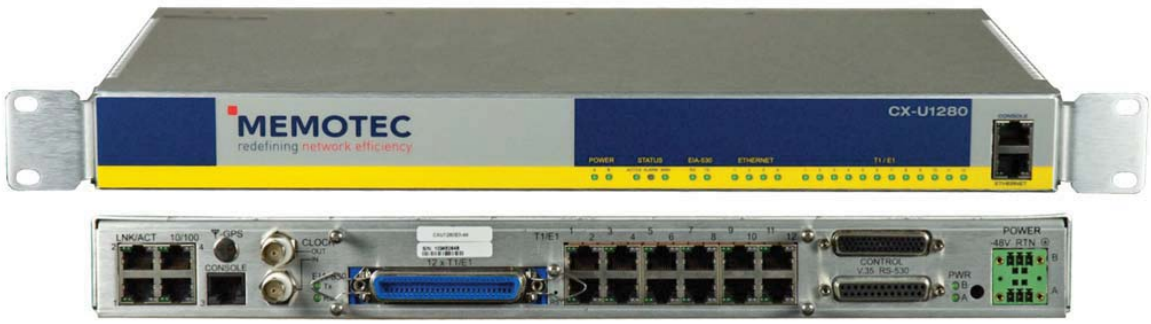

Overview

The CX-U Series brings together a flexible access device and mobile backhaul traffic optimization, offering a variety of backhaul interfaces and transmission options.
The CX-U offers Abis optimization with additional benefits of Local Switching, 2G/3G aggregation, DCME voice trunking optimization, TDM Pseudowire, all over IP, Frame Relay or MLPPP protocol support.

The CX-U products support digital fractional T1/E1, high-speed serial and Ethernet network interfaces with a choice of protocols (Frame Relay, IP/MLPPP) and multiple network backup options. Designed with the utmost reliability in mind, it can support an extended temperature range. Line bypass and optional 100 ms 1+1 hot standby redundancy without service interruption are also available for ultimate availability in challenging remote locations.

The CX-U family is comprised of four products: CX-U 1010, CX-U 1220, CX-U 1240 and CX-U 1280, which can be used in stand-alone mode of operation at hubs or aggregation points, or in conjunction with the CX-U devices located at the remote cell sites.

Typical Users

- Telecom Operators
- Mobile Operators
- Satellite Service Providers
- Government & Military

Common Applications

- Mobile Backhaul
- Mobile Cellular Tower Applications
- Universal Service Obligations Enabler
- A and E Interface Voice Compression Trunking
- Offshore & Maritime Communications

RAN Optimization

The RAN Optimizer transparently connects between the BTS/BSC and the transmission network facility, reducing the amount of backhaul bandwidth required to support mobile services over constrained links, such as satellite. Our GSM Abis traffic optimization and aggregation algorithms, coupled with our Local Switching detection and call looping allows up to 3:1 bandwidth reduction and eliminates local call double-hops over satellite.

RAN Optimizer Benefits:

- Reduced OPEX / Minimal CAPEX
  - Increases backhaul capacity
  - Reduces transmission capacity requirement in proportion to the effective traffic usage
  - Rapid ROI—often in only a few months
- Significant Bandwidth Savings
  - GSM base station Abis/Ater traffic: Minimum 50% bandwidth savings
  - Cell site aggregation with statistical multiplexing benefits
- Sustained Service Quality
  - Preserves voice quality and service integrity
  - Simple and reliable fail-safe operation
- Dependability
  - 10+ years of successful customer deployments
- Add Local Switching feature
  - Compatible with major GSM BTS/BSC vendors
  - Unaltered signalling and codec independent
  - Transparent to billing and other functionalities/VAS
  - Lawful interception compatible

RAN Optimizer Features:

