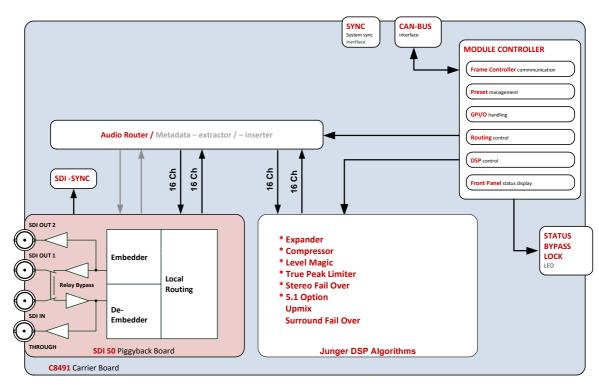


C8491

#### **Features**

- LevelMagic2™ SDI-DSP (international standards selectable) loudness control
- 4 optional 8 or 16 audio channels
- Optional surround processing
- Fail over and surround upmix
- 16 channel 3G/HD/SD-SDI de-embedder
- 16 in 16 de-embedder matrix
- 16 channel 3G/HD/SD-SDI embedder with video delay
- 32 in 16 embedder matrix
- Video test generator
- Variable audio delay of 340ms per embedder channel
- True peak brick wall limiters -20 .... 0dBTP threshold
- Remote control via web server of C8702 Frame Controller, GPI/O, EmBER plus protocol

### Block diagram







C8491

# Technical specifications

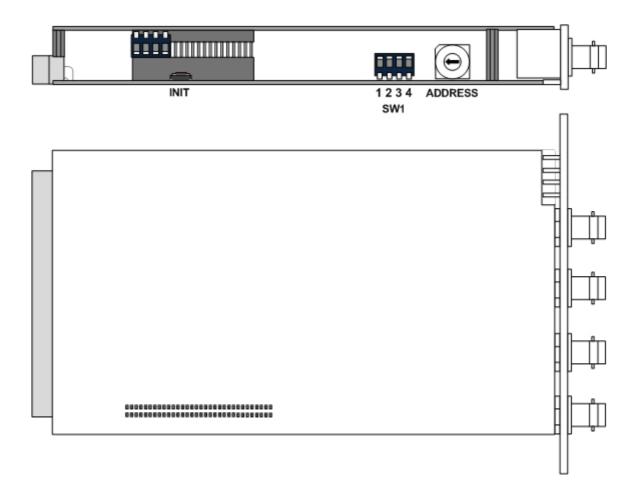
Standards	Video complies with SMPTE 424/425M (3G, Level A and B), SMPTE 292M (HD) or SMPTE 259M (SD). Automatic format detection. Audio embedding and de-embedding complies with SMPTE 299M (3G, HD) or SMPTE 272M-AC (SD). Metadata embedding and de-embedding complies with SMPTE 2020-2.			
Video Data Rate	2970/296Mbps (3G), 1485/1483.5Mbps (HD), 270Mbps (SD)			
Video Formats	1080p23.975, 24, 25, 29.97, 30, 50, 59.94, 60 1080i50, 59.94, 60 720p23.975, 24, 25, 29.97, 30, 50, 59.94, 60 625i50, 525i59.94,			
Video Delay	User selectable 015frames, can be disabled			
Audio	24bits, transparent forwarding of PCM and compressed audio (SDI) 40bits floating point processing (DSP)			
Audio Channels	SDI: 16 inputs and 16 outputs (4 groups with 4 channels each) DSP: 16 inputs and 16 outputs			
Audio Sample Rate	48kHz (SDI compliant)			
Audio Delay	Embedder audio delay selectable 0 340ms per channel DSP audio delay selectable 0 2s per channel			
BNC Input	Impedance	75Ohm		
	Return loss	> 15dB, 5 1485MHz > 10dB, 1485 2970MHz		
	Cable length (max.)	250m @ SD for Belden 1694A cable 230m @ HD for Belden 1694A cable 140m @ 3G for Belden 1694A cable		
	Jitter tolerance	> 0.7UI (Alignment)		
BNC Output	Impedance	75Ohm		
	Output voltage	0.8Vpp (typ.)		
	Return loss	> 15dB, 5 1485MHz > 10dB, 1485 2970MHz		
	Output jitter	< 0.2UI (Alignment), < 0.5UI (Timing)		
Video Latency	Input to Output	120 200pixel, depends on video standard		
Audio Latency (SDI)	Input to Output	Embedder and de-embedder combined HD, 3G < 0.6ms SD typ. 1.5ms (< 2ms)		



C8491

Power Supply	5Vdc (4.75 5.25V), max. 1.200mA		
Dimension	3RU, 4HP, 160mm depth (DIN41612 backplane connector)		
Environmental	Operating temperature 0 40°C, Non-operating -20 70°C, Humidity < 90%, non-condensing		
General Features	<ul> <li>Power fail relay bypass (may be activated via GUI)</li> <li>Lip-Sync compensation for processed and non-processed audio signals</li> <li>Dedicated routing for non-processed channels, all channels can be routed to/from the device or looped through</li> <li>Test pattern generator</li> </ul>		

### Location of switches:





C8491

Initial set up

ADDRESS: This rotary encoder sets the CAN ID of the C8491. The 16 switch positions

are hexadecimal numbers (0x0 to 0xF). The CAN address also defines the place of the module icon within the GUI overview of rows three to six.

SW1:

#1 OFF = internal use and must be set to OFF.

