Patapsco's MediaBand-4

Technical Specification

4 Port E1/T1 to Fibre/Fiber Media Converter

Remotely manageable and able to transport E1/T1s and Ethernet traffic down the same fibre.

Overview

MediaBand-4 transports up to four E1/T1 circuits across a wide variety of fibre links.

The same fibre can be used to simultaneously transport Ethernet services.

- Highly-accurate clocking and clocking options
- Support for multiple different clocks across the fibre
- Remotely manageable via Ethernet ports
- Telecoms Approvals for direct connection to carrier's leased lines
- Distribution options across UTP
- Intuitive graphical manager – no DIP switches!
- Real-time Events & Alarms
- Excellent diagnostics and link performance statistics
- Robust, reliable and professional quality
- Inter-works with other members of the MediaBand family

MediaBand excels in delivering stable, reliable and manageable services across fibre links and benefits from Patapsco's excellent support.

1. Connectivity Overview

The MediaBand-4 interfaces to up to four E1 or T1 circuit and delivers these clear trunks transparently across a fibre link.

Pairs of MediaBands are required, but different versions can be used at each end, opening a number of interesting conversion opportunities which are covered below.

Furthermore, multiple units can be inter-connected to drive more E1/T1s over a single fibre link.

MediaBands can also be inter-connected to distribute E1/T1s across a site on standard CAT5E cabling.

The fibre presentation is via an SFP (Small Form Pluggable) socket into which most standard SFP modules can be inserted, providing customers with the option and flexibility to use different light sources for different fibres over different distances.

An RJ45 Ethernet port is available for connection to a LAN for both transportation of Ethernet traffic over the fibre and for centralised management and Event/Alarm reporting.

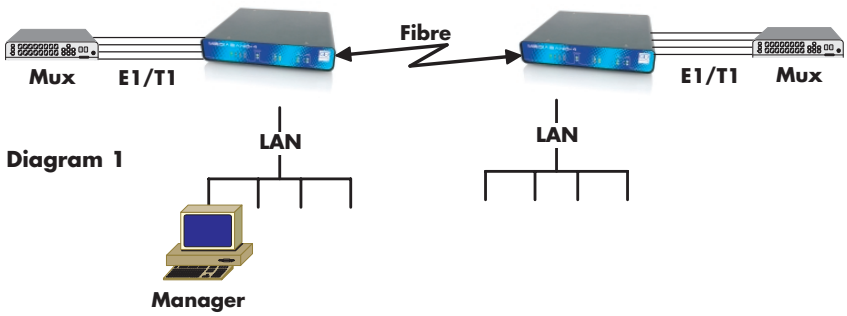


Diagram 1

2. Interfaces

4 x E1 or T1 interfaces (user switchable impedance matching)

RJ45 120 Ohm or 75 Ohm (user switchable) via converter cable.

Full E1/T1 clear-channel

SFP cage with the appropriate SFP Module interconnects to a fibre at 10/100/1GE.

A local 10/100/1GE UTP Ethernet port for transporting packetised traffic, for management purposes or inter-linking MediaBands, RJ12 serial management port.

MediaBand can also be controlled/managed across the fibre link through its partner's LAN or serial connection

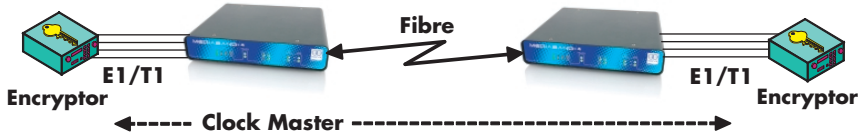
IEC connector for quality internal AC PSU (DC options available)

3. Clocking and Clock Sources

MediaBand can be easily configured via the GUI Manager to clock or be clocked in a number of ways.

If no external clock is available, as in Diagram 2, one MediaBand can be configured to be the clock Master and will clock all of its E1/T1 interfaces. Its partner MediaBands will slave clock across the fibre link. This method, as opposed to running both ends via their onboard oscillators, ensures the clocks are always locked and there will be zero slips/hits due to clock drift.

