## C8000

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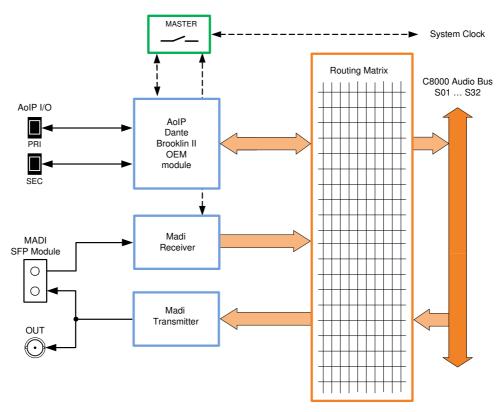
C8316

#### 64ch optical MADI & AoIP I/O

#### features

- Interface for AoIP (AES67 or DANTE)
- Two AoIP network ports for redundant or switch operation
- MADI I/O connection
- Optical SFP module / LC connectors (multi mode or single mode fiber)
- BNC parallel output
- Word length 24bit
- Extended mode (64ch)
- MASTER mode: A C8000 frame may be clocked via MADI input or AES67 network
- Bridging between MADI and AoIP network

#### block diagram



C8316\_manual\_EN\_180823.doc



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## 64ch optical MADI & AoIP I/O

# C8316

#### technical specifications - MADI interface

Standards	Relevant specifications	comply with AES10-2008 and AES11-2009.				
Audio	24bits, transparent forwa	arding of PCM and compressed audio				
Audio Sample Rate	44.1, 48kHz					
Optical Input, LC	64/56 channels @ 44.1 and 48 kHz					
	Connector type	LC (IEC 61754-20)				
	Center wavelength	1310nm (typ.), 1270 1360nm				
	Input optical power	-318 dBm, OM2 multimode (50/125μm) -238 dBm, singlemode (9/125 μm) (standard values, others on request)				
	Cable length (max.)	1.5km, OM2 multimode 2km, singlemode (standard values, others on request)				
Optical Output, LC	64/56 channels @ 44.1 and 48kHz					
	Connector type	LC (IEC 61754-20)				
	Center wavelength	1310nm (typ.), 1270 1360nm				
	Output optical power	-2314dBm, OM2 multimode (50/125μm) -158dBm, singlemode (9/125μm) (standard values, others on request)				
BNC Output	Optical and BNC output carries the same signal.					
	Impedance	75Ohm				
	Output voltage	0.6Vpp (typ.) @ 75Ohm				
General Features	<ul> <li>Reference grad</li> <li>Dedicated routin (max. 64) can b</li> <li>AES3 channel s</li> </ul>	le optical module (SFP) e word clock recovery, master-sync capable ng for non-processed channels, all channels be routed to/from the device or looped through tatus management, non-audio detection (BNC/LC) for media conversion				

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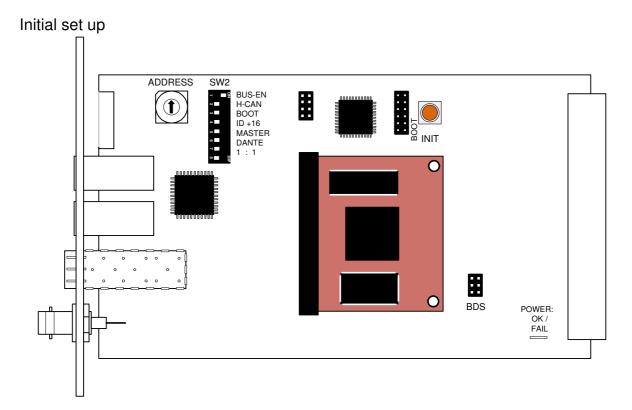
#### 64ch optical MADI & AoIP I/O

## C8316

#### technical specifications - AoIP (AES67 / Dante) interface

Standards	Audio-over-IP by Dante™ Digital Audio Networking Standard AES67 compliant
Audio	24bits, transparent forwarding of PCM and compressed audio
Audio Sample Rates	44.1, 48kHz
Inputs and Outputs	2 x Gigabit Ethernet RJ45 connectors (100M/1Gbit), primary and secondary port
Inputs	64 channels @ 44.1, 48kHz
Outputs	64 channels @ 44.1, 48kHz
General Features	<ul> <li>AES67 compliant</li> <li>Network master-sync can be provided by c8k frame</li> <li>Master-sync capable</li> <li>Non-audio detection for input channels</li> <li>Glitch-free Dante<sup>™</sup> audio redundancy using dual Ethernet networks</li> </ul>

#### installation



C8316

#### 64ch optical MADI & AoIP I/O

# ADDRESS:This rotary encoder sets the CAN ID of the C8316. The switch positions are<br/>hexadecimal numbers (0x0 to 0xF). The CAN address also defines the<br/>location of the module icon within the GUI overview of rows three to six.SW2:#1 BUS-ENON = The output configuration will be taken from the NV (non volatile)<br/>memory after power up.OFF = will set all bus outputs to Tri-State-Mode (inactive).<br/>Now you may use the frame controller to configure the board.<br/>This configuration will automatically be stored into the NV memory<br/>To enable the configuration for the next power up you must<br/>pull out the module and set BUS-EN=ON again.

