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Test & Measurements

Extron Ultra Amplifier Series

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Extron Ultra Amplifier Series

Universally applicable amplifiers with two, four or eight channels. Extron's new Energy Star compliant Ultra Series is available with many options for low impedance operation and for 70 V or 100 V systems or even in a mixed configuration. The compact and fan-less devices are predestined for use in AV applications of all kinds.

Photo: Dieter Stork

Three out of Thirteen for the test XPA U 1002, 358 and 358C-100V (top to bottom)

The California-based manufacturer Extron Electronics has established itself in recent decades as one of the world's leading manufacturers of components for audio visual systems for professional applications. Extron's core business is the development and production of many different products required in professional AV systems. The products can be found in wide areas of training and teaching, in conference centres, on exhibition grounds, in industry, for traffic control technology, in authorities and much more. Most of the typical Extron products operate quietly in the background for signal processing and distribution, as well as for the management of the system and the provision of the necessary interfaces to the outside world. Extron's portfolio also includes dedicated speakers and amplifiers. In the field of amplifiers, a completely new series has recently been introduced with the XPA Ultra series. These models have been specially optimized for the requirements of pro AV workflows. Concrete, this means a high degree of flexibility, combined with the most compact design possible and high energy efficiency.

The XPA Ultra Series

All amplifiers from the Ultra series are half rack wide units with 1 U height and fan-less passive cooling. Currently there are three basic models with 2x 100 W, with 4x 100 W and with 8x 35 W, which are available in a Low-Z version or for 70 V or 100 V systems. For the last two there are also the combi models with two or four outputs each for low-Z operation and for 70 V or 100 V systems.

In total, there are thirteen models in the Extron XPA Ultra Series, providing two, four, or eight amplifier channels. With outputs of 35 W and 100 W respectively, these amplifiers are predestined to drive many small loudspeakers, such as those typically found AV applications.

The discreet grey boxes weighing a maximum of 2 kg in the typical Extron design are rather inconspicuous. On the front panel there is only one LED each for operating mode and excessive temperature and one signal present and limiter/protect LED per channel. As so often with technical devices, the back is more informative and interesting. Here you find for each channel a balanced/unbalanced input, a speaker output and a trimmer for adjusting the gain. All connections are designed for captive screw connectors. In addition, the LEDs for Signal Presence and Limit/Protect are duplicated on the rear panel. This is handy during installation or service work, usually on the rear panel of the units, it's easily to seen in which condition the amplifier channels are. A simple but very practical detail that indicates good communication between users and Extron engineers. Another small useful practical feature are the laser-etched markings and inscriptions on the back, which are easy to read even in low-light.

Since all Ultra amplifiers are optimized for high efficiency, there are no fan for cooling in any of the models. This means that the amplifiers can also be placed freely in conference rooms or wherever they are needed without any disturbing noise. In the case of rack mounting, Extron states that the units can also be stacked without gaps, saving additional space in addition to the already high channel density of the Ultra models.

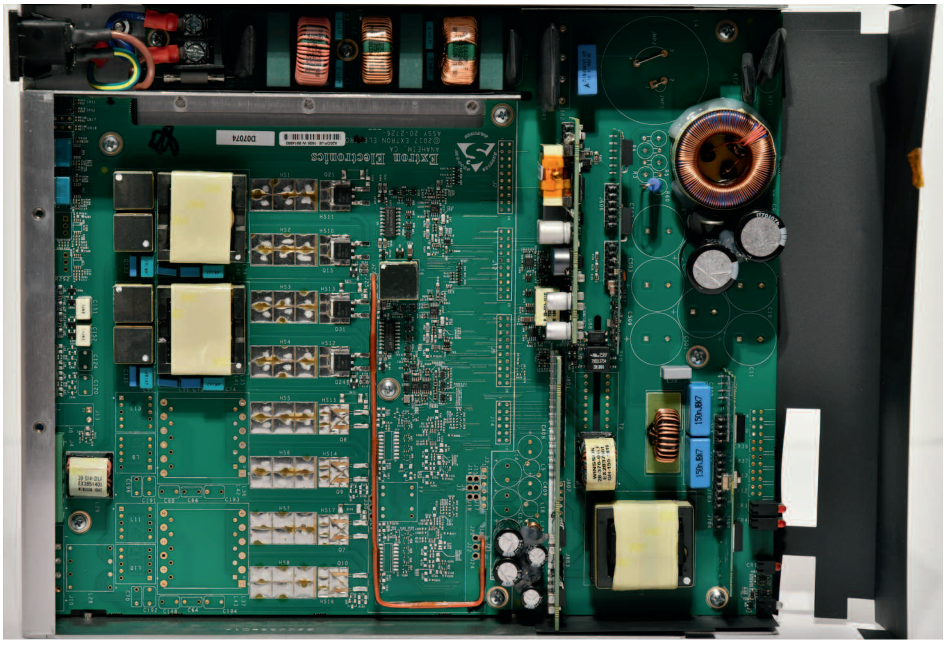
Class-D amplifiers and Everlast power supplies

A look inside the Ultras shows a very tidy and clear structure. PICTURE 01 shows the inside of the XPA U 1002 and the individual assemblies. At the top left, separated by a shielding plate, is the mains filter, at the front right is the power supply and centrally located is the four-channel power amplifier board, on which only two channels are fitted in this model.

The model XPA U 358 shown in PICTURE 02 follows the same design, but for the eight channels the boards for the output stages are fully equipped and staged in two layers. The output stage channels are based on a Class-D driver chip, that drives two FETs each in the power stage. The driver outputs are completely isolated from the rest of the device and can therefore directly drive the power stages with a very high supply voltage. The construction is therefore simple yet flexible. The complete power stage consists of a modulator that generates a PWM signal based on the input signal, the mentioned driver module and two power FETs. The desired voltage range for the output can then be set via the supply voltage from the switching power supply. In order to generate a usable output signal of the Class-D power amplifier, a lowpass filter is required at the output, which acts as a reconstruction filter to filter out the HF components from the signal. After the low pass filter the audio signal is available again. The function is comparable to that of a DA-converter only in this case for high output power. For the low-pass filter, Extron uses its own patented circuit, called CDRS, which suppresses HF components in the signal particularly well to minimize the disturbance of the environment from an EMC point of view.

