Nokia 7250 IXR-e and IXR-e2 series Interconnect Routers

Release 26

The Nokia 7250 Interconnect Router (IXR)-e and IXR-e2 series[1] are designed for demarcation, branch office connectivity, access, and aggregation and are ideal for IP anyhaul applications, including 4G/5G mobile backhaul, fronthaul and enterprise applications for telecommunications providers, AI and cloud providers, and mission-critical enterprise environments.

Overview

The Nokia 7250 IXR-e and IXR-e2 series deliver a broad portfolio of high-speed, high-density, power-efficient routing platforms. They feature fixed-connector systems distinguished by capacity and optical interfaces with flexible breakouts, precise timing and synchronization capabilities, and rich IP routing functionality—all within a compact 1RU form factor. They also support pluggable Digital Coherent Optics (DCO) 100ZR/400ZR+ and pluggable line systems (QSFP-LS).

The 7250 IXR-e series scales from 64 Gb/s full duplex (FD) up to 300 Gb/s FD, supporting 100G QSFP28, 25G SFP28, 10/1G SFP+/SFP, and 100/1000 Mb/s RJ45 connectors, as well as Class C synchronization.

The second-generation IXR-e2 series provides higher capacity—up to 800 Gb/s FD —and a higher-density 25G interface. It adds support for 400G QSFP-DD connectors, SRv6, Class C/D synchronization, PCB-enhanced plating (PEP), AC and DC power redundancy, and a NID, and it offers front-to-back and side-to-side airflow system options.



7250 IXR-e2



7250 IXR-e2c



7250 IXR-e2sc (AC redundant)



7250 IXR-e2n (DC redundant)



7250 IXR-e2n



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



7250 IXR-e (14 x SFP+ + 4 x RJ45)



7250 IXR-ec

1 The 7250 IXR-e and IXR-e2 series is part of the 7250 IXR family. Additional data sheets, including the 7250 IXR-e3 series data sheet are available for other series in the product family.

Ready for growth

Support for 400GE and 100GE high-speed uplinks—including multiple 400GE and 100GE connectors in the same system—along with 25GE, 10GE, and 1GE interfaces enables a cost-effective networking architecture for both access and aggregation layers.

5G mobile and telco-cloud infrastructures are moving toward 25GE interfaces. The Nokia 7250 IXR-e and IXR-e2 series feature native 25GE ports that support 1GE, 10GE, and 25GE transceivers. This allows seamless migration from 1GE to 10GE to 25GE speeds without the need to replace the router, thanks to support for GE SFPs in all SFP+ cages.

Compact and power saving

All 7250 IXR-e and IXR-e2 series variants are compact, 1RU devices that support extended temperature range (ETR) operation, making them ideal for outside cabinet applications. All interfaces and power supplies are front accessible. The 7250 IXR-e2 has a front-to-back airflow configuration, while the ETSI 300 mm compliant variants (7250 IXR-e, IXR-e2c, and IXR-ec) have a side-to-side airflow configuration. Fan filters (available on the 7250 IXR-e and IXR-ec) and redundant fan options increase system lifetime and reduce maintenance costs.

Superior design integration ensures that the 7250 IXR-e and IXR-e2 series consume significantly less power than comparable competing products. This power-efficiency design will provide substantial benefits for large-scale 5G deployments. The 7250 IXR-e2 offers high-performance capabilities, including over 1 Tb/s of interface aggregation and 800 Gb/s throughput. The 7250 IXR-e2n offers feature-rich layer 2, layer 3, MPLS, SRv6, and OAM capabilities, with flexible licensing, and is passively cooled for low power consumption.

Differentiated services support

The Nokia 7250 IXR-e and IXR-e2 series supports low-latency applications while providing a large buffer memory for delay-tolerant applications. Very granular per-service and per-forwarding class policing and queuing features support differentiated quality of service (QoS), making the 7250 IXR-e and IXR-e2 series ideal for any-G aggregation and fixed-mobile network convergence.

To meet the timing and synchronization requirements of 5G networks, the 7250 IXR-e and IXR-e2 series support the G.8273.2 specification for Class C clock noise generation. Additionally, the 7250 IXR-e2 and 7250 IXR-e2c variants offer enhanced capabilities with a Class D clock.

Automation

To simplify and automate network operations, the Nokia 7250 IXR-e and IXR-e2 series enables model-driven network management features through the Nokia Service Router Operating System (SR OS). It is managed by the Nokia Network Services Platform (NSP), which offers a rich set of service management features that automate end-to-end service provisioning and operations, administration and maintenance (OAM) to enhance end-user experience and reduce operating costs.

