# Nokia Ethernet Satellites Extender

Release 23

Nokia Ethernet satellites offer both local and remote network port extension for 7750 Service Router (SR) host nodes. The satellite-based, high-density Ethernet aggregation provides flexibility and improves the cost efficiency of the service router portfolio.

This data sheet focuses on the features and specifications of the 7210 SAS and 7250 IXR platforms when used in satellite mode. These platforms can also be used in standalone mode: operated and managed independently. For further information on these standalone capabilities, please see the respective dedicated Datasheets for each product family.

7210 SAS-S 1/10GE 48 port fiber

7210 SAS-Sx 1/10GE 24 port copper

7210 SAS-Sx 1/10GE 48 port fiber

7210 SAS-Sx 10/100GE 64 port fiber

7210 SAS Mxp

7250 IXR-e (24SFP+ 8SFP28 2QSFP28)

7250 IXR-Xs

7250 IXR-X1

## Benefits

### Flexibility

Packaged in space-saving 1RU and 1.5RU chassis modules, the ethernet satellite platforms offer additional high-density Ethernet interfaces for the 7750 Service Router (SR) host nodes. Satellites may be located locally or remotely from their host. There are options to fit a wide variety of deployment needs. Fiber, copper, and PoE/PoE+ (IEEE 802.3af/at) capable copper models are available with Ethernet interfaces ranging from 100Mb/s to 100 Gb/s. With such a wide variety of interfaces and with high port densities, Ethernet satellite node provide flexibility and excellent growth capacity.

### Cost efficiency

Nokia satellite host systems have petabit routing capacities. Operators can maximize the host's per slot bandwidth by connecting 7210 SAS and 7250 IXR satellites into its high-capacity interface cards. This avoids using high-capacity slots for low-speed interfaces and provides for more efficient usage of the high-throughput host routing capacity.

Local routing between client systems connected to a satellite allows off-loading of low-revenue, high-bandwidth traffic away from the service-rich host, allowing operators to minimize the cost per bit for transport.

### Simple, elegant operation

A satellite node is treated as an integrated part of the host chassis. All configuration and management are done on the host providing plug-and-play functionality, without using an additional IP address.

As all service functionality is provided by the host system, services connecting through a satellite benefit from the rich feature set and high performance of Nokia's edge and core service routers. All quality of service (QoS) functionality, buffering, multicasting, and service processing is done on the host nodes using their software suite with the performance of their advanced hardware platforms.

# Hardware features

Table 1. 7210 Hardware specifications

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 and air filters. It has two modular power supplies, supporting DC and AC at the same time, and has additional timing capabilities.

| | 7210 SAS-S 1/10GE (10 variants based on interfaces, PoE, and power supply) | 7210 SAS-Sx 1/10GE (6 variants based on interfaces, PoE/PoE+) | 7210 SAS-Sx 10/100GE |
|---|---|---|---|
| Interfaces | See table 2 for details | | |
| Timing | • ITU-T SyncE<br>• IEEE 1588v2 TC on some variants. See table 2 for details. | | |
| PoE/PoE+ | Hardware capable[1] | Hardware capable[1] | Hardware capable[1] |
| Dimensions | • Height: 4.32 cm (1.7 in)<br>• Width: 44 cm (17.3 in)<br>• Depth: 38.7 cm (15.2 in) | • Height: 1 RU 4.37 cm (1.72 in)<br>• Width: 44 cm (17.3 in)<br>• Depth: 40.61 cm (15.99 in) | • Height: 1.5 RU 6.6 cm (2.6 in)<br>• Width: 44 cm (17.3 in)<br>• Depth: 45 cm (17.7 in) |
| Power supply options | • Two feeds. One fixed internal supply and one optional modular supply<br>• Hot swappable | • Two feeds. Modular AC and DC power supplies<br>• Supports concurrent use of AC and DC power supplies<br>• Hot-swappable | • Two feeds. Modular AC and DC power supplies<br>• Supports concurrent use of AC and DC power supplies<br>• Hot-swappable |
| Power requirements | • AC input: 100 V to 240 V, 50 Hz to 60 Hz<br>• DC input: -40 V DC to -72 V DC | • AC input: 100 V to 240 V, 50 Hz to 60 Hz<br>• DC input: -40 V DC to -72 V DC | • AC input: 100 V to 240 V, 50 Hz to 60 Hz<br>• DC input: -40 V DC to -72 V DC |
| Cooling | • Fan cooled with front-to-back airflow | • Fan cooled with side-to-back airflow<br>• Air filters on both sides of the chassis | • Fan cooled with side-to-back airflow<br>• 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 when used in satellite mode.

