

DD2FE

Dual MADI/Video/Data Network Device

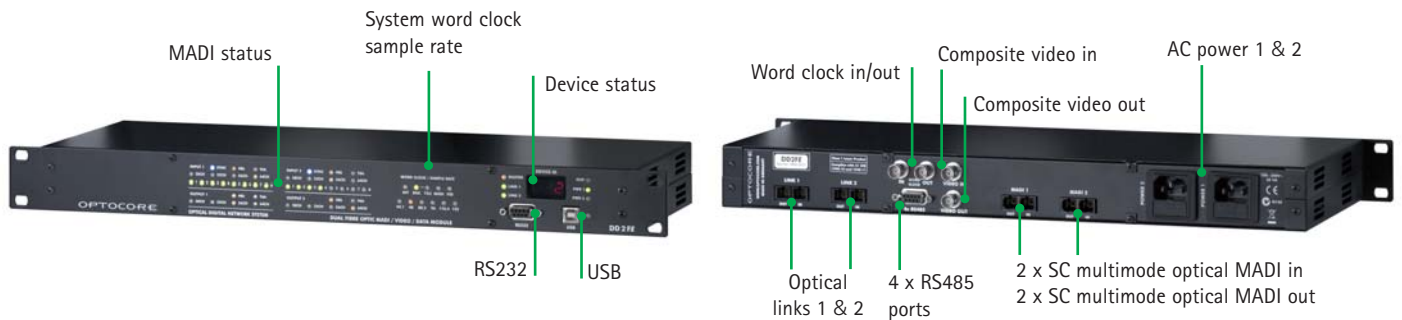
The perfect solution for connecting
Soundcraft and Studer digital consoles



OPTOCORE



DD2FE – Dual MADI/Video/Data Network Device



DD2FE General Description

The DD2FE is a digital I/O unit and interface for the OPTOCORE® OPTICAL DIGITAL NETWORK SYSTEM. The unit provides two optical MADI input and two optical MADI output ports, allowing the transmission of up to 128 input and 128 output digital audio channels.

The huge amount of channels exchanged by a single DD2FE makes it an outstanding and cost-effective interface for digital consoles and I/O systems, or any other device out of the broad range of professional audio products using optical MADI.

Each MADI port is equipped with an SC multimode optical interface and can be adjusted to handle the different MADI formats specified in AES/EBU standards. In addition, the user can define the number of input and output channels received at each MADI port and allocated on the fibre for transmission. This keeps the system highly flexible in all sorts of temporary and permanent applications, especially when long-distance connections and high-quality audio are required.

In addition to audio signals, word clock, video, and data signals are transmitted by the fibre connection. The DD2FE is equipped with ports for word clock input and output, as well as composite video input and output. Four RS485 ports allow the transport of a wide range of standard data formats such as RS422, DMX, and MIDI.

Redundant fibre connections can be established using the two onboard optical LINK interfaces. Depending on the fibre optic transceivers, distances from 700 m up to 70 km can be traversed. The dual redundant ring structure provides maximum reliability in a network with extremely low latency. Dependability is further safeguarded by a dual power supply unit, which automatically switches over to a redundant power supply.

OPTOCORE CONTROL software provides easy access to all configuration and control tools, including routing, naming, storage, and recall of configurations on the computer, and off- and online modes with real-time level display.

The use of surface-mount technology enables the DD2FE to meet the highest standards of construction and digital performance, while the FPGA-based (field programmable gate array) internal logic circuitry permits firmware updates that ensure the DD2FE is always a state-of-the-art device.

DD2FE with Studer and Soundcraft Digital Consoles

OPTOCORE, Studer, and Soundcraft have a common interest in developing state-of-the-art products for the professional audio market that enable sound engineers to focus on their principal task: the creation of an extraordinary sound experience.

In pursuit of this vision of providing variable, convenient, and sophisticated tools, the three companies cooperated closely during the development of the DD2FE to make it fully compatible with the optical MADI ports of the Studer SCore Live DSP platform, which is implemented in Studer and Soundcraft digital console systems for connecting stage boxes and local racks. Using the OPTOCORE DD2FE to transport the MADI signal fully leverages the versatility and impressive capabilities of these systems.

