

ZMG400AR/CR  
E550 Series 2  
Technical Data



Building on its tradition of industrial meters, Landis+Gyr is now bringing out the E550 Series 2, the latest generation of ZMG400 meters. The E550 Series 2 offers two electrical interfaces, advanced modem solution, event logging and anti-tampering functions.

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## Revision History

<b>Version</b>	<b>Date</b>	<b>Comments</b>
a	17.02.2010	First edition
b...e	23.07.2010	Continuous improvement

The E550 transformer connected I&C meters record active and reactive energy consumption in 1-phase 2-wire, 2-phase 3-wire, 3-phase 4-wire and 3-phase 3-wire (no neutral) networks.

### Basic Version

The basic version provides energy registers for tariffication, red test diodes for active and reactive energy, an optical interface for meter reading and an electrical interface.

## E550 – ZMG400AR/CR Series 2

### General

#### Voltage

Nominal voltage  $U_n$  ZMG400xR

3 x 58/100 V to 69/120 V

3 x 110/190 V to 133/230 V

3 x 220/380 V to 240/415 V

3 x 58/100 V to 277/480 V

Voltage range 80% to 115 %  $U_n$

#### Frequency

Nominal frequency  $f_n$  50 or 60 Hz

tolerance  $\pm 2\%$

#### Application

1 phase 2 wire; 2 phase 3 wire; 3 phase 4 wire, 3-phase 3-wire (no neutral)

### IEC-specific Data

#### Current

Nominal current  $I_n$  selectable: 1 or 5 A

Maximum current  $I_{max}$

metrological 1 A max. 600%

metrological 5 A max. 200%

thermal 1 A 8 A

thermal 5 A 12 A

Short circuit 0.5 s  $20 \times I_{max}$

#### Measurement Accuracy

ZMG405xR

active energy, to IEC 62053-22 class 0.5 S

reactive energy, to IEC 62053-23 class 1

### Interfaces

The Series 2 now supports two independent electrical interfaces.

The meter supports RS232, RS485, RS422, CS and a specially powered RS232 to supply external modems.

### Installation support

The monitoring of voltage, current, demand and power factor supports the installation.

## Technical specifications

ZMG410xR

active energy, to IEC 62053-21 class 1

reactive energy, to IEC 62053-23 class 2

### Measurement Behaviour

Starting current ZMG405xR

according to IEC 0.1%  $I_n$

typical 0.07%  $I_n$

Starting current ZMG410xR

according to IEC 0.2%  $I_n$

typical 0.14%  $I_n$

The startup of the meter is controlled by the starting power and not by the starting current.

Starting power in M-circuit single phase

nominal voltage x starting current

### MID-specific Data

#### Current (for classes B and C)

Reference current  $I_{ref}$  selectable: 1.0, 5.0 A

Minimum current  $I_{min}$  0.01 x  $I_{ref}$

Transitional current  $I_{tr}$  0.05 x  $I_{ref}$

Maximum current  $I_{max}$  2.0, 6.0, 10.0 A

Measurement Accuracy to EN 50470-3

ZMG400xR classes B and C

### Measurement Behaviour

Starting current  $I_{st}$

class B:  $I_{st}$  0.002 or 0.01 A

class C:  $I_{st}$  0.001 or 0.005 A

## General

### Operating Behaviour

#### Voltage failure (Power Down)

bridging time	0.5 s
data storage	after another 0.2 s
switch off	after approx. 10 s

#### Voltage restoration (Power Up)

function standby 3 phases	after 4 s
function standby 1 phase	after 5 s
detection of energy direction and phase voltage	after 4 to 5 s

### Power Consumption

#### Power consumption per phase in voltage circuit

phase voltage	58 V	100 V	277 V
active power (typical)	0.8 W	0.8 W	1.5 W
apparent power (typical)	1.0 VA	1.1 VA	2.5 VA

#### Power consumption per phase in current circuit

phase current 1(6)A	1 A	6 A
active power (typical)	0.02 W	0.6 W
apparent power (typical)	0.01 VA	0.25 VA

