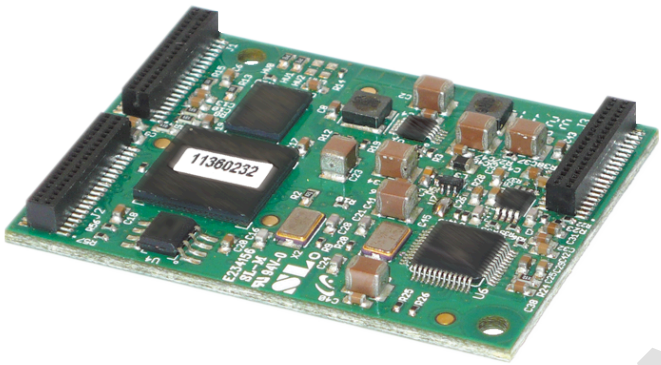

# IP AUDIO MODULE
# 101-102

## Universal audio module with network and serial interfaces



- **IP streaming and control functionality for OEM products**
- **Supports standards such as TCP/IP, RTP, SIP, Multicast**
- **Encodes and decodes PCM, G.711, G.722, Ogg Vorbis, MPEG**
- **2 Serial Interfaces with high speeds, 8 GPIOs**
- **Flash memory & USB interface for data storage**
- **User programmable application firmware**

The Barix IP AUDIO MODULE 102 is a versatile network audio module that encodes and decodes PCM, G.711, G. 722, Ogg Vorbis and MPEG audio. The IPAM 101 model is intended for OEM applications where G.722 and MP3 encoding is not required. Both models enable manufacturers of traditional audio devices to add network capabilities to their products.

Each module is a complete system consisting of CPU, DSP, memory and interface circuitry, providing network and high speed serial interfaces, general purpose I/Os, analog and digital audio interfaces.

For OEM hardware integration a development specification with schematic, pin-out and layout guidelines is available. An IPAM Evaluation Kit, containing a carrier PCB and the IP audio module 102, is available.

Various software packages for standard applications are available for download from the Barix website, optimized for encoding, audio distribution, paging and intercom, including a full featured SIP client.

Custom software can easily be written, based on existing packages from Barix written in the ABCL language.

For low cost applications the Barix IP AUDIO MODULE 300 with reduced set of interfaces and audio decoding capabilities is available.

### Applications

- **Interfacing of audio signals to TCP/IP, web and Internet**
- **Intercom / Paging / Alarm systems**
- **Broadcast equipment**
- **Audio monitoring / distribution / recording (Live audio transmission)**
- **IP Audio Subsystem for integration in paging systems, broadcast equipment, audio monitoring and distribution, alarm systems and digital message repeaters**



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# IP AUDIO MODULE 101-102 - Universal IP Audio Modules

## Technical Specifications

### Electrical

5 VDC (-20% / +10%), 1.6 Watt max.
3 x 40 pin, high density, 0.8 mm spacing, SMT connectors

### Ethernet

Two 10/100 Mbps (auto) Ethernet: primary with built-in PHY, secondary intended for redundancy use (MII only, requiring external PHY), outputs for dual color Link/Activity LEDs

### Audio Interfaces

Mic input 111 $mV_{PP}$ max (with Bias power),
Stereo input 2.2 $V_{PP}$ max, both adjustable in sensitivity
- Frequency response 20 Hz ..20 kHz (-3 dB)*
- Dynamic range 87 dB, SNR -87 dB, THD <0.01% (-3 dBFS)*

Stereo output 3 $V_{PP}$ max, volume, bass and treble adjustable
- Frequency response 20 Hz ..20 kHz (-3dB)*
- Dynamic range 94 dB, SNR -94 dB, THD <0.03%(-3 dBFS)*

$I^2S$ output (Inter-IC Sound)

### Audio formats

| FORMAT | IPAM 101 | | IPAM 102 | |
|---|---|---|---|---|
| | encode | decode | encode | decode |
| PCM | ✓ | ✓ | ✓ | ✓ |
| G.711 | ✓ | ✓ | ✓ | ✓ |
| G.722 | – | – | ✓ | ✓ |
| Ogg Vorbis | – | ✓ | ✓ | ✓ |
| AAC+ | – | ✓ | – | ✓ |
| MP3 | – | ✓ | ✓ | ✓ |

Note:
- AAC+ requires separate licensing by OEM
- MP3, encoding/decoding up to 192/320 kbps
- PCM 16 bit and 8 bit (uLaw, aLaw) @ 8..48 kHz

### Misc. Interfaces

Dual TTL Level UART 300..230'400 Baud asynchronous
Outputs for 2 dual color Ethernet status LEDs, 8 General Purpose I/Os, 1 input for reset button, 1-wire bus, 2 status LED outputs, USB1.1 interface for memory

### CPU / Memory

Integrated CPU / MAC / IO controller with on-chip 256 KB RAM, 2 KB EEPROM for configuration, 2 MB Flash memory for system, application, data and web server content

### Operating System

Embedded, robust OS, IP stack with support for TCP/IP, UDP, RTP, SIP, DHCP, Multicast/IGMP

### User / Application Interfaces

Integrated web server (control/configuration), browser based, serial or Ethernet control interface, programmable software environment

### Mechanical

Weight 14g, 2 mounting holes 2.7mm (for 2.5mm screws)

### Dimensions (W x D x H)

53 x 39 x 8 mm (2.1 x 1.5 x 0.31 inch)

## Environmental / Reliability

### Environment **

Operating conditions -20 to 60°C / -4 to 140°F
Storage conditions -40 to 85°C / -40 to 185°F

**MTBF calculation** (according to MIL217F at 40°C)
IPAM 101 : Min. 900'000 h, IPAM 102 : TBD

## Certifications/compliant with

**RoHS compliant (lead free)**

## Ordering Information

| | |
|---|---|
| **IPAM 101** | **2010.0075** |
| **IPAM 102** | **2011.0078** |

Sold in quantities of 10, 200 and 1000.

| | |
|---|---|
| **IPAM 102 Evaluation Kit** | **2011.9114** |

## IPAM 102 based Barix products

**Exstreamer 500**
**Annuncicom 100, 200, 1000**

For documentation, application notes, available software, tools and related products, please visit www.barix.com

* *depends on used codec, best results @ 48 kHz PCM*

** *0 - 70% relative humidity, non-condensing*



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