



## Digital multimeters DMG 600-610



 **Lovato**  
**electric**  
ENERGY AND AUTOMATION

# Digital multimeters DMG 600 - 610



are capable of viewing the measurements with high accuracy on the wide **LCD display**, which allow to control energy distribution networks.

- ✓ Easy and intuitive menu navigation
- ✓ LCD display with text in 5 languages
- ✓ Expandability with EXP... modules
- ✓ High measurement accuracy
- ✓ Wide range for power supply, measurements and temperature
- ✓ Suitable for LV, MV and HV electric systems and installations

# VERSATILITY, EXPANDABILITY AND HIGH MEASUREMENT QUALITY



The main features include an extended power supply voltage range (100...440VAC), high measurement accuracy ( $\pm 0.5\%$  for voltage and current), expandability (using EXP modules) and LCD interactive interface for simple use.

Main measurements and functions include:

- Voltage: phase, line and system values
- Current: phase values (neutral current calculated)
- Power: apparent, active and reactive phase and total values
- Power Factor per phase and total
- Frequency of measured voltage value
- HIGH-LOW-AVERAGE value functions for all measurements
- Maximum demand of power and current values
- Voltage and current asymmetry
- Total harmonic distortion (THD): voltage and current
- Energy meters for active, reactive, apparent partial and total values, per phase and system values
- Hour counter for programmable total and partial hours
- Phase active power unbalance.

The logo for Lovato electric, featuring a stylized barcode-like graphic to the left of the word "Lovato" in a bold, sans-serif font, with "electric" in a smaller, lowercase font below it.

# Digital multimeters DMG 600 - 610



## ● LCD display

New icon type display, with white backlight to ensure good visibility in environments with low light conditions. Scrolling text with 4 characters to show:

- Alarm messages configured by the user
- Guide messages for the user
- Description of the setup menu and parameters.

The text is available in 5 languages (English, Italian, French, Spanish and Portuguese).



## ● USB and Wi-Fi dongle

Through the optical port, direct connection to a PC USB port (using CX 01) or via WiFi (using CX 02) is allowed. CX 02 dongle (WiFi) can furthermore make:

- Copy of the parameters  
All parameters in the DMG can be saved in the CX 02 memory and in case reloaded on the same device (backup function) or on a different one of the same type (replication of the configuration).
- Clone of the device settings  
In addition to the copy of the parameters, the current values of energy meters and hour counters can be saved in memory as well, in order to fully replicate a DMG on another device of the same type or to restore the DMG to a previously saved state.



## ● Alarms and notification by flashing display

Tied to the limit thresholds or to the activation of a digital input, there are available 4 alarms with user-configurable text description. When an alarm occurs, an icon and a descriptive text appear on any page of the meter. Setting a parameter, the user can activate the flashing of the display backlight in case of alarm. The alarm becomes visible even from a distance, saving a warning light indicating a global alarm.

