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PROCESS AUTOMATION

Freelance 2019

Engineering Manual

S700 I/O Modules





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Engineering Manual S700 I/O Modules

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About This Book

Use of Warning, Caution, Information, and Tip Icons

This publication includes **Warning**, **Caution**, and **Information** where appropriate to point out safety related or other important information. It also includes **Tip** to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:



Electrical warning icon indicates the presence of a hazard which could result in *electrical shock*.



Warning icon indicates the presence of a hazard which could result in *personal injury*.



Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in *corruption of software or damage to equipment/property*.



Information icon alerts the reader to pertinent facts and conditions.



Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although **Warning** hazards are related to personal injury, and **Caution** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all **Warning** and **Caution** notices.

Terminology

The Glossary contains terms and abbreviations that are unique to ABB or have a usage or definition that is different from standard industry usage. Please make yourself familiar to that.

You will find the glossary at the end of the *Engineering Manual System Configuration*.

Document conventions

The following conventions are used for the presentation of material:

- The words in names of screen elements (for example, the title in the title bar of a window, the label for a field of a dialog box) are initially capitalized.
- Capital letters are used for the name of a keyboard key if it is labeled on the keyboard. For example, press the ENTER key.
- Lowercase letters are used for the name of a keyboard key that is not labeled on the keyboard. For example, the **space bar**, **comma key**, and so on.
- Press CTRL+C indicates that you must hold down the CTRL key while pressing the C key (to copy a selected object in this case).
- Press **ESC**, **E**, **C** indicates that you press and release each key in sequence (to copy a selected object in this case).
- The names of push and toggle buttons are boldfaced. For example, click **OK**.
- The names of menus and menu items are boldfaced. For example, the **File** menu.
 - The following convention is used for menu operations: MenuName > MenuItem > CascadedMenuItem. For example: select **File** > **New** > **Type**.
 - The **Start** menu name always refers to the **Start** menu on the Windows Task Bar.

- System prompts/messages are shown in the Courier font, and user responses/input are in the boldfaced Courier font. For example, if you enter a value out of range, the following message is displayed:

Entered value is not valid. The value must be 0 to 30.

You may be told to enter the string TIC132 in a field. The string is shown as follows in the procedure:

TIC132

Variables are shown using lowercase letters.

sequence name

1 S700 PROFIBUS setup

1.1 General

The Freelance System supports use of remote S700 I/O modules through PROFIBUS communication to an AC 700F/800F/900F controller (hereinafter usually called “Freelance controller”).

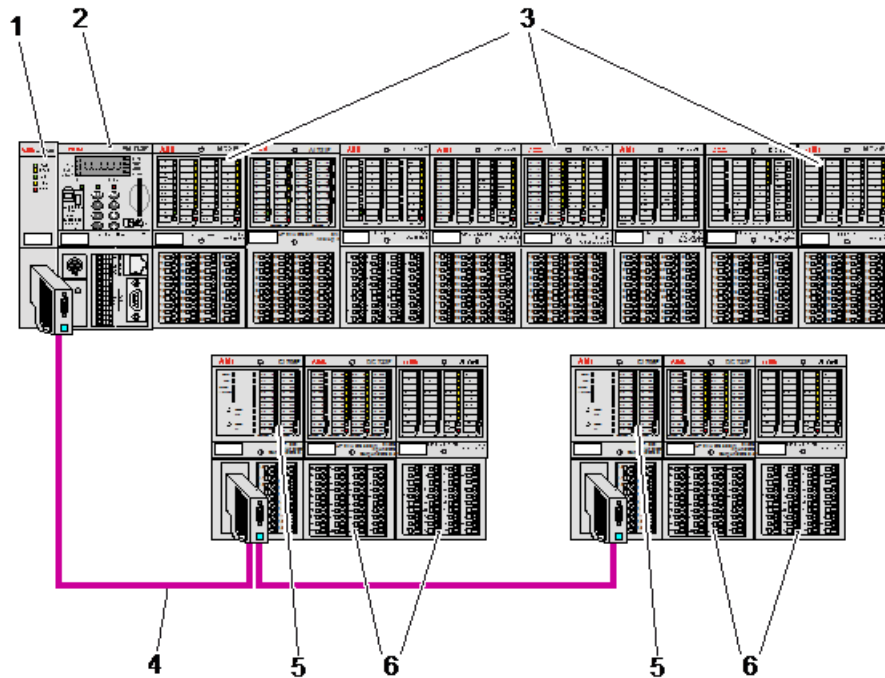
The PROFIBUS communication interface module DC 705F or CI 741F is used to connect S700 I/O modules to the Freelance controller.

The PROFIBUS communication interface module CM 772F, CI 773F or CI 930F is used to connect remote S700 I/O modules to the AC 700F or AC 900F controller.

The PROFIBUS fieldbus interface module FI 830F is used to connect remote S700 I/O modules to the AC 800F controller.

1.2 Setup using S700 IO Modules

An example setup using AC 700F and remote S700 IO modules is shown below:



System_Overview_EN_quer.png

1. **CI 773F**
AC 700F communication interface module, PROFIBUS DP master
2. **PM 783F**
AC 700F CPU module
3. **Local IO modules**
For a complete list refer to *Engineering Manual, I/O Modules for AC 700F / AC 900F*.
4. **PROFIBUS connection**
5. **CI 741F**
PROFIBUS communication interface module of the S700 PROFIBUS slave
6. **S700 remote IO modules**
For a complete list refer to [Section 2, S700 IO Modules](#) on page 41.

For data on setting up a PROFIBUS slave refer to *Engineering Manual, Process Stations* and *Engineering-Reference Manual, Communication and Fieldbusses*.

For details on Mounting and Installation of the S700 IO Modules refer to *Mounting and Installation Instructions, I/O Modules for AC 700F and AC 900F*.

1.2.1 Importing GSD file

Importing Master Device (GSD) Files

Device specific data for PROFIBUS devices are stored in the master device data file (GSD file). The PROFIBUS slave object PROFI_S_DEV allows PROFIBUS field device configuration using a GSD file as the basis. A GSD file is imported into the PROFIBUS slave object to do this.

PROFIBUS slave objects (PROFI_S_DEV) can only be inserted below the PROFIBUS master object (PROFI_M_772/PROFI_M_C/PROFI_M_DEV). The GSD file selection dialog appears during the Insert command.



- > Select PROFIBUS master (PROFI_M_xxx) > **Edit** > **Insert**
- > Select PROFIBUS slave object (PROFI_S_DEV) > Free bus address selection
- > Select device GSD > Operate **Start import** button

Start Import

Start Import imports the selected GSD file. Following the Import command, all the GSD file data is held in the new PROFIBUS slave object. It is no longer possible to update GSD file data in the PROFIBUS slave object. The GSD file name is displayed in the PROFIBUS slave object parameter mask.

All the device master data files are displayed in a list in the default device master data directory. The default device master data directory is: <freelance_installation_directory>\GSD. The following information is displayed in the list for each device

master data file: vendor, device type, version, path and file name of the device master data file.



GSD files are provided for the following S700 PROFIBUS communication interface modules:

- ABB_0EBB.GSD: CI 741F
- ABB_34E4.GSD: DC 705F

After importing the device master data, all information on the modular slave configuration (maximum number of modules, available module types etc.) is available.

For some device types, the device master data file also includes diagnostic texts. These texts are also imported. They are used in the Freelance Engineering commissioning mode and the Freelance Operations system display to display diagnostic states.

The device master data file is not a PROFIBUS slave object component. It is only imported when the object is inserted. i.e. when the device master data file is updated, the device master data file must again be imported into a new PROFIBUS slave object.



The device master data file cannot be update in the PROFIBUS slave object.

Following the Insert command, the object appears both in the tree and graphic views.

Pre defined Template

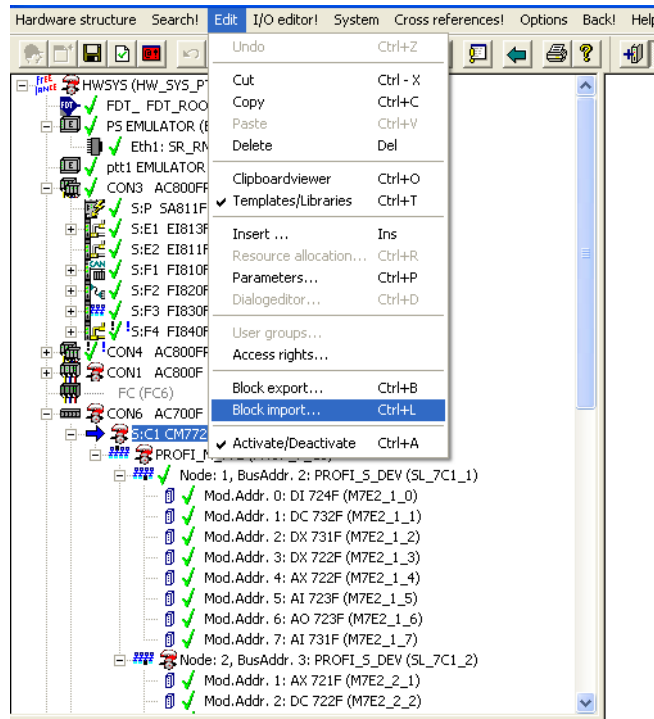
A pre-defined template has been created for the S700 IO Modules. The template (S700_Template_US.hwm) is available with the Freelance setup and is located in the path <freelance_installation_directory>\export after installation.

The template contains the standard tabs and some user defined tabs. The user can define additional tabs or create a new template as required.

Import S700 Template

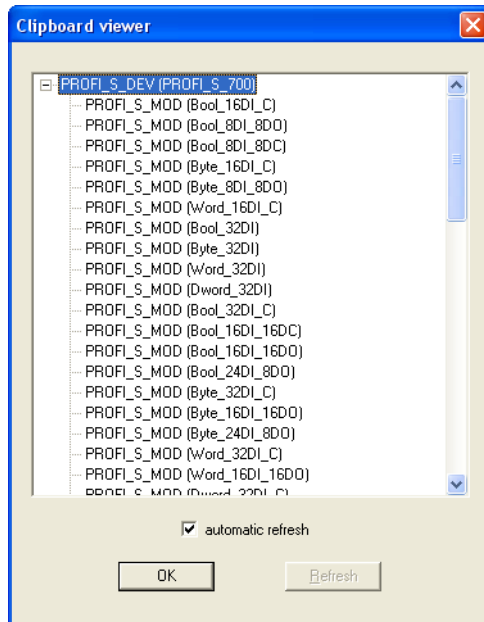


Hardware Manager > Edit > Block import > Browse and select the template *S700_Template_US.hwm* from the **export** folder



Edit_Blk import.bmp

The S700 template is displayed in the Clipboard viewer.



Clipboard_expand.bmp

Drag the template from the Clipboard viewer directly to the Hardware Manager or to the Templates window (bottom left pane of the Hardware Manager).

User-defined Tabs

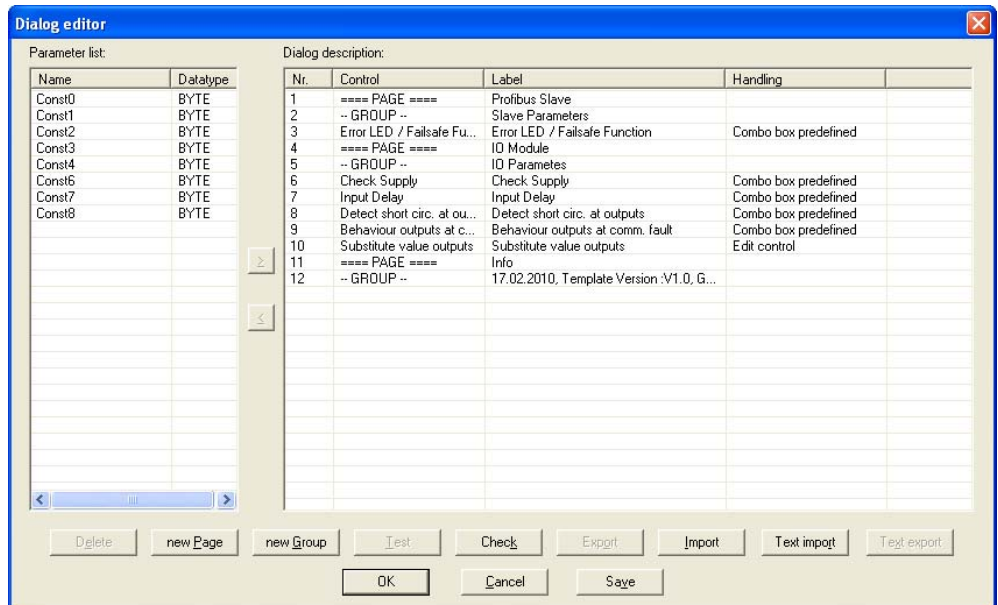
The S700 template has a set of user defined tabs for each of the S700 IO Module.

The user can define additional tabs as required using the Dialog editor.

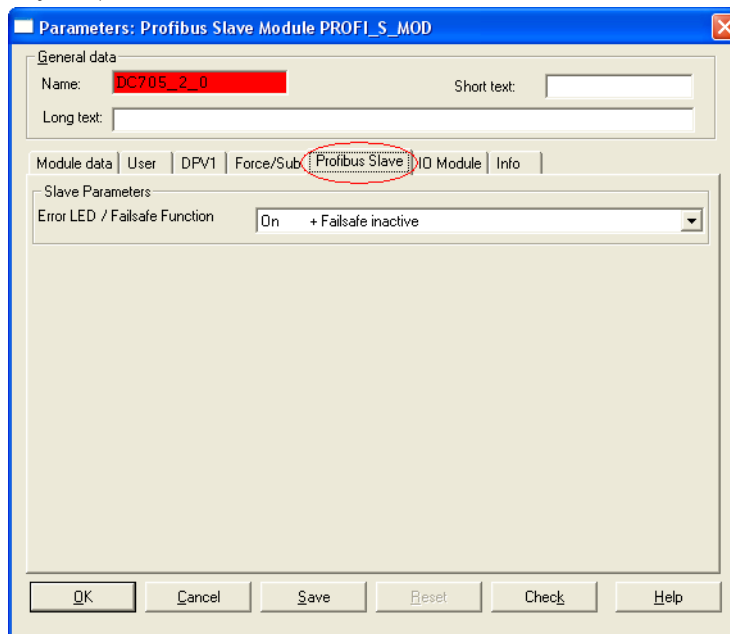


Select the S700 IO > Right click > Dialog editor

These user defined tabs get appended to the right of the standard tabs.



Dialog_editor.bmp



User defined tabs.bmp

1.2.2 Parameterization of the PROFIBUS master object

The PROFIBUS master object represents the PROFIBUS master in Freelance.

