

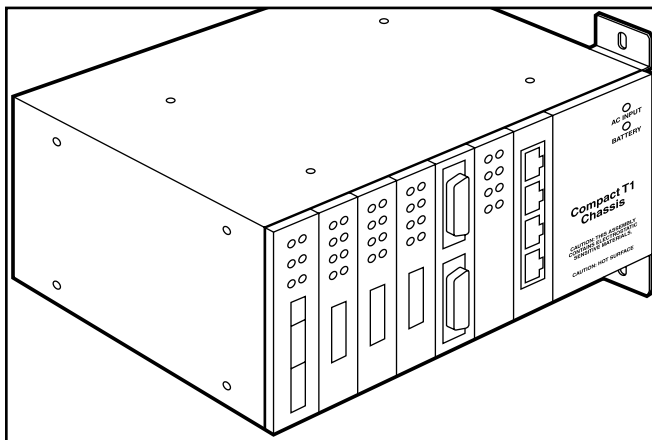
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Black Box Corporation.

BLACK BOX[®]

NETWORK SERVICES

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COMPACT T1 CHANNEL BANK



Combine T1 digital cross-connects with voice, data, and Internet access in one scalable platform!

Key Features

- ▶ **Includes controller card with dual T1 interfaces.**
- ▶ **To add new services, just slide in hot-swappable cards.**
- ▶ **Deploy any service connection or network access line in any of its six slots.**
- ▶ **VoIP card available for sending voice and data over TCP/IP.**
- ▶ **Manage in-band or out-of-band via the Internet.**
- ▶ **AC and DC power sources.**
- ▶ **Integrated CSU/DSU for T1 lines.**
- ▶ **Rackmount with optional kit.**

For multiservice providers, installing and maintaining separate data and voice services can be an expensive endeavor. And as end users continue to demand newer services, the task isn't going to get any easier without a flexible, bandwidth-efficient solution in place.

The BLACK BOX[®] Compact T1 Channel Bank is that solution. Modular in design, the channel bank is a 2U-high rackmountable chassis that enables you to optimize and add services to users and reduce your hardware, deployment, and maintenance costs. With it, you can provide carrier-quality broadband data and voice in a wide range of applications—whether it's a wired, wireless, or IP network one—and not clutter your wiring closet, central office, or wireless radio site with numerous standalone boxes.

The channel bank is ideal for ISPs, ILECs, MSOs, IXC, CLECs, and wireless mobility carriers who want to economically give their customers a number of voice and high-speed data services.

Out of the box, the Compact T1 Channel Bank comes with a preinstalled T1 Controller Card that has dual RJ-48C interfaces, so it's ready-made for connecting to one or two T1 lines. Both ports support speeds of 1.544 Mbps (± 50 bps).

Because the channel bank features a built-in digital cross-connect that communicates at the DSO level, you can deliver voice and data services over one or more T1s or the Ethernet WAN to make the most of available bandwidth in a compact platform.

To configure the chassis, you have a number of access options. One way is to use a Telnet connection through its rear 10-Mbps RJ-45 Ethernet interface. Or configure it through a console by linking to it through the rear RS-232 port.

The chassis' rear panel also has two 25-pair telco connectors for attaching telephony devices. These tip and ring analog interfaces have standard 25-pair telco connectors for connecting key systems, fax machines,

modems, PBXs, or similar equipment to the Compact T1 Channel Bank. The interfaces can also be used as ISDN BRI ports.

The rear panel also has an external 6-screw terminal block for inputting and outputting major and minor alarms.

On the card side, the Compact T1 Channel Bank features six available service slots, which enable you to connect to a variety of voice and data services, mixing and matching the connection types by simply installing the cards you need. Within this expandable platform, the cards provide the physical, electrical, and logical connections for terminating analog lines, PBX interfaces, LAN-to-WAN connectivity, network access, and more.

This modularity makes the channel bank an ideal alternative to using bulky standalone boxes. You get maximum service within a smaller footprint!

For chassis power, the unit has both 115 VAC and -48 VDC sources. You can use the -48 VDC input connector for either direct DC

power or for a battery backup connection when using the AC power source. For added protection, the chassis features a resettable circuit breaker. If there's a short or power surge on the incoming AC/DC line, the breaker will trip to protect the supply from damage.

The Compact T1 Channel Bank offers several local and remote management options. Cards can be configured and managed locally through either the RS-232 interface (by using a VT100™ terminal, PC, or modem) or via the Ethernet port to the chassis' T1 Controller Card.

