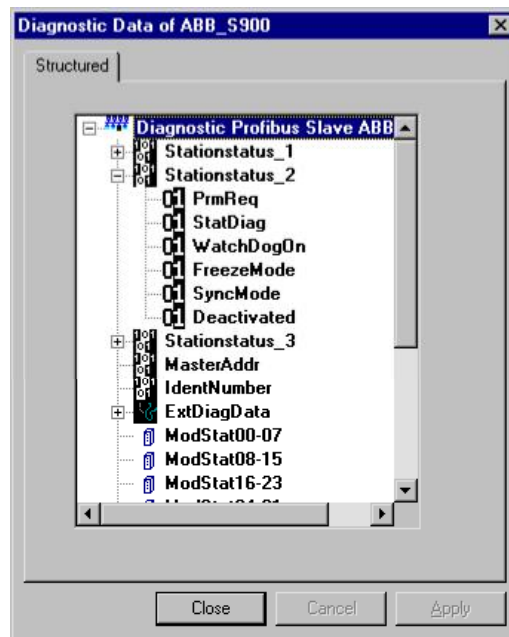


Action	Side-effect
Change the data type or position (input or output value) of a component	All configured values are deleted and default values are set as for inserting a new component.
Cut and paste	All configured values are retained.
Copy and paste	Same side-effects as for inserting a new component --> default values for the new component.
Drag and drop	Same side-effects as for "Copy and paste".
Change the variable assignment of a component	All configured values are retained.
Rename a component	Same side-effects as for "Copy and paste".

Diagnostic data

The Profibus defines three areas of diagnostic data - device, module and channel.

When the I/O editor is first opened, no components have yet been defined for diagnostic data. In connection with **Insert new component** all diagnostic data which has not yet been assigned is listed with the data types with which it is transferred on the Profibus. The data can be displayed structured and not structured. When selecting the data area, you also have to define the appropriate Freelance data type (context menu).



bq012us.bmp

A Profibus slave object uses the following storage areas for the diagnostic data.

Device diagnostic data

The Profibus defines 6 bytes of diagnostic data for each Profibus device. Bytes 7 to 32 (expandable to 244) are device-specific (Ext_Diag_Data). In this area, each slave can store specific diagnostic data. For more information, refer to the device manufacturer's manual.

The predefined diagnostic data consist of 3 status bytes, the master bus address and the IdentNumber:

Status byte 1 (Station status_1)		
Bit	Name	Remarks
0	StationNoExist	The master sets this if this slave cannot be reached through the Profibus. If the bit is set, the other diagnostic bits contain the state of the last diagnostic message or the initial value.
1	StationNoReady	The slave sets this bit if the slave is not yet ready for data exchange.

Status byte 1 (Station status_1)		
Bit	Name	Remarks
2	CfgFault	The slave sets this bit as soon as the configuration data most recently received from the master does not match the data determined by the slave.
3	ExtDiag	The slave sets this bit. If the bit is set, there must be a diagnostic entry in the slave-specific diagnostic area (Ext_Diag_Data). If the bit is not set, there may be a diagnostic entry in the slave-specific diagnostic area (Ext_Diag_Data). The significance of this status message is vendor-specific. For more information, refer to the device manufacturer's manual.
4	NotSupported	The slave sets this bit as soon as a function has been requested which is not supported by the slave.
5	InvalidSlaveRsp	The master sets this bit as soon as an implausible response is received from a slave.
6	PrmFault	The bit is set if the last parameter message was defective. For example, incorrect length, incorrect Ident_Number, invalid parameters.
7	MasterLock	The DP slave has been programmed by another master.

Status byte 2 (Station status_2)		
Bit	Name	Remarks
0	PrmReq	If the slave sets this bit, it must be re-parameterized and re-configured. The bit remains set until parameterization has taken place.
1	StatDiag	If the slave sets this bit, the master must collect diagnostic information until this bit is reset. The slave sets this bit, for example, if it cannot make any valid user data available.
2		The slave sets this bit permanently to 1.
3	WatchDogOn	The slave sets this bit as soon as a watchdog is activated.

Status byte 2 (Station status_2)		
Bit	Name	Remarks
4	FreezeMode	The slave sets this bit as soon as it has received the freeze control command.
5	SyncMode	The slave sets this bit as soon as it has received the sync control command.
6		Reserved
7	Deactivated	The master sets this bit as soon as the slave has been marked as inactive in the slave parameter set and removed from the cyclic processing.

Status byte 3 (Station status_3)		
Bit	Name	Remarks
0		Reserved
1		Reserved
2		Reserved
3		Reserved
4		Reserved
5		Reserved
6		Reserved
7	ExtDiagOverflow	If this bit is set more diagnostic data is available than specified in Ext_Diag_Data. The slave sets this bit if the amount of diagnostic data per channel is larger than the slave input buffer. The master will set this bit if the amount of diagnostic data sent by the slave can not be considered in the diagnostic buffer.

