mecc alte

SMARTECH

POWER FROM WITHIN

CL100

CLOUDLINK MOBILE GATEWAY

USER MANUAL

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Revision	Date	Notes
00	02/02/2026	First version of the manual for the version 01.00 of the controller.

Table of Contents

1   Introduction

⚠ WARNING!: Ensure to read this manual carefully before operating the device.

1.1   References

[1]   EAAM0740xx –BoardPrg4 user's manual.

[2]   EAAM0903xx - CL100 Parameter Table

[3]   EAAM0867xx – SmartCloud

1.2   Terms and Abbreviations

APN	Access Point Name. It is an access point to the Internet for data transfer via GPRS, 3G, 4G, or other technology.
BEIDOU	Chinese Geostationary Navigation System
CAT-M	Type of LPWAN low power LTE-based radio technology standard designed for the Internet of Things
CLOUDLINK	MeccAlte Proxy Server (used for secure internet connections)
EDGE	Enhanced Data rates for GSM Evolution (E)
FIX	Acquisition of geographical coordinates
GLONASS	GLObal'naya NAvigatsionnaya Sputnikovaya System (Russian Navigation System)
GNSS	Global Navigation Satellite System. Generic term for a global navigation satellite system. Examples of GNSS are: GPS, BEIDOU, GLONASS, GALILEO
GPRS	General Packet Radio Service
GPS	Global Positioning System (US navigation system)
GSM	Global System for Mobile
IoT	Internet of Things
IP	Internet Protocol
LPWAN	Low Power Wide Area Network
LTE	Long Term Evolution
LTE-M	Long-Term Evolution Machine Type Communications Category M
M2M	Machine to Machine. Type of contract for communication on the cellular network with the devices connected to the machines (uses a reduced volume of data).
NAT	Network Address Translation. Technique that masks IP addresses. Used by mobile operators to overcome the limited number of IP addresses available.
NB-IoT	Narrow Band Internet of Things. Type of LPWAN (Low Power Wide Area Network Wide Area Network) low power radio technology standard designed for the Internet of Things.
RAT	Radio Access Technology
RF	Radio Frequency
SIM	Subscriber Identification Module
SMARCLOUD	Mecc Alte CLOUD MONITORING SYSTEM with web interface access
SMS	Short Message Service
TTFF	Time to First fix
TCP	Transmission Control Protocol. Transmission protocol for communication between two network points.
VSWR	Voltage Standing Wave Ratio

1.3   Conventions

Along the manual, a vertical bar at the right of the paragraphs shows the modifications with respect to its previous version. In tables, modifications are showed with a grey background.

1.4   General information

This manual describes the technical, functional and use characteristics of **CL100 (CLOUDLINK 100 Device)**

Article Code:

YM061121631xxyy – CL100 VER.xx REV.yy

Accessories:

E090000000169 – USB A CABLE - USB MINI B 5PIN 1,8MT

E090000000048 – CONNECTION CABLE (RS232-RS232) L=2mt F/F

E700000002004 - ANTENNA LTE+GPS+GLONASS SMA 3MT 2,5dB

The **CL100** device allows you to connect a unit (genset or other entity) to the internet data network and monitor its operating status.

CL100 is able to:

- Connect to Mecc Alte controllers and other third parties via Modbus RTU protocol (RS232 / RS485 interface).

- Control the machine status through 8 digital inputs.

- Control two dry contact relays.

- Capture one analogue input (tank level).

- Read generic Modbus devices (e.g.: meters, temperature detectors, etc.).

- Locate the machine through the GNSS positioning system.

- Manage SMS* (send on event/alarm, reply to requests).

- Send data to a data cloud (SMARTCLOUD), which :

  o History data and events in a constantly updated database.

  o Allows access to the portal from any web browser.

  o Manages the sending of emails.

  o Performs reports.

  o Allows data export.

  o Displays the trend of measurements (trend).

  o Displays the geographical position and tracking, if applicable.

The device is equipped with a **LTE Cat.M1** and **NB-IoT** Multimode module and quad-band **2G** fallback (**GPRS/EDGE)** with multi-regional coverage.

They also integrate a Global Navigation Satellite System (**GNSS**) receiver, using **GPS**, **GLONASS, GALILEO** or **BeiDou** system, to provide and reliable positioning information with a high accuracy and performance.
The flexibility extends further with dynamic system selection as **Cat.M1, NB-IoT**, and **GPRS/EDGE** in single mode or as a preferred connection that does not require a module reboot to switch between modes. They provide a solution for applications that require broad geographic coverage, even in areas where **LTE Cat.M1** and **NB-IoT** are not widely available yet.
New **CL100** devices deployed in the field today, can then be activated on existing **2G** networks and still leverage the benefits of **LTE Cat.M1** and **NB-IoT** technology once it becomes available.

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Moreover, you may configure the device for sending/receiving signal and control **SMS** and e-mails.

It is not possible to connect directly to **CL100** using it as a GSM modem.

⚠️ **Note: Module is able to make and receive SMS*, make GPRS/EDGE/LTE traffic but is unable to make and receive voice calls.**

Each device can be interfaced to all Mecc Alte controllers, as well as other manufacturers controllers through a RS232 or RS485 serial port via Modbus RTU protocol.

The connection through serial line allows to acquire different statuses and operating measurements of the genset. In addition, there are eight digital inputs for the acquisition of statuses and commands and two relay outputs with dry contact.

CL100 communicates with the system either periodically or on event, so that all the existing machinery database is updated.

This operation requires a SIM board enabled for data exchange, a radio antenna (**GSM + LTE)** and an antenna for the tracking system (**GPS + GLONASS**).   The antennas can be of the "combo" type: a single antenna that incorporates the two types of antennas.

All antennas need to have male SMA connection.

The device works in the same way with both 12 and 24Vdc as nominal voltage, in any case between 8 and 32 Vdc; as option, it can be supplied with a Lithium Ion internal rechargeable battery, which is able to ensure its working, data transmission and localization for some hours in case of lack of the main supply.

The device is able to automatically enter a Sleep Mode status in order to further decrease its consumptions and increase its operating time.

Additionally, there is a dedicate input available for the connection of another external backup rechargeable battery (max. 6Ah Lead battery). This battery works in case of lack of the CL100 supply or when the supply decreases under the external backup battery.

A cladding system allows to keep this backup battery always ready to use.

The nominal voltage of the external backup battery must be equal to the supply nominal voltage.

1.5   Prerequisites

The device can be configured and modified through the Mecc Alte Board Programmer4 PC Software (hereinafter called "BoardPrg4")

BoardPrg4 can be used on all Mecc Alte devices; the connection to the PC can be direct through Serial RS232 and USB Ports, or remote by modem, Serial RS485 Port or Ethernet. Refer to the related manual. Refer to the related manual.

In addition, it allows to save the file of the configuration in order to reuse it for future uses on equal devices.

⚠️ Important: The CL100 device is designed to be used together with the Mecc Alte SMARTCLOUD system.

Alternatively, the device can be configured also to send SMS* and remotely connect to the Supervision (with no need of using the SMARTCLOUD software).

In order to visualize and/or configure the CL100 devices in the SMARTCLOUD website, you need to have an account and a password and register the unit with the related Cloudlink credentials given by Mecc Alte.

1.6   Software Revisions

Throughout the manual there will be references to the software revisions of the controller. These revisions will be indicated with the Mecc Alte code assigned to them, which is on the side of the controller. The code format is the following: EB0250441XXYY, where "XX" is the main revision of the software, while "YY" is the secondary revision. So, the code EB02504410109 refers to the software revision "1.09" of the device.

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1.7 Safety information

Many accidents are caused by poor knowledge and the non-observance of safety regulations, which must be observed when operating and/or servicing the machine.

To prevent accidents, before using or servicing the machine you should read, understand and observe the precautions and warnings in this manual.

The following indications have been used to identify the safety messages in this manual:

WARNING! This indication is used in the safety messages for risks which, unless avoided, can cause malfunction or damage to property or persons.

INFORMATION! This term implies the message provides information useful for performing the current operation, or explanations or clarifications for procedures.

1.8 Maintenance and cleaning.

The maintenance of this device must be carried out by qualified personnel, in observance of the law in force, in order to prevent from damages to persons or things.

The cleaning of the front panel can be carried out exclusively with a soft cloth. Do not use abrasing products, detergents or solvents.

1.9 Information concerning disposal.

INFORMATION! On the disposal of old electrical and electronic equipment (applicable in European countries that have adopted separate waste collection systems).

Products bearing the barred wheeled waste container symbol cannot be disposed of with normal urban waste. Old electrical and electronic equipment should be recycled in a facility authorized to process these items and dispose of the components. Contact your local authority for information on where and how to deliver such products to the authorized site nearest you. Proper recycling and disposal helps conserve resources and prevents detrimental effects for health and the environment.

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2 Views of the device

Front view:

Upper view:

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Lower view:

Side view:

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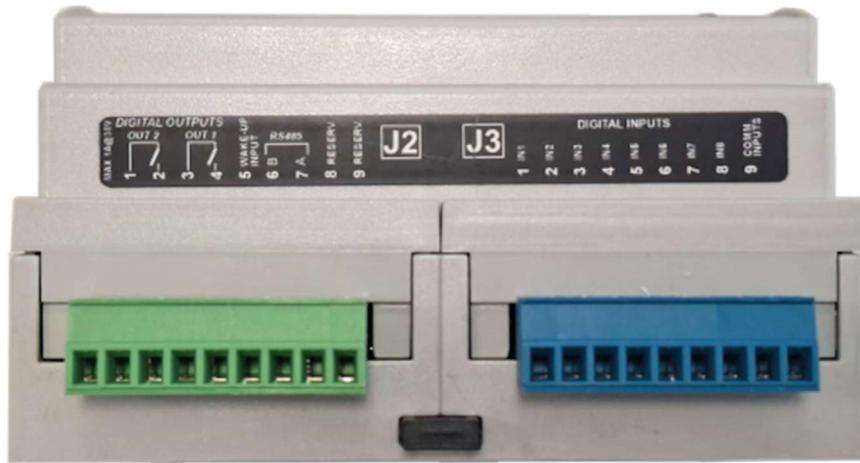
3   Technical Features

(i) **INFORMATION! GND refers to the potential of terminals J1-3 e J1-4**

Supply power voltage +VBATT:			
Nominal power supply (Vn)	12Vdc o 24Vdc		
Power supply range (Vn variation)	From 8 to 32Vdc. Protection against polarity reversal with built-in self-resetting fuse.		
Maximum time of interruption of the supply voltage without resetting the device	With internal battery OFF or deactivated or discharge: 0 Vdc for min. 20 ms from a nominal voltage of 12Vdc (voltage drop) With internal battery ON or full charge 0Vdc for the lifetime of the internal battery		
Sampling rate	5 Khz		
Resolution	12 bit		
Average current Consumption and peak current consumption in "active mode"	Power consumption depends on the frequency of data transmission, the type of connection used (EDGE, LTE CATM1, LTE NB-IoT), the type of serial port used for the connection (Rs232, RS485 isolated) and the charge status of the internal battery. Maximum values are obtained with Tx mode radio module and 2G (GPRS / EDGE) connection, RS485 serial active and internal battery discharged and therefore in full charge status. *** Average values are calculated over 3 minutes, Peak value are calculated during trasmission slot**		

GNSS active RS232 active, RS485 deactivates Internal battery charged		Average* supply current typ	Peak* supply current
Idle mode (GPRS/EDGE)	@ 8Vdc @ 12Vdc @ 24Vdc	80 mA 55 mA 35 mA	100 mA 75 mA 50 mA
Active Tx mode (GPRS/EDGE)	@ 8Vdc @ 12Vdc @ 24Vdc	100 mA 65 mA 60 mA	180 mA 120 mA 115 mA
Idle mode (LTE)	@ 8Vdc @ 12Vdc @ 24Vdc	75 mA 55 mA 40 mA	105 mA 65 mA 45 mA
Active Tx mode (LTE)	@ 8Vdc @ 12Vdc @ 24Vdc	95 mA 70 mA 45 mA	135 mA 95 mA 60 mA
GNSS active RS232 deactivates, RS485 active Internal battery charged		Average* supply current typ	Peak* supply current
Idle mode (GPRS/EDGE)	@ 8Vdc @ 12Vdc @ 24Vdc	150 mA 105 mA 65 mA	260 mA 175 mA 110 mA
Active Tx mode (GPRS/EDGE)	@ 8Vdc @ 12Vdc @ 24Vdc	165 mA 105 mA 65 mA	310 mA 195 mA 110 mA
Idle mode (LTE)	@ 8Vdc @ 12Vdc @ 24Vdc	140 mA 95 mA 60 mA	150 mA 105 mA 65 mA

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			Average* supply current typ	Peak* supply current
Active Tx mode (LTE)	@ 8Vdc		175 mA	215 mA
	@ 12Vdc		110 mA	130 mA
	@ 24Vdc		65 mA	75 mA
GNSS active RS232 deactivates, RS485 active Internal battery discharged			Average* supply current typ	Peak* supply current
Active Tx mode (GPRS/EDGE)	@ 8Vdc		335 mA	500 mA
	@ 12Vdc		210 mA	300 mA
	@ 24Vdc		105 mA	145 mA

Average current Consumption in "Sleep Mode"	Max. 14mA
Average current Consumption in "Deep Stand-by Mode"	Max. 4,5mA

Digital inputs 01-08

Type of input	8 opto-insulated digital inputs with terminal in common, connectable to both supply positive and negative; The maximum voltage applicable between the common terminal and the single input is ±32VDC. The maximum insulation voltage with reference to GND is 42,4 Vrms or 60 VDC. When they are open, the voltage on input terminals is equal to the voltage common terminal.
Activation/deactivation threshold	1,2Vdc
Typical current with closed contact	5mA @ VBATT= 13,5Vdc 10mA @ VBATT= 27,0Vdc
Input signal delay	It can be adjusted by the related parameter for each input
Maximum voltage applicable between the common terminal and the single input	±32Vdc
Nominal insulation voltage	840 Vrms o 1187 Vdc (reference to GND)

Digital outputs 01-02

Type of output	Two relay outputs with dry contacts NO, max. 500mA @30VDC. Each relay output is reconfigurable by parameter
Rated supply	Max. 500mA@30Vdc for each output. Higher voltages or currents need an external relay with proper characteristics.
Maximum voltage applicable	30Vdc (reference to GND)

Analog tank input

Input type	One differential analog input 0..5Vdc The input offers the possibility of differential measurement to compensate measurement negative differences with respect to GND.
Measurement range	0 – 5Vdc
Compensation range	From -3,5Vdc to +5,5Vdc
Input impedance	> 500 kΩ
Frequency	5 kHz

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Measurement resolution	12 bit
Measurement accuracy	< 0,4% F.S.
RS232 Communication interface	
Type of interface	1 RS232 serial port standard TIA/EIA, not insulated on DB connector 9 poles male CANON
Electrical signals	TX, RX, DTR, DSR, GND
Settings	Baud rate selectable by parameter: 300, 600, 1200, 2400, 4800, **9600***, 19200, 38400, 57600, 115200 Parity: **None***, Even, Odd Stop bit: **1*,**2 *** Default Setting**
Type of transmission	**Modbus RTU Master*,** Modbus RTU Slave *** Default Setting**
Maximum distance	The length of the cable depends on its capacitance, inductance and shielding. 15m (50ft) @ 9600bps 10m (33ft) @ 19200bps 7,5m (25ft) @ 38400bps 5,0m (16ft) @ 57600bps 2.5m (8ft) @ 115200bps
RS485 Communication interface	
Type of interface	1 RS485 serial port standard TIA/EIA, with galvanic insulation. External termination resistor required (120 Ω)
Electrical signals	DATA+ (A), DATA– (B)
Settings	Baud rate selectable by parameter: 300, 600, 1200, 2400, 4800, **9600***, 19200, 38400, 57600, 115200 Parity: **None*,** Even, Odd Stop bit: **1*,**2 *** Default Setting**
Type of transmission	Modbus RTU Master
Insulation voltage	Max operating 560Vdc 1KVdc on transient < 60s.
USB 2.0 Communication interface	
Type of interface	1 non-isolated USB 2.0 serial port that can be used in Function mode or Host mode
Function Mode	Connection to PC by MeccAlte Driver USB type Mini-B connector Type of transmission Modbus RTU Slave
Host Mode	Pen Driver Management USB type A connector Maximum output current 350mA@5Vdc with automatic overload protection
Maximum distance	6m (20 feet)