**Important note!** Since this type of module has an electronic output routing facility, great care must be taken when installing or exchanging a module when such frame has components which are On Air! If an unknown output bus configuration is stored, it can cause a conflict with other modules in the frame. If you are not sure about the output bus configuration you must turn **BUS-EN=OFF** before inserting such a module into a system that is On Air. If all settings are done remotely and the unit fits into the bus assignment scheme of that frame, you must remove it and place the switch back into position **BUS-EN=ON** to activate this setting for the **next** power up(s).

#2 H-CAN	OFF	=	CAN bus speed 256kBit/s
	ON	=	CAN bus speed 1Mbit/s

**Important Note!** For a limited number of modules like the **C8316** 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. Be sure that all modules within a frame are operating with the same CAN bus speed.

#3 BOOT	OFF =	Internal use and <b>must</b> be set to <b>OFF</b> .
#4 ID +16		<ul> <li>CAN bus address range is standard (counting from 0x0 to 0xF) see rotary encoder settings above.</li> <li>CAN bus address range is extended by +16 (counting from 0x10 to 0x1F).</li> </ul>
#5 MASTER		Sync is taken from the <b>c8k</b> frame The <b>C8316</b> will be <b>sync master</b> of the frame (or an C8934 island). Sync source is defined by SW2 #6
#6 DANTE		MADI is sync reference. DANTE is sync reference.
#7 1:1		Remote controlled operation by <b>C8702</b> frame controller. Stand alone operation. <b>MADI</b> and <b>AS67</b> interfaces are bridged.
#8	OFF =	Internal use and <b>must</b> be set to <b>OFF</b> .
INIT		g the <b>INIT</b> button during power up will initialize the module ters to factory default values.

#### 64ch optical MADI & AoIP I/O

#### web browser based GUI

**OVERVIEW:** The module overview of a frame (below the display of an example frame)

Veronica - C8000	× +							
() 10.110.59.32/control.xml	.gz			C <sup>e</sup> Q, Search	1	☆自		
	OVERVIEW	CONTROLLER C8702	C8404 DEVICE 0E C8404	AES I-O UPMIX EX C8189	C8316 DEVICE 08 C8316	C8611 DEVICE 9 C8811	C8817 ( C8817	DEVICE 10
Jünger								
C8316 DEVICE 08 C8316 AoIP / Madi Optical Interface		Controller C8702						
MADI Preset AoIP Preset BUS Preset BUS Preset 01 BUS Preset 01	C8404 DEVICE OE	AES I-O UPMIX EX						
Master  Sync Source BUS MADI AOIP	C8404 [0]	cs189 [1]						
Sync Locked  MADI Lock AolP Network Port Primary Secondary	C8316 DEVICE 08	C8611 DEVICE 9 C8811 [9]						
AoIP Device Name C831x-1224da Temperature 40°C	C8817 DEVICE 10 C8817 [10]							

By clicking on the spanner tool symbol you will be forwarded to the control pages of the **C8316** and the status pane on the left hand side, which is also shown on mouse over.

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#### 64ch optical MADI & AoIP I/O

# C8316

**PRESETS:** Each of the three preset banks holds the parameters of the respective MADI, DANTE and c8k internal BUS routing.

Veronica - C8000 ×	+		
() 10.110.59.32/control.xml.g	2	C Search	
	OVERVIEW CONTROLLER C8404 DEVICE 0E C8702 C8404	AES I-O UPMIX EX C8189 C8316 DEVICE 08 C8316	C8611 DEVICE 9 C8817 DEVICE 10 C8817
Jünger	PRESETS DEVICE SETUP AOIP SETUP FAST	ROUTING MADI ROUTING AOIP RO	NUTING BUS ROUTING GPIO 💥
r <sup>2</sup>	MADI		
C8316 DEVICE 08			
C8316 AolP / Madi Optical	Load 1: MADI Preset 01 V LOAD Save as # 1 V Name MADI Preset 01	SAVE	
Interface MADI Preset MADI Preset 01	AOIP		
AoIP Preset AoIP Preset 01 BUS Preset BUS Preset 01	Save as # 17 Vame AoIP Preset 01	SAVE	
Master  Sync Source BUS MADI AOIP	Load 33: BUS Preset 01 V LOAD Save as # 33 V Name BUS Preset 01		
Sync Locked	Save as # 33 Mame BUS Preset 01	SAVE	
MADI Lock	Presets Clipboard COPY TO CLIPBOARD	[empty]	
AolP Network Port Primary  Secondary	Backup Presets to File BACKUP Restore Presets from File RESTORE Browse	No file selected.	
AoIP Device Name C831x-1224da		_	
Temperature 40°C			

There are presets for each of the three banks for the main function blocks of the C8316.

Since the **C8316** offers two interfaces each one has an individual bank of 16 presets to recall parameters at any time.

