

Instruction Manual



External CANopen-Gateway

Version 1.1



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1. General

This manual as well as the specified hardware and software are developments of the Karl E. Brinkmann GmbH. Errors and omissions excepted! The Karl E. Brinkmann GmbH has prepared the documents, hardware and software to the best of their knowledge, However, no guarantee is given that the specifications will bring the user the benefit aimed at. The Karl E. Brinkmann GmbH reserves the right to change the specifications without previous announcement or information to third parties.

2. Ordering Designations

This Instruction Manual :	CC.F4.010-K000
CANopen-Gateway:	02.B0.0BK-K000
Accessory Adaptor RS485 half duplex:	00.58.025-0209 for a simple wiring of the DIN 66019 slaves

3. References

- [1]: CANopen Application Layer and Communication Profile DS301 Version 4.01 of 1.6.2000 from the CAN in Automation e.V.
- [2]: KEB-Protocol description DIN66019 of 08/98, Part-No.: 0S.58.011-K710
- [3]: KEB Combicom CANopen interface connection of 09/99, Part-No.: 0S.58.00A-K101
- [5]: Hardware basis CAN Operator KEB, Part-No.: 00.F4.010-5209

4. CANopen-Gateway

The CANopen-Gateway is a converter for CANopen (ISO/DIS11898, DS301) to KEB-DIN66019 (RS485 half duplex). The Gateway can manage maximally 7 KEB-DIN66019 user on its secondary side. A list with Node-Ids exists in the Gateway, which the Gateway simulates. The Gateway is also addressable over the first Node-Id on this list. The SDO-services (Initiate Domain Down-/Upload) are converted into the appropriate DIN66019-services (Write/Read). **Process data communication** and their management **are not** supported.

5. Hardware

The housing can be mounted onto all popular DIN EN mounting rails.

5.1 Technical Data

Housing dimensions	B = 23 mm, H = 75 mm, T = 110 mm
Ext. power supply	24V DC ($\pm 20\%$)

Input side (CAN):

Isolation	safe separation according to VDE 0160
Connection	SUB-MIN-9pole mail connector accord.to DIN 41652Part 1
Transmission norm	ISO/DIS 11898
Transmission rate	10, 20, 25, 50, 100, 125, 250, 500, 800, 1000 KBit/s
Protocol	CANopen according to [1]
Bus termination	must be made externally

Assignment of connector:

Pin	Signal	Significance
1	-	reserved
2	CAN_L	CAN-Bus signal dominant low
3	CAN_GND	here not connected
4	-	reserved
5	(CAN_SHLD)	here not connected
6	(GND)	here not connected
7	CAN_H	CAN-Bus signal dominant high
8	-	reserved
9	(CAN_V+)	here not connected

Output side (KEB-DIN66019):

Isolation	no isolation
Connection	SUB-MIN-9pole female connector accord.to DIN 41652 Part 1
Transmission norm	RS485-Halbduplex
Transmission rate	1200, 2400, 4800, 9600, 19200, 38400 Bit/s.
Protocol	KEB-DIN66019 nach [2]
Bus termination	firmly installed, 150 Ohm between Pin 4, 8 and Pin 5, 9

Assignment of connector

Pin	Signal	Sgnificance
1	-	reserved
2	-	reserved
3	-	reserved
4	RS485_A	RS485-transmit/receive A
5	RS485_B	RS485-transmit/receive B
6	-	reserved
7	-	reserved
8	RS485_A	RS485-transmit/receive A
9	RS485_B	RS485-transmit/receive B

Assignment of 4-pole terminal strip

Pin	Signal	Significance
1	U_{ext}	Ext. power supply, +24V
2	GND_{ext}	Ext. power supply, ref. potential
3	PE	
4	PE	

5.2 Diagnostic-LEDs

The Gateway has one green and two red diagnostic-LEDs.

5.2.1 Vcc(green)

This LED signal that the 5V operating voltage is available.

5.2.2 Node_Error(red)

This LED shines, if at least one of the activated external nodes could not be addressed by the Gateway. Note, the actualization of this LED is affected by the adjustment of the parameter **Check_Node_Cycle**. Because the actualisation of this LED always occurs subsequent to a communication cycle to one of the external nodes. The Gateway communicates once after switch on with all activated external nodes. Furthermore, the Gateway accesses cyclically all external nodes, which are not addressed externally (via CAN). If Check_Node_Cycle is = 0 (switched off), then the LED is actualized only after an external access (via CAN) onto the external nodes.