#2 OFF = CAN bus speed 256kBit/s

**ON** = CAN bus speed 1Mbit/s

**Important Note!** For a certain number of modules like the **C8491** it is possible to communicate with a CAN bus speed of 1MBit/s. This provides more bandwidth to move measuring data from the module via the frame controller to the **J\*AM** based loudness logger. You must use **J\*AM** version **2.9** or higher.

Be sure that all modules within a frame are operating with the same CAN bus speed.

#3 OFF = internal use and must be set to OFF.

**#4 ID +16 OFF** = CAN bus address range is standard (counting from 0x0 to 0xF)

see rotary encoder settings above.

**ON** = CAN bus address range is extended by **+16** 

(counting from 0x10 to 0x1F)

**INIT** Pressing the **INIT** button during power up will initialize the module

parameters to factory default values.

**General remark!** The **C8491** is a 16 channel device from the SDI de-embedding / embedding point of view but the number of audio processing channels may be different.

Four channels are standard while 8 or 16 channels are an option. Since all parameters are the same for each version, this document describes the 16 channel processor version. The difference will be the number of fail over circuits (1 for the 4Ch, 2 for the 8Ch and 4 for the 16Ch option).

Another option is 5.1 surround processing. If this option is enabled one may also perform permanent surround upmix or use the upmix for surround fail over.

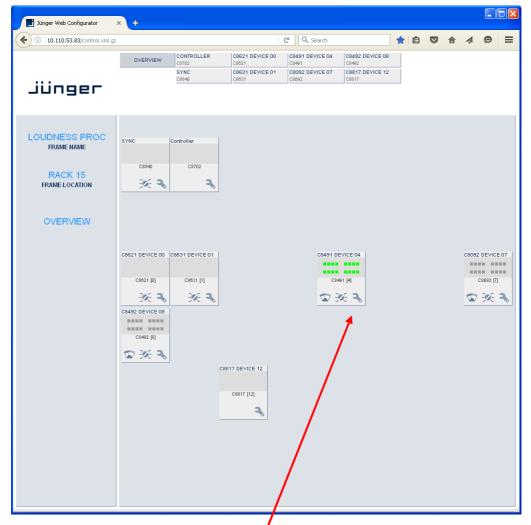


C8491

Web browser based GUI

### **OVERVIEW**

The modules overview of a frame (below the display of an example frame):



By simply clicking on the spanner tool symbol the control pages of the **C8491** will open up as well as the status pane on the left hand side, which is also shown when you hovering with the mouse over the module graphics blocks.



C8491

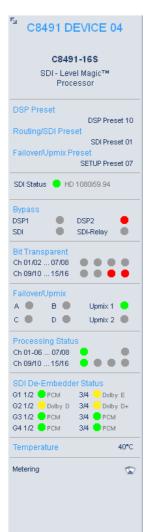
#### **STATUS PANE**

The status area is quite big for the C8491 so you may face difficulties when displaying it on lower resolution displays. You may shrink it by pressing on the little "fly foot print": • C8491 DEVICE 04

Now some information are suppressed and you are able to see the most relevant status information without the need to put the browser into full screen mode.



C8491-16S



C8491 DEVICE 04 - Given name of the module (may be changed on the DEVICE pane). It will be default set during initialization to module type amended by the word DEVICE and the CAN address 04 the module had at that moment.

System name of the module and short description.

**DSP Preset Routing/SDI Preset Failover/Upmix Preset** 

**SDI Status** Soft LED: green yellow

red

**BYPASS** grey / red

DSP1 DSP<sub>2</sub> SDI SDI-Relay

**Bit Transparent** Ch 01/02 ... 07/08 Ch 09/10 ... 15/16 Failover/Upmix

В Upmix 1 Α C D **Upmix 2** 

**Processing Status** 

SDI De-Embedder Status

**Temperature** 

Metering

Name of the actual loaded preset.

Name of the actual loaded preset. Name of the actual loaded preset.

[SD / HD / 3G / TG / UNLOCKED]

if Rx locked.

if Rx locked + async audio

if Rx unlocked + Always ON + Last Valid if Rx unlocked + TG=OFF or TG=AUTO

if TG=Always ON + None

turns red if a bypass is activated.

if the DSP1A or DSP2 bypass check box or if the SDI bypass or the fail-over relay is activated.

shows the bit transparent status of the respective DSP channel pairs.

turns green if a function is active.

turns green if observation of processing status is enabled. Turns red if processing status is bad (see DSP1-A Processing Status Enable).

- nothing embedded [grey

green - PCM

yellow - Dolby E / D / D+]

Module temperature measured on the surface of the PCB.

clicking on that symbol will open the applet to display meter bar graphs (see page 24

for an example) channels.



C8491

### Front panel Status LEDs color code

	off	green	flashing green	red	flashing red
STATUS	never	OK	OK, GUI access	boot error	boot error,
					GUI access
BYPASS	if STATUS = red	at least one program active, no SDI / relay bypass	all programs bypass or SDI / relay bypass	never	never
LOCK	never	SDI locked	never	SDI unlock	never

#### **PRESETS**





C8491

The C8491 has 3 banks of Presets: DSP / Roting/SDI / Failover/Upmix.

The status window on the left hand side shows the names of the active presets. The word "modified" will appear in line with the preset name if any preset parameter was changed since loading this preset.

**DSP** 

Is dedicated to audio processing (Leveler, Compressor / Limiter / Expander / Fail Over / Upmix).

