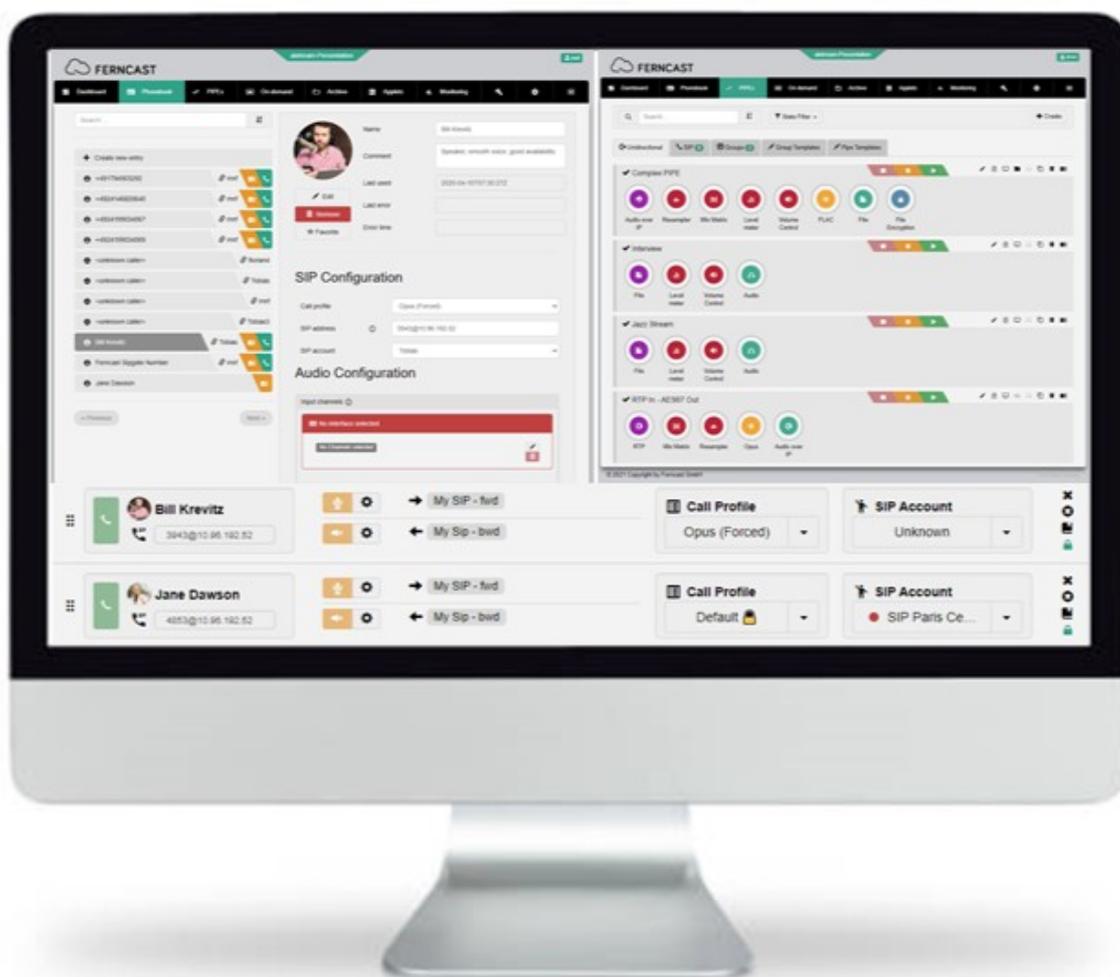


# 

24/7 software solutions for any live audio

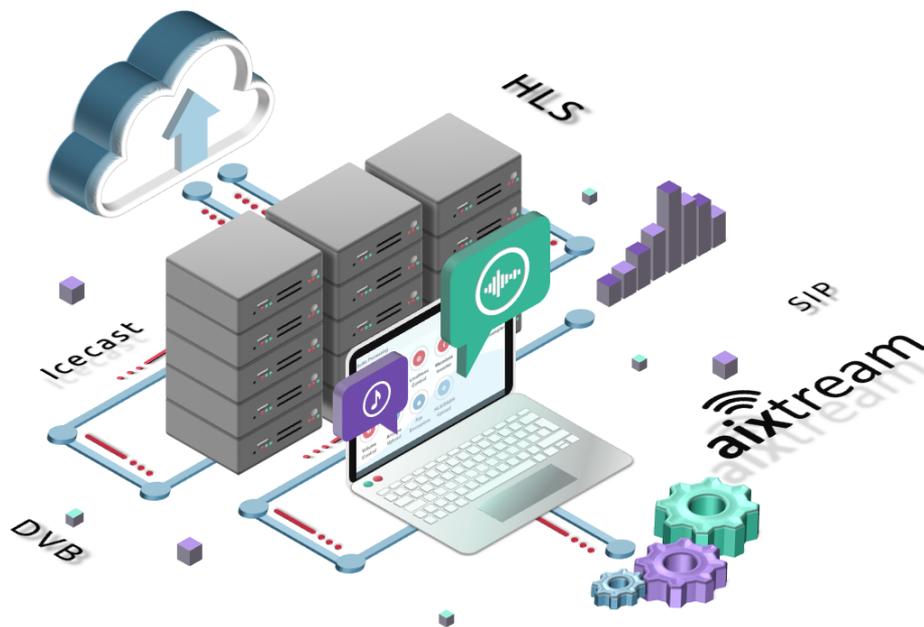


*the future of audio broadcasting & streaming*

# Powered by **aixtream**

## *the future of audio broadcasting & streaming*

The future of broadcast and streaming technology lies in installations using existing hardware, virtual machines and cloud solutions, while proprietary hardware products are becoming less important. For this reason we have developed **aixtream**, a software solution for the control and management of all kinds of audio streaming, transmission and capturing applications.



