AMULET HOTKEY

QS

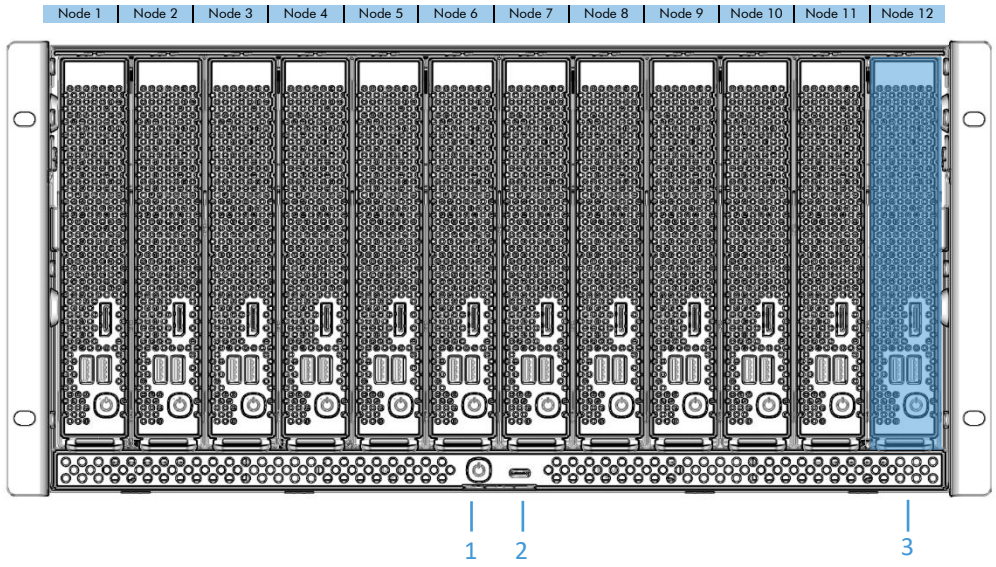
Amulet Hotkey CoreStation HX5

Quickspec

Version 1.0 - September 2025

System Features

HX5 Enclosure Front View

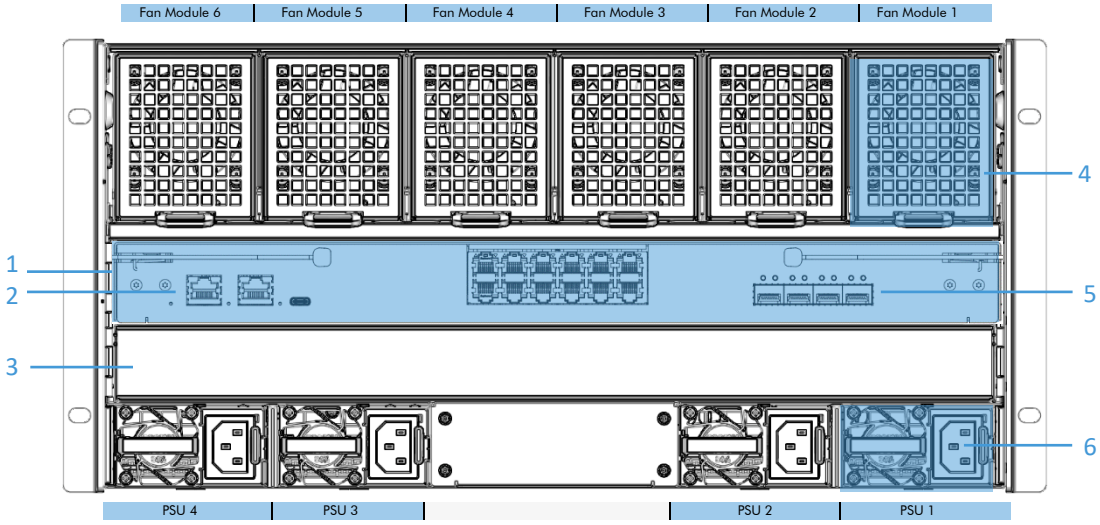


1 Enclosure power button and power indicator

2 System serial port (front)

3 Workstation node (node 12 highlighted)

HX5 Enclosure Rear View



1 HX5 I/O module

2 Management network port

3 Expansion module (for future use)

4 Cooling Module

5 Data uplink ports

6 Power Supply module

Management, Power and Cooling

N120 Switch & Passthrough IO Module

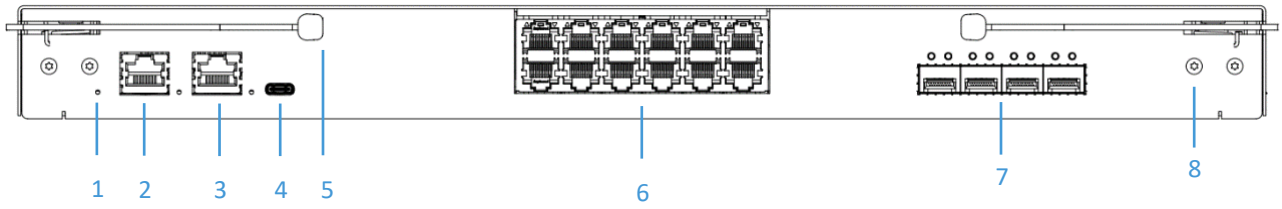
Management Features

Enclosure power and thermal Management

Node Remote Console

Node Advanced Management

N120 IO Module rear view



1	Status Indicator	6	Data Passthrough ports with node Identification indicators (12 total)
2	Management network port 1 (1GBase-T)		
3	Management network port 2 (1GBase-T)	7	Data SFP+ combined uplink ports with link/activity indicators (4 total)
4	System rear console port (USB-C)		
5	Latch Handle	8	Cable management mounting points (Both sides)

Ports and Interfaces

Interface	Internal connection	Capabilities	Functionality
System Console Port	Management Controller	USB-C device port with USB-serial bridge.	Initial setup and configuration only
Management ports (2)	Management controller via Internal switch	100/1000Base-T Ethernet	Management Console Support for link aggregation and daisy-chain (Future software release)
Data uplink ports (4)	Node Fabric 1A via Internal switch	10G SFP+ supporting DAC, Fiber and Copper modules	Combined uplink ports with link aggregation. (Future software release)
Data passthrough ports (12)	Node Fabric 1B direct connection	100/1000/2500Base-T Ethernet.	Independent data connection for each workstation node

Internal Data switch