- Transparent GSM FR, EFR, HR and AMR codec optimization
- Supports any data services (GPRS, EDGE, V.110 Fax/Modem)
- IDLE and silence suppression
- HDLC signaling frame extraction and forwarding
- EDGE traffic compression
- Signaling/voice/data traffic prioritization
- Transparent support of CDMA-IS95 traffic
- 3G and CDMA-1X traffic optimization (ATM IDLE cells removal, cell packing, ATM header and payload compression)
- ATM and TDM Pseudowire over IP
- SS7 traffic forwarding and optimization (Ater links)
- End-to-end Abis link continuity check
- Dynamic Abis map interface auto-configuration
- Traffic prioritization and 3 level QoS
- TRX channels usage real-time monitoring

COMTECH EF DATA

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DCME Voice Compression

The DCME voice compression functionality is a reliable, cost-effective and efficient means of increasing the capacity of operator's transmission links without sacrificing service quality.

Memotec's DCME solution is ideal to reduce the cost of supporting TDM-based voice circuits across satellite links. Using quality G.729 (8 kbps) and G.723 (6.3 and 5.2 kbps) codecs, the CX-U can compress TDM voice while preserving voice quality.

DCME Benefits:

- Increased compression ratio up to16:1 on voice trunks (recommend 12:1 on mobile network originated voice trunks)
- Superior carrier-grade voice quality
- Lower cost and reduced footprint
- Data services handling and interfaces to the NGN/3G soft switch network model
- Fail-safe continuous operation, including hot swappable sub-systems, complete system 1+1 redundancy, housed in a NEBS compliant chassis

DCME Features:

- Support G.729 AB, G.723.1 codecs with variable coding rate
- Silence suppression and Digital Speech Interpolation
- T.30 Fax relay (V.29/V.27ter/V.17)
- Modem relay (V.32/V.32 bis/V.22/V.22 bis)
- SS7 signaling transport with optimization (FISU spoofing)
- CCS signaling transport
- Transcoder free operation (end-to-end one hop compression)
- Multi-clique, multi-bearer operation
- End-to-end continuity tone check, detection and regeneration
- Voice channel usage real-time monitoring

Satel ite Backhaul

Jointly developed with parent company, Comtech EF Data, Memotec's satellite backhaul solution is unrivaled for backhauling mobile base station traffic over satellite links. The optimization function of the CX-U converts/reduces the fixed Abis TDM capacity to a variable amount of bandwidth equivalent to the effective traffic usage of the site. This typically provides 50% bandwidth savings thereby allowing for satellite transponder capacity to be dimensioned for real traffic carried by the RAN instead of the individual BTS radio capacity. Additionally, our Local Switching feature allows calls to be looped back within the same BTS (or cluster of BTSs) saving precious satellite bandwidth, eliminating voice round trip delay and improving caller quality of experience.

Whether your application is an individual remote cell site or cell cluster, a low density rural area, or a challenging remote region, the CX-U offers embedded features for supporting satellite 2G/3G GSM backhaul, making it the system-of-choice for your satellite-based solutions. The CX-U also enables users to deploy 2.5G EDGE data services over existing transmission links with minimal or no increase to OPEX and generating a quick ROI.

Satellite Backhaul Features:

- Point-to-point and point-to-multipoint backhaul
- Single carrier / multiple carriers operation
- Support IP, Frame Relay or TDM VSAT networks
- SCPC and TDMA/DAMA IP modem technology

