

# COMBIVERT G6

PROGRAMMING MANUAL | CONTROL G6 VARAN

Translation of the original manual  
Document 20099381 EN 02






# Preface

The hardware and software described in this document are products of KEB. The information contained in this document is valid at the time of publishing. KEB reserves the right to update this document in response to misprints, mistakes or technical changes.

## Signal words and symbols

Certain procedures within this document can cause safety hazards during the installation or operation of the device. Refer to the safety warnings in this document when performing these procedures. Safety signs are also located on the device where applicable. A safety warning is marked by one of the following warning signs:

 <b>DANGER</b>	Dangerous situation, which will cause death or serious injury if this safety warning is ignored.
 <b>WARNING</b>	Dangerous situation, which may cause death or serious injury if this safety warning is ignored.
 <b>CAUTION</b>	Dangerous situation, which may cause minor injury if this safety warning is ignored.
<b>NOTICE</b>	Situation, which can cause damage to property if this safety warning is ignored.

### RESTRICTION

Used when the following statements depend on certain conditions or are only valid for certain ranges of values.



Used for informational messages or recommended procedures.

## More symbols

- ▶ This arrow starts an action step.
- / - Enumerations are marked with dots or indents.
- => Cross reference to another chapter or another page.



Note to further documentation.  
<https://www.keb-automation.com/search>



## Laws and guidelines

KEB Automation KG confirms with the EC declaration of conformity and the CE mark on the device nameplate that it complies with the essential safety requirements.

The EC declaration of conformity can be downloaded on demand via our website.

## Warranty and liability

The warranty and liability on design, material or workmanship for the acquired device is given in the general sales conditions.



Here you will find our general sales conditions.  
<https://www.keb-automation.com/terms-conditions>



Further agreements or specifications require a written confirmation.

## Support

Although multiple applications are referenced, not every case has been taking into account. If you require further information or if problems occur which are not referenced in the documentation, you can request the necessary information via the local KEB agency.

**The use of our units in the target products is outside of our control and therefore lies exclusively in the area of responsibility of the 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 intended use. However, they are regarded as being only informal and changes are expressly reserved, in particular due to technical changes. 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 intended end use of the product (application) by the customer. They must be repeated, even if only parts of hardware, software or the unit adjustment are modified.**

## Copyright

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

This KEB product or parts thereof may contain third-party software, including free and/or open source software. If applicable, the license terms of this software are contained in the instructions for use. The instructions for use are already available to you, can be downloaded free of charge from the KEB website or can be requested from the respective KEB contact person.

Other wordmarks or/and logos are trademarks (™) or registered trademarks (®) of their respective owners.

# Table of Contents

- Preface ..... 3**
  - Signal words and symbols ..... 3
  - More symbols..... 3
  - Laws and guidelines..... 4
  - Warranty and liability ..... 4
  - Support ..... 4
  - Copyright..... 4
- Table of Contents ..... 5**
- 1 Basic Safety Instructions..... 6**
  - 1.1 Target group..... 6
  - 1.1 Validity of this manual..... 6
  - 1.2 Electrical connection ..... 7
  - 1.3 Start-up and operation ..... 7
- 2 Product Description ..... 8**
  - 2.1 Product features ..... 8
  - 2.2 Overview of functions ..... 8
- 3 Dual Port Memory ..... 9**
  - 3.1 DPM mapping..... 9
  - 3.2 Parameterization data (asynchronous objects)..... 11
  - 3.3 Process data (isochronous objects)..... 12
- 4 Process Data Mapping ..... 13**
  - 4.1 Output process data (manager => client)..... 13
  - 4.2 Input process data (client => manager)..... 17
- 5 Synchronization on VARAN Fieldbus ..... 20**
- 6 Fieldbus Watchdog..... 22**
- 7 Operator Parameters ..... 23**
- 8 Light-emitting Diodes..... 30**
  - 8.1 Status LEDs of VARAN plugs..... 30
  - 8.2 Network status LED..... 30
- 9 Revision History ..... 31**

# 1 Basic Safety Instructions

The products are designed and constructed in accordance with state-of-the-art technology and the recognized safety rules and regulations. However, the use of such devices may cause functional hazards for life and limb of the user or third parties, or damages to the system and other material property.

