

COMBIVERT



G6

Programming Manual

Control Circuit
VARAN

Translation of original manual		
Document	Part	Version
20099381	GBR	00

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1. Preface


The described hard- and software are developments of the Karl E. Brinkmann GmbH. The enclosed documents correspond to conditions valid at printing. Misprint, mistakes and technical changes reserved.


1.1 Information on special measures


The used pictograms have following significance:

Danger  Is used, when death or serious bodily injury may be the consequence of non-observance of the measure.

Warning  Is used, when bodily injury and/or substantial property damage may be the consequence of non-observance of the measure.

Caution  Is used, when property damage may be the consequence of non-observance of the measure.



Attention  Is used, when noise sensitive or unrequested operation may be the consequence of non-observance of the measure.

Info  Is used, when a better or simpler result can be the consequence of the measure.

For a special case the instructions can be supplemented by additional pictograms and text.

1.2 Documentation

Before working with the unit the user must become familiar with it. This includes especially the knowledge and observance of the safety and operating instructions.

Attention 	Observe safety and operating instructions
	Precondition for all further steps is the knowledge and observance of the safety and operating instructions. This is provided accompanied by the device or by the download site of www.keb.de .

Non-observance of the safety and operating instructions leads to the loss of any liability claims. The warnings and safety instructions in this manual work only supplementary. This list is not exhaustive.



1.3 Validity and liability

The use of our units in the target products is beyond of our control and therefore exclusively the responsibility of the machine manufacturer, system integrator or customer.

The information contained in the technical documentation, as well as any user-specific advice in spoken and written and through tests, are made to best of our knowledge and information about the application. However, they are considered for information only without responsibility. This also applies to any violation of industrial property rights of a third-party.

Selection of our units in view of their suitability for the intended use must be done generally by the user.

Tests can only be done within the application by the machine manufacturer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.

Danger  by tamper from unauthorized personnel	
	<p>Unauthorised opening and tampering may lead to death, bodily injury, property damage and malfunctions. Modification or repair is permitted only by KEB authorized personnel. Infringement will annul the liability for resulting consequences.</p>

The suspension of liability is especially valid also for operation interruption loss, loss of profit, data loss or other damages. The disclaimer will void the warranty. This is also valid, if we referred first to the possibility of such damages.

If single regulations should be or become void, invalid or impracticable, the effectivity of all other regulations or agreements is not affected.

Through multitude applications not each possible case of installation, operation or maintenance can be considered. If you require further information or if special problems arise which are not treated in detail in the documentation, you can request the required information from the local agency of the company Karl E.Brinkmann GmbH.

1.4 Copyright

The customer may use the instruction manual as well as further documents or parts from it for internal purposes. Copyrights are with KEB and remain valid in its entirety.

KEB®, COMBIVERT®, COMBICONTROL® and COMBIVIS® are registered trademarks of Karl E. Brinkmann GmbH.

Other wordmarks or/and logos are trademarks (™) or registered trademarks (®) of their respective owners and are listed in the footnote on the first occurrence.

When creating our documents we pay attention with the utmost care to the rights of third parties. Should we have not marked a trademark or breach a copyright, please inform us in order to have the possibility of remedy.

1.5 Specified application

The COMBIVERT G6 serves exclusively for the control and regulation of three-phase motors. The operation of other electric consumers is prohibited and can lead to the destruction of the unit. Frequency inverter are components which are intended for the installation in electric systems or machines.

Die bei KEB eingesetzten Halbleiter und Bauteile sind für den Einsatz in industriellen Produkten entwickelt und ausgelegt. If the KEB COMBIVERT F5 is used in machines, which work under exceptional conditions or if essential functions, life-supporting measures or an extraordinary safety step must be fulfilled, the necessary reliability and security must be ensured by the machine builder.

The operation of our products outside the indicated limit values of the technical data leads to the loss of any liability claims.

