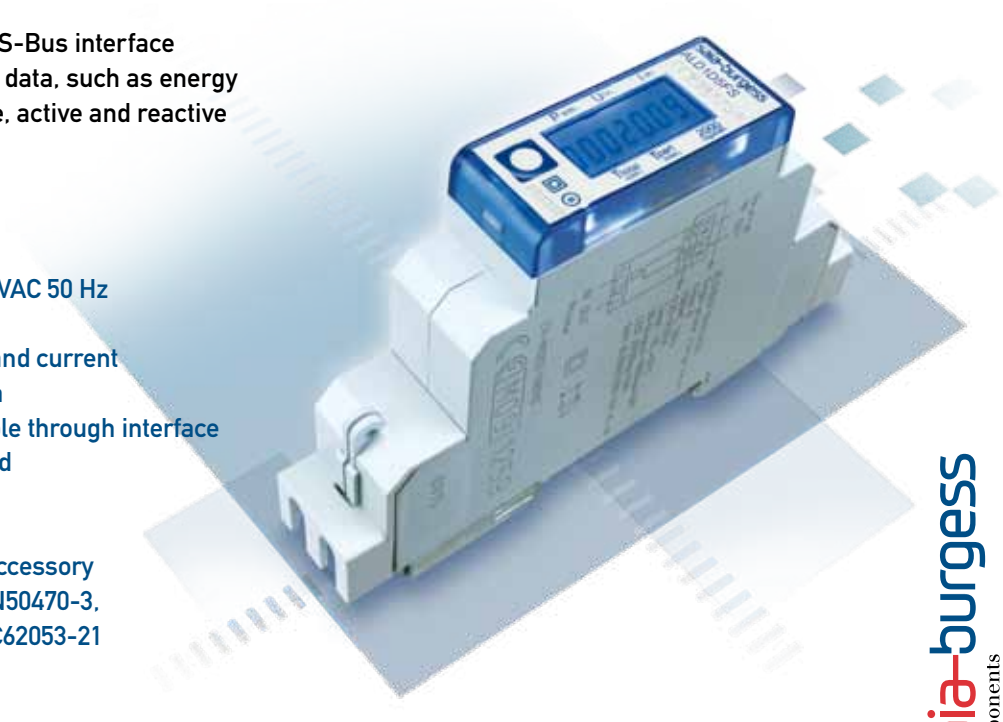
Data sheet

Single phase Energy meter with integrated S-Bus interface

Saia® S Bus
ALD1

Controls Division

Energy meters with an integrated S-Bus interface allow direct reading of all relevant data, such as energy (Total and partial), current, voltage, active and reactive power and cos φ.



Main features:

- Single-phase energy meter, 230 VAC 50 Hz
- Direct measurement up to 32 A
- Display of active power, voltage and current
- S-Bus Interface to query the data
- Reactive power and cosφ available through interface
- Up to 254 meter can be connected to the S-Bus Interface
- 7-digit display
- Lead seal possible with cap as accessory
- Accuracy class B according to EN50470-3, accuracy class 1 according to IEC62053-21

Order Number

Standard Version: ALD1D5FS00A2A00
MID Version: ALD1D5FS00A3A00

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Control Systems and Components

Technical data

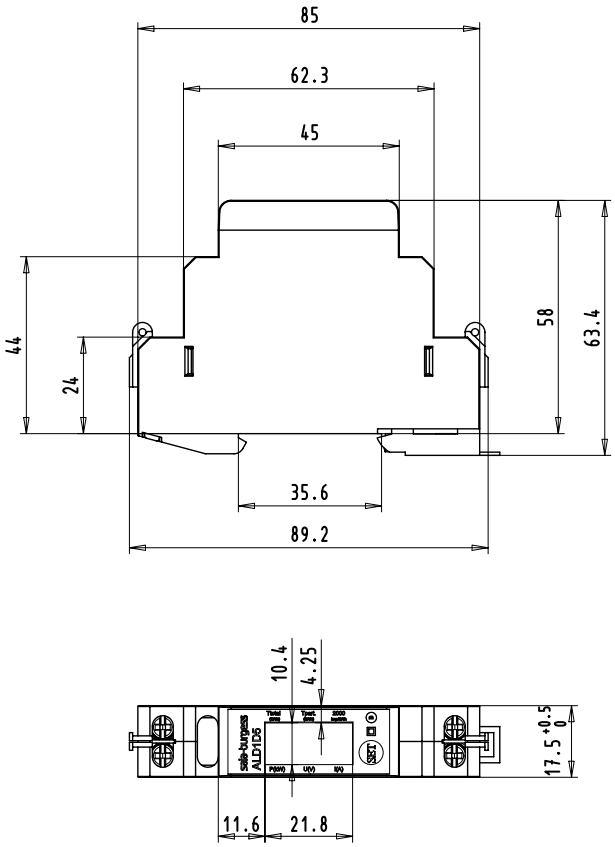
Precision class	B according to EN50470-3, class 1 according to IEC62053-21
Operating voltage	230 VAC, 50 Hz
	Tolerance –20 % / +15 %
Reference/ measurement current	I_{ref} = 5 A, I_{max} = 32 A
Starting/minimum current	I_{st} = 20 mA, I_{min} = 0.25 A
Power consumption	Active 0.4 W per phase
Counting range	00'000.00…99'999.99 100'000.0…999'999.9
Display	LCD backlit, digits 5 mm high
Pulses per kWh	LC-Display 2000 Imp./kWh

