.
- Power down the server and disconnect all power cords before adding or replacing any non hot-plug component.
- When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.

⚠⚠ CAUTION

If the server has been running, any installed processor(s) and heat sink(s) may be hot. Unless you are adding or removing a hot-plug component, allow the system to cool before opening the covers. To avoid the possibility of coming into contact with hot component(s) during a hot-plug installation, be careful when removing or installing the hot-plug component(s).

⚠ CAUTION

To avoid injury do not contact moving fan blades. If your system is supplied with a guard over the fan, do not operate the system without the fan guard in place.

1.8 Rack Mount Warnings

- The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.
- Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.
- Extend only one piece of equipment from the rack at a time.
- You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).
- To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

1.9 Electrostatic Discharge (ESD)

⚠ CAUTION

- ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground – any unpainted metal surface – on your server when handling parts.
- Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

1.10 Other Hazards

1.10.1 Battery Replacement

⚠ CAUTION

- There is the danger of explosion if the battery is incorrectly replaced. When replacing the battery, use only the battery recommended by the equipment manufacturer.
- Dispose of batteries according to local ordinances and regulations.
- Do not attempt to recharge a battery.
- Do not attempt to disassemble, puncture, or otherwise damage a battery.

1.10.2 Cooling and Airflow

⚠ CAUTION

Carefully route cables as directed to minimize airflow blockage and cooling problems.

For proper cooling and airflow, operate the system only with the chassis covers installed. Operating the system without the covers in place can damage system parts. To install the covers:

1. Check first to make sure you have not left loose tools or parts inside the system.
2. Check that cables, add-in boards, and other components are properly installed.
3. Attach the covers to the chassis according to the product instructions.

Chapter 2
Preparation for Installation

2.1 Unpacking the system

Ensure that you have received the following:

- M1 chassis
- AC or DC power cords
- Packing list
- Quick start guide

2.2 Choosing the operating environment

The M1 is designed to operate in a typical office environment. Install the product in a location that is:

- Clean and free of airborne particles (other than normal dust).
- Well ventilated and away from sources of heat, including direct sunlight.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord, because they serve as the main power disconnect for the product.

2.3 Placement

The M1 can be installed on a table top or in a rack. Use the following guidelines to determine the appropriate installation for your needs:

- If the M1 must be moved frequently, install it on a table top or other flat surface.
- If the M1 is going to be installed permanently, install it in a rack using rack mount brackets.

Whichever installation is used, always position the equipment to allow easy access to the rear panel and provide adequate ventilation.

2.3.1 Table top placement

When the M1 is installed on a table top or other flat surface, place the unit on a rubber mat or other material that will prevent the unit from sliding and protect the table top surface.

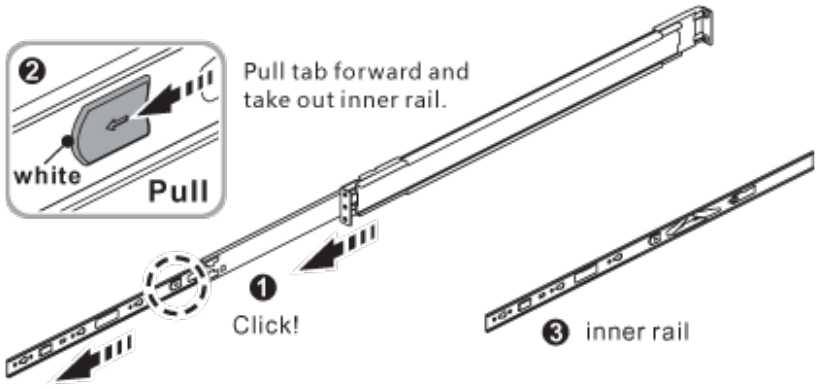
Ensure that the location and position provide the minimum required air flow clearance.

2.3.2 Rack-mount bracket installation

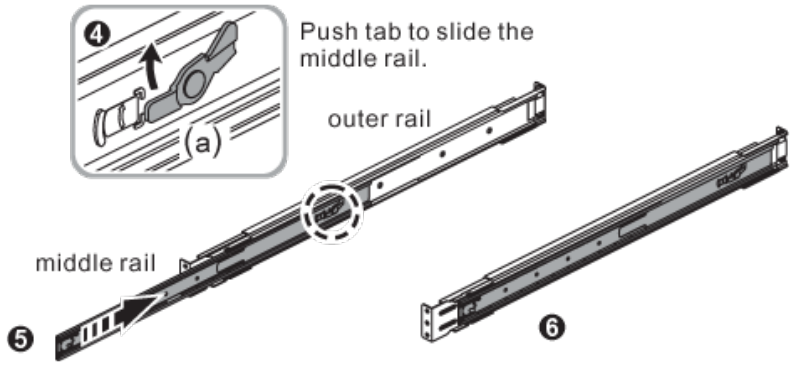
The M1 is designed to be mounted into a rack using a rail kit. Instructions for installing M1 chassis into a rack are in the "Rail kit installation guide".

Installing the chassis into a rack

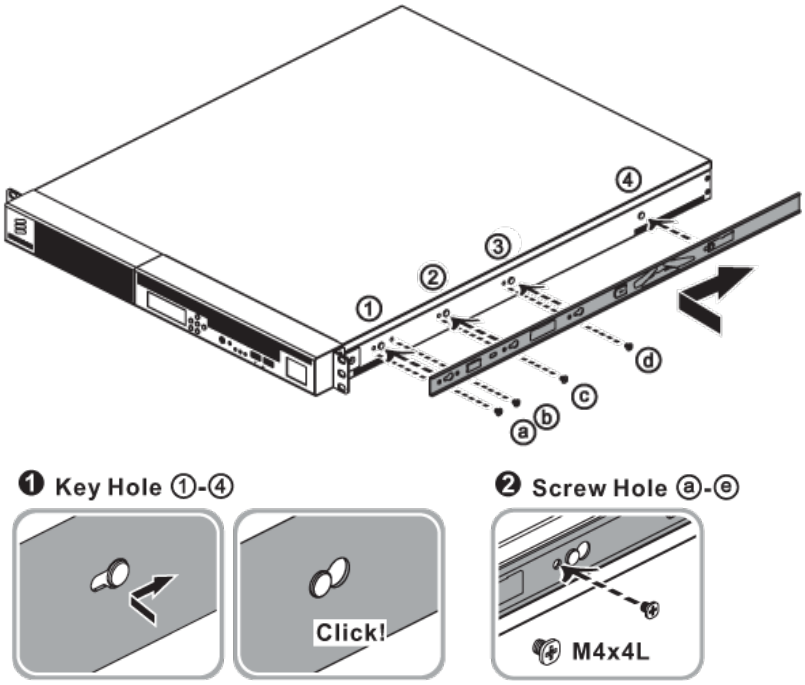
1. Remove the inner rail.



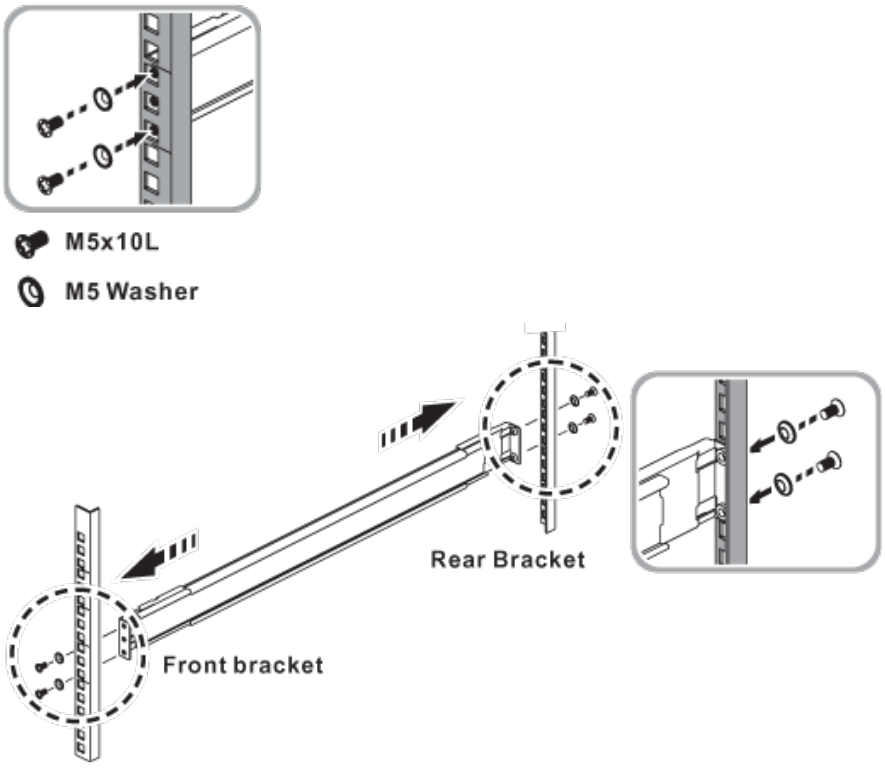
2. Push **(a)** and slide middle rail back.



