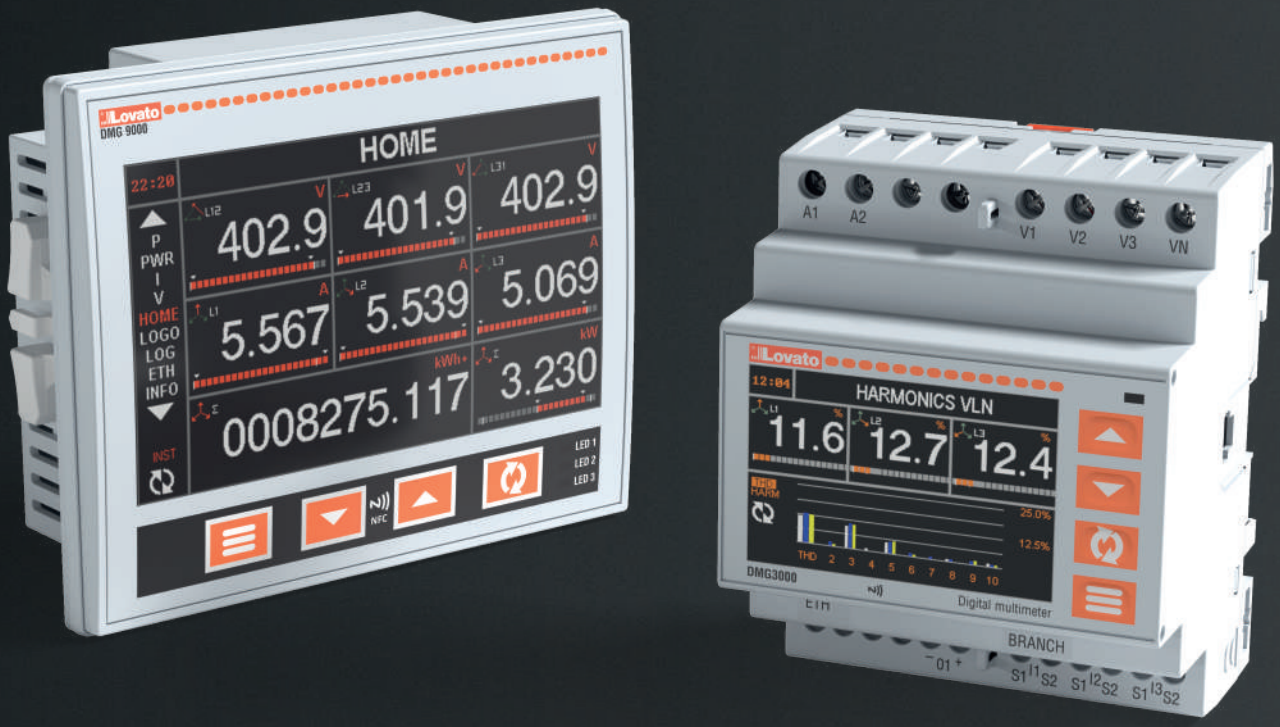
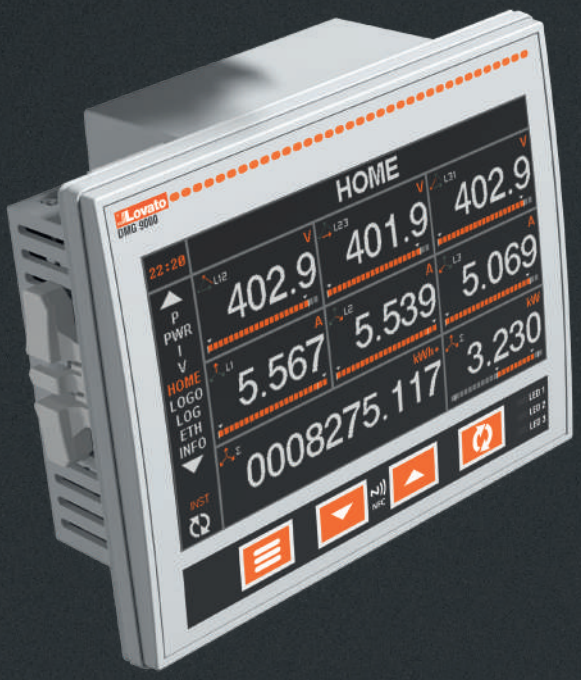
POWER ANALYZERS AND **DIGITAL MEASURING** INSTRUMENTS

DMG SERIES



Lovato electric

POWER **ANALYZERS** DMG SERIES



FLUSH-MOUNT OR **MODULAR** VERSIONS

WIDESCREEN COLOUR **LCD DISPLAY**

The large size of the colour LCD display allows for optimal viewing of measurements and parameters in a clear, simple and intuitive manner.

10 LANGUAGES

The language used can be selected from a wide range of options: English, Italian, French, German, Spanish, Portuguese, Polish, Russian, Czech and Chinese.

PROGRAMMABLE **LEDs**

The front LEDs are programmable and allow you to know the status of the device at any time: user programmed alarms, status of digital inputs or outputs, pulses indicating energy consumption, communication in progress.

NFC CONNECTIVITY

Thanks to NFC technology, it is possible to configure and modify parameters (even when the device is not powered) using the LOVATO NFC app, which can be downloaded free of charge from Google Play Store and App Store for Android and iOS smart devices.

PLC LOGIC

Thanks to the integrated PLC logic, the power analyzers can perform simple automations related to timers and status of alarms and digital inputs. **Ladder** programming is simple and intuitive thanks to the use of Xpress configuration software

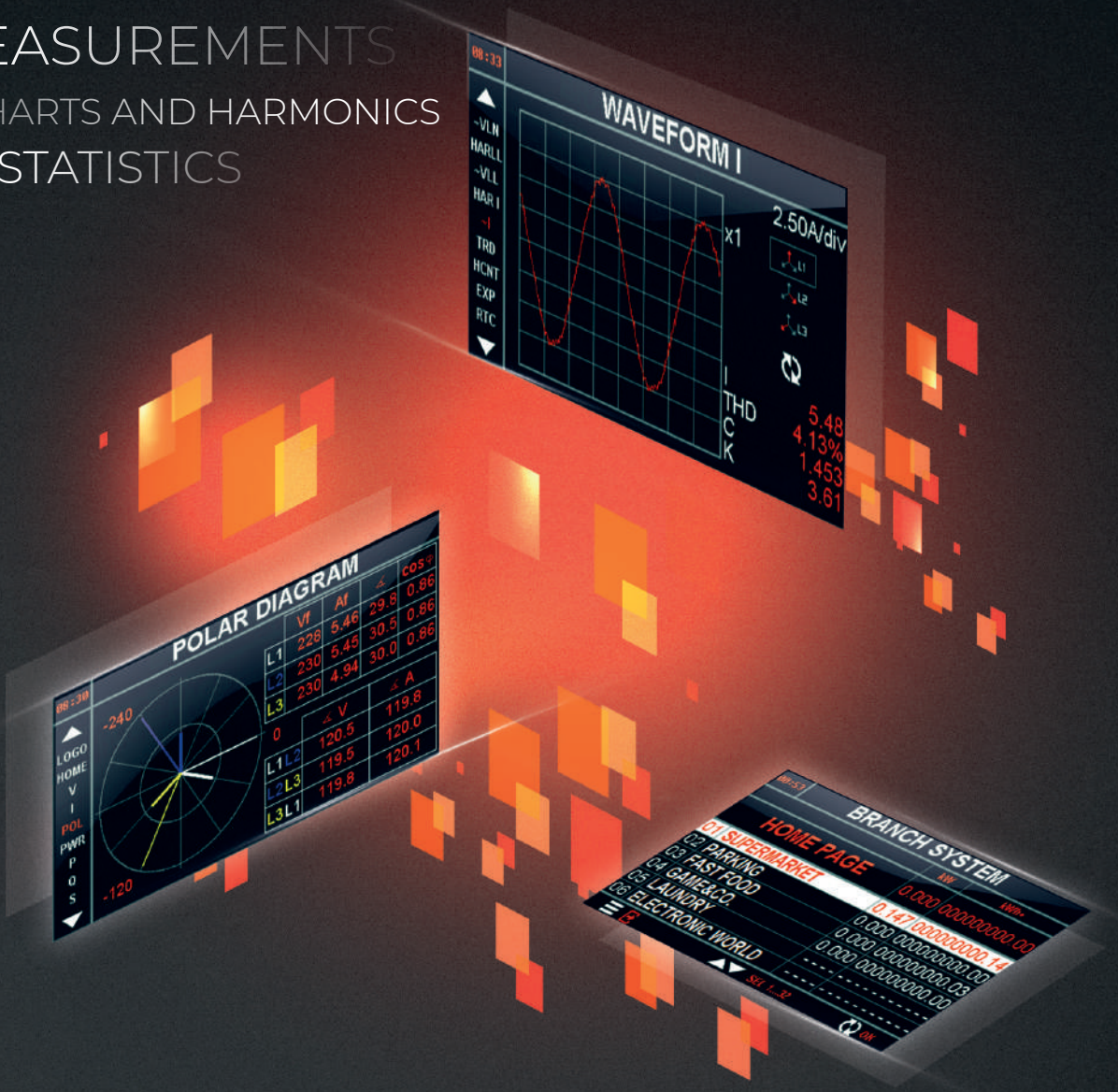
HIGH MEASUREMENT **ACCURACY**

Measurements are verified in accordance with internationally recognized standards for measuring instruments: IEC 62053-22 (class 0.5s), IEC 62053-24 (class 1) and IEC 61557-12.

