Power Measurement

AD-LU 25 GT

Description

The digital power and energy meter AD-LU 25 GT measures all standard values of the three-phase system (active-, reactive-, apparent-power, voltage, currents, harmonics, power factor etc.) and provides this via an Ethernet interface. The measured values can be read out via Modbus-TCP protocol. In addition, these measured values are displayed on an integrated small WEB server. The device can also be parameterized via this WEB server. The AD-LU 25 GT is also equipped with an RS485 interface. This RS485 interface with Modbus-RTU protocol is mainly suitable for connecting an external display (AD-MM 400), but can also be used to read data or parameterize. The current measurement is realized by external current transformers which are available up to 600 A. Thus, also the retrofitting of existing plants is not a problem. It is possible to measure symmetrical or unbalanced 4-wire networks and symmetrically loaded 3-wire networks. Due to the integrated, efficient wide-range power supply, the device operates in a large supply voltage range and does not heat up very much.

Application

Measurement and monitoring of all electrical characteristics in electrical systems. Detection of load profiles for energy management systems, e.g. ISO 50001. Recording the energy consumption of individual consumers. Monitoring of voltage quality variables, e.g. harmonics.

Specific characteristics

- Supports external split-core-transformer
- Ethernet-Interface
- RS485-Interface
- Counters for active, reactive and apparent energy
- Counters for purchased or fed energy

Business data

Order number

AD-LU 25 GT	power meter

Accessory

AD-KSW 50	50 A split-core-transformer
AD-KSW 100	100 A split-core-transformer
AD-KSW 200	200 A split-core-transformer
AD-KSW 400	400 A split-core-transformer
AD-KSW 600	600 A split-core-transformer
AD-MM 400	compatible display
AD-VarioPass3	USB/RS485-adapter

Information

Downloads

Tender text	lu25gt.zip

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Technical specifications

Current-inputs (I1...I3)

Measuring ranges	0 ... 33,3 mA AC (via split-core-transformer)
Input resistance	ca. 10 Ohm

Voltage-inputs (L1...L3)

Measuring range	80 ... 253 V AC
Input resistance	ca. 950 kOhm

Ethernet-interface

Software protocol	Modbus-TCP
Standard-IP	192.168.178.99
Network mask	255.255.255.0
WEB-Server	Port 80

RS485-Bus

Software protocol	Modbus-RTU
Data format	19200, e, 8, 1
Max. bus users	99
Bus termination	120 ohms both sides at the end
Max. length of bus	500 m (no stubs)
Cable	twisted and shielded

Supply

Voltage range AC	80 ... 253 V AC, 50/60 Hz (see voltage-inputs)
Nominal voltage AC	230 V AC
Power consumption	max. 2,5 VA

Transfer behavior - in reference to the current value

Basic accuracy	< 0,5 % (class 0.5)
Temperature influence	80 ppm/K
Response time	< 0,5 s

Housing

Dimensions (WxHxD)	71x90x70 mm
Type of protection	IP 20
Connection method	screw clamp
Terminals, wire cross section	2,5 mm² flex wire / 4 mm² one wire
Bolting torque terminals	0,6 Nm
Skinning length	6 mm
Weight	~ 180 g
Manner of fastening	35 mm DIN rail 35mm

Environmental conditions

Ambient temperature	-10 ... 50 °C
Storage and transport	-10 ... 70 °C (no condensation)

EMC

Product family standard	EN 61326-1 [1)]
Emitted interference	EN 55011, CISPR11 Cl. B, Gr. 1

Electrical safety requirements

Product family standard	EN 61010-1
Overvoltage category	II
Pollution degree	2
Safety measurement	EN 61010-2-030
Measurement category	CAT III

Galvanic isolation, test voltages

Grid side to RS485-Bus	4 kV, 50 Hz (1 min.)
Grid side to control elements	4 kV, 50 Hz (1 min.)

Protection circuits

Input	electrical surge protection
RS485-Bus	electrical surge protection
Power supply	protection against over-temperature, over-voltage and over-current

[1)] During checking, slight signal deviations are possible.