1.6 Product description

The product family COMBIVERT G6 with safety function STO has been developed for the use in safety-oriented applications. The basic standards as well as application and country-specific standards must be observed furthermore. The manual refer to standards that are complementary to note!

This document is a description of the functions and parameters of the G6 - control card with VARAN interface (Versatile Automation Random Access Network).

A VARAN client with integrated VARAN splitter is implemented (1 VARAN output). It supports isochronous and asynchronous data objects to access on the device parameters.

1.6.1 Overview of functions

The control provides the following functions:

- hardware-installed supply of digital and analog inputs and outputs.
- Diagnostic interface
- Ethernet-based fieldbus interface (EtherCAT / Varan)
- CAN fieldbus interface
- Multi encoder interface
- KTY interface
- Brake control
- STO functionality
- Status LED's

1.6.2 Safety function

The safety function STO according to IEC 61800-5-2 contains:

- Safe torque off (Safe Torque Off - STO)

The safety function meet the requirements in accordance with performance level e (ISO13849-1) and SIL 3 (IEC 61508 and IEC 62061). In case of proper project design, installation and operation the safety function protects people against mechanical damages.

Attention



Validity of certificates

FS

The certification of controllers with safety technology is only valid if the material number corresponds with the specified numerical code **and** the FS logo is printed on the type plate.

xx G6 x x x-x x x x

Control/keyboard/display (not valid for customer-/special version)					
A	G6K-G	Open-loop without keyboard/display	0	G6-G	Open-loop without keyboard/display
B	G6K-G	Open-loop with keyboard/display	1	G6-G	Open-loop with keyboard/display
2	G6P-S	SCL (Sensorless Closed Loop) without keyboard/display			
3	G6P-S	SCL (Sensorless Closed Loop) with keyboard/display			
4	G6L-M	ASCL (Asynchronous Sensorless Closed Loop) without keyboard/display			
5	G6L-M	ASCL (Asynchronous Sensorless Closed Loop) with keyboard/display			

Switching frequency; short time current limit; overcurrent cut-off
(not valid at customer/special version)

0	2 kHz	125 %	150 %	1	4 kHz	125 %	150 %
2	8 kHz	125 %	150 %	3	16 kHz	125 %	150 %
4	2 kHz	150 %	180 %	5	4 kHz	150 %	180 %
6	8 kHz	150 %	180 %	7	16 kHz	150 %	180 %
8	2 kHz	180 %	216 %	9	4 kHz	180 %	216 %
A	8 kHz	180 %	216 %	B	16 kHz	180 %	216 %

Voltage, connection

0	1-phase	230 V	AC/DC	3	3-phase	400 V	AC/DC
1	3-phase	230 V	AC/DC	5		400 V	DC
2	1/3-phase	230 V	AC/DC	6	1-phase	230 V	AC
A-Z	Customer-/special version (firmware and download)						

Housing type A, B, C, E

Variants

0	without filter, without braking transistor, without safety function STO	A	like 0 with STO	H	like A with f=0Hz
1	without filter, with braking transistor, without safety function STO	B	like 1 with STO	I	like B with f=0Hz
2	internal filter; without braking transistor, without safety function STO	C	like 2 with STO	K	like C with f=0Hz
3	internal filter, with braking transistor, without safety function STO	D	like 3 with STO	L	like D with f=0Hz

Control type

C	Analog/digital (standard)
D	CAN ^{® 1}
E	IO-Link ^{® 2}
F	EtherCAT ^{® 3}
G	PROFINET ^{® 4}
H	reserved for POWERLINK
I	VARAN

G6 unit type

Inverter size

2. Dual Port Memory

A Dual Port Memory (DPM) is a RAM memory, whereupon read or write access is possible from two sides simultaneously.

The entire bus is treated like a 4GB memory, a defined memory area is assigned to each client. This allows the CPU of the control to access on the participants with simple save, read and write commands.