Mounting

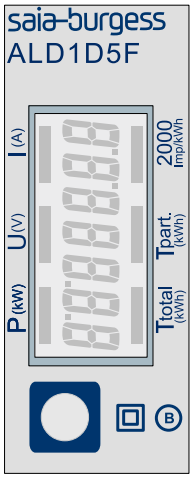
Mounting	On 35 mm rail, according to EN60715TH35
Terminal connections main circuit	Conductor cross-section max. 6 mm², screwdriver Pozidrive no. 1, slot no.1 Breakaway torque: 1.2 Nm
Terminal connections control circuit	Conductor cross-section max. 2.5 mm², screwdriver Pozidrive no. 0, or slot no.1 Breakaway torque: 0.5 Nm
Insulation characteristics	4 kV/50 Hz test according to VDE0435 for Energy Meter part
	6 kV 1.2/50 µs surge voltage according to IEC255-4
	2 kV/50 Hz test according to VDE0435 for Interface
	device protection class II
Ambient temperature	–10 °…+55 °C
Storage temperature	–30 °…+85 °C
Relative humidity	95 % at 25°…+40 °C, without condensation
EMC/interference immunity	Surge voltage according to IEC61000-4-5 at main circuit, 4 kV at S-Bus interface, 1 kV
	Burst voltage according to IEC61000-4-4, at main circuit 4 kV at S-Bus interface 1 kV
	ESD according to IEC61000-4-2, contact 8 kV, air 15 kV

