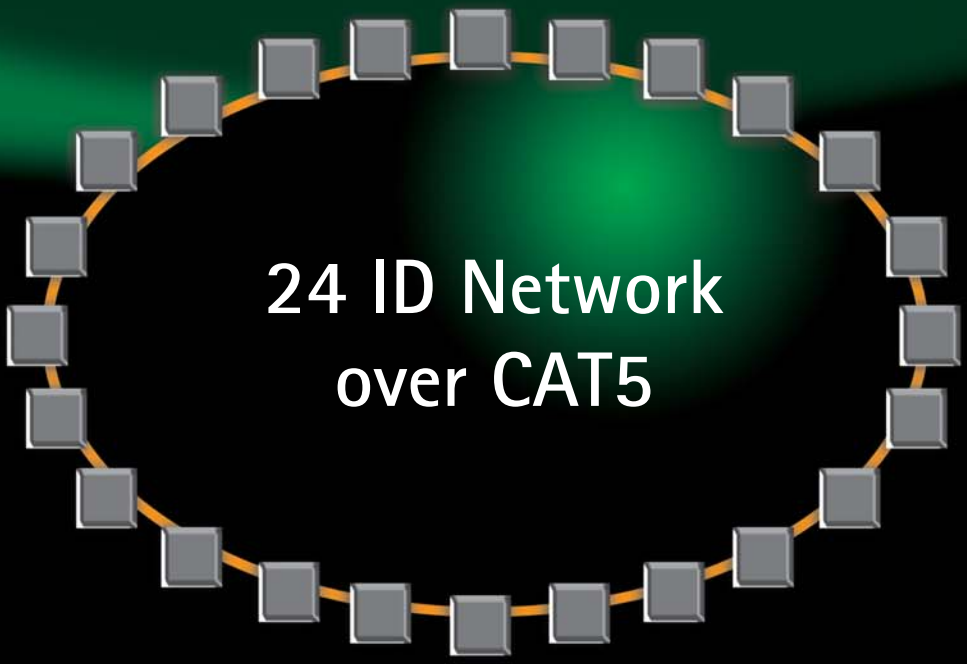
Product Introduction

SANE by OPTOCORE

Synchronous Audio Network plus Ethernet



OPTOCORE

www.optocore.com

General Description

SANE by OPTOCORE is a brand new Digital Audio networking technology brought to you by the World Leaders in Fibre Network Systems. SANE (Synchronous Audio Networking plus Ethernet) for the first time allows the synchronous transfer of digital audio over standard, low cost CAT5 cable whilst still maintaining all of the advantages offered by the OPTOCORE fibre based digital network system such as ultra low latency, guaranteed audio delivery, dual redundant ring topology, transparent transport of open audio standards such as AES/EBU and MADI as well as the distribution of extremely low jitter Word Clock.

SANE by OPTOCORE supports up to 24 nodes per network and transports up to 64 audio channels with just 41.6 µs network latency at full 24 Bit, 48 kHz sample rate. The network is fully synchronous and the hardware will sync to either external clock soures or its own high quality internal Word Clock. The Word Clock will then be distributed across the network for use as an output at any node with less than 50ps jitter. SANE was developed from the ground up to make use of cutting edge technology and components to ensure the lifespan of the product. The use of CAT5 cable along with its extensive feature set makes SANE an extremely cost effective and flexible solution. In addition to providing a completely fault resilient audio network, SANE allows the transport of standard Ethernet data for control and monitoring of 3rd party Ethernet devices.

Unlike other network systems which tunnel audio through an Ethernet system, SANE transports Ethernet over a completely synchronous Audio network. This removes the possibility of any interference or drops in performance due to loading on the Ethernet network. All of this is achieved without the use of any 3rd party networking equipment, simply connect two SANE network devices with a piece of CAT5 cable to create a working system, add a second piece of CAT5 to create a loop and you now have a fully fault redundant network.

Hardware

To facilitate the introduction of SANE as a new networking technology, OPTOCORE has developed a number of new hardware interfaces which will form the basis of the SANE networking system. These interfaces are a brand new platform for OPTOCORE and through the use of the latest components and extensive engineering, we have been able to bring huge cost savings to our customers.

