

Magic Series

Plate Amps for Active Speakers

Preface

With the "Magic Series" of plate amplifiers for active speakers, MARANI wanted to change the standard way of powering active systems.

Not just DSP processing on the signal and Class D modules for powering it, but something much more integrated: a system considering the power, its control and the signal processing a single entity, where the Processes on Signal were considering the Power status and Vice versa.

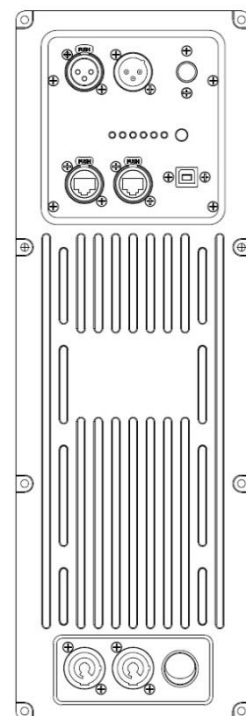
All in all, a system where Power and DSP processing are working in Sync and Syntony in order to optimize the performances of the overall sound reproduction process.

From this point of view, the Magic Series is embedding a dedicated DSP within the Class D modules, taking care both of Signal Processing and Power control.

This approach creates an intimate relation between the processed signal and the delivered power, allowing to get in both cases the best results for the overall system efficiency in terms of power delivery and protection of the power stage itself, so as keeping the integrity of the processed signal.

The all DSP processes are coming from the long experience of MARANI Engineers in developing proprietary algorithms with top features in terms of filtering (IIR/FIR) and Dynamic processes with very low distortion. To complete the architecture of the Magic Series, an advanced networking has been made available to the users, including double ports Ethernet and DANTE interfaces.

The Class D modules, DSP controlled, have been developed in order to fit most of the customers' requirements for their speakers, supporting with a large amount of signal processes and with an embedded tool for the Automatic Calculation of IIR/FIR filters coefficients for the speaker automatic response adjustment: **AEQ**.



Magic Series:

Two types of plate amplifiers are available, one is a Symmetrical Topology one, with a range of powers matching the most common requirements in terms of 2-ways medium power systems and a single or 2-ways high power solutions for satisfying the high power and dynamics required by the SUBs

Symmetrical Series: the powers available in this series are originally Symmetrically distributed to two channels.

Nevertheless, the power can be differently distributed on the two channels in **Asymmetrical way**, with the use of Sw limiting on one of the two and increasing the power on one of them; the total power is partially shared indeed among the two channels.

SUB series: this series see at the moment two plate, one for Lower size woofers, delivering 2.4kW/4Ohm on a single channel and a second module, 2 channels, thought for powering the high power requirements of double 18" solutions or equivalent. The all models of the Magic series Plate amplifiers have been thought for giving to the user the maximum in terms of processes, networking and flexibility in use, particularly

- * **Advanced MIR/FIR filtering:** MIR are MARANI specific IIR Linear Phase filters, shaped as the Classic Linkwitz 24/48dB/Oct; extensive use of FIR which is provided together with a complete set of classic IIR filters.
- * **Power Limiters:** advanced dynamic processes are there for power limiting purposes, operating together with hidden ones working automatically on the base of the signal analysis.
- * **AEQ:** this tool is an embedded system measurement working with an external ASIO card and a microphone, for the system IR measurement and automatic calculation of IIR/FIR filters available into the Filters' set of the Plates themselves.
- * **Fw update by remote:** the Fw can be easily updated by remote via Pc sw control.
- * **Sleep Mode:** is allowing to set a time after the one, if no input signal detected, the plate set in Mute the outputs. Once signal is back, automatically and soon the outputs are unmounted.
- * **Standby Mode:** this mode allows the plate amplifier to set in Mute the outputs and set in low power the power stage, discharging the rails voltages.... entering the power save condition. Also here the use can set a time after the while, if not detected input signal, the system enters the Standby mode. To exit from this mode, need the operator's action.
- * **Advanced networking:** the all plates can be controlled by a single sw shell and can be interconnected via double port Tcp/Ip port or DANTE for daisy chain connections.
- * **Powercon Mains link.**