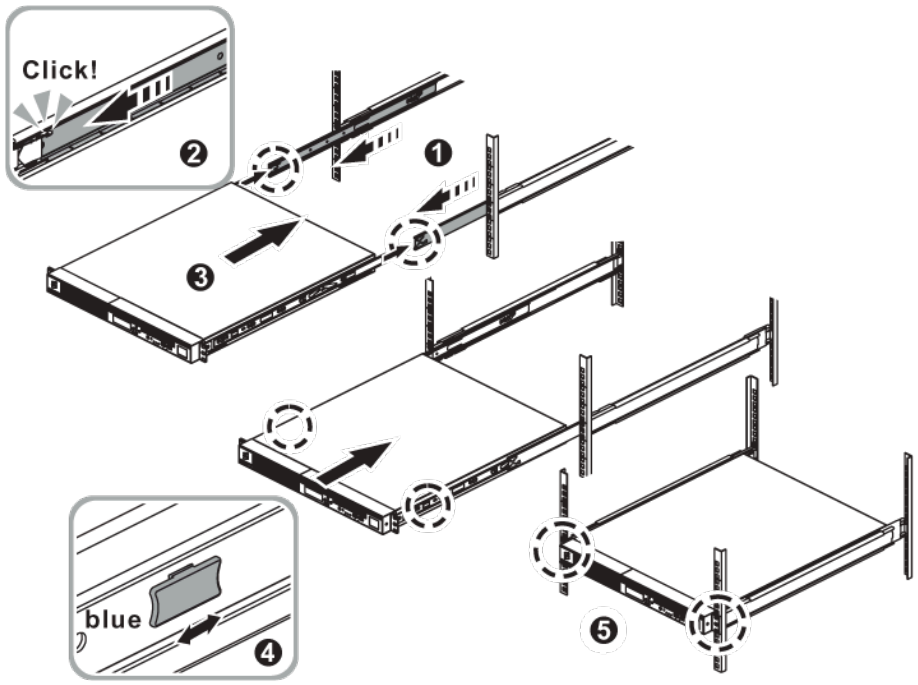
3. Install the inner rail onto the chassis.



4. Fix the outer rail/bracket assembly to the frame.

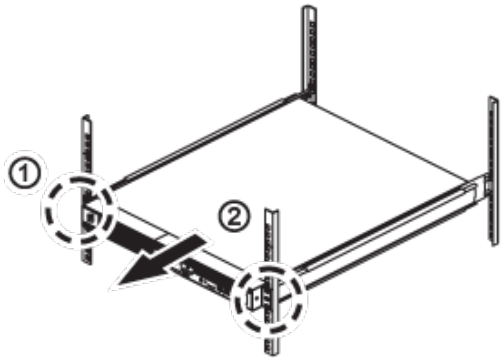


5. Insert the chassis to complete the installation.

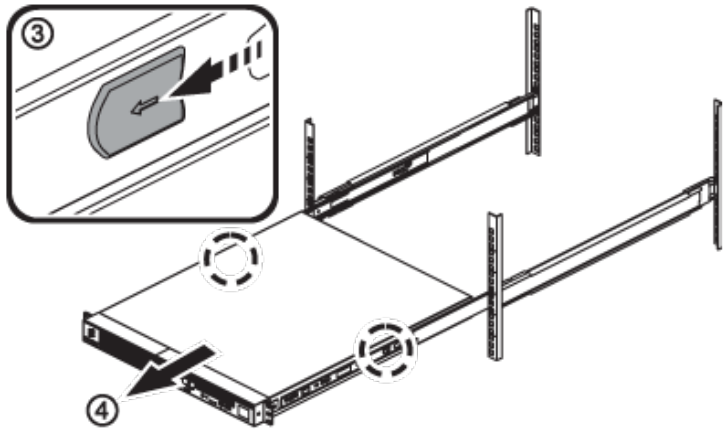


Removing chassis from rack

1. Loosen shipping screw to pull out chassis (1)(2).



2. Press the disconnect tab forward to remove chassis (3)(4).



Chapter 3
Chassis Installation

3.1 Overview

This section describes how to connect input, output, network and management connectors to an M1 platform. All the connections are located on the rear panel.

The M1 is a rack mount 1U server system with redundant power supply modules.

3.2 Connectors for M1

This section describes how to connect input, output and network connectors to the M1. By default, the server is delivered with IP input. You can order specific options

NOTE The backpanel components are SELV (Safety Extra Low Voltage) components.

Figure 1. Rear view of M1 with no optional card

Figure 2. Rear view of M1 with Quad 1 GbE input option

Figure 3. Rear view of M1 with Quad ASI + 10/25 GbE options

Figure 4. Rear view of M1 with Quad ASI + HD-SDI (Contribution) options

Figure 5. Rear view of M1 with 10/25 GbE + HD-SDI (Contribution) options

Figure 6. Rear view of M1 with Quad Satellite option

Figure 7. Rear view of M1 with Dual common interface + Quad Satellite options

Figure 8. Rear view of M1 with SDI output option (Contribution)

Figure 9. Rear view of M1 with SDI output option (Primary distribution)

Figure 10. Rear view of M1 with SDI output (Primary distribution) + Quad 1 GbE input options

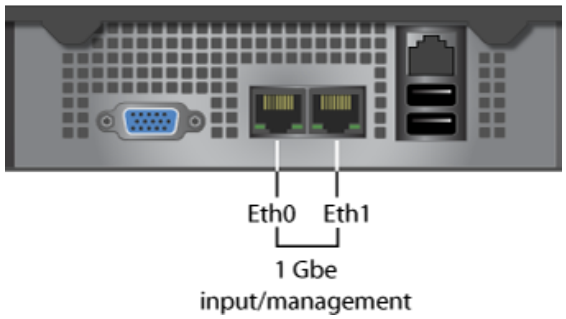
3.2.1 Network connector (management)

Management IP address: By default, the network management interfaces (**Ethernet 0** and **Ethernet 1**) are set in DHCP but you can configure them (see Configuring the Network Connectors on page 35).

To connect the M1 to the network, follow these steps:

1. Connect a 1 Gb network interface cable into the LAN connector on the rear panel of M1. Push the plug into the connector until it clicks into place.
2. Plug the other end of the LAN cable into the corresponding network switch.

Figure 11. M1 network connectors



3. Plug the other end of the LAN cable into the corresponding network switch.

3.2.2 Input connectors

Transport stream can be streamed into MediaKind - RX1 over either Ethernet or ASI depending on the card fitted to the M1.

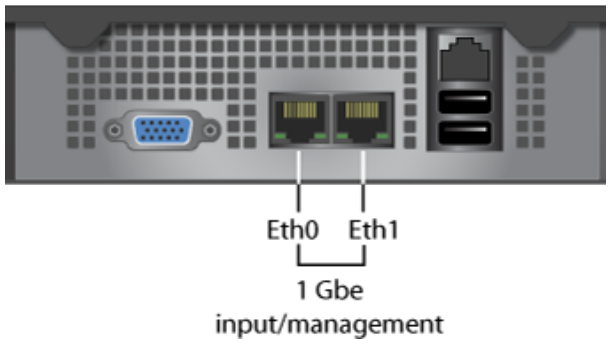
MPEG-2 TS over IP input

IMPORTANT Use the network interfaces #0 or #1 (see graphic below).

To connect the MPEG-2/MPEG-2 TS over IP input connectors, follow these steps:

1. Connect the network interface cable into one of the RJ-45 connectors on the rear panel of the M1.
2. Push the plug into the connector until it clicks into place.

Figure 12. M1 MPEG-2 TS over IP input connectors



3. Plug the other end of the cable into the corresponding switch or hub.

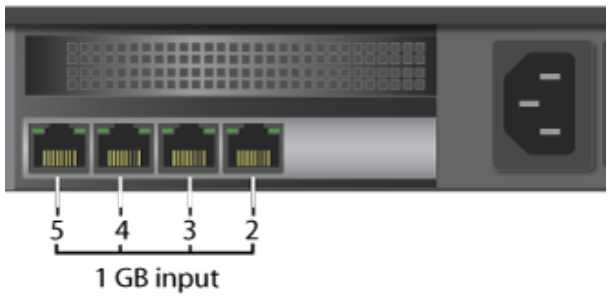
Quad 1 GbE input (option)

IMPORTANT Use the network interfaces #2 to #5 (see graphic below).

To connect the 1 GbE input connectors, follow these steps:

1. Connect the network interface cable into one of the RJ-45 connectors on the rear panel of the M1.
2. Push the plug into the connector until it clicks into place.

Figure 13. M1 Quad 1GB input connectors



3. Plug the other end of the cable into the corresponding switch or hub.

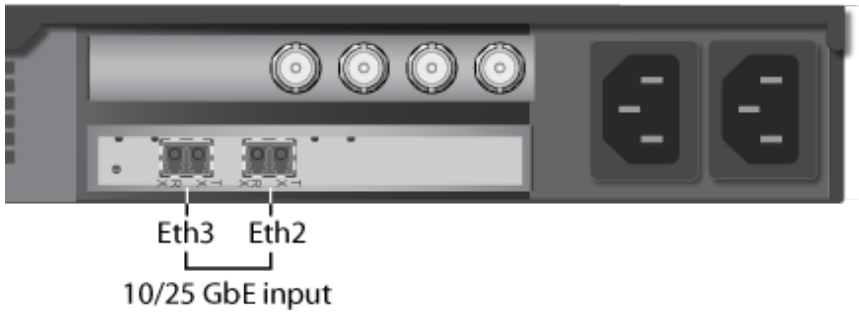
10/25 GbE input (option)

IMPORTANT Use the network interfaces #2 and #3 (see graphic below).

To connect the 10/25 GbE input connectors, follow these steps:

1. Connect the network interface cable into the SFP+ DAC connector on the rear panel of the M1.
2. Push the plug into the connector until it clicks into place.