The following safety instructions have been created by the manufacturer for the area of electric drive technology. They can be supplemented by local, country- or application-specific safety instructions. This list is not exhaustive. Violation of the safety instructions by the customer, user or other third party leads to the loss of all resulting claims against the manufacturer.

## NOTICE



### Hazards and risks through ignorance!

- ▶ Read the instructions for use!
- ▶ Observe the safety and warning instructions!
- ▶ If anything is unclear, please contact KEB Automation KG!

## 1.1 Target group

This instruction manual is determined exclusively for electrical personnel. Electrical personnel for the purpose of this instruction manual must have the following qualifications:

- Knowledge and understanding of the safety instructions.
- Skills for installation and assembly.
- Start-up and operation of the product.
- Understanding of the function in the used machine.
- Detection of hazards and risks of the electrical drive technology.
- Knowledge of *DIN IEC 60364-5-54*.
- Knowledge of national safety regulations.

## 1.1 Validity of this manual

This manual describes the control part VARAN of the COMBIVERT G6.  
The manual

- contains only supplementary safety instructions.
- is only valid in connection with the power unit manual of COMBIVERT G6.

## 1.2 Electrical connection

### ⚠ DANGER



#### Voltage at the terminals and in the device!

##### Danger to life due to electric shock !

- ▶ For any work on the unit switch off the supply voltage and secure it against switching on.
- ▶ Wait until the drive has stopped in order, that perhaps regenerative energy can be generated.
- ▶ Wait until the DC-Link capacitors are discharged (5 minutes). Verify by measuring the DC voltage at the terminals.
- ▶ Never bridge upstream protective devices (also not for test purposes).

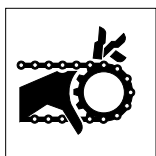
For a trouble-free and safe operation, please pay attention to the following instructions:

- The electrical installation shall be carried out in accordance with the relevant requirements.
- Cable cross-sections and fuses must be dimensioned by the user accordly to the specified minimum / maximum values for the operation.
- Within systems or machines the person installing electrical wiring must ensure that on existing or new wired safe ELV circuits the EN requirement for safe insulation is still met!
- For drive converters that are not isolated from the supply circuit (in accordance with *EN 61800-5-1*) all control lines must be included in other protective measures (e.g. double insulation or shielded, earthed and insulated).
- When using components without isolated inputs/outputs, it is necessary that equipotential bonding exists between the components to be connected (e.g. by the equipotential line). Disregard can cause destruction of the components by equalizing currents.

## 1.3 Start-up and operation

The start-up (i.e. for the specified application) is forbidden until it is determined that the installation complies with the machine directive; account is to be taken of *EN 60204-1*.

### ⚠ WARNING



#### Software protection and programming!

##### Hazards caused by unintentional behavior of the drive!

- ▶ Check especially during initial start-up or replacement of the drive controller if parameterization is compatible to application.
- ▶ Securing a unit solely with software-supported functions is not sufficient. It is imperative to install external protective measures (e.g. limit switch) that are independent of the drive controller.
- ▶ Secure motors against automatic restart.

## 2 Product Description

### 2.1 Product features

These instructions for use describe the parameterization of the following devices:

Device series:	COMBIVERT G6
Hardware:	VARAN

### 2.2 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
- KTY interface
- Brake control
- STO functionality
- Status LEDs



### 3 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.

#### 3.1 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 <sup>3)</sup>
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 <sup>1)</sup>	rw
72 (0x48)	4	Acyclic response data	ro
76 (0x4C)	1	Acyclic response error code <sup>2)</sup>	ro
77 (0x4D)	1	Acyclic response Cmd/MsgID <sup>1)</sup>	ro

<sup>1)</sup> 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)

<sup>2)</sup> 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

<sup>3)</sup> ro: read only, rw: read write

### 3.2 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 „4.1 Output process data (manager => client)“. 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 „4.1 Output process data (manager => client)“.

