

IP-8i AES67 Audio Interface

User Manual

IP-8i User Manual V1.0

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1 About this Manual

You can download the latest version of this user manual here:

http://download.2wcom.com/products/IP-8i_BYQP/




1.1 References and Hyperlinks in this PDF File

If you are reading this manual as a non-print version, please note that this PDF file contains bookmarks. You can navigate through the document via the content overview in your PDF viewing software if you enable bookmarks view.

All references to pages, sections, figures, and tables in the text identify a location within this PDF file. Click on the reference to jump to the referred passage in the text.

1.2 Tags and Their Meanings

The following signal words and signs warn you about risks and dangers:

DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Describes precautions necessary to protect the equipment.
	Contains useful information for the user.



Warning of general danger situation



Warning of electric shock



Warning of hot surface



Warning of fire hazard

2 For Your Safety

The device conforms to the relevant European directives and is safely constructed. Nevertheless, some residual dangers remain. 2wcom Systems GmbH accepts no liability for any damage caused by non-observance of the safety instructions.

- Read through this user manual carefully before using the device. If you pass on the device, be sure to also include this user manual.
- Any improper use of the device and all actions on the device not described in this user manual are considered as misuse outside the statutory limits for liability of the manufacturer.
- Only operate the device if it is in a technically perfect condition. If the device or a part of it is defective, take the device out of operation. Do not repair the device yourself. In case of any damages, send the device to 2wcom immediately for inspection or dispose of it properly according to the regional disposal regulations.
- Keep the device away from unauthorized persons.



Danger from electric current!

- Plug the device into a grounded power socket only. Never remove the grounding wire/contact.
- Do not open the housing of the device by yourself. Do not touch open electrical parts.
- Dangerously high voltages are present inside the housing. Even after disconnecting the mains supply, dangerously high voltage levels may be present for a certain time.
- Do not touch the device when your hands are wet.
- Never expose the device to liquids. If any liquid gets inside the housing, immediately disconnect the device completely from the power supply. Do not continue operating the device.



Fire hazard due to overheating or electric current!

- Ensure sufficient heat dissipation during operation. Avoid the following when installing the device:
 - Non-ventilated environment, e.g. a narrow shelf or built-in cabinet
 - Extremely warm or cold place
 - Direct exposure to sunlight
 - Too high or too low temperatures
 - Extremely wet or dusty environment
- Do not cover the ventilation openings of the device to avoid heat accumulation.
- Do not operate the device in the presence of flammable gases.
- Do not place objects with open flames, such as burning candles, on the device.
- Do not place any heavy objects on the supply cord. A damaged cord can lead to fire or electric shock hazards.
- When disconnecting the supply cord, always pull on the plug, never on the cable, to avoid cord damage.



Danger from explosive atmosphere!

- Do not use the device in an explosive environment.



Warning of hot surface!

The device may heat up greatly during normal operation despite an active cooling system.

- Do not touch the surfaces of the device during or shortly after operation.



Risk of equipment damage!

- Before each use, check the housing, the front panel, the cable and the power plug for visible damage and defects (e.g. scratches, cracks, wear and tear, damaged insulation, improper plug connections or extension cables).
- If the power cord is damaged, immediately disconnect the power plug. Never use the device with a damaged power cord.
- All damaged components must be replaced immediately.
- Only use a grounded three-wire power supply cord and plug that complies with the national regulations.
- Make sure that the power socket is next to the device and readily accessible to the user.
- External devices which are connected to the device could be damaged by the device or damage the device itself if the output levels exceed the specified limits.
- Do not use corrosive detergents on the device such as benzene, thinner, alcohol or acetone. Clean the surface of the device with a soft, dry cloth only.

3 Product Overview

3.1 About the IP-8i

The IP-8i is an AES67 audio interface with 8 digital or 4 analog stereo channels. It allows broadcasters to convert their audio from AES/EBU or analog format to AES67 (RAVENNA, Dante). The IP-8i offers you a straightforward audio to AES67 interface with a variety of features and opportunities to ease your daily work.

Flexible in application: The encoder is designed for converting audio to AES67.

High compatibility: The IP-8i supports a wide range of protocols for streaming, control and monitoring (for example AES67, RAVENNA, Dante PTPv2, SAP, Discovery, Bonjour, SNMP, HTTP, HTTPS, FTP, FTPS or Ember+ and more).

Pay as you grow: All software and hardware components are individually combinable. The scalability of up to eight audio channels using software licenses gives you flexibility in planning your network and reducing your costs.

Transmission robustness: Dual Streaming ensures rock-solid IP transmission. Two optional internal or hot pluggable power supplies guarantee fail-safe operation.

Smart management: Configuration set-up via an easy-to-use web interface. For remote control, the encoder offers various possibilities – HTTPS, FTP, NMS, SNMP. Real time monitoring is possible by the Live Listening feature. Perfect synchronization can be achieved by PTPv2 and latency control.

3.2 Software Rights

Software rights enable additional functions. Some rights may be included in the base version of the product, others are available as an optional purchase. The following table displays an overview of the software rights that are available for the IP-8i.

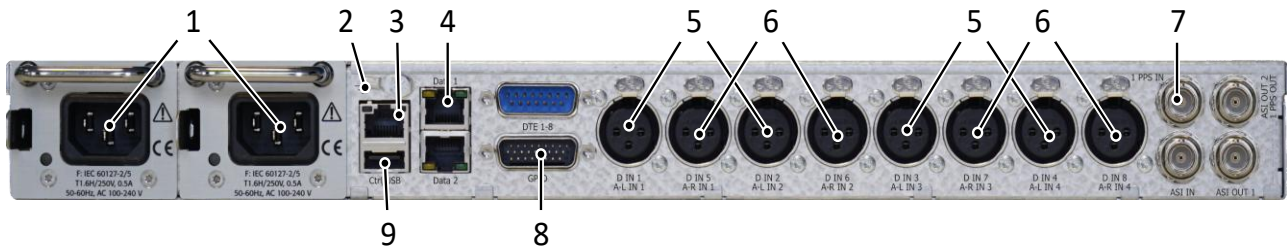
Right	Description
n Channels	Number of channels

3.3 Front Panel



- 1 Headphone: 6.3 mm / 1/4" socket for the connection of headphones
- 2 LCD Screen: Illuminated LCD screen, graphical, 264x64 pixels
- 3 [Warning] LED: LED indicator for alarms. For more information, see 9.1 Status LEDs.
- 4 [Input] LED: LED indicator for signal inputs. For more information, see 9.1 Status LEDs.
- 5 [Output] LED: LED indicator for signal outputs. For more information, see 9.1 Status LEDs.
- 6 [Power] LED: LED indicator for the dual power supply. For more information, see 9.1 Status LEDs.
- 7 Reset pin hole: Recessed button for resetting the device (warm start and recovery mode)
- 8 Jog wheel: For operating the device via the LCD screen

3.4 Back Panel



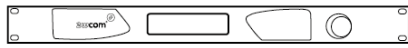
- 1 **Power supply unit:** Mains supply voltage IEC socket.
Optional redundant power supply through a second power supply unit:
 - Option 1: standardized IEC hot-swappable power supply connector; 90–260 V, 47–63 Hz; automatic switchover.
 - Option 2: power supply 48 V DC.
 Combination of power supply 230 V AC and 48 V DC is possible
- 2 **Grounding stud:** This stud can be used to connect a grounding system if necessary.
- 3 **[Ctrl]:** RJ-45 connector, 10/100/1000 Base-T interface for controlling and monitoring the device via Ethernet. The device can communicate with the IP network and can be configured via the integrated web interface using an internet browser.
The LEDs show the link status (green, active if a physical network connection exists) and the activity status (yellow, active if data communication is active).
- 4 **[Data]:** 2x RJ-45 connector; 10/100/1000 Base-T interface for two redundant outputs for data, audio and GPIO transmission via Ethernet.
- 5 **[D IN] [A-L IN]:** AES/EBU female interface for the input of digital audio. Integrated XLR female socket; input of the left channel of the analog audio signal, balanced <math>< 20 \Omega</math>.
- 6 **[D IN] [A-R IN]:** AES/EBU female interface for the input of digital audio. Integrated XLR female socket; input of the right channel of the analog audio signal, balanced <math>< 20 \Omega</math>.
- 7 **[1PPS IN]:** 1PPS input for time synchronization – BNC – 75Ω
- 8 **[GPIO]:** 26-pole D-Sub male connector; combined connector for inputs (GPI) and outputs (GPO).
- 9 **[USB]:** USB 2.0 interface for service, configuration and firmware.

Note: All inputs and outputs that are present on the back panel but not explained in this table, cannot be used with the IP-8i.

4 First Steps

4.1 Checking the Delivery Contents

Use the following list to check the completeness of delivery. The delivery contents may vary in exceptional cases.



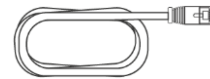
IP-8i



Link to product data



Power cord



Network patch cable

4.2 Installing the Device

For the device to operate safely, note the following regarding the location:

- Mount the device securely and stable in a 19-inch rack designed for this purpose.
- Avoid direct sunlight, direct proximity to radiators and air conditioners, dust, water and chemicals
- When setting up the device, make sure that it is placed at a suitable viewing angle to the displays and that the device has sufficient heat dissipation.

4.3 Connecting the Signals

Before connecting the device to the power supply, first connect the inputs and outputs of the device to the corresponding connectors:

4.4 Connecting the Power Supply

NOTICE Risk of equipment damage!

- Make sure that the device and the contained cords are compatible to the domestic line voltage and frequency!

Optionally, the device comes with 2 exchangeable plug-in power supply units which can be equipped with different redundant power supply connectors: either IEC sockets or Neutrik powerCON sockets.



