G9 1000 Series

Off-the-shelf Hardware

Installation Guide

2024-03-19

Contents

CHAPTER 1

Safety Information

General safety information

This document applies to G9. 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 G9 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

Other Hazards

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.

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

Unpacking the system

Ensure that you have received everything listed in the supplied packing list.

Placement

The G9 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 G9 must be moved frequently, install it on a table top or other flat surface.
- If the G9 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.

Table top placement

When the G9 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.

Rack-mount bracket installation

The G9 is designed to be mounted into a rack using a rail kit. Instructions for installing G9 chassis into a rack are in the "Rail kit installation guide".

CHAPTER 3

Quick Start: main steps

Installing MediaKind software on a G9 chassis includes several steps:

1. You connect all the cables and power the G9 chassis (see Connections).
2. You setup the system.
3. You deploy the software.
4. You manage licenses (see the corresponding User Guide).

CHAPTER 4

Connections

Overview

This section describes how to connect input, output and management connectors to a G9 . All the connections are located on the rear panel.

> **IMPORTANT**
> You should tell your network administrator that you plan to connect your to the network.

> **CAUTION**
> Hard drives are **cold-swap**. Do not remove hard drives when the system is running.

Connectors for G9

The G9 is a rack mount 1U server system, with redundant power supply modules.

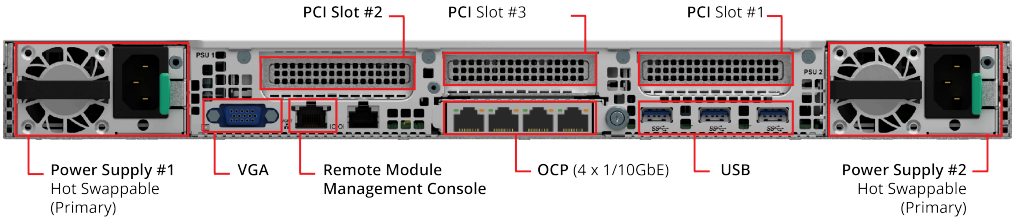


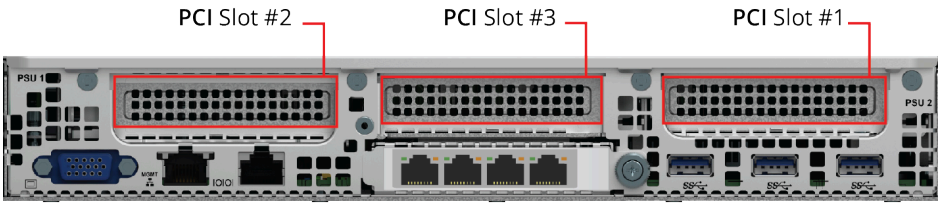
Figure 1. G9 rear panel (basic)

NOTE

- You can use the remote management console to remotely access to the G9 system hardware monitoring and logs without KVM.
- RJ-45 10 GbE Base-T connectors are compatible with RJ-45 1 GbE base-T.
- The backpanel components are SELV (Safety Extra Low Voltage) components.

Optional cards: slot priority order

By default, the G9 is delivered with IP input but you can order specific options.



Card type	Slot priority	Max. cards G9 1027	Max. G9 1057
4x 1GbE	3, 2, 1	1	1
3x 10GbE SFP+	3, 2, 1	1	1
2x 25GbE SFP28	3,2	1	1
4x HD-SDI	1, 2, 3	1	1
8x HD-SDI	1, 2, 3	2	3
SG1	1, 2	2 (with or without 8x HD-SDI option)	2
4x 1/10GbE (available when PCI Slot #3 is free)	3	1	1

Management, input (source) and output (broadcast) connectors

Connectors and options vary depending on G9 model.

> **NOTE**
> For optional cards location, see Slot priority order.