This defined memory area addressed a range in a dual port memory (DPM) on which the application layer of the control card firmware can also access.

Available commands:

Memory read: Reads data from the memory of a bus participant. The command contains the start address and the number of bytes to read.

The client responds with the requested data.

Memory write: Writes data from the memory of a bus participant. The command contains the start address and the data to be written.

The client sends an confirmation.

These first two commands can be combined to form a shared memory read/write command.

Global write: All bus participants are addressed simultaneously. This command is used to global reset of the bus participants and for transmission of SYNC.

2.1 DPM mapping

The following shows the mapping of the DPM. Separated areas for the isochronous Objects (PDO) and the asynchronous Objects (SDO) are available. The byte order for all data objects is "least significant (LS) byte first".

Address [dec (hex)]	Size [Byte]	Description	Access ³⁾
0 (0x00)	16	Configurable isochronous input PDO data (Client => Manager)	ro
16 (0x10)	16	Reserved area	-
32 (0x20)	16	Configurable isochronous output PDO data (Manager => Client)	rw
48 (0x30)	16	Reserved area	-
64 (0x40)	4	Acyclic request data	rw
68 (0x44)	2	Acyclic request index	rw
70 (0x46)	1	Acyclic request subindex (format CANopen DS301)	rw
71 (0x47)	1	Acyclic request Cmd/MsgID ¹⁾	rw
72 (0x48)	4	Acyclic response data	ro
76 (0x4C)	1	Acyclic response error code ²⁾	ro
77 (0x4D)	1	Acyclic response Cmd/MsgID ¹⁾	ro

Dual Port Memory

1) Cmd/MsgID

c	c	c	c	i	m	m	m
---	---	---	---	---	---	---	---

- cccc...command ID
 - 0...invalid
 - 1...read
 - 2...write
 - 3...initialization (all i and m bits are 1)
- i...initialization bit (set during initialization command with all the m-bits)
 - Must be sent once after every switch on to transfer the device from status "init" to status "operational".
- mmm...message ID = counter from 0 to 7 (the response message uses the same ID as the corresponding request)

2) SDO response error codes

Value [dec (hex)]	Description
0 (0x00)	OK, no error
1 (0x01)	Device not ready
2 (0x02)	Invalid address or password
3 (0x03)	Invalid data
4 (0x04)	Parameter write protected
5 (0x05)	BCC error
6 (0x06)	Device busy
7 (0x07)	Service not supported
8 (0x08)	Invalid password
9 (0x09)	Telegram frame error
10 (0x0A)	Transmission error
11 (0x0B)	Invalid set or subindex
12 (0x0C)	Invalid language
13 (0x0D)	Invalid index
14 (0x0E)	Invalid operation

3) ro: read only, rw: read write

2.2 Parameterization data (asynchronous objects)

It is not necessary that the COMBIVERT G6 has synchronized to the fieldbus cycle to receive asynchronous requests and respond.

The parameter data are communicated via the handshaking shown in chapter 3.1. The VARAN master has to write on to the area "acyclic request" at the DPM. The area "acyclic respond" is filled by the device with valid data and can be read by the master.

The format of the subindex addressing is also described in chapter 3.1.

Examples of the byte Cmd/MsgID:

Initialisation:

0	0	1	1	1	1	1	1
---	---	---	---	---	---	---	---

(3Fh)

Read access:

0	0	0	1	0	0	0	0
---	---	---	---	---	---	---	---

(10h)

Write access:

0	0	1	0	0	0	0	1
---	---	---	---	---	---	---	---

(21h)

The number of successful asynchronous communication accesses are shown in the following parameters.

Id-Text	Name	Parameter index
fb20	Master write event counter	0x2194
Meaning	Number of asynchronous write accesses	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...65535 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb21	Master write event counter	0x2195
Meaning	Number of asynchronous read accesses	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...65535 Standard value: 0	
Note	-	

2.3 Process data (isochronous objects)

There are 16 bytes of process data available in both directions.