MEASUREMENTS

CHARTS AND HARMONICS

STATISTICS



MEASUREMENTS

DMG power analyzers display all the measurements useful for a complete check of the electrical network. The voltage measurement input does not require external transformers **up to 600VAC.**

CHARTS AND HARMONICS

Electrical measurements are presented alongside waveform graphs, polar diagrams and harmonic spectrum representations **up to the 63rd order**, which are useful tools for better understanding the status of the system.

STATISTICS

The DMG9000, DMG3000 and DMG3011... models also provide statistics on the quality of the network in accordance with the standard **EN50160** (voltage dips, overvoltages, interruptions and much more) in class C.

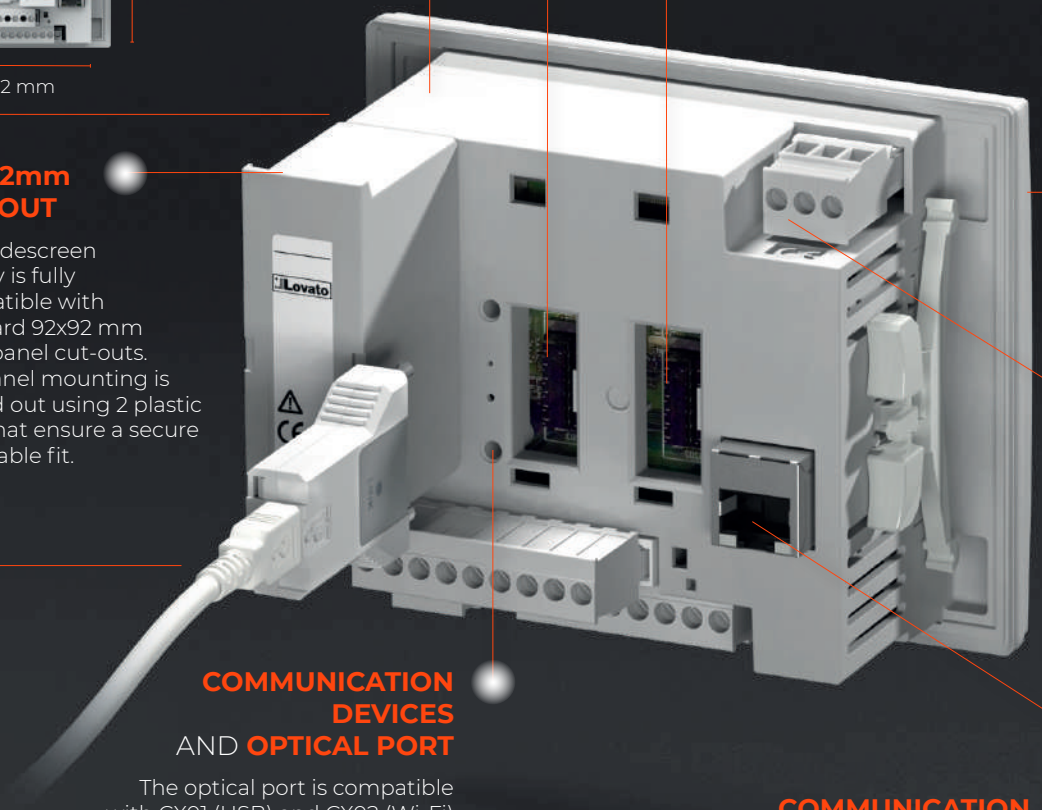
FLUSH-MOUNT POWER **ANALYZERS** DMG SERIES

EXPANDABILITY

Possibility to add **up to 3 expansion modules** EXP... series (inputs, outputs and additional communication ports).

92X92mm CUT-OUT

The widescreen display is fully compatible with standard 92x92 mm front panel cut-outs. The panel mounting is carried out using 2 plastic clips that ensure a secure and stable fit.



IP65 FRONT PROTECTION DEGREE

Ideal for use in harsh environments thanks to the seal supplied as standard.

COMMUNICATION DEVICES AND OPTICAL PORT

The optical port is compatible with CX01 (USB) and CX02 (Wi-Fi) communication devices which allow, thanks to the Xpress software, the configuration of parameters, the diagnostics of the electrical network and the firmware update of the power analyzer.

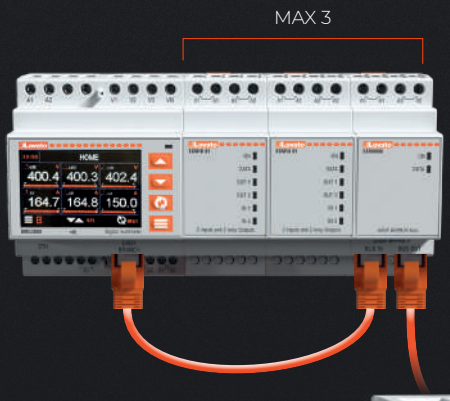
COMMUNICATION

Availability of models with built-in RS485 and Ethernet communication ports.

EASY BRANCH MULTI-CIRCUIT MEASUREMENT SYSTEM

Thanks to the EXS0000 bus module for the EASY BRANCH system and the EXS... modules, wiring can be simplified and greatly accelerated in panels where the electrical parameters of different loads need to be detected, drastically reducing costs and installation times.
Available for models DMG7500, DMG8000, DMG9000 and DMG9000D048.

MODULAR POWER **ANALYZERS** DMG SERIES



EXPANDABILITY

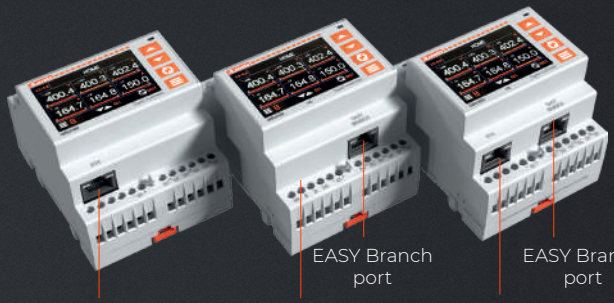
Up to 3 EXM... series expansion modules can be added, choosing from:
- digital inputs and outputs
- additional communication port
- EXM0000 module for connection to the EASY BRANCH multi-circuit measurement system.

MODULAR HOUSING

Ideal for installation in electrical panels and switchboards.
4 modules width (4U).

ROGOWSKI COILS

The DMG3011... models measure current using Rogowski coils, ideal for installing measuring points on systems where classic solutions with solid-core or split-core CTs are impractical or too expensive.



COMMUNICATION

Models available with integrated RS485 or Ethernet communication port.

EASY BRANCH MULTI-CIRCUIT MEASURING SYSTEM

Thanks to the EXM0000 bus module for the EASY BRANCH system and the EXS... modules, wiring can be simplified and greatly accelerated in panels where the electrical parameters of different loads need to be detected, drastically reducing installation costs and times.
Available for DMG2500, DMG3000 and DMG3011... models.

