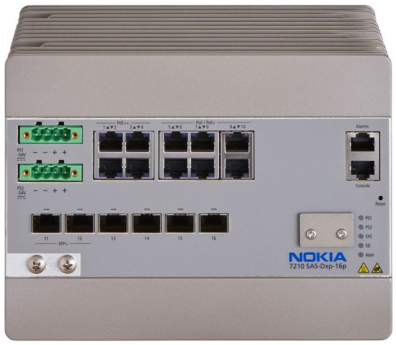
Nokia 7210 SAS-Dxp-16p/-24p

Release 25

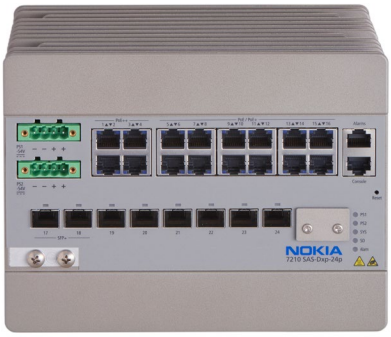
The Nokia 7210 SAS-Dxp-16p/-24p are ruggedized IP/Ethernet systems used in access networks to provide flexible and service rich connectivity options to devices that drive digitization in industrial, public utilities, public infrastructure, public transportation, and numerous other public and private enterprises. With multiple Power over Ethernet (PoE) options, they can reliably connect and power a wide range of devices to simplify deployment and ease operations.

The 7210 SAS-Dxp-16p/-24p are feature-rich IP/Ethernet systems in a fanless, ruggedized, temperature hardened and compact form factor enabling enterprises and critical infrastructure operators to fully realize the promise of applications such as smart grids, smart cities, public safety and digital rail to name a few. The SAS-Dxp-16p and Dxp-24p DIN rail products offer high fan-out Power over Ethernet (PoE/PoE+/PoE++/HPoE) with 1+1 power redundancy.

The 7210 SAS-Dxp-16p/-24p systems use the proven Service Router Operating System (SR OS) for seamless integration into Nokia service router networks. The feature-rich Network Services Platform (NSP) provides fast, efficient, service-level management across the network and functions as a cross-domain network manager unifying the management of local network sites and WAN networks.



7210 SAS-Dxp-16p



7210 SAS-Dxp-24p

Applications

- 7210 SAS-Dxp-16p/-24p systems provide Carrier Ethernet access to drive digitization and automation across various public and private enterprises. They can be used for a variety of applications, such as CCTV cameras, supervisory control and data acquisition (SCADA), security monitoring, workforce voice and data connectivity in substations, railway stations and offices, on street light and utility poles and along rail tracks and roadside.
- 7210 SAS-Dxp-16p/-24p systems provide a foundation for service convergence offering per service differentiation with 8 forwarding classes and per service ingress policing and per port egress queuing to interconnect sensors, people and applications having different service requirements.

Benefits

Support for differentiated services

Public and private enterprises and mission-critical network operators need to fulfil the specific requirements of each of their various applications. To meet these needs, the 7210 SAS-Dxp-16p/-24p offer differentiated Carrier Ethernet services, services coupled with per-service QoS, and bandwidth guarantees. Enterprise and mission-critical network operators can provide customized QoS and traffic profiles to assure the delivery of individual applications and essential business communications.

Application assurance and faster deployment

The 7210 SAS-Dxp-16p/-24p offer Ethernet service trouble shooting and diagnosis. Through monitoring, performance measurement of service metrics, prediction of threshold violations, and reporting of test results they provide a superior level of application assurance. These features also increase the reliability of mission-critical applications.

The plug-and-play capabilities of the 7210 SAS-Dxp-16p/-24p along with the NSP deliver rapid service turn-up without truck rolls, expediting deployment timeframes while minimizing the chance of manual error. The ability to continuously monitor and measure traffic from end to end and troubleshoot proactively enables network problems to be found and resolved before they affect applications.

Cost reduction through operational simplicity

Cost savings can be realized by transitioning from separate legacy networks onto a single platform where multiple services are converged onto one uplink and each application can be supported by a full range of Carrier Ethernet services. With a compact form factor and a variety of features, the 7210 SAS-Dxp-16p/-24p cost effectively scale to support current and future customer and application requirements. It provides savings through advanced QoS, end-to-end OAM, optical integration, streamlined network upgrades, reduced training, testing cycles and operations support system (OSS) integration costs.

Software features

The 7210 SAS-Dxp-16p/-24p support the following features. Please refer to the technical documentation for additional details.

