digital audio
modular
processing system

C8000

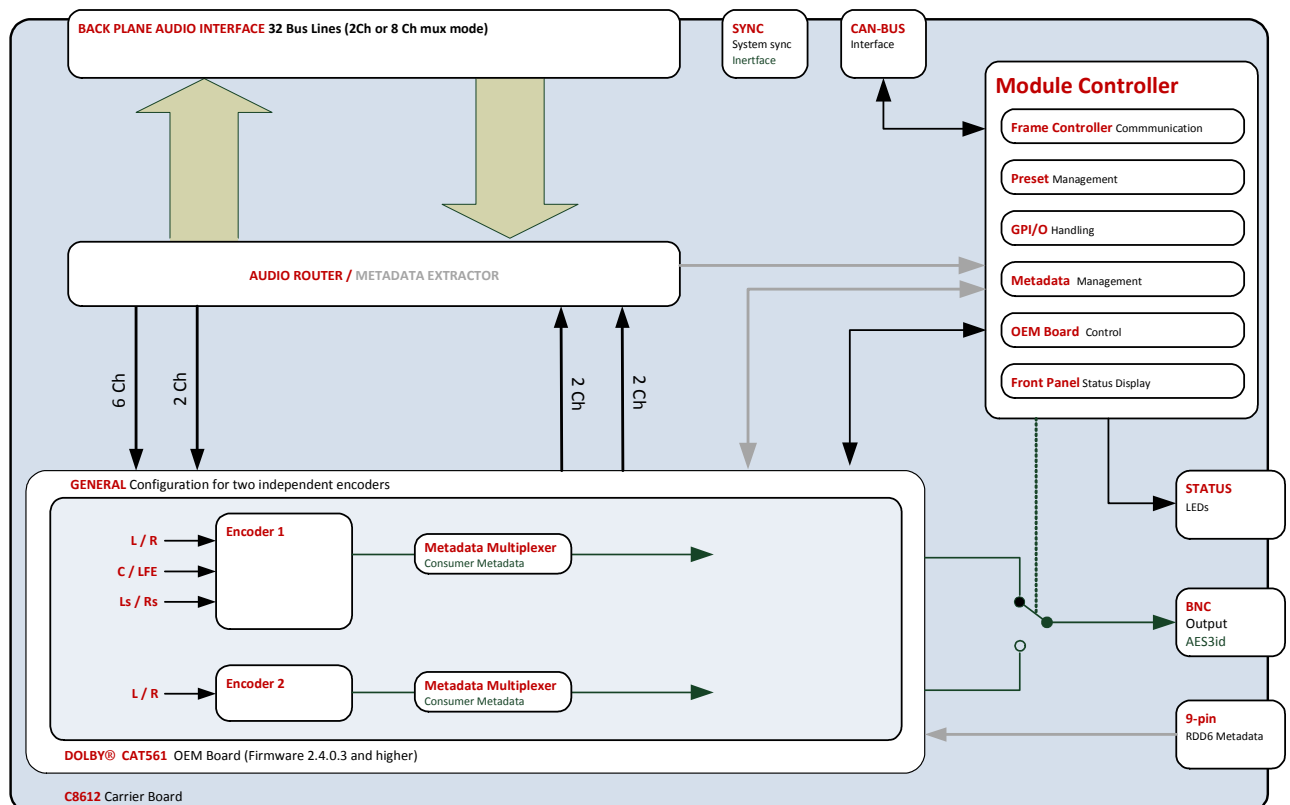**jünger**

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

C8612
DOLBY D+

ENCODER

● STATUS
● DOLBY D
● DOLBY D+

DOLBY OUTPUT

METADATA
● INPUT

features

- Dolby Digital (AC3), Dolby Digital plus, HE-AAC, AAC encoder(s)

- Two independent (5.1 and 2.0) encoders

- Supports associated services (audio description incl. BBC "Warble Tone" technology)

- 5.1 transcoding from Dolby Digital (AC3) to Dolby Digital plus

- Stream multiplexing for single PID applications

- RS485 – RDD6 - metadata input

- 16 Metadata presets

- 16 Setup presets

- 8 bus routing presets

- Encoded output available on internal bus as well as alternately on BNC monitor output

- Remote control (web interface) via C8702 frame controller

block diagram

BACK PLANE AUDIO INTERFACE 32 Bus Lines (2Ch or 8 Ch mux mode)

SYNC System sync Inertface

CAN-BUS Interface

Module Controller

Frame Controller Commmunication

Preset Management

GPI/O Handling

Metadata Management

OEM Board Control

Front Panel Status Display

AUDIO ROUTER / METADATA EXTRACTOR

6 Ch
2 Ch
2 Ch
2 Ch

GENERAL Configuration for two independent encoders

L / R
C / LFE
Ls / Rs

Encoder 1

Metadata Multiplexer Consumer Metadata

L / R

Encoder 2

Metadata Multiplexer Consumer Metadata

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

C8612 Carrier Board

STATUS LEDs

BNC Output AES3id

9-pin RDD6 Metadata

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

technical specifications

Monitor output :
- connector — BNC
- impedance — 75Ω
- signal level — $1V_{p-p}$
- standard — AES 3, SMPTE 276M unbalanced
- data format — 16, 20, 24bit
- sample rate — 48kHz

Input audio formats : 16, 20, 24bit

Output audio formats :
- Dolby D (AC3)
- Dolby D plus (E-AC3)
- HE-AAC v1/2, AAC

Encoding latency :
135ms without automatic compensation turned off
300ms for all formats with automatic compensation

Metadata input :
- format — RDD6 metadata stream (RS485)
- baud rate — 115,2kbps
- connector — Sub-D, 9-pin, female

Backplane connector : ref. to DIN 41612, 64pin, a+b, male

Power supply : +5V DC

Consumption : approx. 600mA

Dimensions : 3RU, 4HP, 160mmd deep (Euro Format)

Ambient : 10ºC to 40ºC

Humidity : 90%, non condensing

pin assignment :

| connector :	Metadata INPUT
female	9-pin D-Sub
1	GND
2	
3	Rx (+)
4	GND
5	
6	GND
7	
8	Rx (-)
9	GND

Dolby® metadata

The Dolby Laboratories, Inc. have introduced the **"data about the audio data"**, the Dolby metadata which are intended to travel along with the multi channel bit stream from acquisition (point of audio recording) to delivery (Dolby Digital decoder at home (either part of the TV / Set Top Box or the home theater system). Those metadata may control the home equipment in a way that the sound impression is as close as possible to what the producers intention was when mixing a movie sound track.

There is not enough room for explanation of the Dolby metadata system in a product manual like this. We recommend to those who are not familiar with this quite complex matter, to study the many publications from Dolby Inc. probably found here:

http://www.dolby.com/gb/en/professional/technology/landing.html

You can browse the Technical Library and **<Search>** for "Metadata". Here you will find the **"Dolby® Metadata Guide"** and other useful information regarding Dolby technologies as well.