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Block and wiring diagram

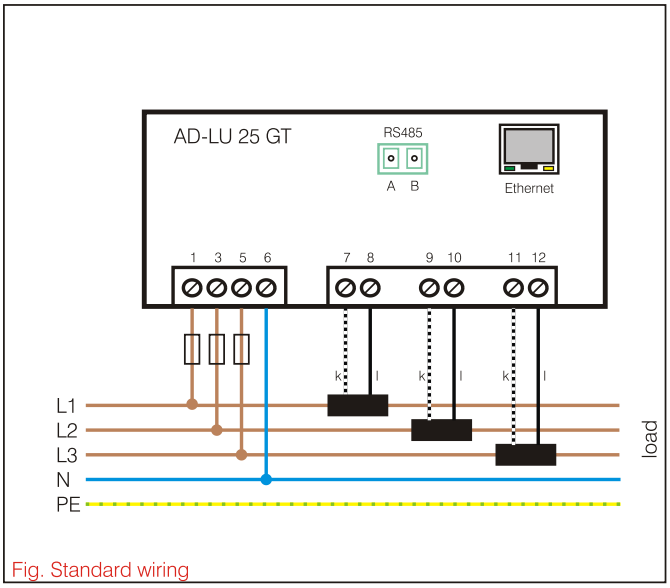


Fig. Standard wiring

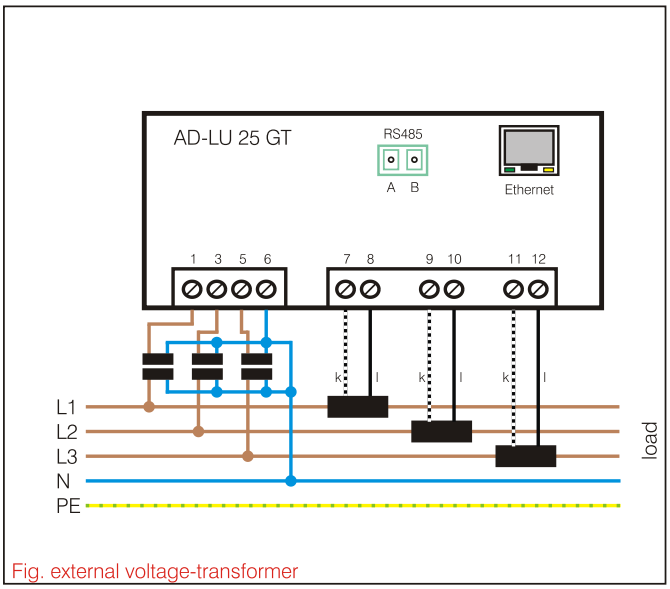
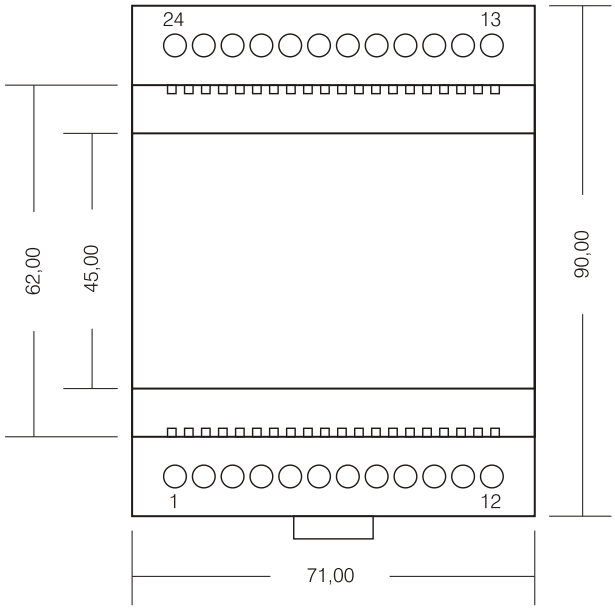
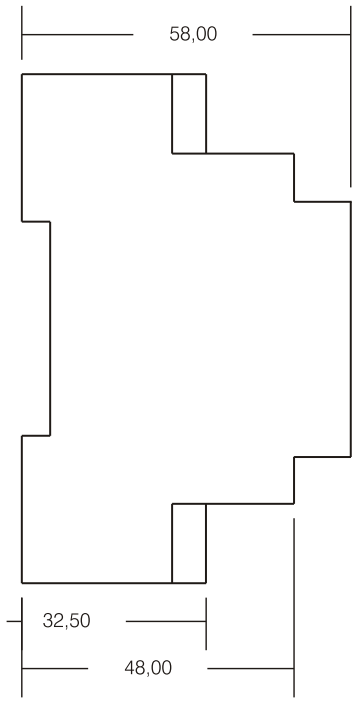


Fig. external voltage-transformer

Dimensions





Hinweis:
Für die Messung symmetrischer Lasten kann das Gerät so umparametriert werden, dass nur ein Stromwandler für die Messung notwendig ist.
In diesem Fall bitte die Strommessung mit Stromwandler 1 auf Phase L1 durchführen.

