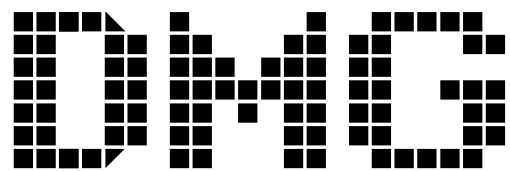


## Digital multimeters and power analyzers **DMG** series



 **Lovato**  
**electric**  
*100% electricity*



# DIGITAL MULTIMETERS AND POWER ANALYZERS

*with backlit graphic  
LCD screen*



For the control of energy distribution systems detecting when problems occur that could put the quality and availability of electricity at risk. The wide range of power supply and measurements, high measurement accuracy of electrical quantities and comprehensive expandability make these products unique to the market.

- ✓ Easy and intuitive menu navigation
- ✓ Graphic display with text in 5 languages
- ✓ Expandability
- ✓ Ethernet, USB, RS232, RS485 and Fieldbus connection
- ✓ 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 MESUREMENT QUALITY



### MAIN FEATURES

	Digital multimeters			Digital multimeters		Digital power analyzers	
	DMG 200	DMG 210	DMG 300	DMG 700	DMG 800	DMG 900	DMG 900T Transducer
Modular version, 4-module	•	•	•				
Flush-mount version, 96x96mm				•	•	•	
DIN rail fixing version, rear mount	•	•	•				•
Graphic 4-key LCD, 128x80 pixels	•	•	•	•	•		
Graphic touch-screen LCD, 128x112 pixels						•	
Expandability			•	•	•	•	•
Integrated RS485 interface		•					
Number of measured electric quantities	160	160	344	160	344	590	590
Total harmonic distortion measurement	•	•	•	•	•	•	•
Detailed harmonic analysis			•		•	•	•

Comply with standards: IEC/EN 61010-1; IEC/EN 61000-6-2; IEC/EN 61000-6-3.

# HOW TO ORDER



DMG 200  
DMG 210  
DMG 300



EXM...

## MODULAR DIGITAL MULTIMETERS

<b>DMG 200</b>	Graphic 128x80 pixel LCD multimeter, 100-240VAC / 110-250VDC
<b>DMG 210</b>	Graphic 128x80 pixel LCD multimeter, RS485 port included, 100-240VAC / 110-250VDC
<b>DMG 300</b>	Graphic 128x80 pixel LCD multimeter, harmonic analysis, expandable 100-240VAC / 110-250VDC

### Expansion modules for DMG 300

<b>EXM 10 00</b>	2 digital inputs and 2 static outputs, opto-isolated
<b>EXM 10 01</b>	2 opto-isolated digital inputs and 2 output relays rated 5A 250VAC
<b>EXM 10 10</b>	Opto-isolated USB interface
<b>EXM 10 11</b>	Opto-isolated RS232 interface
<b>EXM 10 12</b>	Opto-isolated RS485 interface
<b>EXM 10 13</b>	Opto-isolated Ethernet interface
<b>EXM 10 20</b>	Opto-isolated RS485 interface and 2 output relays rated 5A 250VAC
<b>EXM 10 30</b>	Data storage, clock-calendar (RTC) with backup battery for event logging



DMG 700 - DMG 800



DMG 900



DMG 900T



DMG 900RD



EXP...

## FLUSH-MOUNT DIGITAL MULTIMETERS AND POWER ANALYZERS

<b>DMG 700</b>	Graphic 128x80 pixel LCD multimeter, 100-440VAC / 110-250VDC
<b>DMG 800</b>	Graphic 128x80 pixel LCD multimeter, harmonic analysis 100-440VAC / 110-250VDC
<b>DMG 800 D048</b>	Graphic 128x80 pixel LCD multimeter, harmonic analysis 12-24-48VDC
<b>DMG 900</b>	Graphic 128x112 pixel touch screen LCD multimeter, harmonic analysis 100-440VAC / 110-250VDC
<b>DMG 900 D048</b>	Graphic 128x112 pixel touch screen LCD multimeter, harmonic analysis 12-24-48VDC
<b>DMG 900T</b>	Measurement transducer, harmonic analysis, 4 channels V/I 100-440VAC / 110-250VDC
<b>DMG 900T D048</b>	Measurement transducer, harmonic analysis, 4 channels V/I 12-24-48VDC
<b>DMG 900RD</b>	Graphic 128x112 pixel touch screen LCD remote display unit, with connecting cable, 3m long