COMPARATIVE **TABLES**

Flush-mount power analyzers

	DMG7000	DMG7500	DMG8000	DMG9000
Integrated RS485 communication port	-	■	-	■
Integrated Ethernet port	-	-	■	■
Web server	-	-	■	■
Ethernet-RS485 gateway	+ EXP1013 + EXP1012	+ EXP1013	+ EXP1012	■
Memory for data collection	-	-	■	■
NFC connectivity for programming	■	■	■	■
Expandability	■	■	■	■
Network quality statistics according to EN50160	-	-	-	■
Neutral current measurement via dedicated CT	-	-	-	■
Neutral-earth voltage measurement	-	-	-	■
Compatibility with the EASY BRANCH measurement system	-	■	■	■

Modular power analyzers

	DMG2000	DMG2500	DMG3000	DMG3011...
Integrated RS485 communication port	-	■	-	-
Integrated Ethernet port	■	-	■	■
Web server	■	-	■	■
Ethernet-RS485 gateway	-	+EXM1013	+EXM1012	+EXM1012
Memory for data collection	-	-	■	■
NFC connectivity for programming	-	■	■	■
Expandability	-	■	■	■
Network quality statistics according to EN50160	-	-	■	■
Compatibility with the EASY BRANCH measurement system	-	■	■	■
Input for Rogowski coils	-	-	-	■

WEB SERVER function

All models equipped with a built-in Ethernet port (type DMG2000, DMG3000, DMG3011, DMG8000, DMG9000 and DMG9000D048) integrate the web server function for configuration and monitoring from a web browser.

SETTING OF ALL PARAMETERS

The programming of the parameters, as well as from the front panel, can also be done via the browser on a PC.
The integrated web server also allows the setting of the parameters of the EASY BRANCH multi-circuit measurement system, such as the descriptions of the individual measurement points.

INTEGRATED DATA MEMORY

A flash data memory allows historical data to be stored.
The integrated web server allows you to:

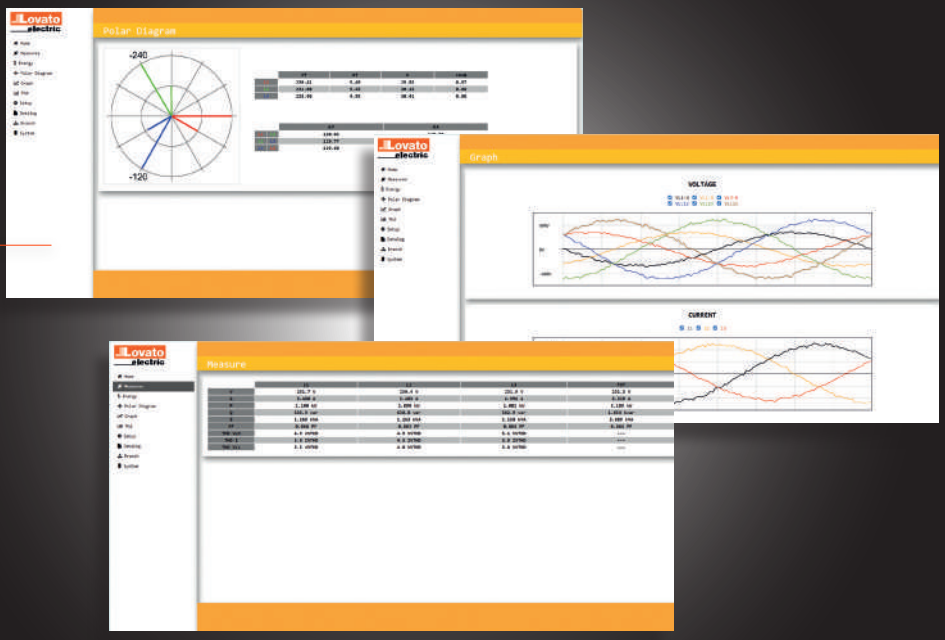
- select measurements (up to 128);
- set the sampling frequency;
- download the .CSV file with the acquired information.

For example, by sampling 20 measurements once per minute, it is possible to store 10 days of data.

Note. Data memory function not available for DMG2000.

MEASUREMENTS

Representation of the measured values through tables and charts.



EASY BRANCH POWER MONITORING SYSTEM / PLUG & PLAY

DMG7500 - 8000 - 9000

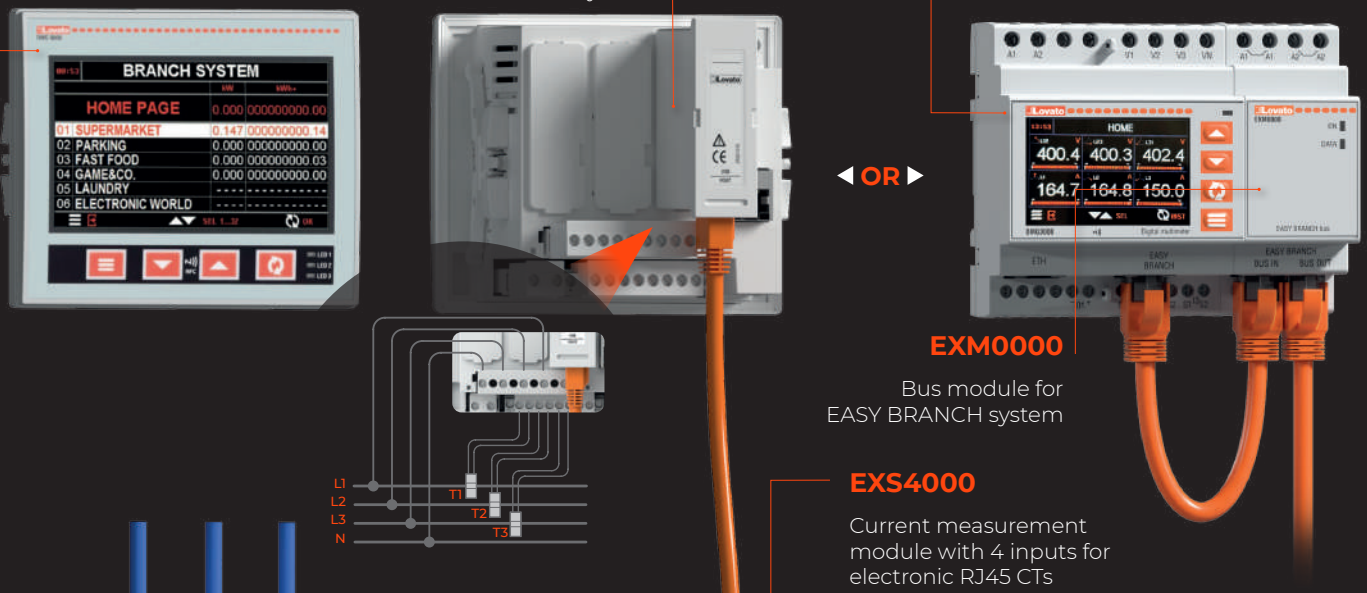
Flush-mount power analyzer

EXS0000

Bus module for EASY BRANCH system

DMG2500 - 3000 - 3011...

Modular power analyzer



◀ OR ▶

EXM0000

Bus module for EASY BRANCH system

EXS4000

Current measurement module with 4 inputs for electronic RJ45 CTs

CABLE

Standard Cat.6 Ethernet cable

EXS3125

Three-phase* 125A electronic current transformer with RJ45 cable (2m long)

EXS3080

Three-phase* 80A electronic current transformer with RJ45 cable (2m long)

EXS3063

Three-phase* 63A electronic current transformer with RJ45 cable (2m long)

