

ARTEMES

arte[s] me[nsoni]s - The Art of Measuring
Power & Energy



Power Analyser
AM-4

Power Analyser AM-4



- PFR - power fault recorder
- PM - power measurement in 4 quadrants
- DFR - fault recording of disturbances
- PQ - power quality according to IEC 61000-4-30
- higher harmonics up to 9 kHz in 200 Hz frequencies
- PMU - phasor measurement unit according to micro PMU standard
- microgrid controller

16-bit resolution | energy measurement | power quality analysis

The AM-4 developed for permanent installations and with a flexible number of channels completes the broad spectrum of the ARTEMES family of power measuring devices. It is designed for the use in all voltage levels and can process current sensors as well as voltage and current. The number of channels can be selected in groups of four and can be expanded up to 16 channels.

The possible application starts with a simple voltage fault recorder, whereby a maximum of 6 independent power feeders can be recorded on a common busbar (current transformer saving circuit).



Power Quality EN 50160, IEC 61000-4-30
power quality according to IEC 61000-4-30
PM in 4 quadrants
web technology for operation and evaluation via web browser

Measurement Functions

Overview - Online

representation of the data over time,
as a vector diagram and as numerical values

recording mode or simulation mode,
RMS, AVG, min, max (10 period values,
adjustable)

RMS, AVG (period values, adjustable
overlapping and duration)

U, I, P, Q, S, D, PF, unbalance

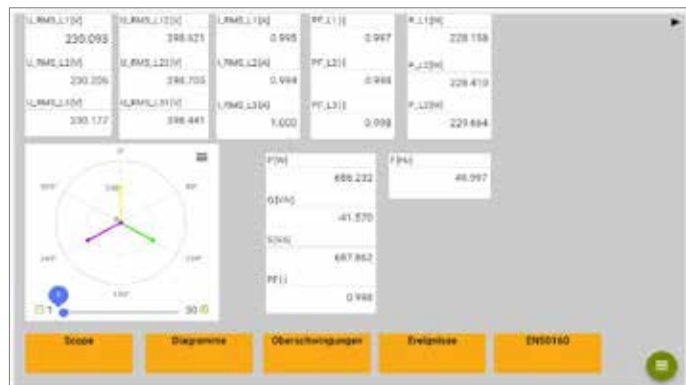
flicker

IEC 61000-4-15: 2012 Class F1

frequency

symmetrical components

IEC 61000-4-30: 2008 Class A



Oscilloscope - Real-Time

real-time oscilloscope on the web browser

voltage and current

selectable scaling left or right



FFT - Real-Time

voltage, current, power, phase angle

phase and phase voltages

bar chart representation and numerical values

IEC 61000-4-7: 2009 Class 1

interharmonics





Dynamic Reports

- diagrams of any channels
- ready-made templates
- reduction and enlargement possible



Static Reports

- report generator for defining reports or ready-made reports
- EN 50160: 2011, Energy (ISO 50001)
- IEC 61000-2-4: 2002
- any diagrams possible
- event statistics



Events Recorder

- transient recordings (TFR)
- fault records (DFR)
- event records EN 50160: 2011
- IEC 61000-4-30: 2008
- scaling: possibilities to enlarge or reduce
- statistical ratings: DisDip/Unipede, CBEMA, events according to EN 50160: 2011

