

# Exstreamer 500

## PRODUCT MANUAL

**Network audio encoder / decoder with I/O for professional and broadcast applications**

Document version 01.00

Release date 28. June 2012

Hardware Rev. 1.x



# Table of Contents

---

---

## Table of Contents.....iii

### Introduction.....I

About this document .....	I
About the EXSTREAMER 500 .....	I
Hardware features.....	I
Integrated Barix IP Audio Module.....	I
Applications.....	I
Available Firmware.....	I

---

### Hardware.....2

Introduction.....	2
Functional block diagram.....	2
RS-232 Serial Interface.....	2
RS-485 Serial Interface.....	2
Analog Audio Interface.....	2
IP Audio Module.....	2
USB Memory Interface.....	2
Network Interface.....	3
Peripheral I/O Interface.....	3
LED I/O Status Display.....	3
Source Selection.....	3
Power supply.....	3
Software reset button.....	3
LED Status Display.....	3

---

### Connectors.....4

Connector placement.....	4
Front connector.....	4
a) EXT. Connector.....	4
Rear connectors.....	4
A) Connector J1 Pin out.....	4
B) Connector J1 Pin out.....	4
C) Connector J2 Pin out.....	5
D) Connector J4 Pin out.....	5
E) Connector J5.....	5
F) Connector J6 Pin out.....	5
G) Connector J7 Pin out.....	5

---

**Mechanical Information.....6**

Dimensions.....	6
Weight.....	6
Mounting.....	6
19" Rack Mounting.....	6
Space requirements.....	6
Thermal considerations.....	6

---

**Technical data.....7**

CPU's, speed, memory.....	7
Audio processor.....	7
Analog audio input and A/D Conversion.....	7
Analog audio output and D/A Conversion.....	7
Analog audio input and AD Conversion 2.....	7
Serial Interfaces.....	8
Network Interface.....	8
Peripheral I/O Interface.....	8
Power supply.....	8
Reset Button.....	8
Dimensions.....	8
Weight.....	8
Environmental conditions.....	8



## Introduction

---

### About this document

This PRODUCT MANUAL aims at giving insight of detailed technical aspects of the device and complements the information given in the product sheet.

### About the EXSTREAMER 500

The Barix EXSTREAMER 500 is a versatile network device that can function either as an audio encoder or decoder for a variety of high quality audio applications.

The EXSTREAMER 500 features analog stereo inputs and outputs with a 15 dBu voltage range covering both the professional audio and the broadcast requirements.

### Hardware features

The Barix EXSTREAMER 500 features:

- High quality, multi standard audio encoding and decoding in formats: PCM 16bit linear, PCM 8bit logarithmic ( $\mu$ Law / aLaw) , MP3 MPEG 1/2 layer 2 and 3
- 2 KB EEprom for configuration storage
- 1 MB Flash memory for application and web server content
- Analog audio: Balanced Stereo Line In and Line Out
- 10/100Mbit Ethernet port
- RS-232 DSub 9pin male, 300..115200 Baud
- RS-485 screw terminal block, 300..115200 Baud
- USB1.1 interface
- 4 digital inputs (dry contact inputs)
- 4 relays outputs (normally open)
- 2 LED device status indicators
- 4 LED I/O status indicators
- Multifunctional button (Software reset, factory defaults reverting, etc.)
- 1 Height Unit , ½ 19" rack width
- Low weight: 620 g
- Low Power consumption: 8 Watt max.
- Power supply from 24 to 48 VDC  $\pm$ 20%

### Integrated Barix IP Audio Module

The Barix EXSTREAMER 500 houses the Barix IP audio module "IPAM 100".

For technical details on the audio module please refer to the corresponding product sheet and the development specification.

### Applications

The Barix EXSTREAMER 500 is suitable in the following application fields:

- Interfacing of digital or analog audio signals to TCP/IP, web, Intranet and Internet
- Studio Transmitter Link
- Remote Contribution
- Coordination circuit
- IP Audio Distribution over Satellite
- Confidence Checking and Remote Monitoring
- Cable Head End IP Audio Distribution
- Live Feed to Studio
- Realtime audio bridging over IP network
- Transmission of discrete control signals (4 in, 4 out)

### Available Firmware

The Barix EXSTREAMER 500 comes preloaded with the ABCL application "STL" but can also be loaded with different firmware packages (e.g. Instreamer and Streaming Client) featuring:

- Embedded and robust operating system with fully routable IP stack
- IP standard based protocols (TCP/IP, UDP, HTTP, ICMP, SNMP)
- Supports BootP, DHCP, Auto IP and IPzator
- Integrated web server for configuration, control, update and streaming functions
- Fully documented Application Programming Interface (API)
- Highly customizable User Interface (HTML) with development kit
- Special software features in OEM versions on request

Other ABCL applications can be downloaded from the Barix website.

