Nokia 7210 SAS

Release 23

The Nokia 7210 SAS product family provides service providers with IP routing and Carrier Ethernet demarcation, access, and aggregation for mobile backhaul, business, and residential service delivery. For enterprise and mission-critical network operators, the 7210 SAS addresses stringent requirements for high network resiliency, deterministic network performance, and scalability.

UAs a member of the Service Router (SR) product portfolio, the 7210 SAS leverages the proven Nokia Service Router Operating System (SR OS) and the Nokia Network Services Platform (NSP) for service and operational consistency across the network. The 7210 SAS is compliant with the Metro Ethernet Forum (MEF) Carrier Ethernet (CE) 3.0 specification, and with Hierarchical Quality of Service (H-QoS) and comprehensive operation, administration, and maintenance (OAM). The 7210 SAS provides deployment flexibility, service richness, and operational simplicity to extend IP/MPLS and Carrier Ethernet services throughout the network.

7210 SAS-R6

7210 SAS-Sx 10/100GE

7210 SAS-MXP

7210 SAS-K30 ETR

7210 SAS-Dxp

7210 SAS-K12 ETR

7210 SAS-S 1/10GE

7210 SAS-K12

7210 SAS-Sx 1/10GE

7210 SAS-K5

7210 SAS Dxp 24p

7210 SAS Dxp 16p

Benefits

Support for differentiated services

Service providers want to unlock new revenue streams. Enterprise and mission-critical network operators need to fulfil the specific requirements of each of their various applications. To meet these needs, the 7210 SAS offers differentiated services, including Carrier Ethernet, IP VPN, and enhanced internet services coupled with per-service QoS, and bandwidth guarantees. Service providers can create tiered service models with flexible billing options, tailoring service packages based on the performance and availability requirements of their customers. Enterprise and mission-critical

network operators can provide customized QoS and traffic profiles to assure the delivery of individual applications and essential business communications.

Customer satisfaction and application delivery assurance

The plug-and-play capabilities of the 7210 SAS along with the NSP deliver rapid service turn-up without truck rolls, expediting in-service deadlines and time-to-revenue while minimizing the chance of operator 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 end users.

Monitoring, performance measurement of service metrics, prediction of threshold violations, reporting of test results and accurate billing provide a superior level of service to end users. These features also increase the reliability of mission-critical applications.

For service providers, self-service customer portals with customized on-demand management capabilities improve the overall quality of experience for their customers.

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 and IP/MPLS services. With a variety of compact form factors and features, the 7210 SAS cost effectively scales 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

Each product model supports, but is not limited to, a variation of the following features. Please refer to 7210 SAS technical documentation for the features supported on each product model.

Services

- Layer-2 virtual private network (VPN) services – virtual leased line (VLL) and virtual private LAN service (VPLS)
- IP VPN services (IPv4 and IPv6)
- Ethernet VPN (EVPN)
  - VPLS
  - Multi-homing with single active and all-active options.
- Internet Enhanced Service (IPv4 and IPv6)
- Routed VPLS with IES and virtual private routed network (VPRN) IPv4 and IPv6 interfaces
- IPv4 multicast
- IPv4 VPN multicast (Next-generation multicast VPN)

Network protocols

- IEEE 802.1Q (VLAN) and 802.1ad (QinQ)
- Provider Backbone Bridging (PBB), Backbone Edge Bridge (BEB) and Backbone Core Bridge (BCB) as defined in IEEE 802.1ah
- Segment routing
  - Intermediate System-to-Intermediate System (IS-IS) and Open Shortest Path First (OSPF)
  - Loop-free alternate (LFA) and remote LFA (RLFA)
- Path Computation Element Protocol (PCEP)
  - Resource Reservation Protocol (RSVP)

