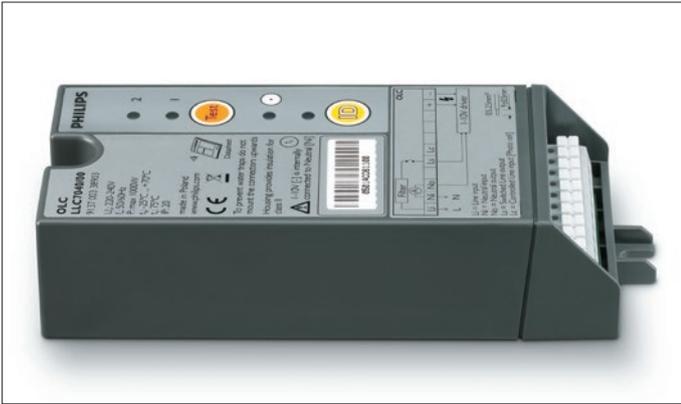


LLC7040 Datasheet

Outdoor Luminaire Controller I-10V



General Description

The Outdoor Luminaire Controller (OLC) is a high-performance LonWorks® network device that connects to a lamp-driver combination to control and monitor. Communication with the OLC is established via the power line utilizing the LonTalk® open protocol. It controls the driver by switching its output and by means of a I-10V dimming interface. Beside this it monitors the electrical characteristics of the lamp-driver combination.

The OLC can autonomously switch its output ON and OFF if combined with a photocell¹.

The OLC is designed to work in combination with the Philips Starsense Segment Controller (SC).

The LLC7040 OLC replaces the LLC7020.

Applications

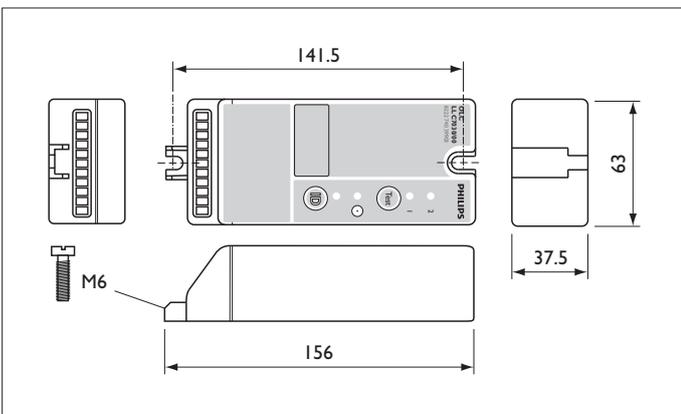
Each LLC7040 can monitor and drive one lamp-driver combination.

It is designed for use in residential, street and road lighting applications, including parking lots, ports, train stations and industrial complexes.

The design of the OLC is optimized for mounting within a luminaire or in the base of the pole.

For optimal system performance, please respect the specified maximum lightpoints connected to a Segment Controller (see datasheet).

The OLC is released and authorized to interact solely with the Philips Starsense SC. Consult the local Philips representative if desired otherwise.



Dimensions in mm



¹Note: Check if feature is supported by the Central Management Software (CMS)

General operation

The OLC combines three main functions:

- 1 The controller function receives the incoming commands from the SC and acts accordingly.
- 2 The monitor function measures the current, mains voltage, mains frequency, power factor, burning hours and power consumption of the connected lamp-driver combination. These measurements are used to determine the energy consumption.
- 3 Based on these measurements, the monitor function determines if the connected lamp-driver is functioning within configured thresholds and sets its status that can be accessed by the SC. This information is used to determine condition of the lamp-driver combination.

One OLC can switch, control and monitor one light point. A default configured OLC will switch ON its output at maximum level on power-up.

The OLC has a backup scenario (safeguard mechanism) that can be configured in different ways (see below).

Repeating

The OLC is equipped with a power line transceiver, which can repeat messages. The SC monitors and controls the dynamic repeating functionality centrally. If communication fails between the SC and a specific OLC, another OLC can be designated dynamically by the SC, which can repeat messages. The SC will autonomously and continuously keep track of which OLC's can be reached directly and which ones require message repeating.