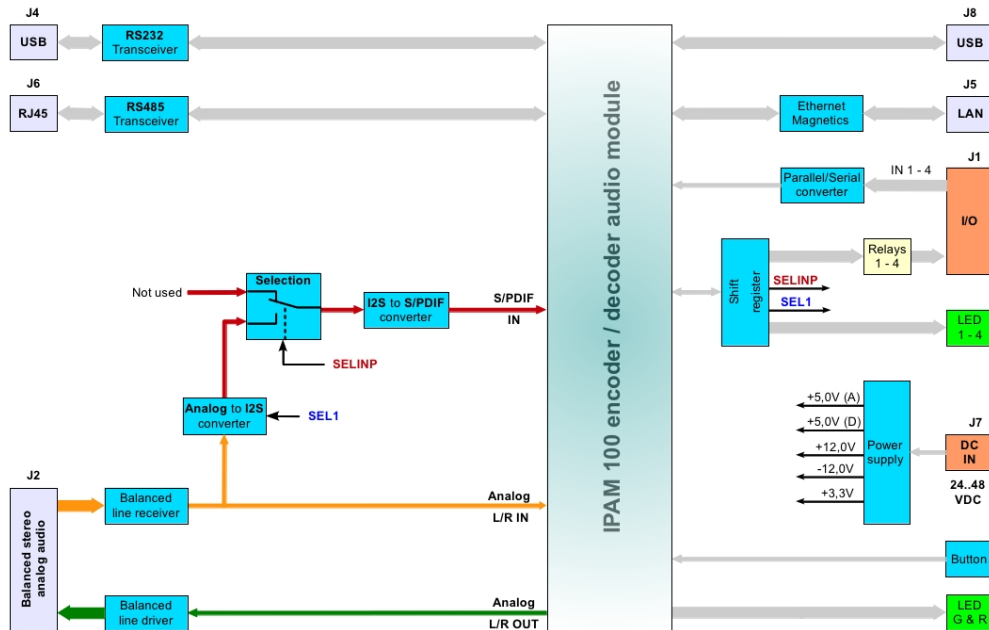
# Hardware

## Introduction

The Barix EXSTREAMER 500 consists of a motherboard with connectors and peripheral circuits supporting the embedded IP audio module "IPAM 100". In this chapter we will explain the functional blocks using the below block diagram starting on the top left and working down each interface to the point where it is connected to the IP audio module. We then do the same from the top right corner.

For the pinout of connectors J1 to J8 please refer to next chapter "Connectors".

## Functional Block diagram



## RS-232 Serial Interface

The connector J4 is a DSub 9pin male connected trough a standard RS-232 serial interface transceiver with the IP Audio module.

The signal lines consist of Data Receive (Rx), Data Transmit (Tx), Ready to Send (RTS), Clear to Send (CTS) and Ground (GND). To power an external device one pin carries + 14.6 Volts sourcing up to 100mA max.

Selectable options are: speed from 300 up to 230400 Baud, 7 or 8 databits, with No, Even or Odd parity, 1 or 2 stopbits, with No, Software (XON/XOFF) or Hardware (RTS/CTS) flow control.

## RS-485 Serial Interface

The connector J6 consist of a socket and a detachable 4 pin screw terminal block plug and is connected trough a standard RS-485 serial interface transceiver with the IP Audio module.

The signal lines consist of Data A (A), Data B (B), Reference (Resistor 100 Ohm to ground) and Shield.

Selectable options are: speed from 300 up to 230400 Baud, 7 or 8 databits, with No, Even or Odd parity, 1 or 2 stopbits.

## Analog Audio Interface

The connector J2 is a DSub 9pin female connected trough a balanced line receiver circuit to the IP Audio Modules analog stereo inputs as well as to the additional Analog to Digital converter (ADC). The IP Audio Modules analog stereo output signals are connected to J2 over balanced line drivers.

