

# **Street lighting controller TELEM-AGC-L**

## **User Manual**

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## 1. Safety Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

### PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Martem AS for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved.

**Important – Please check that the device is grounded through the power connector's PE contact!**

## 2. Introduction

TELEM-AGC-L is used as LCBC (Light Control Box Controller) in smart street lighting solutions. The system is visualized by central map based user interface software. TELEM-AGC-L is a good choice for solutions where older and newer individually controlled LED luminaires are in same control network



## 3. Features

- Autonomous control without need of permanent connection to control center based on internal astronomical clock and sensors
- GPRS communication via secure VPN channels
- Integrated radio and gateway functionality for individually controlled luminaires solution
- Interfaces for energy meters and transducers
- Astronomical clock
- NTP time synchronization
- Logical operations between digital and analog signals

- Alarms via SMS and e-mail
- Web browser interface for control and maintenance
- OpenVPN, IPsec, L2TP and SSH secure connections
- Historical data recording
- SNMP for monitoring
- Various data exchange protocols via Ethernet and serial ports
- An user friendly free configuration tool
- Configurable remotely over communication line
- Configuration export/import to/from CSV format files
- Charger for external backup battery

## 4. Technical Data

### Data communication protocols

To upper level systems:

- IEC 60870-5-104
- IEC 60870-5-101
- Modbus-TCP (on development)

To lower level devices:

- IEC 61850
- IEC 60870-5-101 unbalanced
- IEC 60870-5-103
- IEC 60870-5-104
- Modbus-RTU
- Modbus-TCP
- IEC 62056-21 (IEC 1107)
- SPA-Bus

**Communication ports** can be freely configured for upper or lower level communication.

## Interfaces on base board

- Communication ports
  - GPRS modem
  - Optional radio network interface
  - Ethernet RJ45 connector, 1,5 kV isolation
  - RS-485 connector, galvanically isolated, 15 kV surge protection
  - 1-wire for environmental sensors
  - Photo and temperature resistor inputs
  - USB console port for maintenance
- IO connectors
  - 12+7 optically isolated digital inputs (wet contacts with internal supply)
  - 4 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)

## Expansion modules

- **Module H**
  - 12 optically isolated 230V digital inputs
  - 2 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
- **Module I**
  - 12 optically isolated 230V digital inputs
  - 1 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
  - DALI master interface
- **Module J**
  - 12 digital inputs for dry contacts
  - 2 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
- **Module K**
  - 12 digital inputs for dry contacts
  - 1 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
  - DALI master interface

**Serial data communication parameters**

- 1 start bit
- Odd, even or no parity
- Communication rates from 300 to 115200 bit/sec

**Electrical characteristics of isolated input**

- Withstand to static discharge IEC 61000-4-2
- Withstand to bursts, surges IEC 61000-4-4, 61000-4-5
- Power frequency magnetic field IEC 61000-4-8
- Voltage dips, variations IEC 61000-4-11

**Mechanical parameters**

- Degree of protection IP 31
- Dimensions (W x H x D) 65x155x190 mm  
(with protruding parts)
- Ambient temperature in operation  $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$
- Weight 900 g
- Mounting DIN rail
- Relative humidity 95% non-condensing