### Expansion modules for DMG 700, DMG 800, DMG 900 and DMG 900T

<b>EXP 10 00</b>	4 digital opto-isolated inputs
<b>EXP 10 01</b>	4 static opto-isolated outputs
<b>EXP 10 02</b>	2 digital inputs and 2 static outputs, opto-isolated
<b>EXP 10 03</b>	2 output relays rated 5A 250VAC
<b>EXP 10 04</b>	2 analog opto-isolated inputs, 0/4-20mA or 0-100V or 0...±5V for DMG 800/900 only
<b>EXP 10 05</b>	2 analog opto-isolated outputs, 0/4-20mA or 0-100V or 0...±5V for DMG 800/900 only
<b>EXP 10 10</b>	Opto-isolated USB interface
<b>EXP 10 11</b>	Opto-isolated RS232 interface
<b>EXP 10 12</b>	Opto-isolated RS485 interface
<b>EXP 10 13</b>	Opto-isolated Ethernet interface for DMG 800/900 only
<b>EXP 10 14</b>	Opto-isolated Profibus-DP interface for DMG 800/900
<b>EXP 10 30</b>	Data storage, clock-calendar (RTC), with backup battery for events and data logging, for DMG 800/900 only
<b>EXP 10 31</b>	Data storage with Energy Quality (EN 50160), clock-calendar (RTC) with backup battery for events and data logging, for DMG 900 only

## SOFTWARE AND ACCESSORIES FOR DMK AND DMG

<b>DMK SW</b>	Remote control software for PC – DMK22/32/40/52/62-DMG 210/300/700/800/900, complete with 51 C4 connecting cable
<b>DMK SW 10</b>	Data-logger software for DMK 40 and DMG 300/700/800/900, complete with 51 C2 connecting cable; includes DMK SW software
<b>51 C2</b>	PC- multimeter RS232 connecting cable (1.8m)
<b>51 C4</b>	PC – 4 PX1 converter connecting cable (1.8m)
<b>51 C5</b>	Analog modem – multimeter RS232 connecting cable (1.8m)
<b>51 C9</b>	Analog modem – 4 PX1 converter connecting cable (1.8m)
<b>4 PX1</b>	RS232/RS485 converter drive 220-240VAC (110-120VAC on request)
<b>31 PA 96X96</b>	IP54 front protection cover for DMK2..., DMK3... or DMK 40
<b>PA 96X48</b>	IP65 front protection cover for DMK0... or DMK1...
<b>EXM 80 04</b>	Sealable set of terminal covers for DMG 200, DMG 210 or DMG300



# Modular digital multimeters

## Wide range of operation

- Auxiliary power supply: 100-240VAC/110-250VDC
- Maximum measured rated voltage: 690VAC L-L (600VAC UL/CSA rating)
- Input current: 5A (also 1A for DMG 300 only)
- Voltage measurement range: 10-830VAC L-L
- Current measurement range: 0.005-6A
- Frequency measurement range: 45-65Hz.

## Accuracy

DMG 200 and DMG 210

- Voltage:  $\pm 0.5\%$  (50-830VAC)
- Current:  $\pm 0.5\%$  (0.1-1.1 In)
- Power:  $\pm 1\%$
- Active energy: Class 1
- Reactive energy: Class 2.

DMG 300

- Voltage:  $\pm 0.2\%$  (50-830VAC)
- Current:  $\pm 0.2\%$  (0.1-1.1 In)
- Power:  $\pm 0.5\%$
- Power factor:  $\pm 0.5\%$
- Active energy: Class 0.5S (MID Class B)
- Reactive energy: Class 2.

## USB connection

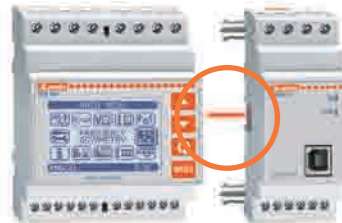
The PC connection for programming and data download takes place in a fast and easy way using the USB port, available on the EXM 10 10 expansion module.

