

# **RAVENNA Web Interface**

# for device and stream configuration

# **User Guide**

Version: 1.0/1 Edition: 24 July 2013



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# **Changes to This Manual**

• Version 1.0/1 (Edition: July 24th 2013) - initial version, valid from build 7145



# Welcome

This documentation covers the RAVENNA Web Interface, a browser-based control interface used to configure RAVENNA devices and streams.

The RAVENNA Web Interface runs on most standard web browsers. It is recommended that you update your web browser to the latest version.

You can access more information by registering at <u>ravenna.alcnetworx.com</u> (click on **Login**). By registering you will receive the latest news for your product, and can download software and documentation.

### **Marginal Notes**

The following symbols are used to draw your attention to:



Points of clarification.



Useful tips and short cuts.



#### Warning

Warnings – alert you when an action should *always* be observed.



# **Operating Principles**

1. Enter the IP address of the RAVENNA device to be configured followed by ":8080" into the URL field of your web browser (i.e. "192.168.1.230:8080"). Alternatively, if the RAVENNA software suite (e.g. the RAVENNA Virtual Sound Card) is installed on your computer, select the **RAVENNA** entry from the Program list in the **Start** menu.

The Overview page for your local RAVENNA installation opens in the browser:

Firefox  Gon LennovoDesktop)		
Iccalhost:8080/#/overview	☆ マ C	gle 👂 🖡 🏠 🖸
RAVENNA	Vendor ALC NetworX Product Windows PC Serial Number 68:05:ca:17:c7:41 Name (on LennovoDeskto	P) World
Clocks		Configuration
Sources		Create source
₩ 8 From my computer Address 239.8.0.0 Channels 2		
Sinks		Create sink

The Overview page lists the PTP clock source (Clocks), and any existing streams:

- Sources audio streams published from your computer to the network.
- Sinks incoming audio streams received from the network.

The icons beside each entry indicate:

~	Clock Valid
0	<b>Clock Faulty</b> - check that your network interface is connected to the RAVENNA network, and that the PTP Grandmaster is running.
0	Clock Listening - the device is in slave mode and is waiting for the Grandmaster.
11	Source/Sink Stream Active
•	Source/Sink Stream Connecting - for Sink streams, check the sending device.
0	Source/Sink Stream Faulty - the stream could not be created.
	If no icon is present, then the Source or Sink stream <u>configuration</u> is incomplete.

Hover your mouse over an icon to reveal further information.

- 2. Click on the <u>Clock</u> or on a <u>Source</u> or <u>Sink</u> stream to view and edit parameters.
- 3. Click on the **Home** icon (top left) to return to the Overview page.

4. Click **Create source** or **Create sink** (on the right) to create a new stream or connection from an existing stream.

5. Select an entry and click on the trash icon to delete a stream or stream connection.



6. Hover over a summary field to reveal further information, for example:

#### Channels (RAVENNA IO device and Play Channels) SDP (Session Description Protocol) Playout Server (on TOSHIBALAPTOP) Playout Server (on TOSHIBALAPTOP) Delay 512 Ch Delay 512 Channels 2 Channel Details SDP **RAVENNA Receive 1** 10 playback channel 0, playback channel 1 Channels v=0 o=- 1371470631326723 0 IN IP4 192.168.1.99 s=Playout Server (on TOSHIBALAPTOP) streamed by "Lawo Jade" t=0 a=clock-domain:PTPv2 0 m=audio 4566 RTP/AVP 98 c=IN IP4 232.114.202.137 a=rtpmap:98 L24/48000/2 a=sync-time:0 a=framecount:128

The Headline area (top right) displays product information and the RAVENNA node name:



- Vendor = the manufacturer's name.
- **Product** = the product name.
- Serial Number = a unique number which identifies the device within the manufacturer's product range.
- **Name** = the node name used for RAVENNA discovery and identification. The node name can be edited in <u>Expert mode</u> but must be unique within the RAVENNA network.
- 7. Click on the **World** icon (top right) to access different RAVENNA nodes visible on the network:



8. Click on the **Configuration** icon (top right) to access other <u>settings</u> (Network, IOs, Advanced and About pages):





# **Clock Parameters**

	RAVENNA
<b>#</b>	
Clock Status	
Туре	PTPv2
Status	✓ Master
Settings	
Domain	0
Prio1	128
Prio2	128
Announce interval	1 sec. 💌
Sync interval	0.5 sec.
Slave only	
Delay mechanism	E2E 💌
DSCP	
Cancel	

This page provides access to the clock settings (except for the RVSC implementation, where clock settings are accessed via the **PTP** status icon in the task bar. See the "RVSC Win/WDM Software Installation Guide".)

