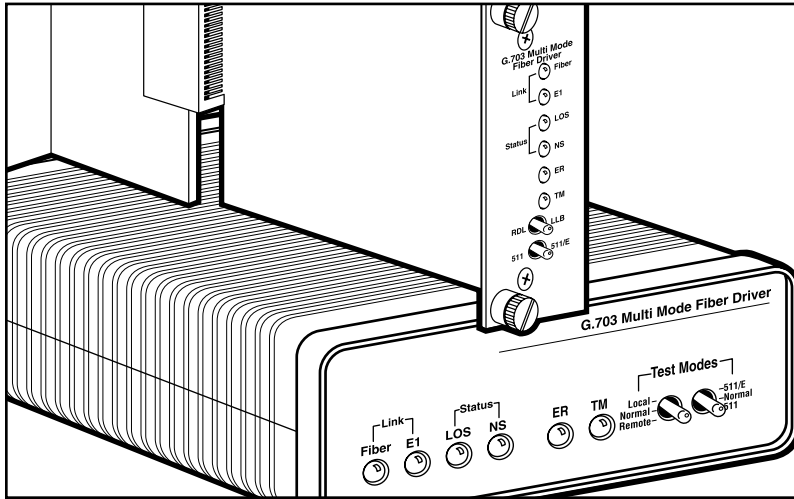# BLACK BOX®
NETWORK SERVICES

G.703/E1 FIBRE LINE DRIVERS

Link two G.703 or E1 devices or networks across a reliable, untappable, <u>single</u> fibreoptic line.

Key Features

▶ *ITU G.703/G.704 (E1) transport over fibre.*

▶ *Full duplex over a single fiber strand.*

▶ *Multimode distances to 1.5 miles (2.5 km), single-mode distances to 31 miles (50 km).*

▶ *Versatile connector options.*

▶ *Internal, network, or receive-recover clock.*

▶ *AMI or HDB3 coding.*

▶ *LED status indicators.*

▶ *V.54-compliant loopback tests and V.52-compliant BERT.*

Why pay for two E1 or G.703/G.704 lines when you can connect all of your equipment—even the most distant devices—to one?

The G.703/E1 Fiber Line Drivers are designed to link a local G.703/G.704 or E1 device or network to a remote site across a single strand of fiberoptic cabling. *Not* a duplex cable—the Line Drivers operate full duplex over just one fiber strand, maximizing your cabling investment. And with fiber, there's no need to worry about electrical interference, surges, or unauthorized access to your data.

Several models are available:

• The Multimode version comes in a standalone model (product code ME400A-ST) and as a card (ME400C-ST) designed to be installed in a MicroRACK such as RM260. The Multimode models can transmit across as much as 2.5 km (1.5 miles) of 62.5/125-µm multimode cable.

They have ST® fibre connectors.

• The Single-Mode version comes in two standalone models (product codes ME401A-FC and ME401A-SC) and two MicroRACK card models (ME401C-FC and ME401C-SC). The Single-Mode Line Drivers can transmit across as much as 50 km (31 miles) of 9/125-µm single-mode cable. The "-FC" models have FC connectors, while the "-SC" models have SC fibre connectors.

All of these Line Drivers can accept either 120-ohm twisted-pair or 75-ohm dual-coaxial E1 or G.703/G.704 connections. They each have an RJ-48C jack for the twisted-pair and two BNC jacks (one TX, one RX) for the coax.
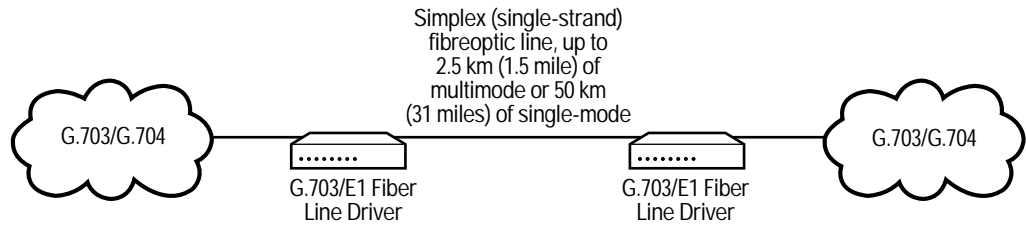
The Line Drivers can be set to use any valid combination of internal clock, network clock (external from the attached

device or network), or receive-recover clock (across the fibre line from the other Driver).

The Drivers normally use HDB3 coding for E1 or G.703/G.704 data. But if you have older equipment, they can be set to use AMI data coding instead.

The Line Drivers each have six front-panel LED indicators: for fibre-line and E1-line status, loss of sync, test mode, error, and no signal. They also have two switches. One can be used to begin and end V.54-compliant local analog loopback and remote digital loopback tests. The other can be used to control the injection of V.52-compliant 511-bit and errored 511-bit Bit-Error Rate Test (BERT) patterns.

Connect two E1 or G.703 networks, as shown here, or run from a local network or device to a distant remote device.