In general, Class-D power amplifiers have the advantage of a significantly higher efficiency compared to the common Class-AB power amplifiers, since the power amplifier transistors only operate in a high-frequency switching function with minimal power dissipation in the transistor. Therefore, small Class-D power amplifiers can work almost without cooling. Where in the past huge heat sinks were required, today, as in the Ultra models, a small copper area on the circuit board is enough. However, the issue of waste heat should not be completely neglected, as higher temperatures can still occur locally in dense structures, which is particularly the case if there is no forced ventilation. As known from computer technology, high temperatures of individual components and here especially of electrolytic capacitors are one of the main causes of failures. Extron has taken this issue very seriously into account, because many devices in pro AV systems are in 24/7 use and therefore they are highly stressed. The photos of the open units show that the power transistors in the Ultra power amplifiers are located far away from the capacitors to avoid excessive heat.

The XPA Ultra models, like most other products and external power supplies from Extron, use Extron's proprietary Everlast power supplies. The name "Everlast" can be seen here as an allusion to the subject of operational safety. Since the power supply units have a central task in all electronic devices, a failure is usually accompanied by serious consequences. For tough 24/7 use, Extron did not want to rely on the widely used standard power supplies and as a consequence Extron developed its own Everlast power supplies.



PICTURE 01: Interior view of the two-channel model XPA U 1002.

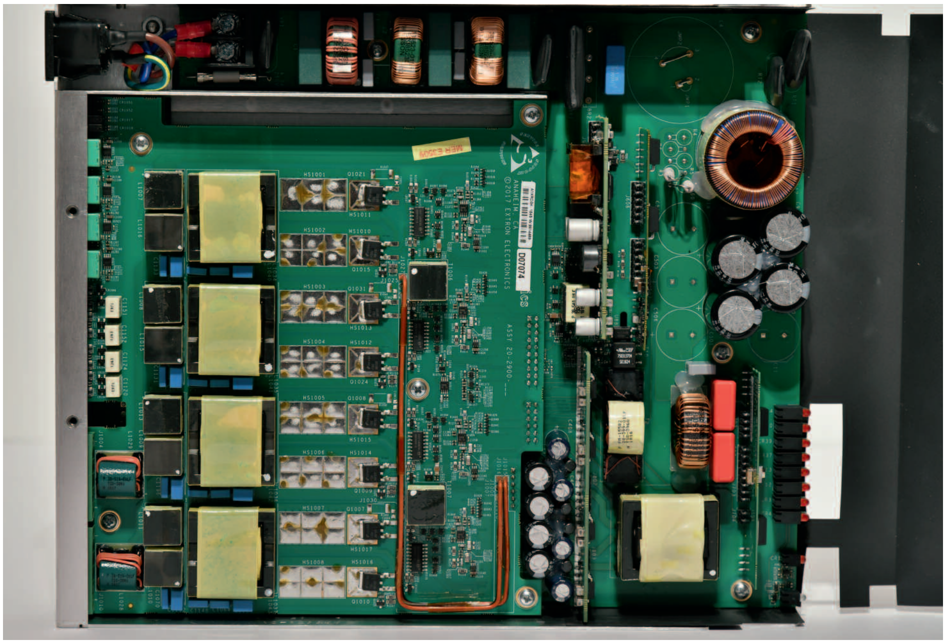
Measurement Values

When it comes to measured values for amplifiers, there are quite different opinions. Does the frequency response or the distortion in relation to the behaviour of the loudspeaker play a role at all? Which power performance values are relevant, peak power or continuous power, and what does it mean? What peripheral values beyond the usual data sheet values are still important? All this will be explained in this paragraph and evaluated for the XPA Ultra models. The XPA U 1002 with 2x 100 W output is taken as an example.

Frequency response, damping rate and signal-to-noise ratio

Let's start with FIG. 01 and the frequency response of the XPA U 1002 unit. The curves already shows that the frequency response changes slightly depending on the connected load. Between a 4 Ω and an 8 Ω load, there is a difference of about 2.5 dB at 20 kHz. Towards lower frequencies the differences disappear quickly, so that at 10 kHz only minimal differences can be de-tected. The reason for this is the lowpass filter in the output, which is necessary for Class-D amplifiers and changes its behaviour depending on the load. Without any load, the curve rises towards high frequencies and the lower the load becomes, the earlier the lowpass response starts and causes the curve to drop. If you ask about the relevance of this behaviour, the question is quickly answered by the fact that there are effects only beyond 10 kHz, which are hardly relevant at the usual loads of 4 or 8 Ω. Added to this is the impedance, which usually rises for real loud-speakers at high frequencies, further reducing the effect of this level drop.

In this context, we come directly to the next measured value, the damping factor of an am-



PICTURE 02: Interior view of the eight-channel model XPA U 358: There are no cables in the Ultra amplifiers, which means that errors caused by the cabling cannot occur.

plifier. Formally, the damping factor is the ratio of a connected load impedance in relation to the internal resistance of a source. If the load impedance is e.g. 8 Ω and the internal resistance of the source, in this case the output stage, is 100 mΩ, then the damping factor has a value of 80. A low internal resistance of the source, ideally 0 Ω, is important for loudspeakers as this on the one hand slows down the resonance of the diaphragms and, if the loudspeaker has a passive crossover, prevents crosstalk between the ways. Like other values in the audio technology, the damping factor is dependent on the frequency. The measurement is done by two separate frequency response measurements of the amplifier, one without and one with a load. The internal resistance can then be calculated from the level loss of the measurement with load in relation to the measurement without load. FIG. 02 shows the quotient of the two measurements for the XPA U 1002 with an 8 Ω load. Over a wide frequency range, the value is 0.99, which results in a damping factor of 100. Above 3 kHz, however, the curve reaches a value greater than 1, i.e. the output voltage rises slightly when the load is connected, which cannot be true. The reason for this lies in the amplifier circuitry, which is slightly overcompensated towards higher frequencies, so that, purely mathematically, there seems to be a negative internal resistance of the amplifier, that compensates the influence of the lowpass filter at the output. The damping factor therefore increases to values towards infinity from a purely mathematical point of view.

