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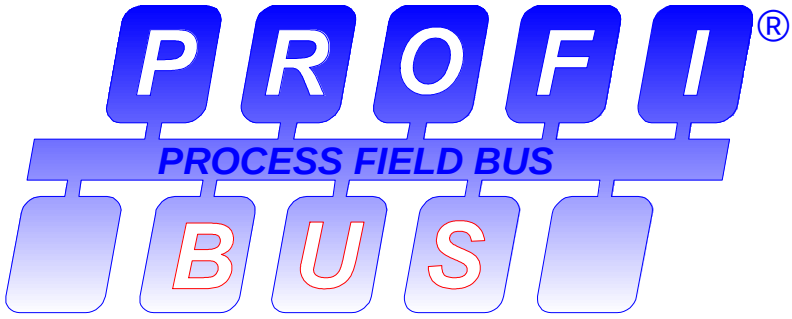

PROFIBUS

Draft
PROFIBUS Guideline

GSD-Specification
for PROFIBUS-DP

GSD Revision 2
Version 1.0, October 1998

PROFIBUS Richtlinie - Best.-Nr. 2.122

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Draft
Technical Guideline
GSD-Specification for PROFIBUS-DP

GSD Revision 2
Version 1.0, October 1998

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1 Preface to GSD Revision 2

The development of the PROFIBUS product range also entails enhancements as regards the device properties and features to be described in the GSD files. These developments, in particular the introduction of PROFIBUS-PA and the associated new transmission rates, are the reason for the extension to the GSD file for the present GSD Revision 2.

A primary aim of the revision was to improve the readability of the formal description of the GSD file. The individual rules in this section have been numbered in order to enable better referencing. Rules that left room for interpretation have been made more precise. Rules that unnecessarily limited the format of the GSD file and thus made it more difficult to create and read GSD files have been relaxed.

The changes to the informal description of the keywords since GSD Revision 1 essentially boil down to the addition of the keywords for the new transmission rates.

In the formal description the following changes have been made since GSD Revision 1.

Rule	Change
188, 189	Description of continuation lines
179	Description of a beginning of a GSD line
168	Description of white spaces in octet strings
161	Description of white spaces in user definitions
148, 147	Support of new transmission rates
137, 136	MaxTsdr for new transmission rates
115, 114	Trdy for new transmission rates
104, 103	Tqui for new transmission rates
93, 92	Tset for new transmission rates
82, 81	Tsdi for new transmission rates
47, 46	Subfamily_Name description
37	Change of the reference number to Unsigned16
20	Last_Bit limited to 495
18	Extension of Unit-Def-Items
18	Value range to {0<=Bit<=495}
15	Ext-Module-Prm-Len description
11	Is concluded with EndExtUserPrmData
4, 5, 6	Replacement of the previous module definition
1, 2, 3	Replacement of the previous GSD description
-	User_Prm_Data_Def has been deleted

2 GSD File

2.1 General

The attributes described below characterize the features and performance of PROFIBUS-DP devices.

Each vendor of a DP-Slave or a DP-Master (class 1) shall offer the characteristic features of the device as a device data sheet and a device data file (GSD-File) to the user. Using this information enables the user to check all data in the configuration phase of a PROFIBUS-DP system and errors can be avoided as early as possible. Because of the defined file format, it is possible to realize vendor independent configuration tools for PROFIBUS-DP systems. The configuration tool uses the GSD-Files for testing the data that were entered regarding the observance of limits and validity related to the performance of the individual device.
The distinction of the GSD-files is achieved by the vendor- and device-identifiers.
In the case of composite-devices, PROFIBUS-FMS specific Device data base information is inserted directly at the beginning of the Device data base file. Section 13.2 defines the format of the GSD files for PROFIBUS-DP devices only.

2.2 Format of the PROFIBUS-DP GSD Files

The GSD-File is an ASCII-file and it may be created with every applicable ASCII text editor. The DP-specific part begins always with the identifier "#Profibus_DP". The device data base will be specified respectively as parameter of a key word. At the evaluation of the key words the kind of letters, capital or small, will be don't care. The data medium which the vendor of the DP-device uses for the delivery of the GSD-file is not defined here.
The file format is line oriented. Each line contains statements for exactly one parameter. If a semicolon is detected during the interpretation of the line, it is assumed that the rest of the line is a comment. The maximum number of characters per line is fixed to 80. If it not possible to describe the information in one line then it is allowed to use continuation lines. A "\" at the end of a line indicates that the following line is a continuation line. It is distinguished between number-parameters and text-parameters. No special end-identifier is defined. But it is to be ensured that the file ends after a complete line. Parameters which are not used for a DP-Master or a DP-Slave shall be omitted.

2.3 Meaning and Coding of the Key Words

2.3.1 General

The type ID specified for the key words refers to the parameters with the same name. In the case of the parameters, a differentiation is made between:
- Mandatory (M) (absolutely necessary)
- Optional (O) (possible in addition)
- Optional with default = 0 if not present (D)
- At least one of the group (G) matches with the corresponding baudrate

Expansions of the device description data specification (for example, new key words) are provided in this document with a version ID (GSD_Revision) that indicates the version where the expansion was added. Key words without version ID belong to the original version.
A GSD file is to be used per language used; in the file, only the parameters of the type Visible String and Slave_Family may differ. The language-related device description data files differ regarding the last letter of the extension (*.gs?).

Default:	?=d
English:	?=e
French:	?=f
German:	?=g
Italian:	?=i
Portuguese:	?=p
Spanish:	?=s

2.3.2 General DP Key Words

GSD_Revision: (M starting with GSD_Revision 1)
Version ID of the GSD file format.
Type: Unsigned8

Vendor_Name: (M)
Manufacturer's Name.
Type: Visible-String (32)

Model_Name: (M)
Manufacturer's designation (Controller Type) of DP device.
Type: Visible-String (32)

Revision: (M)
Revision version of the DP device.
Type: Visible-String (32)

Revision_Number: (O starting with GSD_Revision 1)
Version ID of the DP device. The value of the Revision_Number has to agree with the value of the Revision_Number in the slave-specific diagnosis.
Type: Unsigned8 (1 to 63)


```
Ident_Number: (M)
Device type of the DP device.
Type: Unsigned16

Protocol_Ident: (M)
Protocol ID of the DP device.
Type: Unsigned8
     0:          PROFIBUS DP,
     16 to 255: Manufacturer-specific

Station_Type: (M)
DP device type.
Type: Unsigned8
     0: DP Slave,
     1: DP Master (Class 1)

FMS_supp: (D)
This device is an FMS/DP mixed device.
Type: Boolean (1: True)

Hardware_Release: (M)
Hardware release of the DP device.
Type: Visible-String (32)

Software_Release (M)
Software release of the DP device.
Type: Visible-String (32)

9.6_supp: (G)
The DP device supports the baudrate 9.6 kBaud.
Type: Boolean (1: True)

19.2_supp: (G)
The DP device supports the baudrate 19.2 kBaud.
Type: Boolean (1: True)

31.25_supp: (G starting with GSD_Revision 2)
The DP device supports the baudrate 31.25 kBaud.
Type: Boolean (1: True)

45.45_supp: (G starting with GSD_Revision 2)
The DP device supports the baudrate 45.45 kBaud.
Type: Boolean (1: True)

93.75_supp: (G)
The DP device supports the baudrate 93.75 kBaud.
Type: Boolean (1: True)

187.5_supp: (G)
The DP device supports the baudrate 187.5 kBaud.
Type: Boolean (1: True)

500_supp: (G)
The DP device supports the baudrate 500 kBaud.
Type: Boolean (1: True)
```



```
1.5M_supp: (G)
The DP device supports the baudrate 1.5 MBaud.
Type: Boolean (1: True)

3M_supp: (G starting with GSD_Revision 1)
The DP device supports the baudrate 3 MBaud.
Type: Boolean (1: True)

6M_supp: (G starting with GSD_Revision 1)
The DP device supports the baudrate 6 MBaud.
Type: Boolean (1: True)

12M_supp: (G starting with GSD_Revision 1)
The DP device supports the baudrate 12 MBaud.
Type: Boolean (1: True)

MaxTsdr_9.6: (G)
This is the time a responder needs as a maximum at a baudrate of
9.6 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_19.2: (G)
This is the time a responder needs as a maximum at a baudrate of
19.2 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_31.25: (G ab GSD_Revision 2)
This is the time a responder needs as a maximum at a baudrate of
31.25 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_45.45: (G ab GSD_Revision 2)
This is the time a responder needs as a maximum at a baudrate of
45.45 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_93.75: (G)
This is the time a responder needs as a maximum at a baudrate of
93.75 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_187.5: (G)
This is the time a responder needs as a maximum at a baudrate of
187.5 kBaud to respond to a request message (refer to EN 50170 Part
8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time
```


MaxTsdr_500: (G)
This is the time a responder needs as a maximum at a baudrate of 500 kBaud to respond to a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_1.5M: (G)
This is the time a responder needs as a maximum at a baudrate of 1.5 MBaud to respond to a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_3M: (G starting with GSD_Revision 1)
This is the time a responder needs as a maximum at a baudrate of 3 MBaud to respond to a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_6M: (G starting with GSD_Revision 1)
This is the time a responder needs as a maximum at a baudrate of 6 MBaud to respond to a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

MaxTsdr_12M: (G starting with GSD_Revision 1)
This is the time a responder needs as a maximum at a baudrate of 12 MBaud to respond to a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned16
     Time Base: Bit Time

Redundancy: (D)
This value specifies whether a device supports redundant transmission engineering.
Type: Boolean
     0: No, 1: Redundance is supported.