#### 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
<b>Meaning</b>	Number of asynchronous write accesses	
<b>Type</b>	Variable	
<b>Data length</b>	16 bit	
<b>Access</b>	read / write	
<b>Coding</b>	0...65535 Standard value: 0	
<b>Note</b>	–	

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

### 3.3 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 „3.1 DPM mapping“.

To activate the process data objects in the device, it is necessary to set the mapping of the process data via the parameters from the chapter „4 Process Data Mapping“. In addition the application layer of the G6 control board must be synchronized to the VARAN cycle. The description can be found in chapter „5 Synchronization on VARAN Fieldbus“.

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

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

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

## 4 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.

### 4.1 Output process data (manager => client)

Id-Text	Name	Parameter index
fb10	PD out index	0x218A
<b>Type</b>	Array	
<b>Subindex 0</b>		
<b>Meaning</b>	Number of subindices of this object	
<b>Data length</b>	8 bit	
<b>Access</b>	read	
<b>Coding</b>	8 Standard value: 8	
<b>Note</b>	–	
<b>Subindex 1..8</b>		
<b>Meaning</b>	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.	
<b>Data length</b>	16 bit	
<b>Access</b>	read / write	
<b>Coding</b>	0000h...FFFFh Standard value: 0000h	
<b>Note</b>	–	

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

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

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

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

## PROCESS DATA MAPPING

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



## 4.2 Input process data (client =&gt; manager)

Id-Text	Name	Parameter index
fb15	PD in index	0x218F
<b>Type</b>	Array	
<b>Subindex 0</b>		
<b>Meaning</b>	Number of subindices of this object	
<b>Data length</b>	8 bit	
<b>Access</b>	read	
<b>Coding</b>	8 Standard value: 8	
<b>Note</b>	–	
<b>Subindex 1..8</b>		
<b>Meaning</b>	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.	
<b>Data length</b>	16 bit	
<b>Access</b>	read / write	
<b>Coding</b>	0000h...FFFFh Standard value: 0000h	
<b>Note</b>	–	

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

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

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

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

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

## 5 Synchronization on VARAN Fieldbus

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, => „8 Light-emitting Diodes“.

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

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

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

Id-Text	Name	Parameter index
fb28	pd access time	0x219C
<b>Meaning</b>	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).	
<b>Type</b>	Variable	
<b>Data length</b>	8 bit	
<b>Access</b>	read	
<b>Coding</b>	0...500 µs  Standard value: 0 µs	
<b>Note</b>	–	

## 6 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								
<b>Meaning</b>	Allows a delayed activation of the fieldbus watchdog after switching on the device.									
<b>Type</b>	Variable									
<b>Data length</b>	8 bit									
<b>Access</b>	read / write									
<b>Coding</b>	<table border="1"> <thead> <tr> <th>0...65535</th> <th>Value range</th> </tr> </thead> <tbody> <tr> <td>0:</td> <td>off (fieldbus watchdog inactive)</td> </tr> <tr> <td>1:</td> <td>Activation after the first asynchronous communication</td> </tr> <tr> <td>16:</td> <td>Activation after the first received process output data via isochronous communication</td> </tr> </tbody> </table> <p>Standard value: 0</p>		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
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									
<b>Note</b>	Possible settings are OR connected.									

Id-Text	Name	Parameter index								
fb05	bus watchdog lock	0x2185								
<b>Meaning</b>	Determines on which incidents the fieldbus watchdog gets reseted.									
<b>Type</b>	Variable									
<b>Data length</b>	8 bit									
<b>Access</b>	read / write									
<b>Coding</b>	<table border="1"> <thead> <tr> <th>0...65535</th> <th>Value range</th> </tr> </thead> <tbody> <tr> <td>0:</td> <td>off (no reset)</td> </tr> <tr> <td>2:</td> <td>When receiving an asynchronous communication request, the watchdog gets reseted.</td> </tr> <tr> <td>128:</td> <td>When receiving of process output data via isochronous communication the watchdog gets reseted.</td> </tr> </tbody> </table> <p>Standard value: 0</p>		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.
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.									
<b>Note</b>	Possible settings are OR connected.									