The PROFIBUS master object is used to configure interface and bus parameters for the PROFIBUS. The PROFIBUS master makes no I/O data available itself, the I/O data is assigned via the connected slaves.

Bus Parameter Tab

Parameters: Profibus Master Object PROF1_M_772

General data

Name: PROF_1_C1 Short text: Long text:

Bus Parameter Memory Configuration Master Configuration Online Information

Baudrate

- ☐ 12 MBit/s
- ☐ 6 MBit/s
- ☐ 3 MBit/s
- ☒ 1.5 MBit/s
- ☐ 500 kBit/s
- ☐ 187.5 kBit/s
- ☐ 93.75 kBit/s
- ☐ 45.45 kBit/s
- ☐ 19.2 kBit/s
- ☐ 9.6 kBit/s

Bus address: 1

Bus timing

☒ Automatic adjustment

T_{SL} 300 tBit

min T_{SDR} 11 tBit

max T_{SDR} 150 tBit

T_{QUI} 0 tBit

T_{SET} 1 tBit

T_{TR} 300000 tBit

Min. Slave Interval: 6 x 100 µs

Data Control Time: 100 x 10 ms

Poll Timeout: 500 ms

Max. Retry Limit: 1

GAP factor: 10

OK Cancel Save Reset Check Help

Baud rate Transfer rate 9.6 kBit/s... 12MBit/s.

Bus address The bus address of the PROFIBUS-DP Master.

Bus timing A set of bus parameters can be calculated depending on the devices connected. There are two options for specifying the bus times:

Automatic adjustment

☐ All bus times can be changed manually. In connection with the plausibility check, the set parameters are checked using the parameters of the connected slaves.

☒ The bus times are calculated using the parameters of the

connected slaves. In this case the parameters in the dialog overlay cannot be changed. During the plausibility check, the bus times are recalculated using the parameters of the connected slaves.



Although controller redundancy is not possible for AC 700F, cable redundancy can be configured through Redundancy Link Module (RLM).

Min_Slave_Interval

Time after which a slave can respond again. The largest **Min_Slave_Interval** of all connected slaves determines when a new bus cycle may begin. The value entered is multiplied by 100 μ s in the master.

Data_Control_Time

Monitoring interval for the list of active bus subscribers. The value entered is multiplied by 10 ms in the master.

$T_{WD} > T_{TR}$

Data Control Time $\geq 6 T_{WD}$

T_{WD} : Watchdog monitoring time of the slave (slave parameter)

Poll_Timeout Indicates the maximum time which the PROFIBUS-DP master requires to process a master function.

Max_Retry_Limit

Maximum number of message retries through the FDL (field bus connection level).

Permissible range: 0 .. 7

GAP-Factor Defines the number of token cycles up to an address gap maintenance cycle.

Permissible range: 1 .. 100

T_{SL} Slot time is the maximum time which the PROFIBUS-DP master must wait for a transaction response.

Permissible range: 37 .. 16383 [t_{Bit}]

$T_{SL} > \max T_{SDR} + T_{QUI} + 11 + 2$

T_{SDR} Station Delay Responder. Time which a slave takes to respond

$\min T_{SDR}$ Minimum time which a slave must wait before being permitted to respond.
Permissible range: 11 .. 1023 [tBit]



The default value for the time $\min T_{SDR}$ is set to 15 to ensure compatibility with the redundancy link module RLM01.

$\max T_{SDR}$ Time after which a slave must respond at the latest.
Permissible range: 37 .. $2^{16}-1$ [tBit]

Baud rate kBit/s	$\min T_{SDR}$ tBit	$\max T_{SDR}$ tBit
9.6	11	60
19.2	11	60
45.45	11	400
93.45	11	60
187.5	11	60
500	11	100
1500	11	150
3000	11	250
6000	11	450
12000	11	800

T_{QUI} Quiet Time. This value indicates the bus driver quiet time.
Permissible range: 0 .. 493 [tBit]

T_{SET} Setup Time. Time between an event on the PROFIBUS and the necessary reaction.
Permissible range: 1 .. $494 - T_{QUI}$ [tBit]

T_{TR} Token Rotation Time. Time for token relay via all masters of the PROFIBUS.
Permissible range: 256 .. $2^{24} - 1$ [tBit]

Memory Configuration Tab

Parameters: Profibus Master Object PROF_M_772

General data

Name: PROF_1_C1 Short text:

Long text:

Bus Parameter Memory Configuration Master Configuration Online Information

Bus station addresses

Lowest bus address: 1

Highest bus address: 32

Number of I/O bytes per slave

Max. no of input bytes: 32

Max. no of output bytes: 32

Diagnostic

Number of diagnostic buffer: 32

Max. diagnostic length per message: 100

OK Cancel Save Reset Check Help

Bus station address

Lowest / Highest bus address

Lowest and highest bus addresses which can be operated by the PROFIBUS-DP master. A data area is available for data traffic with all configured slaves. For optimal utilization of this data area, the length of the input data, output data and diagnostic data per slave can be specified. In the plausibility check, the data items entered are checked against each other.

Number of I/O bytes per slave

Max. no of input bytes

Maximum length of the input data [bytes] per slave which can be processed in the master.

Max. no of output bytes

Maximum length of the output data [bytes] per slave which can be processed in the master.

Diagnostic**Number of diagnostic buffer**

Maximum number of diagnostic buffers per slave which can be processed in the master = (Highest bus address - Lowest bus address) + 1.

Maximum diagnostic length per message

Maximum length of the diagnostic data [bytes] of all slaves which can be processed



The maximum diagnostic data length is not included in the GSD file and therefore cannot be checked. In the case of values which are too low, some PROFIBUS slaves may stop cyclic data traffic. The diagnostic data length is maintained at 100 bytes per slave for AC 700F.

Master Configuration Tab

Parameters: Profibus Master Object PROF1_M_772

General data

Name: PROF_2_C1 Short text:

Long text:

Bus Parameter | Memory Configuration | **Master Configuration** | Online Information

DPV1 MSAC2 Connection

DPV1 Connection Timeout: 600 x 10 ms

Performance Optimization

☒ Use limited bus cycle Minimal bus cycle: 10 ms

OK Cancel Save Reset Check Help

PM_772_Master_Config.bmp

DPV1 Connection Timeout

Connection timeout for the transfer of DPV1 parameter. The value must be selected according to the slowest slave in the PROFIBUS line. As the *DPV1 Connection Timeout* is not included in the GSD

file, use the values from the documentation of the slave manufacturer.

Performance Optimization

Use limited bus cycle

- ☐ Disables the setting *Minimal bus cycle*
☒ Enables the setting *Minimal bus cycle*

Minimal bus cycle

Takes the value between 2 - 25 ms.

PROFIBUS Line Redundancy

Parameters: Profibus Master Object PROFI_M_930

General data
 Name: **PROF_1_C1** Short text:
 Long text:

Bus Parameter Memory Configuration **Master Configuration** Online Information

DPV1 MSAC2 Connection
 DPV1 Connection Timeout: 600 x 10 ms

Slave Redundancy
 T MTQ Max. Take Over Time: 5 x 100 ms

Performance Optimization
☒ Use limited bus cycle Minimal bus cycle: 10 ms

Profibus Line Redundancy
☐ Enable Profibus Line Redundancy

OK Cancel Save Reset Check Help

PM_930_Master_Config.png

In the PROFIBUS master object (PROFI_M_C), an additional parameter is available for the CI 930F communication interface module for enabling PROFIBUS Line Redundancy:

- ☐ Disables the setting *Enable PROFIBUS Line Redundancy*
☒ Enables the setting *Enable PROFIBUS Line Redundancy*

The communication between the Master and the Slave is updated at the interval specified here. This reduces the load on the CPU.

Online Information Tab

Parameters: Profibus Master Object PROF1_M_772

General data

Name: PROF_1_C1 Short text:

Long text:

Bus Parameter | Memory Configuration | Master Configuration | **Online Information**

Master Protocol Stack Firmware Version

1.1

DP Cycles

Average DP cycle time: 1 ms

Number of DP cycles: 0

OK Cancel Save Reset Check Help

bq010us.bmp



The data in this tab are only available in commissioning mode.

Master Protocol Stack Firmware Version

Firmware version of the PROFIBUS Master protocol stack.

DP cycle time

Average cycle time on the PROFIBUS in the last 4 s.

Number of DP cycles

Number of PROFIBUS cycles since the last PROFIBUS start.

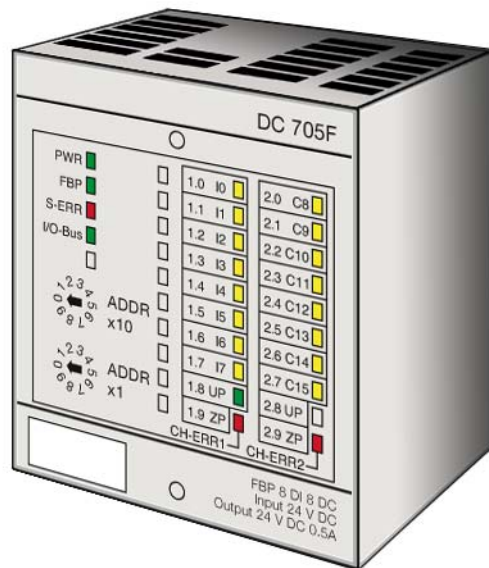
Module Data: PROFIBUS Master Object, PROFI_M_772

Name	Data type	Conf.	Acc.	Comment
ModuleID	INT	no	RO	Slot number of interface card
Parameterization of Bus Parameter Tab				
BAUD	INT	yes	RO	Baud rate 0 = 9.6 kbaud 1 = 19.2 kbaud 2 = 45.45 kbaud 3 = 93.75 kbaud 4 = 187.5 kbaud 5 = 500 kbaud 6 = 1.5 Mbaud 7 = 3 Mbaud 8 = 6 Mbaud 9 = 12 Mbaud
BusAdr	BYTE	yes	RO	Bus address
MinSlvlv	UINT	no	RO	Min_Slave_Interval
DataCtrTime	UINT	no	RO	Data_Control_Time
PollTimeout	UINT	no	RO	Poll_Timeout
MaxRetries	UINT	no	RO	Max Retry Limit
G	UINT	no	RO	GAP factor
T_sl	UINT	no	RO	T _{SL}
min_T_sdr	UINT	no	RO	min T _{SDR}
max_T_sdr	UINT	no	RO	max T _{SDR}
T_qui	UINT	no	RO	T _{QUI}
T_set	UINT	no	RO	T _{SET}
T_tr	UDINT	no	RO	T _{TR}
Parameterization of Options Tab				
LSA	BYTE	yes	RO	Lowest bus address

Name	Data type	Conf.	Acc.	Comment
HSA	BYTE	yes	RO	Highest bus address
MaxInLen	WORD	yes	RO	Max. number of input bytes 0 = 16 bytes, 1 = 32 bytes, 2 = 64 bytes 3 = 96 bytes, 4 = 128 bytes, 5 = 192 bytes, 6 = 244 bytes
MaxOutLen	WORD	yes	RO	Max. number of output bytes 0 = 16 bytes, 1 = 32 bytes, 2 = 64 bytes 3 = 96 bytes, 4 = 128 bytes, 5 = 192 bytes, 6 = 244 bytes
NoDiagBuf	UINT	yes	RO	Number of diagnostic buffers
MaxDiagLen	WORD	yes	RO	Maximum diagnostic length per frame 0 = 16 bytes, 1 = 32 bytes, 2 = 64 bytes 3 = 96 bytes, 4 = 128 bytes, 5 = 192 bytes 6 = 244 bytes
Parameterization Master Configuration Tab				
DPVTimeout	UINT	no	RO	DPV1 Connection timeout
T_MTO	BYTE	no	RO	T _{MTO} (Not available for AC 700F)
Parameterization of Online Info Tab				
DPSwRev	STRING64	no	RO	Firmware version
DPTglTime	WORD	no	RO	Last redundancy starting-up time
DPCycleTime	WORD	no	RO	DP cycle time
DPCycles	WORD	no	RO	Number of DP cycles

1.2.3 PROFIBUS Slave Interface

FBP Interface Module DC 705F



DC705F_perspektive.bmp

DC 705F is used as a PROFIBUS slave interface for remote I/O modules. The bus connection is performed by a neutral FieldBusPlug interface, which allows the connection of all existing FieldBusPlugs.

This module also provides 8 digital inputs 24V DC, 8 configurable digital inputs or outputs which are module-wise electrically isolated.

PROFIBUS communication interface module CI 741F

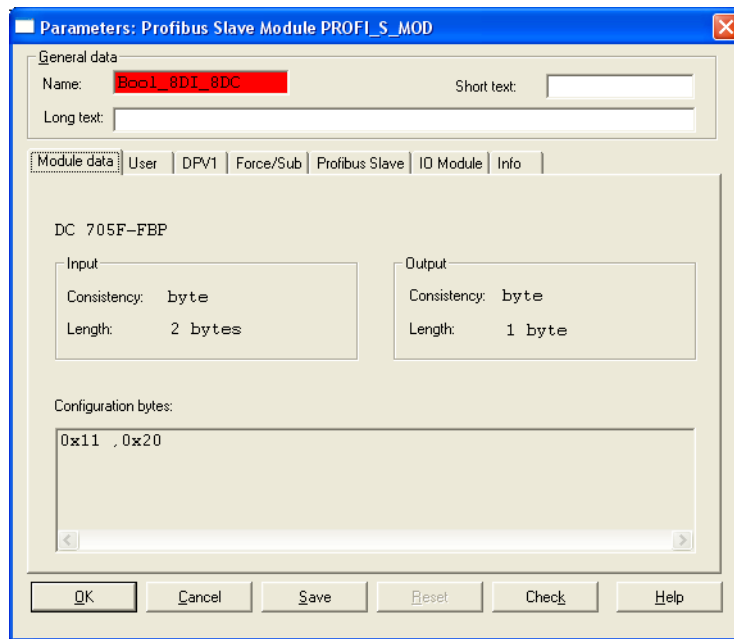
CI 741F is used as the PROFIBUS slave interface for I/O modules. The bus connection is performed by a FieldBusPlug interface, which allows the connection of all existing FieldBusPlugs.

This module also provides 8 digital inputs (24V DC), 8 digital outputs (24V DC) as well as 4 analog inputs and 2 analog outputs (configurable and module-wise electrically isolated).

Configuration of PROFIBUS communication interface modules

Insert the DC 705F-FBP or CI 741F object below the PROFI_S_DEV object in the Hardware Manager.

Tab Module data



DC705F_Module_Data.bmp

Data for the module is displayed in this tab.

