Impeccable sound quality and versatility

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By Michel Forbes

For more than 35 years, Bryston (Canada) has offered solid and well-designed products aimed as much towards professional as audiophile markets. Well known for its analogue audio devices, Bryston also offers digital devices by offering a full range of digital-to-analog converters (DAC). The new BDA-3 is therefore flagship of the range of DACs offered by Bryston. Its position at the top of the range is anchored in its support of DSD 256 and PCM 384 kHz formats, as well as the multitude of digital inputs. The very classic look of the BDA-3 fully integrates visually with the design of all other...
products offered by Bryston. Let’s go to the heart of the matter and explore the Bryston BDA-3.

The design and functionality of the BDA-3 are on par with the existing product range in this category. The approach is resolutely industrial with a look similar to devices that may very well be those of a recording studio. A simple and solid construction, giving the user a robust, solid feel. The front is made of 5 mm thick aluminum, the manufacturer’s name is engraved on the left and is followed by a series of indicator lights specifying the different PCM and DSD sampling rates supported by the BDA-3. To the right, we find an alignment of eleven switches used to select the different digital inputs and a power switch. This design is clean, creating no ambiguity about its operation. Everything is clear and accessible to your fingertips. As all other Bryston equipment, the BDA-3 is available in silver or black.

The back of the BDA-3 displays a host of digital inputs and analog outputs which are listed here:

- No, not one, but two class 2 USB Audio, (used with computers, servers or streamers);
- Four digital inputs including two 75 Ohm coaxial inputs with RCA and BNC connectors;
- A TOSLINK input (optical connector);
- A XLR input (AES/EBU 110 ohm type signals);
- Four HDMI inputs where inputs 1 to 3 are compatible with HDCP 1.4a, while the fourth is compatible with HDCP2.2. It is therefore possible to use this input with UltraHD or 4K devices.

The only digital output available on this DAC is an HDMI pass-through, meaning an output where video signals are passed without processing.

The BDA-3 is compatible with 3rd party remote control devices such as Crestron, Control4, etc. Three ports are dedicated to this use with either a 1/8 inch plug for RS232 protocol, a USB port and finally a RJ-45 (Ethernet) connector. There is also a 1/8 inch Trigger input which allows to connect various Bryston devices and power them up simultaneously through a single turn-on command.

Here is a very complete choice of protocols and connectivity that will appeal to the automated systems integrators. As soon as the DAC is connected to a home network, it is possible to access a Web page indicating the configuration and to update the BDA-3’s firmware.

An IEC-320 C14 connector is used to supply the BDA-3 AC power.

The consumer will be able to experiment at will, with various AC cords, in an attempt to improve (or not) the sound of this DAC.

Finally, the Bryston BDA-3 has two fixed volume analog outputs, on balanced XLR connectors for a 4 Volts output, or unbalanced RCA connectors for a of 2 Volts output. Both outputs can be used simultaneously (Bryston has reported no contraindications to this statement). Strangely both RCA sockets are white; ideally the right output socket should be red for easy spotting.

The use of HDMI ports on a stereo DAC is rather unusual.

It should be noted that the HDMI protocol does not support PCM digital signals above 192 kHz and is limited to the DSD 64 for type DSD signals.

Recently, Bryston has introduced a digital player called BDP-Pi. This player is actually a Raspberry Pi computer to which has been added a DAC card with coaxial and optical S/PDIF and HDMI outputs limited to stereo 48 kHz / 16 bit signals. For now, the BDP-Pi is the only device offered by Bryston which has a HDMI output.

One or two additional S/PDIF Toslink inputs would have been appreciated considering that audio sources such as TVs or media players often provide this type of optical or coaxial connector.
An In-Depth Look…

The essence of a DAC is the use of a chip which converts the digital signals presented on S/PDIF, AES or USB inputs into an analogue signal. Bryston chose a Japanese-made chip, the AKM4490 designed and built by Asahi Kasei Microdevices Corporation. The AKM chips are often present in professional audio devices, but the new Velvet Sound line of products is used specifically for the audiophile market. The AKM chip can support PCM formats up to 768 kHz and DSD 256 (4 times DSD 64) and the internal audio processing is done at a 32 bit depth. Bryston uses two of these chips in monophonic mode in the BDA-3 to decode PCM and DSD digital signals. Two specially designed XMOS circuits are used to channel audio signals through the USB interfaces.

The BDA-3 consists of three separate modules: a section dedicated to the switching of the four HDMI inputs, another for the

anologue section and finally the main digital section. A toroidal transformer is used to power the various components. No complaints about the quality of construction or assembly, Bryston has been offering strong and rugged products since its beginnings and continues to do so even after 35 years of existence.

My Time with the BDA-3

The BDA-3 is very user friendly. The BDA-3 offers a simplicity that will appeal to more than one user – eleven green light-emitting diodes (LED) are used to indicate the different PCM and DSD sampling rates. The locking option (Lock) is turned on as soon as a valid digital signal is detected at the input. A series of switches is available to select any one of eleven inputs as well as re-sampling and re-clocking. The Upsampling option is available only for S/PDIF, TOSLINK, and AES inputs, and oversampling is dependent on the two internal clocks. With an input sampled at 44.1 kHz, the BDA-3’s internal clock will go to 176 kHz whereas a 48 kHz input will be upsampled to 192 kHz. In both cases, this equates to a multiple of four times the initial sampling frequency.