EXS1080

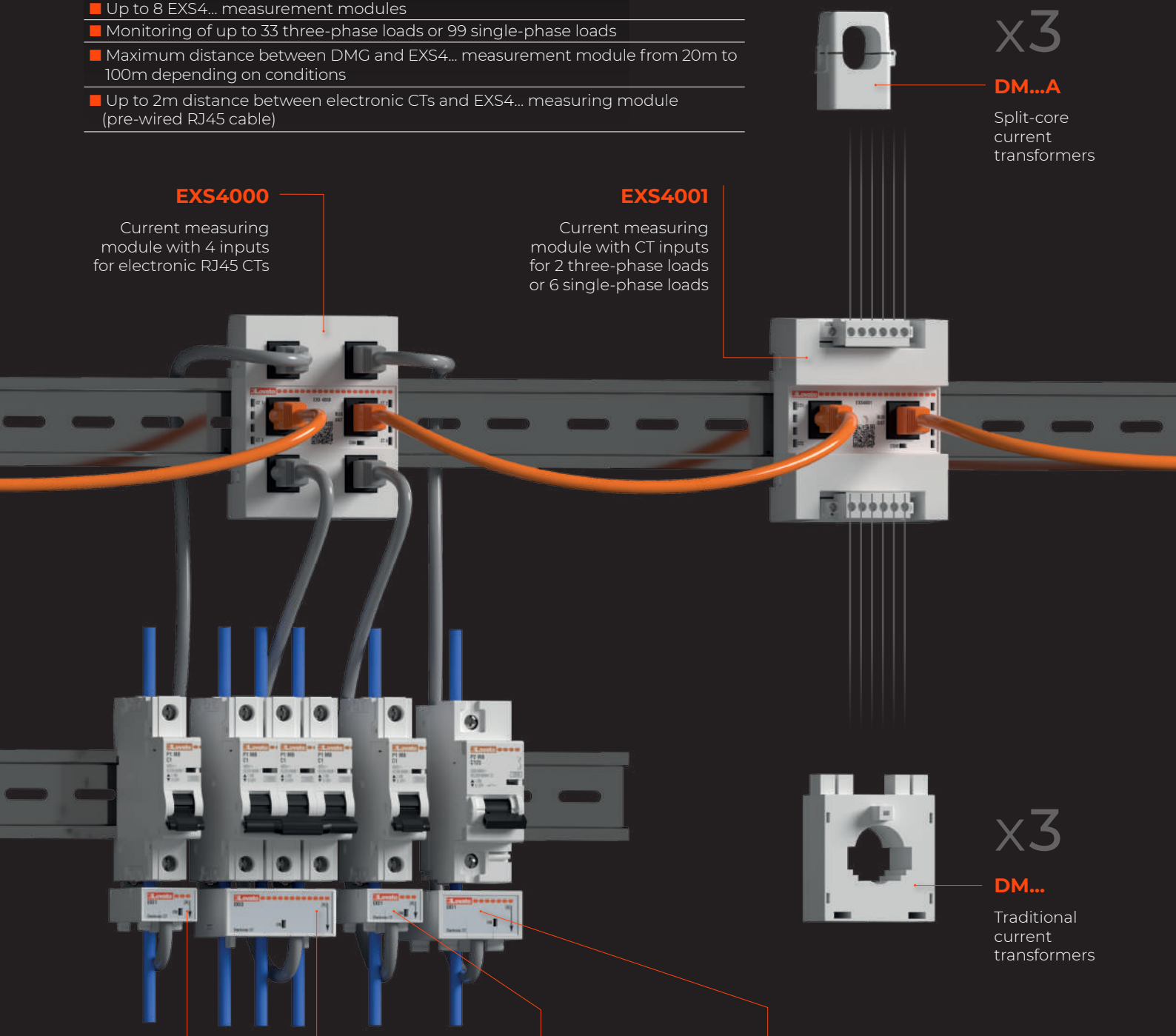
Single-phase 80A electronic current transformer with RJ45 cable (2m long)

* Three-phase electronic current transformers can also be configured as 3x single-phase electronic current transformers.

ONLY ONE **INSTRUMENT** FOR THE MONITORING OF **33 THREE-PHASE LOADS**

When it is necessary to monitor the parameters of multiple loads within an electrical panel, the **EASY BRANCH** multi-circuit measurement system is a more efficient and easier to install alternative to the traditional solution, which requires a separate instrument for each measurement point. Electrical distribution panels in shopping centres or production departments are ideal applications for installing **EASY BRANCH** system by LOVATO Electric.

- Up to 8 EXS4... measurement modules
- Monitoring of up to 33 three-phase loads or 99 single-phase loads
- Maximum distance between DMG and EXS4... measurement module from 20m to 100m depending on conditions
- Up to 2m distance between electronic CTs and EXS4... measuring module (pre-wired RJ45 cable)



x3

DM...A

Split-core current transformers

EXS4000

Current measuring module with 4 inputs for electronic RJ45 CTs

EXS4001

Current measuring module with CT inputs for 2 three-phase loads or 6 single-phase loads

x3

DM...

Traditional current transformers

EXS1063

Single-phase 63A electronic current transformer with RJ45 cable (2m long)

EXS3032

Three-phase* 32A electronic current transformer with RJ45 cable (2m long)

EXS1032

Single-phase 32A electronic current transformer with RJ45 cable (2m long)

EXS1125

Single-phase electronic current transformer 125A with RJ45 cable (2m)

System **components**

POWER ANALYZERS DMG7500, DMG8000, DMG9000, DMG2500, DMG3000, DMG3011...

They represent the heart of the system: they measure the electrical voltage in the panel and the input current, displaying the total measurements upstream of the distribution and the measurements of each individual monitored measurement point on their display. The electrical quantities can also be consulted via the integrated communication ports (RS485 or Ethernet).

BUS MODULE EXS0000 or EXM0000

The EXS0000 bus module for flush-mount power analyzers and EXM0000 for modular versions allows **up to 8 EXS4... current measurement modules** to be connected and powered using a standard Ethernet cable (cat.6). These modules are automatically recognized without the need for any settings by the installer.
When connecting 5 or more EXS4... current modules, the EXS0000 bus module requires a 24VDC-200mA power supply.
It is possible to monitor a maximum of 33 three-phase loads and 99 single-phase loads. This includes loads connected directly to the power analyzer.

CURRENT MEASUREMENT MODULE EXS4000

The module collects the measurements of the loads monitored by EXS3... (three-phase or single-phase) or EXS1... (single-phase) electronic current transformers. Each module can measure **up to 4 three-phase loads or 12 single-phase loads**, or a mixed single-phase and three-phase configuration.
The module automatically recognizes the connected electronic current transformer and uses diagnostic LEDs to indicate the correct self-configuration of the measurement points and successful pairing with the power analyzer.

ELECTRONIC CURRENT TRANSFORMERS EXS1... AND EXS3...

These current transducers are suitable for installation immediately downstream of magnetic circuit breakers thanks to their compact size. Available for **single-phase or three-phase loads**, the diameter and pitch of the pass-through holes have been designed to be in line with those of the MCBs:
- for sizes up to 63A: Ø=7mm and pitch 18mm;
- for sizes up to 125A: Ø=12mm and pitch 27mm.

They connect to the EXS4000 current measurement module via a **2 meter pre-wired RJ45 cable**, making connection quick and error-proof.
EXS3... can also be programmed to manage single-phase loads.

CURRENT MEASUREMENT MODULE EXS4001

It offers the possibility of connecting measurement points monitored with traditional current transformers within the EASY BRANCH system, managing **up to 2 three-phase loads or 6 single-phase loads** for each module, or a mixed single-phase and three-phase configuration. All types of current transformers with secondary /5A or /1A can be used. The module highlights the successful pairing with the power analyzer through diagnostic LEDs.

TRADITIONAL CURRENT TRANSFORMERS DM...

DM... type current transformers (CT) are installed in an electrical system to reduce the line current to a secondary value of 5A compatible with the amperometric inputs of the EXS4001 current measurement modules.
They are available in the following versions:
- with primary winding for reduced currents;
- solid-core type;
- high precision for very accurate measurements;
- split-core and pre-wired types, suitable for panel upgrades;
- **primary current from 5 to 6000A.**

The advantages of the **Easy Branch system**

1. SIMPLE

ONLY **4 COMPONENTS** AND NO **SPECIAL CABLES**

The EASY BRANCH system consists of a few elements to be added to the power analyzer: the EXS0000 module (for flush-mount power analyzers) or EXM0000 module (for modular power analyzers) to get the communication bus, the EXS4... module for measuring currents and the EXS1... EXS3... electronic current transformers or traditional current transformers with 5A or 1A secondary.
Up to 33 three-phase or 99 single-phase measuring points can be obtained!

No special cable is required to connect the current measuring modules to the EASY BRANCH bus: a **standard Cat.6 Ethernet cable** is enough.

2. FAST

DRASTIC **REDUCTION OF WIRING TIME**

In a monitoring system with traditional measuring instruments, 4 voltage cables and 6 current cables are required for each three-phase measuring point, plus two additional cables for the auxiliary power supply, for a total of 12 cables to be connected for each measuring point.
With the EASY BRANCH system, for each additional current measuring module (EXS4000), only one cable with an **RJ45** terminal needs to be connected, obtaining 4 three-phase or 12 single-phase measuring points, each of which is connected with an **RJ45** terminal cable, drastically reducing the wiring time.

3. FOOLPROF

PERFECT WIRING WITHOUT **DELAYS**

The EASY BRANCH system, thanks to the RJ45 connections of the electronic current transformers, eliminates the typical wiring errors that cause inaccuracies in the reading of electrical quantities and delay the commissioning of the panel.

4. PLUG&PLAY

REDUCES SET-UP TIME

The EXS1... and EXS3... electronic current transformers have a **self-recognition** system with the current module to which they are connected, eliminating the need for the installer to set the CT primary.
A LED on the electronic transformers indicates the correct power supply, while a LED on the EXS4000 current measuring module indicates the successful recognition.

