QSC PLD4.5 Processing Amplifier

By: Mark Johnson

The PLD4.5 front panel features individual channel select and mute switches, input and output level indicators, display and menu navigation, and control switches and knob.

Back in the day, the ideal power amplifier for pro audio use was essentially what we would call "a straight wire with gain." That meant for the amp to work as intended, it did just one thing; it took the input signal and simply amplified it. Nothing else. High-power amps were generally heavy things, usually by virtue of a large transformer, and massive heat sinks were needed to dissipate the heat generated by the power transistors. They also featured minimal controls, often just an on/off switch, though some also included gain controls. Nowadays, it ain't necessarily so. Advancements in technology, as well as the competitive environment, have heated things up regarding the design and manufacture of power amplifiers.

One manufacturer at the forefront, then as well as now, was QSC Audio Products. QSC was started in Costa Mesa, California, in the late '60s, by Patrick Quilter (QSC – Quilter Sound Company) to primarily manufacture guitar amplifiers. Eventually, the production of power amps for pro audio overshadowed the guitar amp side of the business, and, ultimately, the company has expanded the products that it designs and manufacture to include not only power amps, but loudspeaker systems, digital signal processing equipment, networking systems, and even a recently introduced mixer.

So here we are, in 2015, looking at the PLD4.5 processing amplifier, which is just one model from QSC's extensive lineup. (The company has something like 14 lines.) There are three models in the PLD line: the 4.2, 4.3, and 4.5. The PLD4.5 can provide up to four channels of Class D amplification. The amount of power available depends on the choice of configuration. The amp provides 2,000W per channel with all four channels driven (with an four-ohm load). Driving two channels at four ohms yields 2,400W continuous and, driving a single channel into four ohms, the PLD will provide 7,500W. The PLD series also feature QSC's PowerLight universal power supply, as well as a fair amount of digital signal processing for each channel.

For all the power it packs, as well as its processing capability, the PLD does not take up much space. It is two-rack-spaces tall (3.5"); the chassis is 17.25 wide (19" wide if you include the rack ears) and 16" deep. The amp weighs in at 22lb. There is a centrally located front control panel and a 400 x 240 TFT color display with cooling vents on the left and right. The handles are integrated with the rack ears and are only open on the inner side, more like hand cups. The control panel

sports a large lighted power button (red when the amp is in standby mode, blue when it is on). There are four output meters (A, B, C, and D) that indicate -20dB, -10dB, and limit, with a mute button above each meter. There are four input indicators for each channel (1, 2, 3, 4) showing signal present and clip. There is a "sel" button for each channel.

To the right of the small (3" diagonal) display screen are "home," "enter," "exit," and "gain" buttons, and to their right is the master control encoder knob.

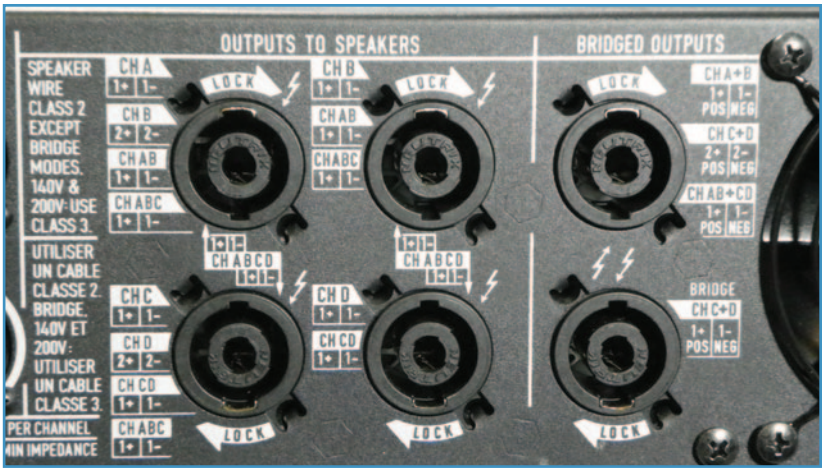
The rear panel features a USB port for connecting with the PC or Mac that runs the Amplifier Navigator software. There are four routable female balanced or unbalanced XLR inputs with parallel male XLR connectors. The outputs consist of four Neutrik NL4 connectors plus an additional two for "bridged outputs." The AC mains power switch is situated next to a locking IEC connector. This is particularly handy in mobile applications, as it prevents the power cable from working loose during transit, or being accidentally pulled out. Speaking of power, the PLD4.5 is designed for international operation and has a universal power supply that will accept 100V AC – 240V AC, 50Hz – 60Hz. Also, if no audio signal is applied over a 15-minute period, the power supply will stop switching. Once signal is reapplied, the amp returns to run mode. If for some reason power is lost, the amplifier will retain all the settings and functionality it had prior to losing power, once the power is restored.

The graphic display provides control, status, and operational information.

A, B, C... it's easy as DSP...