- MPLS Label Edge Router (LER) and LSR.
  - MPLS point to multi-point (P2MP) LSPs for NG-MVPN multicast.
  - MPLS-TP (based on IETF standards)
  - Label Distribution Protocol (LDP), LDPv6, LDP over RSVP, and Targeted LDP (T-LDP)
  - Resource Reservation Protocol — Traffic Engineering (RSVP-TE)
- IP routing
  - Intermediate System-to-Intermediate System (IS-IS) (IPv4 and IPv6), including traffic engineering (TE) support for IPv4
  - Open Shortest Path First (OSPFv2 and OSPFv3) with TE support for IPv4
  - IPv4 unnumbered with MPLS
  - Routing Information Protocol (RIP)
  - Border Gateway Protocol (BGP)
  - BGP label unicast routes as defined in RFC 3107 with next-hop-self and Accumulated Interior Gateway Protocol (AIGP) support.
  - BGP-AD for VPLS auto-discovery
  - BGP pseudowire routing for multi-segment pseudowires
  - BGP route-reflector server for VPRN IPv4 and IPv6 routes
  - BGP intra-AS option B for VPRN IPv4 and IPv6 routes
- Protocol Independent Multicast (PIM) – Sparse mode (SM), Source Specific Multicast (SSM) and IGMPv1/2/3
- IGMPv1/2/3 snooping

Load balancing and resiliency

- IEEE 802.3.ad Link Aggregation Group (LAG) and multi-chassis (MC) LAG
- Pseudowire redundancy
- Primary and Secondary LSPs
- Control plane redundancy
- BGP Prefix Independent Convergence (PIC)
- Fast reroute (FRR)
  - LDP with loop-free alternate (LFA) policies
  - RSVP
  - Segment routing with LFA and RLFA
- Equal-cost multi-path (ECMP) load balancing for LDP LSR/LER, IPv4 and L3 VPN tunnels
- Virtual Router Redundancy Protocol and VRRPv3 for IPv6
- Multi-chassis ITU-T G.8032v2
- IEEE Spanning Tree Protocol (STP)/Rapid Spanning Tree Protocol (RSTP)/Multiple Spanning Tree Protocol (MSTP)
- Hardware-based bidirectional forwarding detection (BFD) along with micro-BFD support for LAG with 10ms timer (IPV4 and IPv6)
- Shared Risk Link Group (SRLG) recovery
- Entropy (pseudowire hash) label
- Virtual chassis (stacking)
- Nonstop routing, nonstop services
- In-service software upgrade (ISSU)

Quality of service

- Service ingress packet classification based on MAC and IP criteria (IPv4 and IPv6), MPLS EXP on network ingress
- Service ingress packet classification based on IP DSCP and Dot1p with a large meter pool for higher SAP/service scaling
- Service egress reclassification based on IP DSCP, IP precedence, Dot1p
- Hierarchical per-service ingress and egress policing, queuing, and shaping
- Deep buffering
- RED slope
- Self-generated traffic marking
- Ethernet bandwidth notification (ETH-BN) for transport over microwave links

OAM

- IEEE 802.3ah Ethernet in the first mile with Dying Gasp support
- IEEE 802.1ag Ethernet OAM and ITU-T Y.1731 for fault and performance management
- MPLS OAM for in-service performance management (delay, jitter, and packet loss) and fault management
- MPLS-TP OAM
- Service mirroring (local/remote)
- Two-Way Active Measurement Protocol (TWAMP), TWAMP light
- ITU-T Y.1564 test head with multiple streams (with EMIX/IMIX frame-size) and service performance measurement
- Per-port and per-service loopback with MAC-swap
- Link Layer Discovery Protocol (LLDP)
- LLDP Media Endpoint Discovery (MED)
- NETCONF/YANG
- cflowd
- SNMPv1, v2c, v3
- IPv6 for management
- Ethernet and IP tools for performance monitoring with MEF 35-based binning and availability
- PTP-based timestamps for service level agreement measurements
- Remote SR OS upgrade
- Auto-configuration (plug-and-play)
- Configuration roll-back

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
- Per-port MAC security (MACsec)
- Strict unicast Reverse Path Forwarding (uRPF)

Hardware overview

Table 1. Chassis models

The 7210 SAS-R6 router provides up to 100GE line-rate throughput per module slot with 960 Gb/s of system capacity. It has redundant control planes and features non-stop routing and services along with in-service software upgradability.