The process data can be accessed via the addresses described in chapter 2.1.

To activate the process data objects in the device, it is necessary to set the mapping of the process data by using the parameters defined in chapter 3. In addition the application layer of the G6 control board must be synchronized to the VARAN cycle. The description of this is located at chapter 4.

The number of successful isynchronous communication accesses are shown in the following parameters.

Id-Text	Name	Parameter index
fb22	PDO request counter	0x2196
Meaning	Number of isochronous write accesses (PD out)	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...65535 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb23	PDO request counter	0x2197
Meaning	Number of isochronous read accesses (PD in)	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...65535 Standard value: 0	
Note	-	

3. Process Data Mapping

The setting of the process data assignment can be done in two different ways. One is through the KEB specific parameters (fb10-fb19), on the other hand about the parameters (co08, c014) which are defined according to the CAN DS301 profile.

After successful adjustment of the process data mapping the process data can be processed by the G6 device.

3.1 Output process data (manager => client)

Id-Text	Name	Parameter index
fb10	PD out index	0x218A
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	Default up to 8 parameter addresses to be used as process data. Only parameters may be used that are allowed as process data. The value corresponds byte 2 and 3 of the DS301 parameter co08.	
Data length	16 bit	
Access	read / write	
Coding	0000h...FFFFh Standard value: 0000h	
Note	-	

Process Data Mapping

Id-Text	Name	Parameter index
fb11	PD out subindex	0x218B
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	The value of the subindex determines the parameter set of the selected PD parameter. The value corresponds byte 1 of the DS301 parameter co08.	
Data length	8 bit	
Access	read / write	
Coding	1...8 for subindex 1...8 (or rather set 0..7) Standard value: 1	
Note	-	

Id-Text	Name	Parameter index
fb12	PD out offset	0x218C
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	Specifies the offset of occupancy in the process data field. Position of the value of the mapped parameter.	
Data length	8 bit	
Access	read / write	
Coding	0...15 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb13	PD out type	0x218D
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	The value specifies the parameter type of the selected PD parameter.	
Data length	8 bit	
Access	read / write	
Coding	0: off (no parameter type defined) 1: Long (32bit) 2: Word (16bit) 3: Byte (8 bit) Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb14	PDO-out count	0x218E
Meaning	Sets the number of PD-out objects	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...8 Standard value: 0	
Note	Is automatically set to 0 when changing the parameters fb10...fb13.	

Process Data Mapping

Id-Text	Name	Parameter index														
co08	RPDO1 mapping	0x1600														
Type	ARRAY															
Subindex 0																
Meaning	Sets the number of mapped objects															
Data length	8 bit															
Access	read / write															
Coding	0...8 Standard value: 0															
Note	Successively, no gaps as on the fb-mapping parameters possible.															
Subindex 1...8																
Meaning	Describes an object mapping. The index, subindex and the object length are specified in bits.															
Data length	32 bit															
Access	read / write															
Coding	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Index</td> <td>Index</td> <td>Subindex</td> <td>Object length</td> </tr> <tr> <td>HB</td> <td>LB</td> <td></td> <td></td> </tr> <tr> <td>B3</td> <td>B2</td> <td>B1</td> <td>B0</td> </tr> </table> <p>Standard value: 00000100h</p>				Index	Index	Subindex	Object length	HB	LB			B3	B2	B1	B0
Index	Index	Subindex	Object length													
HB	LB															
B3	B2	B1	B0													
Note	A writing of this parameter requires that the count (subindex 0) is set to 0.															