Standards-based software-defined networking (SDN) interfaces enable best-path computation to be offloaded to path computation elements (PCEs) such as the NSP. The 7250 IXR-e and IXR-e2 series operate as path computation clients (PCCs) collecting and reporting per-link and per-service delay, jitter and loss metrics together with port utilization levels for efficient path computation.

Technical specifications

Table 1. Nokia 7250 IXR-e2 series specifications

Feature	7250 IXR-e2 (2 variants)	7250 IXR-e2c (2 variants)	7250 IXR-e2sc (2 variants)	7250 IXR-e2n (3 variants)
System throughput: Full duplex IMIX traffic	800 Gb/s	100 Gb/s	100 Gb/s	44 Gb/s
Connectors	• 2 x 400G QSFP-DD • 2 x 100G QSFP28 • 24 x 25/10/1G SFP28/ SFP+/SFP	• 2x 100G QSFP28 • 12 x 25/10/1G SFP28/ SFP+/SFP	• 4 x 25/10/1G SFP28/ SFP+/SFP • 16 x 10/1G SFP+/SFP	• 4 x 10/1G SFP+/SFP • 4 x 1G SFP
Optical breakouts	• 4 x 100G, 2x100G, 4 x 25G, 4 x 10G (on QSFP-DD connectors) • 4 x 25G, 4 x 10G (on QSFP28 connectors)	• 4 x 25G, 4 x 10G (on QSFP28 connectors)	—	—
Control interfaces	Console, management, USB, 1 PPS out, SD slot, alarm input/output		Console, management, USB, SD slot	Console, management, USB, SD slot
Satellite mode option	NA	NA	NA	NA
Timing and synchronization	• Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave – Grandmaster • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS and APTS – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • ITU-T G.8273.2 Class D* • PTP Profile Interworking • RFC 5905 Network Time Protocol (NTP) • Integrated dual-band GNSS receiver – PRTC-B capable (GPS/ Galileo) • Pulse-per-second (1PPS) output timing	• Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • ITU-T G.8273.2 Class D* • PTP Profile Interworking • RFC 5905 Network Time Protocol (NTP) • Pulse-per-second (1PPS) output timing	On redundant power variants: • Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • ITU-T G.8273.2 Class C* • PTP Profile Interworking • RFC 5905 Network Time Protocol (NTP)	On redundant power variants: Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • ITU-T G.8273.2 Class D* • PTP Profile Interworking • RFC 5905 Network Time Protocol (NTP)

* Contact Nokia for implementation details.

Feature	7250 IXR-e2 (2 variants)	7250 IXR-e2c (2 variants)	7250 IXR-e2sc (2 variants)	7250 IXR-e2n (3 variants)
Indicators	• Management, per port (link and activity) LED • GNSS, PS1, PS2, System (Stat), Fan LED	• Management, per port (link and activity) LED • PS1, PS2, System (Stat), Fan LED	Redundant power variants: • Management, USB, per port (link and activity) LED • System (Stat), FAN, Power Supply (PS) LED Non-redundant power variant: • Management, USB, per port (link and activity) LED • System (Stat), FAN LED	Redundant power variants: • Management, per port (link and activity) LED • System (Stat), Power Supply (PS) LED Non-redundant power variant: • Management, USB, per port (link and activity) LED • System (Stat) LED
Memory buffer size	2 GB	1 GB	—	—
Hardware redundancy	Power supplies, cooling fans N+1		Power supplies	Power (optional)
Dimensions	• Height: 1RU, 4.5 cm (1.75 in) • Depth: 25.0 cm (10.0 in) • Width: 43.8 cm (17.25 in) • Rack-mountable in a 48.2-cm rack, 30-cm depth (standard 19-in equipment rack, 12-in depth)	• Height: 1RU, 4.5 cm (1.75 in) • Depth: 21.1cm (8.3 in) • Width: 43.8 cm (17.25 in) • Rack-mountable in a 48.2-cm rack, 30-cm depth (standard 19-in equipment rack, 12-in depth) • ETSI 300-mm compliant	• Height: 1RU, 4.5 cm (1.75 in) • Depth: 21 cm (8.27 in) • Width: 44 cm (17.5 in) • Rack-mountable in a 48.2-cm rack, 30-cm depth (standard 19-in equipment rack, 12-in depth) • ETSI 300-mm compliant	7250 IXR-e2n – Height: 1RU, 4.5 cm (1.75 in) – Depth: 23.9 cm (9.41 in) – Width: 21.5 cm (8.46 in) 7250 IXR-e2n (Redundant power) – Height: 1RU, 4.5 cm (1.75 in) – Depth: 23.98 cm (9.44 in) – Width: 29.21 cm (11.5 in) • Rack-mountable with extension ears • ETSI 300-mm compliant
Power supply options	Two feeds: Modular AC or DC power supplies	Two feeds: AC or DC inputs	Two feeds: AC or DC inputs	Two feeds: AC and DC inputs forredundant variants; Single feed variant: AC only
Power requirements	• AC input (rated): 110 V to 220 V, • DC input (rated): -48 V to -60 V	• AC input (rated): 100 V to 240 V • DC input (rated): -48 V to -60 V	• AC input (rated): 100 V to 240 V • DC input (rated): -48 V to -60 V	• AC input (rated): 100 V to 240 V • DC input (rated): -48 V to -60 V
Conformal coating	Optional	—	—	—
PCB enhanced plating (PEP)	—	Supported	Supported	—
Cooling	• Internal non-replaceable fans • Front-to-back airflow • Optional filter add-on	• Internal non-replaceable fans • Replaceable filter • Right-to-left airflow	• Internal non-replaceable fans • Replaceable filter • Right-to-left airflow	• Passive cooling
Normal operating temperature range	-40°C to +65°C (-40°F to +149°F) sustained			
Shipping and storage temperature	-40°C to +70°C (-40°F to +158°F)			
Normal humidity	5% to 95%, non-condensing			