Repeater_Ctrl_Sig: (D)
Here, the level of the connector signal CNTR-P is specified.
Type: Unsigned8
     0: Not connected, 1: RS485, 2:TTL

24V_Pins: (D)
Here, the meaning of the connector signal M24V and P24V is specified.
Type: Unsigned8
     0: Not connected, 1:Input, 2:Output

Implementation_Type: (O starting with GSD_Revision 1)
Here, a description is provided which standard implementation is used in the DP slave; for example, Standard Software, Controller or ASIC solution. The manufacturer of the standard solution provides the name.
Type: Visible-String (32)

Bitmap_Device: (O starting with GSD_Revision 1)
Here, the file name (*.DIB) of the bit map file is specified in the DIB-Format (70*40 pixels (width*height) 16 colors)that contains the symbolic representation of the device in standard cases.
Type: Visible-String (8)

Bitmap_Diag: (O starting with GSD_Revision 1)
Here, the file name (*.DIB) of the bit map file is specified in the DIB-Format (70*40 pixels (width*height) 16 colors)that contains the symbolic representation of the device for diagnostic cases.
Type: Visible-String (8)

Bitmap_SF: (O starting with GSD_Revision 1)
Here, the file name (*.DIB) of the bit map file is specified in the DIB-Format (70*40 pixels (width*height) 16 colors)that contains the symbolic representation of the device in special operating modes. The meaning is manufacturer-specific.
Type: Visible-String (8)

2.3.3 DP Master (Class 1) Related Key Words

Download_supp: (D)
The DP device supports the functions Download, Start_seq and End_seq.
Type: Boolean (1: True)

Upload_supp: (D)
The DP device supports the functions Upload, Start_seq and End_seq.
Type: Boolean (1: True)

Act_Para_Brct_supp: (D)
The DP device supports the function Act_Para_Brct.
Type: Boolean (1: True)

Act_Param_supp: (D)
The DP device supports the function Act_Param.
Type: Boolean (1: True)

Max_MPS_Length: (M)
Maximum memory size (in bytes) that a DP device makes available for storing the master parameter set.
Type: Unsigned32

Max_Lsdu_MS: (M)
Here, the maximum L_sdu length for all master-slave communication relations is specified.
Type: Unsigned8

Max_Lsdu_MM: (M)
Here, the maximum L_sdu length for the master-master communication relations is specified.
Type: Unsigned8

Min_Poll_Timeout: (M)
This value indicates how long a DP master (Class 1) needs as a maximum for processing a master-master function.
Type: Unsigned16
Time Base: 10 ms

Trdy_9.6: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 9.6 kBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_19.2: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 19.2 kBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_31.25: (G starting with GSD_Revision 2)
This value indicates how fast a DP master (Class 1), at a baudrate of 31.25 kBaud is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_45.45: (G starting with GSD_Revision 2)
This value indicates how fast a DP master (Class 1), at a baudrate of 45.45 kBaud is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_93.75: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 93.75 kBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_187.5: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 187.5 kBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time

Trdy_500: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 500 kBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Trdy_1.5M: (G)
This value indicates how fast a DP master (Class 1), at a baudrate of 1.5 MBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Trdy_3M: (G starting with GSD_Revision 1)
This value indicates how fast a DP master (Class 1), at a baudrate of 3 MBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Trdy_6M: (G starting with GSD_Revision 1)
This value indicates how fast a DP master (Class 1), at a baudrate of 6 MBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Trdy_12M: (G starting with GSD_Revision 1)
This value indicates how fast a DP master (Class 1), at a baudrate of 12 MBaud, is ready to receive again after sending a request message (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tqui_9.6: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 9.6 kBaud.
Type: Unsigned8
     Time Base: Bit Time

Tqui_19.2: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 19.2 kBaud.
Type: Unsigned8
     Time Base: Bit Time

Tqui_31.25: (G ab GSD_Revision 2)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 31.25 kBaud.
Type: Unsigned8
     Time Base: Bit Time

Tqui_45.45: (G ab GSD_Revision 2)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 45.45 kBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_93.75: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 93.75 kBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_187.5: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 187.5 kBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_500: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 500 kBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_1.5M: (G)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 1.5 MBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_3M: (G starting with GSD_Revision 1)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 3 MBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_6M: (G starting with GSD_Revision 1)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 6 MBaud.
Type: Unsigned8
Time Base: Bit Time

Tqui_12M: (G starting with GSD_Revision 1)
This value specifies the modulator fading time (T_{QUI}), (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 12 MBaud.
Type: Unsigned8
Time Base: Bit Time

Tset_9.6: (G)
This value specifies the trigger time , at the baudrate of 9.6 kBaud, in reference to Layer2 (setup time) from the arrival of an event until the corresponding response (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
Time Base: Bit Time


```
Tset_19.2: (G)
This value specifies the trigger time , at the baudrate of 19.2
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_31.25: (G starting with GSD_Revision 2)
This value specifies the trigger time , at the baudrate of 31.25
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_45.45: (G starting with GSD_Revision 2)
This value specifies the trigger time , at the baudrate of 45.45
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_93.75: (G)
This value specifies the trigger time , at the baudrate of 93.75
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_187.5: (G)
This value specifies the trigger time , at the baudrate of 187.5
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_500: (G)
This value specifies the trigger time , at the baudrate of 500
kBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_1.5M: (G)
This value specifies the trigger time , at the baudrate of 1.5
MBaud, in reference to Layer2 (setup time) from the arrival of an
event until the corresponding response (refer to EN 50170 Part 8-2
Section 8.8).
Type: Unsigned8
     Time Base: Bit Time
```


Tset_3M: (G starting with GSD_Revision 1)
This value specifies the trigger time , at the baudrate of 3 MBaud, in reference to Layer2 (setup time) from the arrival of an event until the corresponding response (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_6M: (G starting with GSD_Revision 1)
This value specifies the trigger time , at the baudrate of 6 MBaud, in reference to Layer2 (setup time) from the arrival of an event until the corresponding response (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

Tset_12M: (G starting with GSD_Revision 1)
This value specifies the trigger time , at the baudrate of 12 MBaud, in reference to Layer2 (setup time) from the arrival of an event until the corresponding response (refer to EN 50170 Part 8-2 Section 8.8).
Type: Unsigned8
     Time Base: Bit Time

LAS_Len: (M)
his value indicates how many entries the device in question can manage in the list of active stations (LAS).
Type: Unsigned8

Tsdi_9.6: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 9.6 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_19.2: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 19.2 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_31.25: (G starting with GSD_Revision 2)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 31.25 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_45.45: (G starting with GSD_Revision 2)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 45.45 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_93.75: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) of the initiator at a baudrate of 93.75 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_187.5: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 187.5 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_500: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 500 kBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_1.5M: (G)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 1.5 MBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_3M: (G starting with GSD_Revision 1)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 3 MBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_6M: (G starting with GSD_Revision 1)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 6 MBaud.
Type: Unsigned16
     Time Base: Bit Time

Tsdi_12M: (G starting with GSD_Revision 1)
This value specifies the station delay time (Tsdi) of the initiator (refer to EN 50170 Part 8-2 Section 8.8) at a baudrate of 12 MBaud.
Type: Unsigned16
     Time Base: Bit Time

Max_Slaves_supp: (M)
This value indicates how many DP slave stations a DP master (Class 1) can handle.
Type: Unsigned8

Max_Master_Input_Len: (O starting with GSD_Revision 1)
Here, the maximum length of the input data per DP slave is specified that the DP master supports.
Type: Unsigned8

Max_Master_Output_Len: (O starting with GSD_Revision 1)
Here, the maximum length of the output data per DP slave is specified that the DP master supports.
Type: Unsigned8

Max_Master_Data_Len: (O starting with GSD_Revision 1)
Here, the largest sum of the lengths of the output and input data per DP slave is specified that the DP master supports. If this keyword is not provided, the maximum length will be the sum of the input and output data.
Type: Unsigned16

2.3.4 DP Slave Related Key Words

Freeze_Mode_supp: (D)
The DP device supports the Freeze mode. DP slaves that support the Freeze mode have to guarantee that in the next data cycle after the Freeze control command, the values of the inputs that were frozen last are transferred to the bus.
Type: Boolean (1: True)

Sync_Mode_supp: (D)
The DP device supports the Sync mode.
Type: Boolean (1: True)

Auto_Baud_supp: (D)
The DP device supports automatic baudrate recognition.
Type: Boolean (1: True)

Set_Slave_Add_supp: (D)
The DP device supports the function Set_Slave_Add.
Type: Boolean (1: True)

User_Prm_Data_Len: (D)
Here, the length of User_Prm_Data is specified.
Type: Unsigned8

User_Prm_Data: (O)
Type: Octet-String
Bedeutung: Manufacturer-specific field. Specifies the default value for User_Prm_Data (refer to Section 2.3.6; Examples of GSD File Entries) If this parameter is used, its length has to agree with the User_Prm_Data_Len.