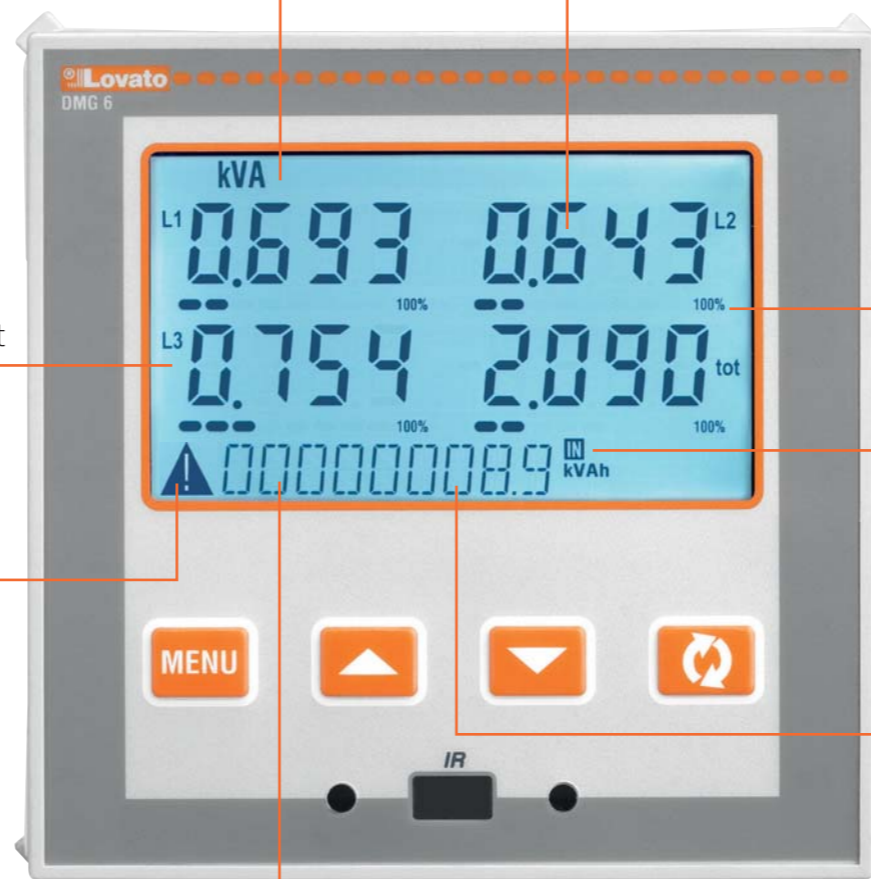
Units of measure

Measurement value

Type of measurement

Flashing icon for alarms

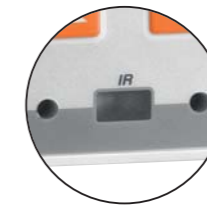
Scrolling text in case of alarms, messages for the user or parameter setup



Bar graph, percentage of a full scale value

Subpage indication:  
Instantaneous measurements, maximum, minimum, average values and maximum demand

Active energy meter always available in all pages



## ● Optical port

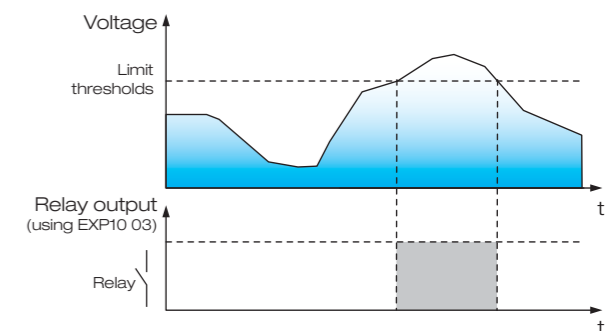
DMG 600 and DMG 610 are equipped with a front optical port to support programming through CX 01 and to use the functionality of CX 02 Wi-Fi dongle.

Advantages:

- No need to remove power from the panel to connect to the multimeter
- Electrical safety (no electrical connection)
- IP54 guaranteed
- Convenience of working on the front.

## ● Limit thresholds

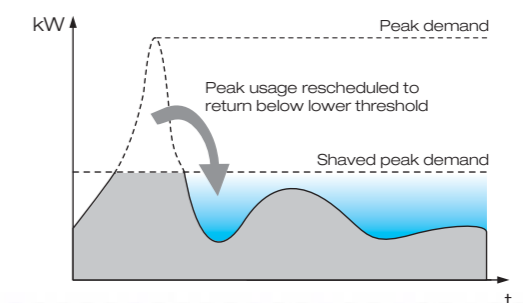
On all available measurements, the user can set up to 4 independent thresholds to generate alarms or activate outputs in excess of the set values. The user can decide the activation of the limit threshold on the overcoming of maximum, minimum values or both, with on and off delay to protect the system from unnecessary trippings and hysteresis thresholds to avoid the "bouncing" around the threshold.



## ● Management of power "maximum demand"

Often in the contracts between user and utility, a limit on the maximum demand of active power, calculated as an average over a time window, exists. In order to help the user, DMG 600 and DMG 610 include features which allow the control of demand limits as follows:

- 4 methods of integration of active and reactive power:
  - Fixed window
  - Moving average
  - Synchronisation via digital input (typical solution used by utilities)
  - Synchronisation message via the serial interface (Modbus)
- Setting a threshold on the average power value, in order to activate outputs which can disconnect non-priority loads to limit the need of power or to notify the user about the need to reduce the loads.