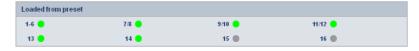
Load

Select a preset by name and press <LOAD>.

Loaded from preset

The soft LEDs show the channels which will be controlled by the active preset. The number of soft LEDs depends on the program configuration. E.g. channels 1-6 are represented by one soft LED because they belong to a 5.1 program while 7/8 represent a stereo program as well as 9/10 and 11/12. Channels 13, 14, 15, 16 belong to mono programs whereas channel 15, 16 are not part of the preset currently loaded.

Here another example where channels 15 and 16 are not part of the actual loaded preset:



Save as #

Select a preset NV memory number.

Name

Assign the preset a name (up to 16 digits).

and press **<SAVE>**.

Channels stored in presets

The check boxes define which channels will be stored when you save a preset. The number of check boxes depends on the program configuration.

Here an example where DSP1 (Ch 1-8) is set for 5.1+2 operating mode and DSP 2 (Ch 9-16) is set for  $4 \times 2$  operating mode. Ch 9/10 and 11/12 are linked for stereo operation and 13, 14, 15, 16 are not linked (mono mode). The parameters of channels 15 and 16 will not be stored:

Channels stored in p	reset			
1-6 🗹	7/8 🗸	9/10 🗹	11/12 🗹	
13 🗹	14 🗹	15 🗌	16 🗌	

Routing/SDI

controls the **SDI** Embedder / De-Embdder including delays and the bus routing if the **(B)** option is activated.

Load Select a preset by name and press <LOAD>.

Save as # Select a preset NV memory number.

Name Assign the preset a name (up to 16 digits).

and press <SAVE>.



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**Failover/Upmix** The third group (#33 ... #40) is intended for fail over and upmix

parameters.

**Load** Select a preset by name and press **<LOAD>**.

**Loaded from preset** The soft LEDs show the Fail Over circuit(s) controlled by the preset

currently loaded:

Loaded from preset

Fail A,B/Upmix Fail C Fail D

I.e. a preset may change the parameters for one 2ch fail over

without changing the parameters for another one.

Save as # Select a preset NV memory number.

Name Assign the preset a name (up to 16 digits).

and press **<SAVE>**.

Processing blocks stored in preset

The check box(es) define from which processing block parameters

will be stored next:

Processing blocks stored in preset

Fail 
A,B Upmix

Fail D

The number of processing blocks involved depend on the

operating mode for the DSPs.

Preset Clipboard <COPY TO CLIPBOARD> copies the active preset to a clip board,

the data may be used by other modules inside the same frame.

Backup Presets to File <BACKUP> creates a backup XML file which may be saved

on a PC.

**Restore Presets from File** < Browse... > opens a file dialog to select a previously stored

preset file. <RESTORE> will upload the file and overwrite existing

presets for this module.



C8491

#### **DEVICE**



#### **INFO**

**Device Name** You can assign the module an individual **name** (up to 16 digits).

Press **<CHANGE NAME>** to make the new name effective.

Platform [C8491-1]

Hardware platform of the module.

Parameter Version [x]

The firmware of the module undergoes revisions where parameters

may be added while others become obsolete. The parameter

version indicates it.

**Important Note!** It is mandatory to **initialize** the module to **factory defaults** if the parameter version has changed in order to clean the memory from rubbish data. Otherwise you may experience malfunctions.

**FIRMWARE** displays the firmware versions of the **C8491** components:

**Controller** The module controller

**Bootloader** The version of the boot loader

**DSP** The processing DSP

**FPGA** The routing and audio interface for the DSP

**SDI** The firmware of the SDI board



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#### **RESET**

**Restart Module** Pressing **<RESTART>** performs a warm start (soft reset)

Initialize and Restore Factory Defaults

Pressing **<INITIALIZE>** restores the factory default values for all parameters of the module including all presets. You will lose your presets and settings. It's highly recommended to backup the

settings and presets to a PC first.

### **BACKUP/RESTORE**

Backup Settings and Pressing <BACKUP> will put all active parameters and the

**Presets to File** content of all presets into an XML file.

You may store such file on a PC.

Restore Settings and Presets from File

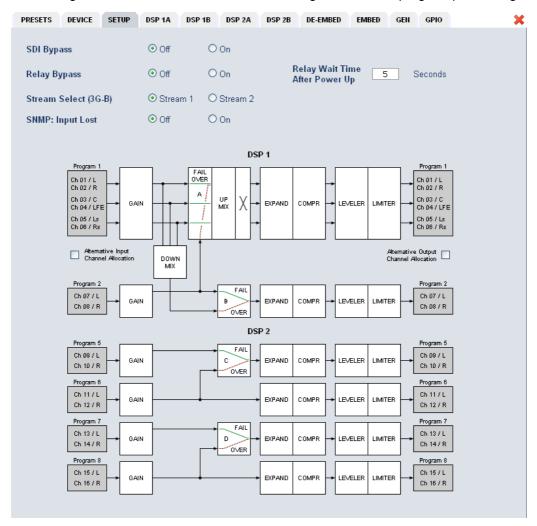
You may browse a matching XML file from a PC.

Pressing <RESTORE> will overwrite all active parameters and the

content of the presets with the content from the backup file.

#### **SETUP**

This page shows the function blocks which are available for the respective programs. The display depends on the program configuration of the DSPs. Below an example where DSP 1 is configured for 5.1 + 2 whereas DSP 2 is configured for 4 x 2 program processing:





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SDI Bypass [Off / On]

You may bypass the audio de-embedder / embedder for testing or

trouble shooting purposes.

