

# CXR-QX3440-E

## IP/TDM DCS-MUX



## Features

### Cross Connect Capability

- Support full non-blocking DS0 cross connect matrix between TDM interfaces and TDMoE Pseudowires
- Suitable for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications
- Auto A-law/ $\mu$ -law conversion

### Ethernet Interface

- 2 x Combo GbE (SFP 100/1000BaseFX and 10/100/1000BaseT)
- IEEE 802.3ad Ethernet Link Aggregation\*

### Pseudowires

- Up to 64 concurrent pseudowires
- Encapsulation format
  - SAToP
  - CESoPSN
  - MEF-8 (CESoETH)
- Configurable CoS and VLAN
- Packet Delay Variation Compensation Depth up to 256 ms

### Timing

- System clock source can be chosen from Internal, External or E1/T1 Line with SSM
- Automatic/Manual Clock Recovery modes
- Adaptive Clock Recovery for Pseudowires
- Jitter and Wander conforms to G.823/824 for Traffic Interface
- SyncE

### Management

- RJ45 Ethernet management interface
- SNMPv1/v3, compatible to SNMP-based GUI network management systems and supported by CXR-iNET and CXR-iNMS
- Telnet and SSH v2
- Web GUI Configuration
- USB console port with VT-100 menu driven interface
- 64K timeslot inband management
- Support Access Control List (ACL)

### Mechanical and Electrical

- 1U height, 19" rack width. ANSI shelf.
- Up to 7 mini-slots for QX3440 series interface modules.
- All plug-in interface modules are hot swappable
- Up to two  $\pm 48$ Vdc or 100 ~ 240 Vac hot swappable power modules
- Dual DC or AC power with load sharing
- Temperature range from -20° to 65°C
- RoHS compliant

Model	QX3440-E
Chassis	1U
# of Mini-slots	5
# of HS-slots	2 <sup>Note</sup>
Max. E1 Ports	28
Max. T1 Ports	28
Cross-Connect Backplane Capacity	184 Mbps

**Note :** Supports Mini-slot modules via HS-Slot adaptors

\*Future Option

## Description

The CXR-QX3440-E is the latest product in the CXR Access DCS-MUX series that combines various access interfaces and transport over GbE or E1 uplinks. The CXR-QX3440-E supports SAToP(CCPA T1 SAToP\*)/CESoPSN/MEF8 Pseudowire Protocols to transport TDM data streams with timing information over packet switched network.

The CXR-QX3440-E provides full non-blocking DS0 cross-connect matrix for up to 28 x E1/T1 + 64 Bundles. Traffic grooming and segregation between the TDM interfaces and the Pseudowires provides flexibility and efficiency, and makes the CXR-QX3440-E an ideal solution for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications.

With hot-pluggable mini size slots design, the CXR-QX3440-EA provides access for E1, T1, FOM, FXS, FXO, E&M, Magneto\*, C37.94, RS232, X.21, EIA530 and V.35 interfaces. These interfaces are compatible with other CXR products.



# CXR-QX3440-ESWA IP/TDM DCS-MUX MPLS-TP / CE SWITCH

## Features

### Cross Connect Capability

- Support full non-blocking DS0 cross connect matrix between TDM interfaces and TDMoE Pseudowires
- Suitable for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications
- Auto A-law/ $\mu$ -law conversion

### Ethernet Switch

- 10G Switching Capacity
- 4GE SFP and 4 FE/GE dual rate SFP

### Ethernet Services

- E-Line, E-LAN, E-Tree services as defined by MEF 9 and 14 and using VPWS/VPLS\*
- Native Ethernet packets supported
- Encapsulation: PW/LSP (MPLS-TP)\*, VLAN tagging (1Q), VLAN double tagging (Q-in-Q)

### Pseudowires

- Up to 64 concurrent pseudowires
- Encapsulation format
  - SAToP(CCPA T1 SAToP\*)
  - CESoPSN
  - MEF-8 (CESoETH)
- Configurable CoS and VLAN
- Packet Delay Variation Compensation Depth up to 256 ms

### Timing

- System clock source can be chosen from Internal, External or E1/T1 Line with SSM
- Automatic/Manual Clock Recovery modes
- Adaptive Clock Recovery for Pseudowires
- Jitter and Wander conforms to G.823/824 for Traffic Interface
- SyncE

