



KIBES-2

KIENZLE BOARD ELECTRONIC SYSTEM

preliminary documentation



responsible for the contents:

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8.4.4	Word (channel) outputs of ZR2-B	<i>Fehler! Textmarke nicht definiert.</i>

1 Product- / System overview

1.1 General system description

You can program 2 main different CAN-configurations as below.
It depends whether you have to create an application for a DWP or a modul combi, because the protocols are different from ZR2-B to them.

a) MUX2-B or MUX2-M or SMUX <- ZR2-B -> DWP

File:	Project:	PrNo:
SELECT DEVICES		
1:	Central computer ZR2-B with KWP	2.7: ---
2:	Driver Working Place DWP	2.8: ---
1:	---	
1:	---	
1:	---	
3:	Multiplex branch 1/2	
1.1:	MUX2-B Multiplex Node	
1.2:	SMUX	
1.3:	---	
1.4:	---	
1.5:	MUX2-B Multiplex Node	
1.6:	---	
1.7:	---	
1.8:	---	
2.1:	MUX2-M Multiplex Node	
2.2:	MUX2-B Multiplex Node	
2.3:	---	
2.4:	---	
2.5:	---	
2.6:	---	

b) MUX2-B or MUX2-M or SMUX <- ZR2-B -> Modulcombi -> MTCO

File:	Project:	PrNo:	SI
SELECT DEVICES			
1:	Central computer ZR2-B with KWP	2.7:	---
2:	Instrumentation CAN I-CAN	2.8:	SMUX
1:	Module Combi		
1:	Couple Marker		
1:	MTCO		
3:	Multiplex branch 1/2		
1.1:	MUX2-B Multiplex Node		
1.2:	SMUX		
1.3:	MUX2-M Multiplex Node		
1.4:	---		
1.5:	---		
1.6:	---		
1.7:	---		
1.8:	---		
2.1:	MUX2-B Multiplex Node		
2.2:	---		
2.3:	---		
2.4:	MUX2-B Multiplex Node		
2.5:	---		
2.6:	---		

The maximum connectable nodes to an ZR2-B are restricted to 8 per each MCAN. It's no problem to install "big" and "small" nodes together, but be aware of the maximum weight per ech MCAN is **12**.

Type	weight	Max. per MCAN
MUX2-B	2	6
SMUX	2	6
MUX2-M	1	8

Examples:

5 MUX2-B + 2 MUX2-M is $5 \times 2 + 2 \times 1 = \mathbf{12}$ ok !

3 MUX2-B + 1 SMUX + 4 MUX2-M is $3 \times 2 + 1 \times 2 + 4 \times 1 = \mathbf{12}$ ok !

6 MUX2-B + 1 SMUX is $6 \times 2 + 1 \times 2 = \mathbf{14}$ doesn't work !

You will then get an error message as:



1.2 Introduction

With the KIBES Software it is possible to program the central computer incl. his multiplex traces as a standard PLC (Programmable logic controller) in FBD (Function block diagram). The developed and compiled program can be downloaded to the central computer ZR2-B. The programming starts in the KIBES basic package. The code generation and compilation is done in the postprocessor. Based on these requests the following points are necessary in the postprocessor:

- Assignment of logical in- and outputs to physical in- and outputs
- Parameter setting for in- and outputs
- Code generation for the central computer
- Communication with the central computer
- ONLINE-Test for Test and Debugging
- Generation of a wide documentation

Additionally we found the following requests:

- free programming for the customer

Therefore the program has to be independent from the specified hardware.

- Free configuration for the system

This means, new devices can be connected and implemented very easy (for example: Door control, IBIS, different multiplex nodes)

The free programming is already realised in the KIBES basic package. The free configuration has to be realised in the postprocessor.

In the postprocessor the configuration editor is the start point. In this editor a project and a configuration can be selected. A configuration describes which devices and sub devices are available in the system. The configuration and its dependence from different action can be described as follows:

- Basic program.

The configuration and the basic program is selected at the same time. In the basic program only the programs for the devices in the configuration are available.

- Assignment editor

Here are only the addresses available which are in the actual configuration.

- Parameter editor

Based on the configuration different parameters are requested. For example: if there is no driver work place (DWP) in the configuration, no free texts are necessary.

Each device (MUX2-N, ZR2-N ore DWP) has a fixed number of in- and outputs. Each state is stored in a data segment in the central computer. This data segment is the interface between the PLC-program and the basic program.

1.3 Menu overview

The postprocessor menu contains the following main points:

Runtime-version

```

KIBES
ZR2B: PP_03_99
END
CONFIG.    EDIT
ADDRESS    EDIT
PARAMETER  EDIT

COMMUNICATION
ONLINE TEST

DOCUMENTATION
LOGBOOK

PROJECT TOOLS

INFO
  
```

Full version

```

KIBES
ZR2B: PP_03_16
END
CONFIG.    EDIT
ADDRESS    EDIT
PARAMETER  EDIT
CODEGEN-COMPILE

COMMUNICATION
ONLINE TEST

DOCUMENTATION
LOGBOOK

PROJECT TOOLS

OPTIONS
INFO
  
```

```

COMMUNICATION
END
LOAD PLC PROG.
INFO
  
```

```

DOCUMENTATION
END
ADDRESS LIST
PARAMETER LIST

OUTPUT OPTIONS
  
```

```

PROJECT TOOLS
END
DELETE PROJECT
COPY PROJECT

DELETE PP DATA

PLC PROG   SAVE
PLC PROG   REST

OLT DATA  SAVE
OLT DATA  REST

IMPORT     EAM
  
```

2 Installation of KIBES Software

2.1 System requirements

The programming with KIBES runs on a standard PC, which has the following minimum requirements:

- IBM compatible PC (minimum 486)
- Memory with minimum 8MB RAM and minimum 540KB free conventional memory.
- min. DOS Version 5.0
- Graphic-Card: EGA-resolution 640 x 350 pixel, VGA-resolution: 640 x 480 pixel
- Disc drive (IBM-Format: 3 1/2" 1.4 MB)
- Hard disk (Disk space minimum 20MB, the); the additional demand for the C-compiler depends on the installation)
- CD-ROM drive (its necessary for the installation of the Microsoft Visual C-Compiler)
- Parallel interface (Centronics)
- 1 x Serial interface RS232 - COM 1 (for mouse)
- 1 x Serial interface RS232 - COM 2 for connection to central computer ZR2

To have a convenient programming environment Mannesmann VDO recommend:

- PC: DX 2/66
- Monitor 17 inch
- Memory: 8MB RAM

2.2 C-Compiler

Microsoft Visual C-Compiler (MSVC) Version 1.5 (1.51, 1.52). This compiler is a part of Microsoft Visual C++ Standard Edition 4.0.

The C-Compiler is not a part of the delivery of mannesmann VDO AG!

There is not a fully complete installation of this C-compiler necessary. The following files must be on the system:

Directory of xxxx\MSVC_1.5\BIN

Q23.EXE	208.384	23.11.93	8:01
CL.EXE	91.648	23.11.93	8:01
C13216.EXE	333.312	23.11.93	8:01
DOSXNT.EXE	393.942	23.11.93	8:01
LINK.EXE	366.080	23.11.93	8:01
LIB.EXE	134.144	23.11.93	8:01
C23216.EXE	493.056	23.11.93	8:01
C33216.EXE	244.224	23.11.93	8:01
C1.ERR	54.596	23.11.93	8:01
C23.ERR	4.563	23.11.93	8:01
CL.ERR	1.756	23.11.93	8:01
CL.MSG	4.279	23.11.93	8:01

Directory of xxxx\MSVC_1.5\INCLUDE

SETJMP.H	918	23.11.93	8:01
STRING.H	5.600	23.11.93	8:01
STDLIB.H	7.992	23.11.93	8:01
STDIO.H	7.816	23.11.93	8:01
STDARG.H	1.221	23.11.93	8:01
MATH.H	8.773	23.11.93	8:01
LIMITS.H	1.700	23.11.93	8:01
FLOAT.H	7.313	23.11.93	8:01
TIME.H	2.977	23.11.93	8:01
FCNTL.H	1.609	23.11.93	8:01
IO.H	3.999	23.11.93	8:01
MEMORY.H	1.957	23.11.93	8:01

Directory of xxxx\MSVC_1.5\INCLUDE\SYS

STAT.H	2.248	23.11.93	8:01
TYPES.H	1.103	23.11.93	8:01

2.3 Installation

The software would be delivered on a CD-ROM. You would find 5 subdirectories on this CD. Their names are as follows: DISK; DOC; GR; PP_03_XX; RT_03_XX (The meaning of XX is your customer-no. E.g. 09)

directory	description
GR	Installation of Base package
PP_03_XX	Installation of postprocessors
RT_03_XX	Installation of KIBES Runtime Version
DOC	Documentation
DISK	Root of disc version
DISK\GR	Discs of base package
Disk\PP_03_XX	Discs of postprocessors
Disk\RT_03_XX	Discs of Runtime Version

With the files in subdirectory DISK you are able to create a disc-version of your KIBES-Software licence. In the subdirectory DOC you will find a documentation about the KIBES-Postprocessor. Use this documents as an supplement to the logi-CAD handbook.

Installation of the base package:

Please change to the subdirectory GR and call INSTALL

Installation of Postprocessor

Change into the subdirectory PP_03_XX and call INSTALL

Installation of the Runtime-version

Change into the RT_03_XX and call INSTALL

Note: Please install first base package and afterwards postprocessor.

3 Inputs / Outputs

3.1 Indroduction

The In- and Outputs were scanned as long as the central computer ZR2-B works normally. This state is when:

- Any input EXT_WAKE_UP01 (plug A2) or EXT_WAKE_UP02 (plug A1) is active
- or there are ICAN or FAPCAN activities
- or the software output „power down delay“ of ZR2-B is active

If a already existing connection to the drivers work place is disconnected the central computer keeps his state.

Before switching off of central computer all outputs of the multiplex node will be switched off also.

If there are no CAN-messages from the node, the PLC-inputs kept there last value. The assigned diagnostic- or failure inputs will be set to the failure value (=254) and the status input of this device will be also activated (status drivers work place). The failure number describes the failure exactly (for example: Timeout, wrong node).

The central computer switches off if there is no power down delay active and no communication at the CAN-bus to the DWP.

3.2 Inputs

Each input is a failure input assigned. The failure input has the same name as the assigned input started with an „~F:“

for example: „EIN_STATUS_01“ -> failure input „~F:EIN_STATUS_01“

Before the first PLC-cycle the failure input will be set to 255 (marks not available). This value will be actualized when the devices or nodes will be detected.

3.2.1 Binary input (concerning software)

Binary inputs can't be changed. Their threshold value is fixed programmed. For example in the drivers work place you can only assign to binary input DWP functions referenced with a name. Thresholds were set internally to 33% and 66%. Also diagnostic inputs are predefined.

Input	Failure input	Significance
0	0	inactive
1	0	active
unchanged	254	failure
unchanged	255	not available

3.2.2 Status input (coming from ZR2-B or MUX2-B)

state	Input	Failure input	Significance
0	0	0	inactive
1	1	0	active
F	unchanged	254	failure
	unchanged	255	not available

All input are quasi analogue inputs. In each node the analogue value (10 bit) is digitized. The method is handled by parameters:

- Higher threshold value
- Lower threshold value
- Type (Arrangement of the areas: „ON“, „OFF“, „ERROR“)
- Failure cycles (can be set by each node)

The on board supply will be divided by the threshold values into two ranges. This threshold values are related in percentage to the on board supply. For example: the on board supply is 28V, higher threshold is set to 75%, this is equivalent to 21V.