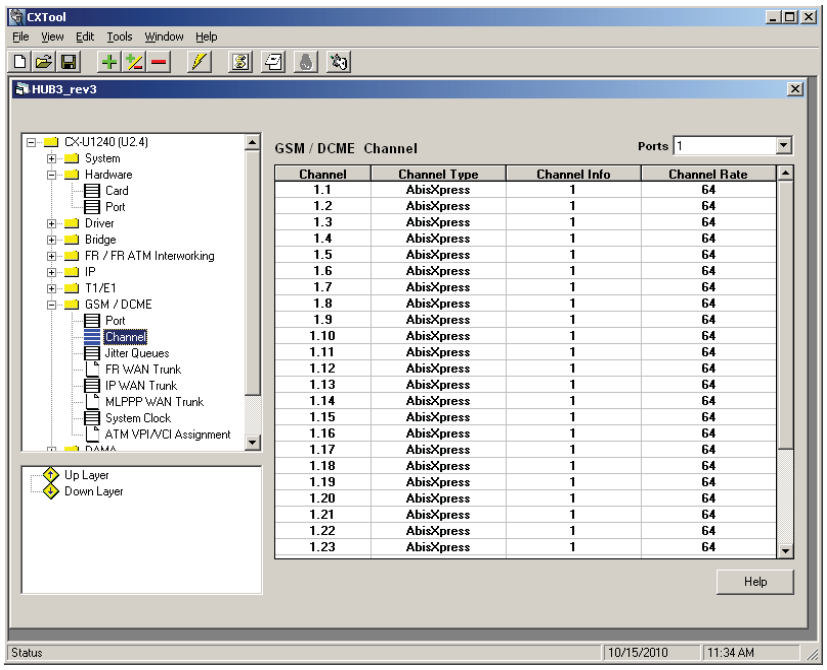
The satellite transponder is dimensioned for real traffic carried by the RAN instead of individual BTS radio capacity.

Local Switching was co-developed by Memotec and Cell & Sat

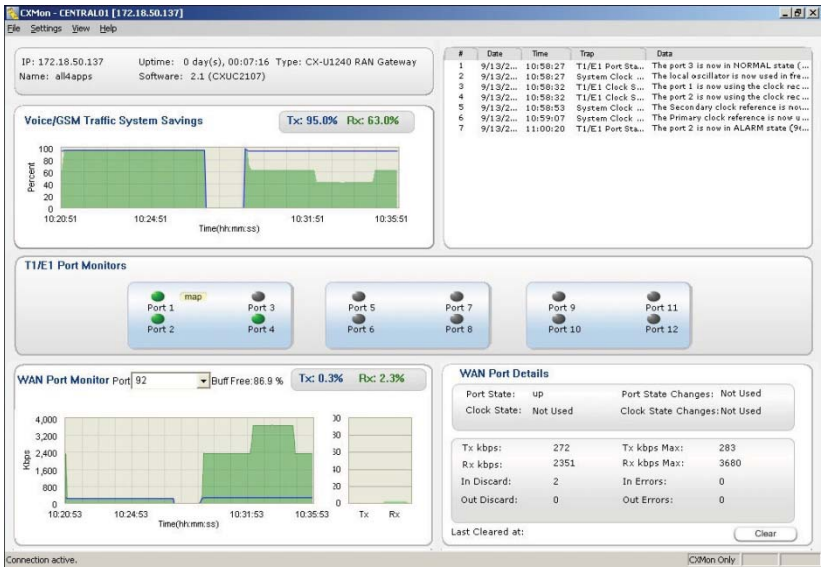
Element Management & Performance Monitoring

Memotec offers a suite of application oriented graphic user interface (GUI) network element configuration (CXTOOL) and performance monitoring (CXMON) tools.

- CXTOOL is an intuitive and user friendly configuration tool. It allows for complete network configurations to be developed quickly and easily. The multi-panel displays all the protocols and features via a single window pane.
- The guided configuration leads the user through a series of steps viewing only the appropriate ranges of values and prompting to related parameters. High-level application templates streamline the configuration process by requiring only key elements to be entered for complex applications such as GSM Abis backhaul.
- The uploading of current configuration file and the tracking of configuration file history simplify the maintenance, recovery and configuration management tasks.



- CXMON provides a high level interface for monitoring and troubleshooting. It monitors, records, and displays the necessary Key Performance Indicators (KPI) information for each application (Abis/Ater RAN optimization, DCME voice compression).
- CXMON provides the key information to effectively monitor, manage and optimize your network of Memotec CX-U optimization devices in a clear and concise real-time graphical display.



- The Memotec CX-U optimization device offers an open interface SNMP solution, providing access to parameters, statistics and statuses and enabling a northbound interface to standard 3rd party Network Management Systems (NMS).
- A full SNMP compliant MIB is available to facilitate the integration into operators' existing NMS systems.

