

### Description

The digital power measuring converter AD-LU 35 GT measures all magnitudes of the three-phase network (current, voltage, energy, effective power, reactive power and apparent power..) and makes this data available via a RS485 bus. The unit is therefore optimally suitable for integration in energy management systems. 3- or 4-conductor networks can be measured. 4-wire networks can be loaded balanced or unbalanced, whereby 3-wire networks can only be measured balanced. The AD-LU 35 GT supplies itself via its measuring voltage L1. The current measurement takes place via additional external Split-Core-Transformer. The device is therefore ideal for retrofitting if no space is available. For measuring high voltages or currents, external converters can be fitted in series at any time. A Modbus-RTU protocol is run via the RS485 bus interface, whereby the AD-LU 35 GT represents a Modbus slave. The bus address is set via the rotary coding switch mounted at the front, this way several of these measuring units can be switched at one bus and can be interrogated from one central point. The AD-LU 35 GT can also be read and parameterized via the available AD-Studio. Two LEDs at the front signal the operating condition and the RS485 data traffic. The compact type of construction and the high performance ability, with simultaneous low energy consumption, allows usage in almost any application.

### Application

A typical usage is in energy management systems for balancing and determining the energy distribution. Due to the measurement via an external current transformer, the unit can be retrofitted without problems in any system without interruption.



### Specific characteristics

- compact size
- current measurement through external split current transformer
- power supply by measuring voltages
- address setting via rotary coding switch
- recording of all sizes of the three-phase system
- parameter setting via AD-Studio

### Business data

#### Order number

AD-LU 35 GT digital power meter

#### Accessory

50A-Split-Core-Transformer	50 A AC primary / 33,3 mA AC secondary
100A-Split-Core-Transformer	100 A AC primary / 33,3 mA AC secondary
200A-Split-Core-Transformer	200 A AC primary / 33,3 mA AC secondary
400A-Split-Core-Transformer	400 A AC primary / 33,3 mA AC secondary
600A-Split-Core-Transformer	600 A AC primary / 33,3 mA AC secondary
VarioPass	RS485 to USB converter
AD-NetGw 100 GT	RS485 to Ethernet converter (Modbus-TCP)

### Technical specifications

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

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

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

Measuring range	80 ... 253 V AC
Input resistance	ca. 500 kOhm

#### 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. 3 VA

#### Transfer behavior - in reference to the current value

Basic accuracy	< 0,5 % (class 0.5)
Temperature influence	80 ppm/K
Response time	< 2 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	~ 170 g
Manner of fastening	35 mm DIN rail 35mm

#### Environmental conditions

Ambient temperature	0 ... 50 °C
Storage and transport	-10 ... 70 °C (no bedewing)

#### EMC

Product family standard	EN 61326 <sup>1)</sup>
Emitted interference	EN 55011, CISPR11 Cl. B

#### 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.)

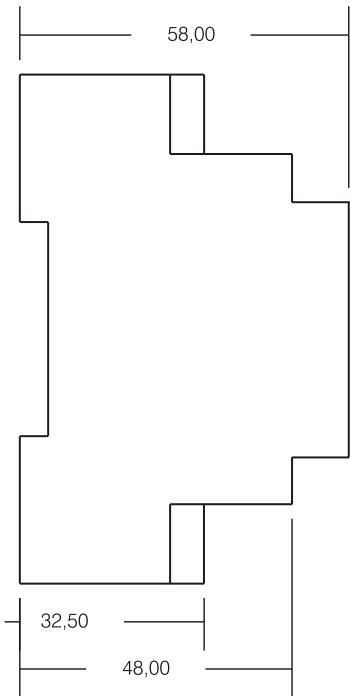
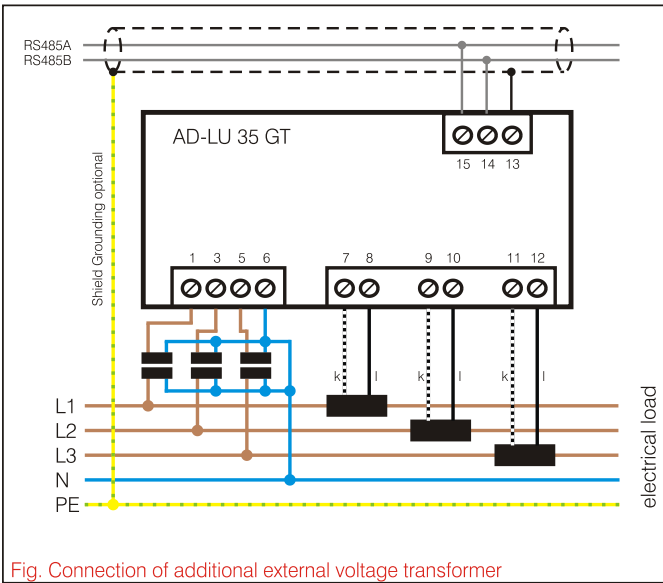
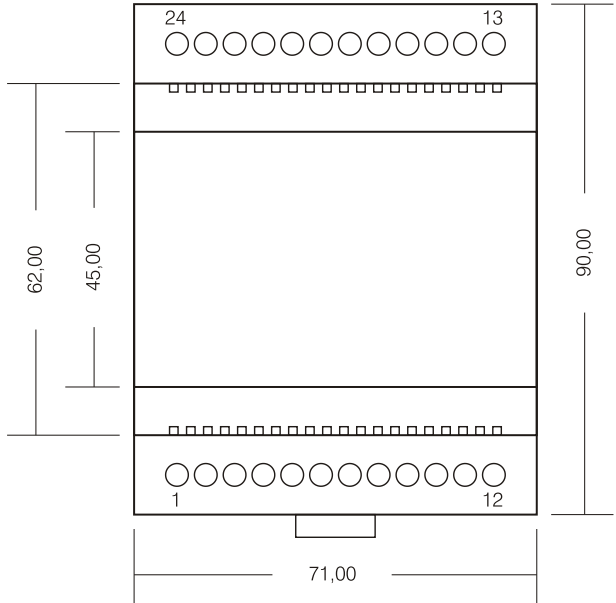
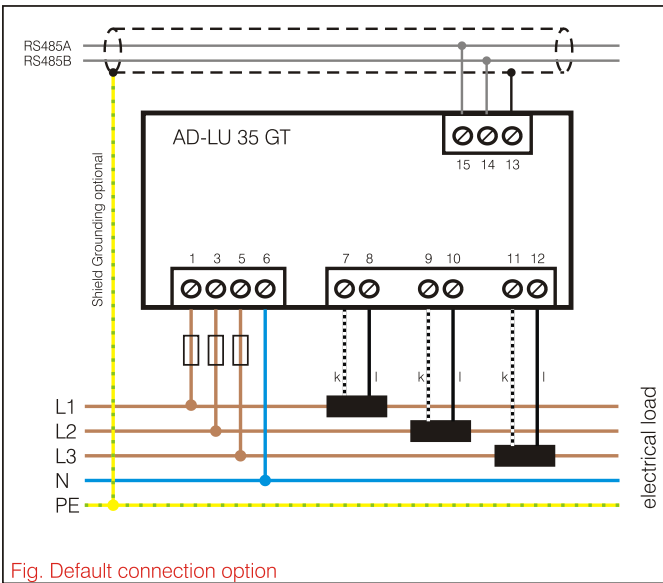
#### Protection circuits