3.2 Input process data (client => manager)

Id-Text	Name	Parameter index
fb15	PD in index	0x218F
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	Default up to 8 parameter addresses to be used as process data. Only parameters may be used that are allowed as process data. The value corresponds byte 2 and 3 of the DS301 parameter co14.	
Data length	16 bit	
Access	read / write	
Coding	0000h...FFFFh Standard value: 0000h	
Note	-	

Id-Text	Name	Parameter index
fb16	PD in subindex	0x2190
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	The value of the subindex determines the parameter set of the selected PD parameter. The value corresponds byte 1 of the DS301 parameter co14.	
Data length	8 bit	
Access	read / write	
Coding	1...8 for subindex 1...8 (or rather set 0..7) Standard value: 1	
Note	-	

Process Data Mapping

Id-Text	Name	Parameter index
fb17	PD in offset	0x2191
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	Specifies the offset of occupancy in the process data field. Position of the value of the mapped parameter.	
Data length	8 bit	
Access	read / write	
Coding	0...15 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb18	PD in type	0x2192
Type	ARRAY	
Subindex 0		
Meaning	Number of subindices of this object	
Data length	8 bit	
Access	read	
Coding	8 Standard value: 8	
Note	-	
Subindex 1...8		
Meaning	The value specifies the parameter type of the selected PD parameter.	
Data length	8 bit	
Access	read / write	
Coding	0: off (no parameter type defined) 1: Long (32bit) 2: Word (16bit) 3: Byte (8 bit) Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb19	PDO-in count	0x2193
Meaning	Sets the number of PD-in objects	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...8 Standard value: 0	
Note	Is automatically set to 0 when changing the parameters fb15...fb18.	

Id-Text	Name	Parameter index													
co14	TPDO1 mapping	0x1A00													
Type	ARRAY														
Subindex 0															
Meaning	Sets the number of mapped objects														
Data length	8 bit														
Access	read / write														
Coding	0...8 Standard value:0														
Note	Successively, no gaps as on the fb-mapping parameters possible.														
Subindex 1...8															
Meaning	Describes an object mapping. The index, subindex and the object length are specified in bits.														
Data length	32 bit														
Access	read / write														
Coding	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Index</td> <td>Index</td> <td>Subindex</td> <td>Object length</td> </tr> <tr> <td>HB</td> <td>LB</td> <td></td> <td></td> </tr> <tr> <td>B3</td> <td>B2</td> <td>B1</td> <td>B0</td> </tr> </table>			Index	Index	Subindex	Object length	HB	LB			B3	B2	B1	B0
Index	Index	Subindex	Object length												
HB	LB														
B3	B2	B1	B0												
	Standard value: 00000100h														
Note	A writing of this parameter requires that the count (subindex 0) is set to 0.														

4. Synchronization on VARAN field bus

In order to ensure the data consistency when accessing to the dual port memory, the internal calculation cycle must be synchronized to the external VARAN cycle.

For this, the external cycle time is defined by the parameter fb25. A PLL shifts the internal calculation grid accordingly. If the synchronization is completed successfully, the synchronous operation is shown over the VARAN status LED. See „7. Light-emitting diodes“

Id-Text	Name	Parameter index
fb25	cycle time	0x2199
Meaning	Default of the external field bus cycle	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...16000 μ s Standard value: 0 μ s	
Note	Value is not saved and always writing after switching on the unit. Only integer multiples of 1000 μ s are accepted.	

Id-Text	Name	Parameter index
fb26	set sync level	0x219A
Meaning	Maximum permissible deviation of internal to external cycle time for which the communication is rated to be synchronous.	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...100 μ s [multiplier: 1, divisor: 10, offset: 0] Standard value: 2 μ s	
Note	-	

Id-Text	Name	Parameter index
fb27	synchronization state	0x219B
Meaning	State of synchronization to the fieldbus cycle	
Type	Variable	
Data length	8 bit	
Access	read	
Coding	0: off (device not synchronous) 1: on (device synchronous) Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
fb28	pd access time	0x219C
Meaning	Processing time, which is required, to process the PD data (from FPGA sync until the end of processing with fully-utilized process data length in both directions).	
Type	Variable	
Data length	8 bit	
Access	read	
Coding	0...500 μ s Standard value: 0 μ s	
Note	-	

5. Fieldbus watchdog

The fieldbus watchdog is a function in the VARAN control board. It is used to trigger an error or warning in the inverter, if certain events are not cyclically repeated within a certain time. The activation of the watchdog is set by the control card parameters fb04 and fb05. The monitoring time and the at exceeding of the monitoring time executed function is set by parameter in the inverter (pn05, pn06).