If the device is equipped with a primary and a secondary power supply, then the primary power supply is used. If the primary power supply fails, then the device promptly switches to the secondary power supply and the status changes immediately on the **Device** status page. If the secondary power supply fails, then the device does not need to switch the power supply source and it takes at least 1 minute for the status to update on the **Device** status page.



If the device is equipped with hot-pluggable power supplies, both power supply cassettes must be installed and used during operation. Operating the device with only one cassette may result in improper cooling, reduced mechanical integrity, and compromised overall system reliability.

4.5 Configuring the Network

NOTICE False connection of the Ethernet interfaces will lead to incorrect operation!

- Use the [Data] interfaces only for data transfer.
- Use the [Ctrl] interface only for the access to the device via the web interface and for SNMP.
To change the supported services per interface, see 6.1 Configuring the Interface Services.

To transfer data over IP and access the device via the web interface, you must connect the device to your IP network.

For the [Ctrl] interface, DHCP is enabled by default. When you connect the device to your DHCP-enabled network, it will automatically get the IP configuration for the [Ctrl] interface. To view the obtained IP address, turn the jog wheel to the left to see the “System Info” display. Here you will find the obtained IP address and further system information.

To connect the device to your IP network and change the IP setup via the LCD menu:

1. Push the jog wheel to enter the configuration menu.
 2. Turn the jog wheel to focus the **Network** tab and push the jog wheel.
 3. Push the jog wheel to enter the menu for the [Ctrl] interface.
 4. Configure the settings for your existing IP network (IP address, netmask, gateway etc.). Consult the responsible network administrator if applicable.
 5. Turn the jog wheel until the **Save** menu item is selected and push the jog wheel.
 6. In the dialog window, select **Yes** to save the settings and restart the device.
- ✓ The device is now connected to the IP network.

4.6 Accessing the Web Interface

The device can be fully operated via the integrated web interface using an internet browser. For this purpose, use a computer that is connected to the same IP network that the device is connected to.

Requirement: You have already connected the [Ctrl] interface to the network.

1. Access the web interface by entering the IP address of the device into a web browser.
 - A login screen appears.
 2. Enter the username and password.
- ✓ The main page of the web interface appears.

The default login data (case sensitive) are:

- For read-only access: **user / user**
- For full access: **manager / manager** or **admin / admin**



Change the login data as soon as possible to avoid unauthorized access to the IP-8i and document the login data in a safe place.

4.7 General Operation

4.7.1 Operation via web interface

The IP-8i has an integrated web interface. You can make all configurations and operations using a web browser.

Note the following rules when operating the device via web interface:

- If you want to keep any changes made in the configuration of the device, click the corresponding **Save** button.
The changes in each block must be saved individually. If you change data in several blocks or tabs, click the **Save** button under each block to save all changed data. Otherwise, any unsaved block will be reset to the previously saved status when leaving the page.
- If you do not want to keep the changes, reload the page or leave the page without saving.
- Use a decimal point as the decimal separator in numbers in the input fields (i.e. “6.5” for “six and a half”).

4.7.2 Operation via LCD menu

Some basic functions of the device can be operated via the LCD menu and jog wheel.

The display has 2 main menus:

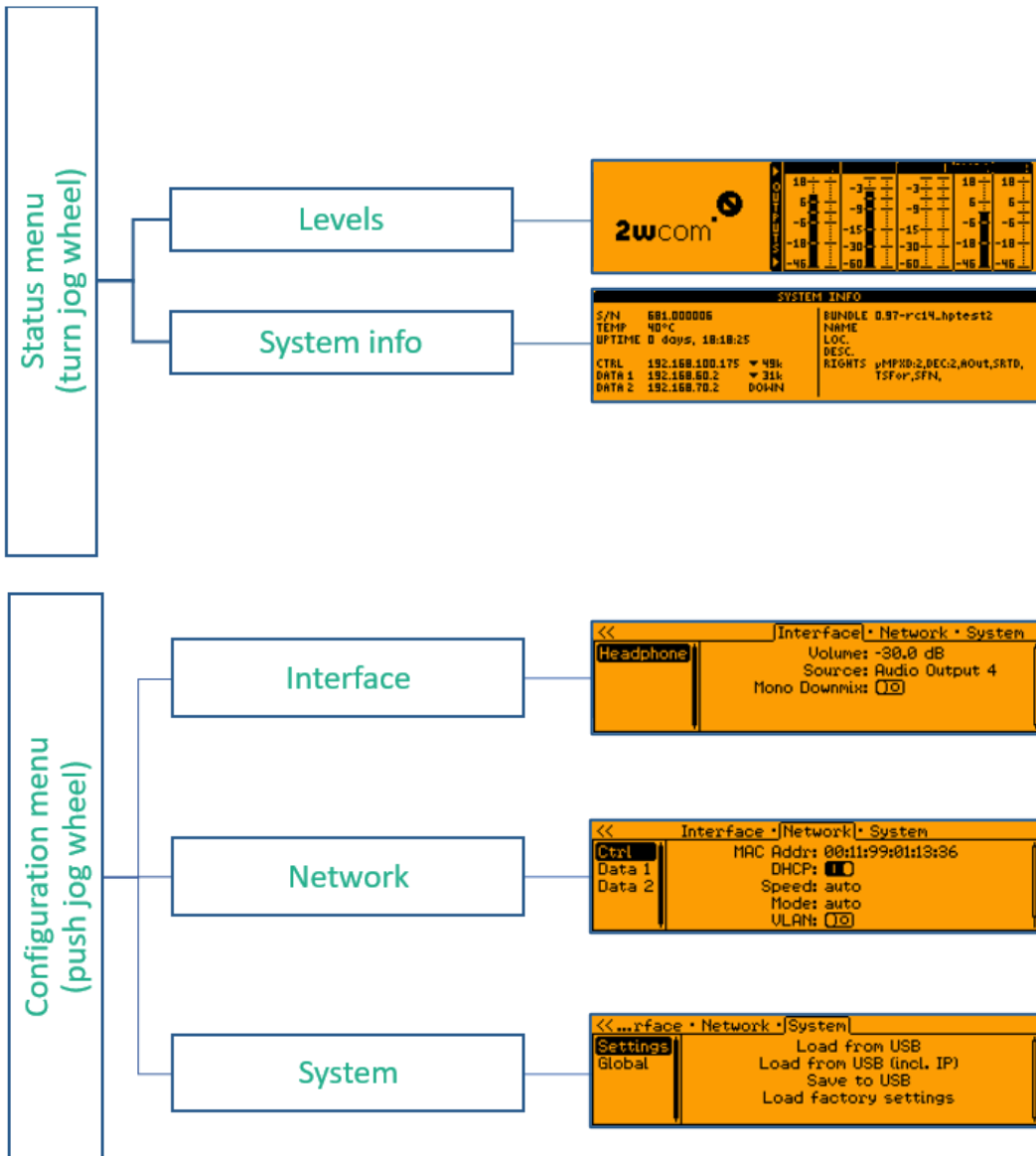
- Status menu (turn jog wheel left or right)
- Configuration menu (push jog wheel)

After a warm or cold start of the device, the display shows the default screen of the status menu. When you navigate in the LCD menu, the display returns to the Status Overview after few minutes of inactivity.

Note the following when operating the device via the LCD menu:

- To switch from the status menu to the configuration menu, push jog wheel.
- To move the focus in the menu structure, turn jog wheel.
- To open a menu tab, focus the tab and push jog wheel.
- To select a configurable menu entry, focus the entry and push jog wheel.
- To configure the selected menu entry, turn jog wheel.
- To confirm changes in a menu entry, push jog wheel.
- To return to the previous menu level, select <<.

Navigation structure



5 Interface Settings

5.1 Configuring the Interface Settings for AES67

You can configure the device output audio over AES67 streams. To configure the AES67 outputs, you must enable the available outputs and configure the AES67 interface settings.

Interface Settings
Audio AES67

Output Settings

	Enabled	Redundancy	Multicast IP	Port	IP Interface	VLAN	Payload ID	Packet Time	Audio Mode	Width	QoS DSCP	TTL	Empty Packets
1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.1	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.2	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.3	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
4.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.4	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
5.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.5	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.6	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
7.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.7	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>
8.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	239.8.83.8	5004	Data 1	0	96	1 ms	Stereo	24 bit	Best effort (0)	42	<input type="checkbox"/>

To configure the AES67 outputs:

1. Navigate to the page **AES67** in the section **Interface Settings**.
 2. In the block **Output settings**, toggle the switch next to the output to enable it the output.
 3. Configure the parameters.
 4. Select **Save**.
- ✓ The AES67 streams are now configured.

Parameters

Redundancy	Enable this function to set up a redundant AES67 stream input.
Multicast IP	Enter the Multicast IP address for the AES67 stream.
Port	Enter the port number for the AES67 stream. The default port number for AES67 streams is 5004.
IP Interface, VLAN	Select the IP interface and VLAN to be used for the AES67 stream input.
Payload ID	Enter the payload ID. The default ID is 96.
Packet Time	The packet time defines the duration of audio contained in each packet. Shorter times can reduce latency but may increase network load.
Audio Mode	Choose stereo or mono channel audio.
Width	Select the bit width of the audio samples.
QoS DSCP	Select a Differentiated Services Code Point (DSCP) to determine the Quality of Service (QoS).
TTL	Choose the Time to Live (TTL) for the packets.
Empty packets	Toggle the switch to enable the device to maintain the connection even with empty packets.

5.2 Configuring the audio settings

You can configure various settings for the input signals to ensure proper transmission and processing. The IP-8i supports up to 8 digital channels, up to 4 analog channels, and a mixed operation of up to 4 channels.

To configure the signal inputs:

1. Navigate to the page **Audio**.
 2. Select the device mode in the drop-down menu **Interface Signal Type**: digital only or analog/digital.
 3. Configure the parameters in the blocks **Audio Inputs**.
 4. Click **Save**.
- ✓ You have configured the signal inputs.