Min_Slave_Intervall: (M)
This time specifies the minimum interval between two slave list cycles for the DP device.
Type: Unsigned16
Time Base: 100 µs

Modular_Station: (D)
Here it is specified whether the DP device is a modular station.
Type: Boolean (0: compact device, 1: modular device)


```
Max_Module: (M if Modular_Station)
Here, the maximum number of modules of a modular station is
specified.
Type: Unsigned8

Max_Input_Len: (M if Modular_Station)
Here, the maximum length of the input data of a modular station is
specified in bytes.
Type: Unsigned8

Max_Output_Len: (M if Modular_Station)
Here, the maximum length of the output data of a modular station is
specified in bytes.
Type: Unsigned8

Max_Data_Len: (O only if Modular_Station)
Here, the largest sum of the lengths of the output and input data
of a modular station is specified in bytes. If this key word is not
provided, the maximum length is the sum of all input and output
data.
Type: Unsigned16

Unit_Diag_Bit: (O)
In order to display manufacturer-specific status- and error
messages of a DP slave centrally, it is possible to assign to a bit
a text(Diag_Text)in the device-related diagnostic field (refer to
Section 2.3.6; Examples of GSD File Entries).
Parameters used:
 Bit:
  Type: Unsigned16
  Meaning: Bit position in device-related diagnostic field
             (LSB in first byte is Bit 0).
 Diag_Text:
  Type: Visible-String (32)

Unit_Diag_Area: (O)
Between the key words Unit_Diag_Area and Unit_Diag_Area_End, the
assignment of values in a bit field in the device-related
diagnostic field to texts (Diag_Text) is specified (refer to
Section 2.3.6; Examples of GSD File Entries).
Parameters used:
 First_Bit:
  Type: Unsigned16
  Meaning: First bit position of the bit field
             (LSB in the first byte is Bit 0)
 Last_Bit:
  Type: Unsigned16
  Meaning: Last bit position of the bit field. The bit field may be
             16 bits wide maximum.
 Value:
  Type: Unsigned16
  Meaning: Value in the bit field

 Diag_Text:
  Type: Visible-String (32)
```



```
Module: (M)
Between the key words Module and EndModule, the IDs of a DP compact
device or the IDs of all possible modules of a modular slave are
specified, manufacturer-specific error types are specified in the
channel-related diagnostic field, and the User_Prm_Data is
described. If, in the case of modular slaves, empty slots are to be
defined as empty module (ID/s 0x00), the empty module has to be
defined. Otherwise, empty slots would not appear in the
configuration data.
If the key word Channel_Diag is used outside the key words Module
and Endmodule, the same manufacturer-specific error type is
specified in the channel-related diagnostic field for all remaining
modules (refer to Section 2.3.6; Examples of GSD File Entries).
If the key words Ext_User_Prm_Data_Ref or Ext_User_Prm_Data_Const
are used outside the key words Module and EndModule, the associated
User_Prm_Data area refers to the entire device, and the data in the
parameter offset to the entire User_Prm_Data. This User_Prm_Data
area has to be at the start of the User_Prm_Data.
The module-specific User_Prm_Data is directly attached to the
device-specific User_Prm_Data in the sequence in which the
associated modules were configured. If the keywords
Ext_User_Prm_Data_Ref or Ext_User_Prm_Data_Const are used within
the key words Module and Endmodule, the data in the parameter
offset refers only to the start of the User_Prm_Data area that is
assigned to this module.
Parameters used:

 Mod_Name:
  Type: Visible-String (32)
  Meaning: Module name of a module used in a modular DP station,
             or device name of a compact DP slave.

 Config:
  Type: Octet-String (17)
  Type: Octet-String (244) (O starting with GSD_Revision 1)
  Meaning: Here, the ID or IDs of the module of a modular DP slave
             or of a compact DP device are specified.

 Module_Reference: (O starting with GSD_Revision 1)
  Type: Unsigned16
  Meaning: Here, the reference of the module description
             is specified. This reference has to be unique
             for a device (same Ident_Number).
             This referencing is useful in order to make
             language-independent configuring possible
             in a language-dependent system,
             or to recognize modules.

 Ext_Module_Prm_Data_Len: (O starting with GSD_Revision 1)
  Type: Unsigned8
  Meaning: Here, the length of the associated User_Prm_Data
             is defined.

Channel_Diag: (O)
With the key word Channel_Diag, the assigment of manufacturer-
specific error types (Error_Type)in the channel-related diagnostic
```


field to texts (Diag_Text) is specified (refer to Section 2.3.6; Examples of GSD File Entries).
Parameters Used:
 Error_Type:
  Type: Unsigned8 (16 <= Error_Type <= 31)

 Diag_Text:
  Type: Visible-String(32)

Fail_Safe: (D starting with GSD_Revision 1)
Here it is specified whether the DP slave accepts a data message without data instead of a data message with data = 0 in the CLEAR mode of the DP master (Class 1).
Type: Boolean (1: True)

Max_Diag_Data_Len: (M starting with GSD_Revision 1)
Here, the maximum length of the diagnostic information (Diag_Data) is specified.
Type: Unsigned8 (6 - 244)

Modul_Offset: (D starting with GSD_Revision 1)
Here, the slot number is specified that is to appear in the configuration tool as the first slot number at configuring (is used for improved representation).
Type: Unsigned8

Slave_Family: (M starting with GSD_Revision 1)
Here, the DP slave is assigned to a function class. The family name is structured hierarchically. In addition to the main family, subfamilies can be generated that are respectively added with "@". A maximum of three subfamilies can be defined.
Example: Slave_Family=3@Digital@24V
The following main families are specified:

0: General (can't be assigned to the categories below)
1: Drives
2: Switching devices
3: I/O
4: Valves
5: Controllers
6: HMI (MMI)
7: Encoders
8: NC/RC
9: Gateway
10: PLCs
11: Ident systems
12-255: reserved
Type: Unsigned8

Max_User_Prm_Data_Len: (O starting with GSD_Revision 1)
Here, the maximum length of the User_Prm_Data is specified.
The definition of this key word excludes the evaluation of User_Prm_Data_Len.
Type: Unsigned8 (0 - 237)


```
Ext_User_Prm_Data_Ref: (O starting with GSD_Revision 1)
Here, a reference to a User_Prm_Data description is specified.
The definition of this key word excludes the evaluation of
User_Prm_Data . If areas overlap when describing the User_Prm_Data,
the area defined last in the Device Description Block has priority.
Parameters used:
 Reference_Offset:
  Type: Unsigned8
  Meaning: Here, the offset within the associated part
             of the User_Prm_Data is defined.

 Reference_Number:
  Type: Unsigned16
  Meaning: This reference number has to be the same as the
             reference number that is defined in the User_Prm_Data
             description.

Ext_User_Prm_Data_Const: (O starting with GSD_Revision 1)
Here, a constant part of the User_Prm_Data is specified. The
definition of this key word excludes the evaluation of
User_Prm_Data . If areas overlap when describing the User_Prm_Data,
the area defined last in the Device Description Data (GSD) file has
priority.
Parameters used:
Const_Offset:
  Type: Unsigned8
  Meaning: Here, the offset within the associated part of
             User_Prm_Data is defined.

 Const_Prm_Data:
  Type: Octet-String
  Meaning: Here, the constants or default selections within the
             User_Prm_Data are defined.


ExtUserPrmData: (O starting with GSD_Revision 1)
Between the key words ExtUserPrmData and EndExtUserPrmData, a
parameter of the User_Prm_Data is described. The definition of this
key word excludes the evaluation of User_Prm_Data.
Parameters used:
 Reference_Number:
  Type: Unsigned8
  Meaning: Here, the reference of the User_Prm_Data description
             is specified. This reference has to be unique.

 Ext_User_Prm_Data_Name:
  Type: Visible-String (32)
  Meaning: Clear text description of the parameters.

 Data_Type_Name:
  Type: Visible-String (32)
  Meaning: Default value of the described parameter.

 Default_Value:
  Type: DataType (has to correspond to the Data_Type_Name)
  Bedeutung: Default-Wert des beschriebenen Parameters
```



```
 Min_Value:
  Type: Data_Type (has to correspond to the Data_Type_Name)
  Meaning: Minimum value of the described parameter.

 Max_Value:
  Type: Data_Type (has to correspond to the Data_Type_Name)
  Meaning: Maximum value of the described parameter.

 Allowed_Values:
  Type: Data_Type_Array (16) (has to correspond to the
Data_Type_Name)
  Meaning: Permitted values of the described parameter.

 Prm_Text_Ref:
  Type: Unsigned8
  Meaning: This reference number has to be the same as
             the reference number that is defined in the PrmText
             description.

PrmText:
Between the key words PrmText and EndPrmText, possible values of a
parameter are described. Texts are also assigned to these values.
Parameters Used:
 Reference_Number:
  Type: Unsigned8
  Meaning: Here, the reference of the PrmText description is
             specified. This reference must be unique.
 Text_Item:
  Parameter Used:
   Prm_Data_Type:
    Type: Data_Type (has to correspond to the Data_Type_Name
                  in the parameter description).
    Meaning: Here, the value of the parameter is specified
                  that is to be described.
   Text:
    Type: Visible-String (32)
    Meaning: Description of the parameter value.
```


