Philips Showline SL BAR 640

By: Mike Wood

This month, we look at a new product under a new brand name from a well-established manufacturer. Showline is a new mark from Philips Entertainment, where it joins the existing stable of Vari-Lite, Strand, and Selecon. Showline is simultaneously none of those companies and all of them, I suppose. The people behind it are the same folks we know based in Dallas, but Showline luminaires are manufactured in a Philips Entertainment Lighting factory in Asia. Showline is specifically a line of LED products designed to work together, all sharing the same calibrated LED system. As I understand it, the products should match one another for color and gamut. That I can't speak to, as I'm only testing one of them! This review looks at the Showline SL BAR 640, a batten product designed as an LED replacement for striplights, border lights, footlights, and symmetric cyc lights. It's a straightforward RGBW LED unit available in a few different configurations. As usual, I tested a single unit supplied to me by Philips as representative and measured everything I could think of, from power input to light output. This review tries to present those measurements as objectively as possible. For the first time, I've tested base RDM functionality. This is a test I've wanted to do for a while and have finally managed to get running. More about that later.

Figure 1: Fixture as tested.

For the tests, the SL BAR 640 was operated from a nominal 115V 60Hz supply. However, the unit is fitted with an autosensing universal power supply input that is rated from 90V – 240V AC, +/- 10%.

Light source and optics

As can be seen from the main photo of the unit tested (Figure 1), the Showline SL BAR 640 has 24 individual LED modules arranged in two rows with 12 modules in each row. Each module contains eight LEDs: two each of red, green, blue, and white, making a total of 192 LEDs, 48 in each color. The LEDs are arranged in a small circular array on a flat circuit board within a plastic faceted reflector. Figure 2 shows the modules in place with the front cover removed. Figure 3 shows a view into the front of the module, through the frosted plastic homogenizing filter that is mounted to the front of the reflector. This filter is plastic welded in place to the reflector, so I couldn't remove it for the photo. Each pair of LEDs is mounted opposite to each other: two reds, two blues, two greens, and two whites.

Figures 4 and 5 show front and rear views of the LED module. This is sealed and is clearly designed to be replaced as a single unit. It's very easy to remove the modules but not simple to replace any components within it. You can see that the rear of the module is a molded aluminum heat sink, with open sides a bit like an inverted basket. The circuit board connects directly to this, and the slots and structure allow horizontal air flow through the fins. Three fans are mounted on the rear plate of the SL BAR 640, drawing air through all the modules. The internal design of the heat sink aluminum molding is interesting; it has a number of features that aren't used in this product, so I suspect it's a universal module that is used elsewhere. It's a very simple optical system; the faceted reflector both homogenizes the eight LEDs and provides some collimation. As far as I can tell, there are no additional primary lenses on the LEDs. This is a wide-angle wash, so the optical requirements are fairly straightforward; we want good color mixing over the whole beam and a light distribution such that adjacent units will blend well together.

The optics homogenize the four-color RGBW arrays well, and the resultant output appears as a single-color wash, with no colored shadows or beam artifacts. Figure 6 shows an example blue wash on a cyc; it's always difficult to pho-

Figure 2: Modules.

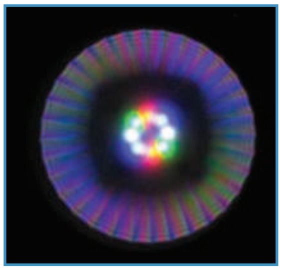

Figure 3: View into module.

Figure 4: RGBW module.

Figure 5: Rear of module.

tograph wash lights so that the photograph properly represents what the eye sees, so I usually try and avoid it, but I needed to show you something.

Figure 6: Blending.

The modules are connected in pairs, with each vertical column available as a single controllable unit or pixel. The DMX512 options give you the ability to address each of these 12 pairs individually or as a combined single unit (you can also group them in twos, threes, and other combinations). That gives the ability to use this as an effects light, with every cell a different color as well as a flat wash unit.

Note that the output from the Showline SL BAR 640 is symmetrical, this is not an asymmetric cyc light; it's a batten or strip light.

