# ARTIQ 235

Class A Power Quality Analyser for Smart Grids

ARTIQ 235 is an advanced compact power quality monitor for smart grids, distribution network monitoring, heavy duty industrial automation and larger energy management projects. Extremely precise power monitor and energy meter in combination with embedded data logger and event recorder makes it an ideal solution for higher added value projects. Display-less version is available for tough and demanding environments.

ARTIQ is equipped with Ethernet communication interface, USB and RS 485 serial line. Configuration and data management are provided with ENVIS application. In combination with ENVIS.Online service the archived data can be periodically stored to the SQL database and automatically processed.

Standards: measures according to EN 61000-4-30 ed. 3 **Class A**, EN 61000-4-7 ed. 2 class I, EN 61000-4-15 ed. 2.0 F1, reports power quality according to EN 50160 ed3, active energy measures in IEC 62053-22 class 0.2S, reactive in IEC 62053-22 class 2, conforms to IEC EN 61557-12.
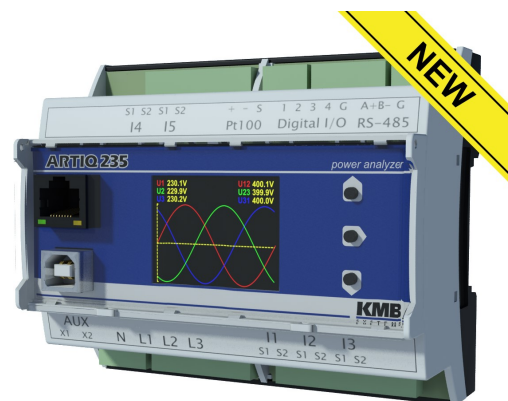
Key features:

• three independent voltage and four current inputs continuously sampled at 28 kHz/ch.

• precise active and reactive energy, 3 TOU tariffs, three- and single-phase meter readings

• embedded RS-485, Ethernet and USB interface

• IEC 61557-12: voltage and current in class 0.1, active power class 0.2, reactive class 2

• low consumption and heat dissipation, wide range operating temperature

• LCD display as option

• input for Pt100 temperature sensor

Standard

INPUTS	MEASUREMENT		+/-	HARMONICS	SAMPLING	CURRENT INPUT
3U, 4I	U,I,P,Q	PF,cos,THD	Wh,varh	128	28kHz	X/5A

INPUTS/OUTPUTS	INPUTS	STANDARDS	STANDARDS	STANDARDS	FLASH	MEASUREMENT
4×DIGI	Pt100	class 0.2S IEC 62053-22	IEC 61557-12	EN 50160	512MB	RCM

RS485	MODBUS	ETH	WEBSERVER	NTP	USB	SUPPLY
	Modbus					230V

Optional

STANDARDS
class A IEC 61000-4-30

Technical specifications

METERING	Voltage (ULN, ULL)	U1, U2, U3, U12, U23, U31 [act, avg, avg_{max}, avg_{min}]
	Current (I)	IL1, IL2, IL3, ILN, Ircm [act, avg, avg_{max}, avg_{min}]
	Power (P)	P1, P2, P3, 3P (import, export, total, 1st harmonic) [act, avg, avg_{max}, avg_{min}]
	Reactive Power (Q)	Q1, Q2, Q3, 3Q (import, export, total, 1st harmonic) [act, avg, avg_{max}, avg_{min}]
	Apparent Power (S)	S1, S2, S3, 3S [act, avg, avg_{max}, avg_{min}]
	Harm. Distortion Power (D)	D1, D2, D3, [act, avg, avg_{max}, avg_{min}]
	Power Factor (PF), cosφ	PF1, PF2, PF3, 3PF, cosφ1, cosφ2, cosφ3, 3cosφ [act, avg, avg_{max}, avg_{min}]
	Symmetrical Components	zero, negative and positive sequence components of voltage and current
	Unbalance Factor	unbI, unbU, φnsI
	Voltage THD (THDU)	THDU1, THDU2, THDU3, THDU12, THDU23, THDU31
	Current THD (THDI)	THDI1, THDI2, THDI3, THDIN
	Individual Harmonics	Harmonics 1st to 127th of Voltage and Current and their angles
	Fundament. Harmonic (Ufh, Ifh)	U1fh, U2fh, U3fh, I1fh, I2fh, I3fh, INfh
	Frequency (f)	f
	Active Energy	class 0.2S (62053-22), import/export, per phase, per tariff, total
	Reactive Energy	class 2 (62053-23), 4 quadrants, per phase, per tariff, total
DATALOG.	Main Archive	min., max., avg. values of ULN, ULL, I, P, Q, S, D, THDU, THDI, f, Avg. values of harmonics and their angles, Ufh, Ifh,Symmetrical components, Unb. factors, state of I/Os
	Electricity Meter Readings	Active and reactive imp. and exp. energy per phase (L1, L2, L3) and per tariff (T1, T2, T3)
	Voltage Event logging	Yes
	Waveforms recording	optional firmware module General Oscilogram
OTHERS	Alarms	Logical functions, under/over limit of U, I, P, Q, S, unbl, THD, cos, f
	Inputs/Outputs	4 universal DIO, input for Pt100
	Memory Size	512MB
	RTC	seconds, minutes, hours, days, months, years
	Communication	RS485, Ethernet, USB

POWER	aux. voltage	**U**: 75 ÷ 275 V_{AC} / 75 ÷ 300 V_{DC}
	power	10 VA / 5 W
	meas. cat.	CAT III / 300 V
INPUT — **VOLTAGE**	meas. range	3 ÷ 1470 V_{AC} / 3 ÷ 850 V_{AC} (ln/ph)
	input impedance	3,9 MΩ (L_i↔N)
	connection	wye, delta, aron
	overload	1300 V_{AC} (perm.), 2210 V_{RMS} (1s)
CURRENT	meas. range	0,0005 ÷ 2 × I_{NOM}
	overload	3 × I_{NOM} (perm.), 5 ÷ 20 × I_{NOM} (1s)

