

Digital Energy Gridcom DXC Family

Access and Transmission Multiplexer

FAST AND RELIABLE COMMUNICATIONS FOR MISSION CRITICAL OPERATIONAL SERVICES

Hybrid platforms to enable aggregation and transport of all operational services over optical fibers

Ready for Future Network

- Cost effective solution
- High quality of service
- Very high modularity
- High level of reliability via full redundancy
- SNMP management
- High board density
- IEC 61850 compatible
- Optical interfaces
- Ethernet switching
- IP routing functions
- TDMoIP for multiplexing on native Gigabit Ethernet
- Tested for harsh substation
 environments
- 10G interfaces
- MPLS-TP

Overview

Reliable and fast communication is vital for continuous operation of power delivery systems and mission-critical operational services.

For many years now, telecommunication networks have been undergoing significant changes. Increased bandwidth requirements and a large variety of services to be transported have led to much more versatile but also complex access and transmission equipment, adapted for the next generation of networks.

Gridcom DXC/eDXC/DXC-S is more than a conventional access and transmission platform, and is based on a modular and evolutive configuration platform.

The range of Gridcom DXC/eDXC interfaces cover all needs from conventional (FXO, FXS, 2/4W E&M, RS232, V.35, V.36, X.21, RS485, 64 k G.703) to more sophisticated configurations oriented toward new data network architectures such as Ethernet, IP and MPLS-TP.

Gridcom DXC/eDXC also includes a standard C37.94 interface to interconnect protection and teleprotection devices through optical fibre, G.703 Co-directional and 1/0 dry contact alarms.





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Fulfilling Utility Requirements

GE offers a new generation of robust and reliable access and transmission multiplexers:

- Access cross-connect Gridcom DXC (PDH)
- Enhanced Digital cross-connect Gridcom eDXC (PDH/SDH/MPLS-TP)
- Transport cross-connect Gridcom DXC-S (SDH/MPLS-TP)

The **Gridcom DXC/eDXC** offers generic slots capable of supporting such interfaces as E1/T1, Ethernet 10/100Mb compatible with IEC 61850, xDSL, G.703, RS232, V35, RS422, RS285, X21, 2/4W E&M, FXO, FXS, Terminal Server, C37.94, as well as short-and long-haul optical interfaces. All vital parts, such as the power supply and the processing board can also be 1+1 protected.

The **Gridcom eDXC/DXC-S** provides enhanced capacities on transmission STM-1/4/16, MPLS-TP, Gigabit Ethernet, 10 Gigabit Ethernet connectivity and Gridcom eDXC supports all PDH boards available on Gridcom DXC equipment.

Reliability/ Availability

By concept and design, **Gridcom DXC/eDXC/DXC-S** is a cost effective solution to match a high level of availability and harsh environmental constraints.

It offers a modular approach in terms of protection mechanisms like controller redundancy, shared power supply units as well as 1+1 protection for the 2Mbit/s and optical interfaces, providing a suitable solution to critical applications.

Powerful Management System

- Different management solutions are available, answering to different network complexities and customer maintenance organizations for remote configuration and management:
- **Gridcom iNET:** Element Management Layer, this solution responds to a centralized monitoring of equipment with Graphical User Interface (GUI).
- **Gridcom INMS:** Network Management Layer is the right solution to fully operate a complex network. In addition to all conventional features usually proposed for the backbone level (Security, graphical user interface, statistics, etc), INMS includes versatile tools for automatic path creation and configuration of equipment simply by a simple "mouse click."
- High-availability schemes are available for both Gridcom iNET and INMS.
- All equipment are SNMP native and offer direct compatibility with the GE telecom management system **Sentinel.**



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Access and Transmission Multiplexer

Gridcom DXC



Access cross-connect multiplexer

Interfaces (DXC/eDXC)

E1 (2Mbps) Interface Boards G703/G704:

- Line rate: 2.048 Mbps +/- 50 ppm
- Line code: AMI or HDB3
- Line impedance: 75/120 Ohms
- Single E1 board (DXC only)
- Small Quad E1 board (DXC only)
- Quad E1 board

G.SHDSL

- Number of ports: 2 or 4
- Line code: 16-TCPAM, full duplex with adaptive echo cancellation
- Line rate G.shdsl: n * 64 kBps (n<=32)

Optical Line Interface Boards

- Type of board: 1/2 slot (DXC only)
- Line rate: 4*2 Mbps
- Maximum attenuation: 30dB (1310 nm)
- Maximum attenuation: 34dB (1550 nm)

TDMolP Interface Board

- 2*10/100/1000 Base T (RJ45) + 2*combo GbE/SFP
- Processing: TDMoIP, SAToP, CESoPSN
- L2 Switch Protocol: RSTP, VLAN, QoS, QinQ
- Protection: Link aggregation

Others Aggregate Interfaces

• T1 (1.5 Mbps) board

Gridcom e-DXC



Combo PDH/SDH/MPLS multiplexer

Voice User Interface Analog 2/4 Wire E/M Interface Board

- Number of ports: 8
- Encoding A-law or m-law
- Impedance Balanced 600 or 900W
- Longitudinal rejection 55 dB
- Loss adjustment -21 to +10 dB / 0.1 dB step
- Signal/Distorsion > 46 dB with 1024 Hz, 0 dBm input
- Frequency response ITU-T G.712