2.3.5 Formal Description of the Device Description Data (GSD) File Format

In the description below, all data in brackets is optional. The symbol "|" means the logical or-operation.
The number before every rule is a sequential enabling the rules to be referenced.

```
190) <Backslash>          = \
189) <Long-Line>          = <Backslash><LineEnd>
188) <WS>                 =
            <Space>
          | <Tab>
          | <Long-Line>
          | <WS><Space>
          | <WS><Tab>
          | <WS><Long-Line>



187) <CRLF>               =
            <Carriage Return><Line Feed>
          | <Carriage Return>
          | <Line Feed>

186) <Num>                =  0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
185) <Namechar>           =
            a | b | c | d | e | f | g | h | i | j | k | l
          | m | n | o | p | q | r | s | t | u | v | w | x
          | y | z | _ | . | - | A | B | C | D | E | F | G
          | H | I | J | K | L | M | N | O | P | Q | R | S
          | T | U | V | W | X | Y | Z | <Num>

184) <Otherchar>          =
            + | * | / | < | > | ( | ) | [ | ] | { | } | !
          | $ | % | & | ? | ´ | ^ | | | = | # | ; | , | : | `

183) <Stringchar>         = <Namechar> | <Otherchar>
182) <Char>               = <Stringchar> | "
181) <Com>                = ; | <Com><Char> | <Com><WS>
180) <ComLn>              = <Com><CRLF>

179) <LineStart>          =
            [<WS>]
          | [<WS>]<LineEnd><LineStart>  { empty line }


178) <LineEnd>            =
            <CRLF>
          | <Com><CRLF>
          | <WS><LineEnd>
          | <LineEnd><ComLn>
          | <LineEnd><CRLF>

177) <Boolean>            = 0 | 1
```



```
176) <Decimal>           = <Num> | <Decimal><Num>

175) <Hexchar>           =
          <Num> | A | B | C | D | E | F | a | b | c | d | e | f

174) <Hexadecimal>       = 0x<Hexchar> | <Hexadecimal><Hexchar>
173) <Number>            = <Decimal> | <Hexadecimal>
172) <Octet>             = <Number>  { 0 <= <Octet> <= 255 }
171) <Unsigned8>         = <Octet>
170) <Unsigned16>        = <Number>  { 0 <= <Unsigned16> <= 65535 }
169) <Unsigned32>        = <Number> { 0<= <Unsigned32> <=4294967295}

168) <Octet-String>      =
            [<WS>]<Octet>
          | <Octet-String>[<WS>],[<WS>]<Octet>

167) <String>            =
            <Stringchar>
          | <Space>
          | <String><Stringchar>
          | <String><Space>

166) <Visible-String>    = "<String>"
165) <Keyword>           = <Namechar> | <Keyword><Namechar>

164) <Any-String>        =
            <Char>
          | <WS>
          | <Any-String><Char>
          | <Any-String><WS>

163) <Any-Line>          =
            <CRLF>
          | <Any-String><CRLF>

162) <Any-Text>          = <Any-Line> | <Any-Text><Any-Line>
161) <User-Definition>   = <Keyword>[<WS>][<Otherchar><Any-Line>]
160) <Vendor_Name>       = <Visible-String>  { Length <= 32 }
159) <Model_Name>        = <Visible-String>  { Length <= 32 }
158) <Revision>          = <Visible-String>  { Length <= 32 }
157) <Revision_Number>   = <Unsigned8>
156) <Ident_Number>      = <Unsigned16>
155) <Protocol_Ident>    = <Unsigned8>
154) <Station_Type>      = <Unsigned8>
153) <FMS_supp>          = <Boolean>
152) <Hardware_Release>  = <Visible-String>  { Length <= 32 }
151) <Software_Release>  = <Visible-String>  { Length <= 32 }
150) <9.6_supp>          = <Boolean>
149) <19.2_supp>         = <Boolean>
148) <31.25_supp>        = <Boolean>
147) <45.45_supp>        = <Boolean>
146) <93.75_supp>        = <Boolean>
145) <187.5_supp>        = <Boolean>
144) <500_supp>          = <Boolean>
143) <1.5M_supp>         = <Boolean>
142) <3M_supp>           = <Boolean>
141) <6M_supp>           = <Boolean>
```



```
140) <12M_supp>          = <Boolean>
139) <MaxTsdr_9.6>       = <Unsigned16>
138) <MaxTsdr_19.2>      = <Unsigned16>
137) <MaxTsdr_31.25>     = <Unsigned16>
136) <MaxTsdr_45.45>     = <Unsigned16>
135) <MaxTsdr_93.75>     = <Unsigned16>
134) <MaxTsdr_187.5>     = <Unsigned16>
133) <MaxTsdr_500>       = <Unsigned16>
132) <MaxTsdr_1.5M>      = <Unsigned16>
131) <MaxTsdr_3M>        = <Unsigned16>
130) <MaxTsdr_6M>        = <Unsigned16>
129) <MaxTsdr_12M>       = <Unsigned16>
128) <Redundancy>        = <Boolean>
127) <Repeater_Ctrl_Sig> = <Unsigned8>
126) <24V_Pins>          = <Unsigned8>
125) <Download_supp>     = <Boolean>
124) <Upload_supp>       = <Boolean>
123) <Act_Para_Brct_supp> = <Boolean>
122) <Act_Param_supp>    = <Boolean>
121) <Max_MPS_Length>    = <Unsigned32>
120) <Max_Lsdu_MM>       = <Unsigned8>
119) <Max_Lsdu_MS>       = <Unsigned8>
118) <Min_Poll_Timeout>  = <Unsigned16>
117) <Trdy_9.6>          = <Unsigned8>
116) <Trdy_19.2>         = <Unsigned8>
115) <Trdy_31.25>        = <Unsigned8>
114) <Trdy_45.45>        = <Unsigned8>
113) <Trdy_93.75>        = <Unsigned8>
112) <Trdy_187.5>        = <Unsigned8>
111) <Trdy_500>          = <Unsigned8>
110) <Trdy_1.5M>         = <Unsigned8>
109) <Trdy_3M>           = <Unsigned8>
108) <Trdy_6M>           = <Unsigned8>
107) <Trdy_12M>          = <Unsigned8>
106) <Tqui_9.6>          = <Unsigned8>
105) <Tqui_19.2>         = <Unsigned8>
104) <Tqui_31.25>        = <Unsigned8>
103) <Tqui_45.45>        = <Unsigned8>
102) <Tqui_93.75>        = <Unsigned8>
101) <Tqui_187.5>        = <Unsigned8>
100) <Tqui_500>          = <Unsigned8>
99)  <Tqui_1.5M>         = <Unsigned8>
98)  <Tqui_3M>           = <Unsigned8>
97)  <Tqui_6M>           = <Unsigned8>
96)  <Tqui_12M>          = <Unsigned8>
95)  <Tset_9.6>          = <Unsigned8>
94)  <Tset_19.2>         = <Unsigned8>
93)  <Tset_31.25>        = <Unsigned8>
92)  <Tset_45.45>        = <Unsigned8>
91)  <Tset_93.75>        = <Unsigned8>