Microchip LAN9698 Managed Ethernet switch with 102Gbps total switching bandwidth. All switch configuration and management operations are performed using the HX5 management console.

Power Supply redundancy levels

Use the CoreStation HX5 power planning tool to determine the required power supplies for the target system configuration.

Redundancy level	Description
Non-Redundant	Provides maximum available power, but no protection against failure
N+1 Redundant with Single feed	Failure of one power supply has no effect on system performance or stability. Power draw must remain within the capacity of the remaining supplies
2+2 Redundant with Dual feed	Failure of one AC feed or two power supplies has no effect on system performance or stability. Power draw must remain within the capacity of the remaining two supplies

Power Supply Units

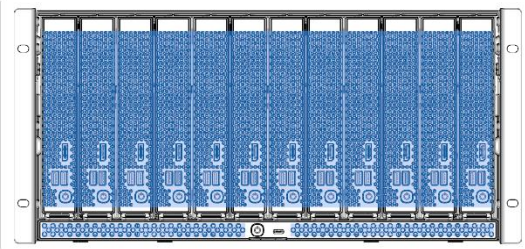
All PSUs used in a CoreStation HX5 enclosure should be of an identical rating. If mixed ratings are fitted, the system will operate without issue, but the lowest rating is for calculating available system power.

Nominal Capacity	Maximum Heat Dissipation	Standard	AC high-line range 200V - 240V_{AC} 50/60Hz	AC low-line range 100V–127V_{AC} 50/60Hz	Input Connector
800W	3,003 BTU/hr	Titanium	800W output	800W output	IEC C14
1300W	4,875 BTU/hr	Titanium	1,300W output	1,000W output	IEC C14

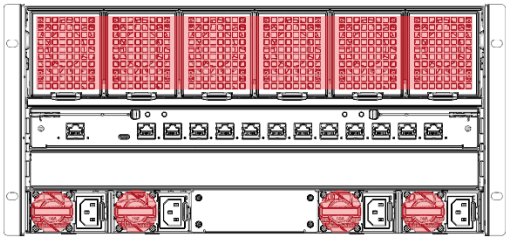
Heat Dissipation is the maximum input power for each supply at full rated load with 230Vac/60Hz input. Unused PSU locations can be left empty or fitted with PSU blanks.

HX5 Enclosure Cooling

CoreStation HX5 uses front-to-back airflow provided by dual-rotor fans in the cooling module to keep the workstation nodes operating in a controlled temperature range. The enclosure is divided into six cooling channels, each of which correspond to a cooling module and the two node slots directly in front.