5. PRECISE

MEASUREMENTS **ACCURACY**

The EASY BRANCH system guarantees high measurement accuracy in accordance with IEC61557-12 and IEC62053-21/23 standards.

6. COMPETITIVE

COMPARISON BETWEEN **EASY BRANCH** AND TRADITIONAL MEASUREMENT SYSTEM

If 5 three-phase loads need to be monitored in an electrical panel:

- **EASY BRANCH system:**
  1 power analyzer, 1 display where to search for measurements, 1 EXS0000 bus module, 1 EXS4000 current measuring module, 4 three-phase electronic transformers and only 12 cables to wire and 5 connections with RJ45 terminals.

- **Traditional system:**
  5 multimeters, 5 displays where to search for measurements, 15 current transformers and 60 cables to wire.

Compared to a traditional measurement system, EASY BRANCH reduces both wiring time and parameterization times, as well as the number of components to be used. The result is considerable cost savings and a more sustainable approach.

FLUSH-MOUNT POWER ANALYZERS WITH WIDESCREEN COLOUR LCD DISPLAY

ORDER CODES

DMG...

Flush-mount power analyzers

Order code	Description
Power analyzers	
DMG7000	Expandable with 3 EXP... modules, 100...240VAC power supply
DMG7500	Expandable with 3 EXP... modules, integrated RS485 port, compatible with EASY BRANCH system, 100...240VAC power supply
DMG8000	Expandable with 3 EXP... modules, integrated Ethernet port, compatible with EASY BRANCH system, 100...240VAC power supply
DMG9000	Expandable with 3 EXP... modules, integrated RS485 and Ethernet ports, compatible with EASY BRANCH system, 100...240VAC power supply
DMG9000D048	Expandable with 3 EXP... modules, integrated RS485 and Ethernet ports, compatible with EASY BRANCH system, 12...48VDC power supply

EXP...

Expansion modules

Order code	Description
Inputs and outputs	
EXP1000	4 opto-isolated digital inputs
EXP1001	4 opto-isolated static outputs
EXP1002	2 digital inputs and 2 static outputs, opto-isolated
EXP1003	2 relay outputs 5A 250VAC
EXP1004	2 opto-isolated analog inputs 0/4...20mA or PT100 or 0...10V or 0...±5V
EXP1005	2 opto-isolated analog outputs 0/4...20mA or 0...10V or 0...±5V
EXP1008	2 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
Communication ports	
EXP1010	Opto-Isolated USB interface EXP1011
EXP1011	Opto-Isolated RS232 interface
EXP1012	Opto-Isolated RS485 interface
EXP1013	Opto-Isolated Ethernet interface
EXP1014	Opto-Isolated Profibus-DP interface
EXP1019	Opto-Isolated ProfiNET interface

CX01

CX02

Communication devices

Order code	Description
CX01	USB device for PC - DMG... connection for programming, data download, diagnostics and firmware updates
CX02	Wi-Fi device for PC - DMG... connection, for programming, data download, diagnostics, cloning

General characteristics

DMG power analyzers... display electrical measurements with high accuracy on a large colour LCD display, allowing the energy distribution network to be monitored. They are manufactured in a flush-mounting enclosure (standard 92x92mm cut-out) with 3 slots for EXP series plug-in expansion modules, allowing the device to be adapted to multiple applications. Thanks to NFC technology, parameters can be configured and modified via smart devices and the LOVATO NFC app, available for Android and iOS devices. The optical port on the back of the device allows parameter configuration, power grid diagnostics and firmware update. The graphical interface, available in 10 languages (English, Italian, French, German, Spanish, Portuguese, Polish, Russian, Czech, Chinese), is designed to facilitate consultation of the available data, including:

– Voltage (phase, phase-to-phase and system voltages)
– Phase current (calculated neutral current, measured for DMG9000 and DMG9000D048)
– Measurements on 4 quadrants
– Power (active, reactive and apparent power per phase and total)
– Power factor of each phase and total
– Frequency
– Maximum value (HIGH), minimum value (LOW) and average value (AVERAGE) function for all measurements
– Peak values (max demand) of power and current
– Voltage and current asymmetry
– Total harmonic distortion (THD voltages and currents)
– Harmonic analysis of voltage and current up to the 63rd order
– Active, reactive and apparent energy meters (partial and total)
– Hour meters (total and partial, programmable).

Operational characteristics

– Auxiliary power supply: 100...240VAC / 110...250VDC
– Voltage measurement range: 50...830VAC L-L
– Can be used in medium and high voltage systems via VT
– Nominal input current: 5A or 1A via external CT
– Frequency measurement range: 45...66Hz and 360...440Hz
– Measurement accuracy (IEC/BS 61557-12):
  • Phase-neutral voltage:
  - Class 0.2 (IEC/EN 61557-12) in the range 100...480VAC
  - Class 0.5 (IEC/EN 61557-12) in the range 50...100VAC
  • Phase-to-phase voltage:
  - Class 0.2 (IEC/EN 61557-12) in the range 174...830VAC
  - Class 0.5 (IEC/EN 61557-12) in the range 87...174VAC
  • Current: Class 0.2 (Iref = 5 AAC)
  • Power: Class 0.5 (active), Class 1 (reactive)
  • Power factor: Class 0.5
  • Frequency: Class 0.02
  • THD and harmonics V and I: Class 5
  • Active energy: Class 0.5s (IEC/EN/BS 62053-22)
  • Reactive energy: Class 1 (IEC/EN/BS 62053-24)
– Integrated data collection memory (DMG8000, DMG9000 and DMG9000D048)
– Integrated communication ports (RS485 or Ethernet)
– Modbus-RTU, ASCII and TCP communication protocol
– Compatible with Synergy, Xpress and App NFC
– Protection rating: IP65 on the front.

Certifications and compliance

Certifications obtained: cETLus.
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

MODULAR POWER ANALYZERS WITH COLOUR LCD DISPLAY

ORDER CODES

DMG...

Modular power analyzers

Order code	Description
Auxiliary power supply 100...240VAC	
DMG2000	Non-expandable, integrated Ethernet port
DMG2500	Expandable with 3 EXM... modules, integrated RS485 port, compatible with the EASY BRANCH system
DMG3000	Expandable with 3 EXM modules... , integrated Ethernet port, compatible with EASY BRANCH system, data memory

DMG3011...

Modular power analyzers with Rogowski coils

Order code	Description
Colour LCD display, expandable with 3 EXM... modules, integrated Ethernet port, compatible with EASY BRANCH system, data memory, auxiliary power supply 100...240VAC. Current reading via 3 Rogowski coils included. Cable length 2 metres.	
DMG3011R0100	Maximum current 100A. Ø50mm
DMG3011R0500	Maximum current 500A. Ø50mm
DMG3011R3000	Maximum current 3000A. Ø150mm
DMG3011R6300	Maximum current 6300A. Ø240mm

EXM...

Expansion modules

Order code	Description
Inputs and outputs	
EXM1000	2 digital inputs and 2 static outputs, opto-isolated
EXM1001	2 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
EXM1002	4 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
Communication ports	
EXM1010	Opto-Isolated USB interface
EXM1011	Opto-Isolated RS232 interface
EXM1012	Opto-Isolated RS485 interface
EXM1013	Opto-Isolated Ethernet interface
EXM1020	Opto-Isolated RS485 interface and 2 relay outputs 5A 250VAC

General characteristics

The DMG... modular power analyzers are capable of displaying electrical measurements with high accuracy on a colour LCD display, allowing the monitor of the energy distribution network.
They are housed in a modular 4-module enclosure (72 mm wide), expandable (except for the DMG2000 code) with 3 modules of the EXM series, which allows to increase the number of I/Os or add a second communication port.
Thanks to NFC technology, available on the DMG2500, DMG3000 and DMG3011 models, you can configure and modify parameters via smart devices and the LOVATO NFC app, available for Android and iOS devices. The graphical interface, available in 10 languages (English, Italian, French, German, Spanish, Portuguese, Polish, Russian, Czech, Chinese), is designed to facilitate the consultation of DMG2500 available data, including:

– Voltage (phase voltages, phase-to-phase and system voltages)
– Phase current (calculated neutral current)
– 4-quadrant measurements
– Power (active, reactive and apparent power per phase and total)
– Power factor of each phase and total
– Frequency
– Maximum value (HIGH), minimum value (LOW) and average value (AVERAGE) function for all measurements
– Peak values (max demand) of power and current
– Voltage and current asymmetry
– Total harmonic distortion (THD voltages and currents)
– Harmonic analysis of voltage and current up to the 63rd order
– Active, reactive and apparent energy meters (partial and total)
– Hour meters (total and partial, programmable).