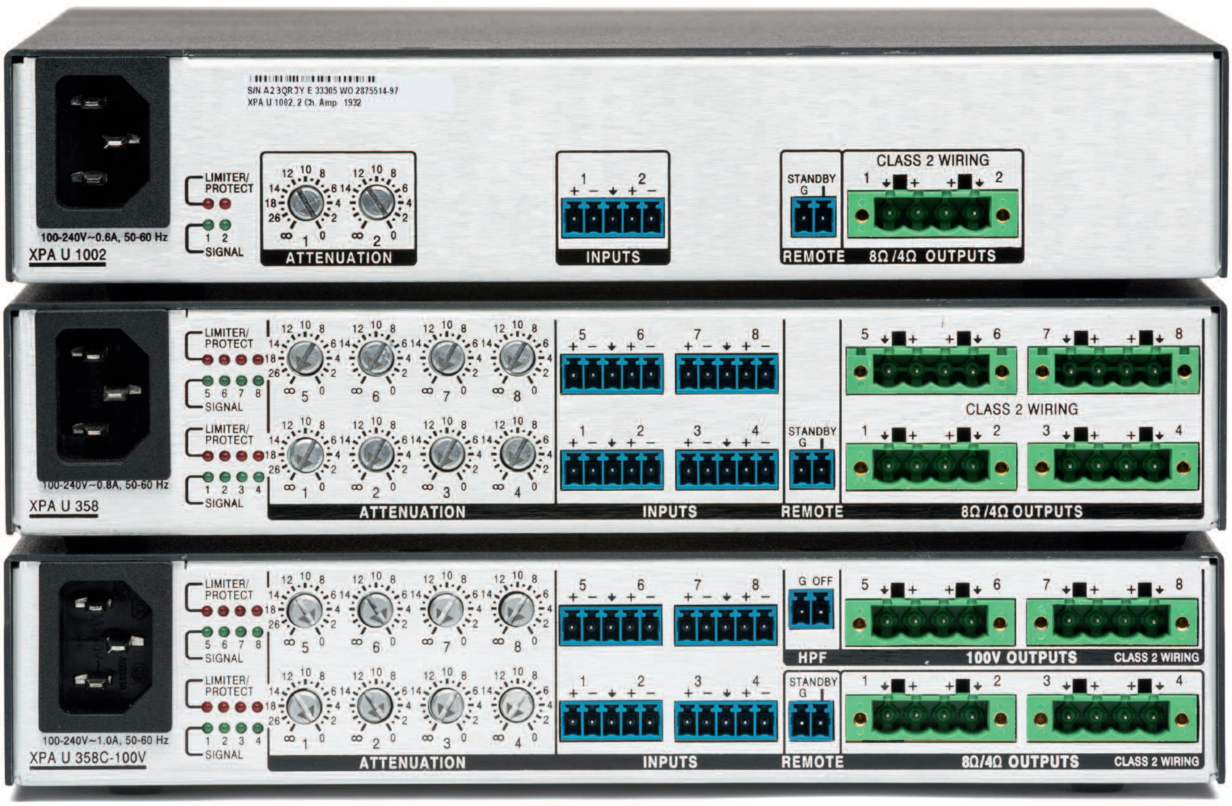
But what values for the damping factor are needed in practice? From the loudspeaker's point of view, the cable resistance and the transition resistances of the connectors and, if available, possible components in a passive crossover network are added to the internal resistance of the amplifier. Even amplifiers with a damping factor of 1000 or more usually only achieve values in the two digit range for the loudspeaker. Values for an amplifier of 100 are therefore more than enough.

Let's move to the next measured value, the signal-to-noise ratio, which can play a very important role depending on the application of an amplifier and the loudspeakers connected to it. Two examples can illustrate this. If, the speakers are used in a sports hall, given the expected noise level in the hall and the distance of the listeners from the speakers, it will not make any difference at all whether the speaker emits a slight hissing or humming sound from the amplifier. However, when it comes to loudspeakers in a theatre, concert hall or conference room, where the speakers may be only a few metres away from the audience, even a small noise from the speakers in a quiet environment can be perceived as disturbing. But how can the actual noise level be calculated? For the XPA U 1002, the measure-ment resulted in an output noise level of 77 dBu with A-weighting. This corresponds to a voltage of 0.11 mV. If you now connect a typical ceiling or wall loudspeaker with a sensitivity of 90 dB at 2.83V/1m, it will generate a noise SPL with a level just under 2 dB. Such a value would be completely unproblematic even in a highly sensitive environment. In the data sheet of amplifiers, the S/N (Signal to Noise) is usually given and not the noise level as an absolute value. The S/N is calculated by setting the maximum output voltage of the amplifier of 31.8 dBu for the XPA U 1002 in relation to the noise level, resulting in an very good S/N of 109 dB. If the A-weighting of the noise level is omitted, the S/N is 104 dB. However, the A-weighting is justified at this point, since the resulting noise level as sound pressure is in a level range where the A-weighting most closely corresponds to the hearing impression.

Two further measurements in FIG. 04 and FIG. 05 show the measured values of the crosstalk attenuation between the channels of an amplifier and the common mode rejection of the balanced inputs.

The crosstalk attenuation (FIG. 04) indicates the value at which a signal crosses from one channel to an adjacent channel. A high crosstalk attenuation is a sign of a good circuit design and layout of the circuit boards and can therefore also be considered as a general quality criterion for an amplifier. For the XPA U 1002, the values up to 2 kHz are -83 dB and then increasing to higher frequencies with approx. 6 dB/oct.. Values of this magnitude are practical and typical, which also speak for a good layout considering the fact of the very dense construction of the Ultra amplifiers and the overall channel density.

The second measurement from FIG. 05 concerns the common-mode rejection ratio (CMRR = Common-Mode Rejection Ratio) of the balanced inputs. With a balanced signal routing, interference signals acting on the signal path are cancelled out in the input stage of the receiver. The higher the common mode rejection of the input, the better the cancellation is. How well this works depends on component tolerances and the circuit layout. With a deviation of 1% in the resistance values at the input stage, for example, a common mode rejection of 60 dB can be achieved. The measurements for the XPA Ultra Amp in FIG. 05 show values of 80 dB and more, which only decrease slightly towards the high frequencies. The suppression of interfering signal components on the supply lines is therefore very successful.



PICTURE 03: The three models from the more interesting rear panel with inputs and outputs on captive screw terminals , gain adjustments for all channels and Signal Present and Limiter/ Protect Leds duplicated on the rear panel!

Photo: Dieter Stork

This feature is especially important when long cables are required for signal feed in a disturbed environment.

