

## Description of

# DCM 9415/... Diagnosis Communication Module

with FF H1 Interface



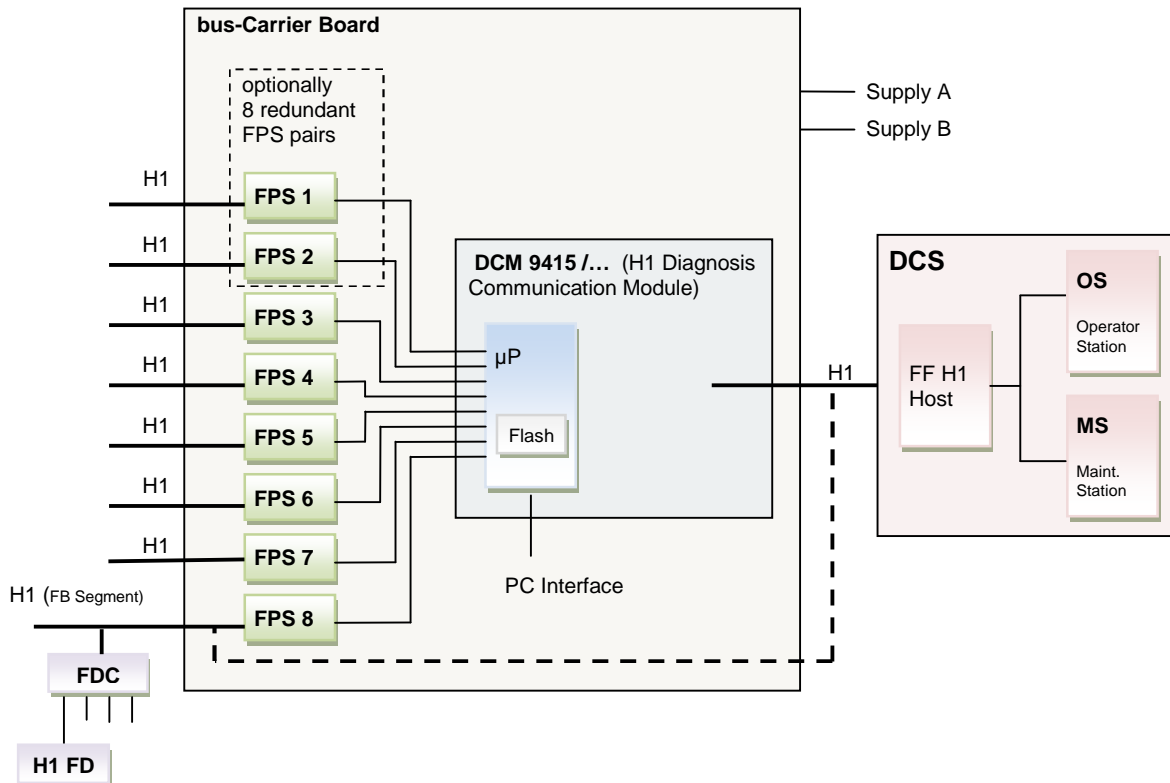
## DCM - FF H1 interface description

### Content:

1	System Overview.....	3
2	Design and System Function .....	4
2.1	System Requirements.....	4
2.2	H1 System Integration of DCM .....	5
2.2.1	Overview .....	5
2.2.2	Integrating DI Function Blocks in Cyclic H1 Communication.....	6
2.2.3	Polling of Collective Statuses of TBs.....	6
2.2.4	Alarms Using H1 Event Mechanisms – Multi-bit.....	6
2.3	Configuration with Device Description (EDD) Files.....	7
2.4	Addressing (Commissioning) of the DCM.....	7
2.4.1	Segment Assignment for Single/Redundant FPS.....	8
2.5	FF Blocks .....	9
2.5.1	Ressource Block DCM (RB_DCM) .....	9
2.5.1.1	Mandatory RB parameters according to FF.....	9
2.5.1.2	Parameters for Field Diagnostic Alarms.....	11
2.5.1.3	Device Data of DCM, Carrier and FPS .....	12
2.5.2	FF Field Diagnostic Alarms.....	13
2.5.3	DI Function Block Alarm (DI_Alarm).....	14
2.5.4	DI Function block DCM alarm (DI_DCM_Alarm) .....	14
2.5.5	DI Function block Segment (DI_Seg 1 – 8) .....	14
2.5.6	Transducer Block DCM (TB_DCM).....	15
2.5.7	Transducer Block Segment (TB_Segment) .....	17
2.5.7.1	Standard TB parameters according to FF.....	17
2.5.7.2	Segment-specific parameters .....	18
2.5.7.3	FPS specific parameters:.....	21
2.5.7.4	FF Field Device-specific Parameters: .....	22
2.5.7.5	Assignment of the FF H1 Field Devices.....	23
2.6	Status, Warning Limit and Indications According to NE 107 .....	24
2.6.1	Generation of the Status Data .....	26
2.7	LED Displays of DCM .....	27
2.8	Menu Structure TB and RB.....	27
2.9	Screen Masks.....	28
2.9.1	Diag overview – DCM - System overview.....	28
2.9.2	Diag Overview – Segment .....	28
2.9.3	Config_Details - DCM - Diagnosis communication module.....	29
2.9.4	Config_Details – Segment x ( x = 1 – 8).....	30
2.9.5	Config_Details – Segment x - FPS ( x = 1 – 8).....	31
2.9.6	Config_Details – Segment x - H1 FD.....	31
2.9.7	Resource Block.....	32
3	Commissioning.....	33
3.1	Overview .....	33
4	Data Communication .....	34
4.1	System Start.....	34
4.2	Online Parameter Changes.....	34
5	Firmware Download.....	35
6	Known Errors:.....	35
7	List of abbreviations:.....	35
8	Release notes:.....	36
9	Further reading.....	36
10	Support address .....	36

## DCM - FF H1 interface description

### 1 System Overview



#### Functional description:

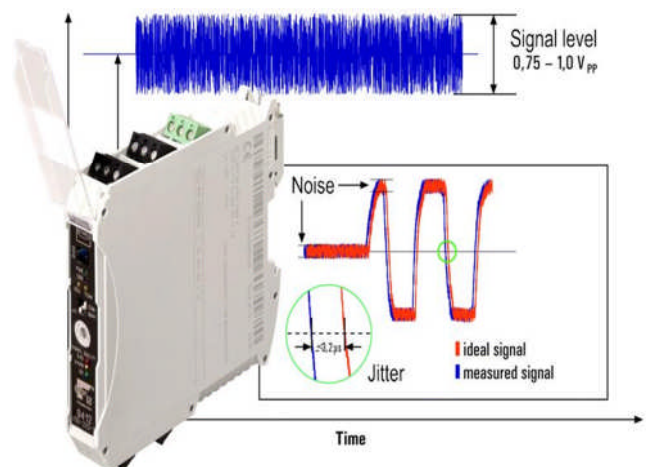
The Diagnosis Communication Module (DCM) 9415 transmits fieldbus diagnostics data, measured by the ISbus fieldbus power supplies (FPS) series 9412, to a host and/or asset management system via FF H1

The fieldbus power supplies 9412 are continuously measuring all the relevant physical layer values acc. to NAMUR NE 123 (e.g. signal level, noise, jitter, unbalance and trunk voltage/current).

The DCM collects the values from up to 8 segments and transmits all the diagnostics information via one of the installed FF H1 segments (or alternatively via a dedicated diagnostics segment).

The integration into host and asset management tools is done via an EDD, offering sophisticated possibilities for setting alarm and pre-alarm levels, obtaining life maintenance data from the bus and creating detailed reports.

Optional system integration via a DTM is planned.



