

Ways of reading the diagnosis

Table 6-7 Reading the diagnosis out using *STEP 7* and *STEP 5* on PROFIBUS DP

Programmable logic controller with DP master	Block or register in <i>STEP 7</i>	Application	See .
SIMATIC S7/M7	"DP Slave Diagnostics" tab	Slave diagnosis in plain-text form on the <i>STEP 7</i> user interface	The section on hardware diagnostics in the <i>STEP 7 online help system</i>
	SFC 13 "DP NRM_DG"	Read out slave diagnosis (store in data area of the user program)	For the structure, see Section 6.1.6.2; for SFC, see the <i>STEP 7 online help system</i>
	SFC 59 "RD_REC"	Read data records of the S7 diagnosis (store in the data area of the user program)	See the system and standard functions reference manual
	SFB 52 "RDREC"	Read data records from the DP slave	For SFB, see the <i>STEP 7 online help system</i> (system functions/system function blocks)
	SFB 54 "RALRM" 1)	Receive interrupts from the interrupt OBs	For SFB, see the <i>STEP 7 online help system</i> (system functions/system function blocks)
SIMATIC S5 with IM308-C as DP master	FB 192 "IM308C"	Read out slave diagnosis (store in data area of the user program)	For the structure, see Section 6.1.6.2; for FBs, see the <i>ET 200 Distributed I/O System manual</i>
SIMATIC S5 with S5-95U PLC as DP master	FB 230 "S_DIAG"		

1) Only with S7-400 as of V3.0 and with CPU 318 as of V3.0

Example of reading the slave diagnosis using FB 192 "IM308C"

Here you will find an example of how to use FB 192 to read out the slave diagnosis for a DP slave in the *STEP 5* user program.

Assumptions

The following assumptions apply to this *STEP 5* user program:

- The IM 308-C operating in DP master mode uses the page frames 0 to 15 (number 0 of IM 308-C).
- The DP slave has the PROFIBUS address 3.
- The slave diagnosis is to be stored in DB20. However, you can also use any other data block for this.
- The slave diagnosis consists of a maximum 64 bytes (IM151-1 STANDARD).

STEP 5 user program

STL	Explanation
:A DB 30	
:SPA FB 192	
Name :IM308C	
DPAD : KH F800	Default address area of the IM 308-C
IMST : KY 0, 3	IM no. = 0, PROFIBUS address of DP slave = 3
FCT : KC SD	Function: Read slave diagnostics
GCGR : KM 0	Not evaluated
TYP : KY 0, 20	S5 data area: DB 20
STAD : KF +1	Diagnostic data from data word 1
LENG : KF -1	Diagnosis length = joker length (all permitted bytes)
ERR : DW 0	Error code stored in DW0 of DB30

Example of reading the S7 diagnosis using SFC13 "DP NRM_DG"

Here you will find an example of how to use SFC 13 to read out the slave diagnosis for a DP slave in the *STEP 7* user program.

Assumptions

The following assumptions apply to this *STEP 7* user program:

- The diagnostic address of the ET 200S is 1022 (3FE_H).
- The slave diagnostic information is to be stored in DB 82: starting at address 0.0, length 64 bytes.
- The slave diagnostics is max. 64 bytes (IM151-1 STANDARD in DPV0 operation).

STEP 7 user program

STL	Explanation
CALL SFC 13	
REQ :=TRUE	Read request
LADDR :=W#16#3FE	Diagnostic address of the ET 200S
RET_VAL :=MWO	RET_VAL of SFC13
RECORD :=P#DB82.DBX 0.0 BYTE 64	Data mailbox for the diagnosis in DB82
BUSY :=M2.0	Read operation runs over several OB1 cycles