Output

It's always a little tricky to measure the lumen output of a non-radially symmetrical unit such as the SL BAR 640; however, the individual module control came to my aid. I illuminated just the center four modules, forming a symmetrical square, and then measured that output. The final results are based on multiplying that up by a factor of six to get the total from all 24. Note, however, that I report the horizontal and vertical beam profiles as from those four modules; this is a more useful way to show the data, as it describes how the end modules of a run of luminaires will behave.

Figure 7 shows the output from the SL BAR 640 with all LEDs at full power. I measured 12,046 lumens across a field angle (10% points) of 87° and a beam angle (50% points) of approximately 50°. As you can see, the output was symmetrical and smooth with sloping sides that

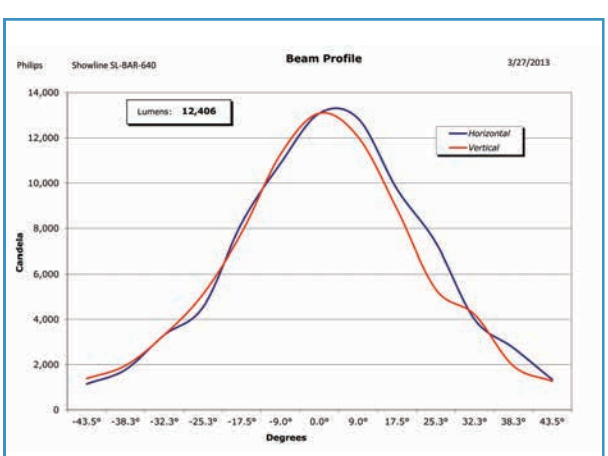

Figure 7: Output.

should blend well between adjacent units. This equates to an efficacy of 26 lm/W. The color with all emitters at full is somewhat pink, as red and blue overpower the green, and it is too far off the black body line to measure a correlated color temperature. This is normal for RGB LED units; you always need to turn down red and blue to get a white mix. The unit has a preprogrammed range of whites available

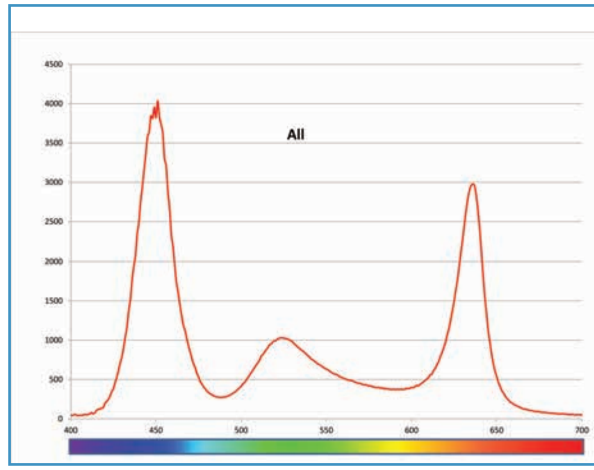

Figure 8: Spectrum with all emitters at full.

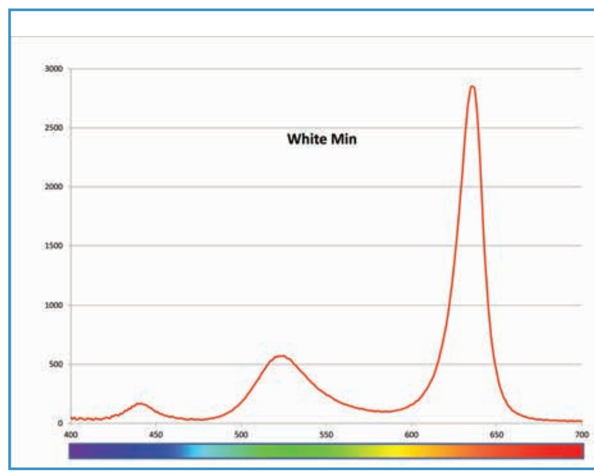

Figure 9: Spectrum at low CCT White.

