

# DIGITAL METERING INSTRUMENTS



DMG SERIES

  
**electric**

ENERGY AND AUTOMATION

# series DMG



## Digital metering instruments |

For the control of energy distribution system detecting when problems occur that could put the quality and availability of electricity at risk.

The wide range and high expandability facilitates the choice of the most suitable product in relation to actual or future measurement needs offering a perfect technical and economical solution.



## MEASURE SETS

- voltage (phase-phase, phase-neutral and neutral-earth)
- supply voltage (DMG... D048 only)
- phase current
- neutral current (calculated and real)
- power (active, reactive and apparent phase and total power)
- P.F. (power factor per phase and total)
- $\cos\phi$  per phase
- active, reactive and apparent system energy
- frequency (frequency measure of measured voltage value)
- voltage and current asymmetry
- total harmonic distortion (THD) of voltage and current
- harmonic analysis of voltage and current up to the 63<sup>rd</sup> order
- maximum (HIGH), minimum (LOW) and medium (AVERAGE) functions for all measurements
- peak values (maximum demand) of power and current
- active power asymmetry
- meters for active, reactive, apparent partial and total energy with programmable tariff functions
- hour counter for programmable total and partial hours
- pulse counter for general use (pulse count for consumption of water, gas, etc. with expansion module only)
- energy quality analysis to EN 50160 Class B (with expansion module).

## BOOLEAN LOGIC

Output activation according to logic combinations of states and alarms on measures

## WIDE RANGE OF VOLTAGE

Measurement voltage input up to 690VAC and auxiliary voltage input up to 440VAC

## COMMUNICATION

Modbus via USB, RS232 or RS485, Ethernet, Profibus

## EXPANDABILITY

Input/output and communication modules

## ROGOWSKI COILS

Kit composed by DMG 611 multimeter, 3 Rogowski coils with currents from 100A to 6300A and calibration report

**MAXIMUM FLEXIBILITY**  
of configuration and system upgrades

**HARMONIC ANALYSIS**  
Voltages and currents up to the 63° order

**ALARMS**  
with customizable texts

**CONFIGURATION WITHOUT OPENING THE ELECTRICAL PANEL**  
via USB or Wi-Fi through communication devices

**MANAGEMENT**  
of active power max demand



## SOFTWARE

### Synergy

Monitoring and energy efficiency software

### Xpress

Configuration and remote control software

Read energy efficiency brochure to find out more!  
Scan this QR code with your smartphone.



Energy Management



DMG

Visit [em.LovatoElectric.com](http://em.LovatoElectric.com)

## > Flush mount

96x96mm



	DMG 600	DMG 610	DMG 615	DMG 611	DMG 700	DMG 800	DMG 900	DMG 900T + DMG 900RD
Maximum rated voltage	600VAC	600VAC	600VAC	600VAC	690VAC	690VAC	690VAC	690VAC
Voltage and current measure accuracy	0.5%	0.5%	0.2%	0.2%	0.5%	0.2%	0.2%	0.2%
Active energy measure accuracy	Class 1	Class 1	Class 0.5s	Class 0.5s	Class 1	Class 0.5s	Class 0.5s	Class 0.5s
Single phase energy meter	■	■	■					
Harmonic analysis	15° order	15° order	15° order	31° order	THD only	31° order	63° order	63° order
Neutral-earth voltage								■
Neutral current	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated or measured via CT	Calculated or measured via CT
Boolean logic					■	■	■	■
Expandable with EXP... modules	1 module	1 module	1 module	1 module	4 modules	4 modules	4 modules	4 modules
Display type	Icons	Icons	Icons	Icons	Graphic	Graphic	Graphic	Graphic (DMG900RD)
Built-in communication port (Modbus)		RS485	RS485	RS485				RS485 or RS232 selectable
Communication port with EXP... modules	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 USB RS485 Ethernet	RS232/ RS485 USB Ethernet Profibus DP slave	RS232/ RS485 USB Ethernet Profibus DP slave GSM/GPRS	RS232/ RS485 USB Ethernet Profibus DP slave GSM/GPRS
Ethernet-RS485 gateway function						■	■	■
Energy quality according to EN 50160								■
Degree of protection	IP54	IP54	IP54	IP54	IP65	IP65	IP65	IP65 (DMG 900RD)
USB communication via CX 01	■	■	■	■				
Wi-Fi communication via CX 02	■	■	■	■				

