KEB

COMBICOM **F5**

INSTRUCTIONS FOR USE | **DEVICENET OPERATOR**

1. General Information

The presented documentation as well as the herein mentioned hard- and software are developments of KEB Automation KG. Errors excepted.

The KEB Automation KG have prepared the documentation, hardware and software to the best of their knowledge, however, no guarantee is given that the specifications will provide the efficiency aimed at by the user.

KEB Automation KG reserves the right to alter specifications without notice to third parties.

1.1 Order informations

This Instruction Manual:	20153960
F5 DeviceNet operator:	00F5060-7000

Utilities for the diagnostic interface

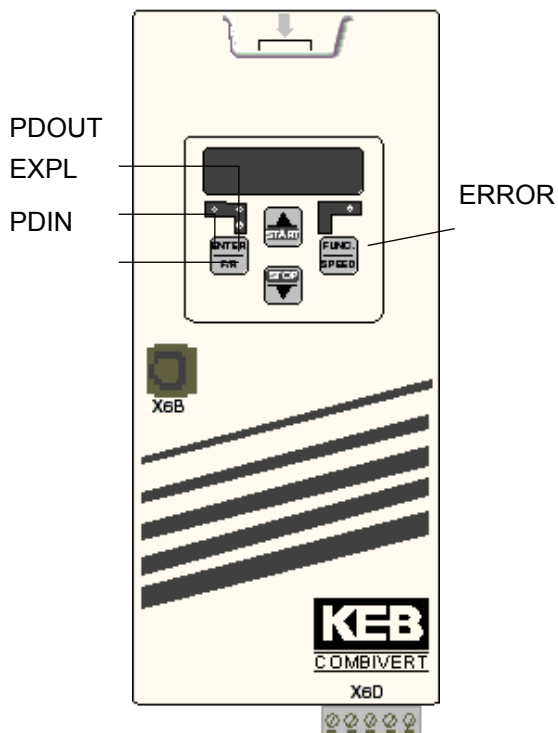|	
HSP5-cable between PC and adapter:	00F50C0-0010
Adapter DSUB / Western:	00F50C0-0020

1.2 F5 DeviceNet operator

KEB develop, produce and sell static frequency inverters worldwide in the industrial power range. The inverters of the type F5 can be equipped optionally with a DeviceNet-interface.

It concerns an intelligent interface, that controls the access over DeviceNet to the parameters of the frequency inverter.

The F5-DeviceNet-operator is integrated into the FI-housing by plug-in and fits into all KEB-F5-frequency inverters. Parallel to the fieldbus operation the operation over the integrated display/keyboard as well as another interface for diagnosis/parameterization (KEB COMBIVIS) is possible.

For programming the KEB-F5-inverter by DeviceNet the user requires in additon to this manual the instruction manual of the respective frequency inverter control [1].
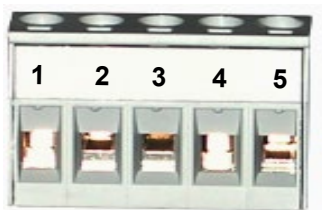
2. Hardware Description

EXPL	Explicit-Message-communication active.
PDOUT	PDOUT-data are written to the FI-control.
PDIN	PDIN-data are read by the FI-control.
ERROR	constantly on: Inverter ready for operation Flashing: Inverter in Error-Status Off: no power supply
X6B	Diagnostic interface to the PC (see diagnostic interface)
X6D	DeviceNet-terminal strip (see DeviceNet-interface)

2.1 DeviceNet-interface

For the connection to the DeviceNet-bus the KEB-F5-DeviceNet operator offers a 5-pole terminal strip. The DeviceNet interface adheres to the specifications made by [2] .