For further details on all parameters, please refer to the **IEEE1588** standard documentation.

#### Status

Туре	Type of PTP clock ( <b>PTPv2</b> )
Status	Status of PTP clock (Master, Slave or Faulty if no PTP clock is detected).

#### Settings

Master	Appears only if this device is a PTP slave; indicates the IP Address of the PTP master.
Offset	Appears only if this device is a PTP slave; indicates the current offset from the PTP master.
Domain	Time domain for PTP. This <i>MUST</i> be set to match the domain number of the related PTP Grandmaster.
Prio1	Internal PTP setting (in samples, e.g. <b>128</b> ). This parameter is used to control the priority of Grandmaster selection. (Refer to the IEEE1588 Best Master Clock algorithm for further details.)
Prio2	u .
Announce Interval	in seconds (1, 2, 4, 8 or 16). In Slave mode, this <i>MUST</i> be set to match the Announce Interval of the related PTP master clock. In <b>Master</b> mode, this determines the desired Announce Interval.
Sync interval	in seconds ( <b>0.5</b> , <b>1</b> or <b>2</b> ). In <b>Slave</b> mode, this <i>MUST</i> be set to match the Sync Interval of the related PTP master clock. In <b>Master</b> mode, this determines the desired Sync Interval.
Slave only	When ticked, the device is forced to run in PTP <b>Slave</b> mode only.



#### **Clock Parameters**

Delay request	End to End ( <b>E2E</b> ) or Peer to Peer ( <b>P2P</b> ). This <i>MUST</i> be set to match the related PTP master clock.
mechanism	While <b>E2E</b> is a more universal setting, <b>P2P</b> provides higher clock sync precision but requires full support from all participating switches (between the node and related clock master.)
DSCP	The QoS (Quality of Service) value for PTP traffic (0-63). It is recommended to assign a value which is treated as highest priority level in the network. Default is 48.





# **Source Stream Parameters**

8: From my con	nputer
Status	
Status	Streaming
Jitter (samples)	
Lost packets	
Stream Settings	
Name	From my computer
Address	239.8.0.0
Frame size	128
DSCP	46
Payload	98
Codec	L24
Channel count	2
IO Settings	
ю	RAVENNA Send 1
Channel blocking	
Capture channels	capture_channel_0, capture_channel_
Save Cancel	

The **Status** parameters are for display purposes only. The **Stream** and **IO Settings** are entered when you create or edit a Source stream:

#### Status

Status	Indicates if streaming is active (Streaming) or not (Connecting or Not configured).
Jitter (samples) Lost packets	These areas appear when streaming is active, and display the amount of jitter and number of lost packets, as reported by subscribers, in graphical form.
	over a trace to see the IP address of the subscriber.



#### Stream Settings

Name	Enter a name to identify the stream on the network (e.g. <b>From my computer</b> ). A default name is automatically entered, and is taken from the RAVENNA <u>node</u> <b>Name</b> (in the headline).
Address	Enter a Multicast IP address for the stream (e.g. 239.8.0.0).
	<b>NOTE:</b> Avoid entering duplicate Multicast IP addresses (i.e. Multicast addresses already in use for other streams on the network). It is recommended to keep the suggested value.
Frame size	Select a frame size in samples from the drop-down menu (48, 64, 128, 192 or 256) or enter any number manually; the default value is 128.
	The frame size defines the number of samples per channel per network packet; the smaller the frame size, the lower the latency but the more susceptible to drop-outs.
	<b>NOTE:</b> To avoid packet bursting, choose the same or a multiple of the block size of the selected I/O device. See <u>IO settings</u> (below) and the <u>Configuration -&gt; IOs</u> menu.
DSCP	Appears only in <u>Expert Mode</u> . Select a QoS (Quality of Service) value from the drop-down menu - <b>EF</b> (46), AF41 (34), AF31 (26) or Standard (0); the default value is <b>EF</b> (46). This should match the priority settings used in your network for preferred real-time media packet forwarding.
Payload	Appears only in Expert Mode. This is an internal RTP value which informs subscribers about the nature of the content (98 = dynamic payload type, specified further in the accompanying SDP).
Codec	Select an option from the drop-down menu to define the wordlength of the PCM digital audio (L16 = 16-bit, L24 = 24-bit, L32 = 32-bit or AM824 = 24-bit audio + 8-bit meta data as used with AES/EBU).
Channel count	Enter the number of audio channels for the stream (e.g. $2$ = stereo).