## > Modular

4 modules



	DMG 100	DMG 110	DMG 200	DMG 210	DMG 300
Maximum rated voltage	600VAC	600VAC	690VAC	690VAC	690VAC
Voltage and current measure accuracy	0.5%	0.5%	0.5%	0.5%	0.2%
Active energy measure accuracy	Class 1	Class 1	Class 1	Class 1	Class 0.5s
Single phase energy meter	■	■			
Harmonic analysis	15° order	15° order	THD only	THD only	31° order
Boolean logic					■
Expandable with EXM... modules					3 modules
Display type	Icons	Icons	Graphic	Graphic	Graphic
Built-in communication port (Modbus)		Built-in RS485		Built-in RS485	
Communication port with EXM... modules					RS232 USB/RS485 Ethernet
Ethernet-RS485 gateway function					■

# > Rogowski

The DMG 611R... kits are multimeters that, by reading the current through Rogowski coils, are the ideal solution for the installation of measuring points on systems where the classic solid-core or split-core CTs are inapplicable or too expensive.

The included calibration report is specific to each individual kit to guarantee measurement accuracy.



■ **Measure kit:** DMG611 multimeter + 3 Rogowski coils

■ **Calibration report:** all kits are calibrated during the testing process and come with the relevant calibration report

■ **Integrated communication:** built-in RS485 with modbus RTU and ASCII protocols

■ **Expandability:** support of EXP modules (EXP1013 Ethernet module with modbus TCP protocol included)

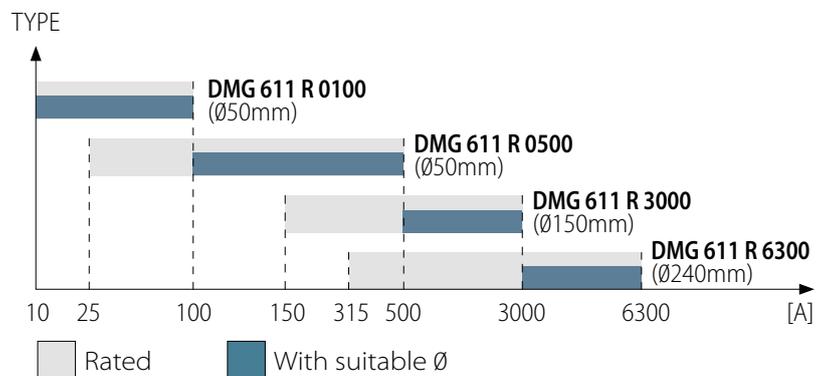
■ **Front optical port:** to support programming through CX 01 dongle and to use the functionality of CX 02 Wi-Fi dongle

■ **Safety:** it is not necessary to short the secondary before disconnecting the coil

## MEASUREMENTS

- voltage, current, frequency
- active, reactive and apparent power
- power factor
- high, low and average value for all measurements
- maximum demand of power and current values
- voltage and current asymmetry
- unbalancing active power
- total harmonic distortion (THD) and harmonic analysis of voltage and current up to the 15<sup>o</sup> order
- energy meters for active, reactive and apparent
- hour counter.

