Digital multimeters and current transformers

Lovato electric

100% electricity

DIGITAL MULTIMETERS, DMK SERIES

Multifunction multimeters to monitor and view electrical parameters.

DMK 2... - DMK 50

THE SIMPLIEST MULTIMETERS TO VIEW 47 ELECTRICAL PARAMETERS.

A valid and cost-effective alternative to single analog instruments.

Lovato electric

DMK 2...

DMK 50

- Measures of voltage, current, power, power factor and frequency values.
- Logging of minimum and maximum values.
- Total and partial hour counter.

TECHNICAL CHARACTERISTICS

Auxiliary supply range	154-288VAC (DMK 20 and DMK 50)
	9-32VDC (DMK 25 and DMK 26)
Voltage measuring range	60-830VAC L-L 30-480VAC L-N For LV use only
Frequency range	45-65Hz
Current measuring range	0.05-6A
Programmable CT ratio	1 - 2000
Measuring accuracy ❶:	
Voltage-Current	0.5 class ±0.25% full scale ±1 digit
Frequency	±1 digit
Apparent power	±0.5% full scale ±1 digit
Active power	±1% full scale ±1 digit (cosφ 0.7-1)
Reactive power ❷	±1% full scale ±1 digit (sineφ 0.7-1)
Operating ambient temperature	-20...+60°C
Degree of protection:	
DMK 2...	IP20 housing and terminals IP54 on front
DMK 50	IP20 housing and terminals IP41 on front

❶ Measuring conditions: temperature +23°C ±1digit; relative humidity 45% ±15%; voltage 0.2-1.2Ue; current 0.2-1.2Ie.
❷ Not available on DMK 26.

DMK 3... - DMK 40 - DMK 6...

THE MOST SOPHISTICATED MULTIMETERS TO VIEW 251 ELECTRICAL PARAMETERS.

Complete power analyzers. The ideal solution to monitor the quality and consumption of electric energy. Suitable for LV – MV – HV systems.

DMK 3... - DMK 40

DMK 6...

- Measures of voltage, current, power, power factor, displacement power factor and frequency values.
- Import-export energy meters.
- Logging of minimum, maximum and average values.
- Harmonic analysis on current and voltage values, 2° to 22° odd and even orders.
- Versions:
  - Basic with measure viewing only, DMK 30 - DMK 60
  - Viewing and 2 programmable outputs, DMK 31 – DMK 61
  - Viewing, 2 programmable outputs, opto-isolated RS485 serial port and optional Modbus® RTU / ASCII protocol software, DMK 32 – DMK 62
  - Basic with data-logger, DMK 40.

TECHNICAL CHARACTERISTICS

Auxiliary supply range	85 - 265VAC 93.5 - 300VDC
Voltage measuring range	20 - 830VAC L-L 10 - 480VAC L-N
Programmable VT ratio	1 - 5000
Frequency range	45 - 65Hz
Current measuring range	0.02 - 6A
Programmable CT ratio	1 - 2000
Measuring accuracy ❶:	
Voltage, current, frequency, harmonic distortion	±1 digit
Apparent power	±0.15% full scale ±1 digit
Active power	±0.25% full scale ±1 digit (cosφ 0.7-1)
Reactive power	±0.25% full scale ±1 digit (sineφ 0.7-1)
Energy	Class 1 (IEC/EN61036 and 61268)
Operating ambient temperature	-20...+60°C
Degree of protection:	
DMK 3... - DMK 40	IP20 housing and terminals IP54 on front
DMK 6...	IP20 housing and terminals IP41 on front

❶ Measuring conditions: temperature +23°C ±1digit; relative humidity <60%; voltage 0.2-1.2Ue; current 0.2-1,2Ie.

