Systemdescription

1 General

The products consist of an FM amplifier (FM 3 and FM 4) and a RKE-Receiver (FBD) on a printed circuit board, accommodated in a housing.

On the component a wave-trap is installed, with which the supply of the rear screen with the heating-voltage takes place. The wave-trap must lock the antenna structures against line-bound electrical system interference currents on the +Ub supply line and prevent that HF-antennasignals flow off against +Ub.

As special equipment an integrated TV amplifier (TV 2) is available.

A version for Japan is intended only with integrated TV amplifier and an additional FM amplifier (FM 5).

The wave-traps, as well as the FM and TV amplifier do not have any influence on the remote-control functions.

In the following the function ranges as well as the appropriate operation values and operating conditions of the individual functional modules are described.

1.2 Integration of the component into the antenna-system

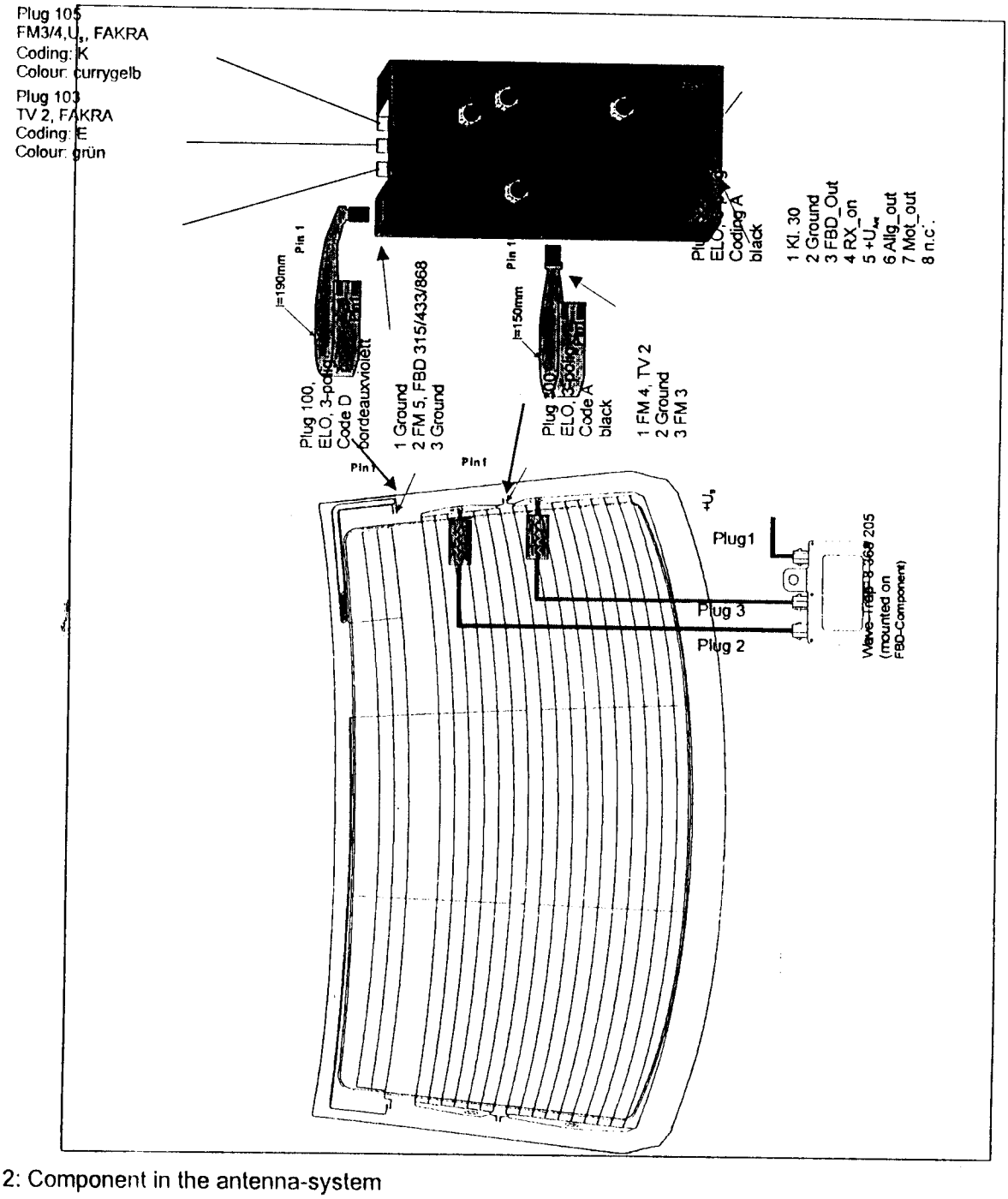

Figure 2: Component in the antenna-system

1.3 Interfaces

Table 1: Interfaces

Plug	Connection	Type	Junction	
Plug 100	Antenna	ELO Code D	Pin 1	Ground
			Pin 2	FM 5, FBD 315/434/868
			Pin 3	Ground
Plug 300	Antenna	ELO Code A	Pin 1	FM 4 / TV 2
			Pin 2	Ground
			Pin 3	FM 3
Plug 103	TV_{OUT} / U_{TV}	SMB (50 Ω)		TV 2
(only 6 912 076, 6 912 077, 6 912 078 and 6 912 079)				
Plug 104	FM	SMB (50 Ω)		FM 5
(only 6 912 076)				
Plug 105	HF_{OUT}/U_{Schalt}	SMB (50 Ω)		FM 3 / FM 4
Plug 560	FBD	ELO Code A	Pin 1	$+U_B$
			Pin 2	Ground
			Pin 3	FBD_out
			Pin 4	RX_on
			Pin 5	$+U_{Ant}$
			Pin 6	Allg_out
			Pin 7	Mot_out
			Pin 8	not connected

1.5 Functional module FM

Characteristics:

- regulated transistor amplifier in basic circuit
- switching of FM 3 / FM 4 by means of switching voltage over HF output (see also 1,4)

Operation values

Table 2: Operating conditions of FM

Description			Min.	Typ.	Max	Tole-rance.		Remark
Voltage (U_B):		[V]	13,80	14,00	14,20	± 0,10		
Temperature:		[°C]	18,00	23,00	28,00	± 0,50		
Output impedance:	Z_0	Ω		50				
