

Philips Advance LED Drivers – Versatility Delivered

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 as well as meet wide variety of customer needs, but they can all provide certain common benefits.

Including:

- Reliable and consistent operation
- High efficiency — >90% in some cases
- Greater than 0.9 PF and Less than 20% THD
- Greater than 50,000 hrs⁴ lifetime
- 5-year limited warranty¹
- ROHS compliance²
- Safety approbations (UL, CSA, CE, ENEC, PSE, SELV or CQC)

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.

Fixed

These are designed to meet the basic needs of LED lighting. Available in either dedicated input voltage or Intellivolt options, these drivers can address wide variety of output current and power requirements.

Dimmable

Along with the benefits of fixed drivers, these drivers are designed to 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. There are specific dimmable versions enabling use of lighting controls to help increase energy saving through a wide variety of protocols, such as 0-10V, Step-Dim, Trailing Edge and Leading Edge. In most of the cases the indoor drivers also integrate a 12V output for active cooling and NTC feedback for LED module temperature protection.

Additional Benefits with Dimmable LED Drivers Include:

- Wide variety of dimming interfaces (0-10V, Phase Cut, Step-Dim)
- Helps you address code requirements for energy efficient buildings
- Offers fixture design flexibility with the AOC feature
- Models offering features such as fan output and module temperature protection



See footnote on page 1-33.

Xtanium LED ELECTRONIC DRIVERS

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Programmable

Optimized to meet the ever evolving needs of today's LED lighting customers, Philips Advance Xtanium 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 provide a large number of features which can be customized based on the desired functionality of the luminaire design with simple programming interface. With multiple choices for current output levels, module temperature control settings and a network-ready DALI interface, this is an easily integrated driver solution. Luminaire designers and manufacturers are also able to streamline logistics without compromising on performance.

Additional Benefits with Programmable LED Drivers Include:

- Robust programmable solution 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 CO₂ impact
- Easily programmable user interface for onsite customization of driver requirements
- Optimized life expectancies of up to 100,000 hours³
- 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

See footnotes on page 1-33.

Current Product Portfolio Positioning

	Point	Linear	Outdoor
<div>Programmable</div> <div>Dimmable</div> <div>Fixed</div>	<ul style="list-style-type: none"> • Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP 	<ul style="list-style-type: none"> • Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP 	<ul style="list-style-type: none"> • Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP, OTL, AST, Dimming type (0-10V, DALI, AmpDim or Dynadimmer)
	<ul style="list-style-type: none"> • Dimming interface options • AOC • MTP • Fan out for active cooling 	<ul style="list-style-type: none"> • Dimming interface options • AOC • MTP 	<ul style="list-style-type: none"> • 0-10V dimming • AOC • MTP
	<ul style="list-style-type: none"> • Fixed output current • 50k Hr. Lifetime⁴ • Connectors • Compact Housing • Reliability 	<ul style="list-style-type: none"> • Fixed output current • 50k Hr. Lifetime⁴ • Connectors • Linear Housing • Reliability 	<ul style="list-style-type: none"> • Fixed output current • 50k Hr. Lifetime (min)⁴ • High surge capability • Reliability

AOC: Adjustable Output Current,
MTP: Module Temperature Protection,
CLO: Constant Light Output,

OTL: Over The Life,
AST: Adjustable Startup Time

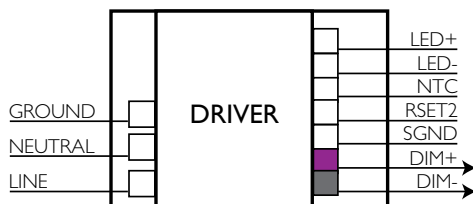
Adjustable Output Current (AOC)

AOC is a means of setting the secondary drive current of the LED driver to a prescribed level. This level is determined by the OEM during fixture design in order to create desired illumination levels, and is not intended for field modification. The desired current level is set by adding an external resistance across two terminals identified on the driver as "RSET" and SGND." The data sheets for applicable drivers include a table and graph that correlate desired drive current to a specific resistance value. Additional specifications on resistor type is also included. Resistors with >0.25W and >20V are typically acceptable.

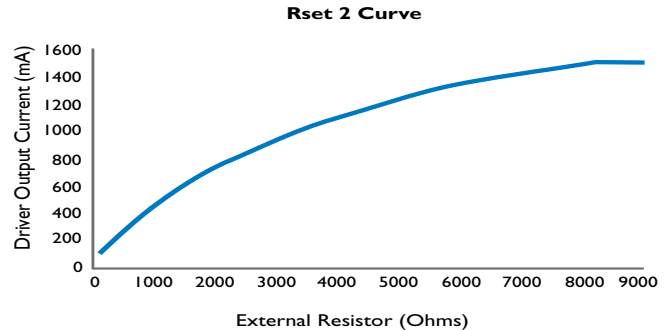
The resistor is furnished by the OEM and can be connected separately or incorporated elsewhere in the system (e.g., on the LED module). Two different current vs. resistance curves are used in these drivers, referred to as RSET1 and RSET2. RSET1 has a maximum current rating of 700mA (no resistance across the specified terminals). RSET2 has a maximum current rating of 2000mA (no resistance across the specified terminals).

