Ayre QA-9

Owner's Manual

Analog-to-Digital Converter

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Ayre

Your Ayre QA-9 offers a significant advance in the musical performance of high-fidelity equipment. The warmth and immediacy of a live performance are apparent from the first listening. The combination of superb resolution and a natural, relaxed quality will draw you into the music, time and time again.

This degree of performance has been implemented using the highest levels of workmanship and materials. You can be assured that the Ayre QA-9 will provide you a lifetime of musical enjoyment.

To our North American customers, please be sure to mail your warranty registration card and photocopy of your original sales receipt within 30 days in order to extend the warranty to five years.

Introduction

The integration of the personal computer (PC) into the home stereo system has provided a revolutionary way to purchase, organize, and play your digital music collection. The Ayre QA-9 analog-to-digital (A/D) converter provides an equally revolutionary way to store and play back your analog music via your PC with unprecedented fidelity and realism.

The QA-9 is available in two versions, both covered in this manual. The standard version include both USB and AES/EBU digital outputs and will meet the requirements of virtually all users. The Pro version adds both DSD and word clock outputs for simplified use in a professional studio environment.

The QA-9 utilizes opto-couplers to provide total electrical isolation for the connections between your computer and music system. This minimizes the introduction of unwanted radio-frequency interference (RFI), generated by all computers.

Avoiding the use of wireless networks (e.g., Wi-Fi), by employing wired connections instead, will reduce RFI levels in your home and results in improved sound quality for any music system.

Installation

The Ayre QA-9 is easy to connect and use. The following guidelines will ensure that the installation goes smoothly.

Analog Inputs

The Ayre QA-9 offers balanced inputs. Balanced connections are made via three-pin XLR connectors.
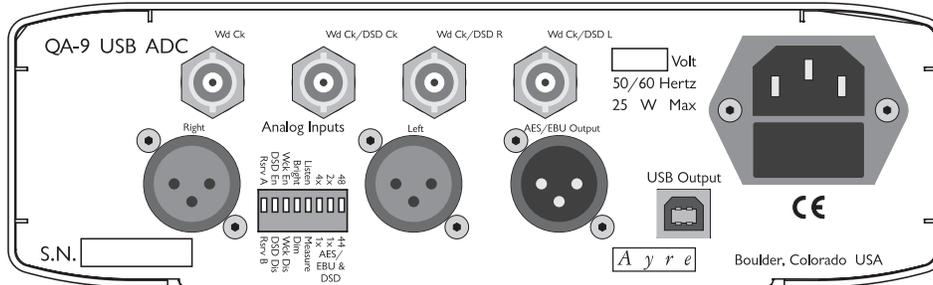
High quality singled-ended-to-balanced adapters are included for single-ended analog sources.

USB Output

Connection via the USB output simplifies operation, as many of the converter settings can be adjusted with your computer's software.

The USB output uses the squarish "B" type connector designed for computer peripheral devices. The rectangular "A" type connector at the other end of the cable is designed to plug directly into the computer itself.

The USB 2.0 standard specifies a maximum cable length of 16 feet (5 meters); It is not recommended to use extenders or hubs with the QA-9.

QA-9 USB ADC

Wd Ck Wd Ck/DSD Ck Wd Ck/DSD R Wd Ck/DSD L

Volt
50/60 Hertz
25 W Max

Right   Analog Inputs   Left   AES/EBU Output

USB Output

Listen
Bright
Wck En
DSD En
Rev A

48
2x
4x

1+1
1x
1x
AES/
EBU &
DSD

Dim
Wck Dis
DSD Dis
Rev B

Measure

S.N.

Ayre

Boulder, Colorado USA

CE

AES/EBU Output

In the case that a USB connection is not available, the QA-9 also incorporates an AES/EBU output for compatibility with other systems. One advantage of the AES/EBU output is that connecting cables in excess of 300 feet (100 meters) may be used.

Your local Ayre dealer can supply high-quality balanced-to-single-ended digital adapters if your system does not accept a balanced XLR digital connection.

When the USB output is active, the AES/EBU output is disabled.