Phase current 5(10)A	5 A	10 A
active power (typical)	0.1 W	0.35 W
apparent power (typical)	0.02 VA	0.1 VA

### Environmental Influences

Temperature range	to IEC 62052-11
operation class 1	-40 °C to +70 °C
operation class 0.5	-25 °C to +70 °C
storage	-40 °C to +85 °C

#### Temperature coefficient

range	-25 °C to +70 °C
average value (typical)	± 0.012% per K
at $\cos\varphi=1$ (from 0.05 $I_b$ to $I_{max}$ )	± 0.02% per K
at $\cos\varphi=0.5$ (from 0.1 $I_b$ to $I_{max}$ )	± 0.03% per K

Impermeability to IEC 60529	IP 53
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### Electromagnetic Compatibility

Electrostatic discharges	to IEC 61000-4-2
contact discharge	8 kV
air discharge	15 kV

Electromagnetic RF fields	to IEC 61000-4-3
80 MHz to 2 GHz	10 and 30 V/m

Radio disturbance according to IEC/CISPR 22	class B
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Fast transient burst test	to IEC 61000-4-4
current and voltage circuits	4 kV
auxiliary circuits > 40 V	2 kV

surge immunity test	to IEC 61000-4-5
current and voltage circuits	4 kV
auxiliary circuits > 40 V	1 kV

### Insulation Strength

Insulation strength	4 kV at 50 Hz during 1 min.
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Impulse voltage 1.2/50 $\mu$ s	to IEC 62052-11
current and voltage circuits	10 kV
auxiliary circuits > 40 V	6 kV

Protection class II	to IEC 60050-131	□ 2
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### Calendar Clock

#### Calendar Type

Gregorian or Persian (Jalaali)

Accuracy	< 5 ppm
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#### Backup time (power reserve)

with supercap	> 21 days
charging time for 7 days backup time	24 h
charging time for max. backup time	300 h
with battery 1	
(calendar clock, display, readout)	10 years
battery type	UM3-R6-AA
with battery 2 (calendar clock only)	10 years
battery type	CR2032

### Display

#### Characteristics

type	LCD liquid crystal display
digit size in value field	9 mm
number of digits in value field	up to 8
digit size in index field	8 mm
number of digits in index field	up to 7

### Inputs and Outputs

#### Control inputs

control voltage $U_S$	100 to 277 V <sub>AC</sub>
max. input voltage	320 V <sub>AC</sub>
input current	< 2 mA ohmic at 230 V <sub>AC</sub>

#### Output solid state

type	solid state relay
voltage	12 to 277 V <sub>AC/DC</sub>
max. current	100 mA
max. switching frequency (pulse length 20 ms)	25 Hz

## Inputs and Outputs (cont.)

### Output electromechanical

type	electromechanical relay
max switch voltage	277 V <sub>AC/DC</sub>
max. switch current	6 A
rated current	5 A

### Optical test outputs active and reactive energy

type	red LED
number	2
meter constant	selectable

## Communication Interface

### Optical interface to IEC 62056-21

type	serial, asynchronous, half-duplex
max. transmission rate	19,200 bps
protocols	IEC 62056-21 and dlms

### RS232 Interface (powered and not powered) to DIN 61393 / DIN 66259

type	serial, asymmetric, asynchr., bidirectional
operating mode	intelligent or transparent
nominal voltage	±9 V <sub>DC</sub>
maximum voltage	±15 V <sub>DC</sub>
minimum voltage	±5 V <sub>DC</sub>
max. transmission rate	38,400 bps
protocols	IEC 62056-21 and dlms
max. conductor length depending on environment and connecting cable	30 m
insulation resistance to meter	4 kV <sub>AC</sub> /50 Hz, 1 min
creep distance	≥ 6.3 mm

### RS485 Interface to ISO-8482

type	serial, symmetrical, half duplex
nominal input voltage common mode range	-7 to +12 V <sub>DC</sub>
binary 1 state	difference voltage < -0.2 V
binary 0 state	difference voltage > 0.2 V
max. transmission rate	38,400 bps
max. number of slaves	31
protocols	IEC 62056-21 and dlms
max. conductor length depending on environment and connecting cable	≤ 1000 m
insulation resistance to meter	4 kV <sub>AC</sub> /50 Hz, 1 min
creep distance	≥ 6.3 mm