Order code	Description	Qty per pkg n°	Weight [kg]
47 ELECTRICAL PARAMETERS			
DMK 20	Flush-mount digital multimeter, 154-288VAC	1	0.356
DMK 25	Flush-mount digital multimeter, 9-32VDC for generating set duty	1	0.356
DMK 26	Flush-mount digital multimeter, 9-32VDC for generating set duty for current maximum demand and current-voltage imbalance measures	1	0.356
DMK 50	Modular digital multimeter 154-288VAC	1	0.287
251 ELECTRICAL PARAMETERS			
DMK 30	Flush-mount digital multimeter, basic version	1	0.360
DMK 31	Flush-mount digital multimeter with 1 relay and 1 solid-state programmable outputs	1	0.400
DMK 32	Flush-mount digital multimeter with 1 relay and 1 solid-state programmable outputs and opto-isolated RS485 port	1	0.420
DMK 40	Digital data-logger multimeter with RS232 and RS485 ports	1	0.460
DMK 60	Modular digital multimeter, basic version	1	0.290
DMK 61	Modular digital multimeter with 1 relay and 1 solid-state programmable outputs	1	0.300
DMK 62	Modular digital multimeter with 1 relay and 1 solid-state programmable outputs and opto-isolated RS485 port	1	0.320
DMK ACCESSORIES…			
DMK SW	PC-DMK 32 or DMK 62 remote control software having Modbus® RTU / ASCII software protocols complete with 51 C4 connecting cable	1	0.246
DMK SW 10	Data setting and acquisition software complete with 51 C2 connecting cable and PC – DMK 40 remote control and supervision software having Modbus® RTU / ASCII software protocols with 51 C4 connecting cable	1	0.400
51 C2	PC – DMK 40 connecting cable, 1.8m long	1	0.090
51 C4	PC – 4 PX1 converter drive connecting cable, 1.8m long	1	0.147
51 C5	DMK 40 – Modem connecting cable, 1.8m long	1	0.111
51 C6	DMK 40 – 4 PX1 converter drive connecting cable, 1.8m long	1	0.102
51 C9	DMK 40 4 PX1 drive – Modem connecting cable, 1.8m long	1	0.137
4 PX1	Opto-isolated RS232/RS485 converter drive 220/240VAC (110/120VAC on request)	1	0.600
31 PA96X96	Front protection cover for DMK 2..., DMK 3... or DMK 40	1	0.077

DM...T

CURRENT TRANSFORMERS

Order code	Primary current /5[A]	Burden class 0,5 [VA]	class 1 [VA]	Qty per pkg n°	Weight [kg]
CURRENT TRANSFORMERS FOR Ø22mm CABLE					
DM1T 0040	40	—	1	1	0.200
DM1T 0050	50	—	1	1	0.200
DM1T 0060	60	—	1	1	0.200
DM1T 0080	80	1.5	3	1	0.200
DM1T 0100	100	1.5	3	1	0.200
DM1T 0150	150	1.5	3	1	0.200
CURRENT TRANSFORMERS FOR Ø23mm CABLE AND 30x10mm, 25x12.5mm OR 20x15mm BUSBAR					
DM2T 0060	60	—	1	1	0.130
DM2T 0080	80	—	1	1	0.130
DM2T 0100	100	—	1	1	0.130
DM2T 0150	150	—	1	1	0.130
DM2T 0200	200	1.5	3	1	0.130
DM2T 0250	250	1.5	3	1	0.130
DM2T 0300	300	1.5	3	1	0.130
DM2T 0400	400	1.5	3	1	0.130
CURRENT TRANSFORMERS FOR 40x10mm, 30x20mm, 25x25mm BUSBARS					
DM3T 0200	200	2	4	1	0.260
DM3T 0250	250	2.5	5	1	0.260
DM3T 0300	300	4	6	1	0.260
DM3T 0400	400	5	8	1	0.260
DM3T 0500	500	6	10	1	0.260
DM3T 0600	600	6	12	1	0.260
DM3T 0800	800	8	15	1	0.260
DM3T 1000	1000	10	20	1	0.260