Dimension diagram

Structure

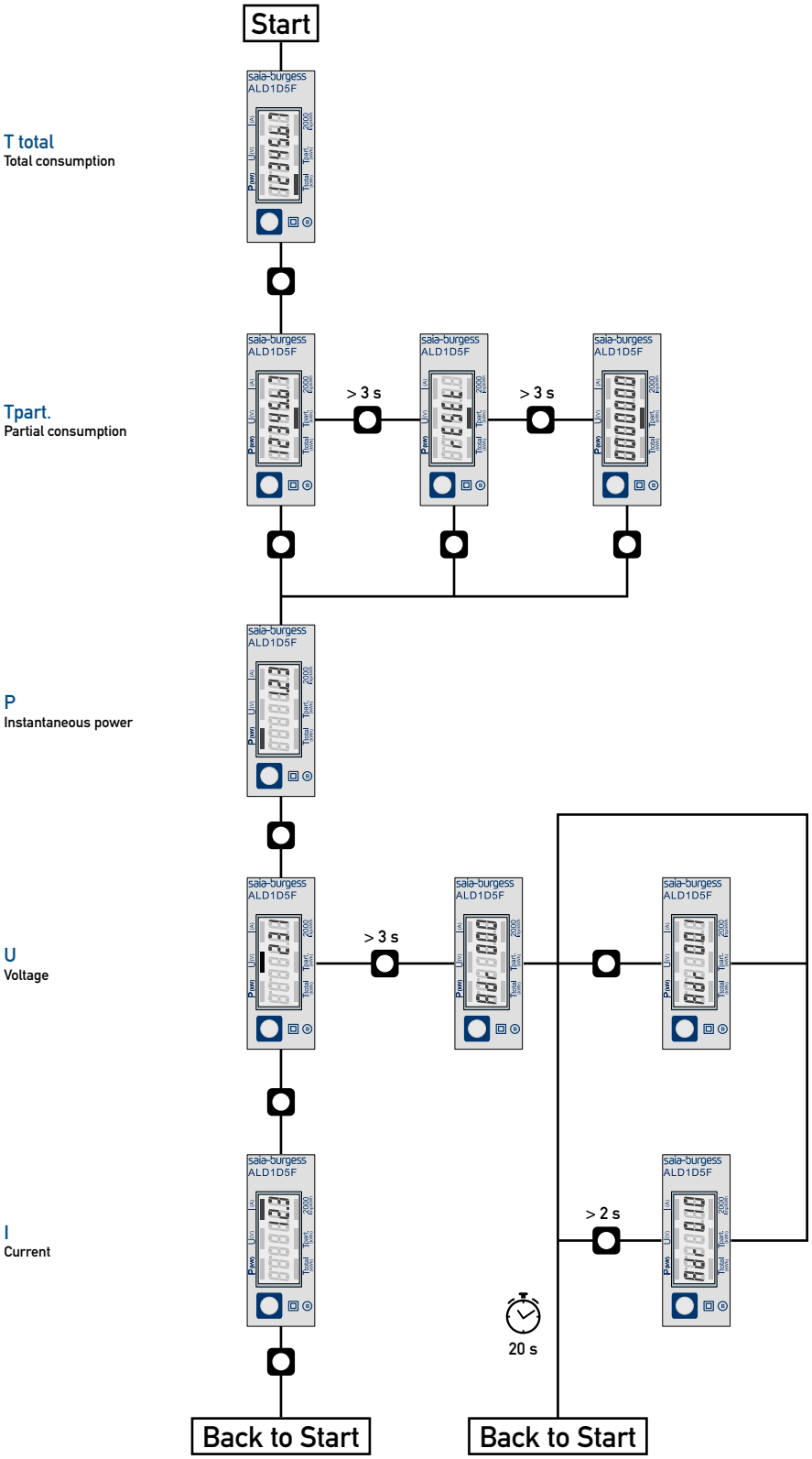


Display elements, direct measurement

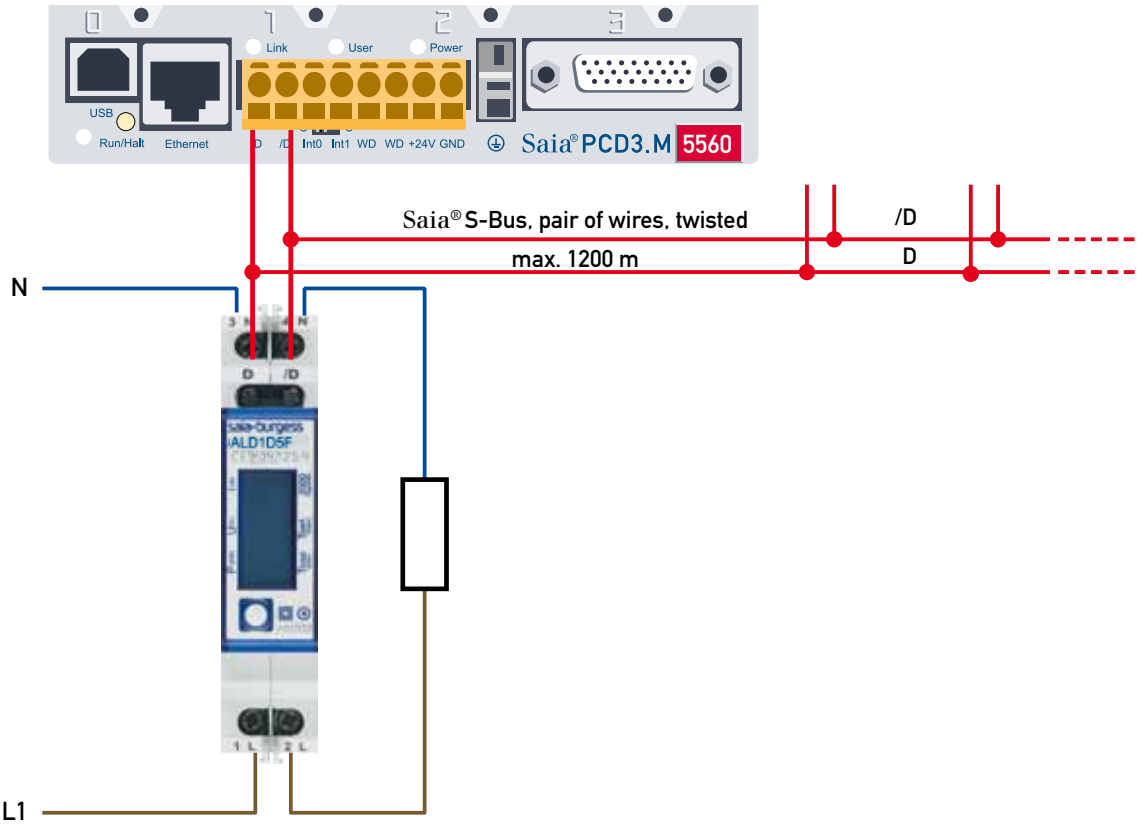


- T total (kWh) Indicates the total consumption
- T part (kWh) Indicates the partial consumption. This value can be reset
- P (kW) Indicates the instantaneous power
- U (V) Indicates the voltage
- I (A) Indicates the current
- 2000 pulses/kWh Pulsates according to the amount of used power.

Menu to display the value on LCD



Wirings Diagram



Technical data S-Bus

Bus system	Saia® S-Bus
Transmission rate	2'400-4'800-9600-19'200-38'400-57'600-115'200. The transmission Baud rate is automatically detected
Transmission mode	Data
Bus length (max.)	1200 m (without repeater)
Response time: (to system response)	Write: up to 60 ms Read: up to 60 ms

- The communication is ready 30 s after the power on
- The use of energy meter in bus with intensive communication could reduce the performance of the bus
- Refresh time for the data is 5 s. For this reason one energy meter should be not polled faster as 5 s
- 254 devices could be connected to the S-Bus. Over 128 devices, a repeater should be used
- The interface don't have a terminal resistor, this should be provided external
- For a description of the used registers please look at the register page

Data transmission

- Only «read/write» register instructions are recognized
- Only one register can be written at a time
- The device will respond «NAK" if more than 1 register is written
- Up to 10 Registers could be read at a time
- The device will respond «NAK" if more than 10 registers are read
- The device will not respond to any unknown query
- The device has a voltage monitoring system. In case of voltage loss, registers are stored in EEPROM (transmission rate) etc.