## Ethernet connection

The EXM 10 13 expansion module allows the DMG 300 multimeter to be connected in a common Internet network and viewed by one or more duly-connected system computers.

## Optic interface

The DMG 300 interface with the expansion modules is made by infrared rays. Special connectors provide for a solid and secure fixing of expansion modules.



## Compact housing

The multimeter housing is made to DIN standards. The width is just 4 modules.



## DIGITAL MULTIMETER

4 module size



## 3 Expansion modules for DMG 300

The DMG 300 multimeter can integrate its functions with the use of the following modules:

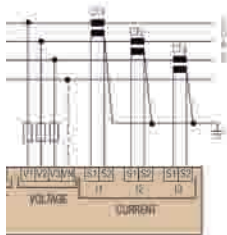
- Digital inputs and outputs, static and relay type
- USB, RS232, RS485 and Ethernet interface communications
- Data storage with calendar clock (RTC) for events.

**DMG 200:** 160 measured electrical quantities.

**DMG 210:** 160 measured electrical quantities, with RS485 interface.

**DMG 300:** 344 measured electrical quantities, expandable.

## Wiring diagrams



Types of connections:

- Single-phase
- Two-phase
- Three-phase with or without neutral
- Three-phase without neutral, ARON connection
- Balanced three-phase, with or without neutral.

## Expansion modules for DMG 300

The DMG 300 multimeter can integrate its functions with the use of the following modules:

- Digital inputs and outputs, static and relay type
- USB, RS232, RS485 and Ethernet interface communications
- Data storage with calendar clock (RTC) for events.



MAX  
3

CLICK

# Flush-mount expandable digital



## Wide range of operation

- Auxiliary power supply: 100-440VAC/110-250VDC
- Maximum measured rated voltage: 690VAC L-L (600VAC UL/CSA rating)
- Input current with CT: 5A or 1A
- Voltage measurement range: 10-830VAC L-L
- Current measurement range: 0.005-6A or 0.005-10A for 5A full scale
- Current measurement range: 0.002-1.3A for 1A full scale
- Frequency measurement range: 45-65Hz or 360-440Hz.



## Wide range of voltage measurement 10...830VAC L-L

The wide measurement range of voltage inputs allows DMG multimeters to be used in an infinite number of applications.



## Accuracy

- DMG 700
- Voltage:  $\pm 0.5\%$  (50-830VAC)
  - Current:  $\pm 0.5\%$  (0.1-1.1 In)
  - Power:  $\pm 1\%$
  - Active energy: Class 1.

DMG 800, DMG 900 and DMG 900T (MID class B)

- Voltage:  $\pm 0.2\%$  (50-830VAC)
- Current:  $\pm 0.2\%$  (0.1-1.1 In)
- Power:  $\pm 0.5\%$
- Active energy: Class 0.5S (MID Class B)
- Reactive energy: Class 2.



## DC versions

Models are available with 12VDC, 24VDC and 48VDC power supply.



## Multiple energy metering with tariff function

16 partial energy meters, clearable.

## DIGITAL MULTIMETER

96x96mm



IP54

**DMG 700:** 160 measured electrical quantities, expandable.  
**DMG 800:** 344 measured electrical quantities, expandable.

## DIGITAL POWER ANALYZERS

96x96mm



IP65

**DMG 900:** 590 measured electrical quantities, expandable.

## Expansion modules

These DMG can increase their features with the use of the following expansion modules and satisfy the many diverse needs of Customers: They include:

- Digital inputs and outputs, static and relay type
- Analog inputs and outputs
- USB, RS232, RS485, Ethernet and Profibus-DP interface communications
- Data storage with calendar clock (RTC) for events
- Data storage with calendar clock (RTC) for events and data logging
- Data storage with Energy Quality and data logging.

### Multifunction analog inputs and outputs

The programmable analog outputs can be configured in voltage or current. The analog inputs can read signals in the form of voltage, current or temperature from PT100 sensor.

