

AM-2-D

4 DIN modules multifunction three-phase meter

- 4 DIN modules compact version
- Fully bi-directional four quadrants measurements for all energies and powers
- Main electrical parameters measured and displayed for a cost-effective consumption analysis
- Version for 1 or 5A CT or for direct connection up to 80A
- Possibility to connect by PT
- 8 MB for data recording
- Possibility to record all energy counters
- Up to 24 parameters selectable among real-time measurements for MIN/AVG/MAX recording
- MODBUS TCP communication by ethernet port
- Possibility to manage the instrument in remote mode by web interface



» General Features

AM-2-D is an innovative instrument for measuring and recording electrical parameters. It is particularly suitable for consumption analysis and control, with an excellent quality/price ratio.

AM-2-D is the ideal instrument to establish the measurement points on the plant. The instrument can communicate through Ethernet port by MODBUS TCP protocol.

Furthermore, the ARTEMES server software is available for the instrument remote management. Web interface is also available in case of using the instrument with Ethernet port: a very useful function that gives the possibility to manage the instrument by any PC connected to the network.

» Benefits

- AM-2-D provides fully and accurate information on the load in the measurement point and it allows to calculate the costs of the energy consumption.
- Data read by PC allows to generate consumption profiles, recorded values trend, alarms/events report and costs calculation as well as critical values identification.
- Available remote firmware upgrade of the instrument.

» Applications

- Energy audit.
- Monitoring system and energy control.
- Individual machine load monitoring.
- Power peak control.
- Switchboards, gensets, motor control centers, etc.
- Remote metering and cost allocation.

» Related Products

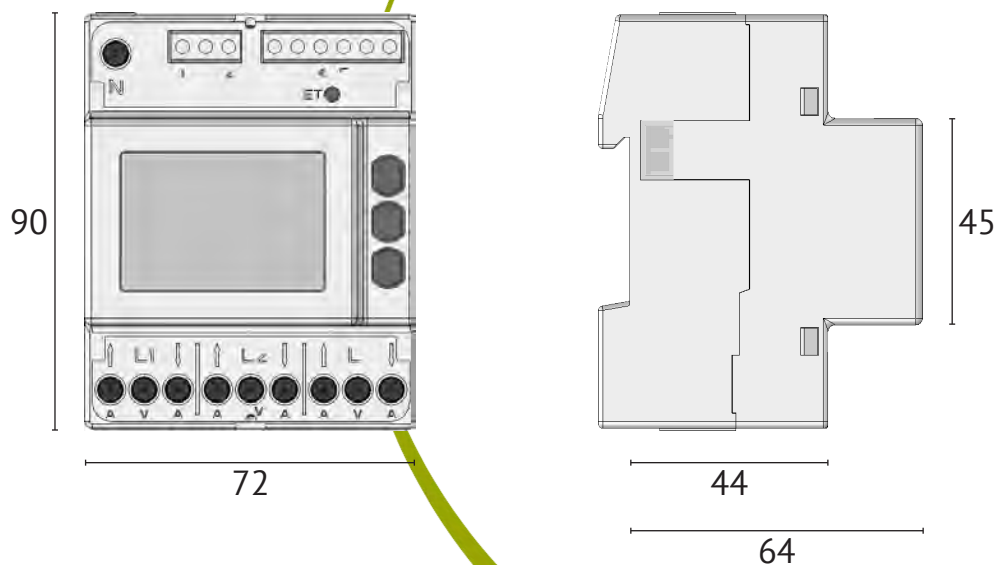
- ARTEMES server



» Available Configurations

CURRENT INPUTS (make one choice only)	For 1/5A CT	●
	Direct connection up to 80A	●
AUXILIARY POWER SUPPLY	85...265 VAC	●
COMMUNICATION PORT (make one choice only)	RS485 for MODBUS RTU/ASCII communication	●
	Ethernet for HTTP, MODBUS TCP communication	●
INSTRUMENT REMOTE MANAGEMENT	Web server	●
SIGN REPRESENTATION IN MODBUS PROTOCOL (make one choice only)	Sign bit	●
	2's complement	●
DMD VALUE CALCULATION MODE	Fixed or sliding window	●
MEMORY	8 MB	●
RECORDINGS	Real time params MIN/AVG/MAX values (up to 24 params programmable)	●
	Energy counters	●
WIRING MODES	Three phase, 4 wires, 3 currents (3.4.3)	●
	Three phase, 3 wires, 2 currents (3.3.2)	●
	Single phase (1ph)	●
THD & HARMONICS	Voltage and current THD values	●
	Voltage and current harmonics up to 15 th	●
APPARENT ENERGY COUNTERS (make one choice only)	Total counters	●
	Separated Inductive&Capacitive counters	●