Dolby Digital / Digtal plus / Pulse (AAC) encoder   C8612

installation
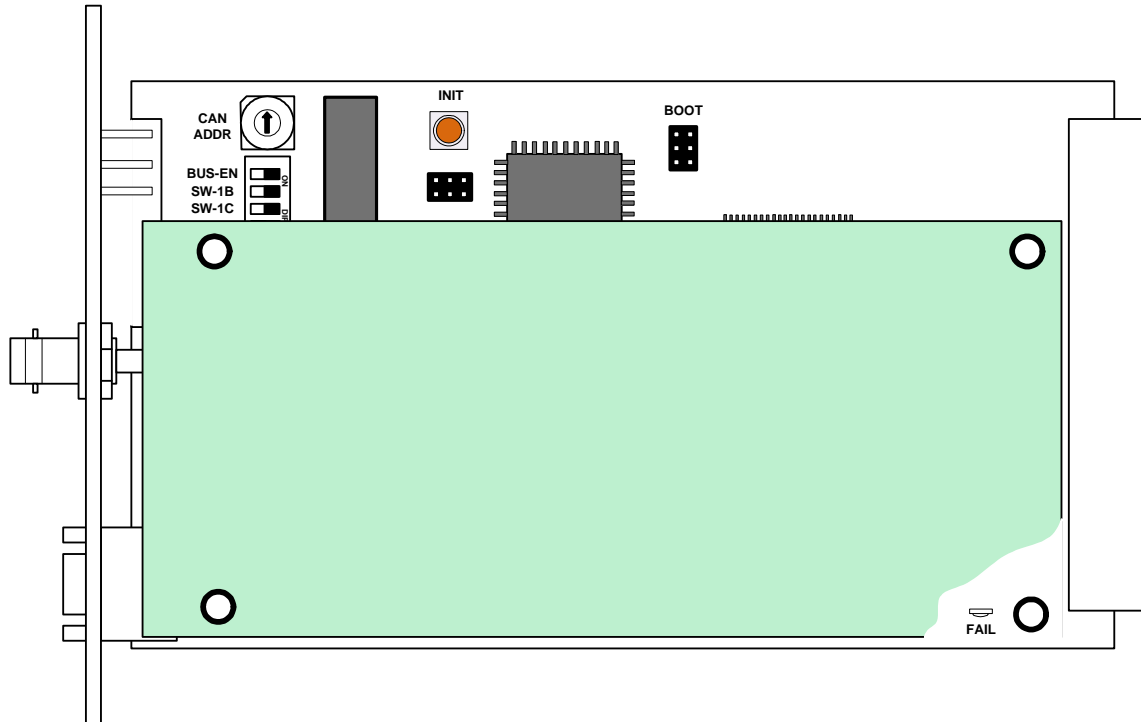
Set the **CAN ADDR** rotary encoder to an address, which is not in use by an other module of a C8000 frame (for details regarding CAN addressing, see C8000 system manual).

BUS-EN = **OFF** will disable the bus driver circuits on power up
SW-1B = **ON** enables the CAN **"+16"** address schema to handle up to 32 modules
SW-1C = **OFF** not used
SW-1D = **OFF** not used

Important Note! If the module has an unknown bus configuration, you **must** set **BUS-EN=OFF**, before inserting the module into a C8000 frame. Otherwise you are in risk to disturb other channels of the frame.

Pressing the **INIT** button during power up, will initialize the module parameters to factory default values.

status LEDs

FAIL flashing red   = hardware problem
(on the bottom right PCB edge)

STATUS	**green**	= OK
	red	= bad
	flashing	= under GUI control
DOLBY D	**green**	= if one of the encoders encodes D-D
	Off	= if none of the encoders encodes D-D or encodes an AAC format
DOLBY D+	**blue**	= if one of the encoders encodes D-D plus
	Off	= if none of the encoders encodes D-D plus or encodes an AAC format

digital audio
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Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

web browser based configuration

Setup of all configurations, parameters and functions via a web browser.
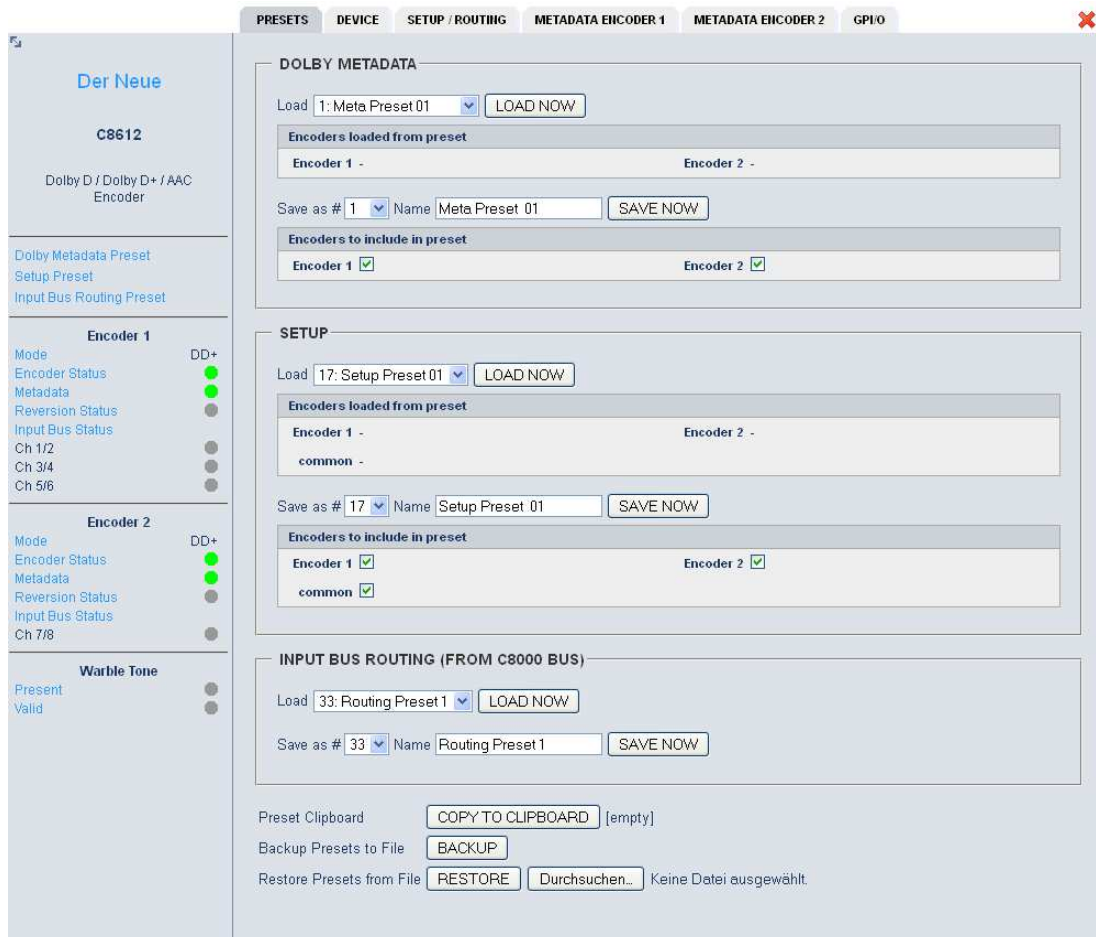*See also C8702 Frame Controller.*