Input data

Consistency The consistency of the data transfer from the module to the slave is displayed.

Length The length of the data transferred from the module to the slave is displayed.

Output data

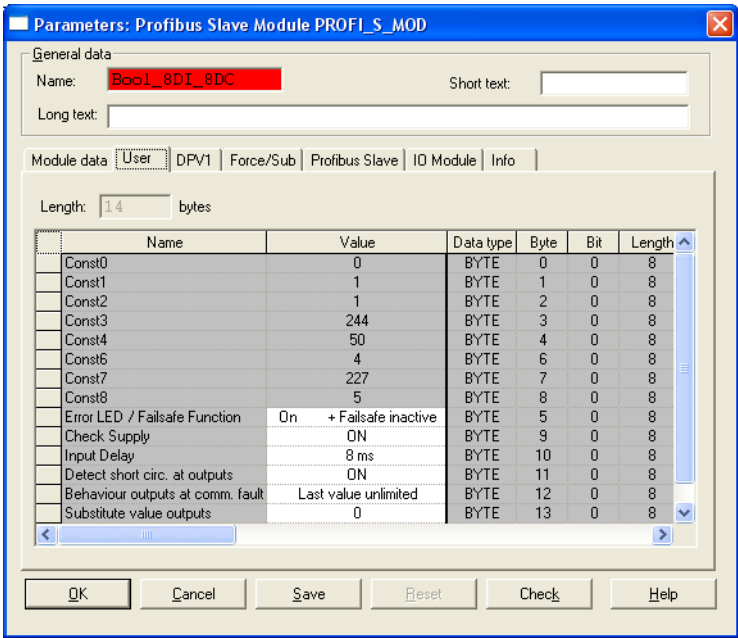
Consistency The consistency of the data transfer from the slave to the module is displayed.

Length The length of the data transferred from the slave to the module is displayed.

Configuration bytes

The sequence of bytes for the configuration of the module specified in the device master data file.

Tab User



Length Displays the number of bytes used for parameter setting. Generated by the system and cannot be edited.

Name Name of the user parameter.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.



If an analog input is configured as a digital input, the data type automatically changes from REAL to BOOL. When changing back a digital input to an analog input, the data type becomes REAL again.

Error LED/Failsafe Function

Setting for the Error LED and Failsafe function of the PROFIBUS slave.

Check supply When this function is activated, the process voltage (supply voltage) is checked by the module. If the voltage is low or no voltage is applied, an alarm is generated.
ON Checking of supply voltage is enabled.
OFF Checking of supply voltage is disabled.

Input delay With activated supply checking, the input delay for the alarm can be defined here. The following values can be selected:
0.1 ms for quick processes with frequently changing signal
1 ms for slower processes
8 ms if spikes are to be filtered out reliably
32 ms if low-pass behavior is wanted.

Detect short circ. at outputs

Enable/disable detection of short circuit at the output channels

Behaviour outputs at comm. fault

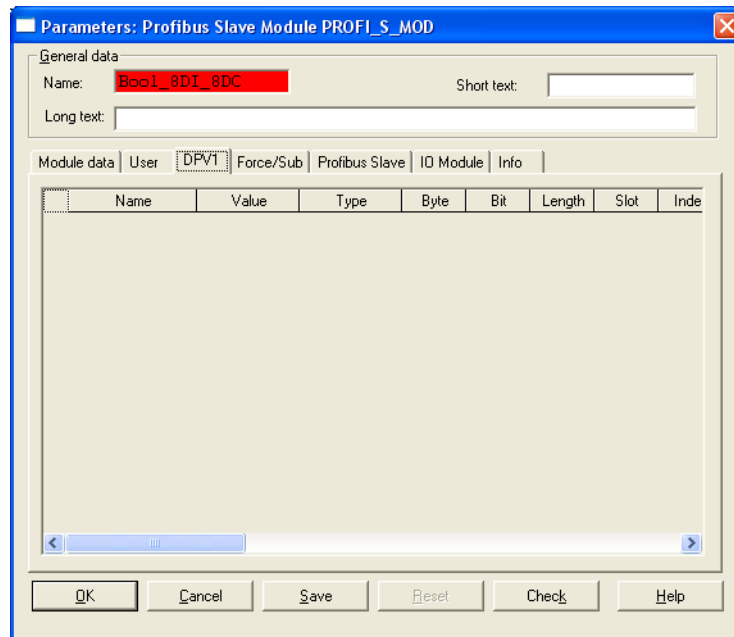
This module allows configuring the behavior of outputs at communication error. The following options are available:

- Last value unlimited
- Substitute value unlimited
- Last value 5 sec
- Substitute value 5 sec
- Last value 10 sec
- Substitute value 10 sec

Substitute value

The configured substitute value is used.

Tab DPV1



DC705F_DPV1.bmp

<i>Name</i>	Name of the DPV1 parameter.
-------------	-----------------------------



If the DPV1 parameter is described in the device master data file, the name is taken from the device master data file. The parameter name cannot subsequently be changed. A parameter defined in the device master data file cannot be deleted.

<i>Value</i>	The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column. <i>Data type</i> Freelance data type of the component.
--------------	--

Byte, Bit the values for **byte** and **bit** describe the position of the Freelance data type within a structured byte field. For simple data types and non-structured byte fields, the values for byte and bit should be 0.

<i>Byte</i>	Number of the first byte in the structured byte field.
-------------	--

<i>Bit</i>	Number of the first bit in the start byte of the structured byte field.
------------	---

Length Length of the DPV1 parameter. For simple data types the length is stated in bits, while for BYTE Arrays and UserDS bytes are used.



The length of BYTE Arrays and UserDS is stated in bytes. The fields for entering the length of BYTE Arrays are therefore highlighted in color.

Slot, Index The values for **slot** and **index** are used to address the DPV1 parameter in the device. For further information, please see the device manual of the respective vendor.

Slot Slot number for addressing a slot in the PROFIBUS device
Permissible range: 0 .. 254 (255 = Reserved.)

Index Index for addressing the desired data within a slot.
Permissible range: 0 .. 254 (255 = Reserved.)

Access The value specifies the access to the DPV1 parameter on the PROFIBUS device.

R/W Read and write access to the parameter.

R Read access only to the parameter.

W Write access only to the parameter.

W Addressing is configured and loaded in the device.

R Addressing is first read from the device object directory in commissioning mode and then used for all further device accesses. This addressing is only possible if the device supports reading from the object directory. For further information, please see the vendor's manual.

Load The value specifies whether the parameter is loaded with Load all DPV1 Parameters or not.



A DPV1 parameter which cannot be written cannot be loaded with Load all DPV1 Parameters either.

Parameters which have been defined as structured data types or BYTE Arrays can only be written if no gaps were left during definition of the data type.

Load-Seq. The value specifies the sequence in which the DPV1 parameters are loaded with Load all DPV1 Parameters.

Min / Max The "Min" and "Max" columns are required for input in the dialog editor. Thus input elements such as combo box or Radio-Button can be configured in the dialog editor.
After the DPV1 parameters have been defined, individual parameterization tabs can be created with the dialog editor.

Read Elem. Used to configure HART commands.

Module Name of the associated module.

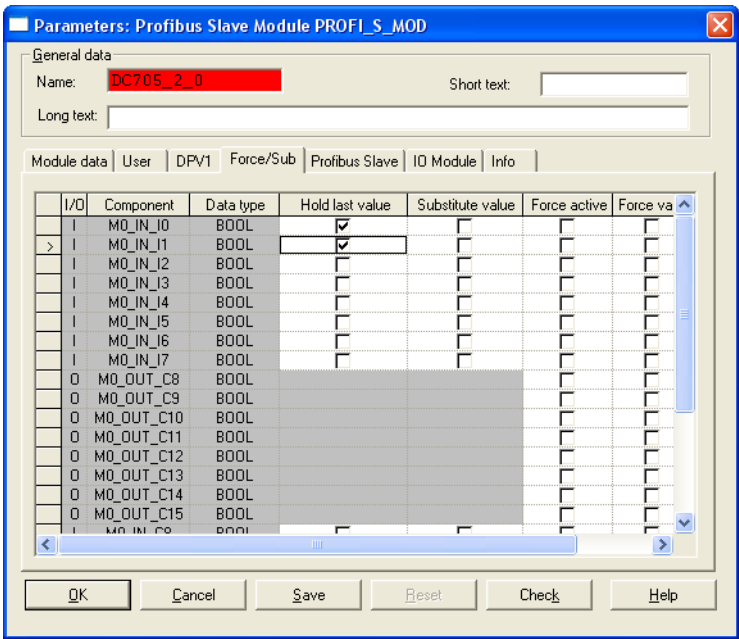
DPV1 parameter can be accessed via OPC. The name of the DPV1 parameter is used as an OPC name. If the name contains space characters or special characters, it is recommended that an alias be defined. Some OPC clients cannot resolve names with space characters or special characters.

OPC Access ☒ The user parameter can be accessed via OPC.

OPC Shortname

Alias of the user parameter if it is accessible on the OPC server.

Tab Force/Substitute



DC705F_force.bmp

Component Name of the component for which force values and default values are specified.

Data Type Data type of the component for which force values and default values are specified.

Hold last value

- ☒ In the event of a fault the last valid value is held.
- ☐ In the event of a fault the substitute value is used.

Substitute value

In the event of a fault, the substitute value entered here is further processed. For analog inputs, a substitute value can be entered here. For digital inputs, the substitute value is specified as follows:

- ☒ Substitute value = 1
- ☐ Substitute value = 0



If both Hold last value is checked and a Substitute value is also given, then in the event of a fault the last value is held.

Force active Specifies whether the configured force value is used.

- ☒ Forcing is enabled.
- ☐ Forcing is disabled.

Force value The value entered here is further processed when forcing is on.

Tab PROFIBUS Slave

DC705F_PROFIBUS_Slave.bmp

This tab allows the user to set the parameters for the PROFIBUS Slave.

Slave Parameters

Error LED/Failsafe Function

Setting for the Error LED and Failsafe function of the PROFIBUS slave.

Tab IO Module

The screenshot shows a Windows-style dialog box titled "Parameters: Profibus Slave Module PROFI_S_MOD". It has a "General data" section at the top with fields for "Name" (containing "Boo1_8DI_8DC" in red), "Short text", and "Long text". Below this is a tabbed interface with tabs for "Module data", "User", "DPV1", "Force/Sub", "Profibus Slave", "IO Module" (which is selected), and "Info". The "IO Parameters" section contains five rows of settings, each with a label and a dropdown or text field:

IO Parameters	Value
Check Supply	ON
Input Delay	8 ms
Detect short circ. at outputs	ON
Behaviour outputs at comm. fault	Last value unlimited
Substitute value outputs	0

At the bottom of the dialog are buttons for "OK", "Cancel", "Save", "Reset", "Check", and "Help".

DC705F_IO_Module.bmp

This tab allows the user to set the parameters for the Digital I/Os in the module.

IO Parameters

Check Supply Enable/disable supervision of power supply

Input Delay Delay for the Digital Input channels

Detect short circ. at outputs

Enable/disable detection of short circuit at the output channels

Behaviour outputs at comm.fault

Set the behavior of output channels on PROFIBUS communication failure, e.g. *Last value* or *Substitute value*

Substitute value outputs

Set the value for the outputs in case of communication failure

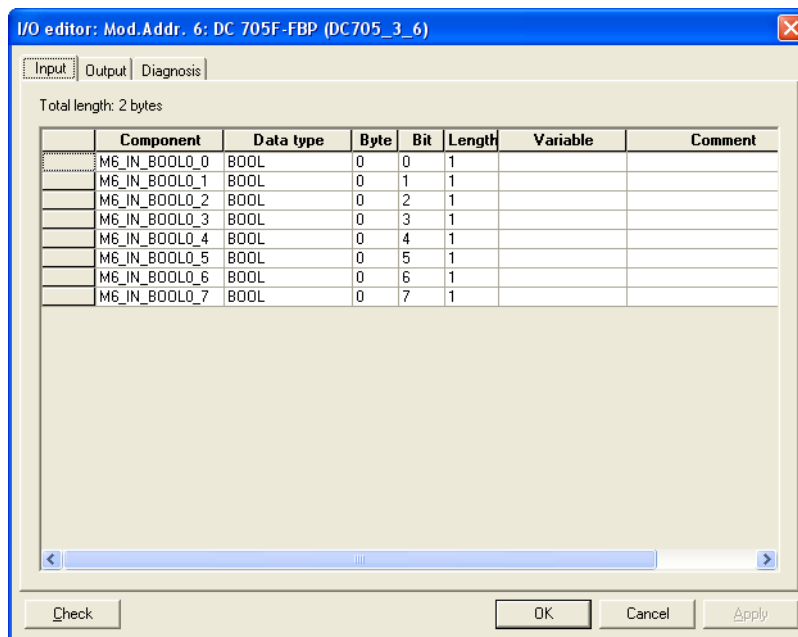
Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor – Input

In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. For details refer to *Engineering Manual, System Configuration, Section Hardware Structure*.



Input.bmp

Component Output (I0 to I7) that is to be edited.

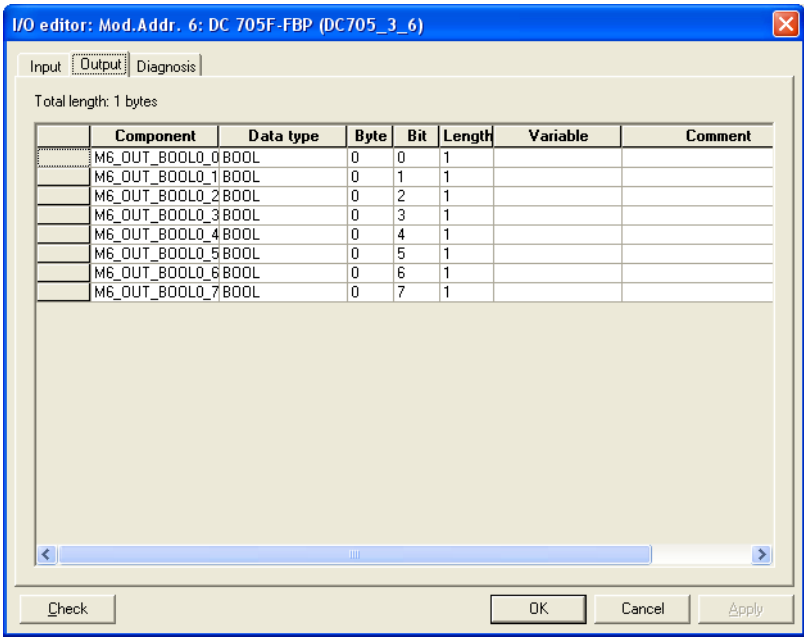
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

I/O Editor – Output



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Section Hardware Structure*.

