

## FIBRE-OPTIC INTERFACE BOARDS XFOC-LC / XFOCA

### NETWORK-INTERFACE BOARD FOR NEXUS SYSTEMS

- Four independent ports for a total of 256-channels of transmission capacity
- Supports various SFP modules including single-mode, multimode, CWDM, long-haul, and duplex modules
- Uses multimode cabling for short distances (<500 meters) or single-mode cabling for long distances (up to 10 km)
- LC ports for multimode and single-mode connectors
- 1.25 Gbps rate, plesiochronous transmission

#### 256 AUDIO CHANNELS ON A SINGLE XFOC-LC BOARD

The XFOC-LC belongs to the third-generation of NEXUS optical interface boards. It provides four ports, each with a transmission capacity of 256 channels. Data transmission is plesiochronous at a rate of 1.25 Gbps.

When it comes to configuring flexible structures or entire networks, the four XFOC ports are advantageous since they reduce significantly the number of interface boards required. The boards can be populated with optical modules on site to allow the number of ports and the connection type (fibre type, distances, etc.) to be adapted to suit the application at hand. Depending on the specific requirement, XFOC-LC boards support various SFP modules including single-mode, multimode, CWDM, long-haul, and duplex modules.

A key difference to early XFOC boards is the change of optical connectors, with LC connectors replacing the SC connectors used previously which are twice the size.

To meet individual requirements, NEXUS Base Devices can be equipped with multiple XFOC boards, for example, to connect to other Base Devices or to implement redundant lines. Audio channels are transmitted over optical lines with full 30-bit resolution (24-bit audio plus ancillary data) in an uncompressed format. This provides, for example, for complete and transparent exchange of AES/EBU signals between two Base Devices.

#### CONTROL INFORMATION INCLUDED

The control data forms a buffered transparent transmission channel asynchronous to audio and sync data. Control data is mainly used for communication between Base Devices (system control) but can also be utilised for routing ancillary data on the NEXUS network.

#### SYNC INFORMATION

Sync data transferred on optical lines includes both the internal wordclock and the bus clock of the sending Base Device. Each Base Device can be synchronised to any fibre-optic line. The internal wordclock is also made available at the wordclock output of the XCPU controller board. Therefore one Base Device can act as the master device on the NEXUS network and all other Base Devices will synchronise to it via their fibre-optic lines. There is no need for extra wordclock lines between the Base Devices.

#### LATENCY COMPENSATION

A NEXUS network can contain fibre-optic lines of various lengths, from a few metres to many kilometres or miles. Shifted wordclock phases between Base Devices caused by optical latencies are corrected reliably. Acting as master, the XFOC board analyses the phase relationship between the received data stream or wordclock and the system clock and adjusts any differences.

#### TRANSMISSION RELIABILITY

There are many factors that ensure extremely resilient, reliable, and trouble-free signal transmission on the audio network:

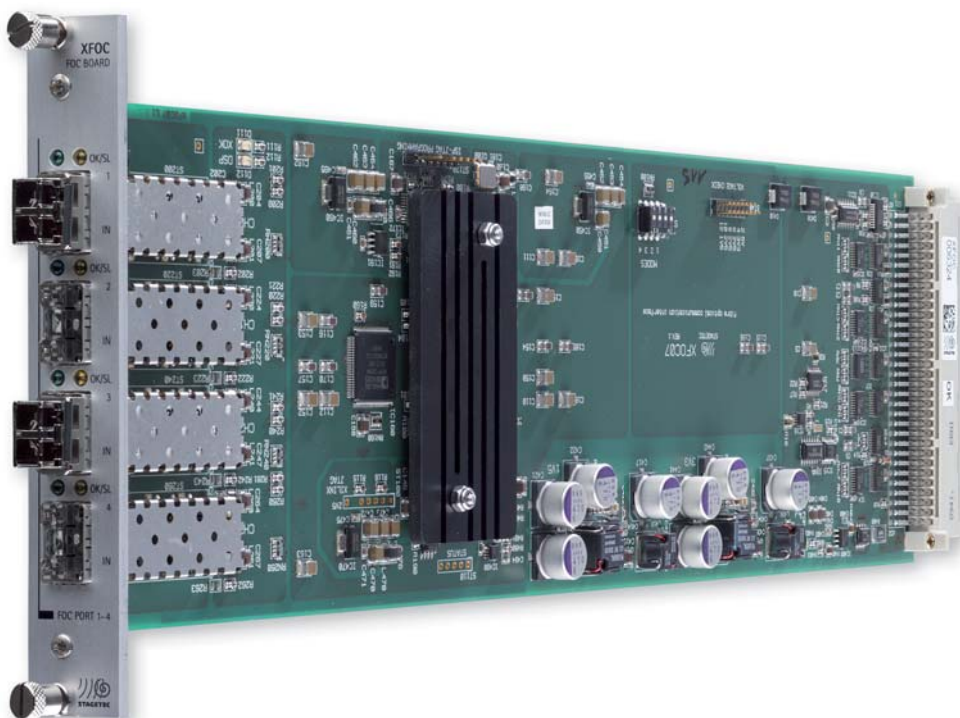
› **OPTICAL FIBRES** Due to the use of optical fibres, the Base Devices are electrically isolated from each other entirely. In addition, the cables are highly fire-resistant (material-dependent) and entirely immune to ESD and EMI.