The parameter Type declares, which state will be assigned to each range:

<Range **higher** then the upper threshold value>

<Range in **between**>

<Range **lower** then the lower threshold value>

Example:

(upper threshold value = 75%, lower threshold value = 25%, on board supply = 24V)

1E0 → Voltage higher then 18V -> State „active“
 Voltages between 6 and 18V -> State „Failure“
 Voltages lower then 6V -> State „inactive“

01E → Voltages over 18V -> State „inactive“
 Voltages between 6 and 18V -> State „active“
 Voltages lower then 6V -> State „failure“

0xE → Voltages over 18V -> State „inactive“
 Voltages between 6 and 18V -> State „
 Voltages lower then 6V -> State „active“

Example: Numbers of failure cycles 3
 lower threshold value 1/3 of the on board supply (33%)
 upper threshold value 2/3 of the on board supply (66%)
 Type „1F0“

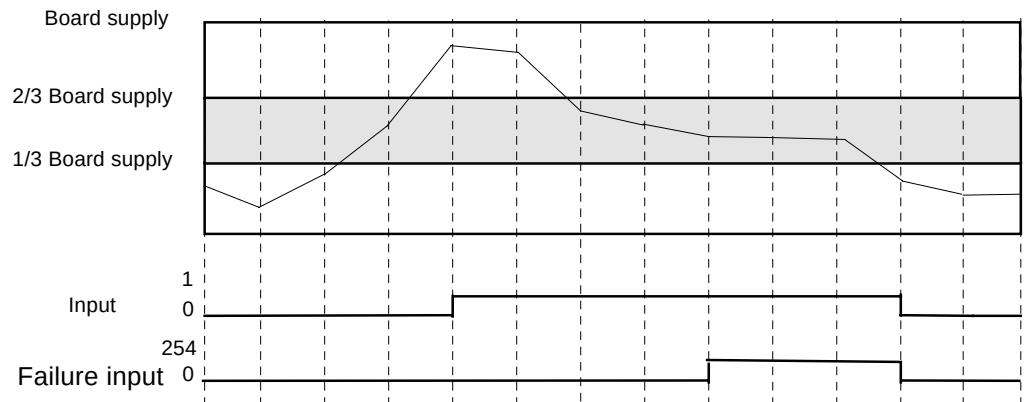
Project: STD005				
Name	I O	T Y	Device	Address
Bus_type_number	A	W	Koppelmerk	Couple Marker 050
CAN_Speed	E	W	MTC0	Tachograph vehicle speed
Dimmer_Display	A	W	Modulkombi	dimmer display
Dimmer_Skala	A	W	Modulkombi	dimmer scale
Dimmer_Vorgabe	E	W	Modulkombi	Dimmer: predefined value
DMUX_EIN_ANALO_1	E	W	Modulkombi	Analog 1
DMUX_EIN_ANALO_2	E	W	Modulkombi	Analog 2
DMUX_EIN_STAT_01	E	B		
DMUX_EIN_STAT_08	E	B	Modulkombi	IB_EIN_S
DMUX_EIN_STAT_12	E	B	Modulkombi	IB_EIN_S
DMUX_EIN_STAT_14	E	B	Modulkombi	IB_EIN_S
DMUX_EIN_STAT_16	E	B	Modulkombi	IB_EIN_STATUS_16
DMUX_EIN_STAT_18	E	B	Modulkombi	IB_EIN_STATUS_18
DMUX_EIN_STAT_20	E	B	Modulkombi	IB_EIN_STATUS_20
DMUX_EIN_STAT_22	E	B	Modulkombi	IB_EIN_STATUS_22
DMUX_EIN_STAT_23	E	B	Modulkombi	IB_EIN_STATUS_23
DMUX_EIN_STAT_24	E	B	Modulkombi	IB_EIN_STATUS_24
DMUX_EIN_STAT_25	E	B	Modulkombi	IB_EIN_STATUS_25
DMUX_EIN_STAT_26	E	B	Modulkombi	IB_EIN STATUS 26

PARAMETER

LOWER THRESHOLD : 33

UPPER THRESHOLD : 66

TYPE : 1E0



3.2.3 Byte- Values(8Bit):

Input	Failure input	Significance
0..250	0	Value
unchanged	254	failure
unchanged	255	not available

3.2.4 Word inputs (16Bit incl. sign)

Input	Failure input	Significance
-32768..32767	0	Value
unchanged	254	failure
unchanged	255	not available

3.2.5 Frequency input EIN_KL.W (e.g.: rpm from alternator)

The frequency input delivers a number of pulses/revolution. This value can be adjusted with a factor failure in the address editor. To use this input you have to connect terminal W from alternator direct to ZR2-B connector C8.

PARAMETER

ANALOG FACTOR : 1.00000

e.g.: sensor with 8 pulses per revolution
max. revolutions 2500 rpm
adjust factor = 8

Input	Failure input	Significance
-32768..32767	0	Value
unchanged	254	failure
unchanged	255	not available

3.2.6 RPM from CAN (e.g.: Modulcombi)

If you want to use the actual engine speed from any CAN (ICAN or PCAN), you have to define a word input and assign in address editor from the device Modulcombi the item "Revolution rpm". The value of this word input then represents the current engine speed of the motor in revolutions per minute

Project: STD005				
Name	Device:Modulkombi Name	Name:	Pin	Remark
Testwert_BrDr_2	Analog 3			
Testwert_Kühlwas	Analog 4			
Testwert_nehmen0	Analog 5			
Testwert_nehmen1	Analog 6			
Testwert_nehmen2	Revolution rpm			
Testwert_nehmen3	~E:Dimmer: predefined value			Error Input
Testwert_Treibst	~E:Revolution rpm			Error Input
Testwert_VorDr_1	~F:Analog 1			Error Input
Testwert_VorDr_2	~F:Analog 2			Error Input
Testwert_Öldruck	~F:Analog 3			Error Input
Testwert_Öltempe	~F:Analog 4			Error Input
Treibstoff_Para1	~F:Analog 5			Error Input
V_Speed	~F:Analog 6			Error Input
Vorratsdruck_1_P	~F:IB_EIN_STATUS_01			Error Input
Vorratsdruck_2_P	~F:IB_EIN_STATUS_02			Error Input
WakeUp_I-CAN	~F:IB_EIN_STATUS_03			Error Input
ZR_EIN_KL.W	~F:IB_EIN_STATUS_04			Error Input

Value	Input(Word)	Failure input (Word)	Remark
0-10000 revs/m	0-10000	0	Detector o.k.

3.2.7 Speed from TCO (EIN_C4)

The value of this word input represents the current speed of the vehicle in km/h. To read speed from TCO's you have to connect from KTCO or MTCO output B8 (4pulses/m output) to ZR2-B connector pin C9

Project: DOKU_FAP				
Name	Device:ZR2B Name	Name:	Pin	Remark
inp_2	EEPROM flag 20			
inp_3	EEPROM flag 21			
inp_4	EEPROM flag 22			
input_1	EEPROM flag 23			
out_1	EEPROM flag 24			
out_2	EEPROM flag 25			
out_3	EEPROM flag 26			
out_4	EEPROM flag 27			
PWM_out	EEPROM flag 28			
TCO_speed	EEPROM flag 29			
	EEPROM flag 30			
	EEPROM flag 31			
	EEPROM flag 32			
	EIN_4 IMP/m		C9	Speed (1km/h /Bit)
	EIN_BORDSPANNUNG		A3	Voltage (5mV/Bit)
	EIN_Kl.W		C10	RPM (U/min /Bit)
	IBIS Error			
	Status EEPROM error code			Error code

Value	Input(Word)	Failure input (Word)	Remark
0-250 km/h	0-250	0	Detector o.k.

3.2.8 Speed from CAN (e.g. MTCO or DTCO)

If you want to use the actual speed from any CAN (ICAN or PCAN), you have to define a word input and assign in address editor from the device MTCO the item “Tachograph vehicle speed”. The value of this word input then represents the current speed of the vehicle in km/h.

Project: STD005				
Name	Device:MTCO Name	Name:	Pin	Remark
Aktivierung_MOKI	Status MTCO: error code			Error code
BrDruck_1_high	Tachograph output shaft speed			
BrDruck_1_low	Tachograph status			
BrDruck_2_high	Tachograph vehicle speed			
BrDruck_2_low	Work status			
Bremsdruck_1	~F:Tachograph output shaft speed			Error input
Bremsdruck_2	~F:Tachograph status			Error input
Bus_type_number	~F:Tachograph vehicle speed			Error input
CAN Speed	~F:Work status			Error input
Dimmer_Display				
Dimmer_Skala				

Value	Input(Word)	Failure input (Word)	Remark
0-127 km/h	0-32767	0	Detector o.k.

3.2.9 Diagnostic inputs (available in binary or word type)

This input contains the state of the corresponding output.

E.g.: The input *DIAG_AUS_12_G4_HS* is the assigned HSS (high side switch) output *AUS_12_G4_HS*.

Value (binary)	Input(Word)	output	Remark
0	0	active	Output ok
0	0	inactive	Output ok
1	254	active	output is in short circuit

3.2.10 Failure inputs for status inputs

For each input exists one failure input. The failure input has the same name as the binary input with a „~F:“ at the beginning (for example, EIN_STATUS_01 and ~F:EIN_STATUS_01). The failure inputs type is always WORD.

Failure input value	Failure input (Word)	Significance
0	0	Input without failure
254	254	Input failure (for example: Status input in the forbidden range)
255	255	Input is not available (or device has made a shut-down)

Before the first PLC-cycle the failure input will be set to 255 (marks not available). This value will be actualized when the devices or nodes will be detected.

3.2.11 Global inputs

These PLC-inputs cannot be assigned to a hardware input. They have the following significance:

word inputs: Status ZR2: Error code or “Status node: Error code”

binary inputs: Status node or status MTCO or ...

Input (Binary)	Input (Word)	Significance
0	0	Device is ready for use
1	254	Not ready for use (CAN-interruption)
1	255	Device is not available (switched of correctly, not configured)

3.3 Outputs

3.3.1 HSS or LSS outputs (Type binary)

A part of the output list of a MUX node

Project: DOKU_FAP

Name	Device: MUX 1.1 Name	Pin	Remark
inp_2	AUS_01_G1_HS	A22	Output HS 3A
inp_3	AUS_02_G1_HS	A20	Output HS 3A
inp_4	AUS_03_G1_HS	A18	Output HS 3A
input_1	AUS_04_G1_HS	A16	Output HS 3A
out_1	AUS_05_G1_HS	A14	Output HS 3A
out_2	AUS_06_G1_HS	A12	Output HS 3A
out_3	AUS_07_G2_HS	A06	Output HS 3A
out_4	AUS_08_G2_HS	A04	Output HS 3A
PWM_out	AUS_09_G2_HS	A02	Output HS 10A
TC0_speed	AUS_10_G3_HS	B18	Output HS 5A

for each output you can set fail save behaviour as

PARAMETER

FAIL SAFE OPERAT.: 0: Output off

OpenL Diag in ON : 1: Output on
H: Hold state
B: Output blink

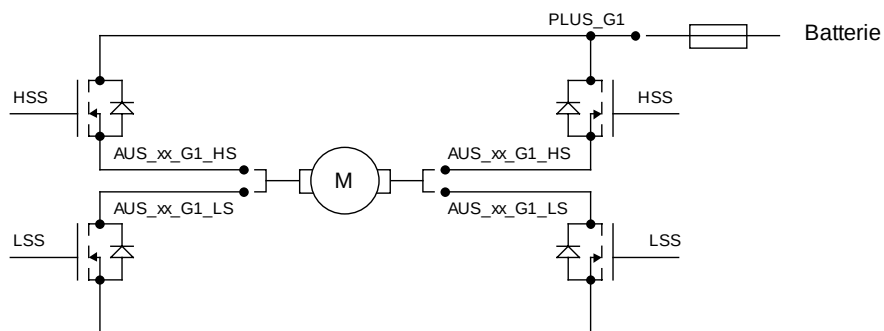
also can be set if you want to have open load detection if the output is witched off or on.