Parameters

Digital Gain	Adjust the gain of the input signals. This is useful if the signal's level is too high or too low.
Sample Rate Converter	To convert the sample rate to a specific frequency, enable the Sample Rate Converter. For more information, see 5.3 Enabling the Sample Rate Converter.
Sampling Rate	If the Sample Rate Converter is enabled, select the sampling rate.
Clock Source	Select the clock source for the Sample Rate Converter. To configure the external clock, see 7.2 Using an External Clock Source.
Generate Null Samples	Enable this function to generate null samples if no input source is connected.

5.3 Enabling the Sample Rate Converter

The IP-8i is equipped with an internal sample rate converter (SRC) that converts stereo audio from one sample rate to another. The IP-8i sample rate converter allows different rates at the digital AES/EBU interfaces.

To enable the sample rate converter:

1. Navigate to the page **Audio**.
 2. Set the switch **Sample Rate Converter** to **ON**.
 3. Select a sampling rate in the dropdown menu.
 4. Click **Save**.
- ✓ The sample rate converter generates an exact sampling rate in the input/output audio.



The configured sample rate and sample width must be correct and correspond to the real values of the signal!

Sample processing with enabled Sample Rate Converter:

- In the SRC input, the jitter of the sampling rate is converted into a constant determined sampling rate for the output.



According to the AES-3 standard, data jitter varies between max +/- 20 ns. Depending on the bit depth, the signal-to-noise ratio has a better quality if the SRC is enabled.

During startup, the sampling frequency can vary up to +/- 20 ns according to the AES/EBU standard. After complete startup of the sample rate converter, the sampling frequency varies less.

5.4 Setting the Critical Level Marker

The audio level of the inputs is displayed on the overview page. You can set the critical level marker to specify when the bar should turn orange.

Critical Level Marker	
Analog Threshold:	<input type="text" value="6.0"/> dBu
Digital Threshold:	<input type="text" value="-9.0"/> dBFS

To set the critical level marker:

1. Navigate to the page **Audio**.
 2. In the block **Critical Level Marker**, define the threshold above which the bar should turn orange.
 3. Click **Save**.
- ✓ The bar indicating the audio level of the inputs now turns orange whenever the audio level is above the set value.

5.5 Changing the Headphone Volume

The input signal can be monitored via the headphone interface.

Interface Settings	
↳ Headphone	
Volume / Source	
Volume [-40.0 ... 0.0]:	<input type="text" value="-20.0"/> dB
Source:	<input type="text" value="Mute"/> ▼
Mono Downmix:	<input type="checkbox"/> OFF

To change the volume of the headphone output:

1. Navigate to the page **Headphone**.
 2. In the block **Headphone**, select the source for the headphone output.
 3. Set the volume for the headphone output in a range from -40.0 to 0.0 dB.
 4. Toggle the switch next to enable **Mono Downmix**.
 5. Click **Save**.
- ✓ The volume of the headphone output is now adjusted.

5.6 Configuring GPO Settings

The IP-8i features 8 GPOs: 7 SPST relays (form A) and 1 SPDT relay (form C). You can use the relays for alarms of the monitoring function. For more information, see 8.19 Setting Up Alarms.

To configure the GPO settings and view the status of the GPOs:

1. Navigate to the page **GPO**.
 2. To invert a GPO, enable the corresponding switch.
 3. Select the source for the GPO switch in the field **Source**. Only GPOs that are selected for the source **Alarm** can be used to indicate a triggered alarm.
 4. Click **Save**.
- ✓ You have configured the GPO settings.

GPO

State / Configuration

	State	Inverted	Source	Audio		State	Inverted	Source	Audio
GPO 1	●	<input type="radio"/> OFF	Alarm	Audio output 1	GPO 5	●	<input type="radio"/> OFF	Alarm	Audio output 1
GPO 2	●	<input type="radio"/> OFF	Alarm	Audio output 1	GPO 6	●	<input type="radio"/> OFF	Alarm	Audio output 1
GPO 3	●	<input type="radio"/> OFF	Alarm	Audio output 1	GPO 7	●	<input type="radio"/> OFF	Alarm	Audio output 1
GPO 4	●	<input type="radio"/> OFF	Alarm	Audio output 1	GPO 8	A ● B	<input type="radio"/> OFF	Alarm	Audio output 1

The virtual LED **State** indicates the status of the GPOs (green: ON, grey: OFF). The state of a relay is ON if the alarm which is assigned to this relay is triggered.

For information on the GPO pin layout, see 11.2 Interface Pin Layouts.

6 Network Settings

6.1 Configuring the Interface Services

For each ethernet interface, you can select the services by which the interface can receive and send data.

Services

Interface services

	HTTP (Web)	HTTPS (Web)	SSH (SFTP)	SNMP	Ember+	Streaming Data
Ctrl:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data 1:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Data 2:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

SNMP: Only affects get and set commands, traps are not affected

To select the supported services:

1. Navigate to the page **Services**.
 2. For each individual interface, define which data can be received and sent.
 3. Click **Save**.
- ✓ The interfaces now only support the selected services.

6.2 TCP/IP: Configuring the Ethernet Interfaces

The IP-8i has several Ethernet interfaces: 1 for configuration and the others for data exchange. Configure the interfaces for data transmission.

NOTICE

False connection of the Ethernet interfaces will lead to incorrect operation!

- Use the [Data] interfaces only for data transfer.
- Use the [Ctrl] interface only for the access to the device via the web interface and for SNMP.

To change the supported services per interface, see 6.1 Configuring the Interface Services.

TCP/IP

DNS Server

Primary: Routing: OFF

Secondary: Routing Interface:

Proxy Server

Enable proxy: ON

Host: Port:

Note: The Proxy server will only be used for icecast input streams

Interface settings

Link	Interface name	Mac address	VLAN	DHCP	IP address	Subnetmask	Gateway	Speed:	Mode:
<input checked="" type="radio"/>	Ctrl	00:11:99:00:94:1E	<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> ON	<input type="text" value="192.168.100.238"/>	<input type="text" value="255.255.240.0"/>	<input type="text" value="192.168.96.1"/>	<input type="text" value="auto"/>	<input type="text" value="full duplex"/>
<input checked="" type="radio"/>	Data 1	00:11:99:00:94:1F	<input checked="" type="checkbox"/> ON	<input type="checkbox"/> OFF	<input type="text" value="192.168.100.250"/>	<input type="text" value="255.255.240.0"/>	<input type="text" value="192.168.96.1"/>	<input type="text" value="auto"/>	<input type="text" value="full duplex"/>
			ID				Priority		
<input type="radio"/>	Data 2	00:11:99:00:94:20	<input type="checkbox"/> OFF	<input type="checkbox"/> OFF	<input type="text" value="192.168.200.100"/>	<input type="text" value="255.255.255.0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	<input type="text" value="full duplex"/>

To configure the ethernet interfaces:

1. Navigate to the page TCP/IP.
2. Configure the parameters for the DNS Server, Ctrl and Data interfaces.



The necessary address settings depend on the individual network and should be assigned by the responsible network administrator, if applicable.

3. Click **Save**.
- ✓ The ethernet interfaces are now configured.

Parameters

- Primary** Enter the IP address of the primary domain name server (DNS).
- Secondary** Enter the IP address of the secondary domain name server (DNS).
- Routing** Enable the Routing, which enables the DNS server to send and answer the requests over different [Data] interfaces.
- VLAN** Enable VLAN and enter a VLAN ID (1-4095).
- Priority** Assign a priority (1-7) to this stream to add a priority code point (PCP) according to the IEEE 802.1Q specification. Select 0 to disable the priority and use best-effort delivery.
- DHCP** Enable dynamic host configuration protocol (DHCP) which enables the device to get an IP address automatically.
- IP Address** If DHCP is disabled, then assign an IP address to the interface.
- Subnetmask** Enter the subnetmask for the IP address.
- Gateway** Enter the address of the local system that is used for the internet access (e.g. the router).
- DNS Server** Enter the IP address of the DNS server used.
- Speed** Set the network connection speed in Mbps or select **Auto**.

6.3 Using TCP/IP Tools for Network Testing

The IP-8i features built-in TCP/IP tools for testing and diagnosing network connections. Use the ping tool for quick connectivity checks and basic latency measurements. Use the traceroute tool for a detailed analysis of the network path and to diagnose routing issues.



Using the Ping Tool

The ping tool helps you determine the connectivity status and latency between the IP-8i and a specified network destination.

1. Navigate to the **TCP/IP** page and select the **Tools** tab.
2. Configure the parameters in the **Ping** block:

- Destination** Enter the hostname or IP address of the destination you want to ping.
- Interface** Select the network interface to use for the ping request
- Count** Specify the number of ping requests to send. The default is 10.
- TTL** Set the maximum number of hops (routers) the ping request can pass through. The default is 255.
- Data size** Define the size of the ping packet in bytes. Enter 0 to use the default size.

3. Select **Start** to initiate the ping test.
 4. Select **Stop** to end the ping test at any time.
- ✓ The results are displayed in the **Output** block. The ping results show each packet's response time and any packet loss, indicating the connection quality and latency.

Using the Traceroute Tool

The Traceroute tool helps you trace the path that data packets take from the IP-8i to a specified network destination. This helps identify any delays or issues occurring along the path.

1. Navigate to the **TCP/IP** page and select the **Tools** tab.
2. Configure the parameters in the **Traceroute** block:

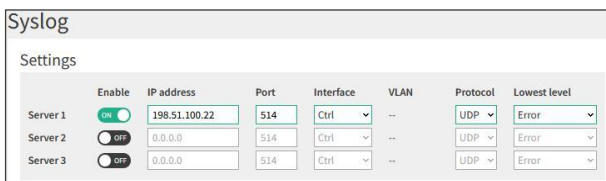
- Destination** Enter the hostname or IP address of the destination you want to trace.
- Interface** Select the network interface to use for the traceroute.
- Max. hops** Specify the maximum number of hops (routers) the traceroute should attempt.