### Ethernet gateway function

It allows to read data from a group of DMGs connected together in a RS485 network, using one Ethernet port.

### Storage module with clock calendar

It provides for data logging of the measurement trends and storing events and alarms with time and date entry.

### Energy Quality (EN 50160) module

It permits to control the energy quality to EN 50160 normative, storing events (micro breakings, voltage dips, etc.) with time and date entry.



## High expandability

The EXP expansion modules are common to all the flush-mount models and transducer. The fitting on the multimeters is done with no need of tools and the connection is made with plug-in connectors.



MAX 4

CLICK

# multimeters and power analyzers

## Front panel mounting ease



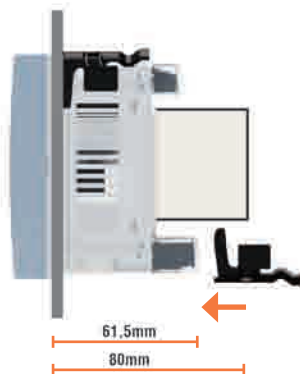
The mounting on and removal from the panel door are done with no need of tools. A special fixing system provides a quick and immediate operation during both installation and removal of the device from the panel front.

## Programmable alarms with Boolean logic

## Temperature detection



The analog input provides for the temperature measurement by sensors, e.g. PT100.



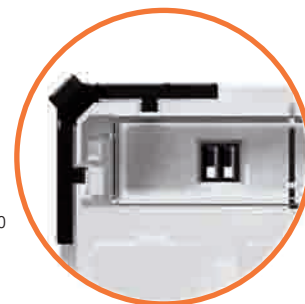
## Low-profile housing

DMG 700, DMG 800 and DMG 900 types are only 60mm deep (61.5mm with the terminals covers in place). With the expansion modules mounted, this becomes 80mm.

## Safety



Being equipped with sealable switches, the models can have set-up and clearing locks. To avoid connection tampering, sealable terminal covers are also available.



## MEASUREMENTS TRANSDUCER



**DMG 900T:** 590 measured electrical quantities, expandable, DIN rail fixing.

## REMOTE DISPLAY UNIT

96x96mm

IP65

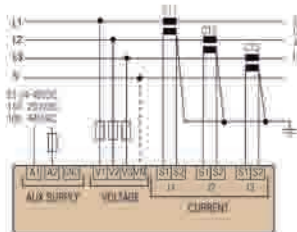


**DMG 900RD:** Remote terminal for viewing electrical quantities measured by the DMG 900T transducer.



## Wiring diagrams

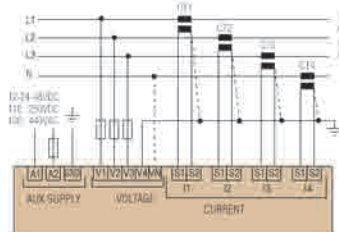
DMG 700 - DMG 800



Types of connections:

- Single-phase
- Two-phase
- Three-phase with or without neutral
- Three-phase without neutral, ARON connection
- Balanced three-phase, with or without neutral.

DMG 900 - DMG 900T



Types of connections:

- Single-phase
- Two-phase
- Two-phase with neutral, measurement of neutral current and neutral-earth voltage
- Three-phase with or without neutral
- Three-phase without neutral, ARON connection
- Balanced three-phase, with or without neutral
- Three-phase with neutral, measurements of neutral-current and neutral-earth voltage.

## Four voltage and current inputs

The DMG 900 and DMG 900T types can also provide measurements of neutral current and neutral-earth voltage.

# DMG Series

## Communications

The DMG instruments provide for communications using the following interface: Ethernet, USB, RS232, RS485 and Fieldbus (Modbus®, Profibus, etc.).



## Page customising

The user can freely define by selecting information and measurements to view on the display.



## Software

The new DMG series digital multimeters are compatible with the DMK SW and DMK SW 10 remote control software, already used with the DMK series multimeters.

### DMK SW

The remote control software is capable of supervising up to 64 digital multimeters connected on one single bus.

### DMK SW 10

It includes a data-logger supervision software and the DMK SW remote control software.



### 2 configurable password levels



The pages with the measurements can be freely consulted while the pages with parameter settings and commands are locked with 2 access levels:

- User
- Installer.

