

## Technical Specifications

### ■ Power:

- -48 VDC, 28W – fully redundant system
- Optional battery unit
- Optional power converter/battery charger
- Input voltage: -42 to -60 at 1 amp maximum
- Input current: 0.5 amp maximum, fully redundant system; 0.4 amp maximum, non-redundant system
- Internal fuseless overvoltage and overcurrent protection

### ■ Environment:

- Operating temperature: -5° – +55° C (23° - 131° F)
- Humidity: 0 to 98% (noncondensing)
- Altitude: 0 to 5,000 ft. (0 to 4,572 m.)

### ■ Regulatory and certifications:

- NEBS Level 3 certified - type 2 and 4 (earthquake zone 4)
- Bellcore GR-63
- North American Regulatory Standards UL 1950 Edition 3
  - Equipment compliance to current (1996) National Electrical Code (NEC)
- FCC Part 15 Class A, Part 68
- CSA
  - Industry Canada CS-03
  - Canadian Safety Association Compliant
- Japanese Approvals Institute for Telecommunications Equipment

### ■ Network Standards:

- ANSI
  - T1.102-1993; T1.107-1995
  - T1.403-1996; 404a-1994
  - T1.404a-1996, T1.105
- CCITT Recommendation V.11
- GR-499-CORE
- AT&T 62411 (Stratum 4 enhanced T1 CPE)

### ■ Product Includes:

- Ports
  - (2) Independent -48VDC power input connectors
  - (4) BNC coax connectors
  - (2) 64-pin female champ connectors
  - (1) BNC coax 44.768 MHz external clock input
  - (1) 4-pin major/minor alarm connector
  - (1) 9-pin female RS-232 management port
  - (1) 25-pin female RS-232 TL-1 automatic outbound alarm
- Message port
  - (1) RJ45 10BaseT SNMP/Ethernet management port
- Accessories
  - User manual
  - 19"/23" rack mounting brackets
  - (1) major/minor alarm cable connector
  - Connector release tool
- Software
  - SNMP, TL1 and Telnet Agent embedded software
  - Command Line Interface embedded software
  - Wide Bank Pilot GUI

### ■ Options:

- MSO (Maintenance Service Option)
- FFO (Fan Faceplate Option)



CarrierAccess

5395 Pearl Parkway  
Boulder, Colorado 80301

Phone: 303-442-5455  
800-495-5455

Fax: 303-546-9724

[www.carrieraccess.com](http://www.carrieraccess.com)

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## Wide Bank 28



**Space-efficient,  
cost-effective  
digital service  
connection  
for a variety of  
platforms and applications**

With the Wide Bank® 28 family of products, standards-based M1-3 multiplexing takes a giant step forward. Wide Bank 28 is a family of carrier-class solutions that significantly increases the number of DS1 service delivery ports that can be deployed at the same time that it dramatically lowers the per-DS1 port deployment cost.

Wide Bank 28 solutions can be deployed in conjunction with DCS, SONET ADM, LDS, Frame Relay and ATM platforms. The Wide Bank 28's small footprint solves the space problem that often limits how many DS1 connections can be supported per rack. By using DS3 or STS-1 service modules to support the equivalent of 28 DS1 ports in a single rack unit space, Wide Bank 28 solutions can support up to 672 T1 connections in one 23-inch rack. For high-density applications, the Fan Faceplate Option for the Wide Bank 28 makes it possible to increase the number of Wide Bank 28 systems operating in a single equipment rack to 40, providing support for up to 1120 DS1 ports.

Upstream management capabilities, high rack density and low T1 costs, all standard features of the Wide Bank 28 solution, combine to provide a solution that delivers more control and capacity in less space than competitive offerings — at a much lower cost.

## Features

### ■ Reduced space requirements

The Wide Bank 28 dramatically reduces the amount of space required to deploy DS1 ports. The Wide Bank 28 supports up to 28 DS1 service connections in only a single rack unit of space. Older generation equipment required an entire rack full of equipment to provide that much capacity. The Wide Bank 28's reduced space requirements make it cost-effective to deploy DS1 ports to support growing requirements in a variety of environments. While saving space is an important consideration for most deployments, Wide Bank 28's small footprint is particularly beneficial for sites such as POPs, collocations, central offices and digital loop carrier cabinets, where space is at a premium and the size of previously available equipment made expansion impractical or prohibitively expensive.

### ■ Lower-cost for deploying and delivering services

Wide Bank 28 solutions make it possible to provision more T1 ports in virtually any platform, greatly increasing the maximum number of ports that can be deployed and services that can be delivered to customers. Adding the Wide Bank 28 to a platform results in a significant reduction in cost per DS1. The bottom line? More revenue-generating opportunity at a lower cost than with competitive solutions—and in much less space.