### Management

- RJ45 Ethernet management interface
- SNMPv1/v3, compatible to SNMP-based GUI network management systems and supported by CXR-iNET and CXR-iNMS
- Telnet and SSH v2
- Web GUI Configuration
- USB console port with VT-100 menu driven interface
- 64K timeslot inband management
- Supports RADIUS authentication

### Mechanical and Electrical

- 1U height, 19" rack width. ANSI shelf.
- Up to 7 mini-slots for QX3440 series interface modules.
- All plug-in interface modules are hot swappable
- Up to two  $\pm 48$ Vdc or 100 ~ 240 Vac hot swappable power modules
- Dual DC or AC power with load sharing
- Temperature range from -20° to 65°C
- RoHS compliant

### Network Protections

- MPLS-TP\*, MPLS LSP 1+1/1:1
- MPLS Transport Profile per RFC-5921
- Any Ethernet port can be configured as NNI (MPLS port) or UNI (Ethernet service port)
- Static MPLS LSP label provisioning via NMS
- Pseudo Wire (PW) to support
  - Ethernet Pseudo Wire(VPWS, VPLS, H-VPLS)
  - PDH Pseudo Wire End-2-End Emulation (SAToMPLS,CESoMPLS)
- MPLS-TP OAM
  - Section/LSP/PW TP-OAM using BFD (Per IEEE 8113.2)
- MPLS-TP QoS
  - 64K Granularity Rate Limit Per Flow
  - Ingress/Egress TC/EXP Class Mapping
  - TC/EXP Priority-based Queuing (8 Queues)
  - Tunnel Traffic Engineering CIR/PIR and CBS/PBS Policing/Shaping
  - PW Traffic Engineering CIR/PIR and CBS/PBS Policing/Shaping
  - WRE
  - Strictly Priority / WRR

### Carrier Ethernet (CE)

- L2 Switching/Bridging
- RSTP/MSTP (IEEE 802.1w/1s)
- VLAN 1Q 802.1q/ Q in Q8 802.1ad
- VLAN Operation: Stack/Switch/Strip
- EPL, EVPL, EP-LAN, EPV-LAN, EP-Tree
- EPL-Access, EPVL-Access
- Link Aggregation (802.3ad): Static/LACP

### L3 Routing\*

- Static Route
- RIPv1 and RIPv2
- OSPFv2 and OSPFv3

### VPLS\*

- VPLS bridging
- H-VPLS bridging
- 32K MAC addresses
- 2K VPLS instances per device
- Split horizon to prevent forwarding loops

Model	QX3440-E
Chassis	1U
# of Mini-slots	6
Max. E1 / T1Ports	24
Max. GE Ports	28
Cross-Connect Backplane Capacity	96 Mbps
Packet Switching Capacity	10G

Note : Supports Mini-slot modules via HS-Slot adaptors  
\*Future Option



## QX3440-ESWA Description

The CXR-QX3440-ESWA is the latest product in the CXR Access DCS-MUX series that combines various access interfaces and transport over GbE or E1 uplinks. The CXR-QX3440-ESWA supports SAToP(T1 SAToP\*)/CESoPSN/MEF8 Protocols to transport TDM data streams over packet switched network.

The CXR-QX3440-ESWA provides full non-blocking DS0 cross-connect matrix for up to 24 x E1/T1 + 64 Pseudowires. Traffic grooming and segregation between the TDM interfaces and the Pseudowires provides flexibility, efficiency and makes the CXR-QX3440-ESWA an ideal solution for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications.

The CXR-QX3440-ESWA supports both MPLS-TP\* and Carrier Ethernet functions as Packet Transport Network. In addition to the native Ethernet transport, the CXR-QX3440-ESWA can be used as the gateway of PDH into the PSN network using circuit emulation technologies. The TDM encapsulation technologies supported are TDMoE, TDMoIP, and TDMoMPLS\*. In parallel, the Circuit Emulation supported are CESoPSN (Nx64K) and SAToP (Unframed E1/T1).

With hot-pluggable mini size slots design, the CXR-QX3440-ESWA provides access for E1, T1, FOM, FXS, FXO, E&M, Magneto\*, C37.94, RS232, X.21 and V.35 interfaces. These interfaces are compatible with other CXR products.