OVERVIEW
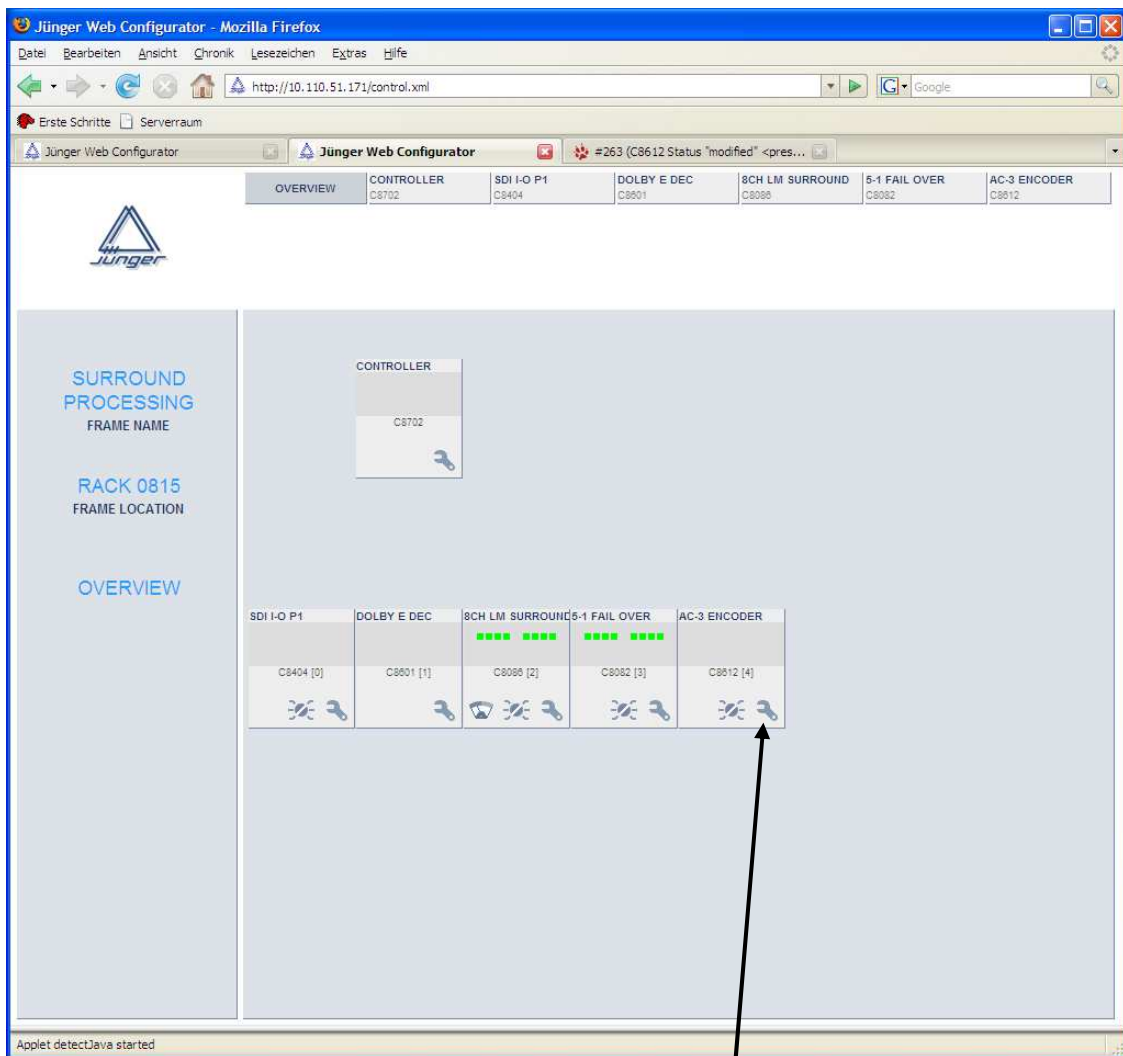
The above example shows a **C8612** (Name: "AC3 Encoder") ● in a typically processing chain. Clicking on the **spanner tool** within the module graphics of the **C8612** will open the pages of that module.

If you click on the **switch tool** you will get the page for changing Presets only.

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

PRESETS

Because this device has two independent encoders, the Dolby metadata and setup presets may be assigned to one or both encoders if necessary.

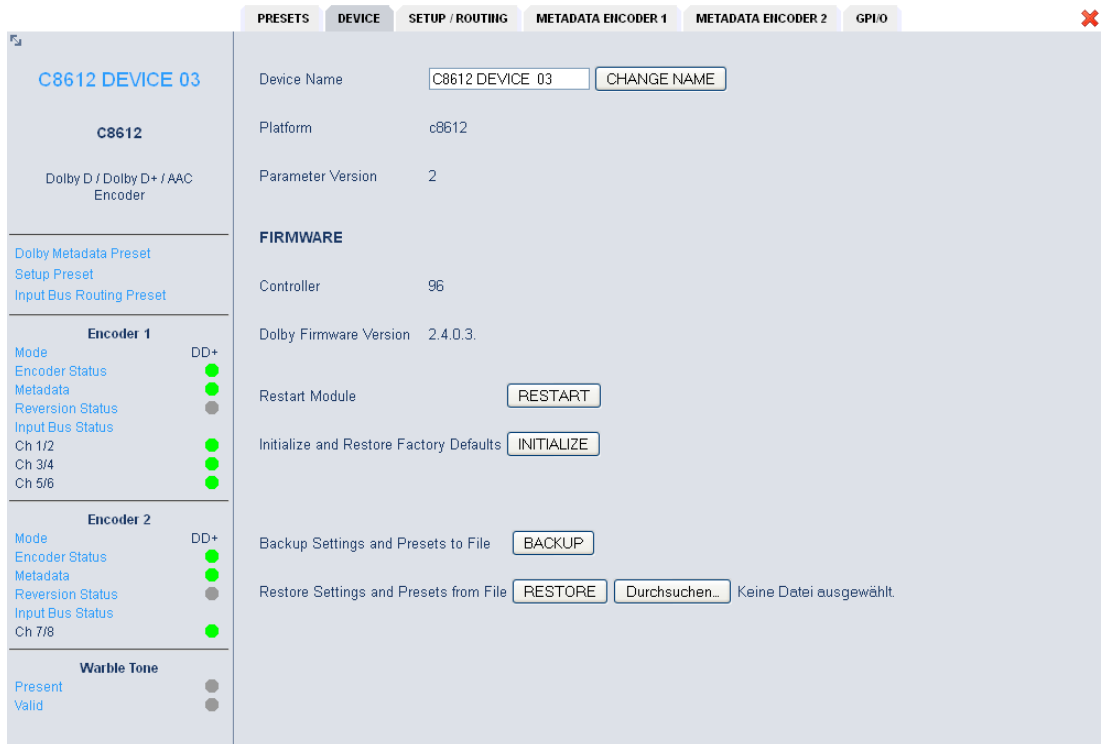|	
Dolby Metadata	This bank of presets stores the parameters from the **Metadata Encoder x** pane.
Load	[1. Meta Preset 01 … 15. Meta Preset, 16. Reversion Preset] will load one of the 16 available Presets from the **NV memory** of the module. Select the preset of your choice and press **<LOAD NOW>.**
Encoders loaded from preset	Here you can see which encoder is affected by the actually loaded preset
Save as #	[1 … 16] Here you can select a Preset Number (memory location).
Name	You can give each preset a 16 character name. The actual parameters will be stored if you press **<SAVE NOW>.**
Encoders to include in preset	[Encoder 1, Encoder 2] Here you can select which encoder will be stored in the selected preset memory.