90)  <Tset_187.5>        = <Unsigned8>
89)  <Tset_500>          = <Unsigned8>
88)  <Tset_1.5M>         = <Unsigned8>
87)  <Tset_3M>           = <Unsigned8>
86)  <Tset_6M>           = <Unsigned8>
85)  <Tset_12M>          = <Unsigned8>
84)  <Tsdi_9.6>          = <Unsigned16>
```



```
83)  <Tsdi_19.2>         = <Unsigned16>
82)  <Tsdi_31.25>        = <Unsigned16>
81)  <Tsdi_45.45>        = <Unsigned16>
80)  <Tsdi_93.75>        = <Unsigned16>
79)  <Tsdi_187.5>        = <Unsigned16>
78)  <Tsdi_500>          = <Unsigned16>
77)  <Tsdi_1.5M>         = <Unsigned16>
76)  <Tsdi_3M>           = <Unsigned16>
75)  <Tsdi_6M>           = <Unsigned16>
74)  <Tsdi_12M>          = <Unsigned16>
73)  <LAS_Len>           = <Unsigned8>
72)  <Max_Slaves_supp>   = <Unsigned8>
71)  <Max_Master_Input_Len>   = <Unsigned8>
70)  <Max_Master_Output_Len>  = <Unsigned8>
69)  <Max_Master_Data_Len>    = <Unsigned16>
68)  <Freeze_Mode_supp>  = <Boolean>
67)  <Sync_Mode_supp>    = <Boolean>
66)  <Set_Slave_Add_supp>     = <Boolean>
65)  <Auto_Baud_supp>    = <Boolean>
64)  <User_Prm_Data_Len> = <Unsigned8>
63)  <User_Prm_Data>     = <Octet-String>
62)  <Min_Slave_Intervall>    = <Unsigned16>
61)  <Modular_Station>   = <Boolean>
60)  <Max_Module>        = <Unsigned8>
59)  <Max_Input_Len>     = <Unsigned8>
58)  <Max_Output_Len>    = <Unsigned8>
57)  <Max_Data_Len>      = <Unsigned16>
56)  <Bit>               = <Unsigned16>
55)  <Diag_Text>         = <Visible-String> { Length <= 32}
54)  <First_Bit>         = <Unsigned16>
53)  <Last_Bit>          = <Unsigned16>
52)  <Value>             = <Unsigned16>
51)  <Mod_Name>          = <Visible-String> { Length <= 32}
50)  <Config>            = <Octet-String>
49)  <Error_Type>        = <Unsigned8>  { 16 <= <Error_Type> <= 31 }
48)  <GSD_Revision>      = <Unsigned8>
47)  <Subfamily_Name>    = <String>     { Length <= 32}

46)  <Family_Name>       =
            <Unsigned8>
          | <Unsigned8>@<Subfamily_Name>
          | <Unsigned8>@<Subfamily_Name>@<Subfamily_Name>
          | <Unsigned8>@<Subfamily_Name>@<Subfamily_Name>
                                                @<Subfamily_Name>

45)  <Implementation_Type> = <Visible-String> { Length <= 32}
44)  <Fail_Safe>         = <Boolean>
43)  <Max_Diag_Data_Len> = <Unsigned8>
42)  <Modul_Offset>      = <Unsigned8>
41)  <Max_User_Prm_Data_Len> = <Unsigned8>
40)  <Bitmap_Device>          = <Visible-String> { Length <= 8}
39)  <Bitmap_Diag>       = <Visible-String> { Length <= 8}
38)  <Bitmap_SF>         = <Visible-String> { Length <= 8}
37)  <Reference_Number>  = <Unsigned16>
36)  <Reference_Offset>  = <Unsigned8>
35)  <Const_Offset>      = <Unsigned8>
34)  <Const_Prm_Data>    = <Octet-String>
```



```
33)  <Module_Reference>  = <Unsigned16>

32)  <Bit-Area>          =
          BITAREA(<First_Bit>-<Last_Bit>){0<=First_Bit<=Last_Bit<=7}
                        {Value Range: UNSIGNED(Last_Bit-First_Bit+1)}

31)  <Data_Type_Name>    =
            UNSIGNED8
          | UNSIGNED16
          | UNSIGNED32
          | SIGNED8
          | SIGNED16
          | SIGNED32
          | BIT(<Bit>)
          | <BitArea> {0<=Bit<=7}

30)  <Data_Type>         =
            <Unsigned8>
          | <Unsigned16>
          | <Unsigned32>
          | <Signed8>
          | <Signed16>
          | <Signed32>
          | <Bit>

29)  <Data_Type_Array>   =
            [<WS>]<Data_Type>
          | <Data_Type_Array>[<WS>],[<WS>]<Data_Type>

28)  <Default_Value>     = <Data_Type>
27)  <Min_Value>         = <Data_Type>
26)  <Max_Value>         = <Data_Type>
25)  <Allowed_Values>    = <Data_Type_Array>
24)  <Prm_Data_Value>    = <Data_Type>
23)  <Text>              = <Visible-String> { Length <= 32}

22)  <Value_Item>        =
          Value(<Value>)[<WS>]=[<WS>]<Diag_Text><LineEnd>

21)  <Value_List>        =
            <Value_Item>
          | <Value-List><Value-Item>



20)  <Unit-Diag-Area-Def> =
          Unit_Diag_Area[<WS>]=[<WS>]<First-Bit>-<Last-Bit><LineEnd>
          <Value_List>
          Unit_Diag_Area_End {0<=First_Bit<=Last_Bit<=495}

19)  <Channel-Diag-Definition> =
          Channel_Diag(<Value>)[<WS>]=[<WS>]<Diag_Text>

18)  <Unit-Def-Item>          =
            GSD_Revision[<WS>]=[<WS>]<GSD_Revision>
          | Vendor_Name[<WS>]=[<WS>]<Vendor_Name>
          | Model_Name[<WS>]=[<WS>]<Model_Name>
```



```
| Revision[<WS>]=[<WS>]<Revision>
| Revision_Number[<WS>]=[<WS>]<Revision_Number>
| Ident_Number[<WS>]=[<WS>]<Ident_Number>
| Protocol_Ident[<WS>]=[<WS>]<Protocol_Ident>
| Station_Type[<WS>]=[<WS>]<Station_Type>
| FMS_supp[<WS>]=[<WS>]<FMS_supp>
| Hardware_Release[<WS>]=[<WS>]<Hardware-Release>
| Software_Release[<WS>]=[<WS>]<Software-Release>
| 9.6_supp[<WS>]=[<WS>]<9.6_supp>
| 19.2_supp[<WS>]=[<WS>]<19.2_supp>
| 31.25_supp[<WS>]=[<WS>]<31.25_supp>
| 45.45_supp[<WS>]=[<WS>]<45.45_supp>
| 93.75_supp[<WS>]=[<WS>]<93.75_supp>
| 187.5_supp[<WS>]=[<WS>]<187.5_supp>
| 500_supp[<WS>]=[<WS>]<500_supp>
| 1.5M_supp[<WS>]=[<WS>]<1.5M_supp>
| 3M_supp[<WS>]=[<WS>]<3M_supp>
| 6M_supp[<WS>]=[<WS>]<6M_supp>
| 12M_supp[<WS>]=[<WS>]<12M_supp>
| MaxTsdr_9.6[<WS>]=[<WS>]<MaxTsdr_9.6>
| MaxTsdr_19.2[<WS>]=[<WS>]<MaxTsdr_19.2>
| MaxTsdr_31.25[<WS>]=[<WS>]<MaxTsdr_31.25>
| MaxTsdr_45.45[<WS>]=[<WS>]<MaxTsdr_45.45>
| MaxTsdr_93.75[<WS>]=[<WS>]<MaxTsdr_93.75>
| MaxTsdr_187.5[<WS>]=[<WS>]<MaxTsdr_187.5>
| MaxTsdr_500[<WS>]=[<WS>]<MaxTsdr_500>
| MaxTsdr_1.5M[<WS>]=[<WS>]<MaxTsdr_1.5M>
| MaxTsdr_3M[<WS>]=[<WS>]<MaxTsdr_3M>
| MaxTsdr_6M[<WS>]=[<WS>]<MaxTsdr_6M>
| MaxTsdr_12M[<WS>]=[<WS>]<MaxTsdr_12M>
| Redundancy[<WS>]=[<WS>]<Redundancy>
| Repeater_Ctrl_Sig[<WS>]=[<WS>]<Repeater_Ctrl_Sig>
| 24V_Pins[<WS>]=[<WS>]<24V_Pins>
| Implementation_Type[<WS>]=[<WS>]<Implementation_Type>