Relay Bypass [Off / On]

The main SDI pass from SDI IN to SDI OUT 1 has a power fail bypass relay. The relay may be turned off manually for testing or

trouble shooting purposes.

Relay Wait Time After Power Up [3 ... 60 seconds]

In order to have the DSP operational and all module function

blocks up and running before processing starts you may delay the moment of switching on the signal path by x amount of seconds.

Stream Select (3G-B) [Stream 1 / Stream 2]

For 3G-B SDI operation (see SMPTE 372 for details) you must

select which of the two streams runs through this particular

module.

**SNMP: Input Lost** [Off / On]

The monitoring of the physical SDI input can be disabled for the

SNMP agent to prevent unwanted traps if the module is frequently

taken out of service.

Alternative Input Channel Allocation

Due to the fact that the DSP is fed in 2Ch mode and in case of surround operation it is possible to select between the standard TV broadcast (L / R / C / LFE / Ls / Rs) and the alternative movie picture (L / C / R / Ls / Rs / LFE) channel allocation.

Program 1

Ch 01 / L
Ch 02 / C
Ch 03 / R
Ch 04 / Ls
Ch 06 / Rs
Ch 06 / LFE

Program 1

Ch 01 / L
Ch 02 / C
Ch 03 / R
Ch 06 / LFE

Atternative Input
Channel Allocation
DOWN
MIX

Program 2
Ch 07 / L
Ch 08 / R

GAIN

OVER

Atternative Output
Channel Allocation

OVER

Program 2
Ch 07 / L
Ch 08 / R

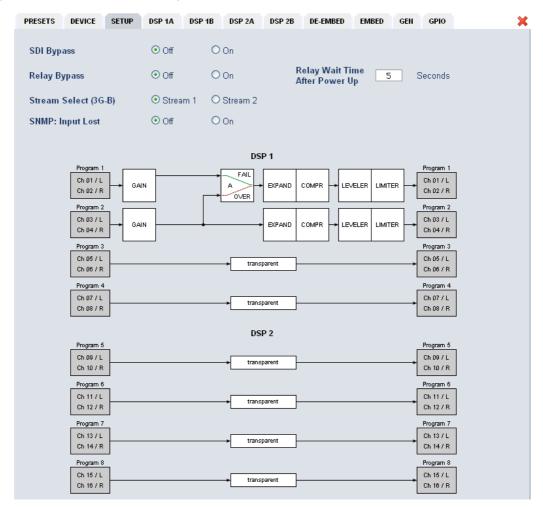
Alternative Output Channel Allocation

See above



C8491

**Important Note!** The available number of processing channels depends on the license that is enabled for the particular module. Here is an example for the basic configuration that has four processing channels only (no channel license is enabled):

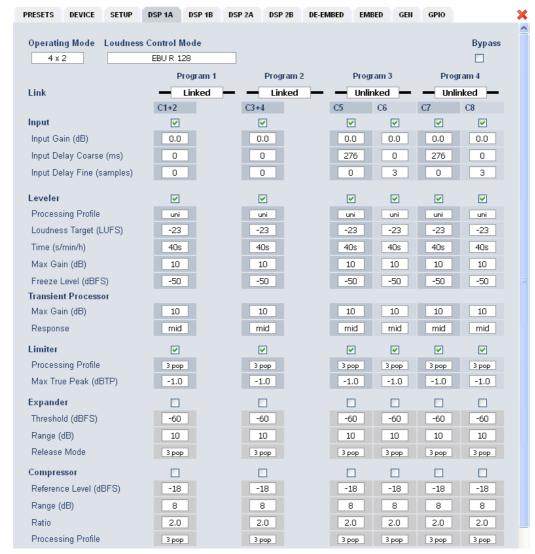




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#### **DSP 1A - 4 x 2 mode**

From here you can control the audio parameters of the **C8491** function blocks. For detailed explanation of the LevelMagic parameters pls. see the separate document: **Junger\_Processing-Parameters\_xxyyzz.pdf** which you may download from our web site.



**Operating Mode** 

 $[5.1 + 2/4 \times 2]$ 

defines the number of audio channels which are used for one audio program. All relevant processing blocks will be configured to meet the selected mode.

**Loudness Control Mode** 

[Level / ITU BS.1770-1, -2, -3, -4 / EBU R 128 / ARIB TR-B32 ATSC A/85 (2011 7 2013) / Free TV OP-59 / Porteria 354]

Bypass

[ON / OFF]

The processing parameters will be bypassed to validate the actual settings. If enabled, the respective **Bypass** DSP1 or DSP2 soft LED turns red in the status panel:



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Link [Unlinked / Linked]

defines the coupling of the control circuits in order to maintain the listening balance for correlated signals or to provide a grouping of

the setup parameters for multi channel signals.