## 64ch optical MADI & AoIP I/O

## C8316

MADI	refers to the MADI ROUTING pane
Load	[1: "name" 16: "name"] Select a preset by number/name and press <b><load></load></b> . The preset number and name loaded automatically appear in the <b>Save as #</b> and <b>Name</b> field below.
Save as #	[1 16] You must elect a preset memory number where you would like to save the actual metadata parameters.
Name	[16 character ASCII text] Assign a name to the preset you are about to save here and press <b><save>.</save></b> The number and the name automatically appear in the <b>"Load"</b> fields as well because they are active now.
AoIP	Refers to the AOIP Routing pane
Load	[17: "name" 32: "name"] Select a preset by number/name and press <b><load>.</load></b> The preset number and name loaded automatically appear in the <b>Save as #</b> and <b>Name</b> field below.
Save as #	[17 32] Select a preset memory number where you would like to save the actual audio program parameters.
Name	[16 character ASCII text] Assign a name to the preset you are about to save (up to 16 digits) and press <b><save>.</save></b>
BUS	Refers to the <b>BUS</b> pane A bank of 8 presets to recall device settings.
Load	[33: "name" 48: "name"] Select a preset by number/name and press <b><load>.</load></b> The preset number and name loaded automatically appear in the <b>Save as #</b> and <b>Name</b> field below.
Save as #	[33 48] Select a preset memory number where you would like to save the actual audio program parameters.
Name	[16 character ASCII text] Assign a name to the preset you are about to save (up to 16 digits) and press <b><save>.</save></b>
Preset Clipboard	Copies the presets to a frame internal <b>clipboard</b> , the data may be used by other modules inside the <b>same</b> frame.
Backup Presets to File	Creates a backup <b>XML file</b> which may be stored to the PC.
Restore Presets from File	You can <b><browse></browse></b> for a backup file from the PC and restore it by pressing the <b><restore></restore></b> soft button.

**DEVICE:** 

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#### 64ch optical MADI & AoIP I/O

Display of device specific hardware information

## C8316

#### Veronica - C8000 + × C Q Search 🗲 🛈 🔏 10.110.59.32/control.xml.gz ☆ 自 ♥ 余 4 ≡ C8404 DEVICE 0E AES I-O UPMIX EX C8316 DEVICE 08 C8611 DEVICE 9 C8817 DEVICE 10 OVERVIEW CONTROLLER C8702 Jünger PRESETS DEVICE SETUP A OIP SETUP FAST ROUTING MADI ROUTING A OIP ROUTING BUS ROUTING GPIO × 5 INFO C8316 DEVICE 08 Device Name C8316 DEVICE 08 CHANGE NAME C8316 Platform c8316 Parameter Version 1 AoIP / Madi Optical Interface FIRMWARE Bootloader 16 MADI Preset MADI Preset 01 Controller 24 AoIP Preset FPGA 8 AoIP Preset 01 **BUS Preset** BUS Preset 01 DANTE INTERFACE 0 Product Type C831x Master Product Version 1.0.0 Module Brooklyn II BUS 🔵 MADI 🌒 AoIP 🌒 Module Software 3.10.0 . Sync Locked Module MB App 1.1.5 MADI Lock . RESET AoIP Network Port Primary 🔶 Secondary 🌑 RESTART Restart Module Initialize and Restore Factory Defaults INITIALIZE AoIP Device Name C831x-1224da Temperature 40°C BACKUP / RESTORE Backup Settings and Presets to File BACKUP Restore Settings and Presets from File RESTORE Browse... No file selected.

#### INFO

Device Name	[16 digit ASCII text] Pressing <b><change name=""></change></b> will do so.
Platform	[C8316] Hardware related descriptor.
Parameter Version	[x] Software related descriptor (descriptor of the feature set).
FIRMWARE	
Bootloader	[xy] Actual version of the card boot-loader.
Controller	[xy] Actual version of the module controller firmware.
FPGA	[xy] Actual version of the system FPGA.

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#### 64ch optical MADI & AoIP I/O

# C8316

DANTE INTERFACE	
Product Type	[c8k_x] Customized version for the c8k system
Product Version	[x.y.z] HW of the DANTE OEM module
Module	[Brooklin II] DANTE OEM module
Module Software	[3.10.0] Software version of the module FPGA
Module MB App	[1.1.5] Software version of the FPGA embedded controller
RESET	
Restart Module	< <b>RESTART&gt;</b> Pressing the soft button will warm start the module.
Initialize and Restore Factory Defaults	<initialize> Pressing the soft button, will clear the parameter memory and will initialize all parameters to their factory default values.</initialize>
BACKUP / RESTORE	
Backup Settings and Presets to File	<backup> Pressing the soft button will create an XML file that one may store on a PC.</backup>
Restore Settings and Presets from File	<restore> I Pressing the soft button will upload a backup file that has been selected via soft button <browse> and move the previously stored settings back to the module.</browse></restore>

#### SETUP:

Set up of general device parameters

PRESETS	DEVICE	SETUP	AOIP SETUP	FAST ROUTING	MADI ROUTING	AOIP ROUTING	BUS ROUTING	GPIO	
	_								
Commo	n Config								
Enable Bu	us Driver			OFF					
MADI Cha	annel Coun	t		64					
MMA MA	DI Sync			OFF	7				

#### **Common Config**

**Enable Bus Driver** 

[ON/OFF]

You can temporarily disable the bus drivers by selecting OFF here. The state of this soft switch also depends on the setting of **SW1** on the module PCB.