### Wiring test



- The wiring test allows to check if the multimeter installation has been carried out correctl.

- The test permits to check the following points:
  - ✓ Reading of the three voltages
  - ✓ Reading of the three currents
  - ✓ Phase sequence
  - ✓ Voltage imbalance
  - ✓ Polarity reversal of one or more CTs
  - ✓ Phase swap between voltage/current.

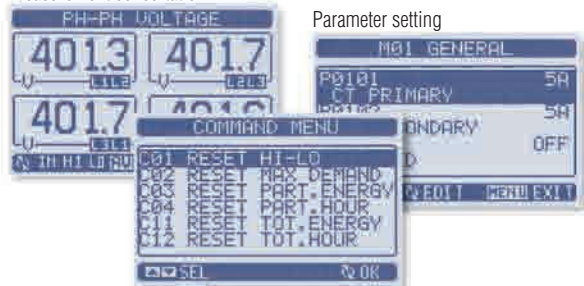
## Graphic LCD screen

White backlight with adjustment intensity.

### 5-language texts facilitate:

Measurement consultation

Parameter setting

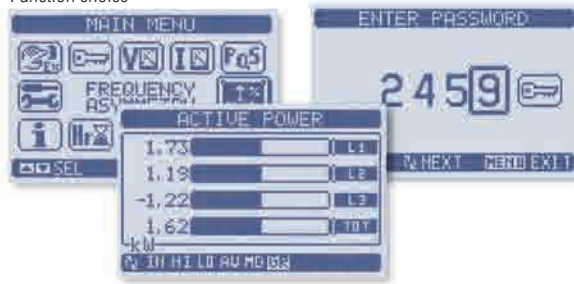


Receiving operator's messages

### Graphic symbology:

Function choice

Access status

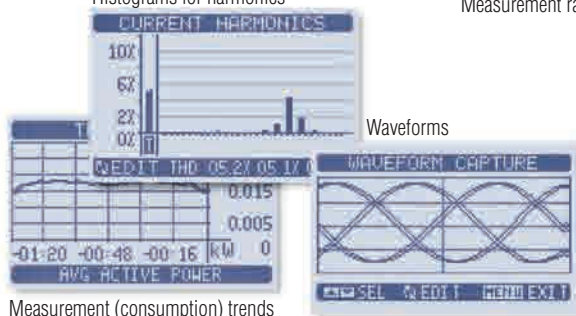


Measurement range

### Various types of graphs

Histograms for harmonics

Waveforms



Measurement (consumption) trends

### High display temperature range



-20 +60°C

## Main parameters and measurement inputs



SINGE, TWO, THREE-PHASE INSTRUMENTS WITH OR WITHOUT NEUTRAL	Digital multimeters			Digital multimeters		Power analyzers	
	DMG 200	DMG 210	DMG 300	DMG 700	DMG 800	DMG 900	DMG 900T
Voltage (phase, phase-to-phase and system values)	•	•	•	•	•	•	•
Neutral-earth voltage						•	•
Phase current values (actual neutral current)	•	•	•	•	•	•	•
Phase current values						•	•
Cosφ for each phase						•	•
Frequency	•	•	•	•	•	•	•
Maximum and minimum value function (HIGH / LOW) for reading and storage of peak voltage, current, power, PF and frequency values	•	•	•	•	•	•	•
Voltage and current asymmetry	•	•	•	•	•	•	•
Total harmonic distortion (THD) of voltage and current values	•	•	•	•	•	•	•
Averaging function	•	•	•	•	•	•	•
Peak values (maximum demand) of power and current	•	•	•	•	•	•	•
Hour counter (programmable total and partial)	•	•	•	•	•	•	•
Harmonic analysis of voltage and current up to 31° order			•	•	•		
Harmonic analysis of voltage and current up to 63° order						•	•
Direction of harmonic power flow						•	•
Active, reactive, apparent, imported and exported energy meters (partial and total)	•	•	•	•	•	•	•
Pulse counter for general use (pulse count for consumption of water, gas, etc. with expansion module only)			•	•	•	•	•
Measurement inputs	3ph+N voltage, 690VAC max	•	•	•	•		
	3Ph+N+GND voltage, 690VAC max					•	•
	3ph current, CT /5A	•	•	•			
	3ph current, CT /5A or /1A		•	•			
	3ph +N current, CT /5A or /1A					•	•