Table of Tributary Modules Applicable to QX3440-E and QX3440-ESWA

Mini-Slot Tributary Modules	Description	Supported by QX3440-E	Supported by QX3440-ESWA
1T1	1-channel T1 interface card	✓	✓
1E1(E75)	1-channel E1 plug-in card with 75ohm	✓	✓
1E1(E120)	1-channel E1 plug-in card with 120ohm	✓	✓
4E1(M4E75)	Mini Quad E1 plug-in card with 75ohm	✓	✓
4E1(M4E120)	Mini Quad E1 plug-in card with 120ohm	✓	✓
M1C37	1-channel C37.94 mini plug-in card	✓	✓
Router-A	2-LAN ports/64WAN port router/bridge plug-in card	✓	✓
FOM	Fiber Optical Module	✓	✓
1X.21 (1X21)	1-channel X.21 plug-in card	✓	✓
1V.35 (1V35)	1-channel V.35 plug-in card	✓	✓
1RS232 (1RS232)	1-channel RS232 plug-in card	*	*
3RS232a	3-channel RS232 plug-in card	x	✓
QEMA	4-channel E&M voice plug-in card	✓	✓
QFXSA	4-channel FXS voice plug-in card	✓	✓
QFXO	4-channel FXO voice plug-in card	✓	✓
QMAGA	4-channel Magneto voice plug-in card	*	*
ECA	Echo Cancellation plug-in card	✓	✓
ABRA	Analog Bridging plug-in card	✓	*
CLKa	Common plug-in card	x	✓

**Note:** ✓ = Supported      \* = Future Option      x = Not Supported


### Ordering Information

To specify options, choose from the list below:

Main Unit		
Model	Description	Note
QX3440-E	1U height rack chassis with fixed CPU for QX3440-E. <ul style="list-style-type: none"> <li>Supports cross-connect and TDMoE onboard.</li> <li>Supports SAToP (CCPA T1 SAToP*), CESoPSN, and MEF-8</li> <li>Up to 64 Pseudowires</li> <li>Supports SyncE</li> <li>Supports Web GUI configuration for selected plug-in cards (with WEBLIC option)</li> </ul>	<ul style="list-style-type: none"> <li>QX3440-E chassis type <b>CHEA</b> with CPU.</li> <li>19"/23" ear mount included.</li> <li>Please order SFP modules separately from SFP optical modules brochure.</li> <li>Includes two High Speed Slot Adapters for mini plug-in cards to be used in H1 and H2 slots.</li> <li>With fixed QX3440-CCPA controller</li> </ul>
QX3440-E-NPW	1U height rack chassis with fixed CPU for QX3440-E. <ul style="list-style-type: none"> <li>Supports Web GUI configuration for selected plug-in cards (with WEBLIC option)</li> </ul>	<ul style="list-style-type: none"> <li>QX3440-E chassis type <b>CHEA</b> with CPU.</li> <li>19"/23" ear mount included.</li> <li>Includes two High Speed Slot Adapters for mini plug-in cards to be used in H1 and H2 slots.</li> <li>With fixed QX3440-CCPA-NPW controller</li> </ul>
QX3440-ESWA	1U height rack chassis with fixed CPU for QX3440-E. <ul style="list-style-type: none"> <li>4 x GbE and 4 x FE/GbE SFP interface onboard.</li> <li>Built-in L2 switch and one GbE RJ45 SNMP.</li> <li>Support cross-connect</li> <li>Supports SAToP, CESoPSN, and MEF-8 formats for TDMoE uplink, up to 64 Pseudowires.</li> <li>Supports SyncE</li> <li>Supports Web GUI configuration for selected plug-in cards (with WEBLIC option)</li> </ul>	<ul style="list-style-type: none"> <li>QX3440-ESWA chassis type <b>CHEB</b></li> <li>19"/23" ear mount included.</li> <li>Please order SFP modules separately from SFP optical modules brochure.</li> <li>With fixed QX3440-CCPB-8GEHSWa controller.</li> <li>Please order SCLKa/SCLKb/SCLKc module for clock in/out, and alarm in/out.</li> </ul>

License		
Model	Description	Note
QX3440-LCT	<ul style="list-style-type: none"> <li>Feature activation license for QX3440-E CPU card to support LCT Graphical Configuration software</li> </ul>	<ul style="list-style-type: none"> <li>License based on serial number. Supports GUI graphic PDH/DS0 cross connect. Free Windows installation software.</li> </ul>
QX3440-WEBLIC	<ul style="list-style-type: none"> <li>Feature activation license for QX3440-E/ESWA CPU card to web Graphical Configuration software</li> </ul>	<ul style="list-style-type: none"> <li>License based on serial number. Supports Web GUI configuration.</li> </ul>