## 7 Operator Parameters

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
<b>Meaning</b>	Displays the control card type, as well as the software version.	
<b>Type</b>	Variable	
<b>Data length</b>	32 bit	
<b>Access</b>	read	
<b>Coding</b>	e.g.: 150600 15xxxx: G6 xx06xx: VARAN xxxx00: Version of the configuration parameters  Standard value: Device-dependent	
<b>Note</b>	–	

Id-Text	Name	Parameter index
os02	software date OS	0x2082
<b>Meaning</b>	Software date of the control card	
<b>Type</b>	Variable	
<b>Data length</b>	32 bit	
<b>Access</b>	read	
<b>Coding</b>	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	
<b>Note</b>	–	

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

## OPERATOR PARAMETERS

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

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

Id-Text	Name	Parameter index
os06	baud rate diag	0x2086
<b>Meaning</b>	Default transfer speed on the diagnostic interface.	
<b>Type</b>	Variable	
<b>Data length</b>	8 bit	
<b>Access</b>	read / write	
<b>Coding</b>	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	
<b>Note</b>	–	



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

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

## OPERATOR PARAMETERS

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

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

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

Id-Text	Name	Parameter index	
os13	operator state	0x208D	
<b>Meaning</b>	Displays the status of the power unit, as well as the image of the power unit parameter of the control board.		
<b>Type</b>	Variable		
<b>Data length</b>	8 bit		
<b>Access</b>	read		
<b>Coding</b>	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		
<b>Note</b>	–		

Id-Text	Name	Parameter index
os14	store state	0x208E
<b>Meaning</b>	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.	
<b>Type</b>	Variable	
<b>Data length</b>	8 bit	
<b>Access</b>	read / write	
<b>Coding</b>	0: busy 1: ready 2: off  Standard value: 1	
<b>Note</b>	–	

Id-Text	Name	Parameter index
os15	store mode	0x208F
<b>Meaning</b>	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.	
<b>Type</b>	Variable	
<b>Data length</b>	8 bit	
<b>Access</b>	read / write	
<b>Coding</b>	0: off, curr. off / on at startup 1: on, always store 2: off, never store  Standard value: 1	
<b>Note</b>	–	

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

Id-Text	Name	Parameter index
os18	safety software date	0x2092
<b>Meaning</b>	Displays the software date of the safety module.	
<b>Type</b>	Variable	
<b>Data length</b>	32 bit	
<b>Access</b>	read	
<b>Coding</b>	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	
<b>Note</b>	–	

Id-Text	Name	Parameter index
os19	safety software version	0x2093
<b>Meaning</b>	Displays the software version of the safety module.	
<b>Type</b>	Variable	
<b>Data length</b>	32 bit	
<b>Access</b>	read	
<b>Coding</b>	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	
<b>Note</b>	–	

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

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

## 8 Light-emitting Diodes

### 8.1 Status LEDs of VARAN plugs

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

### 8.2 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.

## 9 Revision History

Version	Date	Description
00	2015-02	Completion series
00	2015-07	Change to document view. Version not counted up
01	2019-05	Changed to new KEB CI optic
02	2023-08	Update the default pages, editorial changes





**Austria** | KEB Automation GmbH

Ritzstraße 8 4614 Marchtrenk Austria  
 Tel: +43 7243 53586-0 Fax: +43 7243 53586-21  
 E-Mail: info@keb.at Internet: www.keb.at

**Benelux** | KEB Automation KG

Bd Paapsemiaan 20 1070 Anderlecht Belgium  
 Tel: +32 2 447 8580  
 E-Mail: info.benelux@keb.de Internet: www.keb.de