HX5 cool air intake areas



HX5 hot air exhaust areas

The cooling modules each contain two separate spinning fan rotors with independent power, control and monitoring circuitry for enhanced redundancy. Failure or degradation of one rotor will result in the remaining rotor increasing speed to compensate. In some cases, this will result in a reduction in overall performance within that cooling channel. Consult the CoreStation HX5 power and cooling guide for details.

Each cooling module contains sprung flaps to prevent air re-circulation or bypass when only one of the two nodes is fitted to a cooling channel and the system can be operated indefinitely in this state, but it is recommended to fit node blanks to slots which are not in use.

All six cooling modules should be fitted to the enclosure for correct operation.

Workstation Nodes

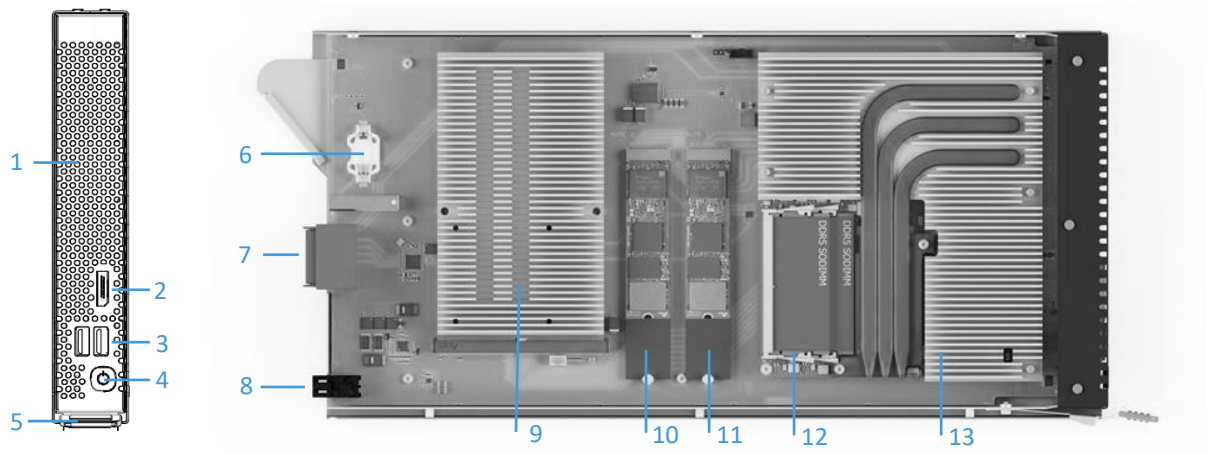
Workstation Node summary

Workstation Series	Processor family	CPU Options	Graphics Options	Memory Capacity	Storage
CoreStation HX2000	Intel Core Ultra 100 series "Meteor Lake H"	Core Ultra 7 165U	Intel Graphics (Integrated)	16GB 32GB 64GB	Two M.2 NVMe droves with optional RAID 1
		Core Ultra 7 165H	Intel Arc Graphics (Integrated) Discrete NVIDIA GPU Ada Generation	16GB 32GB 64GB 96GB	
	Intel Core Ultra 200 series "Arrow Lake H"	Core Ultra 9 285H	Intel Arc 140T GPU (Integrated) Discrete NVIDIA GPU Ada Generation	16GB 32GB 64GB 96GB	

HX2000 Workstation node

Single-slot Workstation node

- Intel Core Ultra 100 series and 200 series CPUs
- Dual channel DD5 SODIMM memory
- Integrated Intel Graphics or optional discrete NVIDIA GPU
- 2.5Gbit/s Network
- Two NVMe Gen 4 storage drives with optional RAID 1



1	Cooling air inlet	8	Power Connector
2	Local video output (DisplayPort)	9	GPU (Optional-fit)
3	Local USB ports (USB-A, 3.0 5Gbps)	10	M.2 Storage position A
4	Power button and status indicator	11	M.2 Storage position B
5	Latch handle	12	Memory modules 2x DDR5 SODIMM
6	RTC Battery	13	CPU Module
7	IO Module Connector		