Id-Text	Name	Parameter index
fb04	Bus watchdog activation	0x2184
Meaning	Allows a delayed activation of the fieldbus watchdog after switching on the device.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...65535	Value range
	0:	off (fieldbus watchdog inactive)
	1:	Activation after the first asynchronous communication
	16:	Activation after the first received process output data via isochronous communication
	Standard value: 0	
Note	Possible settings are OR connected.	

Id-Text	Name	Parameter index
fb05	bus watchdog lock	0x2185
Meaning	Determines on which incidents the fieldbus watchdog gets reseted.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...65535	Value range
	0:	off (no reset)
	2:	When receiving an asynchronous communication request, the watchdog gets reseted.
	128:	When receiving of process output data via isochronous communication the watchdog gets reseted.
	Standard value: 0	
Note	Possible settings are OR connected.	

6. General control card parameters (operator functionality)

The operator parameters set the configuration of the G6 VARAN control. Furthermore, the software version as well as the current status can be read.

Id-Text	Name	Parameter index
os00	operator identifier	0x2080
Meaning	Displays the control card type, as well as the software version.	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	e.g.: 150600 15xxxx: G6 xx06xx: VARAN xxxx00: Version of the configuration parameters Standard value: Device dependent	
Note	-	

Id-Text	Name	Parameter index
os02	software date OS	0x2082
Meaning	Software date of the control card	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0.0000...9999, 3112: The year is displayed before the comma, month and day are after that. 2012,0813 means 13.08.2012. Standard value: 0.0000	
Note	-	

Id-Text	Name	Parameter index
os03	software version	0x2083
Meaning	Software version of the control card	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0.0.0.0...255.255.255.255 e.g.: 1.3.0.1 Standard value: 0.0.0.0	
Note	-	

General control card parameters (operator functionality)

Id-Text	Name	Parameter index
os04	diag error count	0x2084
Meaning	Specifies the number of errors occurred on the diagnostic interface.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...255 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os05	Diagnosis response delay	0x2085
Meaning	Sets the minimum response delay time for requests on the diagnostic interface.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...126 ms Standard value: 0 ms	
Note	-	

Id-Text	Name	Parameter index
os06	baud rate diag	0x2086
Meaning	Default transfer speed on the diagnostic interface.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0: 1.2 kbit/s 1: 2.4 kbit/s 2: 4.8 kbit/s 3: 9.6 kbit/s 4: 19.2 kbit/s 5: 38.4 kbit/s 6: 55.5 kbit/s 7: 57.6 kbit/s 8: 100 kbit/s Standard value: 5	
Note	-	

Id-Text	Name	Parameter index
os07	node ID	0x2087
Meaning	This parameter specifies the inverter address for the diagnostic interface (DIN 66019). The parameter is an image of the system parameter Sy06.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...239 Standard value: 1	
Note	-	

Id-Text	Name	Parameter index	
os08	operator type	0x2088	
Meaning	Displaying the implemented control card functions.		
Type	Variable		
Data length	16 bit		
Access	read		
Coding	Bit 0	Initiator	0: without 1: with initiator
	Bit1	Keyboard/dis- play	0: without 1: with keyboard/LCD display
	Bit8	LT image	0: with power unit image 1: without power unit image
	Bit 10	f = 0Hz	0: without 1: with f=0Hz functionality
	Bit 11	STO	0: without safety function 1: with safety function STO
	Bit 12...13	Bus connection	0: without (standard) 1: CANopen 2: IO-Link 3: EtherCAT 4: VARAN
	Standard value: 0		
Note	-		