## IP Audio Module

The Barix EXSTREAMER 500 houses the Barix IP audio module "IPAM 100" which is used for decoding all sample rates. For the audio conversion at 32 and 48 kHz sampling rates an external, professional grade Analog to Digital converter (ADC) is used and the I2S signal is then fed into the IPAM 100 for encoding. For all other sampling rates the audio signal is converted by the IPAM 100.

## USB Memory Interface

The connector J8 is a standard female USB socket connected directly to the IP Audio Module, intended for plugging in external USB memory sticks.

<b>Network Interface</b>	<p>The connector J5 is a standard RJ-45 socket connected through an Ethernet magnetics circuit to the IP Audio Modules primary network input.</p> <p>This interface is an 10/100 Mbit, full / half duplex, auto negotiation Ethernet interface supporting TCP/IP, UDP, RTP, DHCP and SNMP protocols and providing Barix AutoIP and IPzator features.</p>
<b>Peripheral I/O Interface</b>	<p>The connector J1 consist of two sockets, each with a detachable 6 pin screw terminal block plug.</p> <p>The four inputs are connected through parallel to serial converter circuit with the IP Audio module. These four TTL level inputs are intended to be connected to push buttons or dry-contact closures only.</p> <p>The four outputs are closing relays (normally open) and are connected through a shift register circuit to the IP Audio Module.</p>
<b>LED I/O Status Display</b>	<p>The above mentioned shift register also drives the four I/O status LEDs.</p> <p>These LEDs can be configured to display the states of the four inputs, the states of the four relays or to be driven by a customized BCL application.</p>
<b>Source Selection</b>	<p>The very same shift register also features the signals needed to select the external ADC (SEL1) and to switch the source of the digital audio input (SELINP).</p>
<b>Power supply</b>	<p>The connector J7 consist of a socket and a detachable 2 pin screw terminal block plug allowing for a input power supply range from 24 to 48 VDC <math>\pm 20\%</math>.</p> <p>This input is then fed into several power circuits to provide all internally needed voltages.</p>
<b>Software reset button</b>	<p>The Software reset push button, available on the devices front, is directly connected to the IP Audio Module. Allows for resetting the device (brief push) and reverting to factory defaults (push approx. 10 sec.) as well as additional functions depending on the firmware used.</p>
<b>LED Status Display</b>	<p>The green and red status LEDs are directly connected to the IP Audio Module.</p>

# Connectors

## Connector placement

For connector placement please refer to the below photograph of the devices front and rear side.



## Front connector

a

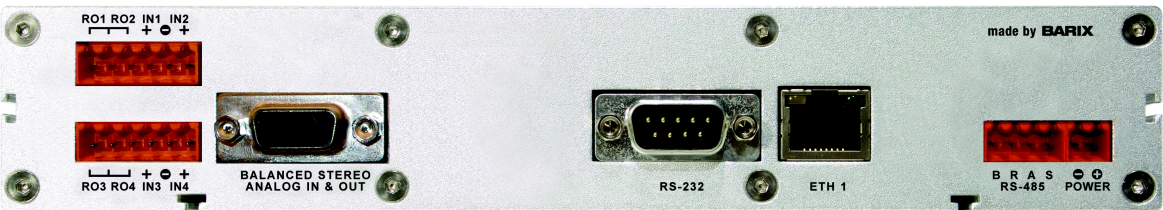
## a) EXT. Connector

Extension port (Standard USB Type A socket)

Memory extension port for use with Standard USB memory sticks



A



## Rear connectors

B

C

D

E

F

G

## A) Connector J1 Pin out

I/O 1&2 (6 pin screw terminal block plug)

Pin	Description
1	Output Relay 1
2	Common Relay 1 & 2
3	Output Relay 2
4	Input 1
5	Ground (-) Input 1&2
6	Input 2

1 2 3 4 5 6



## B) Connector J1 Pin out

I/O 1&2 (6 pin screw terminal block plug)

Pin	Description
1	Output Relay 3
2	Common Relay 3 & 4
3	Output Relay 4
4	Input 3
5	Ground (-) Input 3&4
6	Input 4

1 2 3 4 5 6



**C) Connector J2**  
**Pin out**

**Analog audio In & Out** (DSub 9 pin female)

5 4 3 2 1  
9 8 7 6

Pin	Description
1	Left Out+ [Hot]
2	Left Out- [Cold]
3	Ground [G]
4	Right In+ [Hot]
5	Right In- [Cold]
6	Right Out+ [Hot]
7	Right Out- [Cold]
8	Left In+ [Hot]
9	Left In- [Cold]