External battery backup input	
	One input for the connection with a lead battery with nominal voltage 12 or 24V or equal to the nominal supply voltage of the device supplied on the terminal J1-1.
Nominal voltage	12Vdc o 24Vdc
Maximum charging current	540 mA
Frequency	5 kHz
Measurement resolution	12 Bit
Maximum nominal capacity	6Ah

Radio Access Technology (RAT)	
Protocol Stack	3GPP Release 13
Radio Access Technology (RAT)	**2G GSM / GPRS / EGPRS** **LTE Cat. M1** LTE-M **LTE Cat. NB-IoT** NB-IoT

Bands and Frequency Range	**Bands Used**	**Uplink Frequency**	**Downlink Frequency**
	GSM850*	**824~849 MHz**	**869~894 MHz**
	EGSM900	880~915 MHz	925~960MHz
	DCS1800*	**1710~1785 MHz**	**1805~1880 MHz**
	PCS1900	1749,9~1784,9 MHz	1844,9~1879,9 MHz
	LTE+FDD B1*	**1920~1980 MHz**	**2110~2170 MHz**
	LTE+FDD B2	1850~1910 MHz	1930~1990 MHz
	LTE+FDD B3*	**1710~1785 MHz**	**1805~1880 MHz**
	LTE+FDD B4	1710~1755 MHz	2110~2155 MHz
	LTE+FDD B5	824~849 MHz	869~894 MHz
	LTE+FDD B6	830~840 MHz	875~885 MHz
	LTE+FDD B8*	**880~915 MHz**	**925~960 MHz**
	LTE+FDD B12	699~716MHz	729~746MHz
	LTE+FDD B13	777~787MHz	746~756MHz
	LTE+FDD B18	815~830 MHz	860~875 MHz
	LTE+FDD B19	830~845 MHz	875~890 MHz
	LTE+FDD B20*	**832~862MHz**	**791~821MHz**
	LTE+FDD B26	814~849 MHz	859~894 MHz
	LTE+FDD B28*	**703~748MHz**	**758~803MHz**
	LTE+FDD B39	1880~1920 MHz	1880~1920 MHz
	* Bands used for RED certification B39 Supported only with LTE Category M1		

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Transmitting power	**GPRS power class:** GSM850: 4 (2W) EGSM900: 4 (2W) DCS1800: 1 (1W) PCS1900: 1 (1W)	**EDGE power class:** GSM850: E2 (0.5W) EGSM900: E2 (0.5W) DCS1800: E1 (0.4W) PCS1900: E1 (0.4W)
	LTE power class: CAT.M1 and NB-IoT: 3 (0.25W)	
Data Transmission Throughput	**LTE CAT-M1:** Uplink up to 375kbps (Half duplex) Downlink up to 300kbps (Half duplex) Uplink up to 1Mbps (Full duplex) Downlink up 1Mbps (Full duplex)	**LTE NB-IoT:** Uplink up to 66kbps Downlink up to 34kbps
	EDGE Class: Uplink up to 236.8Kbps Downlink up to 236.8Kbps	**GPRS:** Uplink up to 85.6Kbps Downlink up to 85.6Kbps
Antenna RF	50 Ohm nominal characteristic impedance	
	The maximum gain allowed to antenna and its cable is 3 dBi	
	VSWR < 2.5	
	Please note that the terminal should be installed and operated with a minimum distance of 30cm between the antenna connected to the terminal and any human bodies. Also, the transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.	

Global Navigation Satellite System (GNSS)		
Frequency range	**GPS** 1575.42 ± 1.023Mhz	**GLONASS** 1597.52~1605.92Mhz
	Galileo 1575.42 ± 2.046Mhz	**BeiDou** 1561.098 ± 2.04 Mhz
Receiver type	16-channel C/A Code	
Sensibility	Tracking: -167 dBm (GPS) /-157 dBm (GLONASS) Reacquisition: -157 dBm Cold starts: -148 dBm	
TTFF (open sky)	Hot start <1s, Cold start<35s	
Accuracy (open sky)	2,5m (CEP50)	
Antenna GNSS	50 ohm nominal characteristic impedance An amplified antenna must be used. The plug of the device provides automatically the power supply required (Max 35mA@3,3Vdc)	
Inertial motion sensors		

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Accelerometer 3D	Linear acceleration measurement range: ±2/±4/±8/±16 g full scale Linear acceleration sensitivity: FS = ±2 g 0,061 mg/LSB FS = ±4 g 0,122 mg/LSB FS = ±8 g 0,244 mg/LSB FS = ±16g 0,488 mg/LSB
Gyroscope 3D	Angular rate measurement range: ±125/±250/±500/±1000/±2000 dps full scale Angular rate sensitivity: FS = ±125 g 4,375 mbps/LSB FS = ±250 g 8,75 mbps/LSB FS = ±500 g 17,50 mbps/LSB FS = ±1000g 35,00 mbps/LSB FS = ±2000g 70,00 mbps/LSB
Internal Battery optional	
	Lithium Ion internal rechargeable battery.
Nominal voltage	3,7 Vdc
Nominal capacity	1100 mAh or 1800 mAh
Charging voltage	4,20V ±0,05V
Integrated protections	Short-circuit protection Overcharge protection Protection against over discharge
Recharge time	about 12 hours with empty battery
Charge current	0,1C (200 mA)
Charging conditions	CC/CV
Thermistor	10K NTC
	Battery life depends on several factors: ambient temperature, frequency of data transmission and signal strength of the mobile network. Minimum duration of about 9 hours with data transmission interval set to 3 minutes and good signal level. Longer life using power saving mode.
Environmental conditions	
Operating temperature	Without internal battery From -25°C to +70°C With internal battery* From -20°C to +55°C *Internal battery is recharged from 0°C to +45°C
Storage temperature	Without internal battery From -30°C to +80°C With internal battery From -20°C to +45°C (for less than 1 month) From -20°C to +35°C (for less than 6 month)
Relative humidity	<80% without condensation
Altitude of operation	0 to 2000 m above sea level

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|	
Pollution degree	PD2
Box	
Size	106,3mm (L) x 90,5mm (H) x 62mm (P) (without connectors)
Protection degree	IP 20 EXTERNAL
Mounting	DIN guide (EN60715) according to DIN 43880 regulations
Material	PC/ABS
Extinguishing degree	UL94 class HB
Weight:	273 g (with internal battery)
Compliant	EN 61010-1:2010+ A1 EN 50385:2017 EN 61326-1:2013 EN 301 489-1 V.2.2.3 EN 301 489-19 V.2.1.0 EN 301 489-52 V.1.1.0 EN 301 511 V.12.5.1 EN 301 908-13 V.11.1.2 EN 303 413 V.1.1.1

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4 Installation

4.1 Package content

- 1 *CL100* **(Cloudlink Device).**
- 1 x **GPRS+LTE** and **GNSS** combined antenna.
- 1 x Installation Guide
- 1 x 2 mt. serial RS232 f/f Crossover cable.
- 1 x USB cable

4.2 Device Dimensions

The device is designed to be mounted on a **DIN 43880** guide in upright position. Proper operation requires adequate ventilation. Avoid mounting over and/or close to heat sources.

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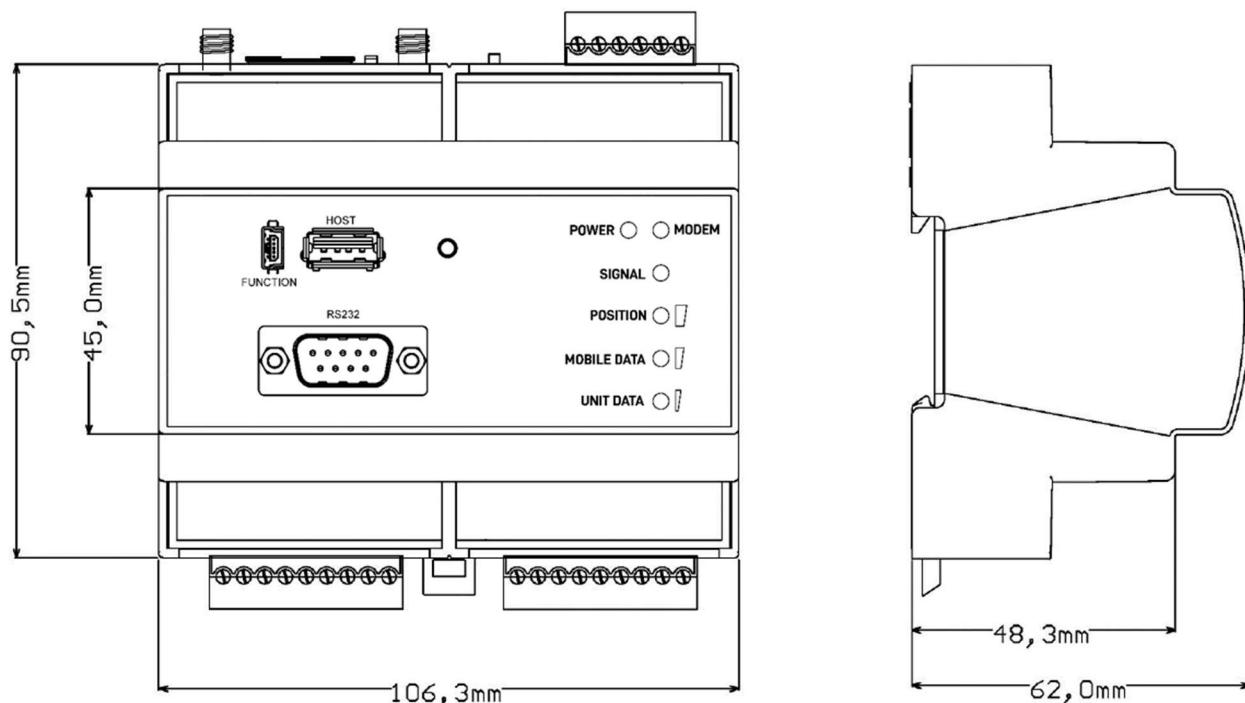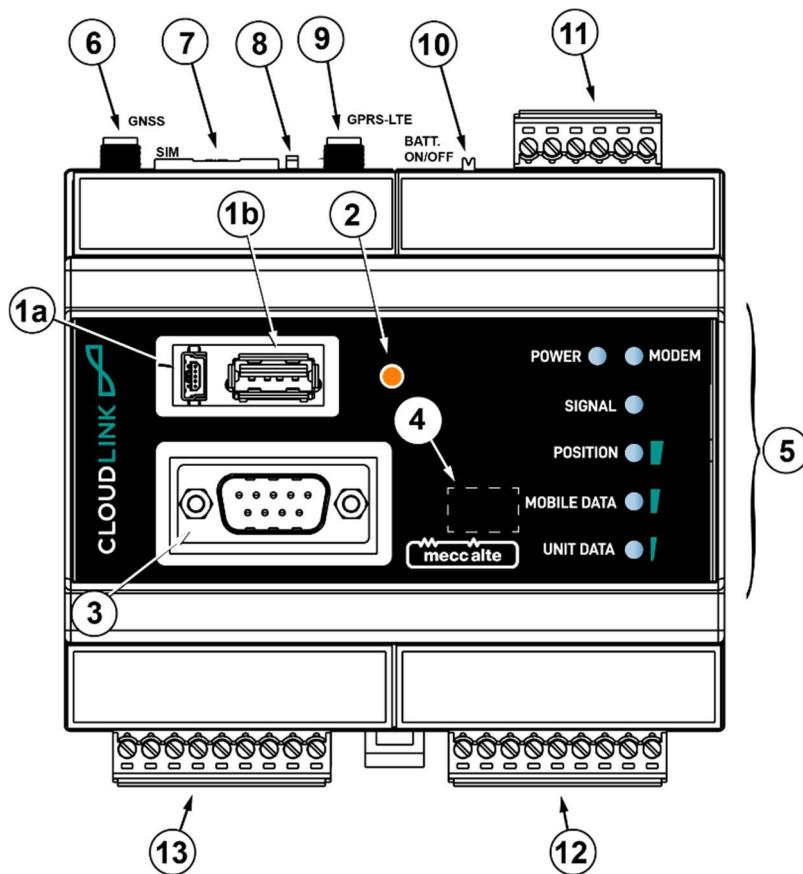
5 Connectors

1. **USB** port
   a. Function
   b. Host
2. **AUX** Button
3. **RS232** Serial Port
4. Dip Switches(reserved)
5. Led Indicators
6. **GNSS** antenna SMA
7. SIM Holder
8. SIM Eject Button
9. **GPRS-LTE** antenna SMA
10. On/Off Switch for internal battery
11. **J1** Connector: Supply, Analogue Input, External backup battery
12. **J3** Connector: Digital inputs:
13. **J2** Connector: Digital Outputs, Serial RS485, Reserved

5.1 J1 Connector (Ref. 11)

- Female connector 6 poles, step 3.81, green colour
- Solid wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Strands wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Max tightening: 0.2/0.25 Nm (1.77/2.21 lbf in)
- Stripping length: 5 ÷ 6 mm (.20 ÷ .24 in)

Connector	Terminal Nr.	Pin	Function
J1 Ref. 11	1	+BATT. MAIN	Positive input main supply (8...32 Vdc)
	2	+BATT. BACKUP	Positive input 6Ah external backup lead battery at 12 or 24Vdc or equal to the voltage applied on J1 terminal 1.
	3	-BATT. MAIN	Negative input main supply and/or backup battery

Connector	Terminal Nr.	Pin	Function
	4	-BATT. BACKUP	Negative input main supply and/or backup battery
	5	IN 0..5V	Analogue measure input in voltage from 0 to 5V with dedicate ground reference on J1 terminal 6
	6	IN GND	Dedicate ground input at analogue input IN 0..5V

5.1.1   Device supply

Connect the device DC supply to the terminal 1 of J1 (positive input, +Vbatt) and terminal 3 of J1 (negative input, GND). Even if the device is protected by an internal self-resetting fuse, it's compulsory to use a 1A protection fuse at J1 terminal 1 (+Vbatt).

The supply voltage when using the device is the one of the genset starting battery; it can be supplied also by a specific power supply.

⚠ WARNING! In compliance with the safety rules, you must guarantee a mains insulation not lower than a transformer one, in conformity with the rule IEC61558-2-6 or equal.

ⓘINFORMATION! During the installation, connect the battery positive as last operation.

5.1.2   External Backup battery

Connect the external backup battery to the terminal 2 of J1 (positive input, +Vbatt) and of the terminal 4 of J1 (negative input).

An internal circuit allows to keep the backup battery always protected.

The nominal voltage of the backup battery (12Vdc or 24Vdc) must be equal to the supply nominal voltage of the device.

The external battery must have maximum capacity of 6Ah.

5.1.3   0-5Vdc Analogue input

The device is equipped with an analogue input for voltage signals; the measurement range is included between 0 and 5VDC.

Connect the positive input of the analogue measure to the terminal 5 of J1 and the ground reference to the terminal 6 of J1. The voltage to measure must be referred to the same potential of the supply negative J1-3, GND; it is better to supply the device or the transducer with the same source that supplies CL100.

⚠ WARNING! In compliance with the safety rules, you must guarantee a mains insulation not lower than a transformer one, in conformity with the rule IEC61558-2-6 or equal.