Input [ON / OFF]

 Input Gain
 [-20 ... +20 dB]

 Input Delay Coarse (ms)
 [0 ... 2000]

 Input Delay Fine
 [0 ... 255]

(samples)

**Leveler** [ON / OFF] turns off Transient Processor as well.

Processing Profile [live / speech / pop / classic]

Loudness Target (dBFS) Level mode [0 ... -50]

(LKFS) ITU mode [0 ... -50] (LUFS) EBU mode [0 ... -50]

**Time (s/min/h)** [10, 20, 40 sec. / 1, 2, 5, 10, 20, 40 min / 1, 2 h]

**Max Gain (dB)** [0 ... 40] **Freeze Level (dBFS)** [-20 ... -60]

**Transient Processor** 

**Max Gain (dB)** [0 ... 40]

Response [soft, mid, hard]
Limiter [ON / OFF]

Processing Profile [live, speech, pop, uni, classic]

 Max True Peak (dBTP)
 [0.0 ... -20]

 Expander
 [ON / OFF]

 Threshold (dBFS)
 [-60 ... -20]

 Range (dB)
 [0 .... 20, Gate]

**Release Mode** [0 / 1 live / 2 speech / 3 pop / 4 uni / 5 / 6 classic / 7 / 8 / 9]

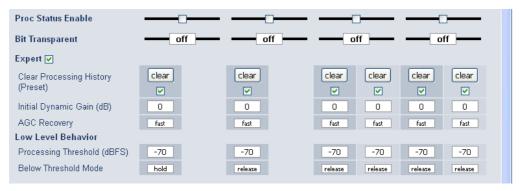
Compressor [ON / OFF]
Reference Level (dBFS) [0 ... -40]

Range (dB) [0 ... 8 .... 20]
Ratio [1: 1.1 ... 1: 4.0]

**Processing** [0 / 1 live / 2 speech / 3 pop / 4 uni / 5 / 6 classic / 7 / 8 / 9]



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**Proc Status Enable** 

[ON / OFF]

If the average gain of the module is equal or above the **Leveler Max Gain** for more than 10s the respective

**Processing Status** soft LED turns **red**. This status information is condensed for all processing channels by the module controller. The frame controller will condense the status information for all processing modules within a frame and may generate a **SNMP trap** and/or fire a **GPO**. In this case the **SNMP manager** may poll the frame for details to "see" which processing channel sticks.

**Bit Transparent** 

[off / on]

indicates that a channel pair is in bit transparent mode

to let non audio signals pass through without the DSP processing

to maintain data structure for non audio signals.

**Expert** 

[show / don't show]

The expert mode offers the possibility for manual intervention of the adaptive behavior of the **LevelMagic** process for critical material. For details pls. see the above mentioned document.

Clear Processing History

(Preset)

manually or GPI controlled

[disable / enable]

defines if the switch is included in a preset. This allows clearing the

processing history if a preset is loaded.

Initial Dynamic Gain (dB)

[-40 ... 1 ... 15]

Start value for the LevelMagic process after Clear Processing

History.

**AGC Recovery** 

[normal / fast]

Low Level Behavior

**Processing Threshold** 

[-80 ... -70 ... -20]

(dBFS)

The threshold from where the processing gain will behave as

defined by Below Threshold Mode.

**Below Threshold Mode** 

[release, hold]

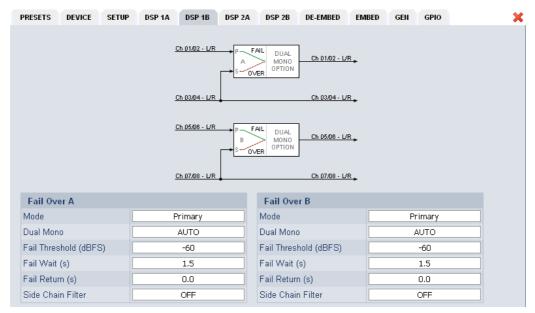
returns slowly to 0 dB gain change or stays at the Processing

Threshold.



C8491

### **DSP 1B - 4 x 2 mode**



The **C8491** offers the feature to use pairs of channels in a fail over mode. I.e. if the audio signal fails in the first audio pair, the processor may switch over to the adjacent (e.g. 1/2 >> 3/4) pair automatically. The functions of the circuits Failover A – Failover B are similar. The switch over will be performed by a cross fade.

#### Failover A

Mode [Primary / Secondary / AUTO]

Selection between both inputs and the auto mode.

**Dual Mono** [OFF / AUTO]

If the fail over input is fed by a dual mono signal, the circuit may

automatically copy the opposite one if one fails.

Fail Threshold (dBFS) [-60 ... -40

Trigger threshold for the fail detector.

**Fail Wait (s)** [1.5 ... 10.0]

Time from detection of an audio loss to the moment of switch over.

**Fail Return (s)** [0.0 ... 10.0]

Time from the detection of an audio until switch back.

Side Chain Filter [ON / OFF]

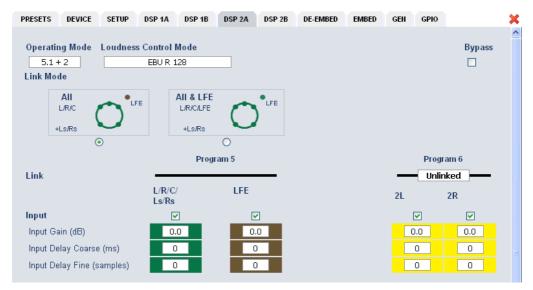
A high pass filter (300 Hz) and a low pass filter (3000 Hz) are applied to the detector side chain (not the audio path) to prevent hum and

noise from blocking fail over switching.



