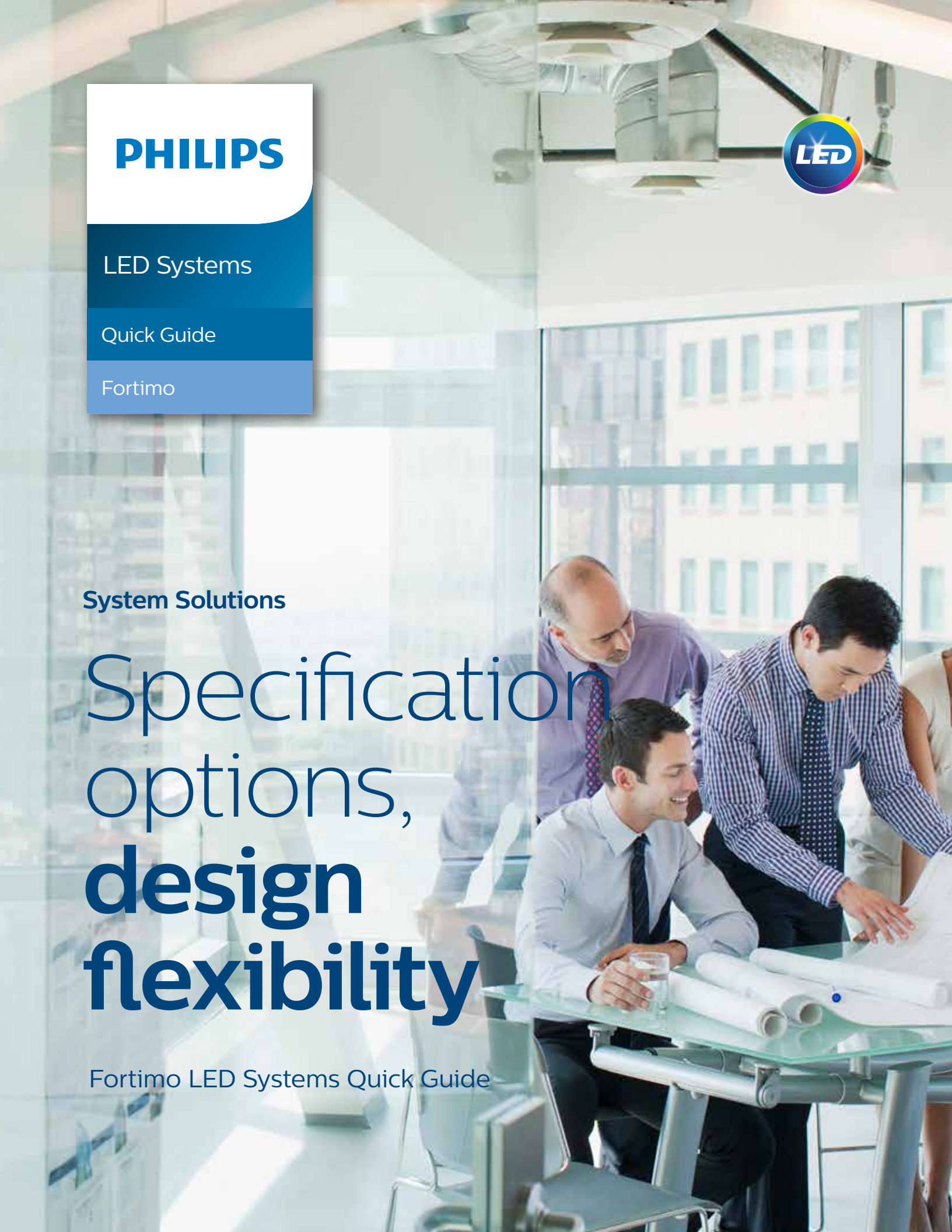
PHILIPS

LED Systems

Quick Guide

Fortimo



System Solutions

Specification options, **design flexibility**

Fortimo LED Systems Quick Guide

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Design flexibility

The flexibility of Philips Fortimo LED Modules and Philips Advance Xitanium LED Drivers allows luminaire manufacturers to remain competitive yet differentiate themselves by offering tailor-made solutions for virtually any light specification.

LED modules

Our flexibility to cover a wide range of lighting specifications with a limited number of LED modules – standard stock items – offers manufacturers the flexibility they need to stand out in the market. In the case of the Fortimo LED Line family, 10 LED boards and four Xitanium LED Drivers can cover the whole fluorescent lamp range. This provides manufacturers maximum diversity for luminaires with minimal internal component complexity.

LED drivers

There are two main methods of configuring LED drivers that are most commonly used. With Xitanium LED programmable drivers, current and voltage points can be chosen either via hardware settings, such as resistors, or through software programming with packages like the MultiOne Configurator.

Versatile solutions

Philips offers lighting solutions that provide lighting manufacturers with the flexibility to distinguish themselves from the competition. Philips Advance LED Drivers with SimpleSet technology help luminaire manufacturers quickly and easily create driver-module systems to meet wide-ranging lighting specifications, while Xitanium SR LED Drivers offer manufacturers a simple solution with big benefits for their customers who want real-time, actionable lighting data. Philips' design-in assistance program and cooperation with the UL Safety Related Electronic Circuit program bring additional opportunities for manufacturer differentiation. More information can be found in upcoming sections in this guide.

Fast, flexible wireless programming

Philips' new SimpleSet wireless programming technology for Philips Advance Xitanium LED Drivers is designed to help OEMs quickly and easily program LED drivers at any time during the manufacturing, distribution or installation process. As a result, they can offer a driver suited to a wide range of lumen packages for Philips Fortimo LED Modules.

Accelerate LED programming

Current methods used to adjust output current of LED drivers have proven to be cumbersome to incorporate into high volume production environments because the driver either has to be powered for programming or needs to be wired to a programming device. Using Philips SimpleSet technology, you will be able to quickly and easily program drive current and set specific lumen levels by simply touching the driver with the programing device. This speed and flexibility will allow you and your customers to set and reset parameters as needed.

A simple flexible solution

Tapping into the new Philips Advance Xitanium LED Drivers with SimpleSet is easy. First, use Philips MultiOne software to set the desired parameters for the LED drivers. Then, after connecting the programming device to the computer, touch the device to the appropriate place on the driver and the programming device wirelessly programs the driver. The software provides visual and audio confirmation that the driver was programmed successfully.

Stay ahead of business demands

SimpleSet technology enables you to do more for your customers and your business. OEMs can quickly meet a broad range of customer requirements and order variations. In addition, wireless programming is flexible so it can be incorporated directly into any and all areas of your product development process, warehouse and distribution. You have never-before-possibilities to create differentiation for your business.

Visit philips.com/simpleset for more information.