Operational characteristics

– Auxiliary power supply: 100...240VAC / 110...250VDC
– Voltage measurement range: 50...830VAC L-L
– Can be used in medium and high voltage systems via VT
– Nominal input current: 5A or 1A via external CT
– Frequency measurement range: 45...66Hz and 360...440Hz
– Measurement accuracy (IEC/BS 61557-12):
  • Phase-neutral voltage:
  - Class 0.2 (IEC/EN 61557-12) in the range 100...480VAC
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  • Phase-to-phase voltage
  - Class 0.2 (IEC/EN 61557-12) in the range 174...830VAC
  - Class 0.5 (IEC/EN 61557-12) in the range 87...174VAC
  • Current: Class 0.2 (Iref = 5 AAC)
  • Power: Class 0.5 (active), Class 1 (reactive)
  • Power factor: Class 0.5
  • Frequency: Class 0.02
  • THD and harmonics V and I: Class 5
  • Active energy: Class 0.5s (IEC/EN/BS 62053-22)
  • Reactive energy: Class 1 (IEC/EN/BS 62053-24)
– Integrated data collection memory (DMG3000, DMG3011...)
– Integrated communication ports (RS485 or Ethernet)
– Modbus-RTU, ASCII and TCP communication protocol
– Compatible with Synergy, Xpress and App NFC
– Protection rating: IP40 on the front.

Certifications and compliance

Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

EASY BRANCH power monitoring system components

EXM0000

EXS0000

Order code	Description
Bus modules for EASY BRANCH system	
EXM0000	Bus module for EASY BRANCH system for modular power analyzers type DMG2500, DMG3000 and DMG3011...
EXS0000	Bus module for EASY BRANCH system for flush-mount power analyzers type DMG7500, DGM8000 and DMG9000...

EXS4000

EXS4001

Order code	Description
Current measuring modules for the EASY BRANCH system	
EXS4000	Current measuring module with 4 inputs for electronic RJ45 CTs
EXS4001	Current measuring module with CT inputs for 2 three-phase or 6 single-phase loads

EXS1063

EXS3063

Electronic current transformers for EASY BRANCH system

Single-phase	
EXS1032	32A with RJ45 cable, 2m long
EXS1063	63A with RJ45 cable, 2m long
EXS1080	80A with RJ45 cable, 2m long
EXS1125	125A with RJ45 cable, 2m long
Three-phase*	
EXS3032	32A (18mm pitch) with RJ45 cable, 2m long
EXS3063	63A (18mm pitch) with RJ45 cable, 2m long
EXS3080	80A (27mm pitch) with RJ45 cable, 2m long
EXS3125	125A (27mm pitch) with RJ45 cable, 2m long

* Can also be configured as a single-phase electronic current transformer (3 single-phase measurements for each EXS3...).

General characteristics

The EASY BRANCH multi-circuit measurement system has been designed to offer a modern solution for measuring electrical parameters when multiple loads need to be monitored within an electrical panel.
Each current measuring module, which can be installed on a DIN rail, is capable of monitoring 2 or 4 measurement points, reporting the values on the display of the DMG power analyzers compatible with the EASY BRANCH system to which they are connected, centralising the consultation of available data, including:
– Phase current
– 4-quadrant measurements
– Power (active, reactive and apparent phase and total power)
– Power factor (phase and total)
– Maximum value function (HIGH), minimum value (LOW) and average value (AVERAGE) for all measurements
– Peak values (max demand) of power and current
– Current asymmetry
– Total harmonic distortion (THD currents)
– Current harmonic analysis up to the 63rd order
– Active, reactive and apparent energy meters (partial and total).

The RJ45 connector on the EXS4000 measurement module allows the connection of EXS1... and EXS3... electronic current transformers without the possibility of error.
The measurements can also be viewed via the communication ports of the DMG... power analyzer, to which up to 8 measurement modules can be connected in cascade thanks to the integrated communication bus via standard Ethernet cable (cat.6), which also provides power.
When connecting 5 or more EXS4... current modules, the EXS0000 bus module requires a 24VDC-0.2A power supply. Each measurement point can be configured as single-phase or three-phase, for a total of up to 33 three-phase points or 99 single-phase points.

Operational characteristics of EXS4... measuring modules

– Power supply via bus cable
– Nominal input current:
  EXS4000: 32A, 63A, 80A, 125A depending on the EXS1... or EXS3... electronic transformer model connected
  EXS4001: 5A or 1A via external CT
– Measurement accuracy (IEC/BS 61557-12):
  • Current: Class 0.5 (Iref = 5AAC)
  • Power: Class 1 (active), Class 2 (reactive)
  • Power factor: Class 1
  • THD and current harmonics: Class 5
  • Active energy: Class 1 (IEC/EN/BS 62053-21)
  • Reactive energy: Class 2 (IEC/EN/BS 62053-23)
– Diagnostic LEDs for correct power supply verification and electronic current transformer recognition
– Mounting on 35mm DIN rail (IEC/EN/BS 60715).

Operational characteristics of EXS1... - EXS3... electronic current transformers

– Diagnostic LED for checking correct connection
– Pre-wired cable length: 2 meters
– RJ45 connector.

Certifications and compliance

Certifications obtained: cETLus for EXS1..., EXS3..., EXS4... and EXS0000.
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

DIGITAL MEASURING **INSTRUMENTS**

WIDE RANGE
OF VOLTAGE

Measures up to 600VAC.

BROAD SET
OF MEASUREMENTS

Voltage, current, power, energy, power factor, frequency, harmonic distortion, and many others.

HARMONIC ANALYSIS

Voltages and currents up to the 15th order.

ALARMS

With customisable texts.

COMMUNICATION

Versions with built-in RS485 or Ethernet communication port.

ROGOWSKI
COILS

Kits consisting of a multimeter and 3 Rogowski coils with currents from 100A to 6300A and calibration report.

CONFIGURATION
ON THE FRONT PANEL

Via USB (CX01) or Wi-Fi (CX02) through communication devices (only for DMG6... flush-mount versions).

DIGITAL MEASURING INSTRUMENTS
WITH ICON DISPLAY

Flush-mount / 96x96mm

	DMG600	DMG610	DMG615	DMG620	DMG611R
Maximum rated voltage	600VAC	600VAC	600VAC	600VAC	600VAC
Current input type	CT /5A or /1A	CT /5A or /1A	CT /5A or /1A	CCT /5A or /1A	Rogowkski
Measurement accuracy for voltage and current	0,5%	0,5%	0,2%	0,2%	0,5%
Active energy measurement accuracy	Class 1	Class 1	Class 0,5s	Class 0,5s	Classe 1
Single-phase energy meter	■	■	■	■	■
Harmonic analysis	15° order	15° order	15° order	15° order	15° order
Current neutral measurement	Calculated	Calculated	Calculated	Calculated	Calculated
Expandability with EXP modules...	1 module	1 module	1 module	1 module	1 modulo
Display type	Icons	Icons	Icons	Icons	Icons
Integrated communication port (Modbus)	-	RS485	RS485	Ethernet	RS485
Optional communication port	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet	RS232 RS485 USB Ethernet
IP protection degree	IP54	IP54	IP54	IP54	IP54
USB communication via CX01 and Wi-Fi via CX02	■	■	■	■	■

Modular / 4 modules

	DMG100	DMG110
Maximum rated voltage	600VAC	600VAC
Current input type	CT /5A or /1A	CT /5A or /1A
Measurement accuracy for voltage and current	0,5%	0,5%
Active energy measurement accuracy	Class 1	Class 1
Single-phase energy meter	■	■
Harmonic analysis	15th order	15th order
Display type	Icons	Icons
Integrated communication port (Modbus)	-	RS485

DIGITAL MEASURING INSTRUMENTS WITH ICON DISPLAY

ORDER CODES

Flush-mount multimeters, expandable

Order code	Description
Backlit icon LCD display, auxiliary power supply 100...440VAC/110...250VDC	
DMG600	Harmonic analysis, front optical port
DMG610	Harmonic analysis, front optical port, integrated RS485 port
DMG615	High accuracy in active energy measurement with Class 0.5s. Harmonic analysis, front optical port, integrated RS485 port
DMG620	High accuracy in active energy measurement with Class 0.5s. Harmonic analysis, front optical port, integrated Ethernet port

Multimeters with Rogowski coils, expandable

Order code	Description
Backlit icon LCD display, harmonic analysis, auxiliary power supply 100...440VAC/110...250VDC, integrated RS485 port. Current reading via 3 Rogowski coils included. Cable length 2 m.	
DMG611R0100	Maximum current 100A. Ø50mm
DMG611R0500	Maximum current 500A. Ø50mm
DMG611R3000	Maximum current 3000A. Ø150mm
DMG611R6300	Maximum current 6300A. Ø240mm

CX01 CX02

Communication devices for DMG6...