General control card parameters (operator functionality)

Id-Text	Name	Parameter index
os09	PU max invbusy retries	0x2089
Meaning	Number of repetitions that are sent on the internal bus from the power module to the controller if it rejects "inverter busy" error.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0...255 Standard value: 200	
Note	-	

Id-Text	Name	Parameter index
os10	PU tout count	0x208A
Meaning	Counts the timeouts on the internal bus between control and power unit.	
Type	Variable	
Data length	16 bit	
Access	read / write	
Coding	0...65535 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os12	operator command	0x208C
Meaning	Default of instructions according to coding (see below)	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0: no 1: Load default values in all operator parameters 2: reinitialize pu-parameter image Standard value: 0	
Note	-	

Id-Text	Name	Parameter index	
os13	operator state	0x208D	
Meaning	Displays the status of the power unit, as well as the image of the power unit parameter of the control board.		
Type	Variable		
Data length	8 bit		
Access	read		
Coding	Bit 0	reserved	
	Bit 1...2	PU-conf.-ID status	0: Power unit-ID unknown 2: Power unit-ID OK 4: Power unit-ID incorrect
	Bit 3...5	PU-image status	0: PU image not initialised 1: write PU image 3: PU image changed 4: PU image initialised 5: PU image check 6: PU image not available
	Bit 6...15	reserved	
	Standard value: 0		
Note	-		

Id-Text	Name	Parameter index
os14	store state	0x208E
Meaning	By writing of value "0" non-volatile parameters are saved immediately. After completion of the storage the value jumps to status "1". If at the end of the download lists in COMBIVIS the value "0" comes before value "1", COMBIVIS will send the value as long as the inverter finishes storing.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0: busy 1: ready 2: off Standard value: 1	
Note	-	

General control card parameters (operator functionality)

Id-Text	Name	Parameter index
os15	store mode	0x208F
Meaning	The memory type of non-volatile parameters must be adjusted with this parameter. The parameters will not be stored if the value is "0", the device automatically changes to value "1" after the next "power down". This value is the default value, the non-volatile parameters are always stored. Value „2“ deactivates the storing, also over the next start of the module.	
Type	Variable	
Data length	8 bit	
Access	read / write	
Coding	0: off, curr. off / on at startup 1: on, always store 2: off, never store Standard value: 1	
Note	-	

Id-Text	Name	Parameter index
os17	safety type	0x2091
Meaning	Type of safety module	
Type	Variable	
Data length	16 bit	
Access	read	
Coding	0: no safety module available 1: Type 1 (STO) Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os18	safety software date	0x2092
Meaning	Displays the software date of the safety module.	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0.0000...9999, 3112: The year is displayed before the comma, month and day are after that. 2012,0813 means 13.08.2012. If no security module is installed, the value "0: no safety functionality" is displayed. Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os19	safety software version	0x2093
Meaning	Displays the software version of the safety module.	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0.0.0.0...255.255.255.255 If no security module is installed, the value "0: no safety functionality" is displayed. Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os29	serial number OS	0x209D
Meaning	Serial number on the control hardware.	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0...4294967295 Standard value: 0	
Note	-	

Id-Text	Name	Parameter index
os30	serial number OS 2	0x209E
Meaning	Serial number part 2 on the control hardware.	
Type	Variable	
Data length	32 bit	
Access	read	
Coding	0...4294967295 Standard value: 0	
Note	-	

7. Light-emitting diodes

7.1 Status LEDs of VARAN plugs

Link LED	Green	Lights up when connection consists between two PHYs
Active LED	Yellow	Lights up when data is received over the VARAN bus

7.2 Network status LED

The LED located on the top of the device indicates the status of the VARAN client application.

LED lights green	Device runs synchron to the VARAN bus and process data are available
LED off	Device does not run synchronous to VARAN bus and/ or no process data available



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