gridCPU-LTE

Data Sheet

Description

The gridCPU-LTE module is a control module with three built-in relays and two or four analog inputs. Being designed to control streetlight from the control cabinet it is the ideal cost effective module for basic control. The module uses LTE (2G/NB-IoT/LTE-M1) or Wi-Fi as a main communication carrier. The module also includes RF Low Energy for configuration through a smartphone. It 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 is very generic and may be utilized for other control purposes.

Software can be updated from a smartphone or remote server using Wi-Fi or LTE. Configurations are updated remotely from the server and stored on the gridCPU module, enabling it to autonomously execute tasks like on/off schedules from a selection of predefined programs. It also include GNSS for correct timing if Wi-Fi/LTE is not available, ensuring precise streetlight control, even if there is no communication or if the central server is unavailable.

The module has two (4 option) analog/digital inputs: One designed and optimized for a light sensor or the other for analog/digital inputs that needs to be monitored. This light level signal can be distributed to other modules through the GridLight™ server. The module is available with Modbus for smart meter integration.

Functionality

Topic	Comments
Monitoring	LTE communication failures Wi-Fi failures RF Low Energy failures Photocell for streetlight control
Communication	2G, NB-IoT (NB2), LTE-M1. Wi-Fi. Bluetooth. Nano SIM card or eSIM chip
Real-time clock	The gridCPU-LTE module has a calendar and a real-time clock with an absolute maximum deviation of ± 7 seconds per 24 hours in the full temperature range. This is without synchronization with external servers. Under normal conditions, clock deviation is automatically adjusted according to the LTE network which gives a maximum deviation of ± 1 second. As a backup GNSS satellite timing is available with internal antenna.
Lamp schedules	Fully compatible with GridLight Advanced Programming Schedules: * Twilight calculation from longitude/lattitude - with offset * Multiple on/off fixed schedules for events like earth hour or christmas lighting * Central light sensor activation through server broadcast to modules * Automatic on after power outage
GNSS	For positioning and time synchronization

Technical Specifications

Operational specifications

Storage temp.	-40°C to +85°C
Operating temp.	-25°C to +65°C
IP grade	IP20
Input voltage	Universal Power Supply 110 - 230 Vac
Voltage protection	4 kV surge protection
Power consumption	Typical < 0,5 W

Standards and approvals

2004/108/EC, EMC Directive

2002/95/EC, RoHS Directive

Over voltage Direktive

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Technical Specifications

LTE	Details
Bands	LTE Cat NB2 + LTE Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/B19/ B20/B25/B26/ B27/B28/B66/B71/B85 EGPRS(2G fallback): 850/900/1800/1900 MHz

Physical Specifications

Weight	205 g
Top part	Gray (RAL 7035)
	Lexan 940
Base part	Black (RAL 7021)
	Noryl VO 1550
Coating	Conformal coated
Connectors	0,14 - 1,55 mm^2 (AWG 26-16)
Mounting	DIN rail (EN50022)

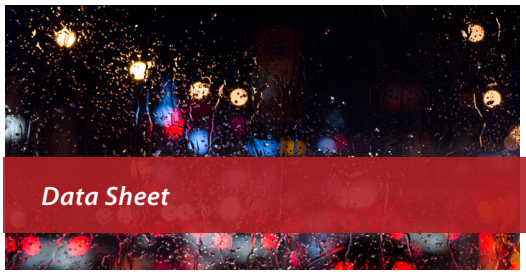
Reliability & Maintainability

Topic	Comments
Software upgrade	The software on the gridCPU-LTE module can be updated from GridLight Field Tool app using Bluetooth/Wi-Fi or remotely through Wi-Fi or LTE network.
Multi-layer system health	System watchdog for ensuring the module is running at all times.
Configuration and programs	New configuration and program schedules are transferred without interrupting the normal functionality of the gridCPU-LTE 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
GNSS	Location networks GPS, GLONASS, BeiDou, Galileo and QZSS supported. Used for time synchronization when communication is down to ensure precise light schedule programs. The module has a built-in GNSS antenna.
Wi-Fi	IEEE802.11b, 802.11g, 802.11n
RF	RF Low Energy
Power supply	Universal input 110 - 230 Vac. Absolute max 95 - 300 Vac. 47-63 Hz.
Lux input	Analog input for Amplex Light sensor. 4-100 lux standard, 40-1000 lux by light sensor dip switch configuration.
Analog input	Analog input 0-10V, 4-20 mA (0-20mA) (On module 150-50-004 a total of 4 analog inputs) Input impedance = 510 Ohms (DC) Accuracy = ± 2% FSD
Relays	Three relays that are galvanically isolated and are used for switching minor loads on and off directly and three-phase or larger loads via an intermediate breaker. One of the three relays provide both NO and NC functionality. Max switching voltage: 250 V AC/30 V DC (resistive). Max switching load: 3A.
MODBUS	On model 150-50-003 MODBUS interface based on RS485. Please contact Amplex for supported modbus digital power meters.
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.