Description		DMK 20 / DMK 50	DMK 25 / --	DMK26 / --	DMK 30 / DMK 60	DMK 31 / DMK 61	DMK 32 / DMK 62	DMK 40 / --
Usage in medium and high voltage					●	●	●	●
Outputs	5A 250V AC1 relay				●	●	●	
	55mA 60VAC/DC AC1 solid-state					●	●	
Serial interface	RS485 opto-isolated						●	● ❶
	RS232 opto-isolated							● ❶
One-phase, two-phase, three-phase, with or without neutral, or three-phase balanced connection		●	●	●	●	●	●	●
TRMS voltage and current measures		●	●	●	●	●	●	●
Averaging filter	for stabilised viewing	●	●	●	●	●	●	●
	supplement, keypad configurable				●	●	●	●
Data-logger with real time clock								●
Input voltage frequency measure		●	●	●	●	●	●	●
Voltage measure	phase to phase, of the system included	●	●	●	●	●	●	●
	phase (LOW and HIGH included)	●	●		●	●	●	●
	system phase	●	●		●	●	●	●
	battery		●	●				
	imbalance			●				
Current measure	phase (LOW and HIGH included)	●	●	●	●	●	●	●
	maximum phase integral				●	●	●	● ●
	system			●				
	imbalance			●				
Phase displacement power factor measure		●	●	●	●	●	●	●
Phase cosφ measure					●	●	●	●
System, phase and system high/low apparent power measures		●	●	●	●	●	●	●
System apparent power measure		●	●		●	●	●	●
System integral apparent power measure, system maximum demand included					●	●	●	●
Active power measure	phase import	●	●	●	●	●	●	●
	phase export				●	●	●	●
	system import	●	●		●	●	●	●
	system export				●	●	●	●
	system LOW – HIGH import	●	●		●	●	●	●
	system LOW – HIGH export				●	●	●	●
	system integral, maximum included				●	●	●	●
Reactive power measure	phase import	●	●		●	●	●	●
	phase export				●	●	●	●
	system import	●	●		●	●	●	●
	system export				●	●	●	●
	system LOW – HIGH import	●	●		●	●	●	●
	system LOW – HIGH export				●	●	●	●
Energy measure	active import and export				●	●	●	●
	reactive import and export				●	●	●	●
Harmonic analysis	odd, 3° to 21° order phase voltage				●	●	●	●
	even, 2° to 22° order phase voltage				●	●	●	●
	odd, 3° to 21° order phase current				●	●	●	●
	even, 2° to 22° order phase current				●	●	●	●
Total harmonic distortion per phase and residual					●	●	●	●
Capacitor phase harmonic overload measure						●	●	●
Total and partial hour counter		●	●	●				
Delayed auto-resetting for pre-set measures		●	●	●				
Remote control and supervision software								● ❷●
Data-logger software								● ❷

❶ These communication interfaces cannot be simultaneously used.   ❷ These softwares cannot be simultaneously used.

WIRGIN DIAGRAMS

DMK 2...	DMK 50	DMK 3... DMK 40	DMK 6...

Single phase

DMK 20 208-240VAC
DMK 25 9-32VDC
DMK 26 9-32VDC

L N — AUX SUPPLY
L1 L2 L3 N — VOLTAGE
I1 I2 I3 C — CURRENT

208-240VAC

10 12 — AUX SUPPLY
30 32 34 36 — VOLTAGE
14 15 16 17 18 — CURRENT

100-240VAC/VDC GND

AUX SUPPLY
VOLTAGE INPUT
CURRENT INPUT

Two-phase

DMK 20 208-240VAC
DMK 25 9-32VDC
DMK 26 9-32VDC

208-240VAC

100-240VAC/VDC

Three-phase with or without neutral

DMK 20 208-240VAC
DMK 25 9-32VDC
DMK 26 9-32VDC

208-240VAC

100-240VAC/VDC

Three-phase without neutral, ARON wiring configuration

DMK 20 208-240VAC
DMK 25 9-32VDC
DMK 26 9-32VDC

208-240VAC

100-240VAC/VDC

DMK 20 208-240VAC
DMK 25 9-32VDC
DMK 26 9-32VDC

208-240VAC

100-240VAC/VDC

❶ For DMK 25 and DMK 26, the supply terminals are indicated by "+" (L) and "—" (N). TA = Current transformer.

DIMENSION [mm]

DMK 2...	DMK 3... - DMK 40	DMK 50	DMK 6...

14 62 6
96 90

96

Refer to DMK 3... for cutout.

12 82 6
96 90

96

91

91

105
90

60
45

44
55
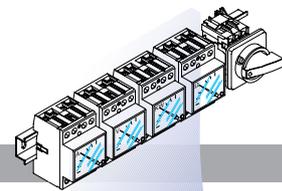
## MODERN SUPERVISION OF ELECTRICAL PARAMETERS

Distorted waveform conditions, such as very disturbed electric lines having voltage and currents with high harmonic content and variable frequency, do not influence the high accuracy DMK multimeter readouts because of the latest state-of-the-art microprocessor technology.
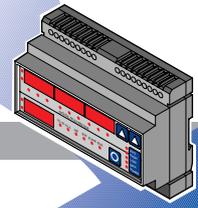
A DMK... FOR EVERY NEED

- All models are suitable for single, two, three-phase connection, with or without neutral
- TRMS measurements
- The DMK 2... and DMK 50 models, suitable for LV systems, offer a cost-effective solution even in replacement of traditional analog instruments
- The DMK 25 and DMK 26 types have technical and operation features specific for use with standby generating sets
- The DMK 3..., DMK 40 and DMK 6... models are complete power analyzers and suitable for medium and high - voltage systems owing to the wide range of VT programming ratio
- DMK 31 - DMK 32 and DMK 61 - DMK 62 offer totally configurable digital outputs providing protection and automation functions. In addition to pulsing respect with energy values, minimum and maximum thresholds can be programmed with adjustable tripping time as well as relay output status and relative resetting
- DMK 32, DMK 40 and DMK 62 types have an opto-isolated RS485 port and with the Modbus® RTU / ACSII protocol software to warrant interfacing with the most common monitoring and automation systems. The Modbus® RTU / ASCII protocols consent to direct dialog also via modem, both line or GSM version
- DMK 40 has 2 Mb of internal memory and data-acquisition supervision software.

