



Street lighting controller TELEM-AGC-L

User Manual

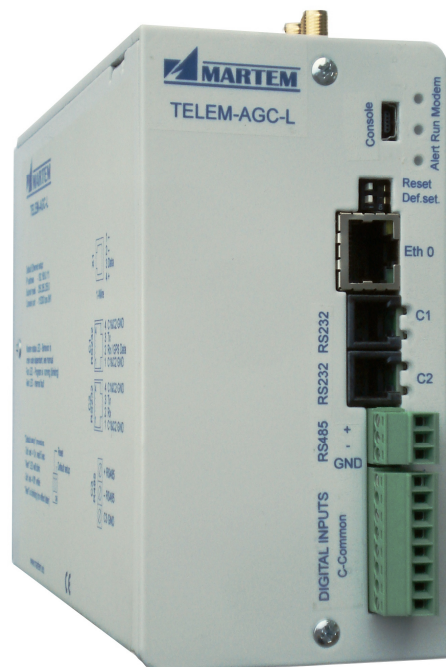
Martem AS
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1. Introduction

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



2. 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
- > 10 sec. operation after power outage for sending last signals
- 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

3. 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
 - 2 x RS-232 with RJ9-4P4C connector, galvanically isolated, 15 kV surge protection
 - RS-485, galvanically isolated, 15 kV surge protection
 - 1-wire for environmental sensors
 - Photo and temperature resistor inputs
 - USB console port for maintenance
- IO connectors
 - 8 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 A
 - 8 optically isolated digital inputs (wet contacts with internal supply)
 - 4 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
- Module B
 - 8 optically isolated digital inputs (wet contacts with internal supply)
 - 3 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
 - DALI master interface
- Module F
 - 16 optically isolated digital inputs (wet contacts with internal supply)
 - 8 relay outputs (max 0,5 A 250 VAC; 0,25 A 220 VDC)
- Module G
 - 16 optically isolated digital inputs (wet contacts with internal supply)
 - 7 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 $-40^{\circ}\text{C}\dots+70^{\circ}\text{C}$
- Weight 900 g
- Mounting DIN rail
- Relative humidity 95% non-condensing

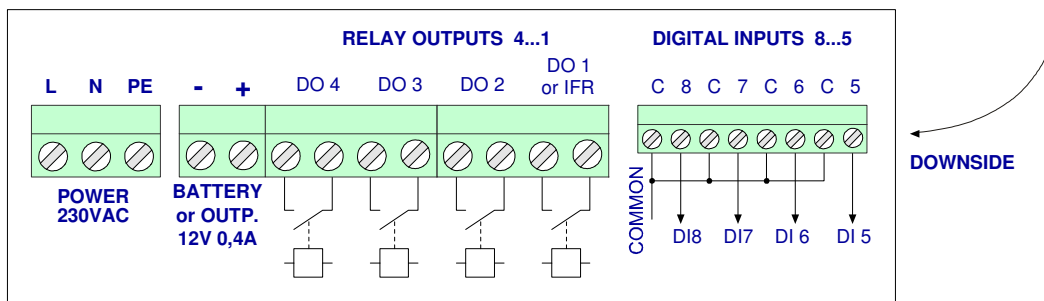
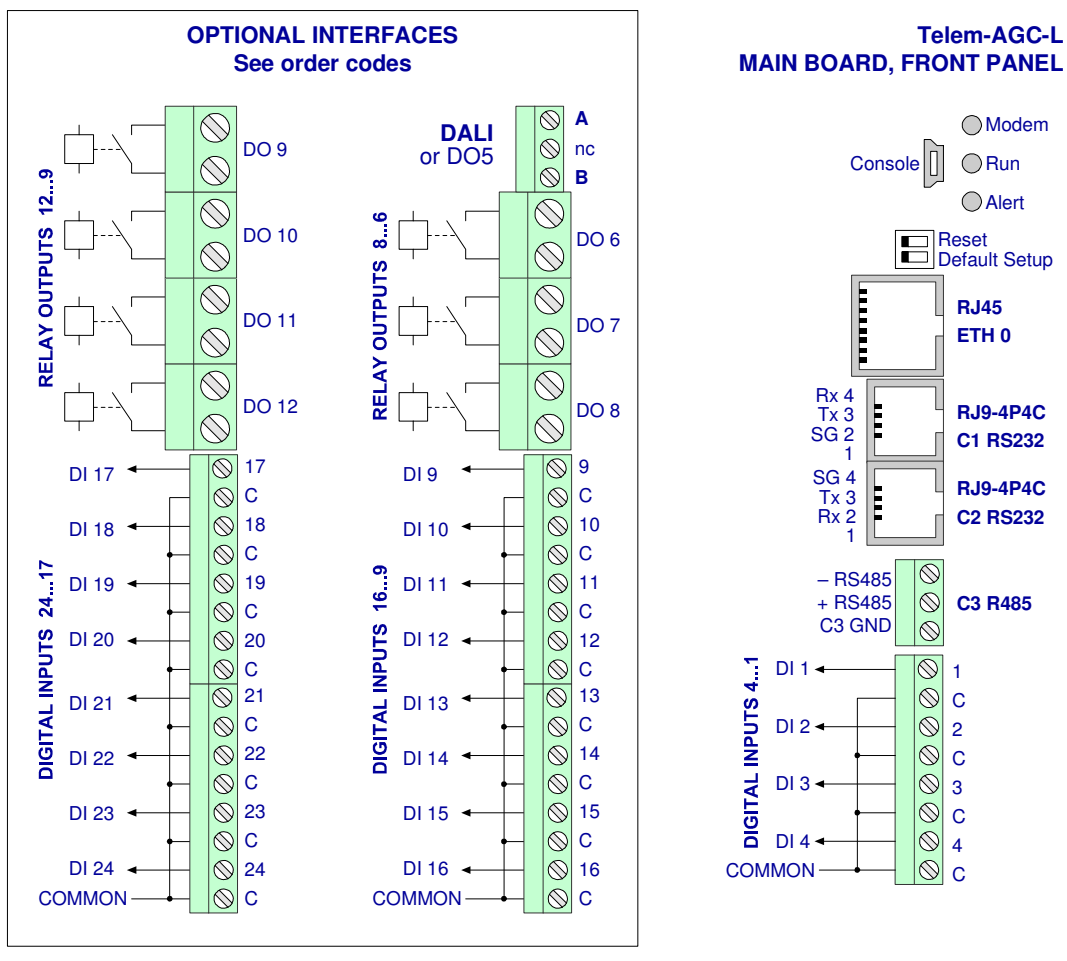
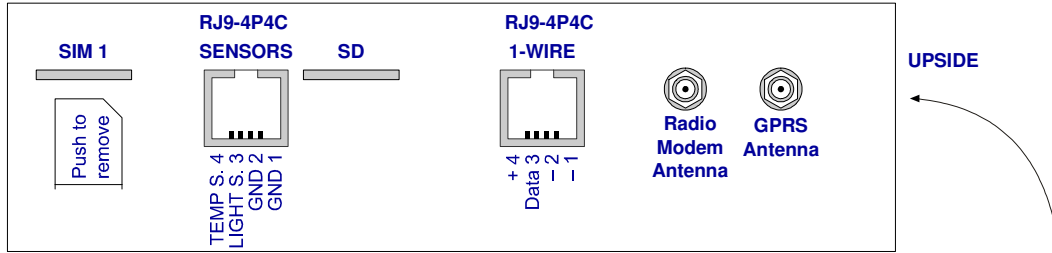
Radio frequency compatibility