gridCPU-LTE



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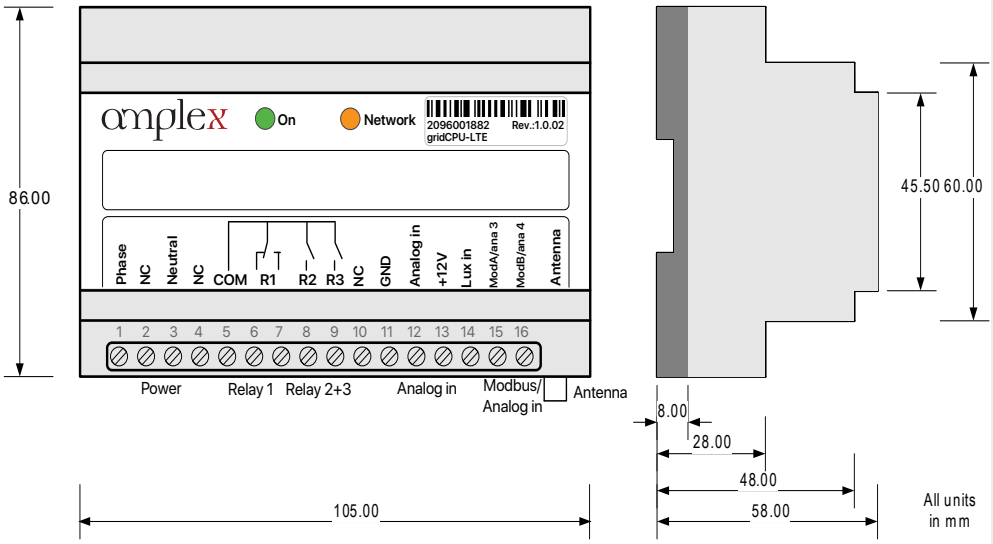
Installation Guide

The gridCPU module can be connected to any GridLight v7.2+ server using SIM cards from all GSM/LTE providers. For larger installations we recommend eSIM that can be mounted during production. Contact Amplex for more details on eSIM.

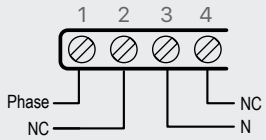
Topic	Comments
Input cable length	< 3 m
2.5 mm² terminals	< 3 m
Enclosure	The gridCPU module must be installed in an enclosure of protection degree IP65 or installed at a location that provides the module with the same level of protection.
Antenna	Insert the antenna in the antenna socket of the gridCPU-LTE module and tighten it gently with your fingers. Do not use tools.

Drawing



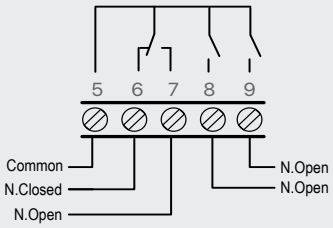
I/O Schematic

Main power connection



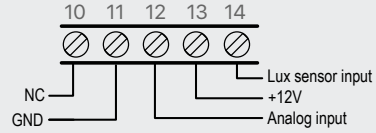
Terminals: 2.5 mm²

Relay connection



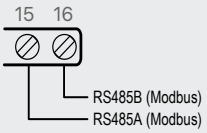
Terminals: 2,5 mm²

Analog input / Light sensor input



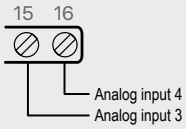
Terminals: 2.5 mm²

Modbus connection (only on 150-10-003)



Terminals: 2.5 mm²

Extra Analog inputs (only on 150-10-004)



Terminals: 2.5 mm²

Ordering Information

Product	Order number
gridCPU-LTE (Modbus)	150-10-003
gridCPU-LTE (2 extra analog inputs)	150-10-004
Vandal resistant antenna - 4G	230-20-004
Mini-PT Dual antenna - 4G	230-30-004

All specifications are subject to changes

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