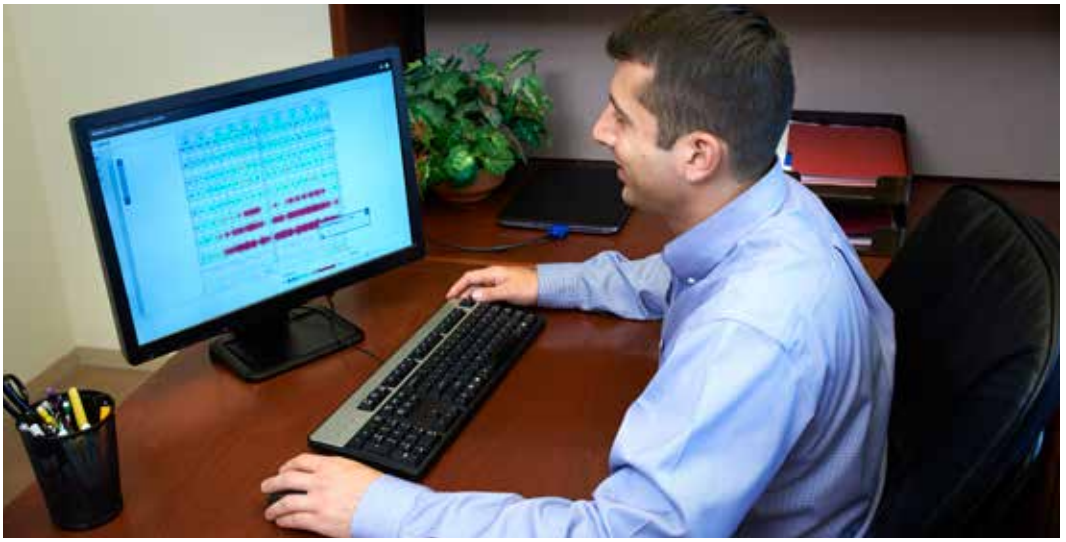
Streamline your wireless connected lighting system

Philips Advance Xitanium SR LED Drivers: uncomplicated and amenable to any sensor or network

In today's digital age, people can gather real-time data and use it to make highly informed decisions in areas from personal finance to time management and much more. It is now possible to wirelessly harvest specific, real-time lighting information in commercial spaces. This empowers lighting customers to fine-tune their energy use for reduced energy costs and use data gathered from the space for other emerging uses.

Lighting manufacturers can benefit, too, by creating lighting solutions without complex, multi-component pathways and associated component costs. Our Philips Advance Xitanium SR LED Drivers are a strong foundation for connected lighting systems, as they standardize the digital connection between driver and sensor to eliminate the need for multiple components and alleviate incompatibility issues as well as time-consuming configurations. This streamlined approach and easy design-in means that you can now spend less time and money to bring your products to market. And for your customers, Xitanium SR LED Drivers enhance energy efficiency by monitoring real-time system data and making this information available at any time to the network. They also manage sensors and commands related to occupancy, daylight harvesting and dim-to-off at each luminaire so you can make the most informed decisions. Together with Philips, it's never been easier for you to create robust, cutting-edge wireless lighting solutions.

Visit philips.com/xitaniumsr for more information.



UL safety related electronic circuit

Philips Fortimo LED Downlight Module (DLM) Gen 4 and Fortimo LED Downlight Module (DLM) Flex with UL Safety Related Electronic Circuit deliver innovation that matters.

In close cooperation with UL, Philips has released its latest additions of the Fortimo LED DLM product family for the UL Safety Related Electronic Circuit program. By designing a system consisting of a Fortimo LED Downlight Module and Philips Advance Xitanium LED Driver, this solution complies with UL991 and CSA22.2 No. 0.8 and enables fixture design without additional thermal protection.

This system uses a thermal sensing circuit to help prevent hazardous conditions caused by potential overheating of the electronic components. If the temperature of the module and/or the driver rises above a critical threshold, a thermal circuit in the driver is activated and reduces the drive current of the module until the temperature returns below 90°C, which is where they would be considered hazardous by UL Safety regulations for recessed downlight fixtures.

This features reduces components and complexity while providing an energy savings to the enduser of up to 2W of power compared to a similiar product requiring active thermal protection.*

See page 14 for the Philips Fortimo LED DLM product line.

*See footnotes on page 27.

OEMs 'design-in' assistance

Philips' dedicated engineering team offers support, analysis and evaluation.

Philips is proud to offer North American OEMs design-in assistance in the use of Philips LED modules. Solely dedicated to the North American market, the team is comprised of talented lighting industry engineers ready to support fixture manufacturers in the integration of Philips LED modules into their finished products.

Located in our Rosemont, Illinois, facility, our engineering team offers support, analysis and evaluation for key integration issues including thermal, electrical, mechanical and optical – with the intent of lowering OEM development costs and speeding OEM time to market.

Available capabilities include:

1. Comprehensive design-in thermal support and testing
2. Optical design support and photometric evaluation
3. Mechanical design assistance and engineering support
4. Electrical/system level verification
5. Initial UL approbation support
6. Surge testing
7. EMI and sound testing

Fortimo LED Linear Family

The Fortimo LED Linear Module Family has been designed to replace fluorescent lighting in new luminaires. By standardizing form factors, Philips has made it easy for designers to fit LED solutions into a variety of linear applications, including standard office to high-bay industrial and now into very slim fixtures where fluorescent light might not be suitable.

Fortimo LED Line
Designed to replace general fluorescent lighting in new luminaires, the Fortimo LED Line system goes into the third generation with improved efficiency and the same Zhaga footprint.

Fortimo LED Line High Flux
The Fortimo LED Line High Flux system is ideal for installations at greater application heights where more light output is needed, such as high-bay. It was designed to withstand high ambient temperatures that are common to applications like industry or vapor tight fixtures.

Fortimo LED Strip
The Fortimo LED Strip system enables design of high-energy efficacy slim linear LED fixtures, which may not be possible with fluorescent lighting or the Fortimo LED Line system.

Fortimo LML Slim Efficiency
The Fortimo LML Slim Efficiency system enables an economic fixture design that meets DLC requirements for linear lighting applications replacing T8 lamp equivalents.

Fortimo LED Line SQ system
The Fortimo LED Line SQ system with square outer dimensions is ideal for 2”x2” or 2”x4” recessed office applications that require a very homogeneous (no pixilation) exit surface window and high quality of light.

Fortimo LED Line

Benefits for the end users

- High energy efficiency
- Improved light output (3R) and quality of light (3 SDCM)[13]
- Improved total cost of ownership[13]
- Applicable for all fluorescent luminaires
- Flexible system design due to pairing with Philips Advance Xitanium Drivers
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers[10]

Fortimo Linear LED systems are the ideal solution for LED luminaires that traditionally would have been equipped with fluorescent lamps.