For troubleshooting the channel bank off-site, the chassis features a dedicated, in-band DSO management channel that provides 64-kbps remote access to the unit. You can also use the 10BASE-T Ethernet connection for out-of-band SNMP network management of TCP/IP networks. Daisychain several channel banks and use SNMP at a central network management station to manage both local and remote units.

For quick and easy wallmounting, the Compact T1 Channel Bank comes with a mounting bracket attached. We

also offer a rackmount kit for mounting in a 19" rack or cabinet.

T1 Controller Card (Included)

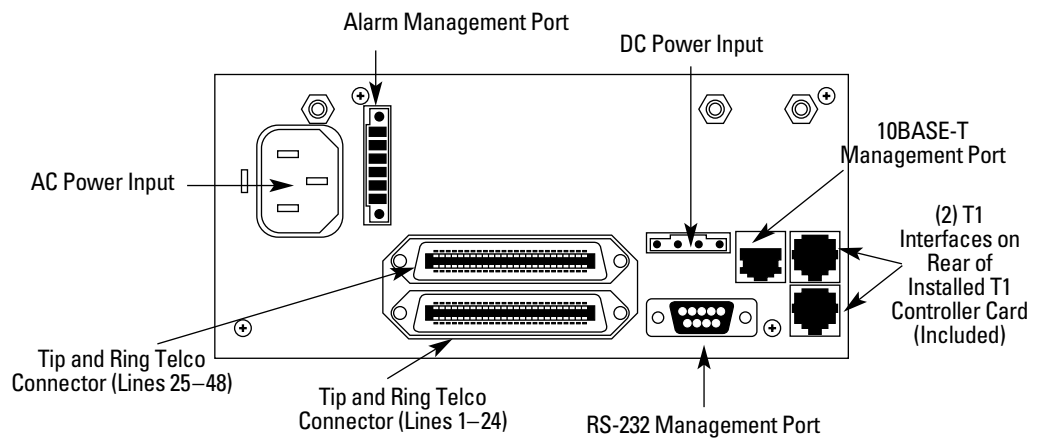
The controller card that comes with the chassis includes two T1 ports with integrated CSUs as well as a built-in I/O cross-connect matrix that provides full, non-blocking connectivity between the card and any of the cards in the slots. To increase the total T1 capacity of the Compact T1 Channel Bank to 18 network access trunks or drop-and-insert user connections, you would simply add a full complement of 4-Port T1 Cards (MT854C) to the slots (for

more on the MT854C, see page 3).

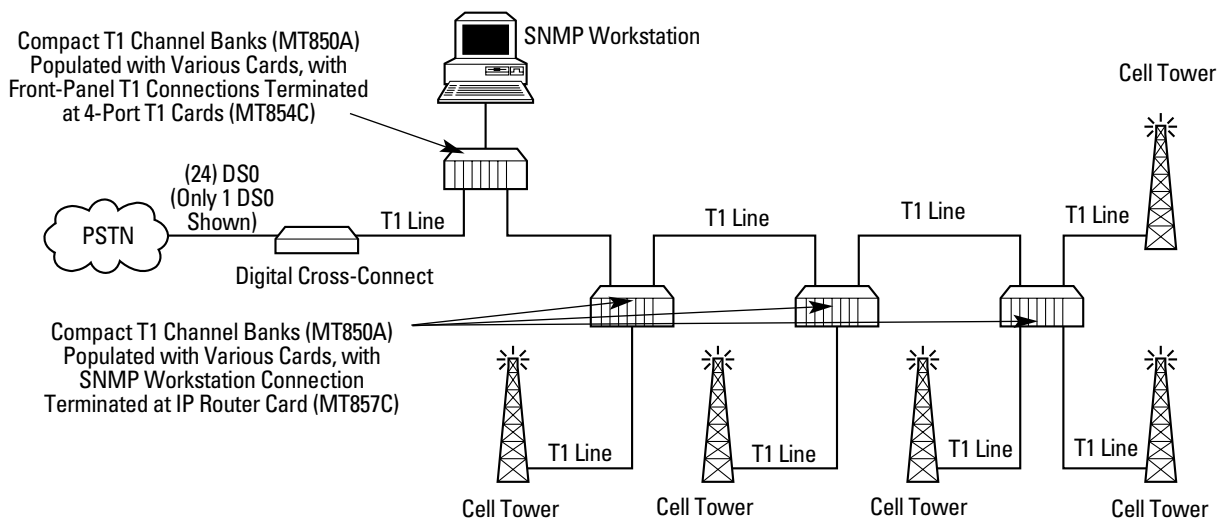
Manage the T1 Controller Card locally using its front-panel DIP switches or through the Command Line Interface (CLI) using an ASCII terminal or PC with terminal emulation software, or a modem that uses XMODEM or PPP sessions.