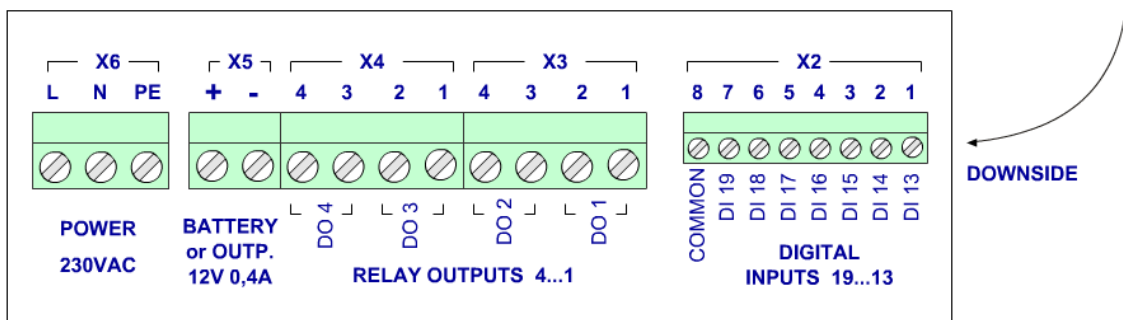
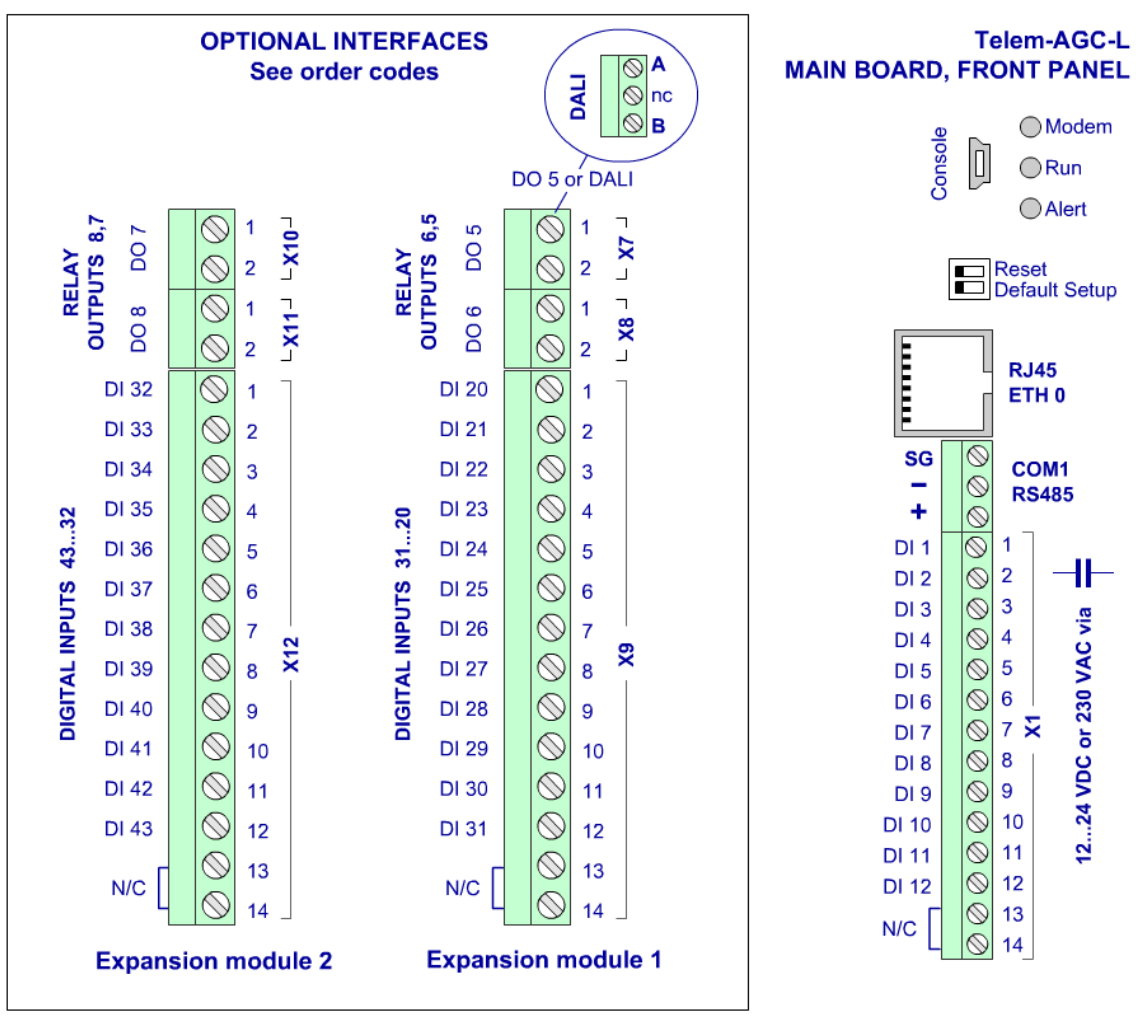
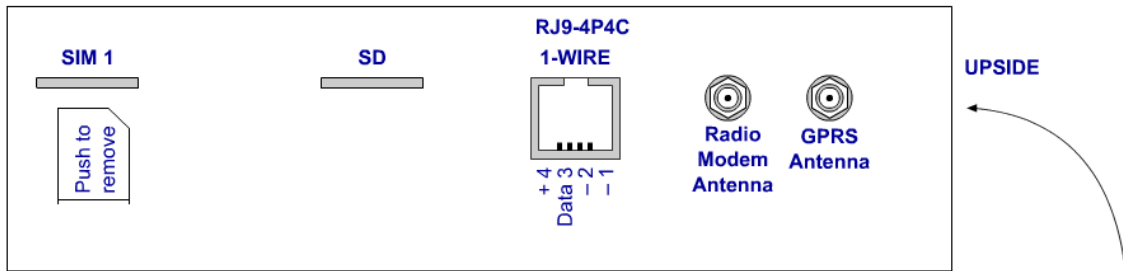
**Radio frequency compatibility**

