

I-MUX T1 / E1 Inverse Multiplexer

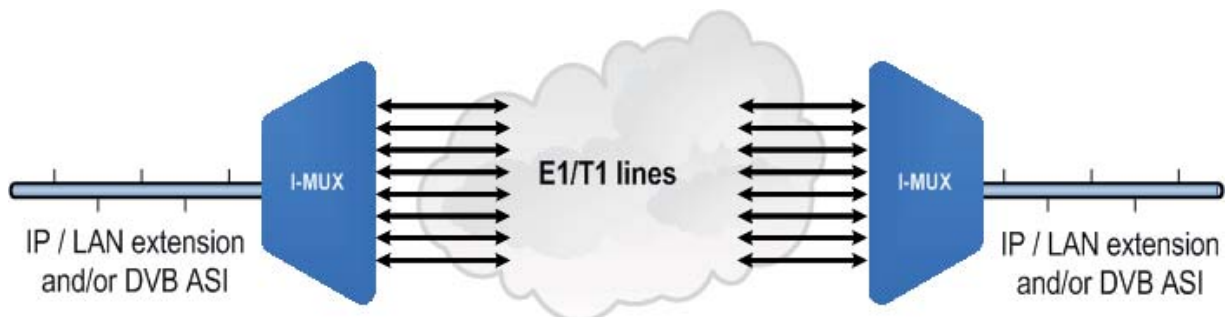


LAN extension over n x E1/T1

Resilient Wide Area Networks

Ideal for data and broadcast use

Ethernet IP and ASI over multiple E1/T1 lines



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The ARG I-MUX Inverse Multiplex provides cost-effective, robust transmission and reception of IP data and broadcast-quality audio and video on a single or multiple E1 / T1 lines.

The system has up to 15.76Mbit/s of usable data bandwidth and is supplied as a compact bi-directional box complete with ease-to-configure Ethernet and ASI user ports.

The ARG I-MUX overcomes the bandwidth limitations of T1 1.55Mbit/s and E1 2 Mbit/s circuits by seamlessly and robustly combining several T1 1.55Mbit/s or 2Mbit/s circuits together.

Up to 8 E1 or 8 T1 framed or unframed circuits can be combined to provide up to 15.76 Mbit/s of usable bandwidth. For example, just two E1 lines can reliably deliver a broadcast-quality newsfeed at MPEG4 3.5 Mbit/s.

The ARG I-MUX does not require pre-bonded circuits. E1/T1 circuits with different clocks from different networks can be combined.

The system compensates for up to 64 mS of delay between circuits, making it the most robust and reliable inverse multiplex solution available.

Dual power supplies and a large installed base contribute to an impressive mean time between failure (MTBF) of over 30 years. Installation and commissioning requires no specialised tools or computer interfaces, thereby minimising the need for staff training, and significantly reducing cost of ownership.

An intuitive front panel provides local set-up and control. A web server interface and SNMP capability provide remote management and linkage to third party network control systems.

- **High speed LAN extension**
- **Simple connectivity between international offices**
- **Higher speed lower cost connectivity than E3 or T3**
- **Low cost high resilient networks**

Multiplexes up to 8 x E1/T1 circuits together

The I-MUX only uses the bandwidth necessary. For example, if the transmission is MPEG4 at 4.5 Mbit/s then only three E1 circuits are required. Significant cost savings over using higher capacity circuits can be realized.

Choice of network interface

The I-Mux can be ordered with 75 Ohm BNC connectors or 75/120 Ohm RJ48 connectors, making the I-MUX suitable for use on any network.

Large buffer between E1/T1 circuits

Large buffer capacity removes any concerns of diversely routed circuits. The I-MUX can operate over circuits which take different routes and from different suppliers if necessary. A massive delay difference of 64 ms is possible between circuits, practically enabling circuit lengths to be thousands of miles apart.

T1 Framing

The unit will provide T1 framing for those situations where framed circuits are provided by the Telco (primarily in the USA).

Pre-Bonded circuits not required

Many inverse multiplexers on the market require pre-bonded E1 and T1 lines. These are lines that are closely matched by the Telco operators, usually US Teleco operators and so are easy for some inverse multiplexers to operate on. The I-Mux does not need pre-bonded E1/T1 circuits and so will work on any E1/T1 circuits world-wide



IP and DVB-ASI transmission

The I-MUX can be used to carry IP, DVB-ASI or both data formats simultaneously. MPEG encoder/decoders with Ethernet ports or ASI ports can be used, or the IP channel can be used for network management data or file transfer.

IP data transmission

Data in IP format is transmitted and received directly from the 10/100 Base T user port. The IP data rate automatically adjusts to available bandwidth. If no ASI data is present all of the bandwidth becomes available for IP.

Transparent ASI Transport Streams

DVB ASI traffic takes priority over IP data. The I-MUX adds less than 1 ms of delay for a 15Mbit/s transport stream on.

Two levels of Reed Solomon error correction

Two levels of Reed Solomon Forward (FEC) are selectable, 4 bytes or 16 bytes. These levels of Reed Solomon make the I-MUX suitable for use on microwave and other potentially noisy circuits.