Dolby Digital / Digtal plus / Pulse (AAC) encoder   C8612

SETUP	This bank of presets stores the encoder setup parameters from the **SETUP / ROUTING** pane.
Load	[1. Meta Preset 01 … 15. Meta Preset, 16. Reversion Preset] Will load one of the 16 available Presets from the **NV memory** of the module. Select the preset of your choice and press **<LOAD NOW>.**
Encoders loaded from preset	[Encoder 1, Encoder 2, common] Here you can see which encoder is affected by the actually loaded preset. Since there are a few parameter which apply to both encoders you can see if these are applied as well.
Save as #	[1 … 16] Here you can select a Preset Number (memory location).
Name	You can give each preset a 16 character name. The actual parameters will be stored if you press **<SAVE NOW>.**
Encoders to include in preset	Here you can select which encoder will be stored in the selected preset memory. Since there are a few parameter which apply to both encoders you can decide if these must be stored as well.
INPUT BUS ROUTING (FROM C8000 BUS)	The module has the ability to store and recall input bus assignments to presets for flexible signal routing.
Load	[33. Routing reset 1 … 40. Routing Preset 8] Will load one of the 8 available routing presets from the **NV memory** of the module. Select the preset of your choice and press **<LOAD NOW>.**
Save as #	[33 … 40] Here you can select a Preset Number (memory location).
Name	You can give each preset a **16 character** name. The actual parameters will be stored if you press **<SAVE NOW>.**
Preset Clipboard	You can copy the data of the active parameters of the two sets of Presets to a **clip board** and paste such data into the Preset memory of another module within one frame. Simply press **<COPY TO CLIPBOARD>** and the phrase : "[c8612 "device name"] **<PASTE>**" will appear. Now you can use the **<PASTE>** soft button on other **C8012** modules within this frame to paste these presets into the modules NV memory.
Backup Presets to File	When you press **<BACKUP>** an XML file that contains all preset data will be prepared by the module. A dialog will pop up that asks you if you want to "Open with" or "Save File". Select save file and press **<OK>** to open the explorer dialog to save the file.
Restore Presets from File	When you press the **<Browse…>** soft button an explorer window will pop. You may now search for an XML file of your choice that contains the preset parameter**.** Press **<Open>** to select that file. Finally you must press **<RESTORE>** to store the preset data into the NV memory of the module.

Dolby Digital / Digtal plus / Pulse (AAC) encoder   C8612

DEVICE

PRESETS   DEVICE   SETUP / ROUTING   METADATA ENCODER 1   METADATA ENCODER 2   GPI/O

C8612 DEVICE 03

C8612

Dolby D / Dolby D+ / AAC Encoder

Dolby Metadata Preset
Setup Preset
Input Bus Routing Preset

Encoder 1	
Mode	DD+
Encoder Status	●
Metadata	●
Reversion Status	●
Input Bus Status	
Ch 1/2	●
Ch 3/4	●
Ch 5/6	●

Encoder 2	
Mode	DD+
Encoder Status	●
Metadata	●
Reversion Status	●
Input Bus Status	
Ch 7/8	●

Warble Tone	
Present	●
Valid	●

Device Name   C8612 DEVICE 03   [CHANGE NAME]

Platform   c8612

Parameter Version 2

FIRMWARE

Controller   96

Dolby Firmware Version   2.4.0.3.

Restart Module   [RESTART]

Initialize and Restore Factory Defaults [INITIALIZE]

Backup Settings and Presets to File   [BACKUP]

Restore Settings and Presets from File [RESTORE] [Durchsuchen...] Keine Datei ausgewählt.

Device Name	You can assign a **16 character name** to the module. Press **<CHANGE NAME>** to store the name.
Platform	Display of the hardware platform.
Parameter Version	During the development new features will be added. This requires to add parameters. The parameter version reflects a curtain set of parameters.

FIRMWARE

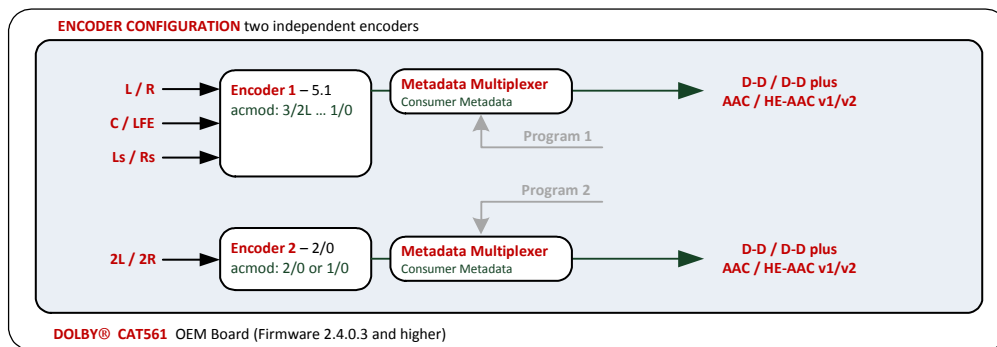|	
Controller	Firmware version of the module controller.
Dolby Firmware Version	Version of the Dolby **CAT561** OEM module.
Restart Module	Pressing **<RESTART>** will warm start the C8612.
Initialize and Restore Factory Defaults	Pressing **<INITIALIZE>** will initialize the C8612 to factory defaults and will warm start the module afterwards.
Backup Settings and Presets to File	Pressing **<BACKUP>** will download all settings including the presets to a file that you can store on the PC.
Restore Settings and Factory Defaults	Pressing **<RESTORE>** after browsing and selecting a backup file, will move parameters and presets from that file back to the module.

Dolby Digital / Digtal plus / Pulse (AAC) encoder
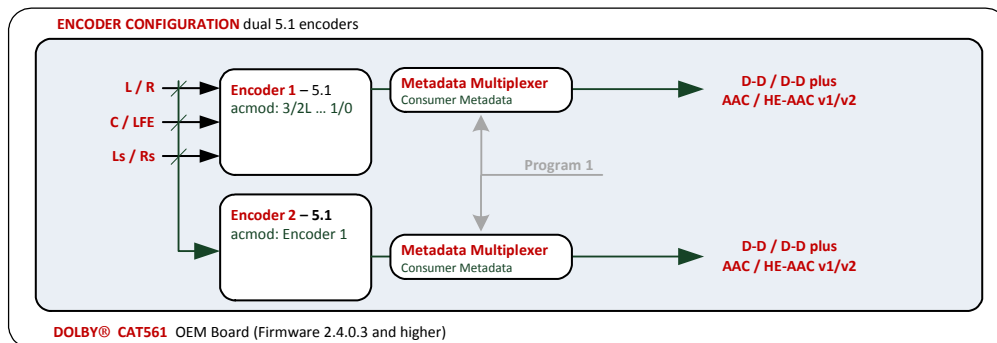
C8612

SETUP / ROUTING :   Setup of the module and the Bus routing

The Dolby OEM module CAT561 has 8 physical PCM audio inputs and may be configured for 4 different operating modes :
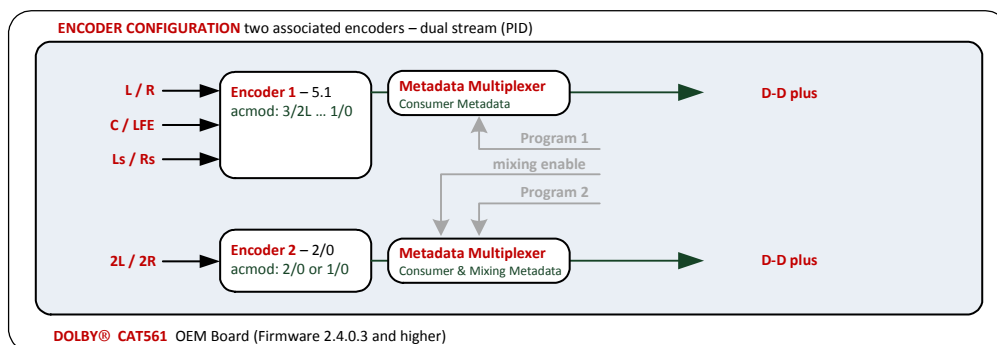
A) Two independent encoders   stream 1 – 5.1 (D-D, D-D plus, AAC, HE-AAC)
(independent audio inputs   stream 2 – 2.0 (D-D, D-D plus, AAC, HE-AAC)
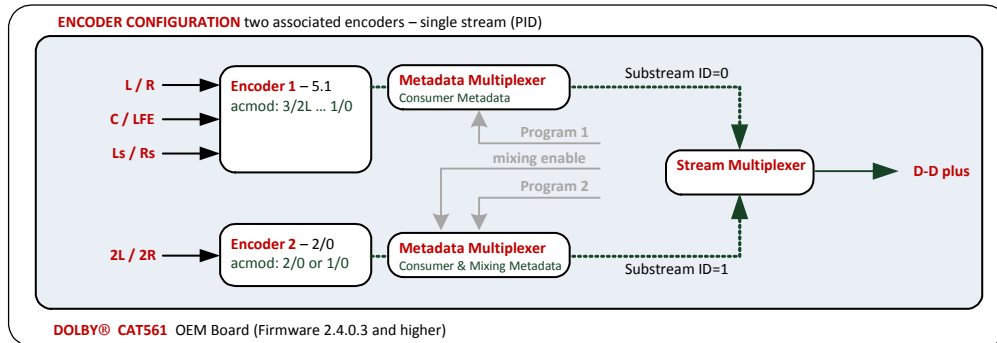Independent metadata)