PARAMETER

FAIL SAFE OPERAT.: 0: Output off

OpenL Diag in ON : 0: switched off
1: switched on

3.3.2 Half bridges or full bridge



- 1st motor with left direction: switch on left HSS and right LSS
- 2nd motor with right direction: switch on left LSS and right HSS
- 3rd If you want to stop a motor, please switch off both HSS and activate both LS



3.3.3 Word Outputs

For device DWP: „Display Dimmer“ (backlight dimming)

represents the backlight dimming scale :

0	100% backlight (no dimming)	1	20% backlight
2	25% “	3	30% “
4	35% “	5	40% “
6	45%	7	50%
8	55%	9	60%
10	65%	11	70%
12	75%	13	80%
14	85%	15	100% backlight (no dimming)

If Values > 16 and < 0 are set, you have 100% backlight

For device MUX2-B: 4 PWM-outputs are available

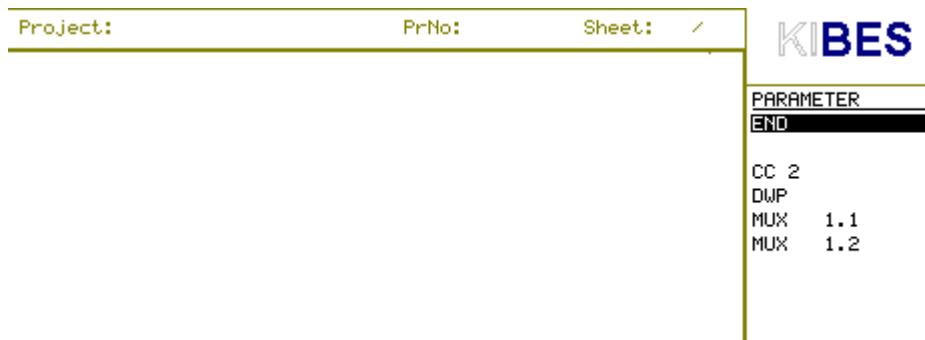
All 4 outputs have a valid range from 0...250

that means physically a relation between HI-pulse to Lo-pulse from 0...100%)

Project: DOKU_FAP			
Device: MUX 1.1			
Name	Name	Pin	Remark
inp_2	PWM_18_G5_LS	E17	Output LS 1A
inp_3	PWM_20_G5_LS	E15	Output LS 1A
inp_4	PWM_22_G5_LS	E13	Output LS 1A
input_1	PWM_24_G5_LS	E11	Output LS 1A
out_1			
out_2			
out_3			
out_4			
PWM_out			

Please be sure that you set parameter “PWM basic frequency” to practical value.

4 Parameters

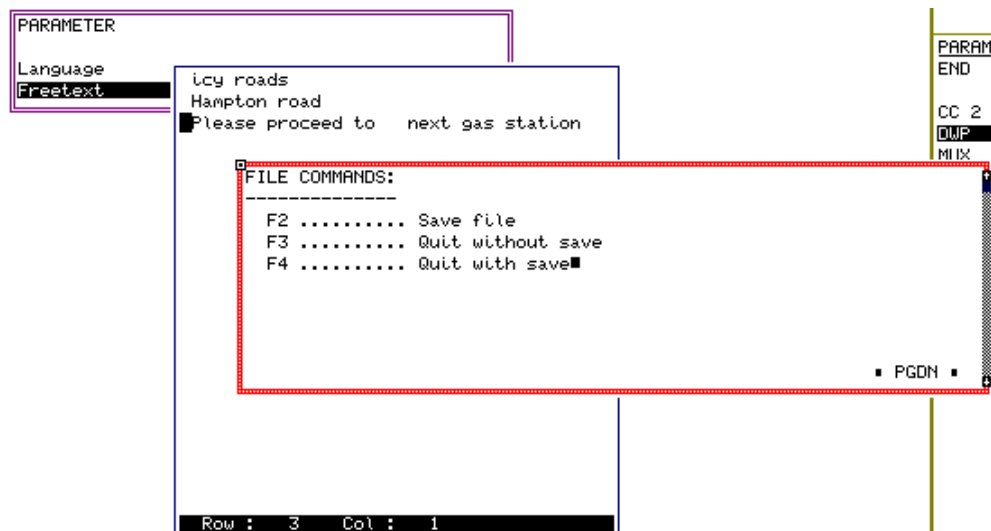


When you are in MAIN MENU, please go to POSTPROCESSORS and then PARAMETER EDIT, select your current project, confirm it and you are in PARAMETER.

Choose a device which you want to change settings.

Available are devices as: CC2 (ZR2-B); DWP (Drivers work place); MUX 1.1 up to MUX 1.8; MUX 2.1 up to MUX 2.8 (Multiplex nodes MUX2-B or MUX2-M or SMUX)

4.1 DWP



Select DWP to set language for fix texts or to define free texts (each row represents a free text)

4.1.1 Define language für DWP

Language: The language of the fix texts is defined as:

Language	Number		Language	Number
German	0		English	1
French	2		Spanish	3
Italian	4		Dutch	5
Polish	6		Norwegian	7
Swedish	8		Finnish	9
Danish	10		Portuguese	11
Croatian	12		Slovene	13
Czech	14			
Hebrew	20			

4.1.2 Define free text

Select „Freetext“ in the current window and confirm with enter or mouse click. You are now in the free text editor.

Each line (row) represent a free text. To activate it in the PLC-program you have to put connect a free text input with a valid number, if not you will have an empty free text.

See above.

To finish defining, press F3 or F4 key to go back to PARAMETER.

4.2 CC2

The screenshot shows a window titled 'PARAMETER'. Inside, there is a label 'Memory model' followed by a colon and a dropdown menu. The dropdown menu is currently set to 'SMALL'. Below the dropdown, the word 'MEDIUM' is visible, indicating the other option in the menu.

Available is model “SMALL” (64 Kbyte code and 64 Kbyte data) and “MEDIUM” (more than 64 Kbyte code and 64 Kbyte data, typically for Applications with data type FLOAT)

Please start first with setting “SMALL”. If your PLC-program gets more and more larger KIBES will send a message during compilation to screen to change to MEDIUM.

4.3 MUX 1.1 – MUX 2.8

PARAMETER	
Time frame of status inp:	50
Cycle of fail safe blink:	100
PWM basic frequency	: 20

You can set first time frame how long a status input have to be in a forbidden range if it is detected.

Also can be set the flashing rate for MUX-outputs if they have no CAN-connection to the ZR2-B any more.

In that window you can set the basic frequency for PWM-outputs.

Be aware that for dimming a value approx. 100 and for control revolution of motors approx. 15 kHz is used.

PARAMETER	
Cycle of fail safe opera:	100

If you use SMUX as an device, only the flashing rate for MUX-outputs if they have no CAN-connection to the ZR2-B any more, can be parametrized.

5 Macros

5.1 General

Each input has to be connected on every macro. If not, compilation error can be the result.

5.1.1 Freetext numbers

0 „empty“ free text
1..999 Number in the free text file
1000 IBIS Text
else not valid

5.1.2 Pictogram numbers

0 „empty“ Pictogram
1..255 valid pictogram number
else not valid

5.1.3 Graphic number

0 „empty“ graphic
1..255 corresponding graphic
else not valid

5.2 Adaption module

5.2.1 Adjust Function

The output value Y is calculated with the linear approximation of the input value X with the fix points X1/Y1 up to X5/Y5. Input value less then X1 resp. higher then X5 will be assigned to Y1 resp. Y5.

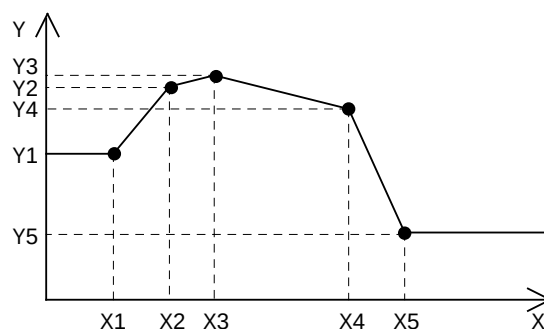
Macro name: ADAPT_1

KIBES symbol:

```
*X      Y=f(X)      Y*
X1:    10  Y1:      0
X2:    20  Y2:    200
X3:    30  Y3:    350
X4:    50  Y4:    500
X5:    80  Y5:   1000
##### 1
```

Input / Output	Type	Comment
X	Word	Input
Y	Word	Output

Modification fields	Type	Comment
Xn	Word	Xn Input value
Yn	Word	Yn Output value



Important: The X-Value of the fix points have to be in high oriented order ($X1 < X2 < X3 < X4 < X5$). If not, the output value cannot be ok.

5.2.2 Adjust function 2

The output value Y is calculated with the linear approximation of the input value X with the fix points X1/Y1 up to X2/Y2. This macro can be used for the range adjustment in relation to the bar graph menus, for example: Input value range 0..100 related to output value range 0..250 (X1=0, X2=100, Y1=0, Y2=250).

Macro name: ADAPT_2

KIBES symbol:

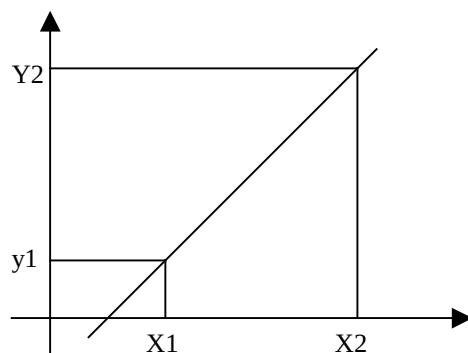
```

X      Y=f(X)      Y
X1:    10   Y1:    123
X2:    50   Y2:   4567
#####1

```

Input / Output	Type	Comment
X	Word	Input
Y	Word	Output

Modification fields	Type	Comment
X1	Word	X1 Input value
X2	Word	X2 Input value
Y1	Word	Y1 Output value
Y2	Word	Y2 Output value



5.2.3 Average value

This macro calculates the average of the input value over a adjustable time period.

Macro name: AVERAGE

KIBES symbol:

```
*X Average Y*
N: 10 1
```

Input / Output	Type	Comment
X	Word	Input
Y	Word	Average

Modification fields	Type	Comment
N	Word	number (min 1, max 500)

5.3 Report modules

General:

- The report modules are use for the storage of different events or state within one PLC-cycle. The macros are stored intermediately within their call in one PLC-cycle.
- At the end of each PLC-cycle the results are presented in the display.
- To reduce the PLC-cycle-time it is recommended to use display module only when they are required. For example: „report door“ only if the bus stop menu is active.
- Inserted fixtext, freetext or pictogram numbers with the value „0“ shows an empty element in the menu.