MasterAddr Length: 8 bits

Here the slave enters the bus address of the master which has parameterized this slave. If the slave has not been parameterized by a master, the slave sets this value to 255.

IdentNumber Length: 16 bits

PNO identification number of the slave. This identification number can be used for test purposes and for precise identification of the device.



A system message for slave specific diagnostic data (Ext_Diag_Data) is only generated if the slave also has the **ExtDiag** bit set.

In addition to the device diagnostic data defined in the Profibus standard, a device can supply a maximum of additional 62 bytes of diagnostic data.

The quantity and structure of this additional diagnostic data are defined in the GSD file. In the configuration of the diagnostic data, the additional diagnostic data is available under the node **ExtDiagData**. For more information, refer to the device manufacturer's manual.

Standard texts can be specified in the GSD file. The textual description of diagnostic bits is stated in the GSD file as follows:

```
; Device-related diagnosis
; The first byte is interpreted as a clear text message.
Unit_Diag_Area = 0-7
Value(1) = "Configuration phase"
Value(2) = "Configuration change"
Value(3) = "CPU in state STOP"
Value(4) = "Min. TSDR not changed"
Value(5) = "Sap not activated"
Unit_Diag_Area_End
```



In the DTM based variant every PROFIBUS DTM provides a GSD file which is imported by the system. If the GSD file provided by the DTM contains diagnostic descriptions, they are used by the system in the same way as for the GSD based variant.

Module diagnostic data

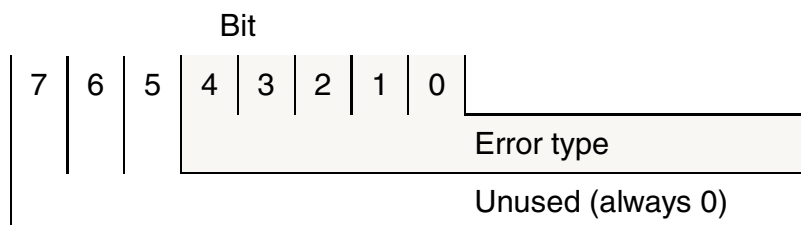
64 bits are assigned to each slave for module-related diagnosis. Each bit represents a module. Bit 0 represents module 0, bit 1 module 1, and so on. If the bit is set, there is a diagnostic state in the module.

In the configuration of the diagnostic data, the module diagnostic data are available under the node in bytes **ModStat0** to **ModStat7**. Module 0 corresponds to bit 0 in byte **ModStat0** and, consecutively, module 63 corresponds to bit 7 in byte **ModStat7**.

The data types can be redefined as BOOL, WORD16 or WORD32.

Diagnostic data channel

A byte is assigned to each channel for channel-related diagnostic data. The byte contains, in bits 0 to 4, the last active error type as a diagnostic value.

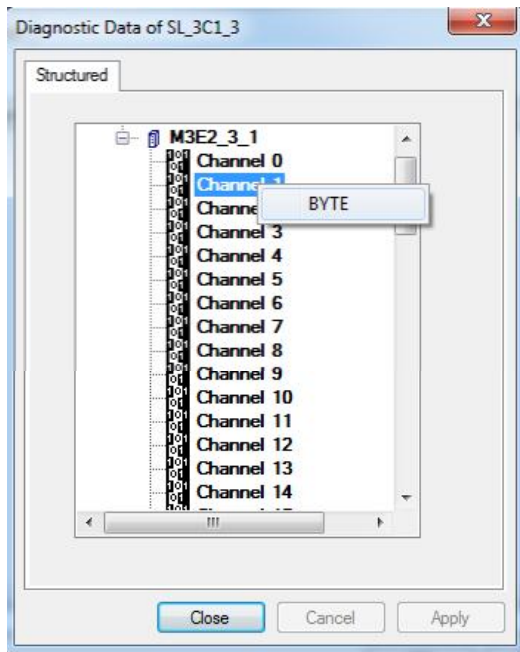


Error type	Description
0	There is no diagnostic message for the channel
1	Short circuit
2	Undervoltage
3	Overvoltage
4	Overload
5	Overtemperature
6	Line break
7	Upper limit exceeded
8	Lower limit exceeded

Error type	Description
9	Error
10 to 15	Reserved
16 to 31	Vendor-specific For more information, refer to the device manufacturer's manual.

In the configuration of the diagnostic data, the channel diagnostic data is available under the node with the respective module name (**channel 0** to **channel 63**).

The data type is preset in each channel to BYTE. The channel diagnostic data for a slave with modules M1F2_11_0 to _4 can be configured using the following dialog.



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When a Profibus slave is configured through a DTM, the module diagnosis is not allocated to the corresponding module nodes in the hardware tree. In this case, the modules are consecutively numbered in the configuration of the module diagnostic data and do not refer to the tag names of the module objects.

The configuration is done in the same way as for a slave configured through a GSD file.