**Features**

- 6U height, full front access (ETSI) shelf support up to 2.5G Mbps backplane
- SDH/SONET VCn/VTn Cross-Connect Capacity: 15Gbps bidirectional non-blocking
- PTN (CE and MPLS-TP) Switching Capacity: 100Gbps bidirectional non-blocking
- Hot-swappable cross-connect modules, tributary modules and power modules
- Temperature-controlled fan tray
- Aggregate cross-connect modules (controller modules)
  - Up to STM-1/4/16 (OC-3/12/48) aggregate lines with software configuration (CCPA)
- Tributary modules: 8 tributary slots
  - Two ports STM-1/4 (OC-3/12) or One port STM-4 (OC-12) module
  - Three ports E3/T3 module
  - 16/32/63 ports E1/T1 tributary module
  - 1 GbE and 8 FE tributary module with L2 switch
  - 1 GbE or 8 FE tributary module without L2 switch
  - 7 FOM tributary module
  - 4 G EO SDH with L2 switch tributary module
  - TD Mo G tributary module
  - Three 10G/Eight 1G ports PTN10G module
- Power Modules
  - DC module (-36 to -72 Vdc)
  - AC/DC hybrid module (90 to 240 Vac; -36 to -72 Vdc)
  - Dual power (1+ 1) protection
- Protection
  - Controller cross-connect unit (CCPA) protection, MSP (1+1), SNCP/UPSR Ring
  - Tributary protection
  - E1/T1: Card/Port (1:1) using Y-box, Line (1+1)
  - E3/T3: Line (1+1)
  - B155/622: MSP, SNCP/UPSR
  - Ethernet
  - FOM: Line (1+1)
  - 4GEoSDH: Card
  - TD Mo G: Card
  - PTN Switch Fabric 1:1 *
- Network Protection
  - MSP 1+1
  - SNCP/UPSR
  - Ethernet Ring Protection (ERPS G.8032)
  - Link Aggregation (Inter and Intra board)
  - LSP Linear Protection (1+1/1:1) * sub 50ms
- External/Internal/Line timing source with SSM
  - SyncE
  - IEEE 1588 *
  - TDM clocks
- TM, ADM, and cross-connect
- Full cross-connect at VC11/VC12/VC3/VC4 levels
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT, BCP, LCAS and non-LCAS
- Management
  - Console port, VT100 menu-driven
  - SNMP port: Both v1 and v3 supported
  - Telnet and SSH
  - Centralized management with CXR’s EMS/iNMS over DCC channel
  - CXR-iNET GUI Element Management System
  - TMN management (CXR-iNMS) with full FCAPS and end-to-end circuit management
- RoHS compliant

*Future Option
Description

The CXR-HX9400R is a standards-compliant high density SDH/SONET/PTN ADM/TM with a full T1/E1 cross-connect rack system.

The HX9400R has full add and drop capability according to the figures below:
- 1 STM-16 tributaries
- 4 STM-4 tributaries
- 16 STM-1 tributaries
- 24 E3/T3 tributaries
- 504 E1/T1 tributaries
- 64 10/100M Ethernet EoS tributaries
- 8 GbE EoS tributaries
- 56 FOM tributaries
- 4 TDMoG tributaries
- 6 10GbE and 16 1GbE tributaries

With up to 4 STM-1/4/16 (OC-3/12/48) aggregate interfaces on cross-connect modules and 16 STM-1 (OC-3) interfaces on tributaries, the CXR-HX9400R offers the service provider a versatile protection scheme including SNCP (UPSR), and MSP (1+1) protection for network topology.

With the PTN10G interface card, the HX9400R can transport SDH/SONET over PSN network. With HX9400R as a gateway between SDH/SONET and PTN, existing SDH/SONET network users will be able to migrate from SDH/SONET/PDH to PTN network smoothly and seamlessly.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The CXR-HX9400R provides powerful Operation, Administration, Maintenance and Provisioning (OAM&P) functionality, including fault management, performance monitoring, configuration management, and network security management. Through a console port, LAN port and DCC channel, OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

The CXR-HX9400R provides a complete set of operation interfaces that are consistent with the Telecommunication Management Network (TMN) concept (ITU Recommendation M.30, G.784) for SDH/SONET Network Element/Operations System (NE/OS), NE/NE, and NE/Craft communications. Users can easily operate the CXR-HX9400R locally or remotely for centralized management.
# Ordering Information

