RackNest 2/14

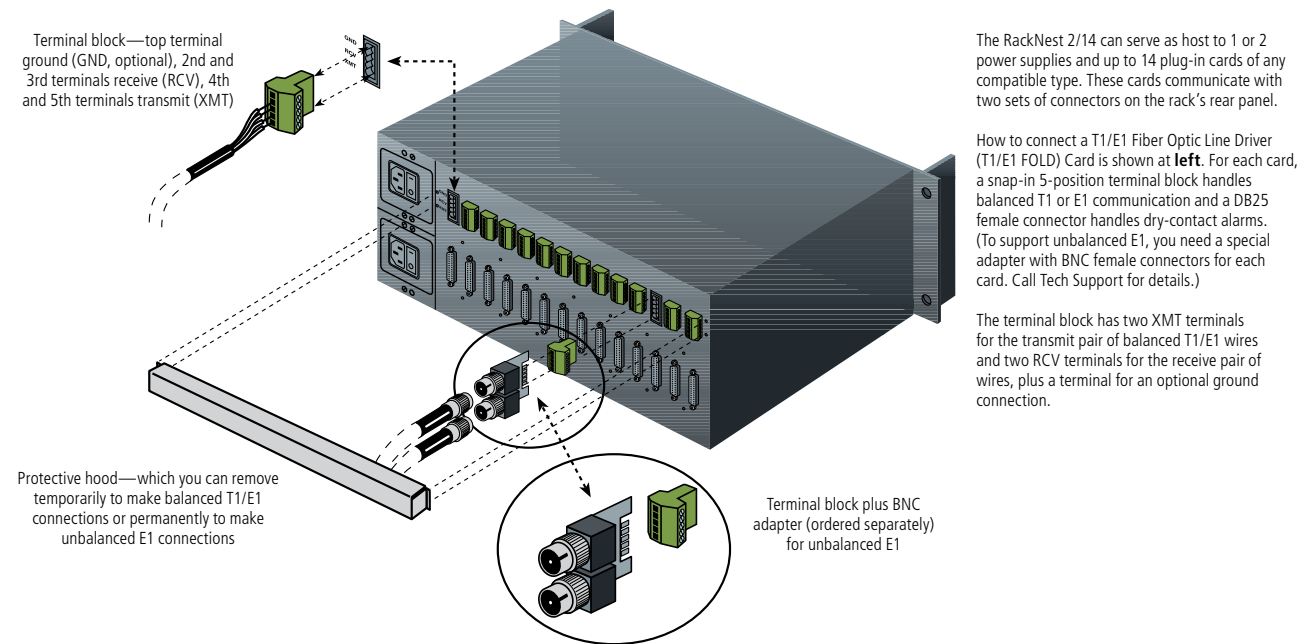# Place any combination of up to 14 copper and fiber optic modules in this powerhouse rack!

FEATURES

» Allows hot-swapping of cards and power supplies.
» Houses fiber optic and copper-wire modems in a single nest.
» High-density 19" modem rack.
» Compact! Only 4U high.
» Order second power supply for redundancy.
» Works with balanced and unbalanced G.703 equipment.
» Five cards to choose from.
» Easy to install and operate.
» LEDs indicate card status.

Terminal block—top terminal ground (GND, optional), 2nd and 3rd terminals receive (RCV), 4th and 5th terminals transmit (XMT)

Protective hood—which you can remove temporarily to make balanced T1/E1 connections or permanently to make unbalanced E1 connections

Terminal block plus BNC adapter (ordered separately) for unbalanced E1

The RackNest 2/14 can serve as host to 1 or 2 power supplies and up to 14 plug-in cards of any compatible type. These cards communicate with two sets of connectors on the rack's rear panel.

How to connect a T1/E1 Fiber Optic Line Driver (T1/E1 FOLD) Card is shown at **left**. For each card, a snap-in 5-position terminal block handles balanced T1 or E1 communication and a DB25 female connector handles dry-contact alarms. (To support unbalanced E1, you need a special adapter with BNC female connectors for each card. Call Tech Support for details.)

The terminal block has two XMT terminals for the transmit pair of balanced T1/E1 wires and two RCV terminals for the receive pair of wires, plus a terminal for an optional ground connection.

OVERVIEW

Sometimes space is so limited that you can't even find room for your modems. So rack 'em! The Black Box® RackNest 2/14 is your space-saving solution.

The RackNest 2/14 is a 19-inch, 4U-high rackmount modem card nest that can house up to 14 plug-in cards. The rack is a reliable concentration point for multiple baseband links supporting last-mile or campus applications.

Simply choose the speed, operation, and interface you need. For extra versatility, the cards are available in V.35, RS-232, or RS-530 interfaces (see **pages 3–4** for our selection of rack cards). Install any combination of up to 14 copper and fiber optic cards.

