Fieldbus Devices

Analog-Output-Bus-Converter

AD-AAB 20 GX

Description

The AD-AAB 20 GX provides 2-channel output of analog signals. The device communication is realized using the MODBUS RTU protocol. The analog setpoints can be set via implemented MODBUS commands.
The power supply and the RS485 bus connection are possible via the rear DIN rail connector. The device is equipped with two rotary coding switches with which the bus address can be set on the device.
The operating voltage is indicated by a green LED. The data communication is signaled with a yellow LED. An optical search function allows the localization of a single device in a network. For this purpose, the green LED is set in a time-limited flashing mode, between 1 and 255 seconds.
As well as interface settings as well as the device address can be modified during operation by means of Modbus commands. All Modbus register addresses and associated commands are listed in the document attachment.

Application

Specification of analog process signals for control purposes.

Specific characteristics

- Two analogue outputs can be used as voltage or current input
- Galvanically isolated RS485 bus interface
- Parameterizable interface settings
- Hardware switch for device address
- Galvanically isolated switching power supply
- Can be parameterized with PC via AD Studio configuration software
- Status LED for operating voltage and data communication
- Optical search function
- Modbus master mode

Business data

Order number

AD-AAB 20 GX

Accessory

Rail connector (5-pin)	Artnr: AD-GX-Connector Zur Durchschleifung von Versorgungsspannung und RS485-Bus Aufrastbar auf Tragschiene (DIN EN 50022).

Information

Downloads

Tender text	aab20gx.zip

Technical specifications

Current outputs	
Range	0 ... 20 mA
Output load	max. 450 Ohm
Voltage outputs	
Range	0 ... 10 V
Output load	min. 10 kOhm
Signal output	
Channel counts (U/I)	2
Basic accuracy	< +/- 0,3 %
Temperature influence	100 ppm/K
Resolution	12 bit
Transmission behaviour	
Response time	max. 15 ms
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 spur lines)
Cable	twisted and shielded
Supply	
Supply voltage	18 ... 30 V DC
Max. power consumption	1400 mW (24V DC)
Housing	
Dimensions (WxHxD)	6,2 x 92 x 101 mm³
Manner of fastening	DIN rail mounting 35mm, EN 50022
Type of protection	IP 20
Connection method	screw clamp
Bolting torque terminals	0,5 Nm
Wire cross section	max. 2,5 mm²
Weight	~ 70 g

ADAMCZEWSKI
Elektronische Messtechnik GmbH
Felix-Wankel-Str. 13
Tel. +49 (0)7046-875
vertrieb@ad-messtechnik.de
74374 Zaberfeld
Fax +49 (0)7046-7678
www.adamczewski.com

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Technical specifications

Environmental conditions

Permissible ambient temperature	-10 ... +50 °C
Storage and transport	-10 ... +70 °C (no condensation)

EMC

Product family standard [1)]	EN 61326-1
Emission [2)]	EN 55011, CISPR11 Cl. A, Gr. 1

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

[2)] Warning:
This device is not intended to be used in residential areas and can not ensure adequate protection of radio reception in such environments.

Electrical safety requirements

Product family standard	EN 61010-1

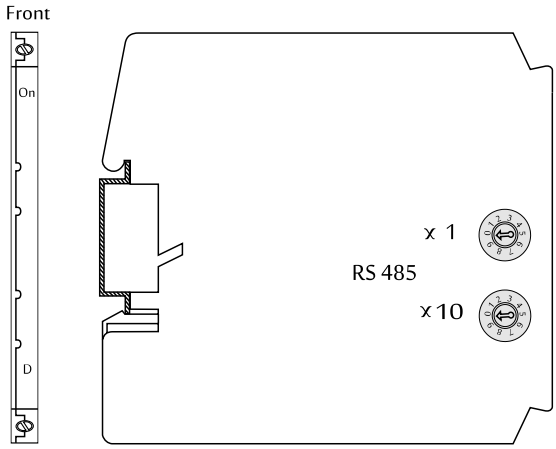
Galvanic isolation, test voltages

RS485 bus / power supply	1,5 kV, 50 Hz (1 min)
Analog output / power supply	1.5 kV, 50 Hz (1 min)
Analog output / RS485 bus	1,5 kV, 50 Hz (1 min)
Analog outputs between themselves	0,5 kV, 50 Hz (1 min)

Protection circuits

Power supply	electrical surge and reverse current protection

Display and operating elements



Designation	LED	Meaning
On	green	Power supply
D	yellow	RS485 Communication
RS485		Address switch(01...99)

