

# Description Guide

The following copyright notice protects this book under Copyright laws which prohibit such actions as, but not limited to, copying, distributing, modifying, and making derivative works.

Copyright ©Bull SAS 2019

Printed in France

## **Trademarks and Acknowledgements**

We acknowledge the right of proprietors of trademarks mentioned in this manual.

All brand names and software and hardware product names are subject to trademark and/or patent protection.

Quoting of brand and product names is for information purposes only and does not represent trademark and/or patent misuse.

### **Hardware**

**November 2019**

**Bull Cedoc  
357 avenue Patton  
BP 20845  
49008 Angers Cedex 01  
FRANCE**

*The information in this document is subject to change without notice. Bull will not be liable for errors contained herein, or for incidental or consequential damages in connection with the use of this material.*

---

# Table of Contents

<b>Preface</b> .....	<b>p-1</b>
Intended Readers .....	p-1
<b>Regulatory Declarations and Disclaimers</b> .....	<b>p-2</b>
Safety Compliance Statement .....	p-2
UE Certification .....	p-2
Electromagnetic Compatibility Statement .....	p-2
European Community (UE) Certification .....	p-2
<b>Safety Notices</b> .....	<b>p-3</b>
<b>Chapter 1. Related publications</b> .....	<b>1-1</b>
<b>Chapter 2. BullSequana Edge server description</b> .....	<b>2-1</b>
2.1. Overview .....	2-1
2.2. General description .....	2-2
2.3. Front components .....	2-3
2.4. Rear components .....	2-4
2.5. Internal components .....	2-5
2.5.1. First layer components .....	2-5
2.5.2. Base layer components .....	2-6
2.5.3. Motherboard .....	2-7
2.5.4. Fans .....	2-8
2.5.5. Memory modules .....	2-9
2.5.6. Disks .....	2-10
2.5.7. Accelerator slots .....	2-11
2.5.8. Mini PCIe slots .....	2-12
2.5.9. Antenna connections .....	2-13
<b>Chapter 3. Buttons, LEDs and ports</b> .....	<b>3-1</b>
3.1. Front buttons and LEDs .....	3-1
3.1.1. Buttons .....	3-1
3.1.2. LEDs .....	3-1
3.2. Rear buttons, LEDs and ports .....	3-2
3.2.1. Buttons .....	3-2
3.2.2. LEDs .....	3-3
3.2.3. Ports .....	3-4
<b>Appendix A. Technical Description</b> .....	<b>A-1</b>
A.1. General Technical Specifications .....	A-1
A.2. Dimensions and Weight .....	A-1
A.3. Module Technical Specifications .....	A-1
A.4. Server Technical Description .....	A-2

A.5.	Antenna specifications .....	A-3
A.5.1.	Dual-band WiFi .....	A-3
A.5.2.	LoRaWAN .....	A-4
A.5.3.	LTE 3G/4G GSM .....	A-5
<b>Acronyms</b>	<b>.....</b>	<b>a-1</b>

---

## Preface

This guide gives a general overview of the server.

---

**See** The Bull support web site for the most up-to-date product information, documentation, firmware updates, software fixes and service offers:  
<http://support.bull.com>

---

---

## Intended Readers

This guide is intended for administrators and operators.

---

## Regulatory Declarations and Disclaimers

---

### Safety Compliance Statement

We hereby certify that this product is in compliance with:

#### **UE Certification**

Low voltage directive 2014/35/UE : Standard EN 60950-1

---

### Electromagnetic Compatibility Statement

This product is in conformity with the protection requirements of the following directives:

#### **European Community (UE) Certification**

---

## Safety Notices


---


**Important** Read the safety notices before undertaking any procedures described in the documentation.

---

All safety notices used in the documentation are listed in the Multilingual Safety Notices Guide, 86 X1 12FL and are classified by severity:

**D0xx**  **DANGER**  
**D0xx**  
**A *Danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.**

**C0xx**  **CAUTION**  
**C0xx**  
**A *Caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.**

**W0xx**  **WARNING**  
**W0xx**  
**A *Warning* notice indicates an action that could cause damage to a program, device, system, or data.**

Each safety notices is prefixed with a unique identification number. This can be used to locate the corresponding translated version in the Multilingual Safety Notices Guide, 86 X1 12FL.





---

## Chapter 1. Related publications

This list is not exhaustive. Useful documentation is supplied on the Resource & Documentation DVD(s) delivered with the system. You are strongly advised to refer carefully to this documentation before proceeding to configure, use, maintain, or update your system.

### Portfolio

- BullSequana Edge Customer Documentation Portfolio, 86 AP 63PA  
contains all the customer documentation relative to the BullSequana Edge server.
- BullSequana Edge Field Documentation Portfolio, 86 AP 64PA  
contains all the field documentation relative to the BullSequana Edge server.

### Read me First

- Resource and Documentation DVD  
contains the tools and documentation required to configure, operate and maintain the system.
- Generic Site Preparation Guide, 86 A1 85FP  
explains how to prepare a Data Processing Center for Bull Systems, in compliance with the standards in force. This guide is intended for use by all personnel and trade representatives involved in the site preparation process.
- Atos Servers Multilingual Safety Notices Guide, 86 X1 12FL  
lists, in different languages, the notices referenced in the documentation procedures.
- BullSequana Edge Description Guide, 86 A1 65FR  
gives a general overview of the server. This guide is intended for use by administrators and operators.

### Installation

- BullSequana Edge Installation Guide, 86 A1 67FR  
explains how to install and start the server for the first time. This guide is intended for use by qualified personnel in charge of installation.

### Operation

- BullSequana Edge SHC Reference Guide, 86 A1 05FS  
explains how to use the BullSequana Edge hardware console. This guide is intended for use by system administrators and operators.
- BullSequana Edge MISM Console User's Guide, 86 A1 99FR  
explains how to use the BullSequana Edge management console. This guide is intended for use by system administrators and operators.
- BullSequana Edge Getting Started Guide, 86 A1 07FS  
explains how to connect, configure, and boot the server. Some basic operations are also described.

### Maintenance

- BullSequana Edge Customer Service Guide, 86 A1 93FR  
explains how to replace the Customer Replaceable Units (CRU). This guide is intended for use by system administrators and operators.

- BullSequana Edge Field Service Guide, 86 A7 94FR explains how to replace the Field Replaceable Units (FRU). This guide is intended for use by qualified personnel.

---

## Chapter 2. BullSequana Edge server description

### 2.1. Overview

BullSequana Edge servers are based upon the MI (Machine Intelligence) architecture. They exploit the Intel ® Xeon ® platform, Skylake-D processor.

BullSequana Edge servers are designed to be modular, easy to maintain, and to support video security and digital signage verticals developed with the machine intelligence program. They are compact devices that can be installed in a closet or in an overhead location.

Each BullSequana Edge server module is 2U high and includes one processor that can support up to four memory modules. There are two PCIe slots (two x16 generation 3) and two mini PCIe slots.