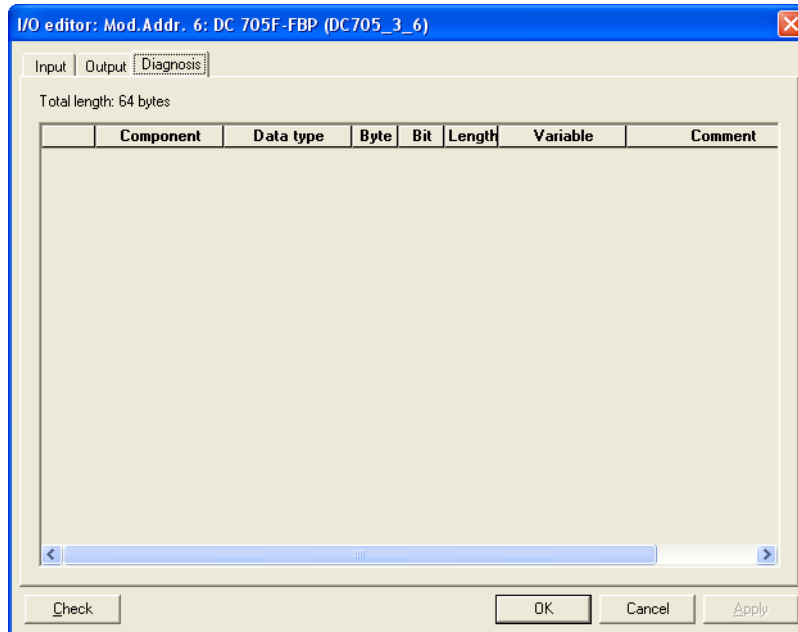


Output.bmp

- Component* Output (O0 to O7) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.

Comment: Comment for the component.

I/O Editor – Diagnosis



DX705_Diagnosis.bmp

Component: Name of the channel error type.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

**Connection via Fieldbus Plug FBP**

For connecting an S700 PROFIBUS Slave to the DC 705 PROFIBUS interface module, the Fieldbus plug FBP is used. The Fieldbus Plug PDP22-FBP is powered independently to DC 705F via the PROFIBUS cable, so the FBP can continue to work even if disconnected from DC 705F and I/O. In such a case only a diagnosis message “Lost Communication to Device” is issued to the PROFIBUS Master and the input values are set to 0. The configuration options “Hold last value” and “Substitute value” do not work in such an error scenario due to the undisturbed PROFIBUS data exchange communication.

To cope with a partial power fail it is highly recommended to use the same power supply for PDP22-FBP and DC 705F. In case use the PDV11-FBP / PDV12-FBP power Feed-In Connector placed near the DC 705F.

**Input values on S700 change to zero when reconnected**

When reconnecting a disconnected or powered off S700 PROFIBUS Slave all input

values changes to 0 for few number of PROFIBUS cycles before actual input values are delivered. An additional effect appears when an input is configured as Hold Last Value. In this case the input value changes from the last value to zero before continuing with the actual value.

**Parameter change in S700 leads to communication error**

Configuration changes for a S700 PROFIBUS slave in a running system are restricted. If four or more changes are done in a single working step, the communication may be disturbed. Loading not more than three configuration changes in one load operation works without any errors.

2 S700 IO Modules

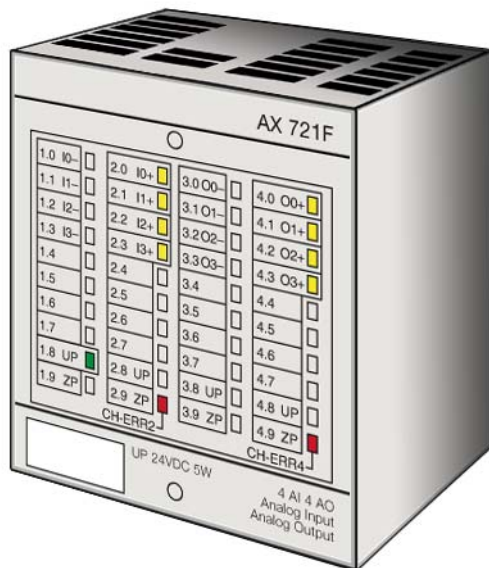
2.1 General

2.1.1 Overview of the S700 IO Modules

Abbreviation	Object description
AX 721F	Analog/Digital Input, Analog Output module
AX 722F	Analog Input/Output module
AC 722F	Analog Input/Output module
AI 723F	Analog Input module
AI 731F	Analog Input module (Thermocouple)
AO 723F	Analog Output module
DX 722F	Digital Input, Digital Output module
DX 731F	Digital Input, Digital Output module
DC 722F	Digital Input/Output module
DC 723F	Digital Input/Output module
DC 732F	Digital Input/Output module
DI 724F	Digital Input module
CD 722F	Frequency Input/PWM Output module
DA 701F	Analog/Digital Input/Output module

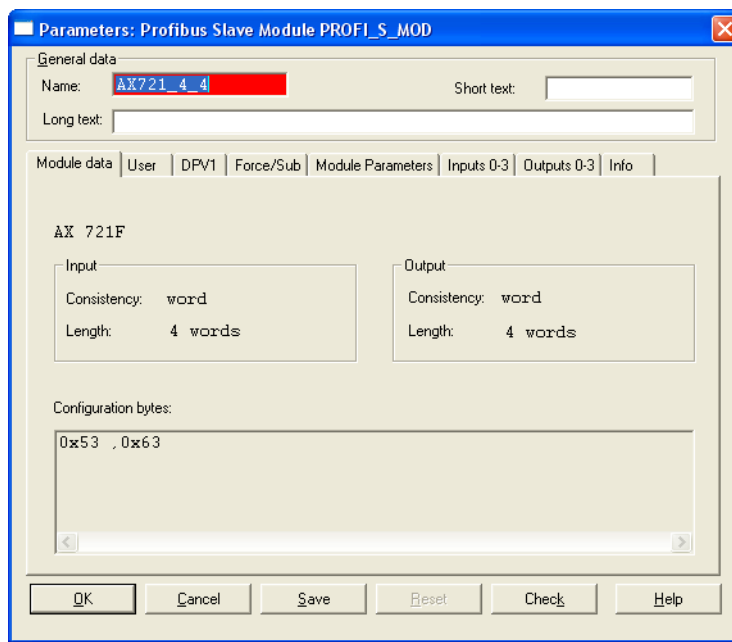
The modules above will be available in the Hardware Manager of the Freelance Engineering after import of the GSD file.

2.1.2 Analog/Digital input, Analog output module AX 721F



AX721F_perspektive.bmp

The analog input/output module AX 721F provides 4 configurable analog inputs and 4 configurable analog outputs.



AX721_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: Free text of up to 12 characters can be entered here.

Long text: Free text of up to 30 characters can be entered here.

Tab Module data

Data for the module is displayed in this tab.

Input data

Consistency The consistency of the data transfer from the module to the slave is displayed.

Length The length of the data transferred from the module to the slave is displayed.

Output data

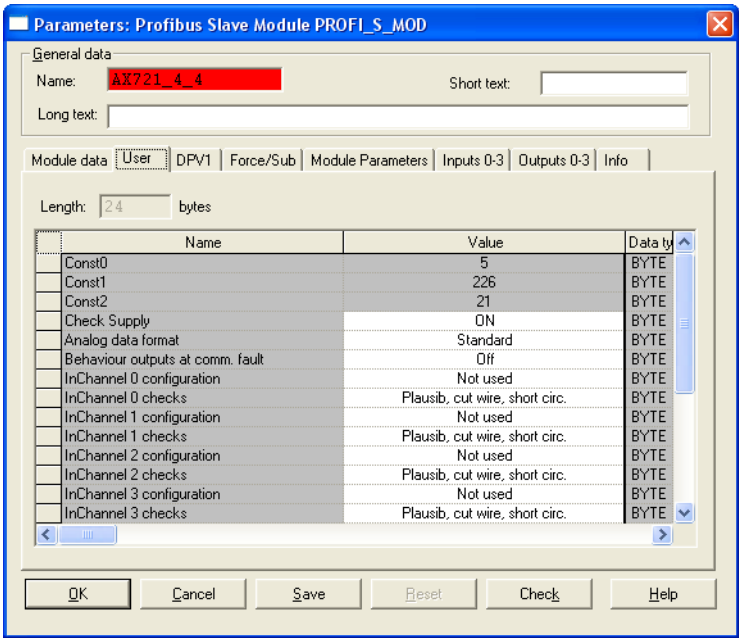
Consistency The consistency of the data transfer from the slave to the module is displayed.

Length The length of the data transferred from the slave to the module is displayed.

Configuration bytes

The sequence of bytes for the configuration of the module specified in the device master data file.

Tab User



AX721_user.bmp

Length Displays the number of bytes used for parameter setting. Generated by the system and cannot be edited.

Name Name of the user parameter.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.



If an analog input is configured as a digital input, the data type automatically changes from REAL to BOOL. When changing back a digital input to an analog input, the data type becomes REAL again.

Check supply When this function is activated, the process voltage (supply voltage) is checked by the module. If the voltage is low or no voltage is applied, an alarm is generated.
ON Checking of supply voltage is enabled.
OFF Checking of supply voltage is disabled.

Behavior outputs at comm. fault

This module allows configuring the behavior of outputs at communication error. The following options are available.

Last value unlimited

Substitute value unlimited

Last value 5 sec

Substitute value 5 sec

Last value 10 sec

Substitute value 10 sec

Substitute value

The configured substitute value is used.



If one of the *Last value* options are selected for *Behavior outputs at comm. fault* then the substitute value for *OutChannel 0 Substitute value* should be zero for channel 0.

Range

The range that can be selected for the corresponding input. The following ranges are available:

Type	Value ranges
Not used	0
Analog Input	0...20mA 4...20mA
Analog U	0...10V -10V...+10V
Analog Pt100(2w) or Pt100(3w)	-50C...+70C -50C...+400C
Analog Pt1000	-50C...+400C
Analog Ni1000	-50C...+150C
Digital input	–



The value of an unused channel is automatically set to 0. The Force/Substitute tab only displays those channels that are configured here.

Wire

The wiring type or operating mode of the channel.

2

Connection in 2-wire technique

3

Connection in 3-wire technique

Differential input

Differential input can be selected for analog voltage inputs (Analog U), only.

Data type

Freelance data type of the component. For data which is described as a bit field, Freelance data types such as BYTE or WORD are used. The PROFIBUS data type bit is changed to the Freelance data type BOOL

Byte, Bit, Length

The values for Byte, Bit and Length describe the position of the Freelance data type in the parameter block. The bit fields defined in this way always start at bit 0 in the Freelance data type.

Name Name of the DPV1 parameter.



If the DPV1 parameter is described in the device master data file, the name is taken from the device master data file. The parameter name cannot subsequently be changed. A parameter defined in the device master data file cannot be deleted.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.

Data type Freelance data type of the component.

Byte, Bit the values for **byte** and **bit** describe the position of the Freelance data type within a structured byte field. For simple data types and non-structured byte fields, the values for byte and bit should be 0.

Byte Number of the first byte in the structured byte field.

Bit Number of the first bit in the start byte of the structured byte field.

Length Length of the DPV1 parameter. For simple data types the length is stated in bits, while for BYTE Arrays and UserDS bytes are used.



The length of BYTE Arrays and UserDS is stated in bytes. The fields for entering the length of BYTE Arrays are therefore highlighted in color.

Slot, Index The values for **slot** and **index** are used to address the DPV1 parameter in the device. For further information, please see the device manual of the respective vendor.

Slot Slot number for addressing a slot in the PROFIBUS device
Permissible range: 0 ... 254 (255 = Reserved.)

Index Index for addressing the desired data within a slot.
Permissible range: 0 .. 254 (255 = Reserved.)

Access The value specifies the access to the DPV1 parameter on the PROFIBUS device.

R/W Read and write access to the parameter.

R Read access only to the parameter.

W Write access only to the parameter.

W Addressing is configured and loaded in the device.

R Addressing is first read from the device object directory in

commissioning mode and then used for all further device accesses. This addressing is only possible if the device supports reading from the object directory. For further information, please see the vendor's manual.

Load The value specifies whether the parameter is loaded with Load all DPV1 Parameters or not.



A DPV1 parameter which cannot be written cannot be loaded with Load all DPV1 Parameters either.

Parameters which have been defined as structured data types or BYTE Arrays can only be written if no gaps were left during definition of the data type.

Load-Seq. The value specifies the sequence in which the DPV1 parameters are loaded with Load all DPV1 Parameters.

Min / Max The “Min” and “Max” columns are required for input in the dialog editor. Thus input elements such as combobox or Radio button can be configured in the dialog editor.
After the DPV1 parameters have been defined, individual parameterization tabs can be created with the dialog editor.

Read Elem. Used to configure HART commands.

Module Name of the associated module.

DPV1 parameter can be accessed via OPC. The name of the DPV1 parameter is used as an OPC name. If the name contains space characters or special characters, it is recommended that an alias be defined. Some OPC clients cannot resolve names with space characters or special characters.

OPC Access ☒ The user parameter can be accessed via OPC.

OPC Shortname Alias of the user parameter if it is accessible on the OPC server.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AX721_4_4 Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Inputs 0-3 | Outputs 0-3 | Info

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
I	M4_IN_I0	UINT	☒	0	☐	0
>	M4_IN_I1	UINT	☒	0	☐	0
I	M4_IN_I2	UINT	☐	0	☐	0
I	M4_IN_I3	UINT	☐	0	☐	0
O	M4_OUT_O0	UINT			☐	0
O	M4_OUT_O1	UINT			☐	0
O	M4_OUT_O2	UINT			☐	0
O	M4_OUT_O3	UINT			☐	0

OK Cancel Save Reset Check Help

AX721_force.bmp

Component Name of the component for which force values and default values are specified.

Type Data type of the component for which force values and default values are specified.

Hold last value This option can be selected for analog inputs, only.
☒ In the event of a fault the last valid value is held.
☐ In the event of a fault the substitute value is used.

Substitute value This option can be selected for analog inputs, only.
In the event of a fault, the substitute value entered here is further processed.



If both **Hold last value** is checked and a **Substitute value** is also given, then in the event of a fault the last value is held.

Force active Specifies whether the configured force value is used.

- ☒ Forcing is enabled.
☐ Forcing is disabled.

Force value The value entered here is further processed when forcing is on.

