

Nokia 7220 IXR-H series Interconnect Routers for SONiC

The Nokia 7220 IXR-H series platforms are designed for the leaf and spine layers of data center fabrics, delivering up to 102.4 Tb/s full duplex (FD) capacity and up to 1.6TE interfaces, providing high-scale interconnectivity for AI and cloud providers, telecommunications providers, and mission-critical enterprise environments.

Overview

Network operators require highly scalable, modular, reliable platforms that are designed to support high-speed interfaces for current and future network buildouts, including support for AI and high-performance computing (HPC) workloads.

The Nokia 7220 IXR-H series provides powerful platforms to create of high-capacity, lossless, low-latency hyperscale networks for AI and machine-learning clusters and workloads. It is well suited for spine- and leaf- deployments in backend and front-end networks of CLOS data center architectures.

Based on the Software for Open Networking in the Cloud (SONiC) network operating system (NOS), the 7220 IXR-H series is available in seven variants, each distinguished by its optical interfaces and system-throughput capabilities.

Scaling from 12.8 Tb/s full duplex (FD) to 102.4 Tb/s FD, the 7220 IXR-H series provides high density 1.6TE, 800GE, 400GE, 200GE, 100GE and 10GE interfaces with flexible optical breakouts, supporting a range of optics — including 1.6T OSFP224, 800G OSFP112, 400G and 800G QSFP-DD and 100G QSFP28 — for intra-fabric and workload connectivity.



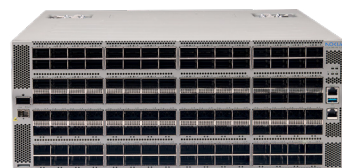
7220 IXR-H4-32D



7220 IXR-H6-64



7220 IXR-H4



7220 IXR-H6-128



7220 IXR-H5-32D



7220 IXR-H5-64D



7220 IXR-H5-64O

Supported platforms

7220 IXR-H4-32D

The 7220 IXR-H4-32D is 1 RU high with a system capacity of 12.8 Tb/s FD. It is equipped with 32 x 400G QSFP-DD connectors supporting 2 x 200G and 4 x 100G optical breakouts, along with 1 x 1/10G SFP+ port.

All QSFP-DD connectors include hardware support for native 400GE, 200GE, 100GE, 50GE and 40GE interfaces, enabling high-performance intra-fabric uplinks, storage and server connectivity. The SFP+ port includes hardware support for native 10GE interfaces.

The 7220 IXR-H4-32D supports two power supplies with 1+1 redundancy using either AC or DC power options. The system supports back-to-front airflow configuration with seven N+1 hot swappable fans.

7220 IXR-H4

The 7220 IXR-H4 is 2 RU high with a system capacity of 25.6 Tb/s FD. It is equipped with 64 x 400G QSFP-DD ports supporting 2 x 200G and 4 x 100G optical breakouts, along with 2 x 1/10G SFP+ ports.

All QSFP-DD connectors include hardware support for native 400GE, 200GE, 100GE, 50GE and 40GE interfaces, enabling high-performance intra-fabric uplinks, storage and server connectivity. The SFP+ ports include hardware support for native 10GE interfaces.

The 7220 IXR-H4 supports two power supplies with 1+1 redundancy using either AC or DC power options. The system supports front-to-back airflow configuration with four N+1 hot swappable fans.

7220 IXR-H5-32D

The 7220 IXR-H5-32D is 1 RU high with a system capacity of 25.6 Tb/s FD. It is equipped with 32 x 800G QSFP-DD connectors supporting 2 x 400G, 4 x 200G and 8 x 100G optical breakouts, along with 2 x 10G SFP+ ports.

All QSFP-DD connectors include hardware support for native 800GE, 400GE, 200GE, 100GE, and 50GE interfaces, enabling high-performance intra-fabric

uplinks, storage and server connectivity. The SFP+ ports include hardware support for native 10GE interfaces.

The 7220 IXR-H5-32D supports two power supplies with 1+1 redundancy using either AC or DC power options. The system supports front-to-back airflow configuration with seven N+1 hot swappable fans.

The 7220 IXR-H5-32D supports Linear pluggable optics (LPO) which enable lower power consumption compared to traditional optical modules. This is critical for AI and HPC use cases where low power consumption is critical.

7220 IXR-H5-64D and 7220 IXR-H5-64O

The 7220 IXR-H5-64D and 7220 IXR-H5-64O are 2RU high with a system capacity of 51.2 Tb/s FD. They are equipped with 64 x 800G QSFP-DD or 800G OSFP112 connectors supporting 2 x 400G, 4 x 200G and 8 x 100G optical breakouts, along with 2 x 10G SFP+ ports. The 7220 IXR-H5-64O is available in two variants, one supporting 320 logical ports and the other supporting 512 logical ports.

