Power Measurement

AD-LU 70 FE

Description

The digital power converter AD-LU 70 FE measures all values of the three-phase power grid such as current, voltage, energy, active, reactive, apparent power and frequency and makes this data available via a fieldbus. The device is therefore ideally suited for integration into energy management systems. The AD-LU 70 FE is powered by its measuring voltage L1. The current measurement takes place via the current transformer with passing-through hole attached to the back side. For the measurement of higher voltages or currents, external transformer must be used.

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.
Attention: This is a Class A product according to EN 55011. Additional EMC actions may be necessary when used in small businesses or in residential areas.



Specific characteristics

- Connection of 4-wire systems of any load
- Measurement of currents, voltages, power, power factors, frequency
- Low power loss during current measurement thanks to integrated through-current transformers
- Counters for applied and feedback energies
- Counters for inductive and capacitive reactive power
- Fieldbus interface for PROFINET or PROFIBUS
- Configuration of current and voltage transducers only via Profinet

Business data

Order number

AD-LU 70 FE	
AD-LU 70 FE-PN	PROFINET
AD-LU 70 FE-PB	PROFIBUS

Information

Downloads

PROFINET / PROFIBUS File	AD-LU70FE-GSx.zip
Tender text	lu70fe.zip
Safety instructions	ad-safety-instructions.pdf

Technical specifications

Current inputs

Measuring ranges	0 ... 1/5/20 A AC
Maximum wire diameter	4,8 mm²

Voltage inputs/supply

Nominal voltage	230 V AC
Rated frequency	50 Hz
Frequency range	40 ... 100 Hz
Measuring range	80 ... 253 V AC
Max. power consumption L1	4 VA
Input resistance L2, L3	970 kOhm

Optocoupler outputs

Maximum switching voltage	30 V DC
Maximum switching current	50 mA DC

PROFINET

Ethernet	2 Port Switch
Protocol specification	PROFINET IO
Default IP-address	0.0.0.0

PROFIBUS

Bus termination	120 ohms both sides at the end
Max. length of bus	500 m (no stubs)
Cable	twisted and shielded

Display

Type	TFT
Resolution	320x240 Pixel

Accuracy

Class	0,5
Temperature influence	100 ppm/K

Housing

Dimensions (WxHxD)	96x96x123 mm
Front panel cut out (bxh)	92x92 mm
Protection Front/Case	IP54/IP20
Connection method	Pluggable screw terminal
Terminals, wire cross section	2,5 mm² flex wire / 4 mm² one wire
Weight	~ 250 g
Manner of fastening	panel-mounting

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. A, Gr. 1

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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 - PROFINET/PROFIBUS	4 kV, 50 Hz (1 min.)
Grid - Digital outputs	4 kV, 50 Hz (1 min.)

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

Block and wiring diagram

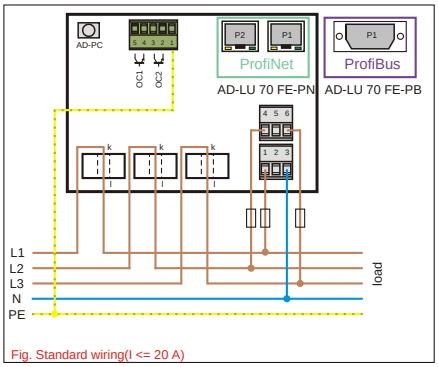


Fig. Standard wiring(I <= 20 A)

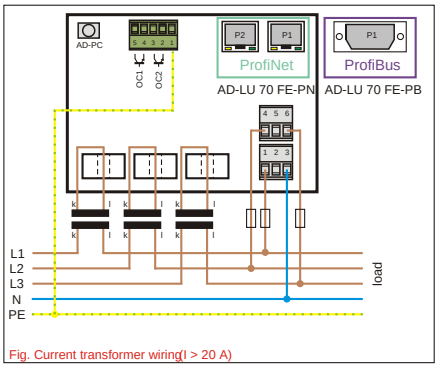


Fig. Current transformer wiring(I > 20 A)