Mini Plug-in Module (Select 1 to 7 cards from list below)		
CXR-QX34DD-T1	1-channel T1 interface card	
CXR-QX34DD-E1-BNC	1-channel of E1 plug-in card w/ 75 ohm	
CXR-QX34DD-E1	1-channel of E1 plug-in card w/ 120 ohm	
CXR-QX34DD-MQE1-BNC	Mini Quad E1 plug-in card with 75 ohm	Includes a three meter conversion cable (3m cable 8 BNC M / DB25)
CXR-QX34DD-MQE1	Mini Quad E1 plug-in card with 120 ohm	Includes a three meter conversion cable (3m cable 8 RJ45 / DB25).
CXR-QX34DD-M3794-LSFOM	1- channel C37.94 plug-in mini card	For <b>LSFOM</b> option, please refer to the table below for detail information.
CXR-QX34DD-RTA	2-LAN ports/64 WAN port router/bridge plug-	

	in card	
CXR-QX34DD-4E1FO-opt	Fiber Optical plug-in card	For <b>opt</b> option, please refer to the table below for detail information
CXR-QX34DD-V35	1-channel V.35 plug-in card	
CXR-QX34DD-X21	1-channel X.21 plug-in card	
CXR-QX34DD-V24	1-channel RS232 plug-in card	
CXR-QX34DD-QEMA-xx	Jumper selectable: 2/4 WIRE; A/B side Quad E&M voice card, complied with IEEE1613 standard.	<ul style="list-style-type: none"> <li>For -48 Vdc and AC (100 to 240 Vac) power supply only.</li> <li>For <b>xx</b> option, please indicate Tn for Type.</li> </ul>
CXR-QX34DD-QFXO	Quad FXO voice plug-in card used with 4 RJ11	<ul style="list-style-type: none"> <li>GS = Ground Start</li> <li>MP = Metering Pulse Receive 12/16 KHz</li> <li>For -48 Vdc and AC (100 to 240 Vac) power supply only.</li> </ul>
CXR-QX34DD-QFXO-GS	Quad FXO with GS plug-in card used with 4 RJ11	
CXR-QX34DD-QFXO-GM	Quad FXO with GS and MP 16 KHz voice plug-in card used with 4 RJ11	
CXR-QX34DD-QFXS-A	Quad FXSA voice plug-in card	<ul style="list-style-type: none"> <li>Jumper setting options: Loop Start, Ground Start (GS), Metering Pulse Transmit 12/16 KHz (MP).</li> </ul>
CXR-QX34DD-QFXS-A-GS	Quad FXSA with GS plug-in card	
CXR-QX34DD-QMAGA	Quad channel magneto plug-in card	
<b>DATA Processing</b>		
CXR-QX34DD-ECHO-CANC	Echo canceller card	
CXR-QX34DD-ABRA	Analog Bridge Card	
<b>Accessories</b>		
<b>Power Module</b>		
CXR-QX3440-E-PWAC	Single AC plug-in power supply (100 to 240 Vac, 50/60 Hz) - SAC	<ul style="list-style-type: none"> <li>For AC, choose an appropriate power cord.</li> <li>Order two DC or two AC or (one DC and one AC) power modules for redundancy.</li> </ul>
CXR-QX3440-E-PW48	Single -48 Vdc (-36 to -72 Vdc) Power Module - SDPC	
<b>HS-SLOT ADAPTER</b>		
CXR-QX3440E-ACC-HSADT	Mechanical adapter for HS-Slot.	
<b>Mounting Ear</b>		
19"/23" ear mounts	A pair of 19"/23" ear mounts is supplied as part of standard package. <b>Note:</b> For other sizes, please contact your nearest CXR sales representative.	
<b>Conversion Cables (All conversion cables are RoHS compliant)</b>		
CXR-ACC-CAB-HDB15M-100-RJ48M	One HD-sub 15 pin/Male connector to one RJ48/Male connector; Length: 100 cm	For external clock interface connection
CXR-QX34DD-ACC-CAB-DB25M-300-8BNM	DB25/Male to eight BNC/Male cable; Length: 300 cm	Used in CXR-QX3440-M4E75- <b>G</b>
CXR-QX34DD-ACC-CAB-DB25M-300-4RJ48M	DB25/Male to four RJ48C/Male cable; Length: 300 cm	Used in CXR-QX3440-M4E120- <b>G</b> and CXR-QX3440-M4T1- <b>G</b> plug-in card
CXR-QX34DD-ACC-CAB-DB25M-30-1M34F	DSUB-25pin/Male to M34/Female V.35 Conversion cable Length: 30 cm	Used in CXR-QX3440-1V35- <b>G</b> plug-in card
<b>Blank Panels (All blank panels are RoHS compliant)</b>		
CXR-QX3440E-PAN-PW	Blank Panel for Power Supply Slot (flat)	
CXR-QX3440E-PAN-MSLOT	Blank Panel for mini Slot A-E (flat)	
CXR-QX3440E-PAN-HSLOT	Blank Panel for H1 and H2 slot (flat)	
<b>Clock and Alarm</b>		
CXR-QX3440-SCLKa	CLKa Mini Slot plug-in card. - Clock in x2, clock out x1 - Alarm in x1, Alarm out x2	Applicable to QX3440-D-CHPDa and QX3440-ESWA-CHEB*.
CXR-QX3440-SCLKb	CLKb Mini Slot plug-in card. - Fuse ALM x1	Applicable to QX3440-D-CHPDa and QX3440-ESWA-CHEB*.