Transmission rate on DeviceNet:	125, 250, 500 Kbit/s, adjustable by operator parameters.
Potential separation:	Safe disconnection according to VDE 0160.
Bus termination:	121 Ohm, must occur externally at the first and last node between CAN_H and CAN_L.
External voltage supply of the DeviceNet interface:	11…25 V DC
Current input of the Device interface:	max. 50 mA / 24 V

Pin assignment DVN1:

Pin	Signal
1	V- (Reference potential for external voltage supply)
2	CAN_L
3	shielding
4	CAN_H
5	V+ (external voltage supply)

2.2 Diagnostic interface

> ! ATTENTION !
>
> To prevent the damage of the serial interface on your Personal Computer be sure that you use the special HSP5 cable from KEB for connecting your PC to the diagnostic interface of the ModBus operator.
> A HSP5-cable is connected to the diagnostic interface via an adapter (see order informations). When connected correctly access to all parameters of the frequency inverter is possible using the PC-software KEB Combivis. Also the operator internal parameters can be read out and partly adjusted or parameterized with download.

3. DeviceNet

DeviceNet is a bus system that is build-up as lowest communication level on the CAN V2.0A. The DeviceNet protocol was defined by the ‚Open DeviceNet Vendor Association' (ODVA) (see [2] and [3]).

3.1 Functions

DeviceNet defines master nodes (active) and slave nodes (passive). The individual nodes exchange data over logical data channels, so-called connections. One or several slave nodes are assigned to a master by the connection establishment and thereafter are locked for other masters. The **KEB** F5 **DeviceNet** interface connection operates as **slave** in the DeviceNet system.

As in every CAN based network it is also a central topic for the DeviceNet how to dispense the limited number of telegram numbers (identifiers). In this respect the DeviceNet differs clearly from other higher CAN protocol layers. The detailed specifications of the indentifier allocation is not to be dealt with here. If necessary it can be looked up in [2].

Every manufacturer that realizes a DeviceNet interface connection must apply for a so-called **Vendor-Id**.

KEB Antriebstechnik has been assigned the **Vendor-Id = 744 (decimal)**.

Basically every DeviceNet node has a node address, that is referred to as **MAC-Id**. The Mac-Id can be within the range 0 to 63. At the KEB-DeviceNet interface connection the Mac-Id is accepted by the parameter inverter address (SY.06). The DeviceNet specification ([3]) also defines the functionality of the unit in so-called device profiles. The DeviceNet interface connection of the KEB-F5 frequency inverter supports the profile of the **generic device**.

In DeviceNet the connections can be defined dynamically over the so-called **Unconnected Message Manager(UCMM)** or are predefined for simple field devices over the so-called **Predefined Master/Slave Connection Set** . The KEB F5 DeviceNet interface connection realizes no UCMM and operates exclusively over the predefined master/slave connection set.

Summarization of the basic DeviceNet properties:	
Vendor-Id	= 744(dec)
Mac-Id	= Value of parameter inverter address (SY.06)
Device Type	= 0 (Generic device)
UCMM	= **not** supported

3.1.1 Explicit Message

With Explicit Message the DeviceNet specification marks the function of addressing an object exlicitly for one time. This function basically allows the access to every parameter in the KEB frequency inverter. Furthermore, with this function special management functions, like the resetting of the connection (reset), can be carried out. The available functions are:

GetAttributeSingle	Reading the attribute of an object.
SetAttributeSingle	Writing the attribute of an object.
AllocateMaster/ SlaveConnectionSet	Establishment of connection(s) of the predefined master/slave connection set.
ReleaseMaster/SlaveConnectionSet	Termination of connection(s) of the predefined master/slave connection set.
Reset	Resetting an object.

In DeviceNet the addressing of an object is done over Class, Instance and Attribute. Class and Instance can have in each case a bit width of 8 bit as well as 16 bit. This defines each slave node by himself with the associated master at connection establishment. Attributes have always a width of 8 bit.
At KEB the Class has a data width of 8 bit and the Instance a data width of 16 bit.