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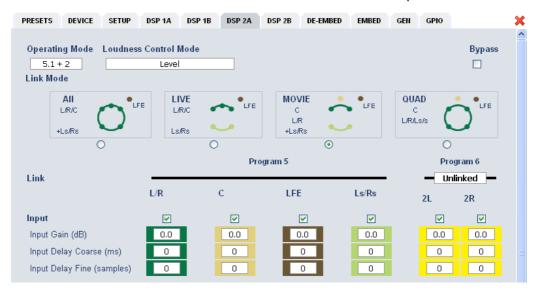
#### DSP $2A - 5.1 + 2 \mod e$



As mentioned above there is also a 5.1 + 2 program configuration available if one has bought the **surround option** for the C8491. In this case the first 6 channels of the DSP are linked for surround processing. This will also apply to **DSP 1** if 5.1 + 2 is selected. The example above shows a condition where the LFE is not linked to the other surround channels and may be controlled independently.

The remaining two channels may be used for an independent stereo audio program or fro two mono channels.

Depending on the loudness control mode, the link options are different. While ITU defines a certain link condition for loudness control and measurement, the proprietary Junger "Level" mode allows for more detailed link variances. The screen shot below shows the most sophisticated **MOVIE** mode:



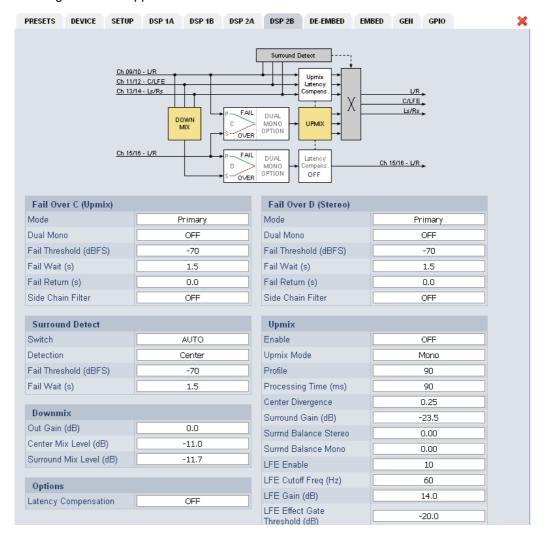


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#### DSP 2B - 5.1 + 2 mode

If you have bought the surround option you will get the option to do an upmix either for permanent operation or as a fail over feature to maintain a surround image if the input surround signal disappears. Also a downmix block is available that can be used to feed a stereo program path or it may be used as a fail over source for the stereo path.

Beside the upmix algorithm, the upmix block has a surround detector that will decide if an input surround signal has disappeared under certain conditions:



### Fail Over C (Upmix)

This can be used to provide a two stage fail over in case of upmix. The upmix source signal can be either the incoming L/R surround pair "Primary" or an extra two channel input "Secondary".

If the surround input is driven by an upstream Dolby E decoder and the signal changes from decoded D-E to PCM stereo on L/R, this stereo will for example be used as an upmix source. But it may also be desirable that in case surround fails a different input is used as the upmix source or the upmix is performed permanently from the secondary input.



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Mode [Primary / Secondary / AUTO / AUTO no Upmix]

You can select between one of the 2ch inputs and the auto mode and

auto mode with upmix disabled (e.g. for path through of

announcements).

**Dual Mono** [OFF / AUTO]

If the fail over input is fed by a dual mono signal, the circuit may

automatically copy the opposite one if one fails.

Fail Threshold (dBFS) [-60 ... -40]

Trigger threshold for the fail detector.

**Fail Wait (s)** [1.5 ... 10.0]

Time from detection of an audio loss to the moment of switch over.

Fail Return (s) [0.0 ... 10.0]

Time from detection of an audio loss until switch back.

Side Chain Filter [ON / OFF]

A high pass filter (300 Hz) and a low pass filter (3000 Hz) is applied to the detector side chain (not the audio path) to prevent hum and noise

from blocking fail over switching.

**Surround Detect** To perform an automatic upmix in case the main surround fails.

Switch [AUTO / FIX Surround / FIX Upmix]

The surround switch may be permanently [FIX] connected to the surround input or the upmix output but it may also perform an [AUTO]

switch over in case the surround input fails.

**Detection** [Center / Surround / Center or Surround / Signal loss]

Here you can decide which channels must be observed for signal loss

to operate the surround switch.

Fail Threshold (dBFS) [-80 ... -70 ... -40]

If the RMS weighted input level drops below this value a fail signal will

be generated.

**Fail Wait (s)** [0.0 ... 10.0]

Time from detection of an audio loss to the moment of switch over. The return from the fail condition (in case surround comes back) will

be immediate.

**Downmix** 

Out Gain (dB) [-20 ... 0 ... 20]

Center Mix Level (dB) [-12.0 ... -3.0 ... 0.0]

Surround Mix Level

[-12.0 ... -3.0 ... 0.0]

(dB) Options

**Latency Compensation** [OFF / ON]

Since the upmix has a certain latency (see Upmix > Processing Time) it can be compensated automatically for the stereo pair to avoid lip sync issues between an upmixed surround and the stereo path.

Failover D (Stereo)

Mode [Prinmary / Secondary / AUTO]

The second fail over circuit can take the downmix as a fail over source

in case the input signal fails. But it may simply put the downmix

through permanently (Mode switch is set to Secondary).

The other parameters are already described in the **DSP 1B** section.



C8491

**Upmix** 

Enable [OFF / ON]

**Upmix Mode** [Mono / Stereo / AUTO]

Profile [1 Front Projection, 2 Emphasize Front, 3 Balanced, 4 Emphasize

Surround, 5 Wrap Surround]

1 Front Projection – Optimized for a stable surround image, independent of correlation of the input signal. Opens a stage-like presentation over the front speakers and uses the rear channels for

ambience creation.