### ■ Robust remote management facilities

The Wide Bank 28 solution offers unsurpassed remote management facilities that eliminate the need to physically replace cards or set switches to isolate equipment versus line problems and differentiate between electronic and network errors. Support of Simple Network Management Protocol (SNMP) enables integration of control of the unit with popular SNMP management systems through a direct Ethernet connection. A Command Line Interface (CLI) provides remote management via an RS-232 Telnet or local management connection. Bit Error Rate Testing (BERT) capabilities automatically self-test internal data paths. Loopback and BERT functions provide DS3 testing. DS3 statistics allow monitoring of network and drop connections. And remote terminal management allows electronic protection switching of individual interfaces, eliminating costly truck rolls and service interruptions.

### ■ Modular design to accommodate evolving needs

Demand for services is growing rapidly, making scalability a must for cost-effective, fast and efficient network expansion. Wide Bank 28 solutions accommodate changing needs with a modular design that allows deployment of from 4 to 28 DS1 ports in 4-port increments to accommodate demand for more capacity as it occurs. When additional ports are needed, capacity can be increased quickly and easily simply by adding one or more DSX-1 interface cards (to a maximum of seven cards per Wide Bank 28).

### ■ Unique sparing and redundancy implementation for high reliability

The Wide Bank 28 system's approach to sparing and redundancy reduces downtime and helps ensure that the system remains available. The typical approach to DS1 hardware redundancy is to use an entire spare Quad controller to replace a single channel that fails, leaving the remaining DS1 channels unprotected in the event of another failure. With Wide Bank 28, if a single channel fails, only a single channel on the spare DS1 card is used, ensuring that there will be a spare available to provide backup if another DS1 channel should fail. Additional features such as hitless electronic and circuit protection, dual controllers, dual power supplies with dual power inputs and fuseless high-voltage line protection all contribute to very low downtime and very high system reliability.

## Technical Specifications

### ■ Components:

- Controller unit (2)
- Quad DS1 units (8)

### ■ Redundancy:

- Controller, DS3 1:1 and power conversion redundancy with second controller card
- DSX 1:7 or 4:28 DS1 electronics redundancy with spare Quad DS1 card

### ■ Management:

- RS-232 port for command line management
- Ethernet port for SNMP and Telnet sessions
- RS-232 port for TL1

### ■ Network Interface:

- Channelized DS3
- Line build out:
  - Short: 0.50 ft.
  - Normal: 50-450 ft.
- Framing format:
  - M23 and C-bit parity
  - Line rate: 44.736 Mbps
- Line interface:
  - Dual 75 ohm BNC coax female connectors

### ■ DS1:

Line build out: 0-660 ft.  
Line rate: 1.544 Mbps  
Line code: AMI or B8ZS  
Line framing: SF (D4) or ESF  
Line interfaces (2): 64 pin Amp connectors

### ■ DSX1:

- Line rate: 1.544Mbps  $\pm$ 32 ppm
- Line code: AMI or B8ZS selectable
- Transparent to DSX-1 framing or lack of framing
- Impedance: 100 $\Omega$   $\pm$  5% resistive, balanced
- Transmit Jitter Attenuation: Meets ANSI T1.403, T1.102 and AT&T 62411
- Transmit Amplitude: Pulse curve amplitude, 2.7 to 3.3 Vp per ANSI T1.102 and T1.403
- Transmit length (cable) 655 ft. ABAM or equivalent to cross connect

### ■ STS-1:

- Line rate: 51.84 Mbps  $\pm$  20 ppm
- Line code: Bipolar with three-zero substitution
- Transmit impedance: 75 $\Omega$   $\pm$  5% resistive, unbalanced
- Framing: STS-1
- Payload mapping: Asynchronous, VT 1.5 SPE for clear-channel transport
- Transmitter: Meets the pulse mask and eye diagram interface signal requirements as specified by ANSI T1.102 and Bellcore GR-253-CORE for all cable lengths up to 450 ft. to cross connect
- Receiver: Accepts signals up to 500 ft. from the cross connect that meets the criteria of ANSI T1.102 and Bellcore GR-253-CORE at the interface

### ■ Clocking:

- Network: Recovered from DS3 or STS-1 network receive signal
- Local: On-board stratum 4E clock source (DS3) or on-board SONET minimum clock (STS-1)
- External: external 51.84 MHz  $\pm$  20 ppm BNC input (STS-1) or external clock [testing] (DS3)

### ■ Diagnostics:

- CSU Loopback
- Internal BERT
- Integrated NIU
- C-Bit Far-End Messaging

### ■ Alarms:

- External alarm contacts for critical and non-critical alarms
- Normally open and normally closed pinout
- Front panel alarm cutoff switch (ACO)

### ■ Physical Dimensions:

- Height: 1.75 in. (4.45 cm.)
- Depth: 10 in. (25.4 cm.)
- Width: 17 in. (43.2 cm.)
- Weight: 10 lb. (4.5 kg.) fully loaded
- Rackmount: 19 in. (48.26 cm.) or 23 in. (58.42 cm.)