» Technical Drawing



» Measurements & Recordings

INSTANTANEOUS VALUES		
VOLTAGE	$V_{L1-N} - V_{L2-N} - V_{L3-N} - V_{L1-L2} - V_{L2-L3} - V_{L3-L1} - V_{\Sigma}$ [V]	● MAM
CURRENT (+/-)	$I_{L1} - I_{L2} - I_{L3} - I_N - I_{\Sigma}$ [A]	● MAM
ACTIVE POWER (+/-)	$P_{L1} - P_{L2} - P_{L3} - P_{\Sigma}$ [W]	● MAM
REACTIVE POWER (+/-)	$Q_{L1} - Q_{L2} - Q_{L3} - Q_{\Sigma}$ [var]	● MAM
APPARENT POWER (+/-)	$S_{L1} - S_{L2} - S_{L3} - S_{\Sigma}$ [VA]	● MAM
POWER FACTOR (ind&cap)	$PF_{L1} - PF_{L2} - PF_{L3} - PF_{\Sigma}$	● MAM
DPF (+/-)	$DPF_{L1} - DPF_{L2} - DPF_{L3}$	● MAM
TANGENT Ø (+/-)	$TAN\theta_{L1} - TAN\theta_{L2} - TAN\theta_{L3} - TAN\theta_{\Sigma}$	● MAM
VOLTAGE THD	$THDV_{L1} - THDV_{L2} - THDV_{L3} - THDV_{L1-L2} - THDV_{L2-L3} - THDV_{L3-L1}$ [%]	● MAM
CURRENT THD	$THDA_{L1} - THDA_{L2} - THDA_{L3} - THDA_N$ [%]	● MAM
FREQUENCY	f [Hz]	● MAM
PHASE ORDER	Ph	●
DEMAND VALUES (DMD)		
DMD CURRENT (abs)	$I_{L1DMD} - I_{L2DMD} - I_{L3DMD} - I_{NDMD} - I_{\Sigma DMD}$ [A]	●
DMD ACTIVE POWER (imp&exp)	$P_{L1DMD} - P_{L2DMD} - P_{L3DMD} - P_{\Sigma DMD}$ [W]	●
BALANCE OF DMD SYSTEM ACTIVE POWER (+/-)	$P_{\Sigma DMBAL}$ [W]	●
DMD REACTIVE POWER (imp&exp)	$Q_{L1DMD} - Q_{L2DMD} - Q_{L3DMD} - Q_{\Sigma DMD}$ [var]	●
BALANCE OF DMD SYSTEM REACTIVE POWER (+/-)	$Q_{\Sigma DMBAL}$ [var]	●
DMD APPARENT POWER (imp&exp)	$S_{L1DMD} - S_{L2DMD} - S_{L3DMD} - S_{\Sigma DMD}$ [VA]	●
BALANCE OF DMD SYSTEM APPARENT POWER (+/-)	$S_{\Sigma DMBAL}$ [VA]	●
DMD POWER FACTOR (imp&exp)	$PF_{L1DMD} - PF_{L2DMD} - PF_{L3DMD} - PF_{\Sigma DMD}$	●
MAX VALUES		
MAX VOLTAGE	$V_{L1-NMAX} - V_{L2-NMAX} - V_{L3-NMAX} - V_{L1-L2MAX} - V_{L2-L3MAX} - V_{L3-L1MAX} - V_{\Sigma MAX}$ [V]	●
MAX CURRENT (abs)	$I_{L1MAX} - I_{L2MAX} - I_{L3MAX} - I_{NMAX} - I_{\Sigma MAX}$ [A]	●
MAX ACTIVE POWER (imp&exp)	$P_{L1MAX} - P_{L2MAX} - P_{L3MAX} - P_{\Sigma MAX}$ [W]	●
MAX REACTIVE POWER (imp&exp)	$Q_{L1MAX} - Q_{L2MAX} - Q_{L3MAX} - Q_{\Sigma MAX}$ [var]	●
MAX APPARENT POWER (imp&exp)	$S_{L1MAX} - S_{L2MAX} - S_{L3MAX} - S_{\Sigma MAX}$ [VA]	●