The parameters in a KEB-DeviceNet are divided into inverter parameters and operator parameters. Inverter parameters are realized in the inverter control, operator parameters are localized directly in the DeviceNet operator. On access to inverter parameters the operator passes on the inquiry of DeviceNet over an internal serial interface to the inverter control. In contrast the access to operator parameters is processed directly in the operator. The differentiation between inverter parameters and operator parameters takes place over the Class in the Explicit Message request. The KEB internal addressing provides a 16 bit parameter address. In addition some parameters exist several times in so-called sets. The KEB-F5 frequency inverter has 8 such parameter sets (set 0 to set 7). The conversion of the KEB internal parameter addressing to the pattern of Explicit Message of DeviceNet was solved as follows:

Class = 100(dec) : Inverter parameter with 16 bit data width

Class = 101(dec) : Inverter parameter with 32 bit data width

Instance = Parameter address (from the application manual) + 1		
Attribute	= 100(dec)	Value in set 0
Attribute	= 101(dec)	Value in set 1
Attribute	= 102(dec)	Value in set 2
Attribute	= 103(dec)	Value in set 3
Attribute	= 104(dec)	Value in set 4
Attribute	= 105(dec)	Value in set 5
Attribute	= 106(dec)	Value in set 6
Attribute	= 107(dec)	Value in set 7
Attribute	= 108(dec)	Value in active set
Attribute	= 109(dec)	Value in current set (Fr.09)

Class = 102(dec) Operator parameter

Instance = see chapter operator parameters

Attribut = see chapter operator parameters

Please note, that most inverter parameters have a real data width of 16 bit. Only a few parameters possess genuine 32 bit data width.
Nevertheless, you can address every inverter parameter as 32 bit parameter (over class = 101(dec)).

3.1.2 Process data communication (Pollio/Cos)

This documentation uses the terms process output data (PDOUT) and process input data (PDIN) for the data direction of the process data.   The terms are based on the perspective from the DeviceNet master, as used in [2] and [3].

Process output data refer to the data that the DeviceNet master transfers to the slave.
Process input data refer to the data that the slave transfers to the master.

The KEB F5 DeviceNet interface supports special process data communication. It is possible to write 4 parameters at maximum at the same time (process output data) and cyclical read 4 parameters at maximum (process input data). Which parameters are mapped onto the process data is adjustable by special operator parameters (see chapter Operator Parameters).

The change of the process data mapping by the connection attributes 'produced connection path' and 'consumed connection path', specified by DeviceNet, is not supported here. That means these attributes of the process data connection are not changeable, but changeable is the assignment of the process data by the above mentioned operator parameters.

The process data functionality exists only once in the operator.
The process data can be exchanged over the Pollio connection or the **ChangeOffState(CoS) connection**.
The two connections cannot be activated simultaneously. The difference between the two connections is in the specific sequence of data exchange:

Pollio-Data exchange:
The master gives the slave new process output data with the **Poll Command** message.
The master receives from the slave the current process input data in the **Poll Response** message.
At this connection the slave is completely passive and transmits the current PDIN data only on request.

When activating this connection the process data in the KEB DeviceNet interface connection are read cyclical by the inverter control, if for the transport class the value 03h is adjusted in TranspClassTrigger (see below). How often the process input data is read depends on the value of the parameter expected packet rate (see below). The expected packet rate is resolved in ms. The cyclic reading of the PDIN data applies in relating with the expected packet rate as follows:

Expected packet rate   > 10ms --> PDIN-cycle time   = expected packet rate/2

Expected packet rate   < 10ms --> PDIN-cycle time   = expected packet rate

CoS-data exchange:
The master gives the slave new process output data with the **Master CoS** message . Depending on the adjustment of the slave it is acknowledged with an acknowledgement telegram (see AckSuppression) or not. On his part the slave transmits new process input data to the master with the **Slave CoS** message. Depending on the adjustment of the master it is acknowleged or not. At this connection the production of PDOUT- and PDIN-data is independently and the slave can become active on its own.
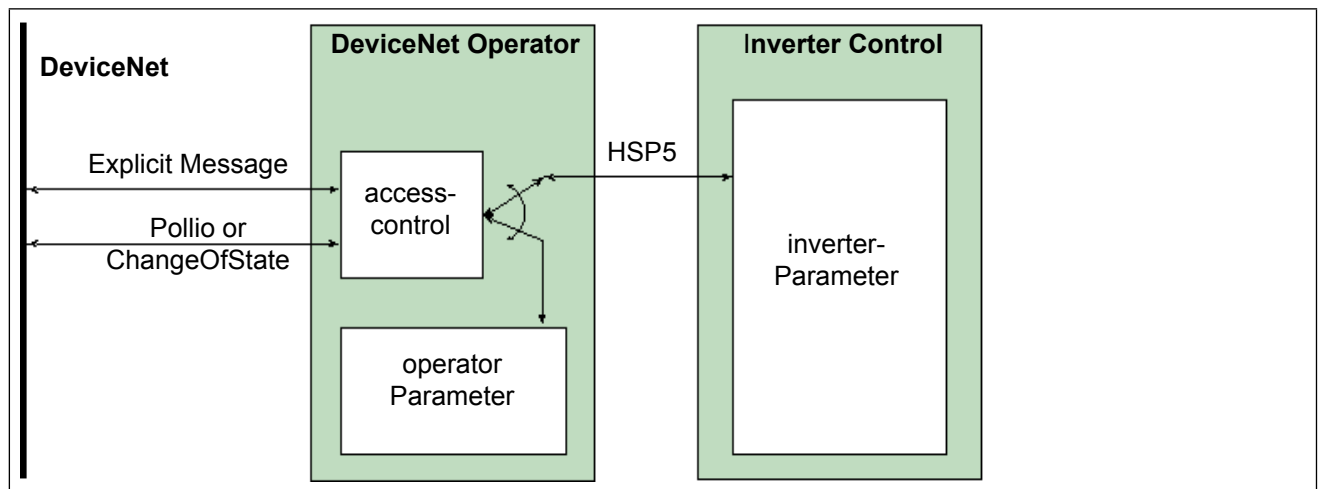
When activating this connection the process data in the KEB DeviceNet interface are always read cyclical from the inverter control. How often the process input data is read depends on the value of the parameter expected packet rate (see below). The expected packet rate is resolved in ms. The cyclic reading of the PDIN data applies to the same relating as the Pollio connection.

4 Operator Parameters

These parameters are located in the DeviceNet operator.
Access to these parameters is carried out directly by the operator and not passed on via the HSP5 interface to the inverter control.
Most operator parameters are available by the diagnostic interface (COMBIVIS) as well as by the DeviceNet Explcit message.

At the following parameter descriptions the line ‚Class/Instance/Attribute' specifies the addressing for the Explicit message and ‚COMBIVIS address' specifies the parameter address for the access by the diagnostic interface.

In the following only the parameters important for the user are listed.
All operator parameters additionally listed in the operator parameter window exist purely for debug purposes and are of no importance to the user.

Please note that some operator parameters are already predefined by DeviceNet, like the baud rate. Unlike the parameters specified by KEB these are not found in the Class range of 102 (dec).

Take Stored PD-Map

Class/Instance/Attribute (dec)	**102/11/100**
COMBIVIS address	**0091h**
Data length	1 Byte
Access	READ_WRITE
Meaning	Defines whether the saved process data mapping is active or if the standard mapping is used.
Coding	0: Standard process data mapping is active Otherwise: Saved process data mapping is active
Default value	FFh

For the process data mapping a data type is defined, that specifies the mapping of a parameter on process data
The data type has a length of 4 Bytes and is structured as follows :

T_PD_Map:

Bit 31…Bit 24	Bit 23…Bit 16	Bit 15…Bit 8	Bit 7…Bit 0
Parameter address		Parameter set	Data length in Byte

Take the parameter address from the application manual of the frequency control.
Only inverter parameters can be mapped.

Parameter set: Bit-coded the mapped parameter set:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
set 7	set 6	set 5	set 4	set 3	set 2	set 1	set 0

The value zero is not permitted for the parameter set.

Data Length: Only 2-Byte or 4-Byte mappings can be selected.

Operator Parameters

PDIN_MapN
(with N = 1…4)

Class/Instance/Attribute (dec)	**102/N/100**			
COMBIVIS address	**0091h + N**			
Data length	4 Byte			
Access	READ_WRITE			
Meaning	Defines N. Mapping for the process input data. Value zero means, that this mapping is not assigned (End identifier).			
Coding	T_PD_Map (s.o.)			
Default value	PDIN_Map1 = 00330102h PDIN_Map2 = 00350102h PDIN_Map3 = 00000000h PDIN_Map4 = 00000000h			
Notice	An altered value demands the deactivation of the PDIN processing (PDIN_Enabled = 0). After completed conversion it must be switched on again explicitly. The default setting means following assignment of the process input data:			
	Byte0	Byte1	Byte2	Byte3
	status word (SY.51)		actual speed (SY.53)	
	Low-Byte:	High-Byte:	Low-Byte:	High-Byte:
	Bit 7…Bit 0	Bit 15…Bit 8	Bit 7...Bit 0	Bit 15...Bit 8