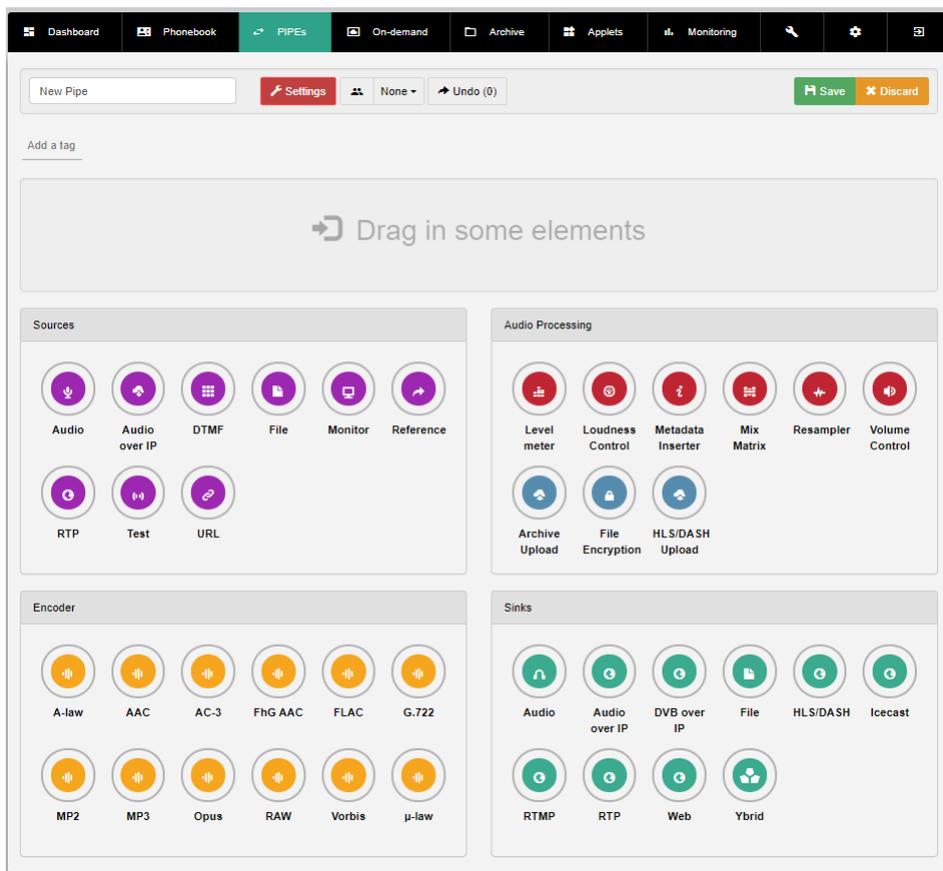
This software is available both **as a full OS installation as well as a virtualized installation and can also be used as cloud solution**. Customers can install aixtream on conventional hardware (anything from a NUC to a rack server) or acquire complete turnkey solutions from Ferncast. It is based on a hardened custom Linux developed by us and therefore offers both maximal security and customizability. Since it is independent of any particular hardware platform, it is **perfectly customizable to your needs and infinitely scalable**.