Table 2. Nokia 7250 IXR-e series specifications

Feature	7250 IXR-e 2QSFP28 8SFP28 24SFP+ (4 variants)	7250 IXR-e 14SFP+ 4RJ45 (4 variants)	7250 IXR-ec (4 variants)
System throughput: Full duplex IMIX traffic	300 Gb/s	120 Gb/s	64 Gb/s
Connectors	• 2 x 100G QSFP28 • 8 x 25/10/G SFP28/SFP+/SFP* • 24 x 10/1G SFP+/SFP	• 14 x 10/1G SFP+/SFP • 4 x 100/1000 Mb/s RJ45	• 6 x 10/1G SFP+/SFP • 20 x 1G SFP • 4 x 100/1000 Mb/s RJ45
Optical breakouts	• 4x25G, 4 x 10G (on QSFP28 connectors)	—	—
Control interfaces	Console, management, USB (except IXR-ec), 1 PPS out, SD slot, alarm input/output (except IXR-e)		
Satellite mode option	Supported	NA	NA
Timing and synchronization	• Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave – Grandmaster (GNSS variant) • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS and APTS (GNSS variant) – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • ITU-T G.8273.2 Class C** • PTP Profile Interworking • RFC 5905 Network Time Protocol (NTP) • Integrated GNSS receiver, GPS supported (GNSS variant) • Support for GNSS SFP • Pulse-per-second (1PPS) output timing		
Indicators	• Management, power status (1 & 2) LEDs • Per port link and activity status LEDs • System (Stat), fan, remote management (LOC) status LEDs		• Power status (Batt A and Batt B) LEDs • Per port link and activity status LEDs • System (Stat), fan status LEDs
Memory buffer size	3 GB	1 GB	1 GB
Hardware redundancy	Power supplies, cooling fans N+1		
Dimensions	• Height: 1RU, 4.5 cm (1.75 in) • Depth: 25.4 cm (10.0 in) • Width: 43.8 cm (17.25 in) • Rack-mountable in a 48.2-cm rack, 30-cm depth (standard 19-in equipment rack, 12-in depth) • ETSI 300-mm compliant		• Height: 1RU, 4.5 cm (1.75 in) • Depth: DC variant 23.5cm (9.3 in) AC variant 25.4cm (10.0 in) • Width: 43.8 cm (17.25 in) • Rack-mountable in a 48.2-cm rack, 30-cm depth (standard 19-in equipment rack, 12-in depth) • ETSI 300-mm compliant

* SFP28 interface support is a future software deliverable. Contact Nokia for details.
** Contact Nokia for implementation details.