Order code	Description
CX01	USB device for PC - DMG6... connection for programming, monitoring, diagnostics and firmware updates
CX02	Wi-Fi device for PC - DMG6... connection for programming, monitoring, diagnostics and cloning

General characteristics

DMG6... digital multimeters can display electrical measurements with high accuracy on their large LCD display, allowing you to monitor the power distribution network.
They are housed in a flush-mounting enclosure (96x96mm) with 1 slot for plug-in expansion modules, which allow them to be adapted to multiple applications. The main features of these multimeters are their wide power supply range, high measurement accuracy, expandability and an interactive interface for easy user operation. They are equipped with a front optical port for programming via USB (CX01) or Wi-Fi (CX02) communication devices to allow:
– Configuration of parameters
– Parameter copying
– Cloning of stored data.
The main measurements are:
– Voltage (phase, linked and system voltages)
– Phase current (calculated neutral current)
– Power (active, reactive and apparent power per phase and total)
– Power factor of each phase and total
– Frequency (measurement of the frequency of the measured voltage)
– Maximum value (HIGH), minimum value (LOW) and average value (AVERAGE) function for all measurements
– Peak values (max demand) of power and current
– Voltage and current asymmetry
– Total harmonic distortion (THD voltages and currents)
– Harmonic analysis of voltage and current up to the 15th order
– Active, reactive and apparent energy meters (partial and total)
– Hour meters (total and partial, programmable).

Operational characteristics

– Auxiliary power supply:
  • 100...440VAC / 110...250VDC
– Voltage measurement range: 90...720VAC L-L
– Can be used in medium and high voltage systems via TV
– Nominal input current:
  5A or 1A via external CT
– Current measurements via Rogowski coils for DMG611...
– Frequency measurement range: 45...66Hz
– True RMS measurements of voltages and currents
– DMG600/610/611... measurement accuracy:
  • Voltages: ±0.5% (50...720VAC)
  • Current: ±0.5% (0.1...1.1In)
  • Power: ±1% f.s.
  • Frequency: ±0.05%
  • Active energy: Class 1 (IEC/EN/BS 62053-21)
  • Reactive energy: Class 2 (IEC/EN/BS 62053-23)
– DMG615/620 measurement accuracy:
  • Voltages: ±0.2% (50...720VAC)
  • Current: ±0.2% (0.1...1.1In)
  • Power: ±0.5% f.s.
  • Frequency: ±0.05%
  • Active energy: Class 0.5s (IEC/EN/BS 62053-22)
  • Reactive energy: Class 2 (IEC/EN/BS 62053-23)
– Communication protocol Modbus-RTU, ASCII and TCP
– Compatible with Synergy and Xpress
– 96x96mm flush-mount enclosure
– Protection rating: IP54 on the front.

Certifications and compliance

Certifications obtained: cULus (except DMG611... and DMG620), EAC and RCM.
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61010-2-030, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 61010-1, CSA C22.2 No. 61010-1, UL 61010-2-030, CSA 22.2 No. 61010-2-030.

DIGITAL MEASURING INSTRUMENTS WITH ICON DISPLAY

ORDER CODES

Expansion modules for flush-mount multimeters

Order code	Description
Inputs and outputs	
EXP1000	4 opto-isolated digital inputs
EXP1001	4 opto-isolated static outputs
EXP1002	2 digital inputs and 2 static outputs, opto-isolated
EXP1003	2 relay outputs 5A 250VAC
EXP1008	2 opto-isolated digital inputs and 2 relay outputs 5A 250VAC
Communication ports	
EXP1010	Opto-isolated USB interface
EXP1011	Opto-isolated RS232 interface
EXP1012	Opto-isolated RS485 interface
EXP1013	Opto-isolated Ethernet interface

MODULAR DIGITAL MEASURING INSTRUMENTS WITH ICON DISPLAY

ORDER CODES

Modular multimeters

Order code	Description
Icon LCD display, auxiliary power supply 100...240VAC/120...250VDC.	
DMG100	Harmonic analysis. Multilingual: Italian, English, French, Spanish, Portuguese and German
DMG110	Harmonic analysis, integrated RS485 port. Multilingual: Italian, English, French, Spanish, Portuguese and German

Kits with CTs

Order code	Description
DMGKIT100060	Kit consisting of one DMG100 multimeter and 3 x 60/5A current transformers for Ø22mm cables
DMGKIT100100	Kit consisting of one DMG100 multimeter and 3 current transformers 100/5A for Ø22mm cables
DMGKIT100150	Kit consisting of one DMG100 multimeter and 3 x 150/5A current transformers for Ø23mm cables
DMGKIT100250	Kit consisting of one DMG100 multimeter and 3 x 250/5A current transformers for Ø23mm cables

General features

DMG... digital multimeters are housed in a modular case (4U) and feature a backlit LCD icon display that gives these modular instruments the ability to clearly, intuitively and flexibly display all electrical parameters of the system.
The DMG110 model also features an isolated RS485 communication port.
The main measurements are:
– Voltage (phase, phase-to-phase and system voltages)
– Phase current (calculated neutral current)
– Power (active, reactive and apparent power per phase and total)
– Power factor of each phase and total
– Frequency (measurement of the frequency of the measured voltage)
– Maximum value function (HIGH), minimum value (LOW) and average value (AVERAGE) for all measurements
– Peak values (max demand) of power and current
– Voltage and current asymmetry
– Total harmonic distortion (THD) of voltages and currents
– Active, reactive and apparent energy meters
– Total and partial hour meters
– Phase energies
– Harmonic analysis up to the 15th order.

Operational characteristics

– Auxiliary power supply:
100...240VAC / 110...250VDC
– Maximum nominal measurement voltage: 600VAC
– Voltage measurement range: 90...720VAC L-L
– Can be used in medium and high voltage systems via VT
– Nominal input current: via external 5A or 1A CT
– Current measurements via CT up to 10,000A
– Frequency measurement range: 45...66Hz
– True root mean square (TRMS) voltage measurements and current
– Measurement accuracy:
  • Voltages: ±0.5% (50...720VAC)
  • Current: ±0.5% (0.1...1.1In)
  • Power: ±1% f.s.
  • Frequency: ±0.05%
  • Active energy: Class 1 (IEC/EN/BS 62053-21)
  • Reactive energy: Class 2 (IEC/EN/BS 62053-23)
– Modbus-RTU and ASCII communication protocol (only for DMG110)
– Remote programming and control via software (only for DMG110; compatible with Synergy and Xpress)
– Modular housing, 4 module
– Protection rating: IP40 on the front.

Certifications and compliance

Certifications obtained: cULus, EAC and RCM.
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61010-2-030, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL 61010-1, CSA C22.2 No. 61010-1, UL 61010-2-030, CSA 22.2 No. 61010-2-030.

ROGOWSKI

The **DMG...R...** kits consist of power analyzers or multimeters that read the current via Rogowski coils.
They are the ideal solution for installing measuring points on systems where traditional solutions with the standard solid-core or split-core current transformers (CTs) are impractical or too expensive.
The included calibration report is specific to each individual kit, to guarantee measurement accuracy.

Integrated communication

- Ethernet port for DMG3011... modular power analyzers
- RS485 port for DMG611R.. multimeters

Expandability

Compatibility with expansion modules with inputs and outputs or additional communication ports.

Calibration report

All kits are calibrated during the testing process and come with the relevant calibration report.

Measure kit

DMG3011 power analyzer or DMG611 multimeter
+ 3 Rogowski coils.

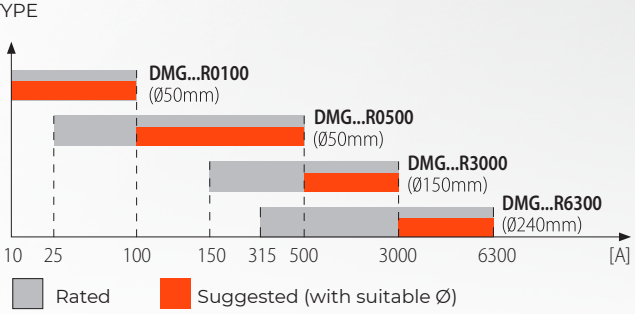
Front optical port

For DMG611R... flush-mount models, parameters can be programmed via an optional USB (CX01) or Wi-Fi (CX02) interface.