Tab Module Parameters

Parameters: Profibus Slave Module PROFIBUS_MOD

General data

Name: AX721_4_4 Short text: Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Inputs 0-3 | Outputs 0-3 | Info

Check Supply: ON

Analog data format: Standard

Behaviour outputs at comm. fault: Off

Channel 00 Substitute Value

OutChannel 0 Substitute value: 0

OK Cancel Save Reset Check Help

AX721_ud1.bmp

Check Supply Enable/disable supervision of power supply

Analog data format
 Data format for the analog values

Behavior outputs at comm. fault
 Set the behavior of output channels on PROFIBUS communication failure, e.g. *Last value* or *Substitute value*

Channel 00 Substitute Value
OutChannel 0 Substitute value

Set the value for the output 0 in case of communication failure

Tab Inputs 0-3

Parameters: Profibus Slave Module PROF1_S_MOD

General data
 Name: **AX721_4_4** Short text:
 Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Inputs 0-3** | Outputs 0-3 | Info

Channel 0
 InChannel 0 configuration: Not used
 InChannel 0 checks: Plausib, cut wire, short circ.

Channel 1
 InChannel 1 configuration: Not used
 InChannel 1 checks: Plausib, cut wire, short circ.

Channel 2
 InChannel 2 configuration: Not used
 InChannel 2 checks: Plausib, cut wire, short circ.

Channel 3
 InChannel 3 configuration: Not used
 InChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AX721_ud2.bmp

Channel X***InChannel x configuration***

Type of the Input measurement (voltage, current, RTD)

InChannel x checks

Enable Plausibility check for cut wire, short circuit

*x* is the channel number for the input channels

Tab Outputs 0-3

Parameters: Profibus Slave Module PROFI_S_MOD

General data
 Name: AX721_4_4 Short text:
 Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Inputs 0-3 | **Outputs 0-3** | Info

Channel 0
 OutChannel 0 configuration: Not used
 OutChannel 0 checks: Plausib, cut wire, short circ.

Channel 1
 OutChannel 1 checks: Plausib, cut wire, short circ.
 OutChannel 1 configuration: Not used

Channel 2
 OutChannel 2 configuration: Not used
 OutChannel 2 checks: Plausib, cut wire, short circ.

Channel 3
 OutChannel 3 configuration: Not used
 OutChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AX721_ud3.bmp

Channel X**OutChannel x configuration**

Type of the Input measurement (voltage, current, RTD)

OutChannel x checks

Only monitoring for plausibility (overflow/underflow) available

*x* is the channel number for the input channels**Input/Output Types Supported**

The following types of Inputs/Outputs are supported by this module:

Inputs

- 4 analog inputs, individually configurable for:
 - unused (default setting)

- 0...10 V
- -10 V...+10 V
- 0...20 mA
- 4...20 mA
- Pt100, -50 °C ...+400 °C (2-wire)
- Pt100, -50 °C ...+400 °C (3-wire), requires 2 channels
- Pt100, -50 °C ...+70 °C (2-wire)
- Pt100, -50 °C ...+70 °C (3-wire), requires 2 channels
- Pt1000, -50 °C ...+400 °C (2-wire)
- Pt1000, -50 °C ...+400 °C (3-wire), requires 2 channels
- Ni1000, -50 °C ...+150 °C (2-wire)
- Ni1000, -50 °C ...+150 °C (3-wire), requires 2 channels
- 0...10 V with differential inputs, requires 2 channels
- -10 V...+10 V with differential inputs, requires 2 channels
- digital signals (digital input)

Outputs

- 4 analog outputs, individually configurable for:
 - unused (default setting)
 - 0...10 V
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input

I/O editor: Mod.Addr. 3: AX 721F (AX721_2_3)

Input Output Diagnosis

Total length: 8 bytes

Component	Data type	Byte	Bit	Length	Variable	Comment
M3_IN_BOOL0_0	BOOL	0	0	1		
M3_IN_BOOL0_1	BOOL	0	1	1		
M3_IN_BOOL0_2	BOOL	0	2	1		
M3_IN_BOOL0_3	BOOL	0	3	1		
M3_IN_BOOL0_4	BOOL	0	4	1		
M3_IN_BOOL0_5	BOOL	0	5	1		
M3_IN_BOOL0_6	BOOL	0	6	1		
M3_IN_BOOL0_7	BOOL	0	7	1		

Check OK Cancel Apply

AX721_IOEditor_input.bmp

Component Output (I0 to I3) that is to be edited.

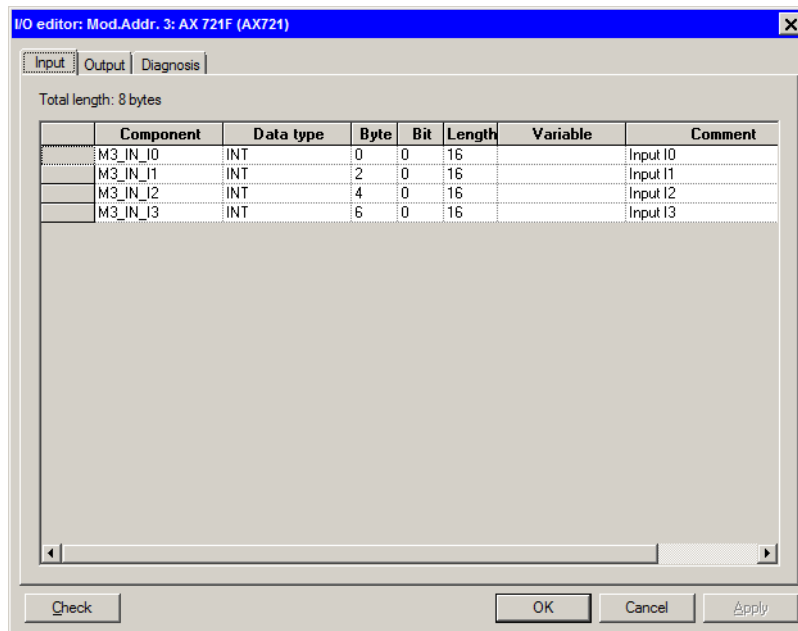
Data type: The data type (REAL or BOOL) of the component.

Variable: The variable name.

Comment: Comment for the component.

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Output



AX721_IOEditor_output.bmp

Component Output (O0 to O3) that is to be edited.

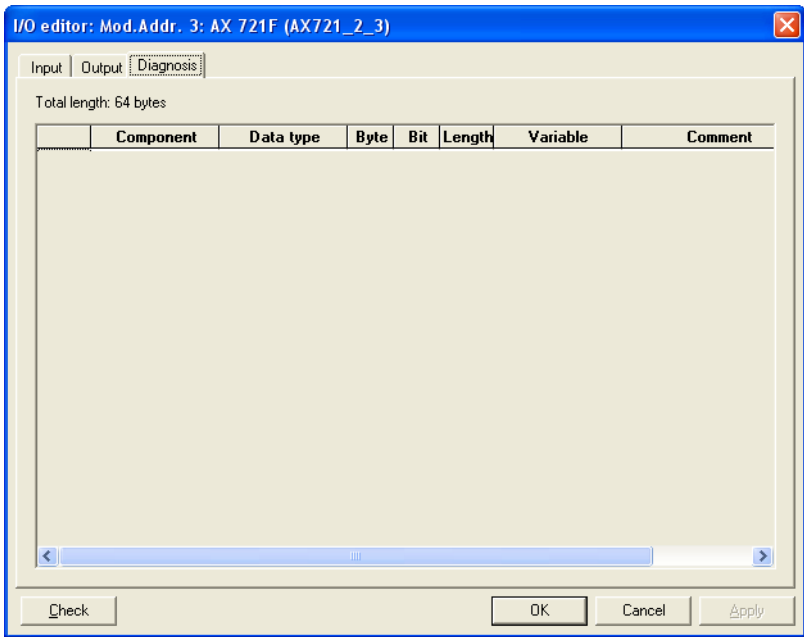
Data type: The data type (REAL or BOOL) of the component.

Variable: The variable name.

Comment: Comment for the component.

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Diagnosis



AX721_IOEditor_diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component (see table).

Variable: The variable name.

Comment: Comment on the component diagnosis.

Object data: Analog input/output module AX 721F

Name	Data type	Conf.	Access	Comment
Parameter definition mask				
CheckSupply	BOOL			
EASid	INT	no	RO	Module location
SrvNO	STRING8	no	RO	Firmware version
HrvNo	STRING8	no	RO	Module hardware version
Ident	STRING8	no	RO	ID number of the module type
ModName	STRING8	no	RO	Name of the module type
Diagnostic data				
STA	UDINT	no	RO	Bit-coded state
CHSTA	UDINT	no	RO	CHannel STAtE, i.e. the state (overflow, underflow or short-circuit) of the respective channel
NDR	BOOL	no	RO	New Data Ready, module is active, cyclic data transfer is in progress
ERR	BOOL	no	RO	Module defective
STI0 -ST3	INT	no	RO	Stands for STatus Input
I0 - I3	REAL	no	RO	
O0 - O3	REAL	no	RO	

Measuring ranges**Input ranges for voltage, current and digital input**

Range	0...10 V	-10...+10 V	0...20 mA	4...20 mA	Digital input	Digital value	
						decimal	hex.
Overflow	>11.7589	>11.7589	>23.5178	>22.8142		32767	7FFF
Measured value too high	11.7589 : 10.0004	11.7589 : 10.0004	23.5178 : 20.0007	22.8142 : 20.0006		32511 : 27649	7EFF : 6C01
Normal range	10.0000 : 0.0004	10.0000 : 0.0004	20.0000 : 0.0007	20.0000 : 4.0006	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	0	4	OFF	0	0000
Normal range or measured value too low	-0.0004 -1.7593	-0.0004 : : : -10.0000		3.9994 : 0 : : :		-1 -4864 -6912 : -27648	FFFF ED00 E500 : 9400
Measured value too low		-10.0004 : -11.7589				-27649 : -32512	93FF : 8100
Underflow	<-1.7589	<-11.7589	<0.0000	<-1.1858		-32768	8000

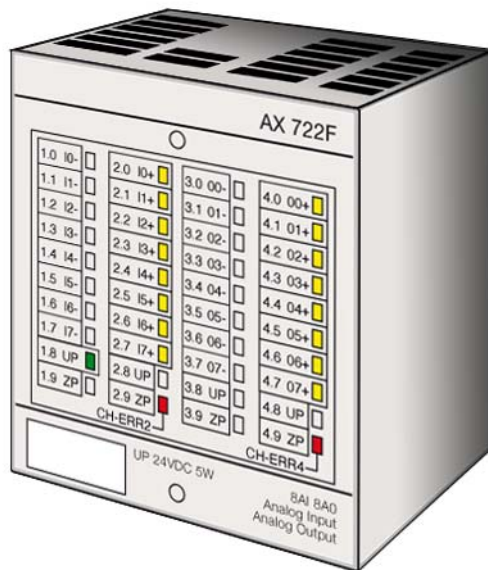
Input Ranges for Resistance

Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 160.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C		4500 : 4001	1194 : 0FA1
			160.0 °C : 150.1 °C	1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C			800 : 701	0320 : 02BD
Normal range	: : 70.0 °C 0.1 °C	400.0 °C : : 0.1 °C	: : 150.0 °C : 0.1 °C	4000 1500 700 1	0FA0 05DC 02BC 0001
	0.0 °C	0.0 °C	0.0 °C	0	0000
	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-1 : -500	FFFF : FE0C
	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-501 : -600	FE0B : FDA8
Underflow	< -60.0 °C	< -60.0 °C	< -60.0 °C	-32768	8000

Output Ranges Voltage and Current

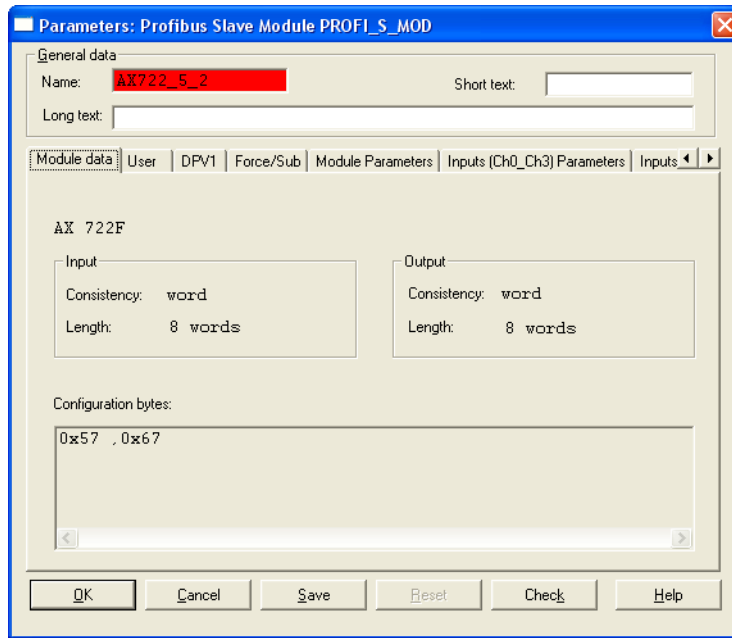
Range	-10...+10 V	-0...20 mA	4...20 mA	Digital value	
				decimal	hex.
Overflow	0 V	0 mA	0 mA	> 32511	> 7EFF
Measured value too high	11.7589 V : 10.0004 V	23.5178 mA : 20.0007 mA	22.8142 mA : 20.0006 mA	32511 : 27649	7EFF : 6C01
Normal range	10.0000 V : 0.0004 V	20,0000 mA : 0.0007 mA	20.0000 mA : 4.0006 mA	27648 : 1	6C00 : 0001
	0.0000 V	0.0000 mA	4.0000 mA	0	0000
	-0.0004 V : -10.0000 V	0 mA : 0 mA	3.9994 mA 0 mA 0 mA	-1 -6912 -27648	FFFF E500 9400
Measured value too low	-10.0004 V : -11.7589 V	0 mA : 0 mA	0 mA : 0 mA	-27649 : -32512	93FF : 8100
Underflow	0 V	0 mA	0 mA	< -32512	< 8100

2.1.3 Analog input/output module AX 722F



AX722.bmp

The analog input/output module AX 722F provides 8 configurable analog inputs and 8 configurable analog outputs module wise electrically isolated.