Processor Options

HX2000 Workstation nodes can be configured with the following processors

Processor	Cores	Core Frequency	Max Memory	Integrated Graphics	AI Processor
Intel Core Ultra 7 Processor 165U	12 total cores, 14 threads	Up to 4.9GHz	64GB 5,600MT/s	Intel® Graphics 4Xᵉ Cores (Xe-LPG Gen) Upto 2.0 GHz	Intel AI Boost NPU3 11.5 TOPS
Intel Core Ultra 7 Processor 165H	16 total cores, 22 threads	Up to 5.0GHz	96GB 5,600MT/s	Intel® Arc Graphics 8Xᵉ Cores (Xe-LPG Gen) Upto 2.3 GHz	Intel AI Boost NPU3 11.5 TOPS
Intel Core Ultra 9 Processor 285H	16 total cores, 16 threads	Up to 5.4GHz	96GB 6,400MT/s	Intel Arc 140T GPU 8Xᵉ Cores (Xe2-LPG Gen) Upto 2.35 GHz	Intel AI Boost NPU3 13 TOPS

Graphics Processor Options

If a discrete GPU is specified, this operates in addition to the integrated GPU and both are available to the Operating System for use.

GPU	GPU Memory	Core count	PCIe	Graphics Power	CPU Restrictions
Intel Graphics	Shared memory with CPU	4 Iris Xᵉ cores 64 EUs	Integrated with CPU package	Part of CPU power, max 25W for GPU-only workloads	165U only
Intel Arc Graphics		8 Iris Xᵉ cores 128 EUs			165H only
Intel Arc 140T GPU		8 Iris Xᵉ cores 128 EUs			285H only
NVIDIA RTX 2000 Ada Lovelace architecture	8GB GDDR6	3072 CUDA cores 96 Tensor cores 24 RT cores	PCIe x8 Gen4.0	60W TGP	165H 285H

Memory Population options

The CPU module supports dual-channel memory, where each channel has one SODIMM connector. Both channels should be populated for maximum performance.

The SODIMM memory can be replaced and upgraded by the customer using compatible modules.

SODIMM modules with hardware error correction (ECC) are not compatible, but the workstation node can be configured to use in-band ECC. This slightly reduces the memory capacity and bandwidth available to the operating system and applications in exchange for additional resilience.

Total RAM Capacity	SODIMM Population	Note
16GB	2x 8GB DDR5 SODIMM	
32GB	2x 16GB DDR5 SODIMM	
64GB	2x 32GB DDR5 SODIMM	
96GB	2x 48GB DDR5 SODIMM	Only available with 165H/285H

Storage Configuration

There are two positions for M.2 NVMe storage devices supporting PCIe/NVMe Gen 4 with x4 link width. SATA storage devices are not supported. These devices are inside the node casing and should only be removed or replaced when the node is removed from the enclosure as they do not provide hot-swap capability.

These can be used as two separate devices or else combined into a single storage array using the storage controller integrated into the CPU module. The configuration and management of RAID volumes is handled at the hardware level and provides resilience for all parts of the Operating System boot process.

Configuration	Drive options	Total Storage
Non-RAID	Zero, One or Two M.2 NVMe SSDs, any combination of capacity	Up to 4TB
RAID 1	Two NVMe SSDs, identical capacity	512GB - 2TB
RAID 0		1TB - 4TB

M.2 Solid State Drives

Capacity	Drive Model	Interface	Seq. read	Seq. write	Endurance (5yrs)
512GB	Micron 3500	NVMe Gen 4	7000MB/s	5100MB/s	300 TB / 0.32 DWPD
1TB	Micron 3500	NVMe Gen 4	7000MB/s	6900MB/s	600 TB / 0.32 DWPD
2TB	Micron 3500	NVMe Gen 4	7000MB/s	7000MB/s	1,200 TB / 0.32 DWPD

Network Interfaces

The node has two network interfaces which both connect to the HX5 IO Module. Either one or both interfaces may be available, depending how the datacenter network is connected to the HX5 ports.

Connectivity	Network Controller	Capabilities	Uses
Fabric 1A	Intel i226	2.5GBase-T Ethernet	CoreStation Management Data network connection using switched uplink ports
Fabric 1B	Intel i226	2.5GBase-T Ethernet	Data network connection to the operating system using pass-through network ports
Fabric 2A	No Connection	-	-
Fabric 2B	No Connection	-	-

Operating System

CoreStation nodes are shipped with an operating system installed for ease of deployment and setup.

OS Option	Image	License	Management options
No OS	none	none	Customer specific
Windows 11 Pro	AHK Proof-of-concept Intended for initial customer testing only.	OEM license stored in BIOS	Locally managed users and apps
Windows 11 Pro	Standard Image Intended for volume deployment with Windows Autopilot.	OEM license stored in BIOS	Windows Autopilot / Intune

Configuration Items

These items can be configured as part of the manufacturing process to streamline deployment but can also be easily changed later.