Feature	7250 IXR-e 2QSFP28 8SFP28 24SFP+ (4 variants)	7250 IXR-e 14SFP+ 4RJ45 (4 variants)	7250 IXR-ec (4 variants)
Power supply options	Two feeds: Modular AC or DC power supplies Supports concurrent use of AC and DC power supplies		Two feeds: AC or DC inputs
Power requirements	• AC input (rated): 100 V to 220 V • DC input (rated): 24 V /-48 V		• AC input (rated): 100 V to 220 V • DC input (rated): -48 V to -60 V
Conformal coating	Supported on 2 variants	Supported on 2 variants	Supported on 2 variants
PCB enhanced plating (PEP)	—	—	—
Cooling		• Internal non-replaceable fans • Replaceable filter • Right-to-left airflow	
Normal operating temperature range		-40°C to +65°C (-40°F to +149°F) sustained	
Shipping and storage temperature		-40°C to +70°C (-40°F to +158°F)	
Normal humidity		5% to 95%, non-condensing	

Software features

The Nokia 7250 IXR-e and IXR-e2 series supports, but is not limited to, the following features.[2]

Services

- Point-to-point Ethernet pseudowires/virtual leased line (VLL)
  - TLDP (Targeted Label Distribution Protocol) signaled
  - BGP-signaled VPWS
  - Static
- Multipoint Ethernet Virtual Provate LAN Service (VPLS)
  - TLDP (Targeted Label Distribution Protocol) signaled (with or without BGP Auto-discovery)
  - BGP-signaled
  - Static
- Ethernet Virtual Private Network (EVPN) – Virtual Private Wire Service (EVPN-VPWS)
- Ethernet Virtual Private Network (EVPN) – ELAN (EVPN-VPLS)
- EVPN Routed-VPLS (IRB): Layer 2 and Layer 3 with IPv4 and IPv6 support, including Virtual Router Redundancy Protocol (VRRP)
- EVPN Multi-homing with single active or all-active modes (Port/LAG based)
- EVPN Multi-homing virtual Ethernet Segments (vES - VLAN/VLAN-range based) with single active or all-active modes[3]
- EVPN Virtual eXtensible LAN (VXLAN) tunnel termination in VPLS and Routed-VPLS[3]
- Routed-VPLS services with Internet Enhances Services (IES) and IP-VPN IPv4 and IPv6
- Ingress and egress VLAN manipulation for L2 services
- IP VPN Virtual Private Routed Network (VPRN), Inter-Autonomous System (Inter-AS) Option A, B, and C
- IPv6 VPN Provider Edge (6VPE)
- EVPN Layer 3 interface-less IPv4 and IPv6 prefix routes (EVPN-IFL)
- MPLS (including SR-MPLS) to SRv6 interworking GW, multi-instance services[3]

2 This section provides an overview of key features supported. Some platforms may have feature exclusions or exceptions. Consult Nokia documentation for detailed feature support and interdependencies.

3 Supported on Nokia 7250 IXR-e2 series variants

Network protocols

- Segment Routing MPLS (SR-MPLS)
  - Intermediate System-to-Intermediate System (SR-ISIS) and Open Shortest Path First (SR-OSPF)
  - Traffic engineering (SR-TE) IPv4, IPv6 NHLFEs
- Segment Routing IPv6 (SRv6)
  - SRv6 IS-IS shortest path tunnel support in MT=0 and MT=2
- Flexible Algorithms
  - Admin-group include/exclude, IGP/TE/Latency metric
- MPLS label edge router (LER) and label switching router (LSR) functions
  - LDP
  - Resource Reservation Protocol with traffic engineering (RSVP-TE)
- BGP Labeled Unicast (LU) (RFC 3107) route tunnels
- Segment Routing with IPv6 dataplane (SRv6)[4]
  - Classic SID, uSID
  - PSP and USP of SRH, USD
  - FlexAlgo
  - BGP SRv6 Policy
  - Hashing based on flow label
  - IPv4/v6 IP-VRF, GRT
  - OAM, ping/traceroute SID/locator, VRF
- IP routing
  - Dual-stack Interior Gateway Protocol (IGP)
  - Multi-topology, multi-instance IS-IS
  - Multi-instance OSPF
  - Multiprotocol BGP (MP-BGP)
  - BGP-LU support in edge, area border router (ABR) and autonomous system boundary router (ASBR) roles
  - Usage-triggered download of BGP label routes to Label - Forwarding Information Base (L-FIB)
  - BGP Prefiix SID
  - Accumulated IGP (AIGP) metric for BGP
  - BGP monitoring protocol (BMP)
  - BGP route-reflector for EVPN and IP-VPN with VPNv4 and VPNv6 address families (AFs)
  - BGP confederations
  - BGP Flowspec[4]
  - IGP and BGP shortcuts
- Layer 3 Multicast - base routing
  - Internet Group Management Protocol (IGMP)
  - Protocol Independent Multicast – Sparse Mode (PIM-SM), Source Specific Multicast (SSM)
  - Multicast Listener Discovery (MLD)
  - Multicast Source Discovery Protocol (MSDP) in base routing
  - Next-generation multicast VPNs (NG-MVPN)
  - NG-MVPN with multicast LDPv4 (mLDPv4)
  - NG-MVPN with Multicast P2MP RSVP-TE
  - IGMP/MLD on Routed VPLS Interface
- Layer 2 Multicast
  - IGMP/MLD snooping
- IP-GRE tunnel support[4]