Diagram 2



MediaBand can pass a single master clock source, derived from an E1/T1, across the fibre link ensuring both ends are synchronised to the provided clock source. Diagram 3 illustrates this scenario. Any E1/T1 port can be used as a clock source and MediaBand can be configured to switch to other interfaces to source clock should this Primary clock fail, thus ensuring other circuits are maintained.

Diagram 3

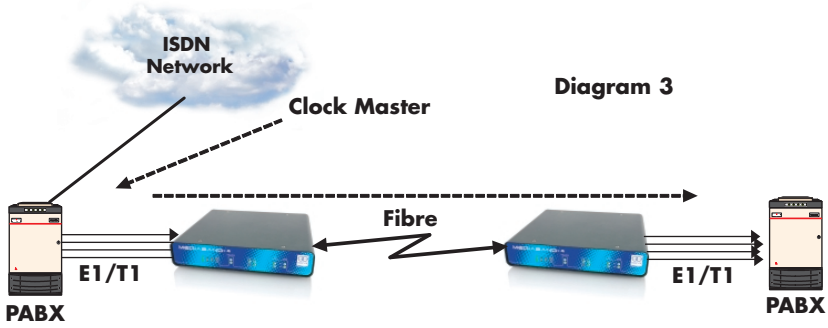
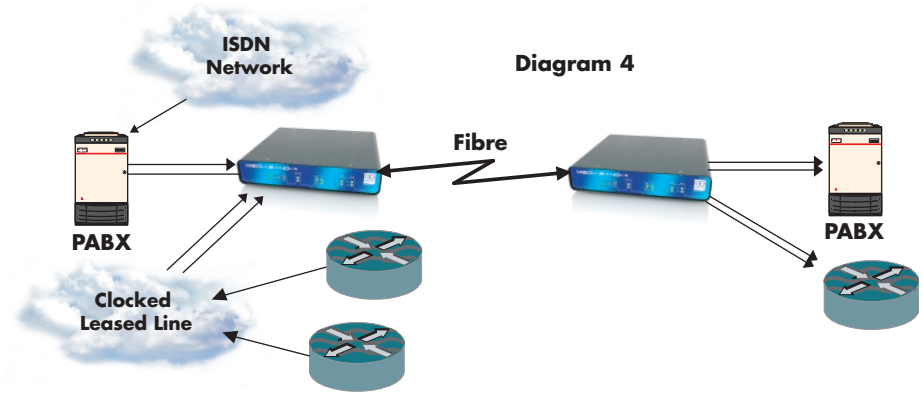


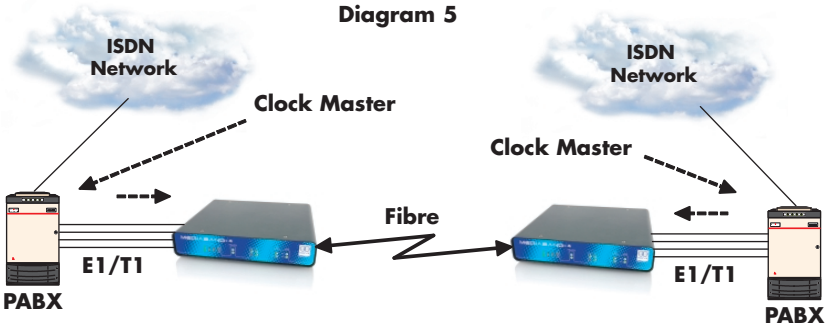
Diagram 4



Uniquely, MediaBand can optionally support more than one clock across the fibre link, so differently-clocked E1/T1s can be combined within MediaBand-4 and the separate clocks presented at the other end of the fibre link. Diagram 4 shows several clocks being transported.

Diagram 5 shows an example where both customer devices have a master clock source on an E1/T1. Each MediaBand can be configured to accept this clock and crucially a buffer can be user-configured to handle any slight clock differences between the two sources, again ensuring there are no data losses.

Diagram 5



All of these configuration parameters are configured, locally or remotely, via the intuitive graphical interface.