It takes a minute to figure out the work flow of the PLD. A couple of button graphics on the display screen beg for the ability for it to be a touch screen, but it is not. On other devices I've used that incorporate a master control navigation knob, you can often simply depress the knob for the "enter" function. I tried a couple of times to push it to enter; however, it doesn't move. There's a separate enter button on the front control panel, as already noted. The process of navigating through the menus to achieve the desired settings can take a while—although, if the amp is dedicated to a specific system, you'll only have to set it up once. The flexibility that the amp provides to configure as your system(s) demand is the key feature of the PLD and even if it will drive multiple systems, the presets can make that a relatively simple process, all things considered. So, read on…

The rear panel I/O includes four routable, paralleled inputs and USB port (above), and six Neutrik NL-4 loudspeaker output connectors (center).



A two-speed fan helps keep things cool.

Presets

One of the cooler features of the PLD Series is that it features factory presets for JBL, EV, Yamaha, Peavey, Cerwin-Vega, Martin Audio, Nexo, and B52 loudspeakers. All in all, there are 20 factory presets that cannot be changed and 50 user-definable presets. Input and output configurations, DSP, and loudspeaker assignments are affected by recalling the various presets. Of the 20 available factory presets, F1 to F9 provide output configurations, but no DSP. Presets F10 to F20 provide basic settings in addition to the output configurations. While these are not editable, they are intended as a place to start when creating custom presets. In addition to the PLD4.5 amp, QSC also provided an AP-5122m monitor wedge for checking out the presets. In fact, for the AP-5122 presets there are two: one for the main speaker and one for the monitor. While it's not detailed what the differences are, specifically, I'll bet that it is to account for the half-space loading of the monitor.

The PLD also includes a preset wizard to assist you if you need or want to create your own custom presets; first, you select an impedance setting based on the total load connected to a given output. Or you can select your desired power for a specific channel. Assuming an eight-ohm load, a four-channel configuration will provide 1,150W per channel. There are another

eight possible configurations, including two 3-channel configurations, four 2-channel configurations, and two 1-channel configurations. The impedance and power settings are linked; changing one will affect the other. You can select your output configuration for separate channels, bridged outputs, or parallel outputs. You basically have 5,000W of continuous power available for you to allocate as needed to up to four channels. That's pretty cool. And it is courtesy of QSC's proprietary Flexible Amplifier Summing Technology (FAST), which allows for the channels of the amp (up to four) to be summed and run in parallel mode.

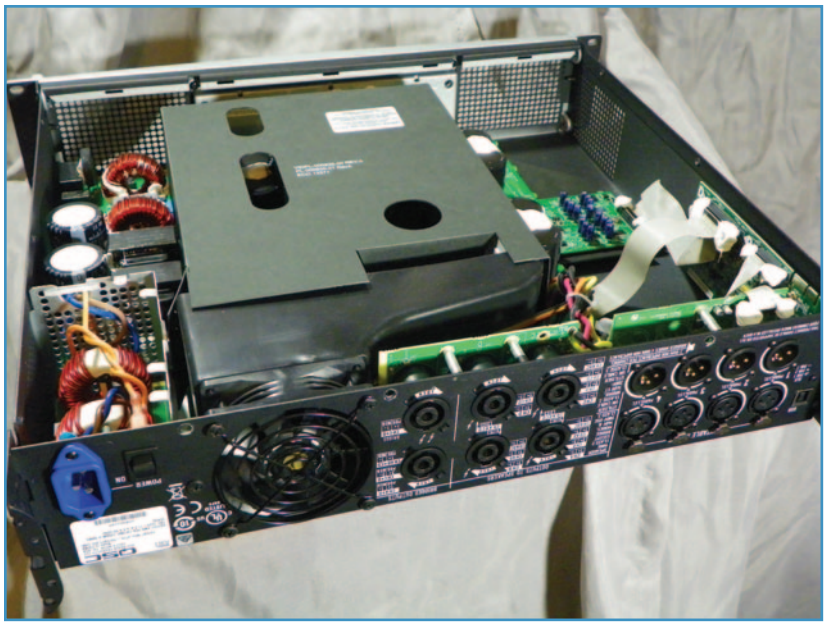
At that point, it is possible to assign loudspeakers to the output channels. You can select a speaker model, and then select a band (two-way LF, two-way HF, and so on), and then choose the filter frequency and type. You can then save your settings and assign a name. This can be tedious, since you have to use the scroll wheel to access the characters (A to Z upper and lower case, 0 through 9, underscore, dash, and space). You can also recall an existing preset, modify the parameters to fit your requirements, and then save the newly created preset.

The PLD's built-in speaker processing functionality provides the ability to adjust a number of parameters for loudspeaker system management including crossover, EQ, delay, and limiter, as well as array correction parameters specific for QSC line array loudspeakers. For crossover settings, you can choose frequency, the type of filter (Butterworth, Linkwitz-Riley, or Bessel-Thomson), and slope (from 6dB — 48dB per octave).

Industrial design, inside and out

QSC also accounted for the hazards of the road by incorporating the ingeniously simple idea of mounting all the innards upside down—so that if the amp is subject to a chemical spill, the dreaded Pepsi Syndrome (where the spilling of some Pepsi into critical electronics causes a meltdown) can be avoided. Also, moisture and/or dirt particles will fall to the bottom of the amplifier enclosure and not on the amplifier circuit board. Internally, there is a small two-speed fan to help keep things cool. If the amp is powered up but in standby mode, the fan runs at low speed. Once the amp is taken out of standby, the fan spins up to high speed.