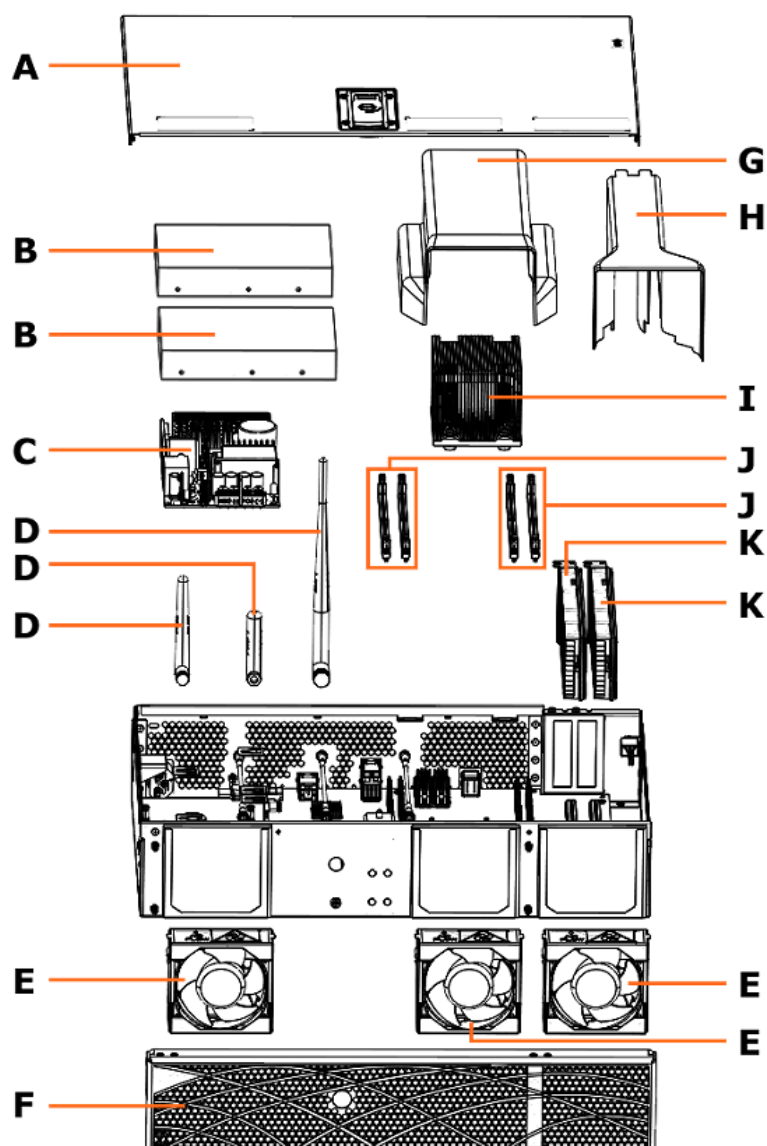
Three wireless technologies are supported:

- 2.4 GHz - 5 GHz dual-band WiFi (Dual-band WiFi)
- Long Range Wireless Area Network (LoRaWAN)
- Long Term Evolution 3G/4G Global System for Mobile Communications (LTE 3G/4G GSM)

BullSequana Edge servers are single air-cooled systems managed by a single Baseboard Management Controller BMC).

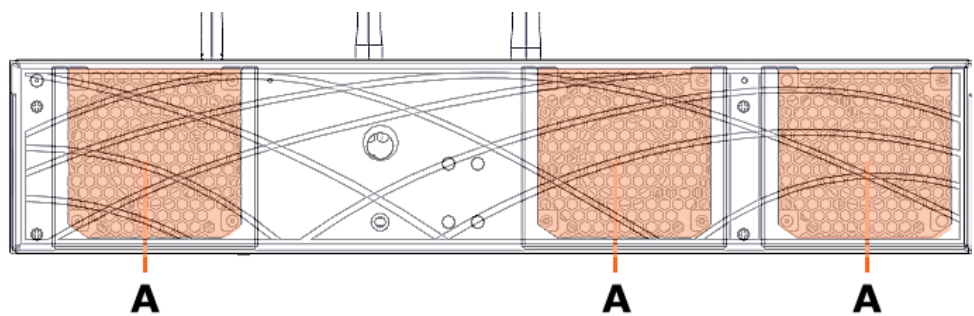
## 2.2. General description

 Exploded view



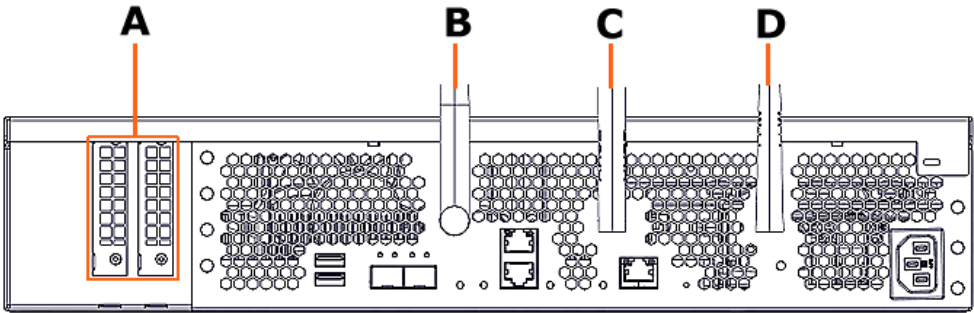
Mark	Description	Quantity
A	Top cover	1
B	Disk SATA or SDD	2
C	Power Supply Unit (PSU)	1
D	External antenna	3
E	FAN module	3
F	Bezel	1
G	Processor air duct	1
H	Accelerator air duct	1
I	Processor	1
J	Memory module	4
K	Accelerator	Up to 2

2.3. Front components



Mark	Description	Quantity
A	FAN module	3

2.4.   Rear components

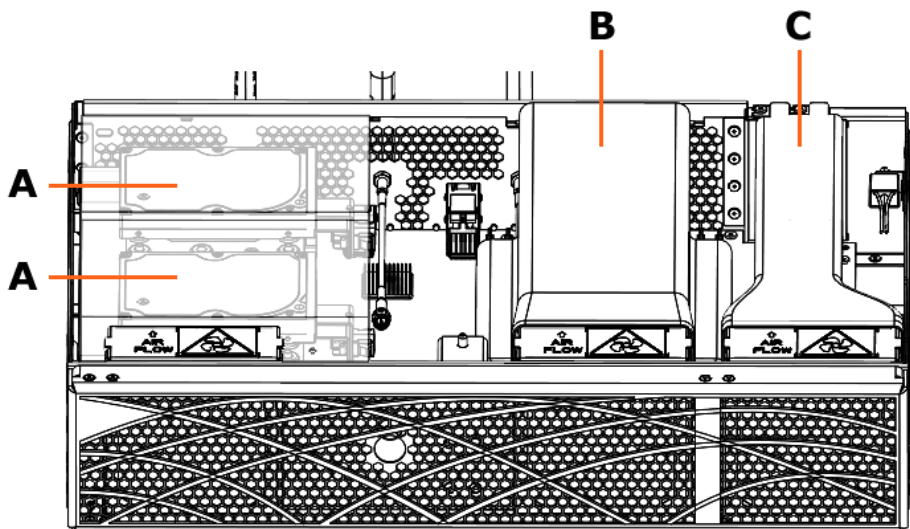


Mark	Description	Quantity
A	PCIe x16 board	2
B	External antenna 2 (Dual-band WiFi or LoRaWAN or LTE 3G/4G GSM)	1
C	External antenna 1 (Dual-band WiFi or LoRaWAN or LTE 3G/4G GSM)	1
D	External antenna 0 (BMC WiFi)	1