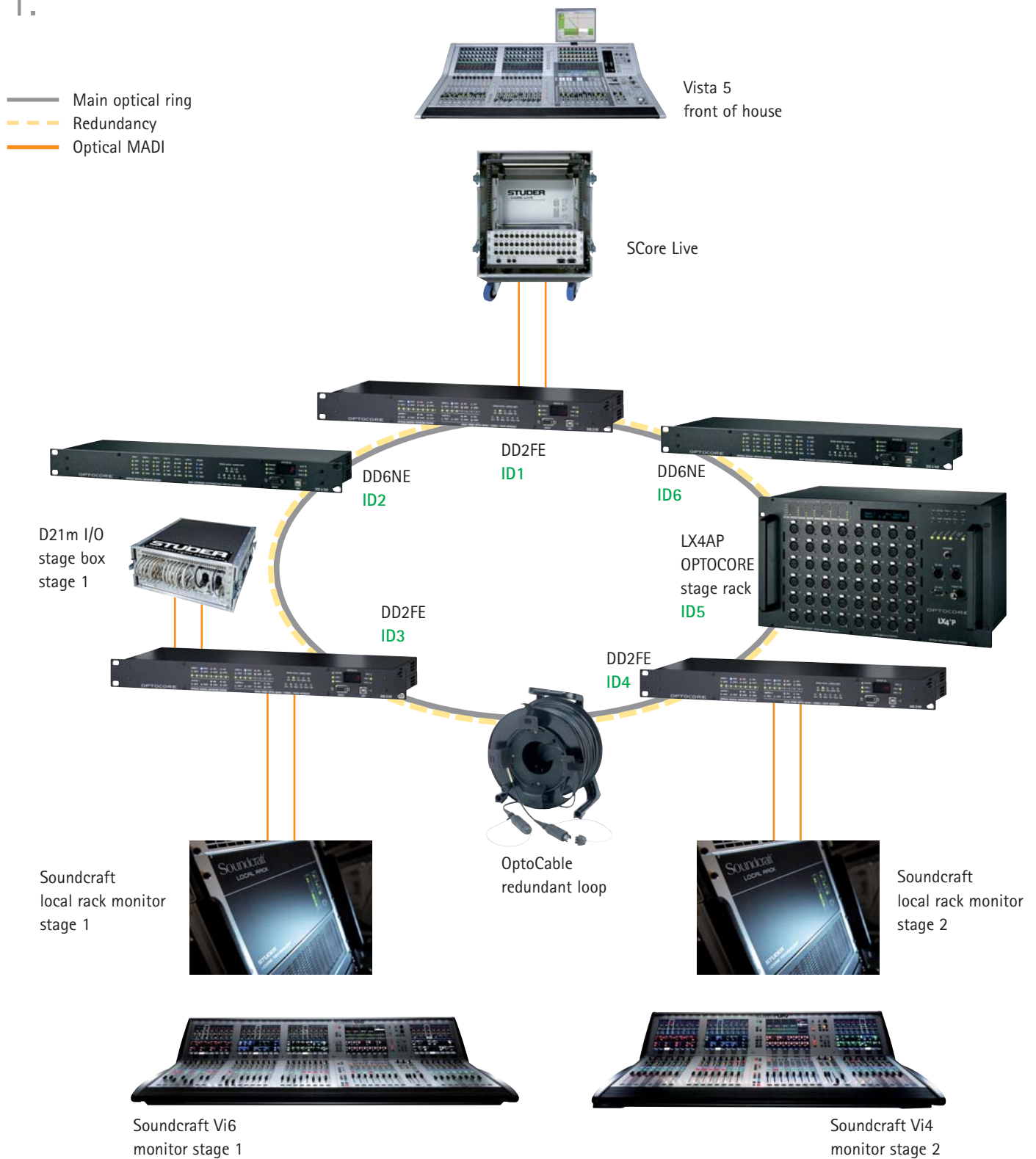
The DD2FE enables transparent transport and exchange of all data incorporated in the MADI signal – including control data for stage box, microphone preamps – over a redundant optical fibre ring. Now, two or more Soundcraft Vi4 or Vi6 consoles can share a single stage box without the need for analogue splitters, while the greatly reduced number of cables running between the consoles facilitates a much faster and easier system setup. Together, Soundcraft digital console systems and the DD2FE comprise a perfect solution for challenging live events.

Once a Studer or Soundcraft console is interfaced to an OPTOCORE network through the DD2FE, it is connected to every other network device in the ring. The console can then directly control the gain and phantom power of the OPTOCORE microphone preamps in any LX4AP or X6-series device in the system, making it equally easy to use any available OPTOCORE I/O device. It's a simple matter to choose the I/O device most suitable to whatever application is at hand.