To specify options, choose from list below:

**Note:**
1. Modules that do not operate in the temperature range from -20 to 65°C are marked in orange.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Unit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HX9400R-PTN-CHPA-6U</td>
<td>6U height Rack chassis for HX9400R-PTN without CPU and power modules</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CPU Modules and Supporting Plug-in Modules</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-PTN-CC16</td>
<td>CPU module with cross-connect unit and two STM-1/4/16 (OC-3/12/48) interfaces without SFP (mini-GBIC) optical modules</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Please order SFP modules separately from SFP optical modules brochure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use with HX9400-R-PTN-CHPA</td>
</tr>
<tr>
<td>HX9400R-PTN-CB</td>
<td>Connector Board</td>
<td>• One required for each chassis</td>
</tr>
<tr>
<td>HX9400R-PTN-FAN</td>
<td>Fan Tray with temperature controlled board</td>
<td>• One required for each chassis</td>
</tr>
<tr>
<td>HX9x00R-FILTER-CBL10</td>
<td>Air Filter Rack with cable management for HX9400R, 2U (88mm), air filter included</td>
<td>• The cable management ring is 10 cm in length.</td>
</tr>
<tr>
<td>HX9x00R-FILTER-CBL06</td>
<td>Air Filter Rack with cable management for HX9400R, 2U (88mm), air filter included</td>
<td>• The cable management ring is 6 cm in length.</td>
</tr>
<tr>
<td>HX9x00R-FILTER</td>
<td>Air Filter to fit HX9400R- FIlRCMA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Tributary Plug-in Modules</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-16E1/T1</td>
<td>16 E1(120 ohm) or 16 T1 software programmable interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-32E1/T1</td>
<td>32 E1(120 ohm) or 32 T1 software programmable interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-63E1/T1</td>
<td>63 E1(120 ohm) or 63 T1 software programmable interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-16E1/T1-75</td>
<td>16 E1(75 ohm) interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-32E1/T1-75</td>
<td>32 E1(75 ohm) interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-63E1/T1-75</td>
<td>63 E1(75 ohm) interface plug-in module</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-ADSTM1/4</td>
<td>STM-1/4 (OC-3/12) software programmable interface plug-in module without SFP (mini-GBIC) optical modules</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-GTX-8TTX</td>
<td>1 GbE or 8FE software programmable interface plug-in module without L2 switch</td>
<td>Operating temperature: -20 to 55°C</td>
</tr>
<tr>
<td>HX9400R-SWM-GTX-8TTX</td>
<td>1 GbE and 8FE interface plug-in module with L2 switch</td>
<td>Operating temperature: -20 to 55°C</td>
</tr>
</tbody>
</table>

**CXR**

2
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-SW-4G-4S-4</td>
<td>Eight GbE software configurable interface plug-in module with L2 switch, use 622Mb/s backplane on all slots</td>
<td>For STM-4 (622M) bandwidth.</td>
</tr>
<tr>
<td>HX9400R-SW-4G-4S-16</td>
<td>Eight GbE software configurable interface plug-in module with L2 switch. Use 2.5Gb/s backplane on slots 3 &amp; 4 only</td>
<td>For STM-16 (2.5G) bandwidth on slot 3 &amp; 4 with use CC16 controller card</td>
</tr>
<tr>
<td>HX9400R-3DSE3</td>
<td>3 T3 or 3 E3 software programmable interface plug-in modules</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-3DSE3-M13</td>
<td>3 T3 or 3 E3 software programmable interface plug-in modules with M13 /Mx3 function for T3 interface only</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-7FOM</td>
<td>7-port Fiber Optical Interface with 7 SFP housings (SFP not included)</td>
<td>• Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-TDMoG</td>
<td>TDMoG plug-in module with G.823 traffic interface, two combo Gigabit Ethernet (GbE) WAN ports and four LAN ports. Operating temperature: -5 to 55°C</td>
<td>• SFP optical modules are not included. Please order SFP modules separately. • Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-TRIB-STM16</td>
<td>STM-16/OC-48 software configurable interface plug-in module without SFP (mini-GBIC) optical modules</td>
<td>• SFP optical modules are not included. Please order SFP modules separately. • Order two for redundancy</td>
</tr>
<tr>
<td>HX9400R-PTN10G</td>
<td>MPLS-TP plug-in module with 3x10G SFP+ ports and 8xGE SFP ports, without SFP (mini-GBIC) optical modules</td>
<td>• This card can only be used in the HX9400R-PTN-CHPA-6U and HX9400R-PTN-CC16</td>
</tr>
</tbody>
</table>

**Accessories**

**SFP Optical Modules**

Please place your order using the codes listed in the separate SFP Optical Module Brochure.