## 2.5. Internal components

### 2.5.1. First layer components

 Front view

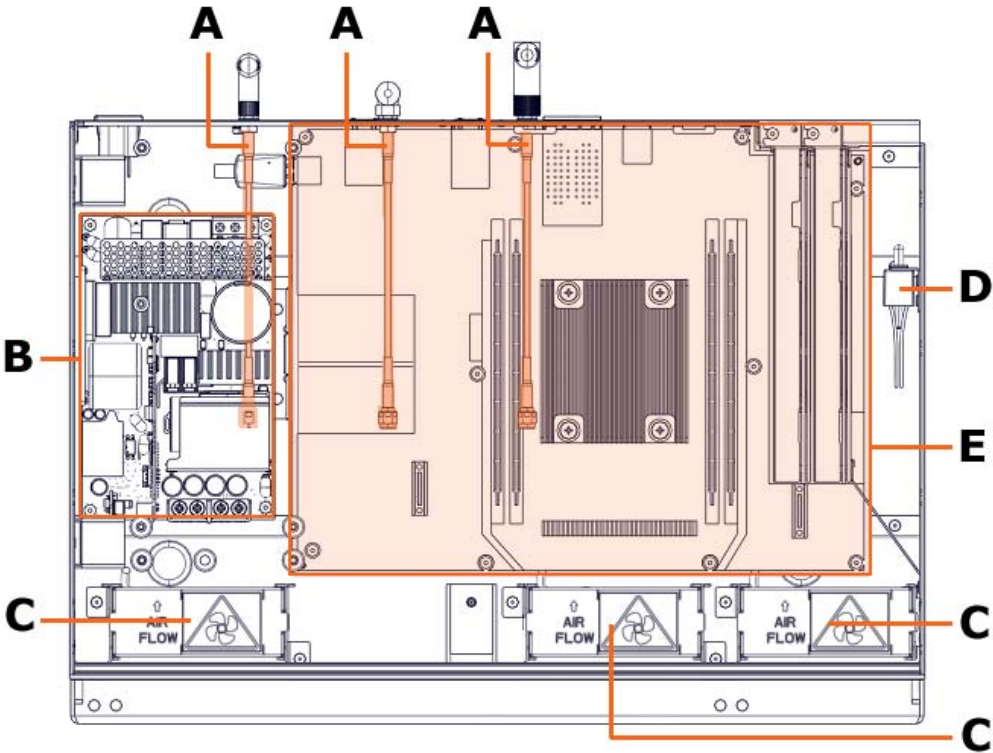


Mark	Description	Quantity
A	Disk	2
B	Processor air duct	1
C	Accelerator air duct	1

**Note** Disks assemblies and air ducts must be removed to access to the base layer components.

### 2.5.2. Base layer components

 Top view

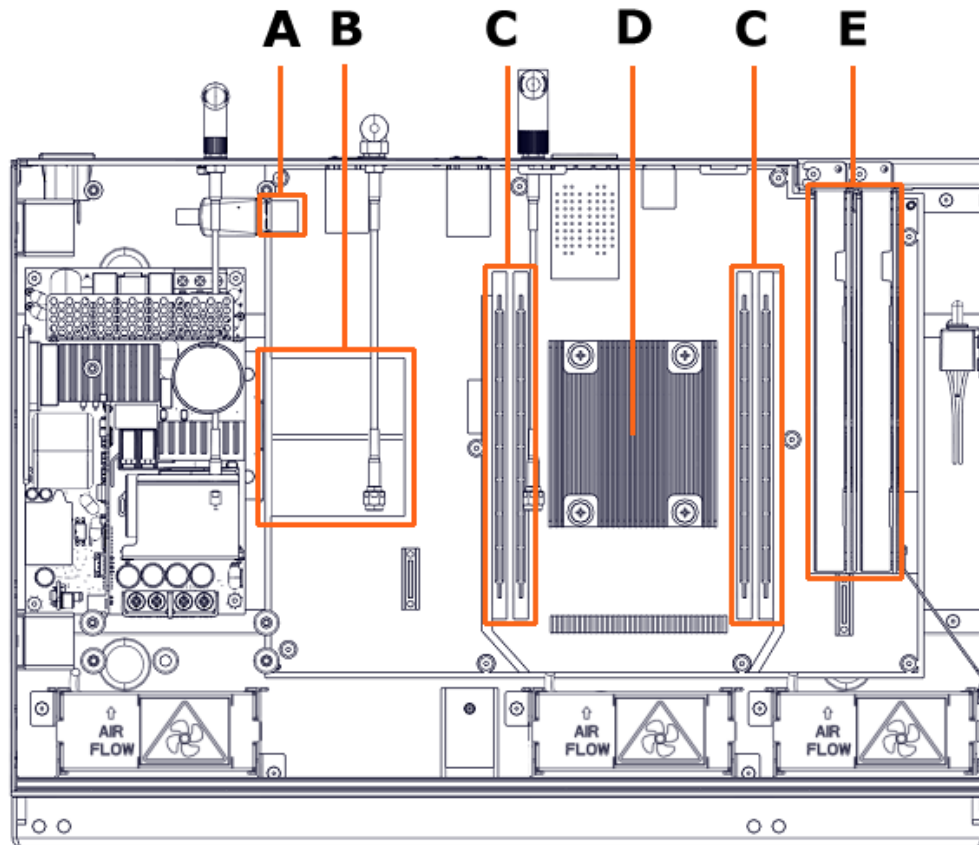


Mark	Description	Quantity
A	Antenna connection	3
B	Power Supply Unit (PSU)	1
C	Fan	3
D	Intrusion detection mechanism	1
E	Motherboard	1