	- Critical ALM x1, MJR ALM x1, MIN ALM x1 - Clock in x2, clock out x2	
CXR-QX3440-SCLKc	CLKc Mini Slot plug-in card. - For 1588 CLK in/out (1 x TOD, 1PPS in/out, and 1 x BITS in/out)	Applicable to QX3440-ESWA-CHEB*.

\*Future Option

**For mini LS Optical module (mini C37.94):**

■ Where **LSFOM** is to select **LS-Fiber Optical Module** option, each module has 5 letters.

LSFOM Code	Mode		Data Rate		Description Wave Length		Distance		Connector	
	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
ZHHTT	Z	Multi-mode	H	155 M	H	820nm	T	2km	T	ST connector
QHATT	Q	Multi-mode	H	155 M	A	850nm	T	2km	T	ST connector
NFB3T	N	Single mode	F	125 M	B	1310nm	3	30km	T	ST connector
QFBTT	Q	Multi-mode	F	125 M	B	1310nm	T	2km	T	ST connector
NHC2S	N	Single mode	H	155 M	C	1550nm	2	20km	S	SC connector

**For FOM card**

■ Where **opt** is used to select optical module type (All optical modules are RoHS compliant):

opt =	Description	Note
SM30-SC	Single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km	Use dual fiber Units delivered ITU-T G.957 application code
SM50-SC	Single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km	
SM30-FC	Single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km	
SM205SC	Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km	
SM100SC	Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km	
SM30W13	Single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km	1310 nm from master to slave Order <b>SM30W13</b> to use with <b>SM30W15</b> Use 1 fiber ITU-T G.957 application code
SM30W15	Single optical module with single bi-directional fiber (slave), 1310 nm receive and 1550 transmit, SC optical connector, 30 km	1550 nm from slave to master Order <b>SM30W15</b> to use with <b>SM30W13</b> Use 1 fiber ITU-T G.957 application code