Figure 14. M1 Quad ASI + 10/25 GbE input modules



3. Plug the other end of the cable into the corresponding 10/25 GbE IP switch.

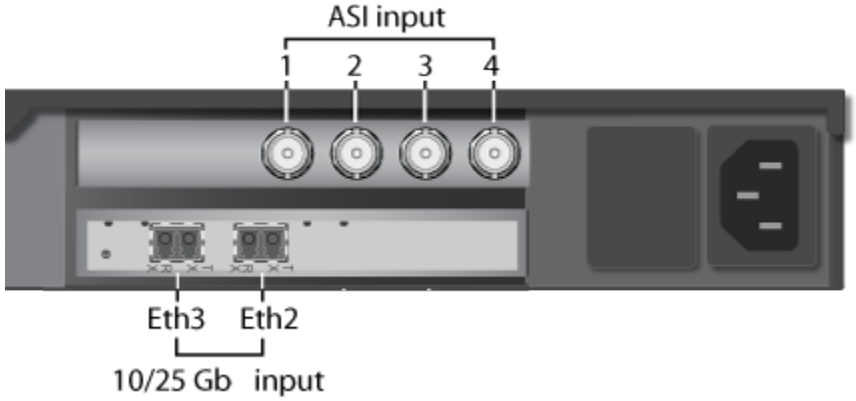
NOTE See Quad ASI input (option) on page 28 for more information on Quad ASI module.

Quad ASI input (option)

To connect the ASI input connector, follow these steps:

1. Connect the ASI cable into one of the BNC connectors on the rear panel of the M1.

Figure 15. M1 quad ASI input connectors



2. Plug the other end of the cable into the ASI source device.

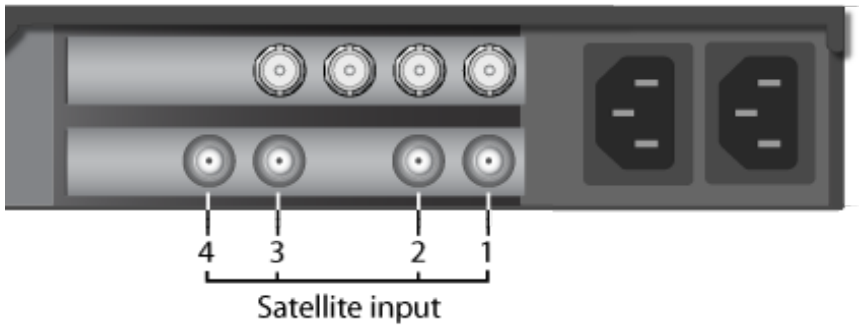
Quad Satellite input (option)

To connect the satellite input connector, follow these steps:

1. Connect the RF cable into one of the F-Type connectors on the rear panel of the M1.

CAUTION Maximum tightening torque is 20in-lb (2.2Nm).

Figure 16. M1 quad satellite input connectors



2. Plug the other end of the cable into the satellite source device.

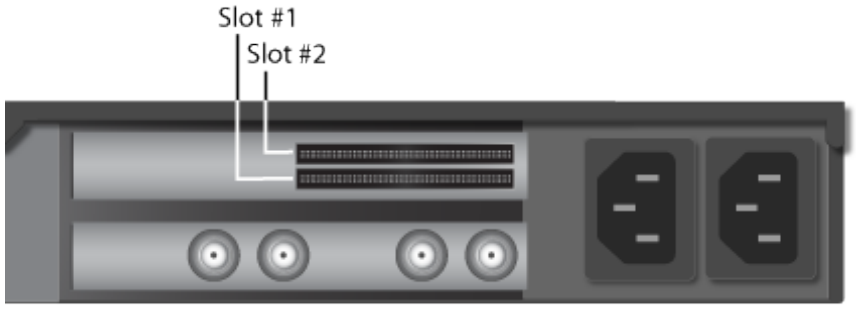
Dual Common interface (option)

To connect the common interface module for use for decrypting incoming services, follow these steps:

1. Insert the CAM into the required slot in the common interface module.

NOTE The CAMs will be inserted upside down when the card is fitted to the right hand side of the chassis i.e. slots should be numbered as shown below.

Figure 17. M1 Dual common interface + Quad Satellite module



2. Insert a viewing card with the correct entitlements into the CAM slot.

NOTE See Quad Satellite input (option) on page 29 for more information on Quad Satellite module.

External Synch input (option)

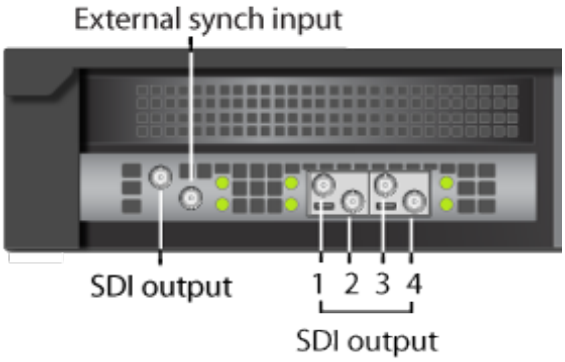
NOTE Two different modules are available:

- External synch input + Contribution SDI output connectors
- External synch input + Primary Distribution SDI output

To connect the external synch input connector, follow these steps:

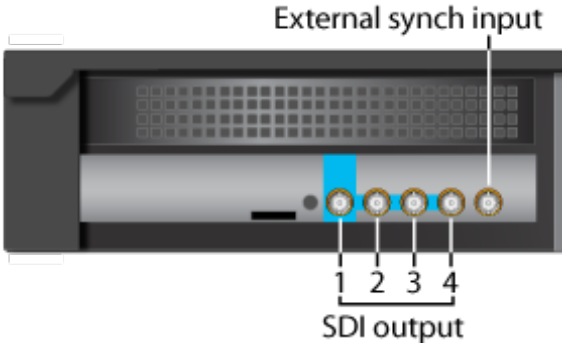
1. Connect the external sync cable into the mini-DIN external sync connector on the rear panel of M1.

Figure 18. M1 external synch input + Contribution SDI output connectors



NOTE See Contribution SDI output (option) on page 30 for more information on SDI output connectors.

Figure 19. M1 external synch input + Primary Distribution SDI output connectors



NOTE See Primary distribution SDI output (option) on page 31 for more information on SDI output connectors.

2. Plug the other end of the cable into the reference clock source.

IMPORTANT After installing the hardware, synchronize the clock (see MediaKind - RX1 User guide)

3.2.3 Output connectors

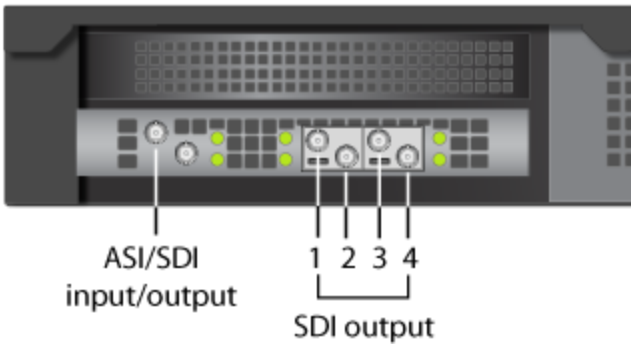
Contribution SDI output (option)

IMPORTANT Use the network interfaces #1 to #4 (see graphic below).

1. Connect the SDI cable into one of the mini-DIN SDI connectors on the rear panel of M1.

2. Push the plug into the connector until it clicks into place.

Figure 20. M1 SDI output connectors



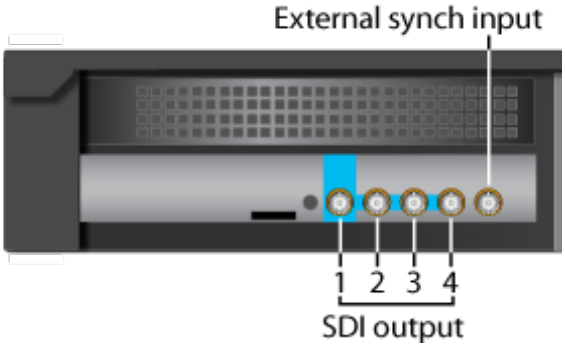
3. Plug the other end of the cable into the SDI receiver.

Primary distribution SDI output (option)

IMPORTANT Use the network interfaces #1 to #4 (see graphic below).

1. Connect the SDI cable into one of the mini-DIN SDI connectors on the rear panel of M1.
2. Push the plug into the connector until it clicks into place.

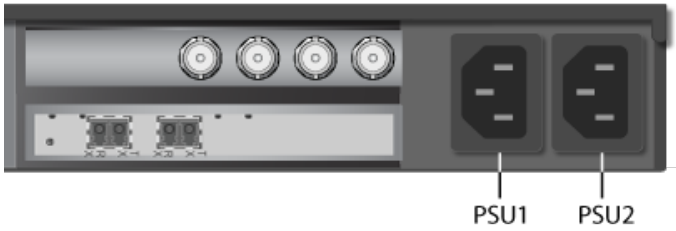
Figure 21. M1 SDI output connectors



3. Plug the other end of the cable into the SDI receiver.

3.2.4 Powering

Figure 22. AC Power supplies



Connecting power cords

The system can support up to two 750 Watts power supply modules providing support for either a non-redundant 1+0 or redundant 1+1 power configuration. In a 1+1 redundant configuration, each power supply module is hot-swappable should one fail.

To connect the power cords, follow this procedure:

CAUTION Before connecting any power cords, verify that the input voltage selector switch (if present) is set to the correct voltage for your region.

WARNING Use a grounded power cord that complies with national electrical safety regulations. Do not use or attempt to modify the supplied power cord if it is not the correct type for your electric power outlet. In regions where electrical storms are frequent, plug the system into a surge suppressor for additional protection.