Services

- Layer-2 virtual private network (VPN) services – virtual leased line (VLL) and virtual private LAN service (VPLS)
- IEEE 802.1Q (VLAN) and 802.1ad (QinQ)

Power over Ethernet

- IEEE 802.3af Power over Ethernet (PoE)
- IEEE 802.3at PoE+
- IEEE 802.3bt (type 3 and 4) PoE++/HPoE

Load balancing and resiliency

- IEEE 802.3.ad Link Aggregation Group (LAG) and multi-chassis (MC) LAG client
- Multi-chassis ITU-T G.8032v2
- IEEE Spanning Tree Protocol (STP)/Rapid Spanning Tree Protocol (RSTP)/Multiple Spanning Tree Protocol (MSTP)

Quality of service

- Service ingress packet classification based on MAC and IP criteria (IPv4 and IPv6),
- Ingress per SAP hierarchical policing
- Service egress per SAP policing
- Service egress per port hierarchical queuing and shaping

OAM

- IEEE 802.3ah Ethernet in the first mile
- IEEE 802.1ag Ethernet OAM and ITU-T Y.1731 for fault and performance management
- Service mirroring (local/remote)
- Two-Way Active Measurement Protocol (TWAMP) light
- ITU-T Y.1564 test head, single stream, fixed packet size
- Per-port loopback with MAC-swap
- Link Layer Discovery Protocol (LLDP)
- SNMPv1, v2c, v3
- IPv6 for management
- Ethernet and IP tools for performance monitoring with MEF 35-based binning and availability
- Remote SR OS upgrade
- Auto-configuration (plug-and-play)

Security

- Secure Shell (SSH) v4 and v6 for management
- SSH with public key infrastructure (PKI)
- IEEE 802.1x on access ports, MAC and VLAN authentication.
- Control plane security
- Management access filters
- Remote Authentication Dial-In User Service (RADIUS) client
- Terminal Access Concentrator Access Control Server Plus (TACACS+)
- User profile management
- VPLS security
- Access control lists
- MACsec

Hardware overview

Table 1. 7210 SAS-Dxp-16p/-24p specifications

	7210 SAS-Dxp-16p (DIN rail and ETR)	7210 SAS-Dxp-24p (DIN rail and ETR)
System throughput Full duplex	34 Gb/s wire speed	42 Gb/s wire speed
Network transport	Ethernet	Ethernet
Interfaces	• 2 x SFP+ 1/10GE • 4 x SFP 1000 Mb/s • 10 x RJ45 10/100/1000 Mb/s PoE/+	• 2 x SFP+ 1/10GE • 6 x SFP 1000 Mb/s • 16 x RJ45 10/100/1000 Mb/s PoE/+ (MACsec on 4 ports: 2SFP+, 2SFP)
Timing and synchronization	• ITU-T SyncE with ESMC • PTP Profiles – ITU-T G.8275.1 – IEEE 1588v2 Default – Power Utility profile: IEC/IEEE 61850-9-3 and C37.238-2017 • PTP Clock Types – Boundary clock – Ordinary clock (only timereceiver) • PTP Encapsulations – Ethernet encapsulation – UDP/IPv4 encapsulation	• ITU-T SyncE with ESMC • PTP Profiles – ITU-T G.8275.1 – IEEE 1588v2 Default – Power Utility profile: IEC/IEEE 61850-9-3 and C37.238-2017 • PTP Clock Types – Boundary clock – Ordinary clock (only timereceiver) • PTP Encapsulations – Ethernet encapsulation – UDP/IPv4 encapsulation
IP rating (main unit)	IP50-rated	IP50-rated
PoE	• Up to 10 PoE (15W) / PoE+ (30W) • Up to 4 PoE++ (60W) / HPoE (90W)	• Up to 16 PoE (15W) / PoE+ (30W) • Up to 4 PoE++ (60W) / HPoE (90W)
Alarm inputs/outputs	Alarm input connector for monitoring device environment	Alarm input connector for monitoring device environment
Dimensions	• Height: 15.0 cm (5.9 in) • Width: 20.3 cm (8.0 in) • Depth: 13.2 cm (5.2 in)	• Height: 15.0 cm (5.9 in) • Width: 20.3 cm (8.0 in) • Depth: 13.2 cm (5.2 in)
Power supply options	• Two feeds. External AC and DC power supplies • 1+1 Power Redundancy	• Two feeds. External AC and DC power supplies • 1+1 Power Redundancy
Power requirements	• DC output: 54 VDC	• DC output: 54 VDC
Cooling	Fanless	Fanless
Mounting options	DIN rail, wall, 19” rack mount	DIN rail, wall, 19” rack mount
Temperature operating range	-40°C to 70°C (ETR) (-40°F to 158°F) up to 13K ft. 65°C still air, 70°C 1.52 m/s air flow	-40°C to 70°C (ETR) (-40°F to 158°F) up to 13K ft. 60°C still air, 65°C 1.52 m/s, 70°C 3.30 m/s air flow
Storage temperature	-40°C to 85°C (-40°F to 185°F) up to 13K ft; Relative humidity 10%-90%	-40°C to 85°C (-40°F to 185°F) up to 13K ft; Relative humidity 10%-90%