**D) Connector J4**  
**Pin out**

**RS-232 serial port** (DSub 9 pin male)

5 4 3 2 1  
9 8 7 6

Pin	Description
1	Not connected
2	Receive Data [Rx D]
3	Transmit Data [Tx D]
4	V+ 14.6V, 100mA max
5	Ground [GND]
6	Not connected
7	Ready to Send [RTS]
8	Clear to Send [CTS]
9	Not connected



**E) Connector J5**

**LAN port 10/100** (RJ-45 socket)

Standard Ethernet pinout



**F) Connector J6**  
**Pin out**

**RS-485 bus** (4 pin screw terminal block plug)

1 2 3 4

Pin	Description
1	485 B
2	Reference *
3	485 A
4	Shield



\*The reference pin is connected via 100 Ohm to the internal ground !

**G) Connector J7**  
**Pin out**

**Power** (4 pin screw terminal block plug)

1 2

Pin	Description
1	Vin -
2	Vin+ 24..48VDC ±20%



## Mechanical Information

---

### Dimensions

The Barix EXSTREAMER 500 aluminum enclosure measures 216 x 38 x 125 mm (Width, Height, Depth) / 8½" x 1½" x 5". The three D-sub 9 pin connectors stand out approximately 5 mm (Audio) and 6 mm / ¼" (RS-232) and therefore increase the overall depth to 131mm / 5¼".

### Weight

The Barix EXSTREAMER 500 weighs only 620 grams / 21.87 oz. (without any cables).

### Mounting

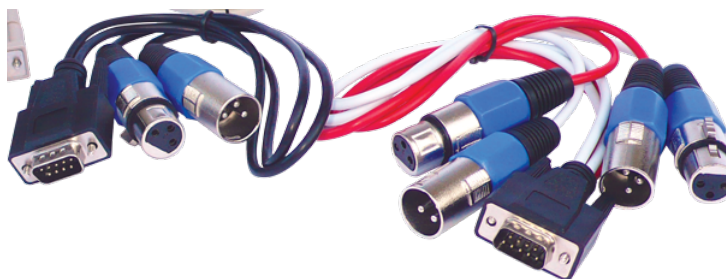
The Barix EXSTREAMER 500 features two T-shaped slots (see detail A in rear plate drawing) on the bottom and a slot on the left and right side each, which can be used for mechanical fixation.

### 19" Rack Mounting

The Barix EXSTREAMER 500 has a standard rack height unit (1 HU) and a half 19" rack width and features T-shaped slots which can be used for mechanical fixation. The Barix "Rack Mount" (sold separately) can be used for mounting up to two devices. See separate product sheet for details.

### Space requirements

Using the Barix Y-Cables (analog and/or digital) from the Barix "Cable Set XLR" (sold separately, see photo below) one has to plan for a total depth of 200 mm / 8" to accommodate the connector(s) and a sufficient bending radius for the Y-cable(s).



### Thermal considerations

The Barix EXSTREAMER 500 is a low power consumption device (8W max.) with an operating temperature range of 32 ~ 104° F / 0 ~ 40° C.

Nevertheless an adequate space around the enclosure is needed to allow for sufficient air flow in order to prevent overheating, especially when mounted in racks with higher power consumption devices or in a high temperature environment.

## Technical data

### CPU's, speed, memory

Lantronix DSTni-EX, 12-125MHz clock software selectable, 256 KB zero wait state static RAM, 1MB Flash ROM (approximately 700KB available for user data), 2KB EEprom for configuration

### Audio processor

Micronas MAS3587F Encoding features:

- PCM 16bit linear @ 8 to 48 kHz sampling rate
- PCM 8bit logarithmic ( $\mu$ Law / aLaw) @ 8 to 48 kHz sampling rate
- MP3 MPEG1 Layer 3 (32, 44.1 and 48 kHz) VBR (variable bit rate 65..192 kbps)
- MP3 MPEG2 Layer 3 (16, 22.05 and 24 kHz) VBR (variable bit rate 35..168 kbps)

Micronas MAS3587F Decoding features:

- PCM 16bit linear @ 8 to 48 kHz sampling rate
- PCM 8bit logarithmic ( $\mu$ Law / aLaw) @ 8 to 48 kHz sampling rate
- MP3 MPEG 1/2 layer 2 and 3, CBR +VBR (constant and variable bit rate 32..320 kbps)