AOC enables:

- Flexibility to select specific drive currents to optimize fixture performance
- Ability to consolidate SKUs and use one driver for multiple fixtures
- Ability to upgrade light engines and use the same driver, hence reducing qualification time and cost



Typical AOC application: 54W Linear Driver catalog number XI054CI50V054DNT1



Rset (Ohms)	Current (mA)
100	100
120	111
150	124.5
180	138.2
220	154.6
270	176.4
330	203.7
390	228.3
470	261.0
560	296.5
680	340.2
820	392.1
1000	452.1
1200	514.9
1500	602.3
1800	684.2
2200	779.7
2700	883.5
3300	992.7
3900	1085.5
4700	1191.9
5600	1273.0
6800	1402.1
8200	1503.1
>8200	1503.1

Xitanium LED ELECTRONIC DRIVERS

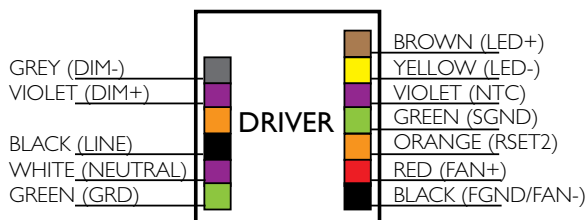
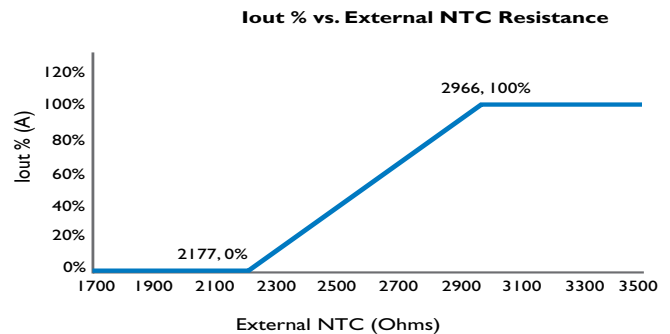
Module Temperature Protection (MTP)

The Module Temperature Protection feature allows the OEM to design the LED system to reduce drive current in the event that the module overheats, hence reducing heating and potentially avoiding failure. This feature is enabled by adding an external Negative Temperature Coefficient (NTC) across two terminals identified on the LED driver as “NTC” and “SGND.” When activated in application — by reaching the minimum temperature appropriate for the given NTC — drive current begins reducing according to the temperature-current curve of the specific NTC. The data sheets for applicable drivers include a graph illustrating current output vs. NTC resistance, and also typically include an example graph of module temperature vs. current output using a specific NTC.

Module Temperature Protection enables:

- Enhanced protection of the LED system from misapplication (e.g., day-burning)
- Longer potential life expectancy of the LED system

Typical MTP application: 50W Downlight Driver
catalog number XI050CI00V054DNMI



Remote Mounting

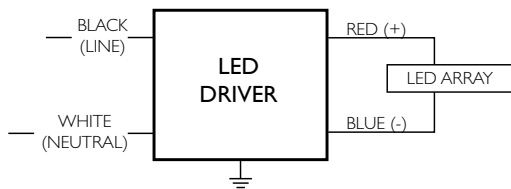
Most LED drivers are utilized in self-contained fixtures where the driver is included within the fixture, which is considered an electrical enclosure. Some applications call for remote mounting of the driver whereby the driver is in a separate electrical enclosure and not within the same enclosure/fixture as the LED light source. In these applications, it is typically acceptable to have the driver mounted remotely but care is required to ensure that voltage drop is minimized to not impact performance of the LED system.

Data sheets for most LED drivers include a table showing recommended maximum remote mounting distances for various wire gauges. In general, larger gauge wires will enable longer maximum distance, and higher LED drive currents will have lower maximum distances. Published maximum wiring distances are typically based on full load and longer distances are usually practical for lower load levels (consult your local sales representative for complete information).

Typical remote mounting application:
100W Outdoor Driver catalog number
LEDINTA0024V4IFO

Maximum Wiring Distance (at full load)

Wire Size (AWG)	Distance (feet)
26	3
24	4
22	7
20	11
18	18
16	29
14	46
12	71
10	120



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Catalog Number Explanation

LED	INT	A	0700	C	210	DO	M
<div>Packaging: M = Midpack I = Individual Pack B = Bulk Pack</div> <div>Fixed or Dimming: FO = Fixed </div>							

Outdoor LED Drivers

Xitanium LED Drivers for outdoor applications are available in three types:

Fixed Output

These drivers perform the basic necessary function for outdoor application, setting the standard for reliability and performance needed for outdoor lighting.