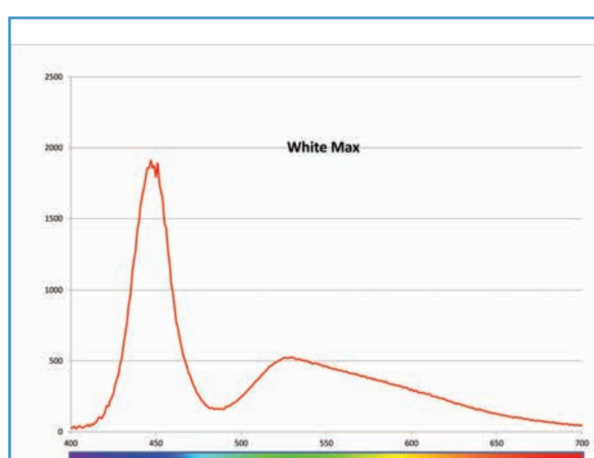

Figure 10: Spectrum at high CCT White.

with color temperatures varying from 2,500K to 10,000K. These whites take advantage of the internal LED calibration that running at full power doesn't, so the output with these calibrated true whites dropped to about 50% of the full power measurement.

Figures 8, 9, and 10 show measured spectra of some of the color points measured. Figure 8 shows peak output with all emitters at full power, clearly showing the typical lower output in green. (Green is a tricky color. We rarely want to use it on its own on stage, but it's a critical component of mixing a bright white and pastels. Our eyes have maximum sensitivity in the greens.) You can see more than one peak in the blue area around 450nm; one comes from the blue LED, while the others from the blue pump in the white LED. The green peaks at 525nm and red at about 635nm. These are all very typical wavelengths used by many manufacturers, and you should find that the Showline fits in with other products. Figures 9 and 10 show the two extremes of white light, Figure 9, with its high red peak, at a minimum color temperature, around 2,500K, and Figure 10, with a large blue peak, at a maximum color temperature, around 10,000K.

Dimming and strobe

The dimming behavior of the SL BAR 640 is excellent. I ran the unit in 16-bit mode, and the fades were smooth and step-free, even at the very bottom of the dimming range. Philips has given the unit a response time similar to that of an incandescent luminaire thermal lag as the default setting. This gives a nice feel to the dimming. You can adjust this lag timing through a DMX512 control channel to be longer or shorter as you wish.

Figure 11 shows the dimming curve as very close to linear. I understand that the Showline SL BAR 640 will offer various options in dimming curve, including a square law and an S curve, but the unit I tested didn't have this option. I prefer to use a square law when it is available. I measured the PWM frequency at 3.9kHz, which should be fast enough to avoid flicker issues with most video cameras.

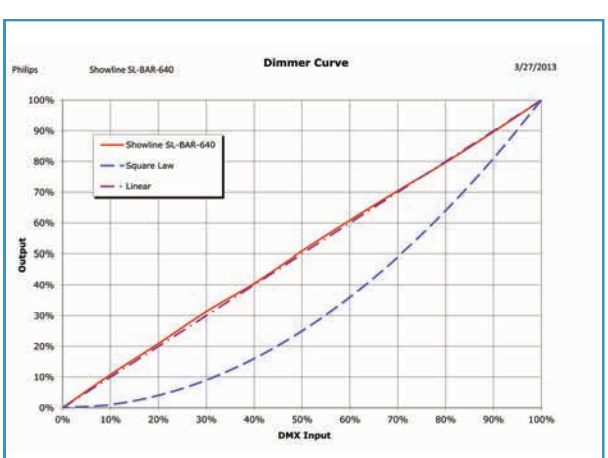

Figure 11: Dimmer curve.

I measured strobe rates through a dedicated strobe channel ranging from 0.39Hz to 30.5Hz.

Color system

The color-mixing range was as expected from an RGBW unit, good in saturated colors near the three emitters and a little limited in some of the subtle mid-tones. I like having a white emitter as well as RGB, as it really helps if you want to use them on performers. (My personal prejudice is never to use RGB alone on human skin; it just doesn't look good). The chart below shows the output in the major colors from the system.

COLOR MIXING

Color	Red	Green	Blue	Magenta	Yellow	Cyan	White
Output	17%	34%	4%	21%	51%	38%	46%

The sum of RGBW is nominally 100%, showing that the Showline SL BAR 640 doesn't use any sort of load sharing.