aixtream meets and exceeds the cutting-edge requirements of large-scale audio streaming use cases, while remaining a flexible solution for all kinds of audio transmissions — including RTP and SIP, OTT online radio streaming, DVB en/transcoding, to podcasting and encrypted audio recording and transmission.

„powered by aixtream" for every application

# The PIPE Concept

Never before was the setup of connection as easy as with the PIPE elements. The user simply adds the desired elements together into the PIPE and the connection is set. The coloration of different PIPE elements ensures clarity and neat organization. The selection of PIPE elements is constantly growing and can always be expanded based on customer requests and feedback.



See the whole selection of options when creating a PIPE!

**A PIPE is fast and easy to configure** (including with touch controls), but is also a very powerful tool. Any audio streaming, recording or processing scenario can be reproduced with it. This includes very specific input/output requirements or complex audio processing workflows, which simply could not be displayed as intuitively with any other configuration concept.

Every PIPE element is part of a pool of elements of the same type. This categorization makes it easy for the user to recognize where to find the elements they are looking for and how they fit together into the final PIPE.

## The PIPE elements



**Sources** include all possible inputs.



**Encoders** are the selection of available codec algorithms.



**Sinks** includes all possible outputs and destinations for the signal.

**Audio Processing** elements handle all other operations, both those happening before and after encoding of the signal.



**Red** elements are audio processing options which take place before encoding.



**Blue** elements are audio processing options which take place after encoding.



## Example applications

### OTT Online Radio Streaming



#### aixtream OTT

*HLS, Icecast, RTMP and Ybrid to the CDN*

OTT (over-the-top) audio web streaming was one of aixtream's first use cases and so it has become one of the premier solutions for this application. Our audio software solutions contain everything you need to get for your internet radio program in all desired formats to all kinds of end points, whether smartphones, kitchen radios or internet browsers. AAC, Ogg and mp3 are supported and even the all-new xHE AAC. We are also especially proud of our certification by nacamar and Akamai.

### DVB Multiplexing



#### aixtream DVB

*MPEG SPTS and MPTS, including muxing and demuxing*

DVB transcoding and multiplexing of audio is still a very common audio streaming and broadcasting application and creating fully DVBcompliant MPEG TS streams is also an option with aixtream. Whether Single Program Transport Streams (SPTS) or Multi-program Transport Streams (MPTS), whether used for an encoding or transcoding device, aixtream offers all the functionality needed to create your MPEG TS from any input. Multiplexing (mux) and demultiplexing (demux) are also fully supported.

## Podcast Creation



### aixtream AOD

#### *Podcast processing with HLS/Dash and CMAF*

Audio-on-demand content, like podcasting and audio libraries, is becoming increasingly popular and even expected by today's listeners and so content creators are encouraged to develop their audio-on-demand content. aixtream enables you to set up your own audio-on-demand processing machine. It can handle every part of the process, from the content ingest and metadata insertion to the upload to the CDN. The user is guided through the configuration every step of the way thanks to a helpful setup wizard.

## Studio Transmitter Link STL



### aixtream STL

#### *Reliable transmission of your audio program to transmitter sites and uplinks*

With its broad support for various inputs and outputs as well as transport protocols, aixtream is also very well-suited to use as a system for monitoring and linking of studios with transmitters and uplinks. Whatever protocols and formats your system works with and whatever format is expected at the transmitter site, aixtream will make sure that your signal arrives safe and sound. The extensive monitoring features ensure that any problems will be detected immediately and allow your personnel to react accordingly.