RJ-45 IP connectors

To connect the IP input connectors, follow these steps:

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

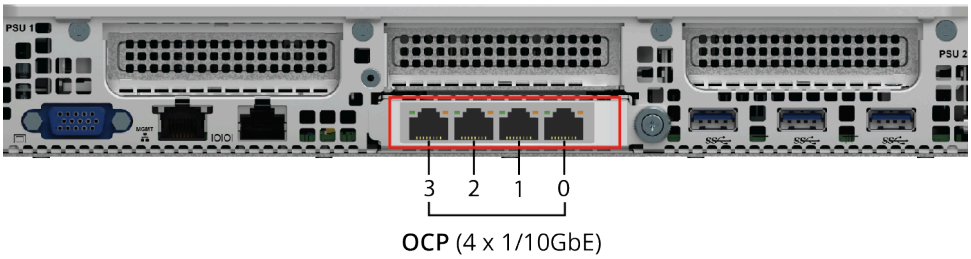


Figure 2. 4 x 1/10 GbE management/input/output (Base server)

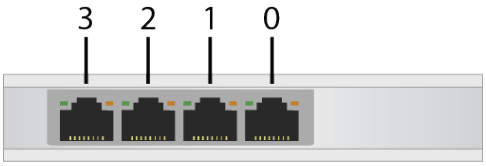


Figure 3. 4 x 1GbE Base T - input/output (option)

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

SFP+ IP connectors (option)

> **NOTE**
> 2x 25 GbE SFP+ card is input-only.

To connect the 2x 25 GbE or the 3x 10 GbE connectors, follow these steps:

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

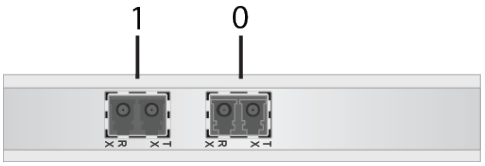


Figure 4. Dual 25 GbE SFP+ input connectors (option)

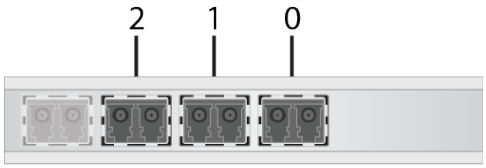


Figure 5. 3x 10 GbE SFP+ input/output connectors (option)

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

HD-SDI input connectors (option)

To connect the SDI input connectors, follow these steps:

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

> **NOTE**
> You can use the supplied mini-DIN (female) patch cables if necessary.

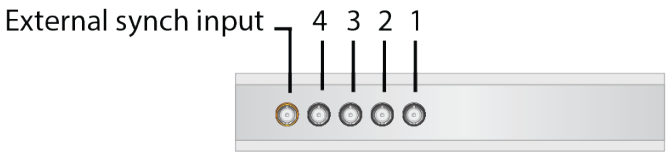


Figure 6. 4 x HD-SDI input connectors

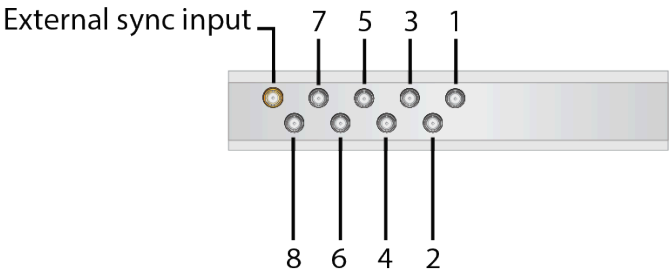


Figure 7. 8 x HD-SDI input connectors

3. Plug the other end of the cable into your SDI source.

CHAPTER 5

Powering

Power supply redundancy

The system supports two 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.

> **NOTE**
> 1+1 and 1+0 redundancy schemes depend on the powering conditions.

Connecting power cords

Before you start:

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

To connect the power cords, follow this procedure:

1. Connect the two power cords to the system.

Figure 8. AC power supplies

2. Plug the two power cords into grounded outlets.

> **NOTE**
>
> 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.

Power-up sequence

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

To power-up the G9, press the power button located on the front control panel.

Figure 9. Front control panel

Power-down sequence

To power-down the G9, follow these steps:

Enter the following command:

```
shutdown
```

> **TIP**
> If the G9 does not shut down, press and release the power button located on the front control panel (see Figure 9: Front control panel).

Power button and states

The power button toggles the system power on and off.

The power-on cycle takes a couple of minutes to complete, as the G9 performs extensive self-diagnostics in this time period.

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

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

Table 1. Power LED functional states

System status LED

LED state	System State	BIOS status description
Off	No AC Power to system.	• System power is not present. • System is in EuP Lot6 off mode.