## DCM - FF H1 interface description

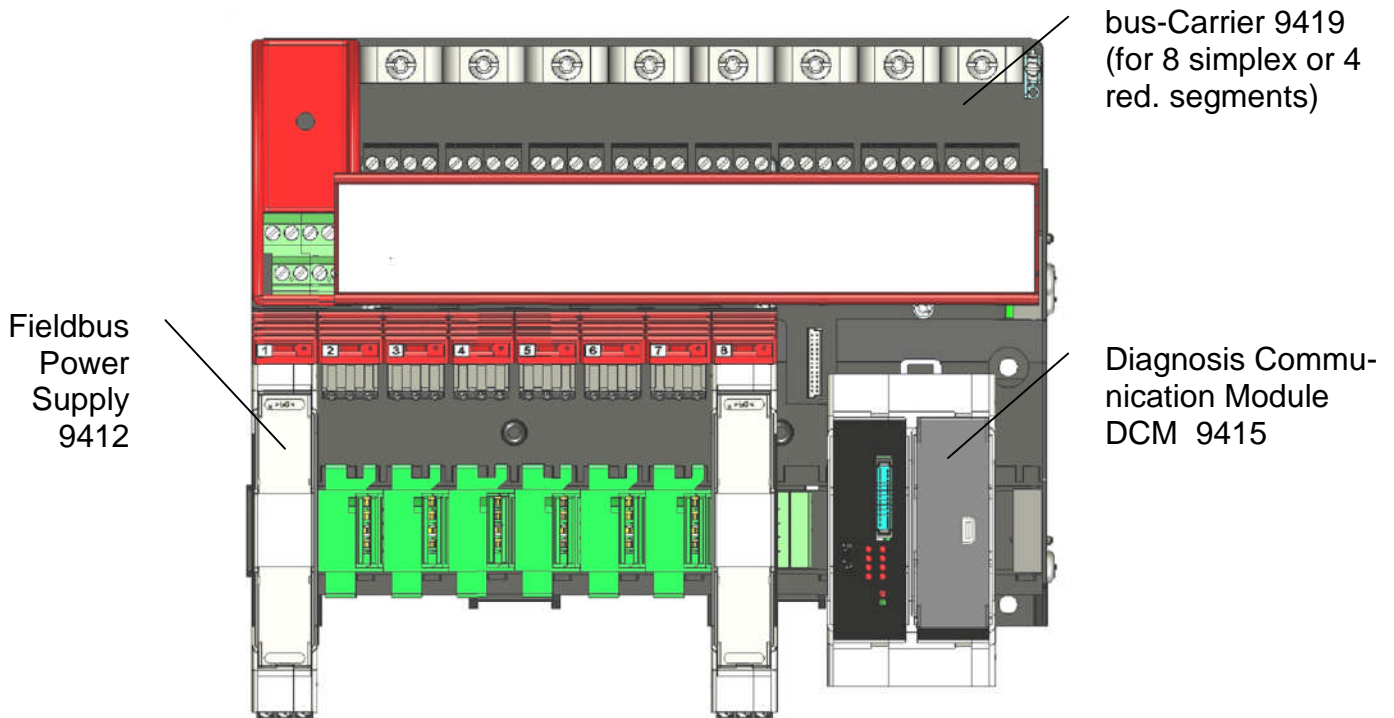
## 2 Design and System Function

### 2.1 System Requirements

#### Hardware and Software requirements:

- R. STAHL Fieldbus Power Supply series 9412 (note: all 9412 fieldbus power supplies feature integrated physical layer diagnostics and therefore can be connected to the DCM)  
from: Hardware Revision B; Software V01-03
- bus-Carrier series 9419 (available in 8 segments simplex operation, 8 segments redundant operation and 16 segments redundant operation)  
from: bus-Carrier series 9419/0\*\*-\*\*1-\*\*\*\*
- Diagnosis Communication Module series 9415  
from: Hardware Revision A; Software Vxx-xx
- FF H1 Host system with support of EDDs; optional Event mechanism

#### Schematic:



#### Optional components:

- for high power trunk installations a suitable field device coupler (FDC) is required:
  - o Ex ia/ib/FISCO fieldbus devices FDC 9411/21 (Zone 1 installation)  
FDC 9411/24 (Zone2 installation)
  - o Ex d/Ex m/Ex q fieldbus devices FDC 9411/11 (Zone 1 installation)
  - o Ex nL/Ex ic/Ex nA fieldbus devices FDC 9410/34 (Zone 2 installation)

## DCM - FF H1 interface description

### 2.2 H1 System Integration of DCM

#### 2.2.1 Overview

The following FF blocks are always available in the DCM:

Name	Block type	Default block tag	Channel parameters	Function
<b>RB_DCM</b>	Resource block	RB_DCM	-	Device data of DCM, FPS and bus-Carrier
<b>DI_1</b>	Standard DI Function block	DI_SEG_1	1	Group error Segment
<b>DI_2</b>		DI_SEG_2	2	
<b>DI_3</b>		DI_SEG_3	3	
<b>DI_4</b>		DI_SEG_4	4	
<b>DI_5</b>		DI_SEG_5	5	
<b>DI_6</b>		DI_SEG_6	6	
<b>DI_7</b>		DI_SEG_7	7	
<b>DI_8</b>		DI_SEG_8	8	
<b>DI_9</b>		DI_Alarm	9	Group error Total
<b>DI_10</b>		DI_DCM_Alarm	10	Group error DCM
<b>TB_DCM</b>	DCM Transducer block	TB_DCM	-	DCM-specific configuration and diagnostic data
<b>TB_Seg_1</b>	Segment transducer blocks	TB_Seg_1	-	Configuration and diagnostic data specific for segment, FPS and H1 field device
<b>TB_Seg_2</b>		TB_Seg_2		
<b>TB_Seg_3</b>		TB_Seg_3		
<b>TB_Seg_4</b>		TB_Seg_4		
<b>TB_Seg_5</b>		TB_Seg_5		
<b>TB_Seg_6</b>		TB_Seg_6		
<b>TB_Seg_7</b>		TB_Seg_7		
<b>TB_Seg_8</b>		TB_Seg_8		

**Status of PV\_D and Out\_D = bad (for all DI FBs) if:**

- no communication with DCM on H1 (fault of the H1 connection)
- DCM device error and no communication to H1 possible

## DCM - FF H1 interface description

The alarm data can be accessed by the DCS or H1 host using different methods:

### 2.2.2 Integrating DI Function Blocks in Cyclic H1 Communication

The signal value of PV\_D or OUT\_D of the DI FBs can be used as alarm information for the application and operator.

The status of PV\_D or OUT\_D is 'bad' if, for example there is no connection to the diagnosis communication module.

**Advantages:** Standard H1 mechanisms are available in the DCS.  
Low additional load of the cyclic communication on H1 due to use of DI FBs

### 2.2.3 Polling of Collective Statuses of TBs

Poll collective statuses of the TBs using acyclic H1 services and monitor errors in the DCS.

see [Generation of the Status Data](#) :

- STATUS\_DCM,
- STATUS\_FPS (1 – 8)
- STATUS\_SEGMENT (1 – 8)
- STATUS\_FD (1 – 8)

**Advantages:** no cyclic communication on H1  
This function is available in most DCS and can be configured.

**Disadvantages:** Software for polling and for evaluation in the DCS is required.  
Long response time due to extensive polling cycles

### 2.2.4 Alarms Using H1 Event Mechanisms – Multi-bit

The DCM supports alarms according to **FF Field Diagnostics Profile (FF-912)**.  
Common alarms and statuses of FPS and DCM are mapped to 'Field Diagnostic Alarms' for FF field devices according to NE 107.  
For details refer to Resource Block DCM, [FF Field Diagnostic Alarms](#)

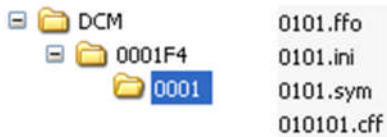
**Advantages:** short response time since it is event-triggered  
low communication level because there is no polling  
short-term events are not lost like it happens during slow polling

**Disadvantage:** supported not by all hosts, however, the trend is rising.

## DCM - FF H1 interface description

### 2.3 Configuration with Device Description (EDD) Files

For the DCM the EDD files (Electronic Device Description) are provided according to FF specification.



- Load DCM EDD files in the configuration tool of the FF H1 system/host. Thus, the DCM is displayed in the H1 Device catalogue of the host.
- For further details on configuration refer to the operating instructions of the H1 host system.

### 2.4 Addressing (Commissioning) of the DCM

Diagnosis Communication Modules (DCM) are delivered ex factory with a H1 fieldbus address = 248.

The H1 host system is used to assign permanent addresses (17 - 36) to the DCM during commissioning as usual in all H1 field devices or temporary H1 fieldbus addresses (223 - 247) during decommissioning.

## DCM - FF H1 interface description

### 2.4.1 Segment Assignment for Single/Redundant FPS

There are three bus-Carrier versions available:

Carrier type	Number of segments	Number of FPS slots
for single FPS	8	8
for redundant FPS	4	8
	8	16

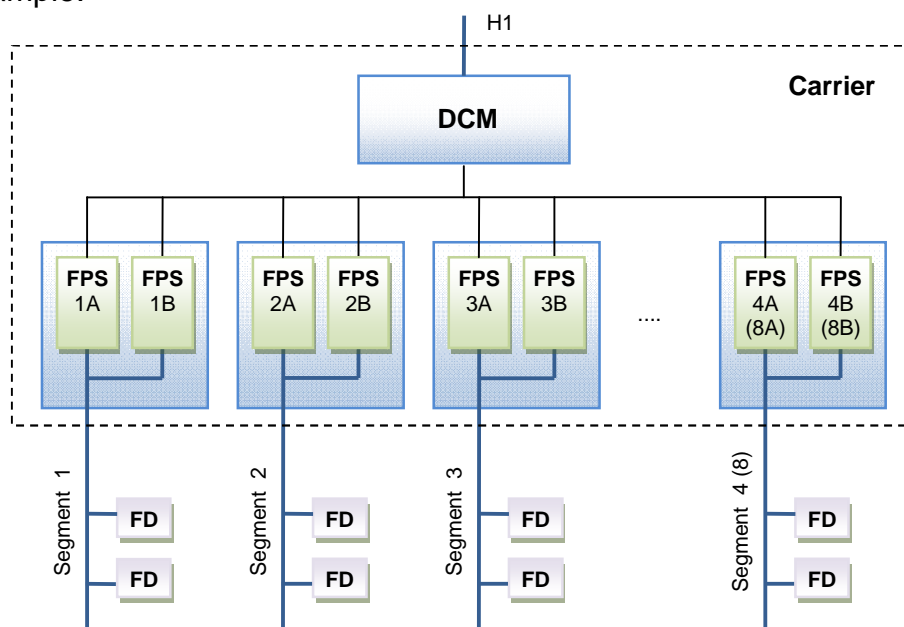
Apart from this 8 segments are always displayed on the H1 interface.

When using FPS redundancy, two FPSs respectively are connected as redundant pairs using special carrier versions.

The DCM displays on H1 only the data of the primary FPS of a segment for the DCS, however, it communicates with both FPS of each redundant pair. In case of an error the backup FPS takes over the function automatically and becomes 'primary'. Malfunctions of the FPS are transmitted as diagnosis messages.