Distortion values

Which distortion measurements are meaningful for power amplifiers and which values should be achieved? Are they relevant at all, since the subsequent loudspeakers usually produce a multiple of the distortion? Both questions have been occupying audiophile circles for a long time. A closer look reveals that loudspeakers primarily produce 2nd and 3rd order harmonic distortions. However, distortions from power amplifiers often contain higher order distortion components, that are lesser hidden in the listening impression and can therefore be more noticeable. Class-AB power amplifiers are already very close to the ideal of rapidly decreasing distortion towards higher order. Class-D circuits, however, are rather unfavourable in terms of their behaviour and often produce many higher-order distortion components. There are several aspects to consider - the absolute value of the Distortions, their spectral composition and the course depending on the frequency.

FIG. 06 and FIG. 07 show the distortions and noise (THD+N) as a function of the output power measured at frequencies of 100 Hz, 1 kHz and 6.3 kHz at loads of 8 Ω and of 4 Ω. In both cases, the clip limit is exactly 100 W regardless of the frequency. In summary, both measurements show that the distortions increase depending on the frequency, so that values of approx. -70 dB (0.03%) are achieved at 100 Hz and -60 dB (0.1%) at 1 kHz. At 6.3 kHz the THD+N value is then -50 dB (0.3%). The specification from the data sheet with 0.1% at 1 kHz 3 dB under full scale (at 50 W) is met or exceeded at both 4 Ω and 8 Ω. The fluctuating course of the 6.3 kHz measurement is probably due to PWM modulation.
The THD+N curves from FIG. 08 were obtained from a series of measurements with a constant power of 25 W at 4 Ω as a function of frequency measured from 20 Hz to 6.3 kHz. The already mentioned THD+N values from FIG. 07 can also be found here.
Besides the absolute value for the distortions, their spectral composition is also of interest. FIG. 09 shows the FFT spectrum for a 1 kHz sinusoidal signal at 50 W output power at 4 Ω and thus 3 dB under full scale. The largest parts of the harmonic distortions are of 2nd order. In addition, there are also many higher order distortion components, but all of them are at -70 dB or less.
The last distortion measurement to be considered is the transient intermodulation distortion (TIM or DIM), in which a 15 kHz sine wave is superimposed on a steep-edged 3.15 kHz square wave. The resulting intermodulation products are evaluated. This measurement reveals weaknesses especially in fast transient signals. The steep transitions of the square-wave component are much more demanding for the output stage than the steady sine wave in the THD measurement. The DIM measurement is therefore also considered to have a relatively high significance in connection with the tonal qualities of a power amplifier. FIG. 10 shows the DIM values as a function of the output voltage. In the relevant range, the values are between -50 and -60 dB. This magnitude is comparable to the values of many other Class-D amplifiers.
Summarizing the results of the distortion measurements, the Extron XPA Ultra models are on par with most other modern Class-D amplifiers. The distortion values usually do not

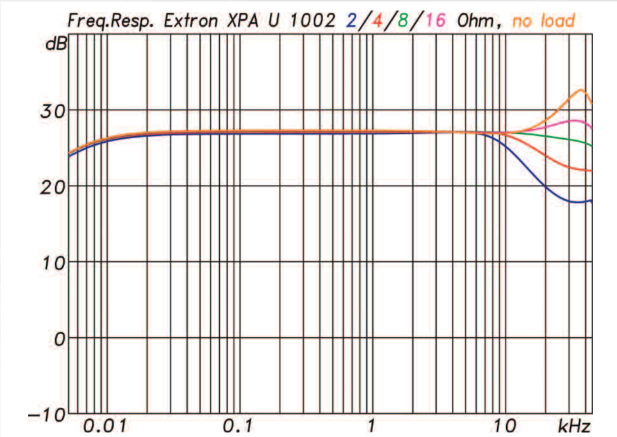


FIG. 01: Frequency response of the XPA U 1002 at loads of 2, 4, 8 or 16 Ω and with open output. The load dependency at high frequencies is caused by the output filters.

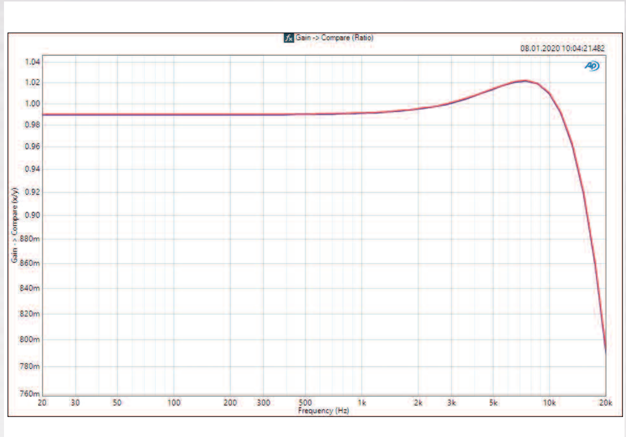


FIG. 02: Quotient of one frequency response measurement each with a 8 Ω load and without load. The damping factor is calculated from the level loss under load. See text for details.

quite match the good Class AB or Class H power amplifiers but can be described as sufficient for the respective application.

Power measurement

Power measurement values of an amplifier are a much-discussed topic. How is the measurement carried out, under what conditions and how are the values ultimately to be interpreted and what do they mean in practice?
Our laboratory measurements of the output power cover all variants of the load of an output stage. In order to be comparable with the manufacturer's data, we carry out a series of different measurements according to different standards for all possible load cases from 2 Ω (if allowed) to 8 Ω. The following values are determined in detail:

- the pulse power for a 1 ms single period of a 1 kHz sine signal
- the sinusoidal power with a constantly applied 1 kHz sinusoidal signal after one second, after ten seconds and after one minute
- the power at a constant noise with 12 dB crest factor after ten seconds, after one minute and after six minutes
- the power at a constant noise with 6 dB crest factor after ten seconds, after one minute and after six minutes
- the power according to EIAJ measured with a pulsed 1 kHz sine signal of 8 ms duration every 40 ms. The signal has a crest factor of 10 dB.
- the power according to CEA 2006 with a 1 kHz sinusoidal signal, whose level experien-

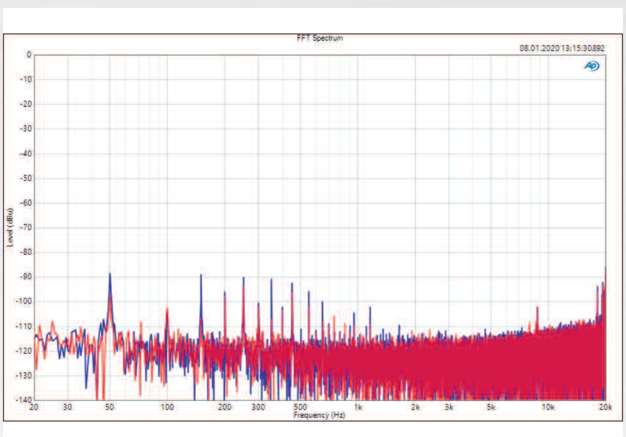


FIG. 03: Interference spectrum at the output with a total level of -72.5 dBu unweighted or -77 dBA with A-weighting. In contrast, the maximum output level is 31.8 dBu, resulting in an S/N of 104 dB unweighted and 109 dB with A-weighting of the noise level.