Simplex (single-strand) fibreoptic line, up to 2.5 km (1.5 mile) of multimode or 50 km (31 miles) of single-mode

G.703/G.704

G.703/E1 Fiber Line Driver

G.703/E1 Fiber Line Driver

G.703/G.704

Specifications

Interfaces:
Network: ITU G.703/G.704 E1, either 120-ohm modular or 75-ohm coaxial, user-selectable;
Fibre line:
ME400 models: 850-nm multimode fiberoptic into simplex (single-strand) 62.5/125-μm cable;
ME401 models: 1310-nm single-mode fiberoptic into simplex (single-strand) 9/125-μm cable;
Card models only: Proprietary MicroRACK power and data bus

Protocol: Synchronous

Clock Source: Internal, recovered from received line signal, or external from G.703/G.704 network

Data Rate: 2.048 Mbps on both line and network interfaces

Line Coding:
Network: AMI or HDB3, user-selectable;
Fibre line: 8B10B

Operation: Fibre line: Full duplex

Transmitter Launch Power:
ME400 models: 0 dBm;
ME401 models: From 0 to –10 dBm

Receiver Sensitivity: 18 dBm

Optical Budget:
ME400 models: 7.5 dB
ME401 models: From 0 to –10 dBm

Maximum Coupling Loss: 1.5 dB per connector

Maximum Distance:
Network cabling from Line Driver to next device: 1.6 km (1 mile) of 24-AWG wire;
Fibre line between two Line Drivers:
ME400 models: 2.5 km (1.5 miles);
ME401 models: 50 km (31 miles)

User Controls:
(2) Front-mounted toggle switches for loopback and BER testing;
(1) 8-position DIP switch for clock source and line coding (bottom-mounted on standalone models, board-mounted on front card of card models);
(4) Jumpers for network-interface type (internal on standalone models, board-mounted on rear card of card models)

Indicators: (6) Front-mounted LEDs for various conditions

Diagnostics:
ITU V.54-compliant local (to G.703/G.704 network) or remote (to fibre line) loopback testing, user-controlled;
ITU V.52-compliant 511/511E BER testing, user-controlled

Connectors:
(1) Rear-mounted RJ-48C for 120-ohm twisted-pair network connection;
(2) Rear-mounted BNC female ([1] TX, [1] RX) for 75-ohm coaxial network connection;
ME400 models: (1) Rear-mounted ST female fibre connection;
ME401A-FC, ME401C-FC: (1) Rear-mounted FC female fibre connection;
ME401A-SC, ME401C-SC: (1) Rear-mounted SC female fibre connection;
Card models only: Matching 50-pin card-edge connectors on front and rear cards

Leads/Signals Supported: RJ-48C: Pins 1, 2, 4, and 5 (Rx+, Rx–, Tx+, and Tx– respectively)

Isolation: G.703/G.704 interface: Transformer coupled, 1500 VAC RMS

Temperature Tolerance:
Operating: 0 to 50°C;
Storage: –40 to +85°C

Humidity Tolerance: 5 to 95% noncondensing

Enclosure: Standalone models: High-impact plastic

Power:
Standalone models: From utility-power (mains) outlet, through external power-supply transformer:
Input (autosensing): 100 to 240 VAC, 50 to 60 Hz, at up to 10 watts;
Output: 5 VDC at up to 1 amp;
Card models: 5 VDC from the midplane bus of the MicroRACK it's installed in

Size:
Standalone models: 3.8 x 10.4 x 12.7 cm;
Card models:
Rear card: 8.4 x 3.8 x 5.7 cm;
Front card: 8.4 x 3.8 x 12.7 cm

Weight:
Standalone models:
Net plus power supply: 0.5 kg;
Shipping: Approx. 0.8 kg;
Card models:
Net, rear card: 100 g;
Net, front card: 77 g;
Shipping: Approx. 0.3 kg

The complete package

The standalone Line Drivers come with a power supply and a manual.
The Line Driver Cards come as a front card and a rear card and come with a manual.

Ordering Information

ITEM	CODE

G.703/E1 Fibre Line Drivers
  Multimode
    Standalone ME400A-ST
    Card for MicroRACK..ME400C-ST
  Single-Mode
    Standalone
      With FC connectors...ME401A-FC
      With SC connectors...ME401A-SC
    Card for MicroRACK
      With FC connectors...ME401C-FC
      With SC connectors...ME401C-SC

You might also need...
Straight-through-pinned UTP patch cable with RJ-45 plugs for G.703/E1 (specify length)..........................EYN737MS-MM
E1 twisted-pair data-line surge protectors SP526A
Coaxial cable with BNC male connectors for G.703/E1 (specify length) ETN59-BNC
E1 coax data-line surge protectors...*Call for a quote*
Multimode patch cable, ST connectors (specify length)..EFN062-C
Indoor style duplex multimode cable, bulk (1000-ft. [304.8-m] spool)..EFN062A
Single-mode patch cable, FC connectors (specify length) EFN6000
Single-mode patch cable, SC connectors (specify length)..EFN5010
Indoor style 6-strand single-mode cable, bulk (500-ft. [152.4-m] spool) EFN006A-0500
If you need to run fibre cable outdoors, please call Black Box Tech Support for help determining what type of indoor/
outdoor or outside-plant cable you'll need.

16-Port Managed MicroRACK RM260
Universal AC power supply for the Managed MicroRACK...PS466A
–48V DC power supply for the Managed MicroRACK PS466A-DC

For standalone Line Driver models, you might want to call Black Box Tech Support for help determining your best
options for AC-power backup and protection.

Black Box offers the best warranty program in the industry—Fido Protection®. For more information, request **FaxBack 22512**.