

# e-terra*gridcom* DXC

## Multiplexer

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

### MAIN FEATURES

- 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

## Access and transmission **multiplexer**

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.

### FLEXIBILITY

The **e-terra*gridcom* DXC/eDXC/DXC-S** is more than a conventional access and transmission platform, based on a modular and evolutive configuration platform:

### ADVANCED FEATURES

- Drop & insert facility and cross connect feature allowing an optimization of the transmission capability and an easy integration of new circuits in the network
- Capable of adapting into any network topology
- Modular and evolutive configuration

### FUTURE ORIENTED AND LEGACY INTERFACES

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

### DESIGNED FOR POWER UTILITIES

The **e-terra*gridcom* DXC/eDXC** includes a standard C37.94 interface to interconnect protection and teleprotection devices through optical fiber, G.703 Co-directional and I/O dry contact alarms.



e-terra*gridcom* e-DXC



e-terra*gridcom* DXC



e-terra*gridcom* DXC-S

## FULFILLING UTILITY REQUIREMENTS

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

- Access cross-connect **e-terra<sub>gridcom</sub> DXC** (PDH)
- Enhanced Digital cross-connect **e-terra<sub>gridcom</sub> eDXC** (PDH/SDH)
- Transport cross-connect **e-terra<sub>gridcom</sub> DXC-S** (SDH)

The **e-terra<sub>gridcom</sub> 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 **e-terra<sub>gridcom</sub> eDXC/DXC-S** provides enhanced capacities on transmission STM-1/4/16, Gigabit Ethernet connectivity and **e-terra<sub>gridcom</sub> eDXC** supports all PDH boards available on **e-terra<sub>gridcom</sub> DXC** equipment.

## RELIABILITY / AVAILABILITY

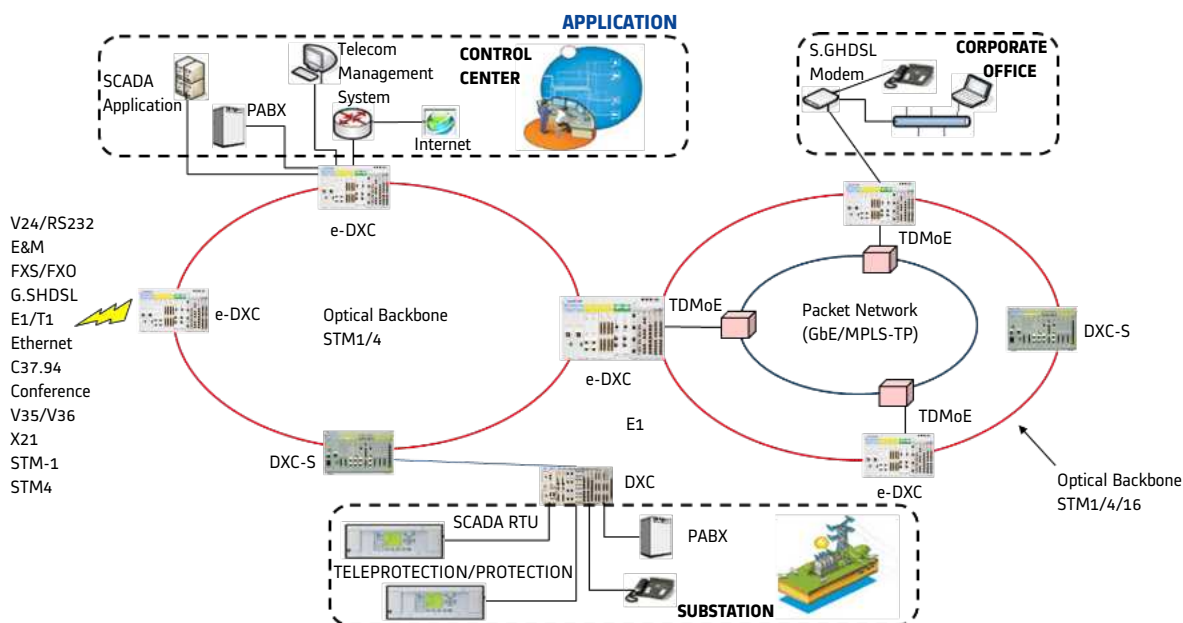
By concept and design, **e-terra<sub>gridcom</sub> DXC/eDXC/DXC-S** is a cost effective solution to match a high level of availability and harsh environmental constraints.