### Analog audio input and A/D Conversion

Audio input path and A/D conversion (Micronas MAS3587F) typical values:

Parameter	Value	Unit
Analog input clipping level (at input gain 0 dB)*	12.32 15	Vpp dBu
Analog input clipping level (at input gain -3 dB)*	17.40 18	Vpp dBu
Analog input impedance (differential)	18	k $\Omega$
Frequency response (-3dB) @44.1 kHz sample rate PCM	9.. 21.4	Hz kHz
Analog line input signal-to-noise ratio (SNR)	-71.5	dB
Dynamic Range	71.5	dB
Input Total Harmonic Distortion (THD @ -3dBFS)	0.033	%
Interchannel Isolation (Stereo Cross Talk)	-77.4	dB

\* Software selectable input gain from -3db to +19.5dB in 1.5 dB steps.

### Analog audio output and D/A Conversion

Audio output path and D/A conversion (Micronas MAS3587F) typical values:

Parameter	Value	Unit
Full Scale Output Voltage (Peak-to-peak) with Volume set to 100%	12.32 15	Vpp dBu
Analog output impedance	40..60	$\Omega$
Frequency response (-3dB) @ 48 kHz sample rate PCM	12.. 24	Hz kHz
Output signal-to-noise ratio (SNR)	-92.3	dB
Dynamic Range	95.1	dB
Output Total Harmonic Distortion (THD @ -3dBFS)	0.0067	%
Interchannel Isolation (Stereo Cross Talk)	-90.7	dB

### Analog audio input and AD Conversion 2

Audio input path and alternative A/D conversion (TI / Burr-Brown PCM1807-PW A/D Converter) typical values:

Parameter	Value	Unit
Analog input clipping level	12.32 15	Vpp dBu
Analog input impedance (Zin)	18	k $\Omega$
Frequency response (-3dB) @ 48 kHz sample rate	4.. 22.9	Hz kHz
Analog line input signal-to-noise ratio (SNR)	-100.6	dB
Dynamic Range	100.6	dB
Input Total Harmonic Distortion (THD @ -3dBFS)	0.0067	%
Interchannel Isolation (Stereo Cross Talk)	-99.1	dB

## Serial Interfaces

Standard RS-232 and RS-485 serial interfaces:

Parameter	RS-232	RS-485
Signals	RxD, TxD, RTS, CTS, GND	A, B, Reference, Shield
Baud rates	300 .. 230400	300 .. 230400
Data bits	7 or 8	7 or 8
Parity	No, Even, Odd	No, Even, Odd
Stop bits	1 or 2	1 or 2
Flow control	No, XON/XOFF, RTS/CTS	No, XON/XOFF, RTS/CTS
Power for external devices	+ 14.6 V 100mA max.	-

## Network Interface

Standard Ethernet network interface, RJ-45 socket. 10/100 Mbit, full / half duplex, auto negotiation.

## Peripheral I/O Interface

The four inputs are TTL level dry-contact closures inputs (pull-up to 5V by 10 K-Ohm).

The four outputs are closing relays (normally open), rated 24 V 0.5 A.

## Power supply

Power supply input range from 24 to 48 VDC  $\pm 20\%$  with a maximal consumption of 8 Watts.

## Reset Button

The Reset push button, available on the front, allows for resetting the device (brief push) and reverting to factory defaults (push approx. 10 sec.)

## Dimensions

216 x 38 x 125 mm (Width, Height, Depth) / 8½" x 1½" x 5".

The three D-sub 9 pin connectors stand out and increase the overall depth to 131mm / 5¼".

## Weight

620 grams / 21.87 oz. (without any cables).

## Environmental conditions

32 ~ 104° F / 0 ~ 40° C, < 70% relative humidity (non-condensing)



© 2012 Barix AG, Zürich, Switzerland.

All rights reserved.

All trademarks belong to their respective owners and are used for reference only.

Barix and Barix IP Audio Module are trademarks of Barix AG, Switzerland and are registered in certain countries.

Newest information about our devices is available via download from our website, [www.barix.com](http://www.barix.com).

We explicitly reserve the right to change and improve the product without notice.

Barix AG  
Seefeldstrasse 303  
8008 Zürich  
SWITZERLAND

T +41 43 433 22 11

F +41 44 274 28 49

[www.barix.com](http://www.barix.com)

[sales@barix.com](mailto:sales@barix.com)

[support@barix.com](mailto:support@barix.com)