### CS Interface to IEC 62056-21 / DIN 66258

type	serial, bidirectional, current interface
nominal voltage without load	24 V <sub>DC</sub>
max. voltage without load	30 V <sub>DC</sub>
binary 1 state	10–30 mA
binary 0 state	≤ 2 mA
max. transmission rate	9600 bps
protocols	IEC 62056-21 and dlms

insulation resistance to meter	4 kV <sub>AC</sub> /50 Hz, 1 min
creep distance	≥ 6.3 mm

### RS422-Interface to ISO-8482

type	serial, symmetric, asynchronous, bidirectional
nominal input voltage common mode range	-3 to +3 V <sub>DC</sub>
binary 1 state	difference voltage < -0.2 V
binary 0 state	difference voltage > 0.2 V
max. transmission rate	38,400 bps
max. number of slaves	10
protocols	IEC 62056-21 and dlms
max. conductor length depending on environment and connecting cable	1000 m
insulation resistance to meter	4 kV <sub>AC</sub> /50 Hz, 1 min
creep distance	≥ 6.3 mm

## Weight and Dimensions

Weight	approx. 1.5 kg
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### External dimensions

width	177 mm
height (with short terminal cover)	244 mm
height (with standard terminal cover)	281.5 mm
height (with extended hook)	305.5 mm
depth	75 mm

### Suspension triangle

height (with extended hook)	230 mm
height (suspension eyelet open)	206 mm
height (suspension eyelet covered)	190 mm
width	150 mm

### Terminal cover

short	no free space
standard	40 mm free space
long (opaque, transparent)	60 mm free space
standard	80 mm free space
standard	110 mm free space
GSM	60 mm free space
ADP1 adapter	
RCR/FTY adapter	

## Material

### Housing

Polycarbonate, partly glass-fibre reinforced

## Connections

### Phase connections

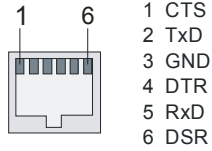
type	cage type terminals
cross section	5.2 x 5.2 mm
recommended conductor cross section	4 to 6 mm <sup>2</sup>
screw head	Pozidrive Combi No. 2
screw dimension	M4 x 15

**Connections (cont.)**

screw head diameter  $\leq 5.6$  mm  
 tightening torque 1.5 to 2 Nm

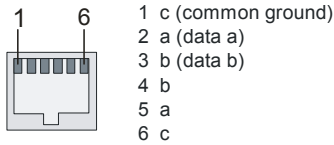
**RS232 Interface**

type designation **.02/.42/.62**  
 type RJ 12  
 pin assignment



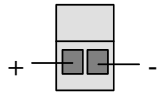
**RS485 Interface**

type designation **.03/.43/.63/.37**  
 type RJ 12  
 pin assignment



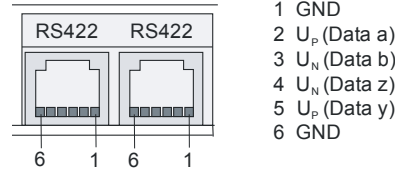
**CS Interface**

type designation **.40/.42/.43**  
 type screw type terminals



**RS422-Interface**

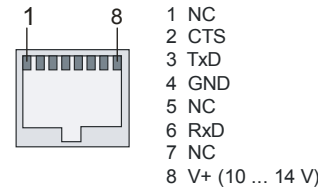
type designation **.60/.62/.63**  
 type RJ 12  
 pin assignment



The two RJ12 jacks of the RS422-interface are looped internally to permit connection of several meters.