### 2.5.3. Motherboard

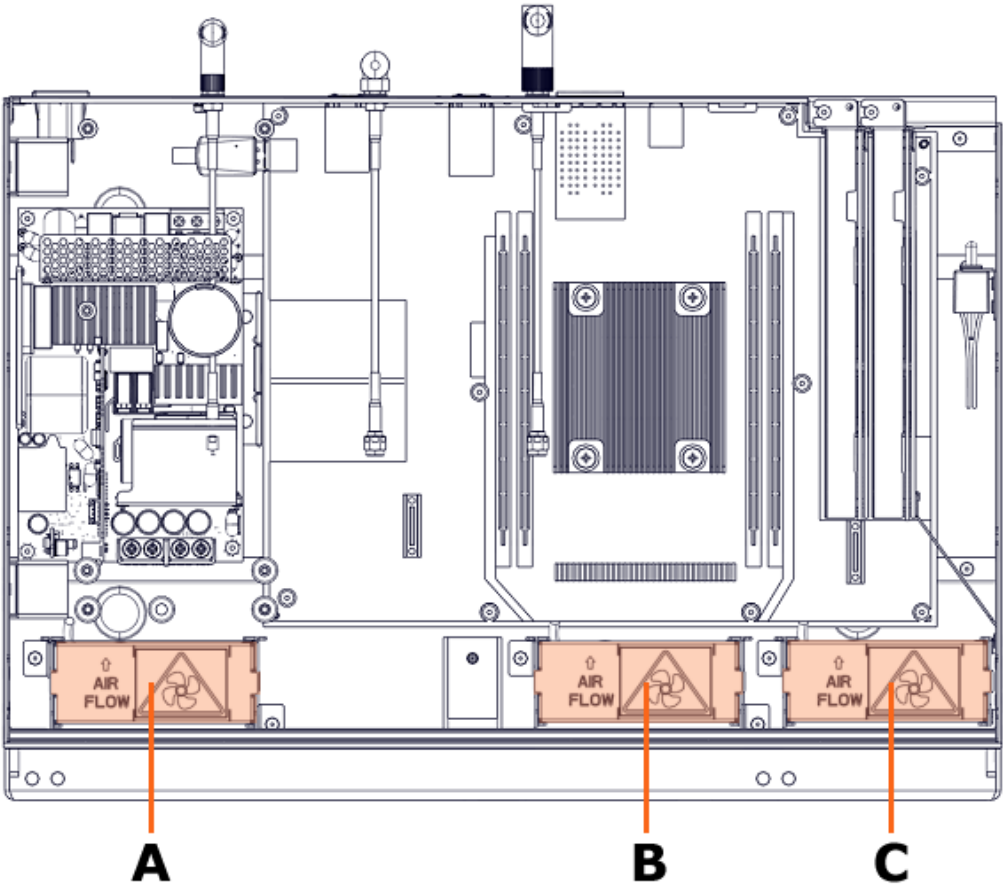
 Top view



Mark	Description	Quantity
A	USB connector (BMC WiFi dongle)	1
B	Mini PCIe slot	2
C	Memory module slot	4
D	Processor assembly	1
E	Accelerator slot	2

2.5.4. Fans

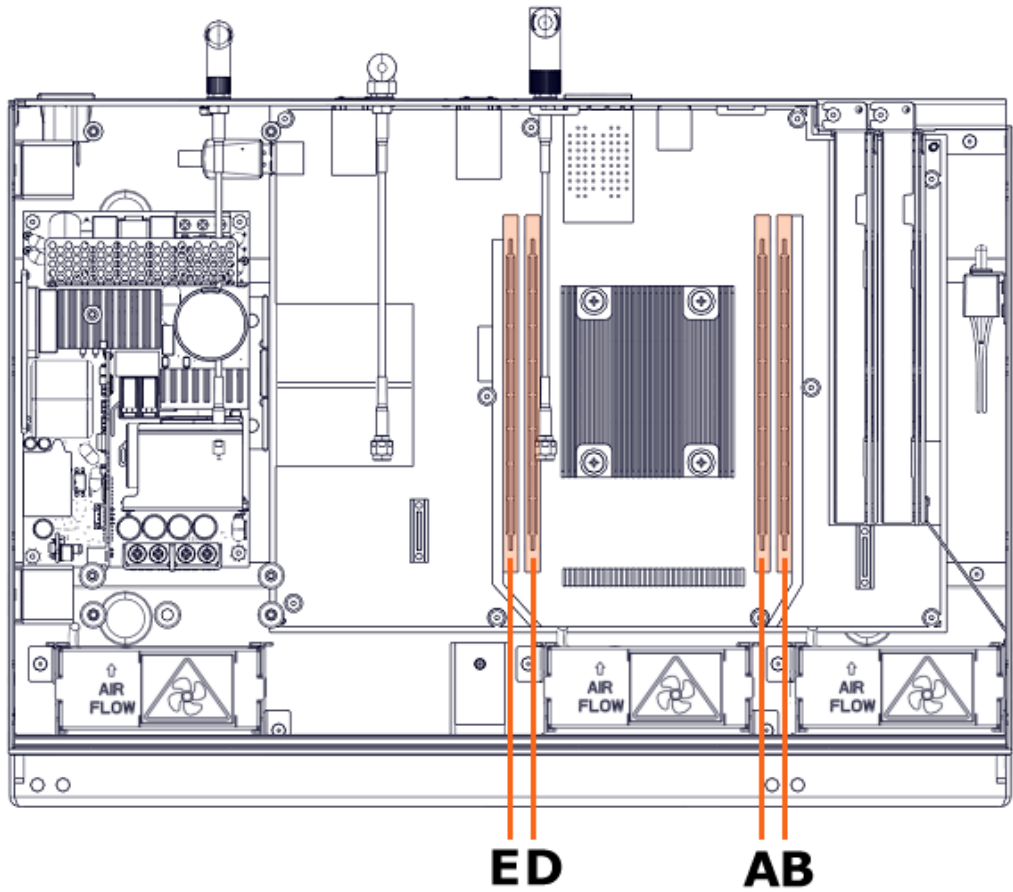
 Top view



Mark	Description
A	FAN 0_GPU
B	FAN 1_CPU
C	FAN 2_PSU

### 2.5.5. Memory modules

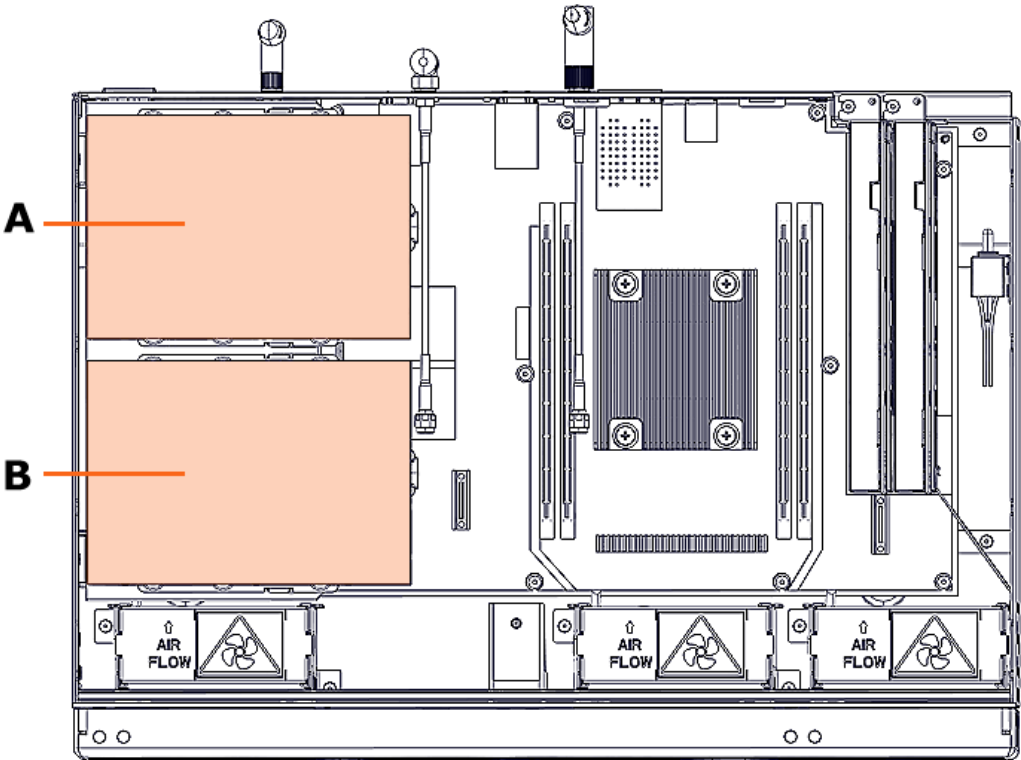
 Top view



Mark	Memory module	Channel	Board slot
A	0	0	CH-A
B	0	1	CH-B
D	0	2	CH-D
E	0	3	CH-E

