BLACK BOX®
NETWORK SERVICES

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MICROMUX SP3I RANGE

*Supports up to six data ports
and a second G.703 port*

Key Features

▶ *Includes a second E1 port.*

▶ *Full add/drop capability for voice and data applications, including PBX integration.*

▶ *Six configurable DTE/DCE data ports.*

▶ *In-band management.*

Black Box SP3i range of products that are a tried and tested in the carrier market place, and are designed to fit into a wide range of applications.

The most common application is that of interface conversion from G.703 to one of the common WAN (Wide Area Network) interfaces such as X.21, V.35, RS449 or RS530. It is also possible to use V.24 synchronous in certain situations.

There are several port options for the range including a single port, a dual port, a quad port and a hex port.

There are two flavours of hex port, one with one G.703 port and the other (the Ultima MXU9910-R3), with two G.703 ports.

G.703 Ports

Each unit can support either unframed (also called unstructured or clear channel) 2.048Mbps G.703 circuits or framed (also called structured or channelised) 64Kbps to 1.984Mbps circuits as directed by the G.704 standard. The G.703 / G.704 ports

are present on a DB15 way female connector, and a range of cables are available to convert this connector to either a pair of BNC's (1 x TX and 1 x RX) for 75ohm operation, an RJ45 Male for 120ohm operation, or a crossover DB15 way to DB15 way cable for connection to other MicroMux units.

The units will support voice or data across the WAN and the MicroMux-CR is the only unit available in the market that can maintain external Timeslot Zero timing information and pass it across an X.21 link whilst maintaining all original timing and data integrity.

Serial Ports

The serial ports are presented as DB25 way female connectors. A range of cables are available to convert this connector to the more common serial connectors used, such as the DB15 way for X.21 use and the MRAC 34 or 34 way Winchester for V.35 use.

The ports can all be configured

for either 2.048Mbps clear channel operation, or for 64K to 1.984Mbps to support data coming from G.703 / G.704 channelised ports.
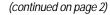
Each port can either provide a clock, or slave to an external clock presented to the serial interface. The ports can also be presented as either DCE or DTE ports. This is ideal for setting up onward links through serial lines. The ability to make use of 56K timeslots also exists, making the range ideal for connection to American T1 lines.

The serial models supported are X.21, V.35, RS449 and RS530. Synchronous V.24 can also be supported depending on application.

The number of serial ports depends upon the model of SP3i that is purchased.

MXU9900-R3 is a single serial port device with a single G.703 uplink port.

MXU9902-R3 is a dual serial port device with a single G.703 uplink port.

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MXU9904-R2 is a quad serial port device with a single G.703 uplink port.

MXU9906-R2 is a hex serial port device with a single G.703 uplink port.

MXU9910-R2 is a hex serial port device with dual G.703 uplink ports.

MXU9911 is a hex serial port device with dual G.703 uplink ports and the ability to maintain external Timeslot Zero integrity.

Clocking

There are a large number of clocking options for the range of SP3i MicroMux's.

They include:

Internal Clock - with an accuracy of 20ppm (Parts Per Million), which is well within the ITU-T G.703 specification of 50ppm. This clock is used for the G.703 ports and the serial ports. All clocks output in this mode will be in phase with each other and derived from the same source. I.E. A speed of 2.048Mbps may be set up on the G.703 interface, while a speed of 128Kbps is configured on the serial port. Both these clocks will be originated from the same source. When using Internal Clock mode, the clock appearing on the Receive of the G.703 port will be dumped.

Slave Clock – where the clock is derived from the G.703 data stream received by the unit. This clock is monitored for its presence and accuracy, and the unit can be programmed to automatically switch to another clock source should the slave clock disappear or become out of specifications. This mode causes the unit to use the clock appearing on the Receive of the G.703 port and turn it around internally, and use that same clock for the clocking out of data of the G.703 Transmit port, whilst using it to clock out the data of the serial port.

External Clock – a clock signal derived from a serial interface can also be used to control all timing information for the unit. In this case, the unit can be programmed

to appear as a DTE if required. The serial port will receive a clock into the unit. This clock is then passed onto the main circuit board and Phase Lock Looped onto the Internal Clock. The serial clock source must provide the unit with an accurate clock to avoid timing issues later. This mode is particularly useful for onward linking onto serial circuits that provide their own timing information, or onto external Base Stations that are also running on their own clock sources.

Applications

All the SP3i MicroMux range can be used in a variety of applications.