5.2   J2 Connector (Ref. 13)

- Female connector 9 poles, step 3.81, green colour
- Solid wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Strands wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Max tightening: 0.2/0.25 Nm (1.77/2.21 lbf in)
- Stripping length: 5 ÷ 6 mm (.20 ÷ .24 in)

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Connector	Terminal Nr.	Pin	Function
J2 Ref. 13	1	OUTPUT 2	Open clean contact relay 2 (max 0.5A 30V)
	2	OUTPUT 2	Common clean contact relay 2 (max 0.5A 30V)
	3	OUTPUT1	Open clean contact relay 1 (max 0.5A 30V)
	4	OUTPUT 1	Common clean contact relay 1 (max 0.5A 30V)
	5	RESERVED WAKE-UP	Sleep Mode **Reserved** digital input
	6	RS485 B	Inverting Receiver Input A/Driver Output A
	7	RS485 A	Noninverting Receiver Input A/Driver Output A
	8	RESERVED	for future functions
	9	RESERVED	for future functions

5.2.1 Relay Outputs

The device is equipped by two clean contact relay outputs NO (max 0.5A 30V) The maximum voltage applicable with reference to GND is 30VDC; higher voltages or currents need an external relay with proper characteristics.

5.2.2 WAKE-UP Input

The device is set with a **non-insulated** digital input that can be activated with a connection to the CL100 supply negative (J1-3 GND)

In the future FW revisions, this input will be available to be used to wake up CL100 from the **Sleep Mode**, with an external electrical signal that can be acknowledged even in case of no battery voltage.

Indeed, in case of no external battery voltage, the CL100 opto-insulated digital inputs may not work.

CL100, supplied by the sole Lithium Ion internal battery (optional), would be able to wake up by means of this input and exit the Sleep Mode.

5.2.3 Insulated RS485 interface

The device is equipped with a non-insulated RS485 interface. On terminal 7 and 6 of J2, connect the signal A (Noninverting Receiver Input A/Driver Output A) and the signal B (inverting Receiver Input B/Driver Output B) of RS485.

Connect the devices on the data line, avoiding star connections; ensure that the first and last device on the line have a 120 ohm termination resistor. In case CL100 is the first or last device, ensure to connect a 120 ohm 1/2 W resistor on terminals 6 and 7 of J2.

This electrical connection also requires a 120 ohm shielded cable.

The default serial port is set as: **Modbus RTU Master, 9600,N,8,1.**

⚠ WARNING! Only one Master port can be selected. By the parameter "P.1101 Master serial port", it is possible to select the ports COM1 (RS232) or COM2 (RS485).

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5.3 J3 Connector (Ref. 12)

- Female connector 9 poles, step 3.81, blue colour
- Solid wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Strands wire section: 0.05 ÷ 1.5 mm² (IMQ) 30÷14 AWG (UL)
- Max tightening: 0.2/0.25 Nm (1.77/2.21 lbf in)
- Stripping length: 5 ÷ 6 mm (.20 ÷ .24 in)

Connector	Terminal Nr.	Pin	Function
J3 Ref. 12	1	IN1	Digital input Nr.1
	2	IN2	Digital input Nr.2
	3	IN3	Digital input Nr.3
	4	IN4	Digital input Nr.4
	5	IN5	Digital input Nr.5
	6	IN6	Digital input Nr.6
	7	IN7	Digital input Nr.7
	8	IN8	Digital input Nr.8
	9	COMM. INPUT	Digital input common connectable to the main supply positive or negative.

On this connector there are 8 opto-insulated digital inputs.

The digital inputs common is available on terminal 9 of J3, and it is possible to connect both positive and negative of the CL100 main supply voltage and both positive and negative of an external DC second source.

If the common terminal 9 of J3 is connected to positive, the inputs will be activated by connecting the input terminals 1..8 of J1 to negative (IN1..IN8).

If the common terminal 9 of J3 is connected to negative, the inputs will be activated by connecting the input terminals 1..8 of J1 to positive (IN1..IN8).

The maximum voltage applicable between the common terminal 9 of J3 and the single inputs (terminals 1..8 of J3) is max ±32VDC.

The maximum insulation voltage, with reference to the device supply negative (terminals 3 or 4 of J1-GND) is max. 840 Vrms or 1187 VDC.

5.4 RS232 Connector (Ref. 3)

- Serial standard port TIA/EIA RS232 **not insulated.**
- Connector DB 9 poles male type CANON
- Max distance 12m (39 feet).

CL100 is equipped with a serial port suitable with the specifications EIA-RS232. It can be externally accessed through the connector DB 9 poles male of the same type of the ones used on PC. This serial port can be used for the MODBUS RTU communication towards the SLAVE device or the PC for Programming/Settings: by default, it is set as **Modbus RTU Master, 9600,N,8,1.**

The connector pinout is standard, as shown below:

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Pinout	Function
1	N.C.
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	N.C.
8	N.C.
9	N.C.
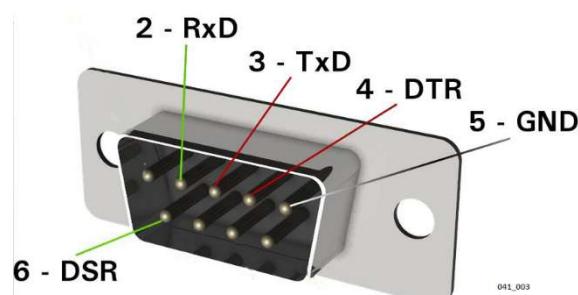
The use of this serial line is allowed only for the devices of the same control panel or, alternatively, for devices that are not subject to external overvoltage and supplied by the same DC supply power of CL100.

In order to connect directly a PC or another RS232 equipment to the devices, you need to use a crossover cable CANON 9 poles female on both terminals, as the following connection diagram:
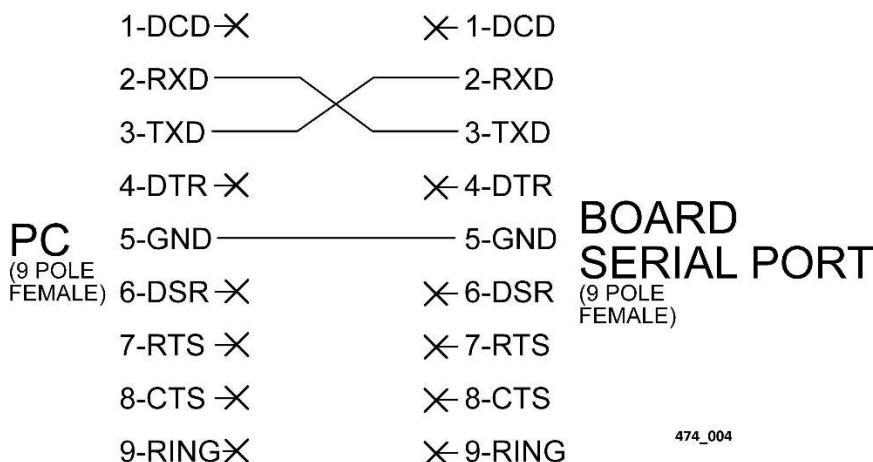
Fig. 2 - RS232 serial

Alternatively, it is possible to use a Crossover cable available with the following Mecc Alte code **E090000000048 CROSS OVER RS232 DB9P F/F MT2 AT CABLE.**

5.5 USB Function Connector (Ref. 1a)

- USB2.0 Port function for the connection with PC
- Mini-USB B type connector
- Max distance 6m (20 feet)

CL100 is equipped with a USB 2.0 Function port (Slave).
The specifications of the USB protocol do not allow its use in permanent industrial field, because of the limited cable length and the high sensibility to electrical disturbances also on the PC. For this reason, **the USB connection cable**

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has to be inserted only when it is necessary to work on the device and it has to be removed from the connector when the operation is over.

For the USB connection, it is necessary to use a cable USB-A male/USB Mini-B male.

The connection through the USB line with a PC is used for two purposes:

- Insertion of the device firmware
- Parameters programming

The insertion/replacement of the device firmware is a specific Mecc Alte operation; besides the operating FW to insert, it requires a particular procedure and proper programs and usually it must not be carried out by the installer, except for specific cases in agreement with Mecc Alte.

From Windows 10 onwards, the device should be automatically recognised as a serial COM port. If this is not the case, you can install the driver **CDC_MeccAlte_Win.inf** supplied by Mecc Alte on the PC.
Once the PC has recognised and installed the driver, the PC will acknowledge the CL100 device as a new serial port, which has to be used exactly as a RS232 serial port.

5.6 USB HOST Connector (Rif. 1b)

- USB2.0 Host port for Pen Driver management (external USB memory)
- USB type A connector.

This USB port can be used to connect a USB stick with a maximum supply current of 350mA@5Vdc.
If the power consumption exceeds the maximum value, the port is automatically deactivated.
The current firmware does not support USB host devices such as USB pen drive. It is designed for possible future developments.

5.7 GSM-LTE (Ref.9) and GNSS (Ref.6) Connectors

- RF SMA male Connectors
- Typical impedance 50 ohm

The device is equipped with two RF connectors that are used for the connection of the external GSM and GPS antennas.
The connectors are SMA female with nominal impedance 50 ohm.

J3 Ref. 9	GSM/LTE	Female SMA connector for mounting **GSM/LTE** (700-960 Mhz and 1710-2655 Mhz).
J4 Ref. 6	GNSS	Female SMA connector for mounting **GPS** (Global Position System) antenna 1574.4~1576.44 MHz (L1) and **GLONASS** 1598~1606 MHz

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Connect the antennas when the device is off; let the cable pass through the lid holes paying attention not to invert the two convectors between themselves. **Tighten the connectors by hand without using wrenches or pincers**. (fig.5)

GSM/LTE (700-960/1710-2655 MHZ) antenna must be connected to the **GSM-LTE SMA** plug on the CL100 device; use only omnidirectional antennas.

- The maximum gain allowed to antenna and its cable is 3 dB.

- The impedance of the antenna must be 50 ohm.

It is not allowed to connect the antenna directly on the plug but a minimum of 3 m of proper coaxial cable is required.

GPS antenna or **GPS+GLONASS** antenna must be connected to the **GNSS SMA** plug on the link device. Use only active antennas with impedance of 50 ohm.
The GPS plug of the Link device provides automatically the power supply required (Max 35mA@3,3Vdc).

A combined GSM/LTE+GPS/GLONASS or GSM/LTE+GPS antenna can be used.

In this case both GPS/GLONASS and GSM/LTE antennas are integrated in one body; they can be ordered together with CL100 devices.

⚠ **Warning: The wrong connection of the antennas to the device may cause the permanent failure of both antennas and RF modules. Be warned that the two connectors are the same.**

To connect the external antenna proceed as follows:

Ensure the **CL100 is Off**, and disconnect power. In case an optional internal battery is installed, ensure also to switch off the device through the switch **S1 (Ref.10).**

Connect the two SMA male connectors of the GSM/LTE and GPS/GLONASS external antennas to the related SMA female connectors screwing them clockwise.

Place the antennas according to manufacturer instructions, looking for a position suitable for the optimal reception of the GNSS and GSM-LTE signals.

⚠ **Warning: the mounting position of the antenna is important for a good functioning of the GNSS receiver. The antenna must have a full view of the sky to provide a visual line with the highest number of satellites. Indoors, the SATELLITE signal may not be available.**

⚠ **Warning: In case of problems, do not force the connector, but check the proper placement.**

⚠ **Warning: A separation distance of at least 30 cm (11.81 inches) between the GSM/LTE antenna and the body of the user and other persons must be maintained at all times.**

⚠ **Warning: The maximum gain allowed for the GSM/LTE antenna and its cable is 3 dB. It is not allowed to connect the antenna directly to the connector but a minimum of 3 m cable is required.**

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6 Connections

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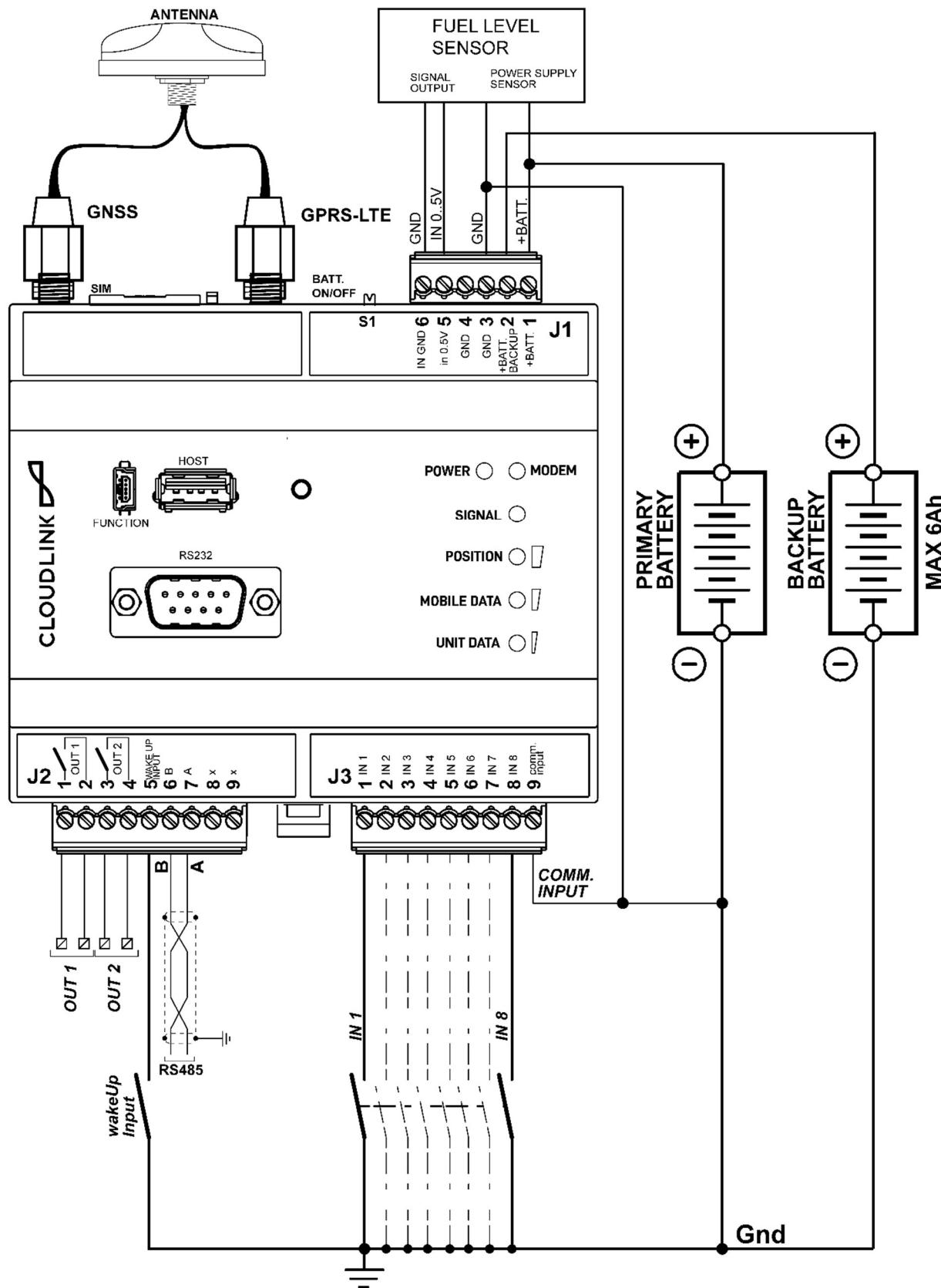
7 LED Indicators