2 Emphasize Front – Based on setting 1 with a less strict front

projection.

**3** Balanced – A balanced distribution of the signal between the front and rear channels, without overemphasizing the rear channels.

**4** Emphasize Surround – The distribution between the front and rear channels is highly dependent on the correlation of the input signal. Highly uncorrelated signals may create emphasized

surround channels.

**5** Wrap Surround – Even distribution of the signal between all channels, to create a feeling of being 'wrapped in sound' to create

spectacular effects.

Processing Time (ms) [3 ... 100]

The processing time has great influence on the quality of the upmix process but of course alters the latency of the audio signal. It is highly recommended to allow as much processing time as possible. E.g. one can e.g. increase the processing time instead of adding audio delay to compensate for a delayed video line. Depending on the system latency requirements (ingest vs. live broadcast) you may

change the processing time accordingly.

Center Divergence [0.0 ... 1.0]

The upmix process assembles a center signal from the input stereo. It may either be fed to the center channel only (0.0) or spread between L/R (1.0). The effect will be a wider presentation of center signals in a surround sound image. Please note that the signal does not completely disappear from one source (L/R or C), depending on

the selected profile.

**Surround Gain (dB)** [-24.0 ... 0.0]

Sets the level of Ls/Rs channels.

Surround Balance Stereo  $[0.00 \dots 1.00]$ 

defines the amount of direct sound mixed into the surround

cnanneis.

0.0 provides pure ambient sound while 0.1 to 1.0 will increase the amount of direct sound. Works only if upmix mode is set to stereo

or switched to stereo in auto mode.



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Surround Balance

[0.00 ... 1.00]

Mono

defines the amount of direct sound mixed into the surround

channels.

0.0 provides pure ambient sound while 0.1 to 1.0 will increase the amount of direct sound. Works only if upmix mode is set to mono or switched to mono in auto mode. For auto mode lower values (0.2 – 0.4) are recommended to prevent unwanted effects when auto

switching between Mono and Stereo.

**LFE Enable** [OFF / ON / Effect Gate]

You may turn this option on if the upmix process is to generate a subwoofer signal that will appear in the LFE channel. When using the Effect Gate function the system interactively processes the subwoofer signal and generates a signal that comes very close to a real LFE signal, without creating permanent rumble and bass

excitation.

**LFE Cutoff Freq (Hz)** [60, 80, 100, 120]

sets the cutoff frequency for the generated LFE signal.

**LFE Gain (dB)** [-20.0 ... 20.0]

You can set the LFE level here

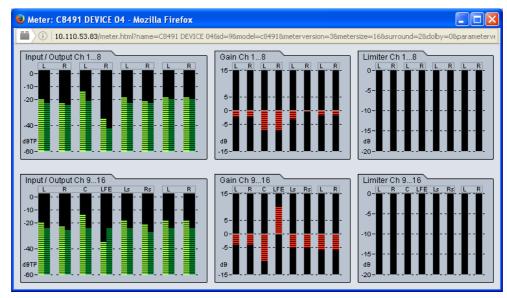
**LFE Effect Gate** [-20.0 ... 0.0]

**Threshold (dB)** sets the relative threshold of the Effect Gate processor.

**Important Note!** If you encode the surround signals from this upmix to a Dolby format we recommend to set the center and the surround downmix level to -3dB for best downmix compatibility.

### Metering

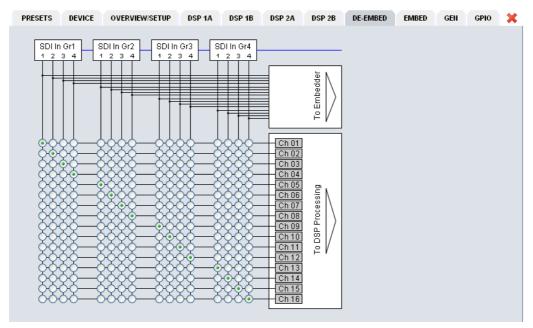
If you click on the **Metering** icon on the left hand side in the status window, a Java applet opens up. This feature is only available if a valid Java plug-in is available for the browser that is used to display the GUI.





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#### **DE-EMBEDDER**



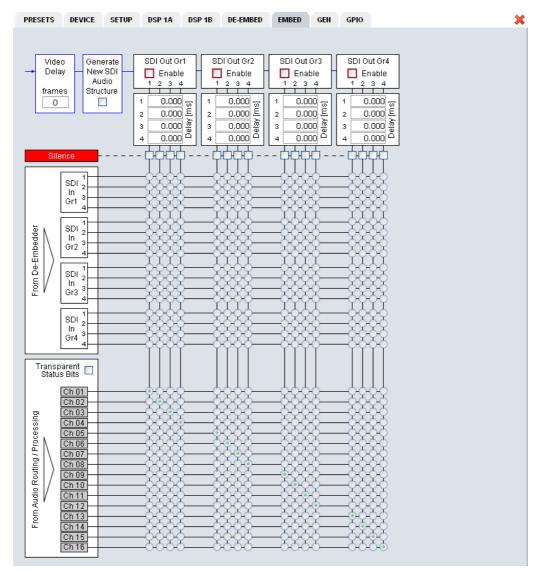
Here you may assign the audio signals from the 16 de-embedded channels to **up to 16** processing channels.

**Important Note!** The number of processing channels may be different. It depends on the license that is activated for the module. A standard four channel module only has Ch 01 ... Ch 04 connected to a DSP. See SETUP pane for details. The other channels are moved transparent to the embedder.



