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# *CONNECTIONS*

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## Soundcraft Si Series MADI Connectivity & Worked Examples

V1.3

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## An Introduction to MADi;

Multi-channel Audio Digital Interface, or MADi, is an industry-standard electronic communications protocol that defines the data format and electrical characteristics of an interface carrying multiple channels of digital audio. The original specification (AES10-1991) defined the MADi link as a 56 channel transport for the purpose of linking large-format mixing consoles to digital multi-track recording devices but it soon found itself adopted by large broadcast studios for routing multi-channel audio throughout their facilities.

Typically the format is transmitted over coaxial cable, fibre-optic lines or CAT5 cables; The MADi standard supports 28, 56, or 64 channels with sampling rates of up to 96 kHz and resolution of up to 24 bits per channel.

As noted, the original specification allowed 56 channels at sample rates from 28 to 54 kHz (32–48 kHz  $\pm$ 12.5%), the 2003 revision specifies a narrower sample rate range of 32–48 kHz but allows 64 channels.

MADi offers a number of benefits over other digital protocols and standards such as AES/EBU (AES3), ADAT, TDIF, S/PDIF, CobraNet™ and similar including:

- Greater number of channels per line
- Use of coaxial and optical fibre media (enable the transmission of audio signals over extended distances)
- It is a simple point-to-point system with no need to address channels within the packets
- Low latency

The use of MADi, with respect to mixing consoles, has changed little over the years but its popularity continues to grow as a reliable interface between two or more mixing consoles or between a mixing console and router or digital recording system.

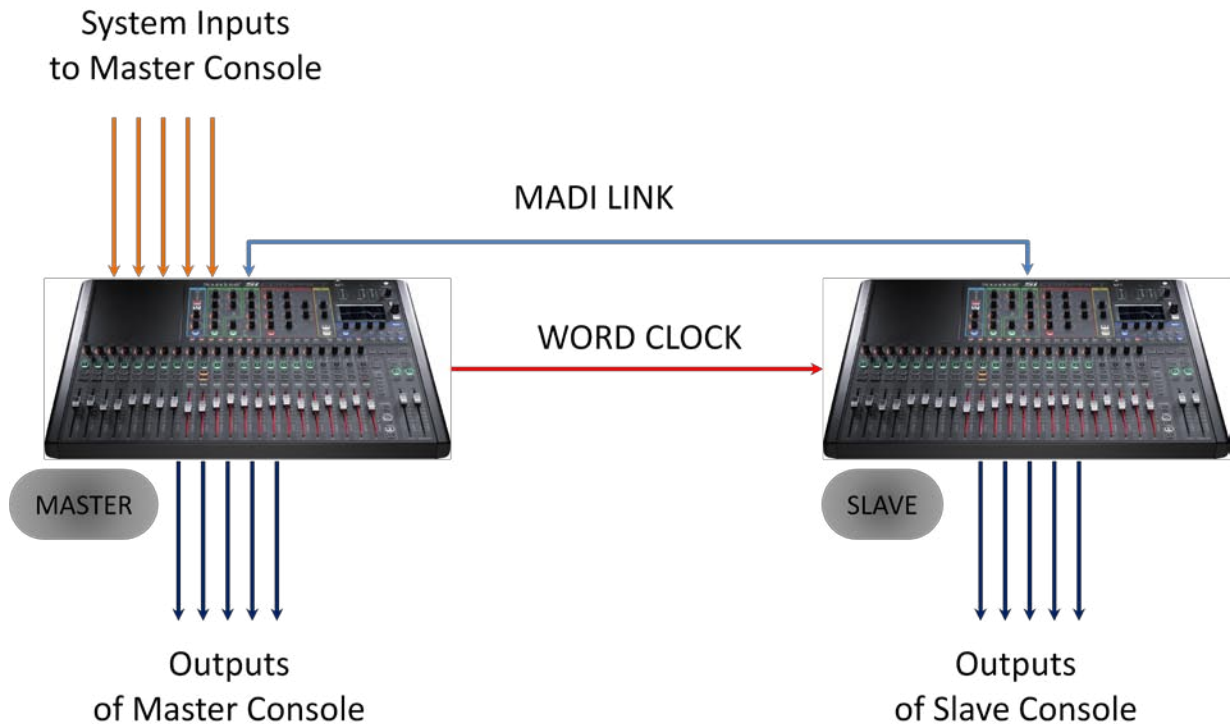
The former example has increased dramatically in popularity as Pro Audio consoles moved into the digital domain and remote stageboxes became more common. This move has enabled a single stagebox to be shared amongst two or more consoles without the need for an analogue split system.