This module controls the display. The yellow and red warning lamp has to be programmed itself. In addition the information beeps.

5.3.1 Report Prio 1

This module is used to show the Priority 1 errors in the disturbance menu (Mask4). The maximum of 10 Priority 1 errors can be stored intermediately.

Macro name: REP_P1

KIBES Symbol:

```
En Report Priority 1
  Symbol:      3
  FxTxt:      3
  FrTxt:      3
  ##### 1
```

Input / Output	Type	Comment
En	Binary	Input (Enable) (Pictogram on/off)

Modification fields	Type	Comment
Symbol	Word	no. of the Pictogram which has to be displayed in the disturbance menu
FeTxt	Word	no. of the Fixtext which has to be displayed in the disturbance menu.
FrTxt	Word	no. of the Freetext which has to be displayed in the disturbance menu

5.3.2 Report Prio 2

This module is used to show the Priority 2 errors in the disturbance menu (mask4). The maximum of 10 Priority 2 errors can be stored intermediately

Macro name: REP_P2

KIBES symbol:

```
En Report Priority 2
Symbol:    28
FxTxt:    28
FrTxt:     1
##### 1
```

Input / Output	Type	Comment
En	Binary	Input (Enable) (Pictogram on/off)

Modification fields	Type	Comment
Symbol	Word	no. of Pictogram which has to be displayed in the disturbance menu
FeTxt	Word	no. of Pictogram which has to be displayed in the disturbance menu
FrTxt	Word	no. of Pictogram which has to be displayed in the disturbance menu

5.3.3 Report Function

With this macro you can activate pictograms. That pictograms are showed in the DWP-display, especially in the driver menu (mask 3). Only a maximum of 10 different pictograms can be displayed at the same time.

Macro name: REP_FUNC

KIBES symbol:

```
En Report Function
1Hz      Symbol:   32
2Hz
##### 1
```

Input / Output	Type	Comment
En	Binary	Input (Enable) (Pictogram on/off)
1Hz	Binary	Pictogram flashes with 1 Hz
2Hz	Binary	Pictogram flashes with 2 Hz *

Modification fields	Type	Comment
Symbol	Word	no. of the Pictogram which have to be displayed in the drive menu

Truth table:

1Hz	2Hz	Pictogram flashes ...
0	0	not
0	1	with 2 Hz*
1	0	with 1Hz
1	1	with 2Hz*



* In the present devices (displays) this feature is not supported.

5.3.4 Bus stop report

This macro is typically used to activate pictograms for the bus stop (mask 5) and driving menu (mask 3).

Macro name: REP_STOP

KIBES symbol:

```
En Report Bus Stop
1Hz Symbol: 39
2Hz
##### 1
```

Input / Output	Type	Comment
En	Binary	Input (Enable) (Pictogram on/off)

Modification fields	Type	Comment
Symbol	Word	no. of the Pictogram which have to be displayed in the bus stop menu

5.3.5 Report Door with ramp

This macro can be used to display the state of one door incl. the ramp in the bus stop menu (mask 5). The door number starts with 1 at the bus front. The door wing 1 is oriented to the bus front.

Macro name: REP_DO_R

KIBES symbol:

```
Report Door
12 malfunc Typ: 2
12 locked Nr.: 3
12 released
12 not released
12 opened
malfunc Report Ramp
is extending
released
not released
extend
##### 1
```

Input / Output	Type	Comment
1 malfunc.	Binary	trouble with door wing 1
1 locked	Binary	door wing 1 locked
1 released	Binary	door wing 1 locked and released
1 not released	Binary	door wing 1 locked and not released
1 opened	Binary	door wing 1 is opened
2 malfunc	Binary	trouble with door wing 2
2 locked	Binary	door wing 2 locked
2 released	Binary	door wing 2 locked and released
2 not released	Binary	door wing 2 locked and not released
2 opened	Binary	door wing 2 is opened
Ramp malfunc	Binary	trouble with the Ramp
Ramp is extending	Binary	The ramp is extending
Ramp released	Binary	The Ramp is locked and released
Ramp not released	Binary	The Ramp is locked and not released
Ramp extend	Binary	The Ramp is extended

Modification fields	Type	Comment
Typ	Word	door Type: 0: no door 1: one wing 2: two wings
Nr	Word	Door no. (1..4)

If no input (door or ramp) is set, the door and the ramp are troubled (disturbed)

Priority when more than one inputs are set.

door wings:	malfunction	most Priority
	locked	
	closed, not released	
	opened	
	closed and released	least Priority
Ramp:	malfunction	most Priority
	is extending (just moving out)	
	pulled in and not released	
	extend (moved out)	
	moved in and released	least Priority

5.3.6 Report door without ramp

This menu can be used to display the state of one door in the bus stop menu. This module is identical with the door display module with ramp.

Macro name: REP_DO

KIBES symbol:

```

Report Door
12 malfunc.   Typ:   1
12 locked    Nr.:   1
12 released
12 not released
12 opened
#####1

```

Input / Output	Type	Comment
1 malfunc	Binary	trouble with door wing 1
1 locked	Binary	door wing 1 locked
1 released	Binary	door wing 1 locked and released
1 not released	Binary	door wing 1 locked and not released
1 opened	Binary	door wing 1 is opened
2 malfunc	Binary	trouble with door wing 2
2 locked	Binary	door wing 2 locked
2 released	Binary	door wing 2 locked and released
2 not released	Binary	door wing 2 locked and not released
2 opened	Binary	door wing 2 is opened

Modification fields	Type	Comment
Typ	Word	door Type: 0: no door 1: one wing 2: two wings
Nr	Word	Door no. (1..4)

5.3.7 Report wheel

This macro is designed to change the outlook of a wheel, to have a sign whether a parking brake is active or not. Also Kneeling attributes can be activated. The result is displayed in bus stop menu (mask 5)

Macro name: REP_WHE

KIBES symbol:

```
Rep Wheel/Kneeling
Wheel 2
Wheel 3
Kneeling down
Kneeling active
##### 1
```

In- / Output	Type	Comment
Wheel 2	Binary	Wheel 2 is filled in with black
Wheel 3	Binary	Wheel 3 is filled in with black
Kneeling down	Binary	Arrow sign for Kneeling position down is reached
Kneeling active	Binary	Kneeling double arrow is showed

Truth table:

Kneeling down	Kneeling active	Kneeling Display...
0	0	off
0	1	Double arrow is visible
1	0	Arrow sign for Kneeling position down is displayed
1	1	Arrow sign for Kneeling position down is displayed

5.3.8 Report Status

With this macro you'll get an overview about activated Priority 1 or 2 messages and also information if any report modules are activated.

Macro name: STAT_REP

KIBES symbol:

```

Status Report
Prio1
Prio1 new
Prio2
Prio2 new
Function Display
Funktion Disp. new
Bus Stop Disp.
Bus Stop Disp. new
##### 1

```

In- / Output	Type	Comment
Prio1	Binary	One or more Priority 1 disturbances are active
Prio1 new	Binary	One or more Priority 1 disturbances comes within this cycle
Prio2	Binary	One or more Priority 2 disturbances are active
Prio2 new	Binary	One or more Priority 2 disturbances comes within this cycle
Function display	Binary	One or more report function macros are active
Function disp. new	Binary	One or more report function comes within this cycle
Bus stop display	Binary	One or more report bus stop macros are active
Bus stop disp. new	Binary	One or more report bus stop macros comes within this cycle.

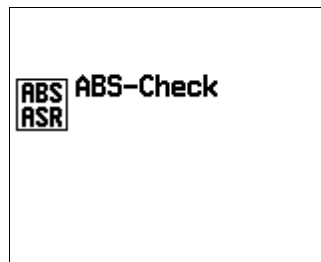


Only Function-, disturbance- and bus stop module which are used before this module in the PLC-program are valid !

5.4 Mask Modules

5.4.1 Mask 0 (Start sequence, ABS/ASR mask)

This macro can be used to display a pictogram and a free text at window position 1 in the driver display.



Blank	0
Pictogram + fix text (2 X 16)	1
Blank	2
Blank	3

Macro name: MASK_1

KIBES symbol:

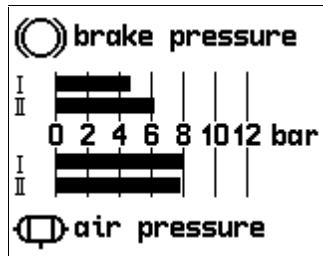
```
En  Mask 0
      Symbol:  51
      FxTxt:   51
      ##### 1
```

In- / Output	Type	Comment
En	Binary	Enable Macro

Modification fields	Type	Comment
Symbol	Word	no. of Pictogram (symbol)
FxTxt	Word	no. of Fixtext

5.4.2 Mask 1 (4 bargraphs)

This macro can be used to display a pictogram and a fix text at window position 0 and 3. At Position 1 a bar graph can be displayed.



Pictogram + fix text (2 X 16) 0

Fixed lettering of bargraphs 1

Variable range of bars

Pictogram + fix text (2 X 16) 3

Macro name: MASK_1

KIBES symbol:

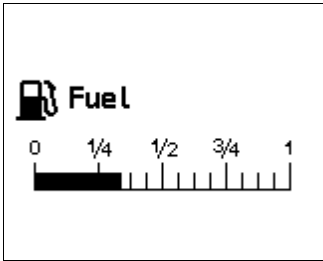
```
En Mask 1
E1 Graphic: 80
E2 Symbol1: 48
E3 FxTxt1: 48
E4 Symbol2: 49
FxTxt2: 49
##### 1
```

In- / Output	Type	Comment
En	Binary	Enable
I1	Word	Bar graph 1 (0..250)
I2	Word	Bar graph 2 (0..250)
I3	Word	Bar graph 3 (0..250)
I4	Word	Bar graph 4 (0..250)

Modification fields	Type	Comment
Graphic	Word	Only no. 80 valid
Symbol1	Word	no. of Pictogram
FxTxt1	Word	no. of Fix text
Symbol2	Word	no. of Pictogram.
FxTxt2	Word	no. of Fix text

5.4.3 Mask 2 (1 bar graph)

This macro can be used to display a pictogram and a fix text at window position 1. At position 2 a bar graph is mentioned



Blank	0
Pictogram + fix text (2 X 16)	1
Fixed lettering of bargraphs2	
Variable range of bars	
Blank	3

Macro name: MASK_2

KIBES symbol:

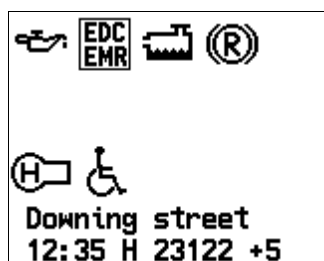
```
En Menu 2
E1 Graphic: 81
    Pikto : 50
    Fixed Txt : 50
##### 1
```

In- / Output	Type	Comment
En	Binary	Enable
E1	Word	Bar graph 1 (0..250)

Modification fields	Type	Comment
Graphic	Word	Graphic (81...85)
Symbol	Word	no. of Pictogram
FxTxt	Word	no. of Fix text

5.4.4 Mask 3 (Driving)

This macro can be used to show states which are fixed with the function display modules REP_FUNC and bus stop display module REP_STOP. At position 3 a free text can be mentioned.