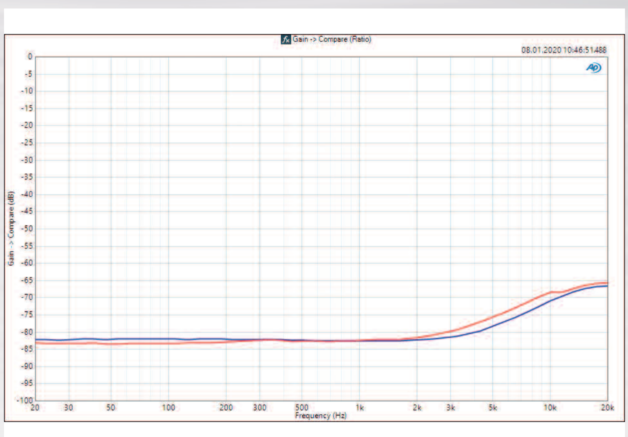


FIG. 04: Crosstalk attenuation from channel 1 to 2 (bl) and from channel 2 to 1 (rt)

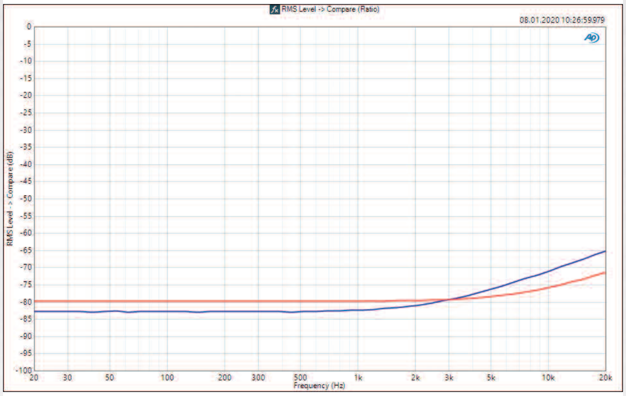


FIG. 05: Common mode rejection of the balanced inputs channel 1 (bl) and channel 2 (rt)

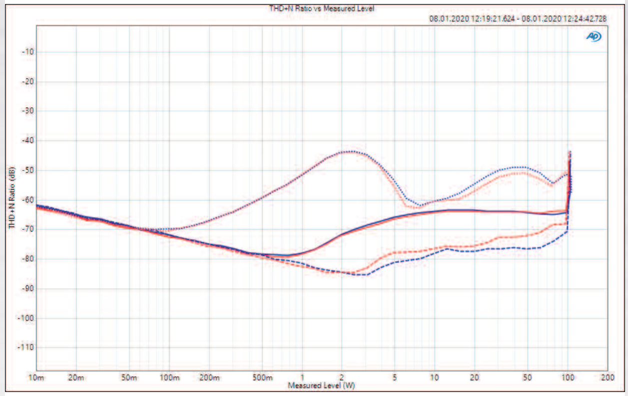


FIG. 06: Distortion values (THD+N) for channel 1 (bl) and 2 (rt) as a function of power (x-axis) for a load of 2x 8 Ω measured at 100 Hz (dashed), at 1 kHz (solid) and 6.3 kHz (dotted).

ces a level jump of +20 dB every 500 ms for 20 ms. The signal has a crest factor of 16 dB.

- the power for a periodically repeating 1 kHz burst of 33 ms length followed by a 66 ms rest period. The crest factor of this signal is 7.8 dB.
- the power for a periodically repeating 40 Hz burst of 825 ms length followed by a 1650 ms rest phase. The crest factor of this signal is also 7.8 dB.

For the sinusoidal measurement signals, the evaluation is easy. The effective value is recorded, and the power is calculated from it. The sine wave should not yet be visibly distorted. Two values can be determined for the sine burst signals according to EIAJ or CEA. On the one hand, the short-term RMS value during the duration of the burst and the RMS value over all including the signal pauses. The ratio of the two values is 7 dB for the EIAJ signal and 13 dB for the CEA signal. The crest factor, which describes the ratio of the peak value in the burst to the RMS value overall, is 3 dB larger in each case and is thus 10 dB and 16 dB respectively. For the burst measurement methods, the overview shows the power value calculated from the short-term effective value of the burst and the overall effective value. Another burst measurement method works with 33 ms long 1 kHz bursts followed by 66 ms long quiescent phases. Here the crest factor is 7.8 dB. Based on this measurement, the frequency of the burst was reduced by a factor of 25 to 40 Hz and the time intervals were extended by a corresponding factor of 25, especially with regard to the bass reproduction capabilities of an out-put stage, where tones are often longer.

Which burst measurements are better or more meaningful can't be said in such a generalized way. It is important, however, to compare only those measurements that are based on the same measurement method.

The measurement with the noise signals with 12 or 6 dB crest factor is somewhat different. The amplifier is driven to its clip limit with these signals and then permanently loaded. After ten seconds, after one minute and after six minutes the peak-to-peak (Vpp) and the effective value (Vrms) of the signal are measured. From this, comparable to burst measurement, one power value is calculated from the effective value of the voltage and one from the peak-to-peak value divided by 2.82. The values are thus comparable with the values of burst measurements.