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



**Note:**  
 To measure symmetrical loads, the device can be reconfigured, that only one current transformer for the measurement is necessary.  
 In this case, use the current transformer 1 to measure the current in L1.

## Modbus Communication

The AD-LU 30 GT has a RS485 bus interface on which the Modbus RTU protocol is used. About this bus interface all measured data of the unit can be read out.

The default standard data format is 19200,e,8,1. Adaptation to a different data format is always possible.

<b>data rate:</b> 19200 baud (bits/s)	<b>parity:</b> even	<b>data bit:</b> 8	<b>stop bit:</b> 1
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The bus address is set at the front mounted rotary switches. The address 0 is prohibited for bus. However, on this zero position the device always using the standard data format (19200, e, 8, 1). The position 0 therefore represents a service position, can be used for example at incorrect parameterization.

The AD-LU 30 GT supports two Modbus functions. These are the functions "Read Holding Registers" (0x03) and "Write Multiple Registers" (0x10). The function "Read Holding Registers" data can be read from the device and data is written with "Write Multiple Registers". The individual register width is 16 bits.

Please refer to the Modbus specification for a detailed description of the Modbus communication. This is freely available online, but can also be obtained from the Adamczewski homepage.

The following Modbus data are accessible via the RS485 bus:

start address	no. of registers	name	unit	data type	read	write
<b>measurement reading:</b>						
40801	2	active power L1	kW	7	1	0
40803	2	active power L2	kW	7	1	0
40805	2	active power L3	kW	7	1	0
40807	2	reactive power L1	kVar	7	1	0
40809	2	reactive power L2	kVar	7	1	0
40811	2	reactive power L3	kVar	7	1	0
40813	2	apparent power L1	kVA	7	1	0
40815	2	apparent power L2	kVA	7	1	0
40817	2	apparent power L3	kVA	7	1	0
40819	2	current L1	A	7	1	0
40821	2	current L2	A	7	1	0
40823	2	current L3	A	7	1	0
40825	2	voltage L1	V	7	1	0
40827	2	voltage L2	V	7	1	0
40829	2	voltage L3	V	7	1	0
40831	2	frequency	Hz	7	1	0
40833	2	total active power	kW	7	1	0
40835	2	total reactive power	kVar	7	1	0
40837	2	total apparent power	kVA	7	1	0
40839	2	power factor L1		7	1	0
40841	2	power factor L2		7	1	0
40843	2	power factor L3		7	1	0
40845	2	total power factor		7	1	0
<b>List-parameters:</b>						
42001	1	BAUDRATE	baud	3	1	1
42002	1	STOPBIT		3	1	1
42003	1	PARITY		3	1	1
42004	1	LOAD TYPE		3	1	1
<b>Data-parameters:</b>						
43001	2	FILTER	s	7	1	1
43003	2	PRIM_current	A	7	1	1
43005	2	SEC_current	A	7	1	1
43007	2	PRIM_voltage	V	7	1	1
43009	2	SEC_voltage	V	7	1	1
<b>Counters:</b>						
43505	2	total energy KWH EXTRAKT	kWh	5	1	1
43507	2	total energy KWH INFEED	kWh	5	1	1
43509	2	total energy KVARH INDUCTIVE	kVarh	5	1	1
43511	2	total energy KVARH CAPACITIVE	kVarh	5	1	1
43513	2	total energy KVAH	kVAh	5	1	1
44001	2	counter operation hours	h	5	1	1

Legend of the data types:

U08: 1	S08: 2	U16: 3	S16: 4	U32: 5	S32: 6	float: 7
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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							
load type	0:unbal.	1:bal.								