



Digital Energy Gridcom DXC

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

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.



Digital Energy Gridcom DXC

Access and Transmission Multiplexer

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)
- Transport cross-connect **Gridcom DXC-S** (SDH)

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, ISDN, RS232, V35, 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-5** provides enhanced capacities on transmission STM-1/4/16, MPLS-TP, Gigabit Ethernet connectivity and e-terragridcom eDXC supports all PDH boards available on e-terragridcom DXC equipment.

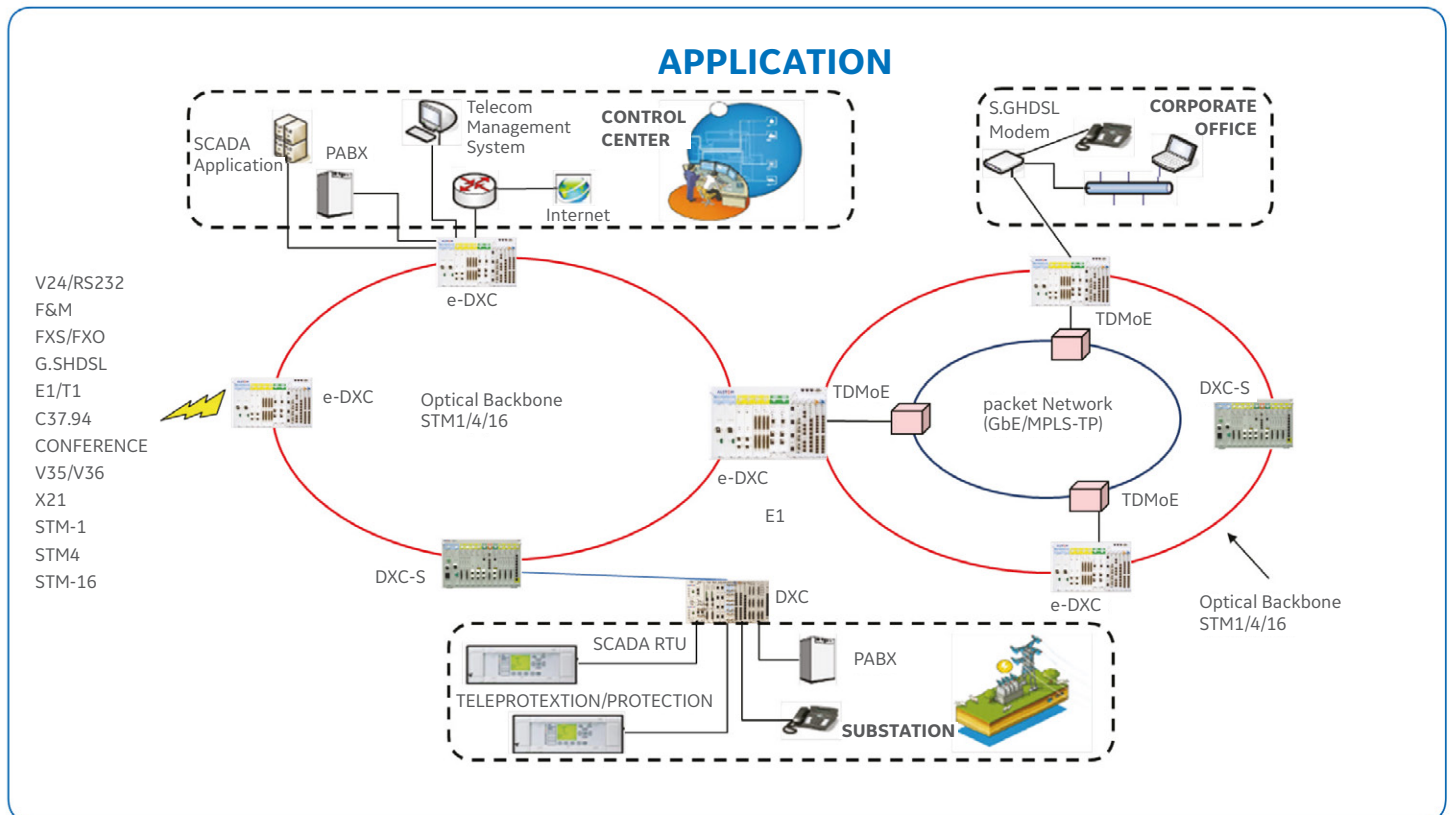
Reliability/ Availability

By concept and design, **Gridcom DXC/eDXC/DXC-5** is a cost effective solution to match a high level of availability and harsh environmental constraints.

In addition, 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:
- AEM: Element Management Layer, this solution responds to a centralized monitoring of equipment with Graphical User Interface (GUI).
- **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 AEM and **INMS**.
- All equipment are SNMP native and offer direct compatibility with the GE telecom management system **Sentinel**.