| Bitmap_Device[<WS>]=[<WS>]<Bitmap_Device>
| Bitmap_Diag[<WS>]=[<WS>]<Bitmap_Diag>
| Bitmap_SF[<WS>]=[<WS>]<Bitmap_SF>
| Download_supp[<WS>]=[<WS>]<Download_supp>
| Upload_supp[<WS>]=[<WS>]<Upload_supp>
| Act_Para_Brct_supp[<WS>]=[<WS>]<Act_Para_Brct_supp>
| Act_Param_supp[<WS>]=[<WS>]<Act_Param_supp>
| Max_MPS_Length[<WS>]=[<WS>]<Max_MPS_Length>
| Max_Lsdu_MM[<WS>]=[<WS>]<Max_Lsdu_MM>
| Max_Lsdu_MS[<WS>]=[<WS>]<Max_Lsdu_MS>
| Min_Poll_Timeout[<WS>]=[<WS>]<Min_Poll_Timeout>
| Trdy_9.6[<WS>]=[<WS>]<Trdy_9.6>
| Trdy_19.2[<WS>]=[<WS>]<Trdy_19.2>
| Trdy_31.25[<WS>]=[<WS>]<Trdy_31.25>
| Trdy_45.45[<WS>]=[<WS>]<Trdy_45.45>
| Trdy_93.75[<WS>]=[<WS>]<Trdy_93.75>
| Trdy_187.5[<WS>]=[<WS>]<Trdy_187.5>
| Trdy_500[<WS>]=[<WS>]<Trdy_500>
| Trdy_1.5M[<WS>]=[<WS>]<Trdy_1.5M>
| Trdy_3M[<WS>]=[<WS>]<Trdy_3M>
| Trdy_6M[<WS>]=[<WS>]<Trdy_6M>
| Trdy_12M[<WS>]=[<WS>]<Trdy_12M>
| Tqui_9.6[<WS>]=[<WS>]<Tqui_9.6>
```



```
| Tqui_19.2[<WS>]=[<WS>]<Tqui_19.2>
| Tqui_31.25[<WS>]=[<WS>]<Tqui_31.25>
| Tqui_45.45[<WS>]=[<WS>]<Tqui_45.45>
| Tqui_93.75[<WS>]=[<WS>]<Tqui_93.75>
| Tqui_187.5[<WS>]=[<WS>]<Tqui_187.5>
| Tqui_500[<WS>]=[<WS>]<Tqui_500>
| Tqui_1.5M[<WS>]=[<WS>]<Tqui_1.5M>
| Tqui_3M[<WS>]=[<WS>]<Tqui_3M>
| Tqui_6M[<WS>]=[<WS>]<Tqui_6M>
| Tqui_12M[<WS>]=[<WS>]<Tqui_12M>
| Tset_9.6[<WS>]=[<WS>]<Tset_9.6>
| Tset_19.2[<WS>]=[<WS>]<Tset_19.2>
| Tset_31.25[<WS>]=[<WS>]<Tset_31.25>
| Tset_45.45[<WS>]=[<WS>]<Tset_45.45>
| Tset_93.75[<WS>]=[<WS>]<Tset_93.75>
| Tset_187.5[<WS>]=[<WS>]<Tset_187.5>
| Tset_500[<WS>]=[<WS>]<Tset_500>
| Tset_1.5M[<WS>]=[<WS>]<Tset_1.5M>
| Tset_3M[<WS>]=[<WS>]<Tset_3M>
| Tset_6M[<WS>]=[<WS>]<Tset_6M>
| Tset_12M[<WS>]=[<WS>]<Tset_12M>
| Tsdi_9.6[<WS>]=[<WS>]<Tsdi_9.6>
| Tsdi_19.2[<WS>]=[<WS>]<Tsdi_19.2>
| Tsdi_31.25[<WS>]=[<WS>]<Tsdi_31.25>
| Tsdi_45.45[<WS>]=[<WS>]<Tsdi_45.45>
| Tsdi_93.75[<WS>]=[<WS>]<Tsdi_93.75>
| Tsdi_187.5[<WS>]=[<WS>]<Tsdi_187.5>
| Tsdi_500[<WS>]=[<WS>]<Tsdi_500>
| Tsdi_1.5M[<WS>]=[<WS>]<Tsdi_1.5M>
| Tsdi_3M[<WS>]=[<WS>]<Tsdi_3M>
| Tsdi_6M[<WS>]=[<WS>]<Tsdi_6M>
| Tsdi_12M[<WS>]=[<WS>]<Tsdi_12M>
| LAS_Len[<WS>]=[<WS>]<LAS_Len>
| Max_Slaves_supp[<WS>]=[<WS>]<Max_Slaves_supp>
| Max_Master_Input_Len[<WS>]=[<WS>]<Max_Master_Input_Len>
| Max_Master_Output_Len[<WS>]=[<WS>]<Max_Master_Output_Len>
| Max_Master_Data_Len[<WS>]=[<WS>]<Max_Master_Data_Len>
| Freeze_Mode_supp[<WS>]=[<WS>]<Freeze_Mode_supp>
| Sync_Mode_supp[<WS>]=[<WS>]<Sync_Mode_supp>
| Auto_Baud_supp[<WS>]=[<WS>]<Auto_Baud_supp>
| Set_Slave_Add_supp[<WS>]=[<WS>]<Set_Slave_Add_supp>
| User_Prm_Data_Len[<WS>]=[<WS>]<User_Prm_Data_Len>
| User_Prm_Data[<WS>]=[<WS>]<User_Prm_Data>
| Min_Slave_Intervall[<WS>]=[<WS>]<Min_Slave_Intervall>
| Modular_Station[<WS>]=[<WS>]<Modular_Station>
| Max_Module[<WS>]=[<WS>]<Max_Module>
| Max_Input_Len[<WS>]=[<WS>]<Max_Input_Len>
| Max_Output_Len[<WS>]=[<WS>]<Max_Output_Len>
| Max_Data_Len[<WS>]=[<WS>]<Max_Data_Len>
| Fail_Safe[<WS>]=[<WS>]<Fail_Safe>
| Max_Diag_Data_Len[<WS>]=[<WS>]<Max_Diag_Data_Len>
| Modul_Offset[<WS>]=[<WS>]<Modul_Offset>
| Max_User_Prm_Data_Len[<WS>]=[<WS>]<Max_User_Prm_Data_Len>
| Slave_Family[<WS>]=[<WS>]<Family_Name>
| Unit_Diag_Bit(<Bit>[<WS>]=[<WS>]<Diag_Text> {0<=Bit<=495}
| <Unit-Diag-Area-Def>
| <Channel-Diag-Definition>
```



```
          | <User-Definition>
          | <Ext-User-Prm-Data-Const>
          | <Ext-User-Prm-Data-Ref>

17)  <Ext-User-Prm-Data-Const> =
          Ext_User_Prm_Data_Const(<Const_Offset>)[<WS>]=[<WS>]
                                                    <Const_Prm_Data>
16)  <Ext-User-Prm-Data-Ref> =
          Ext_User_Prm_Data_Ref(<Reference_Offset>)[<WS>]=[<WS>]
                                                  <Reference_Number>
15)  <Ext_Module_Prm_Len> = <Unsigned8>

14)  <Ext-Module-Prm-Data-Len> =
          Ext_Module_Prm_Data_Len[<WS>]=[<WS>]<Ext_Module_Prm_Len>
                                                          <LineEnd>
13)  <Prm_Text_Ref> =
          Prm_Text_Ref[<WS>]=[<WS>]<Reference_Number><LineEnd>

12)  <Ext_User_Prm_Data_Name> = <Visible-String> { Length <= 32}

11)  <Ext-User-Prm-Data-Def>  =
          ExtUserPrmData[<WS>]=[<WS>]<Reference_Number><WS>
                                  <Ext_User_Prm_Data_Name><LineEnd>
          <Data_Type_Name><WS><Default_Value>
          [   <WS><Min_Value>[<WS>]-[<WS>]<Max_Value>
            | <WS><Allowed_Values>
          ]<LineEnd>
          [<Prm-Text-Ref>]
          EndExtUserPrmData

10)  <Text_Item>         =
          Text(<Prm_Data_Value>)[<WS>]=[<WS>]<Text><LineEnd>

9)   <Text_List>         =
            <Text_Item>
          | <Text_List><Text_Item>

8)   <Prm-Text-Def>      =
          PrmText[<WS>]=[<WS>]<Reference_Number><LineEnd>
          <Text_List>
          EndPrmText


7)   <Module-Def-Item>   =
            <Channel-Diag-Definition>
          | <Ext-User-Prm-Data-Ref>
          | <Ext-User-Prm-Data-Const>
          | <Ext-Module-Prm-Data-Len>
          | <User-Definition>

6)   <Module-Def-List>   =
            <Module-Def-Item>
          | <Module-Def-List><Module-Def-Item>

5)   <Module-Definition> =
          Module[<WS>]=[<WS>]<Mod_Name><WS><Config><LineEnd>
          [<Module-Reference>]
```



```
          [<Module-Def-List>]
          EndModule

4)   <GSD-Item>          =
            [<Prm-Text-Def>]
          | [<Ext-User-Prm-Data-Def>]
          | <Unit-Def-Item>
          | <Module-Definition>


3)   <GSD-Line>          = <LineStart><GSD-Item><LineEnd>
2)   <GSD-List>          = <GSD-Line>|<GSD-List><GSD-Line>

1)   <GSD>               =
          [<Any-Text>]
          <LineStart>#Profibus_DP<LineEnd>
          <GSD-List>
          [<LineStart>#<Keyword><LineEnd>
           [<Any-Text>]
          ]
```