## Expandability



	Digital multimeters			Digital multimeters		Power analyzers	
	DMG 200	DMG 210	DMG 300	DMG 700	DMG 800	DMG 900	DMG 900T
3 optic modules maximum			•				
4 plug-in modules maximum				•	•	•	•
Digital input/outputs			•	•	•	•	•
Analog inputs/outputs					•	•	•
RS232, RS485, USB communications			•	•	•	•	•
Ethernet and Profibus-DP communications			•		•	•	•
Event storage with clock calendar (RTC)			•	•	•		
Event storage and data logger + clock calendar (RTC)						•	•
Energy Quality (EN 50160) analysis						•	•
RS485 built-in interface		•					



# OTHER DIGITAL MULTIMETERS

## DMK SERIES



**FLUSH MOUNT**  
96x48mm

**DESCRIPTION**

**MODULAR**  
3-module

<b>DMK 00</b>	Digital single-phase voltmeter	<b>DMK 80</b>
<b>DMK 00 R1</b>	Digital single-phase voltmeter with programmable relay output	<b>DMK 80 R1</b>
<b>DMK 01</b>	Digital single-phase ammeter	<b>DMK 81</b>
<b>DMK 01 R1</b>	Digital single-phase ammeter with programmable relay output	<b>DMK 81 R1</b>
<b>DMK 02</b>	Digital single-phase voltmeter or ammeter	<b>DMK 82</b>
<b>DMK 03</b>	Digital frequency meter	<b>DMK 83</b>
<b>DMK 03 R1</b>	Digital frequency meter with programmable relay output	<b>DMK 83 R1</b>
<b>DMK 04</b>	Digital single-phase cosphi meter	<b>DMK 84</b>
<b>DMK 04 R1</b>	Digital single-phase cosphi meter with programmable relay output	<b>DMK 84 R1</b>
<b>DMK 10</b>	Digital three-phase voltmeter	<b>DMK 70</b>
<b>DMK 10 R1</b>	Digital three-phase voltmeter with programmable relay output	<b>DMK 70 R1</b>
<b>DMK 11</b>	Digital three-phase ammeter	<b>DMK 71</b>
<b>DMK 11 R1</b>	Digital three-phase ammeter with programmable relay output	<b>DMK 71 R1</b>
<b>DMK 15</b>	Digital single-phase voltmeter, ammeter and wattmeter	<b>DMK 75</b>
<b>DMK 15 R1</b>	Digital single-phase voltmeter, ammeter and wattmeter, with programmable relay output	<b>DMK 75 R1</b>
<b>DMK 16</b>	Digital mini multimeter, 72 electrical quantities	-
<b>DMK 16 R1</b>	Digital mini multimeter, 72 electrical quantities with programmable relay output	-



**FLUSH MOUNT**  
96x96mm

**DESCRIPTION**

**MODULAR**  
6-module

<b>DMK 20</b>	47 electrical quantities	<b>DMK 50</b>
<b>DMK 21</b>	47 electrical quantities with energy meters	<b>DMK 51</b>
<b>DMK 22</b>	47 electrical quantities with energy meters and RS485 port	<b>DMK 52</b>
<b>DMK 25</b>	47 electrical quantities, 12-24VDC power supply	-
<b>DMK 26</b>	47 electrical quantities, 12-24VDC power supply, with power measurements	-
<b>DMK 30</b>	251 electrical quantities	<b>DMK 60</b>
<b>DMK 31</b>	251 electrical quantities with programmable outputs	<b>DMK 61</b>
<b>DMK 32</b>	251 electrical quantities with programmable outputs and opto-isolated RS48 port	<b>DMK 62</b>
<b>DMK 32 D048</b>	251 electrical quantities, 12-48VDC power supply, with programmable outputs and opto-isolated RS48 port	-
<b>DMK 40</b>	251 electrical quantities with data logger, RS485 and RS232 ports	-



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## 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
- ✓ Display of voltage and current harmonics up to the 15th order
- ✓ 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
- Display of voltage and current harmonics up to the 15th order
- 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.