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

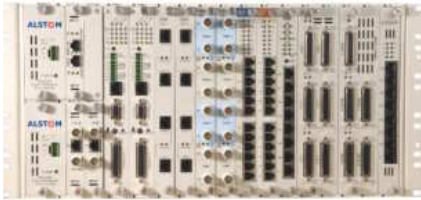
Different management solutions are available, answering to different network complexities and customer maintenance organizations for remote configuration and management:

- AEM: Element Management Layer, this solution responds to a centralised 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 Alstom Grid telecom management system **e-terra<sub>sentinel</sub>**.



## TECHNICAL DATA

### e-terra gridcom DXC



Access cross-connect multiplexer

#### Line 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
- Number of ports:
- Single E1 board (1/2 slot - DXC only)
- Quad E1 board (1 slot)
- Small Quad E1 board (1/2 slot - DXC only)
- Equipment protection: 1+1 EPS
- Line protection: 1+1 APS

##### 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: 4\*10/100/1000 Base T (RJ45). 2\*optical GbE (SFP based).
- Processing: TDMoIP, SAToP, CESoPSN
- L2 Switch Protocol: RSTP, VLAN, QoS, QinQ
- Protection: Link aggregation

### e-terra gridcom e-DXC



Combo PDH/SDH multiplexer

#### Others aggregate interfaces

- G T1 (1.5Mbps) board

#### Tributaries interface (DXC/eDXC)

##### Voice User Interface

##### Analogue 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 900 W,
- Longitudinal rejection 55 dB
- Loss adjustment -21 to +10 dB / 0.1 dB step
- Signal/Distorsion > 46dB 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 900 W
- 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 16.5Hz, 20Hz, 25Hz or 50Hz (selectable)
- Voltage 38Vrms, 64Vrms, or 85Vrms (selectable)

##### Analog FXO interface board

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

### e-terra gridcom DXC-S



SDH transmission multiplexer

#### Others voice interfaces

- Voice conference card

#### Data Interfaces

##### 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 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 64K
- Asynchronous 1.2, 2.4, 4.8, 9.6, 19.2K or 38.4K

*Note : X50 sub-rate multiplexing supported*

##### Data interface at 64k (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
- Date rate N\*64K up to T1/E1 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, 38.4K ; Sync : 64K

## TECHNICAL DATA

### Terminal server

- Layer 2 protocol PPP, SLIP, Raw data
- Routing protocol RIP I/II, Static

### Optical (C37.94) Subsystems

- Type of board Single Slot
- Number of interfaces 1 or 4
- Optical Signal 820nm
- Line Rate n\*64kBps (n=1 to 12)

### Others data interfaces

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

### 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

### Optical line interface boards

- Type of board: 1 slot
- Number of interfaces 7 (SFP)
- 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

### STM1/4 interface boards

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

### 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

### Operating condition

- Power Supply:  
DC module  
-40/-150Vdc (DXC only)  
-36V/-72Vdc (eDXC/DXC-S)  
AC and DC coexistent module (DXC-S)  
90 to 240Vac, 50/60Hz, -48Vdc (-36 to -72Vdc)
- Operating temperature:  
-5°C to 55°C (DXC)  
0°C to 50°C (eDXC/DXC-S)
- Humidity:  
0 to 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 - 5U height

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

- **DXC-S**  
Dimensions:  
433 x 264 x 223.5mm (W/H/D)  
Mounting:  
19" rack mountable - 6U height

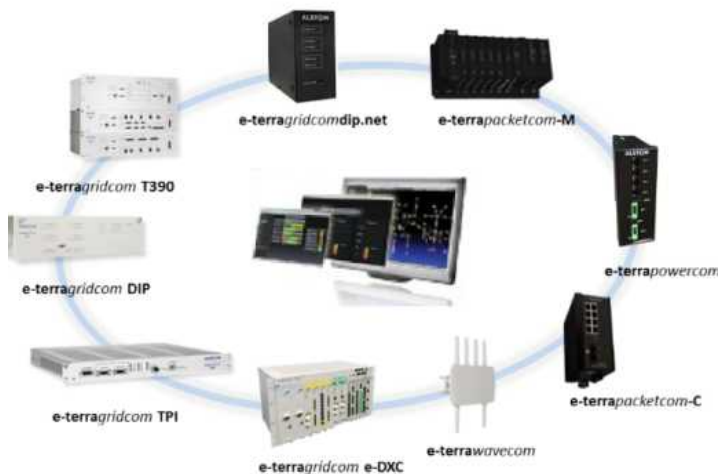
### Power utility standards compliance

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

### World class expertise

- **e-terragridcom 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
- We have 50 years experience of designing, manufacturing and supplying a complete range of telecommunication equipment

### A complete portfolio for mission-critical telecommunications



For more information  
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