2.3.6 Examples of GSD File Entries

Only example 5 in the following sections represents a complete GSD file. The other sections contain typical sections from GSD files. Complete GSD files can be formed by appending one of the examples 1 to 4 to the general parameters.

2.3.6.1 General Parameters

```
;=============================================================
; GSD file for product (device designation), co. (vendor)
; Status : (version of the GSD file) - (contact, tel.)
; (General product information, e.g. Sync_mode_supp )
;=============================================================
;1st line must begin with #Profibus_DP in the    (M)
;case of a DP device
#Profibus_DP
;Vendor 32 characters max.                       (M)
Vendor_Name = "vendor"
;Model name 32 characters max.                   (M)
Model_Name = "model"
;Revision 32 characters max.                     (M)
Revision = "revision 1"
;ID number of the product unsigned 16            (M)
Ident_Number = 0x8023
;Protocol ID 0=DP device                         (M)
Protocol_Ident = 0
;Device type 0=slave, 1=master(class1)           (M)
Station_Type = 0
;DP device type 0=only DP, 1=DP and FMS          (D)
FMS_supp = 0
;Hardware release 32 characters max.             (M)
Hardware_Release = "A01"
;Software release 32 characters max.             (M)
Software_Release = "Z01"
;All the transmission rates supported by a
;DP device must be listed here
;Product supports 9.6kbps                        (G)
9.6_supp = 1
;Product supports 19.2kbps                       (G)
19.2_supp = 1
;Product supports 93.75kbps                      (G)
93.75_supp = 1
;Product supports 187.5kbps                      (G)
187.5_supp = 1
;Product supports 500kbps                        (G)
500_supp = 1
;Product supports 1500kbps                       (G)
1.5M_supp = 1
;Product supports 3000kbps                       (G)
3M_supp = 1
;Product supports 6000kbps                       (G)
6M_supp = 1
;Product supports 12000kbps                      (G)
12M_supp = 1
```



```
;max. response time of the product at 9.6kbps    (G)
MaxTsdr_9.6 = 60
;max. response time of the product at 19.2 kbps  (G)
MaxTsdr_19.2 = 60
;max. response time of the product at 93.75 kbps (G)
MaxTsdr_93.75 = 60
;max. response time of the product at 187.5 kbps (G)
MaxTsdr_187.5 = 60
;max. response time of the product at 500 kbps   (G)
MaxTsdr_500 = 100
;max. response time of the product at 1.5 Mbps   (G)
MaxTsdr_1.5M = 150
;max. response time of the product at 3 Mbps     (G)
MaxTsdr_3M = 250
;max. response time of the product at 6 Mbps     (G)
MaxTsdr_6M = 450
;max. response time of the product at 12 Mbps    (G)
MaxTsdr_12M = 800
;Redundant transfer method 0=no, 1=yes          (D)
Redundancy = 0
;Signal level (CNTR-P) pin 4 of the 9-pin SUB-D  (D)
;0-missing, 1-RS485, 2-TTL
Repeater_Ctrl_Sig = 2
;Meaning of the 24V pins of the 9-pin SUB-D      (D)
;0-missing, 1-input, 2-output
24V_Pins = 0
;
;--Slave-specific values -----
;
;Freeze mode is supported 0=no, 1=yes           (D)
Freeze_Mode_supp = 0
;Sync mode is supported 0=no, 1=yes             (D)
Sync_Mode_supp = 1
;Automatic transmission rate detection is
;supported 0=no, 1=yes                          (D)
Auto_Baud_supp = 1
;The product can be addressed via the bus
;0=no, 1=yes                                    (D)
Set_Slave_Add_supp = 0
;Extended parameter values (User data length)    (D)
;unsigned 8
User_Prm_Data_Len = 0x05
;Values to be preset                            (O)
User_Prm_Data = 0x01,0x02,0x03,0x04,0x05
;Minimum repetition time of a call frame        (M)
;to the slave unsigned 16 (basis 100us)
Min_Slave_Intervall = 0x0016
;Alternatively, the value can be written in
;decimal notation
;Min_Slave_Intervall = 22
```


2.3.6.2 Example 1

```
;Product description 0=compact device, 1=modular (D)
Modular_Station = 1
;Max. number of modules sent as configuration    (M)
;to the slave unsigned 8, in example 1 a max.
;of 12 modules can be selected from those available
Max_Module = 0x0C
;Alternatively, the value can be written in decimal
;notation = 12
;Max. number of inputs in bytes unsigned 8  (M)
Max_Input_Len = 0x10
;Alternatively, the value can be written in decimal
;notation = 16
;Max. number of outputs in bytes unsigned 8      (M)
Max_Output_Len = 0x08
;Alternatively, the value can be written in decimal
;notation = 08
;Max. total of input and output bytes unsigned 16(M)
Max_Data_Len = 0x0018
;Alternatively, the value can be written in decimal
;notation = 24
;Plain-text display of the station diagnosis(O)
;Bit position in the station diagnosis unsigned 16
;Plain-text display max. 32 characters
Unit_Diag_Bit(0000) = "Slow_Mode active"
Unit_Diag_Bit(0001) = "Wrong_Config_Length"
Unit_Diag_Bit(0002) = "Modul_fault"
Unit_Diag_Bit(0006) = "Power failure"
Unit_Diag_Bit(0009) = "Short circuit to Plus"
;Module description, each module is embedded in
;Module - EndModule
;32 characters are available for plain-text display
;The ID is an octet string
;Module for empty slot
Module= "empty slot" 0x00
EndModule
;Input modules byte-organized
Module = "1 Byte DI " 0x10
EndModule
Module = "2 Byte DI " 0x11
Channel_Diag(16) = "Overtemperature or overload "
Channel_Diag(17) = "Broken cable or short circuit "
EndModule
;Output modules byte-organized
Module = "1 Byte DO " 0x20
EndModule
;Input/output modules byte-organized
Module = "1 Byte DI/DO " 0x30
EndModule
Module = "2 Byte DI/DO " 0x31
EndModule
Module = "2 Byte DI/DO " 0x11,0x21
EndModule
;End of GSD file example 1
```


2.3.6.3 Example 2

```
;Modular compact station (3 possible configurations)
;Product description 0=compact device, 1=modular      (D)
Modular_Station = 1
;Max. number of modules sent as configuration to the  (M)
;slave unsigned 8, in example 2 a maximum of 1
;module can be selected from those available
Max_Module = 01
;Max. number of inputs  unsigned 8              (M)
Max_Input_Len = 20
;Max. number of outputs  unsigned 8             (M)
Max_Output_Len = 20
;Max. total of input and output data unsigned 16 (M)
Max_Data_Len = 40
;Module description, each module is embedded in
;Module - EndModule
;32 characters are available for plain-text display
;The ID is an octet string
;Module selection 1
Module= "selection 1 20Byte I/O PPO type1" 0xF3,0xF3,0xF1
EndModule
;Modul selection 2
Module= "selection 2 16Byte I/O PPO type2" 0xF3,0xF3
EndModule
;Modul selection 3
Module= "selection 3 2Byte I, 7Byte O" 0x11,0x26
EndModule
```

2.3.6.4 Example 3

```
; Compact station

;Product description 0=compact device, 1=modular      (D)
Modular_Station = 0
Unit_Diag_Area = 0-5
Value(0) = "error free"
Value(1) = "error on input 0 - 23"
Value(2) = "error on output 0 - 15"
Value(3) = " 24V failure"
Unit_Diag_Area_End
;Module description, each module is embedded in
;Module - EndModule
;32 characters are available for plain-text display
;The ID is an octet string
;Module for compact station
Module= "compact device 16I/16O " 0x11,0x21
EndModule
```


2.3.6.5 Example 4

```
; Compact station with several modules to enable
; assignment of a text to each module

;Product description 0=compact device, 1=modular      (D)
Modular_Station = 0
;Module description, each module is embedded in
;Module - EndModule
;32 characters are available for plain-text display
;The ID is an octet string
;Modules for compact station
;Output module byte-organized
Module = "1 Byte DO " 0x20
EndModule
;Input/output module byte-organized
Module = "1 Byte DI/DO " 0x30
EndModule
Module = "2 Byte DI/DO " 0x31
EndModule
```