Six front-panel LEDs quickly communicate alarm and T1 line status, as well as mode of operation. To manage the card remotely, use either an in-band DSO management channel or a separate SNMP Ethernet connection.

Rear Panel of the Compact T1 Channel Bank



DSO Management with the Compact T1 Channel Bank



The Compact T1 Channel Bank features a DSO management channel, which you can use for SNMP management and remote access. This channel, which enables full TCP/IP connectivity to a remote Compact T1 Channel Bank, can also be used for Trivial File Transfer Protocol (TFTP) upgrades of the T1 Controller Card and service cards as well as remote Telnet access.

Service card options:

As with the Compact T1 Channel Bank's included T1 Controller Card, the optional cards can be locally configured using the front-panel DIP switches or the Command Line Interface (CLI). Manage them locally or remotely by using the interfaces built into the Compact T1 Channel Bank platform.

Front-panel LEDs on all service cards quickly inform of their status and vary depending on the card you order.

Hot-swappable, the cards can be added or removed without powering down the chassis.

8-Port FXS Card

This analog voice card enables up to eight direct phone connections through the Compact T1 Channel Bank, delivering either outside phone lines or on-premise customer business line services from T1 access circuits. Up to 6 of these cards can be added to the channel bank for 48 Foreign Exchange Station (FXS) connections.

Automatic impedance balancing provides echo-free service connections for a wide range of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modem performance.

The 8-Port FXS Card supports Caller ID, three-way calling ID, distinctive ringing, and E&M signaling conversion.

8-Port FXO Card

The FXO Card provides high-density provisioning of reliable Foreign Exchange Office (FXO) or Direct Inward Dialing (DID) telephone services for T1 access circuits. You can add up to 6 of these cards to the chassis for 48 connections.

The FXO function sinks battery current and detects ringing voltage originating from a central office or PBX line, so you can extend dial tone and calling features to remote locations. When configured as a DPT interface, the channels sink and detect forward and reverse line current, emulating the functions of a central office DID line.

The 8-Port FXO Card supports Caller ID, calling party disconnect, distinctive ringing, ground start, and E&M signaling conversion.

As with the FXS Card, the FXO Card's automatic impedance balancing provides echo-free service connections for a wide array of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modem performance.

4-Port OCU-DP Card

The Office Channel Unit Data Port (OCU-DP) Card essentially provides the electrical and physical termination of a 4-wire Digital Data Service (DDS) baseband connection that interfaces with a remote CSU/DSU. Up to 6 of these cards can be inserted into the channel bank chassis for up to 24 connections.

Use the card to link up to four CSU/DSUs that are connected to remote bridges, routers, and other network devices and provide standards-based DDS access for service subscribers or users at their data terminals. The 4-Port OCU-DP Card features scalable, independently configurable, synchronous data service rates from 2.4 to 64 kbps.

In addition to interconnecting lower-speed serial synchronous DTEs and terminating DDS circuits, you can use the OCU-DP Card alongside DS0 voice, fractional T1 data, or other cards in the Compact T1 Channel Bank for a truly integrated solution.

8-Port ISDN Card

This card enables you to deliver high-density, standards-based ISDN Basic Rate Interface (BRI) services over one or more T1 or DSL access lines using TDM or ATM transport. This means you can deploy ISDN voice, data, and real-time video applications as part of any integrated broadband service. For instance, you can economically bundle ISDN with all other services at 64 kbps or 128 kbps over T1 access lines.

Up to 5 of the cards can be used in the chassis for a maximum of 40 ISDN BRI circuits.

Configure the card as either a line unit line terminal (LULT) for making connections to ISDN switch interfaces at the central office, or as a line unit network terminal (LUNT) for the customer premises. The 8-Port ISDN Card provides direct NTU service demarcation for ISDN video conferencing, 128-kbps dial-up Internet, point-of-sale terminals, and ISDN Centrex or telephone applications.