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Modbus-Data

Messwerte:

start address	no. of registers	name	unit	data type	read	write
40501	2	SCA_TOTAL_ACTIVE_POWER	kW	7	1	0
40503	2	SCA_PHASE_A_ACTIVE_POWER	kW	7	1	0
40505	2	SCA_PHASE_B_ACTIVE_POWER	kW	7	1	0
40507	2	SCA_PHASE_C_ACTIVE_POWER	kW	7	1	0
40509	2	SCA_TOTAL_REACTIVE_POWER	kvar	7	1	0
40511	2	SCA_PHASE_A_REACTIVE_POWER	kvar	7	1	0
40513	2	SCA_PHASE_B_REACTIVE_POWER	kvar	7	1	0
40515	2	SCA_PHASE_C_REACTIVE_POWER	kvar	7	1	0
40517	2	SCA_TOTAL_APPARENT_POWER	kVA	7	1	0
40519	2	SCA_PHASE_A_APPARENT_POWER	kVA	7	1	0
40521	2	SCA_PHASE_B_APPARENT_POWER	kVA	7	1	0
40523	2	SCA_PHASE_C_APPARENT_POWER	kVA	7	1	0
40525	2	SCA_TOTAL_POWER_FACTOR		7	1	0
40527	2	SCA_PHASE_A_POWER_FACTOR		7	1	0
40529	2	SCA_PHASE_B_POWER_FACTOR		7	1	0
40531	2	SCA_PHASE_C_POWER_FACTOR		7	1	0
40533	2	SCA_TOTAL_ACTIVE_FUNDAMENTAL_POWER	kW	7	1	0
40535	2	SCA_PHASE_A_ACTIVE_FUNDAMENTAL_POWER	kW	7	1	0
40537	2	SCA_PHASE_B_ACTIVE_FUNDAMENTAL_POWER	kW	7	1	0
40539	2	SCA_PHASE_C_ACTIVE_FUNDAMENTAL_POWER	kW	7	1	0
40541	2	SCA_TOTAL_ACTIVE_HARMONIC_POWER	kW	7	1	0
40543	2	SCA_PHASE_A_ACTIVE_HARMONIC_POWER	kW	7	1	0
40545	2	SCA_PHASE_B_ACTIVE_HARMONIC_POWER	kW	7	1	0
40547	2	SCA_PHASE_C_ACTIVE_HARMONIC_POWER	kW	7	1	0
40549	2	SCA_PHASE_A_VOLTAGE_RMS	V	7	1	0
40551	2	SCA_PHASE_B_VOLTAGE_RMS	V	7	1	0
40553	2	SCA_PHASE_C_VOLTAGE_RMS	V	7	1	0
40555	2	SCA_N_LINE_CALCULATED_CURRENT_RMS	A	7	1	0
40557	2	SCA_PHASE_A_CURRENT_RMS	A	7	1	0
40559	2	SCA_PHASE_B_CURRENT_RMS	A	7	1	0
40561	2	SCA_PHASE_C_CURRENT_RMS	A	7	1	0
40563	2	SCA_CHANNEL_A_VOLTAGE_PEAK	V	7	1	0
40565	2	SCA_CHANNEL_B_VOLTAGE_PEAK	V	7	1	0
40567	2	SCA_CHANNEL_C_VOLTAGE_PEAK	V	7	1	0
40569	2	SCA_CHANNEL_A_CURRENT_PEAK	A	7	1	0
40571	2	SCA_CHANNEL_B_CURRENT_PEAK	A	7	1	0
40573	2	SCA_CHANNEL_C_CURRENT_PEAK	A	7	1	0
40575	2	SCA_FREQUENCY	Hz	7	1	0
40577	2	SCA_PHASE_A_MEAN_PHASE_ANGLE	°	7	1	0
40579	2	SCA_PHASE_B_MEAN_PHASE_ANGLE	°	7	1	0
40581	2	SCA_PHASE_C_MEAN_PHASE_ANGLE	°	7	1	0
40583	2	SCA_MEASURED_TEMPERATURE	°C	7	1	0
40585	2	SCA_PHASE_A_VOLTAGE_PHASE_ANGLE	°	7	1	0
40587	2	SCA_PHASE_B_VOLTAGE_PHASE_ANGLE	°	7	1	0
40589	2	SCA_PHASE_C_VOLTAGE_PHASE_ANGLE	°	7	1	0
40591	2	SCA_IN_PHASE_AB_VOLTAGE_RMS	V	7	1	0
40593	2	SCA_IN_PHASE_BC_VOLTAGE_RMS	V	7	1	0
40595	2	SCA_IN_PHASE_CA_VOLTAGE_RMS	V	7	1	0