2.5.6.     **Disks**

 **Top view**

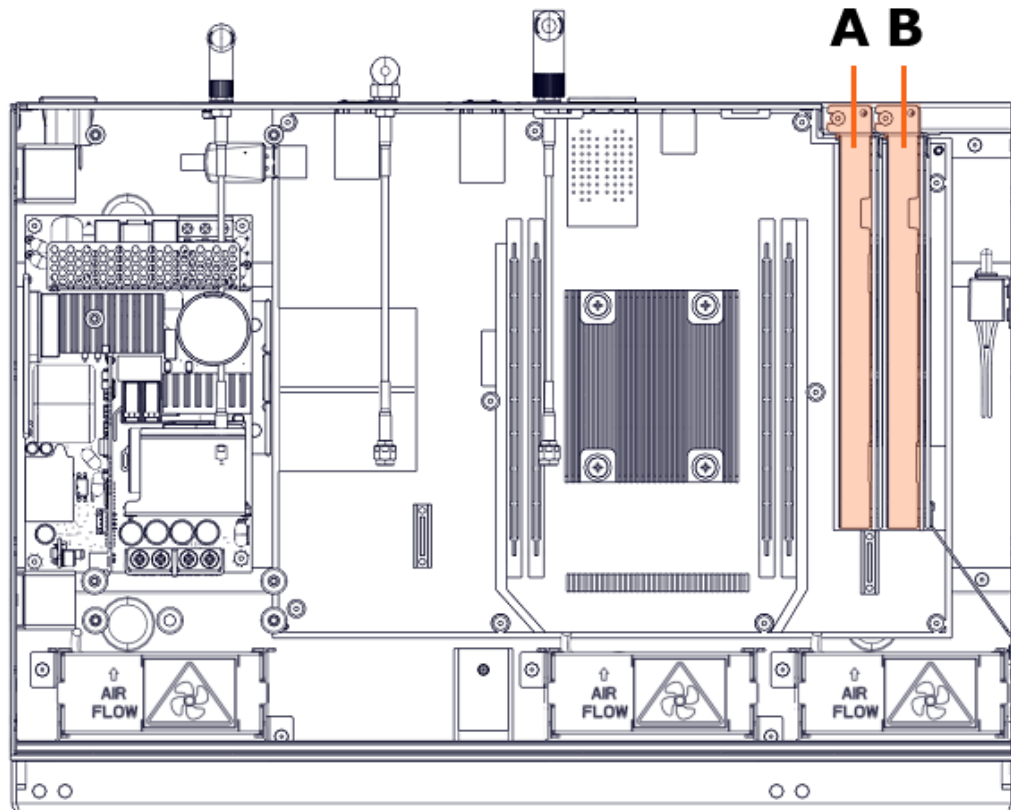


Mark	Description
A	Disk 0
B	Disk 1

## 2.5.7. Accelerator slots

### Slot numbering

 Top view



Mark	Description
A	PCIe generation 3 x16 slot 0
B	PCIe generation 3 x16 slot 1

### Options

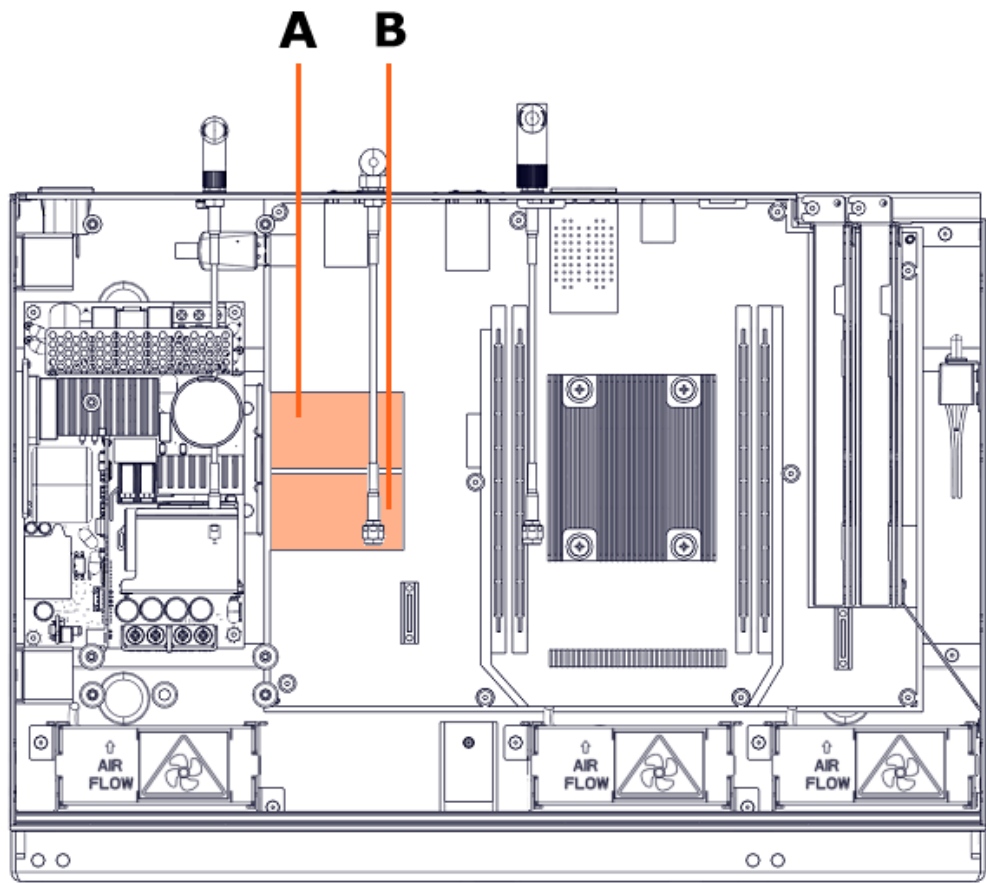
Various accelerator options are available for the PCIe slots:

- The slots are left empty
- Up to two Graphic Processing Unit (GPU) cards
- Up to one 150 watt Field Programmable Gate Array (FPGA) card
- Up to two 75 watt Field Programmable Gate Array (FPGA) cards