ENCODER CONFIGURATION two independent encoders

L / R → **Encoder 1** – 5.1
acmod: 3/2L … 1/0
C / LFE →
Ls / Rs →

Metadata Multiplexer
Consumer Metadata
→ D-D / D-D plus
AAC / HE-AAC v1/v2

Program 1

Program 2

2L / 2R → **Encoder 2** – 2/0
acmod: 2/0 or 1/0

Metadata Multiplexer
Consumer Metadata
→ D-D / D-D plus
AAC / HE-AAC v1/v2

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

B) Two 5.1 encoders
with different data rates
(but same audio inputs)

stream 1 – D-D, D-D plus, AAC, HE-AAC
stream 2 – D-D, D-D plus, AAC, HE-AAC

ENCODER CONFIGURATION dual 5.1 encoders

L / R → **Encoder 1** – 5.1
acmod: 3/2L … 1/0
C / LFE →
Ls / Rs →

Metadata Multiplexer
Consumer Metadata
→ D-D / D-D plus
AAC / HE-AAC v1/v2

Program 1

Encoder 2 – **5.1**
acmod: Encoder 1

Metadata Multiplexer
Consumer Metadata
→ D-D / D-D plus
AAC / HE-AAC v1/v2

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

C) Two encoders used for
associated services

one stream for the main audio, one stream for an associated audio. The streams may be output in parallel from both encoders (AKA dual PID – DVB packet identifier) :

ENCODER CONFIGURATION two associated encoders – dual stream (PID)

L / R → **Encoder 1** – 5.1
acmod: 3/2L … 1/0
C / LFE →
Ls / Rs →

Metadata Multiplexer
Consumer Metadata
→ **D-D plus**

Program 1

mixing enable

Program 2

2L / 2R → **Encoder 2** – 2/0
acmod: 2/0 or 1/0

Metadata Multiplexer
Consumer & Mixing Metadata
→ **D-D plus**

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

Dolby Digital / Digtal plus / Pulse (AAC) encoder | # C8612

or multiplexed into one stream
(AKA single PID mode).

ENCODER CONFIGURATION two associated encoders – single stream (PID)

L / R →	**Encoder 1** – 5.1 acmod: 3/2L … 1/0
C / LFE →	
Ls / Rs →	

Metadata Multiplexer
Consumer Metadata — Substream ID=0

Program 1
mixing enable
Program 2

Stream Multiplexer → **D-D plus**

2L / 2R →	**Encoder 2** – 2/0 acmod: 2/0 or 1/0

Metadata Multiplexer
Consumer & Mixing Metadata — Substream ID=1

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

A major application for associated services is called **Audio Description** (associated service "Hearing Impaired").

For many years the BBC uses a technology called **Warble Tone**. This employs a second audio pair for recording of AD content. One track contains the narrators voice while the other track contains a control signal that is encoded from mix and pan information. This was originally used to perform a so called broadcast mix prior to transmission. The AD mix (program mixed with narrator) was then transmitted parallel to the main audio. Dolby encoding technology paired with Dolby consumer decoder implementation now allows for transmitting the narrators voice only and do a so called receiver mix. This saves a lot of bandwidth for transmission. Mixing information are now transmitted via metadata. The C8612 can translate the Warble Ton track into mixing metadata. This solution allows to broadcast existing AD enabled content from stock :

ENCODER CONFIGURATION two associated encoders – warbletone control – single stream (PID)

L / R →	**Encoder 1** – 5.1 acmod: 3/2L … 1/0
C / LFE →	
Ls / Rs →	

Metadata Multiplexer
Consumer Metadata — Substream ID=0

Program 1
mixing enable
Program 2

Stream Multiplexer → **D-D plus**

Warbletone →	**Encoder 2** – 2/0 acmod: 2/0 or 1/0 Warbleton decoder

Metadata Multiplexer
Consumer & Mixing Metadata — Substream ID=1

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

D) Transcoding a D-D encoded stream may be **transcoded** directly to a D-D plus stream. The metadata may be modified for the output stream.

ENCODER CONFIGURATION two associated encoders – warbletone control – single stream (PID)

L / R →	**Encoder 1** – 5.1 acmod: 3/2L … 1/0
C / LFE →	
Ls / Rs →	

Metadata Multiplexer
Consumer Metadata — Substream ID=0

Program 1
mixing enable
Program 2

Stream Multiplexer → **D-D plus**

Warbletone →	**Encoder 2** – 2/0 acmod: 2/0 or 1/0 Warbleton decoder

Metadata Multiplexer
Consumer & Mixing Metadata — Substream ID=1

DOLBY® CAT561 OEM Board (Firmware 2.4.0.3 and higher)

Dolby Digital / Digtal plus / Pulse (AAC) encoder

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From C8000 System Bus	The audio busses from the C8k frame must be assigned to the respective encoder channels. This can be done in 2 or 8ch mux mode. If the module is connected to a bus that is in 8ch mux mode (e.g. S9), signal pairs my be taken from there or from individual 2ch mux busses (e.g. S1).
Gain dB	[-10.0 … 0.0 … 10.0] An additional gain stage is available here to align the level prior to encoding.
Encoder 1 / Encoder 2	Graphical representation of the two encoders used by the C8612 module.
To C8000 System Bus	[S1 … S32, OFF] The two encoder outputs may be assigned to C8k busses as well as alternately to the external BNC monitor output.
Channel Status	[Professional, Consumer] The AES channel status for the encoded streams my be switched from Professional to Consumer format.
Enable Bus Driver	You may turn off all bus drivers (tri state mode) for installation to prevent conflicts with modules already in service.
Error Detection	[Off / On] The serial audio data from the frame bus can be monitored for proper positioning of an **Error-Flag**. A wrong detection is an indication that there is disturbance upstream (input signal lost, input module broken, upstream module failure).

Dolby Digital / Digtal plus / Pulse (AAC) encoder

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The **Error Detection** can be turned **Off** and **On** for each input via check boxes and the entire module by radio buttons.
You will see the status on the left hand side **"Input Bus Status"**. A **grey** "LED" shows that the detection is disabled, **green** is OK, **red** indicates an error condition.

The bus status may be presented to external monitoring systems via SNMP. The frame controller summarizes such status information and generates SNMP traps for the frame as an entity or may activate GPOs (if GPI/O module(s) are installed). The SNMP manager may afterwards poll the modules for more detailed information (e.g. which bus has an error? See SNMP documentation for details). For inputs connected to unused busses this detection should be turned off to prevent from unwanted SNMP traps.