The Extron XPA U 1002 was measured here. The measurements were performed for loads of 2x 4 Ω and 2x 8 Ω. The 2 Ω operation is not specified. With a 1 kHz sine wave signal, the power amplifier delivers its full power of 100 W per channel to both 4 Ω and 8 Ω. This is possible for 12 s or 14 s, after which the amplifier switches off (see FIG. 13) and then, when the signal is no longer present, becomes active again automatically after a short time. However, signals with a crest factor of 12 dB or 6 dB are also transmitted at full power with permanent stability. For a typical 12 dB crest factor signal, the amplifier delivers a power of 200 W in the peaks at 4 Ω and 120 W at 8 Ω. If the crest factor is reduced to 6 dB, then there are still 126 W at 4 Ω and 120 W at 8 Ω. The average power is then about 50 W per channel. The various burst measurements provide power between 103 and 113 W at 4 Ω and 8 Ω. The information in the data sheet is therefore fulfilled regardless of the test method. Switching off at a constant full load with a sine signal after 12 s is not unusual, nor is it a problem, as the amplifier is not intended and certified as part of a voice alarm system according to EN54-16, where a minimum operating time with a sine signal at full load of one minute is required. With all conceivable applications in pro AV systems, the case of a shutdown due to overload will probably never occur.

Energy efficiency

The load on the power supply is an important issue for power amplifiers with high power and/or long operating times. Directly or indirectly related to this are the installation costs, the operating costs and finally also the operational safety. If the power amplifiers are permanently in operation, the power consumption in sleep mode without signal is an important value. The Ultra power amplifiers have an

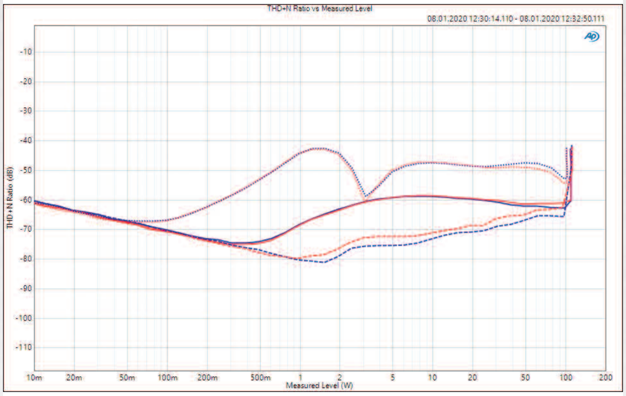


FIG. 07: Distortion values (THD+N) for channel 1 (bl) and 2 (rt) as a function of power (x-axis) for a load of 2x 4 Ω measured at 100 Hz (dashed), at 1 kHz (solid) and 6.3 kHz (dotted).

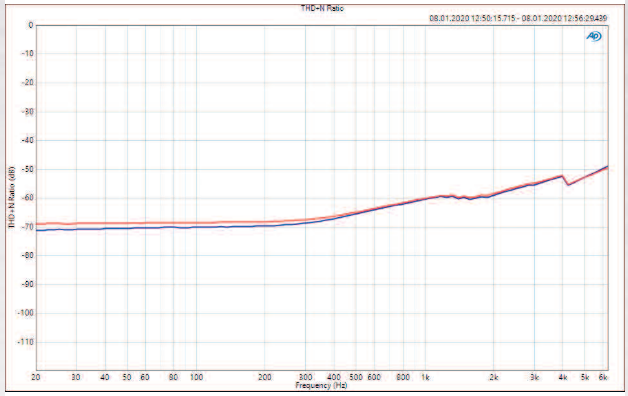


FIG. 08: Distortions as a function of frequency channel 1 (bl) and 2 (rt) measured at 2x25 W power at 4 Ω.

auto-standby function that automatically switches the amplifier into standby mode after 25 minutes of inactivity, where the power consumption then drops below 1 W. As soon as a signal is present again, the amplifier is fully operational in less than 100 ms(!). If desired the Auto-Standby Function can be disabled by connecting a 10k Ω resistor on the standby terminal on the back. When idle, the power consumption is between 5 and 8 watts, depending on the model. For the extreme case of full modulation with one sine wave, which is probably rather rare in practice, the mains load for the XPA U 1002 is a maximum of 236 W.

Standby:	<1 W
No signal:	5-8 W
Max.power 12 dB CF:	64 W
Max.power sine:	236 W

The third value in the table with 64 W is the power consumption when the output stage is fully loaded with a signal with a 12 dB crest factor. If you subtract 5 W base load from this and put the remaining 59 W in relation to a total power output of both channels of 50 W, you get an efficiency of very good 85% without base load and 78% with base load. FIG. 14 shows with two graphs the efficiency of the output stage in more detail. The blue curve shows the output power in relation to the total active power consumed from the power sup-

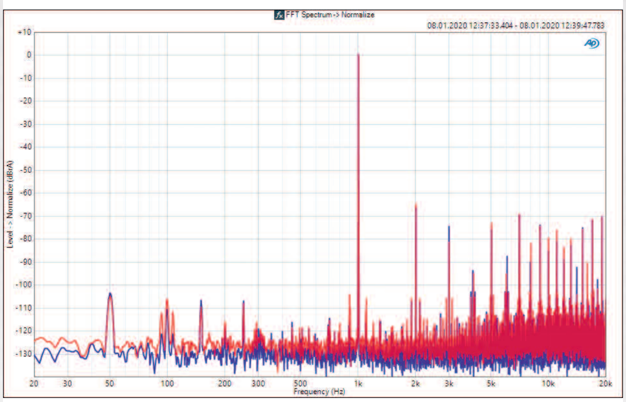


FIG. 09: FFT spectrum channel 1 (bl) and 2 (rt) for a 1 kHz sinusoidal signal at 2x50 W power at 4 Ω.

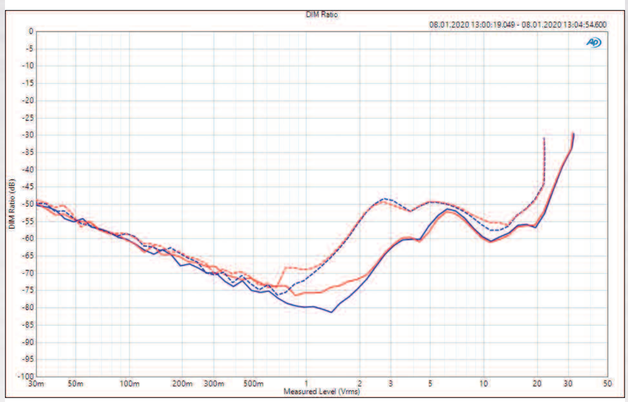


FIG. 10: Transient intermodulation distortions (DIM) for channel 1 (bl) and 2 (rt) depending on the output voltage (x-axis) for a load of 2x 4 Ω (solid lines) and 2x 8 Ω (dashed lines).