If **SW1 #1** is turned off, this switch will be off after a power cycle. You can turn it on temporarily to check out your settings but you must keep in mind that after the next power cycle it will be off again unless you have turned **SW1 #1** on.

This procedure is useful if you must insert a module into a frame that is on air and other services must not be interrupted or disturbed.

#### 64ch optical MADI & AoIP I/O

MADI Channel Count	[64 / 56] General set-up of the number of MADI channels in use. It must be equal to the channel count of the device from where the <b>C8316</b> receives from or where it transmits to.
MMA Sync	[OFF/ON] Will enable a dedicated sync signal for use by the Junger MMA meta data generator. It will be inserted into MADI Ch 64.

**Important Note!** If MMA Sync is turned on, MADI transmitter Ch 64 is blocked and can't be used for audio transport.

#### AOIP SETUP: General settings of the AoIP (Dante OEM) module used for the C8316

**Important Note!** This page content is informational only for the first release of the **C8316**. Parameters may only be changed by use of the DANTE Controller software from Audinate.

🗧 🛈 🔏 10.110.59.32/control.xml.	gz			C	Q, Search	1	☆ 🖻		A	4	ш
	OVERVIEW	CONTROLLER C8702	C8404 DEV C8404	ICE 0E AES I-0 C8189	UPMIX EX	C8316 DEVICE 08 C8315	C8611 DEVIC	E 9	C8817 D	EVICE 10	
jünger	PRESETS DEV	VICE SETUP	AOIP SETUP	FAST ROUTING	MADI RC	DUTING ADIP ROL	TING BUS R	OUTING	GPIO		\$
C8316 DEVICE 08	Device Information Device Name C831x-1224da										
C8316	Device Name		C83	1x-1224da							
	Device Access	Lock Status	Devi	ce Unlocked							
C8316	AES67 Mode	Status	AES67	Mode Disabled							
AoIP / Madi Optical	AoIP Redunda	ncy Mode	5	Switched							
Interface	Primary Address Setup										
1010	Network Statu	s	Cor	nnected 1G							
IADI Preset MADI Preset 01	DHCP - Autom	natic IP Config	01	I (Default)							
oiP Preset	IP Address		10.110.1.99								
AoIP Preset 01	Netmask		255.255.0.0								
US Preset BUS Preset 01	DNS Server			.100.2.10							
DUGTTESELUT	Gateway			0.110.0.1							
laster 🛛 🌒	MAC Address			:c1:12:24:da							
vnc Source											
BUS 😑 MADI 🍘 AOIP 🍘	Secondary A	Address Setup									
	Network Statu	s		Offline							
ync Locked 🧶 🧶	Secondary Address Setup Network Status DHCP - Automatic IP Config		OFF								
IADI Lock 😑	IP Address		1	0.0.0.0							
olP Network Port	Netmask			1.1.1.1							
rimary 😑 Secondary 🌰	DNS Server			1.1.1.1							
innary 🖕 occorrady 👹	Gateway			0.0.0.0							
oIP Device Name C831x-1224da	MAC Address		00:00	:00:00:00:00							
emperature 40°C	Clock Synch	ronization									
	Sync Source		0	C8000 BUS							
	Sync Status		Unlocked								
	Preferred Mast	ter	No								
	Primary Sync	Status		Master							
	Secondary Sy			Startup							
	Network Audio			48 kHz	-						
	Device Latency										

#### 64ch optical MADI & AoIP I/O

# C8316

Device Information		
Device Name		at appears in an AoIP network. It may be set by the oller software.
Device Access Lock Status	•	cked / Device Locked] device access from the network controller is locked
AES67 Mode Status		er the AES67 mode for the DANTE Brooklin II is enabled or not.
AoIP Redundancy Mode	Pls. refer to n	edundant] erface allows redundant network operation. nanufacturer's documentations of your Ethernet n supported switching configuration and redundant
	Redundant -	- The interface will duplicate the audio traffic to both Ethernet ports. Both ports must have different IP addresses.
	Switched –	The secondary port behaves like an Ethernet switch port allowing daisy-chaining through the interface. I.e. IP configuration of the second port is only available for redundant mode.

**Important Note!** When set to switched mode, do **not** connect both ports to the same network (same Ethernet switch) if it does not support STP (Spanning Tree Protocol). This is the case for most of off-the-shelf (office grade) switches. Doing so will cause a race condition where IP packets are circling around from the external switch to the second DANTE (switch) port and back via the first port. This will tear down your network and may create a bunch of new "friends" in your facility.