Specifications

Interfaces

- Digital T1/E1: unframed, fractional, channelized, voice, data, TDM
- T1 line type: ANSI T1.403 (PRI), AT&T TR62411 (D4), and TR 54016 (ESF), Telcordia GR-499-CORE
- T1 encoding: AMI, B8ZS
- E1 line type : CEPT (PRI), G.703/G.704 with or without CRC4 & MF
- E1 encoding: HDB3, AMI
- T1/E1 interface choice of:
  - Balanced 120 Ohms: RJ-21 “Centronics” and RJ-48C individual connectors
  - Unbalanced 75 Ohm: BNC adapters or BT43 connector backplane
- NFAS, AIS and RDI bits/alarm relay
- Serial interface: EIA-530/V.35 (DB25) up to 8192 kbps
- Ethernet: 10/100 Mbps, RJ-45
- RS-232 serial craft interface

Standards

- T1/E1 interface: ITU-T G.703, G.704, G.706, G.732, G.733, G.823, G.824
- Echo: ITU-T G.168
- DCME: ITU-T G.768
- Voice: ITU-T G.711, G.723.1, G.729 a+b
- IP interworking: ITU-T G.799.1/Y.1451.1, Y.1452, Y.1453
- Fax relay: T.30
- Modem relay: V.32 bis
- Ethernet interface: IEEE 802.1, 802.3, 802.3u

Capacity

	CX-U1010	CX-U1220	CX-U1240	CX-U1280
T1/E1	4	12	12	12
WAN Bearer (T1/E1)	1 up to 2	up to 4	up to 4	up to 4
Abis/Ater Optimized	4 T1/E1	6 T1/E1	8 T1/E1	8 T1/E1
PCM Voice Channels	4 T1/E1	6 T1/E1	8 T1/E1	12 T1/E1
TDM/ATM Pseudowire	4 T1/E1	8 T1/E1	8 T1/E1	8 T1/E1
Serial	1	1	1	1
Ethernet	4+1	4+1	4+1	4+1
On-board DSP	1	2	4	8

- Each model has 2 expansion slots that can be fitted with DLP or DDLP modules.

Management

- Centralized EMS with GUI, interactive help and CLI ASCII script file generation
- Open standard SNMP, MIB-based NMS platform
- CLI interface (local or Telnet remote access)
- SNMP-based Open EMS (Configuration & Software management), alarm and performance monitoring
- Abis and voice interface detailed alarm and performance monitoring with KPI (CXMON)
- Secured in-band node management (IP-based)
- T1/E1 alarms: red, yellow, near/far end LOS, AIS, LOF, LOMF, test, loop

Synchronization

- ETSI PDH ITU-T G.823/G.824 and ETSI SDH SEC / ITU-T G.823 clock synchronization compliant
- 8 KHz to 10 MHz (BITS) and 1544 kbps or 2048 kbps G.703 external clock reference input (BNC 75 Ohm connector)
- 8 KHz, 1.544 MHz, 2.048 MHz, 10 MHz (BITS) and 1544 Kbps or 2048 Kbps G.703 clock reference output (BNC 75 Ohm connector)
- Better than Stratum 3 TCXO local clock reference (250 ppb 24 hours holdover over temperature range)
- Optional embedded GPS clock reference

Physical

- Dimensions: Standard 19” rack 1RU high chassis (height x width x depth) 1.75” x 16.5” x 9.25”
- Weight chassis: 2.2 kg (5.5 lbs)
- Input power: DC -36 to -60 V; 24 VDC and 85-264 VAC power available on option
- Consumption: <25 W depending on model and configuration
- MTBF > 20 Years

Environmental

- Operating temp: -10° to 65° Celsius (14° to 149° Fahrenheit)
- Storage temp: -50° to +80° Celsius (-58° to 176° Fahrenheit)
- Operating humidity: 0 to 95% non-condensing
- Altitude: 6000 m

Approva s

- Safety: CSA/UL 60950-1, IEC/EN 60950-1
- Telecom: TIA IS-968, IC-03 Part II
- EMC: FCC Part 15, ICES-003 Class A, EN 55022 Class A, EN 55024

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