Digital Energy Gridcom DXC

Access and Transmission Multiplexer

Gridcom DXC



Access cross-connect multiplexer

Interfaces (DXC/eDXC)

EI (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:
- Single EI board (1/2 slot - DXC only)
- Quad EI board (1 slot)
- Small Quad EI board (1/2 slot - DXC only)
- Equipment protection: 1+1 EPS
- Line protection:

G.SHDSL

- Type of board: Single slot
- Number of ports: 2 or 4
- Line code: 16-TCPAM, full duplex with adaptive echo cancellation
- Line rate G.shdsl: $n * 64 \text{ kbps}$ ($n \leq 32$)

Optical Line Interface Boards

- Type of board: 1/2 slot (DXC only)
- Line rate: 4*2 Mbps
- Attenuation range: 1310 nm 0 to 19 dB or 29 dB
- Attenuation range: 1550 nm 0 to 17 dB or 32 dB

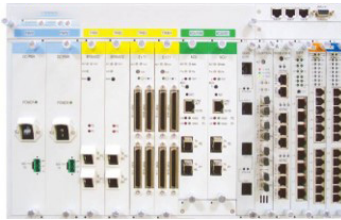
TDMoIP Interface Board

- Type of board: 1 slot
- Number of ports: 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

- TI (1.5 Mbps) board

Gridcom e-DXC



Combo PDH/SDH multiplexer

Voice User Interface

Analog 2/4 Wire E/M Interface Board

- Type of board: Single slot
- Number of circuit: 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/Distortion > 46 dB with 1024 Hz, 0 dBm input
- Frequency response: ITU-T G.712

Analog FXS Interface Board

- Type of board: Single slot
- Number of circuit: 12
- Encoding: A-law or m-law,
- Impedance: Balanced 600 or 900W
- Tx/Rx level adjustment: -21 to +10 dB / 0.1 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

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

Others Voice Interfaces

- Voice conference card

Gridcom DXC-S



SDH transmission multiplexer

Data Interfaces

Analog 2/4 Wire E/M Interface Board

- N*64 kbps V.35/V.36 and X.21 boards
- Type of board: double slot
- Number of circuit: 6
- Data rate for V.35/V.36: $N * 64 \text{ kbps}$ ($1 < N < 31$)
- Data rate for X.21: 56 or 64 kbps*n ($n = 1$ to 24/31)

RS232 Data Boards

- Type of board: Single (8 ports)
 - 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 K or 38.4 K
- Note: X50 sub-rate multiplexing supported

Data Interface at 64 k (G.703)

- Type of board: Single slot
- Number of circuit: 8
- Data rate: 64 kbps (co-directional)

Router Boards

- Physical interface: 10/100 BaseT
- Routing protocol: Static, RIP-I/II, OSPF
- Data rate: $N * 64 \text{ Kbps}$ up to TI/EI capacity.
- Supported protocol: TCP/IP, (ML)PPP, HDLC, Frame Relay
- Modularity: 2 or 8 (1/2 or single slot) LAN ports

Terminal Server

- Type of board: 1/2 slot
- Number of ports: 1 Async and 2 Async/Sync RS232
- Data rate: Async: 1.2, 2.4, 4.8, 9.6, 19.2, 38.4 K; Sync: 64 K

Terminal server

- Layer 2 protocol: PPP, SLIP, Raw data
- Routing protocol: RIP 1/11, Static

Digital Energy

Gridcom DXC

Access and Transmission Multiplexer

Optical (C 37.94) Subsystems

- Type of board Single Slot
- Number of interfaces 1 or 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

High Speed Interfaces (eDXC/DXC-S)

El (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 El board
- Equipment protection: 1+1 EPS
- Line protection: 1+1 APS

Optical Line Interface Boards

- Type of board: 1 slot
- Number of interfaces 7 (SFP)
- Line rate: 4*2 Mbps
- Attenuation range : 1310 nm Oto 19 dB or 29 dB
- Attenuation range: 1550 nm Oto 17 dB or 32 dB

STMI/4 Interface Boards

- Type of board: 1 slot
- Number of interfaces 2 (SFP)
- Line rate: 155/622 Mbps
- Protection: MSP/SNCP

STM16 Interface Boards

- Type of board: 1 slot
- Number os interfaces: 2 SFP
- Line rate: 2.5 Gbps
- Protection: MSP/SNCP

PTN Interface Boards

- 8*GbE (RJ45)
- 3* 10G (SFP)

Ethernet Boards (EoS)

- Physical interface 8 FE and 1 GE
- With or without L2 switch
- L2 protocol: RSTP, VLAN
- Processing: VCAT, GFP, LAPS and LCAS
- Equipment protection: 1+1 EPS

Others Data Interfaces

- E3 interfaces

Operating Condition

- Power Supply:
- DC module -40/-150 Vdc (DXC only) -36 V/-72 Vdc (eDXC/DXC-S) AC and DC coexistent module (DXC-S) 90 to 240 Vac, 50/60 Hz, -48 Vdc (-36 to -72 Vdc)
- Operating temperature: -s0c to 55°C (DXC) 0°C to 50°C (eDXC/DXC-S)
Humidity: Oto 95% at 23°C (non condensing)
- Storage temperature: -25°C to +55°C

Mechanical Characteristics

DXC

- Dimensions: 435 x 225.5 x 220 mm (WxHxD)
- Mounting: 19" rack mountable - SU 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.

Contact Us

ge.com/digital/sales-contact-me

© 2019, General Electric Company. GE Proprietary Information - This document contains General Electric Company (GE) proprietary information. It is the property of GE and shall not be used, disclosed to others or reproduced without the express written consent of GE, including, but without limitation, in the creation, manufacture, development, or derivation of any repairs, modifications, spare parts, or configuration changes or to obtain government or regulatory approval to do so, if consent is given for reproduction in whole or in part, this notice and the notice set forth on each page of this document shall appear in any such reproduction in whole or in part. The information contained in this document may also be controlled by the US export control laws. Unauthorized export or re-export is prohibited. This presentation and the information herein are provided for information purposes only and are subject to change without notice. NO REPRESENTATION OR WARRANTY IS MADE OR IMPLIED AS TO ITS COMPLETENESS, ACCURACY, OR FITNESS FOR ANY PARTICULAR PURPOSE. All relative statements are with respect to GE technology unless otherwise noted.