	7210 SAS-R6
System throughput Full duplex per Control Processing Module (CPM) card (fully redundant), IMIX traffic	480 Gb/s
Network transport	IP/MPLS/Ethernet
Integrated Media Module (IMM) slots	6 (see Table 2 for IMM options)
Timing and synchronization	• ITU-T SyncE with ESMC • IEEE 1588v2 – BC, OC-slave – UDP/IP and Ethernet encapsulation – Profiles: IEEE 1588v2 default, ITU-T G.8265.1 and G.8275.1[1] • 1 x BITS; 1PPS out, 10 MHz out
Extended buffering and shaping (on IMM-b cards)	Egress 192 MB buffer
Optical 1830 Versatile WDM Module (VWM) Passive filter management support	Yes (using the OMC interface)
Optical Management Connection (OMC)	Yes
Control plane and system redundancy	Yes, with nonstop routing and nonstop services
Hot-swappable modules	• SF/CPM, IMM • Power supplies, fan tray, fan filter
Dimensions	• Height: 13.3 cm (5.25 in) 3RU • Width: 36.8 cm (14.5 in) • Depth: 24.0 cm (9.45 in)
Power supply options	• Two feeds. Modular DC power supplies • AC power requires an external rectifier
Power requirements	DC input: -40 V DC to -72 V DC
Cooling	• Fan cooled with right to left air flow • Hot-swappable fan tray
Temperature operating range	0°C to 50°C (32°F to 122°F)

[1] On IMM-b cards. Future software deliverable on IMM-c cards.

Table 2. Nokia 7210 SAS-R6 Integrated Media Modules (IMMs)[1]

7210 SAS-R line cards support both high-throughput up to 100GE and high 100/1000 Mb/s port density. IMM-c cards have 5 MB of buffer space; IMM-b cards have 192 MB for excellent buffering of bursty customer traffic.

Card name	Interfaces	Throughput per slot (full duplex IMIX, non-redundant)
1-port QSFP28 100GE IMM-c[1]	1 x QSFP28	Up to 100 Gb/s
4-port 10GE IMM-b	4 x SFP+ 10GE	Up to 26 Gb/s
2-port 10GE IMM-b	2 x SFP+ 10GE	Up to 20 Gb/s
11/22-port GE IMM-b	• 11 x SFP 100/1000 Mb/s • 22 x cSFP 100/1000 Mb/s (mix of optical SFPs and cSFPs is supported, limited to 11 ports when using copper SFPs)	Up to 22 Gb/s
16-port GE IMM-b	16 x RJ.5 10/100/1000 Mb/s	Up to 16 Gb/s
1-port 10GE, 10-port GE IMM-b	• 1 x SFP+ 10GE • 10 x SFP 100/1000 Mb/s	Up to 20 Gb/s

[1] 7210 SAS-R6 supports two 100GE cards.

Table 3. 7210 SAS-Mxp

The 7210 SAS-Mxp is a multi-purpose access and aggregation router. The SAS-Mxp provides deep buffering and enhanced service scale.

	7210 SAS-Mxp (3 variants: normal, extended temperature range (ETR), and conformal coated -48 V DC ETR)
System throughput Full duplex IMIX traffic	64 Gb/s wire speed
Network transport	IP/MPLS/segment routing/Ethernet
Interfaces (excluding modules)	• 4 x SFP+ 10GE • 22 x SFP 100/1000 Mb/s • 2 x Combo SFP or RJ.5 100/1000 Mb/s
Timing and synchronization	• ITU-T SyncE with ESMC • IEEE 1588v2 – BC, OC-slave – UDP/IP and Ethernet encapsulation – Profiles: IEEE 1588v2 default, ITU-T G.8265.1 and G.8275.1 • 2 x BITS, 1PPS out, 10 MHz out
POE/PoE+	ETR variant: 2 ports with 60 W of power maximum
Extended buffering and shaping	Egress 192 MB buffer
Optical 1830 VWM Passive filter management support	Yes (using the OMC port)
Optical Management Connection (OMC)	Yes
Dimensions	• Height: 6.7 cm (2.64 in) 1.5RU • Width: 43.6 cm (17.17 in) • Depth: 25.3 cm (9.96 in)
Power supply options	• Two feeds. Modular AC and DC power supplies • Supports concurrent use of AC and DC power supplies • Conformal coated ETR variant uses -48 V DC power on both feeds
Power requirements	• AC input: 100 V to 240 V, 50 Hz to 60 Hz; (ETR and non-ETR rated variants available) • DC input: -36 V DC to -72 V DC; (ETR and non-ETR rated variants available) • DC input: +20 V DC to +28 V DC; (ETR rated) • ETR variant requires a 200 W power supply
Cooling	• Fan cooled with right-to-left air flow • Hot-swappable fan tray
Temperature operating range	• Normal: 0°C to 50°C (32°F to 122°F) • ETR: -40°C to 65°C (-40°F to 149°F)