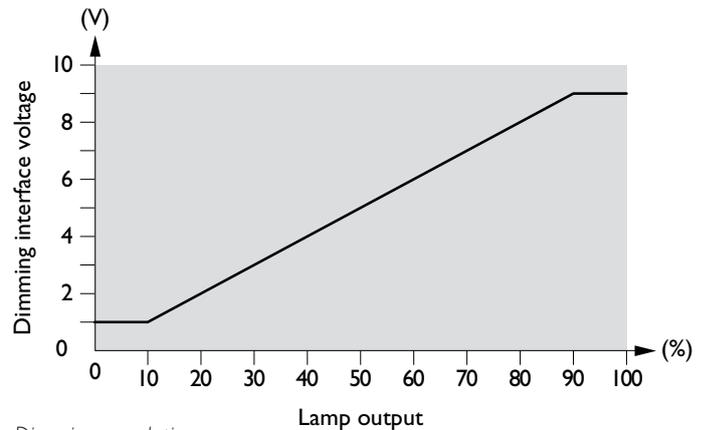
Mounting information

The OLC is designed to be installed inside a luminaire, but can also be mounted in the pole, gear-trays and separate boxes. If the OLC is mounted inside a pole it may only be mounted upright. The OLC may be mounted in any position if the enclosure is IP43 or above. See also the installation instruction of the LLC7040.

Warning: The I-10V interface is not using safety isolation (I-10V [-] is internally connected to the Neutral conductor). Disconnect the main power supply before servicing.

Dimming

The SC sends the dimming level, based on many configuration properties, to the OLC. A dimming correlation may look as follows:



Dimming correlation

The OLC will transfer the incoming dimming command to the OLC's driver, which drives the I-10V dimming interface.

★ Tip

Check the Philips Dynavision driver/controller datasheet for the relationship between the interface signal level and the light output.

Released drivers

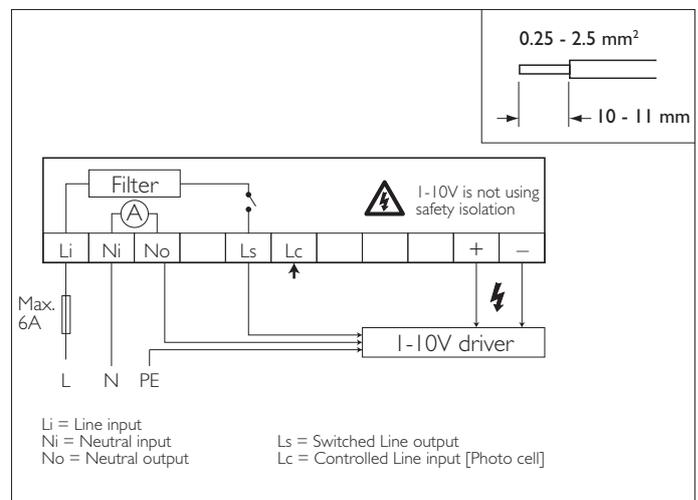
Currently the drivers released to interact with the I-10V dimming outputs of the OLC are:

- Philips HID-DV I-10V 70/100/150 SON
- Philips HID-DV I-10V 70/100/150 CDO
- Philips HID-DVC I-10V 250/400 SON

Any other component must be validated before it may be used with the OLC. Contact your local Philips representative about how to obtain component validation.

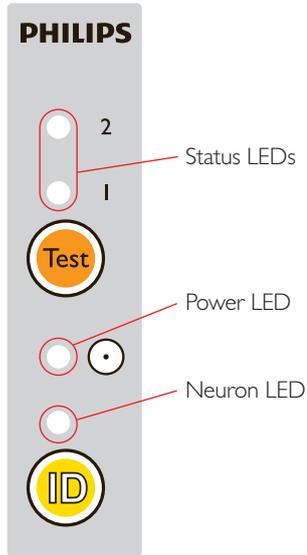
The OLC has been tested with a very wide range of LED/lamp driver types. For the best overall system performance we do recommend the use of Philips LED/lamp drivers.