DSD Output (QA-9 Pro only)

The Ayre QA-9 Pro also offers conversion to digital using Sony's single-bit DSD system. Two DSD interface formats are available to ensure compatibility with the widest range of equipment, SDIF-2 (DSD-Raw) and SDIF-3. Both use three transformer-isolated 75 Ω BNC connectors (Word Clock, Bit Clock, Left Data, Right Data).

Word Clock Outputs (QA-9 Pro only)

Digital studio equipment with word clock inputs can be slaved to the QA-9 Pro with 75 Ω coaxial cable(s). The transformer-isolated BNC connectors present TTL-level signals derived directly from the ultra-low jitter master clock inside the converter.

⚠ **There are no standards for external word clock signals. Contact Ayre for support with compatibility.**

AC Power

The QA-9 may be plugged directly into an unswitched wall outlet. Although proprietary RFI (radio-frequency interference) filtering is built into the QA-9 A/D, in some situations an AC power-line filter (such as those offered by Ayre) may provide additional sonic benefits.

💡 As virtually all computers use switch-mode power supplies that introduce unwanted RFI on the AC power line, it may be beneficial to use an AC power line filter for the computer and its accessories (e.g., display monitor), many of which also utilize switch-mode power supplies.

Break-In

100 to 500 hours of music played through the system will ensure full break-in.

Due to the manufacturing processes used for the printed circuit boards, wires, and capacitors, a break-in period is necessary for the QA-9 A/D converter to reach its full performance potential.

Configuring the Computer

No matter what operating system (OS) your computer uses — Apple, Windows, or Linux — you'll need to set up your computer with the appropriate software.

Transferring analog sources is easiest with archiving software such as Vinyl Studio (Apple and Windows), Pure Vinyl (Apple), or Amarra (Apple). Creating new digital music files is easiest with recording software such as Audacity (Apple, Windows, and Linux), ProTools (Apple and Windows), or Audition (Apple and Windows).

Additional information on setting up your computer for use with the QA-9 and QA-9 Pro A/D is available at the Ayre website:

www.ayre.com/usb.htm

Customization

While the Ayre QA-9 A/D is typically configured with your recording software via the USB connection, the AES/EBU settings and other options are configured with small toggle switches accessible on the rear of the unit.
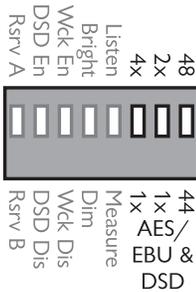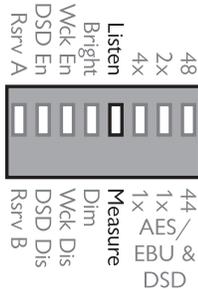
AES/EBU Sample Rate

The AES/EBU output sample rate can be configured as detailed in the table below:

4x/1x	2x/1x	48/44	Sample Rate
Down	Down	Down	44.1 kHz
Down	Down	Up	48.0 kHz
Down	Up	Down	88.2 kHz
Down	Up	Up	96.0 kHz
Up	Don't Care	Down	176 kHz
Up	Don't Care	Up	192 kHz

⚠ **The AES/EBU output is only active when there is no USB connection.**

8

Rsrv A
DSD En
Wck En
Bright
Listen
48
2x
4x

Rsrv B
DSD Dis
Wck Dis
Dim
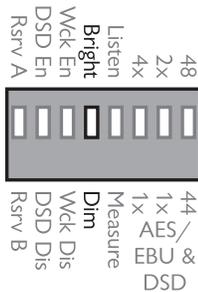**Measure**
44
1x
1x AES/ EBU & DSD

Digital Filter

The digital filter used in the PCM encoding of the Ayre QA-9 features two user-selectable algorithms. One algorithm produces greater accuracy in the time domain and is labeled "Listen". The other algorithm produces greater accuracy in the frequency domain and is labeled "Measure".

Normally the selector switch is set to the **"Listen"** position when listening to music. However some listeners may prefer the additional high-frequency energy provided by the **"Measure"** position.