| | 7210 SAS-Mxp<br>(2 variants: normal and extended temperature range) |
|---|---|
| Interfaces | See table 2 for details |
| Timing | ITU-T SyncE |
| PoE/PoE+ | Hardware capable[1] |
| Dimensions | • Height: 6.7 cm (2.64 in) 1.5 RU<br>• Width: 43.6 cm (17.17 in)<br>• Depth: 25.3 cm (9.96 in) |
| Power supply options | • Two feeds. Integrated AC and DC power supplies<br>• Supports concurrent use of AC and DC power supplies |
| Power requirements | • AC input: 100 V to 240 V, 50 Hz to 60 Hz; (ETR and non-ETR rated variants available)<br>• DC input: -36 V DC to -72 V DC; (ETR and non-ETR rated variants available)<br>• DC input: +20 V DC to +28 V DC; (ETR rated)<br>• ETR variant requires a 200 W power supply |
| Cooling | • Fan cooled with right-to-left air flow<br>• Hot-swappable fan tray |
| Temperature operating range | • Normal: 0°C to 50°C (32°F to 122°F)<br>• ETR: -40°C to 65°C (-40°F to 149°F) |

## Table 2. 7210 SAS satellite variants

The interface specifications and PoE/PoE+ capabilities for each satellite variant are listed below.

| Identifier | Interface | PoE/PoE+[1] | IEEE 1588v2 |
|---|---|---|---|
| 7210 SAS-S 1/10GE 48-port fiber AC | • 4 x SFP+ 10GE<br>• 48 x SFP 100/1000 Mb/s | | Transparent clock (TC)[2] |
| 7210 SAS-S 1/10GE 48-port fiber DC | • 4 x SFP+ 10GE<br>• 48 x SFP 100/1000 Mb/s | | TC[2] |
| 7210 SAS-S 1/10GE 24-port fiber AC | • 4 x SFP+ 10GE<br>• 24 x SFP 100/1000 Mb/s | | |
| 7210 SAS-S 1/10GE 24-port fiber DC | • 4 x SFP+ 10GE<br>• 24 x SFP 100/1000 Mb/s | | |
| 7210 SAS-S 1/10GE 48-port copper AC | • 4 x SFP+ 10GE<br>• 48 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-S 1/10GE 48-port copper AC PoE | • 4 x SFP+ 10GE<br>• 48 x RJ-45 10/100/1000 Mb/s | 720 W maximum[1] | |
| 7210 SAS-S 1/10GE 48-port copper DC | • 4 x SFP+ 10GE<br>• 48 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-S 1/10GE 24-port copper AC | • 4 x SFP+ 10GE<br>• 24 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-S 1/10GE 24-port copper AC PoE | • 4 x SFP+ 10GE<br>• 24 x RJ-45 10/100/1000 Mb/s | 720 W maximum[1] | |
| 7210 SAS-S 1/10GE 24-port copper DC | • 4 x SFP+ 10GE<br>• 24 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-Sx 1/10GE 48-port fiber | • 4 x SFP+ 10GE<br>• 46 x SFP 100/1000 Mb/s<br>• 2 x combo SFP or RJ-45 10/100/1000 Mb/s | 60 W maximum on combo RJ-45 ports[1] | TC[2] |

1 Future software deliverable when used in satellite mode.
2 When used in satellite mode.

| Identifier | Interface | PoE/PoE+[1] | IEEE 1588v2 |
|---|---|---|---|
| 7210 SAS-Sx 1/10GE 24-port fiber | • 4 x SFP+ 10GE<br>• 22 x SFP 100/1000 Mb/s<br>• 2 x combo SFP or RJ-45 10/100/1000 Mb/s | 60 W maximum on combo RJ-45 ports[1] | |
| 7210 SAS-Sx 1/10GE 48-port copper | • 4 x SFP+ 10GE<br>• 48 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-Sx 1/10GE 48-port copper PoE[3] | • 4 x SFP+ 10GE<br>• 48 x RJ-45 10/100/1000 Mb/s | 720 W maximum[1] | |
| 7210 SAS-Sx 1/10GE 24-port copper | • 4 x SFP+ 10GE<br>• 24 x RJ-45 10/100/1000 Mb/s | | |
| 7210 SAS-Sx 1/10GE 24-port copper PoE[2] | • 4 x SFP+ 10GE<br>• 24 x RJ-45 10/100/1000 Mb/s | 720 W maximum[1] | |
| 7210 SAS-Sx 10/100GE QSFP28 | • 4 x QSFP28<br>• 64 x SFP+ GE or 10GE | | TC[2] |
| 7210 SAS-Mxp | • 4 x SFP+ 10GE<br>• 22 x SFP 100/1000 Mb/s<br>• 2 x combo SFP or RJ .5[1] 10/100/1000 Mb/s | • 60 W maximum on combo RJ.5 ports[1] | |

Table 3. 7250 Hardware specifications.