**RS232 powered**

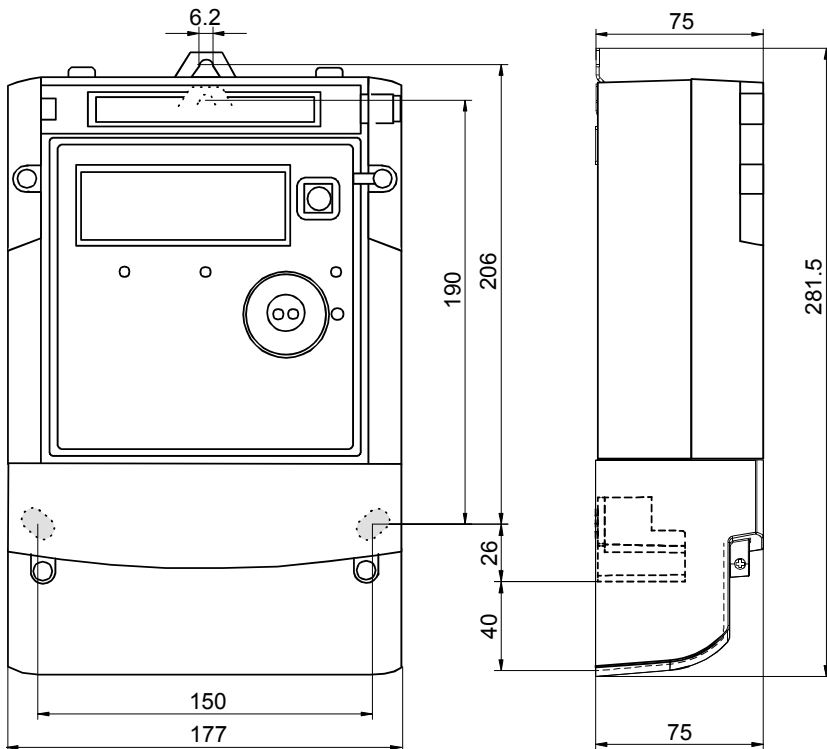
type designation **.07/.37**  
 type RJ 45  
 pin assignment



**Voltage outputs U1, U2, U3, N**

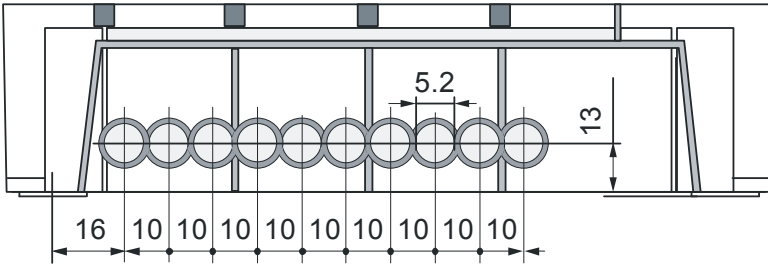
type screw type terminals  
 max. current 1 A  
 max. voltage of control inputs 300 V