The cards slide into edge connectors inside the rack and are secured by a nut. The rear panel consists of 14 5-screw, snap-type terminal blocks and 14 DB25 connectors (one terminal block and one DB25 connector per card). The terminal blocks connect the transmit and receive lines. The transmit pair is connected to the terminals marked XMT, the receive pair is connected to the terminals marked RCV, and an optional ground connection is the fifth screw. The DB25 connectors are interface connectors, and they provide all interface signals for the digital interfaces. However, modem cards with a V.35 interface require an external mechanical adapter.

Hot-swap cards at any time during operation—remove and reinsert them without interfering with other modem cards and their data transmission.

The RackNest 2/14 works with balanced or unbalanced G.703 equipment. Unbalanced interfaces use only one transmit, one receive, and one ground lead in contrast to balanced interfaces, which use a pair of transmit and receive leads.

The RackNest 2/14 includes one 115-VAC or 230-VAC power supply. Plus, you can order a second backup power supply.

And all the hot-swapping's not just for modem cards—check out our RM110A-2PS model. It's the real powerhouse RackNest! The RM110A-2PS accommodates two 115-VAC Power Supplies. Each power supply supports 14 modem cards, regardless of their line type. And, like the cards themselves, the power supplies are hot-swappable during operation, so there's no effect on the modems and their data transmission.

Having the RM110A-2PS is like having insurance for your communications. If one power supply fails, the second kicks in—and the data continues to go through for all your cards.

The RackNest 2/14 is easy to install into a rack. To operate its one or two power supplies, simply plug one or both into the RackNest 2/14 and press the operating switch on the RackNest's rear panel. The On LED confirms the RackNest 2/14 is receiving power.

09/29/2010
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CARDS AVAILABLE FOR THE RACKNEST 2/14:

NOTE: All cards must be used in pairs.

19.2-kbps Async/Sync Card (ME760C)

- Sends RS-232 data over 24 AWG wire up to 4 miles (6.4 km) at 19.2 kbps or up to 15 miles (24.1 km) at 1200 bps!
- Differential diphase modulation eliminates line distortion and provides clean transmissions.
- Runs sync or async, point-to-point or multipoint.
- Operates half-duplex over two wires or full or half-duplex over four wires.
- V.54 diagnostics perform local and remote loopback tests.

Here's your long-distance solution for point-to-point or point-to-multipoint RS-232 applications—the 19.2-kbps Async/Sync Card. It provides clean, clear data transmission up to 4 miles (6.4 km) at 19.2 kbps and an astounding 15 miles (24.1 km) at 1200 bps. And best of all, it achieves these substantial distances over ordinary unconditioned phone lines!

Because this card can cover such long distances over standard twisted-pair wires, it's especially well-suited for campus-wide, building-to-building, or base-to-satellite RS-232 networks. It also works well in retail sales applications (with credit card verifiers, for instance) and shipping applications like cargo weigh stations on interstate highways.

To manage these distances and speeds, the card uses conditioned differential diphase modulation, a process that immunizes the line against background noise and eliminates the signal distortion common over twisted-pair cable. Additionally, this card is joined to the line through dedicated isolation transformers that protect against damaging AC or DC overvoltages.

It's versatile, too. It operates at both sync and async in half- and full duplex mode. (Note that line transmission is always synchronous. The card, when set to async mode, converts async data to sync data in accordance with the ITU V.14 async-to-sync conversion standard.)

You can perform local analog loopback as well as local and remote digital loopback tests with the card's V.54 diagnostic capabilities.

In digital loopback mode, the modem can be tested from either end of the line. These tests are controlled either through push buttons or Pins 18 and 21. You can also insert a delay into the data stream so that loopback tests are not carried across your network.

You can choose from eight selectable data rates up to 19.2 kbps for both point-to-point and multipoint applications.

Sync SHM Cards (ME270C-35-R2, ME270C-530-R2, and ME275C-35-R2)

- Super-high speeds for your point-to-point applications—up to 2.048 Mbps.
- Transmit data at T1 speeds, without installing T1 lines.
- Transmission range up to 1.1 miles (1.8 km).
- Choice of cards for extending balanced or unbalanced G.703 interface on line side.
- Full-duplex transmission over four wires.
- Selectable forward error correction for rates up to 1.024 Mbps.

