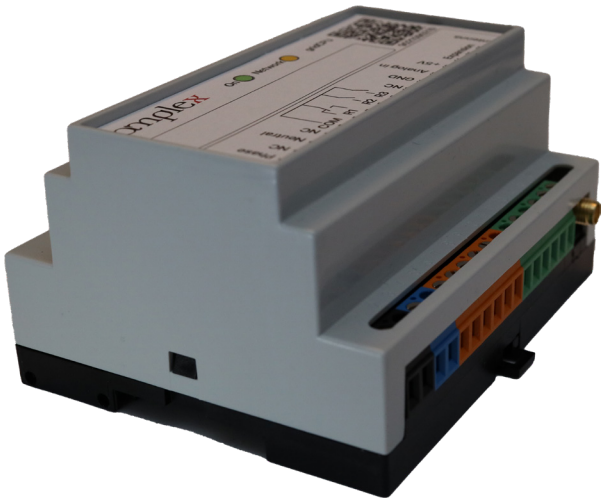
gridCPU-LoRa

Data Sheet

Description



The gridCPU-LoRa module is a control module with three built in relays and an analog input. Being designed to control streetlight from the control cabinet it is the ideal cost effective module for basic control. The module uses LoRaWAN or Wifi as a main communication carrier. 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.

The module can be utilized by using either LoRaWAN or WiFi to communicate with the central GridLight™ server. The module also includes RF Low Energy for configuration through a smartphone.

Software can be updated from a smartphone. Configurations are updated remotely from the server and stored on the gridCPU-LoRa module. Enabling it to autonomously execute tasks like on/off schedules from a selection of predefined programs. It also includes a crystal based high precision clock with a battery backup. Ensure precise streetlight control even if there is no communication or if the central server is unavailable.

The gridCPU-LoRa module supports LoRaWAN Multicast to make sure all lights are turned on and off simultaneous. The module has an analog input designed for a light sensor. This light level signal can be distributed to other modules through the GridLight™ server.

Functionality

Topic	Comments
Monitoring	LoRaWAN failures WiFi failures RF Low Energy failures Photocell for streetlight control
Communication	LoRaWAN with multicast. Wifi. Amplex Secure Keys
Real-time clock	The gridCPU-LoRa 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/lattitude - with offset * Multiple on/off fixed schedules for events like earth hour or christmas * Central light sensor activation through LoRaWAN multicast * Automatic on after power outage
Battery	Internal backup battery for clock

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

RoHS CE

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Technical Specifications

LoRaWAN	Details
Multicast	Supported - compatible with Amplex LoRaWAN Gateway, Activity, Loriot, The Things network.

Expansion slot	Details
Expansion	Open eXpansion Interface (OXI) PCB expansion slot with 3 expansion connectors. OXI is only available on model 150-10-003.

Physical Specifications

Weight	TBD
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-LoRa module can be updated remotely from Amplex Deploy App using bluetooth/wifi
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 gridCPU-LoRa 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
LoRaWAN	For use with Multicast compatible LoRaWAN cloud solutions, including Amplex LoRaWAN gateway cloud, The Things Network, Loriot and Actility.
Wifi	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.
Analog input	Analog input 0-10V, 4-20 mA (0-20mA) 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.
OXI Connectors	3 OXI connectors for Expansion slot module (only on 150-10-003). Connectivity specifications depends on installed OXI module.

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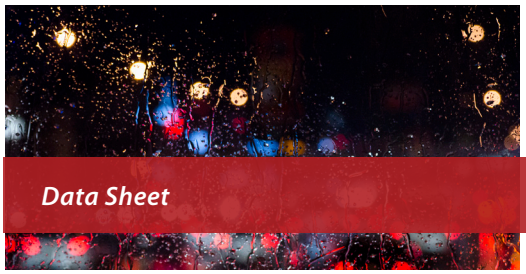

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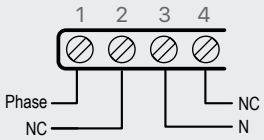
Installation Guide

The gridCPU-LoRa module can be connected to any GridLight v7.2+ server through the leading LoRaWAN cloud providors, including Digimondo firefly, Zenner ELEMENT IoT, OS2iot, Amplex LoRaWAN Gateway, Loriot, The Things Network and Actility.

Topic	Comments
Input cable length	< 3 m
2.5 mm² terminals	< 3 m
Enclosure	The gridCPU-LoRa 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-LoRa module and tighten it gently with your fingers. Do not use tools.

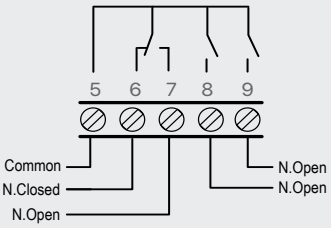
I/O Schematic

Main power connection



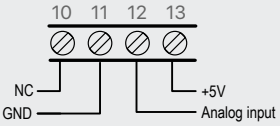
Terminals: 2.5 mm²

Relay connection



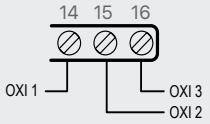
Terminals: 2,5 mm²

Analog input / Light sensor input



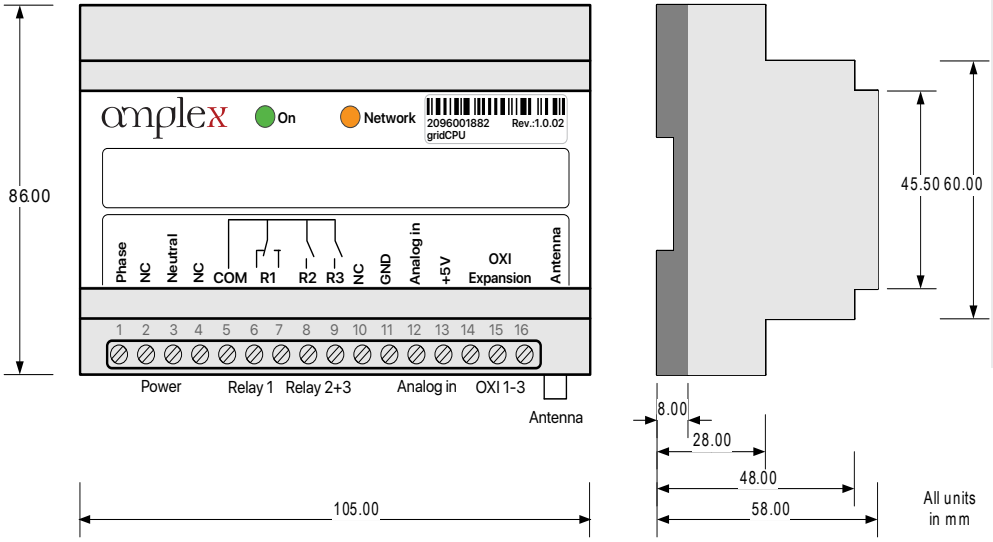
Terminals: 2.5 mm²

OXI



Terminals: 2.5 mm²

Drawing



Ordering Information

Product	Order number
gridCPU-LoRa (OXI)	150-10-003
Amplex LoRaWAN Gateway (outdoor)	170-10-000
Vandal resistant antenna	230-20-000
Mini-PT Dual antenna	230-30-000

All specifications are subject to changes

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