5.2.3 BUS_Off(red)

This LED shines, if the CAN-controller in the Gateway is in status BUS-OFF or ERROR. When this LED shines it means, that a serious error on CAN is present. This can be caused for example by differently adjusted CAN-bit rates of the nodes connected to CAN.

6. CANopen-Communication

Only the SDO-commands **Initiate Domain Upload** and **Initiate Domain Download** are supported by the CAN-Gateway. Only the short form is available. At the short form request and associated response consist of one telegram each. The different nodes are addressed over the fixed identifier assignment linked with the Node-Id.

SDO(rx)-Identifier	=	Request from Master	=	1536	+	Node_Id
SDO(tx)-Identifier	=	Response from Gateway	=	1408	+	Node_Id

All SDO-telegrams must have exactly **8-Byte-length**.

Note ! For the **external nodes** applies: **Node_Id = Inverter-Address + 1**

6.1 Initiate Domain Download Request (Write request from Master to Gateway)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Command	Parameter-Index		Subindex	Data			
0010nn1s	Low-Byte	High-Byte		LSByte			MSByte

nn: Only valid in case of s = 1. Contains the number of bytes in the data-field, that do not contain data.

s: If = 1 see above, otherwise no specification of the data length.

Index: 16-Bit (unsigned) addressing of the parameter.

Subindex: 8-Bit (unsigned) sub-addressing for complex structured parameters.

Data: Value of the parameter

6.2 Initiate Domain Download Response (Write acknowledgement from Gateway)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Command	Parameter-Index		Subindex	reserved			
01100000	Low-Byte	High-Byte					

6.3 Initiate Domain Upload Request (Read request from Master to Gateway)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Command	Parameter-Index		Subindex	reserved			
01000000	Low-Byte	High-Byte					

6.4 Initiate Domain Upload Response (Read acknowledgement from Gateway)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Command	Parameter-Index		Subindex	Data			
0100nn1s	Low-Byte	High-Byte		LSByte			MSByte

6.5 Abort Domain Transfer (Error response from Gateway)

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Command	Parameter-Index		Subindex	Error			
	Low-Byte	High-Byte		Additional Code		Error-Code	Error-Class
10000000				Low-Byte	High-Byte		

7. Parameters of the Gateway

CAN_Baud **Index:** **5FFFh**
Object-Type: **Single variable**
Subindex: **0**
Data length: **1 Byte**
Meaning: Specifies the index of the CAN-transmission rate.
Coding: 0 : 10 Kbit/s
 1 : 20 Kbit/s (default value)
 2 : 50 Kbit/s
 3 : 100 Kbit/s
 4 : 125 Kbit/s
 5 : 250 Kbit/s
 6 : 500 Kbit/s
 7 : 1000 Kbit/s
 8 : 800 Kbit/s
 9 : 25 Kbit/s
 255 : Automatic bit rate recognition (only writable over CAN_Baud2).
Remarks: A changed value becomes active immediately but it is not automatically stored non-volatile. Also refer to CAN_Baud2, Save_CAN_Baud.

Save_CAN_Baud **Index:** **5FFEh**
Object-Type: **Single variable**
Subindex: **0**
Data length: **1 Byte**
Meaning: Serves for the non-volatile storing of the CAN-transmission rate.
Coding
Write: 255: Saving of CAN-transmission rate.
 Otherwise: no saving.
Coding
Read: During reading the value 0 is always returned.

CAN_Baud2 **Index:** **5FECh**
Object-Type: **Single variable**
Subindex: **0**
Data length: **1 Byte**
Meaning: Specifies alternatively to the CAN_Baud the index of the CAN-transmission rate.
 Differs from the CAN_Baud only in transfer of information and storage properties.
Coding: See CAN_Baud.
Remarks: A changed value becomes active after the next switch-on, but it is immediately stored non-volatile. Also refer to CAN_Baud.

DIN66019_Baud **Index:** **5FF5h**
Object-Type: **Single variable**
Subindex: **0**
Data length: **1 Byte**
Meaning: Specifies the index of the DIN66019-transmission rate.
Coding: 0 : 1200 Bit/s
 1 : 2400 Bit/s
 2 : 4800 Bit/s
 3 : 9600 Bit/s (default value)
 4 : 19200 Bit/s
 5 : 38400 Bit/s
Remarks: A changed value becomes active immediately and is stored non-volatile.

Node_List **Index:** **5FE0h**
Object-Type: **Array**
Data length: **1 Byte**
Meaning: Specifies which and how many external nodes can be addressed over the Gateway. The Gateway can manage maximally 8 external nodes.