Time to wait Set the maximum time (in seconds) to wait for each hop's response.

3. Select **Start** to initiate the traceroute test.
 4. Select **Stop** to end the traceroute test at any time.
- ✓ The results are displayed in the **Output** block. The traceroute results list each hop's IP address and response time.

6.4 Monitoring the Device via Syslog

In addition to saving information about events in the log, you can also send them to a syslog server. Syslog eases monitoring the IP-8i.



Syslog							
Settings							
	Enable	IP address	Port	Interface	VLAN	Protocol	Lowest level
Server 1	<input checked="" type="checkbox"/>	198.51.100.22	514	Ctrl	--	UDP	Error
Server 2	<input type="checkbox"/>	0.0.0.0	514	Ctrl	--	UDP	Error
Server 3	<input type="checkbox"/>	0.0.0.0	514	Ctrl	--	UDP	Error

To send event information to a syslog server:

1. Navigate to the page **Syslog**.
 2. Enable at least one of the servers.
 3. Configure the parameters.
 4. Click **Save**.
- ✓ The IP-8i now sends event information to the syslog server(s).

Parameters

IP address	Enter the IP address of the syslog server.
Port	Enter the port number.
Protocol	Select the protocol to be used.
Lowest level	Select the lowest level of a message that will be sent to the syslog server. For more information, see 9.6 Priority of Alarm Messages.
Interface	Select the [Data] interface to be used.
VLAN	If the selected [Data] interface is an interface with VLAN, then select the VLAN to be used.

6.5 SNMP: Configuring Access Data for External Requests

You can configure access data (read community/write community) that is necessary for external SNMP requests to the IP-8i.

SNMP (Simple Network Management Protocol) is a protocol used for managing and monitoring network devices. SNMP requests can be used to retrieve information such as the IP-8i's current settings and performance metrics. This information can be used to diagnose problems and optimize network performance. SNMP requests can also be used to configure the IP-8i remotely, allowing administrators to adjust settings.

SNMP
EMBER
REST API

Settings

Protocol version: SNMPv2c

Read/Write Community

1. Read community:

2. Read community:

1. Write community:

2. Write community:

MIB File

Version:

Download: [SNMP MIB](#)

Trap Configuration

Location of table indices (reboot needed): OID (default)

Trap Manager

	Enable	Version	IP / Domain Name	Interface	VLAN	Port
1	<input type="radio"/> OFF	V2	<input type="text"/>	ctrl	--	162
2	<input type="radio"/> OFF	V2	<input type="text"/>	ctrl	--	162
3	<input type="radio"/> OFF	V2	<input type="text"/>	ctrl	--	162
4	<input type="radio"/> OFF	V2	<input type="text"/>	ctrl	--	162



For the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files must be compiled by your SNMP manager tool. You can save the MIB files in the block **MIB File**.

1. Navigate to the page **External APIs**.
 2. Click on the tab **SNMP**.
 3. Select the protocol version in the block **SNMP Protocol**.
 4. Configure the parameters in the block **Read/Write Community** or **SNMP3 / Security**. The parameters differ depending on the selected protocol version.
 5. Click **Save**.
- ✓ You have configured the access data for external SNMP requests.

Parameters

Read Community	Enter SNMP access data for the external read-only SNMP access to the device.
Write Community	Enter SNMP access data for the external write SNMP access to the device.
Read/Write user	Enter username and password for the external write SNMP access to the device.
Read/Write user	Enter username and password for the external read-only SNMP access to the device.
Security protocols	Select an authentication protocol and a privacy protocol.

6.6 SNMP: Configuring Trap Managers

As part of the monitoring function, the device can send SNMP traps to the defined IP addresses of the SNMP managers. SNMP traps are messages that are sent from a network device to a central management system when a specific event or condition occurs. SNMP traps are used as a means of notifying network administrators of important events, such as errors or performance issues, allowing them to take corrective action as needed. You can also read out the settings via SNMP Get.



For the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files must be compiled by your SNMP manager tool. You can save the MIB files in the block **MIB File**.

1. Navigate to the page **External APIs**.
 2. Click on the tab **SNMP**.
 3. Select the protocol version in the block **SNMP Protocol**.
 4. Select the location of the table indices in the block **Trap Configuration**: **OID** or **OID plus additional index**.
 5. Configure the parameters in the block **Trap Manager**.
 6. Click **Save**.
- ✓ You have configured the trap managers. If you change the location of table indices, the IP-8i must reboot. Each enabled trap is sent once at startup for initialization.

Parameters

- Version** Select the format version of the SNMP traps.
- IP or Domain Name** Enter the IP address or domain name of the trap receiver.
- Port** Enter the port number.

6.7 Ember+: Configuring Access for Monitoring

As part of the monitoring and remote-control function, the device is capable to be controlled via the Ember+ protocol.

1. Navigate to the page **External APIs**.
 2. Click on the tab **Ember+**.
 3. Configure the parameters in the block **Settings**.
 4. Click **Save**.
- ✓ You have configured the Ember+ access.

Parameters

Mode	Select the mode from the dropdown menu.
Timeout	Enter the value for interval in seconds for a timeout.
Port	Enter the port number for the connection.

6.8 Enabling the REST API

A REST API is a standardized method for software applications to communicate over the internet. It operates based on REST principles, using HTTP requests and responses. The REST API enables seamless integration with other applications. It simplifies control through familiar HTTP methods, offers remote management, and facilitates automation, real-time monitoring, scalability, and extensibility. With help of the REST API, you can automate tasks and efficiently manage your audio codec system.

2wcom's REST API is compliant to Open API 3.0. For more information on Open API 3.0, refer to the official documentation: <https://swagger.io/specification/>

To enable the REST API:

1. Navigate to the page External API.
 2. Select the tab REST API.
 3. Set the switch Enabled to ON.
 4. Click Save.
 5. Download the file `openapi.json` from the page.
- ✓ You have now access to the REST API of the IP-8i. For detailed information for developers, refer to the API documentation: https://download.2wcom.com/general/2WCOM_REST_API.pdf

6.9 NTP: Synchronizing Date and Time

The IP-8i can automatically synchronize its date and time with an external NTP (Network Time Protocol) server. The configurable parameters on this page may differ depending on the activated rights.

NTP

Settings

Synchronization:

Bind to Interface:

IP interface:

QoS DSCP (Differentiated Services Code Point):

Enable expert settings:

NTP Server

1. NTP Server:

2. NTP Server:

3. NTP Server:

4. NTP Server:

Expert Settings

Burst on start:

Minimum polling interval: s

Maximum polling interval: s

Maximum allowed jitter: ms

Modify poll behaviour (polltarget):

Modify sample filter (maxdelaydevratio):

Median filter sample count:

Modify source selection (combinelimit):

Enable logging: (measurements, statistics, tracking)

NTP Quality Settings

RMS Offset: μ s

Skew: PPB

1. Navigate to the page **NTP**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have synchronized the date and time with an external NTP server.

Parameters

Synchronization	Start or stop the synchronization with the NTP server.
Bind to interface	To bind the NTP synchronization to a specific IP interface, set the switch to ON . Select the [data] interface and VLAN.
QoS DSCP	Select the quality of service (QoS). The selected packet will be prioritized.
NTP Quality Rating	Select the quality of the NTP server. Low: Event logging, device time synchronization. Medium: For NTP servers that are accessed through the Internet and are used as External Clock source. High: For Stratum 1 NTP servers that are connected locally and are used as External Clock source. (SPN) For Medium and High settings, NTP will be rated as valid once the clock discipline algorithm has converged to acceptable RMS offset and skew values. For the Low setting, NTP becomes valid much quicker with reduced accuracy, however it will increase over time.
Enable expert settings	Set the switch to ON to show further parameters.
1. NTP Server	Enter the IP address or network name of the first NTP server to be used.
2.-4. NTP Server	Enter the IP addresses or network names of the 2nd, 3rd and 4th NTP servers to be used.

7 Audio over IP Settings

7.1 Setting Up SAP

The IP-8i supports SAP (Session Announcement Protocol) for stream announcement.

Prerequisite: You are logged in as an admin.

To set up the SAP connection:

1. Navigate to the page **SAP**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have set up the SAP connection.

Parameters

Mode	To enable SAP, select the service mode. "Client/Server" is recommended.
Announce interval	Enter the time interval between sending SAP announcement.
Multicast loop	Multicast loop to make the IP-8i receive its own SAP announcements. The default setting is OFF.
Receive address and port	Set the multicast address and port to receive SAP announcements.
Ethernet port	Select the [Data] interface for transmission of SAP announcements in the dropdown menu.
Bandwidth limit	To avoid overhead, set a bandwidth limit for SAP announcements.
Destination address and port	Set the destination multicast address and port for SAP announcements.

7.2 Using an External Clock Source

You can synchronize the IP-8i with an external clock. Precise synchronization of time across devices on a network is critical to avoid audio distortion or loss of quality. By using an external clock source, audio codecs can ensure that they are operating with the same time base, allowing them to maintain a consistent audio stream. By keeping all devices synchronized to an external clock source, audio codecs can ensure that their output remains high-quality and reliable. You can configure 1 main and up to 2 backup clocks.