This setting applies to both the USB and AES/EBU outputs.

Rsrv A
DSD En
Wck En
Bright
Listen
48
2x
4x

Rsrv B
DSD Dis
Wck Dis
Dim
Measure
44
1x
1x AES/ EBU & DSD

Display Brightness

The front panel display of the QA-9 has two brightness levels. The switch position labeled "Bright" will make the display readable in all conditions. Setting the switch to the position labeled "Dim" may be desirable for low-light conditions.

Word Clock Outputs (QA-9 Pro only)
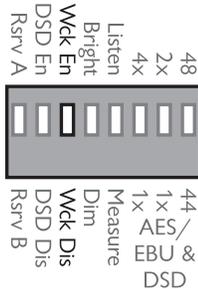
To enable the word clock outputs at the rate indicated on the front panel display, set the switch to the position labeled "WCk En". Switch position "WCk Dis" will turn all the word clock outputs off.
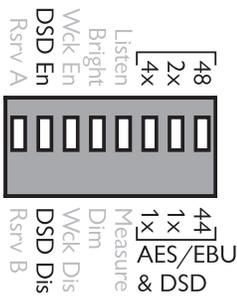
DSD Output (QA-9 Pro only)

Three of the BNC output connectors can be configured to output digital audio data in the professional SDIF-2 or SDIF-3 DSD format. To enable the 3-wire DSD output set the switch to "DSD En".

Enabling he DSD output overrides the word clock output settings for the three shared BNC connectors and forces the fourth to 44.1 kHz.

The front panel display will indicate "DSD" mode with a red LED to the left of the numeric display. The numeric display will then indicate the DSD output rate, e.g., "128" (signifying the multiple of the 44.1 kHz CD rate), as set by the three sample rate selection switches in the table below:

4x/1x	2x/1x	48/44	Rate (x Fs)	Format
Down	Down	Down	64	SDIF-2
Down	Down	Up	64	SDIF-3
Down	Up	Down	128	SDIF-2
Don't Care	Up	Up	128	SDIF-3
Up	Don't Care	Down	256	SDIF-2

SDIF-3 is not available at 256x.

Operation

The Ayre QA-9 A/D uses a zero-feedback, variable-gain analog circuit to adapt to a wide range of input signal levels. This allows the full dynamic range of the analog source to be realized in the digital recording.
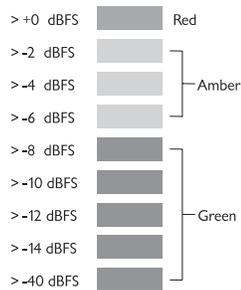
> Adjustment of the analog input sensitivity is only available via the front panel knob.

2.0 dB Steps

Gain Adjustment (Input Sensitivity)

The front panel knob is used to adjust the input sensitivity. Twelve levels, each having a step size of 2.0 dB, are provided. The input sensitivity will need to be set separately for each analog source.

> +0 dBFS	Red
> -2 dBFS	
> -4 dBFS	Amber
> -6 dBFS	
> -8 dBFS	
> -10 dBFS	
> -12 dBFS	Green
> -14 dBFS	
> -40 dBFS	

The color-coded front panel bar-graph displays how much of the available digital range is being used. The uppermost segment is red and indicates that clipping has occurred (with a display hold time of ten seconds).

⚠ **It is recommended to set the audio level prior to recording by playing a loud passage from the analog source. Adjust the QA-9 gain so that the peaks occasionally illuminate the amber LEDs but not the red clipping LED.**

⚠ **If the red clipping indicator LED(s) illuminate during recording, it is recommended to restart the recording with reduced levels.**

💡 Signal level metering is usually provided in the recording hardware or software, but the QA-9 front panel level meters provide the most accurate insight into the actual analog-to-digital conversion.

Display

The 3-digit numeric display indicates the current sample rate (e.g., "192") for the active output. Vertical bar-graph LEDs on either side of the display indicate the digital signal level being generated by each channel of the QA-9.

A green LED to the right of the numeric display indicates the USB status and will be lit when there is an active USB connection. A red LED to the left of the numeric display indicates that DSD output mode has been enabled.

