

# TECHNICAL NOTE

Date 30th May 13 (rev2)

ref 299

Raised by: TC

Distributed to: as required

Digico (UK) Ltd. unit 10 Silverglade Business Park Chessington Surrey KT9 2QL England  
Tel: +44 1372 845600 Fax: +44 1372 845656 email: support@digiconsoles.com

---

## **SD SERIES CONSOLES** **OPERATION OF REDUNDANT MADI SYSTEMS**

NOTE: The following does NOT apply to Optocore® operation.

It is important to understand the difference between MADI used for a SD-Rack and standard MADI. This is as follows. MADI input and output for SD-Rack (or DigiRack) is 57 channels MADI (AES-10) where there are 56 channels of audio and 1 channel of Digico control data relating to the rack operation (gains etc.)

Standard MADI input and output is 56 channels audio only. In addition the routing and controls on screen change to match the device type, but this does not affect audio.

In a mirrored engine system (note the engines are mirrored) ALL MADI outputs (both rack and standard) are active and live ALL the time. Nothing switches off or over on the engines.

The engines are mirrored and therefore the MADI audio outputs on both engines are all identical, no matter what engine is audio master. This can be checked with a suitable MADI monitor. It will be seen they are all the same and changing audio content sent on 1 engine will be followed by the other, because they are mirrored.

The choice of which engine a particular rack listens to (i.e. which is audio master) is switched in the rack. The rack chooses which engine is master following a set of internal priorities and external controls. What these controls are discussed below. It is important to understand the 2 engines do not even know which one is being used by the rack as its audio source. The engine may know which SHOULD be being listened to, but not what actually is. Therefore all audio outputs must be identical. This gives broken cable redundancy.

If connecting to a standard MADI device, no third party devices are capable of switching automatically between MADI from the 2 engines in the same way as the SD-Rack (or DigiRack). In addition the control channel 57 is deliberately suppressed to prevent problems with systems not compliant with 57channel MADI.

Typically recorders are connected to only 1 engine or if redundant operation is required, via a MADI switcher with manual operator control or, with SD7 (only) the session can be programmed to output a MIDI control message to inform an external system which engine is audio master

As noted above the rack decides which is it is going to listen to.

This is either by the rack hearing only 1 engine (due to cable fault or an engine output not present failure) it which case this is the priority. This works because we know both engines should output the same and the rack can choose whichever is present.

Otherwise it is instructed which engine to listen to. This comes down channel 57 from the engines. This works as the pod actually monitors the inactive input for this instruction as well as responding to the active engine. This means, for example, engine B can take over from engine A in the event of the PC failure, even if the audio is present from engine A. However note that it is the rack that switches over, NOT the engine.

The switch over mechanism is that the priority of the 2 MADI inputs (main/ aux, or A/ B) which is normally set in the Rack menu system, is changed to be A then B or B then A by remote control. In this way, even if the audio master is set for A, should there be a cable fault from A, B will still become active and vice versa. Note if the rack is switched off, it will start with the same priority and therefore this may not match the mixer audio master setting at a restart. This may require the audio master to be toggled after mirroring. This is normal.

Of note, the input operation of the dual connected MADI ports on the single engines is similar. However in the event of a MADI output failure from the rack to 2 mirrored engines, the active engine will have to be swapped manually, as the engines will not automatically change over if a MADI port reports an error.