AX722_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

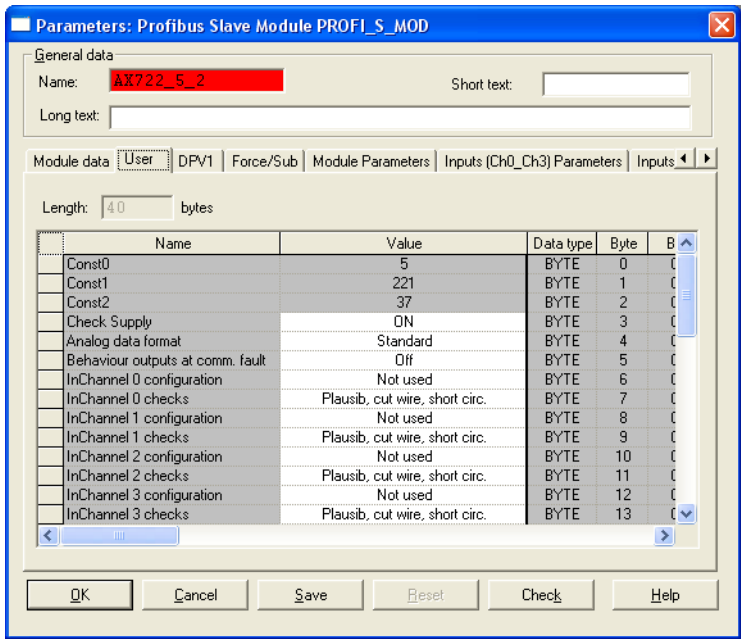
Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

Tab Module data

For further details refer to [Tab Module data](#) on page 43.

Tab User



AX722_user.bmp

For further details refer to [Tab User](#) on page 44

- Name* Name of the input/output channel (I0 to I7) or (O0 to O7)
- Value* Type of input/output.
From O0 to O3 both current and voltage outputs are possible
From O4 to O7 only voltage outputs are possible

Tab DPV1

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name:AX722_5_2Short text:

Long text:

Module data

UserDPV1

Force/Sub

Module Parameters

Inputs (Ch0_Ch3) Parameters

Inputs

Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1		BOOL	0	0	1	0	0
Comp2		BOOL	0	0	1	0	0
Comp3		BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

Check

Help

AX722_DP11.bmp

For further details refer to [Tab DPV1](#) on page 47.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AX722_5_2

Short text:

Long text:

Module data

User

DPV1

Force/Sub

Module Parameters

Inputs (Ch0_Ch3) Parameters

Inputs

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
☐	I M2_IN_10	UINT	☐	0	☐	0
☐	I M2_IN_11	UINT	☐	0	☐	0
☐	I M2_IN_12	UINT	☐	0	☐	0
☐	I M2_IN_13	UINT	☐	0	☐	0
☐	I M2_IN_14	UINT	☐	0	☐	0
☐	I M2_IN_15	UINT	☐	0	☐	0
☐	I M2_IN_16	UINT	☐	0	☐	0
☐	I M2_IN_17	UINT	☐	0	☐	0
☐	O M2_OUT_00	UINT	☐		☐	0
☐	O M2_OUT_01	UINT	☐		☐	0
☐	O M2_OUT_02	UINT	☐		☐	0
☐	O M2_OUT_03	UINT	☐		☐	0
☐	O M2_OUT_04	UINT	☐		☐	0
☐	O M2_OUT_05	UINT	☐		☐	0
☐	O M2_OUT_06	UINT	☐		☐	0
☐	O M2_OUT_07	UINT	☐		☐	0

OK

Cancel

Save

Reset

Check

Help

AX722_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 50.

Tab Module Parameters

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: **AX722_5_2** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Inputs (Ch0_Ch3) | Parameters | Inputs ▶

Module Parameters:

Check Supply:

Analog data format:

Behaviour outputs at comm. fault:

Substitute Values

OutChannel 0 Substitute value:

OK Cancel Save Reset Check Help

For further details refer to [Tab Module Parameters](#) on page 51.

Tab Inputs (Ch0_Ch3) Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data
Name: **AX722_5_2** Short text:
Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Inputs (Ch0_Ch3) Parameters** | Inputs ▾ ▹

Channel 0
InChannel 0 configuration:
InChannel 0 checks:

Channel 1
InChannel 1 configuration:
InChannel 1 checks:

Channel 2
InChannel 2 configuration:
InChannel 2 checks:

Channel 3
InChannel 3 configuration:
InChannel 3 checks:

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Inputs (Ch4-Ch7) Parameters

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: **AX722_5_2** Short text:

Long text:

Inputs (Ch0_Ch3) Parameters | **Inputs (Ch4-Ch7) Parameters** | Outputs(Ch0 - Ch3) Parameters | Outputs(C

Channel 4

InChannel 4 configuration: Not used

InChannel 4 checks: Plausib, cut wire, short circ.

Channel 5

InChannel 5 configuration: Not used

InChannel 5 checks: Plausib, cut wire, short circ.

Channel 6

InChannel 6 configuration: Not used

InChannel 6 checks: Plausib, cut wire, short circ.

Channel 7

InChannel 7 configuration: Not used

InChannel 7 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Outputs (Ch0-Ch3) Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **AX722_5_2** Short text:

Long text:

Inputs (Ch0-Ch3) Parameters | Inputs (Ch4-Ch7) Parameters | **Outputs (Ch0 - Ch3) Parameters** | Outputs (Ch4-Ch7) Parameters

Channel 0

OutChannel 0 configuration: Not used

OutChannel 0 checks: Not used

Channel 1

OutChannel 1 configuration: Not used

OutChannel 1 checks: Plausib, cut wire, short circ.

Channel 2

OutChannel 2 configuration: Not used

OutChannel 2 checks: Plausib, cut wire, short circ.

Channel 3

OutChannel 3 configuration: Not used

OutChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

For further details refer to [Tab Outputs 0-3](#) on page 53.

Tab Outputs (Ch4-Ch7) Parameters

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: **AX722_5_2** Short text:

Long text:

Inputs (Ch4-Ch7) Parameters | Outputs(Ch0 - Ch3) Parameters | **Outputs(Ch4 - Ch7) Parameters** | Info

Channel 4

OutChannel 4 configuration: Not used

OutChannel 4 checks: Plausib, cut wire, short circ.

Channel 5

OutChannel 5 configuration: Not used

OutChannel 5 checks: Plausib, cut wire, short circ.

Channel 6

OutChannel 6 configuration: Not used

OutChannel 6 checks: Plausib, cut wire, short circ.

Channel 7

OutChannel 7 configuration: Not used

OutChannel 7 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

For further details refer to [Tab Outputs 0-3](#) on page 53.

Input/Output Types Supported

The following types of Inputs/Outputs are supported by this module:

Inputs

- 8 analog inputs, individually configurable for:
 - unused (default setting)
 - 0...10 V
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA
 - Pt100, -50 °C...+400 °C (2-wire)

- Pt100, -50 °C...+400 °C (3-wire), requires 2 channels
- Pt100, -50 °C...+70 °C (2-wire)
- Pt100, -50 °C...+70 °C (3-wire), requires 2 channels
- Pt1000, -50 °C...+400 °C (2-wire)
- Pt1000, -50 °C...+400 °C (3-wire), requires 2 channels
- Ni1000, -50 °C...+150 °C (2-wire)
- Ni1000, -50 °C...+150 °C (3-wire), requires 2 channels
- 0...10 V with differential inputs, requires 2 channels
- -10 V...+10 V with differential inputs, requires 2 channels
- digital signals (digital input)

Outputs

- 4 analog outputs, individually configurable for:
 - unused (default setting)
 - 0...10 V
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Input

I/O editor: Mod.Addr. 1: AX 722F (AX722_2_1)

Input Output Diagnosis

Total length: 16 bytes

Component	Data type	Byte	Bit	Length	Variable	Comment
M1_IN_I0	INT	0	0	16		Input I0
M1_IN_I1	INT	2	0	16		Input I1
M1_IN_I2	INT	4	0	16		Input I2
M1_IN_I3	INT	6	0	16		Input I3
M1_IN_I4	INT	8	0	16		Input I4
M1_IN_I5	INT	10	0	16		Input I5
M1_IN_I6	INT	12	0	16		Input I6
M1_IN_I7	INT	14	0	16		Input I7

Check OK Cancel Apply

AX722_IOEditor_Input.bmp

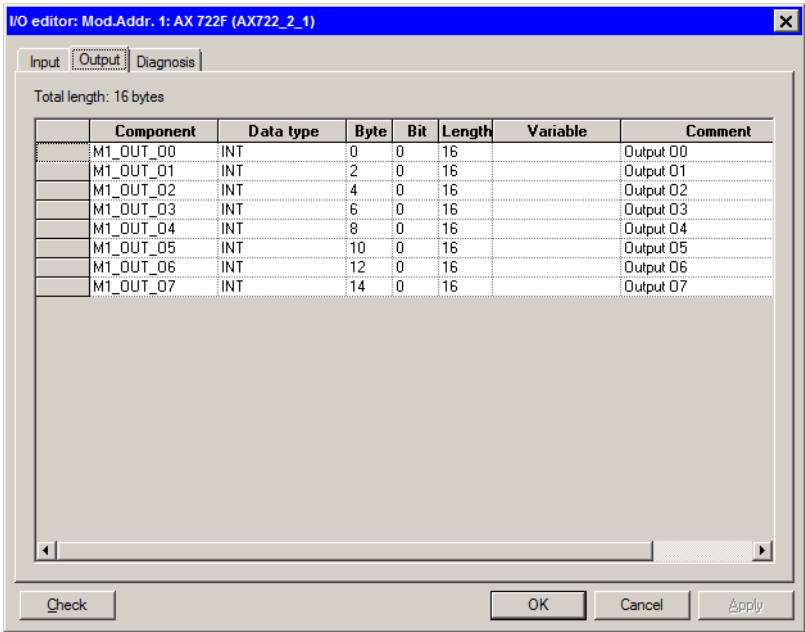
Component Output (I0 to I7) that is to be edited.

Data type: The data type (REAL or BOOL) of the component.

Variable: The variable name.

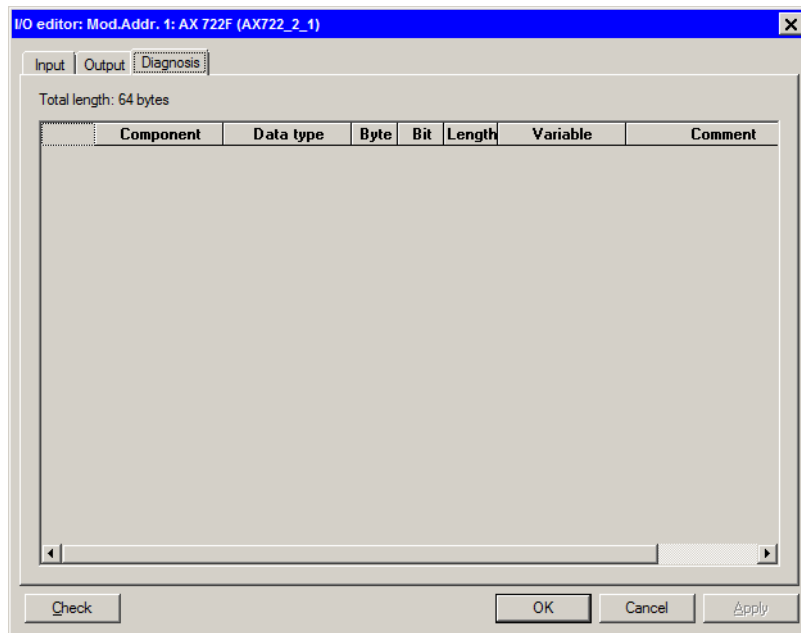
Comment: Comment for the component.

Tab Output



AX722_IOEditor_Output.bmp

- Component* Output (O0 to O7) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

Tab Diagnosis

AX722_IOEditor_Diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

Measuring ranges**Input ranges for voltage, current and digital input**

Range	0...10 V	-10...+10 V	0...20 mA	4...20 mA	Digital input	Digital value	
						decimal	hex.
Overflow	>11.7589	>11.7589	>23.5178	>22.8142		32767	7FFF
Measured value too high	11.7589 : 10.0004	11.7589 : 10.0004	23.5178 : 20.0007	22.8142 : 20.0006		32511 : 27649	7EFF : 6C01
Normal range	10.0000 : 0.0004	10.0000 : 0.0004	20.0000 : 0.0007	20.0000 : 4.0006	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	0	4	OFF	0	0000
Normal range or measured value too low	-0.0004 -1.7593 : : : :	-0.0004 : : : -10.0000		3.9994 : 0 : :		-1 -4864 -6912 : -27648	FFFF ED00 E500 : 9400
Measured value too low		-10.0004 : -11.7589				-27649 : -32512	93FF : 8100
Under-flow	< 0.0000	<-11.7589	< 0.0000	< 0.0000		-32768	8000

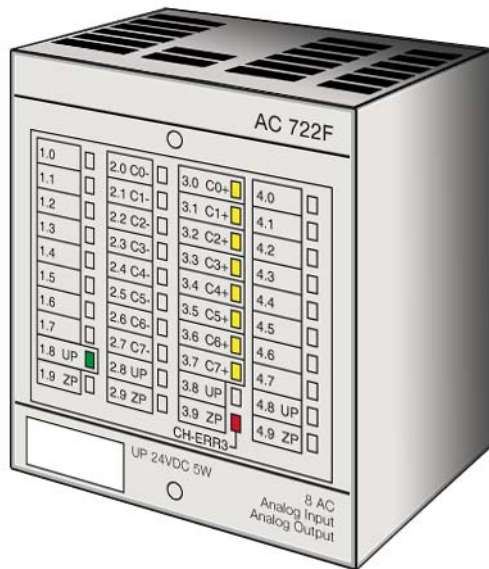
Input Ranges for Resistance

Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 160.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C		4500 : 4001	1194 : 0FA1
			160.0 °C : 150.1 °C	1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C			800 : 701	0320 : 02BD
Normal range	: : 70.0 °C : 0.1 °C	400.0 °C : : : : 0.1 °C	: : 150.0 °C : : : : 0.1 °C	4000 1500 700 : 4	0FA0 05DC 02BC : 0001
	0.0 °C	0.0 °C	0.0 °C	0	0000
	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-1 : -500	FFFF : FE0C
Measured value too low	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-501 : -600	FE0B : FDA8
Underflow	< -60.0 °C	< -60.0 °C	< -60.0 °C	-32768	8000

Output Ranges Voltage and Current

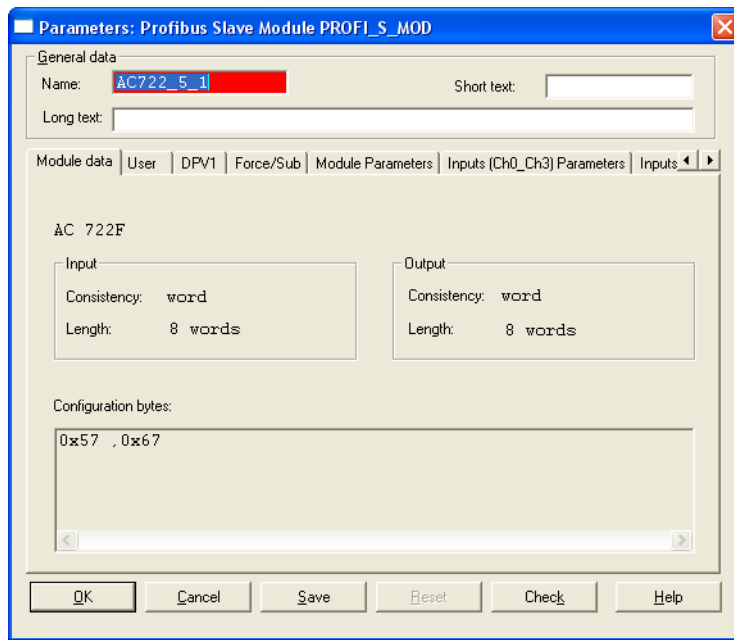
Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	0 V	0 mA	0 mA	>32511	>7EFF
Measured value too high	11.7589 V : 10.0004 V	23.5178 mA : 20.0007 mA	22.8142 mA : 20.0006 mA	32511 : 27649	7EFF : 6C01
Normal range	10.0000 V : 0.0004 V	20,0000 mA : 0.0007 mA	20.0000 mA : 4.0006 mA	27648 : 1	6C00 : 0001
	0.0000 V	0.0000 mA	4.0000 mA	0	0000
	-0.0004 V : -10.0000 V	0 mA : 0 mA	3.9994 mA 0 mA 0 mA	-1 -6912 -27648	FFFF E500 9400
Measured value too low	-10.0004 V : -11.7589 V	0 mA : 0 mA	0 mA : 0 mA	-27649 : -32512	93FF : 8100
Underflow	0 V	0 mA	0 mA	<-32512	<8100

2.1.4 Analog input/output module AC 722F



AC722F_perspective.bmp

The analog input/output module AC 722F provides 8 configurable analog inputs or outputs module wise electrically isolated.