| | 7250 IXR-e 2QSFP28 8SFP28 24SFP+ (2 variants) | 7250 IXR-Xs | 7250 IXR-X1 | 7250 IXR-s |
|---|---|---|---|---|
| Interfaces[4] | • 2 x QSFP28/QSFP+ 100/40GE<br>• 8 x SFP28/SFP+ 25/10GE<br>• 24 x SFP+/SFP 10/1GE | • 6 x QSFP-DD 400GE<br>• 48 x SFP56/SFP28/SFP+ 50/25/10GE | • 4 x QSFP-DD 400GE<br>• 32 x QSFP28/QSFP+ 100/40GE | • 6 x QSFP28<br>• 48 x SFP/SFP+ |
| Timing and synchronization | | • ITU-T SyncE<br>• IEEE 1588v2 TC[2] | | |
| Dimensions | • Height: 1RU, 4.5 cm (1.75 in)<br>• Depth: 25.4 cm (10.0 in)<br>• Width: 43.8 cm (17.25 in) | • Height: 1RU, 4.5 cm (1.75 in)<br>• Depth: 54.6 cm (21.5 in)<br>• Width: 44.45 cm (17.5 in) | • Height: 1RU, 4.5 cm (1.75 in)<br>• Depth: 54.6 cm (21.5 in)<br>• Width: 44.45 cm (17.5 in) | • Height: 1RU, 4.35 cm (1.75 in)<br>• Width: 43.84 cm (17.26 in)<br>• Depth: 51.5 cm (20.28 in) |
| Power requirements | • Two feeds: Modular AC and DC power supplies<br>• AC input (rated): 100 V to 240 V, 50 Hz to 60 Hz<br>• DC input (rated): 24 V DC/-48 V DC | • Power supplies (1+1)<br>• HV AC input (rated): 200 V AC to 240 V AC, 50 Hz to 60<br>• DC input (rated): -48 V to -60 V | • Power supplies (1+1)<br>• HV AC input (rated): 200 V AC to 240 V AC, 50 Hz to 60<br>• DC input (rated): -48 V to -60 V | • Power supplies (1+1)<br>• LVDC input (single feed, rated): -48 V DC/-60 V DC<br>• AC input (rated): 100 V AC to 240 V AC, 50 Hz/60 Hz |
| Cooling | • Internal non-replaceable fans<br>• Replaceable filter<br>• Right-to-left airflow | • Modular replaceable fans (3 total)<br>• Front-to-back airflow<br>• Back-to-front airflow | • Modular replaceable fans (3 total)<br>• Front-to-back airflow<br>• Back-to-front airflow | • Six modular fan trays<br>• Safety electronic breaks on removal<br>• Front-to-back airflow |
| Normal operating temperature range | -40°C to +65°C (-40°F to +149°F) sustained | 0°C to +40°C (32°F to +104°F) sustained | 0°C to +40°C (32°F to +104°F) sustained | 0°C to +40°C (32°F to +104°F) sustained |

## Host system requirements

Satellites are supported on the 7750 SR portfolio includes the 7750 SR-s series, 7750 SR series, the 7750 SR-a series, and the 7750 SR-e series. On the 7750 SR-7/ 12/12e the minimum requirements are a CPM5 and an uplink via an FP2-based IOM/IMM.

1 Future software deliverable when used in satellite mode.
2 When used in satellite mode.
3 7210 SAS-S and SAS-Sx 1/10GE 48-port and 24-port copper PoE variants must use AC power supplies.
4 In satellite mode, not all speeds are supported. Please consult your Nokia representative.

# 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

## Electromagnetic compatibility

- AS/NZS CISPR 32 Class A
- BSMI CNS13438 Class A[3]
- BT GS-7[3]
- EN 55024
- EN 55032 Class A
- EN 55035 Class A (7210 SAS-S non-PoE)
- ETSI EN 300 132-2 (LVDC)[4]
- ETSI EN 300 132-3 (AC)[3,5]
- ETSI EN 300 386
- ETSI ES 201 468[3]
- FCC Part 15 Class A
- GR-1089-CORE[2]
- ICES-003 Class A
- IEC CISPR 24
- IEC CISPR 32 Class A
- IEC/EN 61000-3-2 Power line harmonics[5]
- IEC/EN 61000-3-3 Voltage fluctuations[5]
- 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 (7210 SAS-Sx series, SAS-S copper PoE)
- IEC/EN 61000-6-4 (7210 SAS-Sx series, SAS-S copper PoE)
- 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

(7210 SAS-Mxp)

- IEC 61850-3
- IEEE 1613

## Railway

(7210 SAS-S, SAS-Mxp)

- EN 50121-4
- IEC 62236-4

1 System design intent is according to the listed standards. Certifications vary on different models as noted. Refer to product documentation for detailed compliance status.
2 Not applicable to 7210 SAS-S variants
3 Not applicable to 7210 SAS-Mxp
4 Not applicable on AC-only models: 7210 SAS-Sx 1/10GE copper PoE and SAS-S AC variants
5 Not applicable on DC-only models: 7210 SAS-S DC variants

## 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 Not applicable to 7210 SAS-S variants

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