## SELECTION GUIDE



## OPERATIONAL CHARACTERISTICS

### VOLTAGE INPUTS

- auxiliary supply rated voltage: 100...440VAC/110...250VDC
- measurement range: 50...720VAC L-L

### CURRENT INPUTS

- maximum current I<sub>max</sub>: 100A, 500A, 3000A, 6300A
- measurement range: 10...100% I<sub>max</sub> (DMG 611 R0100) 5...100% I<sub>max</sub> (DMG 611 R0500...R6300)
- input type: Rogowski coils
- measure type: true RMS measurements (TRMS)

### MEASUREMENT ACCURACY

- current: ±0,5% (centered cable) ● ±1% (cable near the coil) ●
- voltage: ±0,5% (50...720VAC)
- active power: ±1%
- active energy: ±1%



### ROGOWSKI COILS CONNECTION

- type of terminals: removable, 2-level push-in

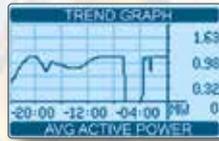
## CERTIFICATIONS AND COMPLIANCE

Certifications obtained: EAC.

Compliant with standards: IEC/EN 61010-1, IEC/EN 61010-2-030, IEC/EN 61000-6-2, IEC/EN 61000-6-3.

# MULTIMETERS DMG SERIES

## MONITORING



Power trend and energy consumption monitoring

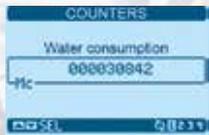
## NETWORK



Network quality verification

## INFORMATION

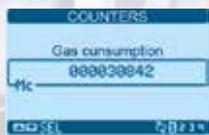
PT 100 temperature  
4-20mA 0-10V  
Impulse meter



Water

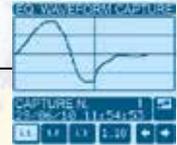


Pressure



Gas

## ANALYSIS



Energy quality analysis according to EN50160



## ALARMS



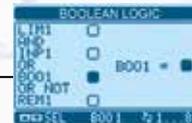
## COMMUNICATION

Modbus RTU communication via USB, RS232, RS485, Modbus TCP, profibus DP slave



## CONTROL AND DIAGNOSTIC

## COMBINATION



## Modular multimeter, non expandable



Order codes	Description
	Icon LCD, auxiliary supply 100...240VAC/120...250VDC. Multilanguage: english, italian, french, spanish, portuguese and german
<b>DMG 100</b>	Harmonic analysis
<b>DMG 110</b>	Harmonic analysis, built-in RS485 port
	Graphic LCD display 128x80 pixel, auxiliary supply 100...240VAC/110...250VDC. Multilanguage: english, italian, french, spanish and portuguese
<b>DMG 200 ①</b>	THD
<b>DMG 210 ①</b>	THD, built-in RS485 port

## Modular multimeter, expandable



Order codes	Description
<b>DMG 300 ①</b>	Graphic LCD display 128x80 pixel, harmonic analysis, auxiliary supply 100...240VAC/110...250VDC, expandable with modules EXM... series. Multilanguage: english, italian, french, spanish and portuguese

## Flush mount multimeters, expandable



Order codes	Description
	Backlight icon LCD display 72x46mm, auxiliary supply 100...440VAC/120...250VDC
<b>DMG 600</b>	Armonic analysis, front optical port
<b>DMG 610</b>	Armonic analysis, front optical port, built-in RS485 port
<b>DMG 615</b>	<b>High accuracy measuring of active energy with Class 0,5s.</b> Armonic analysis, front optical port, built-in RS485 port
	Graphic LCD display 128x80 pixel, auxiliary supply 100...440VAC/110...250VDC
<b>DMG 700 ①</b>	THD
<b>DMG 800 ①②</b>	Harmonic analysis

## Multimeter with Rogowski coils, expandable



Order codes	Description
	Backlight icon LCD display, armonic analysis, auxiliary supply 100...240VAC/110...250VDC, built-in RS485 port. Current reading through 3 Rogowski coils included. 2mt cable length.
<b>DMG 611 R 0100 ⑦</b>	Max current 100A. Ø50mm
<b>DMG 611 R 0500 ⑦</b>	Max current 500A. Ø50mm
<b>DMG 611 R 3000 ⑦</b>	Max current 3000A. Ø150mm
<b>DMG 611 R 6300 ⑦</b>	Max current 6300A. Ø240mm