Analog FXS Interface Board

- Number of ports: 12
- Encoding A-law or m-law
- Impedance Balanced 600 or 900W
- Tx/Rx level adjustment -21 to + 10dB / 0.1dB dB step
- Frequency response ITU-T G.712
- · Loop resistance Min. 300W, Max. 1800W
- Ringing Frequency 16.5 Hz, 20 Hz, 25 Hz or 50 Hz (selectable)
- Voltage 38 Vrms, 64 Vrms, or 85 Vrms (selectable)

Analog FXO Interface Board

- Number of ports: 12
- Encoding A-law or m-law
- Impedance Balanced 600 or 900W
- Tx/Rx level adjustment -21 to +10 dB / 0.1 dB dB step
- Frequency response ITU-T G.712

Gridcom DXC-S



SDH/MPLS transmission multiplexer

Data Interfaces

Universal Data Interface Board

- N*64 kbps V.35/V.36 and X.21 boards
- Number of ports: 6
- Data rate for V.35/V.36 N*64 kBps (1<N<31)
- Data rate for X.21 56 or 64 kBps* N (N=1 to 24/31)

RS232 Data Boards

- Number of ports: 8
- Data rate
- Synchronous 1.2, 2.4, 4.8, 9.6, 38.4, 48 or 64 K
- Asynchronous 1.2, 2.4, 4.8, 9.6, 19.2 Kor 38.4 K Note: X50 sub-rate multiplexing supported

Data Interface at 64 k (G.703)

- Number of ports: 8
- Data rate 64 kBps (co-directional)

Router Boards

- Physical interface 10/100 BaseT
- Routing protocol Static, RIP-I/II, OSPF
- Date rate N*64Kup to TI/EI capacity.
- Supported protocol TCP/IP, (ML)PPP, HDLC, Frame Relay
- Modularity 2 or 8 (1/2 or single slot) LAN ports

Optical (C37.94) Subsystems

- Number of ports: 4
- Optical Signal 820 nm
- Line Rate n*64 kBps (n= 1 to 12)

Dry Contact

- Input: 8
- Output: 8

Others Data Interfaces

- ATM/Frame Relay
- Point-to-Multipoint for RS232
- RS422/RS485

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Access and Transmission Multiplexer

High Speed Interfaces (eDXC/DXC-S)

E1 (2Mbps) Interface Boards G703/G704

Line rate: 2.048 Mbps +/- 50 ppm

- Line code: AMI or HDB3
- Line impedance: 75/120 Ohms
- Number of ports: 16/32/63 E1 board
- Equipment protection: 1+1 EPS
- Line protection: 1+1 APS

STM1/4 Interface Boards

- Number of interfaces 2 (SFP)
- Line rate: 155/622 Mbps
- Protection: MSP/SNCP

STM16 Interface Boards

- Number os interfaces: 2 (SFP)
- Line rate: 2.5 Gbps
- Protection: MSP/SNCP

PTN Interface boards (MPLS-TP)

- 8*GbE (SFP)
- 3*10G (SFP)

PTNext interface board (MPLS-TP)

- 10*GbE (SFP)
- 1*10G (SFP)

Ethernet Boards (EoS)

- Physical interface 4* FE/GE (RJ45) and 4* FE/GE (SFP)
- L2 protocol: RSTP, VLAN
- Processing: VCAT, GFP, LAPS and LCAS

Others Data Interfaces

E3 interfaces

Operating Condition

- Power Supply:
 - DC module (DXC)
 Single/ Dual -24 Vdc: -18 to -36 Vdc, 150 Watts max
 Single/ Dual -48 Vdc: -36 to -75 Vdc, 150 Watts max.
 Single/ Dual -125 Vdc: -40 to -150 Vdc, 100 Watts max
 - DC module (eDXC/DXC-S) Single/ Dual -48 Vdc: -40 to -72 Vdc, 500 Watts max.
- Operating temperature: DXC/eDXC/DXC-S: -20°C to +65°C*
 * if PTN10G is used, operating temperature is -20 to 55°C
- Humidity: O to 95% at 23°C (non condensing)
- Storage temperature: -30°C to +70°C

Mechanical Characteristics

DXC

- Dimensions: 432.4 x 220 x 223.5 mm (W.H.D)
- · Mounting: 19" rack mountable 5U height

eDXC /DXC·S

- Dimensions: 433 x 264 x 223.5 mm (WxHxD)
- Mounting: 19" rack mountable 6U height

Power Utility Standards Compliance

- IEC TS 61000-6-5 compliant(DXC): "Immunity for power station and substation environments"
- IEC 61850-3 / IEEE 1613

World Class Expertise

• **Gridcom DXC/eDXC/DXC·S** brings an outstanding level of reliability and quality of service to access and transmission networks, ensuring fast, simple and reliable installation and configuration.

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