




Digital multimeters and power analyzers DMG series




electric
100% electricity

DMG

DIGITAL MULTIMETERS AND POWER ANALYZERS

*with backlight 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 measurement, high measurement accuracy of electrical parameters 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 MEASUREMENT 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-modules	•	•	•				
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 electrical parameters	>160	>160	>344	>160	>344	>590	>590
THD (Total Harmonic Distortion) measurement	•	•	•	•	•	•	•
Detail harmonic analysis			•		•	•	•

Certifications obtained: GOST, cULus.

Comply with standards: IEC/EN61010-1, IEC/EN61000-6-2, IEC/EN61000-6-3, UL 508, CSA C.22.2 n° 14.

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: 20-830VAC L-L
- Current measurement range: 0.01-6A
- Frequency measurement range: 45-66Hz.

▶ Accuracy



DMG 200 and DMG 210

- Voltage: $\pm 0.5\%$ (50-830VAC)
- Current: $\pm 0.5\%$ (0.1-1.2 In)
- Power: $\pm 1\%$
- Active energy: Class 1 (IEC/EN 62053-21)
- Reactive energy: Class 2 (IEC/EN 62053-23).

DMG 300

- Voltage: $\pm 0.2\%$ (50-830VAC)
- Current: $\pm 0.2\%$ (0.1-1.2 In)
- Power: $\pm 0.5\%$
- Active energy: Class 0.5S (IEC/EN 62053-21)
- Reactive energy: Class 2 (IEC/EN 62053-23).

▶ USB connection



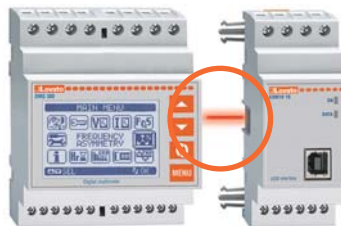
The PC for programming and data download takes place in a fast and easy way using the USB port, available on the EXM 10 10 expansion module.

▶ Ethernet connection

The EXM 10 13 expansion module allows the DMG 300 multimeter to be connected in a common Ethernet 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 beam. 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



▶ Maximum of 3 expansion modules

Up to 3 EXM... expansion modules can be fitted on a DMG 300 and permit to:

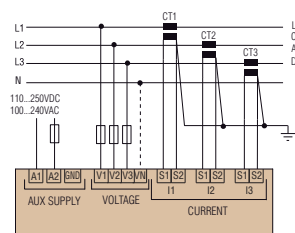
- Communicate
- Control alarms, pulses and tariffs
- Store events with time stamp.

DMG 200: More than 160 measured electrical parameters.

DMG 210: More than 160 measured electrical parameters, with RS485 interface

DMG 300: More than 344 measured electrical parameters, expandable.

▶ Wiring diagrams



Type 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 clock calendar (RTC) for events.



MAX
3

CLICK

Flush-mount expandable digital m

▶ Wide range of operation



- Auxiliary power supply: 100-40VAC/110-250VDC
- Maximum measured rated voltage: 690VAC L-L (600VAC UL/CSA rating)
- Input current with CT: 5A only for DMG 700; 5A or 1A for DMG 800/900/900T
- Voltage measurement range: 20...830V L-L; 10...480V L-N
- Current measurement range for 5A full scale: 0.01-6A for DMG 700/800; 0.01-10A for DMG 900/900T
- Current measurement range for 1A full scale: 0.01-1.2A
- Frequency measurement range: 45-66Hz for all type; also 360-440Hz for DMG 900/900T.

▶ Wide range of voltage measurement 20...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: $\pm 0.5\%$ (0.1-1.2 In)
- Power: $\pm 1\%$
- Active energy: Class 1 (IEC/EN 62053-21)
- Reactive energy: Class 2 (IEC/EN 62053-23).

DMG 800, DMG 900 and DMG 900T

- Voltage: $\pm 0.2\%$ (50-830VAC)
- Current: $\pm 0.2\%$ (0.1-1.2 In)
- Power: $\pm 0.5\%$
- Active energy: Class 0.5S (IEC/EN 62053-21)
- Reactive energy: Class 2 (IEC/EN 62053-23).

▶ DC version



DMG 800/900/900T models are also available with 12-24-48VDC.

▶ Multiple energy metering with tariff function



More than 20 partial energy meters, clearable.