1. Connect the two power cords to the system.
2. Plug the two power cords into grounded outlets.

Power-up sequence

Once the cabling and interconnections are completed, you may power-up the unit.

To power-up the M1, us the power button the front panel:

Figure 23. M1 front panel including power button and system status LED

Power button

The power button toggles the system power on and off.

The power-on cycle takes a approximately 1 minutes to complete.

The integrated LED is a single color (green) and is capable of supporting different indicator states as defined in the following table.

State	Power Mode	LED	Description
Power-off	Non-ACPI	Off	System power is off, and the BIOS has not initialized the chipset.
Power-on	Non-ACPI	On	System power is on.
S5	ACPI	Off	Mechanical is off, and the operating system has not saved any context to the hard disk.
S4	ACPI	Off	Mechanical is off. The operating system has saved context to the hard disk.
S0	ACPI	Steady on	System and the operating system are up and running.

System status LED

The System Status LED shows the current health of the system. The following table provides a description of each supported LED state.

Table 1. Rear I/O status LED definitions

LED	State	Color	Description
Power LED	On	Green	System in tuned on
	Off	No	No power
Alert LED	On	Red	System Event triggered
	Off	No	No power/No event occured
HW Fault LED	On	Green	by user programming
	On	Orange	by user programming
	Off	No	N/A

Table 2. Front I/O status LED definitions

LED	State	Color	Description
LAN1 ~ LAN2 LED	Blinking	Green	LAN linked
	On	Green	LAN active
	Off	No	LAN unlinked

Power-down sequence

To power-down the M1 (MediaKind - RX1), press the **Power** button located on the front panel. The server will automatically stop the running processes and shut down.

NOTE If the M1 does not shut down, press and release the power button located on the front panel.

Chapter 4
Post-Installation Procedures

4.1 Configuring the Network Connectors

The following sections explain how to configure the network connectors.

NOTE By default, the Ethernet interfaces uses a DHCP configuration.

The network interfaces can be configured:

- either via the M1 LCD panel
- or via a standard Linux application, NetworkManager text user interface (TUI) tool: **nmtui**).

4.1.1 Network interface roles

By default, network interfaces roles are the following:

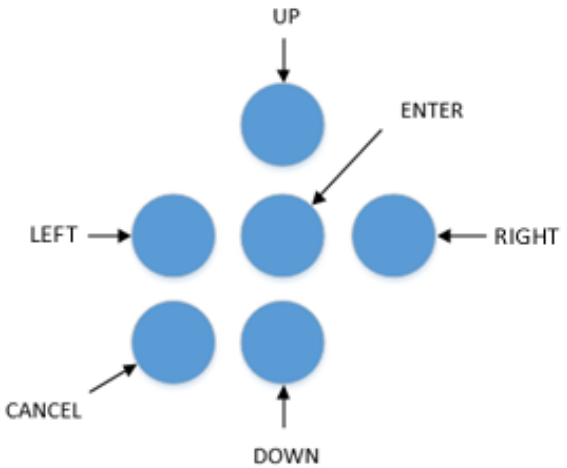
Ethernet connector # (1)(2)	**Role**
Ethernet 1 (*eth0*)	input/output/management
Ethernet 2 (*eth1*)	input/output

1. Note that physical network connectors are numbered from Ethernet 1 to Ethernet 2 though under Linux, Ethernet ports are labeled from eth0 to eth1.
2. To comply with the MediaKind security policy, management traffic is disabled on Ethernet 2 as default. This includes all SSH, API and Web interface packets. DHCP, SNMP Trap, NTP, PTP and transport stream packets are enabled on both ports as standard. Management traffic can be enabled or disabled on either network interface from the front panel or by Linux command line.

4.1.2 Configuration from the LCD panel

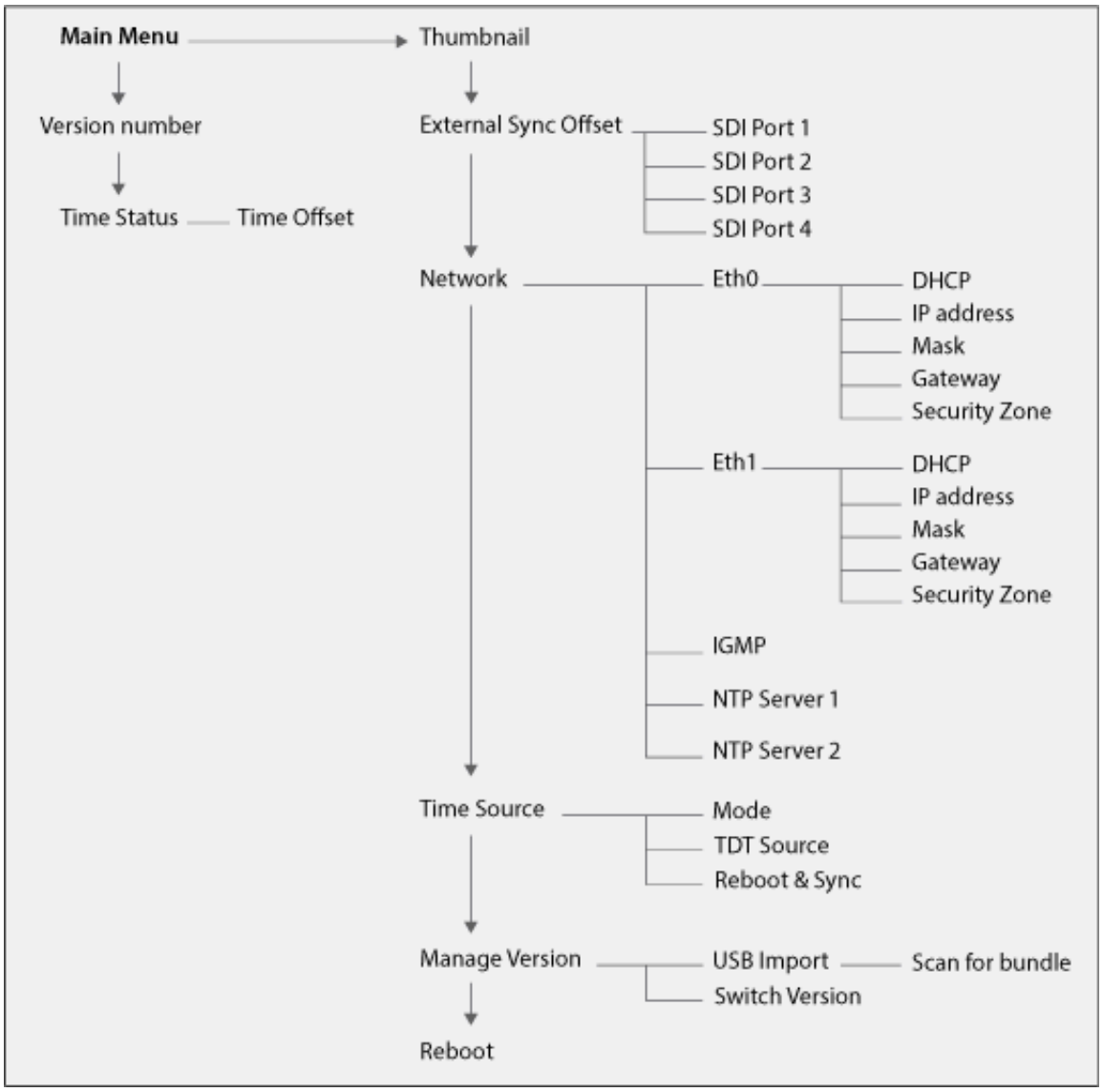
Front panel control buttons

The following buttons on the front panel can be used to navigate into the menus, make selections, and configure the IP addresses:



Front panel menu structure

Below is the current front panel menu structure:



Configuring Network connectors

From the front panel:

1. Use the **UP**, **DOWN**, **LEFT** and **BACK** buttons to navigate and select the parameter to be changed.
2. Use the **UP** and **DOWN** buttons to adjust the value.
3. Press **ENTER** to apply the new value.

4.1.3 Configuration from Linux

To configure the network interfaces from Linux, follow the steps below:

1. Open a Terminal window on MediaKind - RX1 and login using your username and password.

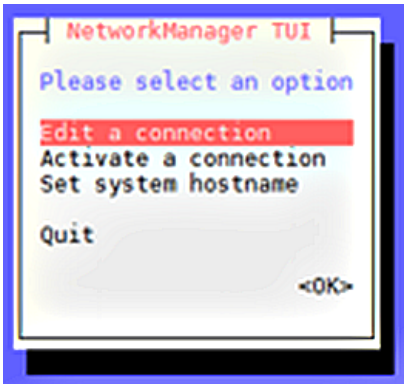
   NOTE Default admin user log in information:

   - Username: **mfadmin**
   - Password: **C&y4u2**

2. Start nmtui by typing the following command:

```
$ sudo nmtui
```

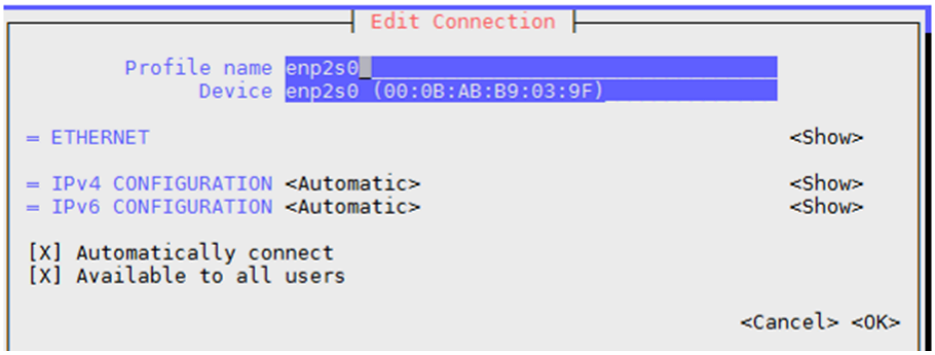
3. Select **Edit a connection**.