6.1.6.2 Structure of slave diagnostic data

Structure of slave diagnostic data

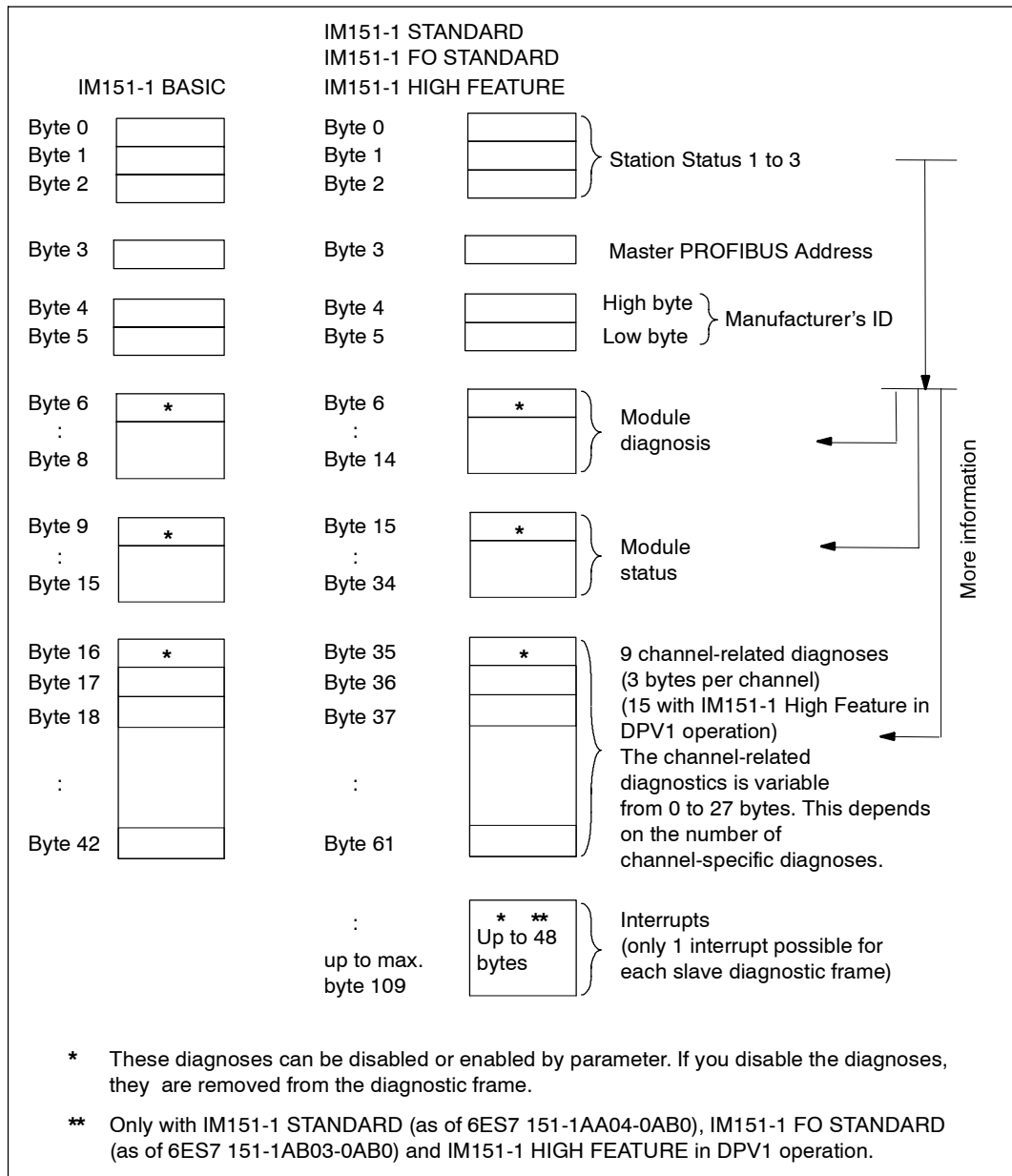


Figure 6-20 Structure of slave diagnostic data

Note

The length of the diagnostic message frame varies:

- Between 6 and 43 bytes in the IM151-1 BASIC
- with IM151-1 STANDARD, IM151-1 FO STANDARD and IM151-1 HIGH FEATURE (depending on configuration)
 - between 6 and 62 bytes in DPV0 operation
 - between 6 and 110 bytes in DPV0 operation (STANDARD)
 - between 6 and 128 bytes in DPV0 operation (HIGH FEATURE)

You can find out the length of the last diagnostic message frame received in:

- *STEP 7* from the RET_VAL parameter of the SFC 13.
 - *STEP 5* from the ERR parameter of the FB 192.
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6.1.6.3 Station statuses 1 to 3

Definition

Station statuses 1 to 3 provide an overview of the status of a DP slave.

Station status 1

Table 6-8 Structure of station status 1 (byte 0)

Bit	Meaning	Cause/remedy
0	1: The DP slave cannot be addressed by the DP master.	<ul style="list-style-type: none"> • Correct PROFIBUS address set on the DP slave • Bus connector connected? • Voltage at DP slave? • RS 485 repeater set correctly? • Reset carried out on DP slave?
1	1: The DP slave is not yet ready to exchange data.	<ul style="list-style-type: none"> • Wait while the DP slave starts up.
2	1: The configuration data sent by the DP master to the DP slave does not correspond to the setup of the DP slave.	<ul style="list-style-type: none"> • Correct station type or correct setup of the DP slave entered in the configuration software?
3	1: External diagnosis available. (Group diagnosis indication)	<ul style="list-style-type: none"> • Evaluate the module diagnosis, the module status and/or the channel-specific diagnosis. Bit 3 is reset as soon as all the faults have been rectified. The bit is reset when there is a new diagnostic message in the bytes of the diagnostics mentioned above.
4	1: The required function is not supported by the DP slave (for example, changing the PROFIBUS address by means of software).	<ul style="list-style-type: none"> • Check the configuration.
5	1: The DP master cannot interpret the response from the DP slave.	<ul style="list-style-type: none"> • Check the bus configuration.
6	1: The DP slave type does not correspond to the software configuration.	<ul style="list-style-type: none"> • Correct station type entered in the configuration software?
7	1: Parameters have been assigned to the DP slave by a different DP master (not the one that currently has access to the DP slave).	<ul style="list-style-type: none"> • The bit is always 1, for example, if you access the DP slave with the programming device or another DP master. The PROFIBUS address of the DP master that assigned parameters to the DP slave is located in the "master PROFIBUS address" diagnostic byte.

Station status 2

Table 6-9 Structure of station status 2 (byte 1)

Bit	Meaning
0	1: New parameters have to be assigned to the DP slave.
1	1: A diagnostic message has been issued. The DP slave will not work until the fault has been corrected (static diagnostic message).
2	1: The bit is always set to "1" in the DP slave.
3	1: Response monitoring has been enabled for this DP slave.
4	1: The DP slave has received the "FREEZE" control command ¹ .
5	1: The DP slave has received the "SYNC" control command ¹ .
6	0: The bit is always at 0.
7	1: The DP slave has been disabled, that is, it has been removed from the processing in progress.

¹ The bit is updated only if another diagnostic message changes, too.

Station status 3

Table 6-10 Structure of station status 3 (byte 2)

Bit	Meaning
0 to 6	0: The bits are always at 0.
7	1: <ul style="list-style-type: none"> • There are more diagnostic messages than the DP slave can store. • The DP master cannot enter all the diagnostic messages sent by the DP slave in its diagnostic buffer (channel-specific diagnosis).

6.1.6.4 Master PROFIBUS Address

Definition

The master PROFIBUS address diagnostic byte contains the PROFIBUS address of the DP master that:

- Assigned parameters to the DP slave and
- Has read and write access to the DP slave

The master PROFIBUS address is in byte 3 of the slave diagnosis.

6.1.6.5 Manufacturer ID

Definition

The manufacturer ID contains a code that describes the type of the DP slave.