LED Off	LED steady On	LED flashing
☐	▣	▣

Signaling		Function
POWER 🟢 Ref. 5	▣	**ON**: Board powered.
	☐	**OFF**: Board not powered.
	▣	Two rapid flashes each 10 seconds indicate the "**SLEEP MODE**" mode (Period 10s, Time On 0,1 s)
	▣	Two rapid flashes each 5 seconds indicate the "**POWER SAVE**" mode (Period 5s, Time On 0,2 s)
🟡 **MODEM** Ref. 5	☐	**OFF**: The **Modem** module is not powered or in power save mode.
	▣	**Flashing** with **64ms ON** and **800ms OFF**: the **Modem** is in the search or access process to the mobile network but is not yet registered.
		Flashing with **64ms ON** and **3s OFF:** correctly registered on the mobile network (GSM). Not connected to APN (data connection)
		Flashing with **64ms ON** and **300ms OFF**: the **GPRS/LTE** module is registered and exchanges data on the mobile network. Connected to APN. GPRS/LTE module is in Active TX mode.
LED 4 **SIGNAL** 🟡 Ref. 5	☐	**OFF**: Signal is NOT GOOD. It indicates the signal is absent or insufficient. The view mode set to standard "**DISPLAY STATUS**": The LEDs "**LED1**, **LED2**, **LED3**" indicate the operational status of the **GPRS/LTE**, **GNSS** and **MODBUS** modules.
	▣	**ON**: Signal OK - present and sufficient (greater than 7 on a scale of 1 to 31).
	▣	**Flashing** 25% : Signal present but insufficient (below 7)
	▣	**Flashing** 50%: it signals the view mode set to "**MOBILE NETWORK SIGNAL**". The glowing LEDs "**LED1**, **LED2**, **LED3**" indicate, from low to high, the received GSM signal. LEDs can have 4 statuses: OFF, flashing 25% on, flashing 75% on, ON. In this way, it is possible to have up to 12 levels of signal. When the 3 LEDs are all on, the maximum level of signal is reached. Examples: LED1 OFF, LED2: OFF, LED 3: OFF → Poor signal or absent LED1: lamp.75%, LED2: OFF, LED3: OFF → Low signal LED1 ON, LED2: lamp. 25%, LED3: OFF → Fair signal LED1 ON, LED2: ON; LED3: lamp.25% → Good signal LED1 ON, LED2: ON; LED3: ON → Excellent signal
	▣	When **LED2** flashes quickly to indicate an error after a transmission attempt, at the same time LED4 indicates: lamp. 25% → APN Error (does not connect to APN) lamp. 50% → SERVER Error (does not connect to server) lamp. 75% → Server response error (connects, but server does not respond or wrong response)

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Signaling		Function
LED 3 POSITION 🟡 Ref. 5	▣	**ON: GNSS** OK, position acquired. The module is working and has **FIX**. The number of satellites and their signals are sufficient to determine the correct geographical coordinates of the device.
	▣	**Flashing**: The **GNSS** module is currently searching for satellites. This flashing condition will persist until a minimum number of satellites (with sufficient signal) are received to do the **FIX** and determine the position.
	☐	**OFF**: **GNSS** module is not communicating. Device in **POWER SAVE** status or **SLEEP MODE** status.
LED 2 MOBILE DATA 🟡 Ref. 5	☐	**OFF:** No active mobile data connection. Device in **POWER SAVE** status or **SLEEP MODE** status.
	▣	**ON, with brief OFF every second (900 ms ON, 100 ms OFF)**: connected to Cloudlink **Server,** waiting data connection request (connected to **APN** with assigned IP address)
	▣	**ON**: connected to Cloudlink **Server,** Data connection active (connected to **APN** with assigned IP address) **Instantaneous off:** exchanging data with the server. (led goes out for a fraction of a second then comes back on)
	▣	2 rapid flashes repeated each 1 sec. **SIM not inserted** or not valid. Check if the SIM is present and inserted correctly (see Paragraph 8.1).
	▣	**300ms ON, 300ms OFF:** connection attempt to "**SERVER**" in progress.
	▣	**100ms ON, 100ms OFF**: connection attempt to "**SERVER**" failed.
LED 1 UNIT DATA 🟡 Ref. 5	▣	**ON**: **MODBUS RTU** serial communication is working. The connected controller (via serial Rs232 or Rs485) responds correctly to the Modbus requests of the CL100. N.B.: Modbus queries can be generated internally if the board presence parameter is set, or they can come from a remote source. If the controller is set in the CL100 parameters, the LED will remain lit; otherwise, it will only light up when a remote Modbus request is received.
	☐	**OFF**: **MODBUS RTU** serial communication in standby. The controller does not react to the CL100's requests, or no controller has been configured. Device in **POWER SAVE** status or **SLEEP MODE** status.

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8 Pushbuttons and DIPSWITCHES (ref. to fig. 1)

Object	Function
Buttons **AUX** Ref. 2	This button, if pressed less than 2 seconds with the powered device in normal operation, allows the change of mode between "**STATE DISPLAY**" and "**MOBILE NETWORK SIGNAL**". Pressing the **AUX** button for more than 5 seconds (**alternate flashing of LED1/LED3 and LED2/LED4**), the device enters the programming mode (RS232 became MODBUS SLAVE). Press the button again in order to exit the modality.
DIPSWITCH **SW701** Ref. 4	SW701 – 1: Reserved, leave OFF.
	SW701 – 2: Reserved, leave OFF.
	SW701 – 3: Reserved, leave OFF.
	SW701 – 4: Modem debug, leave OFF. Sends modem command traffic to the USB port (the USB port cannot be used to connect to BoardPrg)
SWITCH S1 Ref. 10	Enable / Disable the internal battery. If the battery is charged, by turning the switch ON, the device turns on even with no external supply.
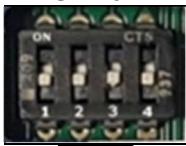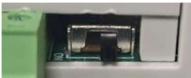
9 Boot procedure

⚠ **Warning: Before performing the operations listed below, please ensure to power the device off (without external power supply and with the internal battery selector in the NO BATTERY position).**

9.1 SIM Card

The device necessarily requires a SIM for its operation.

ⓘ INFORMATION: SIM is not included. Use a mobile operator of your choice.

9.1.1 SIM format

SIM Type: standard SIM Card type **Mini-SIM** (or **PLUG-IN**).
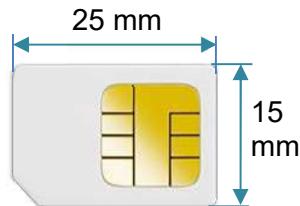
9.1.2 SIM phone plan

The selection of the SIM phone plan depends on some factors:

- The geographical area in which the device is to be used.

Also consider whether the device is used in national or international territory only. There are telephone operators that provide national roaming services: these are those telephone companies that do not have their own infrastructure in the local area and have to " use " another operator's network to guarantee their customers the possibility of data connections (Example: ThingsMobile, Eseye).

- **The mobile networks** available in that area: GPRS (2G) , LTE Cat M1, NB-IoT.

- **The type of use**, i.e. which features of the device should be used between:

	SMARTCLOUD	Cloud-based monitoring system
		Connection via Cloudlink is required.
	CLOUDLINK	Proxy server. Provides a safe and secure connection.
		Each device needs to have CL credentials.
	Email	Event notifications via email
		Requires the use of SMARTCLOUD
	SMS	Event notifications via SMS
	MeccAlte software for PC (BoardPrg4, SS3)	Connection via Cloudlink is required.
		Alternatively, direct TCP communication can be used (but not recommended).

- **The expected data traffic:** Data refresh rate (Datasaver option on Smartcloud), frequency and expected duration of the data connection (how many times and how long is the connection with Boardprg4, SS3, …).

- **The number of units that will be connected**. If you use a large number of devices, you may want to consider contracts with providers that offer bundled SIM cards.

Practical examples:

Case 1: Use only connection to SMARTCLOUD.

The connection to Smartcloud via Cloudlink will allow you to take advantage of the full potential of the cloud, including the generation of events via email, the archiving of data and events, and the sending of commands from the platform via the web.

With standard configuration (Datasaver : Optimum connection). We recommend a minimum contract of 1 GByte/month.

Case 2: TCP/IP connection only with Mecc Alte SS3 and SMS, without using SMARTCLOUD.

In this case, it is advisable to have a SIM card with a public IP address (it must be reachable remotely). If FIXED IP is requested, it will be sufficient to set the IP address on the supervision only the first time. Otherwise the IP will change; to know the current one you can use the SMS "READ IP". The data volume depends exclusively on the expected monthly connection time. In the case of a daily connection of 30 min we recommend an internet contract of 500 MByte minimum. SMS messages need to be included (a telephone number must therefore be provided).

This solution is strongly discouraged because it is not secure.

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Case 3. SMS only. CL100 is used only for sending SMS messages. It does not send data to SMARTCLOUD, it uses the TCP connection.

In this case you can request a SIM with phone number (voice or data) with SMS included. Internet data traffic is not required.

N.B.: In the CL100 parameters set the empty APNs (**P.1002** APN Primary, **P.1005** APN Secondary). In this way CL100 does not try to connect to the internet network, but only monitors SMS messages.

Case 4. Full use, connection to SMARTCLOUD, connection with Mecc Alte SS3 and BoardPrg4, sending SMS.

In this case, we will have a connection to the cloud, so emails will be sent when an event occurs, while data and events will be recorded directly on the server.

At the same time, you can receive SMS notifications generated by the CL100 device.

In addition, you can request an occasional connection to monitor the controller from your PC (SS3) and to modify the parameters if necessary (BoardPrg4).

In this case we recommend to carefully evaluate the amount of data traffic, that depends on the total expected connection time and the set data refresh rate. Generally, you could consider a minimum monthly traffic of 2 GByte. With the addition of SMS (therefore, data or voice number).

If you wish to use the data connection functions (communicate with the device through TCP/IP, use of "**SMARTCLOUD**" system etc.) a SIM with an internet connection active plan is required. The SIM card in the device determines whether the device supports **GSM/GPRS/EDGE**, **LTE Cat M1** and **NB-IoT** or all these connections.

Make sure that your SIM supports the packet data network type you want to use. - i.e. if you want to use the module in **LTE Cat M1** network you have to confirm with the operator that the particular SIM card supports **LTE Cat M1** network.

INFORMATION: Most mobile phone companies use NAT ("Network Translation Address") system also for SIM cards, therefore the IP address acquired from the device side cannot be used to reach it on the network.
If you wish to use a direct TCP connection (not recommended for security reasons), you should request the SIM's DENAT from your provider.
This problem does not exist when using Cloudlink, as it creates a communication channel via proxy, so any data SIM card can be used to connect to Smartcloud.

Note: Module is able to make and receive SMS*, make GPRS/EDGE/LTE traffic but is unable to make and receive voice calls.

Important: During operation, the CL100 device exchanges data at a configurable frequency and can be set for permanent connection.
Mecc Alte will not be held responsible for whatsoever problem or conflict arising from choosing an improper phone rate plan or a wrong device configuration.
Usually, the sending SMS* is not included in flat-rate Internet or data traffic. Contact your provider to know the cost of any SMS* sent.

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*SMS: the networks on which cellular narrowband is deployed, do not always support SMS services over **LTE NB-IoT** or **LTE Cat M1**. Several operators have yet not deployed the SMS functionality for Narrowband. Contact your network provider for details.
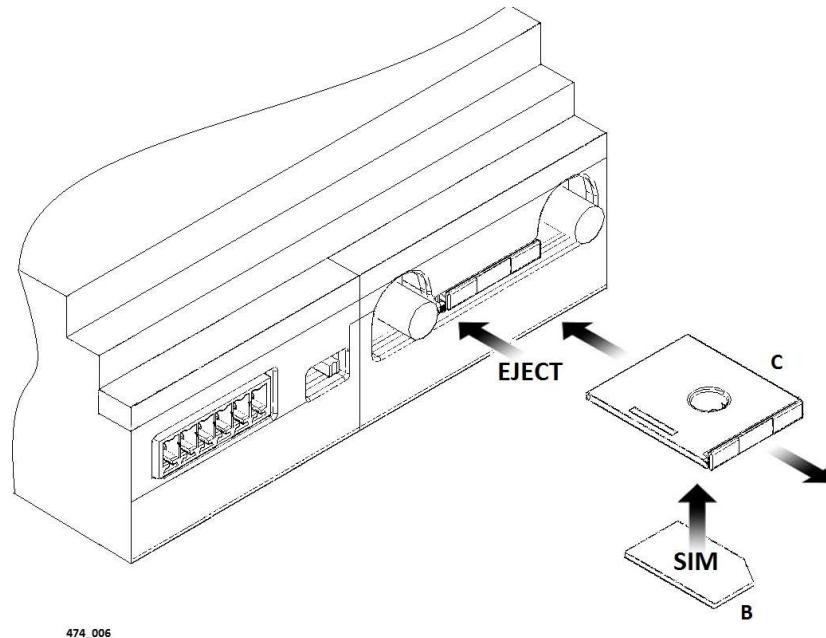
Fig. 3 - SIM Indications

9.1.3   How to insert/extract the SIM card in the CL100

CL100 supports Mini-SIM cards (PLUG-IN SIM). In order to avoid damaging the SIM card or losing information, we recommend you not to touch the SIM card golden chip (where contacts are).
Insert the SIM in the proper card holder as per the figure 3 and following the indications below:

1. Press the EJECT button with a screwdriver until the SIM card is ejected.
2. Extract the SIM card support and insert the SIM card (contacts facing downwards).
3. Insert the SIM card support again in the related slot.

Extract the SIM in the proper card holder as per the figure 3 and following the indications below:

1. Press the EJECT button with a screwdriver until the SIM card is ejected.
2. Extract the SIM card support and remove the internal SIM card.
3. Once the SIM card is removed, ensure to insert again the empty SIM card support in the slot.

⚠ **Note*: Using a mobile phone, remove any protection PIN from the SIM.**

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10 Parameters configuration

10.1 CL100 Configuration modes

CL100 can be set up in the following ways:

- Serial cable connection to PC, using **Board PRG** (recommended at least for the initial setup)
- Via **SMS*** (you need the telephone number of the SIM Card inserted in the device)
- From remote connection through Cloudlink, using **BoardPrg**

10.1.1 Parameters configuration via Board PRG

The use of the device requires the parameters configuration first.

For the complete parameters list refer to the document EAAM090300XA**Errore. L'origine riferimento non è stata trovata.** (CL100 parameters table).

The configuration requires the connection to a PC via RS232 serial (COM port) or via USB.

> Refer to chapter 5.4 RS232 Serial Connector (Ref. 3) or to chapter 5.5 USB Connector (Ref. 1) to define the type of cable to use.

When connecting USB port to a PC, it appears as an additional COM port of the PC itself. Application software can access the USB device as it would a standard COM port. Usually, Windows automatically recognize them when plugged into a USB port of the PC. If it doesn't, you will need to download and install the appropriate driver.

Use the program **BoardPrg** (**version 4.7** and higher) to change parameters following the indications indicated below:

- Connect the USB cable between the PC and CL100 device.

Or

- Connect the RS232 serial cable between PC and CL100 device. Press "**AUX**" and hold it pressed for at least 5 seconds until the yellow Leds 1 and 3 are turned on alternating with the yellow Led 2 and 4.

(*i*) INFORMATION! In case of USB connection, it is not necessary to press the button "AUX".

- Start the "BoardPRG 4" software or following version.
  - Enter "**Communication**"
    - **Select the communication resource**
      - Select the communication resource available on the pc (for example "COM7").