The wide range of system offerings provides a solution for all the different types of luminaires, including recessed and surface-mounted office luminaires, trunking and profile luminaires in retail and waterproof luminaires in industrial applications.

Fortimo LED Line Gen 3 offers best-in-class module efficiency up to 165 lm/W, an increase of approximately 10% versus the previous generation. The new generation offers an improved color consistency of 3 SDCM. A 1,100 lm option is added to the 3R portfolio, which serves the need for higher output.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (˚C)
Fortimo LED Line 1ft 1100lm 830 1R LV3	1046	7.2	145	3000	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 835 1R LV3	1079	7.2	149	3500	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 840 1R LV3	1100	7.2	152	4000	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 850 1R LV3	1100	7.2	152	5000	>80	3	>50,000	70
Fortimo LED Line 2ft 2200lm 830 1R LV3	2092	14.5	145	3000	>80	3	>50,000	70
Fortimo LED Line 2ft 2200lm 835 1R LV3	2157	14.5	149	3500	>80	3	>50,000	70
Fortimo LED Line 2ft 2200lm 840 1R LV3	2200	14.5	152	4000	>80	3	>50,000	70
Fortimo LED Line 2ft 2200lm 850 1R LV3	2200	14.5	152	5000	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 830 3R LV3	1046	6.7	156	3000	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 835 3R LV3	1079	6.7	161	3500	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 840 3R LV3	1100	6.7	164	4000	>80	3	>50,000	70
Fortimo LED Line 1ft 1100lm 850 3R LV3	1100	6.7	164	5000	>80	3	>50,000	70

RoHS COMPLIANT[7] [8] Zhaga[9]

See footnotes on page 27.

Fortimo LED Line High Flux LV2

Benefits for the end users

- Enables LED fixture designs in thermally challenging applications of -40°C ± 55°C ambient temperatures
- High energy efficacy and optimal total cost of ownership vs. conventional lighting systems
- Flexible system design due to pairing with programmable Philips Advance Xitanium Drivers with SimpleSet technology

Fortimo LED Line High Flux Gen 2 is designed to replace conventional lighting in high lumen and high ceiling applications such as high-bay linear 80W TL 5 fluorescent systems.

The Fortimo LED Line High Flux Gen 2 offers high energy efficacy and an optimal thermal design.

Its high lumen output of >2,000 lm/ft and thermal capability of Tc life of 90°C for a 50,000-hour lifetime[1] make it the perfect fit for the most demanding applications.

Together with the wide range of available Philips Advance Xitanium LED Drivers, it provides peace of mind for both OEM and end user, backed by a five-year limited system warranty.[10]

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)
Fortimo LED Line 1ft 2000lm 830 1R LV2	1910	14.1	136	3000	80	3	>50,000	90
Fortimo LED Line 1ft 2000lm 835 1R LV2	1950	14.1	139	3500	80	3	>50,000	90
Fortimo LED Line 1ft 2000lm 840 1R LV2	2000	14.1	142	4000	80	3	>50,000	90
Fortimo LED Line 1ft 2000lm 850 1R LV2	2010	14.1	143	5000	80	3	>50,000	90
Fortimo LED Line 2ft 4000lm 830 1R LV2	3820	28.2	136	3000	80	3	>50,000	90
Fortimo LED Line 2ft 4000lm 835 1R LV2	3900	28.2	139	3500	80	3	>50,000	90
Fortimo LED Line 2ft 4000lm 840 1R LV2	4000	28.2	142	4000	80	3	>50,000	90
Fortimo LED Line 2ft 4000lm 850 1R LV2	4020	28.2	143	5000	80	3	>50,000	90

RoHS COMPLIANT[7] [8] Zhaga[9]

See footnotes on page 27.

Fortimo LED Strip LV3

Benefits for the end users

- High energy efficiency and long lifetime allow state-of-the-art luminaire design
- Slim width enables optimized luminaire design and new form factors
- High color rendering and excellent color consistency bring linear LED lighting to the next level for quality of light
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers[10]

Fortimo LED Strip systems are ideal for use in narrow width luminaire designs for architectural applications that may not be possible with fluorescent lighting. This Fortimo LED Strip product offers best-in-class module efficiency of up to 163 lm/W and flux packages.

The Fortimo LED Strip systems are ideal for use in luminaires for direct lighting in offices, banks, schools, public buildings, supermarkets and other applications to replace high energy efficiency T5 fluorescent lighting.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)
Fortimo LED Strip 1ft 1100lm 830 1R LV3	1060	6.9	155	3000	>80	3	>50,000	70
Fortimo LED Strip 1ft 1100lm 835 1R LV3	1060	6.9	155	3000	>80	3	>50,000	70
Fortimo LED Strip 1ft 1100lm 840 1R LV3	1100	6.9	160	4000	>80	3	>50,000	70
Fortimo LED Strip 1ft 1100lm 850 1R LV3	1120	6.9	163	5000	>80	3	>50,000	70
Fortimo LED Strip 1ft 1100lm 935 1R LV3	890	6.9	130	3500	>90	3	>50,000	70
Fortimo LED Strip 1ft 1100lm 940 1R LV3	910	6.9	132	4000	>90	3	>50,000	70
Fortimo LED Strip 2ft 2200lm 830 1R LV3	2120	13.8	155	3000	>80	3	>50,000	70
Fortimo LED Strip 2ft 2200lm 835 1R LV3	2120	13.8	155	3000	>80	3	>50,000	70
Fortimo LED Strip 2ft 2200lm 840 1R LV3	2200	13.8	160	4000	>80	3	>50,000	70
Fortimo LED Strip 2ft 2200lm 850 1R LV3	2240	13.8	163	5000	>80	3	>50,000	70

RoHS COMPLIANT[7] [8] Zhaga[9]

See footnotes on page 27.

Fortimo LML Slim Efficiency

Benefits for the end users

- Enables most economic and flexible fixture design
- High degree of design freedom allowing slim and compact fixture design
- Flexible system design due to pairing with Philips Advance Xitanium programmable drivers with SimpleSet technology
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers[10]

Fortimo LED LML Slim Efficiency systems are designed to replace conventional lighting in both fixed and dimmable luminaires. Slim board design (width < 20mm) enables compact fixture design and creates a high degree of design freedom. The Fortimo LED LML Slim Efficiency enables the use of a wide variety of optics, resulting in beams ranging from batwing to tight beam distribution, making it a great choice for the illumination of vertical surfaces.