Safety

It is not necessary to short-circuit the secondary before disconnecting the coil.

SELECTION GUIDE



MEASUREMENTS

- Voltage, current, frequency
- Active, reactive and apparent power
- Power factor
- Maximum, minimum and average values for all measurements
- Peak values (max demand) of power and current
- Voltage and current asymmetry
- Active power unbalance
- Total harmonic distortion (THD) and harmonic analysis of voltage and current
- Active, reactive and apparent energy meters
- Hour counter.

VOLTAGE INPUTS

- Auxiliary power supply:
  - 100...240VAC/110...250VDC for DMG3011R...
  - 100...440VAC/110...250VDC for DMG611R.
- Voltage measuring range:
  - 50...830VAC L-L for DMG3011R...
  - 90...720VAC L-L for DMG611R...

CURRENT INPUTS

- Maximum current Imax: 100A, 500A, 3000A, 6300A
- Measuring range:
  10...100% Imax (DMG...R0100)
  5...100% Imax (DMG...R0500 ... R6300)
- Input type: Rogowski coils
- Measurement type: true root mean square (TRMS)

MEASUREMENT ACCURACY

- Current:
  ±0.5% (centred cable positioning)
  ±1% (cable positioning close to the coil)
- Voltage: ±0.5% (50...720VAC)
- Active power: ±1%
- Active energy: ±1%

ROGOWSKI COIL CONNECTION

- Terminal type: removable, 2-level push-in.

Certifications and compliance
Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 61010-1, IEC/EN/BS 61010-2-030, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3.

GATEWAY DATA LOGGERS

Automatic recognition
of connected LOVATO Electric devices.

RS485 and Ethernet ports
for connection to the devices in the field.

Geolocation
via GNSS (GPS) connection (only for EXCGLB02)

Local memory
for data collection.

Compatibility
with LOVATO Electric devices and support for third-party devices.

Integrated web server
for data visualization in tabular or graphical form, accessible via a web browser.

Software for data collection
ready to use for interfacing with Synergy Cloud software and compatible with third-party software.

Internet connection
for data transfer to data collection software via wired network, Wi-Fi or 4G (LTE) mobile connection.

Order code	Description
EXCGLB01	Gateway data logger, 1 RS485 port, 1 Ethernet port, Wi-Fi connection
EXCGLB02	Gateway data logger, 1 RS485 port, 1 Ethernet port, 4G (LTE) connection, GNSS (GPS)
EXCGLB03	Gateway data logger, 1 RS485 port, 2 Ethernet ports, 4G (LTE) connection

	EXCGLB01	EXCGLB02	EXCGLB03
RS485 port	■	■	■
Ethernet port	1	1	2 (independent networks)
Wi-Fi connection	■	-	-
4G (LTE) connection	-	■	■
GNSS (GPS) function	-	■	-
Typical application	System requiring local monitoring. Example: electrical panels with a small number of devices to monitor.	Remote monitoring system with geolocation requirements. Example: rental machines or generating sets to be located via GPS.	Complex system with a medium/high number of devices, requiring monitoring on a cloud platform. Example: electrical panels with a large number of devices, or where a 4G mobile connection is convenient or necessary.

General characteristics
EXCGLB… gateway data loggers are devices capable of collecting data from devices installed in the field, connected via RS485 serial port or Ethernet (even simultaneously), which are stored within the local memory.
They are used in the supervision of any type of system, from simple installations – which may include energy meters, digital measuring instruments, soft starters, variable speed drives, power factor correction controllers – to more complex systems, such as shopping centres or industrial plants, which may have multiple devices for energy monitoring and other types of products equipped with a communication port.
The version with integrated GNSS (GPS) connection also allows the geolocation of machinery, such as rental generating sets. The EXCGLB... gateway data loggers support Modbus-RTU, Modbus-ASCII and Modbus-TCP protocols. The data can be consulted directly from the integrated web server, in the form of data logs or trend graphs, by simply accessing via an Ethernet port and a browser, or sent via the internet to a data collection software like Synergy Cloud.
Internet connectivity for data transmission can be achieved via wired network, Wi-Fi access point or 4G (LTE) mobile network, depending on the chosen model. It is also possible to send data to remote third-party http or ftp servers.
– Connection to field devices via RS485 and/or Ethernet, even in mixed configuration
– Automatic recognition of LOVATO Electric devices
– Support for third-party devices and software
– Internet connection via wired network, Wi-Fi or 4G (LTE) modem
– Geolocation via GNSS (GPS)
– Compatible with Synergy Cloud software.

Operational characteristics
– Auxiliary power supply: 12-24VDC
– Integrated RS485 serial port, Modbus-RTU master
– Integrated Ethernet ports:
  • 1 Ethernet port for EXCGLB01 and EXCGLB02
  • 2 independent Ethernet ports for EXCGLB03
  • http, https, mqtt, ftp, sftp protocols
  • VPN client
  • Modbus-TCP master protocol (device side)
– 1 digital input
– 1 analog input 0...10V
– 1 static 24VDC output
– Integrated Wi-Fi communication for EXCGLB01
– 4G (LTE) mobile network connection for EXCGLB02 and EXCGLB03
– GNSS (GPS) connection for geolocation for EXCGLB02
– 6 status LEDs: power supply, device status, digital input status, output status, communication in progress, wireless communication active
– Operating temperature: -20…+60°C
– Modular enclosure, 4 modules (72mm).

Certifications and compliance
Compliant with standards: IEC61010-1, IEC61000-6-2, IEC61000-6-3, ETSI 301489-1, ETSI 301489-17 (EXCGLB01), ETSI 301489-52, ETSI 301489-19 (EXCGLB02), ETSI 301489-52 (EXCGLB03).

ACCESSORIES

Current transformers

Wound primary
type
from 5 to 30A

Solid-core type
- from 40 to 6000A
- versions for busbars
- versions with high accuracy
- kits with UTF certificates

Split-core type
from 100 to 4000A

Compact pre-wired
split-core type
from 100 to 600A

Other accessories

EXCM4G01
4G modem/router

EXCCON02
RS485-Ethernet
converter

SOFTWARE

Visit the website **em.LovatoElectric.com**

Synergy
Monitoring and energy efficiency software.

Xpress
Configuration and remote control software.

Scan this QR code with your smartphone to find out more!

Energy Management

VIDEO TUTORIALS

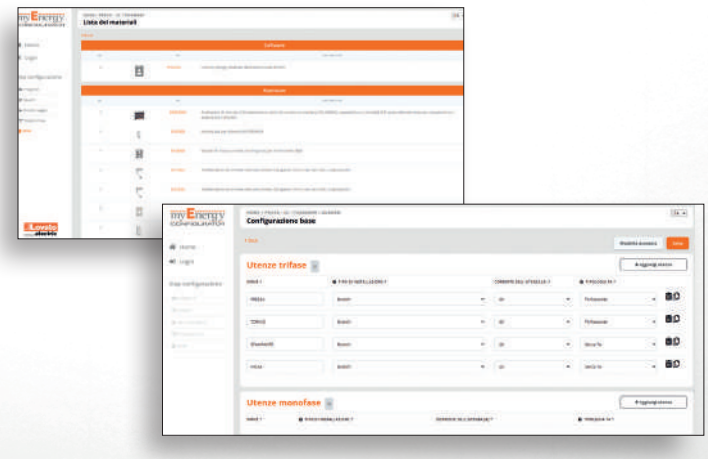
YouTube

Visit the LOVATO Electric YouTube channel and discover the playlist of video tutorials dedicated to the DMG series power analyzers and the EASY BRANCH monitoring system!

Video tutorials

myEnergy ONLINE CONFIGURATOR

Design your energy monitoring system with the **myEnergy configurator!**



myEnergy CONFIGURATOR

Choose the desired energy monitoring type (web server, Cloud, On site) and enter the electrical data of the loads to be monitored. The myEnergy configurator will show you the correct components to use, accompanied by a graphical layout and a list of results. The project can be saved, modified, and sent to LOVATO Electric for technical and commercial verification.

Try it now!

PD175 GB 11 25

POWER ANALYZERS
AND DIGITAL MEASURING INSTRUMENTS
DMG SERIES

Lovato electric
ENERGY AND AUTOMATION

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