DIGITAL MULTIMETER

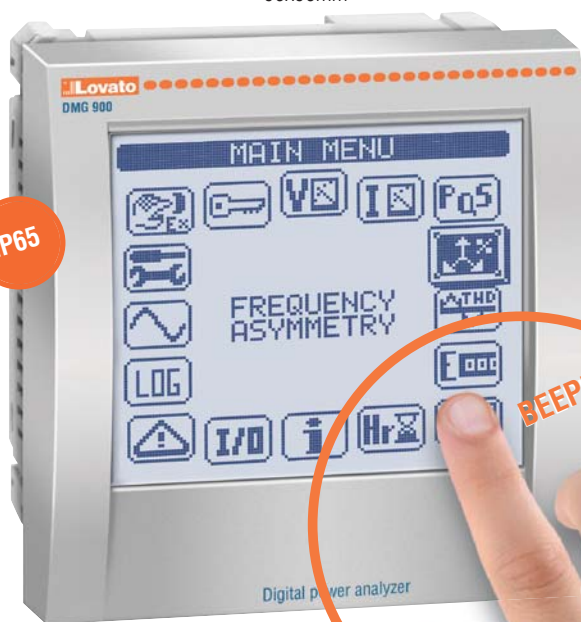
96x96mm



IP54

DIGITAL POWER ANALYZER

96x96mm



IP65

DMG 700: More than 160 measured electrical parameters, expandable.
DMG 800: More than 344 measured electrical parameters, expandable.

DMG 900: More than 590 measured electrical parameters, expandable.

▶ Expansion modules

These DMGs 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 clock calendar (RTC) for events and data logging
- Data storage with clock calendar (RTC) for events, data logging with Energy Quality.

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 stamp.

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 stamp.

▶ 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 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 device installation and removal 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 included.



MEASUREMENT TRANSDUCER

REMOTE DISPLAY UNIT

96x96mm



DMG 900T: More than 590 measured electrical parameters expandable, DIN rail fixing.

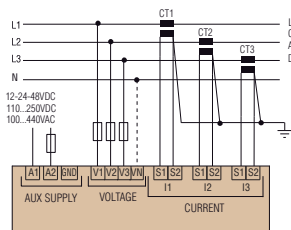


DMG 900RD: Remote terminal for viewing electrical parameters measured by the DMG 900T transducer.



▶ Wiring diagrams

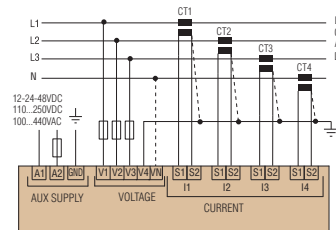
DMG 700 - DMG 800



Type 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



Type 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.

▶ Five voltage and four 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 250 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 page 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

C16 WIRING TEST	
VOLTAGE	PASS
CURRENT	PASS
PHASE SEQ.	PASS
VOLTAGE UNB.	PASS
REVERSE CT	PASS
PHASE MATCH	PASS
MENU EXIT	

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

- 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 intensity adjustment.

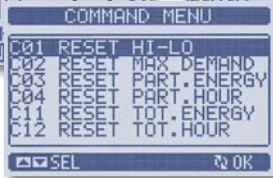
5-language texts facilitate:

Measurement consultation



Executing commands

Parameter setting



Graphic symbology:

Function choice



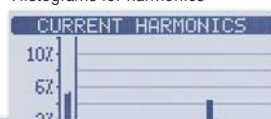
Access status



Measurement range

Various types of graphs:

Histograms for harmonics



Waveforms



Measurement (consumption) trends

Extensive temperature range display



-20 +60°C

Main parameters and measurement inputs

SINGLE, 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	•	•	•	•	•	•	•
Phase current values (actual neutral current)						•	•
Power Factor (PF)	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•
Averaging function	•	•	•	•	•	•	•
Peak values (maximum demand) of power and current	•	•	•	•	•	•	•
Hour counter (programmable total and partial)	•	•	•	•	•	•	•
Total Harmonic Distortion (THD) of voltage and current values	•	•	•	•	•	•	•
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					•	•
Event storage						•	•

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 inputs/outputs			•	•	•	•	•
Analog inputs/outputs					•	•	•
RS232, RS485, USB communications			•	•	•	•	•
Ethernet communications			•		•	•	•
Profibus-DP communications					•	•	•
Data logger + clock calendar (RTC)			•		•	•	•
Energy Quality (EN 50160) analysis						•	•
RS485 built-in interface		•					

HOW TO ORDER



DMG 200
DMG 210
DMG 300



EXM...

MODULAR DIGITAL MULTIMETER

DMG 200	Graphic 128x80 pixel LCD multimeter, 100-240VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 200 L01	Graphic 128x80 pixel LCD multimeter, 100-240VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian
DMG 210	Graphic 128x80 pixel LCD multimeter, RS485 port included, 100-240VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 210 L01	Graphic 128x80 pixel LCD multimeter, RS485 port included, 100-240VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian
DMG 300	Graphic 128x80 pixel LCD multimeter, harmonic analysis, expandable, 100-240VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 300 L01	Graphic 128x80 pixel LCD multimeter, harmonic analysis, expandable, 100-240VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian

Expansion modules for DMG 300...