If the redundant bus-Carrier is used for 4 segments (4 FPS pairs), only 4 segments are processed by the DCM, they are represented in the data structure in the TBs of segments 1 - 4. The TBs of the segments 5 - 8 are not updated in this case and signal, status and alarm data of the DCM are reset to the initialization values.

Example:



## DCM - FF H1 interface description

### 2.5 FF Blocks

#### 2.5.1 Ressource Block DCM (RB\_DCM)

##### 2.5.1.1 Mandatory RB parameters according to FF

Rel-Index	Parameter name	Comment	
0	RESOURCE_BLOCK		Standard parameters according to FF-890
1	ST_REV	The revision level of the static data associated with the function block.	
2	TAG_DESCR		
3	STRATEGY		
4	ALERT_KEY		
5	MODE_BLK	The ACTUAL, TARGET, PERMITTED, and NORMAL modes of the block. For further description, see the Mode parameter formal model in FF-890.	
6	BLOCK_ERR	Error Status of the RB. For a list of enumeration values, see FF-890, Block_Err formal model.	
7	RS_STATE		
8	TEST_RW		
9	DD_RESOURCE		
10	MANUFAC_ID	Manufacturer identification number 500 (0x0001F4) = R. STAHL	
11	DEV_TYPE		
12	DEV_REV		
13	DD_REV		
14	GRANT_DENY		
15	HARD_TYPES		
16	RESTART		
17	FEATURES		
18	FEATURES_SEL		
19	CYCLE_TYPE		
20	CYCLE_SEL		
21	MIN_CYCLE_T		
22	MEMORY_SIZE		
23	NV_CYCLE_TIME		
24	FREE_SPACE		
25	FREE_TIME		
26	SHED_RCAS		
27	SHED_ROUT		
28	FAULT_STATE		
29	SET_FSTATE		
30	CLR_FSTATE		
31	MAX_NOTIFY		
32	LIM_NOTIFY		

## DCM - FF H1 interface description

33	CONFIRM_TIME		Standard parameters according to FF-890
34	WRITE_LOCK		
35	UPDATE_EVT	This alert is generated by any change to the static data.	
36	BLOCK_ALM		
37	ALARM_SUM		
38	ACK_OPTION		
39	WRITE_PRI		
40	WRITE_ALM		
41	ITK_VER		

## DCM - FF H1 interface description

### 2.5.1.2 Parameters for Field Diagnostic Alarms

42	FD_VER		Parameters according to FF Field Diagnostics Profile (FF-912)
43	FD_FAIL_ACTIVE		
44	FD_OFFSPEC_ACTIVE		
45	FD_MAINT_ACTIVE		
46	FD_CHECK_ACTIVE		
47	FD_FAIL_MAP		
48	FD_OFFSPEC_MAP		
49	FD_MAINT_MAP		
50	FD_CHECK_MAP		
51	FD_FAIL_MASK		
52	FD_OFFSPEC_MASK		
53	FD_MAINT_MASK		
54	FD_CHECK_MASK		
55	FD_FAIL_ALM		
56	FD_OFFSPEC_ALM		
57	FD_MAINT_ALM		
58	FD_CHECK_ALM		
59	FD_FAIL_PRI		
60	FD_OFFSPEC_PRI		
61	FD_MAINT_PRI		
62	FD_CHECK_PRI		
63	FD_SIMULATE		
64	FD_RECOMMEN_ACT		
65	FD_EXTENDED_ACTIVE_1	For mapping of the alarm data refer to <a href="#">FF Field Diagnostic Alarms</a>	
66	FD_EXTENDED_ACTIVE_2		
67	FD_EXTENDED_ACTIVE_3		

## DCM - FF H1 interface description

### 2.5.1.3 Device Data of DCM, Carrier and FPS

68	DEVICE_DATA_DCM	Data for each device: <ul style="list-style-type: none"> <li>• Prod_ID</li> <li>• Ser_Num</li> <li>• HW_Rev</li> <li>• FW_Rev</li> </ul>	
69	DEVICE_DATA_TR		
70	DEVICE_DATA_FPS1		
71	DEVICE_DATA_FPS2		
72	DEVICE_DATA_FPS3		
73	DEVICE_DATA_FPS4		
74	DEVICE_DATA_FPS5		
75	DEVICE_DATA_FPS6		
76	DEVICE_DATA_FPS7		
77	DEVICE_DATA_FPS8		
78	DEVICE_DATA_FPS9		
79	DEVICE_DATA_FPS10		
80	DEVICE_DATA_FPS11		
81	DEVICE_DATA_FPS12		
82	DEVICE_DATA_FPS13		
83	DEVICE_DATA_FPS14		
84	DEVICE_DATA_FPS15		
85	DEVICE_DATA_FPS16		
86	COMMENT	Comment for user	
87	RED_FPS_SUPP	Used Bus-Carrier type: 0=Single tray / 1=Redundant tray (supports red. FPS)	

## DCM - FF H1 interface description

### 2.5.2 FF Field Diagnostic Alarms

Assignment of the RB parameters according to FF Field Diagnostic Profile (FF-912)

Manuf Spec. Cond. [Bit]	Alarm assignment		Text assignment in EDD	FD_Extended_Active [Bit]	Default MAPS					
0 - 19	Not assigned		-	-	-					
20	Maintenance Required	Maintenance Common alarms of all field devices of a segment	Maint Seg 1 FD	FD_EXTENDED_ACTIVE_1	0	FD_MAINT_MAP				
			Maint Seg 2 FD		1					
			Maint Seg 3 FD		2					
			Maint Seg 4 FD		3					
			Maint Seg 5 FD		4					
			Maint Seg 6 FD		5					
			Maint Seg 7 FD		6					
			Maint Seg 8FD		7					
		21	Maintenance Common alarms for each segment		Maint Seg 1		8			
					Maint Seg 2		9			
					Maint Seg 3		10			
					Maint Seg 4		11			
					Maint Seg 5		12			
					Maint Seg 6		13			
					Maint Seg 7		14			
					Maint Seg 8		15			
		22	Maintenance common alarms of the FPS of a segment		Maint Seg 1 FPS		16			
					Maint Seg 2 FPS		17			
					Maint Seg 3 FPS		18			
					Maint Seg 4 FPS		19			
					Maint Seg 5 FPS		20			
					Maint Seg 6 FPS		21			
					Maint Seg 7 FPS		22			
					Maint Seg 8 FPS		23			
23		Maintenance common alarm DCM	Maint DCM	-	-					
24	Off Spec	OffSpec common alarms of all field devices of a segment	OffSpec Seg 1 FD	FD_EXTENDED_ACTIVE_2	0	FD_OFFSPEC_MAP				
			OffSpec Seg 2 FD		1					
			... Seg 3 - 6		...					
			OffSpec Seg 7 FD		6					
		25	OffSpec common alarms for each segment		OffSpec Seg 1		8			
					OffSpec Seg 2		9			
					... Seg 3 - 6		...			
					OffSpec Seg 7		14			
		26	OffSpec common alarms of the FPS of a segment		OffSpec Seg 1 FPS		16			
					OffSpec Seg 2 FPS		17			
					... Seg 3 - 6		...			
					OffSpec Seg 7 FPS		22			
		27	OffSpec common alarm DCM		OffSpec DCM		-	-		
		28	Fail		Fail Common alarms of all field devices of a segment		Fail Seg 1 FD	FD_EXTENDED_ACTIVE_3	0	FD_FAIL_MAP
							Fail Seg 2 FD		1	
... Seg 3 - 6	...									
Fail Seg 7 FD	6									
29	Fail Common alarms for each segment			Fail Seg 8 FD	7					
				Fail Seg 1	8					
				Fail Seg 2	9					
				... Seg 3 - 6	...					
30	Fail Common alarms of the FPS of a segment	Fail Seg 7	14							
		Fail Seg 8	15							
		Fail Seg 1 FPS	16							
		Fail Seg 2 FPS	17							
31	Fail Common alarms DCM	... Seg 3 - 6	...							
		Fail Seg 7 FPS	22							
		Fail Seg 8 FPS	23							
		Fail DCM	-	-						

## DCM - FF H1 interface description

### 2.5.3 DI Function Block Alarm (DI\_Alarm)

Group error of the entire system,

Parameter	Function	I/O
PV_D	0 = OK 1 = Group error total: If DCM- or segment- or FPS- or H1 device statuses are not OK.	R
Out_D	ident. to PV_D	R
BLOCK_ERR	FF standard error messages of the block	R
Channel	9 = DI_Alarm	R/W

### 2.5.4 DI Function block DCM alarm (DI\_DCM\_Alarm)

Group error of the DCM

Parameter	Function	I/O
PV_D	0 = OK 1 = Group error DCM (Only device alarms DCM without segment or H1 device alarms)	R
Out_D	ident. to PV_D	R
BLOCK_ERR	FF standard error messages of the block	R
Channel	10 = DI_DCM_Alarm	R/W

### 2.5.5 DI Function block Segment (DI\_Seg 1 – 8)

Group error of the segment

Parameter	Function	I/O
PV_D	0 = OK 1 = Group error Segment if the segment or FPS status is not OK.	R
Out_D	ident. to PV_D	R
BLOCK_ERR	FF standard error messages of the block	R
Channel	1 – 8 = segment number	R/W

#### Attention!

The default setting of the Channel parameter is 'Uninitialized' and the FBs remain in 'Out of Service' mode (OOS). Set the Channel parameter according above instructions to take the FBs into operation ('Auto' mode).