For users, OPTOCORE, Studer, and Soundcraft have given new meaning to the word "flexibility". Now, Studer and Soundcraft consoles can operate together seamlessly in one system, working over the same highly reliable network and even sharing I/O interfaces.

Application examples

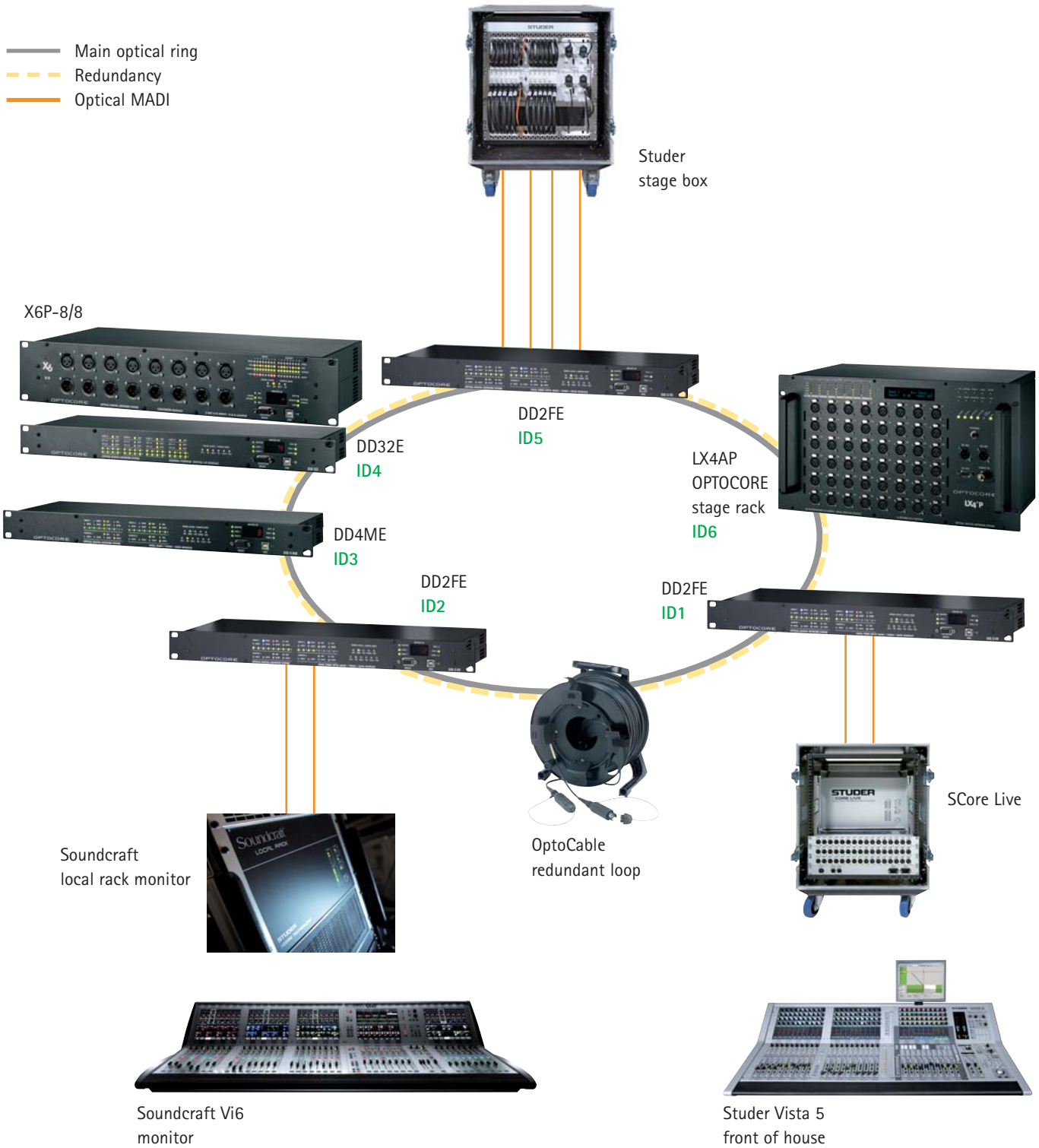
1.