Manufacturer ID

Table 6-11 Structure of the manufacturer ID (Bytes 4, 5)

Byte 4	Byte 5	Manufacturer ID for
80 _H	F3 _H	ET 200S with IM151-1 BASIC
80 _H	6A _H	ET 200S with IM151-1 STANDARD
80 _H	6B _H	ET 200S with IM151-1 FO STANDARD
80 _H	E0 _H	ET 200S with IM151-1 HIGH FEATURE

6.1.6.6 Module diagnosis

Definition

The module diagnosis indicates whether or not modules of the ET 200S have errors/faults. The module diagnosis begins as of byte 6 and comprises:

- 3 bytes in the case of the IM151-1 BASIC
- 9 bytes in the case of the IM151-1 STANDARD; IM151-1 FO STANDARD and IM151-1 HIGH FEATURE.

Module diagnosis

The module diagnosis for the ET 200S with the IM151-1 BASIC is structured as follows:

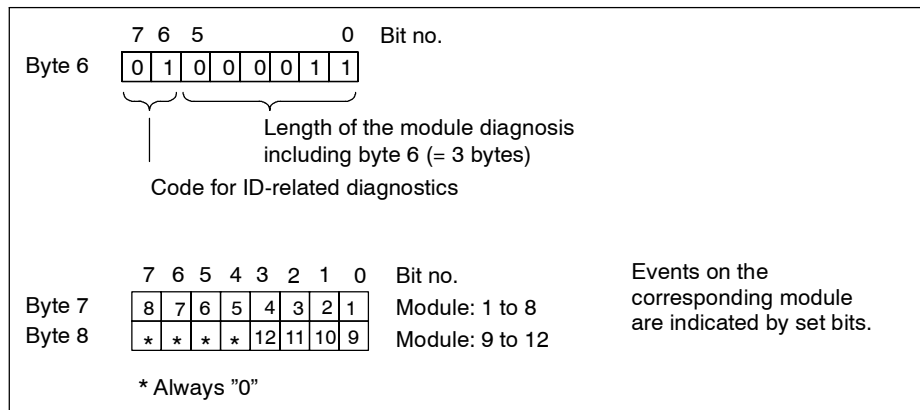


Figure 6-21 Structure of the ID-related diagnosis for the ET 200S with the IM151-1 BASIC

The module diagnosis for the ET 200S with the IM151-1 STANDARD, IM151-1 FO STANDARD and IM151-1 HIGH FEATURE is structured as follows:

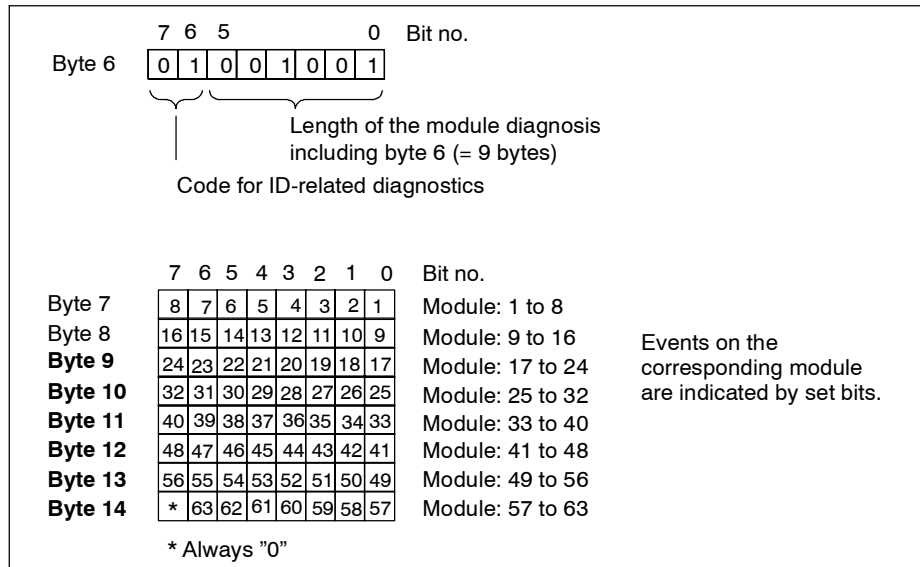


Figure 6-22 Structure of the ID-related diagnosis for the ET 200S with the IM151-1 STANDARD, IM151-1 FO STANDARD and IM151-1 HIGH FEATURE