4-Port T1 Card

Add ports for up to four T1 lines with this card—whether you need to backup existing T1 line connections or add connect additional DS0 channels. This way, you can economically provide and expand your T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Compact T1 Channel Bank service card.

Service providers or enterprise network managers, for instance, can use the card to cost-effectively add and expand network or drop-side T1 bandwidth. The card supports a number of network access technologies, including fractional and full T1 data and voice trunking.

Combine the 4-Port T1 Card with the Compact T1 Channel Bank's already-installed T1 Controller Card to support up to 18 T1 access lines—which is enough for most small- to medium-sized businesses, multi-tenant units, fixed or mobile wireless backhaul applications, and end-office uses. Working with the T1 Controller Card, the 4-Port T1 Card provides local and remote management functions.

Up to 4 of these cards can be added to the chassis for a total of 18 T1 connections (taking into account the two connections provided by the T1 Controller Card).

2-Port V.35 Card

This service card enables you to set up connections to high-speed serial synchronous data terminal equipment (DTE) devices, such as routers, Frame Relay access devices (FRADs), and videoconferencing equipment. Use it, for instance, to integrate Frame Relay or private V.35 services with voice and Internet access over T1 lines. The card features integrated T1 CSU/DSU functionality.

The 2-Port V.35 Card provides scalable high-speed data service capacity to meet growing needs of users. Each of the card's V.35 ports supports any n x 56-/64-kbps rate up to 1.536 Mbps, and both ports can operate simultaneously at any supported speed.

Flexible clocking enables loop timing from any T1 line and provides system clocking to the connected DTE. It also supports adaptation and transport over TDM facilities.

Add a maximum of 6 cards to the Compact T1 Channel Bank chassis for connections to 12 fractional T1 V.35 connections from two T1 network connections. Depending on your application, you'll need to order one or more V.35 data cables.

IP Router Card

With its own dedicated processor, this card offers the performance and expandability of a dedicated router in a modular format. It's ideal for providing high-speed Internet and Intranet connectivity to small and medium-sized businesses, as well as remote- and branch-office users.

The IP Router Card offers powerful IP and IPX routing, 3,000-packets-per-second throughput, and Layer 2 bridging plus networking security and management capabilities. All it takes is a single unique IP address to configure and manage a number of IP Router Cards installed in the Compact T1 Channel Bank chassis. You can add a maximum of six cards to the chassis, and each card acts as a single 10-/100-Mbps Ethernet router with autosensing abilities.

Because the IP Router Card uses Multi-Link Point-to-Point Protocol (ML-PPP) for bandwidth scalability, you can support the growing needs of your customers by offering more than just one or two T1s—multiple T1 facilities can function as a single IP WAN interface, providing up to 60 DS0s of bandwidth or up to 24 WAN connections per a card for multipoint networking. This flexibility enables service providers to target multitenant

units with a single device that supports business-class voice, Internet-access, and data services.

The IP Router Card also supports Point-to-Point Protocol (PPP), Frame Relay, PPP in Frame Relay, and GRE tunneling, as well as packet filtering, Spanning Tree Protocol (STP), and Dynamic Host Configuration Protocol (DHCP).

With three levels of security, the IP Router Card keeps communications safe. It supports PAP and CHAP, Network Address Translation (NAT), NAT Bypass, Port Address Translation (PAT), and RADIUS login authentication.

Media Gateway VoIP Router Card

This card combines IP router functionality with the ability to translate circuit-based voice services into packet-based Voice over IP (VoIP). Installed in the Compact T1 Channel Bank, the Media Gateway VoIP Router Card enables you to packetize voice services using the Media Gateway Control Protocol (MGCP). This way, you can establish a standards-based voice processing, call control, and signaling communications. As a service provider, for instance, you can offer CLASS (Custom Local Area Signaling Services) and IP Centrex services

in which customers can share data and voice via the same line.

The card also provides IP routing and bridging between LAN and WAN connections for VoIP and data traffic, plus IP QoS (Quality of Service)/policy management features. A built-in 10BASE-T/100BASE-TX Ethernet port enables you to connect to voice or local LAN traffic. Integrated routing protocols ease the job of deploying the card in a network. The card also supports multiple types of softswitches, so connecting telephony services through the media gateway to VoIP services isn't a problem either.