Table 4. SAS-S series models

The 7210 SAS-S series IP/MPLS platforms may be used in standalone mode to function the same as other 7210 SAS models. Alternatively, they can be used in satellite mode as port extenders for the 7750 Service Router, 7450 ESS and 7950 Extensible Routing System (XRS) series products. For more information on their satellite capabilities, please see the Nokia 7210 SAS-S series satellite datasheet.

The 7210 SAS Sx 1/10 GE model is similar to the 7210 SAS S but it is fully NEBS compliant with side-to-back airflow. It has two modular power supplies, supporting DC and AC at the same time, and has additional timing capabilities.

The 7210 Sx/S 1/10GE models use stacking ports to provide a virtual chassis capability. This provides a cost-effective solution for modular growth and redundant control.

	7210 SAS-S 1/10GE (10 variants based on interfaces, PoE, and power supply)	**7210 SAS-Sx 1/10GE (6 variants based on interfaces and PoE)**	**7210 SAS-Sx 10/100GE (1 variant based on interface)**
System throughput Full duplex IMIX traffic	• 88 Gb/s on 48-port variants • 64 Gb/s on 24-port variants wire speed	• 88 Gb/s on 48-port variants • 64 Gb/s on 24-port variants wire speed	1.04 Tb/s wire speed
Network transport	IP/MPLS/Ethernet	IP/MPLS/Ethernet	IP/MPLS/Ethernet
Interfaces	See table 5 for details on SAS-S series variants.		
Timing and synchronization	• ITU-T SyncE with ESMC • IEEE 1588v2 Transparent Clock (TC)[1]	• ITU-T SyncE with ESMC • IEEE 1588v2 - BC, OC-slave, TC - UDP/IP and Ethernet encapsulation - Profiles: IEEE 1588v2 default, ITU-T G.8265.1, ITU-T G.8275.1 (standalone mode) • 1PPS[1]	• ITU-T SyncE with ESMC • IEEE 1588v2 - BC, OC-Slave[1], TC - Ethernet encapsulation - Profiles: ITU-T G.8275.1 (standalone mode) • 1PPS[1]
Stacking ports	2	2	2[1]
POE/PoE+	See table 5 for details on SAS-S series variants.		
Dimensions	• Height: 4.32 cm (1.7 in) 1RU • Width: 44 cm (17.3 in) • Depth: 38.7 cm (15.2 in)	• Height: 4.37 cm (1.72 in) 1RU • Width: 43.94 cm (17.3 in) • Depth: 40.61 cm (15.99 in)	• Height: 6.6 cm (2.6 in) 1.5RU • Width: 44 cm (17.3 in) • Depth: 45 cm (17.7 in)
Power supply options	• Two feeds. One fixed internal supply and one optional modular supply • Hot swappable	• Two feeds. Modular AC and DC power supplies • Supports concurrent use of AC and DC power supplies • Hot-swappable	• Two feeds. Modular AC and DC power supplies • Supports concurrent use of AC and DC power supplies • Hot-swappable
Power requirements	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -40 V DC to -72 V DC	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -40 V DC to -72 V DC	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -40 V DC to -72 V DC
Cooling	Fan cooled with front-to-back airflow	• Fan cooled with side-to-back airflow • Air filters on both sides of the chassis	• Fan cooled with side-to-back airflow • Air filters on both sides of the chassis
Temperature operating range	0°C to 40°C (32°F to 104°F)	0°C to 50°C (32°F to 122°F)	0°C to 50°C (32°F to 122°F)

[1] Future software deliverable

Table 5. SAS-S series variants

The interface specifications and other orderable features for each SAS-S series variant are listed below.