SDN

- SR-TE LSPs, RSVP-TE LSPs
  - PCC initialized, PCC controlled – PCC initialized, PCE computed
  - PCC initialized, PCE controlled
- SR-TE LSPs: PCE initialized, PCE controlled
- SR policy: BGP and static
- Topology discovery: BGP-Link State (BGP LS) IPv4 and IPv6
- Telemetry: Streaming interface statistics, service delay and jitter metrics
- Netflow/cflowd
- LSP stats[4]

4 Supported on Nokia 7250 IXR-e2 series variants

Load balancing and resiliency

- IEEE 802.1.AX Link Aggregation Group (LAG) and multi-chassis (MC) LAG
- Weighted LAG hash
- IEEE 802.1AX (2008) Link Aggregation Group (LAG) and multi-chassis (MC) LAG pseudowire and LSP redundancy
- GTP/teid based hashing
- IP, SRv6, and MPLS load balancing by equal-cost multipath (ECMP)
- VRRP
- Fast reroute
  - LDP with loop-free alternate (LFA) and remote loop-free alternate (rLFA) policies
  - RSVP-TE Fast Reroute (FRR)
  - Segment routing with rLFA and topology independent LFA (TI-LFA) , SR-MPLS dataplane
  - Segment routing with rLFA and topology independent LFA (TI-LFA) , SRv6 dataplane[5]
  - BGP Edge and Core Prefix Independent Convergence (BGP PIC)
- Entropy label (RFC 6790)
- Pseudowire and LSP redundancy
- Ethernet Ring Protection Switching ITU-T G.8032v2
- Configurable polynomial and hash seed shift
- IEEE 802.1d Classic spanning tree (STP)
- IEEE 802.1s Multiple spanning trees (MSTP)
- IEEE 802.1w Rapid reconfiguration of spanning tree (RSTP)
- Control plane high availability (HA)

Platform

- Ethernet IEEE 802.1Q (VLAN) and 802.1ad (QinQ) with 9K jumbo frames and 9.8K jumbo frames
- Detailed forwarded and discarded counters for service access points (SAPs) and network interfaces in addition to port-based statistics: per Virtual Output Queue (VoQ) packet and byte counters
- VLAN range-based SAPs
- Dynamic Host Configuration Protocol (DHCP) server for IPv4 IES, VPNv4
- DHCP relay, IPv4 and IPV6, IES, IP-VPN, EVPN-VPLS
- Accounting records

QoS and traffic management

- Hierarchical QoS (H-QoS)
  - Hierarchical egress schedulers and shapers per forwarding class, SAP, network interface, port or LAG
  - Port sub-rate
- Intelligent packet classification, including media access control (MAC), IPv4, IPv6 match-criteria-based classification
- Granular rate enforcement with up to 32 policers per SAP/VLAN, including broadcast, unicast, multicast and unknown policers
- Hierarchical policing for aggregate rate enforcement
- Strict priority, weighted fair queuing schedulers
- Congestion management via weighted random early discard (WRED)
- Egress marking or re-marking

System management

- Simple Network Management Protocol (SNMP)
- Model-driven (MD) management interfaces
  - NETCONF
  - MD-CLI
  - Remote Procedure Call (gRPC)
- Comprehensive management with Nokia NSP

Operations, administration and maintenance

- IEEE 802.1ag, ITU-T Y.1731: Ethernet Connectivity Fault Management (CFM) for both fault detection and performance monitoring, including delay, jitter and loss tests
- Ethernet bandwidth notification (ETH-BN) with egress rate adjustment