PDOUT_MapN
(with N = 1…4)

Class/Instance/Attribute (dec)	**102/N+4/100**			
COMBIVIS address	**0095h + N**			
Data length	4 Byte			
Access	READ_WRITE			
Meaning	Defines N. Mapping for the process input data. Value zero means, that this mapping is not assigned (End identifier).			
Coding	T_PD_Map (s.o.)			
Default value	PDIN_Map1 = 00320102h PDIN_Map2 = 00340102h PDIN_Map3 = 00000000h PDIN_Map4 = 00000000h			
Notice	An altered value demands the deactivation of the PDOUT processing (PDOUT_Enabled = 0). After completed conversion it must be switched on again explicitly. The default setting means following assignment of the process input data:			
	Byte0	Byte1	Byte2	Byte3
	Control word (SY.50)		Actual speed (SY.52)	
	Low-Byte:	High-Byte:	Low-Byte:	High-Byte:
	Bit7…Bit0	Bit15…Bit8	Bit7…Bit0	Bit15…Bit8

PDIN_Enabled

Class/Instance/Attribute (dec)	**102/9/100**
COMBIVIS address	**009Ah**
Data length	1 Byte
Access	READ_WRITE
Meaning	Activates or deactivates the processing of the process input data.
Coding	0: Process input data are not active. Otherwise: Process input data are active.
Default value	DFh

PDOUT_Enabled

Class/Instance/Attribute (dec)	**102/10/100**
COMBIVIS address	**009Bh**
Data length	1 Byte
Access	READ_WRITE
Meaning	Activates or deactivates the processing of the process output data.
Coding	0: Process input data are not active. Otherwise: Process input data are active.
Default value	0Fh

SW_Date_FBS

Class/Instance/Attribute (dec)	**102/12/100**
COMBIVIS address	**not available**
Data length	2 Byte
Access	READ_ONLY
Meaning	Specifies the software date of the DeviceNet-interface
Coding	The last decimal place specifies the year 2000. The next two high-order decimal places specify the month. The most significant decimal place(s) specify the day. example:11112 means 11.11.2002

4.1 Parameter defined by the DeviceNet-Specification

4.1.1 Identity Instance (Class = 1)

Vendor-Id

Class/Instance/Attribute (dec)	**1/1/1**
COMBIVIS address	**not available**
Data length	2 Byte
Access	READ_ONLY
Meaning	Vendor-Id of the manufacturer. Assigned by the ODVA.
Coding	s. ODVA
Default value	744 = KEB Antriebstechnik

Device Type

Class/Instance/Attribute (dec)	**1/1/2**
COMBIVIS address	**not available**
Data length	2 Byte
Access	READ_ONLY
Meaning	Unit-type
Coding	s.(3)
Default value	0 = Generic device

Prod Code

Class/Instance/Attribute (dec)	**1/1/3**
COMBIVIS address	**not available**
Data length	2 Byte
Access	READ_ONLY
Meaning	Produkt Code. Specifies the control type of the KEB-frequency inverter.
Coding	after allocation of the KEB-COMBIVIS-Config-Ids

Revision

Class/Instance/Attribute (dec)	**1/1/4**
COMBIVIS address	**not available**
Data length	2 Byte
Access	READ_ONLY
Meaning	Output status of the DeviceNet-interface
Coding	Bit15…Bit8: Major output status Bit7…Bit0 : Minor output status

Serial number

Class/Instance/Attribute (dec)	**1/1/6**
COMBIVIS address	**not available**
Data length	4 Byte
Access	READ_ONLY
Meaning	Serial number for the distinct identification of the device.
Coding	Bit31…Bit24: Value of the parameter In.10 Bit23…Bit0 : Value of the parameter In.11

Prod name

Class/Instance/Attribute (dec)	**1/1/7**
COMBIVIS address	**not available**
Data length	14 Byte
Access	READ_ONLY
Meaning	Product name. ASCII-String made up of ‚KEB(744) _ plus the KEB-Config-Id as ASCII-String
Coding	‚KEB(744)_NNNNN' mit NNNNN ASCII-String of the connected frequency inverter control.

