

# CheckMeter 2.3 *genX*

**Three-phase Portable Standard Meter for Testing of Electricity Meters**



The CheckMeter 2.3 genX Portable Standard Meter is a three-phase portable electronic meter test unit of accuracy class 0.2, used for testing single and three-phase electricity meters on-site.

The unit has direct voltage inputs and one UCT Universal Current Transducer input, which can be used with different independent transducers to measure the current with clamp-on CT's or direct or with high voltage current sensors.

The UCT 120.3 set of 3 active error compensated clamp-on CT's in the range 10 mA ...120 A is included in the standard accessories.

The CheckMeter 2.3 genX can be upgraded to class 0.1, if the optional UCT I.3-12A input box for direct current connection is used.

## Advantages

- Large 7" (800 x 480 pixels) TFT touch screen colour display with graphical user interface
- Data transfer and communication via USB (Type B) and WLAN
- Built in web server for remote display of graphical user interface and remote control of the unit
- Data storage on removable SD memory card
- Independent UCT sets of current transducers allow service, calibration or later purchase of clamp-on CTs or current sensors without factory return of the device

## Measurement Inputs

- 3 voltage inputs U1, U2, U3
- 1 UCT input for currents I1, I2, I3

## Functions

- Meter testing of pulse outputs (LED/disc mark/S0) and registers of active, reactive, apparent 1- or 3-phase, 3- or 4-wire energy meters with 1 pulse input (configurable as pulse output)
- Measurement of electrical parameters (UI  $\phi$ , PQS, f, PF) including vector diagram, harmonic analysis and wave form display

## Options

- Software CAIntegration
- UCT I.3-12A input box for direct current connection (class 0.1)
- UCT 10.3 set of 3 clamp-on CT's 10 A
- UCT 1000.3 set of 3 clamp-on CT's 1000 A
- UCT LEM.3 set of 3 flexible current probes FLEX 3000 (30/300/3000A)
- UCT AMP-LiteWire 3-phase adapter set for AmpLiteWire + primary high voltage current sensor AmpLiteWire 2000 A

# Technical Data CheckMeter 2.3 gen X

## General

Auxiliary power supply:	Selectable with switch from the auxiliary supply or the measuring circuit (U1-N) at: 46 VAC <sub>min</sub> ... 300 VAC <sub>max</sub> , 47 Hz ... 63 Hz 65 VDC <sub>min</sub> ... 423 VDC <sub>max</sub> Protection: up to 500 VAC <sub>max</sub>
Power consumption:	max. 11 W / 20 VA
Housing:	Hard Plastic
Dimensions:	W 230 x H 159 x D 58 mm (inclusive rubber protection)
Weight:	approx. 1.1 kg (inclusive rubber protection)
Operation temperature:	-10 °C ... +50 °C
Storage temperature:	-20 °C ... +60 °C
Relative humidity:	≤ 85% at Ta ≤ 21°C ≤ 95% at Ta ≤ 25°C, 30 days / year spread

<b>Safety</b>	CE certified
Isolation protection:	IEC 61010-1:2010
Measurement Category:	300V CAT III
Degree of protection:	IP-40

## Measurement Range

Measuring Quantity	Range	Input / Sensor
<b>Voltage (phase - neutral)</b>	0 V ... 300 V	U1, U2, U3
<b>Current</b>	1 mA ... 12 A	UCT I.3-12A
	1 mA ... 10 A	UCT 10.3
	10 mA ... 120 A	UCT 120.3
	100 mA ... 1000 A	UCT 1000.3
	3 A ... 3000 A	FLEX 3000 UCT LEM.3
<b>Primary current</b>	30 A ... 2000 A	AmpLiteWire 2000A

## Measurement Accuracy

Voltage / Current	Range	≤ ± E [%] <sup>1 2 4</sup>
<b>Voltage (U1, U2, U3, N)</b>	46 V ... 300 V	0.2
<b>Current direct UCT I.3-12A</b>	10 mA ... 12 A	0.1
	1 mA ... 10 mA	0.1
<b>Current CT 10A UCT 10.3</b>	30 mA ... 10 A	0.2
	1 mA ... 30 mA	1.0
<b>Current CT 120A UCT 120.3</b>	100 mA ... 120 A	0.2
	10 mA ... 100 mA	1.0
<b>Curr. CT 1000A UCT 1000.3</b>	10 A ... 1000 A	0.2
	1 A ... 10 A	1.0
<b>Current FLEX 3000 UCT LEM.3</b>	300 A ... 3000 A	0.1 + E <sub>M</sub>
	30 A ... 300 A	
	3 A ... 30 A	
<b>Current AmpLiteWire 2000A</b>	300 A ... 2000 A	0.1 + E <sub>M</sub>
	30 A ... 300 A	0.1 + E <sub>M</sub>