Primary Address Setup	Setup of the primary network interface
Network Status	[Offline / Connected + bandwidth]
DHCP – Automatic IP Config	[OFF / ON]
IP-Address	[0.0.0.0 / address]
Netmask	[1.1.1.1 / mask]
DNS Server	[1.1.1.1 / address]
Gateway	[0.0.0.0 / address]
MAC Address	[00:00:00:00:00:00 / address]
Secondary Address Setup	Setup of the secondary network interface
Secondary Address Setup Network Status	Setup of the secondary network interface [Offline / Connected + bandwidth]
Network Status	[Offline / Connected + bandwidth]
Network Status DHCP – Automatic IP Config	[Offline / Connected + bandwidth] [OFF / ON]
Network Status DHCP – Automatic IP Config IP-Address	[Offline / Connected + bandwidth] [OFF / ON] [0.0.0.0 / address]
Network Status DHCP – Automatic IP Config IP-Address Netmask	[Offline / Connected + bandwidth] [OFF / ON] [0.0.0.0 / address] [1.1.1.1 / mask]

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#### 64ch optical MADI & AoIP I/O

# C8316

#### **Clock Synchronization**

Sync Source

[AoIP Network / C8000 Bus / Madi] Source of the reference clock for the Dante module. See also MASTER switch (page 4).

**Important Note!** If this parameter is set to "Dante Network", the c8k frame must be synchronized to the same clock as the network clock master (whoever it is). It **must** be set to "Dante Network" if this module is to become the "Preferred Master" of the network.

Sync Status	[Unlocked / Locked / Locked-Async] The sync source for the <b>Dante</b> interface is the <b>AoIP</b> network. If no network cable is connected the interface is "Unlocked". If it is connected to a network it will be "Locked". If the <b>C8316</b> is set to synchronize to other than the <b>AoIP</b> interface it will show "Locked-Async".
Preferred Master	[No / Yes] The <b>Dante</b> algorithm automatically looks for the best clock master inside the network but one may force a <b>Dante</b> module to become the clock master.
Primary Sync Status	[Startup / Initializing / Faulty / Disabled / Listening / Premaster / Master / Passive / Uncalibrated / Slave]
Secondary Sync Status	[Startup / Initializing / Faulty / Disabled / Listening / Premaster / Master / Passive / Uncalibrated / Slave]
Network Audio Sample Rate	[48kHz] The c8k system is set to use 48kHz sample rate only.
Device Latency Setting	[xms] You can allow for a certain transmission latency if you face network problems of any kind.