As I mentioned earlier, the DMX512 control gives many different options for configuring the LED modules. For most of the time, I ran it as if it were a single unit with all modules controlled together. Philips calls this the "one group" mode. However, you can choose to control them in two, three, four, six, or 12 group modes, giving you more and more granular control of the modules.

As well as RGBW color mixing, the unit offers HSIC (hue, saturation, intensity, white point) control as an option. This can work well for quick access to colors and mixing. Finally, you can go back to basics and instead use a single color channel for quick access to 44 preprogrammed whites and colors as well as to user programmed palettes and color wheel and color chase effects.

Noise

The SL BAR 640 has three fans on the rear of the unit. These draw air across both the LED modules and the driver electronics. By default, they are in auto mode and will ramp up and down as needed to keep things cool. You can also choose to turn them off when, I assume, it will limit output so as to always run silently. These fans are the only noise producers in the unit. When running the unit at full power in an ambient of 25°C, they ramped up to 44.3dBA with a background ambient less than 35dBA at 3.3'. I found the fans "hunted" a bit and, at some power levels, were continually turning on and off. I'd recommend that Philips adds a bit of hysteresis to the control system, as this can be quite noticeable. A perpetually changing noise is often more annoying to an audience than a constant one.

Electrical parameters

The SL BAR 640 uses two internal, fully power-factor-corrected auto-ranging (90V – 264V 50/60Hz +/- 10%) power supplies.

POWER CONSUMPTION AS TESTED AT 120V

	Current, Power	Power Factor
Quiescent Load	0.18A, 6W	0.3
All LEDs illuminated	3.89A, 465W	0.99

Initialization time from power up to output was less than two seconds.

Electronics and control

Power in and out is through daisy-chained Neutrik PowerCon connectors with DMX512 through standard five-pin XLRs. Figure 12 shows the connectors at the input end of the unit, next to one of the fans. Output connectors are at the other end. The SL BAR 640 offers a comprehensive control menu through a color LCD display and ten associated buttons, as shown in Figure 13. This allows you to set up all the control parameters as well as run the fixture in stand-alone mode and check diagnostics.

Figure 12: Connectors and fan.

Figure 13: Display.

Inside the unit, there is a single main control and display board, shown in Figure 14, and two long LED driver boards running the full length of the unit. You can see a glimpse of them in Figure 15. Finally, reflecting the modular nature of the unit, there are two identical 240VA power supplies, one for each half of the unit as shown in Figure 16. Access to all these components is relatively simple, albeit after removing a large number of screws!

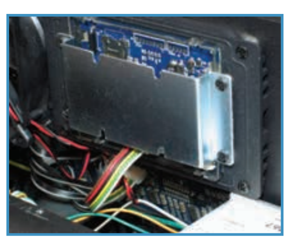

Figure 14: Main electronics.

Figure 15: Drivers.

Figure 16: Power supply.

Construction

The construction is solid and simple, based around aluminum extrusions, moldings, and fabricated plates. It has a clean outline and various rigging options for pipe and floor mount. Dimensions are 48" long, 7.1" wide, and 8.9" high with a weight of 39.6lb.

RDM

Although RDM has been around for quite some time and has been present in many of the units I've examined, it's not something I've been able to test in an objective manner. RDM is well-defined through the relevant PLASA standard *ANSI E1.20 – 2006 Entertainment Technology – RDM - Remote Device Management over USITT DMX512*. Scott Blair and Peter Willis, from the RDM task group, have been asking me to include it in these reviews, but there wasn't a standard set of tests and test equipment I could use. This has changed, however, and Simon Newton (a member of the PLASA Technical Standards Control and Protocols technical standards working group and RDM task group) and others have put together an open-source RDM test suite based around the inexpensive Raspberry Pi computer platform. With his assistance, I assembled a test system using a Raspberry Pi and, in this case, a USB-to-DMX interface kindly loaned to me by Robe. Figure 17 shows the simple test setup. This runs a custom Linux build that gives you a web-based GUI to run a comprehensive suite of more than 200 tests to the *E1.20* standard on a connected RDM responder. You can get more information on this, and the rest of the Open Lighting Project, at www.opendmx.net. The PLASA RDM standard *ANSI E1.20* is available on the PLASA website at plasa.me/67xd0.

Figure 17: RDM test rig.