I/O	**D**	voltage levels	U_L < 3 V, U_H > 7 V, U_{MAX} = 30 V
		input current	5 mA @ 12V / 13 mA @ 24V
	I	SSR ratings	100 $V_{AC/DC}$, 100 mA
OTHER	**TEMP**	operating	-20 ÷ 60°C, <95% non-condens.
		storage	-30 ÷ 80°C, <95% non-condens.
	EMC	emission	EN 61000 – 4 – 2, 3, 4, 5, 6, 11
		immunity	EN 55011 - class A, EN 55022 - class A
		protect. rating	IP 20
		dimensions	108W × 98H × 62D mm / 0,3 kg

COMMUNICATION	RS-485 galvanically isolated KMBlong, MODBUS RTU protocols 2400 ÷ 921600 baud
	Ethernet KMBlong, MODBUS TCP protocols
	USB 2.0 KMBlong, MODBUS RTU protocols Connector type Mini-B

ACCURACY (IEC 61557-12)	
voltage	0.1
current	0.1
active power	0.2
reactive power	1
apparent power	0.5
PF, cosφ	0.5
frequency	0.02
active energy	0.5
reactive energy	2
harm. and THD	1
unbalance	0.2
flicker	2 (F3/F1)

KMB SYSTEMS

Ordering options

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Instrument model
    ARTIQ 235  = Class A instrument series, 3U, 4I, RCM
    ARTIQ 235D = Class A instrument series, 3U, 4I, RCM, LCD
Auxiliary power supply
    U = 75 V ÷ 275 VAC, 75 V ÷ 35O VDC
Current inputs
    X/5A = input for 5A AC and 1A AC MTP (indirect measurement) + 1xRCM
Communication interface
    E = Ethernet interface, RS485, USB
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Optional firmware modules

PQ A module

Enables detailed evaluation of power quality according to the EN 50160 into a separate PQ Main archive. It includes flicker, voltage and current inter-harmonics, a RCS voltage level and voltage events - dips, swells and interruptions. Special Modbus registers are activated so that the supervising SCADA system can continuously monitor the live PQ status.
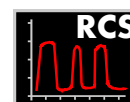
GO module

Module for detection and precise recording of various waveform distortions. This module records the so called oscillograms of voltages and currents in extended detail, capacity and trigger options into the flash memory.
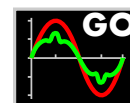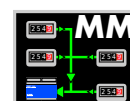
RCS module

The RCS module (ripple control signal or mains voltage) activates an ability to detect, evaluate, decode and store RCS messages transmitted over the distribution network. It precisely measures voltage on the selected frequency and stores the extracted information.

MM Module

The Modbus Master module enhances instruments data logging abilities. By using this module you can configure the instrument to read and store any Modbus registers from any instruments of any manufacturer connected to it's RS-485 line.
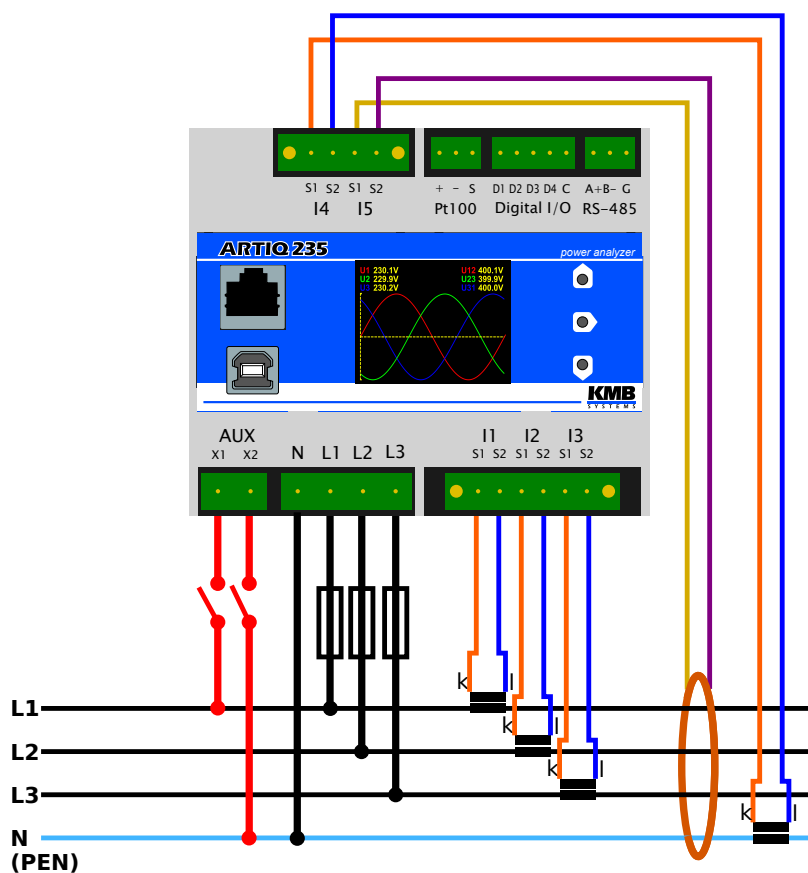
ES Module

The Ethernet to Serial module makes gateway between Ethernet and serial line (RS-485). By using this module you can access your RS-485 instruments over Ethernet.

Typical connection schema

Mechanical dimensions

KMB
S Y S T E M S