What's more, the Media Gateway VoIP Router Card features voice compression, silence suppression, comfort noise generation, and echo cancellation. Distinctive ringing, Call Waiting, DTMF tone detection, call progress tone generation, and Caller ID are just a few of the many signaling and service solutions are also supported by the card. You can even tailor tone databases to support call-progress tones and cadences for a specific country. Selectable FXS impedances provide worldwide coverage of line impedance variations.

A maximum of six Media Gateway VoIP Router Cards can be installed in the Compact T1 Channel Bank.

Specifications for Compact T1 Channel Bank and T1 Controller Card

Compact T1 Channel Bank:

Approvals: UL® 60950; FCC Part 15, Class A and Part 68; NEBS Level 3 certified for Type 2 and 4 equipment; CSA C22.2 No. 60950-00; ICES-003, Class A; CS-03; NOM 19 and 152

Alarms: External 6-screw terminal block; (1) input/(2) outputs for major/minor alarms; T1: LOS, BPV, Yellow, LOF/AIS

Clocking: T1 reference timing with holdover, internal clock with holdover

Cooling Method: Free air convection (requires long axis of unit to be mounted horizontally)

Diagnostics: T1 loop code; V.54 loop codes; QRSS, 2047, 2E20-1, 2E15-1 test patterns

Framing: SF (D4) or ESF

Management: SNMP over 10BASE-T or dedicated DS0; remote management over T1 ESF facility data link or dedicated DS0

Network Standards: ANSI/TIA T1.403 ESF FDL; T1.403-1995

Interface: T1 (1.544 Mbps \pm 50 bps)

Connectors: T1: (2) RJ-48C; Ethernet: (1) RJ-45; RS-232: (1) DB9 F (console port); Telco: (2) 25-pair connectors; Alarms: (1) 6-screw terminal block

Humidity Tolerance: Up to 95% noncondensing

Temperature Tolerance: Operating: 32 to 104°F (0 to 40°C); Storage: -40 to +158°F (-40 to +70°C)

Power: AC (90–135 VAC, 60 Hz) or DC (-42 to -60 VDC @ 3.5 A maximum)

Size: 3.5"H (2U) x 8.5"W x 12"D (8.9 x 21.6 x 30.5 cm)

Weight: 11.8 lb. (5.4 kg) fully loaded

T1 Controller Card (Included):

Approvals: UL® 60950; FCC Part 15, Class A; FCC Part 68; NEBS Level 3 certified; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A; CS-03

Advanced Capabilities: RADIUS login authentication; syslog; NTP

Alarms: (1) major and (1) minor alarm output; (1) one alarm input; alarm contacts accessible from external alarm connector; all alarms are logged in an event log; loss of AC power triggers minor alarm; generates SNMP traps for alarming (MIB objects)

Clocking: Loop-timed from any T1; revertive clock switching provides automatic backup to secondary T1 should the primary T1 fail; operates as a 4E Stratum clock with hold over

Diagnostics: Standard T1 line and payload loopbacks; T1.231 performance history

Network Standards: AT&T® Pub 54016, TR 62411; ANSI T1-403, T1.102, T1.231

T1 Interface: Selectable single or dual T1 ports

T1 Framing: SF (D4) or ESF

T1 Encoding: B8ZS or AMI

T1 Line Build Out (DSX-1): 655 ft. (200 m)

T1 Receive Sensitive (DS1): 0 to -22.5 dB

T1 Protection: Solid-state (fuseless) overvoltage and overcurrent protection; Telcordia GR-1089-CORE intra-building lightning/power cross limits

T1 Speed: 1.544 Mbps \pm 50 bps

Connectors: (2) RJ-48C (on rear of Compact T1 Channel Bank)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.4 lb. (0.2 kg)

Card Specifications

8-Port FXS Card:

Approvals: UL® 60950; FCC Part 15, Class A; NEBS Level 3 certified for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A

Connectors: RJ-21X (rear panel)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.4 lb. (0.2 kg)

Transmission Performance:

Crosstalk Coupling: < 80 dBm0 @ 0 dBm0

Frequency Response: +0 dB -1.0 dB from 300 to 3400 Hz

Gain/Loss: Transmit and receive: +6 to -12 in 0.25 increments, switch selectable per card or management selectable per channel

Idle Noise: A/D < 15 dBm0, D/A, < 10 dBm0

Longitudinal Balance: > 63 dB per IEEE 455 and FCC Part 68

Modems Supported: Full compatibility with V.90 modems

Overload: +3.0 dBm/900 Ω

Return Loss: Return Loss: ERL > 28 dB, SRL > 20 dB with respect to 900 Ω + 2.16 μF