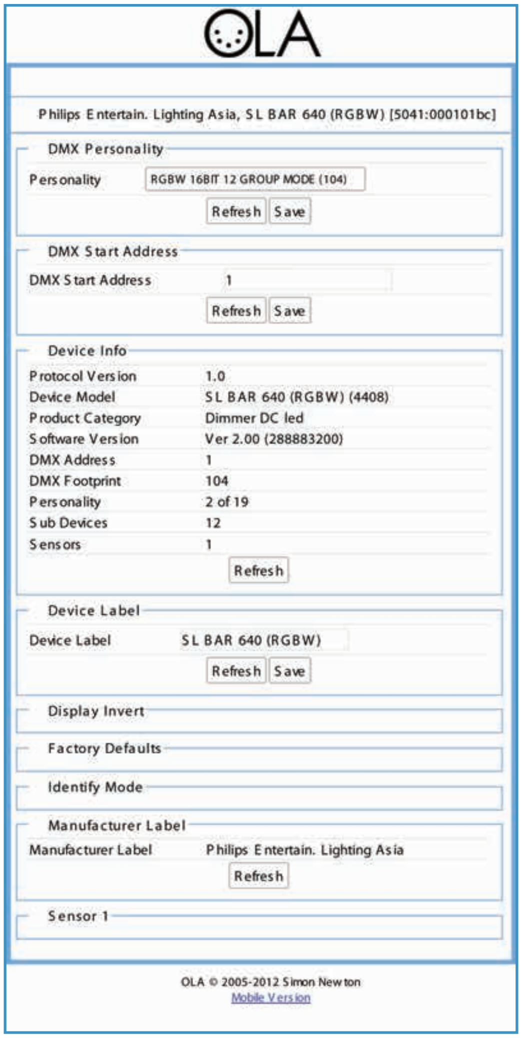

Figure 18: RDM information OLA.

The good news is, it all worked well. Figure 18 shows the basic RDM profile of the SL BAR 640, and Figure 19 shows the test results. The unit passed all the RDM tests for normal operation; the failures were in areas that are non-critical, such as error handling. (It would be rare for a fixture to score 100%.) I also used the system and RDM to set both the fixture personality and start address for my normal testing, so I know it works in real life. All of the many personality modes were listed for section through the RDM test GUI; this made it easy for me to switch between the one group and 12 group modes during my tests. One final feature of the RDM test is that the RDM profile is published on the RDM website. In this case, the data I grabbed on the SL BAR 640 is now online at plasa.me/pu4bd.

Conclusions

There you have it, my first review of a product from Philips' new brand, Showline. The SL BAR 640 is designed to be a workhorse unit in a workhorse role. Would it work for you?

I hope I've provided some hard facts to help you make that decision—but, as always, it's up to you to make the final call.

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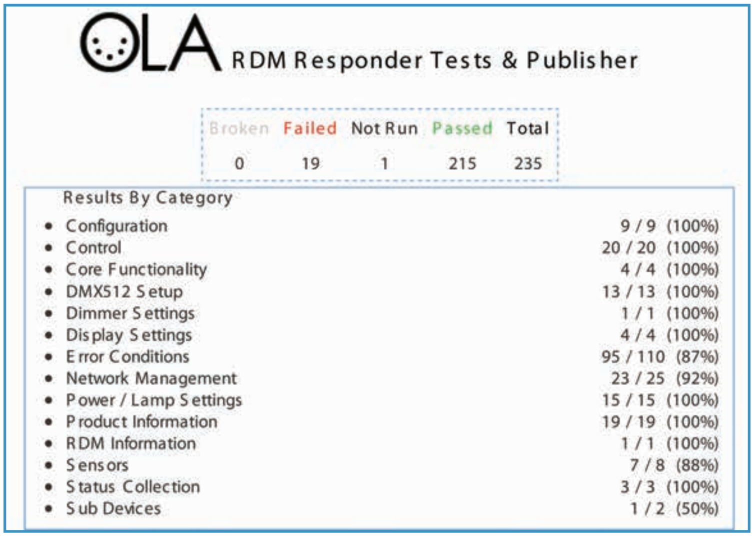

Figure 19: RDM test results OLA.


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