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

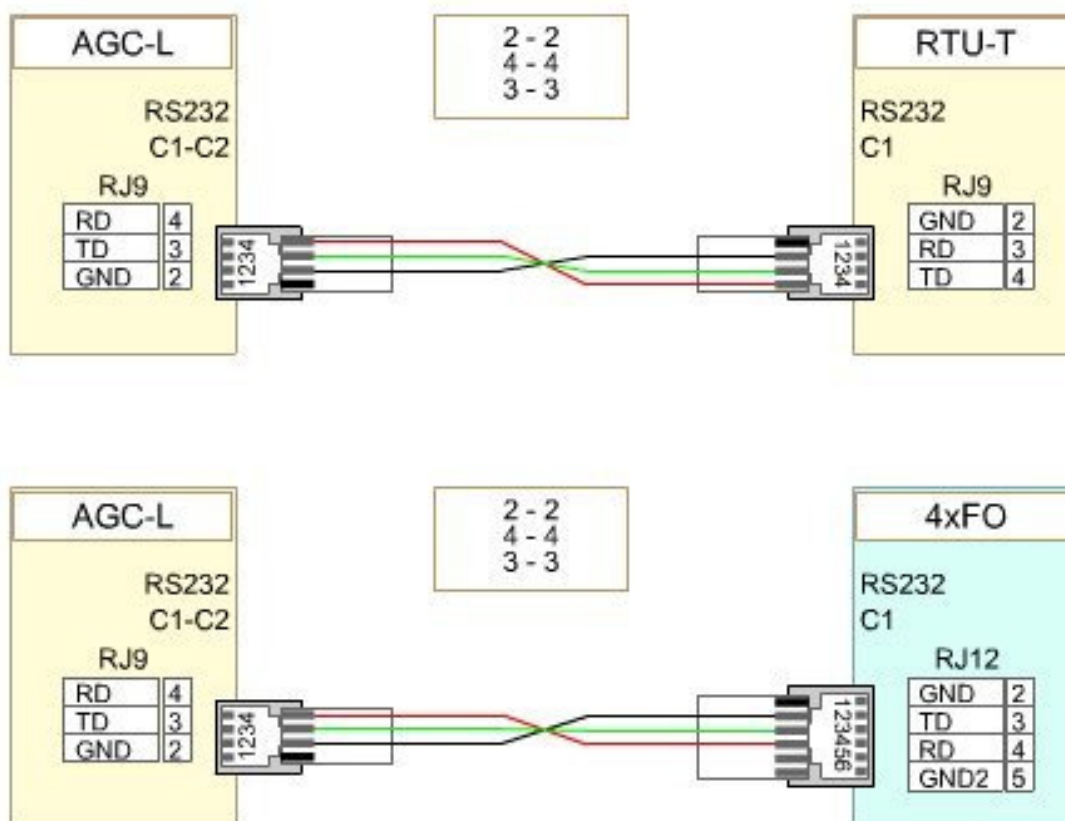
Power supply

- Supply voltage range 230V AC
- Power consumption $< 7\text{W}$

4. Terminal Connectors



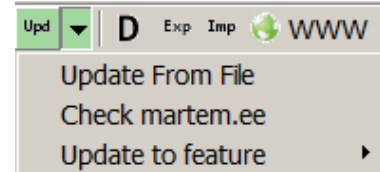
5. Communication cables



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

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.

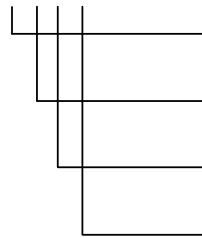
9. Configuration tool

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-X



Power	A – 230 V AC
Extra communication	R – Radio; N – No
GPRS modem	3 – 3G; 4 – 4G; N – No
Expansion module	A – 8 DI, 4 DO; B – 8 DI, 3 DO, DALI; F – 16 DI, 8 DO; G – 16 DI, 7 DO, DALI; N – No

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/>