MAX POWER FACTOR (imp&exp)	$PF_{L1MAX} - PF_{L2MAX} - PF_{L3MAX} - PF_{\Sigma MAX}$	●
MAX TANGENT Ø (imp&exp)	$TAN\theta_{L1MAX} - TAN\theta_{L2MAX} - TAN\theta_{L3MAX} - TAN\theta_{\Sigma MAX}$	●
MAX VOLTAGE THD	$THDV_{L1MAX} - THDV_{L2MAX} - THDV_{L3MAX} - THDV_{L1-L2MAX} - THDV_{L2-L3MAX} - THDV_{L3-L1MAX}$ [%]	●
MAX CURRENT THD	$THDA_{L1MAX} - THDA_{L2MAX} - THDA_{L3MAX} - THDA_{NMAX}$ [%]	●
MAX DMD CURRENT	$I_{L1MAXDMD} - I_{L2MAXDMD} - I_{L3MAXDMD} - I_{\Sigma MAXDMD}$ [A]	●
MAX DMD ACTIVE POWER (imp&exp)	$P_{L1MAXDMD} - P_{L2MAXDMD} - P_{L3MAXDMD} - P_{\Sigma MAXDMD}$ [W]	●
MAX DMD REACTIVE POWER (imp&exp)	$Q_{L1MAXDMD} - Q_{L2MAXDMD} - Q_{L3MAXDMD} - Q_{\Sigma MAXDMD}$ [var]	●
MAX DMD APPARENT POWER (imp&exp)	$S_{L1MAXDMD} - S_{L2MAXDMD} - S_{L3MAXDMD} - S_{\Sigma MAXDMD}$ [VA]	●
MIN VALUES		
MIN SYSTEM ACTIVE POWER	$P_{\Sigma MIN}$ [W]	●
MIN SYSTEM REACTIVE POWER	$Q_{\Sigma MIN}$ [var]	●
MIN SYSTEM APPARENT POWER	$S_{\Sigma MIN}$ [VA]	●
COUNTERS		
ACTIVE ENERGY (imp&exp)	$kWh_{L1} - kWh_{L2} - kWh_{L3} - kWh_{\Sigma}$ [Wh]	● EC
BALANCE OF SYSTEM ACTIVE ENERGY	$kWh_{\Sigma BAL}$ [Wh]	● EC
REACTIVE ENERGY (imp&exp) (ind&cap)	$kvarh_{L1} - kvarh_{L2} - kvarh_{L3} - kvarh_{\Sigma}$ [varh]	● EC
BALANCE OF SYSTEM REACTIVE ENERGY (ind&cap)	$kvarh_{\Sigma BAL}$ [varh]	● EC
APPARENT ENERGY (imp&exp) (ind&cap on request)	$kVAh_{L1} - kVAh_{L2} - kVAh_{L3} - kVAh_{\Sigma}$ [VAh]	● EC
BALANCE OF SYSTEM APPARENT ENERGY (ind&cap on request)	$kVAh_{\Sigma BAL}$ [VAh]	● EC
INSTALLATION HOUR COUNTER	HRCNTi [h]	●
MEASUREMENT HOUR COUNTER	HRCNTm [h]	●
HARMONIC ANALYSIS UP TO 15 th		
VOLTAGE HARMONICS	$V_{L1-N} - V_{L2-N} - V_{L3-N} - V_{L1-L2} - V_{L2-L3} - V_{L3-L1}$ [V]	● MAM
CURRENT HARMONICS	$I_{L1} - I_{L2} - I_{L3} - I_N$ [A]	● MAM

LEGEND

● = standard

AVG = parameters for AVG recording (fixed)

MAM = parameters for MIN/AVG/MAX recording (up to 24 params programmable)

EC = parameters for Energy counter recording (fixed)