The simplest of which is G.703 or G.703 / G.704 to serial conversion. This entails configuring the SP3i for appearing as a DCE device, with the correct clocking information and installing the unit with the correct cables as outlined at the bottom of this document. The clock will either be Internal or Slave, and the unit will provide the required clock for all serial devices connected.

The second most common application is connecting G.703 devices on to serial lines. In addition to the interface conversion required, the units provide an easy method for controlling very difficult timing issues. Most serial lines have their own inherent clock in the network. Since the SP3i MicroMux range can utilise this clock to provide timing to all ports, traditional clocking issues do not occur.

MXU9900-R3 is a single serial port device with a single G.703 uplink port.

MXU9902-R3 is a dual serial port device with a single G.703 uplink port.

MXU9904-R2 is a quad serial port device with a single G.703 uplink port.

MXU9906-R2 is a hex serial port device with a single G.703 uplink port.

MXU9910-R2Ultima is a hex

serial port device with dual G.703 uplink ports.

MXU9911 is a hex serial port device with dual G.703 uplink ports and the ability to maintain external Timeslot Zero integrity across serial links.

DTEX21CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB15 way male, for connection to a DCE device such as an NTU.

DCEX21CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB15 way Female, for connection to a DTE device such as a Router.

DTEV35CBL is the cable that converts from the DB25 way Female on the back of the unit, to an MRAC 34 way male, for connection to a DCE device such as an NTU.

DCEV35CBL is the cable that converts from the DB25 way Female on the back of the unit, to an MRAC 34 way Female, for connection to a DTE device such as a Router.

DTE449CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB37 way Male, for connection to a DCE device such as an NTU.

DCE 449CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB37 way Female, for connection to a DTE device such as a Router.

DTE530CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB25 way Male, for connection to a DCE device such as an NTU.

DCE 530CBL is the cable that converts from the DB25 way Female on the back of the unit, to a DB25 way Female, for connection to a DTE device such as a Router.

CBLBNC is the cable that converts from the DB15 way

Female on the back of the unit, to a pair of 75 ohm BNC connectors for G.703 connection.

CBLRJ45 is the cable that converts from the DB15 way Female on the back of the unit, to a single 120 ohm RJ45 connector for G.703 connection.

CBLPT is the cable that converts from the DB15 way Female on the back of the unit, to open ended wires for punch down block connection. These are often referred to as pigtails.

CBLDCH is the cable that converts from the DB15 way Female on the back of the unit to another DB15 way Female, with crossed pinning, for connection to another SP3i MicroMux.

Power Supply

As standard, all units come with an internal 90 – 250 Volt A.C. power supply, 50 – 60 Hz auto sensing. This makes the range ideal for international use. This supply presents a single IEC320 mains socket.

As an option, a -48 Volt D.C. internal power supply is available, present screw terminal blocks.

Specifications for Extenders

Data Ports: DB25 F Connectors: multiprotocol support (EIA-530, RS-449, X.21 and V.35); capable of rate adaption at any Nx64 and Nx56; clock rate up to 2.048 Mbps; presentation via DB25 F connector and adaptor cable; DTE and DCE support; DTE clock phase option; loopback option; SP-3i SRA: (1) data port; SP-3iMultiport (2), (4), or (6) data ports; SP-3i Ultima: (6) data ports.

Network Ports: CDB15 F connector to adaptor cable (twin BNC for 75-ohm connection, RJ-45 F for 120-ohm connection); G.703 clear channel and G.704 structured support; use of recovered clock; internal master clock or externally derived clock; network side data inversion option; remote loopback option; MXU9900-R3, MXU9902-R3, MXU9904-R2, MXU9906-R2: (1) network port; MXU9910-R2: (2) network ports.

Indicators: (5) LEDs: Power Status, Carrier Line Status, Frame Sync Status, clock Master Enabled, Local and Remote Loopback Enabled.

Power: 230 VAC, 50 Hz/115 VAC, 60 Hz; optional international power supply: 90/250 volts, switch-selectable, 50/60 Hz, autosensing (optional 48-VDC power supply on request); All power supplies are internal.

Size: MXU9900-R3, MXU9902-R3: 5.5H x 44.4W x 24.1D cm;

MXU9904-R2, MXU9906-R2, MXU9910-R2: 5.5H x 44.4W x 24.1D cm.

Weight: MXU9900-R3, and MXU9902-R: 2.32 kg; MXU9904-R2, and MXU9906-R2: 3.22 kg