**Lovato**  
**electric**

# 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
- Help messages for the user
- Description of 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

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.

Unit of measure

Measurement value

Type of measurement

Flashing icon for alarms

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

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



## ● 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.

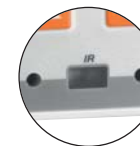
The expansion modules shared with other devices lighten the costs of management

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.



## ● Optical port

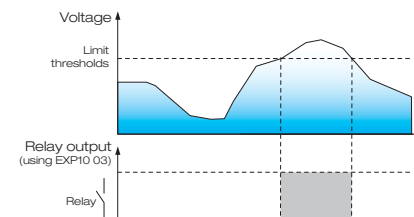
DMG 600 and DMG 610 are equipped with a front optical port to support programming through CX 01 and to use the functionality of CX 02 Wi-Fi dongle.

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 and protection functions

On all available measurements, the user can set up to 8 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.



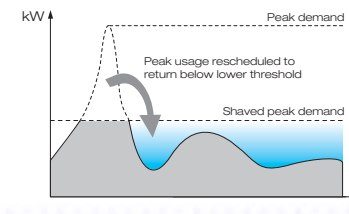
Adding the EXP1003 expansion module to the DMG600-610 provides protection relay functions:

- Broad range of protection functions (maximum or minimum voltage, current, frequency, or power, ...)
- Relay activation (NC or NO logic) on a specific protection or on all at once
- Includes 2 changeover relays, independently configurable with different protection functions
- Protection functions activated by digital inputs.

## ● 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.



## ● 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.



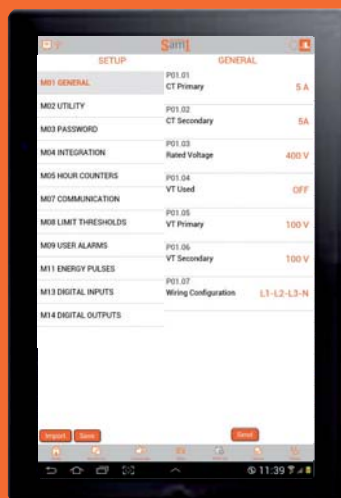
Google play



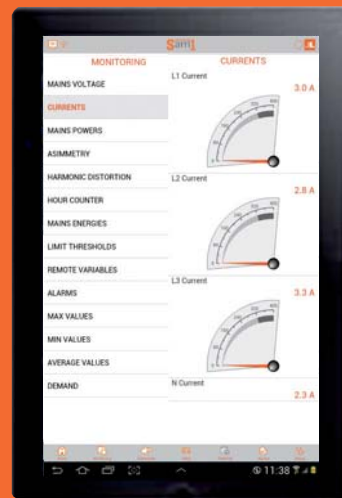
iTunes



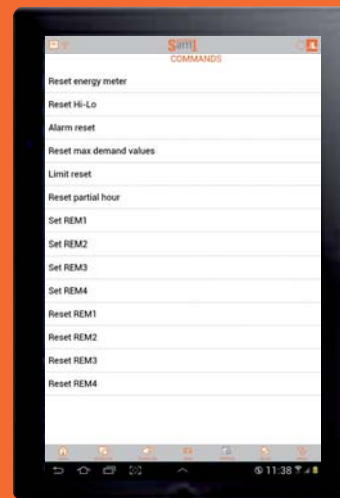
PARAMETER SETTING



MEASUREMENT VIEWING



SEND COMMANDS



ALARM VIEWING



## ● Xpress configuration and remote control software



provides for:

- Transfer parameter settings from PC to DMG 110 and vice-versa
- Read measurements
- Display events and alarms
- Send commands.

## ● Synergy energy management software

to supervise and control (via Web server) the electrical parameters measured by LOVATO Electric devices with a communication port.

In addition to providing datalogs and simple, user-configured Web pages, it can also be used to:

- Configure alarms (for sending by email)
- Make and view trend graphs
- Send commands to devices
- Energy usage by time slots.



# 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: IP54 on front; 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



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