4.1.2 DeviceNet Instance (Class = 3)

Mac-Id

Class/Instance/Attribute (dec)	**3/1/1**
COMBIVIS address	**not available**
Data length	1 Byte
Access	READ_WRITE
Meaning	Address of the node in the DeviceNet network.
Coding	0…63(dec): node address
Default value	1
Notice	At the KEB-F5-DeviceNet interface connection the value of the parameter inverter address (SY.06) is adopted for the Mac-Id. When changing the Mac-Id this value is also changed in the inverter in SY.06.

Baud rate

Class/Instance/Attribute (dec)	**3/1/2**
COMBIVIS address	**0090h**
Data length	1 Byte
Access	READ_WRITE
Meaning	Defines the DeviceNet transmission speed.
Coding	0 = 125 KBit/s, 1 = 250 KBit/s, 2 = 500 Kbit/s
Default value	0 = 125 Kbit/s

BusOffInterrupt

Class/Instance/Attribute (dec)	**3/1/3**
COMBIVIS address	**not available**
Data length	1 Byte
Access	READ_WRITE
Meaning	Define the response off the BusOff-event on the DeviceNet-Bus.
Coding	0 = The CAN_Chip remains in BusOff 1 = Attempt to restart the CAN-Chip in order to start the communication operation again.
Default value	1

BusOffCnt

Class/Instance/Attribute (dec)	**3/1/4**
COMBIVIS address	**not available**
Data length	1 Byte
Access	READ_WRITE
Meaning	Counter for the BusOff occurrences at the DeviceNet bus.
Coding	1
Default value	0

AllocInfo
(s. [2], p. 5-57)

Class/Instance/Attribute (dec)	**3/1/5**		
COMBIVIS-address	**00B1h, 00B2h**		
Data length	2 Byte		
Access	READ_ONLY		
Meaning	Indicates the current status of the predefined master/slave connection set at the slave .		
Coding	**Bit 0** ⋮ **Bit 7**	MasterMac-Id	Here the Mac-Id of the master is entered to which the slave was assigned. The value FFh means, that no master has assigned this slave.
	Bit 8	Expl. Message	= 1	The Explicit Message connection is activated.
		Polled	= 1	The Polled connection is activated.
		BitStrobed	= 1	The BitStrobed connection is activated (not possible here).
	⋮	MultiCastPolling	= 1	The MulticastPolling connection is activated (not possible here).
		ChangeOfState	= 1	The ChangeOfState connection is activated.
	Bit 15	Cyclic	= 1	The cyclic connection is avtivated (not possible here)
		AckSuppression	= 1	No acknowledgement at ChangeOfState respectively cyclic connection
Default value	00FFh		

4.1.3 Important connection parameters

For you as user the following parameters are only of interest if you want to understand the subleties of the DeviceNet connections. The listed parameters are all part of the connection-instance 'type', a central object in the DeviceNet specifications.

TranspClassTrigger

(s. [2], p. 5-9ff)

Class/Instance/Attribute (dec)	**5/1/3** for Explicit Message Connection (not available by diagnosis interface) **5/2/3** for Pollio Connection (COMBIVIS address = 00BEh) **5/4/3** for ChangeOfState Connection (COMBIVIS address = **00C6h**)							
Data length	1 Byte							
Access	READ_ONLY							
Meaning	Parameter composed of three parts. It is specified hereby, which function the node assumes for this connection, when a telegram is being sent and the procedure upon reception.							
Coding	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Dir	Production Trigger			Transport Class			
	Dir		= 0	Endpoint of the connection is a client.				
			= 1	Endpoint of the connection is a server.				
	Production Trigger		= 0	Telegram is transmitted cyclical.				
			= 1	Telegram is sent upon change of the condition				
			= 2	Dependent on application object				
	Transport Class		= 0	Telegrams are not acknowledged.				
			= 2	Telegrams are acknowledged immediately, without passing.				
			= 3	Telegrams are acknowledged after transfer to the application.				
Default value	= 83h for Explicit Message Connection							
	= 82h for Pollio Connection							
	= 13h for ChangeOfState Connection							