Table 2. System status LED state definitions

Solid green	System is operating normally	• System is in S5 soft-off state. • System is running (in S0 State) and its status is healthy. The system is not exhibiting any errors. Source power is present, BMC has booted, and manageability functionality is up and running. • After a BMC reset, and with the chassis ID solid on, the BMC is booting Linux*. Control has been passed from BMC uBoot to BMC Linux*. The BMC in this state for roughly 10–20 seconds.
Blinking green (#1)	System is operating in a degraded state although still functioning, or system is operating in a redundant state but with an impending failure warning.	• Redundancy loss such as power-supply or fan. Applies only if the associated platform subsystem has redundancy capabilities. • Fan warning or failure when the number of fully operational fans is less than the minimum number needed to cool the system. • Non-critical threshold crossed – Temperature (including HSBP temp), voltage, input power to power supply, output current for main power rail from power supply and Processor Thermal Control (Therm Ctrl) sensors. • Power supply predictive failure occurred while redundant power supply configuration was present. • Unable to use all installed memory (more than 1 DIMM installed). • Correctable Errors over a threshold and migrating to a spare DIMM (memory sparing). This indicates that the system no longer has spared DIMMs (a redundancy lost condition). Corresponding DIMM LED lit. • In mirrored configuration, when memory mirroring takes place and system loses memory redundancy. • Battery failure. • BMC executing in uBoot. (Indicated by Chassis ID blinking at 3 Hz while Status blinking at 1 Hz). System in degraded state (no manageability). BMC uBoot is running but has not transferred control to BMC Linux*. Server will be in this state 6–8 seconds after BMC reset while it pulls the Linux* image into flash. • BMC Watchdog has reset the BMC. • Power Unit sensor offset for configuration error is asserted. • SSD Hot Swap Controller is off-line or degraded
Blinking green	System is operating in a degraded state although still functioning, or system is operating in	• Correctable Errors over a threshold and migrating to a spare DIMM (memory sparing). This indicates that the system no longer has spared DIMMs (a redundancy lost condition). Corresponding DIMM LED lit. • In mirrored configuration, when memory mirroring takes place and system loses memory redundancy. • Battery failure.

Table 2. System status LED state definitions (continued)

	a redundant state but with an impending failure warning.	• BMC executing in uBoot. (Indicated by Chassis ID blinking at 3Hz). System in degraded state (no manageability). BMC uBoot is running but has not transferred control to BMC Linux*. Server will be in this state 6-8 seconds after BMC reset while it pulls the Linux* image into flash. • BMC Watchdog has reset the BMC. • Power Unit sensor offset for configuration error is asserted. • HDD HSC is off-line or degraded.
Blinking green and amber alternatively	System is initializing after source power is applied.	• PFR in the process of updating/authenticating/recovering when source power is connected, system firmware being updated. • System not ready to take power button event/signal.
Blinking amber	System is operating in a degraded state with an impending failure warning, although still functioning. System is likely to fail.	• Critical threshold crossed – Voltage, temperature (including HSBP temp), input power to power supply, output current for main power rail from power supply and PROCHOT (Therm Ctrl) sensors. • VRD Hot asserted. • Minimum number of fans to cool the system not present or failed. • Hard drive fault. • Power Unit Redundancy sensor – Insufficient resources offset (indicates not enough power supplies present). • In non-sparing and non-mirroring mode, if the threshold of correctable errors is crossed within the window. • Invalid firmware image detected during boot up or firmware update.
Solid amber	Critical/non-recoverable – system is halted. Fatal alarm – system has failed or shut down.	• Processor CATERR signal asserted. • MSID mismatch detected (CATERR also asserts for this case). • CPU 0 is missing. • Processor Thermal Trip. • No power good – power fault. • DIMM failure when there is only 1 DIMM present and hence no good memory present. • Runtime memory uncorrectable error in non-redundant mode. • DIMM Thermal Trip or equivalent. • SSB Thermal Trip or equivalent. • Processor ERR2 signal asserted. • BMC/Video memory test failed. (Chassis ID shows blue/solid-on for this condition.) • Both uBoot BMC firmware images are bad. (Chassis ID shows blue/solid-on for this condition.) • 240 VA fault.

Table 2. System status LED state definitions (continued)

	• Fatal Error in processor initialization: o Processor family not identical o Processor model not identical o Processor core/thread counts not identical o Processor cache size not identical o Unable to synchronize processor frequency o Unable to synchronize QPI link frequency. • BMC fail authentication with non-recoverable condition, system hang at T-1; boot PCH only, system hang; PIT failed, system lockdown.

