audiofetch

System Datasheet

AudioFetch 16-channel Audio Processing Box (APB)

The AudioFetch system delivers high-quality low-latency audio from multiple TVs, STBs, and other audio sources via WiFi to personal mobile devices such as smartphones and tablets.

Ideal for personalized audio listening experience in fitness clubs, sports bars, movie theaters, waiting rooms, meetings, conventions or wherever users need convenient access to one or more in-house audio sources.

Features

System options from 4 to 132 channels

Low audio latency ≈ 115ms

Compatible with most WiFi networks

Plug-n-Play installation
  Optional configuration via Web Browser

Compatible with multiple audio sources:
  Analog   Digital Coax   Digital Optical

Users download AudioFetch App at iTunes® or Google Play® stores
  App selects channel/source and plays audio in-sync with the video

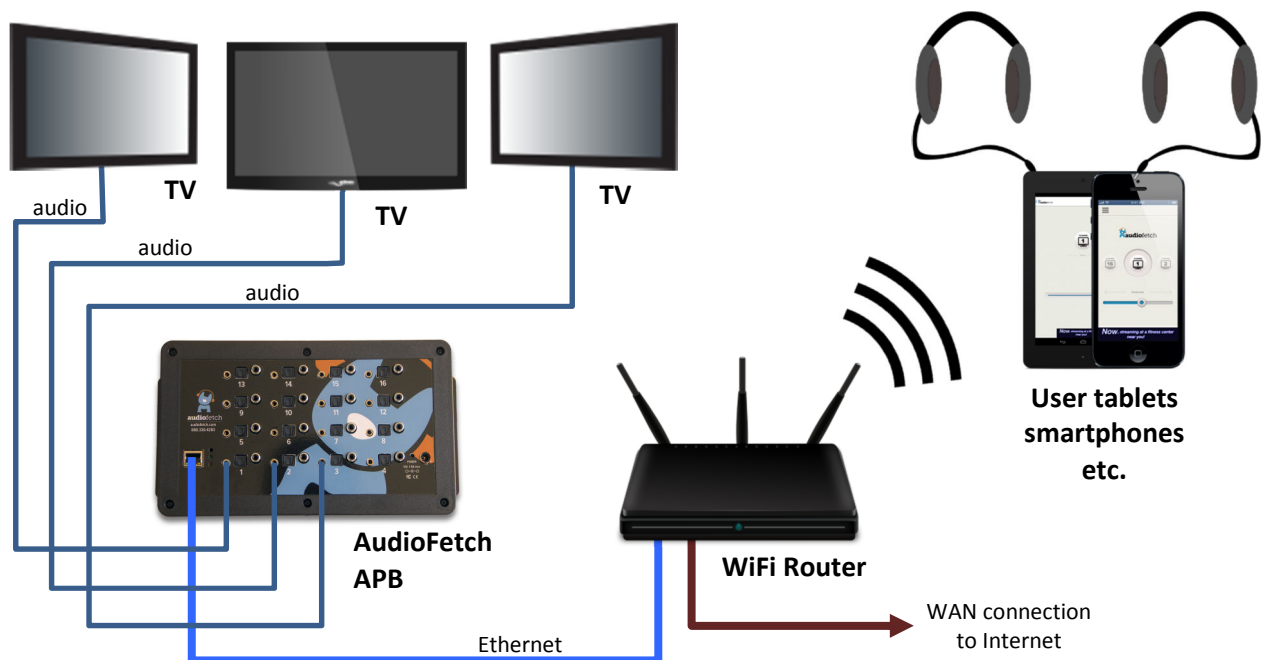Up to 250 simultaneous users (each APB), negligible latency impact
  No upgrades required – 250 streams capability is standard

Small installation footprint with simple cabling and flexible mounting

Optional 2nd Ethernet port for enhanced configuration security

Independent audio gain adjustments for each channel

Typical Application for fitness club or sports bar   (simplified network)

TV

TV

TV

audio

audio

audio

AudioFetch APB

Ethernet

WiFi Router

WAN connection to Internet

User tablets smartphones etc.

Typical Installation

1. Install AudioFetch APB in desired location
   a. Preferably near to AC outlet for connecting the AudioFetch power adapter
   b. Small light-weight enclosure mounts easily to walls, ceilings, racks, etc.
2. Connect audio sources (TVs, etc.) to APB audio inputs – one source per APB channel
   a. Audio signals/cabling can be: analog, digital coax, or digital optical
3. Connect APB to existing LAN with an Ethernet cable
   a. LAN must include a WiFi Access Point (to which users' mobile devices will connect)
   b. LAN should include Internet access (for users to download AudioFetch App, email access, etc.)
   c. APB's Ethernet connection is 10Base-T / 100Base-TX compatible
   d. LAN's Ethernet port should operate at 100Base-TX speed to support minimum latency
4. Connect APB to AC power using the supplied power adapter
5. On mobile devices:
   a. Connect to the WiFi Access Point
   b. Go to iTunes® or Google Play® store and download/install the free AudioFetch app
   c. Start the AudioFetch app and swipe to select the desired audio channel
   d. Enjoy the personal listening experience provided by the AudioFetch system!
6. Optional custom configuration of the system can be accomplished through web-based configuration pages:
   a. Run the AudioFetch APB Discovery Utility on a Windows® PC – this will display a list of connected APBs available for configuration
   b. Click the "Connect" button next to the APB you wish to configure
   c. A web browser will open requesting login credentials
   d. Log in to access the configuration pages