## SIP Communication — SIP Hub



### aixtream SIP

#### *Bidirectional SIP communication for every job*

AoIP (audio-over-IP) with RTP and SIP calls is a classic broadcasting use case and aixtream is the perfect modern solution for it as well. With its highly scalable number of inputs and outputs, you can be sure that however many streams you need to send or receive, aixtream can handle them. This makes it a perfect choice for both the hub system in a larger network of streams as well as the remote audio contribution. Extensive configuration options and widget support ensure that your connection setup and monitoring is as easy as it could be.

## SIP Services



### Ferncast SIP Services

#### *SIP audio streaming — affordable and professional*

SIP (Session Initiation Protocol) is the best and most comfortable way to handle Audio over IP and Voice over IP. We support you every step of the way with our own SIP server. In addition to the SIP functionality in our software, we provide you with affordable and professional SIP accounts to facilitate your SIP calls and streams. Whether you are a voice actor or sound studio using SIP to simplify IP calls or a broadcaster needing power user features, our SIP services have you covered.

## Answering Machine



### aixtream TAM

*Answering machine for broadcast-level traffic with call processing and logging*

Extensive audio processing, system automatization and audio logging features combine to make aixtream an excellent call management system. The system can be configured for handling incoming calls exactly as your workflow demands, but can also be operated on-the-fly via a custom GUI panel. Callers can be welcomed with prerecorded messages stored on the system, routed to all kinds of other outputs or into an ongoing show. Meanwhile, everything is recorded and logged as per your specifications.

## Audio Logging and Security



### aixtream CAPT

*Reliable audio recording, including advanced logging and backup upload*

Secure audio recording, in-depth event logging and commentating, as well as audio monitoring was the second use case aixtream was originally developed for and this shows itself in many unique features. The inbuilt Log tracks all events in great detail and can be searched and filtered. User management is especially in-depth. This ensures that the chance for user error and unauthorized operation are minimized. Audio files can be encrypted and stored locally or externally via simultaneous upload by rsync, Samba, HTTP or (S)FTP. The saved audio can be swiftly analyzed within the GUI.

## Cloud Services



### aixtream Cloud

#### *Everything aixtream — everywhere*

Cloud solutions for audio streaming and broadcasting are the next frontier. As a software solution, aixtream is uniquely suited to use in the cloud without you having to buy even the tiniest piece of hardware. All the applications you could use aixtream for can be handled directly in the cloud with aixtream on our servers. Besides entirely dispensing with the need for hardware on your premises and the need to integrate a new system into your network, aixtream in the cloud ensures you only ever pay for what you actually use.

## WebRTC Applications



### aixtream RTC

#### *WebRTC streaming for low delay audio to and from browsers and apps*

WebRTC-based audio streaming opens up new possibilities for a wide range of users and use cases. Not every applications makes it possible or convenient to have professional audio streaming hardware in the field or at home. WebRTC with aixtream democratizes audio streaming by allowing everyone with web access to partake in professional audio streaming workflows — from voice actors and announcers working from home, reporters in the field equipped with nothing but a phone to a variety of use cases requiring low-delay monitoring.