> **When the green "USB" LED is lit, the AES/EBU output is not active.**

Specifications

Analog Input Impedance	2 MΩ (1 MΩ per phase)
Analog Input Sensitivity	10.0 Vrms – at minimum gain 0.75 Vrms – at maximum gain
Analog XLR Input Polarity	Pin 1 = Ground Pin 2 = Non-inverting (Positive) Pin 3 = Inverting (Negative)
USB Audio Output Signal *Class 2* *Class 1*	 44.1, 48, 88.2, 96, 176.4, and 192 kHz at 24 bits 44.1, 48, 88.2 and 96 kHz at 24 bits
AES/EBU Output Signal	44.1, 48, 88.2, 96, 176.4, and 192 kHz at 24 bits XLR, 110 Ω, transformer-isolated
Word Clock Output Signals	44.1, 48, 88.2, 96, 176.4 and 192 kHz BNC, 75 Ω, transformer-isolated
DSD Output Signals	64x, 128x and 256x BNC, 75 Ω, transformer-isolated
Power Consumption	25 watts

Dimensions	8-½" W x 11-½" D x 3" H
	21.5 cm x 29 cm x 7.5 cm
Weight	5 pounds
	2.3 kg

Warranty

North American Warranty

Your Ayre QA-9 analog-to-digital converter is warranted against defects in materials and workmanship for a period of ninety days from the date of original purchase. This ninety-day coverage is automatic upon acceptance of delivery and no registration is required.

Additionally you have the option, at no cost, to extend the warranty for a period of five years from the date of purchase by returning the completed Warranty Registration Card and a photocopy of your original purchase receipt in the enclosed postage-paid envelope to Ayre within thirty days of product delivery. This optional warranty is only available within the thirty-day registration period.

North American Warranty Statement

1. If any defects are found in the materials or workmanship of this Ayre product within the warranty period, the unit will be repaired or replaced by Ayre Acoustics, Inc. (Ayre) or its authorized agent.

2. Purchaser must return the product, packed in the original shipping carton, freight prepaid to:

>   Ayre Acoustics, Inc.
>   2300-B Central Avenue
>   Boulder, Colorado 80301

or to Ayre's authorized agent. The product must be accompanied by a written description of the defect and a photocopy of your original purchase receipt. Ayre will not be responsible for any shipping damage and strongly recommends the purchase of shipping insurance.

3. Ayre reserves the right to inspect any product that is the subject of any warranty claim prior to repairing or replacing it. Final determination of warranty coverage lies solely with Ayre.

Out-of-warranty claims will be billed for labor, materials, return freight, and insurance as required. Any product for which a warranty claim is accepted will be returned to the purchaser and the cost of shipping and insurance will be factory prepaid within the boundaries of the USA. Units to be shipped outside of the USA will be shipped freight collect only.

4. Ayre strives to manufacture the finest possible equipment, and therefore reserves the right to make improvements on its products, without necessarily assuming any obligation to retrofit such changes upon its previously manufactured models.

5. The above warranty is the sole warranty given by Ayre, and is in lieu of all other warranties. All implied warranties, including warranties of merchantability or fitness for any particular purpose shall be strictly limited to the duration of the above warranty. Ayre shall have no further obligation of any kind, whether express or implied. Further, Ayre shall in no event be obligated for any incidental or consequential damages as a result of any defect or any warranty claim, whether express or implied.

6. Ayre does not authorize any third party, including any dealer or sales representative, to assume any liability of Ayre or make any warranty for Ayre. The unit must not have been altered or improperly serviced. The serial number on the unit must not have been altered or removed.

7. The remaining period of this warranty is only transferable to subsequent purchasers if the product is resold by an authorized Ayre dealer.

International Warranty

Warranty terms outside of North America may vary. Please contact the authorized Ayre distributor in your country of purchase for the terms of warranty and also the service itself.

A Place for

Notes

Serial Number: _____

Purchase Date: _____

Dealer: _____

Salesperson: _____