

### Description

The digital power and energy meter AD-LU 20 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 20 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 is fed via the front-mounted through-current converters, which can measure up to 20 A directly. However, additional current transformers for larger currents can also be connected at any time. 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

- internal current-transformer
- Ethernet-Interface
- RS485-Interface
- Counters for active, reactive and apparent energy
- Counters for purchased or fed energy

### Business data

<b>Order number</b>	
AD-LU 20 GT	power meter
<b>Accessory</b>	
AD-MM 400	compatible display
AD-VarioPass3	USB/RS485-adapter

## Information

### Downloads

Tender text [lu20gt.zip](#)

## Technical specifications

### Current-inputs (I1...I3)

Measuring ranges 0 ... 1 A AC; 0 ... 5 A AC;  
0 ... 20 A AC  
Max. conductor diameter 4,8 mm

### Voltage-inputs (L1...L3)

Measuring range 50 ... 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 50 ... 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 mm<sup>2</sup> flex wire / 4 mm<sup>2</sup> 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 <sup>1)</sup>  
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.)

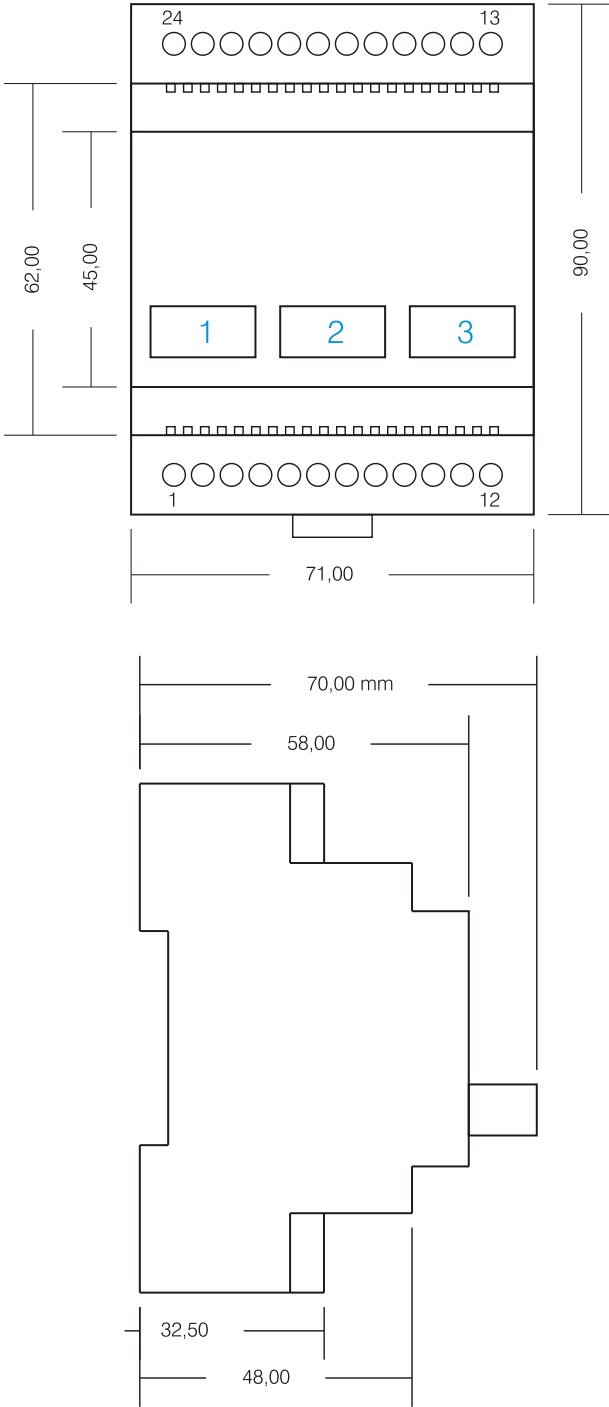
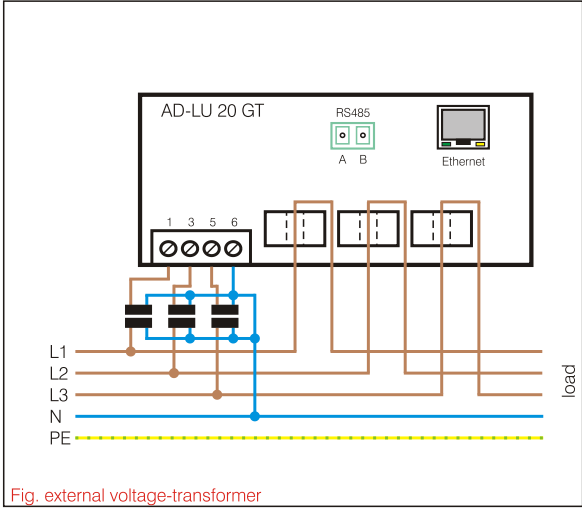
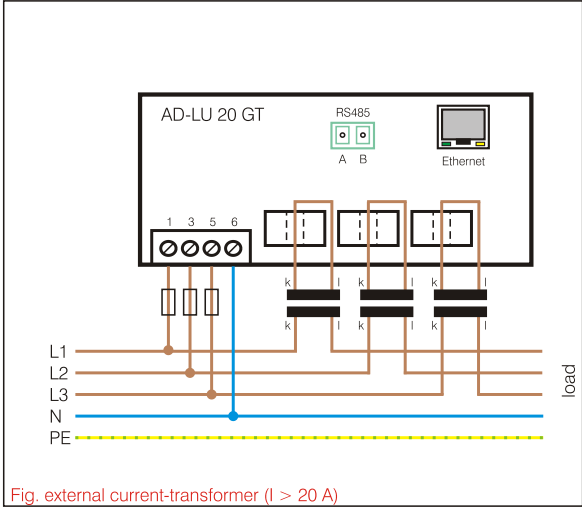
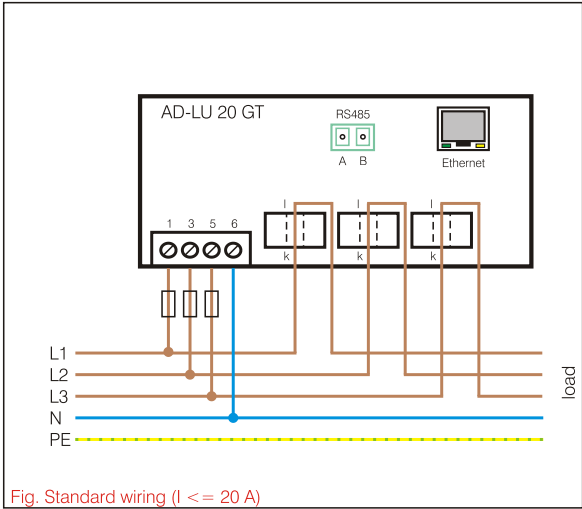
## Protection circuits

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

<sup>1)</sup> During checking, slight signal deviations are possible.

### Block and wiring diagram

### 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.

# Power Measurement

AD-LU 20 GT

## 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).