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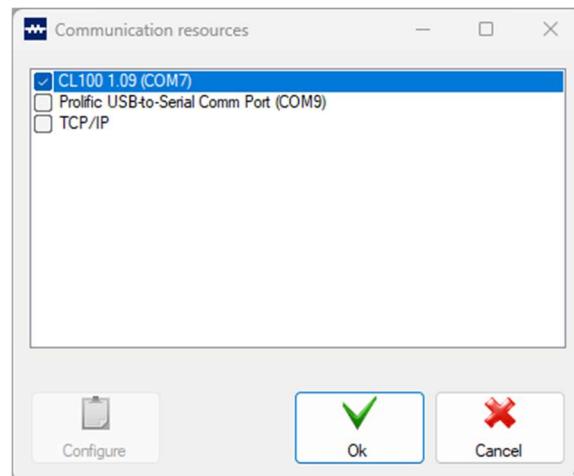
- o   Confirm with OK
- o   Enter "**Communication**"
  - ▪   **Select the address**
    - o   Set the CL100 address (by default is **1)**
    - o   Confirm with OK
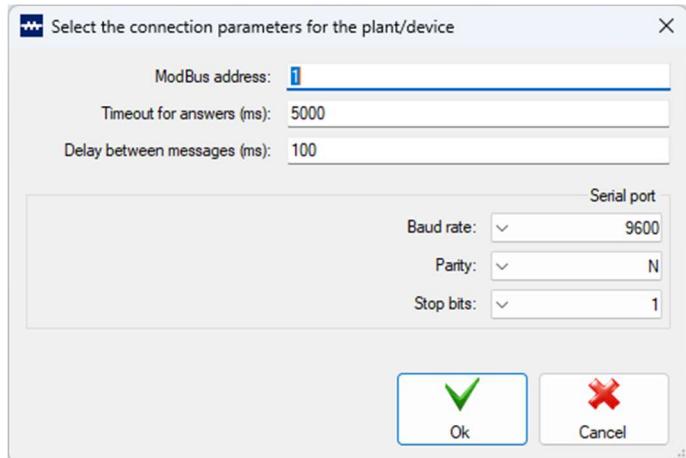
On the center and right lower side, you will see the connected device (**CL100 1.09**), the serial communication parameters, that are **COM7, and Serial Address 1**: the closed message near the serial configuration indicates that the communication is not active yet.

- o   Enter "**File**"
  - ▪   Select "**Select the device**"
    - o   Select **CL100**, possible **Subtype** and indicate the **Revision of the device you have**.
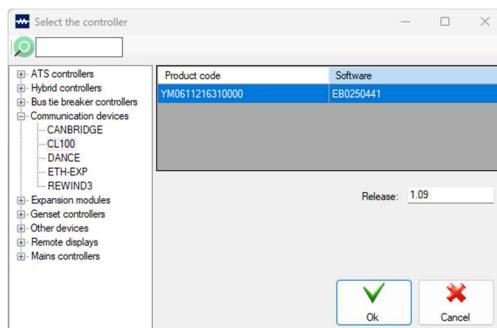
- o   Confirm with **OK**
- o   Press "**Connect**" and check that on the lower right side the number of the transmissions increase.
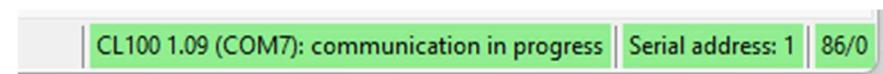
- o   Press "**Configuration**" to open the list of PARAMETERS.
- o   Press "**Read**" to acquire the parameters on the CL100 device connected

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> o Press "**Copy**" to transfer the values read from the column "On the device" to the column "On the PC".

⚠ Important: Read the parameters (Read command), and transfer the values to the New Value column, where you can edit them (Copy command).

Now, you can configure the device.

You may now save the configuration on a PC (Save), and reload it (Load) later to configure other modules in the same way.

Below you can find the ***minimum requirement configuration parameters*** to be set in order to allow the CL100 device to dialog with the Software SMARTCLOUD. Factory values of the supplied device refer to the use with services directly managed by Mecc Alte.

Refer to documents EAAM0903xxXA **Errore. L'origine riferimento non è stata trovata.** (CL100 parameter table) and EAAM00740xx **Errore. L'origine riferimento non è stata trovata.** (BoardPrg 4.xx guide) for the parameters configuration.

1) MOBILE CONNECTION	
P.1002 Main APN (Access Point Name)	Enter the APN supplied by your ISP. If necessary, enter Username and Password using P.1003 – P.1004 * Default Setting = ibox.tim.it
P.1003 APN Main – User name (optional)	*Enter the Username, if required by the type of contract with the telephone operator* * Default Setting = "blank"
P.1004 APN Main – Password (optional)	Enter the user Password, if required by the type of contract with the telephone operator * Default Setting = "blank"
P.1008 GPRS network connection mode	0 = Disconnect the device after each data transmission. 1 = Leave the device permanently connected. Anyhow, it is suggested to leave this parameter set to 1. *** Default Setting = 1** The connection method affects the quantity of generated traffic that the mobile service provider can bill.
P.1014 Mobile network mode	Configures the preferred Network Mode to: 0 = Automatic → automatic connection between GSM/GPRS/EDGE or LTE network. In this mode, the device decides independently, based on the available networks and signal strength, which type of network to connect. When **first power up**, it will search with the following priority: CAT-M > NB-IOT > GSM/GPRS/EDGE. *Search time depends on signal strength and active mobile networks detect. It may be necessary to wait several minutes before the first connection to the mobile network is established.*

	1 = GSM/GPRS → connection to the GSM/GPRS/EDGE 2G network only. * Default Setting = "1 – GSM/GPRS"
	2 = LTE → connection to the LTE network only
P.1015 LTE category	Configures the preferred LTE network mode to: 0 = CAT-M → connection to the CAT-M1 network only. 1 = NB-IoT → connection to the NB-IoT network only. 2 = CAT-M and NB-IoT → automatic connection between CAT-M or NB-IoT network. *** Default Setting = 2**

2) CLOUDLINK - SMARTCLOUD	
P.0560 - Cloudlink - Enable	0=Disabled (default) 1= Enabled
P.0561 – Cloudlink Host server (IP or name)	Enter the Cloudlink server address. CLOUDLINK server: smartcloud.meccalte.com * Default Setting = "smartcloud.meccalte.com"
P.0562 – Cloudlink Server Port	Enter the port for the server dedicated to data transfer. CLOUDLINK Port: 23010 * Default Setting = 23010
P.0563 – Cloudlink Channel ID	Cloudlink Credentials are used on Smartcloud to connect to the device. Cloudlink credentials are preset and unique for each device. You should not change or delete them. The password is only visible to Superusers.
P.0564 – Cloudlink User	
P.0565 – Cloudlink Password	
P.0566 – SSL Protocol – Enable	Defines whether to use the SSL security protocol * Default Setting = 1-Enabled
P.0567 – SSL Protocol - Version	Defines the TLS version for the SSL Protocol * Default Setting = 3-TLS 1.2

3) SERIAL PORTS	
P.1101 Master serial port	Select which is the master modbus serial port to use for the monitoring of the controller: 1 = COM1 – RS232 * 2 = COM2 – RS485 * Default Setting =1

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P.1111 Baud rate COM1 **P.1112 Configuration COM1**	Set the configuration of the COM1 RS232 serial port. The serial configuration must be equal to the one set in the controller to connect. * Default Setting =9600,n,8,1
P.1121 Baud rate COM2 **P.1122 Configuration COM2**	Set the configuration of the Com2 Rs485 serial port. The serial configuration must be equal to the one set in the controller to connect. * Default Setting =9600,n,8,1

4) MODBUS CONTROLLERS	
P.1131 Modbus Receive timeout	Set the maximum waiting time for a Modbus response. * Default Setting =1.0
P.1132 Modbus Pause between task	Set the time delay expressed in seconds that CL100 will have to wait before starting a new asking polling. * Default Setting =2.0
P.1161 Controller 01 - Modbus Address **P.1163 Controller 02** **P.1165 Controller 03** **P.1167 Controller 04** **P.1169 Controller 05** **P.1171 Controller 06** **P.1173 Controller 07** **P.1175 Controller 08**	Set the controller modbus address to be interrogated by CL100. * Default Setting P.1161 =1, other 0
P.1162 Controller 01 - Board type **P.1164 Controller 02** **P.1166 Controller 03** **P.1168 Controller 04** **P.1170 Controller 05** **P.1172 Controller 06** **P.1174 Controller 07** **P.1176 Controller 08**	Set the type of controller that needs to be polled by CL100. (PS: If you do not need SMS and the controller is MeccAlte, it does not need to be set, so you can leave it at 0) 　　0 = None 　　1 = Mecc Alte controllers - Automatic identification. (DST4602, DST4602 Evolution, GC600, GC315, GC400, GC250, MC200, MC400, ATS115, HS315, RN200, DST4400, DST4601/PX, DST2600, GC310, GC350, GC500). 　　2 = DSE 5210 　　3 = DSE 7320 　　4 = DSE 7510

	5 = DSE 5510
	6 = not used
	7 = Multimeter IME Nemo D4
	8 = COMAP IL NT AMF25
	9 = COMAP IG NTC BB
	10 = ELCOS CAM-120
	11 = CUMMINS PC 2.x (Diesel)
	12 = POWERNET M200
	13 = DEIF AGC-3
	14 = DEIF ACG-3 CAN
	15 = Woodward easYgen 3200
	16 = Woodward easYgen 3200 CAN
	17 = Caterpillar EMCP3
	18 = Caterpillar EMCP4
	19 = Cummins MCM3320
	20 = Lovato RGK800
	21 = Lovato RGK700/RGK610 - Coelmo Lexys/Giotto
	22 = Lovato RGK610 - Coelmo Giotto
	23 = CUMMINS PC 3.x (Gas)
	24 = CUMMINS PC 1.x
	25 = CUMMINS PS0500
	26 = CUMMINS PS0600
	27 = DEIF AGC-4
	28 = DEIF AGC-150
	29 = DEIF AGC-200/233
	30 = ELCOS MC4
	* Default Setting =1
P.2001 – Controller 01 – Password for serial ports **P.2002 – Controller 02** **P.2003 – Controller 03** **P.2004 – Controller 04** **P.2005 – Controller 05** **P.2006 – Controller 06** **P.2007 – Controller 07** **P.2008 – Controller 08**	To be used only if a serial password has been set on the connected board (not set by default). The serial password prevents Modbus writing, i.e. commands and alarm description requests, etc.
5) SMS	
P.1201 Communication events for SMS **(Value in hexadecimal)**	Select the events (alarms, warnings, start/stop engine) to be notified via SMS. 1 = Alarms and deactivations * 2 = Warnings *

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	4 = *Engine* **Start** *
	8 = Engine stop *
	10 = Mains failure
	20 = Mains back
	40 = Operating Mode
	80 = Events from Mecc Alte board
	* Default Setting =0F
P.1203 Numbers of SMS for each event	Set how many SMS messages have to be sent automatically for each event. By setting 0, the sending is disabled.
	* Default Setting =1
P.1205 Filter on SMS receiving	If set to 1, it allows not to answer messages coming from telephone providers and to avoid error messages exchange that would occupy the device uselessly and charge the cost of the messages sent.
	Therefore, it is suggested to leave this filter enabled setting it to **1**.
	* Default Setting =1-Enabled

P.1206 SMS header – part 1 – Plant name	Set the plant header for SMS
	  0- None
	  1- Plant name from CL100 (P.1700)
	  2- Plant name from board (for Mecc Alte controllers)
	  3- Plant name CL100 + Controller

P.1207 SMS header – part 2 - controller	Adds board identifier to SMS header (useful in the case of several boards connected via RS485):
	  0- None
	  1- Modbus address and board type (Ex: Axx DST4602)
	  2- Unit number and board type (Ex. Uxx DST4602)
	  3- Unit number only (Uxx)
	  4- Modbus address only (Axx)

P.1210 P.1211 **P.1212 P.1213** **P.1214 P.1215** **P.1216 P.1217** **P.1218 P.1219** **P.1220 P.1221**	With these parameters it is possible to set up to 6 phone number for the event signalization.
	For each number it is possible to set whether to send a SMS (Type number = 1) for the event signalization.
	Set at least one phone number.
	* Default Setting Telephone Number (X) = "Blank"
	* Default Setting Type Number (X) = 0
6) DIGITAL INPUTS	

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P.1300 P.1310 **P.1320 P.1330** **P.1340 P.1350** **P.1360 P.1370** **Function**	With these parameters it is possible to set the function to assign at each of the 8 insulated digital inputs available on the connector J3: 0 = None * 1 = Engine running 2 = Warning 3 = Shutdown 4 = Emergency stop 5 = Minimum Fuel Level 6 = Status 1 7 = Status 2 8 = Status 3 9 = Generic status 10 = Generic warning 11 = Generic alarm 12 = Generic deactivation Usually, the inputs are configured if there is not a serial connection with the genset controller or in case it is necessary to acknowledge the statuses not available via serial port. * Default Setting =0
P.1301 P.1311 **P.1321 P.1331** **P.1341 P.1351** **P.1361 P.1371** **Polarity and coverage**	For each input, it is possible to set the polarity with or without Oil coverage. 0 = Normal* 1 = Inverted 2 = Normal with Oil coverage 3 = Inverted with Oil coverage By default, the inputs are considered active when a voltage is applied between the common terminal (**J3-9 COMM. INPUT**) and related input terminal (**J3-1/8 INPUT1 / INPUT8**). The logic status can be inverted with respect to the physical status by setting this parameter to 1. The possible oil coverage selected indicates that the input is considered active, after the time set in the parameter **P.13X2**, but only if 15 seconds have passed (oil coverage time) from the engine start (acknowledged by digital input). * Default Setting =0

P.1302 P.1312 **P.1322 P.1332** **P.1342 P.1352** **P.1362 P.1372** **Activation delay**	For each input, it is possible to set a delay time between the physical activation of the input and the logic activation of the function Time is expressed in seconds. * Default Setting =0,0 sec
From P.1303 to P.1305 **From P.1313 to P.1315** **From P.1323 to P.1325** **From P.1333 to P.1335** **From P.1343 to P.1345** **From P.1353 to P.1355** **From P.1363 to P.1365** **From P.1373 to P.1375**	For each input, it is possible to set messages and related identification code: Activation message. Deactivation message. Event code. Default Setting = "blank"
7) GPS	
P.1500 GNSS (GPS) module Enable	It allows to enable or disable the CL100 internal GPS localization module. 0 = Disabled 1 = Enabled* If there is no need of automatic localization or Tracking, it is possible to disable the module in order to decrease consumptions. In this case, the parameters **P.1501** and **P.1502** allow to set fixed coordinates (Latitude and Longitude) for the plant localization. * Default Setting = 1
P.1503 GPS Movement sensibility for creation of event	It allows to send an event of movement in case of acknowledgement of a variation of the position (in meters) that is higher than the value indicated in this parameter. If it is set to 0, the event is disabled. * Default Setting = 0
P.1504 Time for the data sending of Tracking	If it is set to 0, it sends an event for each movement. If it is >0, it sends the event when, if the sensibility expressed in **P.1503** is exceeded, the time set has passed. * Default Setting = 0

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8) Other	
P.1700 Plant name	Specify the name you wish to assign to the system This name will be displayed in SMS messages * Default Setting = Device ID code (example: 0000A85F831A)
P.1701 Language	Language used for the events description. * Default Setting = 0-English
P.1702 Timezone	Set the local time zone that will be used to calculate the LOCAL TIME to send messages to server. A unit corresponds to 15 minutes. * Default Setting = 4

For further information, please consult the parameters table of the CL100 device EAAM0903xxXA **Errore. L'origine riferimento non è stata trovata.**.

Press "**Transmit**" and wait for the transmission of the data.

In case of incongruence, a yellow triangle ⚠ signals the difference of values.

10.1.2 SMS Configuration

If it is not possible to set the parameters via the serial port (for example, if you are not on site), it is possible to set the parameters via SMS commands.

However, this practice is not recommended for security reasons. It is always preferable to set the parameters directly locally.

Note: Note: for each command correctly sent to CL100, you will receive a confirmation SMS back

"COMMAND EXECUTED".

SMS (Valid for all parameters)

SMS 1	`WRITE PARAMETER 1002 [APN]`	APN selection (depeds on the SIM provider)
	i.e. `WRITE PARAMETER 1002 ibox.tim.it`	

SMS 2	`WRITE PARAMETER 560 1`	Enable Cloudlink connection

SMS 3	`WRITE PARAMETER 566 1`	Enable SSL Protocol

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SMS 4	WRITE PARAMETER 2501 1	Enable NTP for clock synchronisation

Now, you can set up the other parameters visiting the website SMARTCLOUD (smartcloud.meccalte.com).

