

Description

The two-channel AD-KEB 20 GX is used to read in digital signals that are present as a contact or active 24V signal. The respective signal state is indicated on the device by means of a red LED. Device communication takes place via the RS485 bus interface and is implemented using the MODBUS RTU protocol.

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.

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.

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. The presettable absolute counters continuously add incoming pulses and are saved in a non-volatile memory every hour. The current counters are reset during readout to detect subsets.

Application

Reading in digital signals in general electrical engineering, automation technology and in the water / wastewater sector.

For example: pulse counting with presettable counters or frequency measurement.



Specific characteristics

- RS485 bus / Modbus RTU protocol
- Rotary coding switch for bus address setting
- Counter function
- Frequency measurement
- Switching Power Supply
- Optical search function

Business data

Order number

AD-KEB 20 GX

Accessory

Rail connector
(5-pin)

Artnr: AD-GX-Connector
Zur Durchschleifung von
Versorgungsspannung und
RS485-Bus
Aufraubar auf Tragschiene
(DIN EN 50022).

Technical specifications

Input

Input voltage	24 V DC / 3,5 mA (max. 30V)
Switching threshold	~ 17 V
Contact load	5 V / 1,5 mA

Measure

Frequency	< 2200 Hz
Gate time	1 s
Accuracy	+/- 0,3%
Counter	0...4294967295
Pulse width (counter)	> 25 ms
Counting frequency	< 20 Hz
Contact debouncing	20 ms
Counter storage	stündlich

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	800 mW (24V DC)

Housing

Dimensions (WxHxD)	6,2 x 92 x 101 mm ³
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 mm ²
Weight	~ 70 g

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.



Technical specifications

Electrical safety requirements

Product family standard EN 61010-1

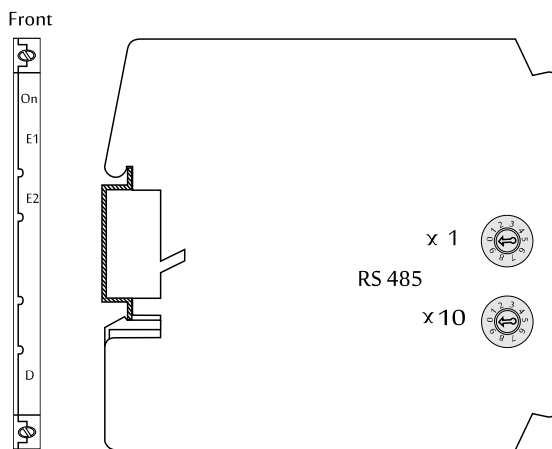
Galvanic isolation, test voltages

RS485 bus / power supply 1,5 kV, 50 Hz (1 min)
 Digital input / Power supply 1.5 kV, 50 Hz (1 min)
 Digital input / RS485 bus 1,5 kV, 50 Hz (1 min)
 Digital input between themselves 0 kV

Protection circuits

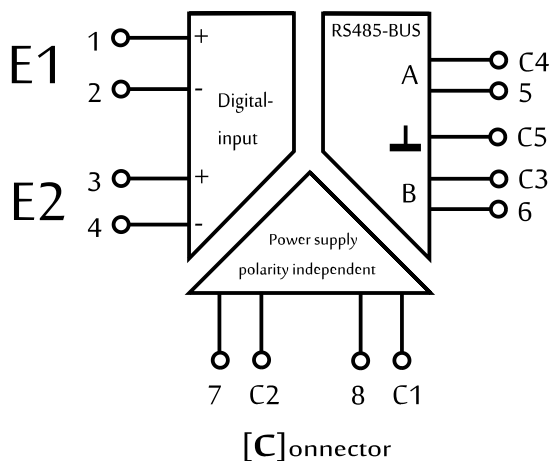
RS485-Bus electrical surge protection
 Power supply electrical surge and reverse current protection

Display and operating elements

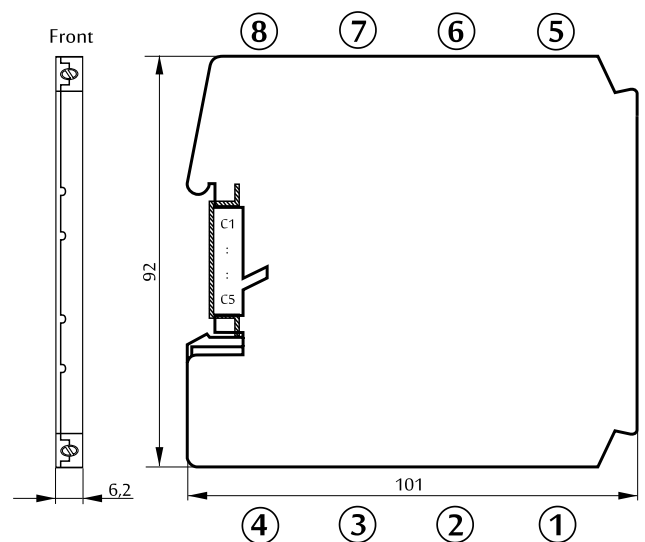


Designation	LED	Meaning
On	green	Power supply
E1	red	Input 1 state
E2	red	Input 2 state
D	yellow	RS485 Communication
RS485		Address switch(01...99)

Block and wiring diagram



Dimensions



Modbus Communication

The AD-KEB 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-KEB 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
40503	1	24V Input 1	U16	0/1	yes	no
40504	1	24V Input 2	U16	0/1	yes	no
40505	1	Input contact 1	U16	0/1	yes	no
40506	1	Input contact 2	U16	0/1	yes	no
40551	2	Input frequency 1	FLOAT	0,00...2200 Hz	yes	no
40553	2	Input frequency 2	FLOAT	0,00...2200 Hz	yes	no
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	Input signal type 1	U16	[0]=aktiv; [1]=Contact	yes	yes
42904	1	Input signal type 2	U16	[0]=aktiv; [1]=Contact	yes	yes
43001	1	Debouncing 1	U16	x 20 ms	yes	yes
43002	1	Debouncing 2	U16	x 20 ms	yes	yes
47209	2	Absolutely counter 1	U32	0...4294967295	yes	yes
47211	2	Absolutely counter 2	U32	0...4294967295	yes	yes
47213	2	Currently counter 1	U32	0...4294967295	yes	no
47215	2	Currently counter 2	U32	0...4294967295	yes	no
49102	1	Device reset	U16	0	no	yes
49105	6	Device type	String	KEB20GX	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 48 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...99	yes	yes
40612	1	Source register [1]	U16	nnnnn	yes	yes
40613	1	Target address [1]	U16	1...98	yes	yes
40614	1	Target register [1]	U16	nnnnn	yes	yes
40615	1	Register count [1]	U16	1/2	yes	yes
40846	1	Source address [48]	U16	1...99	yes	yes
40847	1	Source register [48]	U16	nnnnn	yes	yes
40848	1	Target address [48]	U16	1...98	yes	yes
40849	1	Target register [48]	U16	nnnnn	yes	yes
40850	1	Register count [48]	U16	1/2	yes	yes

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.