2.3.6.6 Example 5

```
; GSD file with extended User_Prm_Data description
;
;1st line must begin with #Profibus_DP in the case    (M)
;of a DP device
#Profibus_DP
;
; Prm-Text-Def-List:
;
;Text definition 1 for User_Prm_Data
PrmText = 1                          ; Reference number 1
Text(0) = "STOP"
Text(1) = "START"
EndPrmText
;Text definition 2 for User_Prm_Data
PrmText = 2                          ; Reference number 2
Text(0) = "Rotational speed 1"
Text(1) = "Rotational speed 2"
Text(2) = "Rotational speed 3"
Text(3) = "Rotational speed 4"
EndPrmText
;
; Ext-User-Prm-Data-Def-List:
;
;User_Prm_Data-Definition 1
ExtUserPrmData = 1 "Rotational speed 1"  ; Reference number 1
Unsigned8 20 0-100                   ; Default = 20, Min = 0, Max = 100
EndExtUserPrmData
;User_Prm_Data- Definition 2
ExtUserPrmData = 2 "Rotational speed 2"  ; Reference number 2
Unsigned16 2000 0-10000              ; Default = 2000, Min = 0,
                                     ; Max = 10000
```



```
EndExtUserPrmData
;User_Prm_Data- Definition 3
ExtUserPrmData = 3 "START/STOP"  ; Reference number 3
Bit(1) 1 0-1                ; Default = 1, Min = 0, Max = 1
Prm_Text_Ref = 1            ; Referece to text definition 1
EndExtUserPrmData
;User_Prm_Data- Definition 4
ExtUserPrmData = 4 "Rotational speed selection" ;Reference number 4
BitArea(4-7) 2 0-3          ; Default = 2, Min = 0, Max = 3
Prm_Text_Ref = 2            ; Reference to text definition 2
EndExtUserPrmData
;User_Prm_Data definition 5
ExtUserPrmData = 5 "Device parameter" ; Reference number 5
Unsigned16 20 0-1000        ; Default = 20, Min = 0,
                            ; Max = 1000
EndExtUserPrmData
;User_Prm_Data definition 6
ExtUserPrmData = 6 "Parameter" ; Reference number 6
Unsigned8 30 10,20,30,40    ; Default = 30,
                            ; Allowed_Values = 10,20,30,40
EndExtUserPrmData
;
; Unit definition list:
;
;General parameters
;Vendor name 32 characters max.                  (M)
Vendor_Name = "vendor"
;Model name 32 characters max.              (M)
Model_Name = "model"
;Revision 32 characters max.                     (M)
Revision = "revision 1"
;ID number of the product unsigned 16            (M)
Ident_Number = 0x8023
;Protocol ID 0=DP device                         (M)
Protocol_Ident = 0
;Device type 0=slave, 1=master(class1)           (M)
Station_Type = 0
;Mixed-mode device 0=DP only, 1=DP and FMS       (D)
FMS_supp = 0
;Hardware release 32 characters max.             (M)
Hardware_Release = "A01"
;Software release 32 characters max.             (M)
Software_Release = "Z01"
;Product supports 9.6kbps                        (G)
9.6_supp = 1
;Product supports 19.2kbps                  (G)
19.2_supp = 1
;Product supports 93.75kbps                 (G)
93.75_supp = 1
;Product supports 187.5kbps                 (G)
187.5_supp = 1
;Product supports 500kbps                        (G)
500_supp = 1
;Product supports 1500kbps                  (G)
1.5M_supp = 1
;Product supports 3000kbps                  (G)
3M_supp = 1
```



```
;Product supports 6000kbps                  (G)
6M_supp = 1
;Product supports 12000kbps                 (G)
12M_supp = 1
;max. response time of the product at 9.6kbps        (G)
MaxTsdr_9.6 = 60
;max. response time of the product at 19.2 kbps  (G)
MaxTsdr_19.2 = 60
;max. response time of the product at 93.75 kbps (G)
MaxTsdr_93.75 = 60
;max. response time of the product at 187.5 kbps (G)
MaxTsdr_187.5 = 60
;max. response time of the product at 500 kbps   (G)
MaxTsdr_500 = 100
;max. response time of the product at 1.5 Mbps   (G)
MaxTsdr_1.5M = 150
;max. response time of the product at 3 Mbps     (G)
MaxTsdr_3M = 250
;max. response time of the product at 6 Mbps     (G)
MaxTsdr_6M = 450
;max. response time of the product at 12 Mbps    (G)
MaxTsdr_12M = 800
;Redundant transfer method 0=N, 1=Y             (D)
Redundancy = 0
;RTS signal level (CNTR-P) pin 4 of the 9-pin SUB-D   (D)
;0-missing, 1-RS485, 2-TTL
Repeater_Ctrl_Sig = 2
;Meaning of the 24V pins of the 9-pin SUB-D      (D)
;0-missing, 1-input, 2-output
24V_Pins = 0
;
;--Slave-specific values -----
;
; Freeze mode is supported 0=no, 1=yes          (D)
Freeze_Mode_supp = 0
; Sync mode is supported 0=no, 1=yes            (D)
Sync_Mode_supp = 1
;Automatic transmission rate detection is
;supported 0=no, 1=yes                          (D)
Auto_Baud_supp = 1
;The product can be addressed via the bus
;0=no, 1=yes                                    (D)
Set_Slave_Add_supp = 0
;Extended parameter values (User data length)    (D)
;unsigned 8
User_Prm_Data_Len = 0x20
;Minimum repetition time of a call frame         (M)
;to the slave unsigned 16 (basis 100us)
Min_Slave_Intervall = 0x0016
;Alternatively, the value can be written in decimal
;notation = 20
;Product description 0=compact device, 1=modular (D)
Modular_Station = 1
;Max. number of modules sent as configuration    (M)
;to the slave unsigned 8, a max. of 12 modules
;can be selected from those available
Max_Module = 0x0C
```



```
;Alternatively, the value can be written in decimal
;notation = 12
;Max. number of inputs in bytes unsigned 8  (M)
Max_Input_Len = 0x10
;Alternatively, the value can be written in decimal
;notation = 16
;Max. number of outputs in bytes unsigned 8      (M)
Max_Output_Len = 0x08
;Alternatively, the value can be written in decimal
;notation = 08
;Max. total of input and output bytes unsigned 16(M)
Max_Data_Len = 0x0018
;Alternatively, the value can be written in decimal
;notation = 24
;Plain-text display of the station diagnosis(O)
;Bit position in the station diagnosis unsigned 16
;Plain-text display max. 32 characters
Unit_Diag_Bit(0000) = "Slow_Mode active"
Unit_Diag_Bit(0001) = "Wrong_Config_Length"
Unit_Diag_Bit(0002) = "Modul_fault"
Unit_Diag_Bit(0006) = "Power failure"
Unit_Diag_Bit(0009) = "Short circuit to Plus"
;
;Definition of the User_Prm_Data for the device (header station):
;As of offset 0 come four constant bytes
Ext_User_Prm_Data_Const(0) = 0x0A,0x00,0x01,0x02
;As of Offset 4 comes a User_Prm_Data area as described under
;referenz 5 with the default value 0x0014
Ext_User_Prm_Data_Ref(4) = 5
;As of offset 6 come four constant bytes
Ext_User_Prm_Data_Const(6) = 0x01,0x02,0x03,0x04
;As of offset 10 comes a User_Prm_Data area as described under
;reference 5 with the default value 0x0014
Ext_User_Prm_Data_Ref(10) = 5
;


; Structure of User_Prm_Data[0-11]:
;     |      constant     | variable|      constant     | variable|
;     +----+----+----+----+----+----+----+----+----+----+----+----+
;     |0x0A|0x00|0x01|0x02|0x00|0x14|0x01|0x02|0x03|0x04|0x00|0x14|
;     +----+----+----+----+----+----+----+----+----+----+----+----+
;Offset  0    1    2    3    4    5    6    7    8    9   10   11
;
; Module definition list:
;
;Module description, each module is embedded in
;Module - EndModule
;32 characters are available for plain-text display
;The ID is an octet string
;Module with 2 byte outputs and 5 byte associated User_Prm_Data
Module = "Actuator  x1" 0x21
Ext_Module_Prm_Data_Len = 5
Ext_User_Prm_Data_Const(0) = 0x05
Ext_User_Prm_Data_Ref(1) = 2
Ext_User_Prm_Data_Ref(3) = 1
Ext_User_Prm_Data_Const(4) = 0x00
```



```
Ext_User_Prm_Data_Ref(4) = 3
Ext_User_Prm_Data_Ref(4) = 4
Channel_Diag(16) = "too high"
EndModule
;Modul with 2 byte inputs and 1 bytes associated User_Prm_Data
Module = "Sensor  x1" 0x11
Ext_Module_Prm_Data_Len = 1
Ext_User_Prm_Data_Ref(0) = 6
EndModule
;Module with 1 byte inputs and without associated User_Prm_Data
Module = "Sensor  x2" 0x10
EndModule
;
;The sequence of the selected modules results in a
;particular sequence in User_Prm_Data
;
; Module    0    1    2    3    4    5    6
; Sensor         X2   X1   X1        X2   X2
; Actuator X1                  X1
;        +----+----+----+----+----+----+----+
;        |0x21|0x10|0x11|0x11|0x21|0x10|0x10|
;        +----+----+----+----+----+----+----+
;
;The structure of the User_Prm_Data follows on from this:
;2 of the 3 selectable module types use module-specific
;parameter assignment. The User_Prm_Data area is extended
;dynamically depending on the selected configuration of
;the slaves.
; v = variable area of User_Prm_Data (default value is
;     entered)
; c = constanter area of the User_Prm_Data (constant is
;     entered)
;
; Structure of User_Prm_Data[12-23]:
;
;      |       Module 0         | M2 | M3 |       Module 4         |
;      | c  |    v    | v  |v/c | v  | v  | c  |    v    | v  |v/c |
;      +----+----+----+----+----+----+----+----+----+----+----+----+
;      |0x05|0x07|0xD0|0x14|0x22|0x1E|0x1E|0x05|0x07|0xD0|0x14|0x22|
;      +----+----+----+----+----+----+----+----+----+----+----+----+
;Offset  12   13   14   15   16   17   18   19   20   21   22   23
;
```


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