gridDOT-LTE

Data Sheet

Description

The gridDOT-LTE is one of the most versatile Zhaga/SR modules on the market for streetlight fixture control. It monitors lamp fixtures using the Zhaga/SR plug and a DALI/DALI 2 interface. The module comes in various flavours for the LTE mobile network to support NB-IoT, LTE-M and one version also includes 2G fallback. The gridDOT-LTE series is designed for GridLight™ to provide the necessary functionality for optimal and safe streetlight control including ability to provide adaptive dimming based on movement or traffic density. The module consumes very low power making this a very feasable solution.

The module can use the mobile network carriers to communicate with the central GridLight™ server. The module also includes Bluetooth Low Energy (BLE) and WiFi for configuration through a smart phone and communication between light fixtures for activity based operation. Bluetooth is also used to communicate with neighbour fixtures for movement based dimming when an optional Zhaga PIR sensor is added to the fixture.

Data from the LED fixture on status, failures and power consumption can be delivered to the server. Software can be updated from a smart phone or remotely over the network. 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 GPS positioning designed to ensure precise streetlight time control even if there is no LTE mobile communication or if the central server is unavailable.

The gridDOT module supports a centralized light sensor to ensure a uniform action for lights on/dimmed/off. 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.

The gridDOT module also exists in a LoRaWAN version. See separate underline.

Functionality

Topic	Comments
Monitoring	statusOfControlGear (OK or one or more underlaying 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) LTE network failures WiFi failures Bluetooth failures
Communication	LTE (various options). Wifi. Bluetooth. DALI/DALI2/D4i
Time-sync	The gridDOT module has a calendar and uses positioning services (GNSS) for time syncronization. GNSS precision is typically <0.1 sec.
Lamp schedules	Fully compatible with GridLight Advanced Programming Schedules: * Twilight calculation from longitude/lattitude - 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 LTE * Traffic based dynamic dimming * Adaptive lighting capabilities based on input from motion sensing * Automatic on after power outage (especially for cabinet control)

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

IEC 60598-1

✓RoHS CE 0682

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Communication Variant Specifications

Module	Communication carriers and bands
gridDOT-LTE-0	**Cat NB2**: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85
gridDOT-LTE-1	**Cat M1**: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85
gridDOT-LTE-2	**Cat NB2+Cat M1**: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B71/B85
gridDOT-LTE-3	**Cat NB2+Cat M1**: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B71/B85 **EGPRS(2G fallback)**: 850/900/1800/1900 MHz
gridDOT	**LoRaWAN** option - see separate <u>datasheet</u>.

Physical Specifications

Weight	65 g
Diameter	80 mm
Height	40 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. Remote software updates through LTE network.
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/0	Comments
Zhaga book 18/SR	Open standard connector used by all leading LED manufacturer for outdoor streetlighting
GNSS	Location networks GPS, GLONASS, BeiDou, Galileo and QZSS supported. Used for time syncronization when communication is out to ensure precise light schedule programs even when communication is down.
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 SR/DALI/DALI 2/D4i through the Zhaga (Book 18) plug. Supports up to 4 DALI slaves.
SIM	4FF Nano SIM card, 1,8V - SIM socket option, not included in all variants. Contact Amplex for details.
eSIM	MFF (MFF1 and MFF2) standard sized eSIM can be mounted directly on PCB during production. Contact Amplex for details.

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Installation Guide

The gridDOT module can be connected to any GridLight™ v7.5+ server through the LTE mobile network. The module should be compatible with any Zhaga book 18 socket (SR socket). Using the GridLight Field Tool™ app for iPhone and Android, the gridDOT is easily configured and added to the server.

Mechanical interface of the lamp connector (Zhaga book 18 - Diameter: 80mm)
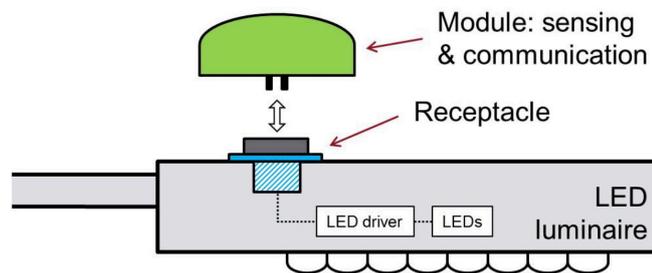
Zhaga book 18 defines a standardized interface between an outdoor LED luminaire and a sensing/communication module that sits on the outside of the luminaire. The module connects to the LED driver and control system, and typically can provide sensory inputs while also communicating with the LTE mobile network.

Ordering Information

Product	Order number
gridDOT-LTE-0 (NB-IoT)	150-30-001
gridDOT-LTE-1 (LTE-M1)	150-30-010
gridDOT-LTE-2 (NB-IoT+LTE-M1)	150-30-020
gridDOT-LTE-3 (NB-IoT+LTE-M1, 2G fallback)	150-30-030
gridDOT (LoRaWAN version - see datasheet)	150-20-001

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All specifications are subject to changes