External clock

<p>Main</p> <p>External Clock Source: <input type="text" value="NTP"/></p> <p>Switch criteria</p> <p>NTP quality rating OK</p> <p>T1: <input type="text" value="30"/> s</p> <p>T2: <input type="text" value="30"/> s</p>	<p>Backup 1</p> <p>External Clock Source: <input type="text" value="1PPS"/></p> <p>Switch criteria</p> <p>1PPS signal present</p> <p>T1: <input type="text" value="30"/> s</p> <p>T2: <input type="text" value="30"/> s</p>	<p>Backup 2</p> <p>External Clock Source: <input type="text" value="none"/></p>
--	---	--

Note:
The device continues to work in free-running mode with the internal clock in case all configured external clock sources fail.

To synchronize the IP-8i with an external clock:

1. Navigate to the page **External Clock**.
 2. Select an external clock source for the main and backup clock sources.
 3. Configure the parameters for the main and backup clock sources.
 4. Configure the switch criteria for the main and backup source. The configurable criteria may vary depending on the selected clock source.
T1 is the delay time for alarm trigger. T2 is the delay time for alarm end.
 5. Click **Save**.
- ✓ The IP-8i is now synchronized with an external clock. You can view the status information of the external clock on the page **Overview**.



In case all configured external clock sources fail, the device will continue to work in free-running mode using the internal clock.

Parameters - PTP

- Domain Number** Enter the domain number.
- PTP Interface** Select the Ethernet interface to use for PTP.
- PTP Unicast** If PTP Unicast is enabled, enter the unicast address.

7.3 Monitoring Audio via Live Listening

Live Listening is a function for audio monitoring via web interface or any web stream client. Live Listening enables you to listen "live" to any of the audio input sources as well as the audio outputs directly over the web interface. The IP-8i is equipped with an adjustable bit rate encoder that can encode the input audio signal in five different formats. You can manually set up the parameters for audio encoding depending on the bandwidth available for data distribution.

Prerequisite: You have already configured the input sources and assigned them to the encoder and decoder.

To set up audio monitoring via Live Listening:

1. Navigate to the page **Live Listening**.
2. Configure the parameters.
3. Set the switch **Activation** to **ON**.
4. Click **Save**.
5. In the banner, select an available audio source from the dropdown menu **Live Source**.



6. To change the playback volume, click the green volume levels.
 7. To start streaming, click the play button.
- ✓ The IP-8i now plays the audio over the web interface.

Parameters

- Port** Enter the port number for streaming.
The URL for Icecast streaming is "IP address of the device:streaming port". The standard port for live streaming is 8000. Example: `http://192.168.12.23:8000`.

Audio over IP Settings

Encoder Format	Select an audio format for streaming.
Audio Mode	Select a stereo or mono audio mode.
Sampling Rate	Select a sampling rate for streaming.
Bitrate	Select a bit rate for the selected audio format quality.

8 System Settings

8.1 Rebooting the Device

To reboot the device:

1. Navigate to the page **Global**.
 2. In the block **Control**, click **Now** in the field **Reboot Device**.
- ✓ The device restarts. After the restart, you will have to log in again.

8.2 Restoring Factory Settings

Restoring the factory settings will delete all configurations that were made by a user except for the IP address of the CTRL interface. This also applies to the access accounts.

To reset the device to factory settings:

1. Navigate to the page **Global**.
 2. In the block **Control**, click **Now** in the field **Load Factory Settings**.
- ✓ You have restored the factory settings.



8.3 Entering Device Information

For better identification of the IP-8i, you can enter device-specific data.

1. Navigate to the page **Global**.
 2. Configure the parameters in the block **System info**.
 3. Click **Save**.
- ✓ The saved information is now displayed in the banner.

Parameters

Name	Enter the name of the device for better reference.
Location	Enter the location of the device.
Description	Enter further important information on the device.

8.4 Setting Up Session Timeout

Session timeout is a security feature that automatically logs out the user after a period of inactivity. You can define the period of inactivity or disable session timeout.

1. Navigate to the page **Global**.
 2. In the field **Session timeout**, enter the value in minutes for the period of inactivity necessary to automatically log out the user. Enter "0" to disable this function.
 3. Click **Save**.
- ✓ You will now be automatically logged out after the set period of inactivity.

8.5 Changing the Title of the Browser Tab

You can change the title of the browser tab to display the information you need for better reference.

1. Navigate to the page **Global**.
 2. In the field **Browser Tab Title**, enter the information you want to display. You can use variables for specific information. Variables will update automatically if the corresponding information changes. View the possible variables by hovering over the input field.
 3. Click **Save**.
- ✓ The title of the browser now displays the configured information.

8.6 Updating the Firmware with a File

There are different ways to update the firmware of your 2wcom device.

You can update the firmware directly via the web interface. For more information see 10.3.1 Checking for Updates.

Alternatively, you can upload ARM firmware stored locally and activate it via the web interface or load a firmware file from a USB stick.

To install a firmware file via the web interface:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop** and select the firmware file you want to upload. Alternatively, you can select a firmware file that was previously uploaded to the **Storage** page.
 3. Click **Upload / Activate** to install the firmware file. This may take a while. Do not interrupt this process.
 4. After a successful activation, follow the prompt to restart the device.
- ✓ After the reboot, the new firmware is active.

To manually install firmware from a USB stick via the LCD menu:

1. Insert a USB stick with the firmware file into the [USB] port.
 2. Use the jog wheel to select **Config menu** → **System** → **Global** → **Update firmware from USB**.
 3. Select the firmware file you want to upload.
 4. Select **Update**. The installation may take a while. Do not interrupt this process.
 5. Select **OK** to reboot the device.
 6. Remove the USB stick from the device.
- ✓ After the reboot, the new firmware is active.

8.7 Activating rights

Some functions of the IP-8i are optional and licensed. To use these functions, you must activate additional rights by uploading a rights file. To receive rights files, please contact your 2wcom sales representative. For more information, see 3.2 Software Rights.

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop**.
 3. Select the rights file (*.2wcom_key) that you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
 5. After a successful upload, follow the prompt to restart the device.
- ✓ The new rights will be active after restart. You can view the current rights in the block **System information**.

8.8 Uploading and Activating an SSL Certificate

An SSL certificate is a digital certificate that provides authentication for a website and enables an encrypted connection.

To upload and activate an SSL certificate:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop**.
 3. Select the SSL certificate file (*.pem) you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
- ✓ You have uploaded an SSL certificate.

8.9 Loading Settings from a File

You can upload a settings file to restore previous settings or copy the settings from another device. You can do this either via the web interface or the LCD menu. You can load the settings either without or including IP settings such as IP addresses and VLANs. This enables you to easily swap out a device. Note that if you load settings including IP via the web interface, you will lose the connection to the device due to the new IP address. For information on how to generate a settings file, see 8.10 Generating and Saving a Settings File.

To load a settings file via the web interface:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop** and select the settings file you want to upload. Alternatively, you can select a previously uploaded or saved file from the internal storage of the device.
 3. Click **Upload / Activate** to install the settings file. The file upload may take a while. Do not interrupt this process.
- ✓ The new settings are now active. If you chose to also load the IP settings, the device now has a new IP address.

To load a settings file via the LCD menu:

1. Insert a USB stick with the settings file into the [USB] port.
 2. Use the jog wheel to select **Config menu** → **System** → **Settings** → **Load from USB** or **Load from USB (incl. IP)**.
 3. Select the settings file you want to upload.
 4. Select **Upload**. The file upload may take a while. Do not interrupt this process.
- ✓ The new settings are now active. If you chose to also load the IP settings, the device now has a new IP address.

8.10 Generating and Saving a Settings File

You can download the current settings and save them as a file either to your local storage or to the internal storage of the IP-8i. You can use this file later to restore the settings or upload it to another device to copy the settings.

1. Navigate to the page **Global**.
 2. In the block **Settings Download**, enter a file name and click **Generate**.
 - A file is being created. This may take a few seconds.
 - The download option with the time and date of file creation appears.
 3. Click **Download**.
 4. Save the file to a location of your choice.
 5. Click **Save**.
- ✓ You have saved settings to a local file. To upload and activate the settings stored locally, see 8.9 Loading Settings from a File.

8.11 System Information

The block **System information** on the page **Global** gives an overview of all general information about the device and the system including the present local date and time, the time of the last boot, the uptime, serial number and software version of the system.

The current version of your IP-8i is the bundle version.

Furthermore, the block includes a list of all available rights for the device. The activated rights are indicated by the green check marks next to them. The rights that are not activated are grayed out.

System information

Present local date and time:	03. February 2026, 09:03:44
Last boot:	03. February 2026, 08:37:29
Uptime:	0 days, 00:26:14
Serial number:	742.000040
▶ Bundle version:	1.02
▶ Codec versions	
HW revision XPS/IF:	1.02 / 1.00
Rights:	8 Channels, Live Listening
Missing rights:	Livewire
Open source acknowledgements:	Link

8.12 Generating and Downloading a Diagnostic Report

In case of any problems or failures, you can generate and download a diagnostic report to send to 2wcom.

To generate and download a diagnostic report:

1. Navigate to the page **Global**.
 2. In the block **Diagnostic Report**, select the time period for which the device captures all activities.
 3. Click **Generate**. A file is being created. This may take a while. Do not interrupt this process.
 - The download option with the time and date of file creation appears.
 4. Click **Download**.
 5. Save the file to a location of your choice.
- ✓ You have generated and downloaded a diagnostic report.

8.13 Uploading a Debug Script

To identify a specific error, you can upload a debug script that you have received from 2wcom. Depending on the expected error, the debug script monitors extra status information and records the incoming data. When the error occurs, the recording stops and a debug.log file is generated which contains all information that 2wcom needs to fix it.

To upload a debug script:

1. Navigate to the page **Global**.
 2. In the block **Debug Report**, click **Browse/Drop file**.
 3. Select the debug script file (*.upd) you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
 5. To start the debugging process, click **Start**. This may take a while. Do not interrupt this process.
 - When an error occurs, the script is automatically stopped. A download link for the debug.log file appears.
 6. To download the debug.log file, click on the link.
 7. Send the file to your 2wcom contact person.
- ✓ 2wcom can now identify the error and determine further action.