**Note:** Non-CXR SFP modules are not guaranteed to work with our equipments. It is strongly recommended to buy CXR-logo SFP modules.

**User’s Manual**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-MANUAL-E</td>
<td>Printed HX9400R English manual</td>
</tr>
<tr>
<td>HX9400R-MANUEL-F</td>
<td>Printed HX9400R French manual</td>
</tr>
</tbody>
</table>

**Power Modules**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-DC48</td>
<td>Single -48Vdc (-36 to -72Vdc) power module</td>
<td>• For redundancy purposes, ordering a second plug-in module will provide dual power.</td>
</tr>
<tr>
<td>HX9400R-ACDC</td>
<td>Single AC and DC (coexistent) power module (90 to 240Vac, 50/60Hz and -36 to -72Vdc)</td>
<td>• For AC power module, choose an appropriate power cord.</td>
</tr>
</tbody>
</table>

**Blank Panels**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HX9400R-PAN-PW</td>
<td>Blank panel for power supply slots</td>
</tr>
<tr>
<td>HX9400R-PAN</td>
<td>Blank panel for other slots</td>
</tr>
</tbody>
</table>
## CXR-HX9400R SDH/SONET ADM/TM Product Specifications

### Supporting PTN, SDH & PDH

#### Max. Number of Cross-Connect Modules
4 STM-1/4/16 (OC-3/12/48) aggregate lines

#### Max. Number of Tributary Modules for STM1/4/16 (OC3/12/48) Cross-Connect Module
- 4 STM-4 (OC-12) tributaries
- 16 STM-1 (OC-3) tributaries
- 24 E3/T3 tributaries
- 504 E1/T1 tributaries
- 64 10/100M Ethernet EoS tributaries
- 4 TDMoG tributaries
- 6 10GbE and 16 1GbE tributaries

### SFP Module Characteristics (Please refer to SFP optical module brochure for detail)

#### E1 Interface
<table>
<thead>
<tr>
<th>Line Rate</th>
<th>2.048 Mbps ± 50 ppm</th>
<th>Jitter</th>
<th>ITU G.823</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Code</td>
<td>AMI/HDB3</td>
<td>Framing</td>
<td>Unframed with a framing monitor on</td>
</tr>
<tr>
<td>Input Signal</td>
<td>ITU G.703</td>
<td></td>
<td>receiving side</td>
</tr>
<tr>
<td>Output Signal</td>
<td>ITU G.703</td>
<td>Impedance</td>
<td>75 ohm coax/120Ω twisted pair</td>
</tr>
</tbody>
</table>

#### T1 Interface
<table>
<thead>
<tr>
<th>Line Rate</th>
<th>1.544 Mbps ± 32 ppm</th>
<th>Jitter</th>
<th>ITU G.824</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Code</td>
<td>AMI/B8ZS</td>
<td>Framing</td>
<td>Unframed with a framing monitor on</td>
</tr>
<tr>
<td>Input Signal</td>
<td>ITU G.703 DSX-1 0dB to –6dB</td>
<td>Impactance</td>
<td>100 ohm twisted pair</td>
</tr>
<tr>
<td>Output Mask</td>
<td>Bellcore GR-499-core</td>
<td></td>
<td>One connector for 16 ports</td>
</tr>
</tbody>
</table>