Modbus-Data

start address	no. of registers	name	unit	data type	read	write
List-Parameters:						
41001	1	LIST_LOAD_TYPE		3	1	1
41002	1	LIST_RS485_BAUDRATE		3	1	1
41003	1	LIST_RS485_PARITY		3	1	1
41004	1	LIST_RS485_STOPBIT		3	1	1
Data-Parameters:						
42001	2	DATAPAR_FILTER	s	7	1	1
42003	2	DATAPAR_PRIM_CURRENT	A	7	1	1
42005	2	DATAPAR_SEK_CURRENT	A	7	1	1
42007	2	DATAPAR_PRIM_VOLTAGE	V	7	1	1
42009	2	DATAPAR_SEK_VOLTAGE	V	7	1	1
42019	2	DATAPAR_LOAD_HOURS_LIMIT	%	7	1	1
Counters (full units):						
43503	2	ENERGY_KWH_TOTAL_CONSUMPTION	kWh	5	1	1
43505	2	ENERGY_KWH_TOTAL_INFEED	kWh	5	1	1
43507	2	ENERGY_KVARH_TOTAL_INDUCTIVE	kVarh	5	1	1
43509	2	ENERGY_KVARH_TOTAL_CAPACITIVE	kVarh	5	1	1
43511	2	ENERGY_KVAH_TOTAL	kVAh	5	1	1
43513	2	LOAD_HOURS	kVAh	5	1	1
Counters (tenth units):						
44103	2	ENERGY_KWH_TOTAL_CONSUMPTION	kWh	5	1	1
44105	2	ENERGY_KWH_TOTAL_INFEED	kWh	5	1	1
44107	2	ENERGY_KVARH_TOTAL_INDUCTIVE	kVarh	5	1	1
44109	2	ENERGY_KVARH_TOTAL_CAPACITIVE	kVarh	5	1	1
44111	2	ENERGY_KVAH_TOTAL	kVAh	5	1	1
44113	2	LOAD_HOURS	h	5	1	1

Legend of the data types:

U08: 1	**S08:** 2	**U16:** 3	**S16:** 4	**U32:** 5	**S32:** 6	**float:** 7

Coding of the list-parameter (list index:value):

Baudrate	**0:**2400	**1:**4800	**2:**9600	**3:**14k4	**4:**19k2	**5:**28k8	**6:**38k4	**7:**57k6	**8:**76k8	**9:**115k2
Stopbit	**0:**1	**1:**2								
Parität	**0:**even	**1:**odd	**2:**none							
Lastart	**0:**beliebig	**1:**gleich								

Password assignment for WEB interface

When accessing the configuration data via the WEB interface of the device, a user login is required. The default user name is "admin", without password entry. The user name and password can only be reassigned via the WEB interface in the "Factory settings" ? "Reset password?" directory. New entries can be made in the following login screen. At least one of the input fields must contain an entry.

Factory RESET without network access

If the assigned password is no longer known and access is no longer possible, the device can be reset using the following procedure.

1. Device off, LAN cable must be plugged in.
2. Switch on the power supply.
3. Wait for the LAN link LED, then immediately disconnect the LAN cable (operating LED flashes).
4. Wait 2 seconds.
5. Plug in the LAN cable again.

IP settings and password are reset (IP standard setting: IP = 192.168.178.99/255.255.255.0 / DHCP = ON).