## ● Expandability (1 slot)

The configuration of the devices in different installations can have many variants, for example the types of communication (USB, RS485, Ethernet) or the number of inputs and outputs required.

DMG 600 and DMG 610 support expandability by EXP... modules.

The expansion modules shared with other devices lighten the costs of management and first of all guarantee configuration flexibility at installation time and secondly ease of performance increasing when the system is already in operation.

The following EXP modules are available:

- Digital inputs and outputs (static type to generate energy pulses or relay type to control coils)
- USB, RS232, RS485 and Ethernet communication.

The module is recognized automatically by the base device which set it to be used. The particular shape of the back of the DMG lets the addition of the expansion module without increasing the space required inside the electrical panel, because the size of the EXP module is fully contained in the base module size, limited to 65mm only, including connectors.



## ● Sam1 APP

Furthermore, CX 02 dongle is the access point to the device through the Sam1 APP.

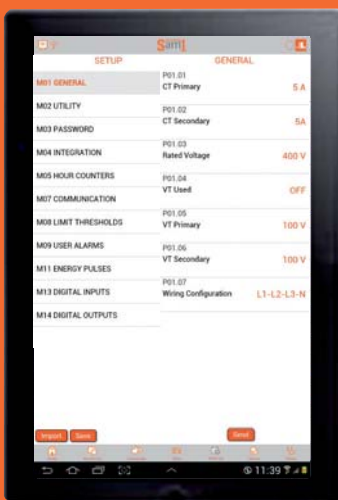
Thanks to Sam1, one can:

- See on smartphones or tablets all the measures of the multimeter
- Send commands, such as counters reset or enabling and disabling of multimeter outputs
- Set the parameters, save a copy in a file and retrieve it in case of need (the file can be sent via email as well)
- See active user alarms.

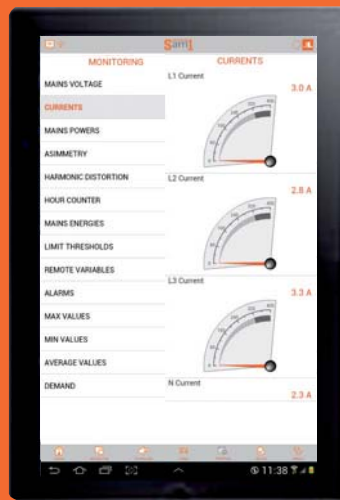
Sam1 APP can be downloaded from Google Play Store or Apple iTunes.