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DSP Specifications

Overall:

- 96kHz sampling rate
- 96 bit double-precision 96kHz DSP processes
- 0.05% THD
- 26/12/18dB selectable Max input Level - 105dB S/N

Input Section:

- Noise Generator
- 2 independent inputs sections for user and advanced levels
- Gain, Mute and Phase inversion
- Input Delay: up to 300ms
- HP filter up to 24dB/Oct
- Input EQ: 10+10 PEQ (Parametric, Shelving, LP, HP, BP, SB, AP)
- 31b Peq or 1kTaps FIR per Channel
- Noise Gate / Dynamic Loudness / RMS (Auto) Compressor

Output Section:

- Crossover Filters: MIR/FIR/IIR up to 48dB/oct (Butterw./LR/Bessel)
- Output Delay: up to 40ms
- Output IIR EQ: 8 filters (Param. Shelf, LP, HP, BP, SB, AP)
- FIR up to 512 taps
- RMS (Auto) / Peak / Zero Attack Hard Limiter

Control & Monitor:

- Standby and Sleep modes
- Remote Fw update
- Stby., Signal, Lim, Temp and Prot monitor
- Temperature meters

Overall:

- 8 User preset memories library
- Manufacturer/User passwords
- User control groups
- AEQ
- Power Save



Communications:

- Two ports Ethernet switch for daisy chain
- USB 2.0 Type B port
- Dual port DANTE interface (Optional)

Amplifier Specifications

Models (Total: 8)	PDA300DMn		PDA800DMn		PDA2KDMS	PDA4KDMS	PDA5k2DMS	PDA5k3DMS
80hm	-	250W*2	500+150	400W *2	1050W*1	2100W*1	1200W*2	1200W+500W*2
40hm	500W+150W	350W*2	1000+150	800W*2	2000W*1	4100W*1	2300W*2	2200W+1000W*2
THD + N (@1W)	<0.04%	<0.04%	<0.03%	<0.03%	<0.03%	<0.03%	<0.03%	<0.03%
Max Voltage(8ohm)	42.4/24.5	42.4/24.5	63.25/20.5	49	83.4	128	95	95
Max Current	10.6/6.12	10.6/6.12	15.6/5.16	12.25	20.85	32	23.75	23.75
Peak Current	15/8.53	15/8.53	22.1/7.23	17.3215	29.4819	45.248	33.5825	33.5825
Max Input (dBu)	6	6	6	6	6	6	6	6
Voltage Gain (dB)	32dB	32dB	32dB	32dB	38dB	40dB	38dB	38dB
Noise Floor (dBu)	≅ -58	≅ -58	≅ -57	≅ -57	≅ -54	≅ -50	≅ -52	≅ -52
THD + N (@1W)	≅ 0.04	≅ 0.04	≅ 0.03	≅ 0.03	≅ 0.03	≅ 0.03	≅ 0.03	≅ 0.03
S/N (NO Load)	≥99	≥99	≥99	≥99	≥102	≥100	≥99	≥99
Power Consumption								
220V @ 4 ohm 1/3	254 W / 1.13A		461 W / 2.17A		698 W / 3.09A	1660 W / 7.62A	1904 W / 8.74A	1904 W / 8.74A
Idle 110V	13 W / 0.2A		16.59 W / 0.26A		16.25 W / 0.26A	36.85 W / 0.49A	36.6 W / 0.49A	36.6 W / 0.49A
Thermal Dissipation in BTU/hr								
220V @ 4 ohm 1/3	866.648		1572.932		2381.576	5663.92	6496.448	6496.448
Operational Mains Voltage	90~260V AC							
Power Factor	>0.96							
Efficiency	>87%							
Protections	DC+HF+TEMP PFC							
General								
Connection Type	TCP/IP(2xRJ45 port for daisy-chain), USB with Firmware update							
Sound Source	Analog, Digital(AES/EBU), Dante(Option, Primary & Secondary)							
External plate (W x H)	385x135mm		405x135mm			508x200mm		