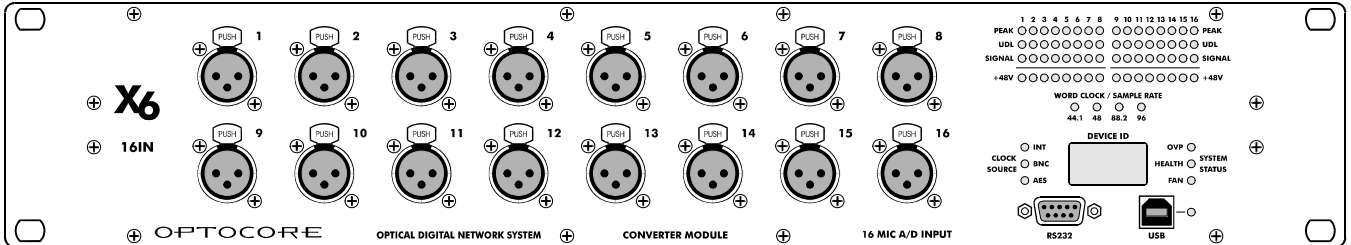


### X6-Series

DESCRIPTION

CONVERTER UNITS

OPTICAL DIGITAL NETWORK SYSTEM



**NETWORK.** The OPTOCORE® OPTICAL DIGITAL NETWORK SYSTEM is a patented, synchronous, optical fibre network system specially designed to meet the requirements of the professional live audio, broadcast, studio, installation and video industries. The system offers a unique, flexible and scalable, dual redundant ring structure providing maximum safety in a user-friendly network with an exceptionally low latency time whilst using the least possible amount of optical fibres. Alternatively, a network can be reduced to a point to point connection. Controlling and channel-routing is easily achieved from any point within the network by computer or media-access device. Additionally, the excellent word clock capability of the system is available at all nodes on a ring.

**CONCEPTION.** The 16 audio channel converter units of the X6-series were developed to be inserted to the optical fibre network system via a DIGITAL I/O UNIT DD32. By this means, up to four converter modules can be served by one DD32, summing to at least 64 analog in- or outputs. The devices may also be used as high-quality AD and DA converter units for non OPTOCORE applications. Three different versions are available: 1. 16IN: 16-mic/line input, 2. 16OUT: 16-line output, 3. 8/8: 8-mic/line input – 8-line output. High integration density achieved with SMD production ensures smallest possible enclosure dimensions. With regards to audio transmission quality, the components and circuitry meet the highest of demands. The conception of the X6-series has been developed in close collaboration with professional users from the fields of broadcast, live-sound and studio.

**AUDIO SECTION.** In the audio section the devices are each equipped with 24-bit converting technology for up to 96kHz sample rate for the high-quality conversion of analog audio signals. Each analog in- and output is electronically balanced and XLR connected. Each input includes excellent OPTOCORE-style microphone pre-amping and switchable phantom power with selectable gain: 0dB up to 50dB in steps of 10dB (Level definition: 0dB ≡ +18dBu ≡ 0dBFS). For all of the inputs, a post mic-pre-amp, dual electronically balanced analog output is available via SubD25 connector on the rear panel. All of the outputs can be adjusted in two steps of 0dB and –10dB of maximum level.

Each unit provides 2 digital ports each with 8 channels of the RS422 hardware standard, allowing for the transmission of 2 x 16 AES3 digital audio channels. These ports are software adjustable to realise several connection options if desired. Only one of the ports needs to be connected to a DD32 principal port.

**WORD CLOCK.** A word-clock in/out port accepts common audio word-clock and video syncs to drive the internal working clock with the help of several PLLs, a “Thru” connector eases further word-clock distribution. A high quality word clock can also be output by one device in a system of several. As such, an excellent synchronisation, even with non-OPTOCORE systems, can be established. Please note that the word-clock may be also distributed via the control chain connections.

**POWER SUPPLY.** The power supplies of the devices are 400V<sub>AC</sub> tolerant. An over-voltage-monitor lights the OVP, Over Voltage Protection, status LED during an over voltage condition, simultaneously suppressing the normal function of the devices. The units are cooled by a temperature dependant speed controlled fan.

**CONTROL FACILITIES.** The condition of each of the analog channels is indicated by 4 LEDs. The threshold parameters of the PEAK and the UDL (User Defined Level) LEDs may be software adjusted by the operator. The SIGNAL LEDs show an analog display behaviour (signal dependant brightness). The right hand section comprises ten status LEDs and a 3-character LED-display for ID purposes.

If the devices are inserted to the fibre network system via a DD32, a control chain via the fibre is automatically established through this connection and the controlling of all devices is achieved from any point within a network via computer using the OPTOCORE remote control software or a media-access device through the SubD9 connected RS232 input. The USB-port (through a USB device connector) is also designed for remote controlling and will soon be enabled. The routing and naming of all in- and output channels by means of matrix visualisation, the activating/deactivating and the level metering of any in- and output channel as well as the storage and recall of the configuration set-up to/from PC hard-disk is thus provided.

Establishing a chain by connection of the control in and -out ports allows several stand-alone devices to be controlled from any single point.

**UPGRADING.** The units of the X6-series feature fully re-programmable FPGAs, DSPs and microprocessors. Firmware and software update releases can be downloaded from the web site and transferred to the devices in a matter of mouse clicks.

**DATA DELAY.** The intrinsic signal delay of an OPTOCORE channel through the fibre is extremely small and is dominated by the necessary converting times. All data streams transmitted through similar channel types will appear at all outputs on a network at the same time. Transmission delay is negligible amounting to <200ns for each unit attached to the network. With OPTOCORE transmission there is no summing of delay throughout the units in a network. The processing of AD converted audio signals causes typically a delay of  $39/F_s$  and the processing of DA converted audio signals causes typically a delay of  $28/F_s$  ( $F_s$  = sample frequency). For synchronisation purposes and data re-arrangement another maximum of  $2/F_s$  of delay needs to be calculated. The result is a delay of only  $69/F_s$  from "analog to digital to light to digital and back to analog", which calculates to a maximum of 1.44ms @  $F_s=48\text{kHz}$  and 0.72ms @  $F_s=96\text{kHz}$ .

**RELATED DOCUMENTS :** X6-Manual, Optocore-Technical Specifications, Network-Description, Optocore-Accessories, Optical Cable Specifications, DD32-Description.

**FURTHER DOCUMENTS :** DD32-Manual, DD32-YM-Manual (usage with YAMAHA devices), LX4-Manual, LX4A-Description, LX4B-Description

Please download documents from [www.optocore.com](http://www.optocore.com)