Frequency-range:	FM	[MHz]	87,5	108		± 0,25	Except for 6 912 76	
	FM Japan	[MHz]	76	90			Only 6 912 76	
Networkanalyser-test level:		[dBm]			-10	± 0,50		

- to measure the FM-range, the HF output (plug 105) is to be wired over a DC-choke in the following way:

FM 3 --> 0 V
FM 4 --> 12 V

1.6 Functional module FM 5 (only 6 912 076)

Characteristics:

- regulated transistor amplifier in basic circuit

Operation values

Table 3: Operating conditions of FM

Description			Min.	Typ.	Max	Tole-rance.		Remark
Voltage (U_B):		[V]	13,80	14,00	14,20	± 0,10		
Temperature:		[°C]	18,00	23,00	28,00	± 0,50		
Output impedance:	Z_0	Ω		50				
Frequency-range: FM Japan		[MHz]	76	90		± 0,25		
Networkanalyzer-test level		[dBm]			-10	± 0,50		

1.7 Functional module TV (only 6 912 076, 6 912 077, 6 912 078, 6 912 079)

Tabelle 4: Operating conditions of TV

Description			Min.	Typ.	Max.	Tole-rance	Remark:
Frequency range:	VHF	[MHz]	47	-	230		Except for 6 912 076
	VHF (Japan)	[MHz]	90	-	230		only 6 912 076
	UHF	[MHz]	470	-	862		
Output impedance:	Z_0	Ω		50			
Test Voltage:	U_{test}	[V]	11,80	12,00	12,20	±0,05	
Temperature:	T_{test}	[°C]	18,0	23,0	28,0	±0,50	
Networkanalyser-test level		[dBm]	-25,5	-25,0	-24,5	±0,50	

1.8 Functional module FBD

The FBD receiver uses a special structure in the rear screen as antenna. The receiver consists of the following main building blocks:

- HF-Receiver-IC with antenna-matching
- low Power µC
- Voltage regulator
- Input- / Output - driver (digital)

For reasons of the quiescent current optimisation the receiver operates in a clocked mode, which can be switched off by means of a connection by RX_on against ground (continuous reception mode).

1.8.1 Output: FBD_Out

The transmission at the output FBD_out takes place by means of a simple serial protocol: Every time a byte was completely read in, by adding a start and a stop bit with a data transmission rate from 4800 Bit/sec.
At this output however the 2-ms-presignal is no longer evident, i.e. the transferred bytes correspond to the bytes in the radiotelegram. At the end of each telegram the field strength is attached.