### 2.5.8. Mini PCIe slots

#### Slot numbering

 Top view



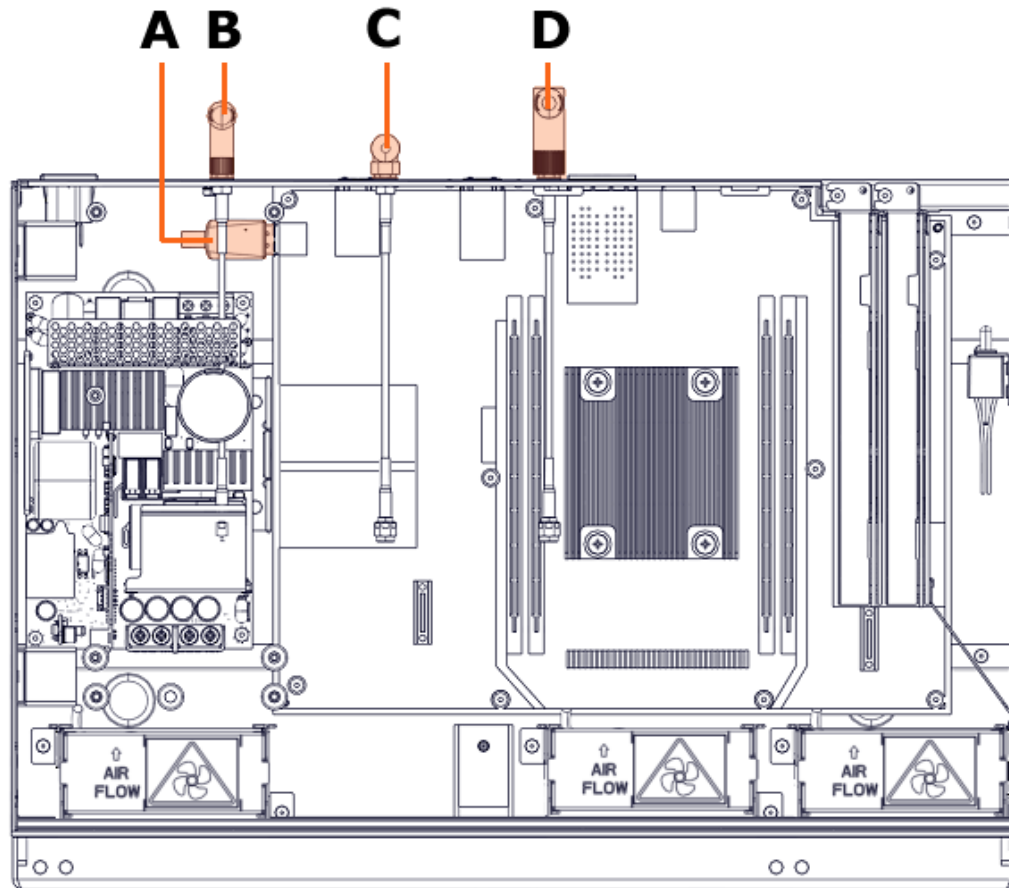
Mark	Description
A	Mini PCIe slot 0
B	Mini PCIe slot 1

#### Options

The mini PCIe slots can house either dual-band WiFi or LoRaWAN or LTE 3G/4G GSM cards.

### 2.5.9. Antenna connections

 Top view



Mark	Description
A	BMC WIFI dongle
B	External antenna 0 : BMC WiFi
C	External antenna 1 : Dual-band WiFi or LoRaWAN or LTE 3G/4G GSM
D	External antenna 2 : Dual-band WiFi or LoRaWAN or LTE 3G/4G GSM



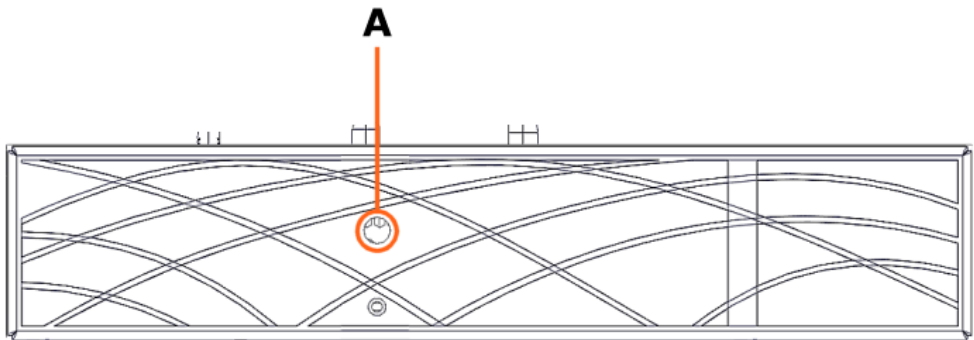


# Chapter 3. Buttons, LEDs and ports

## 3.1. Front buttons and LEDs

### 3.1.1. Buttons

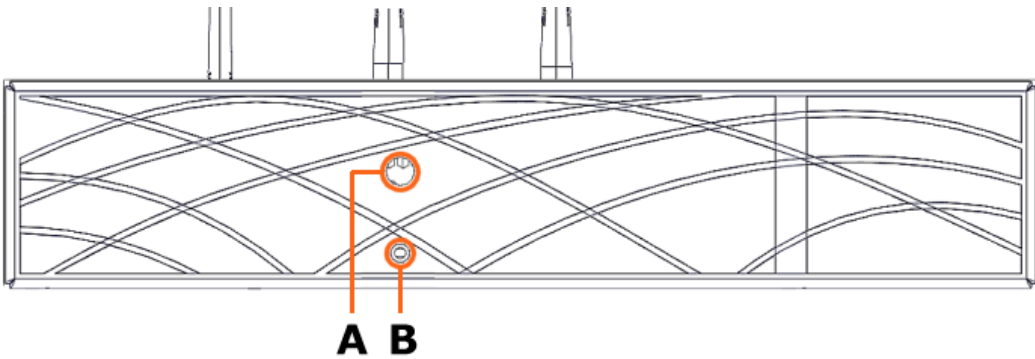
 Front view



Mark	Description
A	Power On/Off

### 3.1.2. LEDs

 Front view

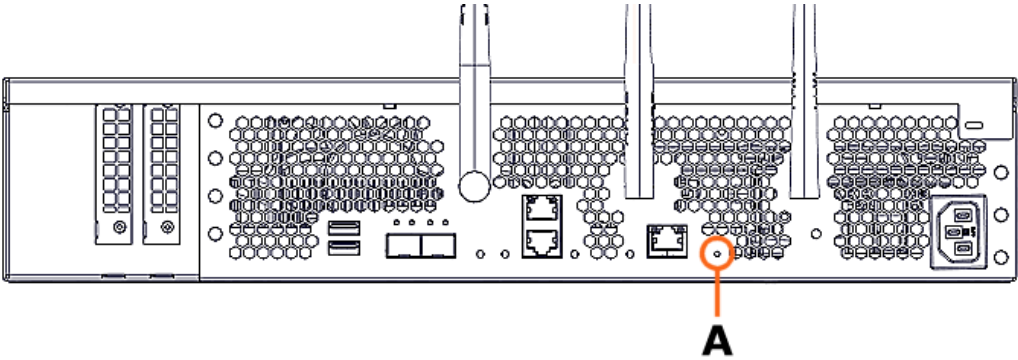


Mark	Color	Description
A	Solid green	Module power on status / OS boot
	Blinking green	Module standby status / BMC boot
B	Solid blue	Module Identification