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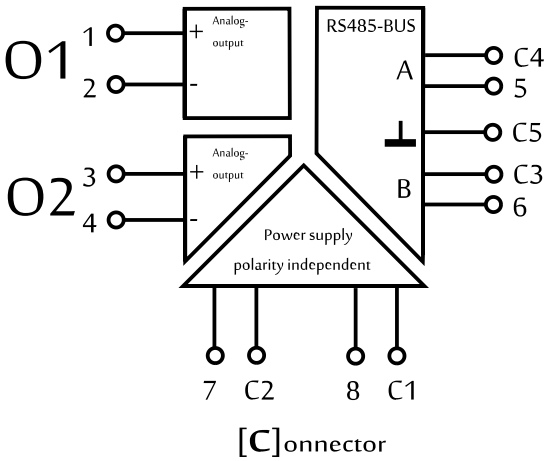
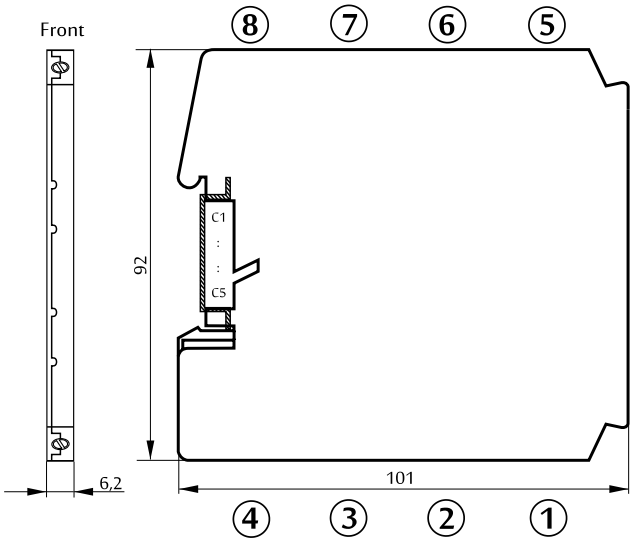
Block and wiring diagram



Dimensions



Modbus Communication

The AD-AAB 20 GX contains a RS485 bus interface on which the Modbus RTU protocol is used. All control functions of the device can be executed via this bus interface. The preset standard data format is 19200,e,8,1. Adaptation to a different data format is possible at any time. The bus address (1...99) is set to the side-mounted rotary switches. The address 0 is not permitted for the bus operation. However, on this zero position the device is accessible only via the standard data format (19200, e, 8.1). The position 0 thus represents a service position, the example can be used during parameterization error.

The AD-AAB 20 GX supports two Modbus functions. These are the functions **"Read Holding Registers" (0x03)** and **"Write Holding Registers" (0x10)**. With the **"Read Holding Registers"** function data can be read from the device and written with **"Write Holding Registers"** data. The individual register width is 16 bits. Please see the Modbus specification for detailed explanations of the Modbus communication. This is online available for free and can be downloaded from the Adamczewski homepage.

The following Modbus data are accessible via the RS485 bus:

Start address	Reg. number	Name	Datatype	[Code] = Value	read	write
40501	1	Address switch	U16	1...99...247	yes	yes
40502	1	Flashing function	U16	0/1...255	yes	yes
40901	2	Analog output U1	FLOAT	0...10V	no	yes
40903	2	Analog output I1	FLOAT	0...20mA	no	yes
40905	2	Analog output U2	FLOAT	0...10V	no	yes
40907	2	Analog output I2	FLOAT	0...20mA	no	yes
40909	2	Scale out U1	FLOAT	+/- Scale value	no	yes
40911	2	Scale out I1	FLOAT	+/- Scale value	no	yes
40913	2	Scale out U2	FLOAT	+/- Scale value	no	yes
40915	2	Scale out I2	FLOAT	+/- Scale value	no	yes
44201	2	Scale begin Channel 1	FLOAT	+/- Scale range	yes	yes
44203	2	Scale begin Channel 2	FLOAT	+/- Scale range	yes	yes
44205	2	Analog begin Channel 1	FLOAT	0...100 %	yes	yes
44207	2	Analog begin Channel 2	FLOAT	0...100 %	yes	yes
44211	2	Scale end Channel 1	FLOAT	+/- Scale range	yes	yes
44213	2	Scale end Channel 2	FLOAT	+/- Scale range	yes	yes
44215	2	Analog end Channel 1	FLOAT	0...100 %	yes	yes
44217	2	Analog end Channel 2	FLOAT	0...100 %	yes	yes
42901	1	Baud rate	U16	Index, see list below	yes	yes
42902	1	Parity	U16	[0]=even; [1]=odd; [2]=no	yes	yes
42903	1	Modbus Master	U16	0/1	yes	yes
49102	1	Device reset	U16	0	no	yes
49105	6	Device type	String	AAB20GX	yes	no
49119	1	Firmware version	U16	MSB/LSB	yes	no

Coding baudrate list

index	0	1	2	3	4	5	6	7	8	9
baud	2400	4800	9600	14400	19200	28800	38400	57600	76800	115200

After changing the interface parameters, a device reset is required.

Modbus master mode

The device can even work in Modbus master mode to transfer data between any devices within an RS485 line.
For Modbus master operation, starting with Modbus register 40611, there are 37 consecutive data transfer sets, with 5 configuration registers each.

Start address	Reg. number	Name	Datatype	[Code] = Value	read	write
40611	1	Source address [1]	U16	1...98	ja	ja
40612	1	Source register [1]	U16	nnnnn	ja	ja
40613	1	Target address [1]	U16	1...99	ja	ja
40614	1	Target register [1]	U16	nnnnn	ja	ja
40615	1	Register count [1]	U16	1/2	ja	ja
40791	1	Source address [37]	U16	1...98	ja	ja
40792	1	Source register [37]	U16	nnnnn	ja	ja
40793	1	Target address [37]	U16	1...99	ja	ja
40794	1	Target register [37]	U16	nnnnn	ja	ja
40795	1	Register count [37]	U16	1/2	ja	ja

For the Modbus master mode, the parameter "Modbus master" must be activated and the address switch set to position 99.
Data transfer begins six seconds after activation or device restart.
A flashing green LED indicates a communication error.