**Note:** For other special optical modules, please contact your nearest CXR sales representative.

***QX3440-E Controller on-board CCPA Combo Gigabit Ethernet (GbE) Interface for TDMoE Services***

Number of Ports	2
Speed	10/100/1000M bps
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection
<b><i>Ethernet Function</i></b>	
Basic Features	MDI/MDIX for 10/100/1000M BaseT auto-sensing Ping function contained ARP
<b><i>Pseudowire</i></b>	
Concurrent PW	Up to 64
Encapsulation Format	SAToP(CCPA T1 SAToP*), CESoPSN, MEF-8 (CESoETH)
QoS	User configurable 802.1p CoS, ToS in out-going IP frame
<b><i>Clock Source</i></b>	Internal, Line Interface, External (E1/T1/2048 KHz), Adaptive Clock Recovery for Pseudowires, SyncE
<b><i>Alarm Relay</i></b>	Max. Current: 1A for 24VDC, 0.625A for 48VDC Fuse alarm, performance alarm
<b><i>Management</i></b>	
Console	Micro USB Connector User Interface: Menu driven VT-100
Ethernet	2 Combo GE port, Connector: RJ45 & SFP SNMPv1/v3, Telnet/SSH, support Radius client function
Inband Management	Inband 64 Kbps, support HDLC/PPP
<b><i>System Configuration Parameters</i></b>	Active Configuration, Stored Configuration, and Default Configuration (Stored in Non-volatile Memory)
<b><i>Performance Monitor</i></b>	
Performance Registers	Last 24 hours performance in 15 minute intervals and last 7 days in 24 hour summaries
Separate Registers	Network, user, and remote site
Performance Reports	Reports include E1 Bursty Errored Second, Severe Errored Second, Degraded Minutes. Also available in Statistics (%)
Alarm Queue	To record the latest alarm type, location, date and time
Threshold	Bursty Seconds, Severely Errored Second, Degraded Minutes
<b><i>Diagnostics</i></b>	
Loopback	E1/T1 interface (Line Loopback, Payload Loopback, Local Loopback), DTE Loopback (DTE-to-DTE, DTE to Line)
Test Pattern	For Controller: 2 <sup>20</sup> -1, 2 <sup>15</sup> -1, 2 <sup>11</sup> -1, 2 <sup>9</sup> -1, and 4-byte user define pattern
<b><i>Front Panel</i></b>	
Controller LED Indicators	Power, ACTIVE, ALARM



**QX3440-ESWA Controller on-board CCPB-8GEHSWa**

Number of Ports	8SFP
Speed	4 ports 1000Mbps and 4 ports 100/1000Mbps
<u>Ethernet Function</u>	
Basic Features	Dual rate SFP with autodetection Ping function contained ARP
<u>Pseudowire</u>	
Concurrent PW	Up to 64
SAToP	S Unframed E1/T1 packets
CESoPSN	Fractional E1/T1 (N x DS0) packets
<u>Clock Source</u>	
	Internal, Line Interface, External (E1/T1/2048 KHz from SCLKa, SCLKb, SCLKc module), 1PPS/TOD from SCLKc, Adaptive Clock Recovery for Pseudowires, SyncE
<u>Alarm Relay</u>	
	Max. Current: 1A for 24VDC, 0.625A for 48VDC Fuse alarm, performance alarm from SCLKa SCLKb
<u>Encapsulation</u>	
TDM	over MPLS, over Carrier Ethernet, over IP (using pseudowire)
IP	over MPLS (using pseudowire)
Ethernet	VPWS, VPLS (using pseudowire)
<u>Management</u>	
Console	Electrical : RS232, connectot DB9 Female, Micro USB Connector User Interface: Menu driven VT-100
Ethernet	GE port, Connector: RJ45 SNMPv1/v3, Telnet/SSH, support Radius client function , Web GUI support
Inband Management	Inband 64 Kbps, support HDLC/PPP
<u>System Configuration Parameters</u> Active Configuration, Stored Configuration, and Default Configuration (Stored in Non-volatile Memory) Configuration Upload/Download through TFTP/SFTP	
<u>Performance Monitor</u>	
Performance Registers	Last 24 hours performance in 15 minute intervals and last 7 days in 24 hour summaries
Separate Registers	Network, user, and remote site
Performance Reports	Reports include E1 Bursty Errored Second, Severe Errored Second, Degraded Minutes. Also available in Statistics (%)
Alarm Queue	To record the latest alarm type, location, date and time
Threshold	Bursty Seconds, Severely Errored Second, Degraded Minutes
<u>Diagnostics</u>	
Loopback	E1/T1 interface (Line Loopback, Payload Loopback, Local Loopback), DTE Loopback (DTE-to-DTE, DTE to Line)
Test Pattern	For Controller: 2 <sup>20</sup> -1, 2 <sup>15</sup> -1, 2 <sup>11</sup> -1, 2 <sup>9</sup> -1, and 4-byte user define pattern
<u>Front Panel</u>	
Controller LED Indicators	Power, ACTIVE, ALARM

**Transportation Cards**

**Network Line Interface - T1**

Line Rate	1.544 Mbps ± 50 bps	Output Signal	DSX1
Line Code	AMI or B8ZS	Framing	D4/ESF (selectable)
Input Signal	ABAM cable length up to 655 feet	Connector	RJ48C