LED Module	Flux[2, 3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)
Fortimo LML SE 1ft 700lm 830 1R LV G1	650	5.1	127	3000	> 80	3.5	> 50,000	65
Fortimo LML SE 1ft 700lm 835 1R LV G1	670	5.1	131	3500	> 80	3.5	> 50,000	65
Fortimo LML SE 1ft 700lm 840 1R LV G1	700	5.1	137	4000	> 80	3.5	> 50,000	65
Fortimo LML SE 1ft 700lm 850 1R LV G1	730	5.1	140	5000	> 80	3.5	> 50,000	65
Fortimo LML SE 2ft 1400lm 830 1R LV G1	1300	10.2	127	3000	> 80	3.5	> 50,000	65
Fortimo LML SE 2ft 1400lm 835 1R LV G1	1340	10.2	131	3500	> 80	3.5	> 50,000	65
Fortimo LML SE 2ft 1400lm 840 1R LV G1	1400	10.2	136	4000	> 80	3.5	> 50,000	65
Fortimo LML SE 2ft 1400lm 850 1R LV G1	1460	10.2	141	5000	> 80	3.5	> 50,000	65

RoHS[7] COMPLIANT

[8]

See footnotes on page 27.

Fortimo LED linear family overview

			Driver Part #							
LED Module Product Family	**Product Description**	**Typ Flux LED Module [lm]**	**XI020 C056V 054BST1**	**XI040 C110V 054BPT1**	**XI054 C150V 054DNT1**	**XI054 C150V 054SNT1**	**XR054 C150V 054RNT1**	**XV054 C150V 054RNT1**	**XI075 C200V 054BPT1**	**XI095 C275V 054DNF1**
			Number of LED Modules per Driver							
Fortimo LED Line SQ LV1	Fortimo LED Line Square 1ft SQ HV/LV	1,250	1	2...3	3...4	3...4	3...4	3...4	3...6	5...7
Fortimo LED Line 1R LV2 High Flux	Fortimo LED Line 1ft 1R LV2	2,000	1	2	3	2...3	2...3	2...3	2...4	4...6
	Fortimo LED Line 2ft 1R LV2	4,000	N/A	1	N/A	1	1	1	1...2	2...3
Fortimo LED Line 1R LV3	Fortimo LED Line 1ft 1R LV3	1,110	1...2	2...4	5...6	4...6	3...6	3...6	4...8	7...11
	Fortimo LED Line 2ft 1R LV3	2,220	1	1...2	3	2...3	2...3	2...3	2...4	4...5
Fortimo LED Strip 1R LV3	Fortimo LED Strip 1ft 1R LV3	1,110	2	3...5	5...7	4...7	4...7	4...7	5...10	8...13
	Fortimo LED Strip 2ft 1R LV3	2,220	1	2	3	2...3	2...3	2...3	3...5	4...6
Fortimo LED Line 3R LV3	Fortimo LED Line 1ft 3R LV3	650	2...4	4...8	8...11	7...11	6...11	6...11	7...15	13...20
	Fortimo LED Line 1ft 3R LV3	1,100	2	3...4	5...6	4...6	4...6	4...6	5...8	8...12
Fortimo LML Slim Efficiency	Fortimo LML SE 1ft 1R LV1	700	2...3	3...7	7...10	6...10	5...10	5...10	6...14	10...17
	Fortimo LML SE 2ft 1R LV1	1,400	1	2...3	4...5	3...5	3...5	3...5	3...7	5...8

Maximum of number of parallel LED modules per chain might be limited to a lesser amount of LED modules as shown. Please consult individual LED module datasheets.

Note: Operation with lower quantites of LED modules other than listed is possible although the system performance expectations may not be met (ie., PF, THD). Please consult the individual driver datasheets for typical performance specified at the intended load point. Verification of system performance using actual components is recommended. The information in this overview is accurate at the time of writing. All data and specification are subject to change.

Product combinations (systems) that are listed in this document are tested and released as a system and covered by Philips Lighting North America Corporation's limited system warranty which can be found at: http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd.

Please consult your Philips OEM sales manager for the latest and more exhaustive overview.

See footnotes on page 27.

Fortimo LED Downlight Module (DLM) Family

Reliable options in the evolving LED downlight world

LED technologies continue to shift the lighting paradigm across all applications, and downlighting is no exception. In fact, downlighting was one of the first lighting applications to commercially embrace LED technology. As the technologies continue to evolve, long lifetimes, environmental sustainability and low initial costs attract general commercial audiences requiring functional lighting, while the exponential rise in LED efficiency, light quality and light output are creating new opportunities for high-end, sophisticated applications. The challenge remains for luminaire manufacturers to leverage these valuable advancements with costly and time-consuming retooling while also satisfying functional and performance end user lighting needs.

New Philips Fortimo LED Downlight Module (DLM) Gen 4 and Fortimo LED Downlight Module (DLM) Flex systems now provide you with the latest high quality LED options to satisfy both functional and performance requirements, along with excellent energy efficiencies and color consistency. Best of all, we retained the same familiar DLM footprint so that you don't have to endure the hassles of retooling or redesigning fixtures.

Fortimo LED DLM Flex

Benefits for the end users

- Good performance at an economic price point
- Flexibility to tune the performance as needed by modifying the operating point
- UL SREC compliance enables fixture design without additional thermal protection
- Luminaire manufacturability and ease of design-in
- Excellent thermal management
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers[10]

Fortimo LED Downlight Module (DLM) Flex systems provide you with the latest advances, including high quality LED options to satisfy both functional and performance requirements and excellent energy efficacies and color consistency.

In addition, the Fortimo LED DLM Flex Module retains the familiar Fortimo DLM family footprint. Retaining the same footprint means that the OEM does not have to retool or redesign fixtures or change manufacturing processes.

When you're looking to create luminaires for practical and general lighting applications or have price-sensitive requirements, the Fortimo LED DLM Flex Module is the ideal solution.

Its direct white mid-power LED technology combines good light quality and energy efficiency up to 107 lm/W with low initial costs while also offering low maintenance and a long lifetime of 50,000 hours.[1]

Five lumen packages, including a new 5,000 lm option and four color temperatures (incl. 2700K), are available. The module can be operated at different currents.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)	Rad. angle
Fortimo LED DLM Flex 1100/827 Gen1 NA	1100	12.0	92	2700	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1100/830 Gen1 NA	1100	10.8	102	3000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1100/835 Gen1 NA	1100	10.6	104	3500	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1100/840 Gen1 NA	1100	10.3	107	4000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1500/827 Gen1 NA	1500	16.9	89	2700	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1500/830 Gen1 NA	1500	16.3	92	3000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1500/835 Gen1 NA	1500	16.0	94	3500	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 1500/840 Gen1 NA	1500	15.5	97	4000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 2000/827 Gen1 NA	2000	23.0	87	2700	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 2000/830 Gen1 NA	2000	20.6	97	3000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 2000/835 Gen1 NA	2000	20.2	99	3500	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 2000/840 Gen1 NA	2000	19.6	102	4000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 3000/827 Gen1 NA	3000	34.1	88	2700	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 3000/830 Gen1 NA	3000	30.9	97	3000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 3000/835 Gen1 NA	3000	30.0	100	3500	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 3000/840 Gen1 NA	3000	29.4	102	4000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 5000/827 Gen1 NA	5000	58.8	85	2700	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 5000/830 Gen1 NA	5000	51.5	97	3000	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 5000/835 Gen1 NA	5000	51.0	98	3500	> 80	3	> 50,000	85	108
Fortimo LED DLM Flex 5000/840 Gen1 NA	5000	50.0	100	4000	> 80	3	> 50,000	85	108

RoHS COMPLIANT[7] [8]

See footnotes on page 27.