## Public Announcement Systems



### aixtream PAS

#### *Audio transmission within established networks in all formats*

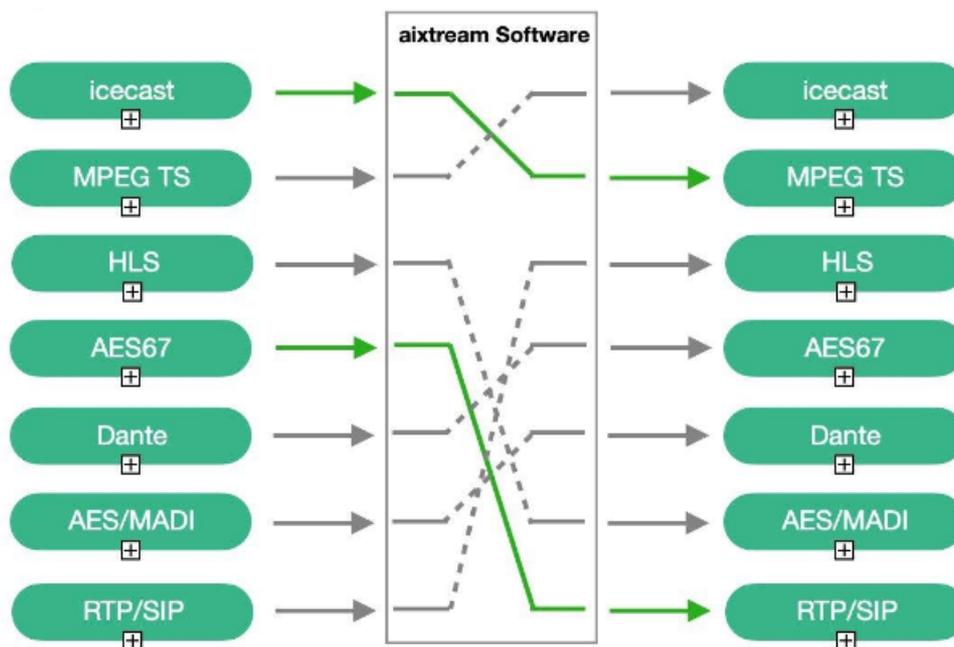
Audio announcements in stadiums, train stations, airports and similar facilities must reliably get from A to B just like in other professional audio applications. Depending on local circumstances a variety of approaches are used to transmit the audio from the input to the speaker systems and this is a situation for which aixtream stands out. Whether RTP streams, SIP calls, HTTP streams or WebRTC inputs, aixtream can handle them all, even when a mix of different methods is required. It also offers admins a handy way to playback pre-recorded messages or tracks on command or automatized.



- ✓ Simple configuration
- ✓ Easy redundancy
- ✓ Intuitive display & UI
- ✓ Swift integration