4. Ethernet Port

MediaBand-1 provides a 10/100/1GE Ethernet port. This can be used for Management of a particular unit or its partner at the other end of the fibre.

This Ethernet port can also be used to transport user Ethernet traffic through MediaBand and across the fibre, as shown in Diagram 1 above. This means a single fibre link can transport an E1/T1 PLUS Ethernet traffic. Support for packets up to 1632 bytes in size (10,240 bytes Mar 09).

4.1 Rate Limiting

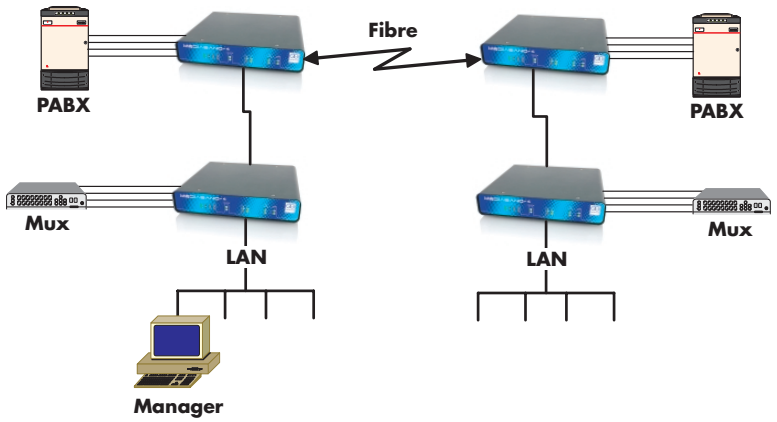
Depending on Ethernet and fibre speeds, it is possible for the local LAN traffic, when using MediaBand's ability to transport Ethernet across the fibre, to swamp the fibre link to the detriment of the E1/T1.

MediaBand has a Rate Limiting feature which can "choke" the Ethernet traffic down to a configured speed, irrespective of the speed of the connected Ethernet, ensuring delivery of the E1/T1 circuit.

4.2 MediaBand Distribution

Instead of connecting the Ethernet port to a LAN, using a dedicated CAT5E cable between two locally-located MediaBands means multiple units can be inter-connected to use the same fibre, as in Diagram 6. This means, within the limits of driving distances, E1/T1 ports can be located where needed, for example in different communications racks. Diagram 6 shows two MediaBand-4s providing 8 E1/T1s across the fibre.

Diagram 6



5. Interworking

It is possible to mix versions of MediaBand, so for example in place of the second MediaBand-4 in diagram 6 you could use a X.21 or V.35 MediaBand-VX

See also Patapsco's MediaBand-8 and MediaBand-32 which are resilient chassis supporting 8, 16 or 32 E1/T1 ports over fibre, with the option of using two fibres for load-sharing and resiliency. MediaBand-32 load-shares across the two fibres and automatically switches to a single fibre should one fail.

6. Approvals

All approvals completed in a UK Accredited laboratory. Reports available. CE marked.

Safety and Emissions (EMC) approvals (CE and FCC)

Telecoms approvals for connection to carrier leased lines is optionally available for applications similar to those in Diagram 4

MediaBand-4 is RoHS compliant without the use of "exceptions".

7. Management

7.1 Overview

MediaBand can be locally or remotely configured using Patapsco's easy-to-use high functionality DbManager GUI software. DbLite is supplied free with each unit.

Optionally available are versions to support and give visibility of many MediaBand units, consolidating control, configuration, Events/Alarms and diagnostics. It is sophisticated but simple to use via an intuitive Graphical User Interface (GUI) and can also generate SNMP Traps and Alarms.

The DbManager supplied with MediaBand (DbLite) allows control and visibility of a single MediaBand at any one time. A document identifying the differences between DbLite and other versions is available.

An option to encrypt the management traffic across the packet network is available, together with a key management/update system.

Demonstration software is available which illustrates both the DbManager and the MediaBand features. Please ask for information. Movies are available at www.patapsco.com

7.2. Configuration Changes

Configuration changes on MediaBand are made via the DbManager. All configurations can be stored on DbManager.