Table 2. System status LED state definitions (continued)

CHAPTER 6

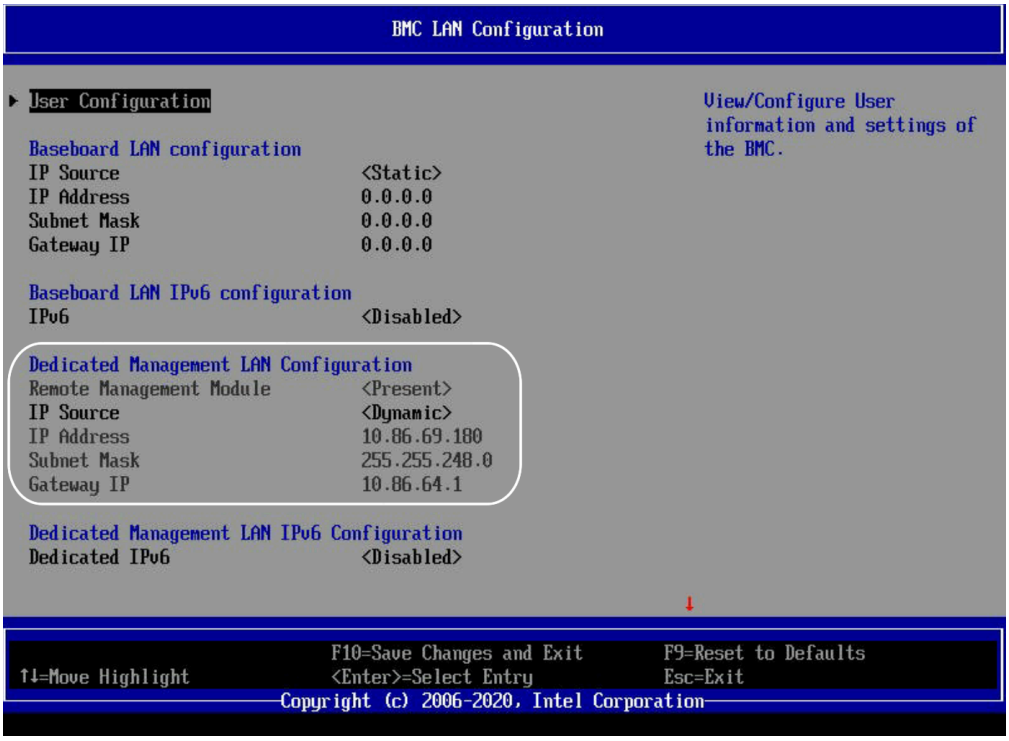
System configuration

System setup

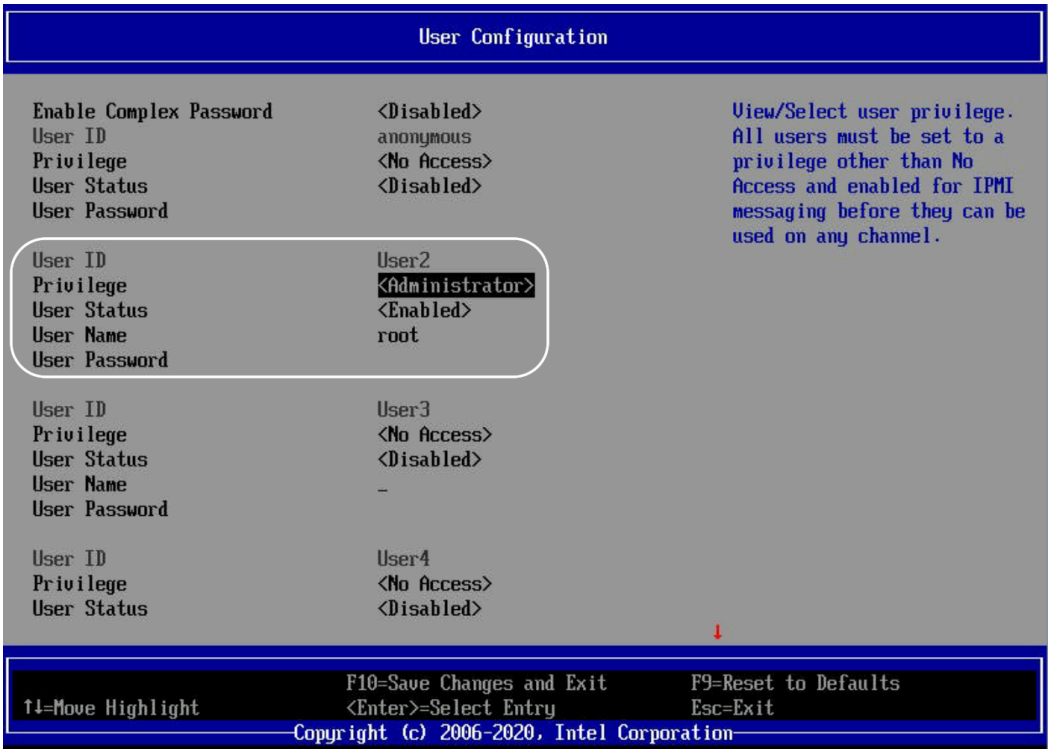
Once you have connected display and keyboard, you can start setup:

1. Repeatedly press F2 during the power-on test to configure the Bios.
2. Go to **Main menu** and set the **Timezone**.
3. Configure the RMM:
   a. Go to **Server Management** > **BMC LAN Configuration** > **Dedicated Management LAN Configuration**.
   b. From **Remote Management Module**: set the IP address either to Dynamic (DHCP) or Static.

> **NOTE**
> If static, you need to define RMM IP address, Subnet-Mask and Gateway-IP.



4. Configure the Administrator: from **User Configuration** > **User2**:
   - Set **Privilege** to **Administrator**.
   - Set **Username** to **Root**.
   - Enter **Password** following the specified rules.



5. Press **F10** to save and exit.
   Result: The system reboots.
6. At console prompt, log in to the **root/med1aK:nd** account to configure AlmaLinux as needed.
7. Configure networks interfaces either via **nmcli** (command-line) or **nmtui** (screen-based) interfaces to Network Manager.
8. Change the host name manually through the `/etc/hostname` and `/etc/hosts` files.
9. You can backup the system configuration via the system boot menu or the `system.backup` command-line interface for future system restore:

   ```
   system.backup --create [backup name]
   ```

What to do next: Deploy MediaKind software on the chassis.

CHAPTER 7

Software Deployment

Software Deployment

Once you have connected your G9 and configured the network interfaces, you need to finalize the installation procedure:

1. Deploy MediaKind software on the chassis.

   The deployment procedure is described in the corresponding Software Installation Guide. Depending on your environment and your need, you may need to follow a specific procedure to deploy your MediaKind solution.
   - You have one or few encoder(s) that should run on their own, refer to the "Standalone Deployment Procedure" section.
   - You want to deploy your encoder(s) in a distributed mode with a single user interface controller redundant with another controller so that any of both can monitor and manage all your MediaKind servers, refer to the "Distributed Deployment Procedure" section.

2. Manage licenses: see corresponding MediaKind software User Guide.

CHAPTER 8

Maintenance

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.

Prerequisites

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

> **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.

Create a backup

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

1. (Re-) Start the 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 entry with the **down arrow** then press **Enter**.

   > **NOTE**
   > System can store up to 3 backups: one factory backup and two custom backups. **If you want to make a new custom backup, you will have to remove an existing custom backup**.