## DCM - FF H1 interface description

### 2.5.6 Transducer Block DCM (TB\_DCM)

Rel-Index	Parameter name	Comment	Initial value
0	TB_DCM	-	
1	ST_REV	-	0
2	TAG_DESCR	-	Spaces
3	STRATEGY	-	0
4	ALERT_KEY	-	0
5	MODE_BLK	-	AUTO
6	BLOCK_ERR	-	0
7	UPDATE_EVT	-	0
8	BLOCK_ALM	-	0
9	TRANSDUCER_DIRECTORY	-	0
10	TRANSDUCER_TYPE	-	65535
11	XD_ERROR	-	0
12	COLLECTION_DIRECTORY	-	0
13	PRIMARY_VALUE_D	-	0
14	SUPPLY_A	Measurement Supply voltage A [V]	0
15	SUPPLY_A_LIMIT_HIHI	Upper spec. limit value Supply voltage A [V]	30,0
16	SUPPLY_A_LIMIT_HI	Upper warning limit value Supply voltage A [V]	30,0
17	SUPPLY_A_LIMIT_LO	Lower warning limit value Supply voltage A [V]	19,0
18	SUPPLY_A_LIMIT_LOLO	Lower spec. limit value supply voltage A [V]	19,0
19	SUPPLY_A_ALARM	Bit_3: SUPPLY_A_ALR_HIHI	0
		Bit_2: SUPPLY_A_ALR_HI	0
		Bit_1: SUPPLY_A_ALR_LO	0
		Bit_0: SUPPLY_A_ALR_LOLO	0
20	SUPPLY_A_STATUS	0 - 7	0
21	SUPPLY_B	Measurement Supply voltage B [V]	0
22	SUPPLY_B_LIMIT_HIHI	Upper spec. limit value supply voltage B [V]	30,0
23	SUPPLY_B_LIMIT_HI	Upper warning limit value Supply voltage B [V]	30,0
24	SUPPLY_B_LIMIT_LO	Lower warning limit value Supply voltage B [V]	19,0
25	SUPPLY_B_LIMIT_LOLO	Lower spec. limit value supply voltage B [V]	19,0
26	SUPPLY_B_ALARM	Bit_3: SUPPLY_B_ALR_HIHI	0
		Bit_2: SUPPLY_B_ALR_HI	0
		Bit_1: SUPPLY_B_ALR_LO	0
		Bit_0: SUPPLY_B_ALR_LOLO	0
27	SUPPLY_B_STATUS	0 - 7	0

## DCM - FF H1 interface description

Rel-Index	Parameter name	Comment	Initial value
28	RED_SUPPLY_ENABLE	Reloading switch 'PWR' of bus-Carrier OFF = red. supply / ON = single supply	0
29	RESET_DCM_LIMITS	0 = manual 1 = Reset to defaults	0
30	GRENZWERT_HYSTERESE	Hysteresis for all limit values of the system [%]	2
31	DEV_FAILURE_DCM	Summary bit for all <b>device errors in the DCM which require device replacement.</b> e.g. RAM, ROM, stack error..... Communication error between Stahl µC and carrier µC Communication error between Stahl µC and H1 interface 0=OK / 1= Fail	0
32	DEV_FAILURE_DETAILS	For error details see table below	
33	DIAG_MESSAGE_DCM	Information string from the device, for example for variable transmission of error codes or special events. Only for presentation in the TB and not for automatic processing.	"
34	<b>STATUS_DCM</b>	<b>Collective status of the DCM</b> = greatest value of all DCM status values: Supply_A_status, Supply_B_status, DCM self-test (0-7)	0
35	SEG_STATUS_1	Collective statuses of the segments 1 – 8 for indication using TB_DCM:  <ul style="list-style-type: none"> <li>• Segment_Tag</li> <li>• Status_FPS</li> <li>• Status_Segment</li> <li>• Status_FD</li> </ul> The data content is identical to the parameters with the same name in the segment TBs.	-
36	SEG_STATUS_2		-
37	SEG_STATUS_3		-
38	SEG_STATUS_4		-
39	SEG_STATUS_5		-
40	SEG_STATUS_6		-
41	SEG_STATUS_7		-
42	SEG_STATUS_8		-

### DEV\_FAILURE\_DETAILS: BIT\_ENUMERATED Definition of the parameter

Bit Pos.	BIT_ENUM.	Text assignment in EDD	Bit Pos.	BIT_ENUM.	Text assignment in EDD
1	0x00000001	Configuration Error Segment 1	13	0x00001000	Communication Error DCM
2	0x00000002	Configuration Error Segment 2	14	0x00002000	Communication Error Carrier
3	0x00000004	Configuration Error Segment 3	15	0x00004000	Memory Error
4	0x00000008	Configuration Error Segment 4	16	0x00008000	Firmware Version Mismatch
5	0x00000010	Configuration Error Segment 5	17	0x00010000	General Error (see Diagnostic Message)
6	0x00000020	Configuration Error Segment 6			
7	0x00000040	Configuration Error Segment 7			
8	0x00000080	Configuration Error Segment 8			
9	0x00000100	Configuration Error Supply Voltage A			
10	0x00000200	Configuration Error Supply Voltage B			
11	0x00000400	Configuration Error DCM			
12	0x00000800	(Reserved)			

#### Note:

Configuration error segment x is also reported by means of FF diagnostic alarm 'Maint Seg x'.  
Configuration Error DCM and others in DCM are also reported via FF Diagnostic Alarm 'Maint DCM'.

## DCM - FF H1 interface description

### Messages using Diag\_Message\_DCM

Message text or error code	Cause of error	Solution
FPS slot detection failure	<p>Error of FPS slot detection hardware in DCM. Slot numbers of redundant FPS pairs can't be dedicated.</p> <p><b>Hint:</b> Diagnosis data of FPS are still processed from DCM.</p>	Replace DCM

## 2.5.7 Transducer Block Segment (TB\_Segment)

TB parameters for the segments 1 to 8 of a DCM:

### 2.5.7.1 Standard TB parameters according to FF

Rel. Index	Parameter name	Comment	Initial value
0	TB_SEG_n		
1	ST_REV		0
2	TAG_DESCR		Spaces
3	STRATEGY		0
4	ALERT_KEY		0
5	MODE_BLK		AUTO
6	BLOCK_ERR		0
7	UPDATE_EVT		0
8	BLOCK_ALM		0
9	TRANSDUCER_DIRECTORY		0
10	TRANSDUCER_TYPE		65535
11	XD_ERROR		0
12	COLLECTION_DIRECTORY		0
13	PRIMARY_VALUE_D		0

Standard parameters according to FF-902

## DCM - FF H1 interface description

### 2.5.7.2 Segment-specific parameters

14	SEGMENT_ENABLE	Segment monitoring : 0 = Disable / 1 = Enable Disable: Unused segments can be disabled. -> Parameters of the FBs contain initialisation values. -> Alarms are deleted and statuses are set to 'Diagnosis passive'. -> Monitoring of the associated FPS is disabled to suppress alarms of FPS connected unintentionally.	1
15	RESET_MIN_MAX	Reset all min- / max- values in current segment 0 =Operation / 1 = Reset	0
16	RESET_SEG_LIMITS	Set Limits in current Segment to Default values 0 = manual 1 = Reset to def. (norm sig qual) 2 = Reset to def. (med sig qual) 3 = Reset to def. (high sig qual) 4 = Copy Seg Lim to other Seg.	0
17	NUM_FD	<b>Number of available H1 devices (responding) at segment</b>	
18	NUM_FD_LIM_HI		32
19	NUM_FD_LIM_LO		0
20	NUM_FD_LIM_ALARM	Bit_2: No_FD_lim_HI_alarm	0
		Bit_1: No_FD_lim_LO_alarm	0
21	NUM_FD_STATUS	0-7	0
22	OUT_VOLTAGE	<b>Segment voltage [V]</b>	
23	OUT_VOLTAGE_LIM_HI	Default values depending on the FPS type are used in case of a manual reset via RESET_SEG_LIMITS (see table below).	30,4
24	OUT_VOLTAGE_LIM_HIHI		30,4
25	OUT_VOLTAGE_LIM_LO		15
26	OUT_VOLTAGE_LIM_LOLO		15
27	OUT_VOLTAGE_LIM_ALARM	Bit_3: Out_voltage_lim_HIHI_alarm	
		Bit_2: Out_voltage_lim_HI_alarm	
		Bit_1: Out_voltage_lim_Lo_alarm	
		Bit_0: Out_voltage_lim_LoLo_alarm	
28	OUT_VOLTAGE_STATUS	0-7	0
29	OUT_CURRENT	<b>Segment current [mA]</b>	
30	OUT_CURRENT_LIM_HI	<= 500 mA :                   redundant or single operation >500mA to 1000 mA :       boost operation of FPS pair.	500
31	OUT_CURRENT_LIM_HIHI		500
32	OUT_CURRENT_LIM_ALARM	Bit_3: Out_current_lim_HIHI_alarm	
		Bit_2: Out_current_lim_HI_alarm	
33	OUT_CURRENT_STATUS	0-7	0
34	SIG_LEV_MIN	<b>Lowest signal level of all devices (level) [mV]</b>	
35	SIG_LEV_MIN_LIM_LO		230
36	SIG_LEV_MIN_LIM_LOLO		230
37	SIG_LEV_LIM_LO_ALARM	Bit_1: SigLev_min_lim_LO_alarm	