5 Supported on Nokia 7250 IXR-e2 series variants

- IEEE 802.3ah: Ethernet in the First Mile (EFM)
- ETH-CFM LBM Responder
- ITU-T Y.1564 Service Activation Test (SAT)
- Bidirectional Forwarding Detection (BFD) IPv4, IPv6
- Micro-BFD - per member link
- Hardware based sBFD[6]
- Link Layer Discovery Protocols (LLDP) (IEEE 802.3AB-2005)
- Two-Way Active Measurement Protocol (TWAMP), TWAMP Light/STAMP for base and flex-algo topologies
- A full suite of MPLS OAM tools, including LSP and virtual circuit connectivity verification (VCCV) ping
- Service assurance agent
- Mirroring with slicing support
  - Port
  - VLAN
  - Filter output: MAC, IPv4/IPv6 filters
  - Local/remote
- Port and VLAN loopback with MAC-swap
- Configuration rollback
- Zero Touch Provisioning (ZTP) capable

Security

- Remote Authentication Dial-In User Service (RADIUS), Terminal Access Controller Access Control System Plus (TACACS+), and comprehensive control-plane protection capabilities
- Distributed CPU Protection (DCP)
- MAC-, IPv4- and IPv6-based access control lists and criteria-based classifiers
- Secure Shell (SSH)
- MACsec (only on IXR-e 14 x SFP+ + 4 x RJ45)
- SR OS Secure Boot
- TPM 2.0[6]
- IP unicast RPF (uRPF)[6]

6 Supported on Nokia 7250 IXR-e2 series variants

Standards compliance[7]

Environmental specifications

- ATIS-0600015.03
- ATT-TP-76200
- 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
- ETSI EN 300 753 Acoustic Noise Class 3.2
- GR-3108
- GR-63-CORE
- VZ.TPR.9305
- VZ-TPR-9205

Safety

- AS/NZS 62368.1
- IEC/EN 60825-1
- IEC/EN 60825-2
- IEC/EN/UL/CSA 62368-1
- IEC 60529 IP20

Electromagnetic compatibility

- AS/NZS CISPR 32 Class A
- BSMI CNS15936 Class A
- BT GS-7
- EN 55032 Class A
- EN 301 489-1 (IXR-e and IXR-e2 only)
- EN 301 489-19 (IXR-e and IXR-e2 only)
- EN 303 413 (IXR-e and IXR-e2 only)
- EN 55035
- ETSI EN 300 132-1
- ETSI EN 300 132-2
- ETSI EN 300 386
- ETSI ES 201 468
- FCC Part 15 Class A

7 System design intent is according to the listed standards. Certifications vary on different variants. Refer to product documentation for detailed compliance status.

- FTZ 1 TR9 (Deutsche Telekom)
- GR-1089-CORE
- ICES-003 Class A
- IEC CISPR 35
- IEC CISPR 32 Class A
- IEC/EN 61000-3-2 AC Current Harmonics
- IEC/EN 61000-3-3 AC Voltage Fluctuations
- IEC/EN 61000-6-2, 6-4
- 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
- ITU-T K.20
- KCC Korea-Emissions & Immunity (in accordance KS C 9832 and KS C 9835)
- VCCI Class A

Railway

- AREMA[8]
- EN 50121-4 (IXR-e2c and IXR-ec only)
- IEC 62236-4 (IXR-e2c only)

Power utility substations

- IEC 61850-3[9]
- IEEE 1613 / 1613.1[9]
- IEC 61000-6-5 (IXR-e2c only)
- IEC/AS 60870.2.1 (IXR-e2c only)

Directives, regional approvals and certifications

- DIRECTIVE 2011/65/EU Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (Recast) Directive (RoHS2)
- DIRECTIVE 2012/19/EU Waste Electrical and Electronic Equipment (WEEE)
- DIRECTIVE 2014/30/EU Electromagnetic Compatibility (EMC)
- DIRECTIVE 2014/35/EU Low Voltage Directive (LVD)
- MEF CE 3.0 certified
- NEBS Level 3
- China RoHS: CRoHS
- Australia: RCM Mark
- Europe: CE Mark
- Japan: VCCI Mark
- South Korea: KC Mark
- Taiwan: BSMI Mark
- TEC Mark (excluded are IXR-e2, IXR-e2c, IXR-e2n and IXR-e2sc)
- United Kingdom: UKCA Mark

8 Applicable to 7250 IXR-ec variant
9 Applicable to 7250 IXR-e2, 7250 IXR-e2c, 7250 IXR-ec variants



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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