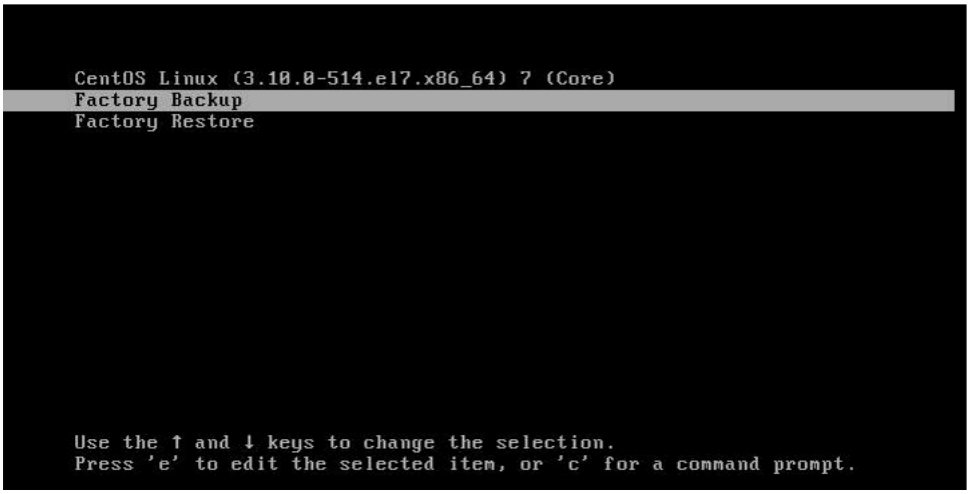


Figure 10. Selecting Factory Backup entry

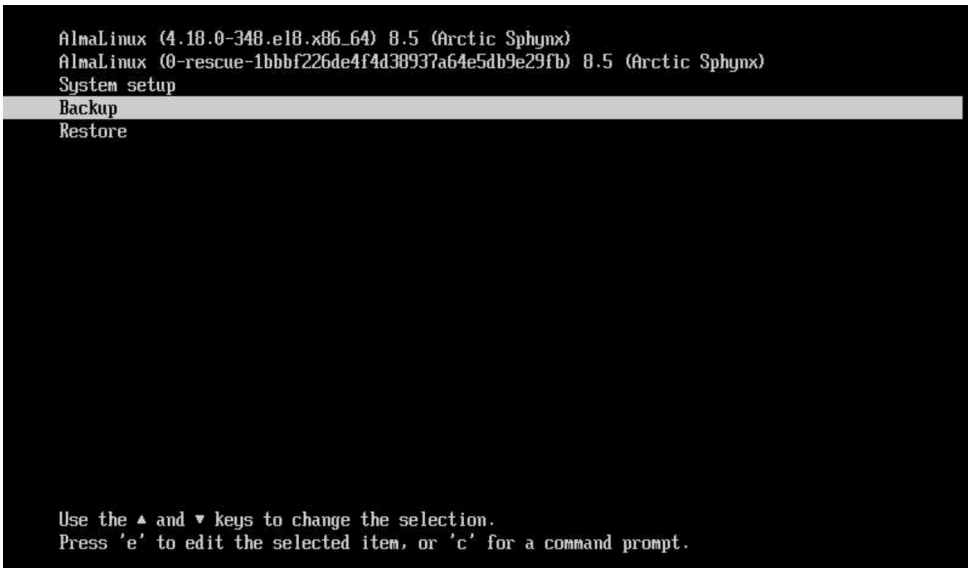


Figure 11. Selecting Factory Backup entry

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

Restore

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

1. (Re-) Start the 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 entry with the **down arrow** then press **Enter**.
   If there is more than one backup, a factory restore menu lets you choose the backup to restore.
   Result: The backup process should last between 2 and 5 minutes.
4. Once restore has completed, system reboots.

Contacting MediaKind Support

Contact information

> **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 9

Physical Characteristics

Physical Characteristics

Dimensions (H x W x D)	1.7” (43.2 mm) x 17.25” (438 mm) x 30.75” (781 mm)
Weight	30.9 lbs (14.18 kg)
Operating temperature	50 to 95° F (10 to 35° C)
Storage temperature	-40 to 158° F (-40 to 70° C)
Non-operating Relative Humidity	50 to 90% non-condensing with a max. wet bulb of 82.4°F (28° C) at temperatures from 25°C to 35 °C
Power	**Input voltage:** Input: 115-220 VAC auto-ranging
	Input frequency: 47 Hz to 63 Hz
Power consumption	Idle: up to 266 W Encoding: up to 553 W (Contact your Sales representative)
Heat dissipation	Idle: up to 1076 Btu/hr Encoding: up to 2032 Btu/hr (Contact your Sales representative)
Power supplies	Dual load-balancing hot-swappable 1300 W AC 80 PLUS Titanium
MTBF	29036 Hrs

CHAPTER 10

Regulatory Information

For complete information on safety instructions for installation and assembly, and regulatory compliance information, please download the following files:

- Safety Information: Intel Server System R1000WF Product Family - System Integration and Service Guide (see Appendix F)
- Regulatory Information: Intel® Server System R1000WF Product Family - Technical Product Specification (see Appendix G)