



2 Mbps Codec COMBIMUX



DESCRIPTION

COMBIMUX is a universal system for the transmission of audio and data signals via 2 Mbps. It is ideally suited for contribution and distribution networks. Its 19" cabinet holds several I/O modules that can be configured by jumpers and by software to operate in several ITU-T and ISO/MPEG audio coding modes. COMBIMUX does also perform the Drop & Insert functions. The equipment is configured by a PC using the COMBISOFT program that selects the coding procedure, allocates the time slots to the various audio signals and monitors the operational state. The COMBIMAP software monitors and controls complete networks.

COMBIMUX offers the shortest processing time: In J.41 mode only 3.6 milliseconds for a complete point to point transmission from the analogue audio input through the 2 Mbps interfaces to the analogue audio output.

Depending on the type and quantity of the signals to be transmitted, Mandozzi Elettronica SA. offers two versions of COMBIMUX:

COMBIMUX DT 88 is built into a 19" cabinet of two height units (h x w x d = 87.5 x 485 x 260 mm) that can be equipped with two input/output modules. The power supply module (non redundant), the central processor and the 2 Mbps module are integrated into the cabinet.

COMBIMUX DT 99 is built into a 19" cabinet of four height units (h x w x d = 177 x 485 x 300 mm) that can be equipped with the following modules:

- 1 CPU or SNMPU
- 1 E1 or E1Q (2 Mbps interface module)
- 1 or 2 power supply units: At least one is always needed, two for redundant supply
- The BGT cabinet offers the space for up to six I/O modules
- The BGTE cabinet offers the space for up to ten I/O modules. The space for the additional I/O slots was gained by installing the two power supply units in an additional 19" cabinet of 4 HU, called BGTP. This cabinet has space for six power supply units that are feeding three COMBIMUX cabinets redundantly, resp. six cabinets non redundantly.

FEATURES

- Mono-directional or bi-directional transmission of audio signals and data (serial and parallel data) on 2 Mbps channels.
- Analogue and/or digital (AES/EBU) audio interfaces. The digital interfaces are equipped with sampling rate converters.
- Transmission of IP signals over the 2 Mbps channel.
- Automatic IP back up connection in case of 2 Mbps failures.
- Several equipment can be cascaded (e.g. in order to increase the number of audio interfaces).
- Drop & Insert functions.
- E1Q modules with four E1 interfaces and integrated 240 x 240 time slot switch allow complex network structures to be realised.
- Comfortable configuration and monitoring functions by means of laptops with user friendly control surfaces.
- Remote configuration of any number of COMBIMUX equipment via IP.
- Remote monitoring of any number of COMBIMUX equipment via SNMP.
- Remote monitoring and configuration of complete networks by means of the COMBIMAP software.
- The equipment is especially designed to operate in severe electromagnetic environments
- Due to the interchangeability of the I/O modules, the possibility to configure them by software or jumpers and to equip them with customer specified connectors, COMBIMUX satisfies the most various requirements.
- Redundant or non redundant 230 VAC or 48 ... 60 VDC power supply, or mixed AC/DC.
- All modules can be replaced under power.

SPECIFICATIONS

- The **CPU module** manages the COMBIMUX, stores the configuration also in the case of power failure and communicates with the configuration PC. The J.41 and J.57 coding modes of the Encoder and Decoder modules can be defined by jumpers on the CPU module. This allows the modules to be automatically configured after power up.

- The **SNMP processor module**, inserted into COMBIMUX instead of the CPU module, gives the possibility to monitor and to remotely configure the COMBIMUX via SNMP.

- The **E1 module** realises the interfacing between the external 2 Mbps lines and the local I/O modules. Up to three 2 Mbps lines can be connected to the module. Two are bi-directional (the main interface and the drop / insert interface), whereas the third one is mono-directional ("monitoring output") and can be used as second, de-coupled output. The 2 Mbps interfaces respect ITU-G703/704. The E1 module transmits transparently - via time slot 16 - two channels of up to 4.8 kBd data called Z11 and Z12. The E1 module is also responsible for the clock signal that can be supplied from four different sources (selected by the configuration PC):

- An external 2.048 MHz reference signal (sine or square signal or G.703 signal)
- The main 2 Mbps signal
- The drop / insert 2 Mbps signal
- The internal oscillator

- The **ENCODER module** encodes two mono audio signals according to ISO MPEG 1 Layer II, ITU-T G.722, J.41 and J.57, and AC3. The audio input signals can be either analogue or digital (AES/EBU). If the ENCODER is set to MPEG 1 L II coding at 192 kbps, 48 kHz, it activates the ADR/DAB mode. In AC3 mode, the interface for the multi-channel signal coded according to AC3 is AES/EBU, and the signal occupies seven time slots inside the 2 Mbps frame

- The **DECODER module** decodes two mono audio signals according to ISO MPEG 1 Layer II and Layer III, ITU-T G.722, J.41 and J.57, and AC3. For the time being, the ADR/DAB mode is not realised in the DECODER.

In AC3 mode, the interface for the multi-channel signal coded according to AC3 is AES/EBU, and the signal occupies seven time slots inside the 2 Mbps frame.

- In addition to the audio signals, the **ENCODER and DECODER module** also transmit, resp. receive data:

- In MPEG mode: serial data in the form of ancillary data (up to 19.2 kBd) plus 7 TTL signals.
- In J.57 mode: 2 x 1 kbps.
- In J.41 and G.722 mode: 38.4 kBd data plus 7 parallel signals (TTL) via a separate time slot.
- In J.41 mode: one low speed ON/OFF signal (available at TTL level at the ancillary data connector). The L bit used is transmitted only during low amplitude audio samples.

- The **CODEC module** encodes two mono audio signals and decodes two other ones according to G.722 or J.41 (same standard for both transmission directions, audio only).

- The **X.21 Module** allows two data streams to be inserted into and two other ones to be extracted from the 2 Mbps frame. Each of the two interfaces can be configured by software individually to work either as DCE (clock from the 2 Mbps network) or DTE (clock from the external equipment).

- The **DATA module** transmits and receives four serial and 16 parallel signals via a separate, freely selectable 64 kbps time slot. Signals with up to 38'400 Bd can be transmitted. If hand shake operation is selected, it is possible to transmit four signals with up to 38'400 Bd each.

- The **WAN module** offers the possibility to transmit IP signals 100/10 Base T over the E1 line. The time slots used can be set independently for each direction to any number between 1 and 30.

- The **UMAC-C module** is an Audio over IP module that respects the standards set forth by the EBU N/ACIP group. It transmits and receives two mono or one stereo signal in ITU-T G.711, G.722, ISO-MPEG 1 Layer II and III, Enhanced APT-X, AAC (LC, HE, HEv2, LD and ELD), OPUS, linear.

- The **COMBISOFT** program is used to configure and monitor the COMBIMUX equipment from an external PC. If equipped with an SNMPU module, COMBIMUX can be remotely configured and monitored via IP.

- **COMBIMAP** is a software that allows complete COMBIMUX networks to be monitored from a maintenance centre via IP. It shows on a graphic display a geographical map with the COMBIMUX locations and the operational state of the equipment.