   NOTE To navigate:

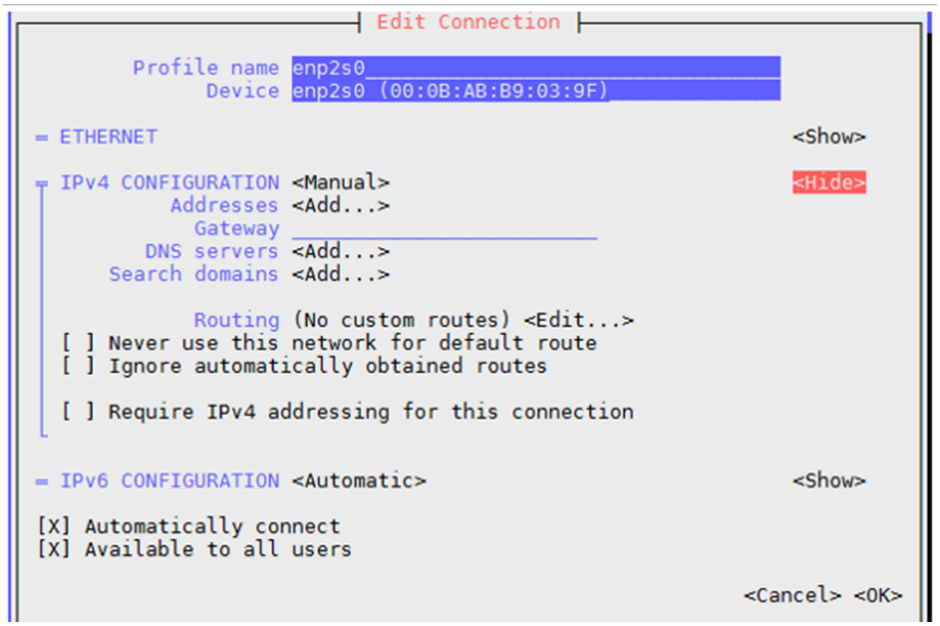
   - Use the **Arrow keys** or press **Tab** to step forwards and press **Shift+Tab** to step back through the options.
   - Press **Enter** to select an option.
   - The **Space bar** toggles the status of a check box.

4. Select the port to be configured, either **Eth0** or **Eth1**.



5. Depending on which address protocol is being used on the network (IPv4 or IPv6) select either **<Automatic>** for DHCP or **<Manual>** for static IP for each protocol type.

   NOTE If using **<Manual>** select **<show>** and set up the Ethernet connection as required.



6. Select **<OK>** when the configuration is complete then **<QUIT>** the program.
7. Change the network interface security settings:
   - to **Control and data zone**: sudo /opt/ericsson/mfcp/restrict_ssh.sh -u -i eth1
   - to **Data only zone**: sudo /opt/ericsson/mfcp/restrict_ssh.sh -i eth1
8. To ensure that all the new parameters have been applied, it is recommended to restart.

Post Requisite:

NOTE See the redhat Networking Guide for more information.

4.2 Managing licenses

4.2.1 Manage licenses

MediaKind solutions offer flexible licensing models. Each model depends on your solution and installation options. A service can be configured but can only be processed for a limited period of time without a license (grace period).

License servers and installation

The license manager is a micro-service application installed on a server, or on 2 servers if in redundancy mode. By default, the Controller hosts this application that is identified by a *Licensing* processing type.

The license manager may also run on dedicated servers for very large configurations.

TIP View license details per feature to display:

- license usage per feature
- license codes
- license expiry dates **in Universal Time** (UTC)

4.2.2 Display license details

There is a license code per feature. Licenses are required for features and options in the MediaKind solution and have expiry dates.

IMPORTANT

- Licenses are managed by a License Manager.
- The License Manager is a micro-service application installed by default on the Controller server or a dedicated license server.
- There may be more than one license server if your solution is installed in redundancy.

1. Display servers.

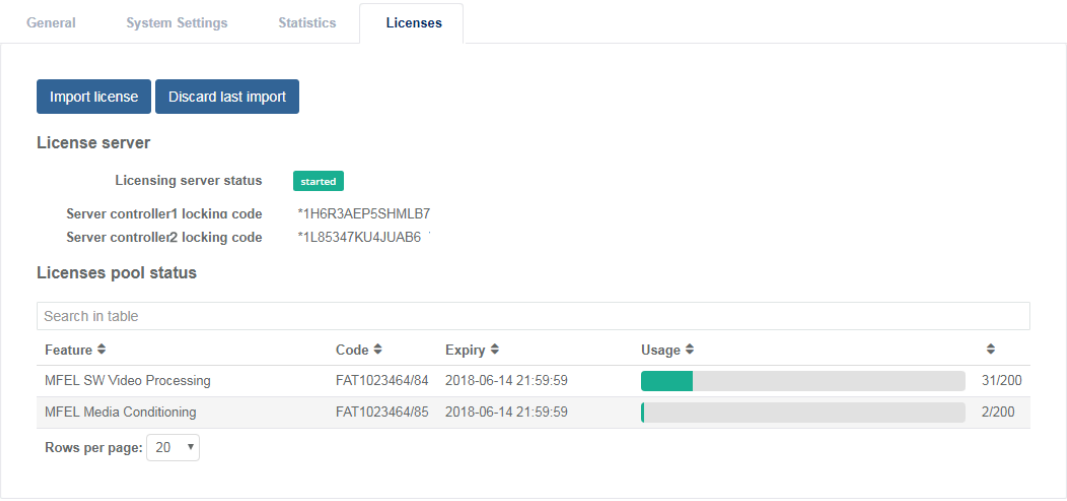
   Result: The servers display.

2. Click  for the server with the **Licensing** processing type.

   NOTE The *Licensing* processing type may display for the Controller server if the licensing manager is installed on the same machine as the Controller.

3. Select the **Licenses** tab.

Example:



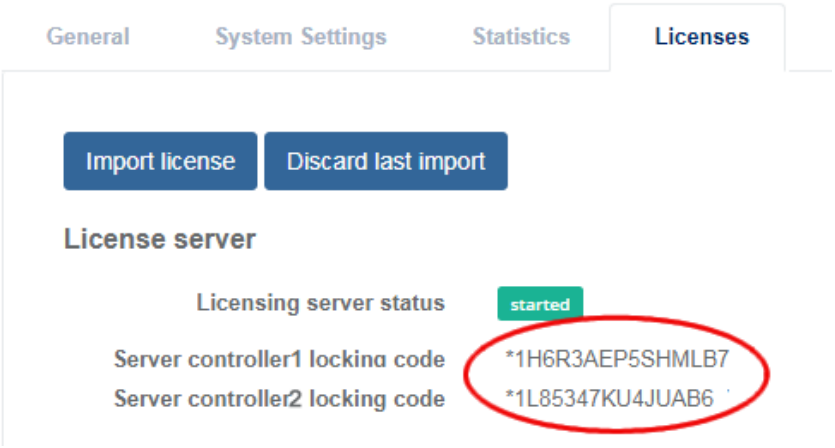
Result: The license information displays.

NOTE All **time stamps are in Universal Time (UTC)**.

4.2.3 Request license file

This is your first time connecting to your MediaKind user interface and you want to request a license file.

1. Display license details.
   Result: The licensing information displays for the specific server.
2. Copy the locking code, including the asterix (*) and paste into the email or file you plan to send to MediaKind.
   Example:



IMPORTANT In redundant solutions:

- Multiple locking codes display per server.
- Provide both locking codes.

3. Copy and paste the LAC reference number for your Software Handling Community to the same file or email and send to your MediaKind representative.

NOTE The LAC reference number and the Software Handling Community details are in the software Delivery Note. See software installation package.

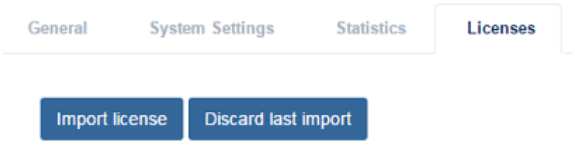
4.2.4 Import license file

New license files are available from the support center.

Prerequisites:

- The new license file needs to be available on the machine.
- Only configuration and admin users can import license files.

1. Display the license details.
   Result: The licensing information displays for the specific server.
2. Click **Import license** > **Select file** to browse and select the file to import.
   Example:



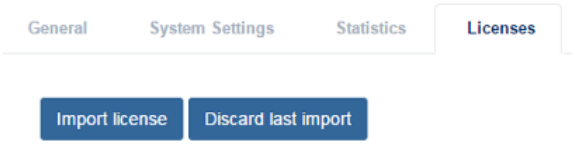
Result: A summary displays.

TIP If an error occurs, keep a copy of the error number and contact support.

4.2.5 Revert to the previous license file

This feature is helpful when solving import errors that restrict license use. **Only use if MediaKind support staff approves a revert**.

1. Display the license details.
2. Click **Discard last import**.
   Example:



Result: You are prompted to confirm.

3. Click **OK** to confirm.

Result: The last license file import is discarded and the previous file is used.