## DCM - FF H1 interface description

		Bit_0: SigLev_min_lim_LOLO_alarm		
38	SIG_LEV_MIN_STATUS	0-7		0
39	SIG_LEV_MAX	<b>Highest signal level of all devices (level) [mV]</b>		
40	SIG_LEV_MAX_LIM_HI			1200
41	SIG_LEV_MAX_LIM_HIHI			1200
42	SIG_LEV_LIM_HI_ALARM	Bit_3: SigLev_max_lim_HIHI_alarm		
		Bit_2: SigLev_max_lim_HI_alarm		
43	SIG_LEV_MAX_STATUS	0-7		0
44	NOISE	<b>Average In-band weighted noise [mV] Noise in the H1 frequency range</b>		
45	NOISE_LIM_HI			50
46	NOISE_LIM_HIHI			50
47	NOISE_LIM_HI_ALARM	Bit_3: Noise_lim_HIHI_alarm		
		Bit_2: Noise_lim_HI_alarm		
48	NOISE_STATUS	0-7		0
49	JITTER_PEAK	<b>Maximum signal jitter in the zero crossing of all devices in the segment [µs]</b>		
50	JITTER_PEAK_LIM_HI			3,2
51	JITTER_PEAK_LIM_HIHI			3,2
52	JITTER_PEAK_LIM_ALARM	Bit_3: Jitter_peak_lim_HIHI_alarm		
		Bit_2: Jitter_peak_lim_HI_alarm		
53	JITTER_PEAK_STATUS	0-7		0
54	OTHER_DIAG	Bit_0: <b>TERMINATOR</b> indicates the terminator switch setting at FPS 1 = Terminator on; 0 = Terminator off -> Only indication without influence on the collective status of the segment		0
		Bit_1: <b>TERMINATOR_ERR_DETC</b> 0 = OK / 1 = Terminator error detected (not all terminator errors can be detected, for example multiple termination)		0
		Bit_2: <b>SHORTCIRCUIT</b> 0 = OK / 1 = short-circuit at the segment		0
		Bit_3: <b>SPUR_SHORT_ERR</b> Short-circuit on at least one spur of the connected FDCs. 0 = OK / 1 = Short (in preparation)		0
		Bit_4: <b>COMM_DETC</b> 1 = H1 communication detected (request or response) Alarm if no communication on the segment effecting the collective status of the segment.		0
55	UNBALANCE	Bit_0: UNBALANCE_LO 1 = <b>short signal-</b> to shield		0
		Bit_1: UNBALANCE_HI 1 = <b>short signal+</b> to shield		0
56	<b>STATUS_SEGMENT</b>	<b>Common status of the segment</b> = greatest value of all segment status values: NUM_FD_STATUS, NOISE_STATUS, UNBALANCE_LO, UNBALANCE_HI, JITTER_PEAK_STATUS, OUT_VOLTAGE_STATUS, OUT_CURRENT_STATUS, SIG_LEV_MIN_STATUS, SIG_LEV_MAX_STATUS, OTHER_DIAG		0

## DCM - FF H1 interface description

### RESET\_SEG\_LIMITS

RESET_SEG_LIMITS	Function
0 = manual	Normal operation. The LIMIT values of the current segment are manually changeable.
1 = Reset to defaults (normal signal quality)	Reset of the LIMIT values of the segment to default values with different requirements to the signal quality -> see tables below.
2 = Reset to defaults (medium signal quality)	
3 = Reset to defaults (high signal quality)	
4 = Copy segment limits to other segment	The LIMIT values of the current segment are copied to other segments of the DCM. <b>Attention!</b> Previous settings of the LIMIT values are overwritten without using Undo.

### Segment limit default values depending on the signal quality:

Signal quality	normal (IEC requirements)	medium	high
<b>Usage</b>	≥10 spurs, cable length < 1900 m, Ex i FDCs	<10 spurs, cable length < 1000 m	<10 spurs, cable length < 300 m, no Ex i FDCs
<b>Parameter</b>			
SIG_LEV_MIN_LIM_LO SIG_LEV_MIN_LIM_LOLO	230 230	460 460	600 600
SIG_LEV_MAX_LIM_HI SIG_LEV_MAX_LIM_HIHI	1200 1200	1200 1200	1200 1200
NOISE_LIM_HI NOISE_LIM_HIHI	50 50	40 40	30 30
JITTER_PEAK_LIM_HI JITTER_PEAK_LIM_HIHI	3.2 3.2	2.6 2.6	2.0 2.0

### Segment limit default values depending on FPS type:

FPS type	9412/00-...	9412/01-...	9412/02-...	Defaults without FPS
<b>Parameter</b>				
OUT_VOLTAGE_LIM_HIHI	30.4	17.3	23.7	30.4
OUT_VOLTAGE_LIM_HI	30.4	17.3	23.7	30.4
OUT_VOLTAGE_LIM_LO	28.0	15	21.4	15
OUT_VOLTAGE_LIM_LOLO	28.0	15	21,4	15

## DCM - FF H1 interface description

### 2.5.7.3 FPS specific parameters:

Rel. Index	Parameter name	Comment	Initial value
57	FPS_GENERAL	<b>Bit_0: TRUNKPOWER</b> 0 = Trunk powered; 1 = Trunk not powered Only for indication - no effect on the status!	0
		<b>Bit_1: TERMINATOR_ERR</b> 1 = message if the 'Terminator' switch is not identical in the FPS pair.	0
		<b>Bit_2: VERSION_ERR</b> 1 = FPS pair is incompatible. Replace devices	0
		<b>Bit_3: 1 = OVERTEMPERATURE</b>	0
58	MODE	0 = Simplex operation FPS 1 = Redundant or Boost operation 2 = Redundant or Boost operation 3 = undefined Only for indication - no effect on the status!	0
59	FPS_COMMENT	<b>Comment for user</b>	“
60	DIS_RED_WARN_FPS	<b>FPS redundancy Warnings</b> of an FPS pair: 0= Enable / 1 = Disable for example for Single operation of an FPS in a redundant bus-Carrier.	0
61	DEV_FAIL_FPS	<b>Device error FPS</b> 0=OK / 1 = device error -> Device must be replaced. Details are reported via Diag_Message_FPS.	0
62	DIAG_MESSAGE_FPS	<b>Information string from the FPS</b> , for example for variable transfer of error codes or special events. Only for presentation in the TB, not for automatic processing.	“
63	STATUS_FPS	<b>Collective status of the FPS</b> = greatest value of all FPS status values or if error bits = 1 including self-test error messages from FPS as well as communication errors between FPS and DCM.	0

### Messages using Diag\_Message\_FPS

Message text or error code	Cause of error	Solution
FPS slot x doesn't power!	The redundant module does not supply any current. Faulty assembly or defective.	<ul style="list-style-type: none"> <li>• Check the correct positioning in the bus-Carrier</li> <li>• Check wiring in case of operation without Carrier</li> <li>• replace one of the redundant FPSs</li> </ul>
FPS slot x not available	No response from one FPS of a redundant pair.	Replace FPS in slot x.

## DCM - FF H1 interface description

### 2.5.7.4 FF Field Device-specific Parameters:

Rel-Index	Parameter name	Comment																						
64	DEV_DIAG_1	<table border="1"> <tr> <th colspan="2">DEV_DIAG_x parameter per FF field device ( x = 1 – 32):</th> </tr> <tr> <td><b>FD_Address</b></td> <td>Address of the field devices</td> </tr> <tr> <td><b>FD_Jitter_akt</b></td> <td>Jitter measurement in the zero cycle of the field devices</td> </tr> <tr> <td><b>FD_Jitter_max</b></td> <td>Jitter measurement – max. value saved in the DCM</td> </tr> <tr> <td><b>FD_Jitter_status</b></td> <td>Status for FD jitter The Jitter Limit values of the segment are used for generation of FD_Jitter_status</td> </tr> <tr> <td><b>FD_SigLev_akt</b></td> <td>Signal level of the field devices on the segment</td> </tr> <tr> <td><b>FD_SigLev_min</b></td> <td>Signal level – min. value saved in the DCM</td> </tr> <tr> <td><b>FD_SigLev_max</b></td> <td>Signal level – max. value saved in the DCM</td> </tr> <tr> <td><b>FD_SigLev_status</b></td> <td>Status for Signal Level. The Signal Level Limit values of the segment are used for generation of FD_SigLev_status</td> </tr> <tr> <td><b>FD_Live</b></td> <td>0 = Not Responding / 1 = Operational (Live) <b>*1)</b> Only for indication.</td> </tr> <tr> <td><b>FD_Status</b></td> <td>Collective status of a H1 Dev</td> </tr> </table>	DEV_DIAG_x parameter per FF field device ( x = 1 – 32):		<b>FD_Address</b>	Address of the field devices	<b>FD_Jitter_akt</b>	Jitter measurement in the zero cycle of the field devices	<b>FD_Jitter_max</b>	Jitter measurement – max. value saved in the DCM	<b>FD_Jitter_status</b>	Status for FD jitter The Jitter Limit values of the segment are used for generation of FD_Jitter_status	<b>FD_SigLev_akt</b>	Signal level of the field devices on the segment	<b>FD_SigLev_min</b>	Signal level – min. value saved in the DCM	<b>FD_SigLev_max</b>	Signal level – max. value saved in the DCM	<b>FD_SigLev_status</b>	Status for Signal Level. The Signal Level Limit values of the segment are used for generation of FD_SigLev_status	<b>FD_Live</b>	0 = Not Responding / 1 = Operational (Live) <b>*1)</b> Only for indication.	<b>FD_Status</b>	Collective status of a H1 Dev
DEV_DIAG_x parameter per FF field device ( x = 1 – 32):																								
<b>FD_Address</b>	Address of the field devices																							
<b>FD_Jitter_akt</b>	Jitter measurement in the zero cycle of the field devices																							
<b>FD_Jitter_max</b>	Jitter measurement – max. value saved in the DCM																							
<b>FD_Jitter_status</b>	Status for FD jitter The Jitter Limit values of the segment are used for generation of FD_Jitter_status																							
<b>FD_SigLev_akt</b>	Signal level of the field devices on the segment																							
<b>FD_SigLev_min</b>	Signal level – min. value saved in the DCM																							
<b>FD_SigLev_max</b>	Signal level – max. value saved in the DCM																							
<b>FD_SigLev_status</b>	Status for Signal Level. The Signal Level Limit values of the segment are used for generation of FD_SigLev_status																							
<b>FD_Live</b>	0 = Not Responding / 1 = Operational (Live) <b>*1)</b> Only for indication.																							
<b>FD_Status</b>	Collective status of a H1 Dev																							
65	DEV_DIAG_2																							
66	DEV_DIAG_3																							
67	DEV_DIAG_4																							
68	DEV_DIAG_5																							
69	DEV_DIAG_6																							
70	DEV_DIAG_7																							
71	DEV_DIAG_8																							
72	DEV_DIAG_9																							
73	DEV_DIAG_10																							
74	DEV_DIAG_11																							
75	DEV_DIAG_12																							
76	DEV_DIAG_13																							
77	DEV_DIAG_14																							
78	DEV_DIAG_15																							
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89	DEV_DIAG_26																							
90	DEV_DIAG_27																							
91	DEV_DIAG_28																							
92	DEV_DIAG_29																							
93	DEV_DIAG_30																							
94	DEV_DIAG_31																							
95	DEV_DIAG_32																							
96	<b>STATUS_FD</b>	<b>Collective status of all H1 field devices of a segment</b> = greatest value of all H1 dev. status values of the segment: FD_Jitter_STATUS, FD_SigLev_STATUS, FD_STATUS																						