#### E3 Interface
<table>
<thead>
<tr>
<th>Line Rate</th>
<th>34.368 Mbps ± 20ppm</th>
<th>Jitter</th>
<th>ITU G.823</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Code</td>
<td>HDB3</td>
<td>Framing</td>
<td>Unframed, G.751</td>
</tr>
<tr>
<td>Input Signal</td>
<td>ITU G.703</td>
<td>Impedance</td>
<td>75 ohm coax</td>
</tr>
<tr>
<td>Output Signal</td>
<td>ITU G.703</td>
<td>Connector</td>
<td>BNC connector</td>
</tr>
<tr>
<td>Output Mask</td>
<td>ETS 300 689 Sec.4.2.1.2 ITU G.703</td>
<td>Temperature</td>
<td>-5 to 65°C</td>
</tr>
</tbody>
</table>

#### T3 interface
<table>
<thead>
<tr>
<th>Line Rate</th>
<th>44.736 Mbps ± 20ppm</th>
<th>Jitter</th>
<th>ITU G.824</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Code</td>
<td>B3ZS</td>
<td>Framing</td>
<td>Unframed, M13/Mx3 (unframed E1/T1), G.747</td>
</tr>
<tr>
<td>Input Signal</td>
<td>ITU G.703</td>
<td>Impedance</td>
<td>75 ohm coax</td>
</tr>
<tr>
<td>Output Signal</td>
<td>ITU G.703</td>
<td>Connector</td>
<td>BNC connector</td>
</tr>
<tr>
<td>Output Mask</td>
<td>Bellcore GR-499-core</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Fast Ethernet Interface**

- **Line Rate**: 10/100M bps
- **Layer2 Protocol**: RSTP (802.1W), VLAN (802.1Q, 802.1P), Flow Control (802.3X), MSTP (802.1S), IGMP Snooping
- **Process Protocol**: VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042) and non-LCAS
- **Connector**: RJ45

**Gigabit Ethernet Interface**

- **Line Rate**: 10/100/1000Mbps
- **Layer2 Protocol**: RSTP (802.1W), VLAN (802.1Q, 802.1P), Flow Control (802.3X), MSTP (802.1S), IGMP Snooping
- **Process Protocol**: VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042) and non-LCAS

**7 FOM (Fiber Optical Interface)**

- **Port number**: 7
- **Source**: Laser
- **Wavelength**: 1310 ± 50 nm, 1550 ± 40 nm
- **Optical Line Rate**: 38.84Mbps
- **Connector**: SFP housing with LC type
- **Reach**: 2~240 Km
- **Protection**: 1+1 Line Protection

**PTN10G**

- **GE Interface**: Port number 8, Connector SFP, Line Code Scrambled NRZ

**10G Interface**

- **Port number**: 3, Connector SFP+, QoS Eight priority queues

**Standards Compliance**

- **IEEE**: 802.1ad (Tag Stacking (Q-in-Q)), 802.3ag (Ethernet OAM), 1588 v2 (Precision Time Protocol)
- **ITU**: G8113.2 (MPLS-TP OAM), Y1731 (Ethernet OAM)

**4 GEoSDH Combo Gigabit Ethernet(GbE) Interface**

- **Number of Ports**: 2 (Port 1 and Port2)
- **Speed**: 10/100/1000M bps
- **Function**: RJ45 Interface
  - 10/100/1000 BaseT, auto-negotiation
  - Auto MDI/MDIX
- Force mode: duplex(half/full), speed (10/100/1000M)
- SFP Housing
- Rx power low alarm

**Connector**: RJ45 for twisted pair GbE, LC for optical GbE, auto detection

---

**B2G5 STM-16/OC-48 Interface Card Specifications**

- **Total Ports**: 2
- **Data Rate**: 2.5Gbps
- **Line Code**: NRZ, CMI
- **Output Mask**: ITU.G703
- **Jitter**: ITU G.703

---

**Gigabit Ethernet(GbE) Interface**

- **Number of Port**: 2 (Port3 and Port4)
- **Speed**: 10/100/1000 BaseT
- **Function**: Rx power low alarm
- **Connector**: LC for optical GbE

---

**Gigabit Ethernet Function**

- **Layer2 Protocol**: RSTP (802.1W), VLAN (802.1Q, 802.1P), Flow Control (802.3X), MSTP (802.1S), IGMP Snooping, QoS
- **Process Protocol**: VLAN (802.1q bridging), IEEE 802.1q, LCAS (G.7042) and non-LCAS
- **Bridge**: 802.1d, MAC learning (maximum MAC table 16K entry)
- **VLAN**: Supports tag stacking, up to 2 VLAN tags, VLAN packet transparent
- **QoS/CoS**: Eight priority queues, Packet classification based on the 802.1p user priority, IPV4 ToS (DiffServ), The scheduling algorithm of the priority queue follows either Strictly Priority or Weighted Round-Robin (WRR).