TP devices featuring CAT5 Twisted Pair Interfaces

The new audio interfaces are 1RU, they support sample rates up to 192 kHz and feature either one (V3R-TP) or two (X6R-TP) card slots where the customer can choose any mix of different I/O cards.

The available card options are:

- 8x Mic inputs
- 8x Line inputs
- 8x Line outputs
- 8x AES inputs with Sample Rate Converters
- 8x Mic inputs featuring two independent preamps per mic channel

X6R-TP – 16 channel I/O module with RJ-45 ports (TP)
audio channels available: 16 on the card, plus 32 AES, plus 64 over the SANE port = 112 channels

In addition to the configurable I/O card slots, the V3R-TP and X6R-TP both feature rear panel mounted AES/EBU audio on 25 pin D-Type connectors. These connections allow access to 32 channels of AES/EBU switchable to inputs or outputs in banks of 8 channels. The two rear mounted RJ-45 ports are the SANE interfaces. These allow access to the full 64 channels available on the network as well as providing Ethernet connectivity to the device. The LAN port is a further Ethernet breakout which allows connection of any other 3rd party Ethernet based device. These devices are the building blocks of any SANE network and represent the first step towards huge cost savings for our customers when considering medium format and scalable digital network systems.

FX devices with Fibre Optic Transceivers

The second variant of SANE compatible hardware comes in the form of the V3R-FX and X6R-FX. These devices feature the same configurable I/O as the TP devices with the addition of two OPTOCORE fibre ports. These OPTOCORE interfaces allow the FX devices to provide a synchronous bridge between SANE and OPTOCORE networks.

This combination of fibre optic and CAT5 opens up a huge range of possibilities for the system designer. For example, OPTOCORE devices could be used to create a campus wide backbone with up to 512 audio channels which then breaks out to CAT5 based networks at each main building with either single or multiple SANE networks covering the smaller areas.

X6R-FX – 16 channel I/O module with RJ-45 ports (TP) and Fibre Ports (FX)
audio channels available: 16 on the card, 64 SANE and 512 over the OPTOCORE ports = 592 channels

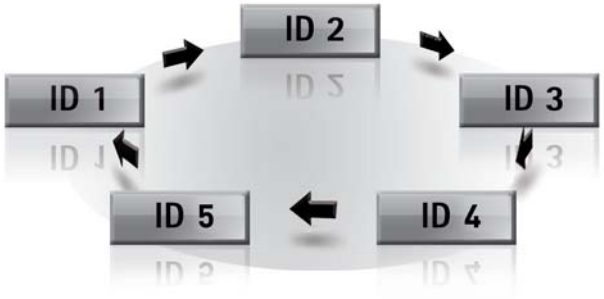
Benefits for all Installation and Broadcast applications

Broadcast houses will benefit from the ultra low latency and Word Clock distribution of the OPTCORE and SANE network systems. Simply use SANE for all of your audio routing within each studio and then jump on to an OPTOCORE fibre based backbone for distribution to other studios, hubs and transmitters.

All networks using SANE or OPTOCORE are completely synchronous and lock to a single Word Clock source for the entire system. They maintain ultra low system latencies and of course offer the transport of Ethernet as well as other control data and protocols.