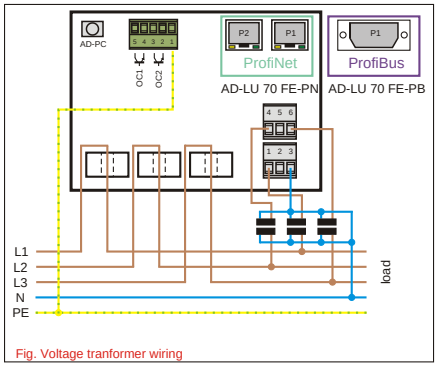
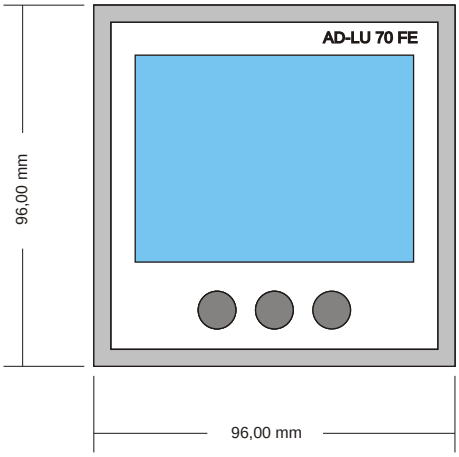
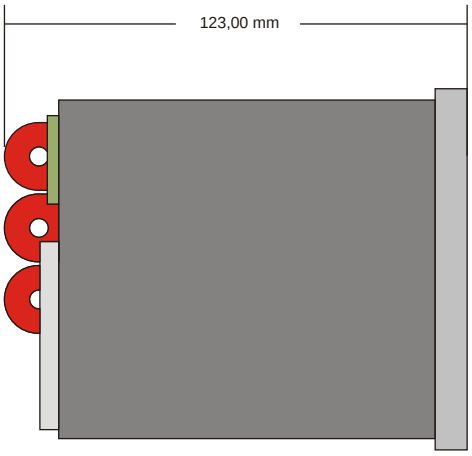


Fig. Voltage tranformer wiring

Dimensions





Explanations:

PROFINET: NS-Led (Netzwork Status):
The NS-LED signals the network status.

LED Status:	Description:	Comments
off	Offline	- no Power - no connection with IO-Controller
green	Online RUN	- connection with IO-Controller established - IO-Controller in RUN Status
green - 1 flash	Online STOP	- connection with IO-Controller established - IO-Controller in STOP Status - IO-data bad - IRT synchronization not finished
grün - blinking	link mode	- Uses by engineering tools to identify the node on the network
red	fatal event	- Major internal error
rot - 1 flash	station name error	- Station name not set
rot - 2 flash	IP-Address error	- IP-address not set
rot - 3 flash	configuratio error	- Expected identification differs from real identification

PROFINET: MS-Led (Modul Status):
The MS-LED signals the status of the ProfiNet module in the power meter.

LED Status:	Description:	Comments
off	not initialized	- Nor power or module in "SETUP" or "NW-INIT" state
green	normal operation	- Modul has shifted from "NW-INIT" state
green - 1 flash	diagnostic event	- diagnostic event present
red	exception error or fatal event	- Device in state EXCEPTION or major internal error
alternating red/green	firmwareupdate	- Do not power off the modul - turning the module off during this phase could cause permanent damage

PROFIBUS: OP-Led (Operation Mode):
The OP-Led signals the operation mode.

rot - 2 flash	Configuration error	- See "Profibus Configuration Error" in Profibus specification
off	Offline / no power	
green	Online, data exchange	
green - flashing	Online, clear	
rot - 1 flash	Parameterization error	- See "Parameterization Data Handling" in Profibus specification
rot - 2 flash	Configuration error	- See "Profibus Configuration Error" in Profibus specification

PROFIBUS: ST-Led (Status):
The ST-Led signals the status of the device.

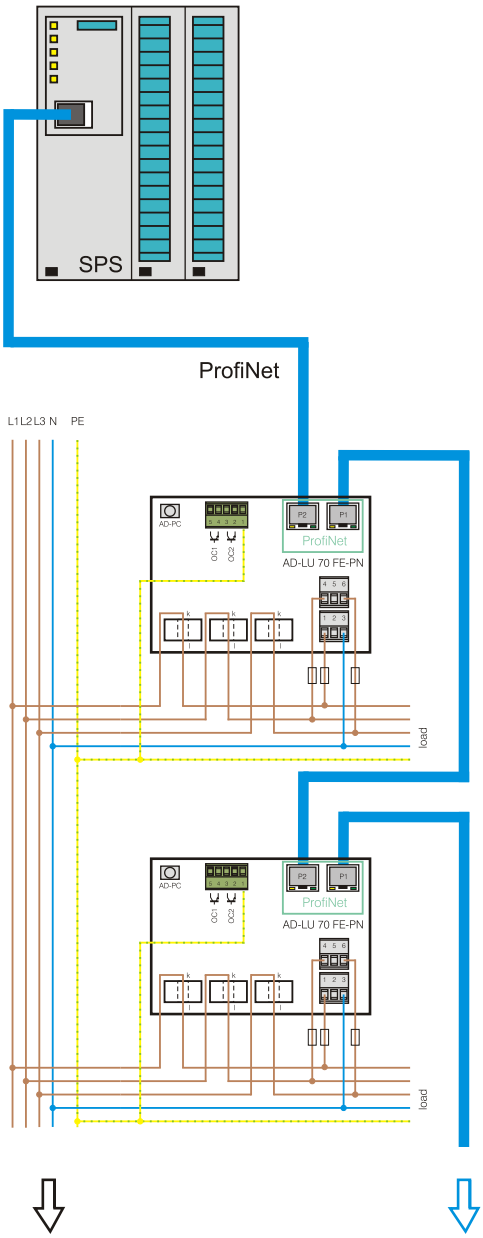
LED Status:	Description:	Comments
off	Not initialized	- Not initialized jet
green	initialized	- Initialization completed successfully
green - flashing	initialized, diagnostic events present	Extended diagnostic bit is set
rot	Exception error	- Exception error detected