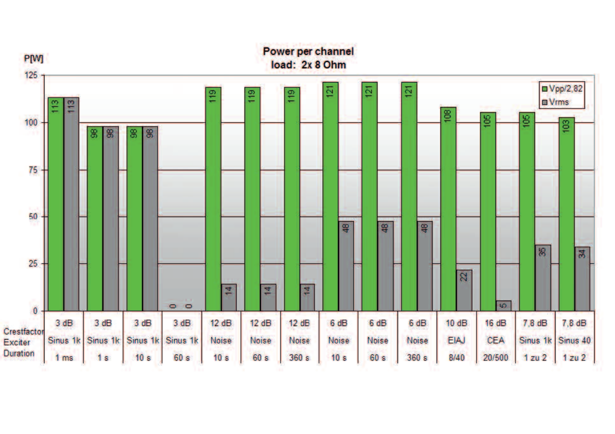


FIG. 11: Power values of the XPA U 1002 at 8 Ω with simultaneous loading of both channels with different signal types. See text for details.

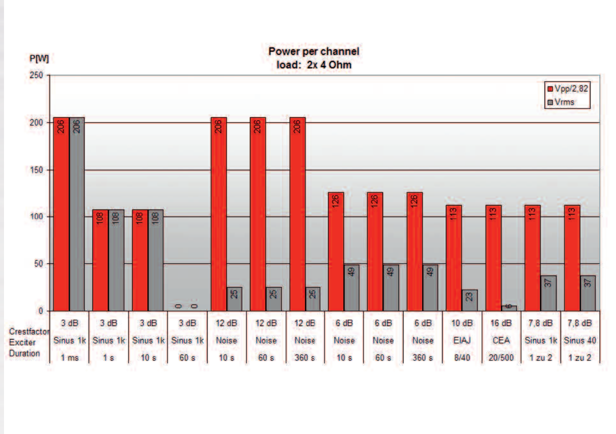


FIG. 12: Power values of the XPA U 1002 at 4 Ω with simultaneous loading of both channels with different signal types. See text for details.

ply. Together with the base load, low output powers result in rather low values for the efficiency. For the red curve, the output power is only related to the power consumed in addition to the base load. The output stage itself thus achieves an efficiency of 80% and more without any base load. The measured values at very low powers below 10 W are subject to a certain inaccuracy, so that discontinuities in the curves may occur.

In addition to the absolute values, the current drawn from the mains should follow the voltage as closely as possible, so that the output stage behaves like a real resistance as a load for the mains. Deviations are caused by displacement reactive currents (capacitive or inductive) and by distortion reactive currents (harmonic content). The power factor (PF = power factor) is a technical expression of how well the current curve approximates the voltage curve.

FIG.15 shows the measurement of the XPA U 1002 at full load. The power factor is 0.94 and the cos ρ value for describing the phase relation of voltage and current to each other is 0.96. Both values testify to an effective network utilization without large reactive currents or harmonic components. Somewhat striking is the high-frequency component superimposed on the current, which is around 50 kHz. In the figure, the HF component appears large at

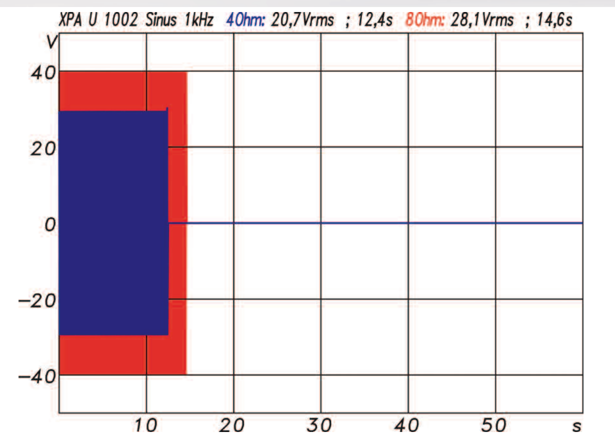


FIG. 13: Behaviour of the XPA U 1002 with a constantly applied sine wave signal for maximum output power at 2x 4 Ω (bl) and at 2x 8 Ω (rt).

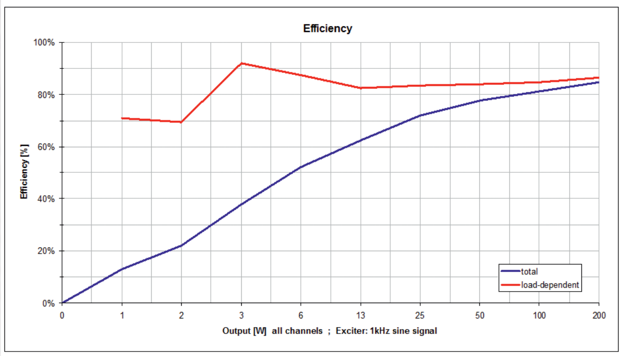


FIG. 14: Efficiency of the XPA U 1002 output stage in % depending on the power output (x-axis). In red the curve without base load which shows a very good efficiency of the power am-plifiers. For very low power (<10 W) the measured values are subject to a certain inaccuracy.

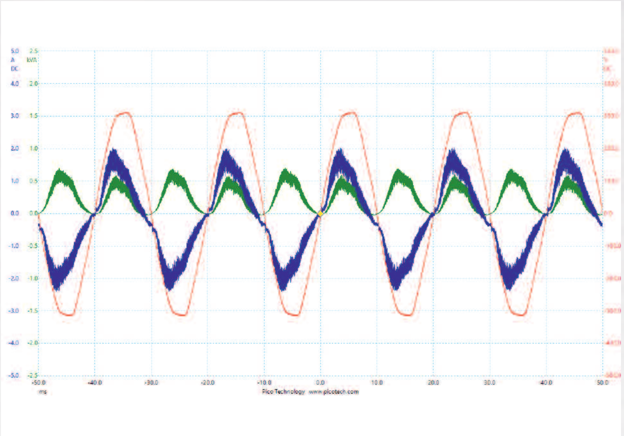


FIG. 15: Course of mains voltage (red), mains current (blue) and the power consumption (green) calculated from them with an RMS value of 253 VA. The power factor is 0.94 and the cos φ value is 0.96.