ExpPacketRate
(s. [2], p. 5-25f)

Class/Instance/Attribute (dec)	**5/1/9** for Explicit Message Connection (not available by diagnosis interface) **5/2/9** for Pollio Connection (**COMBIVIS address** = 00BDh) **5/4/9** for ChangeOfState Connection (COMBIVIS address = **00C5h**)
Data length	2 Byte
Access	READ_ONLY for Explicid Message Connection READ_WRITE for Pollio and ChangeOfState Connection
Meaning	Expected repeat rate of telegrams on the specified connection. If a value unequal to zero is adjusted and the quadruple time elapses, but no telegram is sent, then the watchdog timeout function is executed.
Coding	= 0 --> no monitoring of the activity ! = 0 --> n*1 ms
Default value	2500 for Explicit Message Connection 0 for Pollio Connection 0 for ChangeOfState Connection

WDToutAction
(s. [2], p.5-26)

Class/Instance/Attribute (dec)	**5/1/12** for Explicit Message Connection (COMBIVIS address = 00B4h) **5/1/12** for Pollio Connection (COMBIVIS address = 00B8h) **5/4/12** for ChangeOfState Connection (COMBIVIS address = **00C0h**)
Data length	1 Byte
Access	READ_WRITE
Meaning	Defines the function, that is executed upon occurrence of timeout on a connection. Not all values are permitted for every type of connection.
Coding	**= 0 Transition to TimedOut:** Transition into the TimedOut-status and remaining there until a reset or a release of the connection is carried out.
	= 1 AutoDelete: The connection is automatically released.
	= 2 AutoReset: The connection remains established and the watchdog timer is started again.
	= 3 Deferred Delete: Deferred release of a connection. The connection goes into Deferred-status and is deleted as soon as all other connections, established over this connection, no longer exist.
Default value	1 for Explicit Message Connection 0 for Pollio Connection 0 for ChangeOfState Connection

ProdInhgibitTime

Class/Instance/Attribute (dec)	**5/4/17** for ChangeOfState Connection (COMBIVIS address = **00CAh**)
Data length	2 Byte
Access	READ_WRITE
Meaning	Indicates the minimum period of time between two successive transmission telegrams on this connection.
Coding	1 ms
Default value	0

5   List of Operator Parameters

Identity Instance

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
1	1	1	---	Vendor-Id	2	RO	CONST
1	1	2	---	Device Type	2	RO	CONST
1	1	3	---	Prod Code	2	RO	CONST
1	1	4	---	Revision	2	RO	CONST
1	1	5	---	Status	2	RO	NO
1	1	6	---	Serial Nr	4	RO	CONST
1	1	7	---	Prod name	14	RO	CONST

DeviceNet Instance

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
3	1	1	---	Mac-Id	1	RW	AUTO
3	1	2	0090h	Baud rate	1	RW	AUTO
3	1	3	---	BusOffInterrupt	1	RW	NO
3	1	4	---	BusOffCnt	1	RW	NO
3	1	5	00B1h/ 00B2h	AllocInfo	2	RO	NO

Explicit Message Connection Instance

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
5	1	1	00B3h	State	1	RO	NO
5	1	2	---	Instance Type	1	RO	NO
5	1	3	---	TranspClassTrigger	1	RO	NO
5	1	4	00B5h	ProdConnId	2	RO	NO
5	1	5	00B6h	ConsConnId	2	RO	NO
5	1	6	---	InitCommChar	1	RO	NO
5	1	7	---	ProdConnSize	2	RO	NO
5	1	8	---	ConsConnSize	2	RO	NO
5	1	9	---	ExpPacketRate	2	RO	NO
5	1	12	00B4h	WDToutAction	1	RW	NO
5	1	13	---	ProdConnPathLen	2	RO	NO
5	1	14	---	ProdConnPath	*1	RO	NO
5	1	15	---	ConsConnPathLen	2	RO	NO
5	1	16	---	ConsConnPath	*1	RO	NO