There only is a Data-output if the pre-signal and the Pre-Byte with the appropriate value ($0xCX_{hex}$) are received.

Protocol	Start / 8 Bit / Stop
Data-rate	4800 Bit/s
Coding	NRZ
Transmission	LSB first

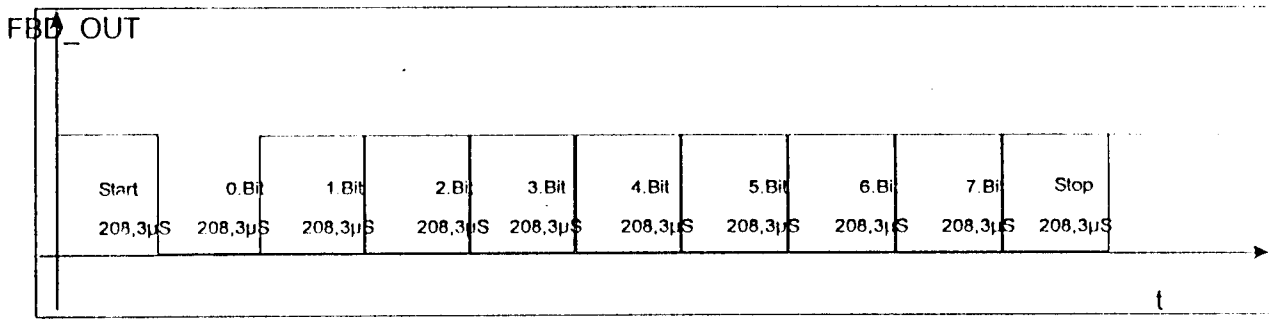

Figure 4: Serial Output to CAS-controller

1.8.2 Output: ALLG_OUT

After receiving the corresponding pre-signal, the data will be given to this output. Afterwards no further filtering is made.

1.8.3 Output: MOT_OUT

This output releases the controlling-process in the CAS. It is switched from the receiver only if a telegram was received from the telestart-hand-sender.

1.8.4 Input: RX_ON

With this input the receiver can be switched into the continuous reception mode.

1.8.6 Operating Values: FBD

Due to different communications regulations there are different FBD-Receivers. They only differ in the carrier-frequency. They have the identical technical behaviour.

There are 4 versions of the FBD-receivers. 3 Versions operating in FSK-mode with the frequencies of: 868,4 MHz, 434,2 MHz and 315,0 MHz with different FM-deviation. Another version operates in ASK-mode at 315,0 MHz. The digital section as well as the interfaces (Plug 560 and Plug 100) of the different versions are identical.

Table 5: Operating conditions for all FBD components

Description		Min.	Typ.	Max.	Tole-rance.	Remark
Voltage (U_B):	[V]	13,90	14,00	14,10	±0,10	
Temperature:	[°C]	18,00	23,00	28,00	±0,50	
Data-Rate	[kBit/s]	3,98	4,00	4,02	±0,01	

Table 6: Carrier-frequencies and modulation for the FBD components

Description		Min	Typ.	Max.	Tole-rance	Remark
Carrier-frequency	[MHz]	868,39	868,40	868,41	±0,005	6 912 073 and 6 912 079
FSK-Deviation	[kHz]	±47,5	±50	±52,5	±1,0	
Modulation			FSK			
Carrier-frequency	[MHz]	434,19	434,20	434,21	±0,005	6 912 075 and 6 912 078
FSK-Deviation	[kHz]	±38	±40	±42	±1,0	
Modulation			FSK			
Carrier-frequency	[MHz]	314,99	315,00	315,01	±0,005	6 912 074 and 6 912 077
FSK-Deviation	[kHz]	±28,5	±30	±28,5	±1,0	
Modulation			FSK			
Carrier-frequency	[MHz]	314,99	315,00	315,01	±0,005	6 912 076
Modulation			ASK			

Table 7: Current consumption for all FBD components

Description		Min.	Typ.	Max.	Tole-rance	Remark
Average power consumption (Plug 560; Pin 1):	[mA]		1,4 2,6		±0,1	Duty-Cycle 1/10 (only 6 912 076)
power consumption (Plug 560; Pin 1):	[mA]		8,0		±0,1	RX_on grounded