

Description

The gridDOT is the smallest SR module on the market for streetlight fixture control and monitor lamps using the Zhaga/SR plug and a DALI/DALI 2 interface. The module uses LoRaWAN as a main communication carrier and is designed for GridLight™ to provide the necessary functionality for optimal and safe streetlight control. The module consumes very low power making this a very feasible solution.

The module can be utilized by using either LoRaWAN or WiFi to communicate with the central GridLight™ server. The module also includes Bluetooth Low Energy (BLE) for configuration through a smart phone and communication between modules for activity based operation.

Data from the LED fixture on status and failures can be delivered to the server via LoRaWAN or WiFi. Software can be updated from a smart phone. Configurations are maintained remotely from the GridLight™ server and stored on the gridDOT module. This enables it to autonomously execute tasks like dimming and on/off schedules from a selection of predefined programs. It also includes a crystal based high precision RTC with a battery backup designed to ensure precise streetlight control even if there is no communication or if the central server is unavailable.

The gridDOT module supports LoRaWAN Multicast to make sure all lights are dimmed, turned on and off simultaneous. The light level signal can be received from the GridLight™ server based on input from a gridCPU or AmsCPU(-IO) module with a light sensor. Multicast is also used for software updates.



Functionality

Topic	Comments
Monitoring	statusOfControlGear (OK or one or more underlying errors) lampFailure (Lamp should be on by fault) lampArcPowerOn (Lamp on) limitError (Expected dimming level not supported) fadeRunning (Fading program) powerFailure (DALI bus power failure) LoRaWAN failures WiFi failures Bluetooth failures
Communication	LoRaWAN with multicast. Wifi. Bluetooth. Amplex Secure Keys AGP Light Schedule API
Real-time clock (RTC)	The gridDOT module has a calendar and a real-time clock with battery backup, with an absolute maximum deviation of ± 7 seconds per 24 hours in the full temperature range. This is without synchronization with external units. Under normal conditions, clock deviation is automatically adjusted according to the LoRaWAN Server which gives a maximum deviation of ± 1 second. The LoRaWAN Server timing is based on NTP.
Lamp schedules	Fully compatible with GridLight Advanced Programming Schedules: * Twilight calculation from longitude/latitude - with user defined offset * Multiple dimming levels and dimming hours * Multiple on/off/dimmed fixed schedules for events, ie. earth hour * Central light sensor activation through LoRaWAN multicast * Traffic based dynamic dimming * Adaptive lighting capabilities based on input for motion sensing * Automatic on after power outage (especially for cabinet control)
Battery	Internal backup battery for clock

Technical Specifications

Operational specifications

Storage temp.	-40°C to +85°C
Operating temp.	-35°C to +85°C
IP grade	IP67
Input voltage	24V DC (through Zhaga)
Power consumption	Typical < 0,2 W

Standards and approvals

Zhaga book 18 | SR (System ready)
2004/108/EC, EMC Directive
2002/95/EC, RoHS Directive



Technical Specifications

LoRaWAN	Details
Multicast	Supported - compatible with Amplex LoRaWAN Gateway, Actility, Lorient, The Things network and other major gateway manufactures.
API keys	As the gridDOT module is based on the open standard LoRaWAN, the module can be controlled and managed from other servers than GridLight™ server using the optional "gridDOT API Keys".

Physical Specifications

Weight	27 g
Diameter	40 mm
Height	30 mm
Top part	Polycarbonate (Customer specific colors on request)
Base part	PBT
Coating	Conformal coated
Mounting	Zhaga book 18 / SR

Reliability & Maintainability

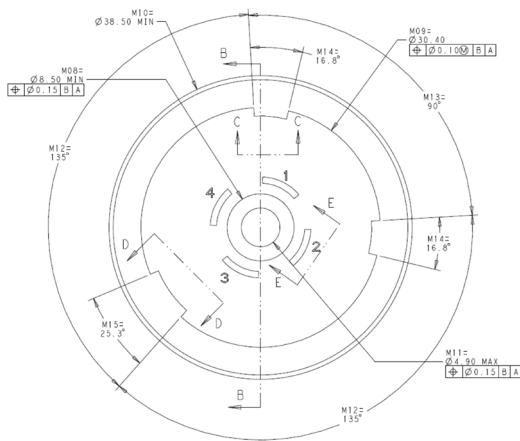
Topic	Comments
Software upgrade	The software on the gridDOT module can be updated remotely from GridLight Field Tool app using Bluetooth/WiFi. Smaller software updates through LoRaWAN Multicast when the available bandwidth is adequate (LoRaWAN Spreading Factor is 10 or better)
Multi-layer system health	Various internal processes ensure that the system is up and running at all times. In case a process is stalled, it is restarted without disturbing other processes.
Configuration and programs	New configuration and program schedules are transferred without interrupting the normal functionality of the gridDOT module. When the software has been transferred, the integrity of the configurations is checked and then reconfigured.
Self-test	A built-in self-test (BIST) is performed after power-up.

Connections

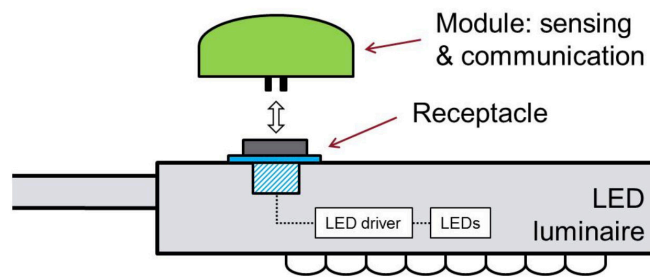
I/O	Comments
Zhaga book 18/SR	Open standard connector used by all leading LED manufacturer for outdoor streetlighting
LoRaWAN	For use with Multicast compatible LoRaWAN cloud solutions, including Amplex LoRaWAN gateway cloud, The Things Network, Lorient and Actility. LoRaWAN Class C. RF Spectrum: 868MHz/EU863-870
WiFi	IEEE802.11b, 802.11g, 802.11n
Bluetooth	Bluetooth Low Energy - BLE
Power supply	24VDC - as specified in the Zhaga book 18 standard.
DALI	DALI master. Supports DALI/DALI 2 through the Zhaga (Book 18) plug. Supports up to 4 DALI slaves.

Installation Guide

The gridDOT module can be connected to any GridLight™ v7.2+ server through the leading LoRaWAN cloud providers, including Amplex LoRaWAN Gateway, Lorient, The Things Network and Actility. Open individual API keys can optionally be provided so gridDOT can be used with other leading Streetlight Management Systems than GridLight™.



Mechanical interface of the lamp connector
(Zhaga book 18 - LEX-M)



Zhaga book 18 defines a standardized interface between an outdoor LED luminaire and a sensing/communication module that sits on the outside of the luminaire. The module connects to the LED driver and control system, and typically can provide sensory inputs while also communicating with the LoRaWAN network.

Ordering Information

Product	Order number
gridDOT - clear top	150-20-001
gridDOT - smoke top	150-20-002
gridDOT API key	150-21-001
Amplex LoRaWAN Gateway (outdoor)	170-10-000