Signal Distortion: > 45 dB with 1004 Hz, 0 dBm0 input

Terminating Impedance: 900 Ω + 2.16 μF

Transhybrid Impedance: Automatic

Transhybrid Loss: ERL > 28 dB, SRL > 20 dB with respect to 900 Ω + 2.16 μF

Signaling Performance:

Calling Party Disconnect: Calling party (forward) disconnect provides 2-second current interruption to disconnect answering devices and modems (requires E&M signaling service on the T1)

Control Technique: Solid-state with no mechanical relays

DC Loop Range: 1600 Ω extended

FXS Signaling: FXS loop start or FXS ground start with LS/GS selection per channel

FXSDN Signaling: E&M immediate or wink start to either loop start or ground start conversion with

ringback tone for carrier services; wink delay for advanced ANI/DNIS 800 number services

Internal Ringing Cadence: 2 seconds on, 4 seconds off for E&M wink start conversion modes

Loop-Feed: Nominal -48 VDC with 31-mA current limit for long loops, -36 VDC @ 27 mA for short loops with automatic battery switching

Maximum Ringers: 5 REN, FCC Class B ringers

Off-Hook Detection: Detects tip or ring currents > 6 mA

Overcurrent: 600 V rms, 60 A

Overvoltage: UL® 1950, FCC Part 68 lightning protection

Ring Ground: Detects ring ground currents > 8 mA

Ring Voltage: All-channel simultaneous ringing power, 85 V rms, 20 Hz

Ringer Equivalency Number (REN): 0.0 by definition

8-Port FXO Card:

Approvals: UL® 60950; FCC Part 15, Class A; FCC Part 68; NEBS Level 3 certified for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A; CS-03

Connectors: RJ-21X (rear panel)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.6 lb. (0.3 kg)

Transmission Performance:

Calling Party Disconnect: Detects and forwards current interruption to disconnect answering devices and modems

Crosstalk Coupling: < 70 dB at 0 dBm0

Encoding: μ-law 255 for U.S. and Canada as defined in CCITT G.711 and G.712

Frequency Response: +0.3 dB -1.0 dB from 300 to 3400 Hz

Gain/Loss: +7 to -9 dB, switch selectable per card

Idle Noise: A/D < 16 dBm0, D/A, 12 dBm0

Modems Supported: Full compatibility with V.90 modems

Overload: +3.0 dBm/900 Ω

Return Loss: ERL > 26 dB, SRL > 18 dB with respect to 900 Ω + 2.16 μF

Signal Distortion: > 35 dB with 1004 Hz, 0 dBm0 input

Terminating Impedance: 900 Ω + 2.16 μF

Transhybrid Loss: ERL > 26 dB, SRL > 18 dB with respect to 900 Ω + 2.16 μF

Signaling Performance:

Address Signaling: DTMF or dial pulse

DC Loop Range: > 1600 Ω loop or ground start

FXO DC Resistance: 100 Ω

Ringer Equivalency Number (REN): 0.4B (AC)

Ring Voltage Detection: Detects Class A ringing follows distinctive ringing

Maximum DC: 150 mA

Overvoltage: UL® 1950, FCC Part 68 lightning protection

Overcurrent: 600 V rms, 60 A

Protection: Solid-state (fuseless) overvoltage and overcurrent protection

Signaling Selection: DPT functionality enabled/disabled on all 8 channels

Termination Type: FXO loop start or ground start, switch selectable per card or via management interface per channel

4-Port OCU-DP Card:

Approvals: UL® 60950; FCC Part 15, Class A; designed to meet NEBS Level 3 for Type 2 and 4 equipment (not certified); CSA C22.2 No. 60950-00; ICES-003, Class A

Clocking: Loop-timed from any T1 in the platform; sources clock to the DTE device

Loopbacks: OCU, CSU, DSU: Manual loopbacks activate via CLI; non-latching loopbacks activate via network code; latching loopbacks activate via network code

Connectors: (4) RJ-48S (front panel); strap selections for (1) RJ-21X (rear panel)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.4 lb. (0.2 kg)

4-Port T1 Card:

Approvals: UL® 60950; FCC Part 15, Class A; FCC Part 68; NEBS Level 3 certified for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A; CS-03

Connectors: (4) RJ-48C (front panel); RJ-21X (back panel)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.3 lb. (0.1 kg)