3.2.   Rear buttons, LEDs and ports

3.2.1.   Buttons

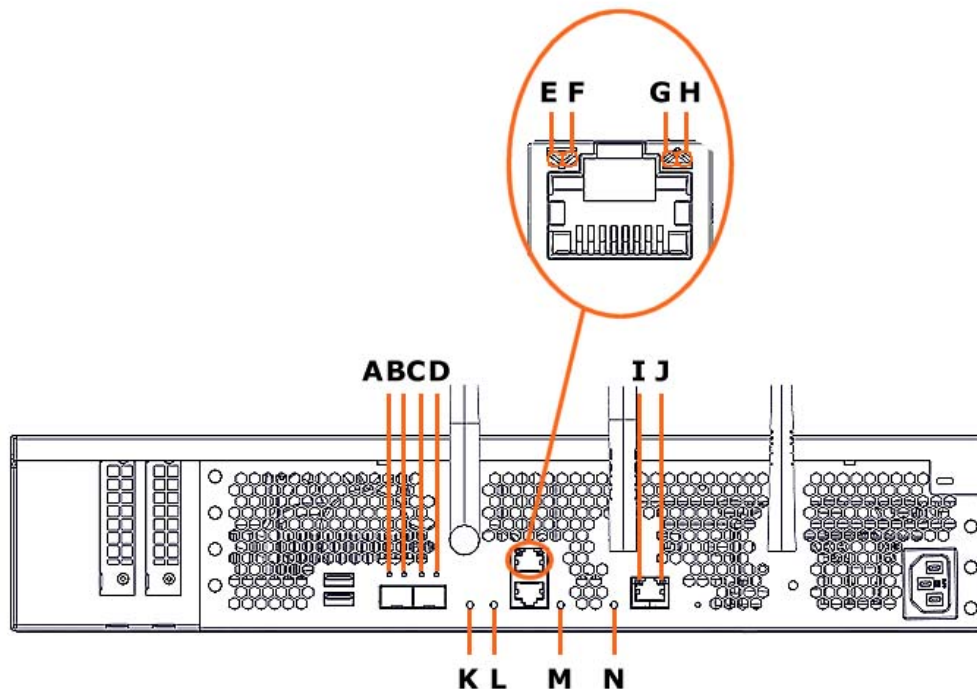
   Rear view



Mark	Description
A	Firmware recovery button

### 3.2.2. LEDs

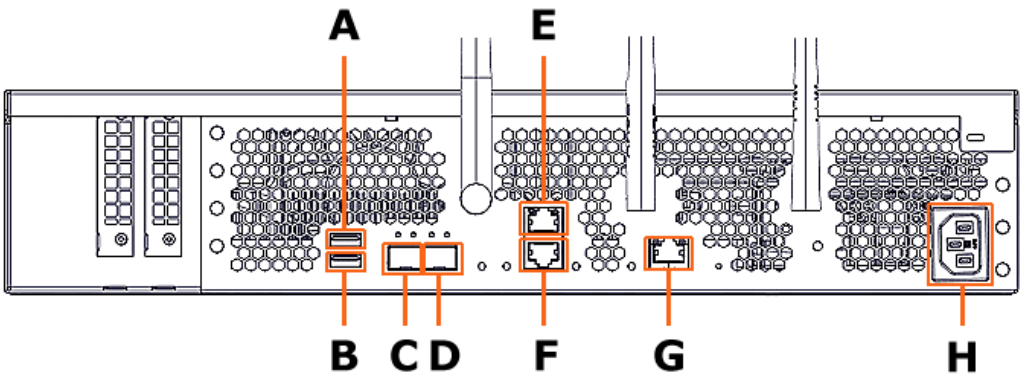
 **Rear view**



Mark	Color	Description	Component
A	Amber	Link 1 GB/s Ethernet up	SFP+ port 1
	Green	Link 10 GB/s Ethernet up	SFP+ port 1
B	Blinking amber	Ethernet link activity	SFP+ port 1
C	Amber	Link 1 GB/s Ethernet up	SFP+ port 0
	Green	Link 10 GB/s Ethernet up	SFP+ port 0
D	Blinking amber	Ethernet link activity	SFP+ port 0
E	Green	Link 1 GB/s Ethernet up	RJ45 port 0
F	Blinking amber	Ethernet link activity	RJ45 port 0
G	Blinking amber	Ethernet link activity	RJ45 port 1
H	Green	Link 1 GB/s Ethernet up	RJ45 port 1
I	Green	Link 1 GB/s Ethernet up	RJ45 BMC
J	Blinking amber	Ethernet link activity	RJ45 BMC
K	Red	Error	N/A
L	Red	Intrusion	N/A
M	Blinking green	SATA activity	SATA 1
N	Blinking green	SATA activity	SATA 0

3.2.3. Ports

 Rear view



Mark	Port type	Port name
A	USB 3.0	Port 1
B	USB 3.0	Port 0
C	SFP+ - 10 Gb/s Ethernet	Port 1
D	SFP+ - 10 Gb/s Ethernet	Port 0
E	RJ45 - 1 Gb/s Ethernet	Port 1 - host
F	RJ45 - 1 Gb/s Ethernet	Port 0 - host/BMC
G	RJ45 - 1 Gb/s Ethernet	BMC
H	220V power supply	N/A

---

## Appendix A. Technical Description

### A.1. General Technical Specifications

Operating Limits	
Ambient air temperature	+5°C to + 45°C Gradient 20°C / hour
Relative humidity (non condensing)	5% to 90% Gradient 5%/hour
Pressure	70 to 106 kPa
Elevation	Sea level < 3000 m
Non-Operating Limits	
Ambient air temperature	<-20°C and >60°C
Relative humidity (non condensing)	<5% and >95% (Gradient 30%/h)
Moisture content	1 to 29 g/m3
Shipping Limits	
Operating air temperature	-20°C to + 60°C Gradient 25°C/hour
Relative humidity (non condensing)	5% to 95% Gradient 30%/hour

### A.2. Dimensions and Weight

BullSequana Edge server	
Height	2U - 86 mm
Width	430 mm
Depth	290 mm
Weight	10 Kg

### A.3. Module Technical Specifications

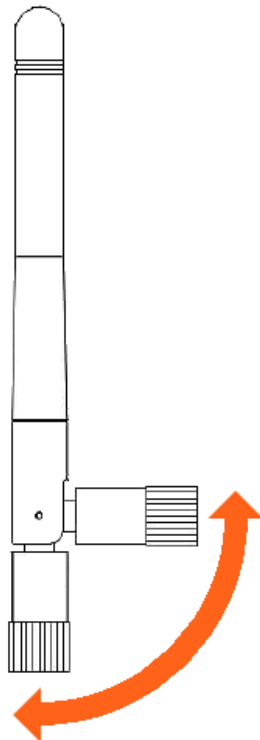
Electrical Specifications	
Each BullSequana Edge server module is equipped with 1 PSU	
Rated Current	6 - 3 A
Power consumption	Typical: < 500 W
Thermal dissipation	Maximum: 600 W
Rated Voltage Range	100 - 240 V
Rated Frequency Range	50/60 Hz
Environmental Specifications	
Noise	25°C inlet, 75% of worst TDP power and without fan filter: 40dB