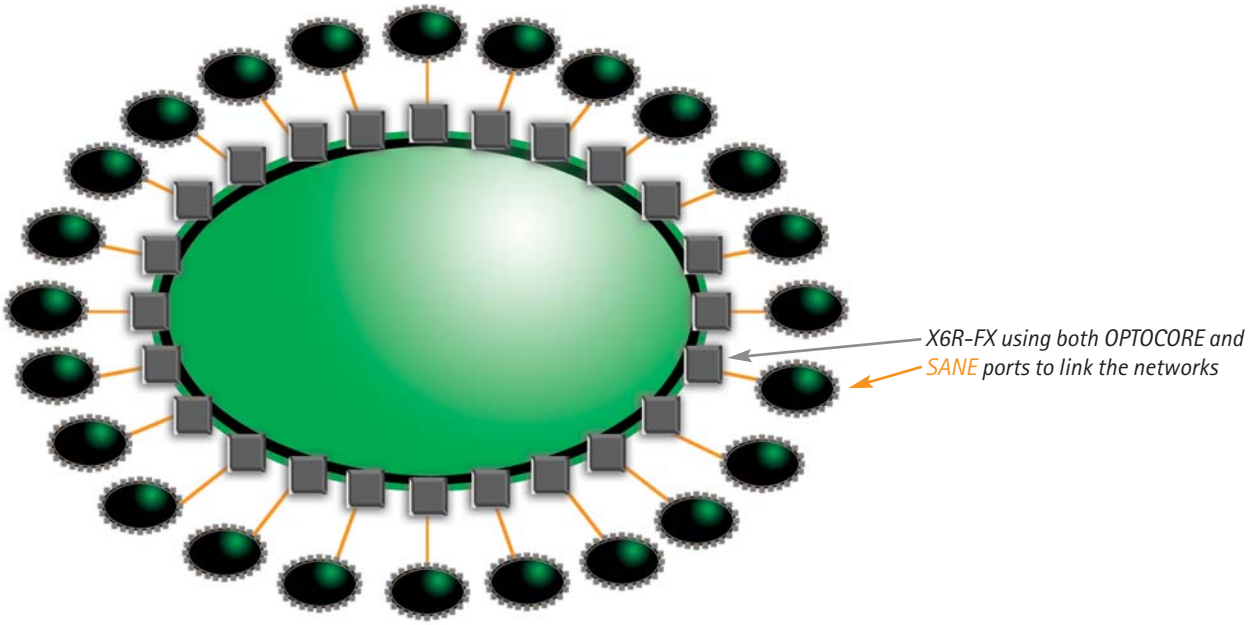
SANE by OPTOCORE

Basic SANE Network:
A simple daisy chain network featuring three X6R-TP or V3R-TP devices. Each SANE out port is connected via CAT5 to the SANE in port of the next device. Simply closing the loop by adding an extra piece of CAT5 will enable full fault redundancy on the network transport without any other user interaction.



Large SANE Network:
A larger SANE network featuring any combination of V3R-TP/FX and X6R-TP/FX devices. As with all SANE networks, the system is locked to a single Word Clock source, it is fully fault redundant due to its ring topology, Master Clock negotiation and dual independent PSUs per device.

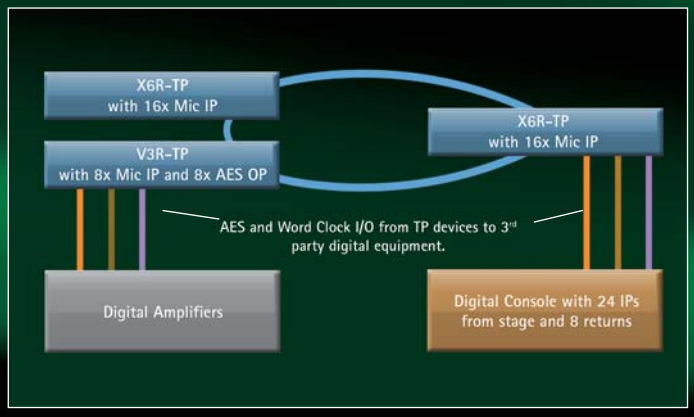
Advanced network using both SANE and OPTOCORE networks:



This example shows how to interface between OPTOCORE and SANE networks. By using an FX device at each location where you wish to join the two network types, it is possible to create vast networks , all linked with synchronous, digital audio.

A single device will be the Word Clock master for the entire system. The Word Clock can be generated internally or taken from an external source.

General Example:



Building a simple stage return system has never been so easy or cost effective. Simply choose the TP devices required to fulfil the I/O requirements at each location and then interlink each device with CAT5. No other networking hardware or setup is required.

Conclusion:

SANE is the result of years of product development and market research. It combines functionality, ease of use and class leading performance with huge cost savings offered by working with a CAT5 based infrastructure and cutting edge technology. By keeping the core technologies of OPTOCORE and SANE so close, we have been able to offer a complete networking system covering both fibre optic and copper technology in to a tightly knit and integrated solution suitable for all users in the installed sound, broadcast and live sound markets.

OPTOCORE

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