AC722_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

Tab Module data

For further details refer to [Tab Module data](#) on page 43.

Tab User

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AC722_5_1 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Inputs (Ch0_Ch3) Parameters Inputs

Length: 40 bytes

Name	Value	Data type
Const0	5	BYTE
Const1	241	BYTE
Const2	37	BYTE
Check Supply	ON	BYTE
Analog data format	Standard	BYTE
Behaviour outputs at comm. fault	Off	BYTE
InChannel 0 configuration	Not used	BYTE
InChannel 0 checks	Plausib, cut wire, short circ.	BYTE
InChannel 1 configuration	Not used	BYTE
InChannel 1 checks	Plausib, cut wire, short circ.	BYTE
InChannel 2 configuration	Not used	BYTE
InChannel 2 checks	Plausib, cut wire, short circ.	BYTE
InChannel 3 configuration	Not used	BYTE
InChannel 3 checks	Plausib, cut wire, short circ.	BYTE

OK Cancel Save Reset Check Help

AC722_User.bmp

For further details refer to [Tab User](#) on page 44.

Name Name of the input/output channel (I0 to I7) or (O0 to O7)

Value Type of input/output.
From O0 to O3 both current and voltage outputs are possible.
From O4 to O7 only voltage outputs are possible.

Tab DPV1

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AC722_5_1

Short text:

Long text:

Module data

User DPV1

Force/Sub

Module Parameters

Inputs (Ch0_Ch3) Parameters

Inputs

Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1	☒	BOOL	0	0	1	0	0
Comp2	☒	BOOL	0	0	1	0	0
Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

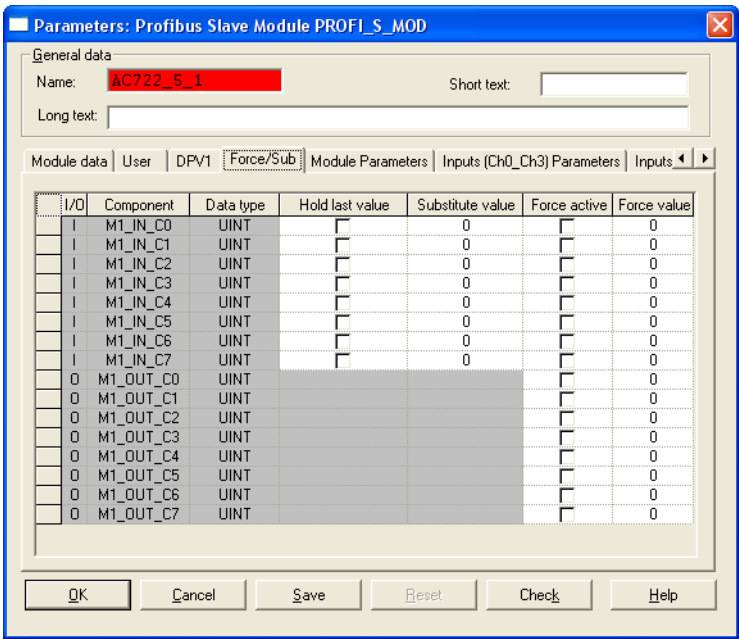
Check

Help

AC722_DPV1.bmp

For further details refer to [Tab DPV1](#) on page 47.

Tab Force and Substitute Value



AC722_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 50.

Tab Module Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **AC722_5_1** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Inputs (Ch0_Ch3) Parameters | Inputs

Module Parameters

Check Supply: **ON**

Analog data format: **Standard**

Behaviour outputs at comm. fault: **Off**

Substitute Values

OutChannel 0 Substitute value: **0**

OK Cancel Save Reset Check Help

AC722_ud1.bmp

For further details refer to [Tab Module Parameters](#) on page 51.

Tab Inputs (Ch0-Ch3) Parameters

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: **AC722_5_1** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Inputs (Ch0-Ch3) Parameters** | Inputs

Channel 0

InChannel 0 configuration: Not used

InChannel 0 checks: Plausib, cut wire, short circ.

Channel 1

InChannel 1 configuration: Not used

InChannel 1 checks: Plausib, cut wire, short circ.

Channel 2

InChannel 2 configuration: Not used

InChannel 2 checks: Plausib, cut wire, short circ.

Channel 3

InChannel 3 configuration: Not used

InChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AC722_ud2.bmp

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Inputs (Ch4-Ch7) Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **AC722_5_1** Short text:

Long text:

Module Parameters | Inputs (Ch0_Ch3) Parameters | **Inputs (Ch4-Ch7) Parameters** | Outputs(Ch0 - Ch3) P

Channel 4

InChannel 4 configuration: Not used

InChannel 4 checks: Plausib, cut wire, short circ.

Channel 5

InChannel 5 configuration: Not used

InChannel 5 checks: Plausib, cut wire, short circ.

Channel 6

InChannel 6 configuration: Not used

InChannel 6 checks: Plausib, cut wire, short circ.

Channel 7

InChannel 7 configuration: Not used

InChannel 7 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AC722_ud3.bmp

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Outputs (Ch0-Ch3) Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **AC722_5_1** Short text:

Long text:

Inputs (Ch4-Ch7) Parameters | **Outputs(Ch0 - Ch3) Parameters** | Outputs(Ch4 - Ch7) Parameters | Info

Channel 0

OutChannel 0 configuration: Not used

OutChannel 0 checks: Plausib, cut wire, short circ.

Channel 1

OutChannel 1 configuration: Not used

OutChannel 1 checks: Plausib, cut wire, short circ.

Channel 2

OutChannel 2 configuration: Not used

OutChannel 2 checks: Plausib, cut wire, short circ.

Channel 3

OutChannel 3 configuration: Not used

OutChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AC722_ud4.bmp

For further details refer to [Tab Outputs 0-3](#) on page 53.

Tab Outputs (Ch4-Ch7) Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data
 Name: **AC722_5_1** Short text:
 Long text:

Inputs (Ch4-Ch7) Parameters | Outputs(Ch0 - Ch3) Parameters | **Outputs(Ch4 - Ch7) Parameters** | Info

Channel 4
 OutChannel 4 configuration: Not used
 OutChannel 4 checks: Plausib, cut wire, short circ.

Channel 5
 OutChannel 5 configuration: Not used
 OutChannel 5 checks: Plausib, cut wire, short circ.

Channel 6
 OutChannel 6 configuration: Not used
 OutChannel 6 checks: Plausib, cut wire, short circ.

Channel 7
 OutChannel 7 configuration: Not used
 OutChannel 7 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AC722_uds.bmp

For further details refer to [Tab Outputs 0-3](#) on page 53.

Input/Output Types Supported

The following types of Inputs/Outputs are supported by this module:

Inputs

- 8 channels, when used as individually configurable analog inputs:
 - unused (default setting)
 - 0...10 V
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA
 - Pt100, -50 °C...+400 °C (2-wire)

- Pt100, -50 °C ...+400 °C (3-wire), requires 2 channels
- Pt100, -50 °C ...+70 °C (2-wire)
- Pt100, -50 °C ...+70 °C (3-wire), requires 2 channels
- Pt1000, -50 °C...+400 °C (2-wire)
- Pt1000, -50 °C ...+400 °C (3-wire), requires 2 channels
- Ni1000, -50 °C ...+150 °C (2-wire)
- Ni1000, -50 °C ...+150 °C (3-wire), requires 2 channels
- 0...10 V with differential inputs, requires 2 channels
- -10 V...+10 V with differential inputs, requires 2 channels
- digital signals (digital input)

Outputs

- 4 channels, when used as individually configurable analog outputs:
 - unused (default setting)
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

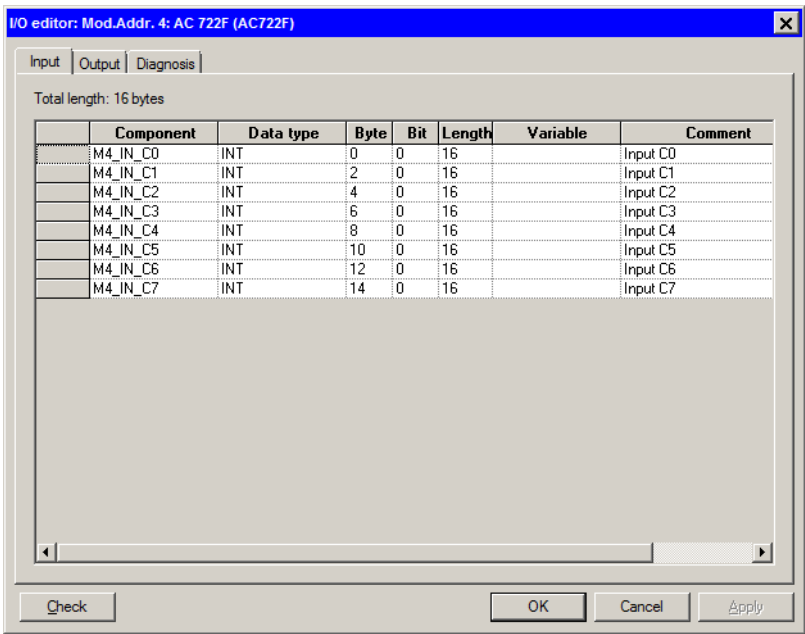
I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input



AC7222_IOEdit_Input.bmp

- Component** Output (I0 to I7) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Output

I/O editor: Mod.Addr. 4: AC 722F (AC722F)

Input Output Diagnosis

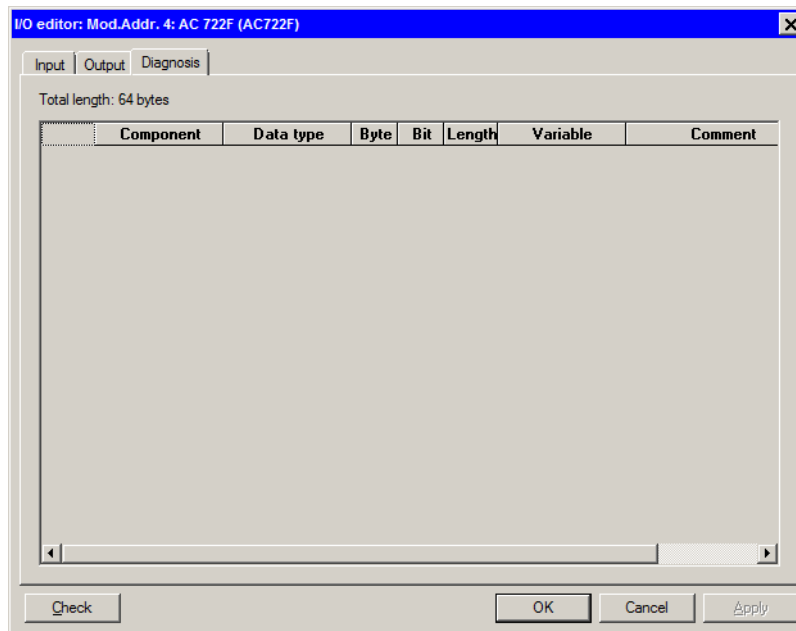
Total length: 16 bytes

Component	Data type	Byte	Bit	Length	Variable	Comment
M4_OUT_C0	INT	0	0	16		Output C0
M4_OUT_C1	INT	2	0	16		Output C1
M4_OUT_C2	INT	4	0	16		Output C2
M4_OUT_C3	INT	6	0	16		Output C3
M4_OUT_C4	INT	8	0	16		Output C4
M4_OUT_C5	INT	10	0	16		Output C5
M4_OUT_C6	INT	12	0	16		Output C6
M4_OUT_C7	INT	14	0	16		Output C7

Check OK Cancel Apply

AC722_IOEdit_Output.bmp

- Component** Output (O0 to O7) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Diagnosis

AC722_IOEdit_Diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

Measuring ranges**Input ranges for voltage, current and digital input**

Range	0...10 V	-10...+10 V	0...20 mA	4...20 mA	Digital input	Digital value	
						decimal	hex.
Overflow	>11.7589	>11.7589	>23.5178	>22.8142		32767	7FFF
Measured value too high	11.7589 : 10.0004	11.7589 : 10.0004	23.5178 : 20.0007	22.8142 : 20.0006		32511 : 27649	7EFF : 6C01
Normal range	10.0000 : 0.0004	10.0000 : 0.0004	20.0000 : 0.0007	20.0000 : 4.0006	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	0	4	OFF	0	0000
Normal range or measured value too low	-0.0004 -1.7593 : : :	-0.0004 : : : -10.0000		3.9994 : 0 : :		-1 -4864 -6912 : -27648	FFFF ED00 E500 : 9400
Measured value too low		-10.0004 : -11.7589				-27649 : -32512	93FF : 8100
Underflow	< 0.0000	<-11.7589	< 0.0000	< 0.0000		-32768	8000