All QSFP-DD connectors include hardware support for native 800GE, 400GE, 200GE, and 50GE interfaces, enabling high-performance intra-fabric uplinks, storage and server connectivity. The SFP+ ports include hardware support for native 10GE interfaces.

The 7220 IXR-H5-64D and 7220 IXR-H5-64O support two power supplies with 1+1 redundancy using either AC or DC power options. Both systems support a front-to-back airflow configuration with four N+1 hot-swappable fans.

The 7220 IXR-H5-64D and 7220 IXR-H5-64O support LPO, which enable lower power consumption compared to traditional optical modules. This is critical for AI and HPC use cases where low power consumption is critical.

7220 IXR-H6-64

The 7220 IXR-H6-64 is a 3RU high with a system capacity of 102.4 Tb/s FD. It is equipped with 64 x 1.6T OSFP224 connectors supporting 2 x 800G, 4 x 400G, 8 x 200G, 8 x 100G, 2 x 400G, 4 x 100G, 4 x 200G and 2 x 200G optical breakouts, along with 2 x 25G SFP28 ports.

All OSFP connectors include hardware support for native 1.6TE, 800GE, 400GE, 200GE and 100GE interfaces, enabling high-performance intra-fabric uplinks, storage and server connectivity. The SFP28 ports include hardware support for native 25GE and 10GE interfaces.

The 7220 IXR-H6-64 is air-cooled from front-to-back and supports redundant AC and DC power supplies with eight N+1 redundant fans.

7220 IXR-H6-128

The 7220 IXR-H6-128 is a 4RU high with a system capacity of 102.4 Tb/s FD. It is equipped with 128 x 800G OSFP112 ports supporting 8 x 100G, 2 x 400G, 4 x 100G, 4 x 200G and 2 x 200G optical breakouts, along with 1 x 100G QSFP28 port.

All ports include hardware support for native 800GE, 400GE, 200GE and 100GE interfaces, enabling high-performance intra-fabric uplinks, storage and server connectivity. The QSFP28 port provides native 100GE speeds.

This 7220 IXR-H6-128 is air-cooled from front to back and supports redundant AC and DC power supplies with 7+1 redundant fans.

The 7220 IXR-H6-128 supports Linear Pluggable Optics (LPO) and Linear Receive Optics (LRO) which enable lower power consumption compared to traditional optical modules. This is essential for AI and HPC use cases where low power consumption is critical.

SONiC

Software for Open Networking in the Cloud (SONiC) is an open-source NOS based on Linux. It offers a full suite of network functionality, including Border Gateway Protocol (BGP) and Remote Directory Memory Access (RDMA), that has been production-hardened in the data centers of some of the largest cloud-service providers.

SONiC offers teams the flexibility to create the network solutions they need while leveraging the collective strength of a large ecosystem and community.

The 7220 IXR-H series platforms are certified for Nokia Community SONiC.

Software features

SONiC offers a comprehensive set of open-source features that are readily available and maintained via the SONiC community. For a complete list of capabilities and software support functions, please consult the [SONiC website](#) and Nokia Community SONiC release notes.

Technical specifications

Table 1. 7220 IXR-H4-32D and IXR-H4 specifications

Feature	7220 IXR-H4-32D	7220 IXR-H4
System throughput (FD)	12.8 Tb/s	25.6 Tb/s
Connectors	• 32 x 400G QSFP-DD • 1 x 10G SFP+	• 64 x 400G QSFP-DD • 2 x 10G SFP+
Optical breakout	2 x 200G, 4 x 100G	2 x 200G, 4 x 100G
Ethernet interface density (maximum ports per chassis)		
400GE	32	64
200GE	64	128
100GE	128	256
50GE*	128	256
40GE	32	64
25GE	128*	128*
10GE	128*	256*
Management ports	1 x 1000BASE-T	1 x 1000BASE-T
USB ports	1 x USB2.0	1 x USB2.0
Console port	1 x RJ45	1 x RJ45
Processor	8-core x86	8-core x86
Memory	32G DDR4	32G DDR4
Memory buffer size	113.5 MB	113.5 MB
Storage	32G MLC	128G MLC
Power	1+1 redundant AC: 100V to 240V DC: -48V / -60V 1600 W AC 1600 W DC	1+1 redundant AC: 200V to 240V DC: -48V / -60V 2400 W AC 2100 W DC
Hot-swappable power supplies	Yes	Yes
Fan modules	7 (N + 1) Front-to-back or back-to-front airflow	4 (N + 1) Front-to-back airflow
Hot-swappable fan modules	Yes	Yes
Dimensions	Height: 4.35 cm (1.75 in); 1 RU Width: 43.85 cm (17.26 in) Depth: 55 cm (21.65 in) Fits in standard 19-in mounting rack	Height: 8.7 cm (3.43 in); 2 RU Width: 44 cm (17.32 in) Depth: 64.92 cm (25.56 in) Fits in standard 19-in mounting rack
Weight	9.3 kg (20.50 lb) (unpopulated) 12.5 kg (27.56 lb) (fully populated)	9.3 kg (20.50 lb) (unpopulated) 12.5 kg (27.56 lb) (fully populated)
Discrete Trusted Platform Module (TPM)	TPM 2.0	
Normal operating temperature range	0°C to +40°C (32°F to +104°F) sustained	
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)	
Normal humidity	5% to 95%, non-condensing	