Fortimo LED DLM Gen 4

Benefits

- Increased efficacies of up to 32% compared to Gen 3[12]
- CRI of minimum 80
- Excellent quality of white light (3 SDCM)
- Dimming options include 0-10V

RoHS COMPLIANT [7] [8]

See footnotes on page 27.

The Fortimo LED Downlight Module is equipped with a special remote phosphor technology that enables very high levels of LED efficacy. Additionally, the excellent lumen maintenance and long lifetime of up to 50,000 hours[1] make frequent re-lamping a thing of the past – a promise that is backed by a Philips five-year limited warranty.[10]

Peace of mind for manufacturers

The LED module and driver have been developed and rigorously tested in combination with each other, including key enhancements like thermal protection for the module. Additionally, the module has been successfully implemented using LM-80 guidelines. As a result, they provide a great lumen output and light distribution, while efficacy upgrades can be implemented when available.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)
Fortimo LED DLM 1100 10W/827 UL Gen4	1100	10.3	107	2700	> 80	3	> 50,000	80
Fortimo LED DLM 1100 10W/830 UL Gen4	1100	10.1	109	3000	> 80	3	> 50,000	80
Fortimo LED DLM 1100 10W/835 UL Gen4	1100	9.6	114	3500	> 80	3	> 50,000	80
Fortimo LED DLM 1100 9W/840 UL Gen4	1100	9.2	120	4000	> 80	3	> 50,000	80
Fortimo LED DLM 1500 16W/827 UL Gen4	1500	15.4	97	2700	> 80	3	> 50,000	80
Fortimo LED DLM 1500 14W/830 UL Gen4	1500	14.5	103	3000	> 80	3	> 50,000	80
Fortimo LED DLM 1500 14W/835 UL Gen4	1500	13.8	108	3500	> 80	3	> 50,000	80
Fortimo LED DLM 1500 13W/840 UL Gen4	1500	13.2	114	4000	> 80	3	> 50,000	80
Fortimo LED DLM 2000 22W/827 UL Gen4	2000	22.3	90	2700	> 80	3	> 50000	80
Fortimo LED DLM 2000 21W/830 UL Gen4	2000	20.9	95	3000	> 80	3	> 50000	80
Fortimo LED DLM 2000 20W/835 UL Gen4	2000	19.9	100	3500	> 80	3	> 50000	80
Fortimo LED DLM 2000 19W/840 UL Gen4	2000	18.9	106	4000	> 80	3	> 50000	80
Fortimo LED DLM 3000 34W/827 UL Gen4	3000	33.5	90	2700	> 80	3	> 50000	80
Fortimo LED DLM 3000 32W/830 UL Gen4	3000	31.8	94	3000	> 80	3	> 50000	80
Fortimo LED DLM 3000 30W/835 UL Gen4	3000	30.1	100	3500	> 80	3	> 50000	80
Fortimo LED DLM 3000 28W/840 UL Gen4	3000	28.7	105	4000	> 80	3	> 50000	80

Fortimo LED Spotlight Module (SLM) Gen 4

Benefits for the end users

- High energy efficiency
- Flexibility to tune the performance as needed by modifying the operating point
- Luminaire manufacturability and ease of design-in
- Excellent thermal management
- 5-year limited system warranty with Philips Advance Xitanium LED Drivers[10]

The Fortimo LED SLM Gen 4 is a next generation solution for spotlight and downlight applications. Fortimo LED SLM Gen 4 is a product in line with the Fortimo brand promise of light quality. Philips provides a system proposition ranging from 1,100 lm to 4,500 lm in preset outputs, with the flexibility to tune as needed. The product leverages the latest chip-on-board LED technology with a Zhaga Book 3 compliant holder. Being a low voltage UL Class II electrical design and a UL recognized component, Fortimo LED SLM Gen 4 enables easy design-in with Philips Advance Xitanium LED Drivers.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)	LES (mm)	Rad. angle
Fortimo LED SLM 1100lm 827 L9 G4 NA	1100	10.6	104	2700	82	3	> 50,000	85	9	115
Fortimo LED SLM 1100lm 830 L9 G4 NA	1200	10.6	113	3000	82	3	> 50,000	85	9	115
Fortimo LED SLM 1100lm 835 L9 G4 NA	1250	10.6	118	3500	82	3	> 50,000	85	9	115
Fortimo LED SLM 1100lm 840 L9 G4 NA	1270	10.6	120	4000	82	3	> 50,000	85	9	115
Fortimo LED SLM 1100lm 927 L9 G4 NA	930	10.6	88	2700	97	3	> 50,000	85	9	115
Fortimo LED SLM 1100lm 827 L13 G4	1160	10.2	114	2700	82	3	> 50,000	85	13	115
Fortimo LED SLM 1100lm 830 L13 G4	1240	10.2	122	3000	82	3	> 50,000	85	13	115
Fortimo LED SLM 1100lm 835 L13 G4	1290	10.2	127	3500	82	3	> 50,000	85	13	115
Fortimo LED SLM 1100lm 840 L13 G4	1330	10.2	130	4000	82	3	> 50,000	85	13	115
Fortimo LED SLM 1100lm 927 L13 G4	970	10.2	95	2700	97	3	> 50,000	85	13	115
Fortimo LED SLM 2000lm 827 L13 G4	1850	17.3	107	2700	82	3	> 50,000	85	13	115
Fortimo LED SLM 2000lm 830 L13 G4	2020	17.3	117	3000	82	3	> 50,000	85	13	115
Fortimo LED SLM 2000lm 835 L13 G4	2100	17.3	122	3500	82	3	> 50,000	85	13	115
Fortimo LED SLM 2000lm 840 L13 G4	2150	17.3	124	4000	82	3	> 50,000	85	13	115
Fortimo LED SLM 2000lm 927 L13 G4	1570	17.3	91	2700	97	3	> 50,000	85	13	115
Fortimo LED SLM 3000lm 827 L15 G4	2760	26.0	106	2700	82	3	> 50,000	85	15	115
Fortimo LED SLM 3000lm 830 L15 G4	2970	26.0	114	3000	82	3	> 50,000	85	15	115
Fortimo LED SLM 3000lm 835 L15 G4	3090	26.0	119	3500	82	3	> 50,000	85	15	115
Fortimo LED SLM 3000lm 840 L15 G4	3170	26.0	122	4000	82	3	> 50,000	85	15	115
Fortimo LED SLM 4500lm 830 L19 G4	4860	42.4	115	3000	82	3	> 50,000	85	19	115
Fortimo LED SLM 4500lm 835 L19 G4	5060	42.4	119	3500	82	3	> 50,000	85	19	115
Fortimo LED SLM 4500lm 840 L19 G4	5160	42.4	122	4000	82	3	> 50,000	85	19	115

RoHS COMPLIANT[7] [8] Zhaga[9]

See footnotes on page 27.