#### 64ch optical MADI & AoIP I/O

Preset       AIP Preset         Preset       AIP Preset         BUS Preset       AIP Receiver         Secondary       AIP         Cash-122das       AIP         Preset       AIP         Preset       AIP         AIP       AIP         AIP Receiver       33         AIP       AIP         AIP		gz							G	Qs	iearch				4	Ê	0	俞	¢.	Ξ
Bits	_	OVERVIEW		OLLER			DEVICE			UPMIX	EX		DEVICE	80		DEVICE			DEVICE	10
Basis DEVICE 08       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 01       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmitter       Image Transmitter       Image Transmitter         And Present 02       Image Transmiter       Image Transmiter	jünger																			
28316 DEVICE 08       Add Presenter       Add Presenter       Add Presenter       Add Presenter         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 01       Add Present 01       Add Present 01       Add Present 01         Model Transmitter       Add Present 02       Add Present 02       Add Present 02       Add Pr	1	PRESETS DEV	/ICE	SETUP	AO	IP SETU	IP I	AST RO	DUTING	МА	DI ROU	JTING	AOIP	ROUTI	NG	BUS ROL	ITING	GPIC	0	×
CB16       Image: CB16 in the first 21334 is of	C8316 DEVICE 08																	Bus [	Driver [	2
All Mark Workstore       If       I								1-16	the second				3/4	5/6		Constrained and a second second	<u> </u>	13/14	15/16	
Of Preset       MACI Preset 01         IP Preset	C8316		16	$^{\prime}$				$\overline{\ }$				$\mathbf{N}$								
Of Preset in MOI Preset 01 is Preset in US Preset 01 is Oreal in		Madi Receiver	32																	
Preset MUD Preset of BY Received BUS Preset of BY MUD APPRESENT BY MUD APPRES	ADI Brenet																			
Aver Present US Present	MADI Preset 01																			
arransmitter       AddP Receiver       32       arransmitter         in Lock       arransmitter       AddP Receiver       32         if Device Name       arransmitter       arransmitter         if Device Name       arransmitter       Routing destination for the MADI interface. 16 adjacent M channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined MADI destination groups. The diagon line shows the connected source and destination group.         ransmitter       Routing destination for the AoIP interface. 16 adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AADI destination groups. The diagon line shows the connected source and destination group.         00 BUS       Routing destination for the c&k frame busses. Two adjacent for four pre-defined AoIP destination groups. The diagon line shows the connected source and destination group.         00 BUS       Routing destination for the c&k frame busses. Two adjacent for four pre-defined AoIP destination group. The diagon line shows the connected source and destination group.			16		$\mathbf{X}$															
Image: Secondary of the MADI interface. 16 adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination groups. The diagonal line shows the connected source and destination group.         O0 BUS       Routing destination for the c&k frame busses. Two adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination groups. The diagonal line shows the connected source and destination group.         00 BUS       Routing destination for the c&k frame busses. Two adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination groups. The diagonal line shows the connected source and destination group.         00 BUS       Routing destination for the c&k frame busses. Two adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination groups. The diagonal line shows the connected source and destination group.		AoIP Receiver	32			$\setminus$														-
38       MOI       A 0P         11       178       1       1         11       1920       1       1       1         11       1920       1       1       1       1         11       1920       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       <	vnc Source		48										$\overline{\}$	_						
In Lock       Image: Secondary of the secondary of	US 🌒 MADI 🌒 AoIP 🌒									_				N						
If Network Port imary       Secondary       If varia       If varia<	ync Locked		17/18				$\overline{\}$					-								
image       Secondary       Image       2122       Image			19/20																	
CB31k-1224da mperature       40°C         40°C       2528         2939       200         31732       200         200       200         31732       200         201       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200         2020       200			21/22																	
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Image: Stransmitter       Routing destination for the MADI interface. 16 adjacent M channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined MADI destination groups. The diagon line shows the connected source and destination group.         ransmitter       Routing destination for the AoIP interface. 16 adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined MADI destination groups. The diagon line shows the connected source and destination group.         00 BUS       Routing destination for the c8k frame busses. Two adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination groups. The diagona line shows the connected source and destination group.         00 BUS       Routing destination for the c8k frame busses. Two adjacent A channels are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the of four pre-defined AoIP destination group.	mperature 40°C		25/26																	
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Bus lines are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the				chai 16 s of fo ine Rou chai 16 s	sour our   sho iting nne	rce pre- ows o de ls a rce	cha -de the estinare cha	ann fine e co nati gro ann	els ed N onn on on els	fro IAI ecto for ed f fro	m a DI c ed : the or f m a	an a dest sou e Ac fast an a	avai tina irce DIP i rou avai	lab tior an nte utin lab	le ir n gr nd d erfac g. l. le ir	nput oup esti ce. .e. y	t an s. 1 nat 16 : /ou t an	id r The ion adja cai id r	out dia gro ace n se out	ago oup ent / elec e th
Bus lines are grouped for fast routing. I.e. you can select 16 source channels from an available input and route the				chai 16 s of fo ine Rou chai 16 s of fo	sour our   sho iting nne sour our	rce pre- ows de ls a rce pre-	cha -de the estina are cha -de	ann fine e co nati gro ann fine	els ed N onn on els els ed A	fro IAI ecto for ed f fro Nolf	m a DI c ed = the or f m a P de	an a dest sou e Ac fast an a esti	avai tina irce oIP i rou avai nat	lab tior an nte itin lab	le ir n gr id d erfac g. l. le ir grc	nput oup esti ce. .e. y nput oups	t an s. 1 nat 16 : /ou t an s. T	id r The ion adja cai id r he	out dia gro ace n se out dia	ago oup ent / elec e th gor
16 source channels from an available input and route the of eight pre-defined pairs of bus lines. The diagonal dotte				chai 16 s of fo ine Rou chai 16 s of fo ine	sour sho iting nne sour our sho	rce pre- ows de ls a rce pre- ows	cha -de the estina re cha -de the	ann fine e co nati gro ann fine e co	els onn on els els onn	from AAI ector for ed f from AoIF ector	m a DI c ed : the or f m a D do ed :	an a dest sou e Ac fast an a esti sou	avai tina irce oIP i rou avai nati irce	lab tior an Inte utin lab ion an	le ir n gr d d erfac g. l. le ir grc id d	nput oup esti ce. .e. nput oups esti	t an s. 7 nat 16 /ou t an s. T nat	id r The ion adja cai id r he ion	out gro ace n se out dia gro	ago oup ent / elec e th gor oup
	ransmitter			chai 16 s of fo ine Rou 16 s of fo ine Rou Bus	sour shc iting nne sour shc iting line	rce pre- ows de ls a rce pre- ows de a a	cha -de the estinare cha -de the estinare	ann fine e co nati gro ann fine e co nati gro	els ed N onn upe els ed A onn on	fro MAI ecto for ed f fro NoIF ecto for	m a DI c ed : the or f m a P da ed : the	an a dest sou a Ac fast an a esti sou e c8 fast	avai tina irce oIP i rou avai nati irce k fra t rou	lab tior an inte itin lab ion an am utin	le ir n gr d d erfad g. l. le ir grc d d e bi g. l	nput oup esti ce. .e. nput oups esti uss	t an s. 1 nat 16 : /ou t an s. T nat es. /ou	id r The ion adja cai id r he ion Tw cai	out gro ace n se out dia gro n se	ago oup ent / elec e th gor oup dja elec

FAST ROUTING: Easy to use matrix for routing of groups of signals with a single button.

Important Note! The c8k bus drivers are automatically set to 8ch mux mode for fast routing. I.e. two adjacent busses (both in 8ch mux mode) will carry the 16 source signals.

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#### 64ch optical MADI & AoIP I/O

## C8316

MADI Receiver	Routing sources of the MADI interface. 16 MADI channels are grouped for fast routing. I.e. you can select a group of 16 source channels from the MADI input and route them to one of the available destination groups.
AoIP Receiver	Routing sources of the AoIP interface. 16 AoIP channels are grouped for fast routing. I.e. you can select a group of 16 source channels from the AoIP network and route them to one of the available destination groups.
From C8000 BUS	You can select pairs of c8k bus lines (both operating in 8ch mux mode). 16 channels from the c8k busses are grouped for routing. I.e. you can select a pre-defined group of 16 c8k channels and route them to one of the available destination groups.