Identifier	Interface	PoE
7210 SAS-S 1/10GE 48-port fiber AC	• 4 x SFP+ GE or 10GE • 48 x SFP 100/1000 Mb/s	
7210 SAS-S 1/10GE 48-port fiber DC	• 4 x SFP+ GE or 10GE • 48 x SFP 100/1000 Mb/s	
7210 SAS-S 1/10GE 24-port fiber AC	• 4 x SFP+ GE or 10GE • 24 x SFP 100/1000 Mb/s	
7210 SAS-S 1/10GE 24-port fiber DC	• 4 x SFP+ GE or 10GE • 24 x SFP 100/1000 Mb/s	
7210 SAS-S 1/10GE 48-port copper AC	• 4 x SFP+ GE or 10GE • 48 x RJ-45 10/100/1000 Mb/s	
7210 SAS-S 1/10GE 48-port copper AC PoE	• 4 x SFP+ GE or 10GE • 48 x RJ-45 10/100/1000 Mb/s	720 W maximum
7210 SAS-S 1/10GE 48-port copper DC	• 4 x SFP+ GE or 10GE • 48 x RJ-45 10/100/1000 Mb/s	
7210 SAS-S 1/10GE 24-port copper AC	• 4 x SFP+ GE or 10GE • 24 x RJ-45 10/100/1000 Mb/s	
7210 SAS-S 1/10GE 24-port copper AC PoE	• 4 x SFP+ GE or 10GE • 24 x RJ-45 10/100/1000 Mb/s	720 W maximum
7210 SAS-S 1/10GE 24-port copper DC	• 4 x SFP+ GE or 10GE • 24 x RJ-45 10/100/1000 Mb/s	
7210 SAS-Sx 1/10GE 48-port fiber	• 4 x SFP+ GE or 10GE • 46 x SFP 100/1000 Mb/s • 2 x combo SFP or RJ-45 10/100/1000 Mb/s	60 W maximum on combo RJ-45 ports
7210 SAS-Sx 1/10GE 24-port fiber	• 4 x SFP+ GE or 10GE • 22 x SFP 100/1000 Mb/s • 2 x combo SFP or RJ-45 10/100/1000 Mb/s	60 W maximum on combo RJ-45 ports
7210 SAS-Sx 1/10GE 48-port copper	• 4 x SFP+ GE or 10GE • 48 x RJ-45 10/100/1000 Mb/s	
7210 SAS-Sx 1/10GE 48-port copper PoE[1]	• 4 x SFP+ GE or 10GE • 48 x RJ-45 10/100/1000 Mb/s	720 W maximum
7210 SAS-Sx 1/10GE 24-port copper	• 4 x SFP+ GE or 10GE • 24 x RJ-45 10/100/1000 Mb/s	
7210 SAS-Sx 1/10GE 24-port copper PoE[1]	• 4 x SFP+ GE or 10GE • 24 x RJ-45 10/100/1000 Mb/s	720 W maximum
7210 SAS-Sx 10/100GE QSFP28	• 4 x QSFP28[2] • 64 x SFP+ GE or 10GE	

[1] 7210 SAS-S and SAS-Sx 1/10GE 48-port and 24-port copper PoE variants must use AC power supplies.
[2] 1 x 100GE port is supported without the breakout option.

Table 6. 7210 SAS-K series models

The 7210 SAS-K uses Nokia silicon for programmability, industry-leading features and deep buffering. Programmability extends network longevity. Buffering of bursty customer traffic at demarcation and first aggregation sites enhances network throughput and customer experience.