These parameters are normally already set to share data with the SMARTCLOUD server. If not, send the following SMS:

SMS 5	WRITE PARAMETER 0561 [SERVER_NAME]	Set the name or IP address of the Cloudlink server
	i.e. WRITE PARAMETER 0561 smartcloud.meccalte.it	

SMS 6	WRITE PARAMETER 0562 [SERVER_PORT]	Set the port for connecting to the Cloudlink server
	i.e. WRITE PARAMETER 0562 23010	

If you are unable to connect to the controller, remember to select the serial port to which it is connected.

SMS 7	WRITE PARAMETER 1101 [SERIAL_PORT]	Select the master serial port.
		    0 = RS232 (Default)
		    1 = RS485

	i.e. WRITE PARAMETER 1101 1	

Only in case of RS485:

SMS 8	WRITE PARAMETER 1121 [RS485_BAUD]	Set the Baud rate on RS485 serial port.
	i.e. WRITE PARAMETER 1121 19200	

SMS 9	WRITE PARAMETER 1122 [RS485_SETTINGS]	Select the Baud rate on RS485 serial port.
		    0 = 8 bit, No parity, 1 stop bit (Default)
		    1 = 8 bit, Even parity, 1 stop bit
		    ……

	i.e. WRITE PARAMETER 1122 1	

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For any additional information regarding the parameters number, please consider the proper parameter table.

The general format for every command is: WRITE PARAMETER ParameterNumber Value

10.2 Mobile Network Configuration.

To use the communication on data network mobile it is necessary to configure some parameters.
If you wish to use the GPRS/LTE functions (communicate with the device through TCP/IP, use of "SMARTCLOUD" system etc.) a SIM with an internet connection active plan is required (as the SIM used in the Smartphones).
We recommend using Smartcloud via Cloudlink, as the connection is secure and does not require a public IP address.
The use of **SMARTCLOUD** requires a permanent connection between the device and the Cloudlink server. Server will manage communication by sending periodic Modbus requests. The Modbus polling rate depends on the settings on the **SMARTCLOUD** system.

If you need to use the direct Modbus/TCP connection (not recommended and disabled by default), please note that the IP address is assigned to the controller directly from the mobile network and the controller will then be contactable using this IP address. In this case, the SIM card must allow you to obtain a public IP address, so you will need to request the DENAT from your provider. It is also possible to interrogate the controller via SMS* to know the current IP address.

⚠ **It is not possible to use the Cloudlink connection and the direct Modbus/TCP connection at the same time. Therefore, if Cloudlink is enabled (P.0560=1-Enabled), the Modbus/Tcp Enable parameter must be disabled (P.1010 = 0-Disabled), and vice versa.**

These parameters can be modified on the controller through SMS*, with the BoardPrg4xx and through the web service in the appropriate configuration page of the device:

Parameter	Description	Default
P.1002	APN primary (access Point Name)	ibox.tim.it
P.1003	APN primary username (optional)	
P.1004	APN primary password (optional)	
P.1005	APN secondary (access Point Name)	
P.1006	APN secondary username (optional)	
P.1007	APN secondary password (optional)	
P.1008	Connection mode to data network	1-Stay connected
P.1010	Modbus/TCP enable	0-Disabled
P.1011	Modbus/TCP port	502
P.1014	Mobile network mode	1-GSM/GPRS
P.1015	LTE category	2-CAT M and NB-IoT
P.2510	SIM PIN	

- **P.1002** parameter configures the APN (Access Point Name) of the mobile operator used. Some operators require access credentials (username e password) to access the APN: in this case use the parameters **P.1003** and **P.1004** to configure username and password. If access credentials are not required (standard), leave **P.1003** and **P.1004** empty.
- **P.1008** parameter configures how the controller has to connect to the data mobile network:
  - ➢ **0 ("Disconnect every time")**. In this mode the controller connects to the data mobile network only when strictly necessary, i.e. when it needs to transmit data to the server.
    This method is no longer used. For all types of connections currently managed by CL100, it is necessary to keep the data connection active.
    Both **SMARTCLOUD** and MODBUS/TCP requires a stable connection, so this option cannot be used.

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> ➢ **1 ("Stay connected")**. This mode is suggested: the controller connects to the data mobile network as soon as possible and remains connected until it is possible. In this mode the data exchange with the Modbus/TCP protocol with the controller is possible (BoardPrg4, Mecc Alte SS3).

It is recommended to set this parameter to "**1- Stay connected**".

- **P.1010** parameter activate/deactivate the data exchange with the protocol Modbus/TCP on the mobile network: when it is enabled, the parameter **P.1011** configures the TCP port on which the controller is able to communicate. The standard port used for the Modbus/TCP protocol is 502, but it can be modified for specific applications. Leave **P.1010** at "**1**" and **P.1011** at "**502**" if you need to use the connection via BoardPrg4 or Mecc Alte SS3.
- **P.1014** parameter configures the preferred Network Mode to:
  - ➢ **0 ("Automatic")**: automatic connection between GSM or LTE network. In this mode, the module will do the network searching with following priority for the first time: CAT-M > NB-IOT > GSM/GPRS/EDGE.

    Search time depends on signal strength and active mobile networks detect.

  - ➢ **1 ("GSM/GPRS")**: connection to the GSM/GPRS/EDGE network only
  - ➢ **2 ("LTE")**: connection to the LTE network only (CAT-M or NB-IoT network)

Set this parameter to "**1-GSM/GPRS**" if you use SIM cards that only support 2G- GSM/GPRS/EDGE connection.

- **P.1015** parameter configures the preferred LTE network mode to:
  - ➢ **0 ("CAT-M")**: connection to the CAT-M network only.
  - ➢ **1 ("NB-IoT")**: connection to the NB-IoT network only.
  - ➢ **2 ("CAT-M** and **NB-IoT")**: automatic connection between CAT-M or NB-IoT network.

Set this parameter to "**2 - CAT-M and NB-IoT**".

10.3 SMARTCLOUD system

SMARTCLOUD is cloud-based system that allows you to continuously monitor and control your units remotely via a web browser. Collects data and geographical location and allows commands to be sent.

The CL100 devices can communicate with the **SMARTCLOUD** system via GPRS/LTE modem, using **CLOUDLINK** connection. CLOUDLINK is a proxy server that can only be accessed by authorised devices with identification credentials.

The parameters relating to the connection with **SMARTCLOUD** are described below.

For further details and information regarding **SMARTCLOUD**, please refer to the EAAM0867xx manual.

14 – CLOUDLINK		
Parameter	**Description**	**Default**
P.0560	**CLOUDLINK** Enable	0-Disabled
P.0561	**CLOUDLINK** Server IP address or name	smartcloud.meccalte.com
P.0562	**CLOUDLINK** Server port	23010
P.0563	**CLOUDLINK** Credentials : Channel ID	
P.0564	**CLOUDLINK** Credentials : User	
P.0565	**CLOUDLINK** Credentials : Password	
P.0566	**CLOUDLINK** SSL Protocol – Enable	1- Enabled
P.0567	**CLOUDLINK** SSL Protocol – Version	2- TLS 1.2
15 – NTP		
Parameter	**Description**	**Default**
P.2501	**NTP** – Enable	1- Enabled
P.2502	**NTP** – Host server (IP or name)	It.pool.ntp.org
P.2503	**NTP** – Port	123

- **P.0560** parameter enables the CL100 to connect to the **CLOUDLINK** server, for the use of **SMARTCLOUD**.

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- **P.0561** configures the IP address or the name of "**CLOUDLINK**" server. It is possible to set the IP address in text format or the server name in full (for Mecc Alte Service set "**smartcloud.meccalte.com**") which will be converted by the controller – into IP address using the DNS server (suitably configured or automatic on GPRS).

- **P.0562** parameter configures **CLOUDLINK** server port. For Mecc Alte Service set "**23010**".

- **P.0563-0564-0565** contains the Cloudlink (CL) credentials that identifies the device and ensure a secure and controlled connection. CL Credentials are assigned and set by MeccAlte at the factory. To modify them, you must have authorisation and the SuperUser password is required to access the parameters.

- **P.0566-0567** Activate and configure the SSL security protocol. For operation with CLOUDLINK, they must be enabled and set as default.

10.4 Serial port

Connect the device to be monitored to the Rs232 serial port (**Ref.3**) or to the Rs485 serial port (**Ref.13**).

RS232 port is allowed only for the devices of the same control panel or for devices that are not subject to external overvoltage and supplied by the same DC supply power of CL100.

Alternatively, use the RS485 port, which is galvanically isolated.

3 – SERIAL PORTS		
Parameter	Description	Default
P.1101	Master serial port	1 - COM1 Serial Port - RS232
P.1111	COM1 serial port (RS232) - Baud rate	9600
P.1112	COM1 serial port (RS232) - Setting	0 - 8 bit, no partity, 1 stop bit
P.1121	COM2 serial port (RS485) - Baud rate	9600
P.1122	COM2 serial port (RS485) - Setting	0 - 8 bit, no partity, 1 stop bit

- **P.1101** allows you to select which serial port is to be used:

  ➢ Set **1** for COM1: Port - Rs232.

  ➢ Set **2** for COM2: Port - Rs485.

- **P.1111** and **P.1112** parameters configures configure baud-rate and setting of the serial port Rs232.
- **P.1121** and **P.1122** parameters configures configure baud-rate and setting of the serial port Rs485.

10.5 Modbus Devices

If CL100 is connected to a device to be monitored, the following parameters must be set:

4 –MODBUS DEVICE		
Parameter	Description	Default
P.1131	Modbus receive Timeout	1,0
P.1132	Modbus pause between task	0,5
P.1161	Board 01 – Modbus address	01
P.1162	Board 01 – Board type	1 – DST4400,DST4601PX…

- **P.1131** and **P.1132** parameters configures Timeout and pause between task.
- **P.1161** parameter configures configure the modbus address to be connected.

- **P.1162** parameter configures the type of board to be connect to CL100

10.6 SMS

The **CL100** device can send alerts directly to a mobile phone via SMS (mobile originated SMS); to do so, the device can need to be programmed to send SMS to a specific phone number.

The networks on which cellular narrowband is deployed, support SMS services over GSM network but do not always over **LTE NB-IoT** or **LTE Cat M1**. Several operators have yet not deployed the SMS functionality for Narrowband. Contact your network provider for details.

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The Board port must be configured as a "Modbus Slave" device and the telephone numbers and communication events are managed directly by CL100.

If this function is used, set the following parameters:

6 – SMS		
Parameter	**Description**	**Default**
P.1201	SMS – Communication events (for SMS) – Hex value	0F
P.1203	SMS – Number of SMS for each event (0=Disabled)	1
P.1205	SMS – Filter on SMS (0= no filters)	1 - Enable
P.1210	SMS – Phone number (1)	
P.1211	SMS – Phone type (1)	0 – Not used
……..	……….	
P.1220	SMS – Phone number (6)	
P.1221	SMS - Phone type (6)	0 – Not used

- **P.1201** configures in which cases the device must spontaneously send communication events via SMS. The set value must be expressed in hexadecimal. By "double-clicking" on the value it is possible to directly select which states must generate an event.
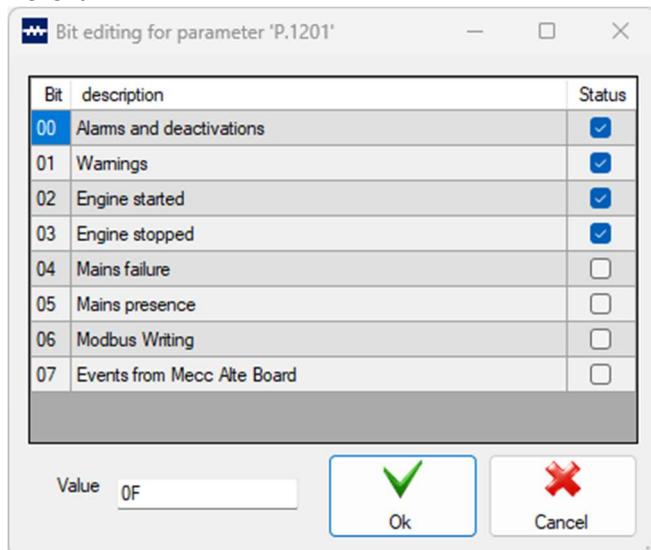
Confirming with the OK button the software will automatically set the hexadecimal value corresponding to the selected bits according to the following table

Bit	**Value HEX**	**Description**
0	**1**	**Alarms and deactivations**
1	**2**	**Warning**
2	**4**	**Engine started**
3	**8**	**Engine stopped**
4	10	Mains failure
5	20	Mains presence
6	40	Modbus writing

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7	80	Events from Mecc Alte Board. In this case CL100 sends events generated from the Controller, so the Events has to be configured on the Controller side.

The default value "**0F**" corresponds to the states highlighted in **boldface**

10.7 Connection via Mecc Alte Supervision

It is possible to connect to supervision using direct TCP, although this is not recommended for security reasons.

A mobile data connection must therefore be used for connection with the Mecc Alte Supervisor.

- The CL100 must have activated the modbus/tcp function (P.1010 GPRS-enable Modbus/Tcp = 1-enabled).
- The PC must be connected to Internet.
- The SIM card must have an IP PUBLIC not NAT.

i INFORMATION: Some mobile companies use a NAT ("Network Translation Address") system also for SIM cards, therefore the IP address received by SMARTCLOUD server is not usable for the connection with the plant. It is necessary to explicitly ask the network operator not to use the NAT on the SIM.

There 2 different ways to know the IP address of the device:

- Ask your provider for a fixed IP address. Remember that some providers allow (on demand as additional service) to have a fixed IP address.
- IP demand via SMS (READ, IP)

Usually (if no fixed IP address has been required) each connection has a different IP address. The telephone provider may reassign the IP address in other situations too (if there are no transmissions for some minutes, etc.).

⚠ *Important:* **During operation, the CL100 device exchanges data at a configurable frequency and can be set for permanent connection.**
Mecc Alte will not be held responsible for whatsoever problem or conflict arising from choosing an improper phone rate plan or a wrong device configuration.
The data exchanged and the consequent pricing depend on the operations carried out during the connection and on the price plan set by the provider.

10.8 Use of the CL100 device to send SMS only

The following configuration parameters enable to use the CL100 device as GSM Modem (without using SMARTCLOUD), allowing to send SMS.

- **P.0560** Cloudlink Enable: 0-Disabled
- **P.2501** NTP Enable: 0-Disabled
- **P.1201** SMS - Communication of events: 80 hex (for Mecc Alte boards)

The value 80 hex (128 decimal) allows to send SMS directly generated by the controller, with no need of interpretation. This function is available in all Mecc Alte controllers.

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11 Lithium Ion internal battery

In addition to the possible external backup battery that can be connected to the terminals **J1-2** and **J1-4** (Lead battery max. 6A), CL100 is supplied with a Lithium Ion internal rechargeable battery, which is able to ensure its working, data transmission and localization for some hours in case of lack of the main supply.

The recharge happens automatically by supplying the device; the full charge requires approximately 12 hours, after which the battery is in permanent buffer charge.

The device operation time depends on several factors, such as the environment temperature, the use of output relays, the data sending frequency and the local GSM signal intensity.

The duration of the battery can be highly increase by activating one of the types of energy saving: Power Save, Sleep Mode or Deep Stand-by Mode.

The battery is activated/deactivated through the switch **S1** (Ref.**10** of fig.**1**).

If the battery is switched off the charging cycle and monitoring is performed anyway.

The internal battery can be recharged only when the device temperature is between 0°C and +45°C.

12 External tank management

CL100 is equipped with a dedicate 0-5V input set to acquire the data of an analogue external level sensor.

Connect the positive input of the analogue measure to the terminal 5 of J1 and the ground reference to the terminal 6 of J1. The voltage to measure must be referred to the same potential of the supply negative J1-3, GND; it is better to supply the device or the transducer with the same source that supplies CL100.
Refer to the connection diagram for further clarifications on the electrical connection.