6.1.6.7 Module information

Definition

The module status indicates the status of the configured modules and expands on the module diagnosis as regards the configuration. The module status begins after the module diagnosis and comprises:

- 7 bytes in the case of the IM151-1 BASIC
- 20 bytes in the case of the IM151-1 STANDARD, IM151-1 FO STANDARD and IM151-1 HIGH FEATURE.

Module status

The module status for the ET 200S with the IM151-1 BASIC is structured as follows:

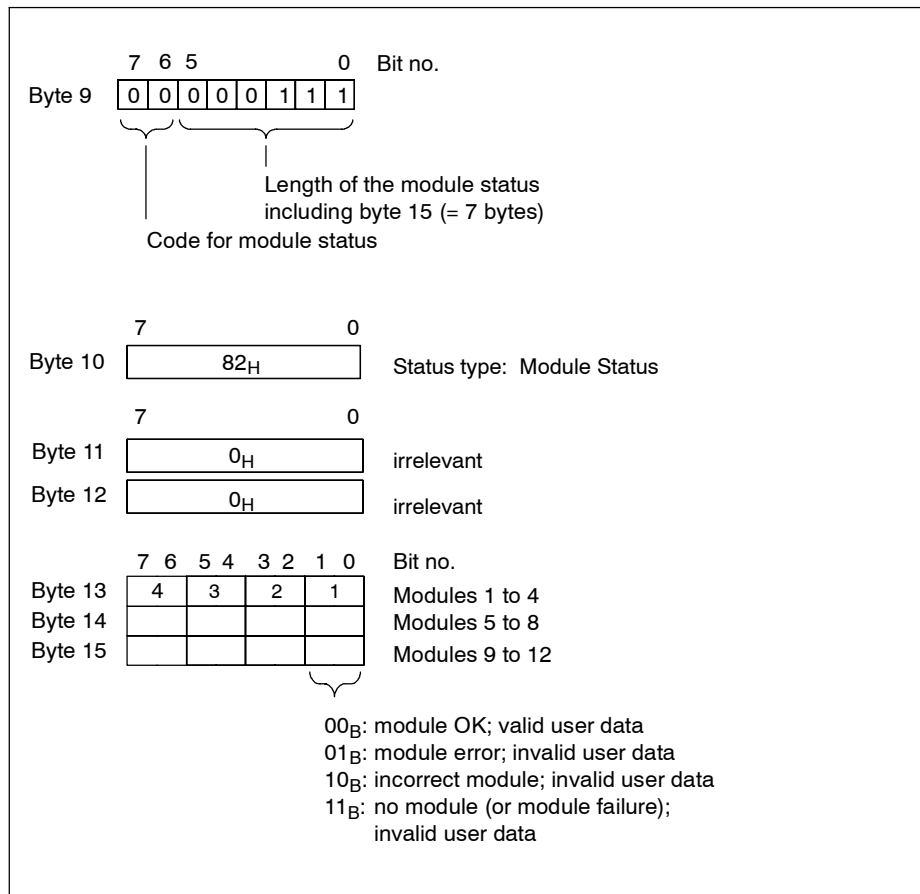


Figure 6-23 Structure of the module status for the ET 200S with the IM151-1 BASIC

The module status for the ET200S with the IM151-1 STANDARD, IM151-1 FO STANDARD, and IM151-1 HIGH FEATURE is structured as follows:

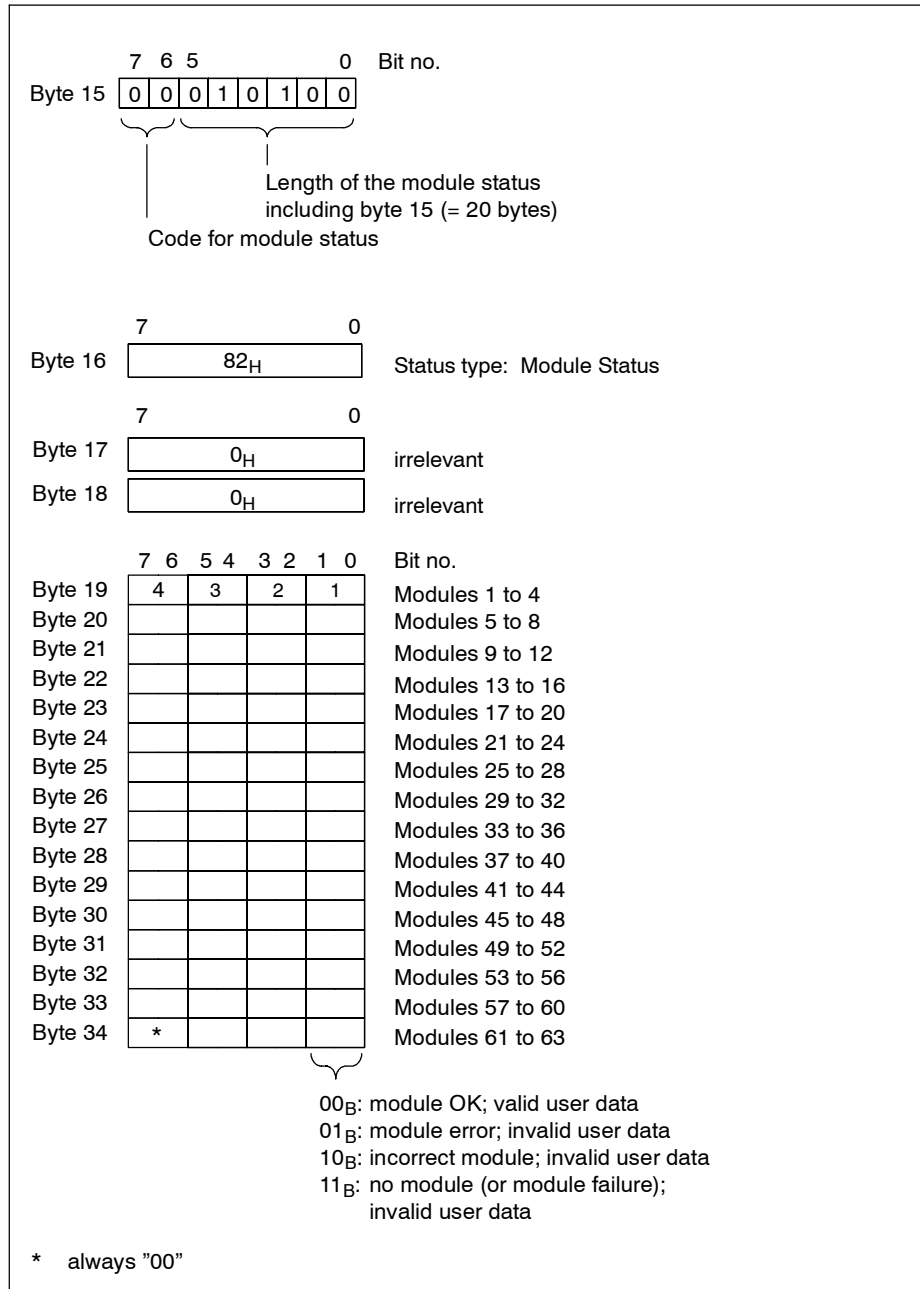


Figure 6-24 Structure of the module status for ET 200S with the IM151-1 STANDARD; IM151 FO STANDARD and IM151 HIGH FEATURE