---

**TDMoG Interface**

**WAN Aggregate Interface**

- **Number of Ports**: 2 Combo GbE (Including Electrical and Optical ports; Auto-detection of SFP for highest priority)
- **Electrical Port**
  - **Speed**: 10/100/1000 BaseT (802.3i, 802.3u, 802.ab)
  - **Auto-negotiation**: (10/100/1000)
  - **Auto MDI/MDIX**: Full/half Duplex
  - **Connector**: RJ45

- **Optical Port**
  - **Speed**: 100/1000 BaseFX (802.3u, 802.3z)
  - **Connector**: SFP

---

**Ethernet Tributary Interface**

- **Number of Ports**: 4
- **Speed**: 10/100/1000 BaseT (802.3i, 802.3u, 802.ab)
- **Auto-negotiation**: (10/100/1000)
- **Auto MDI/MDIX**: Full/Half Duplex
- **Connector**: RJ45

---

**STM-16/OC-48 Interface**

- **Total Ports**: 2

Note: MSP 1+1 can only run when you put card in slot 3 in one port (slot 4 in one port) or put card in slot 3 in two ports (slot 4 in two ports)
Data Rate 2,488,320 Mbit/s (~2.5 Gbit/s)
Line Code NRZ after scrambling
Connector Type SFP LC connector
Application code S-16.1 or L-16.1 or L-16.2
Jitter ITU-T G.825
For more detail, please refer to the SFP Optical Modules Brochure

**System Clock**
Clock Source Internal clock
4 aggregate lines clocks (STM-1/4 (OC-3/12))
6 tributary clocks
1 external input clocks (ITU-T G.703 - 2.048 MHz or E1 or T1)
1 PPS
SyncE (over Ethernet interface on PTN10G)
Clock Output 1 external output (E1 for STM-1/4, T1 for OC-3/12)
1 ToD/PPS

**Management Interface**
LED Multi colors
Console Electrical: RS232, DCE
Connector: DB9, female
User interface: Menu driven VT-100
Telnet
SNMP SNMPv1, RFC1213
OSS interface 10/100BaseT FE (IEEE 802.3u )
NE/NE interface DCC/HDLC/PPP/Ethernet type II, In-band E1

**Alarm Input/Output**
Inputs
Ports 4
Internal resistance 1K
Connectors RJ45
Activiation current 3 mA
Deactivation current 1.5 mA

Outputs
Ports 4
Maximum switching voltage 110 V DC, 125 V AC
Initial insul. resist. Min. 100M ohm (at 500Vdc)
Connectors RJ45

**Diagnostics**
**XCU Card**
Loopback Test Local loopback, payload loopback, line loopback
BERT Test Optical interface Direction: to optical lines

**B155/622 Card**
Loopback Test Local loopback, payload loopback, line loopback:
BERT Test Optical interface Direction: to optical lines

**E1/T1 Card**
Loopback Test Local loopback, line loopback:
BERT Test E1/T1 interface Direction: to optical lines, to tributary lines

**7 FOM Card**
Optical Fiber Local and remote loopbacks
E1 Test Pattern To optical direction or backplane direction

**Performance Monitor**
Performance Reports Performance Parameters: Error Block (EB), Background Block Error (BBE), Error Second (ES), Burst Error Second (BES), Severe Error Second (SES), Unavailable Second (UAS)
Alarm History System Alarm Alarm Cut Off, Power Loss/Uneqv, Fan Fail, Fan Module Uneqv, RBC Uneqv, Overheat, TS Sync Loss, Logon and Logout, Optical Port Uneqv, Card In, Card Out, Card Type Mismatch, Card Port Number Mismatch, Card Fail, Card Registration, SNCP Switch, MSP Switch, Trib Protection Sync, Standby XCU Takeover, Standby Trib Takeover, XCU Sync, SFP Tx Fail, SFP Rx Fail, SFP Temperature

SDH/SONET SDH Line PI-LOS, RS-LOF, RS-TIM, RS-BIP UAS, MS-SD, MS-SF, MS-AIS, MS-RDI, MS-BIP UAS, MS-REI UAS
Ho-Path AU-LOP, AU-AIS, HP-SD, HP-SF, HP-TIM,
HP-UNEQ, HP-PLM, HP-RDI-S, HP-RDI-C, HP-RDI-P, HP-BIP UAS, HP-REI UAS, LOM

Lo-Path TU-LOP, TU-AIS, LP-SD, LP-SF


VT-Path LOP-V, AIS-V, SD-V, SF-V

Alarm Queue Contains up to 300 alarm records of latest alarm types, alarm severity, date and time.