Tank data can be read via dedicated Modbus registers.

Consult the parameters table for the tank management parameters:

10) TANK	
P.1600 Tank - Capacity in Liters	Set the tank capacity in liters. * Default Setting = 0
P.1601 Percentage value of the sensor with empty tank	Set the value read by the sensor (in percentage) when the tank is empty. * Default Setting = 0
P.1602 Percentage value of the sensor with full tank	Set the value read by the sensor (in percentage) when the tank is full. * Default Setting = 0
P.1603 Reserve in percentage (0.0=no reserve control)	It enables the event of tank in reserve. * Default Setting = 0

P.1604 Minimum level for engine stop	It indicates the tank level below which the stop command of the controller is sent. If **P.1605 > 0** (function of automatic stop activated) when the percentage value of the fuel in the tank stays under the minimum level for at least **10** seconds: • It sends the activation of Event MINIMUM FUEL LEVEL (STOP) • It sends the STOP command via modbus to the controller connected (Mecc Alte, DSE, ComAp, Elcos) if selected. • It commands the possible digital output (P.1400=1 commands output1, P.1410=1 commands output 2). When the value comes back over the minimum level +0,5% for at least 10 seconds: • It sends the Deactivation of event MINIMUM FUEL LEVEL * Default Setting = 0
P.1605 Function of automatic stop on minimum level	It determines the activation and the mode of automatic stop on the minimum level of the external fuel tank. 0 = function disabled* 1 = function enabled, it sends the stop command once (therefore, it is possible to restart the engine manually) 2 = function enabled, it sends the stop command continuously if the engine is acknowledged as started (it does not allow the restart of the genset) * Default Setting = 0

13 Energy saving

CL100 is equipped with two different levels of energy saving:
1. Power Save Mode (1° level of energy saving)
2. Sleep Mode (2° level of energy saving)

13.1 Power Save

The **Power Save** mode can be activated by setting the parameter **P.1650 (Minutes from engine off or controller disconnected)** at a value different from 0. The value set in this parameter indicates the number of minutes that CL100 waits before entering this mode of energy saving.

CL100 **enters** the status **Power Save** only after the time indicated in **P.1650** if:

• It does not receive any answer from the serial controller that is connected (**P.1162>0**) for the Timeout set in **P.1131**.

• It is not connected to any controller (**P.1162 =0**) and a digital input configured with the function *1-Engine operating* is deactivated, that is the engine is stopped.

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The behaviour in the status of **Power Save** is the following:

- If **P.1670 = 1 (sending of events Power Save and Sleep Mode)**, CL100 sends the event *"POWER SAVE ACTIVATED"*
- The Modem is in power save and it is checked every 3 minutes to verify if there are SMS incoming.
- The serial controller is checked every 5 seconds to verify if the serial communication is reactivated (the controller has been turned on again)
- The signaling leds are all turned off except for the PWR ON LED and the LED4, which double flashes every 5 seconds.

CL100 **exits** the **Power Save** status in case it acknowledges again the controller connection as active (in case **P.1162>0**) or the engine started from digital inputs (in case **P.1162>0**).

13.2 Sleep Mode

The **Sleep Mode** mode can be activated by setting the parameter **P.1661 (Delay for minimum battery voltage)** at a value different from 0. The value set in this parameter indicates the number of seconds that CL100 waits before entering this mode of energy saving.

CL100 enters the **Sleep Mode** status when the device supply voltage (supplied by the terminals J1-1 or J1-2) stays under the value set in the parameter **P.1660** *(Battery voltage minimum threshold)* for the time **P.1661**.

The behaviour in the status of **Sleep Mode** is the following:

- If **P.1670 = 1** (**sending of events Power Save and Sleep Mode)**, CL100 sends the event "RW212 - SLEEP MODE ACTIVATED"
- The Modem is off
- The GPS is off
- The signaling leds are all turned off except for the PWR ON LED and the LED4, which double flashes every 10 seconds.
- The serial controller is no longer questioned
- The recharge circuit of the internal Lithium Ion battery is turned off
- The primary Microprocessor enters in the low consumption status (Wait mode) awaking every second to read:
  - o Battery voltage
  - o AUX Button
  - o Digital inputs
- According to the time set in the parameter **P.1662 (GPS module awaking frequency)**, the GPS is turned on again to check possible movements. The GPS module stays on until the position is acquired ot the maximum time of 8 minutes does not expire.

CL100 **exits** the **Sleep Mode** status when:

- The supply voltage goes back over the minimum level set (**P.1660**) + 300mV, after 3-4 sec.
- A GPS movement is acknowledged
- The AUX button is pressed for at least 300 msec.
- The digital input of engine started is acknowledged.
- The wake-up input to the terminal **J2-5** is activated.
- A movement from the internal movement sensor is acknowledged (Accelerometer + Gyroscope):

In order to enable the awaking from accelerometer or gyroscope, it is necessary to set the following parameters:

11) ENERGY SAVING	
P.1663 Accelerometer/gyroscope sensibility	Set a sensibility value between 0 and 63. A high value indicates a low sensibility on the axes X,Y,Z. Each time the value acknowledged exceeds the threshold set an Accelerometer/Gyroscope event is created. * Default Setting = 10
P.1664 Number of event from Accelerometer/ gyroscope for awaking	Set the number of events that have to be created from the accelerometer/gyroscope and that determine the exit from **Sleep Mode**. The value 0 disables the awaking. * Default Setting = 2

14 Auxiliary data management

There are some parameters (from P.1801 to P.1827) that allow to read any Modbus RTU device connected to the CL100 serial ports (RS232/RS485). It's also possible to control other devices (counters, thermometers, multifunctional instruments, etc...) or acquire data from the connected controller.

It is possible to use the auxiliary data also in combination to other controllers, or without other controllers connected.
In this case, among the data sent to SMARTCLOUD, the auxiliary ones only will be counted.

The auxiliary data are 3 and have to be number values (no text or bit value).
The acquired values are available on CL100 modbus register.
the server may read them in the future. This feature is not yet available on Smartcloud.

15 SMS

CL100 can use SMS in two functions: spontaneous messages or response on requests (commands).
Both functionalities require that the SIM has a phone number and can manage the SMS.

15.1 Automatic SMS

These are the messages that are generated automatically by the CL100 device and can be activated by parameter. Automatic SMS messages are sent to predefined numbers configured by parameters.

15.2 SMS commands

CL100 is able to receive and interpret SMS messages. In this case you will have an immediate response and you will be able to execute an immediate command. The messages received by CL100 can be interpreted directly or redirected to the connected board.
It is recommended to activate the SMS filter to prevent the CL100 from responding to service messages from telephone operators (P.1205 Filter on SMS reception = 1-Enabled).

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15.3 SMS Interpretation

Below is the logic of interpretation of SMS messages by CL100.

The important factors are:

- **Recognition:** the message is acknowledged if it is included in the list of commands known to the CL100**.**
- **Destination.** The message can be addressed to the CL100 itself (as in the case: READ SIGNAL, READ IP, RESET DEVICE), or to the connected board (e.g.: READ STATUS, CMD RESET ALARMS). In the second case, if the connected board supports the forwarding, the message is forwarded to the board, otherwise CL100 will try to reply with the data detected by the board (e.g.: READ STATUS).
- **Forwarding.** This function is available for Mecc Alte boards that support the SMS forwarding mode via modbus (all boards currently in production support it; for older boards the model and version must be checked). Message forwarding indicates that the message received from the CL100 is written in the modbus registers of the board connected by serial port. The board responds to the message by serial to the CL100, which sends the reply of the board through SMS.
- **Addressing.** If there is only one board connected to the CL100 the message will be addressed to it. If more than one board is connected, it is possible to redirect the message by prefixing "**Gxx**" or "**Mxx**" or "**GRxx**". The addressing works only if message forwarding (via modbus) to Mecc Alte boards is available. This suffix is used to address the message to one of the connected boards. "**xx**" indicates the modbus address of the board (must be between 1 and 254).

Example : "G2 READ STATUS"

Forward the READ STATUS message to the board with modbus address 2.

Note: The READ STATUS command, one of the most widely used, will be forwarded to the card if it's a Mecc Alte card that supports forwarding. In the case of non Mecc Alte boards, or old generation Mecc Alte boards that do not support forwarding, it will be the CL100 that composes the reply message using the data acquired via modbus from the boards.

When CL100 receives the compressed message it first checks if SMS is a valid message.

a) If the SMS is not valid (not recognised):
- If the board supports SMS **Forwarding**, it is redirected via modbus to the board. If it is not a Mecc Alte board, it will reply "*command unknown*".
- If the board does not support **Forwarding**, CL100 will respond with "*Command unknown*".

b) If the SMS is valid (it's recognised):
- If the message is destinated for the CL100 it responds directly
- If the message is destined for the board:
  o If it's a Mecc Alte board:
    - If it supports **Forwarding**, it redirects the message to the board and redirects the reply.
    - If it doesn't support forwarding:
      o for requests (e.g. READ STATUS) for which an SMS reply with data is expected, the reply will be composed by CL100 with the data available and that have been acquired fromthe board.
      o for commands (e.g. CMD REMOTE START) the SMS is converted into a modbus command where possible.

  o If it's a board from another manufacturer:

If managed compose the answer with the available data. For commands, if supported, it converts them into a modbus command sent to the board.

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15.4 SMS to CL100

SMS commands list managed directly by CL100 (it answers directly, so independently by the controller connected via serial port):

Text	Command
READ NETWORK	It reads the GSM signal level
READ SIGNAL	It reads the GSM signal level
READ CONFIG	Requires information on the CL100 device (software revision, etc.).
READ PARAMETER 1031	It reads a parameter value (in this case P.1031 Time for data sending with engine stop in sec.)
WRITE PARAMETER 1031 3600	It changes a parameter (in this case P.1031=3600, that is sending data every hour with engine stop)
READ MODEM &V2	Sends an AT command to the modem and returns the answer (in this case it sends the AT&V2 command to the modem and returns the modem configuration)
READ INPUT	It reads the status of the CL100 digital inputs
READ OUTPUT	It reads the status of the CL100 outputs
READ GPS	It reads the data received by GPS module (position, height, n. satellites, UTC time)
WRITE OUTPUT 2 ON	It commands a CL100 output (in this case it activates output 2)
WRITE ALL OUTPUT 11	It commands the CL100 outputs (in this case it activates both outputs)
CMD DISABLE SMS	It disables the spontaneous SMS sending (on event)
CMD ENABLE SMS	It enables the spontaneous SMS sending (on event)
READ IP	Reading of the GPRS connection status and current IP address
RESET DEVICE	It carries out the start of CL100. CL100 resets and resends the event of first start
MODEM STATUS	It indicates : device ID, modem connection status, signal and the last occurred error. Connection data referred to the old server connection, no longer used. Example : **ID:00001B970914 Tx OK:0 Er:0 NO ERRORS, MOB.MODE: 3-EGPRS, DISABLED, SG: 20**
MODEM PROXY STATUS	Reports the status of the connection with the Cloudlink proxy server: **ID:0000B1141D12 ChannelId: [ixxxxxxxx] Stat:4-WAIT CMD. PING:37 Tx OK:511 Er:0 NO ERRORS, MOB.MODE: 1-GSM, APN: OK, internet.wind.biz, SRV: smartcloud.meccalte.com** **ID:** CL100 Device ID **ChannelId:** Cloudlink identifier **Stat:** Status 0-IDLE - No activity, disconnected 1-INIT. - initial, network connection in progress 2-IP ACQ. – Connected to APN 3-CONNECTED – Connected to the server, but no data 4-WAIT CMD – Connected to the server, command channel active 5-TUN OPEN.- Data channel opened with the proxy server 6-TUN ACT. – Data exchange in progress with server 8-DISC. – Disconnected from proxy server 99-ERROR – Generic error **PING:** Number of PING received from server **Tx OK:** Number of successful modbus requests **Er:** Number of modbus requests with error

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	MOB.MODE: Mobile network mode
	    1-GSM
	    3-EGPRS
	    7-LTE M1
	    9-LTE NB
	APN: indicates which APN the device is connected to
	SRV: indicates which Cloudlink server the device is connected to

MODEM REV	Responds with modem review and other information: **ID: 0000B1141D12 Rev: 1529B08SIM7000G, AP:2018-08-01 12:34:35 MDM:2018-08-01 12:07:20, Model:SIMCOM_SIM7000G, IMEI:869951030169328, Type:7** **ID:** CL100 Device ID **Rev:** modem revision (contains B08 that indicates the revision number) **AP:** Application Processor build time **MDM:** Modem / Baseband build time **Model:** modem model (SIMCOM SIM7000G) **IMEI :** modem IMEI **Type:** should be = 7 if the modem is recognised correctly

15.5 SMS interpreted by CL100 with board data

This set of commands is interpreted by CL100, which constructs the reply using data from the boards (Mecc Alte and non-Mecc Alte boards).

Text	Command
READ GEN	Reading data genset - analogue 1
READ ANALOG1	Reading data genset - analogue 1
READ MAINS	Reading data mains / engine - analogue 2
READ ANALOG2	Reading data mains / engine - analogue 2
READ POWER	Reading powers - analogue 3
READ ANALOG3	Reading powers - analogue 3
READ AW	Reading list of active alarms and warnings
READ WARNINGS	Reading list of current warnings

15.6 SMS forwarded to Mecc Alte boards

Only for Mecc Alte boards that support the function of forwarding SMS messages via modbus. In this case each board accepts different commands depending on its category and version.

SMS	DST2600, DST2700	DST4400, AC3000	DST4601, DST4601/PX	GC310, GC350, GC500, GC500Plus	MC100	MC400	MC200	DST4602	ATS100	ATS115	HS315	GC315Plus, GC315Link, GC400, GC600	BTB100	BTB200	RN200
READ STATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
READ WARNINGS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
READ ANALOG1	X	X	X	X				X			X	X	X	X	

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READ ANALOG2	X	X	X	X				X	X	X	X	X	X	X	
READ ANALOG3	X	X	X	X				X			X	X	X	X	
READ SOURCEA									X	X					
READ SOURCEB									X	X					
READ LOAD									X	X					
READ PLANT					X	X	X								X
READ MAINS					X	X	X								
READ GENERATORS					X	X	X								
READ RENEWABLES															X
READ EXTRA TEMP					X	X	X				X	X			X
READ EXTRA ANALOG					X	X	X				X	X			X
CMD LOCK	X	X	X	X		X	X	X				X			
CMD UNLOCK	X	X	X	X		X	X	X				X			
CMD RESET ALARMS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CMD STOP	X	X	X	X	X	X	X	X			X	X			X
CMD TEST START	X	X	X	X	X	X	X	X			X	X			
CMD TEST STOP	X	X	X	X	X	X	X	X			X	X			
CMD REMOTE START	X	X	X	X	X	X	X	X			X	X			X
CMD REMOTE STOP	X	X	X	X	X	X	X	X			X	X			X
CMD FORCE A									X	X					
CMD FORCE B									X	X					
CMD FORCE N									X	X					
CMD FORCE X									X	X					
CMD OPEN													X	X	
CMD CLOSE A													X	X	
CMD CLOSE B													X	X	
CMD CLOSE X													X	X	
NEW ALARM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NEW WARNING	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NEW MAINS STATUS	X	X	X	X	X	X	X	X				X			
NEW AUXILIARY SOURCE STATUS											X				

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NEW ENGINE STATUS	X	X	X	X			X			X	X				
NEW SOURCEA STATUS								X	X						
NEW SOURCEB STATUS								X	X						
NEW SWITCH STATUS								X	X						
NEW BUSA STATUS														X	X	
NEW BUSB STATUS														X	X	
NEW GENERATORS STATUS																X
NEW RENEWEABLES STATUS																X

15.7 Commands SMS valid for Mecc Alte controllers

Below are the relevant SMS commands for Mecc Alte generator control with description:

Command	Description
READ STATUS	Requires the general state of the system (board mode OFF-AUTO-MAN, alarms and warning and alarms present, engine status, breakers status, engine working hours)
READ WARNINGS	Requires the complete list of warnings present at the moment.
READ ANALOG1	Reads generator measurements: voltage, current, frequency, generator changeover status.
READ ANALOG2	It reads the measures concerning the mains and the engine: mains voltage and frequency, starter battery voltage, coolant temperature, oil pressure, fuel level, speed (RPM).
READ ANALOG3	Requires power measurements: power factor, load type, active power, reactive power, apparent power, energy meter.
READ EXTRA TEMP	Reads the temperature measurements acquired by the DITEMP modules (DITHERM / DIGRIN) connected to the board.
READ EXTRA ANALOG	Reads the analogue measurements acquired by the DIVIT modules connected to the board.
CMD RESET ALARMS	Alarm reset. This is equivalent to set the device to OFF/RESET and return it to the previous mode (MAN or AUTO)
CMD STOP	Engine stop command. It is equivalent to pressing the STOP button on the board.
CMD TEST START	Change the operating mode of the board from automatic to TEST.
CMD TEST STOP	Restores the operating mode from TEST to AUTO.
CMD REMOTE START	Change the operating mode from AUTO to REMOTE START.
CMD REMOTE STOP	Restores the operating mode from REMOTE START to AUTO.
CMD LOCK	Inhibits the use of the generator set.
CMD UNLOCK	Unlock the inhibition to use the Generator

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15.8 Commands SMS valid for DSE controllers

Valid SMS commands for DSE 5210, 7320, 7510, 5510 boards:

Text	Command
CMD RESET ALARMS	Reset alarms
CMD LOCK	It blocks the controller
CMD UNLOCK	It unblocks the controller
CMD STOP	Engine stop command
CMD TEST STOP	Engine stop command
CMD REMOTE STOP	Engine stop command
CMD TEST START	Engine start command
CMD REMOTE START	Remote start command
CMD TEST START	Engine start command
MODE STOP	It changes the controller mode in STOP
MODE MAN	It changes the controller mode in MAN
MODE AUTO	It changes the controller mode in AUTO
MODE TEST	It changes the controller mode in TEST
TRANSFER TO GEN	It carries out a transfer function on the genset
TRANSFER TO MAINS	It carries out a transfer function on the mains

15.9 Commands SMS valid for COMAP controllers

Valid command SMS for COMAP InteliLite NT, InteliGen NTC BaseBox boards:

Text	Command
CMD RESET ALARMS	Reset alarms
CMD STOP	Engine stop command
CMD TEST START	Engine start command in test
CMD TEST STOP	Engine stop command in test
CMD REMOTE START	Remote start command
CMD REMOTE STOP	Remote stop command

15.10 Commands SMS valid for ELCOS controllers

Commands SMS valid for ELCOS CAM-120 controllers:

Text	Command
CMD STOP	Engine stop command
CMD TEST START	Engine start command in test
CMD TEST STOP	Engine stop command in test

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CMD REMOTE START	Remote start command
CMD REMOTE STOP	Remote stop command

15.11 Commands SMS valid for DEIF controllers

Commands SMS valid for DEIF AGC3 controllers:

Text	Command
CMD RESET ALARMS	Reset alarms
CMD STOP	Engine stop command
CMD REMOTE START	Remote start command
CMD REMOTE STOP	Remote stop command
MODE MAN	It changes the controller mode in MAN
MODE AUTO	It changes the controller mode in AUTO
MODE TEST	It changes the controller mode in TEST
MODE SEMI	It changes the controller mode in SEMI-AUTO

15.12 Commands SMS valid for WOODWARD controllers

Commands SMS valid for Woodward EasyGen3200 controllers:

Text	Command
CMD RESET ALARMS	Reset alarms
CMD STOP	Engine stop command
CMD REMOTE START	Remote start command
CMD REMOTE STOP	Remote stop command
CMD TEST START	Engine start command in test
CMD TEST STOP	Engine stop command in test

15.13 Commands SMS valid for CATERPILLAR controllers

Commands SMS valid for Caterpillar EMCP3, EMCP4 controllers:

Text	Command
CMD RESET ALARMS	Reset alarms
CMD STOP	Engine stop command
CMD REMOTE START	Remote start command
CMD REMOTE STOP	Remote stop command
CMD TEST START	Engine start command in test
CMD TEST STOP	Engine stop command in test
MODE STOP	It changes the controller mode in MAN
MODE AUTO	It changes the controller mode in AUTO
MODE RUN	It changes the controller mode in RUN

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16 Cloudlink and Smartcloud connection

This device can connect to a proxy server (Cloudlink), creating a secure connection. This connection can be used for Smartcloud.
Below is a diagram of how it works.
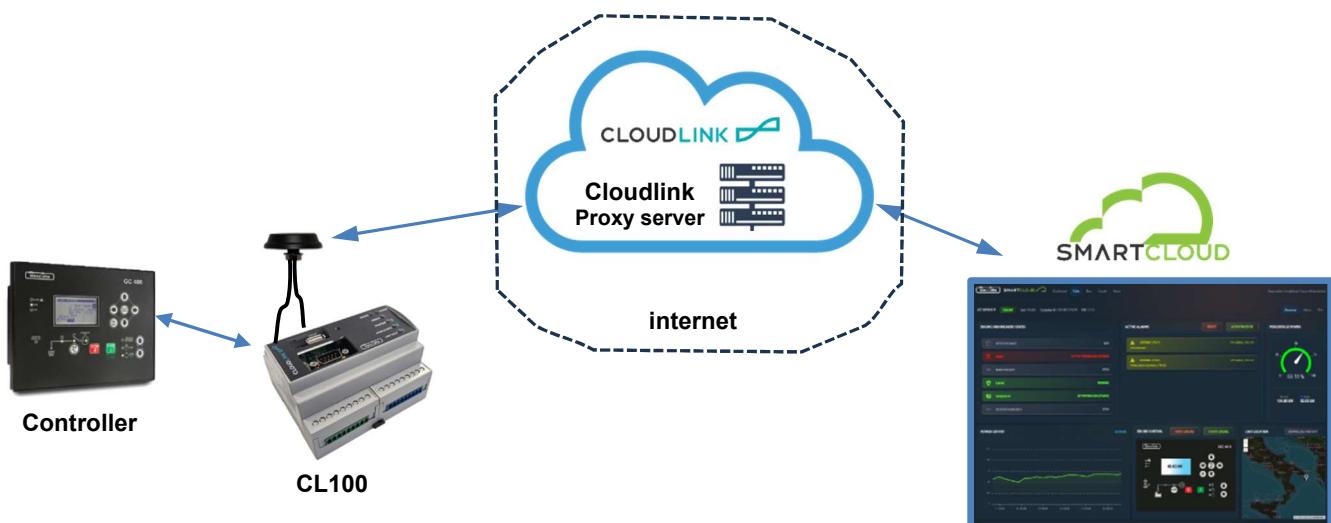
CL100 will connect to the Internet data network and, through this, to the Cloudlink proxy server. Then you can create a unit on SmartCloud and connect it to your real device via Cloudlink, creating a secure and protected connection.

16.1 Unit creation

If you have not yet created an account, we recommend that you follow the SmartCloud manual EAAM0867xx.
Once you have logged in, go to Units and press 'Add unit'.
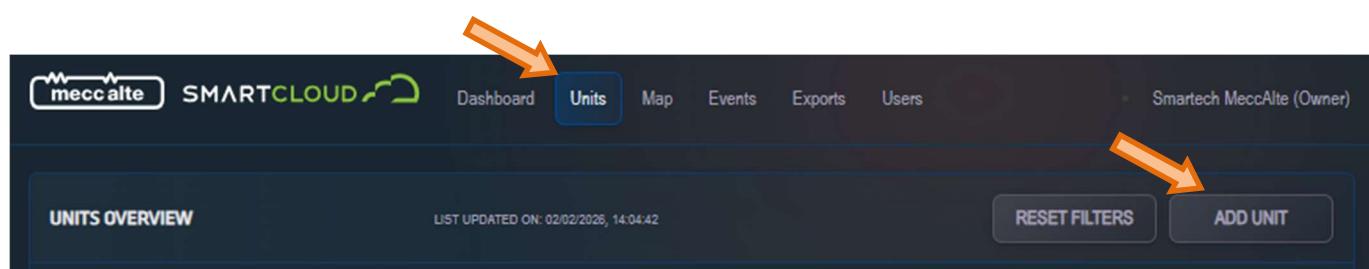
create the CL100 remote device:

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Unit name = name your device
Connectivity type = CLOUDLINK
Cloudlink ID, User, Password = These are your device's unique credentials. You can find them on the label inside the box provided.
Controller address = **255   (the gateway modbus address)**

16.2 How to insert credentials

You will find the credentials on the label inside the box. If they are not there, please contact MeccAlte to obtain them.
Please note that the credentials below are only an example; you must use the ones assigned to your device!
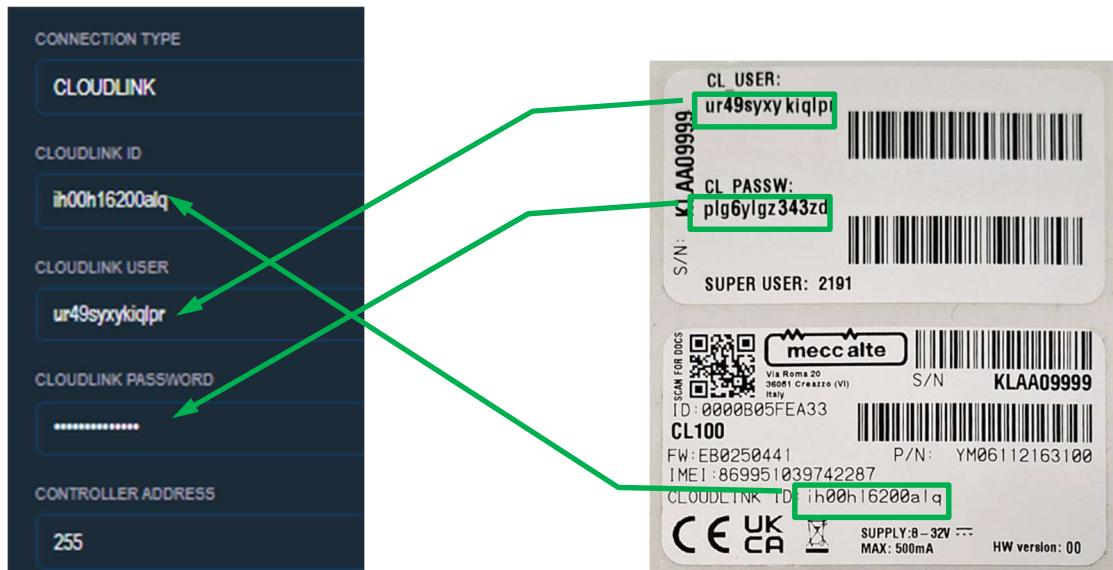
If the device is switched on with the SIM card and correctly connected to the network, you can check whether it is connected by pressing TEST CONNECTION.

if the device is connected, the type and device ID will be acquired automatically.

You can save the unit by pressing Save and waiting for it to go ONLINE:

At this point, you can also add your controller connected in serial to the CL100:

Remember to select GATEWAY CONTROLLER on Connection type, to indicate that the controller is connected through a gateway device (CL100). Than select the CL100 device.

And verify if GPS Mode = Gateway (the coordinates come from the gateway device)

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You can also run the TEST CONNECTION for the controller:

And save the unit.

Within a few seconds, it will connect to the device and display measurements, statuses, and location.

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17 Troubleshooting

We propose below some indications for solving the most frequent problems.

17.1 No connection with SMARTCLOUD

CL100 doesn't send data to SMARTCLOUD Why?

Checks and probable causes

1. Is the device powered? (LED POWER)

2. Is the CL100 enabled for SMARTCLOUD ? (P.0560-Cloudlink – Enable =1-Enabled)

3. Are there valid Cloudlink credentials ? Channel id, User and password should already be set up on the device. Remember that the password is not visible to the user, but is entered in the CL100.

4. Have you enabled NTP? (P.2501 NTP Enable = 1-Enabled) The use of the SSL protocol requires clock synchronisation, otherwise Cloudlink invalidates the certificate and refuses the connection.

5. Has the SIM Card been inserted correctly? If the SIM Card isn't read, LED 2 (MOBILE DATA) will flash intermittently (2 rapid flahses repeated every 1 sec.)

6. Has the SIM PIN been disabled?

   in order to use the SIM card in CL100, the PIN code must be removed. It can be removed by inserting the SIM in the mobile phone and selecting the deactivation option of the PIN code or asking the operator.
   If it is not possible to remove it, you can set it in parameter P.2510 SIM – PIN.

7. Has the SIM been enabled to the data traffic (M2M or Internet contract)?

8. Is the Modem registered to the Network? Starting from power-up, the MODEM LED should follow this sequence:
   - flashing for about 1 sec (64 ms ON, 800 ms) – Not registered on the network
   - slow flashing every 3 sec (64 ms ON, 3000 ms OFF) – Registered on the mobile network (GSM)
   - rapid flashing (64 ms ON, 300 ms OFF) – connected to the data network (APN)

9. Ensure that the GPS antenna hasn't been inverted with the GSM one. In this case, the modem doesn't work!

10. Is the antenna correctly connected, enabled and placed? Check that antennas are securely screwed in place.

11. Is the area sufficiently covered by a GSM signal? Briefly pressing the AUX button displays the signal level on the LEDs.

12. Does the APN set correspond to the one of the provider (ibox.tim.it for TIM, m2mbis.vodafone.it for Vodafone, internet.wind.biz for Wind, etc.)?

13. Does the APN need USER and PASSWORD? Some telephone providers (mostly the foreign ones) require the configuration of username and password.

14. Have the parameters been set correctly? (Server Address and Port. In case of Mecc Alte SMARTCLOUD: Host server = smartcloud.meccalte.com, Port=23010)

15. Check that the Cloudlink and Smartcloud servers are not suspended for maintenance.

16. Has the unit been created on Smartcloud and associated with Cloudlink credentials?

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17.2 CL100 connected to SMARTCLOUD, but controller OFFLINE

SMARTCLOUD receives the data but they are all at zero and I don't see the genset data. Why?

Checks and probable causes

Check the LED1 status (UNIT DATA) that indicates if it activates/deactivates the serial communication with the controller that manages the genset:

If Led1 on CL100 is off, there is no communication. Check the following points:

1. Is the controller connected to CL100 supplied and still working?

2. Check the connection parameters: baud rate, n. bit settings, parity and stop bit (all devices connected to the same serial port must have the same communication parameters).

3. Does the controller connected to CL100 have the serial port configured as SLAVE MASTER RTU?

4. Is it connected via RS485?
   a. Check that the 2 connection wires are not inverted. In case of doubts, you can try and move them. Usually they are marked by the letters A and B.
   b. Did you select the RS485 port on CL100 as Master? (Par.1101 Master serial Port = 2-Port COM2-RS485)
   c. Have you checked that the communication parameters for the RS485 port (P.1121 and P.1122) are equal to the ones of the device to interrogate?
   d. Are there other devices on the RS485 network? Try to disconnect them and leave only the controller connected to the CL100.
   e. Is the modbus address of the controller to interrogate correct?

5. Is it connected via RS232?
   a. Did you select the RS232 port on CL100 as Master? (Par.1101 Master serial Port = 1-Port COM1-RS232)
   a. Have you checked that the communication parameters for the RS232 port (P.1111 and P.1112) are equal to the ones of the device to interrogate?

If the Led1 on CL100 is on, the communication with the controller connected via serial port is active but the data received are wrong. Check the following points:

1. Is the type of controller configured correctly? Check the par. 1162 controller type.

2. Is the modbus address of the controller to interrogate correct? It could read another device on the RS485 network.

3. Is the controller connected supported by CL100?

4. Is the device connected a modbus slave RTU?

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