**\*1) FD\_Live = Operational (Live)**

All telegram responses of the H1 Field Device are detected. Indication also in cases where a H1 device is connected physically to the bus and well powered but not detected by the DCS and only livelist telegrams are performed due to protocol technical errors.

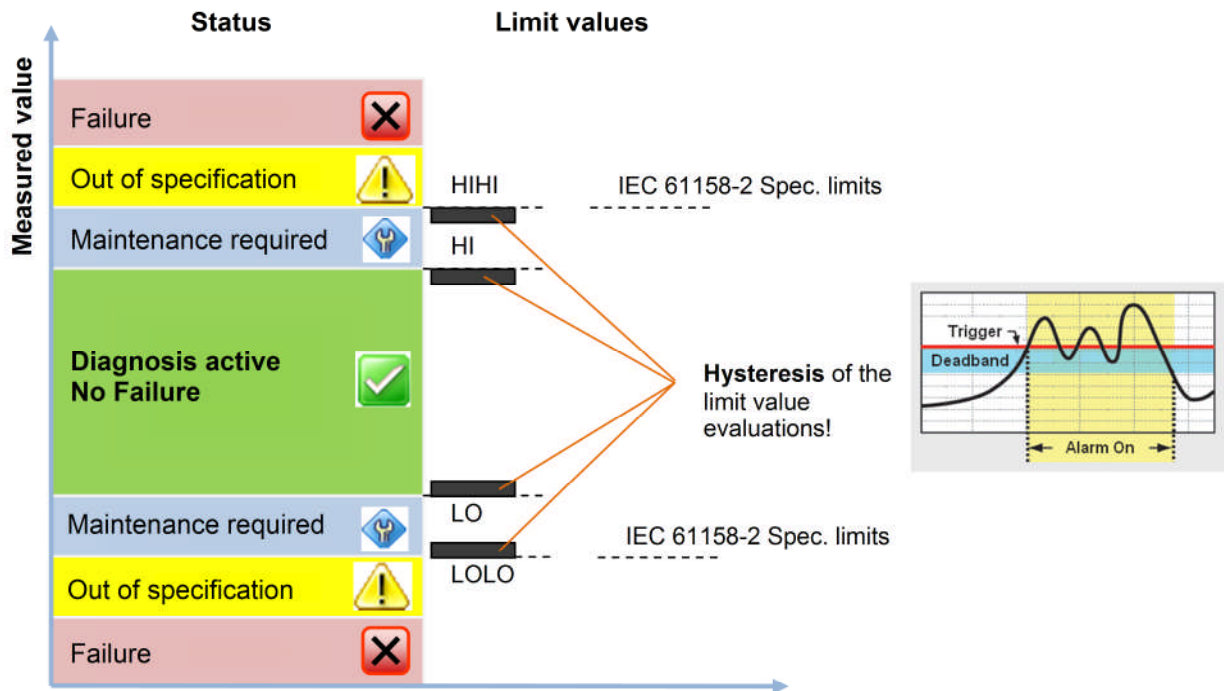
### 2.5.7.5 Assignment of the FF H1 Field Devices

H1 field devices connected at the H1 segment are automatically detected by the FPS. The device-specific diagnostic data of the FF devices are allocated according to the addresses in the ascending order to positions 1 - 32 of the TB parameters of the corresponding segment.

## DCM - FF H1 interface description

### 2.6 Status, Warning Limit and Indications According to NE 107

The measured values of the FPS are checked in the DCM as regards the limit values (HIHI; HI, LO, LOLO), information for the alarm flags as well as the signal status is generated on the basis of these data. On the basis of alarm flags and signal status message texts are assigned using EDD in the User Interface.



Icon	Information	Text message	Status coding	LED SEG 1-8	NAMUR Definition
-	No icon displayed	„-“	0	OFF	-
	Diagnosis passive	Diagnosis passive	1		-
	Diagnosis active no Errors	OK	2		The output signal is valid
	Maintenance required	Maintenance required	3	Blinks	The output signal is still valid, but function can be restricted soon.
		Red. FPS Dev. Failure *1)	4		
	Out of specification	Out of specification	5	ON	The device is operated outside of its specified range.
	Failure	Device Failure	7		Due to malfunction the output signal is invalid.

\*1) for red. FPS pairs the segment is operated further in case of FPS failure -> Therefore, Maintenance required !  
During Boost operation -> Device failure!

## DCM - FF H1 interface description

### Default values of the limit values according to IEC IEC 61158-2:

The default values of the HIHI and LOLO limit values are set if possible to the limit values specified in IEC. The parameters can be changed by the user.

### Reset of the limit value parameters and min. / max. values to default values

- Reset\_DCM\_Limits: Set limits in the DCM to default values
- Reset\_SegLimits: Set limits in the current segment to default values
- Reset\_Min\_Max: Reset all min. / max. values in the current segment

The default FF parameter 'Restart' of the Resource block is not used to reset the limit values.

### Hysteresis of the limit values:

Each limit value check has a hysteresis range to avoid jittering of alarm messages. The hysteresis size can be adjusted centrally as percentage value 'Limit value hysteresis' of the DCM for all limit value checks of all 4 or 8 Segments of one DCM.

Adjustable range = 0 – 10% related to a hysteresis base value which is individually defined for each measurement type. Default value = 2%

The hysteresis is on one side in the "good" range of the signal. Thus, the set limit value always remains effective irrespective of the set hysteresis.

### Tests of user specifications for limit values in the DCM:

- **HIHI > HI**
- **HI > LO**
- **LOLO < LO**
- **HIHI = HI** and **LOLO = LO** are permitted. If equal, no 'Maintenance required' status is generated.

### Permitted ranges for limit values.

Appropriate value ranges for the limit value specification by the user are defined in the DCM, they are checked there and in case of error they are reported by means of the DEV\_FAILURE\_DETAILS parameter.

### Reaction in case of error:

- TBS: BlockError = Config error  
Device\_Failure\_Details = Configuration error
- FBs: BlockError = Config error  
Status of the DI bits = bad
- Mode of the blocks is not changed. No OOS

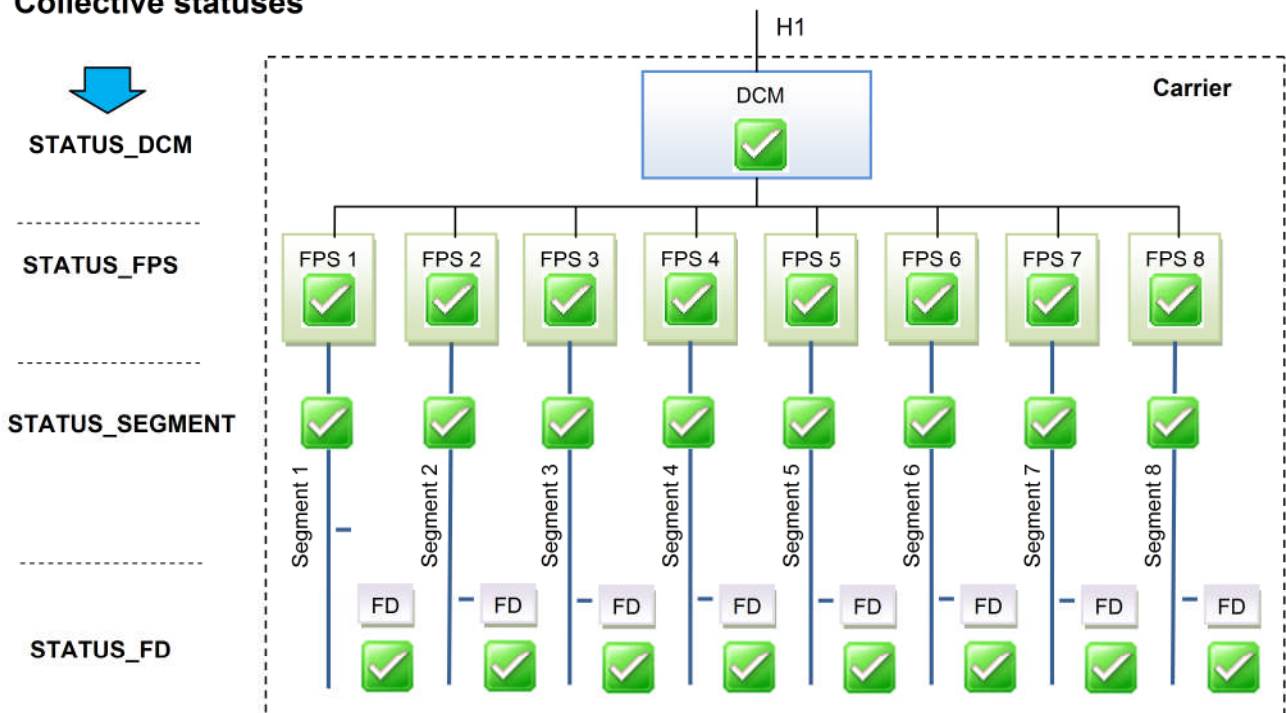
## DCM - FF H1 interface description

### 2.6.1 Generation of the Status Data

The status values of the individual measurements are collected in collective statuses for each group. Collective status = worst status value of the group