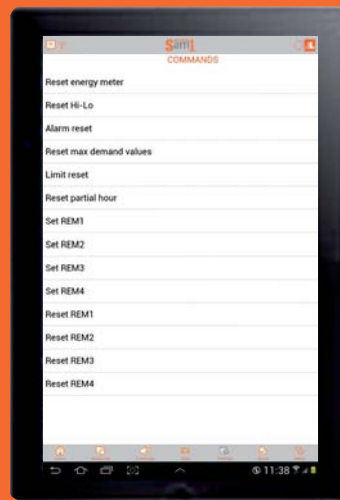
PARAMETER SETTING



MEASUREMENT VIEWING



SEND COMMANDS

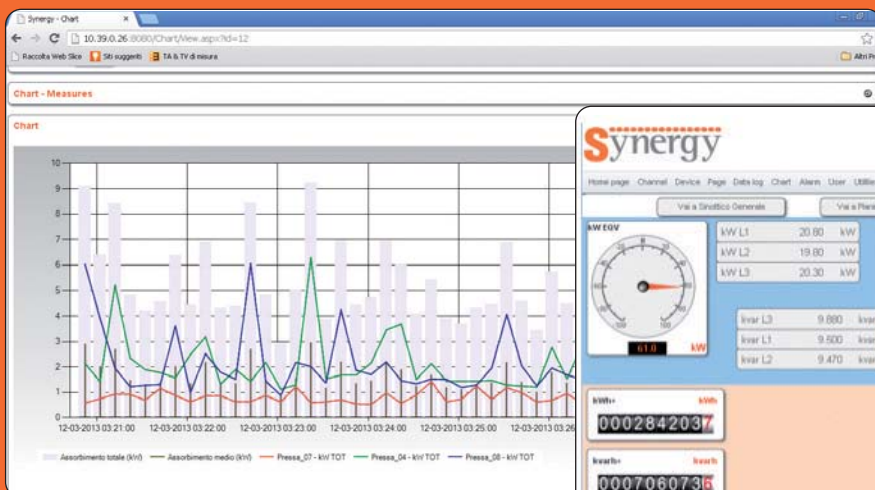


ALARM VIEWING



## ● Compatibility with Synergy energy management software

DMG 600 and DMG 610 are compatible with the current version of Synergy, which can be downloaded from [www.LovatoElectric.com](http://www.LovatoElectric.com) website. Thanks to the built-in RS485 serial port, DMG 610 can be immediately added to an existing network without needing extra external accessories or expansion modules. However, if another type of communication is required, through the modules EXP..., both DMG can be equipped with the EXP10 13, adding an Ethernet port, suitable to work with both static IP and dynamic IP address, making the DMG network configuration similar to which is normally carried out for PCs.



# HOW TO ORDER

## LCD multimeters



DMG 600 - DMG 610

| Order code | Description                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------|
| DMG 600    | Backlight icon LCD, 72x46mm, auxiliary supply 100-440VAC / 120-250VDC, front optical port                |
| DMG 610    | Backlight icon LCD, 72x46mm, auxiliary supply 100-440VAC / 120-250VDC, front optical port and RS485 port |

### Operational characteristics

- Auxiliary supply voltage range: 100-440VAC / 120-250VDC
- Voltage measurement range: 50-720VAC
- Usage in medium and high-voltage systems with voltage transformers
- Rated input current: 1A or 5A
- Frequency measurement range: 45-66Hz
- True RMS measurements: for voltage and current
- Measurement accuracy:
  - Voltage:  $\pm 0.5\%$  (50-720VAC)
  - Current:  $\pm 0.5\%$  (0.1-1.1In)
  - Power:  $\pm 1\%$  f.s.
  - Frequency:  $\pm 0.05\%$
  - Active energy: Classe 1 (IEC/EN 62053-22)
  - Reactive energy: Class 2 (IEC/EN 62053-23)

- Non-volatile memory for data storage
- Communication protocol Modbus-RTU, ASCII and TCP
- Compatible with **Synergy** software and **Sam1** APP
- Flush-mount housing 96x96mm
- IEC degree of protection: on front IP54; IP20 at terminals.

### Certifications and compliance

Certifications obtained: EAC, cULus.  
 Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL 61010-1, CSA C22-2 n°61010-1.

## Expansion modules



EXP10...

| Order code          | Description                                                        |
|---------------------|--------------------------------------------------------------------|
| Inputs and outputs  |                                                                    |
| EXP10 00            | 4 opto-isolated digital inputs                                     |
| EXP10 01            | 4 opto-isolated static outputs                                     |
| EXP10 02            | 2 digital inputs and 2 static outputs, opto-isolated               |
| EXP10 03            | 2 relay outputs rated 5A 250VAC                                    |
| EXP10 08            | 2 opto-isolated digital inputs and 2 relay outputs rated 5A 250VAC |
| Communication ports |                                                                    |
| EXP10 10            | Opto-isolated USB interface                                        |
| EXP10 11            | Opto-isolated RS232 interface                                      |
| EXP10 12            | Opto-isolated RS485 interface                                      |
| EXP10 13            | Opto-isolated Ethernet interface with web server function          |

## Communication ports and accessories



CX 01



CX 02



EXP80 00

| Order code | Description                                                                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CX 01      | USB/optical dongle for PC – LOVATO Electric product connection, for programming, data download, diagnostics and firmware upgrade. Complete with cable, 1.8m long |
| CX 02      | Wi-Fi dongle for PC – LOVATO Electric product programming, data download, diagnostics and cloning                                                                |
| EXP80 00   | Plastic insert for customising label fixing                                                                                                                      |

[www.LovatoElectric.com](http://www.LovatoElectric.com)

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