	SAS-K30 ETR	7210 SAS-K12 (2 variants: normal and ETR)	7210 SAS-K5 (2 variants: normal and ETR)
System throughput Full duplex, IMIX traffic	30 Gb/s wire speed	9 Gb/s wire speed	5 Gb/s wire speed
Network transport	IP/MPLS/segment routing/Ethernet	IP/MPLS/segment routing/Ethernet	Ethernet
Interfaces	• 3 x SFP+ 10GE • 8 x Combo SFP/RJ-45 10/100/1000 Mb/s	• 2 x SFP 100/1000 Mb/s • 4 x RJ-45 10/100/1000 Mb/s • 6 x Combo SFP or RJ-45 10/100/1000 Mb/s	• 2 x SFP 100/1000 Mb/s • 2 x RJ-45 10/100/1000 Mb/s • 1 x Combo SFP or RJ-45 10/100/1000 Mb/s
Timing and synchronization	• ITU-T SyncE with ESMC • IEEE 1588v2 – BC, OC-slave – UDP/IP and Ethernet encapsulation – Profiles: IEEE 1588v2 default, ITU-T G.8265.1, G.8275.1 • 1PPS	• ITU-T SyncE with ESMC • IEEE 1588v2 – BC, OC-slave – UDP/IP and Ethernet encapsulation – Profiles: IEEE 1588v2 default, ITU-T G.8265.1, G.8275.1 • 1PPS on ETR variant	• ITU-T SyncE with ESMC • IEEE 1588v2 – BC, OC-slave – UDP/IP encapsulation – Profiles: IEEE 1588v2 default, ITU-T G.8265.1
Port-based MACsec	Yes	ETR variant	No
Extended buffering and shaping	Ingress, egress 512 MB buffer	Ingress, egress 64 MB buffer	Ingress, egress 64 MB buffer
IP rating	IP20	7210 SAS-K12: IP50 7210 SAS-K12 ETR: IP20	IP50 (both variants)
Dimensions	• Height: 8.8 cm (3.5 in) 2RU • Width: 43.8 cm (17.2 in) • Depth: 25.2 cm (9.9 in)	7210 SAS-K12: • Height: 3.5 cm (1.4 in) 1RU • Width: 29.5 cm (11.6 in) • Depth: 21.8 cm (8.6 in) 7210 SAS-K12 ETR: • Height: 6.6cm (2.6 in) 1.5RU • Width: 33.9cm (13.35in) • Depth: 24.0cm (9.45in - ETSI)	7210 SAS-K5: • Height: 3.5 cm (1.4 in) 1RU • Width: 18.4 cm (7.2 in) • Depth: 21.8 cm (8.6 in) 7210 SAS-K5 (ETR): • Height: 4.1 cm (1.6 in) 1RU • Width: 18.4 cm (7.2 in) • Depth: 21.8 cm (8.6 in)
Power supply options	• Two feeds. Two fixed internal AC power supplies and one fixed internal DC power supply.	• 7210 SAS-K12: One feed. External AC or DC power supply • 7210 SAS-K12 (ETR): Two feeds. External AC or DC power supplies. Supports concurrent use of AC and DC power • AC, -48 V DC and +24 V DC power supplies are available	• 7210 SAS-K5: One feed. External AC or DC power supply • 7210 SAS-K5 (ETR): Two feeds. External AC or DC power supplies. Supports concurrent use of AC and DC power supplies • AC, -48 V DC and +24 V DC power supplies are available for both variants.
Power requirements	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -18 V DC to -72 V DC	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -36 V DC to -72 V DC	• AC input: 100 V to 240 V, 50 Hz to 60 Hz • DC input: -36 V DC to -72 V DC • DC input: +20 V DC to +28 V DC
Cooling	Passive cooling	Passive cooling	Passive cooling
Temperature operating range	-40°C to +65°C (-40°F to +149°F)	• 7210 SAS-K12: 0°C to 40°C (32°F to 104°F) • 7210 SAS-K12 (ETR): -40°C to +65°C (-40°F to +149°F)	• 7210 SAS-K: 0°C to 40°C (32°F to 104°F) • 7210 SAS-K (ETR): -40°C to +65°C (-40°F to +149°F)

Table 7. 7210 SAS-Dxp

The 7210 SAS-Dxp is a cost-effective, Ethernet access device used for demarcation, business and wholesale services.

	7210 SAS-Dxp (2 variants: normal and ETR)
System throughput Full duplex, IMIX traffic	30 Gb/s wire speed
Network transport	Ethernet
Interfaces	• 2 x SFP+ 1/10GE • 4 x SFP 100/1000 Mb/s • 6 x RJ-45 10/100/1000 Mb/s
Timing and synchronization are available on the ETR variant	• ITU-T SyncE with ESMC • IEEE 1588v2 – Profiles: ITU-T G.8275.1
IP rating	IP50
Dimensions	• Height: 4.32 cm (1.70 in.) 1RU • Width: 26 cm (10.23 in.) • Depth: 23.5 cm (9.25 in.)
Power supply options	• 7210 SAS-Dxp: One feed. Fixed internal AC or DC power supply. • 7210 SAS-Dxp (ETR): Two feeds. One fixed internal AC or DC power supply and one external AC or DC power supply
Power requirements	• AC input: 100 V to 250 V, 50 Hz to 60 Hz • DC input: -36 V DC to -72 V DC
Cooling	Fanless
Temperature operating range	• 7210 SAS-Dxp: 0°C to 40°C (32°F to 104°F) • 7210 SAS-Dxp (ETR): -40°C to 65°C (-40°F to 149°F)

Table 8. 7210 SAS-Dxp

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.