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#### **EMBEDDER**



From here you can control the embedder. You may select between the 16 audio channels from the input (de-embedder) and the signals from the processors (DSPs).

Video Delay

[1 ... 8 frames]

To compensate for processing delay especially if upmix is involved or for other purposes, you can apply up to 8 frames of video dely. The amount of time depends on the video standard.

Generate New SDI Audio Structure [ON / OFF]

If you need to replace the structure of the **Ancillary Audio Data Blocks** [HANC – horizontal ancillary data] you can clean the whole area and generate a new structure. This is an important feature to solve issues discovered from time to time with legacy embedders especially if it comes to SD-SDI. If the option is checked, no group will be generated as long as no **SDI Out Grx** is checked.



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SDI Grx Enable You must check these check boxes to enable the respective

embedder. The check boxes show flashing red frames as a warning as long as no embedder is turned on. The respective column of the local (embedder) routing matrix for each group is not high lighted as

long as its embedder is not enabled.

**Delay** [0 ... 340 ms]

Before the signals are embedded you may engage a delay per mono

channel.

**Silence** Mutes the respective audio channel at the embedder side.

Transparent [ON / OFF]

Status Bits You can decide whether the AES Channel Status Bits are taken

(transparent) from their source or if you want to generate new ones:

Format : Professional Audio Mode : Audio

Emphasis : None
Freq. Mode : Locked
Sample Freq. : 48kHz

Channel Mode : Not Indicated

User Bits : None Auxiliary Bits : 24Bit

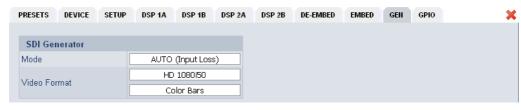
Audio Word Length: Not indicated

If the embedder detects a non audio signal it will set the "Audio Mode" to "Other" (non audio) and set the validity bit for the AES stream.



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#### **GENERATOR**



#### **SDI** Generator

Mode [AUTO (Input Loss) / ALWAYS ON / OFF]

If the generator is set to "AUTO (Input Loss)" and the input signal is lost, the generator will use the pre-selected video format from the

setting below.

**Video Format** [Last Valid / None / SD 525i59,94 ... HD 720p50 ... 3G-B 1080p50]

For the generator mode "ALWAYS ON" you may select one of the

standards to be used.

For the "AUTO (Input loss)" mode you may additionally decide between

"Last Valid" or "None".

**Last Valid -** The generator uses the last seen input format.

If no SDI signal is present when power is turned on, the output defaults to 720p60.

**None -** The generator output will stay off if the signal is lost.

[Color Bars / Black Frame]

The generator can either generate 100% Color Bars or Black.

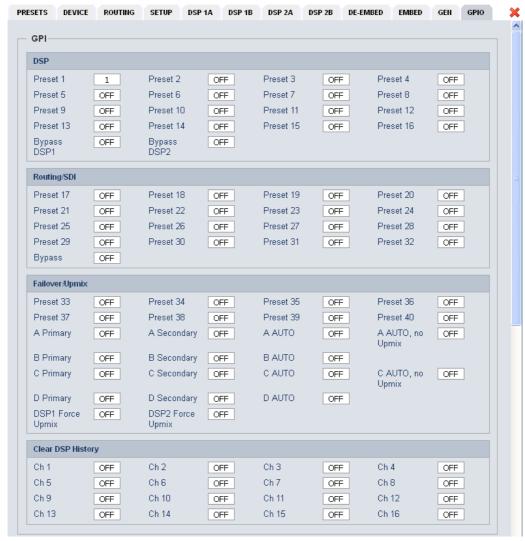
**Important note!** The generator always operates on an **internal quartz reference**. I.e. the signal is **not** synchronized to the SDI input if it is enabled in the "ALWAYS ON" mode.



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#### **GPIO**

The **C8491** has three dedicated sets of GPI/Os for the **DSP**, the **SDI** and the **Failover/Upmix**. Moreover it offers the function to clear the DSP history (see level magic expert parameters) by control of an external GPO device.



**GPI**s

are useful if you want to recall settings remotely (e.g. by presets). The C8k frame can handle **127** different **GPIs**. You must assign a unique number to the respective function. Such numbers will be generated by the **brc8x** Broadcast Remote Controller or by a **GPI/O** interface module **C8817**. If the **C8491** receives such a number over the internal CAN bus, it will for example load the respective preset or it will turn on a bypass function or clear the processing (DSP) history.



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**GPO**s (Tallies) may signal the status of a module for a **GPI** devices like legacy equipment monitoring systems. The c8k frame can handle **127** different virtual **GPO** numbers.

If an event occurs, the **C8491** puts the assigned number on the CAN bus so a **C8817 GPI/O** module can engage a relay or the **brc8x** may activate its tallies.



Clear GPO on Preset modified If a GPO indicates that a certain preset is loaded and if you change parameters which are related to that preset the word "modified" will be displayed in line with the preset name in the status window.

In this case you may clear that GPO to indicate that the parameters are not the same as the content of the previously loaded preset.

**Important Note!** Virtual **GPI** and **GPO** numbers do not "see" each other on the CAN bus. I.e. you can not use a **GPO** number to trigger an event inside the frame directly. If this is the task you must use the **C8817 GPI/O** module that can do the **GPI/O** conversion and provides you with the possibility to set up logical combinations of physical and virtual **GPI/Os**.