Table 2. 7210 SAS-Dxp-16p/-24p power supplies

	100W AC PSU	290W DC PSU	480W AC PSU	960W AC PSU
Power source	**Input voltage** AC: 85-264 VAC or DC: 88-300 VDC	**Input voltage** DC: 24-48/18-60 VDC	**Input voltage** AC: 90-264 VAC	**Input voltage** AC: 90-264 VAC
Max power rating	100W	290W	480W	960W
IP rating	IP65	IP20	IP20	IP20
PoE standards support	PoE (15W), PoE+(30W)	PoE (15W), PoE+(30W), PoE++(60W), HPoE(90W)	PoE (15W), PoE+(30W), PoE++(60W), HPoE(90W)	PoE (15W), PoE+(30W), PoE++(60W), HPoE(90W)
Cooling	Fanless	Fanless	Fanless	Fanless
Dimensions (HxWxD)	40 x 67.5 x 226 mm	124 x 82 x 127 mm	121 x 144 x 118.6 mm	124 x 125 x 133.6 mm
Temperature operating range	-40 °C to +70 °C (-40 °F to 158 °F)	-40 °C to +70 °C (-40 °F to 158 °F)	-40 °C to +75 °C (-40 °F to 167 °F)	-40 °C to +70 °C (-40 °F to 158 °F)

Technical specifications[1]

Environmental specifications

- ETSI EN 300 019-2-1 Class 1.2
- ETSI EN 300 019-2-2 Class 2.3
- ETSI EN 300 019-2-3 Class 3.3
- IEC 60068-2-1
- IEC 60068-2-2
- IEC 60068-2-30
- IEC 60255-21-2
- IEC 61850-3
- IEEE 1613:2009 + A1:2011

Safety

- AS/NZS 62368.1
- CB certificate with all National Deviations and/or other compliance certificates
- FDA CDRH 21-CFR 1040
- IEC 60529
- IEC/EN/BS 60825-1
- IEC/EN/BS 60825-2
- IEC/UL/CSA/EN/BS 62368-1

Electromagnetic compatibility

- AS/NZS CISPR 32 Class A
- BT GS7
- IEC CISPR 32 Class A
- CISPR 35
- CNS 13438
- ETSI EN 300 386
- EN/BS 55032 Class A
- EN/BS 55035
- ETSI EN 300 132-2
- ETSI EN 300 132-1
- ETSI ES 201 468
- FCC Part 15 Class A
- FTZ 1 TR9 (Deutsche Telekom)
- ICES-003 Class A
- IEC/EN/BS 61000-3-2 Power line harmonics
- IEC/EN/BS 61000-3-3 Voltage fluctuations
- IEC/EN 61000-4-2 ESD
- IEC/EN 61000-4-3 Radiated immunity
- IEC/EN 61000-4-4
- IEC/EN 61000-4-5 Surge

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

- IEC/EN 61000-4-6 Conducted Immunity
- IEC/EN 61000-4-8
- IEC/EN 61000-4-9
- IEC/EN 61000-4-10
- IEC/EN 61000-4-11 Voltage Interruptions
- IEC/EN 61000-4-12
- IEC/EN 61000-4-16
- IEC/EN 61000-4-17
- IEC/EN 61000-4-18
- IEC/EN 61000-4-29
- IEC/EN 61000-6-2 Industrial
- IEC/EN 61000-6-4
- IEC/EN 61000-6-5
- IEC/AS 60870.2.1
- IEEE Std C37.90
- IEEE Std C37.90.1
- IEEE Std C37.90.2
- IEEE Std C37.90.3
- ITU-T K.20
- KCC Korea-Emissions & Immunity
  (in accordance KS C 9832 (Emissions)
  KS C 9835 (Immunity)) (South Korea)

Global standards

- Australia (RCM Mark)
- Europe (CE Mark)
- China (MII NAL) Network Access License
- China RoHS (CRoHS); Ministry of Information Industry order No.39
- EU Directive 2014/30/ EU (EMC)
- EU Directive 2011/65/ EU (RoHS)
- EU Directive 2012/19/ EU (WEEE)
- EU Directive 2014/35/ EU (LVD)
- China RoHS (CRoHS)
- Japan (VCCI Mark)
- South Korea (KC Mark)
- United Kingdom (UKCA Mark)
- VCCI Class A

Power utility substations

- IEC 61850-3
- IEEE 1613.1-2013
- IEEE 1613:2009 + A1:2011

Railway

- AREMA
- EN 50121-4
- IEC 62236-4

High voltage DC power

- TR176001

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.

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