Encoder Parameter

Due to the different functions available for different encoding formats, the accessible parameters may differ widely depending on the encoder mode.

Encoder Mode

[Dolby Digital, Dolby Digital +, HE-AAC v1/2, AAC]

Bitstream Packing Format
(only visible for AAC formats)

[ADTS MPEG-2, ADTS MPEG-4, LATM/LOAS impl. SBR, LATM/LOAS expl. SBR, LATM in-band impl. SBR, LATM in-band SBR, LATM out-of-band impl. SBR, LATM out-of-band expl. SBR]
For AAC encoding you may also define which MPEG-4 objet type and multiplex technology must be used (see MPEG-4 Audio standards for details).

Encoder Configuration

Encoder 1 is fixed to 5.1
Encoder 2 [2.0, 5.1]

If both encoders are set to "Dolby Digital +" and the second encoder is set to mode 2.0 it is possible to multiplex the streams from the two encoders to form a single elementary stream for DVB or ATSC encoding :

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612
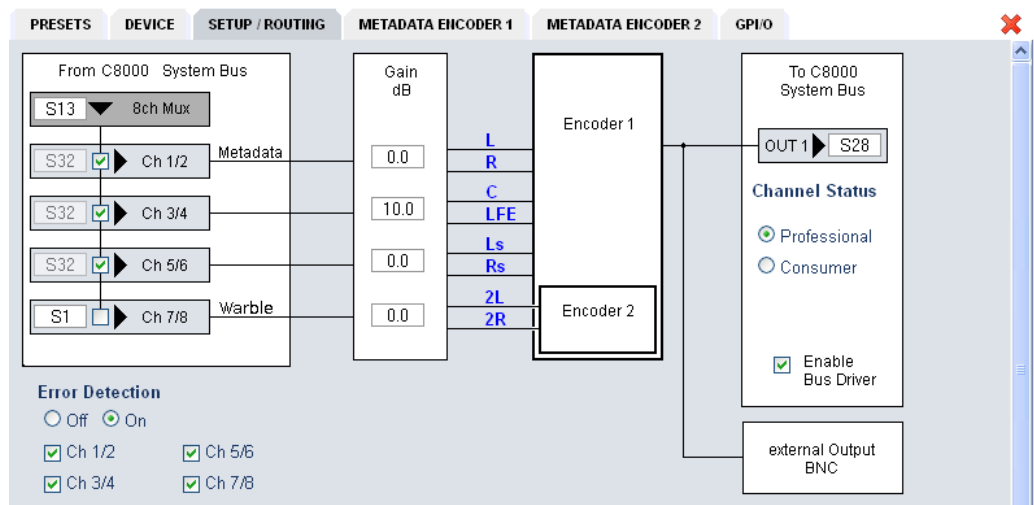
If both encoders are configured for 5.1 the graphic changes to represent the signal flow :
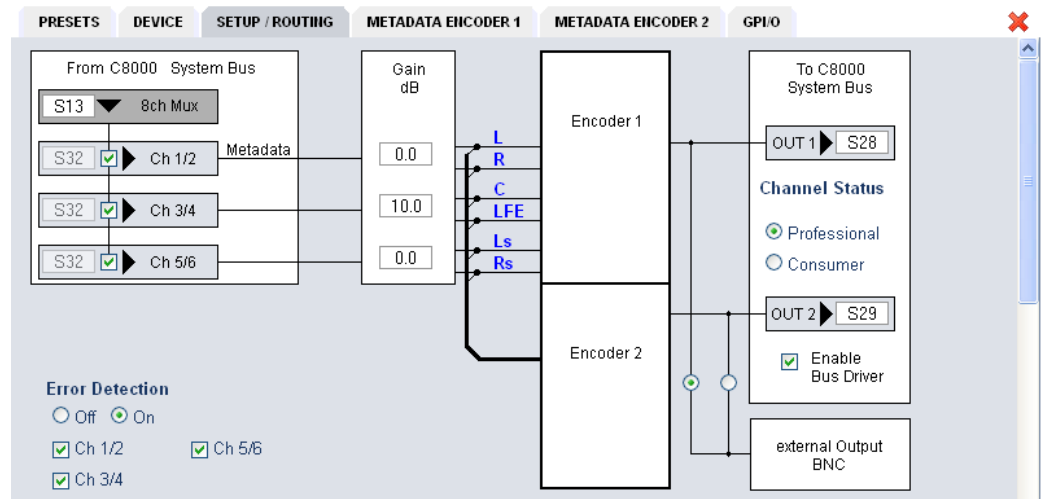
Data Rate [kbps]	depending on the encoder mode : Dolby Digital [32 … AUTO 448] Dolby Digital plus [32 … AUTO 256] Dolby pulse [28 ... HE-AAC v2 AUTO] the respective data rates for the various AUTO modes depend on the channel mode AKA "acmod".

Dolby Digital data rates :

32 kbps	224 kbps
40 kbps	256 kbps
48 kbps	320 kbps
56 kbps	384 kbps
64 kbps	448 kbps
80 kbps	512 kbps
96 kbps	576 kbps
112 kbps	640 kbps
128 kbps	reserved
160 kbps	Auto 384
192 kbps	Auto 448

Dolby Digital AUTO data rates :

acmod	Auto 384	Auto 448
1/0	96 kbps	96 kbps
2/0	192 kbps	256 kbps
2/1	256 kbps	256 kbps
2/2	320 kbps	320 kbps
3/0	256 kbps	256 kbps
3/1	320 kbps	320 kbps
3/2	384 kbps	448 kbps

Dolby Digital minimum data rates :

Channel Mode	min. datarate
1/0	56 kbps
2/0	96 kbps
3/0	128 kbps
2/1	128 kbps
3/1	192 kbps
2/2	192 kbps
3/2	224 kbps

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Dolby Digital plus data rates :

32 kbps	320 kbps
40 kbps	336 kbps
48 kbps	352 kbps
56 kbps	368 kbps
64 kbps	384 kbps
72 kbps	400 kbps
80 kbps	448 kbps*
88 kbps	512 kbps*
96 kbps	576 kbps*
104 kbps	704 kbps*
112 kbps	768 kbps*
120 kbps	832 kbps
128 kbps	896 kbps
144 kbps	960 kbps
160 kbps	1024 kbps
176 kbps	1088 kbps
192 kbps	1152 kbps
200 kbps	1216 kbps
216 kbps	1280 kbps
224kbps	1344 kbps
232 kbps	1408 kbps
240 kbps	1472 kbps
248 kbps	1532 kbps
256 kbps	Auto 192
272 kbps	Auto 200
288 kbps	Auto 224
304 kbps	Auto 256

Dolby Digital plus AUTO data rates :

acmod	Auto 192	Auto 200	Auto 224	Auto 256
1/0	80 kbps	80 kbps	96 kbps	96 kbps
2/0	96 kbps	96 kbps	112 kbps	128 kbps
2/1	144 kbps	144 kbps	144 kbps	144 kbps
2/2	192 kbps	192 kbps	192 kbps	192 kbps
3/0	144 kbps	144 kbps	144 kbps	144 kbps
3/1	192 kbps	192 kbps	192 kbps	192 kbps
3/2	192 kbps	200 kbps	224 kbps	256 kbps

Dolby Digital plus minimum data rates :

Channel Mode	min. datarate	@transcode
1/0	32 kbps	64 kbps
2/0	40 kbps	64 kbps
3/0	48 kbps	192 kbps
2/1	48 kbps	192 kbps
3/1	64 kbps	192 kbps
2/2	64 kbps	192 kbps
3/2	72 kbps	192 kbps
7.1	448 kbps	--