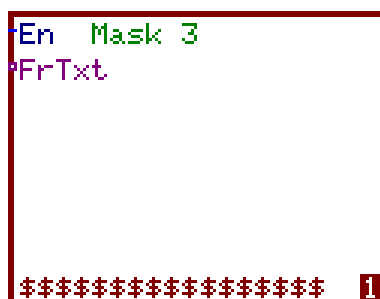
Function window
(2 x 5 pictograms) 0

Bus stop window 2

Free text (2 x 20) 3

Macro name: MASK_3

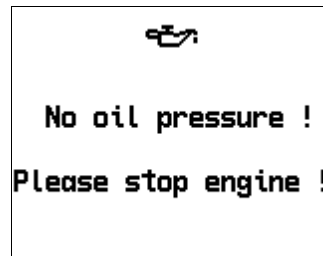
KIBES symbol:



In- / Output	Type	Comment
En	Binary	Enable
FrTxt	Word	no. of free text

5.4.5 Mask 4 (disturbance menu)

This macro displays the stored disturbances which were activated with modules REP_P1 and REP_P2. It starts first with Priority 1 and then with Priority 2 messages.



Pictogram (centered)	0
fix text (2 x 16)	1
free text (2 x 20)	2
Blank	3

Macro name: MASK_4

KIBES Symbol:



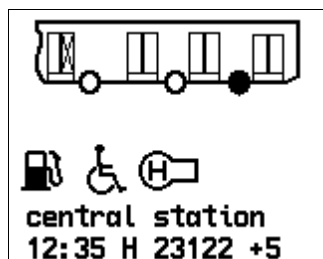
In- / Output	Type	Comment
En	Binary	Enable
Prio1	Binary	Messages with Prio 1 are mentioned
Prio2	Binary	Messages with Prio 2 are mentioned
Continue	Binary	Next message will be mentioned
Reset	Binary	Set the display to the first disturbance
End	Binary	End of all messages is reached. After pressing the „Next button“ the display starts from the beginning.



If Prio 1 and Prio2 is set, all messages are mentioned. If more messages are stored, automatically the character „>>“ is mentioned at the right side of the display. Not at the last disturbance.

5.4.6 Mask 5 (Bus stop menu with freetext)

This macro can be used to display a bus graphic incl. all door animation at position 0. At position 2 the pictogram of a bus stop symbol can be mentioned. At position 3 can be a freetext displayed.



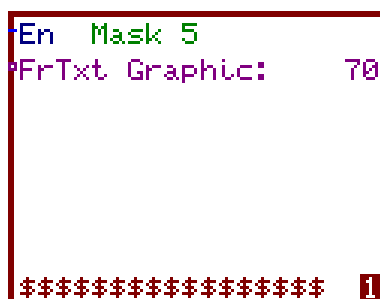
Bus graphic 0

Bus stop window
(max. 5 pictograms) 2

Free text (2 x 20) 3

Macro name: MASK_5

KIBES symbol:

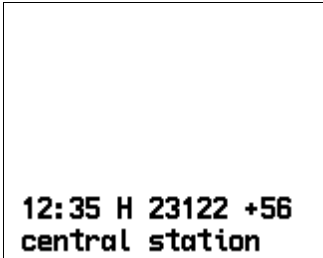


In- / Output	Type	Comment
En	Binary	Enable
FrTxt	Word	Free text No.

Modification fields	Type	Comment
Graphic	Word	bus graphic no. (70...77)

5.4.7 Mask 6 (Free text mask)

This menu can be used to display 4 free texts

	Free text (2 x 20)	0
	Free text (2 x 20)	1
	Free text (2 x 20)	2
	Free text (2 x 20)	3

Macro name: MASK_6

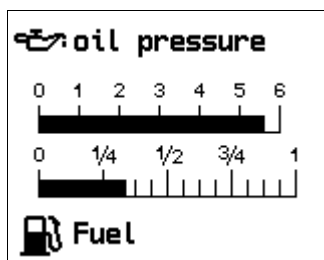
KIBES symbol:

```
En Mask 6
FrTxt0
FrTxt1
FrTxt2
FrTxt3
##### 1
```

Modification fields	Type	Comment
En	Binary	Enable
FrTxt0	Word	Free text no. (Position 0)
FrTxt1	Word	Free text no. (Position 1)
FrTxt2	Word	Free text no. (Position 2)
FrTxt3	Word	Free text no. (Position 3)

5.4.8 Mask 7

This menu can be used to display 2 bargraphs, 2 symbols and 2 fix texts



Pictogram + fix text (2 x 16) 0

Bar graph 1 1

Bar graph 2 2

Pictogram + fix text (2 x 16) 3

Macro name: MASK_7

KIBES symbol:

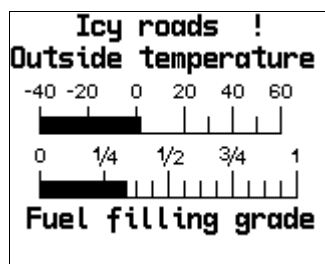
```
En  Mask 7
E1  Symbol1:  0
E2  FxTxt1:    0
    Graphic1:  0
    Graphic2:  0
    Symbol2:   0
    FxTxt2:    0
```

Inputs / Outputs	Type	Comment
En	Binary	Enable
E1	Word	Graph amplitude1 (in Pixels)
E2	Word	Graph amplitude2 (in Pixels)

Modification Fields	Type	Comment
Symbol1	Word	pictogram No.1
FxTxt1	Word	Fix text No.1
Graphic1	Word	Graph 1 Graphic No.
Graphic2	Word	Graph 2 Graphic No.
Symbol2	Word	pictogram no.2
FxTxt2	Word	Fix text no.2

5.4.9 Mask 8

This macro can be used to display 2 free texts and 2 bar graphs



Free text 1 (2 x 20)	0
Bar graph 1	1
Bar graph 2	2
Free text 2 (2 x 20)	3

Macro name: MASK_8

KIBES symbol:

```
En  Mask 8
E1  FxTxt1:  0
E2  Graphic1: 0
     Graphic2: 0
     FxTxt2:  0
```

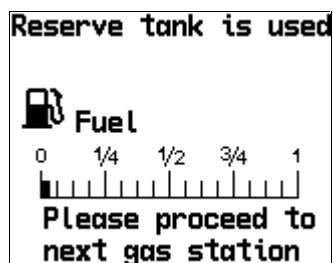
Input / Output:	Type	Comment
En	Binary	Enable
E1	Word	Graph amplitude1 (in Pixels)
E2	Word	Graph amplitude2 (in Pixels)

Modification Fields	Type	Comment
FxTxt1	Word	Free text no 1
Graphic1	Word	Bar graph 1 Graphic No.:(81...85)
Graphic2	Word	Bar graph 2 Graphic No.(81...85)
FxTxt2	Word	Free text no. 2

Input range Graphic 82,83,84,85	0...120 Pixels
Input range Graphic 81,82	0...128 Pixels

5.4.10 Mask 9

This macro can be used to display 2 free texts, a pictogram, a fix text and a bar graph



Free text 1 (2 x 20)	0
Pictogram + fix text (2 x 16)	1
Bar graph	2
Free text 2 (2 x 20)	3

Macro name: MASK_9

KIBES symbol:

```
En Mask 9
E1 FrTxt1: 0
   Symbol1: 0
   FxTxt1: 0
   Graphic1: 0
   FrTxt2: 0
```

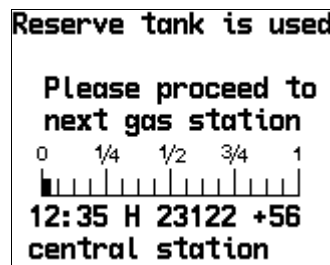
Inputs / Outputs	Type	Comment
En	Binary	Enable
E1	Word	Graph amplitude1 (in Pixels)

Modification Fields	Type	Comment
FrTxt1	Word	Free text 1 no.
Symbol1	Word	no. of pictogram 1
FxTxt1	Word	Fix text 1 No.
Grafic1	Word	Graphic no. (81..85)
FrTxt2	Word	Free text 2 No.

Input range Graphic 82,83,84,85	0...120 Pixels
Input range Graphic 81,82	0...128 Pixels

5.4.11 Mask 10

This menu can be used to display 3 free texts and 1 bar graph



Free text 1 (2 x 20)	0
Pictogram + fix text (2 x 16)	1
Free text 2 (2 x 20)	2
Free text 3 (2 x 20)	3

Macro name: MASK_10

KIBIS symbol:

```
En Mask 10
E1 FrTxt1: 0
   FrTxt2: 0
   Graphic1: 0
   Frtxt3: 0
```

In / Outputs:	Type	Comment
En	Binary	Enable
E1	Word	Graph amplitude (in Pixels)

Modification Fields	Type	Comment
FrTxt1	Word	Free text 1 No.
FrTxt2	Word	Free text 2 No.
Graphic1	Word	Graphic (81..85)
FrTxt3	Word	Free text 3 No.

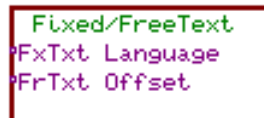
Input range Graphic 82,83,84,85	0...120 Pixels
Input range Graphic 81,82	0...128 Pixels

5.4.12 Text (Change of current language)

This module can be used for changing the display language during the program flow. For example in polyglot countries.

Macro name: TEXT

KIBES symbol:



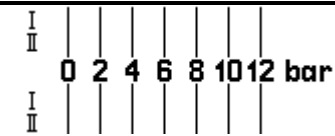
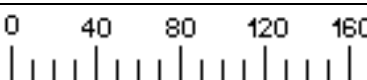
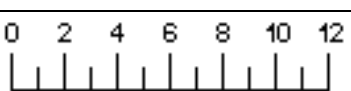
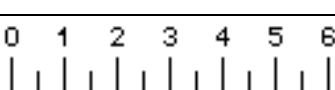
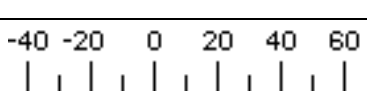
```
Fixed/FreeText
?FxTxt Language
?FrTxt Offset
```

In/output	Type	Comment
FxTxt	Word	Code of language ref. chapter 4.1
FrTxt	Word	Offset

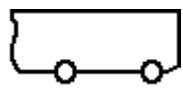
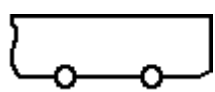
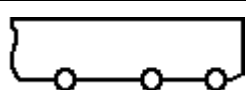
Remark: Offset is subsidiary for the offset in the free text editor to image different languages by free text.