Technical Data

		AM-4-Body	AM-4-Body-GPS
slots for measuring cards			4
analogue channels	depending on the number of measurement cards		0/4/8/12/16
digital channels			4
digital outputs	relais contacts no/nc		4
measurement parameters	resolution		16 bit
	sampling rate up to 12 channels		bis zu 20 kSamples/sec pro Kanal
	sampling rate up to 16 channels		bis zu 10 kSamples/sec pro Kanal
	synchronisation with PPS (GPS)		0
	bandwidth		9kHz
measurement values	phase voltages, neutral voltage		✓
	line voltages		✓
	phase currents, neutral current, protective current		✓
	phasors of voltage, current, angle (AS-PMU according to IEEE C37.118)		✓
online evaluation	web interface		✓
	recorder - diagram and actual values		✓
	oscilloscope, FFT		✓
	FFT IEC 61000-4-7		Option PQ
data processing	flexible report generator on web		✓
	EN 50160		Option PQ
	IEC 61000-2-4 class 1,2,3		Option PQ
	ISO 50001 energy report		✓
data storage	internal SD		64 GB
	ARTEMES server		inkl. Lizenz (max 3 Mess-Clients)
	ARTEMES CLOUD		Option: AM-10-CLOUD
communication ports	USB 3.0		1
	LAN		1
	WLAN / GSM		Option externer Router AM-Route
EMC	IEC 61326-1 industry		✓
	IEC 61000-4-4 surge, IEC 61000-4-5 burst		4 kV
	isolation (AC, 1 min)		2 kV
dimensions	width x depth x height		185*190*140
mounting			DIN-rail
supply voltage	DC		24 V DC
	AC		230 V mit externem Netzteil AM-4-PS
power consumption	VA		ca 20 VA
weight	kg		2 kg
temperature range	operation		0° C bis +60° C
	storing		-20° C bis +80° C

Measurement Cards

AM-4-4HV	number of analogue inputs	4 (differential, isolated)
	measuring range	+/- 400/800 V
	accuracy (value, 5-100% deviation)	0,001
	connection	screw clamp, 2,5 mm ²
AM-4-4LV	number of analogue inputs	4 (differential, isolated)
	measuring range	+/- 0.01/0.1/1/10 V
	accuracy (value, 5-100% deviation)	0,001
	connection	screw clamp, 2,5 mm ²
AM-4-4I	number of analogue inputs	4 (differential, isolated)
	measuring range	+/- 2/20 A
	accuracy (value, 5-100% deviation)	0,001
	connection	screw clamp, 2,5 mm ²

Configuration Examples

	application	components
1 device with 4 voltage inputs	typical fault recorder (PFR) on a branch	1* AM-4-body-gps
	if the power supply voltage of 24 V DC is available	1* AM-4-4-HV
1 device with GPS and 4 voltages / 4 currents	typical phasor measurement unit - PMU	1* AM-4-body-gps
		1* AM-4-4-HV
		1* AM-4-4I
		1* AM-4-PS
1 device without GPS with 4 voltages and 12 small signal inputs for current sensors	typical for energy distribution and network quality on several branches	1* AM-4-body
		1* AM-4-4-HV
		3 * AM-4-4LV
		1 * AM-4-PS

Accessory



AM-4-PS
AM-4-PS
 power supply AC/DC 24V, for AM-4-body, DIN mount



AM-Route-L
AM-Route-L
 external router for GSM and WLAN connection of instruments of type AM-2, AM-3, AM-4, AM-5 and AM-6, DIN Rail mounting Kit included



AM-15-ANT2-GSM
AM-15-ANT2-GSM
 external antenna for WLAN, 1800 MHz LTE / 4G antenna, 17dBi power gain, weatherproof, incl. 15m TWIN cable



AM-GPS-ANT-EXTERN
AM-GPS-ANT-EXTERN
 antenna, GPS L1, permanent assembly, TNC

AS-Server

AS-Server
 SERVER for more than 4 measurement units, web-based analysis tool



AM-CLS-Rog10k

AM-CLS-Rog10k
AM-CLS-Rog10k
 Rogowski coil, up to 10kA, Lemo connector P1, for Artemes measurement instruments with screw adapter



AM-4-UPS

AM-4-UPS
AM-4-UPS
 DC power supply with integrated UPS, 24V DC, 0.8 Ah, battery is already included, DIN rail mounting



Softcase Transport Bag

AM-SC-M
 soft carry bag, size medium



AM-CLS-5

AM-CLS-5
AM-CLS-5
 current clamp 5A, open ends



AM-4-MoCa

AM-4-MoCa
AM-4-MoCa
 mobile chassis including power supply and AM-Route-L



Measurements for Power Applications

System Integration and Monitoring Solution

convenient generation of reports

data compression and data base solutions for easy and individual use

cloud solutions for continuous and distributed measurement tasks

automated test sequences for repeated testings



energy management systems for commerce and industry

load profile measurings and multi-channel power analyses

power quality analyses according to defined standards

qualification of power plants with renewables

software and hardware solutions for individual test bench systems