It's tough to keep your file transfers, bridging, and heavy data traffic moving at a steady pace. If you want your data to go fast, one of these Sync SHM Cards gets things moving!
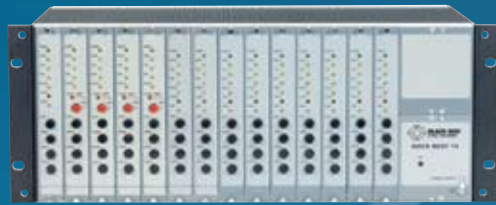
The cards move data up to 2.048 Mbps, increasing your network speed in some cases by as much as 33%. They'll help eliminate traffic jams, increase file-transfer times, and enable your network bridges to work at their true full speed. Your mainframes will trade data faster than ever. And your network users will spend less time waiting for big files to download. These cards are also ideal for CAD users with large graphics files—transmitting faster than a T1 line.

The cards operate full duplex over unconditioned lines at 13 user-selectable data rates up to 2.048 Mbps. You can also select the transmission baud rate on the link.

Transmit and receive timing can be provided internally or derived externally from the data terminal or receive signal. The cards also have FIFOs for jitter attenuation or phase difference correction either from the incoming analog signal on the line side or from the external clock on the DTE side.

V.54 diagnostic capabilities enable you to perform local analog loopback as well as local and remote digital loopback. The SHM cards also include an internal pseudo-random pattern generator along with a basic error rate tester (BERT) to ensure complete end-to-end integrity. If a bit error is detected, an LED alerts you.

Built-in isolation transformers and protection circuitry protects the cards and any attached DTE from line hazards such as AC or DC overvoltages.

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T1/E1 Fiber Optic Line Driver (MT650C-R2)

- Drive data at full T1 or E1 speed over fiber.
- Maximum distances up to 3.1 miles (5 km) of multimode cable or 23.6 miles (38 km) of single-mode cable.
- Optical link is immune to EMI/RFI, surges, taps, and ground loops.
- ST® connectors.

Would you like to put your high-speed computer or other DTE device in a different room from your T1 or E1 CSU/DSU? In a different building? A different campus? Or would you just like to make a connection at T1 or E1 speeds without handing your entire budget to a telco for a subscription to T1 or E1 service?

Pairs of these T1/E1 Fiber Optic Line Drivers (T1/E1 FOLDs) can pass data to each other at full T1 or E1 speed across multimode or single-mode fiber optic cables. Not only does this solve device-placement problems, it does so with optical links that aren't susceptible to tapping, noise, and other hazards of electrical communication.

The T1/E1 FOLD transmits and receives data on the 1300-nm wavelength into as much as 23.6 miles (38 km) of single-mode cable. It has common ST® type connectors.

You can set the FOLD to use a 100-Ω balanced T1 interface, a 120-Ω balanced E1 interface, or a 75-Ω unbalanced E1 interface. The balanced interfaces on the cards are expressed on the RackNest's 5-position terminal blocks. For the unbalanced interface, you'll need a special adapter (call us for ordering details).

RM110A

ME760C

MT650C-R2

TECH SPECS

Number of Slots — 14 slots for cards
Connectors —
   Line: (14) 5-screw, snap-type terminal blocks;
   DTE: (14) DB25 F connectors
Operating Temperature — 32 to 122° F (0 to 50° C)
Humidity — 10 to 90%, noncondensing
Power — RM110A: 115-VAC (±10%), 47–63 Hz;
   RM110AE: 230 VAC (±10%), 47–63 Hz;
   RM110A-2PS: (2) 115-VAC power supplies (one main and one redundant), 47–63 Hz
Size — 7"H x 19"W x 10.4"D (17.8 x 48.3 x 26.4 cm)

Item	Code
First, choose a rack with your system's voltage…	
RackNest 2/14	
115-VAC	**RM110A**
230-VAC	**RM110AE**
RackNest 2/14 with Dual Power Supplies	
115-VAC	**RM110A-2PS**
…then order backup power supplies you may need…	
Power Supply	
115-VAC	**PS1000A**
230-VAC	**PS1000AE**
…next, order up to 14 cards to populate the rack…	
Async/Sync Card, 19.2 kbps	
RS-232	**ME760C**
Sync Cards	
Balanced G.703 Interface on Line Side, 2.048 Mbps	
V.35	**ME270C-35-R2**
RS-530	**ME270C-530-R2**
Unbalanced G.703 Interface on Line Side, 2.048 Mbps	
V.35	**ME275C-35-R2**
T1/E1 Fiber Optic Line Driver (T1/E1 FOLD), ST	
1300-nm Single-Mode	**MT650C-R2**
To connect the V.35 cards, you need…	
V.35 Adapter	**FM150-R2**
NOTE: Each adapter supports two cards.	
For optimum performance and a 20% savings, order…	
CAT5 Solid-Conductor Bulk Cable, 2-Pair, PVC, Custom Lengths	**EYN717A**
NOTE: Other lengths and plenum cable available.	
Call Tech Support.	
Standard RS-232 Low-Noise Cable, 25-Conductor, 10-ft. (3-m)	**ECM25T-0010**
NOTE: Other lengths available. Specify gender when ordering.	