Wiring Diagram



User interface

The OLC has two push buttons - one for testing the lamp-driver and one to send its unique Neuron® ID number to the Segment Controller (see Starsense User Manual for more information).The test button can also be used as maintenance indicator:



- Status LEDs LED 1 and 2 will show device state / output state.
- Power LED Will show device- or output status - if it's continuously in blinking mode, the OLC is in error mode, consult your local Philips representative.
- Neuron LED Will show when Neuron® ID is sent.
The yellow service LED indicates the internal OLC state:
 - ON: Application-less.The OLC has only communication parameters loaded.
 - Blinking: Unconfigured.This OLC state indicates that it has communication parameters and an application program and network address information. This OLC state is the "idle" state. Commissioning and configuration need to be performed.
 - OFF: Configured.

From the factory the OLC is configured for a default lamp and is operating normally.

Test button

- Pressing the test button while the output is OFF will switch the output ON for 15 minutes at maximum.The output will be turned OFF after the timer has expired. During this period the red LED 1 blinks slowly.
- Pressing the test button while the output is at maximum level will cause the output to switch for 15 minutes at dimmed level.The output will be turned OFF after the timer has expired. During this period the red LED 1 blinks rapidly.
- Pressing the test button while the output is ON at a dimmed level will switch the output OFF.



Attention

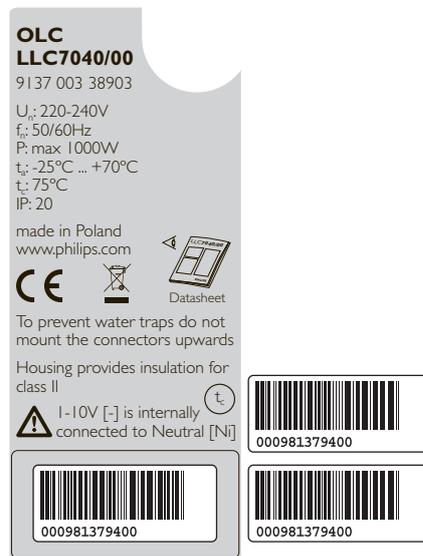
The OLCs output will be switched OFF after 15 minutes. Power-cycle the OLC to have the output automatically switched to its configured power-up level.

Maintenance identification

After maintenance has been done on an OLC, press the test button for 4 seconds.An identification message will be sent via Powerline and will be made visible in the supervisor software.

Neuron® ID

Each OLC has a unique fixed 48-bit identifier called Neuron® ID.The Neuron® ID is printed on the three barcode labels placed on the front of the OLC, which barcode readers can read.



OLC label



Attention

When the OLC is installed it is vital for the Starsense system operation that it knows the Neuron® ID and the location of the device.A drawing or list indicating which Neuron® ID belongs to which installed OLC acts as an input for creating the Starsense telemanagement configuration.



Attention

Apply mains power to the OLC only after it is mounted securely and it has been wired as shown in the typical wiring diagram. In case of an OLC that it is not yet commissioned, at power-up both red LEDs will come ON for 3 seconds.The unit is fully operational and ready for commissioning and configuration after both red LEDs go OFF.The green power LED should stay ON continuously indicating that power is applied and the OLC is running in a correct mode.The OLC is now in its default configuration.The safe-guard mechanisms, burning hours counter, power-up behavior and manual interfaces are operational. In default configuration mode, the OLC will always turn the light ON at power-up.The switch ON level can be pre-configured through the OLC power-up value.

Safe-guard mechanism with photocell¹

The OLC can be configured to fall back onto photocell operation mode when it detects a communication failure with the SC. This safe-guard mechanism prevents light points from staying OFF during the night - causing dangerous situations - and from staying ON during the day - which would waste energy. The OLC is equipped with one single-pole 230VAC input to monitor the photocell operation. When in safe-guard mode, the OLC output will follow the photocell input.

Note: It is only possible to connect photocells which use an electromagnetic relay.

Safe-guard mechanism with back-up scheduler¹

The back-up scheduler is the default back-up mechanism of the OLC is not configured otherwise.

When the OLC detects a communication failure with the SC, it will continue to operate according to a predefined back-up schedule. The OLC will run on its own internal real-time clock and use this schedule to switch its output. In this operation mode the OLC will not regulate the light levels.

The switch ON level can be pre-configured through the OLC power-up value.