Fortimo LED SLM Gen 4 Crisp White

Benefits for the end users

- Unique combination of white rendering and rich colors from one LED source
- Chip-On-Board (COB) LED technology
- Powerful, compact and uniform light source
- Excellent beam control, small beam angle
- Long lifetime > 50,000 hours[1]
- CRI 92 for deep, rich colors[5]

Retailers want lighting that makes the colors of clothes and fabrics appear rich, intense and vivid. LED spotlight sources with a warm color temperature are perfect for the job. Unfortunately, until now they tended to make whites look off-white or yellowish. But that's all set to change because with the new Fortimo LED SLM Crisp White Modules you can give your customers the best of both worlds: vivid colors and intense, pure whites.

A unique color experience

Fortimo LED SLM Crisp White is a unique solution that offers unparalleled rendering of white and colors with one light source. It's the first retail LED lighting solution to make whites appear pure and bright while at the same time making other colors appear warm, saturated and intense. That's because it offers two color temperatures with a single lamp – 4000K for whites and 3000K for colors. The result is an extremely attractive display that presents a totally new color experience to shoppers – one that shows all the store's merchandise in the best possible light. Fortimo LED SLM Crisp White creates the most attractive retail experience with authentic rendering to bring out the true colors in merchandise.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)	LES (mm)	Rad. angle
Fortimo LED SLM 1100lm 930 CW L9 G4	930	10.6	88	3000	92	3	> 50000	85	9	115
Fortimo LED SLM 1100lm 930 CW L13 G4	1490	18.0	83	3000	92	3	> 50000	85	13	115
Fortimo LED SLM 2000lm 930 CW L13 G4	2180	27.3	80	3000	92	3	> 50000	85	13	115
Fortimo LED SLM 3000lm 930 CW L15 G4	2770	33.8	82	3000	92	3	> 50000	85	15	115
Fortimo LED SLM 3800lm 930 CW L19 G4	3610	42.5	85	3000	92	3	> 50000	85	19	115

RoHS COMPLIANT[7] c UL us[8] Zhaga[9]

See footnotes on page 27.

Fortimo LED High Brightness Module (HBMt)

Benefits for the end users

- LED module that provides high lumen output from a small area
- Cost-effective LED light engine
- Luminaire design based on traditional reflector optics
- Standardized footprint offers interchangeability with light engines from different manufacturers

The Fortimo LED High Brightness Module (HBMt) system is a high efficacy, easy to design-in, future-proof solution for OEMs looking to incorporate LEDs into their outdoor, high-bay or industrial luminaire portfolios. With a compact rectangular light engine and non-integrated driver, the Fortimo LED HBMt system allows for creation of different light distributions using a metal reflector, similar to HID lamps. OEMs with experience in traditional luminaire design can easily leverage that expertise in developing a LED-based luminaire.

LED Module	Flux[2,3] (lm)	Power (W)	Efficacy (lm/W)	CCT[4] (K)	CRI[5] (Ra)	SDCM[6]	Lifetime (L70)	T case life (°C)
Fortimo LED HBMt 4000 30W/740	4000	30	140	4000	70	<7	50,000	85
Fortimo LED HBMt 4000 30W/757	4000	30	140	5700	70	<7	50,000	85
Fortimo LED HBMt 4000 31W/840	4000	31	130	4000	80	<7	50,000	85
Fortimo LED HBMt 6000 43W/740	6000	43	140	4000	70	<7	50,000	85
Fortimo LED HBMt 6000 43W/757	6000	43	140	5700	70	<7	50,000	85
Fortimo LED HBMt 6000 46W/840	6000	46	130	4000	80	<7	50,000	85

RoHS COMPLIANT[7] c UL us[8] Zhaga[9]

See footnotes on page 27.

Complementary partners

In order to make the Fortimo LED Module systems more easily accessible to all luminaire manufacturers, whether small or large, Philips Lighting has set up links with our complementary partners.

These are companies who have developed either reflectors or heat sinks specifically for the Fortimo LED systems. These complementary partners have regular contact with Philips Lighting and receive early information about the Philips Fortimo product roadmap. We recommend that you visit the websites of these companies and contact them directly about their Fortimo-related products.

The following are suggestions of products that can be used with certain Philips Fortimo systems. Philips makes no warranties regarding these products and assumes no legal liability or responsibility for loss or damage resulting from the use of the information herein.

The list of partners below is current as of February 2015. Please contact your local Philips sales representative for a complete listing.

Cooling Systems

AVC
www.avc.com.tw

MechaTronix
www.mechatronix-asia.com

Nuventix
www.nuventix.com

Sunon
www.sunon.com

Wisefull
http://www.wisefull.com

Thermal Interface

Laird Technologies
www.lairdtech.com

The Bergquist Company
www.bergquistcompany.com

Reflector

ACL
www.reflektor.com

Almeco
www.almecogroup.com

Alux Luxar
www.alux-luxar-reflektoren.com

Jordan
www.jordan-reflektoren.de/en/home

LEDIL
www.ledil.com

NATA
www.nata.cn

Widegerm
www.widegerm.com.hk

Xitanium LED Drivers

LED driver categories

Long-lasting and low-maintenance, LED-based light sources are an excellent solution for all lighting applications. For optimal performance, these solutions require reliable drivers matching the long lifetime of the LEDs. The Philips Advance Xitanium LED Driver portfolio offers a range of products specially designed to operate LED solutions for a variety of lighting applications, such as office, retail, industrial and outdoor, and meet a wide variety of customer needs, but they can all provide certain common benefits.

Based on the features that each driver has to offer, the Philips Advance Xitanium LED Drivers can be classified into three main categories: Fixed, Dimmable and Programmable.

Benefits include:

- Reliable and consistent operation
- High efficiency drivers - >90% in some cases
- Greater than 0.9 PF and less than 20% THD
- Greater than 50k hrs lifetime[1]
- 5-year limited warranty[10]
- ROHS compliance[7]
- Safety approbations (UL, CSA, CE, ENEC, PSE, SELV or CQC)

Fixed

Fixed LED drivers meet the basic needs of LED lighting. Available in either dedicated input voltage or InteliVolt options, these drivers can address a wide variety of output current and power requirements.