Setting	Description	Options
Performance Profile	Determines the maximum power which can be used by this node. Higher profiles provide more performance but use more power. See the CoreStation HX5 power and cooling tool for further details.	• Maximum Performance • High Performance (default) • Balanced • Low Power • Lowest Power
Use Condition Profile	Configures the CPU turbo performance for best operating lifetime based on the target use case. See HX5 user guide for further details.	• Single User [Default] • Multiuser
Storage Configuration	When two storage devices are fitted, they can be configured to appear to the Operating System as either two separate drives or a single array spanning both drives.	• RAID 1 (default when two drives are specified) • RAID 0 • Disabled
ECC Memory	Enable in-band error checking for memory with a slight performance penalty	• Disabled (default) Enabled

System specifications

Ambient Operating Range

The system has an overall maximum ambient rating of 35°C and a safe continuous operating ambient based on the system configuration.

The ambient conditions are specified at the front of the enclosure in the centre. Each node has a thermal sensor at the front to measure and record the inlet temperature during operation.

Recommended operating range	• ASHRAE Recommended • 18°C to 27°C • Up to 60% Relative Humidity • 5.5°C to 15°C dew point
Allowable operating range	• ASHRAE A2 • 10°C to 35°C • 20% to 80% Relative Humidity
Operating Altitude	• -50m to +3,000m (-160ft to +9,800ft)
Allowable range for storage and transport	• -20°C to 65°C (-4°F to 149°F) • 5% to 95% relative humidity, non-condensing • After storage or transport, ensure the system is left to reach the operating range before power-up and any moisture has evaporated

Ambient Thermal Tables

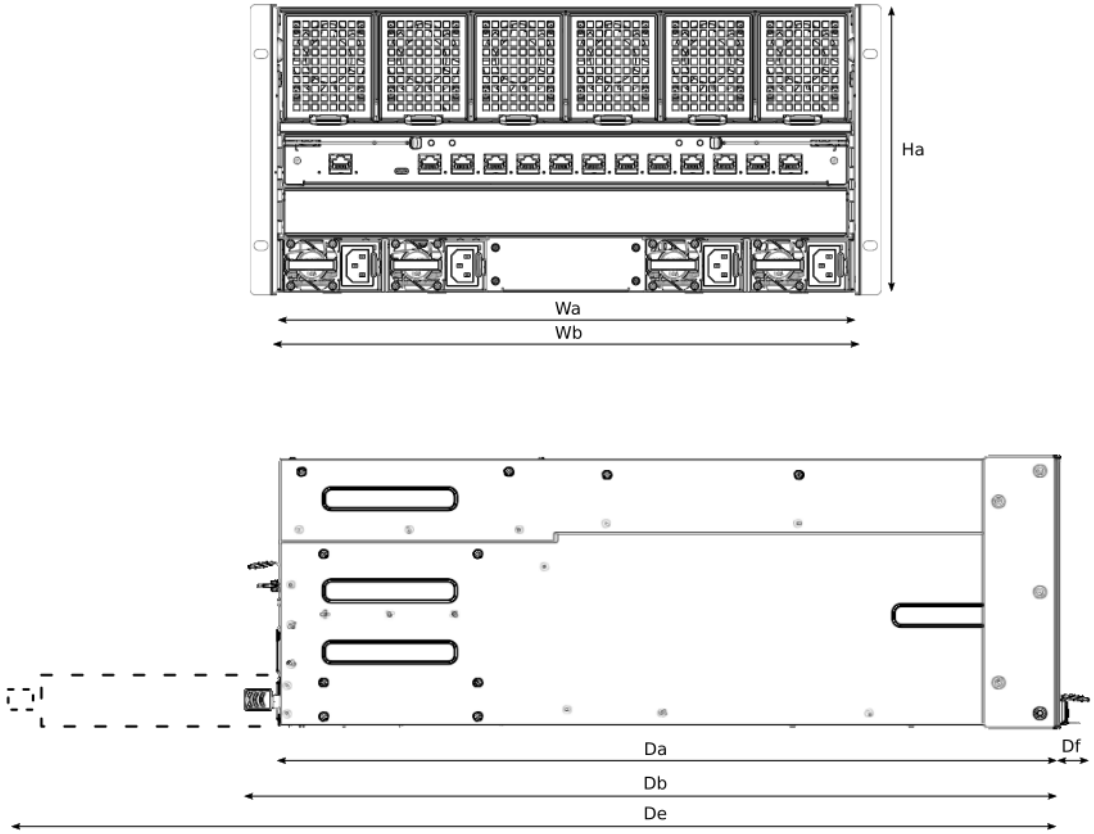
The maximum ambient temperature for continuous operation depends on the configuration of the system. The table below is based on a cooling channel using two identical workstation nodes.