#### **IO Settings**

Ю	Select a RAVENNA IO device from the drop-down menu (e.g. <b>RAVENNA Send 1</b> ). <b>NOTE:</b> devices do <i>NOT</i> appear if they are disabled (see the <u>Configuration -&gt; IOs</u> menu).
Channel blocking Capture Channels	These options assign channels from the audio interface to the RAVENNA Source stream. Tick <b>Channel blocking</b> to assign the number of chosen audio channels as a single block of consecutive channels (e.g. channel 1+2, 3+4, etc). Then use the <b>Capture channels</b> field to select the first channel of the block. Untick the <b>Channel blocking</b> option to edit the channel assignments individually.

When creating a new Source stream, the resultant network packet size is displayed at the bottom of the page; the packet size is determined by the **Frame size**, **Codec** and **Channel count**.

If the packet size exceeds the Ethernet MTU (Maximum Transmission Unit), then a warning appears. To fit the MTU, you may reduce the **Frame size**, lower the wordlength (**Codec**) or split the stream by reducing the **Channel count** per stream.



# **Stream Sink Parameters**

9: From network	
Status	
Status	Receiving stream
Jitter (samples)	190 185
Lost packets	180           175           170           0.5           0.0           0.5           1.0
Stream Settings	
Description	From network
Source	Playout Server (on TOSHIBALAPTOP)
Delay	512
Channel count	2
IO Settings	
10	RAVENNA Receive 1
Channel blocking	
Play channels	playback_channel_0, playback_channe
Save Cancel	

The **Status** parameters are for display purposes only. The **Stream** and **IO Settings** are entered when you create or edit a stream Sink:

#### Status

Status	Indicates if streaming is active (Receiving Stream) or not (Connecting or Not configured).
	<b>Channel map collision</b> appears if one or more channels of the stream are assigned to an audio interface channel already in use. If so, check the other stream Sink configurations.
	<b>Multicast/port conflict</b> appears if a stream Sink with the same Multicast IP address is already in use. Currently, a stream can only be received once per node.
Jitter (samples) Lost packets	These areas appear when streaming is active, and display the amount of jitter and number of lost packets in graphical form.



#### Stream Settings

Description	Enter a name to label the stream, locally on your computer (e.g. From network).
Source	Select a Source stream from the drop-down menu. You can select any stream available on the RAVENNA network, including streams published from your own PC. The name of the stream is determined by the sender ( <b>Playout Server</b> ); the sender's device name is included in brackets ( <b>on TOSHIBALAPTOP</b> ).
Delay	Enter the amount of delay to be applied, in samples, before samples are played out (forwarded to the internal audio interface); the default value is <b>512</b> . The delay is referenced to the sampling time at the sender. Thus, it needs to be large enough to cover all possible influences, such as the packet assembly delay at the sender (frame size), transport delay, maximum packet jitter and packet disassembly delay at the receiver.
	<b>TIP:</b> Set the delay to be larger than the <u>frame size</u> specified by the sender. As a general rule, the delay value should be $2 \times \text{sender's frame size}$ . So, if the sender's frame size = 128, set the delay = 256. If you experience drop-outs, increase the delay time.
Channel count	The channel count determines the number of channels to be routed from the selected stream to the internal audio interface. If 0 is entered, all available channels are used upon subscription.