Dimmable

Dimmable drivers address the growing demand for controllability and flexibility. The Adjustable Output Current (AOC) feature enables operation of various LED configurations from different LED manufacturers and offers "future-proof" solutions for new LED generations. Specialized dimmable drivers enable use of lighting controls to increase energy savings.

Additional benefits include:

- Wide variety of dimming interfaces (0-10V, phase cut, step-dim)
- Helps address code requirements for energy efficient buildings
- Offers fixture design flexibility through the AOC feature
- Options such as fan output and module temperature protection

Programmable

Optimized to meet the ever-evolving needs of today's LED lighting customers, Philips Advance Xitanium Programmable LED Drivers are a one-stop solution for the varying power needs of industrial high-bay, office or retail lighting. Offering an unparalleled level of flexibility, these drivers can be customized based on the desired functionality of the luminaire design with a simple programming interface. With multiple choices for current output levels, module temperature control settings and a network-ready DALI interface, these drivers are an easily integrated driver solution. Luminaire designers and manufacturers are also able to streamline logistics without compromising on performance.

Additional benefits include:

- Robust programming that offers ultimate design flexibility with a reliable long lifetime
- Reduced SKU complexity and simplified logistics management (one driver to serve many needs)
- Multiple dimming options provide energy savings and can help reduce light pollution and CO_2 impact
- Easily programmable user interface for onsite customization of driver requirements
- Optimized life expectancies of up to 100,000 hours[11]
- Driver programmability provides features for the ever-evolving improvements in LED efficacy, removing the need to design-in a new LED driver as technology improves or changes

For a full list of available drivers for indoor and outdoor applications, please refer to the Philips Advance **LED Drivers Quick Guide.**

Indoor LED drivers

Dimmable

Part Number	Housing	Input Voltage (Vac)	Max Output Power (W)	Output Current (Adc)	Output Voltage Range (Vdc)	Features
XI013C030V048DNM1	1	120 - 277	13	0.1 - 0.3	24 - 48	0-10V, AOC, MTP
XI020C056V054BST1	4	120 - 277	20	0.1 - 0.56	27 - 54	0-10V, SimpleSet
XI020C070V030RNP1	1	120 - 277	20	0.4 - 0.7	20 - 30	Leading Edge, Trailing Edge, AOC
XI025C070V036DNM1	2	120 - 277	25	0.2 - 0.7	18 - 36	0-10V, AOC, MTP
XI025C100V036DNM1	1	120 - 277	25	0.3 - 1.0	18 - 36	0-10V, AOC, MTP
XI025C100V045DNM1	1	120 - 277	25	0.1 - 1.0	18 - 45	0-10V, AOC, MTP
LEDINTA0520C60DB	2	120 - 277	30	0.35 - 0.52	25 - 56	0-10V, AOC, MTP
XI036C100V048DNM1	1	120 - 277	36	0.1 - 1.0	24 - 48	0-10V, AOC, MTP
913701213402	2	120 - 277	39	0.20 - 0.70	20 - 56	0-10V, AOC, MTP, Fan
XI040C110V054BPT1	3	120 - 277	40	0.1 - 1.1	27 - 54	0-10V, SimpleSet
LEDINTA2000C24DO	4	120 - 277	48	1.0 - 2.0	12 - 24	0-10V, AOC
LEDINTA1000C60DB	2	120 - 277	50	0.7 - 1.05	25 - 48	0-10V, AOC, MTP
XI050C105V052DNM1	2	120 - 277	50	0.7 - 1.05	25 - 52	0-10V, AOC, MTP, Side entry
XI050C100V054DNM1	2	120 - 277	50	0.3 - 1.0	27 - 54	0-10V, AOC, MTP, Fan
XI054C150V054DNT1	3	120 - 277	54	0.7 - 1.5	27 - 54	0-10V, AOC, MTP
XG054C150V054BPT1	3	120 - 277	54	0.1 - 1.5	27 - 54	0-10V, SimpleSet
XI054C150V054SNT1	3	120 - 277	54	0.7 - 1.5	27 - 54	STEP DIM, AOC, MTP
XR054C150V054RNT1	3	120	54	0.7 - 1.5	27 - 54	Leading Edge, AOC, MTP
XV054C150V054RNT1	3	277	54	0.7 - 1.5	27 - 54	Leading Edge, AOC, MTP
XI075C200V054BPT1	4	120 - 277	75	0.1 - 2.0	27 - 54	0-10V, SimpleSet
XI095C275V054DNF1	4	120 - 277	95	1.0 - 2.75	27 - 54	0-10V, AOC, MTP

Programmable

Part Number	Housing	Input Voltage (Vac)	Max Output Power (W)	Output Current (Adc)	Output Voltage Range (Vdc)	Features
XV025C100V036DPM1	1	277	25	0.3 - 1.0	18 - 36	0-10V, AOC, MTP, FAN, PROG
XR025C100V036XPM1	1	120	25	0.3 - 1.0	18 - 36	TE, 0-10V, AOC, MTP, FAN, PROG
XR025C100V036LPM1	1	120	25	0.3 - 1.0	18 - 36	DALI, AOC, MTP, FAN, PROG
XI025C100V036XPL1	2	120 - 277	25	0.3 - 1.0	18 - 36	TE, 0-10V, AOC, MTP, FAN, PROG
XV050C100V054DPM1	1	277	50	0.3 - 1.0	27 - 54	0-10V, AOC, MTP, FAN, PROG
XR050C100V054XPM1	1	120	50	0.3 - 1.0	27 - 54	TE, 0-10V, AOC, MTP, FAN, PROG
XI050C100V054XPL1	3	120 - 277	50	0.3 - 1.0	27 - 54	TE, 0-10V, AOC, MTP, FAN, PROG
XI075C200V054XPT1	4	120 - 277	75	0.7 - 2.0	27 - 54	0-10V, AOC, MTP, PROG
XI075C200V054YPT1	4	120 - 277	75	0.7 - 2.0	27 - 54	DALI, AOC, MTP, PROG

AOC: Adjustable Output Current, via Rset or programming
MTP: Module Temperature Protection
FAN: 12V auxiliary voltage to power an active cooling device
PROG: Programmable, includes Constant Light Output (CLO)