8.14 Setting the Time and Date

You can set the time, time zone and date of the internal clock.

1. Navigate to the page **Time**.
 2. In the block **Local time**, select the present time zone in the dropdown menus.
 3. Click **Save**.
 4. In the block **Time and date settings**, enter the current date and time.
 5. Click **Save**.
- ✓ You have set the time and date. The current time and date of the internal clock is shown in the field **Present local date and time**.

8.15 Changing Login Data

The default accounts are a read-only access (Guest account), a full access without a permission to manage the user accounts (Manager account), and a full access (Admin account). The user account

SFTP service is used only for the access from an external SFTP client for uploading audio files and saving them in the internal storage.

Change the login data after the first login to the web interface.

The default login data for the first login are (case sensitive):

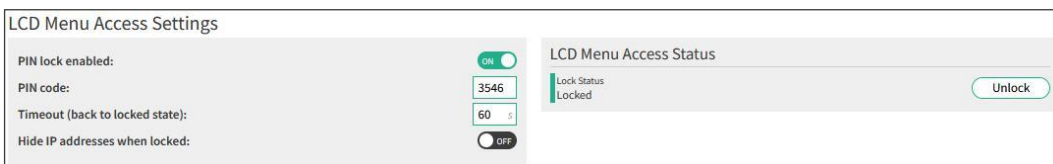
- Guest account: “guest”/ “guest”
- Manager account: “manager”/ “manager”
- Admin account: “admin”/ “admin”
- FTP service: “sftpuser”/ “sftpuser”

To change the login data:

1. Log in as an admin.
 2. Navigate to the page **User** in the section **System Settings**.
 3. In the tab **Login Data** change the login data for an account in the corresponding block and repeat the new password.
 4. Click **Save**.
- ✓ You have changed the login data.

8.16 Setting a PIN Code for the LCD Menu

You can set a PIN code to ensure that only authorized personnel can change any settings through the LCD menu.



To set a PIN code:

1. Navigate to the page **User**.
 2. In the block **LCD Menu Access Settings** in the tab **Login Data**, enable the function **PIN lock enabled**.
 3. Enter a PIN code and the timeout duration after which the LCD menu locks.
 4. Determine whether the IP addresses should be hidden or shown when the LCD menu is locked.
 5. Select **Save**.
- ✓ The LCD menu is now secured by a PIN code. The status of the LCD menu is displayed in the block on the right. To unlock or lock the LCD menu through the web interface, select **Unlock/Lock**.

8.17 Adapting the Access for User Accounts

You can configure the access to certain web interface pages for the manager and guest accounts.

Prerequisite: You are logged in as an admin.

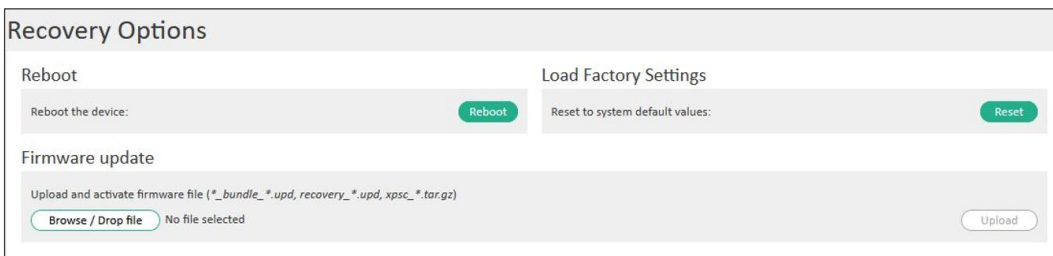
To adapt the access for manager and guest accounts each individual IP-8i menu:

1. Navigate to the page **User**.
 2. Click on the tab **Menu Access**.
 3. Enable or disable the access to the separate menus by setting the corresponding switch to either **ON** or **OFF**.
 4. Click **Save**.
- ✓ The new access configuration is now active.

8.18 Accessing the recovery mode via reset pin hole

If you cannot access the IP-8i via the web interface, you can reboot the device using the reset pin hole. You can also use the reset pin hole to access the recovery mode in which you can flash the device or restore factory settings.

- To restart the device, press the reset button for a second.
1. To access the recovery mode, press the reset button for a few seconds until all LEDs on the front panel turn off and only power LED starts flashing quickly.
 - The device starts in recovery mode.
 2. Access the recovery web interface by entering the IP address of the device into a web browser. In recovery mode, you can upload and activate firmware, reset the system to factory settings or reboot the device.



3. After flashing or resetting the device, reboot the device by clicking **Reboot**.
- ✓ After a few seconds, the device will be ready for operation.

8.19 Setting Up Alarms

You can set several alarms that trigger in case of defined events. You can monitor the following:

AES/EBU No Signal	Alarm is triggered if no decoded digital audio is available in the audio input.
LAN link	Alarm is triggered in case of an error in Ethernet data communication.
NTP clock status	Alarm is triggered if no NTP server is available.
Primary power supply (left)	Alarm is triggered in case of an error in the primary power supply unit.
PTP clock status	Alarm is triggered if PTP signal is not present.
Secondary power supply (right)	Alarm is triggered in case of an error in the secondary power supply unit.
Silence Detection	Alarm is triggered if the device detects silence in the left and/or right channel of the audio output.
Temperature	Alarm is triggered if the device temperature exceeds the configured value.

To set up alarms:

1. Navigate to the page **Alarm**.
 2. For each alarm, configure the corresponding parameters.
 3. Click **Save**.
- ✓ Enabled alarms will now be saved in a log entry and signaled over SNMP, LED or GPO if triggered.

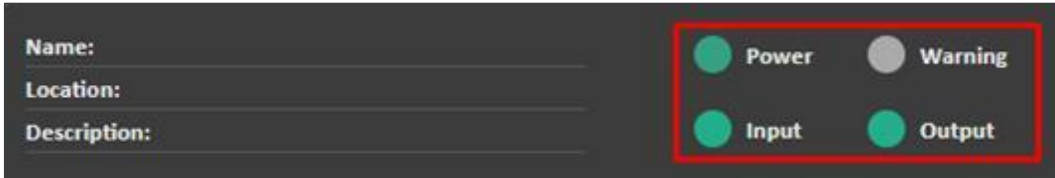
Parameters

Enable	Enable or disable an alarm.
Priority	Select the priority of the alarm message. (see 9.6 Priority of Alarm Messages)
Values	Enter the value below or above which the alarm triggers.
T1	Set the delay time for alarm trigger.
T2	Set the delay time for alarm end.
SNMP, LED, GPO	Enable the corresponding switch if the alarm should be signaled by SNMP traps, an LED or GPO switch. The corresponding GPO must be activated for the source "Alarm" (see 5.6 Configuring GPO Settings).

9 Status Information

9.1 Status LEDs

The IP-8i is equipped with 4 status LEDs on the banner of the web interface that display the status of the inputs, outputs, power supply and alarms.



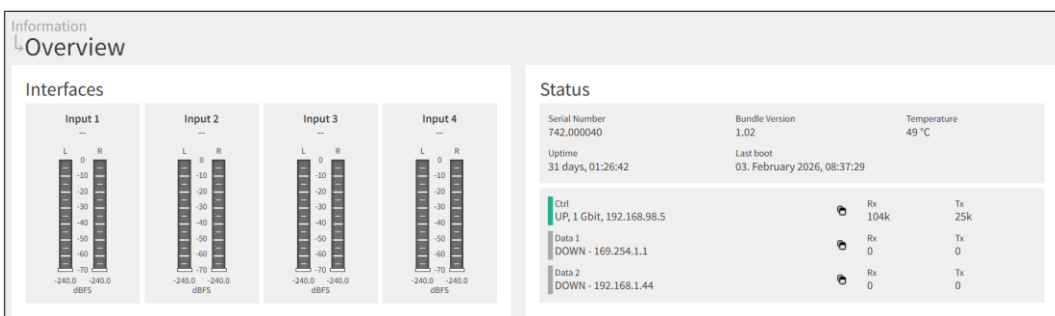
The following table displays the meaning of each LED:

LED	Color	Meaning
Power	●	All supply cords are connected and the power supply is OK.
	● ●	Toggles (green/red) if only one power supply is connected or OK.
Warning	●	LED is off if no alarms are triggered.
	●	At least one alarm is triggered.
Input	●	No input monitoring alarms are enabled.
	●	Input monitoring alarms are enabled and all inputs are OK.
	●	One or more inputs are bad, but at least one is good.
	●	All inputs are bad.
Output	●	This LED is inactive as the IP-8i does not have any outputs.

9.2 General Overview

Overview page

The page **Overview** gives you general information on the status of your IP-8i. The appearance of this page might differ depending on the activated rights, built-in modules and settings.



The audio levels of the inputs and/or outputs are displayed in the left block. To change the threshold above which the bar turns orange, see 5.4 Setting the Critical Level Marker.

The block **Status** gives general device-specific information as well as information on the ethernet interfaces.

The tab **AES67** on the page **Overview** gives a detailed overview on the status of the enabled AES67 outputs.

AES67 Outputs											
No	Multicast IP	Port	Eth	Bitrate	Packets/s	Max size	Receiver Address	Lost	Jitter	Roundtrip time	Fraction Lost
1	239.8.83.1	5004	Data 1	0	0	0					
2	239.8.83.2	5004	Data 1	0	0	0					
3	239.8.83.3	5004	Data 1	0	0	0					
4	239.8.83.4	5004	Data 1	0	0	0					
5	239.8.83.5	5004	Data 1	0	0	300					
6	239.8.83.6	5004	Data 1	0	0	300					
7	239.8.83.7	5004	Data 1	0	0	300					
8	239.8.83.8	5004	Data 1	0	0	300					

9.3 Device Status

The **Device** page gives information on the current status of the hardware.