The installation of USB drivers on Windows 7 and/or 10 is simple. Using streaming software like Foobar2000 and JRiver is supported and their configuration is well documented in the user guide provided with the BDA-3. For Mac and Linux users, it is not necessary to install drivers, as the USB 2.0 protocol is native on both platforms. It was necessary to adjust the output level to 100% in the Linux AlsaMixer to make the BDA-3 functional. The manufacturer has been notified of this problem.

Having two separate USB ports was much appreciated in this assessment, the first having been connected to a music server using Linux and the second connected to a Surface pro computer using Windows 10 and Foobar2000 software.

The first advantage of the HDMI standard is the transfer of audio and video signals on a single wire. When a Blu-ray drive, or a multimedia reader is connected to the BDA-3, the stereophonic audio signal will be extracted and decoded into an analog signal by the BDA-3. An elegant solution that will appeal to lovers of home theatre and allow them to benefit from multichannel AND stereophonic signals while using the same sources.

To test the HDMI input, I opted for a Raspberry Pi computer using the piCorePlayer. This drive connects directly to my music server through my local network. The Raspberry Pi has an HDMI plug that can be used for stereo audio output and it displays the navigation interface provided by the playback software.

Finally as the BDA-3 has no variable outlets, a headphones amplifier was connected to the RCA jacks.

Listening Tests

We can confirm that the sound quality is different depending on the technology used and the type of circuit used for the decoding of digital signals. The rendering of the AKM4490 chip is very close to a professional sound usually found in studio devices. This isn’t a clinical or “sterile” sound, but a rather very well-articulated and detailed one. It is a hybrid approach that takes the qualities of the studio sound of Burr-Brown chips with the definition of the ESS chips.

Small noises are audible when going from one input to another. They are very low in volume, but ideally, it would be preferable that a small fade (or mute) is made between input changes. However, no sounds are heard when passing form the 44.1 kHz to 48 kHz clock and vice versa. Nothing is more annoying than a heavy noise between two pieces of different resolutions combined in the same playlist.

I started tests using the HDMI input and the result was rather unexpected. Surprisingly, the same list of files streamed through the HDMI input results in a much more articulate sound than listening through the USB input, a sign that the jitter is better handled. The volume is slightly higher and it is the articulation
of the music on the rhythmic plan which is the most obvious and easily detectable, if we focus on the electric bass of rhythm section. All audio content is more detached and less blurry, much more engaging in terms of listening. However, I was not able to play DSD 64 files using this platform, even if the configuration of the piCorePlayer should make it possible.

With the HDMI sources, an observed delay of 2 to 3 seconds occurs when switching from USB to HDMI. However, the selection between optical, coaxial and AES inputs is almost instantaneous and without audible delay. This type of problem is relatively minor and can probably be corrected with the installation of new firmware for the BDA-3. Bryston was informed and its technical support service has been very responsive to my comments.

From the optical output of my LG TV, the new series Stranger Things offered by Netflix lends itself to this assessment. Fantastic and horror genres often use sophisticated sound mixes to support the typical atmosphere of these types of movies. The introduction to episode 3 offers a sonic landscape that alternates between music of the 1980s and a sophisticated reverb of an empty pool inhabited by a strange malevolent entity. Every little detail of the Foley track is well reproduced and articulated. The sound is subtly sweeter by using the Upsampling function. The end of reverberations is precise and detailed, and we are tempted to keep our headphones on for several hours.

Back to music and use of the music server in USB mode. Most of my list of high-resolution music is very well reproduced, without artifact when switching from one format to another, and this, up to 384 kHz. The separation between each instrument is particularly strong and accurate. We can detect small gaps of time between the voices, especially with the New Frontier of Donald Fagen’s NightFly album play. Take Five by Dave Brubeck Quartet sampled at 176 kHz, for its part, is reproduced with finesse and the quality of the sound of the cymbals of drummer Joe Morello made us appreciate the benefits of high-resolution audio files.

DSD format playback is available and can go up to 256 DSD. A key feature of DSD is a silky and soft sound, and we are not disappointed here. Once more, the excellent free files from the Norwegian company 2 L - The Nordic Sound demonstrate the quality of the sound and precise reproduction of the acoustics of the Church.

Using the coaxial input, the SqueezeBox Touch produces sound quality very close to the USB input. All formats are well reproduced up to 192 kHz and DSD files are converted to PCM signal.

Conclusion

The BDA-3 becomes the reference for Bryston DAC due as much to its sound quality as for its versatility in the many inputs and outputs. Its design and build are a direct complement to the other products offered by the Canadian company. The BDA-3 will be the perfect companion to a system built from devices form manufacturers other than Bryston, especially if we think of control and its integration in terms of home automation. Support of HDMI connections opens new avenues in respect to stereo signals and the opportunity to benefit from a sophisticated graphical interface offered by some streamers.

In terms of sound, the BDA-3 has nothing to envy from products offered by other manufacturers, the choice of the latest AKM chips and support of all formats available in PCM or DSD formats providing excellent durability. One must appreciate Bryston’s seriousness to offer a series of products over the years that are as well built as they are successful.

GENERAL INFORMATION

Price: $3 495
Warranty: 5 years, parts and labor
Manufacturer/distributor: Bryston Ltd., Tel.: 1.800.632.8217, www.bryston.com
Mediagraphy
Netflix, Stranger Things
Donald Fagen, NightFly
Dave Brubeck Quartet, Take Five, format 176 kHz