Change the S-Bus address direct on device

- In the menu, go for «U»
- Push long (≥ 3 sec) ➔ «SBUS-ADR»
- Push short ➔ S-Bus address +1, push long ➔ S-Bus address +10
- Once the desired address is selected wait, to validate, till the root menu to come back

Register

The following registers are available.
The registers 4, 10, 11, 12, 18, 19, 22 and 23 are not used and will give always the answer 0.

R	Read	Write	Description	Unit
0	X		Firmware-Version	Ex: «11» = FW 1.1
1	X		S-Bus com. number of supported registers	will give «29»
2	X		S-Bus com. number of supported flags	will give «0»
3	X		Baudrate	BPS
4	X		Not used	will give a «0»
5	X		Type/ASN function	will give «ALD1»
6	X		Type/ASN function	will give «D5FS»
7	X		Type/ASN function	will give «00A»
8	X		Type/ASN function	will give « »
9	X		HW Vers. Modif	Ex: «11» = FW 1.1
10	X		Not used	will give a «0»
11	X		Not used	will give a «0»
12	X		Not used	will give a «0»
13	X		Serial number	
14	X		Status/Protect	«0» = no Problem «1» = Problem with last communication request
15	X		S-Bus timeout	ms
16	X	X	S-Bus address	
17	X		Error flags	0 : No error 1 : Error
18	X		Not used	will give «0»
19	X		Not used	will give «0»
20	X		Counter energy total	10^{-2} kWh. (multiplier 0,01) Ex: 00912351= 009123,51 kWh
21	X	X	Counter energy partial Any written value reset the counter	10^{-2} kWh. (multiplier 0,01) Ex: 00912351= 009123,51 kWh
22	X		Not used	will give «0»
23	X		Not used	will give «0»
24	X		Effective voltage	V Ex: 230 = 230 V
25	X		Effective current	10^{-1} A (multiplier 0,1) Ex: 314 = 31,4 A
26	X		Effective active power	10^{-2} kW (multiplier 0,01) Ex: 1545 = 15,45 kW
27	X		Effective reactive power	10^{-2} kVA (multiplier 0,01) Ex: 1545 = 15,45 kVar
28	X		cos phi phase	10^{-2} (multiplier 0.01) Ex: 67 = 0.67

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