There is another connector on this amp that heretofore was not commonplace on amplifiers but is becoming de rigueur on contemporary pro audio electronic equipment—a USB port. It allows the use of QSC's Amplifier Navigator software. This is a free download available on QSC's website, with a version for Mac and another for PC. Amplifier Navigator allows you to control and monitor the connected amplifiers and to do firmware updates, copy all of your settings and presets, and store them to a laptop or desktop computer; it provides the ability to update up to 20 amplifiers simultaneously with the copied and stored settings. That's a great feature if you have large sys-



The amplifier is uniquely designed with the electronics mounted upside down to prevent liquid spills or dust and dirt from damaging the components.

tems that require configuring (or reconfiguring). My review amp required a firmware update, which took just a minute or two. The software included a help file, which was nice; however, you cannot access the functionality of the software if you have the help file open.

Getting schooled, QSC-style

If this were your standard straight wire with gain, there would be no need for training, but it's not, so QSC has produced a series of videos to provide some insight into some of the key elements that make up the PLD.

For all its complexity, in-depth control, and processing capabilities, at its most basic you can still just connect to AC power, plug in a signal source, connect a loudspeaker, and the amp will work. This is one badass amp. List price for the PLD4.5 is $2,399.99, which makes it a great deal for amplifiers in the high-power, multi-channel category. QSC is careful to designate the PLD4.5 as a "processing amplifier." The on-board DSP and the presets make it all the more useful for practically any application.

The Light Source INC

thelightsource.com

704-504-8399

Faith Assembly, Olando Florida

POWERFUL

The Light Source 6" Fresnel LED fixtures can deliver up to 8,200 lumens per luminaire. Fewer fixtures equal savings on wiring, installation time, and electricity. ETL listed and made in the USA. RGBW also available.

Fixture Power and Beam Angle	Wall Plug Hot Watts	Photometrics Beam	Field	Lumens	Lum/Watt	Distance to Diameter	Candela	Intensity and Beam diameter on floor in feet at different mounting heights in feet — Mounting Height	8	10	12	15	20	25	30	35	40	45	50
100 Watt 78 Degree	100	78	91	7,965	80.19	1.62	5,550	Footcandles	87	56	39	25	14	9	6	5	3	3	2
								Beam Diameter	13	16	19	24	32	40	49	57	65	73	81
100 Watt 65 Degree	100	65	78	7,900	78.48	1.40	7,192	Footcandles	112	72	50	32	18	12	8	6	4	4	3
								Beam Diameter	11	14	17	21	28	35	42	49	56	63	70
100 Watt 52 Degree	100	52	74	8,211	81.75	0.98	11,006	Footcandles	172	110	76	49	28	18	12	9	7	5	4
								Beam Diameter	8	10	12	15	20	24	29	34	39	44	49
100 Watt 44 Degree	100	44	62	7,945	79.16	0.81	15,152	Footcandles	237	152	105	67	38	24	17	12	9	7	6
								Beam Diameter	6	8	10	12	16	20	24	28	32	36	40
100 Watt 36 Degree	100	36	52	7,677	76.32	0.65	20,453	Footcandles	320	205	142	91	51	33	23	17	13	10	8
								Beam Diameter	5	6	8	10	13	16	19	23	26	29	32
100 Watt 30 Degree	100	30	44	7,526	75.01	0.54	28,356	Footcandles	443	284	197	126	71	45	32	23	18	14	11
								Beam Diameter	4	5	6	8	11	13	16	19	21	24	27
100 Watt 25 Degree	100	25	37	7,129	70.84	0.44	36,039	Footcandles	563	360	250	160	90	58	40	29	23	18	14
								Beam Diameter	4	4	5	7	9	11	13	15	18	20	22
100 Watt 20 Degree	100	20	30	6,555	65.25	0.35	45,358	Footcandles	709	454	315	202	113	73	50	37	28	22	18
								Beam Diameter	3	4	4	5	7	9	11	12	14	16	18

Beam angle is to 50% of center intensity, Field angle is to 10% of center intensity. 3000 Degrees Kelvin, Minimum 80 CRI, Typical 82 CRI,
Universal Power Input 100-277VAC - 100 Watts wall plug Ratings: 120V .82 amps .99 PF, 208V .5 amps .95 PF, 240V .44 amps .92 PF, 277V .4 amps .86 PF
The Light Source fixtures are available in 2700K, 3000K, 3500K, 4000K, and 5600K. - LED Light Engines 2700K, 3000K, 3500K, and 4000K, have the same lumen output.

The 120 Watt RGBW fixture has approximately the same Lumen output as the 100 watt white fixtures in 78, 65, and 52 degree only	Fixture Wattage	30	40	60	80	100	120
	Lumen/Intensity Multiplier	0.31	0.39	0.54	0.84	1.00	1.15

Independent Testing Data on the 100 Watt Fixture Provided by Light Laboratory, Inc.