- The block **Mainboard** displays the voltages on the mainboard and the device temperature.
- The block **Fans** displays the speed of the fans.
- The blocks **Power Supply** display the status and type of the left and right power supplies. The colored bar indicates the status: green – ok, red – no power. If only one power supply module is built in, only one block is displayed on this page.
- The block **Expansion Modules** displays built-in hardware options. If no expansion modules are built in, this block is not shown.

Device Status

Base Components

Mainboard

12V 11.96V	5V 5.01V	3.3V 3.33V	2.5V 2.56V	1.8V 1.80V	1.2V 1.21V	1.0V 1.01V
Temperature 50 °C						

Fans

Fan 1 Speed 420 RPM
Fan 2 Speed 720 RPM

Power Supply 1 (Left)

Type
110/230V AC

Power Supply 2 (Right)

Type
110/230V AC

Expansion Modules

FM/DAB Tuner

Hardware revision 0.20a	Module type EXM12	Part number 0400001980
----------------------------	----------------------	---------------------------

9.4 NTP Status

Navigate to the page **NTP Status** to view the status of the NTP servers used for time synchronization. The first block gives information on the quality of the current synchronization. The IP-8i always uses the best available source. The quality status of the current NTP server synchronization is displayed via a color-coded bar:

- green = the quality is good
- red = at least one of the listed data is bad

NTP Status

NTP Quality Rating

NTP Source
Valid

NTP Time Synchronization Status

Reference ID C1CB03AB (ntp4.lwcom.net)	Ref time (UTC) Wed Sep 06 12:28:18 2023	Stratum 2	Frequency 82.817 ppm slow	Residual Frequency -0.006 ppm	Skew 0.144 ppm	RMS offset 0.000246994 seconds	Last offset -0.000073261 seconds	Leap status Normal
---	--	--------------	------------------------------	----------------------------------	-------------------	-----------------------------------	-------------------------------------	-----------------------

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The list below explains the data that is displayed in this block:

- NTP Source** States whether an NTP source is available.
- Reference ID** The reference ID and IP address of the server to which the computer is currently synchronized.
- Ref time (UTC)** The time (UTC) at which the last measurement from the reference source was processed.
- Stratum** The stratum value indicates how many levels away the NTP server is from the primary reference source. Lower stratum values indicate a closer and more accurate clock source.
- Frequency** The rate by which the clock would be wrong if it were not corrected.
- Residual Frequency** Difference between what should be frequency according to the measurements from the reference source and the frequency that is currently used.
- Skew** The frequency offset to the clock standard.
- RMS Offset** The root-mean-square offset is a long-term average offset to the currently estimated time.
- Last offset** The time (UTC) at which the last measurement from the reference source was processed.
- Leap status** Normal: no leap second.
Insert second: leap second will be inserted at the end of the month.
Delete second: leap second will be deleted at the end of the month.
Not synchronized: unknown status (no valid measurement was made).

The block **NTP Server Status** lists all NTP servers and gives detailed information on them. The status of the NTP server source is displayed via a color-coded bar:

- green = current best
- orange = combined
- red = not combined

NTP Server Status											
NTP Server 1											
Source State	Name/IP address	Stratum	Poll	Reach	LastRt	Measured Offset	Adjusted Offset	Estimated Error	Frequency	Freq. Skew	Standard Deviation
Current best	ntp4.lwcom.net	1	100 s	377	578	-201us	-275us	+/- 2921us	-0.068	0.162	218us
NTP Server 2											
Source State	Name/IP address	Stratum	Poll	Reach	LastRt	Measured Offset	Adjusted Offset	Estimated Error	Frequency	Freq. Skew	Standard Deviation
Not combined	mail.sebi.org	2	100 s	377	577	-792us	-792us	+/- 34ms	-0.180	0.281	141us
NTP Server 3											
Source State	Name/IP address	Stratum	Poll	Reach	LastRt	Measured Offset	Adjusted Offset	Estimated Error	Frequency	Freq. Skew	Standard Deviation
Combined	time.cloudflare.com	3	100 s	377	532	-276us	-276us	+/- 5891us	-0.039	0.255	206us
NTP Server 4											
Source State	Name/IP address	Stratum	Poll	Reach	LastRt	Measured Offset	Adjusted Offset	Estimated Error	Frequency	Freq. Skew	Standard Deviation
Not combined	217.160.114.150	2	100 s	377	171	-2939us	-2939us	+/- 86ms	+0.265	0.448	560us

The list below explains the data that is displayed in this block. For more information, visit chrony.tuxfamily.org/doc/4.1/chronyc.html

- Source State** Current best: the best source which is currently selected for synchronization
Combined: other sources selected for synchronization which are combined with the best source.
Not combined: any other source.
- Name/IP address** The name or the IP address of the source

Stratum	The stratum value indicates how many levels away the NTP server is from the primary reference source. Lower stratum values indicate a closer and more accurate clock source.
Poll	Polling interval, which is the frequency at which the device queries the NTP server for time updates.
Reach	Indicates the reachability of the NTP server. This is a bitmask value that shows how successfully the device has been able to reach and communicate with the server.
LastRx (Last Receive)	Shows how long ago the last good sample was received from the source.
Measured Offset	The measured time difference between the local clock and the NTP server's clock at the time of synchronization.
Adjusted Offset	This value represents the measured offset after any corrections or adjustments have been applied to align the local clock with the NTP server's time.
Estimated Error	The total worst-case timing error accumulated between the stratum 1 server and the client.
Frequency	This is the estimated residual frequency for the server.
Frequency Skew	The frequency offset to the clock standard.
Standard Deviation	This is the estimated sample standard deviation.

9.5 Log

The **event log** is a record of significant system events, such as system restarts and error messages, which are crucial for monitoring the performance of the device. These events have an alarm priority and may require immediate attention or action to resolve issues or ensure proper operation (see also 8.19 Setting Up Alarms).

No	Time	Priority	State	Message
887	2023-09-07 11:06:03	Informational		Successful login as Admin from 192.168.96.90
886	2023-09-06 13:15:14	Informational		Successful login as Admin from 192.168.99.120
885	2023-09-06 08:16:55	Informational		Successful login as Admin from 192.168.99.120
884	2023-09-05 14:07:24	Informational		Successful login as Admin from 192.168.96.90
883	2023-09-05 12:40:30	Informational	●	BNC Input 1: Silence Detection (Ref: 0.0, Level: 5.0 [dBu])
882	2023-09-05 12:40:02	Emergency	●	BNC Input 1: Silence Detection (Ref: 0.0, Level: -11.9 [dBu])

The **extended log** contains less critical information compared to the event log, and is primarily intended to provide insights into general events. The log entries in the extended log are informational and do not carry alarm priorities, they are volatile and do not persist over restarts.

No	Time	Source	Type	Message
54	2023-09-05 16:33:50	Default	RtpRxTimedOut	RTP Rx stream timed out from IP 192.168.101.72:52238, SSRC:0x00000000
53	2023-09-05 16:00:09	Default	RtpUnrecoveredPkt	RTP Rx 1 packet(s) unrecovered (eq. 3ms), 1st missed SEQ:36339
52	2023-09-05 16:00:09	Default	RtpMissedPkt	RTP Rx 1 packet(s) missed, 1st missed SEQ:36339 (from 192.168.101.72:52238)
51	2023-09-05 15:21:27	Default	RtpRxStart	Start RTP Rx from IP 192.168.101.72:52238, SSRC:0x00000000
50	2023-09-05 15:21:27	Default	RtpRxStart	Start RTP Rx from IP, SSRC:0x65ebd7cc
49	2023-09-05 15:21:11	Default	RtpRxTimedOut	RTP Rx stream timed out from IP 192.168.101.72:52238, SSRC:0x00000000
48	2023-09-05 15:21:00	Default	RtpRxStart	Start RTP Rx from IP 192.168.101.72:52238, SSRC:0x00000000

- To automatically refresh the page and immediately see new entries, toggle the switch **Auto Refresh**.
- To sort the log entries, click on the column header of the parameter by which you want to sort the entries. To reverse the order, click the same header again.
- To search for a specific entry, enter a term into the search bar.
- To save the list to a log file, click **Download**.
- To delete all log entries, click **Clear**. Confirm your decision in the dialog window.

9.6 Priority of Alarm Messages

In case of an alarm, an error report with the priority of the error will be sent to the Network Operations Center (NOC). The responsible second-level support will decide by means of this information how urgent the alarming case is and what measures are necessary. The event will be recorded in a log entry.

Priority	ID/Code	Definition
Emergency	0	System is unusable
Alert	1	Actions must be taken immediately
Critical	2	Critical condition
Error	3	Error condition
Warning	4	Warning condition
Notice	5	Normal but significant condition
Informational	6	Informative message
Debug	7	Debug-level message

10 Maintenance and Support

10.1 Maintenance and Disposal

No special maintenance is necessary on the device. Do not use corrosive detergents on the device such as benzene, thinner, alcohol or acetone.

Remove dust on the housing of the device with a soft, dry cloth.

Electrical appliances do not belong in domestic waste. Dispose of the device in an environmentally friendly manner via suitable collection systems in accordance with the local regulations.

10.2 Troubleshooting and Warranty

More often than not, it is only a small detail that has been overlooked and leads to a problem.

Therefore, read the user manual carefully, as this will help you to understand, prevent and eliminate typical problems. Use the following table to self-check common error sources prior to contacting our support.

For information on the warranty of 2wcom products, visit <https://www.2wcom.com/terms-and-conditions/>.