Installations require little or no expertise in the field as most configurations (other than setting an IP address) can be performed remotely.

Configurations are held in non-volatile memory.

7.3 Management Tools

A wide number of statistics are available for the E1/T1 circuit and Ethernet port.

7.3.1 Alarms/Events

All Alarms are reported back to the DbManager and presented in a dedicated window with descriptor. Events and Alarms are held within MediaBand for access via DbManager. A dry contact alarm relay is available in the RJ12 port.

7.3.2 Clocks

Information and graphs showing clock movements over time. Shows frequency stability and the status of the clock.

7.3.3 Loop-Backs

Loops can be placed on the TDM port in either direction and at the Ethernet level.

7.3.4 Pings

MediaBand generates Ping/Trace Route and responds to Ping and UDP Echo requests.

7.3.5 Boot Test

Internal test on power-up with results visible via DbManager.

7.4 Software/Firmware Updates

New software can be loaded via the DbManager to MediaBand New software is loaded to the off-line sector of Flash and is confirmed via a CRC. Users can switch to the new software at any time. DbManager can load new code to multiple MediaBands simultaneously.

8. Power

7.1 Internal High-Quality AC supply

Auto-sensing, standard IEC input.

7.2 Optional DC Supplies 48VDC or 24VDC (nominal)

Replaces AC supply. Specify when ordering.

9. Specifications

A. TDM port (E1)
RJ45 connector
Presents as DCE (crossed cable for DTE)
120 Ohm
75 Ohm user-selectable via converter cable
G.703 unstructured
HDB3
Transparent to user signalling

B. TDM port (T1)
RJ45 connector
Presents as DCE (crossed cable for DTE)
100 Ohm
Unframed G.703 1.544Mbps
B8ZS or AMI selectable
Transparent to user signalling

C. Ethernet Interfaces
1 x SFP cage (module not supplied) for various fibre modes
1 x RJ45 UTP
10/100/1GE
Auto-sensing or manual

D. Local Management Port
RJ12
Asynchronous
Auto-sensing to 115kbps
Also remote access via packet network

E. Oscillator Performance*
Standard
Hold-over 24hrs 0.5ppm
Aging per day 20ppb
Temperature Stability 0.600ppm
Enhanced
Hold-over 24hrs 15ppb
Aging per day 10ppb
Temperature Stability 12ppb
* Figures based on typical parts and performances. Individual oscillators may vary slightly. Temperature Stability range -5°C to +70°C assumes 20 minutes from power on. Aging and holdover at constant temperature

F. IP & MAC Address
Single MAC address, IP address, subnet mask and default gateway

G. Configuration
Held in non-volatile memory

H. Realtime Clock
For time-stamping Events and Alarms

I. Power (AC)
Internal via IEC connector
Auto-sensing 96VAC-240VAC
Max consumption 0.2Amps RMS @230VAC
MTBF 400,000hrs

I. Power (DC)
1. Nominal -48VDC
4mm terminal block
-33VDC to -75VDC
0.35A max
MTBF 1,790,000hrs
2. Nominal -24VDC
4mm terminal block
-18VDC to -75VDC
0.55A max
MTBF 800,000hrs

J. Dimensions & Environment
Metal chassis and front/rear panels
W – 225; D – 200; H – 44mm
Weight – 0.9Kg/2lb
Optional 19" rack-mount kit; 1 unit per 1U or 2 units side-by-side per 1U
Operating Temperature -20°C to +55°C
Humidity 10-90% non-condensing

K. Maintenance
There are no serviceable parts or maintenance required

L. Approvals
EMC
EN55022:1988
EN55024:1988
EN61000-3-2:2000
EN61000-3-3:1995
AS/NZ CISPR22:2000
FCC Part 15(B)
RoHS Compliant without the use of exceptions

M. Safety
EC EN60950-1:2002
ACA TS001:1997
ACS/NZ60950:2000
AS/NZS3260:1993
IEC950

N. Telecomms (optional)
TBR12/TBR13
TBR4/TBR3
TIA/E1A-1S/968
TNA117
AS-ACIF S006/S016

For ordering information, see separate document

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