#### MADI ROUTING

SET S DE	VICE	ETUP A	DIP SETUP	FAST ROUTING	MADI ROUTING	AOIP ROUTING	BUS ROUTING	GPIO	3
From C8	000 Syst	em Bus	AolP	MADI		м	ADI		
2ch Mode	-	OM Mode							
Bus	Bus	Channel	RX	RX			TX		
				Ch1/2		Cł	1/2		
				Ch3/4		Cł	13/4		
'				Ch5/6		Ch	15/6		
				Ch7/8		Ch	17/8		
				Ch9/10		Ch	9/10		
				Ch11/12		Ch	11/12		
'		'		Ch13/14		Ch1	13/14		
				Ch15/16		Ch1	15/16		
'			Ch1/2			Ch1	17/18		
'			Ch3/4			Ch1	19/20		
)			Ch5/6			Ch2	21/22		
			Ch7/8			Ch2	23/24		
'			Ch9/10			Ch2	25/26		
)			Ch11/12			Ch2	27/28		
)			Ch13/14			Ch2	29/30		
			Ch15/16			Ch3	31/32		
)			Ch17/18			Ch3	33/34		
			Ch19/20			Ch3	35/36		
			Ch21/22			Ch3	37/38		
)			Ch23/24			Ch3	39/40		
			Ch25/26			Ch4	1/42		
)			Ch27/28			Ch4	3/44		
)			Ch29/30			Ch4	15/46		
			Ch31/32				17/48		
)	S17	Ch1/2				Ch4	9/50		
	S17	Ch3/4				Ch	51/52		
)	S17	Ch5/6				Ch	53/54		
)	S17	Ch7/8					55/56		
)	S18	Ch1/2					57/58		
'	S18	Ch3/4					59/60		
)	S18	Ch5/6					51/62		
)	S18	Ch7/8					3/64		

This pane shows the possible sources for the MADI transmitter. The above example is the result of the **FAST ROUTING** settings above.

## 64ch optical MADI & AoIP I/O

# C8316

#### From C8000 System Bus

2Ch Mode	
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Two audio channels are put onto one bus line.
8ch TDM Mode	Eight channel mux mode
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Eight audio channels are put onto one bus line.
Channel	[Ch1/2 Ch7/8] A channel pair of the eight multiplexed
AoIP	
RX	[Ch1/2 Ch63/64] One of the 32 channel pairs provided by the DANTE OEM interface.
MADI	
RX	[Ch1/2 Ch63/64] One of the 32 channel pairs provided by the MADI interface.
MADI	
ТХ	[Ch1/2 Ch63/64] One of the 32 channel pairs of the MADI transmitter.

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#### 64ch optical MADI & AoIP I/O

# C8316

#### **AOIP ROUTING**

From C80 2ch Mode	000 Syste 8ch TD	m Bus M Mode	MADI		AoIP		
Bus	Bus	Channel	RX		ТX		
			Ch1/2	 	 Ch1/2		
			Ch3/4	 	 Ch3/4		
			Ch5/6	 	 Ch5/6		
H	-		Ch7/8	 	 Ch7/8		
H			Ch9/10		 Ch9/10		
H	-		Ch11/12	 	 Ch11/12		
H			Ch13/14		 Ch13/14		
H	- 22	22	Ch15/16		 Ch15/16		
H	~				Ch17/18		
H				 	 Ch19/20		
H	1227			 	 Ch21/22		
H				 	 Ch23/24		
H				 	 Ch25/26		
H	-			 	 Ch27/28		
H				 	Ch29/30		
	22			 	 Ch31/32		
H				 	 Ch33/34		
H				 	 Ch35/36		
	1223			 	Ch37/38		
				 	 Ch39/40		
H				 	 Ch41/42		
1				 	 Ch43/44		
H					Ch45/46		
I					Ch45/48		
Л					Ch47/48 Ch49/50		
			11				
			1—1		Ch51/52		
1			11		Ch53/54		
1			11		Ch55/56		
1	-		1		Ch57/58		
					Ch59/60		
1	1975)		tt		Ch61/62 Ch63/64		

This pane shows the possible sources for the AoIP interface. The above example is the result of the **FAST ROUTING** settings above.

#### From C8000 System Bus

2Ch Mode	
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Two audio channels are put onto one bus line.
8ch TDM Mode	Eight channel mux mode
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Eight audio channels are put onto one bus line.
Channel	[Ch1/2 Ch7/8] A channel pair from the eight multiplexed channels.