+/- = signed value

imp&exp = values splitted in imported and exported

abs = absolute value

ind&cap = values splitted in inductive and capacitive

DMDBAL = difference between the positive and negative demand value: [DMD+] - [DMD-]

BAL = difference between the imported and exported value: [imp] - [exp]



» Specifications

POWER SUPPLY	
Voltage range:	85 ... 265 VAC
Safety:	300 V CAT III
Maximum consumption:	4.5 VA - 1.6 W
Frequency:	50/60 Hz
VOLTAGE INPUTS	
Voltage range:	3x10/17 ... 3x285/495 VAC
Safety:	300 V CAT III
Minimum voltage for FFT calculation:	20/35 VAC (multiplied by PT ratio in case of PT use) with direct connection
CURRENT INPUTS	
Maximum value:	1/5A CT model: 6A 80A model: 80A
Starting current (I_{st}):	1/5A CT model: 2 mA 80A model: 20 mA
CT burden:	1/5A CT model: 0.04 VA
Minimum current for FFT calculation:	1/5A CT model: 100 mA * CT ratio 80A model: 200 mA
TYPICAL ACCURACY	
Voltage:	±0.2% reading in 10% FS...FS range (FS=Full Scale value)
Current:	±0.4% reading in 5% FS...FS range
Power:	±0.5% reading ±0.1% FS (PF=1)
Frequency:	±0.1% reading ±1 digit in 45...65 Hz range
Active energy:	Class 1 according to IEC/EN 62053-21
Reactive energy:	Class 2 according to IEC/EN 62053-23
DISPLAY & KEYBOARD	
Display:	Backlighted LCD, 43x29 mm 3 rows, 4 digits + symbols
Keyboard:	3 front buttons + 1 protected button
COMMUNICATION PORT	
Type:	ethernet (RJ45)
Protocols:	HTTP, NTP, DHCP, MODBUS TCP
Baud rate:	10/100 Mbps
DIGITAL OUTPUT (DO)	
Type:	Passive optoisolated
Maximum values (according to IEC/EN 62053-31):	27 VDC - 27 mA
Energy pulse length (only for DO in pulse mode):	50 ±2ms ON time
Maximum output reaction time (only for DO in alarm mode):	1 s
WIRE DIAMETER FOR TERMINALS	
Measuring terminals (A & V):	1/5A CT model: 1.5 ... 6 mm ² 80A model: 1.5 ... 35 mm ²
Terminals for digital output, AUX input, RS485 port:	0.14 ... 2.5 mm ²
SIZE & WEIGHT	
LxHxP, W:	72x90x65 mm, max 436 g
ENVIRONMENTAL CONDITIONS	
Operating temperature:	-25°C ... +55°C (3K6)
Storage temperature:	-25°C ... +75°C (2K3)
Max humidity (without condensation):	80%
Sinusoidal vibration amplitude:	50 Hz ±0.075 mm
Protection degree - frontal part:	IP51 (granted only in case of installation in a cabinet with at least IP51 protection degree)
Protection degree - terminals:	IP20
Pollution degree:	2
Installation and use:	Internal
STANDARD COMPLIANCE (for the parts applicable for the instrument)	
Directives:	2006/95/EC, 2004/108/EC
Safety:	EN 61010-1, EN 61010-2-030, EN 61010-2-032
EMC:	EN 61326-1, EN 55011, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, EN61000-6-2



ORDER CODE	POWER SUPPLY	COMMUNICATION PORT with SIGN BIT in Modbus	APPARENT EN. COUNTER (VAh)	REMOTE MANAGEMENT	
	Auxiliary	ETHERNET	SEPARATED Ind&Cap	ARTEMES server	Web Server
FOR 1/5A CTs (not included)					
AM-2-D5	85 265VAC	●	●	●	●
80A DIRECT CONNECTION					
AM-2-D80	85 265VAC	●	●	●	●

OPTIONS available only on request (MOQ 30 pcs), to be indicated together with the selected order code from the list above:

- 2'S COMPLEMENT for sign representation in Modbus protocol
- TOTAL apparent energy counters (Ind+Cap)

NOTE: Subject to change without notice



AM99-001-00066

ARTEMES GmbH | sales@artemes.org | www.artemes.org