## **IO Settings**

Ю	Select an available audio IO device from the drop-down menu (e.g. <b>RAVENNA Receive 1</b> ). <b>NOTE:</b> devices do <i>NOT</i> appear if they are disabled (see the <u>Configuration -&gt; IOs</u> menu).
Channel blocking Play Channels	These options assign channels from the subscribed RAVENNA stream to the selected audio IO device.
	<b>NOTE:</b> channels are numbered starting at 0. Individual names may appear if IO channels have been named in the <u>Configuration -&gt; IOs</u> menu.
	Tick <b>Channel blocking</b> to assign channels as a single block of consecutive channels (e.g. stream channels 04 -> audio IO channels 36).
	Use the <b>Play channels</b> field to select the first channel of the block.
	Untick the Channel blocking option to edit the channel assignments individually.
	<b>TIP:</b> when receiving more stream channels than available audio IO channels, untick <b>Channel Blocking</b> to freely assign the channels.
	<b>NOTE</b> : do <i>NOT</i> assign the same <b>Play channel</b> more than once. Otherwise you will receive a channel conflict error.



# **Configuration Menu**

The Configuration menu provides access to the **Network**, **IOs**, **Advanced** and **About** pages:



#### Network



	rename nodes in Expert mode by clicking on the pencil icon. Some naming constraints apply (i.e. the node name must be unique; no spaces are allowed, etc.)
Interfaces	This area lists all the available network interfaces installed on the RAVENNA node. Click on an interface to view its details. In some RAVENNA implementations, these fields are read-only.



#### lOs

Firefox	🛀 🍓 (on LennovoDesktop)	+					
🗲 🛞 la	ocalhost:8080/#/ios				☆ ⊽ C	<mark>8</mark> <del>▼</del> Google	₽ 🖡 🏠 🖸 ד
		ENNA			Vendor Product Serial Number Name	ALC NetworX Windows PC 00:00:00:00:000 (on LennovoDesktop) ♂	ALC NetworX
*							<b>⊘</b> ▼ 0\$ ▼
IOs							
Q	AnalyzerFile						
Q	AnalyzerRamp						
Q	GeneratorRamp						
Q	GeneratorSine						
Q	RAVENNA Receive 1	Block size 128 bytes	Sample rate 48000 Hz	Play channels 8			
Q	RAVENNA Send 1	Block size 128 bytes	Sample rate 48000 Hz	Capture channels 8			
Q	RAVENNA Speakers	Block size 128 bytes	Sample rate 48000 Hz	Capture channels 8			

This page provides access to all audio IO devices and test signals.

- 1. Click on a left-hand button to enable or disable an IO device:
  - Green = enabled.
  - **Red** = disabled.

Audio IO devices *MUST* be enabled if they are to appear in the Source/Sink Stream IO selection menu.

2. When enabling an IO device, you are asked to enter the following parameters:

Audio block size	Select a value (in samples) from the drop-down menu. This determines how often an audio interrupt will be triggered.
Sample rate	Enter the desired sampling rate (e.g. <b>48000 Hz</b> = 48kHz).
Play/Capture	The number of audio IO channels (e.g. <b>8</b> ) and their labelling.
channels	



### Advanced



Advanced

- 1. Tick Enable expert mode to gain access to:
  - RAVENNA log file settings.
  - Test signals (in the <u>lOs</u> page).
  - Some additional parameters for Source stream configuration (DSCP & Payload).
  - Renaming for the RAVENNA nodes.

Note that the status of **Expert mode** is stored by your web browser, and not by the RAVENNA software.

#### **Configuration Menu**



#### Log Files

The RAVENNA software produces three log files for diagnostic purposes (*/log/butler*, */log/streamer* and */log/ptp*). Each file contains messages. You can open the log files and prioritise messages as follows:

1. Open the Advanced page and enable Expert mode.

**2.** For each message, in the **butler** and **streamer** log files, enter a priority by selecting a dropdown option:

- Info = lowest log level
- **Debug** = medium log level
- Trace = highest log level
- Not Set = level is inherited from the branch below (i.e. root).