- RF emission IEC 55022 Class A
- Immunity to RF fields IEC 61000-4-3, 61000-4-6

**Power supply**

- Supply voltage range 230V AC
- Battery connection 12V battery for backup (optional)
- Power consumption  $< 5\text{W}$

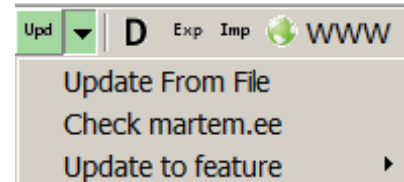
## 5. Terminal Connectors



## 6. Firmware update

**NB! Before updating to new firmware read the setup from your device, and make a backup.**

- Run **GWS.exe** and set up SSH connection with the device
- Press the **Upd▼** button next to **R W C** buttons
- If you have compressed .7z firmware update file (provided by Martem AS) choose **Update From File**
- If you do not have .7z firmware update file choose **Check martem.ee** to refresh existing firmware versions list for this AGC-L device
- Press **Update to feature** and choose needed firmware version. Download is starting...
- After firmware is downloaded **Confirm** window appears. Press **Yes** button, the update process starts
- Wait until the device resumes to its normal operation state (**RUN** LED will start slow blinking again)
- Firmware update is complete.



### Checking results of the firmware update operation:

- Press **R** button to read back the device setup data
- Check the **Version** from **GWS Status** tab

## 7. DIP switches

**Reset:** Switch RESET to ON state and then back to OFF state for Reset operation

**Dft. Set:** To apply default setup:

1. Switch DFT. SET to ON state

\*Alert indication LED starts blinking within 5 seconds

\*Alert indication LED will blink for 2 seconds

2. Switch DFT. SET back to OFF state when the alert indication LED **is blinking** to apply default setup

\*If DFT. SET is switched back to OFF state when the alert indication LED is not blinking, default setup will NOT be applied

**IFR:** Additional jumper inside of device, on the main board near to output relay no.1. If this jumper position is closer to front panel the first output relay is used for IFR, otherwise the 1. output could be used as ordinary output.

## 8. Indication LED-s

**MODEM** – green LED – indicates the 4G, 3G, 2G modem network connection

**RUN** – green LED – blinking green indicates that the program is running

**ALERT** – red LED – failure

Green LED-s for serial communication ports for RX, TX indication.

## 9. Configuration tool

The Telem-AGC device is configured with Telem-GWS software.

The configuration process is described in Telem-GWS software manual.

## 10. Order code

### AGC-LX-XX-XX

Power	A – 230 V AC
Extra communication	R – Radio; N – No
GPRS modem	4 – 4G; N – No
Expansion module 1	H – 12 DI, 230 V AC, 2 DO I – 12 DI, 230 V AC, 1 DO, DALI J – 12 DI, Dry contact, 2 DO K – 12 DI, Dry contact, 1 DO, DALI N – No
Expansion module 2	Same options as on Expansion module 1, except I, K and W

## 11. Open-source software information

This device produced by Martem Ltd. includes open-source components. The most up to date info of exact software used by Martem's build system and licensing info of used software can be found from <https://phobos.martem.ee/shr/br-sources/>