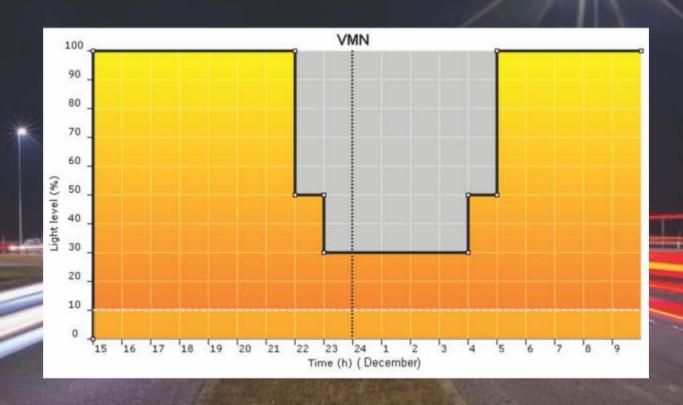
DIMMING INTERFACES



HIGH EFFICIENCY LED STREET LUMINAIRES MADE IN THE EU



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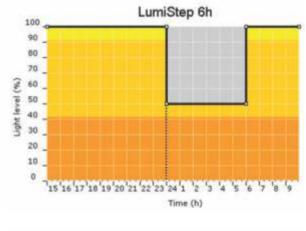
Dimming or reducing light level results in higher energy efficiency and longer life time of the LED and driver (lower temperatures). It also reduces light pollution.

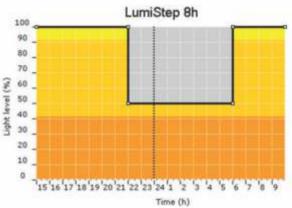
Our lamps are available with different dimming options, depending on the model, some are standard and some are available as a paid option.

LumiStep 6h / 8h

The LumiStep feature provides a simplified version of Autonomous dimming. It is a single level, step-dimming protocol which can reduce energy use by up to 25%. The light level of each luminary is dimmed to 10% (depending on the customer's demands) during specific hours of the night. When the installation's on- and off- times are synchronized with sunset and sunrise; LumiStep automatically determines the night midpoint. The dimming protocol offers a choice of a 6 or 8 hour dim period. The 6-hr setting will provide full light until the night midpoint, and then dim for 6 hours before going back to 100% light output.

The 8 hour schedule will start dimming 2 hours before and continue for 6 hours after the midpoint.





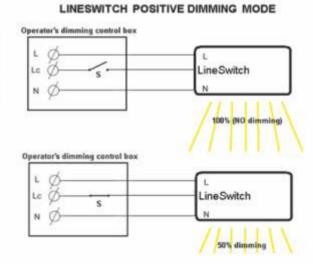
LineSwitch (Phase dimming) - positive / negative



LineSwitch is a step-dim solution which enables users to dim (to a predefined level by the customer) groups of light points via dedicated pilot line wiring (additional phase wire). A cabinet controller signals to the driver via the pilot line (additional phase wire), and LineSwitch changes the light level for all the luminaries connected to that cabinet. It is available in POSITIVE or NEGATIVE dimming modes. Positive dimming mode means the luminary dims when the additional Phase line (Lc) is activated in the luminary. If the Lc is not activated, the luminary will operate at 100% lumen output.



L - Phase line Lc - Phase Control line for dimming control N - Neutral line

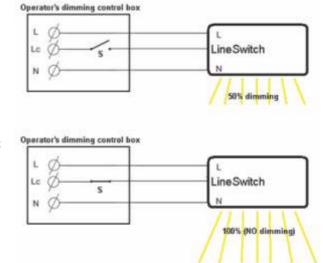




Negative dimming mode means that luminary dims when the additional Phase line (Lc) is not activated in the luminary. If the Lc is activated, the luminary will operate at 100% lumen output.



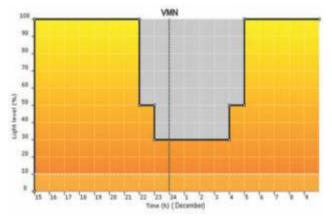
LINESWITCH NEGATIVE DIMMING MODE



Autonomous (Dynadimmer) dimming

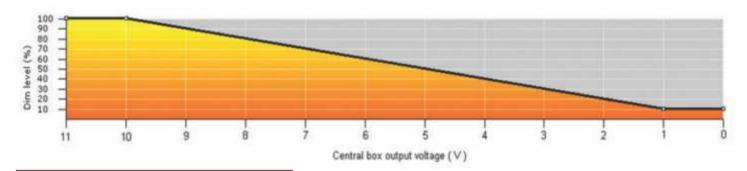
Our lamps can have Autonomous 50% reduction to save energy during the hours around midnight, when there is less traffic on the roads or streets. We pre-set (during the production process) the lamp driver to dim at specific level(s) fully & automatically. No additional management system, clock or second phase is needed. This setting can be changed later only but the luminary should be taken to our company or to an authorized service company.

- → The driver automatically counts the hours when the lamp is on. Virtual midnight - VMN is in the middle of this period.
- → We set the driver to dim X hours before virtual midnight and can go back to 100% operation Y hour after virtual midnight.
- → Up to 5 actions can be performed over one night.
 Below are the standard settings. These settings can be changed according to the client's requirements.



Dimming via 1 -10V

When luminary is connected to a central controller 1-10V, the protocol can provide continuous dimming. The protocol can dim to 10% light output, delivering substantial energy savings during off-peak hours. 10V from the central controller means 100% power of the luminary, 1V from the central controller means 10% power of the luminary (10% dimming).



Control via DALI

Our luminaries can be connected to a variety of network control systems via DALI. DALI stands for Digital Addressable Lighting Interface, a global open standard communication protocol which defines commands for lighting components. DALI creates two-way communication between each light point in the installation and the network node or controller of a Central Monitoring System (CMS). The system provides control over the lighting and monitors light source and driver status, and enables remote configuration and diagnostics. In addition to DALI, these products offer a choice of dimming protocols. The lighting installation can deliver immediate energy savings with integrated Dynadimmer, and later upgrade to a telemanagement system which will provide detailed data on energy use, component status, lifetime and much more, all without replacing existing luminaires components.