Attention:

In case the OLC is powered off and the communication is still not establish at power-up time, the real time clock will not be available, so back-up scheduler will not be active. Lamps will simply turn ON and stay like this. To prevent this behaviour, a safe-guard mechanism based on a photocell can be configured¹.

Daylight control based on photocell operation

In Daylight Control Mode (DCM) the switching points are controlled by the available sunlight (via a photocell) and the light level is controlled by the Starsense system. When OLC is configured in DCM will follow the photocell input with its output while still receiving and executing the dimming levels from the segment controller. Monitoring function of the OLC are not influenced by the DMC. The following functional table represents the correlation between available light levels, photocell operation and the OLC output:

Photocell detection	Photocell relay	Photocell Line out
Dusk	Closed	Mains voltage on OLC input [Lc]
Dawn	Open	0Volt on OLC input [Lc]

Technical data

Operating conditions

Temperature	-25°C to +70°C
Relative humidity	10% to 90%
Max. housing temperature	+75°C (on Tc spot, see OLC cover)

If the Tc rises beyond 85°C during use, the OLC will switch off the relay (load).

Non-operating conditions

Temperature	-40°C to +85°C
Relative humidity	5% to 90%

Mains connection

Mains voltage	220-240V ± 10%
Mains frequency	50/60 Hz ± 5%
Max. load wattage	1 × 1000W

Power consumption

Stand-by wattage	<2W
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Connector block

Mains connector	WAGO 804 series contact cage clamp connection
Wire cross section [mm ²]	0.25 - 2.5 mm ² solid 0.25 - 2.5 mm ² fine stranded 0.25 - 1.5 mm ² fine stranded with ferrule and plastic collar 0.25 - 2.5 mm ² fine stranded with ferrule, without plastic collar
Wire cross section [AWG]	20-12 AWG solid
Wire strip length	10-11 mm

¹Note: Check if feature is supported by the Central Management Software (CMS)

Power line interface

Channel type	PL-20C power line
Coupling	Line-to-Neutral, Non-Isolated Coupling
Protocol	ANSI/EIA 709.1
Power line transceivers	Compliant to ANSI/EIA 709.2
Frequency band	CENELEC consumer band: C-band (132.5kHz), automated B-band (110kHz) selection if communication on C-band fails
Approval	FCC and CENELEC EN50065-1 compliant. RoHS directive 2002/95/EC REACH SVHC
Filter	Internal band stop filter; to filter interference from the lamp driver.

I-10V interface

Interface	Compliant to IEC 60929:2004 Annex E
Number of interfaces	1 interface

Photocell input

Input	Suitable for magnetic relay type photocell (without snubber)
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Indicators

Power LED (green)	This LED is on when the OLC has power.
Service LED (yellow)	This LED is normally off. Blinking indicates that the application is in un-configured state.
Output LED (red 2x)	2 red LEDs labelled 1 and 2, which indicate the output state / device state of the OLC.

Manual controls

Service button (yellow):	Send Neuron® ID
Test button (orange):	Change output states (100%-50%-OFF)
Barcode code	Code 128 (Neuron ID)
Back-up scheduler	Accuracy ± 0.7%
Safety pre-fuse requirement	Max. value pre-fuse: 6 ATH

Housing

Material	Bayblend® KU 2-1514 (PC+ABS Blend)
Flammability	UL 94V-0 at 1.5mm thickness
Glow wire test	850°C
Protection class	IP20 in any position IP22 in upright position
Dimensions	H: 15.6 cm, W: 6.3 cm, D: 3.75 cm
Weight	0.21 kg

Standards

Safety	EN61347-2-11
Immunity	EN61547; EN50065-2-1
Emission	CISPR15 edition 7.1

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Packing data

Type	Box dimensions (mm)	Qty	Material	Weight (Kg)	
				net	gross
LLC7040/00 PL OLC I-10V	295 x 385 x 165	24	cardboard	4.46	5.61

Ordering Data

Type	Ordering number	EAN code level 1	EAN code level 3	EOC
LLC7040/00 PL OLC I-10V	9137 003 38903	87115 59732800	87115 59732824	732800 99



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 Data subject to change
www.philips.com/lightingcontrols