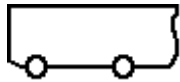
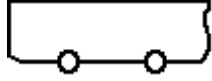
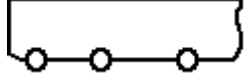
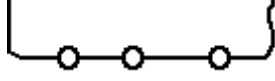
6 Lists

6.1 Available bar graphs for DWP

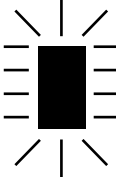
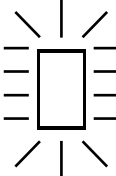
No.	note	Bar graph
80	Makes at the moment only for brake and air pressure sense	
81	Is predestined for fuel	
82	Makes sense for cooling water temperature	
83	Can used for air or brake pressure, also for oil pressure	
84	Makes sense for oil pressure or turbo charger	
85	Designed for inside or outside temperature	

6.2 Available city bus graphics for DWP

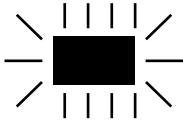
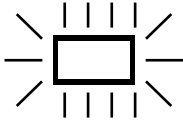
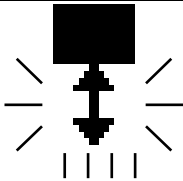
70	left directed max. 2 doors (front, middle)	
71	left directed max. 3 doors (front, middle, rear)	
72	left directed max. 3 doors (front, middle, before 3 rd axle)	
73	left directed max. 4 doors (front, middle, before 3 rd axle, rear)	

74	right directed max. 2 doors (front, middle)	
75	right directed max. 3 doors (front, middle, rear)	
76	right directed max. 3 doors (front, middle, before 3 rd axle)	
77	right directed max. 4 doors (front, middle, before 3 rd axle, rear)	

6.3 Conditions of door wing1 and 2

If the door is filled out and flashes it should sign: door has malfunction, trouble or less pressure	
If the door is not filled out and flashes it should sign: released and closed door	
If the door is filled out and permanent it should sign: released and opened door	
If the door is not filled out and permanent it means: door is closed and not released	
If the door is not filled out and have a cross it means: The door or a wing is locked	
not present	Blank

6.4 Conditions of ramp

If the ramp is filled out and flashes it should sign: ramp has malfunction, trouble or less pressure	
If the ramp is not filled out and flashes it should sign: released and closed ramp	
If the ramp is filled out and permanent it should sign: released and opened door	
If the ramp is not filled out and permanent it means: ramp is closed and not released	
The right sign is displayed when the ramp is in operation, its signed by an flashing arrow	
	blank

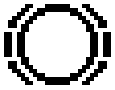
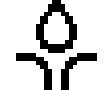
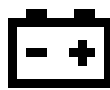
6.5 Wheel attributes

normal wheel	 
	left directed right directed
braked wheel e.g. to sign that parking brake is active	 
	left directed right directed

6.6 Kneeling attributes

Kneeling off	leer	empty
Kneeling active		It signs the driver that kneeling function is active
Kneeling finished		After kneeling this sign must be displayed

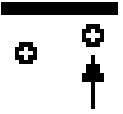
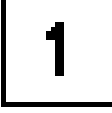
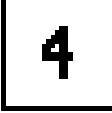
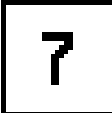
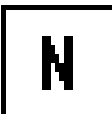
6.7 Pictograms

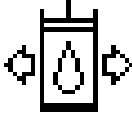
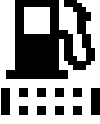
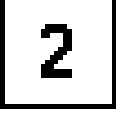
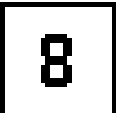
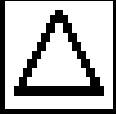
no.	Pictogram	no.	Pictogram	no.	Pictogram
1		2		3	
4		5		6	
7		8		9	
10		11		12	
13		14		15	
16		17		18	
19		20		21	
22		23		24	

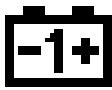
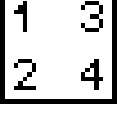
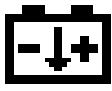
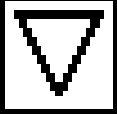
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6.8 Fix texts (standard display node)

Nr.	german	english	french	spanish	italian
0	" " " "	" " " "	" " " "	" " " "	" " " "
1	"Kühlwasser " "zu heiss "	"Cooling water " "hot "	"Eau refroidiss. " "trop chaude "	"Agua refrigerant " "muy caliente "	"acqua di raffr. " "troppo caldo "
2	"Getriebeöl " "zu heiss "	"Gearbox oil " "hot "	"Huile boîte vit. " "trop chaude "	"Aceite engranaje " "muy caliente "	"olio per cambi " "troppo caldo "
3	"Kein Öldruck " " " "	"No oil pressure " " " "	"Pas de pression " "d'huile "	"Sin presión de " "aceite "	"senza pressione " "olio "
4	"Vorratsdruck " "zu gering "	"Air pressure " "low "	"Pression d'air " "insuffisante "	"Presión reserva " "muy baja "	"press. di scorta " "troppo poco "
5	"Vorratsdruck " "zu gering "	"Air pressure " "low "	"Pression d'air " "insuffisante "	"Presión reserva " "muy baja "	"press. di scorta " "troppo poco "
6	"Ausfall " "Motorregelung "	"Failure " "accel. control "	"Panne commande " "moteur "	"Fallo " "Regulación motor "	"guasto " "regolaz. motore "
7	"Störung " "Knicksteuerung "	"Fault Articul. " "veh. steering "	"Défaut commande " "articulation "	"Avería Control " "tensión corrient "	"disturbo " "comando di punta "
8	"Hubdach " "notentriegelt "	"Lifting roof " "emerg. released "	"Capot levable " "débloqué d'urg. "	"Techo telescópico " "desbloqueado "	"tetto di sollev. " "sblocc. d'emerg. "
9	"Ausfall " "Niveauregelung "	"Failure " "Level control "	"Panne " "Réglage niveau "	"Fallo Regulación " "de altura "	"guasto " "regolaz. livello "
10	"Feuer Motorraum " " " "	"Fire in engine " "compartment "	"Feu compartiment " "moteur "	"Fuego compartim. " "motor "	"fuoco vano " "motore "
11	"Bremsflüssigkeit " "zu gering "	"Brake fluid " "low "	"Liquide de frein " "insuffisante "	"Líquido de freno " "insuficiente "	"líquido freni " "troppo poco "

Nr.	german	english	french	spanish	italian
12	"Nothahn betätigt" "	"Emergency tap " "actuated "	"Robinet secours " "actionné "	"Grifo emergencia" "accionado "	"rubinetto emer- " "genca attivato "
13	"Vorratsdruck " "zu gering "	"Air pressure " "low "	"Pression d'air " "insuffisante "	"Presiòn reserva " "muy baja "	"press. di scorta" "troppo poco "
14	"Kühlwasserstand " "zu niedrig "	"Cooling water " "low "	"Eau refroidiss " "insuffisante "	"Nivel agua refri" "muy bajo "	"liv.acqua.raffr." "troppo basso "
15	"Ausfall Motoröl-" "nachfüllung "	"Failure engine " "oil refill "	"Panne rempliss. " "huile moteur "	"Fallo Relleno de" "aceite de motor "	"guasto olio mot." "riempimento "
16	"Störung " "Niveauregelung "	"Fault " "Level control "	"Défaut " "Réglage niveau "	"Averia Regulaci." "de altura "	"disturbo " "regolaz.livello "
17	"Ausfall ABS/ASR " "	"Failure ABS/ASC " "	"Panne ABS/ASR " "	"Fallo ABS/ASR " "	"guasto ABS/ASR " "
18	"Störung Retarder" "	"Fault Retarder " "	"Défaut " "Ralentisseur "	"Averia " "Retardador "	"rallentamento " "disturbo "
19	"Bremsbelag " "zu gering "	"Brake lining " "insufficient "	"Garniture freins" "insuffisante "	"Forro del freno " "insuficiente "	"guarniz. freno " "troppo poco "
20	"Störung " "Schmierung "	"Fault " "Lubrication "	"Défaut " "Graissage "	"Averia " "Lubrificaciòn "	"disturbo " "lubrificazione "
21	"Keine " "Batterieladung "	"No battery " "charge "	"Pas de charge " "batterie "	"Sin carga " "de bateria "	"nessuno " "carico batterie "
22	"Keine " "Batterieladung "	"No battery " "charge "	"Pas de charge " "batterie "	"Sin carga " "de bateria "	"nessuno " "carico batterie "
23	"Notpumpe Lenkung" "aktiv "	"Emergency pump " "steering active "	"Pompe secours " "direction active"	"Bomba emergencia" "direcciòn activa"	"sterzo.pomp.emer" "attivo "
24	"Notprogramm " "Getriebe aktiv "	"Emergency progr." "Gearbox active "	"Programme urg. " "boîte vit. act "	"Programa emerge." "engranaje activo"	"progr. di emerg." "meccanismo attiv"

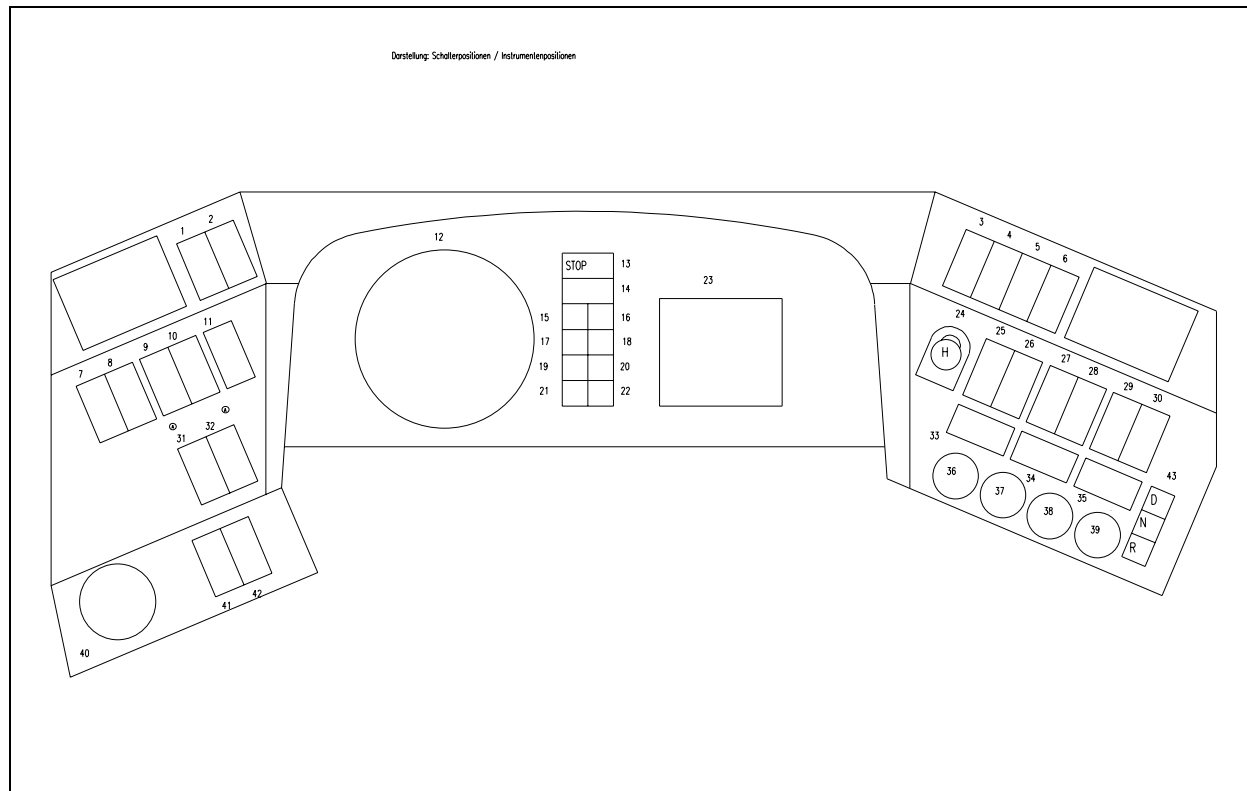
Nr.	german	english	french	spanish	italian
25	"Ausfall AVS/EPS "	"Failure AVS/EPS "	"Panne AVS/EPS "	"Fallo AVS/EPS "	"guasto AVS/EPS "
	" "	" "	" "	" "	" "
26	"Achssperre "	"Axle lock "	"Arrêt essieu "	"Bloqueo de eje "	"sbarramento asse"
	"aktiv "	"active "	"actif "	"activo "	"attivo "
27	"Störung "	"Fault "	"Défaut démarr. "	"Averia "	"disturbo "
	"Flammstart "	"flame start "	"à flamme "	"Arranque llama "	"avviare fiamma "
28	"Kraftstoffvorrat"	"Fuel gauge "	"Réserve car- "	"Reserva combust."	"scorta carburant"
	"zu gering "	"low "	"burant insuff. "	"insuficiente "	"troppo poco "
42	"Ausfall "	"Failure "	"Panne commande "	"Fallo "	"guasto "
	"Motorregelung "	"Accel. control "	"moteur "	"regulaciòn motor"	"regolaz.motore "
43	"Systemausfall "	"System failure "	"Défaut système "	"Fallo de sistema"	"guasto al sistem"
	" "	" "	" "	" "	" "
44	"Störung "	"Fault "	"Défaut boîte "	"Averia "	"disturbo "
	"Getriebe "	"Gearbox "	"vitesses "	"Engranaje "	"meccanismo "
48	"Bremsdruck "	"Brake "	"Pression "	"Presiòn "	"pressione "
	" "	"pressure "	"freinage "	"de freno "	"freni "
49	"Vorratsdruck "	"Air pressure "	"Pression d'air "	"Presiòn reserva "	"pressione di "
	" "	" "	" "	" "	"riserva "
50	"Kraftstoff "	"Fuel "	"Carburant "	"Combustible "	"carburante "
	" "	" "	" "	" "	" "
51	"ABS-Check "	"ABS-Check "	"Contrôle ABS "	"Comprobaciòn ABS"	"controllo ABS "
	" "	" "	" "	" "	" "
54	"Störung "	"Failure "	"Panne "	"Averia "	"Anomalia "
	"Türanlage "	"Door System "	"Manoeuvre Portes "	"sistema puerta "	"impianto porta "
55	"Störung "	"Failure "	"Panne "	"Averia "	"Anomalia riscald"
	"Heizung/Lüftung "	"Heater/Ventilat."	"Chauff./Ventil. "	"ventilaciòn "	"/ventilaz. "