Power / Energy	Voltage: 46 V... 300 V (U - N)	≤ ± E [%] <sup>1 2 3</sup>
Measuring quantity / Input I	Range	<b>Cl. 0.2</b>
<b>Active (P), Reactive (Q), Apparent (S)</b>		
CT 10A UCT 10.3	30 mA ... 10 A	0.2
	1 mA ... 30 mA	1.0
CT 120A UCT 120.3	100 mA ... 120 A	0.2
	10 mA ... 100 mA	1.0
CT 1000A UCT 1000.3	10 A ... 1000 A	0.2
	1 A ... 10 A	1.0
<b>Drift / year at Power / Energy (PQS) (clamp-on CT)</b>		
0.05		

Power / Energy	Voltage: 46 V... 300 V (U - N)	≤ ± E [%] <sup>1 2 3</sup>
Measuring quantity / Input I	Range	<b>Cl. 0.1</b>
<b>Active (P), Reactive (Q), Apparent (S)</b>		
Direct UCT I.3-12A (I1, I2, I3)	10 mA ... 12 A	0.1
	1 mA ... 10 mA	0.1
<b>Drift / year at Power / Energy (PQS) (I direct)</b>		
0.02		

Temperature coefficient (TC):	Range	≤ ± TC [%/°C] <sup>3</sup>
	0° C ... +40°C	0.005
	-10° C ... +50°C	0.008

Frequency / Phase Angle / Power Factor	Range	≤ ± E
Measuring Quantity	Range	
<b>Frequency (f)</b>	40 Hz ... 70 Hz	0.01 Hz
<b>Phase Angle (φ)</b>	0.00 ° ... 359.99°	0.1 °
<b>Power Factor (PF)</b>	-1.000... +1.000	0.002

## Notes

- x.x: Related to the measuring value  
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E(M) = FS/M \* x.x (e.g. 0.1 at FS = 10 mA, E(2mA) = 10/2 \* 0.1 = 0.5 %)
- Fundamental frequency in the range 45 ... 66 Hz
- S: x.x, P, Q: x.x / PF (related to apparent power), 3- and 4-wire networks
- E<sub>M</sub>: Accuracy specified by manufacturer of clamp-on CT or sensor

## Pulse Input / output

The input can be configured as output

Input level:	4 ... 12 VDC (24 VDC)			
Input frequency:	max. 200 kHz			
Supply:	12 VDC (I < 60 mA)			
Output level:	5V			
Pulse length:	≥ 10µs			
<b>Meter constant:</b>	C = C <sub>0</sub> / (ln * Un)			
Active, Reactive, Apparent	C <sub>0</sub> = 36'000'000 [imp/Wh(varh, VAh)]			
	The meter constant depends on the highest selected internal ranges ln, Un.			
	The direct voltage input has only one range: Un = 300 V.			
	The actual constant CPZ <sub>1</sub> with unit [imp/Ws (vars, VAS)] is indicated on the display at frequency output.			
	Internal current ranges ln [A]			
Direct UCT I.3-12A I1, I2, I3	0.012	0.12	1.2	12
CT 10A UCT 10.3	0.1	1	10	-
CT 120 UCT 120.3	0.12	1.2	12	120
CT 1000A UCT 1000.3	1	10	100	1000
FLEX 3000 UCT LEM.3	-	30	300	3000
	Example: Un = 300V, ln = 12 A C = 10'000 [imp/Wh(varh, VAh)]			
Output frequency:	CPZ <sub>1</sub> = C / 3'600 [imp/Ws( vars, VAS)]			
	f <sub>0</sub> = CPZ <sub>1</sub> * PΣ (QΣ, SΣ)			
	f <sub>max</sub> = CPZ <sub>1</sub> * 3 * Un * ln			
	= 2.77778 imp/Ws * 3 * 300V * 12A			
	= 30'000 [imp/s]			
	Factor 3 for 3-phase system			

## Option

UCT I.3-12A input box for direct current connection (class 0.1)