## A.4. Server Technical Description

<b>Processor</b>	
Number	BullSequana Edge server: 1 processor
Type	Intel® Xeon® family: Skylake-D
<b>Architecture</b>	
Platform	Based on Intel Yuba City Platform
<b>Memory</b>	
Minimum / Maximum	BullSequana Edge server: up to 256 GB
Type	DDR4 RDIMM, LR-DIMM Up to 2667 MT/s
Slots	4x slots per module
<b>I/O slots per module</b>	
Bus slots	2x16 Gen3 PCIe slots
<b>I/O ports per module</b>	
USB port	2 USB 3.0
Ethernet port	2x 10 GB and 3x 1GB Ethernet ports
<b>Disk bays per module</b>	
Disk	2x 2.5" SSD\HDD or 3.5" HDD
<b>GPUs per module</b>	
GPU	2x NVIDIA GPU cards

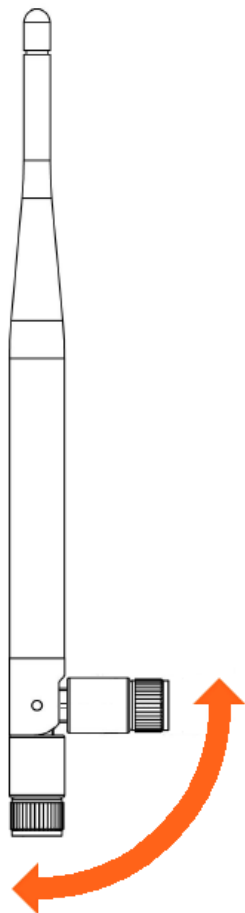
**A.5. Antenna specifications**

**A.5.1. Dual-band WiFi**



Dimensions	
Unfolded height	108 mm
Attached height	78 mm
Maximum width	10 mm
Minimum width	8 mm
Attached depth	31 mm
Technical specifications	
Frequency	2.4 - 5.8 GHz
Voltage Standing Wave Ratio	≤ 1.8 : 1
Gain	2.5 dB
Polarization	Vertical
Impedance	50 Ω
Max Power	20W

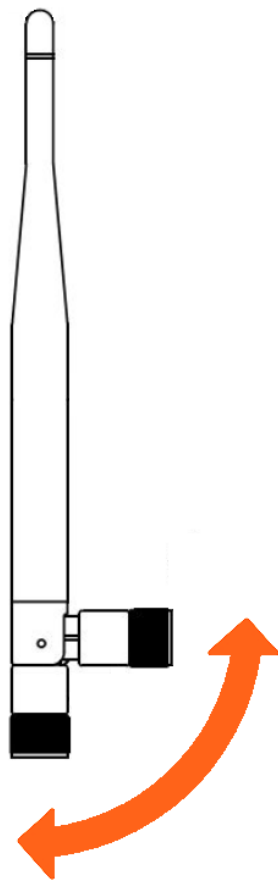
**A.5.2. LoRaWAN**



Dimensions	
Unfolded height	195 mm
Attached height	172 mm
Maximum width	13 mm
Minimum width	6 mm
Attached depth	38 mm
Technical specifications	
Frequency	868 MHz
Voltage Standing Wave Ratio	<2.0
Gain	3 dBi
Polarization	Liner
Impedance	50 $\Omega$



**A.5.3.     LTE 3G/4G GSM**



Dimensions	
Unfolded height	195 mm
Attached height	172 mm
Maximum width	13 mm
Minimum width	6 mm
Attached depth	38 mm
Technical specifications	
Frequency	700 - 2700 MHz
Voltage Standing Wave Ratio	≤ 2.5
Gain	5 dB
Polarization	Vertical
Impedance	50 Ω
Max Power	50W



---

# Acronyms

---

## A

**ACPI**

Advanced Configuration and Power Interface

**APM**

Advanced Power management

**ATX**

Advanced Technology extended

---

## B

**BMC**

Baseboard Management Controller

**BSM**

Bull System Management software

**BW**

Bandwidth

---

## C

**CPU**

Central Processing Unit

**CRU**

Customer Replaceable Unit

---

## D

**DIMM**

Dual In-line Memory Module

---

## E

**EMI**

Electro Magnetism Interferences

---

## F

**FPGA**

Field Programmable Gate Array

**FRU**

Field Replaceable Unit

---

## G

**GPU**

Graphical Processing Unit

---

## H

### **HDD**

Hard Disk Drive

---

## I

### **I2C**

Intra Integrated Circuit

### **IPMI**

Intelligent Platform Management Interface

### **IPxx**

Ingress Protection

---

## J

### **JRE**

Java Runtime Environment

---

## K

### **KVM**

Keyboard Video Mouse

---

## L

### **LAN**

Local Area Network

### **LED**

Light Emitting Diode

### **LoRa**

Long range wireless communications

### **LPWAN**

Low-Power Wide Area Network

---

## M

### **MAC**

Media Access Control

### **MI**

Machine Intelligence

### **MIB**

Management Interface Base

### **MIPSE**

Machine Intelligence Pocket Server

### **MRT**

Mean Repair Time

### **MTBF**

Mean Time Between Failure

**MTBI**  
Mean Time Between Interrupts

**MTTR**  
Mean Time to Restoration

---

## N

**NIC**  
Network Interface Controller

---

## O

**OOB**  
Out of Band

---

## P

**PC**  
Personal Computer

**PCI**  
Peripheral Component Interconnect

**PCIe**  
PCI Express

**PCH**  
Platform Controller Hub

**PSU**  
Power Supply Unit

**PUE**  
Power Usage Effectiveness

**PXE**  
Preboot execution Environment (PXE)

---

## Q

**QAT**  
Quick Assist Technology

---

## R

**RAS**  
Reliability, Availability, Serviceability

**RDIMM**  
Registered Dual In-line Memory Module

**RTC**  
Real Time Clock

**RU**  
Rack Unit

---

## S

### **SATA**

Serial ATA

### **SEL**

System Event Log

### **SKL**

SkyLake Intel CPU

### **SoC**

System on Chip

### **SOD**

Statement of Direction Document

### **SMBIOS**

System Management BIOS

### **SNMP**

Simple Network Management Protocol Bull Confidential and Proprietary BNT\_ARCH\_6003, v0.92 8/51

### **SPOF**

Single Point of Failure

### **SSD**

Solid State Disk storage peripheral

---

## T

### **TCO**

Total Cost of Ownership

### **TDP**

Thermal Design Point

### **TELNET**

TELEcommunication NETwork

### **TPM**

Trusted Platform Module

### **TTM**

Time To Market

---

## U

No entries.

---

## V

### **VESA**

Video Electronics Standard Association

### **VPD**

Vital Product Data

---

## **W**

### **WOL**

Wake On LAN

---

## **X**

No entries.

---

## **Y**

No entries.

---

## **Z**

No entries.







**Bull Cedoc**  
**357 avenue Patton**  
**BP 20845**  
**49008 Angers Cedex 01**  
**FRANCE**