2-Port V.35 Card:

Approvals: UL® 60950; FCC Part 15, Class A; NEBS Level 3 for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A

Alarms: Standard T1.403 alarms

Clocking: Any one of the (4) T1 interfaces on a card can be selected by the controller as the the Compact T1 Channel Bank timing source

Diagnostics: T1.403 payload loopbacks (ESF only); T1.403 remote and local line loopbacks (ESF and SF); DS0 loopbacks; T1.231 Performance History (15-minute intervals, 24 hour totals); T1.203 Performance Report Messages (PRMs)

Network Interface: Card can be configured as either a network or drop-side interface

Network Standards: T1.107, T1.102, T1.203, T1.231, T1.403

T1 Encoding: B8ZS or AMI

T1 Framing: SF (D4) or ESF

T1 Line Build Out (DSX-1): 655 ft. (200 m)

T1 Protection: Solid-state (fuseless) overvoltage and overcurrent protection

T1 Receive Sensitive (DS1): 0 to -22.5 dB

T1 Signal Latency: < 3 ms; <10 ms overall in Compact T1 Channel Bank

T1 Speed: 1.544 Mbps ± 50 bps

Connectors: (2) mini DB26 (front panel), DCE to DTE pinout

Network Interface: T1 TDM

Clocking: Looped timed from any T1 or ISDN BRI card installed in the Compact T1 Channel Bank; sources clock to the DTE device

Diagnostics: Addressable V.54 loop up and loop down (127-code) pattern generation/detection; 2047, 215-1, 220-1, and QRSS test patterns with error counter

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.3 lb. (0.1 kg)

Card Specifications (continued)

8-Port ISDN Card:

Approvals: UL® 60950; FCC Part 15, Class A; NEBS Level 3 certified for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A

Alarms: TR-821

Bridged Tap Length (Maximum): 2500 ft. (762 m)

Clocking: Loop timing derived from Channel 1 of the card or any T1 on Compact T1 Channel Bank

Compatibility: Interoperable with other standards-based ISDN BRI equipment

Diagnostics: Initiates 2B+D, B1, or B2 loopbacks toward the BRI at the NT1; performs self test at power up; supports external loopback testing via EOC messages from the switch in 3 DSO Mode

Line Coding: 2

Management MIBs Supported: Standard ISDN SNMP

Messages: TR-829 multi-EOC messages in 3 DSO and 4:1 TDM Modes

Network Interface: (3) DSO Mode: Uses (3) contiguous DSO channels per ISDN BRI channel on T1

Network Standards: Telcordia TR-NVT-000397 (1993); Telcordia TR-TSY-000821 (1991); Telcordia TR-TSY-000829 (1989); ANSI T1.1992; ITU-T Q.920, Q.921

Performance Monitoring: TR-397/TR-829/TR-821 Generic Segmented Performance Monitoring

Protection: Solid-state (fuseless)

Speed: 160 kbps

Test Signature: Metallic DC test signature in Line Unit Network Terminal (LUNT) Mode

Connectors: RJ-21X (rear panel)

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.4 lb. (0.2 kg)

IP Router Card:

Approvals: UL® 60950; FCC Part 15, Class A; NEBS Level 3 certified for Type 2 and 4 equipment; GR-63-CORE, GR-1089-CORE; CSA C22.2 No. 60950-00; ICES-003, Class A; NOM 19, Safety of Data Processing Equipment

Advanced Capabilities: DHCP server; syslog; Simple Network Time Protocol (SNTP); Spanning Tree Protocol; Van Jacobson message header compression; Domain Name Server (DNS) proxy; IP fragmentation and reassembly support; secondary IP address

Bridging Capabilities: IEEE 802.1D MAC bridging

Clocking: Loop timed from any T1 or the internal system clock; SNTP support for timing from a separate network

Filtering: LAN/WAN filters up to Layer 4, stateful

Frame Relay: RFC 1490 encapsulation; ANSI T1.617 Annex D LMI; ITU Q.933 Annex A LMI

LAN Interface: 10BASE-T/100BASE-TX routing

Connectors: (1) 10-/100-Mbps RJ-45 (autosensing)

MIBs Supported: RFC 1212 (Concise MIB); RFC 1213 (MIB II); RFC 1643 (Ethernet); RFC 2233 (interface); RFC 2011 (IP); RFC 1471 (LCP/PPP); RFC 1473 (IP/PPP); RFC 2115 (Frame Relay); RFC 1406 (DS1/E1); RFC 1659 (RS-232); Enterprise MIB