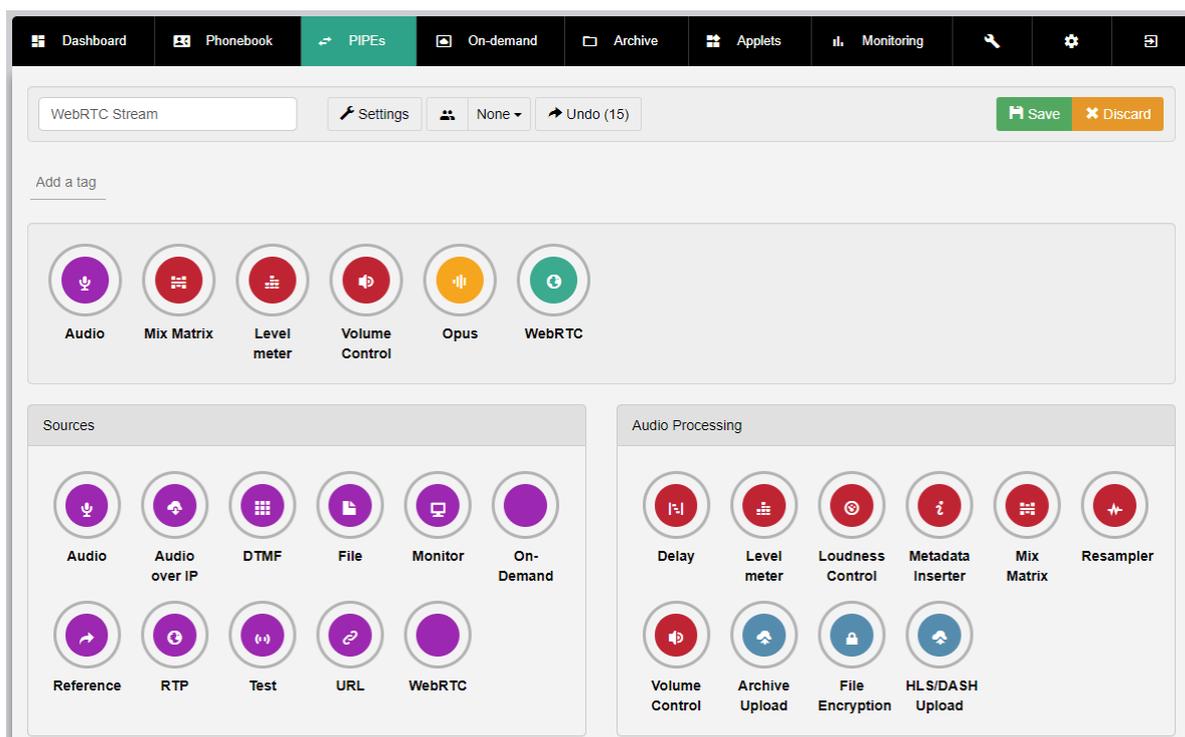
# Advantages for You

- An **infinitely scalable software solution**. No matter whether your application requires one or hundreds of streams, aixtream is the solution for you. It is suited for a Raspberry Pi as much as an HP Proliant server.
- An important part of the aixtream concept is the continuous integration. For you this means **constant improvements and new features**. With aixtream you invest into the future.
- Thanks to its **high scalability** aixtream enables an **unbeatable price-performance ratio**.
- Hardened custom Linux by Ferncast, which meets the **highest security requirements** and can be **adapted to your specific needs**.
- aixtream is available as **full installation** for your hardware platform (as operating system) as well as **for your hypervisors and other virtual machines**.
  - all common platforms for virtualization are supported (e. g. Virtualbox, VMware, ESXi, QEMU, CitrixHypervisor (formerly Xen))
- It offers a **modern, intuitive and user friendly interface**. Setup and administration of audio transmission, recording and backup was never easier. The PIPE concept makes **the configuration of even very complex scenarios easier and faster** than ever.



**Every input to every output without limitations!**

- **Every audio streaming application is supported**, no matter what input you use and what output you want.
  - RTP communication and broadcasting
  - SIP communication and reporting
  - OTT streaming via HLS, Icecast, RTMP
  - DVB transcoding via MPEG TS
  - Audio capturing/recording and logging (incl. encryption)
  - Inputs/Outputs: Analog, AES/EBU, MADI, AES67/Ravenna (Livewire), Dante
- It is **certified and officially supported** by leading Content Delivery Networks (CDNs) like **Akamai, nacamar** (Ybrid), **G&L**, others
- The **software can easily be adapted to specific customer requirements**. New features, widgets, applet scripts and more can be added quickly thanks to our agile development philosophy. With aixtream you maximize the efficiency of your work flows.
- Access via the **REST API simplifies the integration** into existing management systems.
- **aixtream can be expanded as desired even after the initial purchase**, thanks to a flexible licensing model. You are on the safe side, even when the scope of your applications expands later.
- It is **also available as a cloud solution** for even more comfort and ease of audio transmission and handling.



## Additional highlights



### Sound processing for the best quality

Ferncast's background in audio processing cannot be overlooked. Noise reduction, Ferncasts own CLC based on R.128 and other features ensure the administrators and technicians get the processed output that the application requires.



### Adaptive streaming with aistream and suitable CDN

With our coding method we can deliver any required bitrate output to the CDN. No matter the quality the application requires, we use the most advanced encoders for the largest possible reach and the best possible audio quality for your listeners.



### Backup is important

Depending on the particular application scenario, aistream offers a diverse selection of backup features. From a simple internal stream backup to complete system backup over multiple remote locations, everything is possible.



### REST API and SNMP

The aistream solution already offers a great variety of options for monitoring of streams and system state, like the compact overview of system load as well as automatic emails to administrators in case of errors. In addition our REST API and other interfaces allow integration into other monitoring systems



### Ybrid

A new technology developed by nacamar to make the radio Programm more dynamic and comfortable for the listener. For example by providing the listener the option to skip songs - fascinating.