### Alarm Input/Output

#### Inputs
- **Channel**: 4
- **Connector**: RJ45
- **Internal Resistance**: 1K
- **Activation Current**: 3 mA
- **Deactivation Current**: 1.5 mA
- **Allowable Current**: 4 mA

#### Outputs
- **Channel**: 4
- **Connector**: RJ45
- **Initial Insulation Resistance**: Min. 100M ohm (at 500Vdc)
- **Maximum switching voltage**: 110 V DC, 125 V AC

### Power
- **AC and DC coexistent module**: 90 to 240Vac, 50/60Hz, -48Vdc (-36 to -72Vdc)
- **DC module**: -48Vdc (-36 to -72Vdc)

### Physical and Environmental
- **Dimensions for 6U module**: 433 x 264 x 223.5mm (WxHxD)
- **Dimension for Air Filter Rack A with cable management**: 433 x 88 x 223.5mm (WxHxD)
- **Dimension for Air Flow Guide Rack**: 433 x 44 x 223.5mm (WxHxD)
- **Dimension for Y-Box**: 432 x 44 x 100 mm (WxHxD)
- **Panel**: RJ connector: 432 x 44 x 23mm (WxHxD)
  - WW connector: 432 x 44 x 40mm (WxHxD)
  - BNC connector: 432 x 66 x 53mm (WxHxD)
- **Temperature**: -20 to 65°C (operating)
  - -30 to 70°C (storage)

**Note**: Some of the plug-in cards do not operate in exactly the same temperature range as HX9400R. Please refer to the specs of individual cards.

#### Humidity
- 0-95%RH (non-condensing)

#### Mounting
- Desk-top stackable, 19/23 inch rack mountable

### Standards Compliance
- **ANSI**: T1.105, T1.107
- **IEEE**: 802.1q (VLAN), 802.1w (RSTP), 802.1s (MSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.3u, 802.1p (QoS)
- **MEF**: 8 CESoETH

### Certification
- **EMC**: FCC Part 15 Subpart B, Class A; EN 55022, Class A; EN55024; EN300 386
- **Safety**: IEC60950-1/EN 60-950-1

*Future Option*
CXR-HX9400R Front Panel
### CXR-HX9400R Card Type and Capacity Reference Table

#### Table STM-1/4/16 (OC3/12/48) Aggregate Line

In this table, STM-16 can be OC-48, STM-4 can also be OC-12; STM-1 can also be OC-3; E1 can also be T1; and E3 can also be T3.

<table>
<thead>
<tr>
<th>SLOTS</th>
<th>TRIB 1</th>
<th>TRIB 2</th>
<th>TRIB 3</th>
<th>TRIB 4</th>
<th>XCU1(W)</th>
<th>CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLOBAL PAYLOAD SDH</td>
<td>4 X 155M</td>
<td>N/A</td>
<td>4 X 155M</td>
<td>N/A</td>
<td>2 x 2.5G</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>2 x 155M</td>
<td>2 x 155M</td>
<td>2 x 155M</td>
<td>2 x 155M</td>
<td>2 x 2.5G</td>
<td>2 x 2.5G</td>
</tr>
</tbody>
</table>