Dolby Digital / Digtal plus / Pulse (AAC) encoder

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Dolby pulse data rates :

28 kbps	160 kbps	576 kbps
30 kbps	176 kbps	640 kbps
32 kbps	192 kbps	704 kbps
36 kbps	200 kbps	768 kbps
40 kbps	208 kbps	800 kbps
44 kbps	216 kbps	AAC Auto
48 kbps	224 kbps	AAC Auto
52 kbps	232 kbps	AAC Auto
56 kbps	240 kbps	AAC Auto
60 kbps	248 kbps	AAC Auto
64 kbps	256 kbps	HE-AAC v1 Auto
72 kbps	272 kbps	HE-AAC v1 Auto
80 kbps	288 kbps	HE-AAC v1 Auto
88 kbps	304 kbps	HE-AAC v1 Auto
96 kbps	320 kbps	HE-AAC v1 Auto
100 kbp	350 kbps	HE-AAC v2 Auto
112 kbp	384 kbps	HE-AAC v2 Auto
128 kbp	400 kbps	HE-AAC v2 Auto
144 kbps	448 kbps	HE-AAC v2 Auto
156 kbps	512 kbps	

Dolby pulse data rate ranges :

acmod	AAC		HE-AAC v1		HE-AAC v2	
	min.	max.	min.	max.	min.	max.
1/0	24 kbps	288 kbps	24 kbps	64 kbps	24 kbps	64 kbps
2/0	32 kbps	576 kbps	64 kbps	128 kbps	48 kbps	48 kbps
2/1	48 kbps	800 kbps	44 kbps	192 kbps	44 kbps	192 kbps
2/2	64 kbps	800 kbps	56 kbps	256 kbps	56 kbps	256 kbps
3/0	48 kbps	800 kbps	44 kbps	192 kbps	44 kbps	192 kbps
3/1	64 kbps	800 kbps	56 kbps	256 kbps	56 kbps	256 kbps
3/2	96 kbps	800 kbps	72 kbps	320 kbps	72 kbps	320 kbps
3/2 L	96 kbps	800 kbps	88 kbps	320 kbps	88 kbps	320 kbps

Dolby Digital / Digtal plus / Pulse (AAC) encoder

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Dolby pulse AUTO data rates :

acmod:	1/0	**2/0**	2/1	2/2	3/0	3/1	**3/2**
GUI label							
AAC Auto 56/256	56	96	156	200	156	200	256
AAC Auto 64/320	64	128	192	256	192	256	320
AAC Auto 128/384A	128	192	256	320	256	320	384
AAC Auto 128/384B	128	256	256	320	256	320	384
AAC Auto 128/512	128	256	320	448	320	448	512
HE-AAC v1 Auto 36/128	36	48	96	128	96	128	128
HE-AAC v1 Auto 48/160	48	64	96	128	96	128	160
HE-AAC v1 Auto 64/192	64	96	128	160	128	160	192
HE-AAC v1 Auto 64/256	64	128	192	192	192	192	256
HE-AAC v1 Auto 64/320	64	128	192	192	192	192	320
HE-AAC v2 Auto 36/128	36	48	96	128	96	128	128
HE-AAC v2 Auto 40/160	40	48	96	128	96	128	160
HE-AAC v2 Auto 40/192	40	48	128	160	128	160	192
HE-AAC v2 Auto 40/256	40	48	192	192	192	192	256

Encoder Latency Compensation
The latency of both encoders is 303ms independent from the mode
If the function is **Off** the latency is reduced to 135ms for Dolby Digital.

Metadata Source
[Preset, Bus & Preset, External]
For both encoders, the source of the metadata can be selected independently either from a preset, from the c8k audio bus and from Preset (to partially overwrite metadata from bus) or via external (RS485) connector. In case of "External"

Metadata Program Select
[1 … 8]
If the metadata source is "Bus & Preset" or "External" you may select one of the 8 possible programs to define the metadata for that encoder. If the source is set to "preset" it is fixed :
Encoder 1 is using program 1 while encoder 2 is using program 2.

Metadata Reversion Mode
[last used, preset]

Metadata Reversion Preset
#16

Above you have seen the common parameters for all encoding modes.
If you turn on Dolby Digital plus or the various encoding modes for Dolby pulse (AAC modes),
the available encoder settings will be extended by the ones described below.

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

Dolby Digital plus Bitstream Parameters	The encoded bit stream can be interpreted as independent if the signals do not belong to the same source. But they could also be dependent, if two encoders are used to form a 7.1 stream.
Stream Type	[independent, dependent]
Substream ID	[0 … 7]
Stream Multiplexing	[off (dual PID), on (single PID)]
Audio Description	
Mixing Metadata Enable	[off, on] One may enable the decoder to perform the so called receiver mix. In this case the encoder of the associated sub stream provides the decoder with respective metadata.
External Program Scale Factor [dB]	[MUTE, -50 … 0 … 12] Here you define the level of the main program for the receiver mix.
Auto Mixing	Set of parameters used by the decoder to control the auto mix. The C8612 supports the ducking mode. I.e. you can set the parameters for the ducking circuit at the receiver end.
Auto Voice Over Mode	[off, on] You may turn the auto mixing off and on here.
Trigger Level [dBFS]	[0 … -95] The ducking circuit measures the level of the voice over input signal. Here you define the detection level, that will trigger the ducker.
Trigger Delay Time [ms]	[0 … 4992] The time it takes from the moment the ducker is triggered to the moment the ducker begins to reduce the external program level (the main audio program].
Trigger Hold Time [ms]	[0 … 4992] The time that must elapse until the ducker starts to increase the external program level after the voice over signal falls below the trigger level.
Duck Attack Time [ms]	[0 … 4992] The time it will take to fade out the external program from nominal level to the value set by "External Program Scale Factor".
Duck Release Time [ms]	[0 … 4992] The time it will take to fade in the external program from its duck level to the nominal level.
Look Ahead Time [ms]	[0 … 85] The time the trigger circuit is able to look "ahead" to decide if the voice over channel becomes active.
Mono Panning [deg]	[0.0 … 358,5] If the voice over signal is sent in either 1/0 or 1+1 channel mode, the decoder may perform a mono panning of the voice signal to place it somewhere in the surround field.

Dolby Digital / Digtal plus / Pulse (AAC) encoder

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Below a sketch to illustrate the respective parameters of the ducker in relation to main program and the voice over feed before it will be mixed :
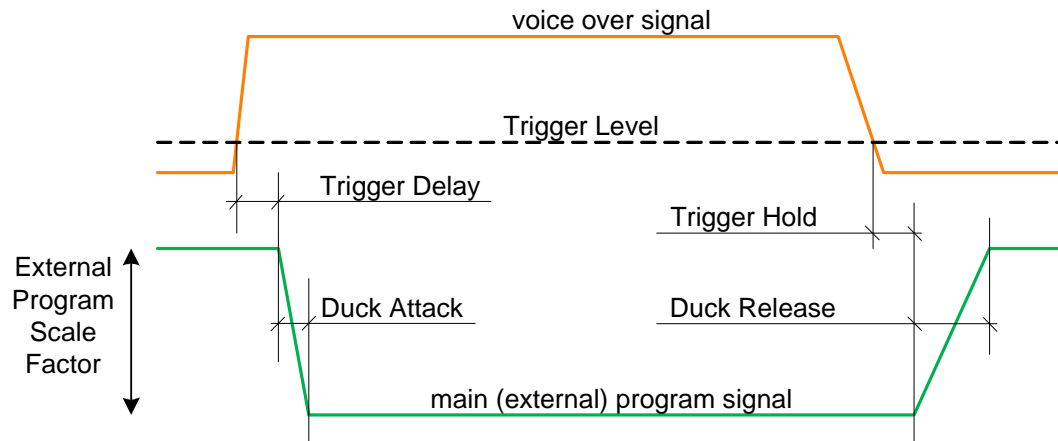
Warble Tone