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Circuit examples



ProfiNet/ProfiBus Data

P Total [kW]	float	4 Byte	Read
P L1 [kW]	float	4 Byte	Read
P L2 [kW]	float	4 Byte	Read
P L3 [kW]	float	4 Byte	Read
Q Total [kvar]	float	4 Byte	Read
Q L1 [kvar]	float	4 Byte	Read
Q L2 [kvar]	float	4 Byte	Read
Q L3 [kvar]	float	4 Byte	Read
S Total [kVA]	float	4 Byte	Read
S L1 [kVA]	float	4 Byte	Read
S L2 [kVA]	float	4 Byte	Read
S L3 [kVA]	float	4 Byte	Read
Power Factor Total	float	4 Byte	Read
Power Factor L1	float	4 Byte	Read
Power Factor L2	float	4 Byte	Read
Power Factor L3	float	4 Byte	Read
P Fundamental Total [kW]	float	4 Byte	Read
P Fundamental L1[kW]	float	4 Byte	Read
P Fundamental L2[kW]	float	4 Byte	Read
P Fundamental L3[kW]	float	4 Byte	Read
P Harmonic Total [kW]	float	4 Byte	Read
P Harmonic L1 [kW]	float	4 Byte	Read
P Harmonic L2 [kW]	float	4 Byte	Read
P Harmonic L3 [kW]	float	4 Byte	Read
U L1 [V]	float	4 Byte	Read
U L2 [V]	float	4 Byte	Read
U L3 [V]	float	4 Byte	Read
Calculated I N-LINE [A]	float	4 Byte	Read
I L1 [A]	float	4 Byte	Read
I L2 [A]	float	4 Byte	Read
I L3 [A]	float	4 Byte	Read
Peak U L1 [V]	float	4 Byte	Read
Peak U L2 [V]	float	4 Byte	Read
Peak U L3 [V]	float	4 Byte	Read
Peak I L1 [A]	float	4 Byte	Read
Peak I L2 [A]	float	4 Byte	Read
Peak I L3 [A]	float	4 Byte	Read
Frequency [Hz]	float	4 Byte	Read
Angle I L1 [°]	float	4 Byte	Read
Angle I L2 [°]	float	4 Byte	Read
Angle I L3 [°]	float	4 Byte	Read
Angle U L1 [°]	float	4 Byte	Read
Angle U L2 [°]	float	4 Byte	Read
Angle U L3 [°]	float	4 Byte	Read
Counter total extract [kWh]	dword	4 Byte	Read
Counter total feed [kWh]	dword	4 Byte	Read
Counter total ind [kvarh]	dword	4 Byte	Read
Counter total cap [kVarh]	dword	4 Byte	Read
Counter total apparent power [kVAh]	dword	4 Byte	Read
Counter working hours [h]	dword	4 Byte	Read
Param I PRIM [A]	float	4 Byte	Read/Write
Param I SEC [A]	float	4 Byte	Read/Write
Param U PRIM [V]	float	4 Byte	Read/Write
Param U SEC [V]	float	4 Byte	Read/Write
Control Word (*1)	word	2 Byte	Write
Status Word (*2)	word	2 Byte	Read
Serial Number	dword	4 Byte	Read
Firmware Version	word	2 Byte	Read
Language	word	2 Byte	Read

(*1)	Bit 15	Bit 14	Bit 13	Bit 12	Bit 1	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Control Word	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Counter Reset	Softw. Reset

(*2)	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Status Word	—	—	—	—	—	—	—	—	—	High Temp.	I3 Overfl.	I2 Overfl.	I1 Overfl.	L3 Error	L2 Error	L1 Error

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