› **ERROR RECOGNITION** The system detects broken lines, sync loss, input-level, and decoding errors automatically.

› **REDUNDANCY** Increased safety is achieved by setting up redundant fibre-optic lines from the same or another XFOC board. In case of failure, the controller switches from the primary connection to the redundant one automatically.

› **INDEPENDENT PORTS** The largely independent configuration of the ports on a board provides for a high level of immunity from hardware errors when setting up a redundant line from the same board. Data loss at changeover is prevented since the current audio sample is always memorized.

› **DATA-STREAM SIGNATURES** A signature is created for the split data stream and is verified by the receiver. This allows for the respective board or receiver to be muted in the event of an error.





XFOC-LC SPECIFICATIONS		
Connectivity	Audio channels: 256 duplex channels per port(@ 48 kHz), 30-bit	
	Communication channel: 1 duplex channel per port	
	Sync channel: 1 duplex channel per port	
Transmission rate	per Fibre: 1,250 Mbps (gross)	
Module in standard version:		
LWC multimode sender (up to 500 metres) or single-mode sender (up to 10 km/6.21 miles)	Wavelength	1,280 to 1,350 nm (nominal WL: 1,310 nm)
	Optical power	-9.5 to -3 dBm @ 50 / 125-µm fibre
Note: The multimode and single-mode transmitters are classified as CLASS1 LED/LASER PRODUCTS.		
Module in standard version:		
LWL multimode receiver or single-mode receiver	Wavelength	1,280 to 1,350 nm (nominal WL: 1,310 nm)
	Optical sensitivity	-20 to -3 dBm @50/125µm fibre
Recommended fibre	Multimode fibre	50 / 125-µm graded-index fibre or 62.5 / 125-µm graded-index fibre
	Single-mode fibre	9 / 125-µm single-mode fibre
Terminal	Standard version	1 to 4 LC duplex
Power supply	Operating voltage	+4.75 to 5.25 V
	Current	approx. 1.3 A
Operating conditions	Temperature range	0 °C to +60 °C
	Humidity	90 % (max.), non-condensing
Storage conditions	Temperature range	-35 °C to +70 °C / -31 to 158 °F
	Humidity	90 % (max.), non-condensing
Physical specifications	General	Board for 19" module frame; 3 U, 340 mm / 13.39"
	Front panel	4 HP × 3 U (20,02 mm × 128,5 mm)
	Required space	1
	Weight	approx. 310 g

## XFOC A FIBRE-OPTIC INTERFACE BOARD

The XFOC A is a passive adapter board which provides a robust Neutrik connector instead of the relatively fragile LC optical ports. For this purpose, the XFOC A features an optical pigtail – a cable (maximum length: 35 cm) equipped with an LC connector – to be plugged into the desired XFOC-LC port. This makes the signal available at the Neutrik connector on the XFOC A.

The XFOC A converts two or four duplex ports and can be installed anywhere on the mainframe.

Four XFOC A versions are available:

- Passive adapter board featuring a hardwired optical cable, Neutrik »opticalCON DUO« LC connectors, and single-mode cabling; converts duplex ports.
- Passive adapter board featuring a hardwired optical cable, Neutrik »opticalCON DUO« LC connectors, and multimode cabling; converts duplex ports.
- Passive adapter board featuring LC ports, two Neutrik »opticalCON QUAD« quad-cores, single-mode cabling.
- Passive adapter board featuring LC ports, two Neutrik »opticalCON QUAD« quad-cores, multimode cabling.