Application 1: Redundant OPTOCORE ring at a typical live event with three OPTOCORE DD2FE, a Studer Vista 5 console at FOH, and Soundcraft Vi6 and Vi4 for the monitor mix sharing a OPTOCORE LX4AP and a Studer D21m I/O as stage boxes. Two DD6NE enable the transport of Ethernet, e.g. light or audio control data between FOH and stage.



2.



Application 2: I/O resources and audio channel data can be shared not only by the Studer and Soundcraft consoles operating in this system, but by every OPTOCORE device in the ring. OPTOCORE preamps can be controlled by the Studer and Soundcraft consoles. In addition the network can include feeds to recording facilities with coaxial MADI interfaces or loudspeaker amplifiers with analogue or digital inputs.

Technical Specifications DD2FE

MADI Ports Convention AES10-1991 / AES10-2003		
Inputs	Number / Connectors	2 / optical
	MADI digital audio channels	56 or 64 per input
Outputs	Number / Connectors	2 / optical
	MADI digital audio channels	56 or 64 per output
Data rate		125 Mbps
Auxiliary Ports Convention EIA / TIA-485		
Data channels	Digital control data	4
Data rate		Up to 10 Mbps
Impedance	Termination	330 Ω
	Source	$\leq 10 \Omega$
Word clock Hardware standard 75 Ω / BNC		
Data rate	Depending on used sample rate	44,1 / 48 / 88,2 / 96 / 176,4 / 192 kHz
Impedance	Output	75 Ω
	Input	1k / 75 Ω software switch
Video Hardware standard 75 Ω / BNC		
Channels		1 x input, 1 x output
Format		Composite video
Link Input, Output, Dual – Full bandwidth		
Connection		Duplex SC
Protocol		OPTOCORE
Transmission		Full duplex
Data rate		2 x 1 Gbps
Optical waveguide cable lengths	Multimode fibre 50 μm	$\leq 700 \text{ m}$ (2300 ft)
	Monomode fibre 9 μm	$\leq 70 \text{ km}$ (43.5mi)
Power supply 2 independent power supplies with function check and automatic switch-over		
Type		Switch-mode, universal input
Mains voltage		100 ... 240 W, 400 VAC tolerant
Frequency		50 ... 60 Hz
Remote Control		
RS232	Convention EIA / TIA-232	R x D, T x D / 57600 Baud
USB Port		Interface to PC
Dimensions 1 RU / 19"		
W x H x D	483 x 44 x 136 mm	19 x 1.73 x 5.35 inch
Weight	2.1 kg	4.6 lbs

Technical Specifications are subject to change without notice.

Some Outstanding OPTOCORE Features:

- **Ultra-low latency** – The unique synchronous design yields a digital delay of only 41.6 μs from any point to any point over the entire network, including the matrix. This delay remains constant and does not vary with the number of nodes in the network.
- **Very low weight, very long distances** – A typical network duplex fibre cable weighs 5.8 kg/km (20 lbs/mi) as compared to unshielded CAT5 cable, which weighs in at 38 kg/km (135 lbs/mi). Mic snakes and multicore cables are even heavier. Transmission distances between devices of 700 m (2300 ft) on multimode cables, and up to 70 km (43.5 mi) on single-mode cables are standard in an OPTOCORE network.
- **Built-in second ring provides cable redundancy** – if a cable breaks, the network recovers in one sample cycle!
- **High bandwidth** – 1 Gbit/s for 512 audio channels. Bandwidth can be reallocated to suit the needs. For example, more data or video channels can be added by allocating fewer audio channels.
- **Complete signal integration on one fibre** – The OPTOCORE protocol allows the transport of a wide variety of signals simultaneously with audio, including video and data. Some example data sources are: DMX, MIDI, Ethernet, RS422, and RS485. The Ethernet ports of OPTOCORE devices extend data-carrying capabilities even further. Ethernet converter boxes can, for example, adapt USB, RS232, and CAN data to Ethernet.
- **Scalability** – As system requirements grow, simply adding devices will expand the system with new features or a higher channel count.
- **No central switch** – The OPTOCORE redundant ring topology eliminates the need for a central switching device. The network is invulnerable to a central switch failure that would bring the entire network down.
- **Matrix routing down to individual channels** – Every OPTOCORE network device has full access to all channels on the network and can individually extract only a single channel when desired. No more need to waste time and energy figuring out how to handle eight-channel groups.

For more outstanding OPTOCORE features, please visit: <http://www.optocore.com>

www.optocore.com



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