* Future software deliverable

Table 2. 7220 IXR-H5-32D, IXR-H5-64D and IXR-H5-64O specifications

Feature	7220 IXR-H5-32D	7220 IXR-H5-64D	7220 IXR-H5-64O
System throughput (FD)	25.6 Tb/s	51.2 Tb/s	51.2 Tb/s
Connectors	• 32 x 800G QSFP-DD • 2 x 10G SFP+	• 64 x 800G QSFP-DD • 2 x 10G SFP+	IXR-H5-64O (320 variant) and IXR-H5-64O (512 variant) • 64 x 800G OSFP • 2 x 10G SFP+
Logical ports	160	320	320 or 512
Optical breakouts	2 x 400G, 4 x 200G, 8 x 100G	2 x 400G, 4 x 200G, 8 x 100G	2 x 400G, 4 x 200G, 8 x 100G
Hardware support (maximum ports per chassis)			
800GE	32	64	64
400GE	64	128	128
200GE	128	256	256
100GE	144	288	• IXR-H5-64O (320 variant): 256 • IXR-H5-64O (512 variant): 512
50GE	—	—	—
25GE	—	—	—
10GE	2	2	2
Management ports	1 x 1000BASE-T	1 x 1000BASE-T	1 x 1000BASE-T
USB ports	1 x USB3.0	1 x USB3.0	1 x USB3.0
Console port	1 x RJ45	1 x RJ45	1 x RJ45
Processor	8-core x86 with dual boot SPI	8-core x86 with dual boot SPI	8-core x86 with dual boot SPI
Memory	32G DDR5	32G DDR5	32G DDR5
Memory buffer size	165.2 MB	165.2 MB	165.2 MB
Storage	32G iSLC	32G iSLC	32G iSLC
Power	1+1 redundant AC: 200V to 240V DC: -48V / -60V 2400 W AC 2400 W DC	1+1 redundant AC: 200V to 240V DC: -48V / -60V 3000 W AC 3200 W DC	1+1 redundant AC: 200V to 240V DC: -48V / -60V 3000 W AC 3200 W DC
Hot-swappable power supplies	Yes	Yes	Yes
Fan modules	7 (N + 1) Front-to-back	4 (N + 1) Front-to-back	4 (N + 1) Front-to-back
Hot-swappable fan modules	Yes	Yes	Yes
Dimensions	Height: 4.35 cm (1.75 in); 1 RU Width: 43.85 cm (17.26 in) Depth: 65 cm (25.5 in) Fits in standard 19-in mounting rack	Height: 8.7 cm (3.43 in); 2 RU Width: 43.85 cm (17.26 in) Depth: 63 cm (24.8 in) Fits in standard 19-in mounting rack	Height: 8.7 cm (3.43 in); 2 RU Width: 43.85 cm (17.26 in) Depth: 63 cm (24.8 in) Fits in standard 19-in mounting rack
Weight	12.45 kg (27.44 lb) (unpopulated) 16.37 kg (36.09 lb) (fully populated)	18.46 kg (40.7 lb) (unpopulated) 25 kg (55.11 lb) (fully populated)	19.84 kg (43.74 lb) (unpopulated) 25.2 kg (55.55 lb) (fully populated)
Discrete Trusted Platform Module (TPM)	TPM 2.0		
Normal operating temperature range	0°C to +40°C (32°F to +104°F) sustained		
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)		
Normal humidity	5% to 95%, non-condensing		