Warble Tone is a legacy technology developed by the BBC to help production, storage and transmission of AD (audio descriptive) content. It is a control signal that has the information about voice channel mono panning and main program (external program) fading. It is digitally encoded and placed on one track of a two track signal. The other track contains the voice over signal. This makes it easy to store such AD content on the other two tracks of a 4 track VTR or move it as a 2 track signal in parallel to the main stereo to the transmission site. At the transmission site in the past an extra so called Broadcast Mix was done and a second audio program (e.g. in dual language transmission format) was created. This enables the viewer of a movie or a TV show to select either the main program or the Audio Description program. In the old days of analog stereo transmission the left channel carried the main program converted to mono and the right channel the AD mono mix. When digital TV showed up and provided 4 audio tracks for transmission, both programs have been transmitted in stereo. Everybody will understand that this eats up a lot of precious bandwidth … Today we are able to do the receiver mix and it needs much less bandwidth to transmit just the voice over channel and a few control parameter which can be encoded in parallel to the main program to save more bandwidth. In a single PID transmission format it allows to use the technology of transmitting MPEG encoded stereo audio in parallel to Dolby Digital plus encoded stereo and audio descriptive channel. In this case the existing Warble Tone content can still be used. The C8612 simply decodes the Warble track and translates this into mixing meta data.

Warble Tone Control Mode

[Off, On]
This turns the Warble Tone operation on. You must provide Warble Ton signal to input 7/8 of the C8612 (see functional graphic).

Warble Tone Reversion Mode

[last used, internal, auto]
If there is a lost of Warble Ton you can decide what to do.

C8000

C8612

METADATA ENC 1 :   Shows the set of metadata which are relevant for the first encoder.

Above you see an example of a set of metadata which are coming from the bus. They are partially overwritten. Below the remaining metadata of the expert area if you scroll down the page :

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612

METADATA ENC 2 :   Shows the set of metadata which are relevant for the second encoder. The example below is for "Metadata Source = Preset" :

If the **Metadata Source** is "Preset" (internal) you may change these values at any time. If the source is **Bus & Preset** you may partially overwrite it as long as there are valid metadata at the input.
If there are no valid metadata at the input the module enters the **Reversion Mode**.
For the reversion preset such overwrite checkboxes will not be displayed! And a hint is given :

If you switch Reversion Mode to **"last used"**, you may load any preset and you will get the check boxes to decide which parameter must be overwritten if you load that preset during regular operation.

Dolby Digital / Digtal plus / Pulse (AAC) encoder

C8612
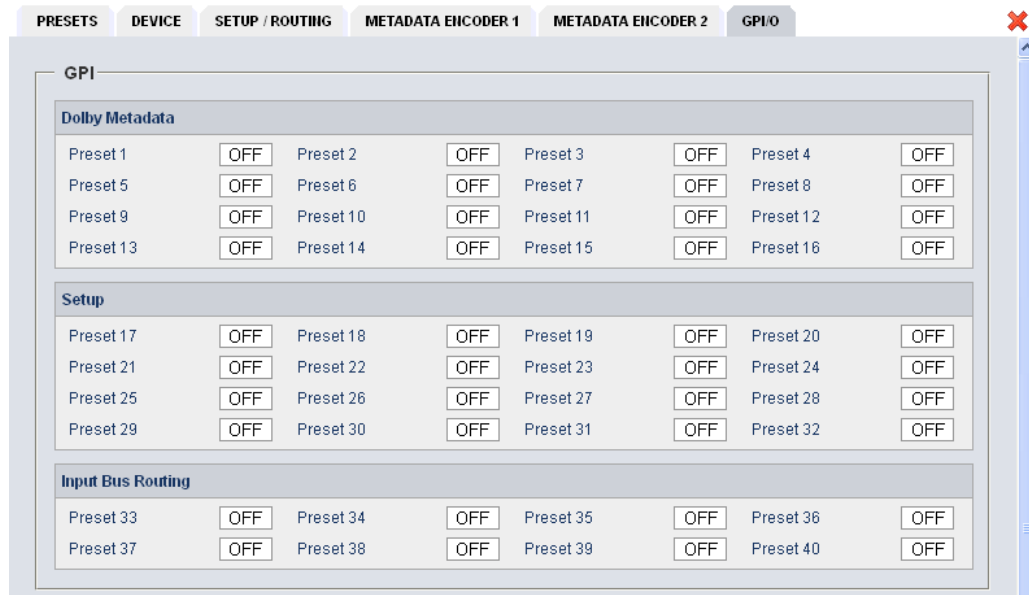
GPI/O

On the **GPI/O** page you can assign virtual **GPI numbers** to activate one of the **Dolby Metadata** or the **Setup** or the **Input Bus Routing** preset for the module.

If a physical **GPI** is detected by a **GPI/O** module **C8817** it will put an associated number on the **CAN** bus (see C8817 manual for details). Each module in a frame is permanently listening for such numbers and compares them with above settings.

You can also assign **GPO** numbers which will indicate the respective action :
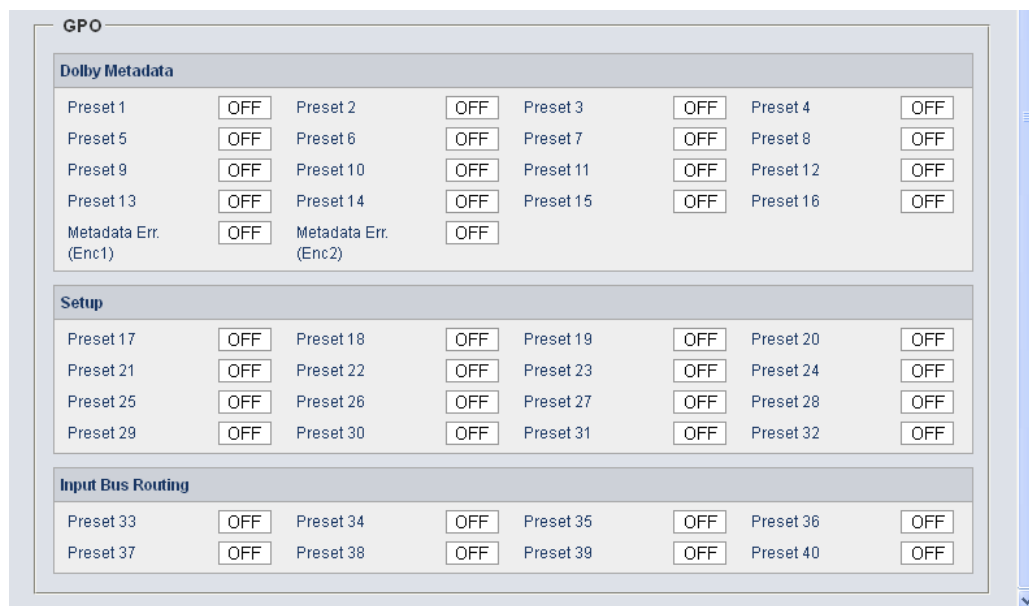
E.g. if a **Preset x** is loaded the **C8612** puts the associated **GPO number** on the **CAN bus**.
The **GPI/O** module permanently listens for such numbers. If it reads such number it will engage the respective **GPO** (see C8817 manual for details).

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