EXM 10 00	2 digital outputs and 2 static outputs, opto-isolated
EXM 10 01	2 opto-isolated digital inputs and 2 output relays rated 5A 250VAC
EXM 10 10	Opto-isolated USB interface
EXM 10 11	Opto-isolated RS232 interface
EXM 10 12	Opto-isolated RS485 interface
EXM 10 13	Opto-isolated Ethernet interface
EXM 10 20	Opto-isolated RS485 interface and 2 output relays rated 5A 250VAC
EXM 10 30	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

DMG 700	Graphic 128x80 pixel LCD multimeter, 100-440VAC / 110-250VDC multi language Italian, English, French, Spanish and Portuguese
DMG 700 L01	Graphic 128x80 pixel LCD multimeter, 100-440VAC / 110-250VDC multi language English, German, Czech, Polish and Russian
DMG 800	Graphic 128x80 pixel LCD multimeter, harmonic analysis, 100-440VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 800 L01	Graphic 128x80 pixel LCD multimeter, harmonic analysis, 100-440VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian
DMG 800 D048	Graphic 128x80 pixel LCD multimeter, harmonic analysis, 12-24-48VDC
DMG 900	Graphic 128x112 pixel touch screen LCD multimeter, harmonic analysis 100-440VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 900 L01	Graphic 128x112 pixel touch screen LCD multimeter, harmonic analysis 100-440VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian
DMG 900 D048	Graphic 128x112 pixel touch screen LCD multimeter, harmonic analysis, 12-24-48VDC
DMG 900T	Measurement transducer, harmonic analysis, 4 V/I channels 100-440VAC / 110-250VDC, multi language Italian, English, French, Spanish and Portuguese
DMG 900T L01	Measurement transducer, harmonic analysis, 4 V/I channels 100-440VAC / 110-250VDC, multi language English, German, Czech, Polish and Russian
DMG 900T D048	Measurement transducer, harmonic analysis, 4 V/I channels 12-24-48VDC
DMG 900RD	Graphic 128x112 pixel touch screen LCD remote display unit, with 3m long connecting cable

Moduli di espansione per DMG 700, DMG 800, DMG 900 e DMG 900T

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

SOFTWARE AND ACCESSORIES

DMK SW	Remote control software for PC - DMG 210/300/700/800/900/900T, complete with 51 C4 connecting cable
DMK SW 10	Data-logger software for DMG 300/800/900/900T, complete with 51 C2 connecting cable; includes DMK SW software
51 C2	PC - multimeter RS232 connecting cable (1.8m)
51 C4	PC - 4 PX1 converter connecting cable (1.8m)
51 C5	Analog modem - multimeter RS232 connecting cable (1.8m)
51 C9	Analog modem - 4 PX1 converter connecting cable (1.8m)
4 PX1	RS232/RS485 converter drive 220-240VAC ①
EXM 80 04	Sealable set of terminal covers for DMG 200, DMG 210 and DMG 300



4 PX1

① 110-120VAC on request.

www.LovatoElectric.com

LOVATO ELECTRIC S.P.A.
CONTROL SOLUTION FOR INDUSTRY
VIA DON E. MAZZA, 12 - 24020 GORLE (BERGAMO) ITALY
Tel. +39 035 4282111 Fax +39 035 4282200
E-mail: info@LovatoElectric.com

Sales department Tel. +39 035 4282354 - Fax +39 035 4282400

LOVATO Electric offices in the world

United Kingdom
LOVATO ELECTRIC LTD
Tel. +44 8458 110023
www.Lovato.co.uk

Czech Republic
LOVATO SPOL. S.R.O.
Tel. +420 226 203203
www.LovatoElectric.cz

Germany
DELTEC LOVATO GmbH
Tel. +49 7237 1733
www.DeltecLovato.de

USA
LOVATO ELECTRIC INC
Tel. +1 757 545 4700
www.LovatoUsa.com

Spain
LOVATO ELECTRIC S.L.U.
Tel. +34 93 7812016
www.LovatoElectric.es

Canada
LOVATO ELECTRIC
CORPORATION
Tel. +1 450 681 9200
www.Lovato.ca

Poland
LOVATO ELECTRIC SP. Z O.O.
Tel. +48 71 7979010
www.LovatoElectric.pl

Mexico
LOVATO ELECTRIC
DE MEXICO, S.A. DE C.V.
Tel. +52 555 3415662
www.LovatoElectric.com.mx



Present in over 100 countries