## Communication devices for DMG6...



Order codes	Description
<b>CX 01</b>	USB dongle for PC ↔ DMG 6... connection, for programming, monitoring, diagnostics and firmware upgrade
<b>CX 02</b>	Wi-Fi dongle for PC ↔ DMG 6... connection, for programming, monitoring, diagnostics and cloning

## Accessories



**DM**  
Current transformers  
da 50A a 4000A



**EXC M4G 01**  
Modem/Router 4G



**EXC CON 01**  
RS485-Ethernet converter



**EXC GL A01**  
Gateway data logger

## Expansion modules for DMG 300



Order codes	Description
	Inputs and outputs.
<b>EXM10 00</b>	2 digital inputs and 2 static outputs, opto-isolated
<b>EXM10 01</b>	2 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
<b>EXM10 02</b>	4 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
	Communication ports.
<b>EXM10 10</b>	Opto-isolated USB interface
<b>EXM10 11</b>	Opto-isolated RS232 interface
<b>EXM10 12</b>	Opto-isolated RS485 interface
<b>EXM10 13</b>	Opto-isolated ethernet interface
<b>EXM10 20</b>	Opto-isolated RS485 interface and 2 relay outputs 5A 250VAC
<b>EXM10 30</b>	Data storage, RTC with backup battery for data logging

## Flush mount analyzers, expandable



Order codes	Description
<b>DMG 900 ①②</b>	Backlight graphic LCD display 128x112 pixel, touch-screen, harmonic analysis, 4 current channels (neutral measurement), 100...440VAC/110...250VDC. Multilanguage: english, italian, french, spanish and portuguese
<b>DMG 900T ②③</b>	Measurement transducer, harmonic analysis, 4 current channels (neutral measurement), 100...440VAC/110...250VDC, RS232 and RS485 ports
	Remote display for DMG 900T...
<b>DMG 900RD ④</b>	Backlight graphic LCD display 128x112 pixel, touch-screen, with 3m long connecting cable

## Expansion modules for flush mount multimeters and power analyzers



Order codes	Description
	Inputs and outputs.
<b>EXP10 00</b>	4 opto-isolated digital inputs
<b>EXP10 01</b>	4 opto-isolated static outputs
<b>EXP10 02</b>	2 digital inputs and 2 static outputs, opto-isolated
<b>EXP10 03</b>	2 relay outputs 5A 250VAC
<b>EXP10 04 ⑤</b>	2 opto-isolated analog inputs 0/4...20mA or PT100 or 0...10V or 0...±5V
<b>EXP10 05 ⑤</b>	2 opto-isolated analog outputs 0/4...20mA or 0...10V or 0...±5V
<b>EXP10 08</b>	2 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
	Communication ports.
<b>EXP10 10</b>	Opto-isolated USB interface
<b>EXP10 11</b>	Opto-isolated RS232 interface
<b>EXP10 12</b>	Opto-isolated RS485 interface
<b>EXP10 13</b>	Opto-isolated Ethernet interface
<b>EXP10 14 ⑥</b>	Opto-isolated Profibus-DP interface
<b>EXP10 15 ⑥</b>	GPRS/GSM modem, without antenna
<b>EXP10 30 ⑥</b>	Data storage, RTC with backup battery for data logging
<b>EXP10 31 ⑥</b>	Data storage, with Energy Quality (EN 50160 - class B), clock calendar (RTC) with backup battery for data logging

- ① For versions in english, czech, polish, german and russian add L01 after the code.
- ② For versions 12-24-48VDC auxiliary supply add D048 after the code.
- ③ No simultaneous operations of serial ports. Consult Technical Service for information (Tel. 035 4282422; E-mail: service@LovatoElectric.com) or the instructions manual.
- ④ Powered directly by DMG 900T; direct link to DMG 900T dedicated port.
- ⑤ Only for DMG 800/900.
- ⑥ Only for DMG 900.
- ⑦ Multilanguage: italian, english, french, spanish, portuguese, german.

# ■ DIGITAL METERING INSTRUMENTS



ENERGY AND AUTOMATION

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