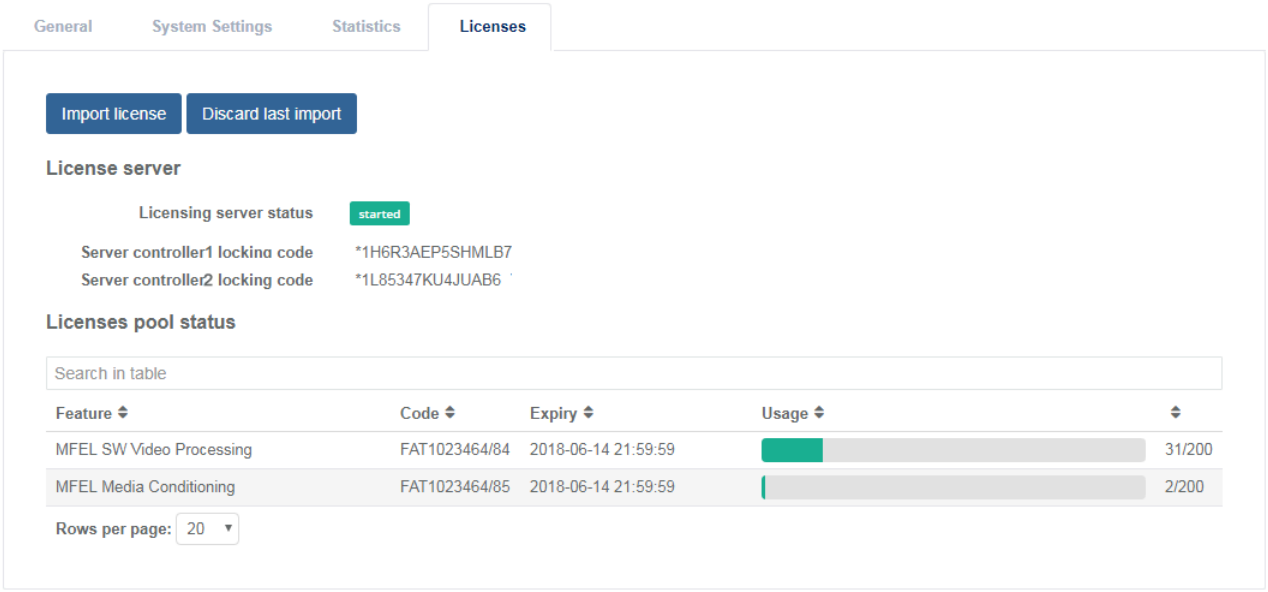
4.2.6 Display license token usage

Use the **Reports** menu to review the Encoding On-Demand license usage.

4.2.7 License information details

License information displays in a table. View information on license usage and availability per feature. Find license codes (FAT codes) for administration and support.

NOTE All **time stamps are in Universal Time (UTC)**.



4.2.8 Encoding On-Demand licensing

Tokens represent processing capabilities that can be acquired and released over time. The license contains a fixed amount of tokens of different types. The interactions between Encoding On-Demand and the license system are limited to the worker.

The transcoding worker is using 5 different tokens, all specific to On-Demand processing capabilities:

- video processing (FAT 102 3464/97): for encoding video/audio
- Dolby decoding 2.0 (FAT 102 3464/98): for decoding one audio, =< 2.0 channels
- Dolby encoding 2.0 (FAT 102 3464/99): for encoding one audio, =< 2.0 channels
- Dolby decoding 5.1 (FAT 102 3464/100): for decoding one audio, > 2.0 channels
- Dolby encoding 5.1 (FAT 102 3464/101): for encoding one audio, > 2.0 channels

Video processing tokens

Video processing tokens are requested when the worker starts. The amount of token requested depends on the CPU capabilities required by the processing. The worker then repeatedly synchronizes with the license server to know the number of token needed by introspecting its CPU usage and requesting or releasing extra tokens. As long as a single token has been acquired by the worker at start-up, the processing is expected to run to completion, even though extra tokens are not available later in the processing. Given that the license contains at least one token, a worker performing the transcoding task of job that can not acquire a single token (request at start-up is rejected because all the tokens have already been acquired by concurrent processes) will stop and the job will be retried.

Whenever the first token cannot be acquired (due to connection problems with the license server or absence of video processing tokens in the license for example), the job is expected to fail after a timeout. Some amount of processing can perform during this timeout.

At the end of processing, the worker releases tokens.

Dolby related tokens

A Dolby token is needed for each Dolby stream processing (decoding and encoding).

Dolby tokens are specific to the channel layout of the given stream.

If no 2.0 token (either decoding or encoding) is available on server, a 5.1 token will be taken instead. Basically 5.1 tokens “include” 2.0 token.

NOTE Contrary to video processing token, the lack of available Dolby-related token will always generate a job failure (no retry).

4.3 Basic system commands

4.3.1 Configuring NTP

NTP can be either configured via the Linux command line or via the front panel control.

NOTE To configure NTP via the front panel control, see Front panel control buttons on page 35 and Front panel menu structure on page 36.

To configure NTP via the Linux command line, follow these steps:

1. Edit the **/etc/ntp.conf** file.
2. Add the NTP server URL:

```
server <ntp server url>iburst
```

NOTE You may configure several NTP servers by adding several lines.

3. Complete configuration by entering the following command:

```
service ntpd restart
```

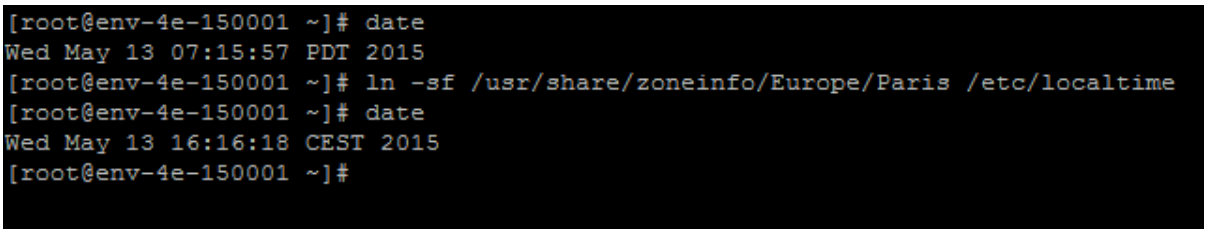
4.3.2 Changing time zone

By default M1 time zone is set to Pacific Standard Time (PST), GMT -08:00.

To change time zone, follow these steps:

1. From a PC on the same network, you need one IP address **10.0.0.y** with mask**255.255.255.0**.
2. Connect over SSH to (using Putty software for example).
3. Enter the following command: `ln -sf /usr/share/zoneinfo/PST8PDT /etc/localtime`, and replace `/PST8PDT` with the directory (if your zone has one) and filename of the time zone you wish to use.The list of available time zones is located in **/usr/share/zoneinfo**.
4. Check the modification using the `date` command.
   Result:

Figure 24. Changing time zome



4.3.3 Configuring IGMP

By default, RX1 uses IGMP v2 protocol version. It can be switched to V3 if required either from the Linux command line or via the front panel control.

Forcing Red Hat Linux to IGMP Version 2

To force Linux to IGMP v2, follow these steps:

1. Edit the file **/etc/sysctl.conf**
2. Add the following lines:

```
net.ipv4.conf.eth0.force_igmp_version = 2
net.ipv4.conf.lo.force_igmp_version = 2
net.ipv4.conf.default.force_igmp_version = 2
net.ipv4.conf.all.force_igmp_version = 2
```

3. Active the edited **sysctl.conf** file by entering the following command:

```
sudo sysctl -p
```

NOTE You can find out more about your current running IGMP configuration by using this command: `cat /proc/net/igmp`.

4.3.4 Configuring rp_filter

To turn on the rp_filter, follow these steps:

1. Enter the following command:

```
sudo vi /etc/sysctl.d/98-live-encoder.conf
```

2. Change `net.ipv4.conf.eth1.rp_filter` to either `1` or `2`.

NOTE Default value is 0.

3. Enter the following command:

```
sudo sysctl --load /etc/sysctl.d/98-live-encoder.conf
```

4. To verify the the rp_filter settings, enter the following command:

```
sudo sysctl -a | grep rp_filter
```

Rp_filter options are as listed below:

- **0** - No source validation.
- **1** - Strict mode as defined in RFC3704 Strict Reverse Path. Each incoming packet is tested against the FIB and if the interface is not the best reverse path the packet check will fail. By default failed packets are discarded.
- **2** - Loose mode as defined in RFC3704 Loose Reverse Path. Each incoming packet source address is also tested against the FIB and if the source address is not reachable via any interface the packet check will fail.

Chapter 5
Maintenance

5.1 MediaKind - RX1 upgrade

5.1.1 Single bank upgrade procedure

Follow these steps:

1. Connect over SSH to the target using the IP address and the following credentials:
   - login: **mfeng**
   - password: **2u4y&C**
2. Copy the installer script (xxxx.sh) into the **/home/mfeng** directory of the MediaKind M1 unit using SCP protocol with (for example) MobaXterm, WinSCO or FileZilla.

   NOTE This upload takes about two minutes.
3. Make the installer executable:

   ```
   chmod +x installer.sh
   ```
4. Run the installer script:

   ```
   sudo ./installer.sh
   ```

   WARNING This command should be used with care.
5. When you are asked for the password, enter **2u4y&C**.

   NOTE Installation takes about 10-15 minutes and ends after data is written to flash.

   Result: This will create a temporary install directory in /var (after first checking there is sufficient space for the installation).

   NOTE If there is not sufficient space for the installation to proceed, an error message is displayed, the installer can be run again once sufficient space has been made available in /var.
6. Uncompress the software; install it and remove the temporary install directory.
7. When requested, reboot the box using the following command:

   ```
   sudo reboot
   ```

Post Requisite: Postrequisite steps: To confirm successful installation, browse to **http://IP_ADDRESS** on the connected PC, where **IP_ADDRESS** is the address found earlier.