Internal protection switching

Two or more E1/T1 circuits can be used to provide a managed '1+1' or 'n+1' protection capacity for high availability services. Bandwidth is spread across all available circuits.

Front panel control

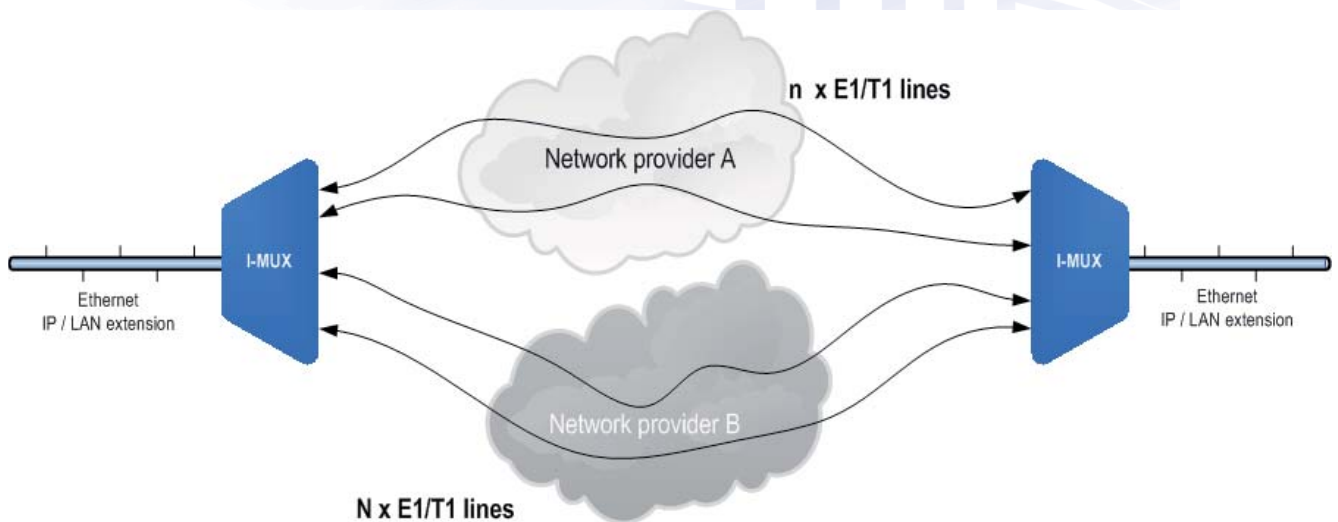
The I-Mux can be setup from the front panel with a password to lock settings. The receiving section of the I-MUX automatically configures itself and settings from the remote transmitting I-Mux. This is especially useful in large networks or at remote sites when ease and speed of commissioning is important

Web Management and SNMP

A built in Browser interface and SNMP MIB ensure that the I-MUX can fit into any current or future Network Management System (NMS). Rear panel contact closure alarms are provided for interface to third party NMS and monitoring equipment such as the ARG REMON

High Reliability

A calculated Mean Time Between Failure (MTBF) in excess of 30 years proves that the I-MUX is probably one of the most reliable inverse multiplexers available. All ARG products feature dual power supplies as standard and we also offer a -48v dc option on all products.





IP and ASI payload

Error Correction	4 Byte RS FEC	16 Byte RS FEC
IP and MPEG Payload per E1 link	1.97 Mb/s	1.85 Mb/s
Maximum IP and MPEG Payload per E1 System (8 links)	15.76 Mb/s	14.8 Mb/s
IP and MPEG Payload per T1 link	1.48 Mb/s	1.40 Mb/s
Maximum IP and MPEG Payload per T1 System (8 links)	11.84 Mb/s	11.2 Mb/s

Technical Specifications

MPEG Interface

DVB ASI Compliant.
 ASI formats supported: 188, 204 PAD/RS
 Traffic takes priority above TCP/IP

E1/T1 Circuit Interface

Complies with ITU-T G.703
 Jitter compliance: ITU-T G.823
 Impedance: 75 ohm unbalanced
 120 ohm balanced

TCP/IP Interface

10/100 base T
 Any data rate up to available bandwidth.
 Second priority to DVB ASI traffic.

System

Maximum number of bi-directional E1/T1 links: 8
 Maximum delay variance between links : 64ms

Forward Error Correction

Reed-Solomon, 4 Byte or 16 Byte

Management and Control

Front panel interface for local control
 Remote monitoring is offered by optional web server and SNMP

Mechanical

Height: 43.6mm (1U)
 Width: 482.6mm (19")
 Depth: 383mm (15") incl. connectors
 Weight: 5.6kg (12.3lbs)

Power Supply

Dual supply, single phase auto-ranging
 Power consumption 6W max.
 Choice of: 100-240VAC (50-60Hz)
 or: 36-72V DC (factory fitted option)

Environmental

Operating temperature: 0°C to 45°C
 Storage temperature: -5°C to 70°C