The latter example has seen strong growth as artists and record companies look to multi-track record almost every notable event for later publication and release whilst sound engineers frequently employ multi-channel playback of a rehearsal or previous event to do more comprehensive sound checks without need for the band (virtual sound-check).

# Application Example 1a, Two Si Compact Consoles Sharing Inputs

This example illustrates the principle of two consoles linked by MADI allowing sharing of the inputs to the master console.

**System Diagram:**



## Setup Procedure:

1. Connect system as illustrated.
2. Patch input channels of master console as required.
3. Patch channel direct outputs of master console to MADI OUT.
4. Patch inputs of client console to MADI IN.
5. Set CLIENT console to EXTernal word clock synchronisation.

## Key Benefits:

1. Eliminates need for analogue input connections to 2nd console.
2. MADI link can be dual redundant.
3. Enabling DOGS system on Si Compact allows changes to mic amp gain on master console without affecting input levels to client console.
4. MADI recorder can be connected AUX MADI OUT of either console if not using a dual redundant MADI link.

## Restrictions:

1. There is no direct output from stereo channels of an Si Compact.
2. Master console must be on with suitable patches made for client console to receive system inputs.









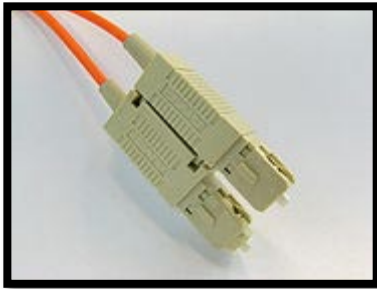




## General Notes:

**IMPORTANT:** Where possible systems should be locked by word clock for improved system performance and to prevent against potential dropout or spurious noise. Soundcraft do not condone operating any digital audio systems without suitable locking systems being implemented.

There are many MADI recorders and interfaces on the market that allow the MADI stream to be re-distributed or converted into other formats such as an ADAT or analogue that add additional functionality or flexibility to examples outlined above.



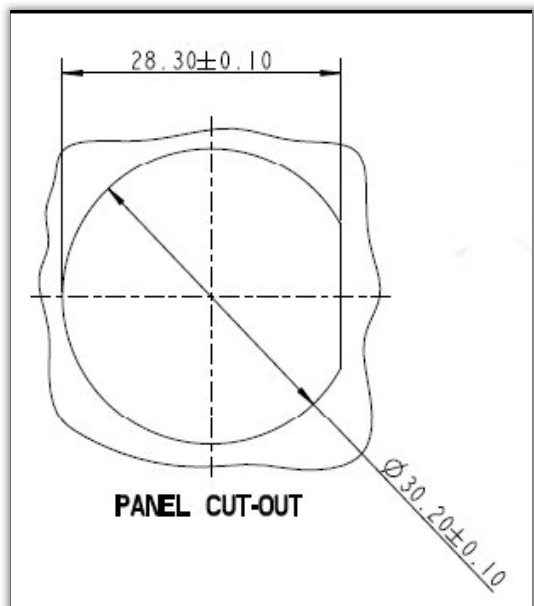
The type of connector used by the Si and Vi optical MADI cards is the 'SC' type as shown. The transceivers and fibre cable (unless otherwise specified) are the 'Multi Mode' type; offering typical distance between nodes of up to 1500m using a single run of multimode 50/125 optical fibre, 600m using 3 X 200m reels of multimode 50/125 optical fibre joined in series.



The most common type of connector & cable are the 'Duplex' type where the fibres are bonded together in a 'figure of 8' shape with the connectors clipped together as a pair.

Some Soundcraft Vi systems employ a 'ruggedised' connector from Fibreco known as the 'Senior' <http://www.fibreco.co.uk/products.php?id=0>

To enable mating between this form factor and the 'SC' type, a chassis mount RZ2705-01 connector (which includes a captive 1M 'tail' terminated with a pair of SC connectors) is required;



A cut-out diagram for the RZ2705-01 connector assembly is shown in the following page.