Routing Capabilities: IPX RIP/SAP; IP RIPv1, RIPv2, RIPv/RIPv2 compatibility mode; static routing; classless routing (CIDR)

Router Performance: Minimum of 3000 64-byte packets per second throughput

Security: (3) user accounts; three levels of security; PAP and CHAP; Network Address Translation (NAT); NAT Bypass; Port Address Translation (PAT); RADIUS login authentication

WAN Interface: Any T1 interface on the Compact T1 Channel Bank; up to (24) WAN interfaces per router; up to (60) DSOs bandwidth per router

WAN Interface Protocols: PPP, Frame Relay, PPP in Frame Relay, MLPPP and GRE tunneling

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.3 lb. (0.1 kg)

Media Gateway Router Card:

Approvals: UL® 60950; FCC Part 15, Class A; designed to meet NEBS Level 3 for Type 2 and 4 equipment (not certified); CSA 22.2 No. 60950-00; ICES-003, Class A

Connection Types: TDM-to-Packet or Hairpin (TDM-TDM); 2-way; 1-way; inactive (for call hold); (2) connections per endpoint (for call waiting, transfer); 3-way conferencing

LAN Interface: 10BASE-T/100BASE-TX routing

Connectors: (1) 10-/100-Mbps RJ-45 (autosensing)

Protection: Solid-state (fuseless)

Routing Capabilities: IPX RIP/SAP, RIP V1/2 static routing and Classless Inter-Domain Routing (CIDR)

Router Performance: Up to 0.84 Mbps upstream full-duplex IP WAN traffic; minimum of 3000 64-byte packets per second per duplex direction

Security and Advanced Capabilities: PAP and CHAP; NAT, NAT Bypass; PAT; firewall filtering; DHCP server/BOOTP Relay; syslog; Domain Name Server (DNS) proxy; SNTP; Spanning Tree Protocol; secondary IP address; voice prioritization; TDM-Side Signaling; FXS loop start; DTMF tone detection; call progress tone generation; Caller ID generation; FSK VMWI distinctive ringing

Softswitch Call Control and

Signaling: MGCP (IETF RFC 2705 and NCS 1.0); IETF Version 0.1, 1.0, 1.0bis; interoperable with the leading softswitches; MGCP auditing

Voice Processing and Mediation:

Voice coding using G.711, G.726-16, G.726-24, G.726-32, G.726-40; capacity of (48) channels of PCM, (24) channels of compressed codecs; concentration (over-subscription) of voice channels supported for compressed codecs; G.168 echo cancellation (up to 64 ms); RTP packetization (over UDP/IP); 10–30 ms packetization time; TOS prioritization; 160-ms jitter buffer; dynamic delay adjustment; RTCP performance reporting; call progress tone and cadence generation via provisionable tone files

Voice/Fax Modem Interface: Up to (48) designated FXS or DSO channels

WAN Interface: Any T1 interface on the Compact T1 Channel Bank

WAN Interface Protocols: IP over PPP, Frame Relay, PPP over Frame Relay, MLPPP

Size: 3.5"H x 0.75"W x 11.25"D (8.9 x 1.9 x 28.6 cm)

Weight: 0.3 lb. (0.1 kg)

Why Buy From Black Box? Exceptional Value. Exceptional Tech Support. Period.

Recognize any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 p. m. and you need help, but your vendor's tech support line is closed.

According to a survey by Data Communications magazine, 90% of network managers surveyed say that getting the technical support they need is extremely

important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application.

Don't waste time and money—call Black Box today.

Ordering Information

ITEM	CODE
Compact T1 Channel Bank Chassis.....	MT850A
<i>For the chassis' six slots, order cards...</i>	
8-Port FXS Card.....	MT851C
8-Port FXO Card.....	MT852C
4-Port OCU-DP Card.....	MT853C
4-Port T1 Card.....	MT854C
2-Port V.35 Card.....	MT855C
8-Port ISDN Card	MT856C
IP Router Card	MT857C
Media Gateway Router Card.....	MT861C
<i>To rackmount your chassis, order...</i>	
Compact T1 Channel Bank Rackmount Kit.....	MT860
<i>You may also need...</i>	
Compact T1 Channel Bank V.35 Cable	MT859
T1 Cable, Straight-Pinned	ETNMS01