Dimming

These drivers include 0-10V dimming as well as Adjustable Output Current (AOC) and Module Temperature Protection (MTP), typically. These features help address the growing demand for controllability and flexibility. 0-10V dimming allows the lighting system to be used with various controls to help increase energy savings. AOC enables the OEM to help increase performance of the fixture and provides flexibility for use in multiple fixtures. MTP further enhances life and reliability in the event of misapplication.

Programmable

These drivers offer unparalleled flexibility with the ultimate feature set managed through a programmable interface. This allows the OEM to create a fixture portfolio to meet specific needs for a wide range of applications, using a minimum number SKUs to reduce complexity and simplify logistics.

Xitanium LED Drivers for outdoor applications are specifically designed for use in:

- Area
- Roadway
- Parking garage
- Gas station canopy
- Wallpacks
- Floodlights

These drivers are available in wattages of 10W to 150W for hard-wired integration into outdoor luminaires for the most rugged applications. They operate to specification under wide temperature and electrical ranges to ensure reliability. Specific features of this series are:

- Standard drive currents 350, 530, 700, 1050 and 1500mA
- UL Class 1 or Class 2
- Input voltage ranges of 120-277V or 347-480V
- Surge protection
- High efficiency for maximum payback
- High reliability for low maintenance costs



Xitanium LED ELECTRONIC DRIVERS

Outdoor Drivers

Catalog #	Max Output Power (W)	Output Voltage (V)	Output Cur- rent (Amps)	Input Volts	UL/ CSA Class 2	Dimming					Features					Dim./ Wiring Dia.	Max Tcase (°C)
						0-10V	TE	LE	Step Dim	DALI	AOC	MTP	CLO	Fan	Others		
Fixed																	
LED120A0350C28FO	10	2.8 - 28	0.35	120	●											V-Can/1	90
LED120A0012V10F	12	12	1	120	●											V-Can/1	90
LED120A0700C24FO	17	2.8 - 24	0.7	120	●											V-Can/1	90
LED120A0700C28FO	20	2.8 - 28	0.7	120	●											V-Can/1	90
LED277A0700C28FO	20	2.8 - 28	0.7	277	●											V-Can/1	90
LED120A0024V14FO	34	2.8 - 24	1.4	120	●											J-Box/1	90
LED120A0024V18FO	40	2.8 - 24	1.75	120	●											J-Box/1	90
LEDINTA0024V20FLO	48	24	0.10 - 2.0	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V22FO	53	24	2.2	120 - 277	●											S-Can/1	90
LEDINTA1600C36FO	58	9 - 36	1.6	120 - 277	●											S-Can/1	90
LED120A0012V50F	60	12	0.8 - 5.0	120	●											S-Can/1	90
LEDINTA0012V50FO	60	12	0.10 - 5.0	120 - 277	●											S-Can/1	90
LEDINTA0024V28FO	67	24	0.10 - 2.8	120 - 277	●											S-Can/1	90
LEDINTA0024V30FLO	72	24	0.10 - 3.0	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V32FO	77	24	3.2	120 - 277	●											S-Can/1	90
LED120A0024V33F	80	24	0.8 - 3.3	120	●											S-Can/1	90
LEDHCNA0024V41FLO	100	3.5 - 24	0.10 - 4.16	347 - 480	●											F-Can Bump/1	85
LEDINTA0024V41FLO	100	3.5 - 24	0.10 - 4.16	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V41FO	100	3.5 - 24	0.10 - 4.16	120 - 277	●											S-Can/1	90
LEDINTA700C140F3O	100	60 - 140	0.35/0.53/ 0.70	120 - 277												F-Can Bump/6	80
LEDHC-NA0350C425FO	150	120 - 425	0.35	347 - 480												F-Can Bump/1	80
LEDINTA0350C425FO	150	120 - 425	0.35	120 - 277												F-Can Bump/1	80
LEDHC-NA0700C210FO	150	60 - 210	0.7	347 - 480												F-Can Bump/1	80
LEDINTA0700C210FO	150	60 - 210	0.7	120 - 277												F-Can Bump/1	90
Dimmable																	
LED120A0700C28DO	20	10 - 28	0.7	120	●	●										V-Can/2	90
LED277A0700C30DO	21	15 - 30	0.7	277	●	●										V-Can/2	80
XI040C070V056CNJ1	40	12 - 54	0.7	120 - 277	●	●										J-Can/2	80
XI040C120V035CNJ1	40	12 - 36	1.2	120 - 277	●	●										J-Can/2	80
LEDINTA0024V20DLO	48	24	2	120 - 277	●	●										F-Can Bump/2	85
XI050C150V038CNH1	50	19 - 38	1.5	120 - 277	●	●										H-Can/2	80
LEDINTA0024V30DLO	72	24	3	120 - 277	●	●										F-Can Bump/2	85
XI075C053V140CNY1	75	71 - 143	0.53	120 - 277		●										Y-Can/2	80
XI075C053V140DNY1	75	71 - 143	0.10 - 0.53	120 - 277		●					●					Y-Can/3	80
XI075C070V105CNY1	75	54 - 107	0.7	120 - 277		●										Y-Can/2	80