Group	Collective statuses	Segment	Measurements with status	
DCM	STATUS_DCM	-	SUPPLY_A	Measurement Supply voltage A [V]
			SUPPLY_B	Measurement Supply voltage B [V]
			DEV_FAILURE_DCM	Device error DCM
FPS	STATUS_FPS	1 - 8	TERMINATOR_ERR	Tests for redundant FPS pairs
			VERSION_ERR	
			OVERTEMPERATURE	Temperature in the FPS
			DEV_FAIL_FPS	Device error FPS
Segment	STATUS_SEGMENT	1 - 8	NUM_FD	Number of H1 FD (responding) at the segment
			OUT_VOLTAGE	Segment voltage [V]
			OUT_CURRENT	Segment current [mA]
			SIG_LEV_MIN	Lowest signal level of all devices [mV]
			SIG_LEV_MAX	Highest signal level of all devices [mV]
			NOISE	Average In-band weighted noise [mV]
			JITTER_PEAK	Maximum signal jitter in the zero crossing of all devices in the segment [µs]
			UNBALANCE	Short signal to shield
			OTHER_DIAG	TERMINATOR_ERR_DETC, SHORTCIRCUIT, SPUR_SHORT_ERR, COMM_DETC
			Field devices FD (1 – 32)	STATUS_FD
FD_SigLev_curr	Signal level of the field devices at the segment			

### Collective statuses



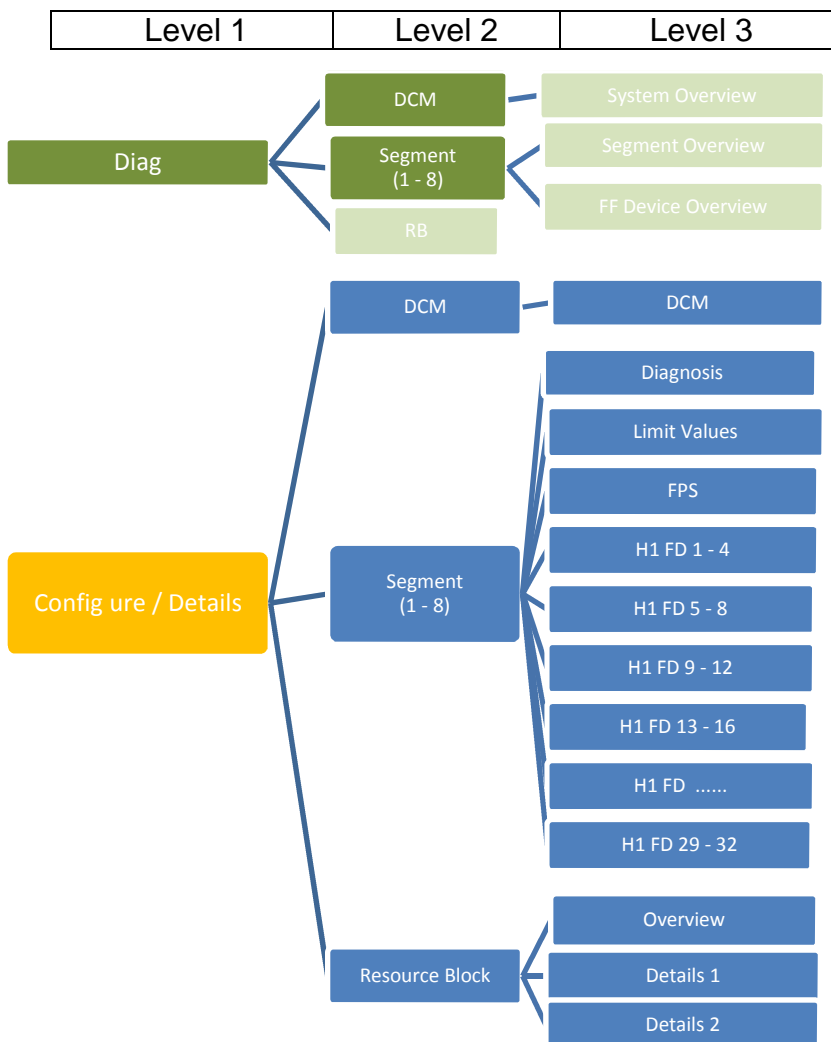
## DCM - FF H1 interface description

### 2.7 LED Displays of DCM

Name	Color	Allocation	Function
PWR	Green	DCM global	On = OK Off = No 24 V supply Flashing = No supply of H1 connection DCM
ERR	Red		Off = OK Flashing = Maintenance *1) On = Out of Spec. or Failure. *1)
SEG	Red		one LED per Segment Off = Segment OK (FPS, Segment, FD) Flashing = Maintenance *1) On = Out of Spec. or Failure. *1)

\*1) Details readable per software

### 2.8 Menu Structure TB and RB



## DCM - FF H1 interface description

### 2.9 Screen Masks

#### 2.9.1 Diag overview – DCM - System overview

<b>DCM</b> Status: <input type="text" value="OK"/>	
<b>Segment 1</b> Tag: <input type="text" value="SegTag1"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>	<b>Segment 5</b> Tag: <input type="text" value="SegTag5"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>
<b>Segment 2</b> Tag: <input type="text" value="disabled"/> FPS: <input type="text" value="Diagnosis passive"/> Segment: <input type="text" value="Diagnosis passive"/> H1 Devices: <input type="text" value="Diagnosis passive"/>	<b>Segment 6</b> Tag: <input type="text" value="SegTag6"/> FPS: <input type="text" value="Maintenance required"/> Segment: <input type="text" value="Out of specification"/> H1 Devices: <input type="text" value="Device Failure"/>
<b>Segment 3</b> Tag: <input type="text" value="SegTag3"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>	<b>Segment 7</b> Tag: <input type="text" value="SegTag7"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>
<b>Segment 4</b> Tag: <input type="text" value="SegTag4"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>	<b>Segment 8</b> Tag: <input type="text" value="SegTag8"/> FPS: <input type="text" value="OK"/> Segment: <input type="text" value="OK"/> H1 Devices: <input type="text" value="OK"/>

#### 2.9.2 Diag Overview – Segment

##### Register 1: Segment Overview

TAG_DESC	<input type="text" value="Segment_Tag"/>
Segment Monitoring	<input type="text" value="enabled"/>
Segment Status	<input type="text" value="OK"/>
FPS Status	<input type="text" value="Maintenance required"/>

##### Register 2: FF Device Overview

Num	FD	Addr	Status	Num	FD	Addr	Status
1	16		OK	9	-	-	
2	32		OK	10	9		OffSpec
3	251		OK	11	-	-	
4	-	-		12	-	-	
5	-	-		13	39		OK
6	-	-		14	-	-	
7	17		Maintenance required	15	-	-	
8	-	-		16	-	-	

## DCM - FF H1 interface description

### 2.9.3 Config\_Details - DCM - Diagnosis communication module

**DCM Information**

TAG\_DESC

**Supply Voltage**

Supply A  V

Supply B  V

**Settings**

	LOLO		LO		HI		HIHI
Supply A	<input type="text" value="26,0"/> V		<input type="text" value="29,3"/> V		<input type="text" value="30,5"/> V		<input type="text" value="32,0"/> V
Supply B	<input type="text" value="26,0"/> V		<input type="text" value="29,3"/> V		<input type="text" value="30,5"/> V		<input type="text" value="32,0"/> V

Set DCM limits

Hysteresis  %

**Diagnosis**

DCM Device Status

Diagnosis information

Device Failure Details

- Configuration Error Segment 1
- Configuration Error Segment 2
- Configuration Error Segment 3
- Configuration Error Segment 4
- Configuration Error Segment 5
- Configuration Error Segment 6
- Configuration Error Segment 7
- Configuration Error Segment 8
- Configuration Error Supply Voltage A
- Configuration Error Supply Voltage B
- Configuration Error DCM
- Reserved
- Communication Error DCM
- Communication Error Carrier
- Memory Error
- Firmware Version Mismatch
- General Error, see Diagnostic Message

## DCM - FF H1 interface description

### 2.9.4 Config\_Details – Segment x (x = 1 – 8)

#### Register 1: Diagnosis

**Segment Information**

TAG\_DEDC:       FPS Status:

Monitoring:       FPS Diag:

Terminator on

---

**Segment Diagnosis**

Num H1 Devices	<input type="text" value="12"/>	<input type="text" value="OK"/>
Voltage	<input type="text" value="29,3"/> V	<input type="text" value="OK"/>
Current	<input type="text" value="23"/> mA	<input type="text" value="OK"/>
Signal Level Min	<input type="text" value="150"/> mV	<input type="text" value="OK"/>
Signal Level Max	<input type="text" value="257"/> mV	<input type="text" value="OK"/>
Noise	<input type="text" value="15"/> mV	<input type="text" value="OK"/>
Jitter Max	<input type="text" value="7,3"/> µs	<input type="text" value="OK"/>

---

**Segment Alarms**

<input checked="" type="checkbox"/> Terminator error	<input checked="" type="checkbox"/> Short S- to shield
<input checked="" type="checkbox"/> Shortage segment	<input checked="" type="checkbox"/> Short S+ to shield
<input checked="" type="checkbox"/> Spur shortage behind FDC	<input checked="" type="checkbox"/> H1 communication active

#### Register 2: Limit Values

	LOLO		LO		HI		HIHI
Num H1 devices	---		<input type="text" value="1"/>		<input type="text" value="32"/>		---
Segment voltage	<input type="text" value="25,2"/> V		<input type="text" value="26,3"/> V		<input type="text" value="30,7"/> V		<input type="text" value="32,0"/> V
Segment current	---		---		<input type="text" value="1500"/> mA		<input type="text" value="1550"/> mA
Min signal level	<input type="text" value="100"/> mV		<input type="text" value="120"/> mV		---		---
Max signal level	---		---		<input type="text" value="350"/> mV		<input type="text" value="375"/> mV
Noise	---		---		<input type="text" value="15"/> mV		<input type="text" value="20"/> mV
Jitter peak	---		---		<input type="text" value="6,3"/> µs		<input type="text" value="6,7"/> µs
Set limits in current segment	<input type="text" value="manual"/> <input type="text" value="manual"/> <input type="text" value="reset to default"/>						

## DCM - FF H1 interface description

### 2.9.5 Config\_Details – Segment x - FPS ( x = 1 – 8)

**FPS Segment**

TAG\_DESC

FPS red. warnings enable    FPS Comment

**FPS Alarms**

● Over temperature ● unequal Terminator settings

● FPS device error ● Pair incompatible

**FPS Diagnosis**

Trunk Power  FPS Status

Mode  Diag Message

### 2.9.6 Config\_Details – Segment x - H1 FD

	Device 1	Device 2	Device 3	Device 4
Address	<input type="text" value="4"/>	<input type="text" value="12"/>	<input type="text" value="18"/>	<input type="text" value="0"/>
Live	<input type="text" value="operational"/>	<input type="text" value="operational"/>	<input type="text" value="operational"/>	<input type="text" value="not responding"/>
Signal Status	<input type="text" value="OK"/>	<input type="text" value="Out of Spec."/>	<input type="text" value="OK"/>	<input type="text" value="-"/>
Jitter Status	<input type="text" value="OK"/>	<input type="text" value="OK"/>	<input type="text" value="OK"/>	<input type="text" value="-"/>
Signal Min	<input type="text" value="850"/> mV	<input type="text" value="852"/> mV	<input type="text" value="851"/> mV	<input type="text" value="0"/> mV
Signal	<input type="text" value="907"/> mV	<input type="text" value="1402"/> mV	<input type="text" value="900"/> mV	<input type="text" value="0"/> mV
Signal Max	<input type="text" value="950"/> mV	<input type="text" value="1402"/> mV	<input type="text" value="950"/> mV	<input type="text" value="0"/> mV
Jitter	<input type="text" value="5,1"/> μs	<input type="text" value="5,2"/> μs	<input type="text" value="5,2"/> μs	<input type="text" value="0"/> μs
Jitter Max	<input type="text" value="6,1"/> μs	<input type="text" value="6,1"/> μs	<input type="text" value="6,2"/> μs	<input type="text" value="0"/> μs
Min / Max values in current segment	<span>operation</span> <input type="button" value="v"/> <input type="button" value="operation"/> <input type="button" value="reset"/>			
<b>Segment limits</b>				
Signal	LOLO <input type="text" value="220"/> mV	LO <input type="text" value="220"/> mV	HI <input type="text" value="1200"/> mV	HIHI <input type="text" value="1200"/> mV
Jitter	---	---	<input type="text" value="5,7"/> μs	<input type="text" value="6,2"/> μs

\*1) Reset for all min. / max. drag pointer of all H1 device measurements (values of jitter and signal Level) in the current segment.  
 After PowerOn the min./max. values are set automatically to the first valid measured value.

## DCM - FF H1 interface description

### 2.9.7 Resource Block

#### Register 1: Overview

TAG_DESC	Block_Tag_String
Comment	User defined
Product Number	9415/...-...-
Address	9
Manufacturer	R. STAHL Schaltgeraete GmbH
Carrier Type	single FP5

#### Register 2: Details 1

	Product Number	Serial Number	Hardware Rev.	Firmware Rev.
DCM	9415/...-...-	1234567-1234	'A'	01-06
Carrier	9419/08-R-YO-0-01-C1	5613846-3654	'A'	03-24
FP51	9412/00-310-11	6459659-4456	'C'	02-17
FP52	9412/00-310-11	3645967-4542	'C'	02-17
FP53	9412/00-310-11	4456239-0125	'B'	02-16
FP54	9412/00-310-11	1236549-9665	'C'	02-17
FP55	-	-	-	-
FP56	-	-	-	-
FP57	9412/00-310-11	9865612-1723	'A'	02-16
FP58	9412/00-310-11	6533654-5546	'A'	02-16

#### Register 3: Details 2

FPS 9 to 16 as above.

## DCM - FF H1 interface description

### 3 Commissioning

#### 3.1 Overview

##### Planning of the entire network:

- What FF H1 hosts (DCS, PLCs ..) are on the network
- What FF H1 field devices are on the network
- Selection of the network supply and topology (FDCs, FPS ...)
- DCM to be configured as a device on the network at address 'x' or on a dedicated segment.
- Unambiguous assignment of the H1 addresses. (normally checked by the host)

##### Perform commissioning:

- Mechanical assembly of the carrier with FPS and DCM (see operating instructions of Series 9412)
- Mechanical assembly of FDCs (see operating instructions of Series 9411)
- Mechanical assembly of all H1 field devices (FD)
  
- Establish H1 bus connections.
  
- Connect the carrier with FPS and DCM to the power supply.  
Thus, all H1 segments with connected H1 FD are also supplied with energy.
  
- Designing FF H1 host:
  - Import EDDs of all FF H1 FDs (including the DCM) in the FF configurator of the host
  - Assign (configure) H1 FDs to H1 host interfaces of the DCS
  - Assign (configure) DCM to the H1 host interfaces of the DCS and set parameters
  
- Commission H1 host.  
For the automatic start of the cyclic communication on H1.
  
- Check communication on H1 using the following auxiliary means:
  - Diagnostic data of the H1 host regarding H1 communication with DCM and with FD.
  
- Diagnosis of FPS, segments and H1 field devices
  - using the DCM functions (DI FBs, alarms, status parameters of TB and RB)
  - Segment LEDs of the DCM
  - LEDs of the FPS
  - LEDs of the FDCs

## 4 Data Communication

### 4.1 System Start

Device data and parameters are saved in the DCM permanently.

After Power On all data can be accessed in the DCM via H1 and the DCM starts the diagnostic measurements automatically.

All parameters have pre-assigned default values ex works. The screen masks described in the EDD can be used to change all parameters if necessary and save them on the device.

### 4.2 Online Parameter Changes

Configuration and parameter changes are possible both in the Out Of Service (OOS) and AUTO mode (MODE\_BLK.ACTUAL).

**Note:** For standard FFH1 fieldbus devices configuration changes are possible only in the OOS mode. Since the DCM does not provide process data but diagnosis data, changes are also possible in the AUTO mode.

## DCM - FF H1 interface description

### 5 Firmware Download

Firmware updates of the DCM can be downloaded using an associated PC Tool using a serial interface.

After the download has been started by means of the PC tool, the DCM is decommissioned for the time of the download (approx. 7 min) and cannot be contacted via H1 fieldbus anymore.

After completing the firmware download the DCM boots and returns to normal operating state.

### 6 Known Errors:

Error Description	Reason	Remedy
DI FBs are in OOS Mode.	Parameter 'Channel' is not set and is in 'Uninitialized' state.	Set Target Mode of DI FB to 'OOS'. Set Channel Parameter Set Target Mode of DI FB to 'Auto'.

### 7 List of abbreviations:

DCM	Diagnosis Communication Module
FPS	Fieldbus Power Supply
FDC	Field Device Coupler
FD	Field Device or Field Diagnostics
FB	Function Block
RB	Resource Block
TB	Transducer Block
FF	Fieldbus Foundation
H1	Name of Fieldbus from Fieldbus Foundation
AS	Automation System
HW	Hardware
FW	Firmware
PDU	Protocol Data Unit

## DCM - FF H1 interface description

### 8 Release notes:

Version	Extensions / Changes
Interface description DCM	
V 1.00	First Revision

### 9 Further reading

Find more details about FF H1 communication on: [www.fieldbus.org/](http://www.fieldbus.org/)

### 10 Support address

**R. STAHL Schaltgeraete GmbH**

Center of Competence Instrumentation Systems

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Support information: <http://www.stahl.de>

Service hotline: +49 (7942) 943-4123

Fax : +49 (7942) 943-40 4123