Problem	Possible Causes	Solution
Device does not turn on	<ul style="list-style-type: none"> Power cable is connected improperly Mains supply failure Blown fuse 	<ul style="list-style-type: none"> Check power supply cord. Make sure that the power plug is fully inserted. Check mains supply. Replace fuse by same type.
Device is not accessible via Ethernet	<ul style="list-style-type: none"> Network cable is not connected IP address/TCP port is unknown A device with the same IP address was connected a few minutes before. Thus, the ARP table still assigns the old MAC address to the IP address. 	<ul style="list-style-type: none"> Connect the network cable. Check IP address obtained from DHCP via LCD menu. The operation system refreshes the ARP table every few minutes. For instant access to the device, reset the ARP table of your computer, e.g. by entering <code>arp-d</code> in the Windows command prompt.
Device does not respond		<ul style="list-style-type: none"> Reboot the device. Update the software.

10.3 Support

The section **Support** is located in the lower left corner of the web interface. In this section you can check for updates, manuals and documents and access the 2wcom support center.

Alternatively, you can go to the [2wcom Download Center](#) to check for manuals, documents and firmware bundles of every 2wcom device.

10.3.1 Checking for Updates


You can check for updates and install them, if available. You can also view the release notes and details about the available updates. Additionally, it is possible to download the firmware file to install at a later point in time.

Alternatively, you can upload ARM firmware stored locally and activate it via the web interface or load a firmware file from a USB stick to update the firmware. For more information see 8.6 Updating the Firmware with a File.

To install an available update:

1. In the menu **Support**, click **Check for updates**.
 - The window **Available Firmware Versions** opens.
 2. Select the update you want to install.
 - The dialog window **Firmware Update** opens.
 3. Click **Yes, update now**. The update may take a while. Do not interrupt this process. Since the device reboots during this process, you will be logged out.
- ✓ The firmware is now updated.



In the window **Available Firmware Versions**, firmware bundles that are newer than the currently installed one are marked with ★. Important updates are marked with !. Click **Open** to view the change notes and details about a bundle version. To download a firmware bundle for later installation, click .



In the window **Available Firmware Versions**, you can enable an **automatic update check** every 24 hours. If a new update is available, it will be indicated by the ★ icon next to the **Check for Updates** menu item. You can also enable a notification dialog that informs you of any new updates.

10.3.2 Checking for manuals and documents

You can check which manuals and documents are available for your device.

To show the current version of the manual and other available documents:

1. Click on **Manuals / Documents** in the section **Support**.
 - The window **Manuals / Documents** opens.
 2. Choose a manual or document you want to view.
 - ⓘ The list shows the language the document is written in, the name, date, version and type of the document.
 3. Click **Open** to open the manual or document.
- ✓ You have opened the current version of the manual or another document.

10.3.3 Accessing the support center

Report failures and request support via the 2wcom support center.

For a support request to 2wcom, please have the serial number of the device ready. You can find the serial number of your device on the page **Global** and on the sticker on the rear side of the device: "S/N xxx.xxxxxx".

To access the support center:

1. Click on **Support Center** in the section **Support**.
 - The page **Support** of the 2wcom website opens as a new browser tab.
 2. Click on **2wcom Support Center**.
 - The 2wcom support center opens as a new browser tab.
- ✓ You have accessed the 2wcom support center.

10.4 Manufacturer

2wcom Systems GmbH
Am Sophienhof 8
24941 Flensburg
Germany

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Web www.2wcom.com

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11 Technical Details

11.1 Specifications

11.1.1 Formats and Protocols

11.1.1.1 Audio

Codecs (included)	Linear PCM (AES67)
Sample rates	32, 44.1, 48 kHz

11.1.1.2 Streaming

IP protocols	TCP, UDP unicast, multiple unicast & multicast
Audio over IP formats	RTP (RFC 3550, RFC 3551, RFC 3640, RFC 2250) SMPTE ST 2110 (optional) AES67 based on RAVENNA or Dante RAVENNA (SAP, RTSP, AES67, PTPv2)
Transmission robustness	Dual Streaming

11.1.1.3 Synchronization

Internal	free-running
External	PTP, PTPv2, NTP
Sample rate converter	8:1 (with bypass modes)

11.1.2 Interfaces

11.1.2.1 Audio

Digital (in)	8x AES/EBU, 110 Ω balanced integrated XLR female, shared with analog in (configurable)
Analog (in)	4x L/R, > 10 k Ω balanced integrated XLR female, shared with digital in (configurable)
Analog reference level	+9 dBU max. +18 dBU (input/output)
Digital reference level	-9 dBFS
Adjustable gain	-9 – +6 dB
Dynamic range	16 Bit: > 89 dB; 24 Bit: > 130 dB
Frequency response	Depends on sample rate. For example: 48 kHz: 0.1 dB; 20 Hz – 22.5 kHz

11.1.2.2 Ethernet

Connector	3x RJ45 (1x Control, 2x Data)
Type	Auto-switching 10/100/1000 BASE-T

11.1.2.3 Serial and GPIO

USB	USB 2.0 interface for service, configuration, and firmware updates
GPIO	26 pole D-Sub male; combined connector for inputs (GPI) and outputs (GPO)

11.1.2.4 Internal Storage

Size	7 GB
Type	eMMC

11.1.2.5 Front Panel

Headphone	6.3 mm / 1/4" socket, < 10 Ω
LEDs	Power, Input, Output, Warning
Operation	Display and Jog Wheel
Display	LCD, graphical, 264x64 pixel

11.1.3 General Data

11.1.3.1 Integrated Web GUI

Languages	English
Web technologies	HTML5, Java Script

11.1.3.2 Device

Power consumption	< 20 W
Case dimensions	19", 1 RU, depth: 310 mm, width: 424 mm, front panel: 484 mm
Weight	< 5 kg
Material	Steel plate, aluminum-zinc coated
Operating temp. range	0 – +45 °C
Storage temp. range	-40 – +70 °C

11.1.3.3 Power Supply

Standard AC	1x internal IEC power connector voltage range 90 – 260 VAC (nominal 100 – 240 VAC) frequency range 47 – 63 Hz (nominal 50 – 60 Hz)
Standard DC (optional)	1x internal (Neutrik powerCON) voltage range -40 – -60 VDC (nominal -48 VDC)
Dual internal (optional)	2x internal redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)
Dual hot-plug (optional)	2x hot-swappable redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)

11.2 Interface Pin Layouts

11.2.1 GPIO

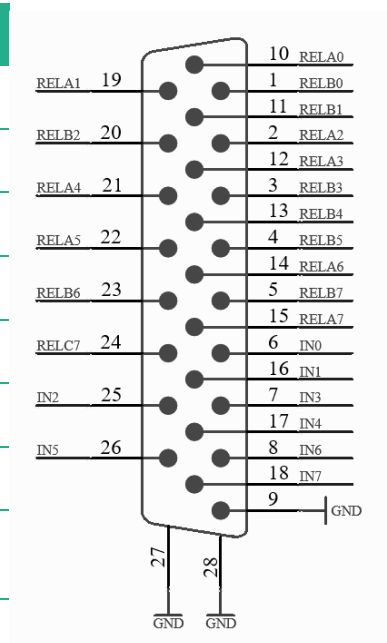
The IP-8i features 8 GPI and 8 GPO contacts that are housed in the same 26-pole D-Sub male connector. The inputs can be used for remote control (in combination with remote control software). The outputs include 7 SPST relays (form A) and 1 SPDT relay (form C) that can be used for alarms of the monitoring function.



The IP-8i only supports the outputs of the GPIO contacts.

The pin layout for GPO is as follows:

GPO No.	Sub-D pin name (pin no.)	Switch type
1	RELA0 (10), RELB0 (1)	SPST, NO
2	RELA1 (19), RELB1 (11)	SPST, NO
3	RELA2 (2), RELB2 (20)	SPST, NO
4	RELA3 (12), RELB3 (3)	SPST, NO
5	RELA4 (21), RELB4 (13)	SPST, NO
6	RELA5 (22), RELB5 (4)	SPST, NO
7	RELA6 (14), RELB6 (23)	SPST, NO
8	RELA7 (15), RELB7 (5), RELC7 (24)	SPDT
-	GND (9)	-



SPST: a simple on/off switch: single pole, single throw

SPDT: single pole, double throw

NO: normally open

NOTICE**Risk of equipment damage!**

- The relay contacts have a maximum load of 0.5 A at 30 V DC. Do not exceed these values.
-

11.3 Certificates and Declarations



EC declaration of conformity

The manufacturer

2wcom Systems GmbH
 Am Sophienhof 8
 24941 Flensburg
 Germany

hereby confirms that the product:

IP-8i

in its conception, construction and form put into circulation is in accordance with all the relevant essential health and safety requirements of the following EC/EU directives as amended and the national laws and regulations adopting these directives:

- Audio/video, information and communication technology equipment - Part 1: Safety requirements EN IEC 62368-1:2021
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low Voltage (LVD) Directive 2014/35/EU
- Radio Equipment Directive (RED) 2014/53/EU
- Restriction of Hazardous Substances (RoHS 2) Directive 2011/65/EU

This EC-declaration of conformity is the result of a test, which was accomplished in accordance with the standards EN 301489-1:2020-06, EN 300422-1:2022-05, EN 300422-2:2017-07, EN 55011:2023-10, EN 55035:2022-06, EN 55032:2022-08, EN IEC 61000-3-2:2023-10, EN 61000-3-3:2023-02, EN 61000-4-2:2009-12, EN 61000-4-3:2021-11, EN 61000-4-4:2013-04, EN 61000-4-5:2021-04, EN 61000-4-6:2014-08, EN 61000-4-11:2021-10, EN 61000-4-16:2016-10, EN 63000:2019-05.

This declaration is no longer valid if the machine is modified without our consent.

2wcom Systems GmbH

March 16, 2026