**Brazil** | KEB South America - Regional Manager

Rua Dr. Omar Pacheco Souza Riberio, 70  
 CEP 13569-430 Portal do Sol, São Carlos Brazil  
 Tel: +55 16 31161294 E-Mail: roberto.arias@keb.de

**Czech Republic** | KEB Automation GmbH

Videnska 188/119d 61900 Brno Czech Republic  
 Tel: +420 544 212 008  
 E-Mail: info@keb.cz Internet: www.keb.cz

**France** | Société Française KEB SASU

Z.I. de la Croix St. Nicolas 14, rue Gustave Eiffel  
 94510 La Queue en Brie France  
 Tel: +33 149620101 Fax: +33 145767495  
 E-Mail: info@keb.fr Internet: www.keb.fr

**Germany | Geared Motors**

KEB Antriebstechnik GmbH  
 Wildbacher Straße 5 08289 Schneeberg Germany  
 Telefon +49 3772 67-0 Telefax +49 3772 67-281  
 Internet: www.keb-drive.de E-Mail: info@keb-drive.de

**Italy** | KEB Italia S.r.l. Unipersonale

Via Newton, 2 20019 Settimo Milanese (Milano) Italia  
 Tel: +39 02 3353531 Fax: +39 02 33500790  
 E-Mail: info@keb.it Internet: www.keb.it

**Japan** | KEB Japan Ltd.

15 - 16, 2 - Chome, Takanawa Minato-ku Tokyo 108 - 0074 Japan  
 Tel: +81 33 445-8515 Fax: +81 33 445-8215  
 E-Mail: info@keb.jp Internet: www.keb.jp

**P. R. China** | KEB Power Transmission Technology (Shanghai) Co. Ltd.

No. 435 QianPu Road Chedun Town Songjiang District  
 201611 Shanghai P.R. China  
 Tel: +86 21 37746688 Fax: +86 21 37746600  
 E-Mail: info@keb.cn Internet: www.keb.cn

**Poland** | KEB Automation KG

Tel: +48 60407727  
 E-Mail: roman.trinczek@keb.de Internet: www.keb.de

**Republic of Korea** | KEB Automation KG

Deoksan-Besttel 1132 ho Sangnam-ro 37  
 Seongsan-gu Changwon-si Gyeongsangnam-do Republic of Korea  
 Tel: +82 55 601 5505 Fax: +82 55 601 5506  
 E-Mail: jaeok.kim@keb.de Internet: www.keb.de

**Spain** | KEB Automation KG

c / Mitjer, Nave 8 - Pol. Ind. LA MASIA  
 08798 Sant Cugat Sesgarrigues (Barcelona) Spain  
 Tel: +34 93 8970268 Fax: +34 93 8992035 E-Mail: vb.espana@keb.de

**Switzerland** | KEB Automation AG

Witzbergstrasse 24 8330 Pfaeffikon/ZH Switzerland  
 Tel: +41 43 2886060 Fax: +41 43 2886088  
 E-Mail: info@keb.ch Internet: www.keb.ch

**United Kingdom** | KEB (UK) Ltd.

5 Morris Close Park Farm Industrial Estate  
 Wellingborough, Northants, NN8 6 XF United Kingdom  
 Tel: +44 1933 402220 Fax: +44 1933 400724  
 E-Mail: info@keb.co.uk Internet: www.keb.co.uk

**United States** | KEB America, Inc

5100 Valley Industrial Blvd. South  
 Shakopee, MN 55379 United States  
 Tel: +1 952 2241400 Fax: +1 952 2241499  
 E-Mail: info@kebamerica.com Internet: www.kebamerica.com



**MORE KEB PARTNERS WORLDWIDE:**

[www.keb-automation.com/contact](http://www.keb-automation.com/contact)



**Automation with Drive**

**[www.keb.de](http://www.keb.de)**

KEB Automation KG Suedstrasse 38 32683 Barntrup Tel. +49 5263 401-0 E-Mail: [info@keb.de](mailto:info@keb.de)