RS232/RS485

PLC

Modbus®, RTU or ASCII (RS485)
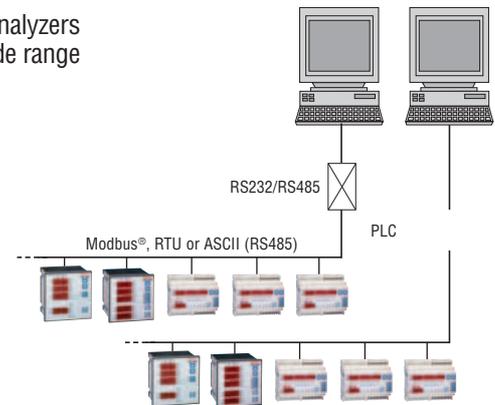
DMK SW REMOTE CONTROL AND SUPERVISION SOFTWARE FOR DMK 32 AND DMK 62

The remote control software, DMK SW, can supervise a maximum of 64 DMK 32 and/or DMK 62 digital multimeters connected to a single RS485 bus.

The DMK SW is divided into modules, which warrant simple use:
- Synoptic main page which includes the most important data inbound from the various DMK
- Detailed page with data as regards to one single DMK
- Data storage which permits to log the required measures
- Event-alarm logging which registers the alarms arriving from equipment along with software elaboration data
- Trend graphs to verify electrical parameters
- Harmonic content analysis with bar graphs
- Energy meters to obtain periodical readings for consumption monitoring.

DMK SW10 DATA ACQUISITION SUPERVISION SOFTWARE FOR DMK 40

The DMK SW10 includes the data acquisition and viewing software along with the remote control and supervision software, DMK SW.

The data-logger software consents to:
- Configure the multimeter parameters, both for the data-logger and for the installation set-up, such as CT-VT ratios, etc
- View and print data recorded in the multimeter storage memory, in table or graph/trend format; the data-logger cannot be configured nor consulted from the multimeter front
- Data download in ACCESS, EXCEL or TEXT format
- View all the actual electrical measures on a virtual multimeter panel
- Set the real time clock with daylight saving time management
- Directly connect to the multimeters or via modem.

new

2005
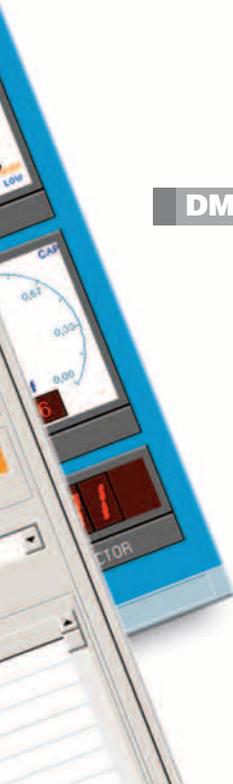
2-side cable entry limit switches
KC... and KN... types

Foot switches
KG... and KR... types

Modular protection relays
PM... series

Modular level control relays
LVM... series

AC motor drives, VFS11... types

Automatic power factor controllers
DCR... series

Planet-SWITCH

- **Motor protection circuit breakers**
- **Switch disconnectors**
- **Contactors**
- **Motor protection relays**
- **Electromechanical starters**
- **Push-buttons and selectors**
- **Limit and foot switches**
- **Rotary cam switches**

Planet-DIN

- **Modular contactors**
- **Time relays**
- **Protection relays**
- **Level control relays**
- **Earth leakage relays**

Planet-LOGIC

- **Digital metering instruments and current transformers**
- **Soft starters**
- **AC motor drives**
- **Automatic power factor controllers**
- **Automatic battery chargers**
- **Automatic transfer switches**

The products described in this documentation are subject to be revised or improved at any moment. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in compliance with the regulations in force for electrical systems in order to avoid damages and safety hazards.

Lovato electric

100% electricity

www.LovatoElectric.com