5.1.2 Dual bank upgrade procedure

Upgrade can be either configured via the front panel control or via SSH.

Upgrade via the front panel control

1. Copy the upgrade bundle to a USB key
2. Plug the USB key into the front of the M1 chassis
3. On the front panel press the **RIGHT** key and then the **DOWN** key until the following menu is displayed: **USB Import**
4. Press the **RIGHT** arrow.
   Result: The display will show the following: **Scan for Files**.
5. Press the **ENTER** key.
   Result: The display will display the number of bundles found.
6. Press the **DOWN** key until you find the bundle you wish to install and press the **RIGHT** key.
   Result: The following menu is displayed: **Action: Import only**
7. Press the **ENTER** key and the cursor will flash.
8. Press the **DOWN** key to display the following: **Import + deploy**.
9. Press **ENTER**.
   Result: The bundle will automatically be installed and run.

   NOTE The following will messages will be displayed during installation and will take about 4.5 minutes: **Importing.. Deploying.. Rebooting...**

Related reference

Front panel control buttons on page 35
Front panel menu structure on page 36

Upgrade via SSH

Follow these steps:

1. Connect over SSH to the target using the IP address and the following credentials:
   - login: **mfeng**
   - password: **2u4y&C**
2. Copy the bundle (xxxx.sh) into the **/opt/mediakind/robust-upgrade/mnt/bundles/import/** directory of the M1 unit using SCP protocol with (for example) MobaXterm, WinSCO or FileZilla.

   NOTE This upload takes about two minutes.
3. Import the bundle using the following command:

   ```
   bundle_manager import rx1_x.x.x.x_x.mkb
   ```

   Result:
   The following message will be displayed:

   ```
   SUCCESS=True
   ```

   The bundle is now validated and imported.

4. To see a list of imported and validated budles type the following command:

```
bundle_manager get_bundles
```

5. To deploy the new version of code to the non-running bank and activate it, run the following command:

```
bundle_manager switch_to rx1 x.x.x.x_x
```

NOTE This command uses the software version number only and not the bundle name. For example, 11.0.1.0_0 not rx1_11.0.1.0_0.mkb.

Result: Installation takes about 4-5 minutes and ends after data is written to flash.

6. Uncompress the software; install it and remove the temporary install directory.

Result:
The unit will reboot at the end of the installation.
Post Requisite: To confirm successful installation, browse to **http://IP_ADDRESS** on the connected PC, where **IP_ADDRESS** is the address found earlier.

5.2 Factory Backup/Restore Procedure (single bank)

You can create a system backup of the unit at time. Backups contain the current running version of code, IP settings and service configurations.

Backups are useful either after commissioning a new system or as a restore point before applying a new version of code.

NOTE You can restore the system back to factory defaults at any time. **You cannot backup or restore licenses**.

For customers with units located in remote sites, it is possible to restore the unit back to factory defaults whilst retaining the current IP settings so contact is not lost.

5.2.1 Prerequisites

The procedure requires using a KVM or a monitor and keyword connected to M1.

NOTE A Factory Restore point is made at the time of shipment from the factory. The Factory Backup cannot be replaced and will contain the full version of code and system defaults that the unit was shipped with.

5.2.2 Create a backup

CAUTION Do NOT interrupt, reboot or power off your system during the update process.

1. (Re-) Start the M1 and be ready to press the **down arrow** key.
2. Press the **down arrow** key to enter into the boot menu.

   NOTE You have **only 5 seconds** before default boot option runs.

3. Select the **Backup** entry with the **down arrow** then press **Enter**.

NOTE Only 2 backups can be stored: one factory backup and one custom backup. **If you want to make a new custom backup: replace the existing custom backup**.

Figure 25. Selecting Backup entry

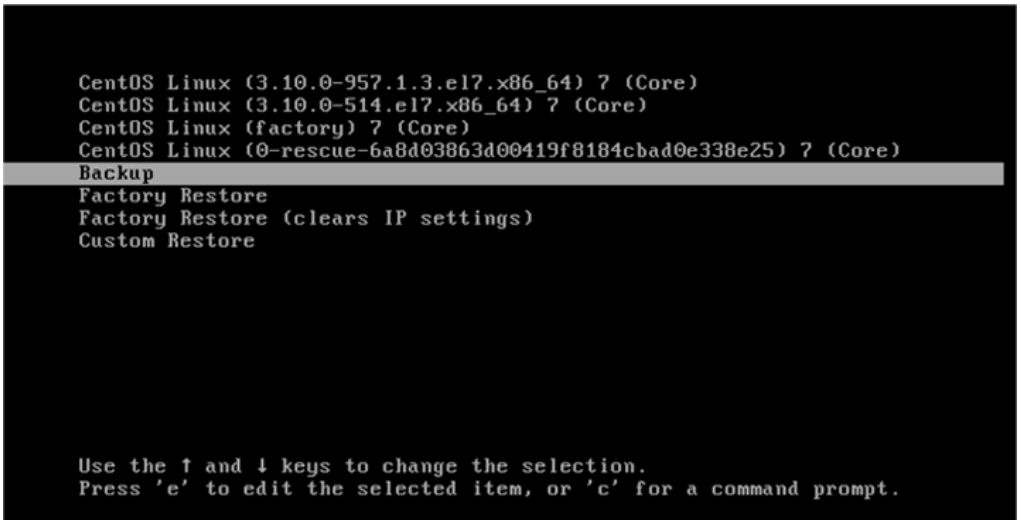
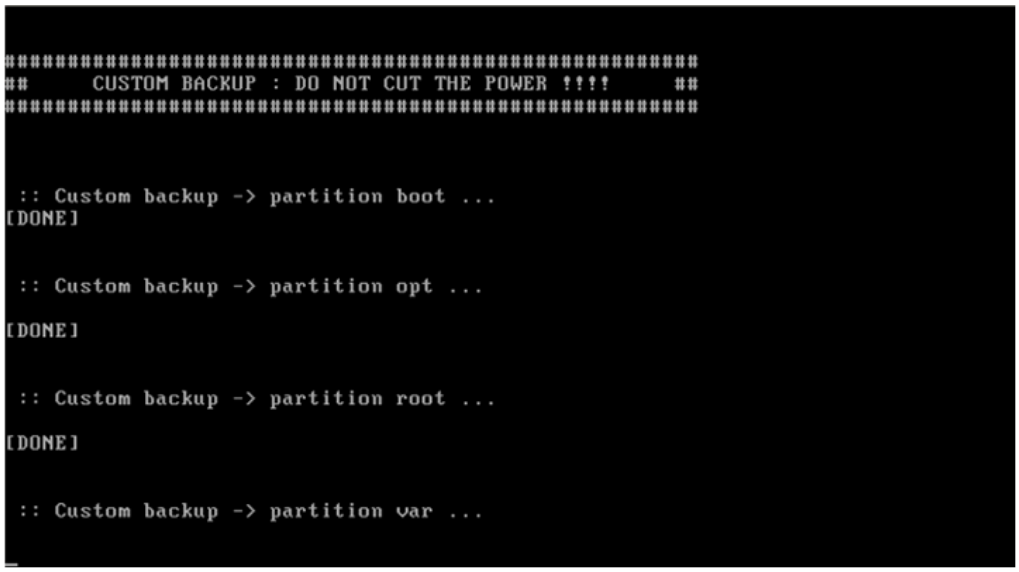
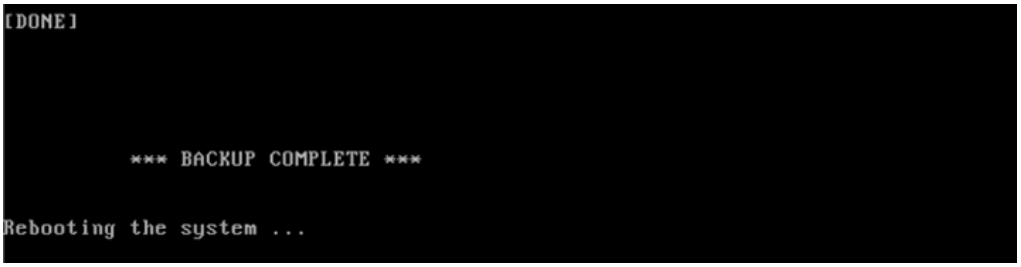


Figure 26. Factory backup process



Result: The backup creation process should last between 2 and 5 minutes. Once backup has completed, system reboots.

Figure 27. Backup procedure completed



5.2.3 Restore

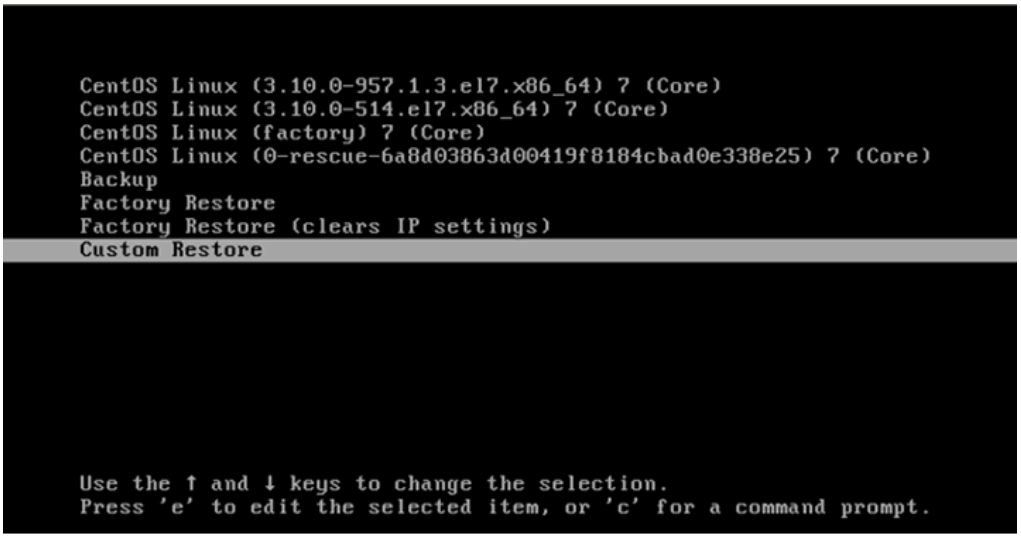
CAUTION Do NOT interrupt, reboot or power off your system during the update process.