# Technical specifications

## Specifications and features

Modes of installation	<ul style="list-style-type: none"> <li>• full installation as operating system</li> <li>• virtualized installation on hypervisors (guest on other operating systems) and containers <ul style="list-style-type: none"> <li>○ hypervisors (virtual machines) supported: Oracle VM VirtualBox, VMware Workstation, VMware ESXi, QEMU, Citrix Hypervisor (formerly Xen Hypervisor), Docker <ul style="list-style-type: none"> <li>▪ others on request</li> </ul> </li> </ul> </li> </ul>
Operating system	Hardned Linux system, Ferncast custom
Supported hardware systems	Generic, all sizes supported, from NUCs to multi-RU servers
Supported n. of channels	<ul style="list-style-type: none"> <li>• mono</li> <li>• stereo</li> <li>• multichannel</li> </ul> <p>Total number of channels used on a single system can scale to multiple hundred, based on systems performance (CPU and RAM)</p>
Available audio I/O	<ul style="list-style-type: none"> <li>• Analog</li> <li>• Digital (AES/EBU and MADI)</li> <li>• AES67/Ravenna (incl. Livewire)</li> <li>• Dante</li> <li>• RTP (incl. via SIP)</li> <li>• HLS, Icecast, RTMP <ul style="list-style-type: none"> <li>○ Master playlists for HLS</li> </ul> </li> <li>• DVB via MPEG TS <ul style="list-style-type: none"> <li>○ SPTS &amp; MPTS, all ancillary data handling methods supported, automatic channel switchover</li> <li>○ RTP, UDP, ASI out</li> </ul> </li> <li>• WebRTC</li> </ul>
Available network I/O	<ul style="list-style-type: none"> <li>• Ethernet <ul style="list-style-type: none"> <li>○ Data and control separated</li> </ul> </li> <li>• Mobile telecommunication networks</li> </ul>
En/decoder algorithms	<ul style="list-style-type: none"> <li>• MPEG 11172-3 Layer 2, 3</li> <li>• MPEG 13818-3 Layer 2, 3</li> <li>• MPEG 13818-7 AAC LC, LD, ELD, ELDv2</li> <li>• MPEG 14496-3 HE-AAC v1&amp;v2</li> <li>• Fraunhofer xHE AAC</li> <li>• ITU G.711, G.722</li> <li>• Linear PCM</li> <li>• Opus</li> <li>• Dolby AC-3</li> <li>• FLAC</li> </ul>

## Specifications and features

	<ul style="list-style-type: none"> <li>• Vorbis</li> </ul>
Recommended CPU	<ul style="list-style-type: none"> <li>• Smallest applications: i5-7260U</li> <li>• Large-scale streaming or broadcasting: i7 8700 or greater</li> </ul>
Recommended storage size	16 GB or greater
USB input	USB is supported, incl. additional audio and network interfaces connected via USB
Monitoring and management	<p>Integrated</p> <ul style="list-style-type: none"> <li>• Rest API</li> <li>• Smart Control Applets (in UI)</li> <li>• SNMP</li> <li>• Ember+</li> </ul> <p>Third party support</p> <ul style="list-style-type: none"> <li>• Dataminer</li> <li>• BOSS (Dimetis)</li> </ul>
Metadata handling	<p>Metadata insertion standards-compliant based on protocol</p> <ul style="list-style-type: none"> <li>• manual metadata insertion (integrated)</li> <li>• automated insertion via HTTP or UECP</li> </ul>
Other standards and norms	<ul style="list-style-type: none"> <li>• RFCs <ul style="list-style-type: none"> <li>◦ <b>2250</b>, 3016, 3640, <b>3261</b>, 3555, 4961, 6416, <b>6716</b>, 6901, 7064, 7587, <b>8825</b>, and many, many more</li> </ul> </li> <li>• EBU Tech 3326</li> </ul>
Other features	<ul style="list-style-type: none"> <li>• Audio on demand processing (podcasts and more)</li> <li>• Phonebook</li> <li>• Listen-in monitoring</li> <li>• Audio recording and capturing</li> <li>• Audio visualization</li> <li>• File encryption</li> <li>• External file upload <ul style="list-style-type: none"> <li>◦ FTP, SFTP, HTTP, rsync, Samba</li> </ul> </li> <li>• Smart Control Applets <ul style="list-style-type: none"> <li>◦ Automatic email alerts</li> <li>◦ Backup programming</li> <li>◦ Special logging messages</li> </ul> </li> <li>• Extensive user role management</li> <li>• License rental</li> <li>• Interface Bonding and VPN</li> <li>• Online and offline updating</li> </ul>

## Contact

### Want to find us?

Reach out to us to learn more about aixtream! We can even schedule a personal presentation for you and offer demo installation for you to try out.

**Address:** Gallierstraße 41a  
52074 Aachen  
GERMANY

**Website:** <https://www.ferncast.com/>

**Telephone:** +49 241 99034567

**Email:** [info@ferncast.com](mailto:info@ferncast.com)

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