XPA U 358	8x 35 W (4/8 Ω)
XPA U 358-70V	8x 35 W (70V)
XPA U 358-100V	8x 35 W (100V)
XPA U 358C-70V	8x 35 W (4+4)*
XPA U 358C-100V	8x 35 W (4+4)*
* 4x Low-Z and 4x 70/100V	

XPA U 1004	4x 100 W (4/8 Ω)
XPA U 1004-70V	4x 100 W (70V)
XPA U 1004-100V	4x 100 W (100V)
XPA U 1004C-70V	4x 100 W (2+2)*
XPA U 1004C-100V	4x 100 W (2+2)*
* 2x Low-Z and 2x 70/100V	

XPA U 1002	2x 100 W (4/8 Ω)
XPA U 1002-70V	2x 100 W (70V)
XPA U 1002-100V	2x 100 W (100V)

PICTURE 02: Front view of the compact half rack wide devices with one LED per channel for Signal Present and Limiter/Protect.

first glance due to the overall low current, but in absolute terms this is not the case. Of course, the XPA Ultra amplifiers have all the relevant test certificates (CE, UL).
With all models, rack adapters are included to mount the devices individually or two next to each other in a 19 "rack.

Conclusion

With the Ultra Series, Extron Electronics introduces a total of 13 new amplifier models, ranging from 2x 100W to 8x 35W for low impedance loads or 70/100V systems, covering a very wide range of pro AV applications. The smart devices in discreet half rack wide 1 U housings are not only space-saving but also highly efficient, do not require active ventilation and can be installed quickly and easily in many places. The good picture is rounded off by a series of protective circuitry, an effectively operating standby circuit and a stable output power, which, like all the other information in the data sheet, was achieved or exceeded in our laboratory measurements. All in all, the measured values are comparable with those of other Class-D power amplifiers. However, the Ultra models become particularly interesting due to their peripheral characteristics such as space requirements, efficiency, thermal design, standby circuit, etc. If there was one more wish, it would be an option for a Dante interface, as already known from the Extron NetPA models. // [11770]

XPA ULTRA

POWER AMPLIFIERS

The World's Only 8 Channel Half-Rack Amp Just Got More Powerful

Now Offering Eight 75 Watt Channels

Engineered for Your Success

With exceptional channel density, the XPA U 758 lets you install sixteen 75 watt channels in just one rack space. This ENERGY STAR qualified audio power amplifier delivers eight 75 watt channels in a half rack, 1U, convection cooled, plenum rated enclosure that includes rack mount hardware. The XPA U 758 offers unprecedented power and channel density with the ability to install units without using rack spaces for ventilation, conserving precious rack space. It features a highly efficient advanced Class D amplifier design with power factor correction, ultra low inrush current, defeatable auto-standby with fast wake up, and our patented CDRS – Class D Ripple Suppression.

Fast Wake Up From Standby

The XPA U 758 meets ENERGY STAR qualification requirements with an auto power-down feature that places the amplifier into standby after 25 minutes of inactivity. It silently comes out of standby upon detection of signal in under 100 milliseconds, fast enough that the beginning of sound is not cut off. The XPA Ultra provides the ability to defeat auto-standby while maintaining ENERGY STAR status.

Features:

- NEW 75 watts rms output power per channel at 8 ohms
- NEW Eight channels in a 1U, half rack width enclosure - rack mount hardware included
- NEW Defeatable auto-standby with fast wake up
- ENERGY STAR® qualified amplifier
- Extron Patented CDRS™ – Class D Ripple Suppression
- Convection cooled, fanless operation - can be stacked without extra rack space for ventilation

Extron

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NetPA ULTRA
POWER AMPLIFIERS

ENERGY STAR | AudioDSP | DANTE DOMAIN MANAGER READY | AES67 | EVERLAST POWER SUPPLIES

Industry-Leading Amplifiers Now with Dante

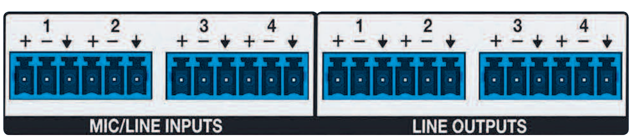
With the NetPA® Ultra amplifiers, you get all the advantages of our award winning XPA Ultra amplifiers combined with the power of Dante network audio distribution. Dante connectivity makes it easy to distribute audio from a centralized location to decentralized remote amplifiers throughout a facility, building, or campus using standard network hardware. These ENERGY STAR qualified amplifiers also offer integrated DSP, allowing a single device to function as a complete audio system endpoint. NetPA Ultra power amplifiers provide system scalability, easier installation, and simplified wiring, while meeting the stringent quality requirements of professional audio installations.

Dante Connectivity

The NetPA Ultra models deliver Dante networked audio to local sound reinforcement systems. They enable decentralized and reliable distribution of Dante audio to multiple speaker zones throughout a facility or building, and are the ideal choice for audio amplification in Dante systems. Offering AES67 for Audio over IP Interoperability and Dante Domain Manager enterprise level network management, the NetPA Ultra power amplifiers can connect to a variety of other devices and network infrastructure.

Analog Inputs & Outputs

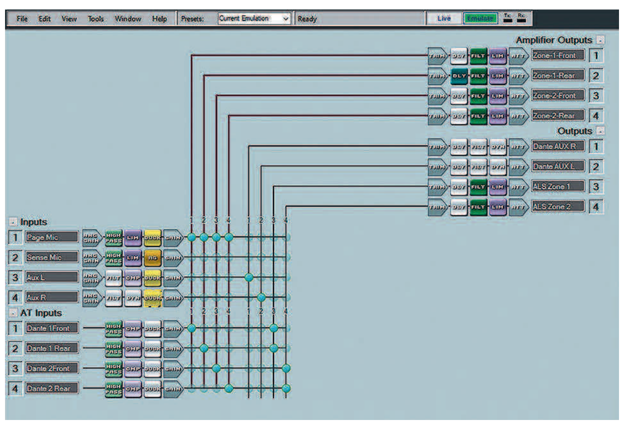
The analog line outputs allow for connection of additional amplifiers, simplifying connection to the source while processing flexibility. The mic/line inputs can be routed to the amplifier or to the Dante network for additional flexibility.



NetPA U 1004 Rear Panel

Mix Matrix with DSP

A built in matrix allows any analog or Dante input to be mixed to any amplifier output, Dante output or analog line output. Included in the mix matrix is essential processing such as gain adjustments, filters, dynamics, and delay. This offers the possibility to create simplified complete systems that include source ducking and routing, without a separate audio processor.



Extron DSP Configurator Software

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