Specifications

EXTERNAL CONNECTORS	
DC POWER	Connect only the supplied AudioFetch power adapter

Audio Inputs (Three options for each channel)	Source is auto-detected/selected with this order of priority if multiple cables accidentally plugged in to a single channel:
	    TOSLINK connector for digital optical
	    RCA connector for digital coax
	    3.5mm Stereo connector for analog audio

Ethernet	Connect to 100Base-TX compatible Ethernet port on LAN
AVAILABLE APB HARDWARE CONFIGURATIONS	
Number of Channels (Per Chassis)	4, 8, 12, or 16 channel models available (stereo audio)
Optional Models with mono operation (Per Single Chassis)	8, 16, 24, or 32 channel models available, full channel availability only through 3.5mm analog signal input connectors

Multiple APBs connected to LAN	Yes – up to 4 APBs may be connected to a LAN for increased number of channels:
	  Up to 64 channels with standard stereo APB models
	  Up to 128 channels with optional mono APB models
	NOTE: stereo and mono APBs cannot be mixed on the same LAN

Optional 2nd Ethernet Port (Subject to Development Fee)	Available as an option on stereo models with 8 or more channels and on mono models with 16 or more channels - this additional Ethernet port is used to isolate configuration access from the network providing user access for increased system security and stability.

POWER	
DC Power Input on APB	+12VDC 1.2A maximum Use only the provided AudioFetch AC power adapter
AC Power Adapter (provided)	AC Input: 100-240V, 50-60 Hz, .36A DC Output: 12V, 1.5A

AUDIO INPUTS	

Digital Optical Input
    Encoding
    Sample Rates supported
	S/PDIF signal format over fiber-optic TOSLINK cable
	Uncompressed PCM, interleaved stereo
	48KHz

Digital Coax Input
    Input Signal Level
    Input Impedance
    Encoding
    Sample Rates supported
	S/PDIF signal format over coaxial cable
	0.55 Volts P-P typical
	75 Ω
	Uncompressed PCM, interleaved stereo
	48KHz

Analog Input
    Input Signal Level
    Input Impedance
	L/R Stereo Channels into stereo 3.5mm connector, AC-coupled in APB
	2.4 Volts P-P maximum
	12 KΩ typical

Audio Gain Adjustment range
    (applies to Digital and Analog inputs)
	+20 to -100 dB in 0.5 dB steps
	    Independent adjustment for each channel available through web based configuration pages

MONO APB inputs NOTE: Mono-capable APBs are separate models	Each 3.5mm stereo analog connector accepts 2 independent mono signals through a provided adapter. Digital coax/optical connectors are present but shouldn't be used.

AUDIO STREAMING	
Simultaneous connected users (audio-streams) on each APB	250 per channel (maximum)

System Latency – 1 user
System Latency – 250 users
    (time delay between audio input on APB and headphone output on mobile device)
	115ms typical
	120ms typical
	    These are based on minimal delays in the network/WiFi and thus represent sum of latencies in the APB, AudioFetch App, and mobile device Operating System only. Network, WiFi, and mobile device performance can affect latency. Some Android devices have increased latency.

NETWORK INTERFACE	
Ethernet Port	10Base-T or 100Base-TX, half/full duplex, auto-negotiated (LAN equipment should always use 100Base-TX) HP Auto MDI/MDI-X configuration (works with either straight-through or crossover cables)
IP Address	Auto configured via DHCP (default) Can be set to static IP address (using browser-based configuration)
NETWORK PROTOCOLS AND PORTS	
IP version support	IPv4
Protocols and Ports used for APB outgoing traffic	UDP multicast (to addr 239.255.255.50), src:1900, dst:1900 UDP, src:1900, dst:varies (dst port depends on mobile device OS) UDP, src:1900, dst:varies UDP, src:6970, dst:6970 UDP, src: 30981, dst: 30981 TCP, src:80, dst:varies TCP, src:6971, dst:varies
Protocols and Ports used for APB incoming traffic	UDP multicast (from addr 255.255.255. 255), src:30981, dst: 30981 UDP broadcast (from addr 239.255.255.50), src:varies, dst:1900 TCP, src:varies, dst: 80 TCP, src:varies, dst: 6971
Streaming traffic for audio channels	Other than occasional control packets, each audio stream consists of UDP unicast packets outgoing from the APB
NETWORK BANDWIDTH	
Bandwidth consumed by each audio stream (Stereo APBs)	50 UDP packets per second averaging 201 bytes each (includes the IP header but not physical layer header) Therefore, UDP (+ IP header) bandwidth is: 4020 bytes/sec (average) for each audio stream Discovery and keep-alive control traffic is negligible compared to this
Bandwidth consumed by each audio stream (MONO APBs)	50 UDP packets per second averaging 121 bytes each (includes the IP header but not physical layer header) Therefore, UDP (+ IP header) bandwidth is: 2420 bytes/sec (average) for each audio stream Discovery and keep-alive control traffic is negligible