Table 3. 7220 IXR-H6-64 and IXR-H6-128 specifications

Feature	7220 IXR-H6-64	7220 IXR-H6-128
System throughput (FD)	102.4 Tb/s	102.4 Tb/s
Connectors	• 64 x 1.6T OSFP224 • 2 x 25G SFP28	• 128 x 800G OSFP • 1 x 100G QSFP28
Optical breakouts	2 x 800G, 4 x 400G, 8 x 200G, 8 x 100G, 2 x 400G, 4 x 100G, 4 x 200G, 2 x 200G	8 x 100G, 2 x 400G, 4 x 100G, 4 x 200G, 2 x 200G
Hardware support (maximum ports per chassis)		
1.6TE	64	-
800GE	128	128
400GE	256	256
200GE	512	512
100GE	512	513
25GE	2	—
10GE	2	—
Management ports	1 x 1G RJ45 OOB	• 1 x 1G RJ45 OOB • 1 x 10G SFP+ OOB
USB ports	1 x USB 3.0 Type A	1 x USB 3.0 Type A
Console port	1 x RJ45	1 x RJ45
Processor	8-core, 16-thread	16-core, 32-thread
BMC	—	BMC - 4-core arm with eMMC 32GB of storage
Memory	32GB DDR5	32GB DDR5
Memory buffer size	267MB	267MB
Storage	32GB iSLC	640Gb pSLC NVMe
Power	2+2 redundant: AC 3200W PSU; DC 2700W PSU	2+2 redundant: AC 3200W PSU; DC 2700W PSU
Hot-swappable power supplies	Yes	Yes
Fan modules	5+1 fan modules, front-to-back (port side intake) airflow, hot swappable	7+1 fan modules, front-to-back (port side intake) airflow, hot swappable
Hot-swappable fan modules	Yes	Yes
Dimensions	3 RU / 131.3mm * 438mm * 808mm (H*W*D)	4 RU / 175mm * 440mm * 650mm (H*W*D)
Weight	48 lb (21.77kg) (unpopulated) 64 lb (29 kg) (fully populated)	68.98 lb (31.29 kg) (unpopulated) 88.56 lb (40.17 kg) (fully populated)
Discrete Trusted Platform Module (TPM)	TPM 2.0	
Normal operating temperature range	Operating: 0°C - 40°C sustained	
Shipping and storage temperature	Non-operating: -40°C - 70°C	
Normal humidity	5% to 95%, non-condensing	

Standards compliance¹

Environmental and NEBS²

- ATIS 0600015.03
- ETSI EN 300 019-2-1; Storage Tests, Class 1.2
- ETSI EN 300 019-2-2; Transportation Tests, Class 2.3
- ETSI EN 300 019-2-3; Operational Tests, Class 3.2
- GR-63 CORE Level 2
- GR-3160-CORE
- VZ.TPR.9205

Safety

- AS/NZS 62638-1
- FDA CDRH 21-CFR 1040
- IEC/BS/EN 60825-1
- IEC/BS/EN 60825-2
- IEC/UL/CSA/BS/EN 62368-1

Electromagnetic compatibility

- AS/NZS CISPR 32 Class A
- BSMI CNS 15936 Class A
- BT GS-7
- EN/BS 55035
- EN/BS 55032 Class A
- ETSI EN 300 132-1 (AC)²
- ETSI EN 300 132-2 (LVDC)²
- ETSI EN 300 386
- ETSI ES 201 468
- FCC Part 15 Class A
- FTZ 1 TR9 (Deutsche Telekom)
- GR-1089 CORE²
- ICES-003 Class A
- IEC CISPR 32 Class A

- IEC CISPR 35
- IEC/EN/BS 61000-3-2
- IEC/EN/BS 61000-3-3
- IEC/EN 61000-4-2 ESD
- IEC/EN 61000-4-3 Radiated Immunity
- IEC/EN 61000-4-4 EFT
- IEC/EN 61000-4-5 Surge
- IEC/EN 61000-4-6 Conducted Immunity
- IEC/EN 61000-4-11 Voltage Interruptions
- IEC/EN 61000-6-2
- IEC/EN 61000-6-4
- ITU-T K.20
- KCC Korea - Immunity KS C 9835
- KCC Korea - Emissions KS C 9832
- VCCI-CISPR 32

Directives and regional approvals

- Directive 2011/65/EU RoHS
- Directive 2012/19/EU WEEE
- Directive 2014/30/EU EMC
- Directive 2014/35/EU LVD
- ISO 14001
- ISO 9001
- BSMI Mark: Taiwan
- CE Mark: Europe
- CRoHS: China RoHS
- KC Mark: South Korea
- RCM Mark: Australia
- UKCA Mark: United Kingdom
- VCCI Mark: Japan
- TL9000

¹ System design intent is according to the listed standards. Refer to product documentation for detailed compliance status.

² 7220 IXR-H6-64 and IXR-H6-128 testing in process



About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

Nokia operates a policy of ongoing development and has made all reasonable efforts to ensure that the content of this document is adequate and free of material errors and omissions. Nokia assumes no responsibility for any inaccuracies in this document and reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

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