List of Operator Parameters

**Pollio Connection
Instance**

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
5	2	1	00B7h	State	1	RO	NO
5	2	2	---	Instance Type	1	RO	NO
5	2	3	00BCh	TranspClassTrigger	1	RO	NO
5	2	4	00B9h	ProdConnId	2	RO	NO
5	2	5	00BAh	ConsConnId	2	RO	NO
5	2	6	---	InitCommChar	1	RO	NO
5	2	7	00BBh	ProdConnSize	2	RO	NO
5	2	8	00BCh	ConsConnSize	2	RO	NO
5	2	9	00BDh	ExpPacketRate	2	RW	NO
5	2	12	00B8h	WDToutAction	1	RW	NO
5	2	13	---	ProdConnPathLen	2	RO	NO
5	2	14	---	ProdConnPath	*1	RO	NO
5	2	15	---	ConsConnPathLen	2	RO	NO
5	2	16	---	ConsConnPath	*1	RO	NO

**ChangeOfState
Connection Instance**

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
5	4	1	00BFh	State	1	RO	NO
5	4	2	---	InstanceType	1	RO	NO
5	4	3	00C6h	TranspClassTrigger	1	RO	NO
5	4	4	00C1h	ProdConnId	2	RO	NO
5	4	5	00C2h	ConsConnId	2	RO	NO
5	4	6	---	InitCommChar	1	RO	NO
5	4	7	00C3h	ProdConnSize	2	RO	NO
5	4	8	00C4h	ConsConnSize	2	RO	NO
5	4	9	00C5h	ExpPacketRate	2	RW	NO
5	4	12	00C0h	WDToutAction	1	RW	NO
5	4	13	---	ProdConnPathLen	2	RO	NO
5	4	14	---	ProdConnPath	*1	RO	NO
5	4	15	---	ConsConnPathLen	2	RO	NO
5	4	16	---	ConsConnPath	*1	RO	NO
5	4	17	00CAh	ProdInhibitTime	2	RW	NO

**Parameter defined
Operator Parame-
ters**

Class	Inst.	Attrib.	PAddr	Name	Dlen	Access	memory
102	11	100	0091h	Take Stored PD-Map	1	RW	AUTO
102	1	100	0092h	PDIN_Map1	4	RW	AUTO
102	2	100	0093h	PDIN_Map2	4	RW	AUTO
102	3	100	0094h	PDIN_Map3	4	RW	AUTO
102	4	100	0095h	PDIN_Map4	4	RW	AUTO
102	5	100	0096h	PDOUT_Map1	4	RW	AUTO
102	6	100	0097h	PDOUT_Map2	4	RW	AUTO
102	7	100	0098h	PDOUT_Map3	4	RW	AUTO
102	8	100	0099h	PDOUT_Map4	4	RW	AUTO
102	9	100	009Ah	PDIN_Enabled	1	RW	AUTO
102	10	100	009Bh	PDOUT_Enabled	1	RW	AUTO
102	12	100	---	SW_Date_FBS	2	RO	CONST

Dlen	Data length in Byte *1: Take the data length of ConnPath from the attribute ConnPathLen
Access	RW : Write and readable (SetAttributeSingle and GetAttributeSingle). RO : Read-only (GetAttributeSingle)
memory	AUTO : Value of the parameter is stored automatically non-volatile. CONST : Value is constant NO : Value is not stored non-volatile and must be written again after every re-start.

6 EDS-File

For the KEB-DeviceNet slave interface connection so-called EDS-files
(**E**lectronic **D**ata **S**heet) are available..
All relevant information is contained in it.
You receive the desired EDS-file directly from KEB Antriebstechnik.
www.KEB.de/ common/ tools/ DVN_EDS.zip.

7 List of Literature

[1]	Operating Instructions frequency inverter control KEB Combivert F5 with Application Manual.
[2]	DeviceNet Specification Volume I , Release 2.0 of Open DeviceNet Vendor Association (ODVA)
[3]	DeviceNet Specification Volume II , Release 2.0 of Open DeviceNet Vendor Association (ODVA)

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