**Meter Dimensions (standard terminal cover, suspension eyelet open)**

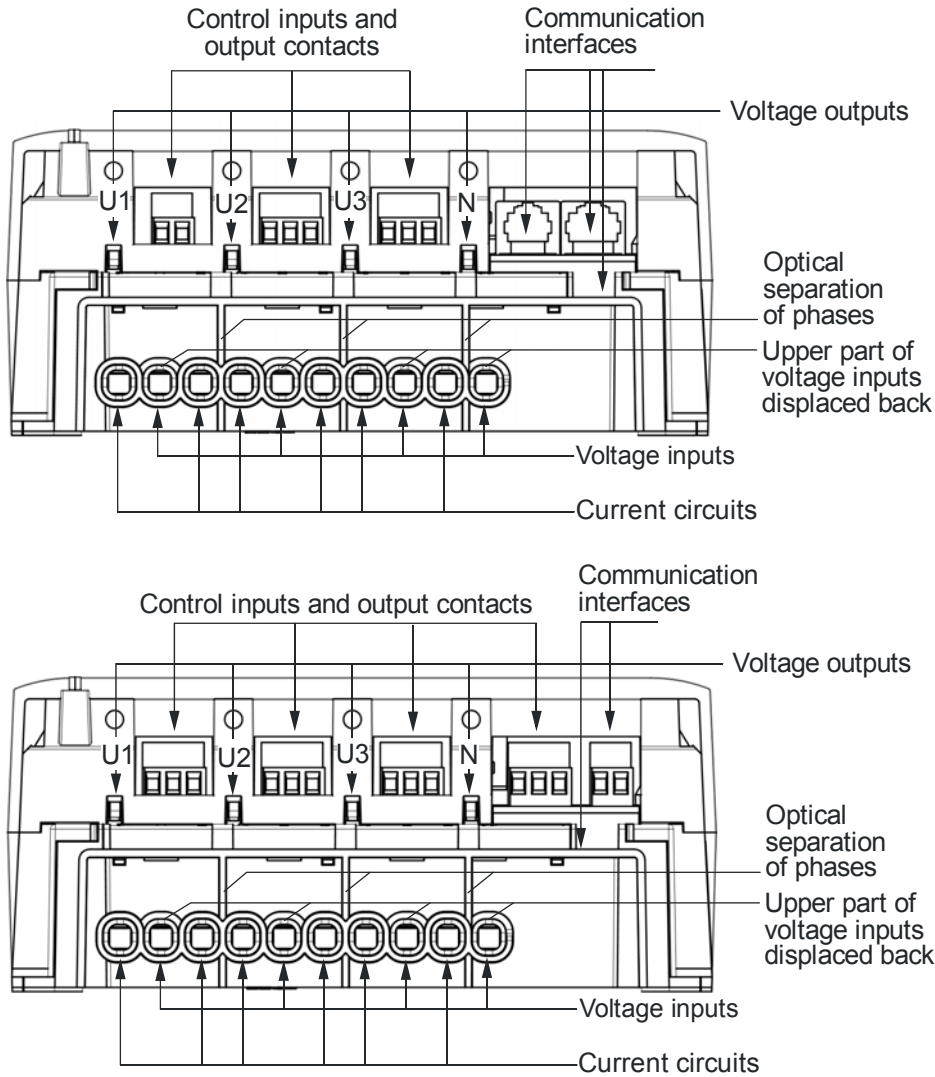


The height of the suspension triangle with extended hook is 230 mm. See also User Manual.

Terminal Dimensions



Terminal Layout



<b>Type designation</b>	<b>ZMG</b>	<b>4</b>	<b>10</b>	<b>CR</b>	<b>4.</b>	<b>260</b>	<b>b.</b>	<b>43</b>	<b>S2</b>
<b>Network type</b>									
<b>ZMG</b>	<b>3-phase 4 wire network (M-circuit)</b>								
<b>Connection type</b>									
4	Transformer operated								
<b>Accuracy class</b>									
10	Active energy class 1 (IEC), B (MID)								
05	Active energy class 0.5 (IEC), C (MID)								
<b>Measured quantities</b>									
CR	Active and reactive energy								
AR	Active energy								
<b>Tariff functions</b>									
1	Energy rates, externally controlled								
2	Energy rates, internally controlled with time switch (TOU)								
3	Energy and demand rates, externally controlled								
4	Energy and demand rates, internally controlled with time switch (TOU)								
<b>Number of control inputs / number of output contacts / special functions</b>									
000	No control inputs, no output contacts, no special functions								
020	2 output contacts								
260	2 control inputs, 6 output contacts								
440	4 control inputs, 4 output contacts								
041	No control inputs, 4 output contacts, 1 output relay 5A								
<b>Additional functions</b>									
0	none								
3	with software events								
4	with hardware and software events								
7	with load profile								
a	with load profile and software events								
b	with load profile, hardware and software events								
<b>Interfaces 2 (Xx) and 1 (xX) (S2 = Series 2)</b>									
00 No interfaces	40 CS*	60 RS422**	07 Powered RS232***						
02 RS232	42 CS and RS232*	62 RS422 and RS232**	37 RS485 and						
03 RS485	43 CS and RS485*	63 RS422 and RS485**	Powered RS232***						

\*) only as .260x.4x or as .440x.4x

\*\*) only as .041x.6x

\*\*\*) only as .020x.07 or as .041x.37

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