**Network Line Interface - E1**

Line Rate	2.048 Mbps ± 50 ppm	Framing	ITU G.704
Line Code	AMI or HDB3	Connector	BNC/RJ48C
Input Signal	ITU G.703	Electrical	75 ohm Coax/120 ohm twisted pair
Output Signal	ITU G.703	Jitter	ITU G.823

**Network Line Interface - Mini 4E1**

Line Rate	2.048 Mbps ± 50 ppm	Framing	ITU G.704
Line Code	AMI or HDB3	Connector	DB25S
Input Signal	ITU G.703	Electrical	75 ohm Coax/120 ohm twisted pair
Output Signal	ITU G.703	Jitter	ITU G.823

**Network Line Interface - Mini 4T1**

Line Rate	1.544 Mbps ± 32 ppm	Framing	D4/ESF
Line Code	AMI/B8ZS	Connector	DB25S
Input Signal	ITU G.703 DSX-1 0dB to -30dB w/ALBO	Output Signal	ITU G.703 DSX-1 w/o, -7.5, -15dB LBO ITU G.703 DSX-1 w/short (0-110, 110-220, 220-330, 330-440, 440-550, 550~660 feet)
Jitter	AT&T TR 62411	Pulse Template	AT&T TR 62411
Data Rate	n * (64) Kbps (n=1-24)		

**Physical /Electrical**

Dimensions	442 x 44 x 297 mm (W×H×D)	
Power	Single/ Dual -48 Vdc (-36 to -72 Vdc) Single/ Dual AC plug-in power supply (100 to 240 Vac, 50/60 Hz)	
Temperature	Operating	Storage
	-20 to 65°C	-30 to 70°C
Weight	Net Weight	Max. Weight
	5.5 Kg (12.13lbs)	7.5 Kg (16.53lbs)
Humidity	0-95%RH (non-condensing)	
Mounting	Desk-top stackable, 19" /23" rack mountable	
Power Consumption	QX3440E : 30 Watts, maxi 60W, with full interface. QX3440ESWA : 80W maxi	

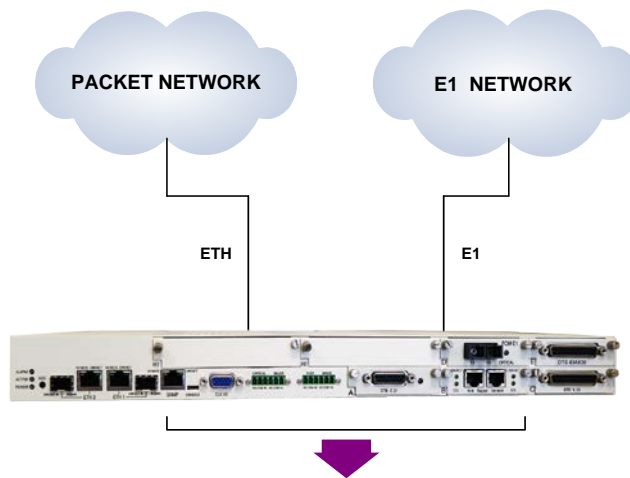
**Certification**

EN55032 Class A, EN50024, FCC Part 15 Class A, EN62368-1

**Compliance**

ITU G.703, G.704, G.706, G.732, G.736, G.823, G.826, G.711, G.712, G.775, O.151, V.11, V.28, V.54  
IETF SNMP v.3 (RFC2571~2575), ITU-T Rec.G.821, ITU-T Rec.G.827

## Application Illustration



### Mini Slot Plug-in Cards

- 1-channel T1 interface card
- 1-channel E1 plug-in card with 75ohm
- 1-channel E1 plug-in card with 120ohm
- Mini Quad E1 plug-in card with 75ohm
- Mini Quad E1 plug-in card with 120ohm
- Mini Quad T1 plug-in card
- 1-channel C37.94 mini plug-in card
- 1-channel X.21 plug-in card
- 2-LAN ports/64WAN port router/bridge plug-in card
- Fiber Optical Module
- 1-channel V.35 plug-in card
- 1-channel EIA530 plug-in card
- 1-channel RS232 plug-in card
- 4-channel E&M voice plug-in card
- 4-channel FXS voice plug-in card
- 4-channel FXO voice plug-in card
- Echo Cancellation plug-in card
- Analog Bridging plug-in card



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