Subindex: **0 (number of active nodes)**
Default value: **4**

Subindex: **1 (Node_Id of the 1. configured node (the Gateway itself))**
Default value: **100**

Subindex: **2 (Node_Id of the 2. configured node)**
Default value: **1**

Subindex: **3 (Node_Id of the 3. configured node)**
Default value: **61**

Subindex: **4 (Node_Id of the 4. configured node)**
Default value: **81**

Subindex: **5 (Node_Id of the 5. configured node)**
Default value: **indefinite**

Subindex: **6 (Node_Id of the 6. configured node)**
Default value: **indefinite**

Subindex: **7 (Node_Id of the 7. configured node)**
Default value: **indefinite**

Subindex: **8 (Node_Id of the 8. configured node)**
Default value: **indefinite**

Remarks: A changed value becomes active immediately and is stored non-volatile.



Karl E. Brinkmann GmbH

Försterweg 36 - 38 • D - 32683 Barntrup
Telefon 00 49 / 52 63 / 4 01 - 0 • Fax 00 49 / 52 63 / 4 01 - 1 16
Internet: www.keb.de • E-mail: info@keb.de

KEB Antriebstechnik GmbH & Co. KG

Wildbacher Str. 5 • D - 08289 Schneeberg
Telefon 0049 / 37 72 / 67 - 0 • Telefax 0049 / 37 72 / 67 - 2 81
E-mail: info@keb-combidrive.de

KEB Antriebstechnik Austria GmbH

Ritzstraße 8 • A - 4614 Marchtrenk
Tel.: 0043 / 7243 / 53586 - 0 • FAX: 0043 / 7243 / 53586 - 21
Kostelni 32/1226 • CZ - 370 04 České Budejovice
Tel.: 00420 / 38 / 731 92 23 • FAX: 00420 / 38 / 733 06 97
E-mail: info@keb.at

KEB Antriebstechnik

Herenveld 2 • B - 9500 Geraadsbergen
Tel.: 0032 / 5443 / 7860 • FAX: 0032 / 5443 / 7898
E-mail: koen.detaeye@keb.de

KEB China

Xianxia Road 299 • CHN - 200051 Shanghai
Tel.: 0086 / 21 / 62350922 • FAX: 0086 / 21 / 62350015
Internet: www.keb-cn.com • E-mail: info@keb-cn.com

Société Française KEB

Z.I. de la Croix St. Nicolas • 14, rue Gustave Eiffel
F - 94510 LA QUEUE EN BRIE
Tél.: 0033 / 1 / 49620101 • FAX: 0033 / 1 / 45767495
E-mail: sfkeb.4@wanadoo.fr

KEB (UK) Ltd.

6 Chieftain Buisness Park, Morris Close
Park Farm, Wellingborough, GB - Northants, NN8 6 XF
Tel.: 0044 / 1933 / 402220 • FAX: 0044 / 1933 / 400724
Internet: www.keb-uk.co.uk • E-mail: info@keb-uk.co.uk

KEB Italia S.r.l.

Via Newton, 2 • I - 20019 Settimo Milanese (Milano)
Tel.: 0039 / 02 / 33500782 • FAX: 0039 / 02 / 33500790
Internet: www.keb.it • E-mail: kebitalia@keb.it

KEB - YAMAKYU Ltd.

15 - 16, 2 - Chome, Takanawa Minato-ku
J - Tokyo 108 -0074
Tel.: 0081 / 33 / 445-8515 • FAX: 0081 / 33 / 445-8215
E-mail: kebjt001@d4.dion.ne.jp

KEB Portugal

Lugar de Salgueiros - Pavilhao A, Mouquim
P - 4760 V. N. de Famalicao
Tel.: 00351 / 252 / 371 318 • FAX: 00351 / 252 / 371 320
E-mail: keb.portugal@netc.pt

KEB Taiwan Ltd.

1F, No.19-5, Shi Chou Rd., Tounan Town
R.O.C. - Yin-Lin Hsian / Taiwan
Tel.: 00886 / 5 / 5964242 • FAX: 00886 / 5 / 5964240
E-mail: keb_taiwan@mail.apol.com.tw

KEBCO Inc.

1335 Mendota Heights Road
USA - Mendota Heights, MN 55120
Tel.: 001 / 651 / 4546162 • FAX: 001 / 651 / 4546198
Internet: www.kebco.com • E-mail: info@kebco.com