#### Tributary (Plug-in Modules)

<table>
<thead>
<tr>
<th>Link without MSP</th>
<th>STM-1 (2 ports)</th>
<th>STM-1 (2 ports)</th>
<th>STM-1 (2 ports)</th>
<th>STM-1 (2 ports)</th>
<th>STM-1 (4/16) (2 ports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link with MSP (1+1)</td>
<td>STM-1 (2 ports)</td>
<td>STM-1 (2 ports)</td>
<td>STM-1 (2 ports)</td>
<td>STM-1 (2 ports)</td>
<td>STM-1 (4/16) (2 ports)</td>
</tr>
<tr>
<td>Max 504 E1 (Single)</td>
<td>63 E1</td>
<td>63 E1</td>
<td>63 E1</td>
<td>63 E1</td>
<td>63 E1</td>
</tr>
<tr>
<td>Max 252 E1 (Protection)</td>
<td>63 E1</td>
<td>63 E1 (B)</td>
<td>63 E1</td>
<td>63 E1 (B)</td>
<td>63 E1 (B)</td>
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<tr>
<td>Max 24 E3 (Single)</td>
<td>3 E3</td>
<td>3 E3</td>
<td>3 E3</td>
<td>3 E3</td>
<td>3 E3</td>
</tr>
<tr>
<td>Max 12 E3 (Protection)</td>
<td>3 E3</td>
<td>3 E3 (B)</td>
<td>3 E3</td>
<td>3 E3 (B)</td>
<td>3 E3 (B)</td>
</tr>
<tr>
<td>Max 64 10/100 BT</td>
<td>8x10/100BT 1 x 1000BT</td>
<td>8x10/100BT 1 x 1000BT</td>
<td>8x10/100BT 1 x 1000BT</td>
<td>8x10/100BT 1 x 1000BT</td>
<td>8x10/100BT 1 x 1000BT</td>
</tr>
<tr>
<td>Max 32 10/100 BT</td>
<td>6x10/100BT 1 x 1000BT (B)</td>
<td>6x10/100BT 1 x 1000BT (B)</td>
<td>6x10/100BT 1 x 1000BT (B)</td>
<td>6x10/100BT 1 x 1000BT (B)</td>
<td>8x10/100BT 1 x 1000BT</td>
</tr>
<tr>
<td>Max 56 FOM (Single)</td>
<td>7 FOM</td>
<td>7 FOM</td>
<td>7 FOM</td>
<td>7 FOM</td>
<td>7 FOM</td>
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<tr>
<td>Max 28 FOM (Protection)</td>
<td>7 FOM</td>
<td>7 FOM (B)</td>
<td>7 FOM (B)</td>
<td>7 FOM (B)</td>
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<tr>
<td>Max 4GESW (Single)</td>
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<td>N/A</td>
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<td>Max 4GESW (Protection)</td>
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<td>N/A</td>
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<td>4GESW (B)</td>
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<tr>
<td>Max TDMoG (Single)</td>
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<td>1 TDMoG</td>
<td>N/A</td>
<td>1 TDMoG</td>
</tr>
<tr>
<td>Max TDMoG (Protection)</td>
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<td>1 TDMoG</td>
<td>1 TDMoG</td>
<td>1 TDMoG (B)</td>
<td>1 TDMoG</td>
</tr>
<tr>
<td>Max B2G5 (Single)</td>
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<td>N/A</td>
<td>B2G5</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Max B2G5 (Protection)</td>
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<td>N/A</td>
<td>B2G5</td>
<td>B2G5 (B)</td>
<td>N/A</td>
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<tr>
<td>PTN10G (Single)</td>
<td>N/A</td>
<td>N/A</td>
<td>3 x 10G or 8 x 1G</td>
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<td>N/A</td>
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<tr>
<td>PTN10G (Protection)</td>
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<td>N/A</td>
<td>3 x 10G or 8 x 1G</td>
<td>3 x 10G or 8 x 1G (B)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### Note 1:
- (B) signifies backup/protection

#### Note 2:
- With MSP (1+1) protection, the protection pair on XCU (W) and XCU (E) are as follows:
  - XCU (W) port 1 and XCU (E) port 1
  - XCU (W) port 2 and XCU (E) port 2

#### Note 3:
- The 4GEoSDH and B2G5 module only applicable to HX9400R's tributary slot 3 and 4. The CHPA backplane support up to 2.5G Mbps mapping bandwidth.
**Note 4:** The backplane bandwidth for the TDMoG card is up to 622M. If the TDMoG module set to non-protection mode on trib slot 1, 3, 5, or 7, then the slot 2, 4, 6, or 8 is not available for other tributary modules.

**Applications**

![Diagram showing applications of CXR-HX9400R SDH/SONET ADM/TM](image)