Nr.	german	english	french	spanish	italian
56	"Störung Aussen- " "beleuchtung "	"Defect Outside " "Lighting "	"Défaut Eclairage " "Extérieur "	"Averia Alumbrado " "exterior "	"Anomalia Illum. " "esterna "
57	"Luftfilter " "verschmutzt "	"Air Filter " "dirty "	"Filtre d'air " "sali "	"Filtro de aire " "sucio "	"Filtro dell'aria " "sporco "
59	"Hydrostat " "Ölstand prüfen "	"Hydrostat " "Check Oil Level "	"Hydrostat " "Vérif. Niv.Huile"	"Hidrostatato " "Contr.niv.aceite"	"Idrostatato " "Contr. liv. olio"
60	"Ausfall " "Fahrregelung "	"Failure " "Cruise Control "	"Panne " "Réglage vitesse "	"Fallo " "sist. conducciòn"	"Fuoriuscita " "regolaz. moto "
62	"Störung " "Lenkgetriebe "	"Fault " "Steering Gear "	"Défaut Mécanisme " "de Direction "	"Averia engranaje " "direcciòn "	"Anomalia " "scatola guida "
65	"Störung " "FPS "	"Fault " "FPS "	"Défaut " "FPS "	"Averia " "FPS "	"Anomalia " "FPS "
66	"Störung " "FSS "	"Fault " "FSS "	"Défaut " "FSS "	"Averia " "FSS "	"Anomalia " "FSS "
73	"Aussentemperatur " " "	"Outside Temp. " " "	"Température ext. " " "	"Temp. exterior " " "	"Temper. esterna " " "
74	"Innentemperatur " " "	"Inside Temp. " " "	"Température int. " " "	"Temp. interior " " "	"Temper. interna " " "
75	"Temperatur " " "	"Temperature " " "	"Température " " "	"Temperatura " " "	"Temperatura " " "
76	"Druck " " "	"Pressure " " "	"Pression " " "	"Presiòn " " "	"Pressione " " "
77	"Hydrostat " "Motor aus "	"Hydrostat " "Engine off "	"Hydrostat " "Moteur coupé "	"Hidrostatato " "Motor parado "	"Idrostatato " "Motore off "
78	"Störung Halte - " "stellenbremse "	"Defect " "Halt Brake "	"Défaut " "Frein Immobil. "	"Averia Freno " "de parada "	"Anomalia freno " "di tenuta "

Nr.	german	english	french	spanish	italian
79	"Störung " " "Bremsdrucksignal"	"Defect Brake " " "Pressure Signal "	"Défaut Signal " " "Pression Frein "	"Avería senal " " "presión freno "	"Anomalia segnale" " "pressione freno "
80	"Störung " " "Blinkanlage "	"Defect Direction" " "Indicator System"	"Défaut " " "Clignotants "	"Avería " " "Luz.intermitente"	"Anomalia " " "impianto lampeg."
81	"Störung " " "Motorsensorik "	"Defect Engine " " "Sensor System "	"Défaut " " "Capteurs Moteur "	"Avería " " "sensores motor "	"Anomalia " " "sensori motore "
82	"Störung " " "Einstieghilfe "	"Easy entry " " "system fault "	"Défaut " " "assistance accès"	"Avería " " "Ayuda acceso "	"Anomalia " " "ausilio salita "
83	"Störung " " "Zusatzlenkung "	"Auxiliary " " "steering fault "	"Défaut direction" " "auxiliaire "	"Avería " " "Direcc. adicio. "	"Anomalia sterzo " " "supplementare "
84	"Störung " " "Feststellbremse "	"Parking brake " " "fault "	"Défaut frein " " "stationnement "	"Avería " " "Freno estacion. "	"Anomalia freno " " "di stazionamento"
85	"Störung " " "E-Antrieb "	"Electric drive " " "fault "	"Défaut moteur " " "électrique "	"Avería " " "Accionam. eléc. "	"Anomalia " " "azionam. elettr."
86	"Störung " " "MUX "	"MUX " " "fault "	"Défaut " " "MUX "	"Avería " " "MUX "	"Anomalia " " "MUX "
87	"Service " " " "	"Service " " " "	"Maintenance " " " "	"Servicio " " "Postventa "	"Service " " " "

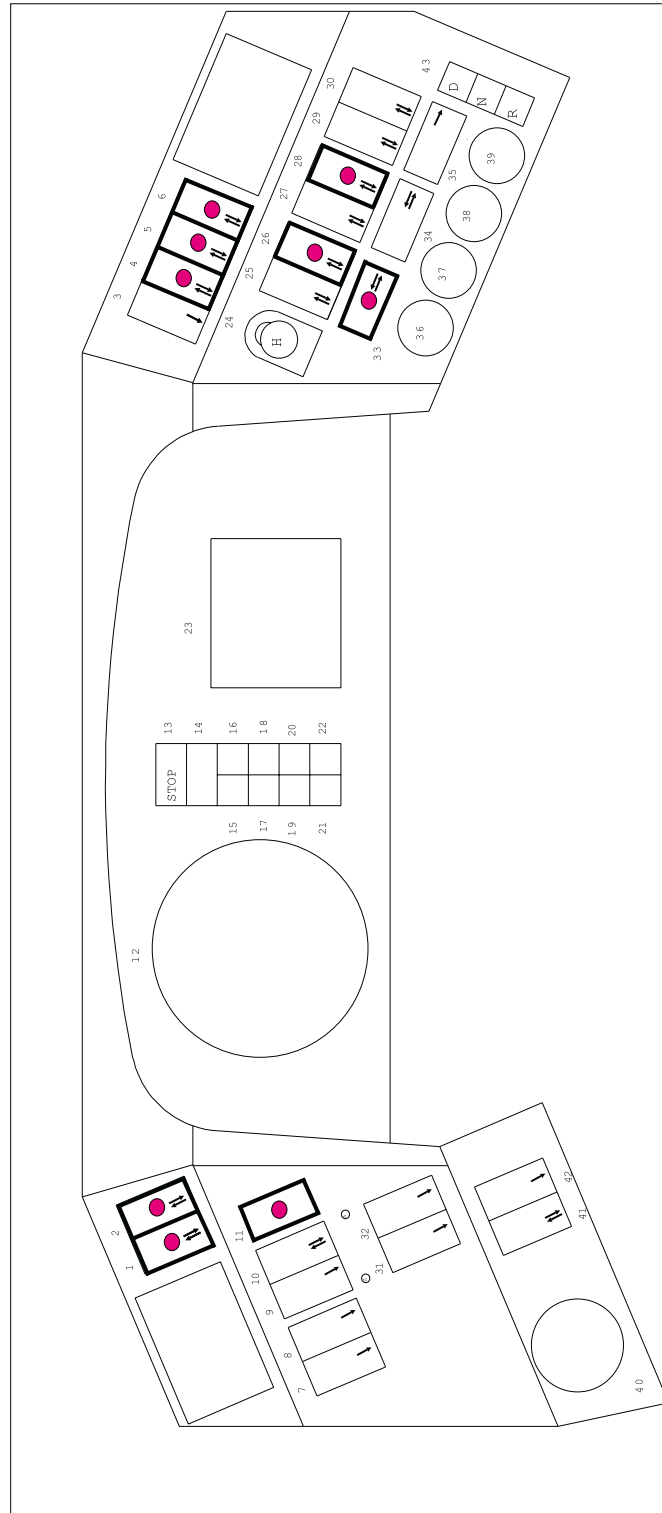
7 DWP

7.1 Assignment list DWP / KIBES



designations of DWP

Darstellung:
Schalterpositionen /
Instrumentenpositionen



ILLUMINATION:	UP / DOWN:	LEFT / RIGHT:	DOWN:

7.1.1 Outputs of DWP

POS.	NAME	IK_PIN	COMMENT
	Sound beeper 1 (400 Hz)	X7 1/2	Loudspeaker with def. volume
	Sound beeper 2 (600 Hz)	X7 1/2	Loudspeaker with def. volume
	Sound beeper 3 (900 Hz)	X7 1/2	Loudspeaker with def. volume
	Display Off		Switch off display
01	Customized funct. illumination 11	X5 26	Illumination custom. req. switch 1
02	Customized funct. illumination 12	X5 27	Illumination custom. req. switch 2
04	Customized funct. illumination 14	X5 29	Illumination custom. req. switch 4
05	Customized funct. illumination 15	X5 30	Illumination custom. req. switch 5
06	Customized funct. illumination 16	X5 31	Illumination custom. req. switch 6
11	Hazard blinker	X5 25	Illumination hazard switch
13	Central warning lamp red	X8 01	Module of indication lamps
14	Central warning lamp yellow	X8 02	Module of indication lamps
15	Turn indicator warning lamp	X8 04	Module of indication lamps
16	High beam warning lamp	X8 03	Module of indication lamps
17	Customized funct. illumination 01	X8 05	Mod. of indic. lamps (brake)
18	Customized funct. illumination 02	X8 06	Mod. of indic. lamps (ABS/ASR)
19	Customized funct. illumination 03	X8 07	Module of indication lamps
20	Customized funct. illumination 04	X8 08	Module of indication lamps
21	Customized funct. illumination 05	X8 09	Module of indication lamps
22	Customized funct. illumination 06	X8 10	Module of indication lamps
23	Display operation day/night (inverse)		
26	Door release	X5 32	Illumination custom. req. switch 7
28	Fog light warning lamp (yellow)	X5 33	Illum. custom. req. switch 8 ! !
33	Customized funct. illumination 13	X5 21	Illumination custom. req. switch 3
36	Customized funct. illumination 07	X5 21	Illumination door switch 1
37	Customized funct. illumination 07	X5 21	Illumination door switch 1
37	Customized funct. illumination 08	X5 22	Illumination door switch 2
38	Customized funct. illumination 08	X5 22	Illumination door switch 2
38	Customized funct. illumination 09	X5 23	Illumination door switch 3
39	Customized funct. illumination 10	X5 24	Illumination door switch 4