1. (Re-) Start the M1 and be ready to press the **down arrow** key.
2. Press the **down arrow** key to enter into the boot menu.

   NOTE You have **only 5 seconds** before default boot option runs.

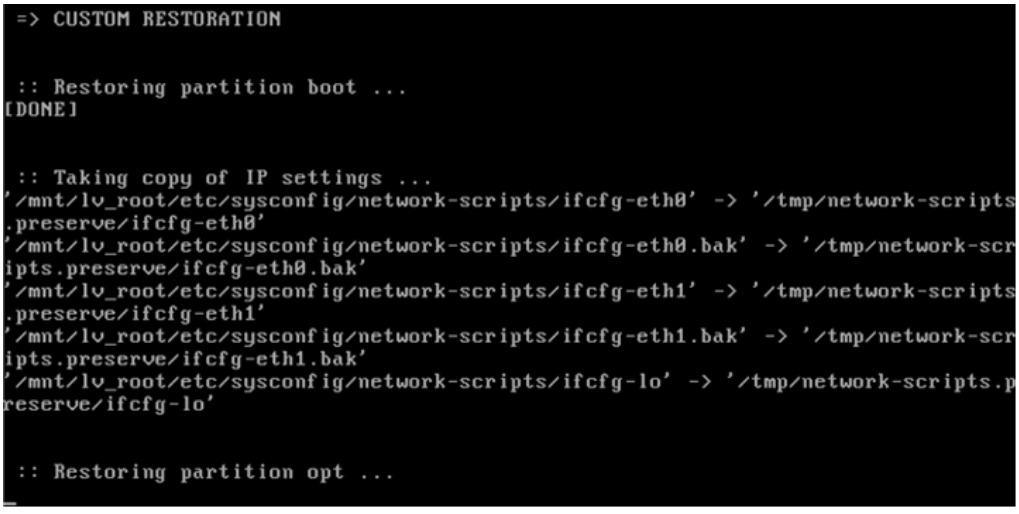
3. Select the **Restore** entry required with the down arrow then press **Enter**.

Figure 28. Selecting Custom Restore entry



- **Factory Restore** – Restores code version, system settings and removes all service configurations to return the unit to how it was shipped from the factory. Current network settings are retained.
- **Factory Restore (clears IP settings)** – Restores code version, system settings and removes all service configurations to return the unit to how it was shipped from the factory. Network settings are reset to factory defaults.
- **Custom Restore** – Restores code version, system settings, network settings and all service configurations to how they were when the custom backup was created.

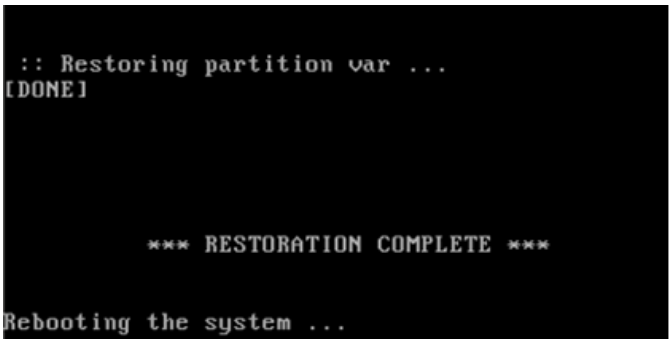
Figure 29. Custom Restore process



NOTE All licenses on the unit will be unaffected by a restore.

4. Once restore has completed, system reboots.

Figure 30. Custom restore complete



5.3 Contacting MediaKind Support

5.3.1 Contacting MediaKind support

CAUTION It is not allowed to perform installation or modification of any software on the appliance as it could impact its proper functioning and could limit the warranty.

You may contact us for specific projects requiring customized options or specific development, available through our service organization.

For contact information, see the MediaKind website at http://www.mediakind.com.

If you have support questions, contact MediaKind support or send an email to your Sales contact.

MediaKind Support contact: support@mediakind.com

Chapter 6
Physical Characteristics

6.1 Physical Characteristics

M1 chassis model: Advantech Vega 7010

Dimensions (H x W x D)	17.48” (44.4mm) x 16.77” (426 mm) 21.65” (550 mm)
Weight	41.86 lbs (19 kg)
Operating temperature	0 to 50° F (32 to 122° C)
Storage temperature	-4 to 158° F (-20 to 70° C)
Operating Humidity	10~85%@40C non-condensing
Power consumption	180 W
Heat dissipation	615 BTU/hr

Chapter 7
Regulatory Information

7.1 Regulatory Compliance and Certification

CAUTION To help ensure Safety regulatory compliance of the final integrated product, you must

adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL and/or other National Recognized Test Laboratory (NRTL) Certification Listing and other regulatory approvals; this will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

To help ensure EMC compliance with your local regional rules and regulations, before computer integration, make sure that the chassis, power supply, and other modules have passed EMC testing using a server board with a microprocessor from the same family (or higher) and operating at the same (or higher) speed as the microprocessor used on the server board.

7.2 Product Regulatory Compliance

M1 chassis and system component level products have been tested and comply to the following safety, electromagnetic compatibility (EMC), and product environmental regulations and requirements. **Intended Application** - The server chassis and system component products are evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as: medical, industrial, telecommunications, NEBS, residential, alarm systems, test equipment, etc.), other than an ITE application, may require further evaluation.

7.3 Electromagnetic Compatibility Notices

7.3.1 FCC Verification Statement (USA)

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 Reference Guide, 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 User will be required to correct the interference at ones own expense.

7.3.2 ICES-003 (Canada)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

7.3.3 Europe (CE Declaration of Conformity)

The CE mark is affixed to indicate compliance with the following directives:

- **Low Voltage Directive (LVD):** Directive 2014/35/EC on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
- **Electromagnetic Compatibility (EMC) Directive**: Directive 2014/30/EU on the harmonization of the laws of the Member States relating to electromagnetic compatibility.
- **Radio Equipment Directive (RED):** (If the product is configured as a broadcast receiver). Directive 2014/53/EU of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.
- **Restriction of Hazardous Substances (RoHS) Directive**: Directive 2011/65/EU of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

7.4 Specific warnings

WARNING Any changes or modifications to this equipment not expressly approved by MediaKind. could void the user's authority to operate the equipment.

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 .

WARNING Always install rack-mount equipment with the heaviest units near the bottom of the rack. Do not pull out more than one piece of equipment at a time. Doing so may cause the rack to become unbalanced and may result in the rack falling .

WARNING Do not use the front handles for the purpose of lifting the equipment. Support the equipment from the bottom when removing and installing in a rack .

7.5 Rack mount installation guidelines

Anchor the equipment rack: The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of the rack on slides. You must also consider the weight of any other device installed in the rack. A crush hazard exists should the rack tilt forward which could cause serious injury.

Temperature: The temperature, in which the server operates when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 40 °C (104 °F). Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. The rack must also include ventilation sufficient to exhaust a maximum of 2121.5 BTUs (British Thermal Units) per hour for the server. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

7.5.1 If AC power supplies are installed

Mains AC power disconnection: The AC power cord(s) is considered the mains disconnect for the server and must be readily accessible when installed. If the individual server power cord(s) will not be readily accessible for disconnection then you are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire rack, not just to the server(s).

Grounding the rack installation: To avoid the potential for an electrical shock hazard, you must include a third wire safety ground conductor with the rack installation. If the server power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the server power cord is plugged into a wall AC outlet, the safety ground conductor in the power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

Overcurrent protection: The server is designed for an AC line voltage source with up to 20 amperes of overcurrent protection per cord feed. If the power system for the equipment rack is installed on a branch circuit with more than 20 amperes of protection, you must provide supplemental protection for the server.

7.6 AC power cord usage guidelines

WARNING Do not attempt to modify or use a power cord set that is not the exact type required.

You must use a power cord set that meets the following criteria:

- Rating: In the U.S. and Canada, cords must be UL (Underwriters Laboratories, Inc.) Listed/CSA (Canadian Standards Organization) Certified type SJT, 18-3 AWG (American Wire Gauge). Outside of the U.S. and Canada, cords must be flexible harmonized (<HAR>) or VDE (Verband Deutscher Electrotechniker, German Institute of Electrical Engineers) certified cord with 3 x 0.75 mm conductors rated 250 VAC (Volts Alternating Current).
- Connector, wall outlet end: Cords must be terminated in grounding-type male plug designed for use in your region. The connector must have certification marks showing certification by an agency acceptable in your region and for U.S. must be Listed and rated 125% of overall current rating of the server.
- Connector, server end: The connectors that plug into the AC receptacle on the server must be an approved IEC (International Electrotechnical Commission) 320, sheet C13, type female connector.
- Cord length and flexibility: Cords must be less than 4.5 meters (14.76 feet) long.