PRODUCT DATASHEET

COMBO-24 Plug-In Card

DESCRIPTION

The COMBO-24 plug-in card provides 24 2-wire interfaces that you can configure for DS0 voice only, ADSL only, or DS0 voice and ADSL on the same pair using integrated splitters. Each DS0 current-source analog interface supports POTS or UVG service. Each ADSL interface supports G.DMT, G.Lite, or G.hs service.

The COMBO-24 occupies 2 slots and can be plugged into any pair of adjacent universal slots on the Calix C7 shelf. Physical access to each interface is provided through standard 25-pair RJ-21 connectors mounted on the back of the Calix C7 shelf.

KEY ATTRIBUTES

SIMPLIFIED ACCESS NETWORK: Integration of voice and ADSL interfaces on one plug-in card accelerates the deployment of copper broadband services to all subscribers. The Calix C7 provides ATM aggregation and a choice of T1 UNI/IMA, DS3, OC-3c, OC-12c, or OC-48c uplinks.

INTERFACE DENSITY: The 14-inch high Calix C7 shelf can be equipped with up to 10 COMBO-24 cards for a total of 240 ADSL interfaces per shelf. Up to five shelves can be configured in a single node configuration to deliver 1200 ADSL interfaces from one 7-foot bay.

ENVIRONMENTALLY HARDENED: The COMBO-24 plug-in card is environmentally hardened. For deployment in cabinet environments, Calix offers a complete line of simplified services cabinets that support CSA designs between 96 and 2880 lines.

FLEXIBLE CLASS 5 SWITCH INTERFACE: POTS interfaces are mapped into GR-303, TR-08, or TR-57 interfaces. The Calix C7 can provide multiple GR-303 interface groups to Class 5 switches.

BANDWIDTH AND GRANULARITY: The Calix C7 supports G.DMT traffic profiles of up to 10.8 Mbps (S=1/2 mode, selected modems) downstream and 896 Kbps upstream, provisionable in 32 Kbps increments. G.Lite profiles of up to 1.5 Mbps downstream and 512 Kbps upstream, provisionable in 32 Kbps increments, are also supported.

SERVICE GUARANTEES AND RATE REPORTING: The Calix C7 supports rate reporting for each interface. This allows you to monitor subscriber line performance and maintain customer service level agreements using CBR, UBR, rtVBR, nrtVBR, and GFR classes of service.

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END-TO-END SERVICE AUTO PROVISIONING: The user specifies the two end points, traffic characteristics, and protection requirements of a particular service. The system configures the path and bandwidth (primary and protected) between those two ends. The criteria used by the system for path selection is programmable, and you always have the option of overriding the automatic selection and configuring the services manually.

PLUG AND PLAY: New COMBO-24 plug-in cards can be added to the system with ease and minimum user intervention, allowing quick and easy turn up of new services.

METALLIC TEST ACCESS: The Calix C7 supports metallic test access for facility testing of metallic circuits. Service technicians can perform onsite metallic testing through a direct connection in the front of the Calix C7, or perform remote automated testing through a rear access connection.

NEBS LEVEL 3 COMPLIANCE: Telcordia GR-63-CORE, Network Equipment-Building System (NEBS) Requirements, Issue 1, October 1995. Telcordia GR-1089-CORE, Electromagnetic Compatibility and Electrical Safety, Issue 2, December 1997 with revision 1, February 1999.

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S P E C I F I C A T I O N S

COMBO-24 Plug-In Card

ORDERING INFORMATION
Calix Part No. 100-00097

PORTS
24 POTS and 24 ADSL ports per card
10 cards, 240 ports, per shelf
5 shelves, 1200 POTS and 1200 ADSL ports per rack

POTS DETAILS

SUPPORTED SERVICES
Configurable as POTS or UVG service
All CLASS services

SIGNALING MODES
Loop-Start (LS)
Ground-Start (GS)
Loop-Reverse-Battery (LRB)

IMPEDANCE
Programmable through craft interface:
600 Ω + 2.16 µf
900 Ω + 2.16 µf

IDLE CHANNEL NOISE
< 18 dBrnC

SUBSCRIBER LOOP LENGTH
1830 Ω including telset

RINGING
15 REN/card ring source

LOOP CURRENT
During normal operation: 22 mA
During battery backup: 19 mA

GAIN
Provisinable with auto-detection capability:
–3 dB to +7 dB for A to D
–7 dB to +3 dB for D to A

IDLE CHANNEL NOISE
GR-303, 12.5.8.10. < 18 dBrncC0

ON-HOOK TRANSMISSION
+/– 1.0 dB gain adjust tolerance in the transmit and receive directions

RING VOLTAGE
Unbalanced 90 Volts AC at 20 Hz

FREQUENCY RESPONSE
400–2800 Hz: +/– 0.5 dB

ADSL DETAILS

ADSL FORMAT
Full-rate ANSI T1.413 Issue 2
G.DMT full-rate ITU-T G.992.1
G.Lite ITU-T G.992.2
ITU-T G.994.1 G.hs or "Handshake"

MAXIMUM DATA RATES
DMT Full rate S=1/2 mode (selected modems): 10.8 Mbps downstream, 896 Kbps upstream. Selectable in 32 Kbps increments.

Full rate: 8 Mbps downstream, 896 Kbps upstream. Selectable in 32 Kbps increments.

G.Lite: 1.5 Mbps downstream, 512 Kbps upstream. Selectable in 32 Kbps increments.

ATM
UNI 3.0/3.1 PVC support
CBR, UBR, rtVBR, nrtVBR, and GFR
Full VPI/VCI address field with translation
16 PVCs per interface
Receive direction: dual leaky bucket policing
Transmit direction: traffic shaping
F4/F5 OAM cells for management
Traffic Management 4.0/4.1

STATUS INDICATORS
5 module status LEDs on unit faceplate:

FAIL: Red – indicates the plug-in card has failed

ACTIVE: Green – indicates one or more lines are active

BUSY: Green – indicates at least one line is off-hook

SYNC: Green – indicates at least one ADSL line is synched

LINE: Yellow – indicates one or more provisioned lines has a fault condition

POWER
42 Watts per card
Auto ranging to optimize line driver for each loop and minimize power

PHYSICAL DIMENSIONS
9.3 inches (height) x 1.4 inches (width) x 9.0 inches (depth) — 2 slots

OPERATING ENVIRONMENT
Temperature: –40 C to +65 C (–40 F to +149 F)
Humidity: 5 to 90% non-condensing
Altitude: to 13,125 feet

STORAGE TEMPERATURE
–40 C to +70 C (–40 F to +158 F)

SAFETY
NTRL-UL 1950

EMI/RFI
FCC Part 15 Class A

STANDARDS SUPPORT
TR-NWT-000057, Issue 2, January 1993, Section 4.8 Universal Voice Grade (UVG) Line Units
Full-rate ANSI T1.413 Issue 2
G.DMT full-rate ITU-T G.992.1
G.Lite ITU-T G.992.2
ITU-T G.994.1 G.hs or "Handshake"
T1.413 Annex A: ADSL operating above POTS
ITU-T G.997.1 (Physical Layer Management)
ITU-T I.610 (B-ISDN (ATM) operation and maintenance principles and functions)
ATM Forum Traffic management 4.0, 4.1
ITU-T G.992.1, Annex E (CO POTS splitter interoperability)
ANSI T1.413 Issue 2, Annex E (CO POTS splitter interoperability)

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