#### 64ch optical MADI & AoIP I/O

## MADI RX [Ch1/2 ... Ch63/64] One of the 32 channel pairs provided by the MADI interface AoIP Tx [Ch1/2 ... Ch63/64] One of the 32 channel pairs sent to the AoIP interface

#### **BUS ROUTING**

						Enable E	Bus Driver [
AoIP	To C80	00 Syste	em Bus	MADI	To C80	000 Syste	em Bus
545455	2ch Mode		OM Mode		2ch Mode		DM Mode
RX	Bus	Bus	Channel	RX	Bus	Bus	Channel
	+H			Ch1/2	-	S1	Ch1/2
1944 ( ) 1944 ( )	-	- 1997		Ch3/4	-	S1	Ch3/4
	-	1 <del>76</del> 1		Ch5/6	-	S1	Ch5/6
1220	+	- 227		Ch7/8		S1	Ch7/8
(1944) 			-	Ch9/10	-	S2	Ch1/2
				Ch11/12		S2	Ch3/4
82.0		1227		Ch13/14	-	S2	Ch5/6
()++-)(	-	-		Ch15/16		S2	Ch7/8
		-					
2440	-				-		
		100					377
120	+ +	227			-	5422	1 22 1
	-					124	
		177	-				
120	1				-	122	
Ch33/34	+ H	S3	Ch1/2				
Ch35/36	+ +	S3	Ch3/4			6424	244
Ch37/38		S3	Ch5/6		-		3.77
Ch39/40	+	S3	Ch7/8		-	7922	1 22 1
Ch41/42	-	S4	Ch1/2			348	
Ch43/44		S4	Ch3/4				0.77
Ch45/46		S4	Ch5/6		-	1.22	
Ch47/48	-	S4	Ch7/8			्यः	
Ch49/50		S5	Ch1/2		-		
Ch51/52	-	S5	Ch3/4			6444	244
Ch53/54		S5	Ch5/6				8.47
Ch55/56		S5	Ch7/8		-	722	222
Ch57/58		S6	Ch1/2			1248	
Ch59/60	1	S6	Ch3/4				
Ch61/62		S6	Ch5/6				

This pane shows the possible sources for the c8k busses from the AoIP as well as from the MADI interfaces. The above example is the result of the **FAST ROUTING** settings above.

C8000

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## 64ch optical MADI & AoIP I/O

## C8316

Enable BUS Driver	[ON / OFF] You can disable the output drivers by un-checking the <b>Enable Bus Driver</b> check box. The state of this check box also depends on the setting of <b>SW2</b> on the module PCB. If <b>SW2 #1</b> is turned off, this checkbox will be off after a power cycle. You can turn it on temporarily to check out your settings but you must keep in mind that after the next power cycle it will be off again unless you have turned <b>SW2 #1</b> on. This procedure is useful if you must insert a module into a frame that is on air and other services must not be interrupted or disturbed.
AoIP	
RX	[CH1/2 Ch63/64] One of the 32 channel pairs provided by the AoIP interface.
To C8000 System Bus	
2Ch Mode	
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Two audio channels are put onto one bus line.
8ch TDM Mode	Eight channel mux mode
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Eight audio channels will be muxed onto one bus line.
Channel	[Ch1/2 Ch7/8] A pair from the eight multiplexed channels.
MADI	
RX	[CH1/2 Ch63/64]
To C8000 System Bus 2Ch Mode	
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Two audio channels are put onto one bus line.
8ch TDM Mode	Eight channel mux mode
Bus	[S1 S32] One of the 32 bus lines of the c8k back plane. Eight audio channels may be muxed onto one bus line.
Channel	[Ch1/2 Ch7/8] A pair from the eight multiplexed channels.

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#### 64ch optical MADI & AoIP I/O

# C8316

#### GPIO

The C8316 has three dedicated sets of GPI/Os to remote control the MADI-, the AoIPand the Bus Presets.

PI								-
Madi Presets								
<sup>o</sup> reset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF	
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF	
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF	
Preset 13	OFF	Preset 14	OFF	Preset 15	OFF	Preset 16	OFF	
AoIP Presets								
Preset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF	
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF	
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF	
Preset 13	OFF	Preset 14	OFF	Preset 15	OFF	Preset 16	OFF	
Bus Presets								
Preset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF	
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF	
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF	

**GPI**s

are useful if you want to recall settings remotely (e.g. via presets). The C8k frame can handle **127** different virtual (system) **GPI** numbers. 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 **C8316** 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.

#### 64ch optical MADI & AoIP I/O

## C8316

**GPO**s (Tallies) may signal the status of a module for **GPI** driven devices like legacy equipment monitoring systems. The c8k frame can handle **127** different virtual (system) **GPO** numbers. If an event occurs, the **C8316** 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 P	reset modified 📃
Madi Presets							
Preset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF
Preset 13	OFF	Preset 14	OFF	Preset 15	OFF	Preset 16	OFF
AoIP Presets							
Preset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF
Preset 13	OFF	Preset 14	OFF	Preset 15	OFF	Preset 16	OFF
Bus Presets							
Preset 1	OFF	Preset 2	OFF	Preset 3	OFF	Preset 4	OFF
Preset 5	OFF	Preset 6	OFF	Preset 7	OFF	Preset 8	OFF
Preset 9	OFF	Preset 10	OFF	Preset 11	OFF	Preset 12	OFF
Preset 13	OFF	Preset 14	OFF	Preset 15	OFF	Preset 16	OFF

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 system **GPI/O** link-up that also provides you with the possibility to set up logical combinations of physical and virtual (system) **GPI/Os**.