Outdoor LED drivers

Fixed

Part Number	Housing	Input Voltage (Vac)	Max Output Power (W)	Output Current (Adc)	Output Voltage Range (Vdc)
LED120A0350C28FO	1	120	10	0.35	2.8 - 28
LED120A0012V10F	1	120	12	1.00	12
LED120A0700C28FO	1	120	20	0.70	2.8 - 28
LED277A0700C28FO	1	277	20	0.70	2.8 - 28
LEDINTA0024V22FO	2	120 - 277	53	2.20	24
LEDINTA0012V50FO	2	120 - 277	60	0.10 - 5.0	12
LEDINTA0024V28FO	2	120 - 277	67	0.10 - 2.8	24
LEDINTA0024V32FO	2	120 - 277	77	3.20	24
LEDHCNA0024V41FLO	3	347 - 480	100	0.10 - 4.16	3.5 - 24
LEDINTA0024V41FO	2	120 - 277	100	0.10 - 4.16	3.5 - 24
LEDINTA700C140F3O	3	120 - 277	100	0.35/0.53/0.70	60 - 140
LEDHCNA0350C425FO	3	347 - 480	150	0.35	120 - 425
LEDINTA0350C425FO	3	120 - 277	150	0.35	120 - 425
XH150C070V210CNF1	3	347 - 480	150	0.70	60 - 210
LEDINTA0700C210FO	3	120 - 277	150	0.70	60 - 210

Dimmable

Part Number	Housing	Input Voltage (Vac)	Max Output Power (W)	Output Current (Adc)	Output Voltage Range (Vdc)	Features
LED120A0700C28DO	1	120	20	0.70	10 - 28	0-10V
LED277A0700C30DO	1	277	21	0.70	15 - 30	0-10V
XI040C070V056CNJ1	2	120 - 277	40	0.70	12 - 54	0-10V
XI040C105V042CNJ1	2	120 - 277	40	1.05	14 - 42	0-10V
XI040C120V035CNJ1	2	120 - 277	40	1.20	12 - 35	0-10V
XI050C120V042BNY1	3	120 - 277	50	0.50 - 1.20	25 - 42	0-10V, AOC
XI055C105V052BNY1	3	120 - 277	50	0.35 - 1.35	25 -52	0-10V, AOC
LEDINTA0024V30DLO	5	120 - 277	72	3.00	24	0-10V
XI075C053V140CNY1	3	120 - 277	75	0.53	71 - 143	0-10V
XI075C053V140DNY1	3	120 - 277	75	0.10 - 0.53	71 - 143	0-10V, AOC, MTP
XI075C070V105CNY2	3	120 - 277	75	0.70	54 - 107	0-10V
XI075C070V105DNY1	3	120 - 277	75	0.10 - 0.70	54 - 107	0-10V, AOC, MTP
XI075C105V070CNY2	3	120 - 277	75	1.05	36 - 72	0-10V
XI100C150V038CNH1	4	120 - 277	100	1.50	19 - 38	0-10V, 2 Channels
LEDINTA0024V41DLO	5	120 - 277	100	4.10	15 - 24	0-10V
LEDHCNA0024V41DLO	5	347 - 480	100	4.10	15 - 24	0-10V
LEDINTA0350C425DO	5	120 - 277	150	0.35	120 - 425	0-10V
LEDHCNA0350C425DN	5	347 - 480	150	0.35	120 - 425	0-10V
LEDINTA0530C280DO	5	120 - 277	150	0.53	120 - 280	0-10V
XH150C053V280CNF1	5	347 - 480	150	0.53	120 - 280	0-10V
LEDINTA0700C210DO	5	120 - 277	150	0.70	60 - 210	0-10V
XH150C070V210CNF1	5	347 - 480	150	0.70	60 - 210	0-10V
XI150C105V140CNF1	5	120 - 277	150	1.05	40 - 140	0-10V
XH150C105V140CNF1	5	347 - 480	150	1.05	47 - 142	0-10V
LEDINTA1500C100DO	5	120 - 277	150	1.50	30 - 100	0-10V

AOC: Adjustable Output Current, via Rset or programming
MTP: Module Temperature Protection

Programmable

Part Number	Housing	Input Voltage (Vac)	Max Output Power (W)	Output Current (Adc)	Output Voltage Range (Vdc)	Features
929000708803	1	120 - 277	40	0.10 - 0.70	29 - 57	0-10V, AOC, MTP, PROG+
929000710303	1	120 - 277	40	0.10 - 0.53	38 - 76	0-10V, AOC, MTP, PROG+
929000702302	4	120 - 277	75	0.35 - 0.70	80 - 152	0-10V, AOC, MTP, PROG
929000710103	2	120 - 277	75	0.10 - 0.70	54 - 107	0-10V, AOC, MTP, PROG+
929000708903	4	120 - 277	75	0.10 - 1.05	36 - 75	0-10V, AOC, MTP, PROG+
XH075C120V075KPF1	4	347 - 480	75	0.35 - 1.20	25 - 75	0-10V, AOC, MTP, PROG
929000710403	2	120 - 277	100	0.10 - 0.53	94 - 189	0-10V, AOC, MTP, PROG+
929000708703	2	120 - 277	100	0.10 - 0.70	71 - 143	0-10V, AOC, MTP, PROG+
XI150C035V425MPH1	3	120 - 277	150	0.2 - 0.35	212 - 425	0-10V, AOC, MTP, PROG+
929000702202	4	120 - 277	150	0.35 - 0.70	125 - 280	0-10V, AOC, MTP, PROG
929000709003	4	120 - 277	150	0.10 - 1.05	70 - 148	0-10V, AOC, MTP, PROG+
XH150C120V150KPF1	4	347 - 480	150	0.35 - 1.20	50 - 150	0-10V, AOC, MTP, PROG

AOC: Adjustable Output Current, via Rset or programming
MTP: Module Temperature Protection
PROG: Programmable, includes DALI, Dynadimmer, Constant Light Output (CLO), Adjustable Startup Time (AST), Over The Life (OTL)
PROG+: All the above + AMP DIM

Footnotes

* Based on Fortimo LED DLM 1100 9W/840 UL Gen 4 and the assumption of 2W power consumption of a thermal protector.

1. Average rated life is based on engineering data testing and probability analysis. The hours are at the B50, L70 - 50,000 hours life with 70% lumen maintenance at Tc of 56° C for 3R and 61° C for 1R.
2. Photometric testing consistent with CIE 127:2007 2nd Edition.
3. Production units fall between +/-7.5% of listed values.
4. 3000K = +/-100K, 3500K = +/-120K, 4000K = +/-140K, 5000K = +/-160K.
5. All CRI are 80 or above.
6. Production units will fall between +/- 0.2 of listed value.
7. Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products. For products used in North America compliance to RoHS is voluntary and self-certified.
8. Indicates that the LEDs are components recognized with UL and complies with UL8750 Standard for LEDs.
9. Philips Fortimo _____ Module is a Zhaga certified light engine. For more information visit www.zhagastandard.org.
10. View limited warranty at http://www.usa.lighting.philips.com/connect/tools_literature/warranties.wpd for details and restrictions.
11. Minimum 90% survivals based on MTBF modeling.
12. Fortimo LED DLM 1100/840 (Gen 3 91 lm/W, Gen 4 120 lm/W module efficacy).
13. Improved over Generation 2.

Disclaimer

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