	RAVENNA	Vendor Product Serial Number Name	ALC NetworX Windows PC 00:00:00:00:00 (on LennovoDesktop) ♂	ALC NetworX
A				Q • 08 •
Advanced				
Enable expert	mode			
Logging				
butler				_
ravenna			Not se	t 💽
ravenna.ad			Info Debug Trace	
ravenna.bond			Not set	
ravenna.bond.uplo	ad_handler		Not se	t 💌
ravenna.cometd			Not se	t 💌
ravenna.conf			Not se	t v
streamer				
ravenna			Not se	t 🔹
ravenna.analyzer			Not se	t T
ravenna.audio			Not se	t
ravenna.audio.rtau	dio		Not se	t 💌
ravenna.audio.win	/rd_category		Not se	t
ravenna.decoders			Not se	t 🔹 👻



**3.** Scroll down the page, and click on one of the log file links to open the log file in a new browser window:

Firefox 💌	ion LennovoDesktop)	× http://localhost:8080/log/butler	× +	100 C	The second s		- 0	X	
				<u> </u>	<b>1</b> 731				7
Collection (Collection)	ost:8080/log/butler			ਹਿ <b>ਕ</b> G	S + Google	2 1	- 11		1
2013/06/14	10:50:27.635 Th3DE048 II	NFO ravenna.ipc.clt rv ipc.c:4	06 Connected to IPC service 13	7.0.0.1:42538					^
2013/06/14	10:50:27.665 ipc mag has	ndler INFO ravenna ry device i	i.c:113 Vendor: ALC NetworX						
2013/06/14	10:50:27.665 ipc msg has	ndler INFO ravenna rv device i	d.c:114 Product: Windows PC						-
2013/06/14	10:50:27 665 inc mag has	ndler INFO ravenna ry device i	i c:115 Serial Number: 68:05:	a · 17 · c7 · 41					
2013/06/14	10:50:27 665 inc mag has	ndler INFO ravenna ry device i	1 c:113 Vendor: ALC Network						
2013/06/14	10:50:27 665 inc mag has	ndler INFO revenue ry device i	d c:114 Product: Windows PC						
2013/06/14	10:50:27.665 ing mag has	ndler INFO revenue ry device i	i cilli Serial Number: 62:05:	17.07.41					
2013/06/14	10.50.27.665 rten regue	at thread INFO revenue ing alt	ru ing altipit a.88 stop som	at thread started					
2013/06/14	10.50.27 665 Theprove T	NEO revenue ing alt ru ing log	cillé list of stessing ("	avenue ru error": 900 "root"	. 600 "revenue generator", 800			andere	
2013/06/14	10.50.27.605 TH3DE046 T	NFO Inventa.ipc.cit iv ipc ibg	init a.EEA Tonding config from	avenua.iv_erior . 500, 1000	. 600, lavenna.generator . 500,	Lavein	ia.em	couers	
2013/06/14	10.50.27.685 THEDEORS T	NFO ravenna.ipc.cit iv_ipc_cit	init c:575 Config looded from	key butler					
2013/06/14	10.00.27.000 INSDE040 IN	NFO Tavenna.ipc.cit iv_ipc_cit	init.c.5/5 config loaded from	key buccer					
2013/06/14	12:01:11.152 10-964 ERR	ok ravenna.ad session_resolver_	refoconi resp.cpp:185 Rise con	mection was closed.					
2013/06/14	12:01:11.152 10-964 ERR	ok ravenna.ad session_resolver_	zeroconi_rtsp.cpp:191 1rigger	ing reconnect.					
2013/06/14	12:01:11.152 10-964 ERR	OK ravenna.ad session_resolver_	zeroconi_rtsp.cpp:185 RISP con	nection was closed.					
2013/06/14	12:01:11.152 10-964 ERR	OR ravenna.ad session_resolver_	zeroconf_rtsp.cpp:191 Trigger:	.ng reconnect.					
2013/06/14	14:35:46.661 Th4075E8 E	RROR ravenna.zeroconf.bonjour b	onjour_client cpp:116 DNSServ	ceProcessResult returned -655	63				
2013/06/14	14:35:46.661 Th4075E8 E	RROR ravenna.zeroconi.bonjour b	onjour_client.cpp:116 DNSServ:	ceProcessResult returned -655	941				
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4. Or, click on List running processes to open a list of running processes.



#### About

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RAVENNA	Vendor ALC NetworX Product Windows PC Serial Number 00:00:00:00:00 Name (on LennovoDesktop) &	ALC NetworX
About		
Version		
Butter bond 0.25-7005 (54)		
Credits		

This software utilizes the following Open-Source-Software: AngularJS, AVAHI, Bonjour, Boost C++ Libraries, CMake, Jansson, JsonCpp, JQuery, log4c, RTAudio

The About page lists the current version of the RAVENNA Web Interface and all credits.