7.1.2 Binary inputs of DWP

POS.	NAME	IK_PIN	COMMENT
	Automatic gear box switch 1		not supported
	Automatic gear box switch 2		not supported
	Automatic gear box switch 3		not supported
	Automatic gear box switch D		not supported
	Automatic gear box switch: N		not supported
	Automatic gear box switch: R		not supported
	Customized funct. illumination 17		not supported
	Customized funct. illumination 18		not supported
	Customized funct. illumination 19		not supported
	Customized funct. illumination 20		not supported
	Display change 2		not supported
	Display change 3		not supported
	High beam	X4 26	left hand steering switch
	Horn	X4 34	left hand steering switch
	Ignition key inserted		not supported
	Ignition key: terminal N- 15	X5 02	(wake up)
	Ignition key: terminal N- 15R	X5 34	Ignition (radio)
	Ignition key: terminal N- 50	X5 03	Starter
	Ignition key: terminal N- P	X5 01	permanent power
	IN active		Instrument is running
	Parking light left		not supported
	Parking light right		not supported
	Status DWP		if set, then DWP OK
	Turn signal left	X4 24	left hand steering switch
	Turn signal right	X4 25	left hand steering switch
	Winshild washer	X4 33	left hand steering switch (windscreen)
	Winshild wiper (interval)	X4 32	left hand steering switch
	Winshild wiper speed 1	X4 30	left hand steering switch
	Winshild wiper speed 2	X4 31	left hand steering switch
01	Customized funct. illumination 1a	X5 11	CRS 1 pressed down
01	Customized funct. illumination 1b	X9 05	CRS 2 pressed up
02	Customized funct. illumination 2a	X5 12	CRS 3
02	Customized funct. illumination 2b	X9 06	KSW 4
03	Display change 1 (Quit)	X5 10	Confirmation switch
04	Customized funct. illumination 4a	X5 14	CRS 7
04	Customized funct. illumination 4b	X9 08	CRS 8
05	Customized funct. illumination 5a	X5 15	CRS 9
05	Customized funct. illumination 5b	X9 09	CRS 10
06	Customized funct. illumination 6a	X5 16	CRS 11
06	Customized funct. illumination 6b	X9 10	CRS 12
07	Exhaust brake on/off	X5 05	
09	ASR switch deselected	X5 04	

10	Window shade down	X5 07	pressed down
10	Window shade up	X9 04	pressed up
11	Hazard warning indicator	X4 17	Switch (wake up)
24	Parking brake	X4 07	
25	Kneeling: lift down	X4 02	pressed down
25	Kneeling: lift up	X9 01	pressed up
26	Customized funct. illumination 7a	X5 17	CRS 13
26	Customized funct. illumination 7b	X9 11	CRS 14
27	Clear Pram request	X9 03	clear door. (up)
27	Pram request set (door remains open)	X4 04	hold door unlocked (down)
28	Customized funct. illumination 8a	X5 18	CRS 15
28	Customized funct. illumination 8b	X9 12	CRS 16
29	Access ramp unlock	X4 06	
30	Handicapped ramp: lift down	X4 03	pressed down
30	Handicapped ramp: lift up	X9 02	pressed up
31	Loud speaker: inside/outside	X5 09	
32	Radio message 1 (lower key)	X5 08	(wake up)
32	Radio on message 2 (upper key)	X5 35	(wake up)
33	Customized funct. illumination 3a	X5 13	CRS 5
33	Customized funct. illumination 3b	X9 07	CRS 6
34	Door wing 1: lock	X5 19	wing left
34	Door wing 2: lock	X4 01	wing right
35	Doors release	X4 05	
36	Push button door 1	X4 08	
37	Push button door 1	X4 08	
37	Push button door 2	X4 14	
38	Push button door 2	X4 14	
38	Push button door 3	X4 15	
39	Push button door 4	X4 16	
40	Front fog light	X4 20	turn switch for lights
40	Low-beam	X4 19	turn switch for lights
40	Parking light	X4 18	turn switch for lights (wake up)
40	Rear fog light	X4 21	turn switch for lights
41	Interior Lightning 1	X4 23	(wake up signal)
41	Interior Lightning 2	X4 27	(wake up signal)
42	Pay-desk illumination	X4 22	

7.1.3 Word inputs of DWP

08	Exhaust brake	X5 06	direct (analog value)
	Status DWP error number		

For every input it exists an error input of type WORD

8 ICAN

8.1 Couple markers

For communication between ZR2-B and DMUX you can use couple markers. For read (input) and write (output) to the modulcombi (DMUX).

This structure is ver often used to tell the DMUX if any input or output from any MUX-node is active or not.

Also when the driver has an interactive steering wheel you have to send the information if a knob is pressed or not via this couple marker types.

We offer 128 typed binary and 128 of word (channel), beginning from: Couple marker 001 up until Couple marker 128.

8.2 Modulcombi

This device (includes DMUX) offers a lot of different in- and outputs.

8.2.1 Word (channel) Inputs

Device:Modulcombi	Name:	Pin	Remark
Name			
Analog 1			
Analog 2			
Analog 3			
Analog 4			
Analog 5			
Analog 6			
Dimmer: predefined value			
Revolution rpm			
Status MOKI: error code			Error Code
~E:Dimmer: predefined value			Error Input

8.2.2 Binary inputs

Device: Modulcombi	Name:	Pin	Remark
Name			
IB_EIN_STATUS_01			
IB_EIN_STATUS_02			
IB_EIN_STATUS_03			
...			
IB_EIN_STATUS_66			
IB_EIN_STATUS_67			
IB_EIN_STATUS_68			
Key 1			
Key 2			
Key 3			
Key 4			
Key 5			
Key 6			
Status MDKI			0->Device O.K.

They start from IB_EIN_STATUS_01 and ends with IB_EIN_STATUS_68

8.2.3 Word (channel) outputs

Device: Modulcombi	Name:	Pin	Remark
Name			
dimmer display			Output
dimmer scale			Output
Gauge 1			Output
Gauge 2			Output
Gauge 3			Output
Gauge 4			Output
language			Output
speaker volume			Output
video channel			Output

8.2.4 Binary outputs

Before you get any valid data from an Modulcombi you have to activate the device itself, if not all incoming data is set to zero und you will have no „real“ connection.

Device:Modulcombi	Name:	Pin	Remark
Name			
Activation of MOKI			
contiguous sound 1			Output binary
contiguous sound 2			Output binary
contiguous sound 3			Output binary
contiguous sound 4			Output binary
IB_AUS_11			Output binary
IB_AUS_12			Output binary
IB_AUS_13			Output binary
IB_AUS_14			Output binary
IB_AUS_15			Output binary
IB_AUS_16			Output binary
IB_AUS_17			Output binary
IB_AUS_18			Output binary
IB_AUS_19			Output binary
IB_AUS_20			Output binary
IB_AUS_21			Output binary
IB_AUS_22			Output binary
IB_AUS_23			Output binary
IB_AUS_24			Output binary
ignition for TCO			Output binary
invert display			Output binary
LED_01			Output binary
LED_02			Output binary
LED_03			Output binary
LED_04			Output binary
LED_05			Output binary
LED_06			Output binary
LED_07			Output binary
LED_08			Output binary
LED_09			Output binary
LED_10			Output binary
LED_11			Output binary
LED_12			Output binary
LED_17			Output binary
LED_18			Output binary
single sound 1			Output binary
single sound 2			Output binary
single sound 3			Output binary
single sound 4			Output binary

8.3 MTCO

This device is not available for DWP.

8.3.1 Word (channel) inputs

Before reading inputs below, be sure that the MTCO is activated.

The „Tachograph vehicle speed“ is in the format according SAE J1939 prescribes.

Example: Word input has the value 25600 means that your actual speed is 100 Km/h.

The high-Byte describes Km/h and the low-Byte the fraction in 256.

The “Work status” represents driver operation.

You’ll get an information if driver 1 or 2 is in driving mode, remaining working time, stand-by time or break time and also if the vehicle drives or not.

Device:MTCO Name	Name:	Pin	Remark
	Status MTCO: error code		Error code
	Tachograph output shaft speed		
	Tachograph status		
	Tachograph vehicle speed		
	Work status		
	~F:Tachograph output shaft speed		Error input
	~F:Tachograph status		Error input
	~F:Tachograph vehicle speed		Error input
	~F:Work status		Error input

8.3.2 Binary inputs

Device:MTCO Name	Name:	Pin	Remark
	Status MTCO		0->Device O.K.

8.3.3 Word (channel) outputs

The device MTCO doesn’t provide any word outputs !

8.3.4 Binary outputs

Before you get any valid data from an MTCO/DTCO you have to activate the device itself, if not all incoming data is set to zero.

Device:MTCO Name	Name:	Pin	Remark
	Activation MTCO		

8.4 ZR2-B

8.4.1 Word (channel) inputs of ZR2-B

Device:ZR2B			
Name	Name:	Pin	Remark
EEPROM flag 01			
EEPROM flag 02			
EEPROM flag 03			
...			
EEPROM flag 30			
EEPROM flag 31			
EEPROM flag 32			
EIN_4_IMP/m		C9	Speed (1km/h /Bit)
EIN_BORDSPANNUNG		A3	Voltage (5mV/Bit)
EIN_Kl.W		C10	RPM (U/min /Bit)
IBIS Error			
Status EEPROM error code			Error code
Status ZR2: Error Code			Error code

8.4.2 Binary inputs of ZR2-B

Device:ZR2B			
Name	Name:	Pin	Remark
DIAG_AUS_01_G1_LS		C11	Input diagnosis
DIAG_AUS_02_G1_LS		C12	Input diagnosis
Distance			Dist. input (5m/puls
EEPROM flag 01			
EEPROM flag 02			
EEPROM flag 03			
...			
EEPROM flag 60			
EEPROM flag 61			
EEPROM flag 62			
EEPROM flag 63			
EEPROM flag 64			
Ext. Wakeup CAN DWP			Input status
EXT_WAKE_UP_01		A02	Input status
EXT_WAKE_UP_02		A04	Input status
first PLC loop			
IBIS Status			
Status EEPROM			1 -> Device O.K.
Status ZR2			0+S100 -> Device O.K

8.4.3 Binary outputs of ZR2-B

Device: ZR2B	Name:	Pin	Remark
Name			
AUS_01_G1_LS		C11	Output LS 100mA
AUS_02_G1_LS		C12	Output LS 100mA
EEPROM flag 01			
EEPROM flag 02			
EEPROM flag 03			
EEPROM flag 04			
EEPROM flag 05			
:			
:			
EEPROM flag 60			
EEPROM flag 61			
EEPROM flag 62			
EEPROM flag 63			
EEPROM flag 64			
Erase EEPROM flag			
Power down delay			Device can't powerof
Store EEPROM flag			

8.4.4 Word (channel) outputs of ZR2-B

Device: ZR2B	Name:	Pin	Remark
Name			
EEPROM flag 01			
EEPROM flag 02			
EEPROM flag 03			
:			
:			
EEPROM flag 30			
EEPROM flag 31			
EEPROM flag 32			