	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/ PoE/+ (MACsec on 4 ports: 2SFP+, 2SFP)
Timing and synchronization	• ITU-T SyncE with ESMC • IEEE 1588v2[1] - BC, OC-slave, TC - UDP/IP - Ethernet encapsulation • Profiles: IEEE 1588v2 default[1], ITU-T G.8275.1[1], IEC 61850-9-3, C37.238-2017	• ITU-T SyncE with ESMC • IEEE 1588v2[1] - BC, OC-slave, TC - UDP/IP - Ethernet encapsulation • Profiles: IEEE 1588v2 default[1], ITU-T G.8275.1[1], IEC 61850-9-3, C37.238-2017
IP rating (main unit)[2]	IP50	IP50
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 V DC	DC output: 54 V DC
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. 65°C still air, 65°C 1.52 m/s, 70°C 3.30 m/s air flow

[1] Hardware ready, software in future release.
[2] Pending certification

Technical specifications[1]

Environmental specifications

- ATT-TP-76200[2]
- ETSI EN 300 019-2-1 Storage[2]
- ETSI EN 300 019-2-2 Transportation[2]
- ETSI EN 300 019-2-3 Operational
- ETSI EN 300 753 Acoustic Noise[2]
- GR-63-CORE[2]
- VZ.TPR.9205[2]
- RoHS 6/6 design

Safety

- IEC/EN 60825-1
- IEC/EN 60825-2
- AS/NZS 60950-1
- IEC/EN/UL/CSA 60950-1 Ed2
- AS/NZS 62368-1
- IEC/EN/UL/CSA 62368-1 Ed2

Electromagnetic compatibility

- AS/NZS CISPR 32 Class A
- BSMI CNS13438 Class A[2]
- BT GS-7[2]
- EN 55022
- EN 55024
- EN 55032 Class A
- ETSI EN 300 132-2 (LVDC)[2]
- ETSI EN 300 132-3 (AC) (7210 SAS-S/Sx series[2], SAS-K series, SAS-Dxp)
- ETSI EN 300 386
- ETSI ES 201 468[2]
- FCC Part 15 Class A
- GR-1089-CORE[2]
- ICES-003 Class A
- IEC CISPR 22
- IEC CISPR 24
- IEC CISPR 32 Class A
- IEC/EN 61000-3-2 Power line harmonics[2]
- IEC/EN 61000-3-3 Voltage fluctuations[2]
- 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 Industrial
- IEC/EN 61000-6-4
- KCC Korea-Emission & Immunity (in accordance with KN32/KN35)
- VCCI Class A

Wireless

(7210 SAS-Sx 1/10GE, SAS-Sx 10/100GE)

- ETSI EN 301 489-1
- ETSI EN 301 489-17 (Bluetooth)
- KN 301 489-1
- KN 301 489-17 (Bluetooth)

Power utility substations[2]

- IEC 61850-3
- IEEE 1613

Railway[2]

- EN 50121-4
- IEC 62236-4

[1] System design intent is according to the listed standards. Certifications vary on different models. Certifications applicable to only one or two models are noted. Refer to product documentation for detailed compliance status.
[2] Applicable to specific models

Directives, regional approvals and certifications

- DIRECTIVE 2011/65/EU RoHS
- DIRECTIVE 2012/19/EU WEEE
- DIRECTIVE 2014/30/EU EMC
- DIRECTIVE 2014/35/EU LVD
- DIRECTIVE 2014/53/EU RED
  (7210 SAS-Sx 1/10GE, SAS-Sx 10/100GE)
- NEBS Level 3[2]
- MEF 3.0
- Australia - RCM Mark
- China RoHS – CRoHS
- Europe – CE Mark
- Japan – VCCI Mark
- South Korea – KC Mark

2 Applicable to specific models

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