Short-term operation above these limits will cause temporary performance throttling and higher fan speeds, but the system will continue to operate. Long-term use above these limits may result in premature failures in nodes and fans.

Refer to the CoreStation HX Power Estimation tool for detailed analysis of ambient limits for a specific config.

Node CPU TDP	Up to 28W	Up to 45W	Up to 65W
Up to 27°C Ambient	Standard heatsink	Standard heatsink	Standard heatsink
Up to 30°C Ambient	Standard heatsink	Standard heatsink	Not Supported
Up to 35°C Ambient	Standard heatsink	Standard heatsink	Not Supported

Enclosure Dimensions



Da	Depth of system enclosure	602mm (23.7in)	**Df**	Protrusion from front of rack	24.9mm (0.98in)
Db	Depth to furthest point (PSU handles)	627mm (24.7in)	**Ha**	Height of system enclosure	218mm /(8.58in) 5 rack units
Dc	Depth required for cable band	700mm (27.6in)	**Wa**	Width of system enclosure	441mm (17.4in)
De	Depth required to remove modules in situ	820mm(32.3in)	**Wb**	Width of enclosure to fit within rack posts	447mm (17.6in)

Weights

Empty enclosure: 12.2 kg (26.9 lbs)

Enclosure with four PSUs, IO Module and cooling modules: 23.4 kg (51.6 lbs)

HX2000 Workstation Node with integrated GPU: 3.0 kg (6.6 lbs)

Fully populated system: 59.4 kg (131 lbs)

Fully populated shipping weight: 72.0kg (159 lbs)

Service Items and Accessories

CoreStation HX5 Accessories

Part Number	Description	Used For
AHKP-102461	CoreStation HX5 static rail kit	Mounting HX5 Enclosure in a standard 4-post rack
AHKP-102367	CoreStation HX5 Node Blank	Unused node positions in HX5 enclosure
AHKP-102394	10G SFP+ DAC passive cable assembly, 5m	Data uplink connection to top-of-rack switch over short distances.
AHKP-102395	10G SFP+ DAC passive cable assembly, 3m	
AHKP-102399	10G SFP+ Module, Copper 10GBase-T, 100m	Data uplink connections using cat 6A or better cable
AHKP-102400	10G SFP+ Module, Short-range Fiber 850nm, 300m, Duplex LC	Data uplink connections using multi-mode fiber
AHKP-102401	10G SFP+ Module, Long-range Fiber 1310nm, 10km, Duplex LC	Data uplink connections using single-mode fiber
AHKP-102438	Rack Power Cord 0.6M (C13/C14 10A) black	Power connection to PDU with IEC C13 sockets
AHKP-102522	Rack Power Cord 0.6M (C13/C14 10A) white	
AHKP-102439	Rack Power Cord 2M (C13/C14 10A)	
CL-XX01-0009	UK Power Cord 2M (C13, 250V 10A)	Power connection to PDU with UK mains sockets
AHKP-102440	Ethernet Cable, Cat 5e UTP, 5m	Management network connection
AHKP-102478	USB-A to USB-C, 2m	USB Cable for serial console port connection

Upgrades and replacement system parts

Part Number	Description
Contact Sales	CoreStation HX5 Gold Cooling Module
Contact Sales	CoreStation HX5 800W Titanium PSU
Contact Sales	CoreStation HX5 1300W Titanium PSU
Contact Sales	CoreStation HX2000 Memory 16GB SODIMM 5,600
Contact Sales	CoreStation HX2000 Memory 32GB SODIMM 5,600
Contact Sales	CoreStation HX2000 Memory 48GB SODIMM 5,600
Contact Sales	Micron 3500 M.2 SSD 512GB
Contact Sales	Micron 3500 M.2 SSD 1TB
Contact Sales	Micron 3500 M.2 SSD 2TB
Contact Sales	CR2032 Lithium coin cell

Resources
https://amulethotkey.force.com/support/s/resources

EMEA Support
+44(0)20 7960 2400
eurosupport@amulethotkey.com

North America Support
+1(212)269 9300
ussupport@amulethotkey.com
casupport@amulethotkey.com

Asia Pacific Support
apsupport@amulethotkey.com

Latin America Support
latamsupport@amulethotkey.com