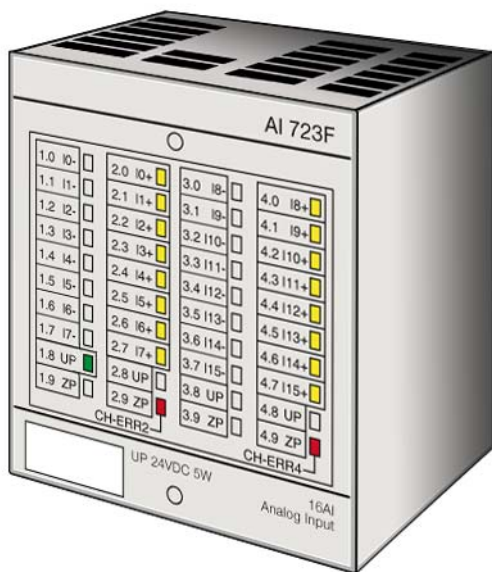
Input Ranges for Resistance

Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 160.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C		4500 : 4001	1194 : 0FA1
			160.0 °C : 150.1 °C	1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C			800 : 701	0320 : 02BD
Normal range	: : 70.0 °C : 0.1 °C	400.0 °C : : : : 0.1 °C	: : 150.0 °C : : : : 0.1 °C	4000 1500 700 : 1	0FA0 05DC 02BC : 0001
	0.0 °C	0.0 °C	0.0 °C	0	0000
	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-1 : -500	FFFF : FE0C
Measured value too low	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-501 : -600	FE0B : FDA8
Underflow	< -60.0 °C	< -60.0 °C	< -60.0 °C	-32768	8000

Output Ranges Voltage and Current

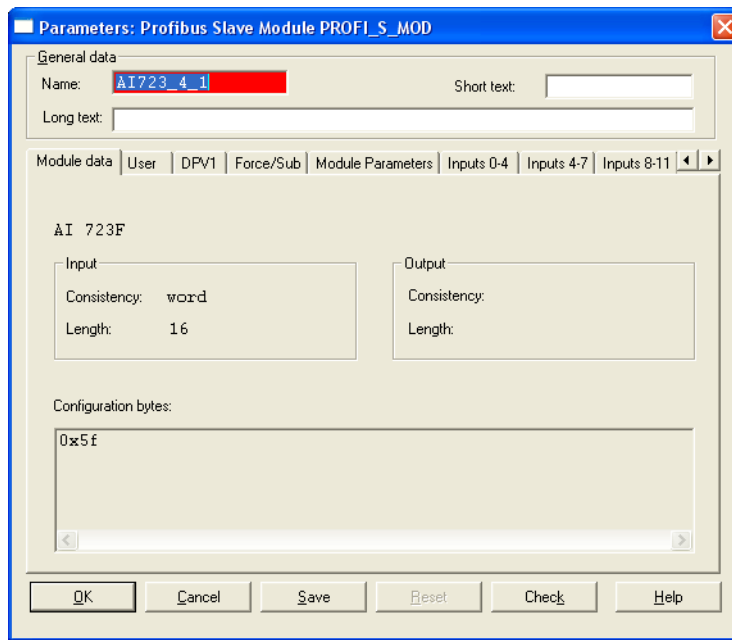
Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	0 V	0 mA	0 mA	>32511	>7EFF
Measured value too high	11.7589 V : 10.0004 V	23.5178 mA : 20.0007 mA	22.8142 mA : 20.0006 mA	32511 : 27649	7EFF : 6C01
Normal range	10.0000 V : 0.0004 V	20,0000 mA : 0.0007 mA	20.0000 mA : 4.0006 mA	27648 : 1	6C00 : 0001
	0.0000 V	0.0000 mA	4.0000 mA	0	0000
	-0.0004 V : -10.0000 V	0 mA : 0 mA	3.9994 mA 0 mA 0 mA	-1 -6912 -27648	FFFF E500 9400
Measured value too low	-10.0004 V : -11.7589 V	0 mA : 0 mA	0 mA : 0 mA	-27649 : -32512	93FF : 8100
Underflow	0 V	0 mA	0 mA	<-32512	< 8100

2.1.5 Analog input module AI 723F



AI723.bmp

The analog input/output module AI 723F provides 16 configurable analog inputs module wise electrically isolated.



AI723_Mod_Data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

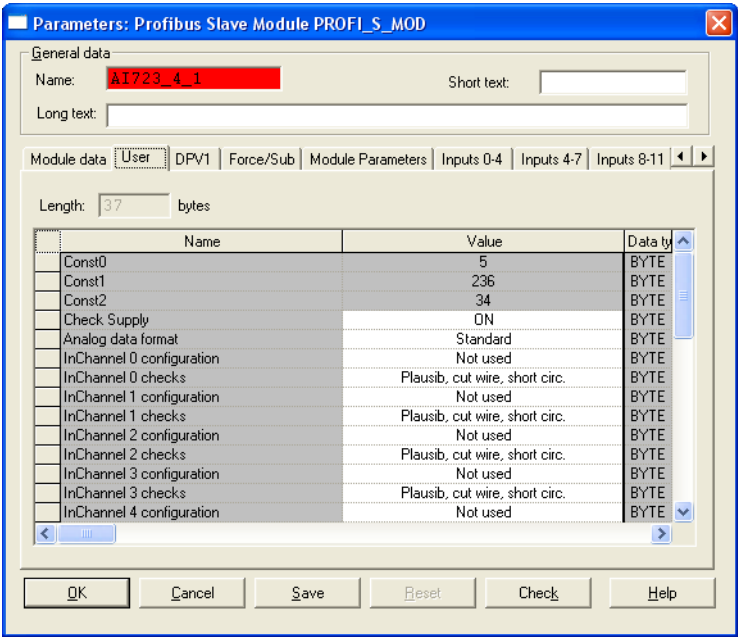
Short text: Free text of up to 12 characters.

Long text: Free text of up to 30 characters.

Tab Module data

For further details refer to [Tab Module data](#) on page 43.

Tab User



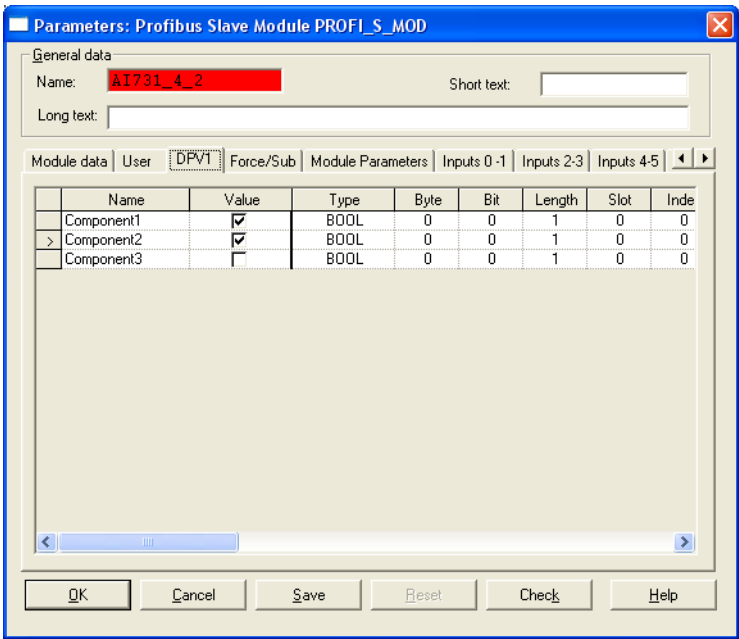
AI723_User.bmp

For further details refer to [Tab User](#) on page 44.

Name Name of the input channel (I0 to I15)

Value Type of input.

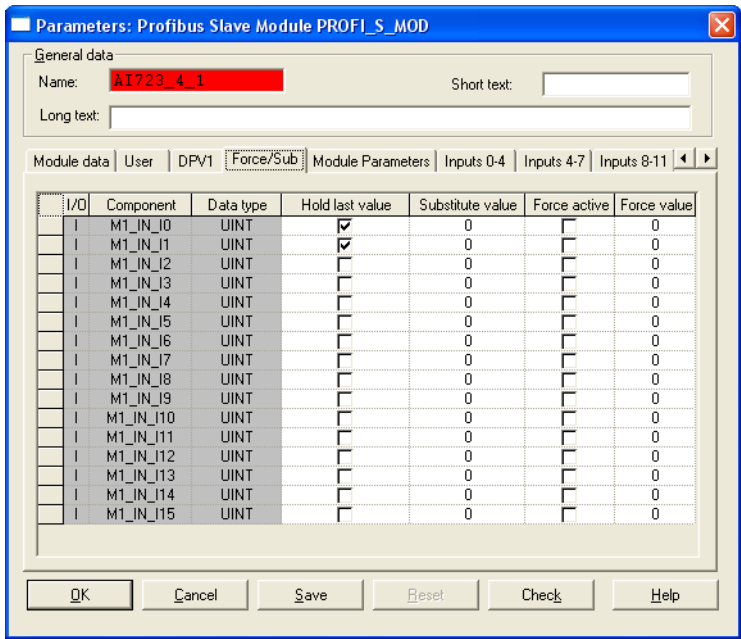
Tab DPV1



AI723_DP1.1.bmp

For further details, refer to [Tab DPV1](#) on page 47.

Tab Force and Substitute Value



AI723_Force.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 50.

Tab Module Parameters

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: AI723_4_1 Short text: Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Inputs 0-4 | Inputs 4-7 | Inputs 8-11

Check Supply: ON

Analog data format: Standard

OK Cancel Save Reset Check Help

AI723_ud1.bmp

For further details refer to [Tab Module Parameters](#) on page 51.

Tab Inputs 0-4

Parameters: Profibus Slave Module PROFIS_MOD

General data
 Name: **AI723_4_1** Short text:
 Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Inputs 0-4** | Inputs 4-7 | Inputs 8-11

Channel 0
 InChannel 0 configuration: Not used
 InChannel 0 checks: Plausib, cut wire, short circ.

Channel 1
 InChannel 1 configuration: Not used
 InChannel 1 checks: Plausib, cut wire, short circ.

Channel 2
 InChannel 2 configuration: Not used
 InChannel 2 checks: Plausib, cut wire, short circ.

Channel 3
 InChannel 3 configuration: Not used
 InChannel 3 checks: Plausib, cut wire, short circ.

OK Cancel Save Reset Check Help

AI723_ud2.bmp

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Inputs 4-7, Tab Inputs 8-11 and Tab Inputs 12-15 are similar to **Tab Inputs 0-4**.

Input Types Supported

The following types of Inputs are supported by this module:

Inputs

- 16 analog inputs, individually configurable for:
 - unused (default setting)
 - 0...10 V
 - -10 V...+10 V
 - 0...20 mA

- 4...20 mA
- Pt100, -50 °C ...+400 °C (2-wire)
- Pt100, -50 °C ...+400 °C (3-wire), requires 2 channels
- Pt100, -50 °C ...+70 °C (2-wire)
- Pt100, -50 °C ...+70 °C (3-wire), requires 2 channels
- Pt1000, -50 °C ...+400 °C (2-wire)
- Pt1000, -50 °C ...+400 °C (3-wire), requires 2 channels
- Ni1000, -50 °C ...+150 °C (2-wire)
- Ni1000, -50 °C ...+150 °C (3-wire), requires 2 channels
- 0...10 V with differential inputs, requires 2 channels
- -10 V...+10 V with differential inputs, requires 2 channels
- digital signals (digital input)

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

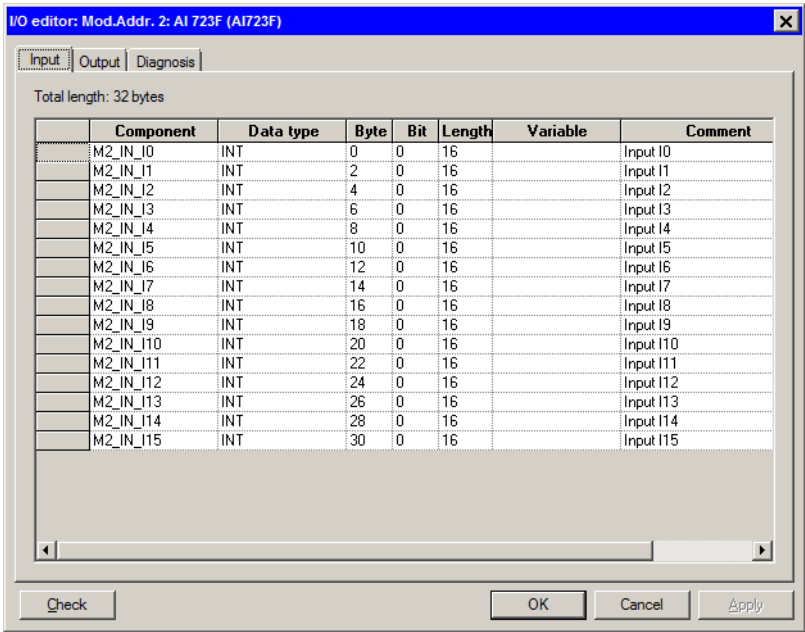
I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

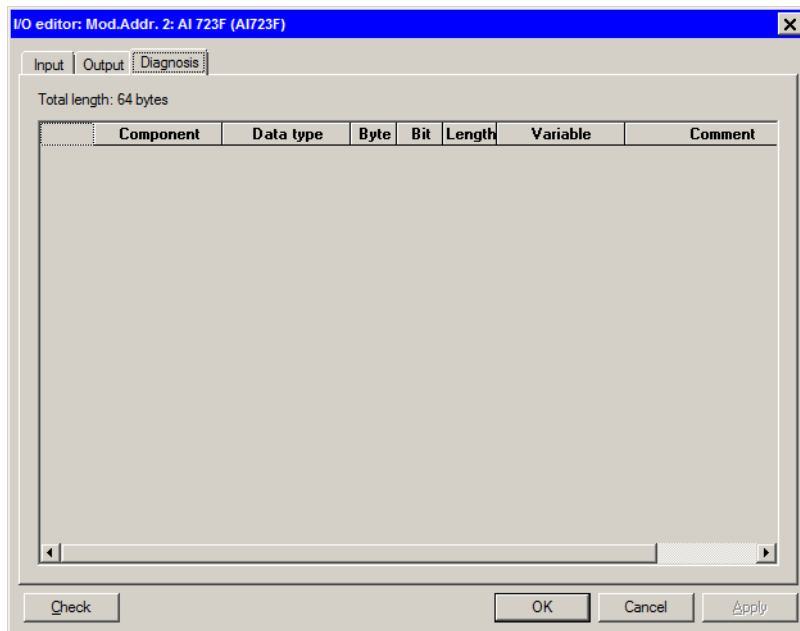
With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input



AI723_IOEditor_input.bmp

- Component** Output (I0 to I15) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Diagnosis

AI723_IOEditor_Diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

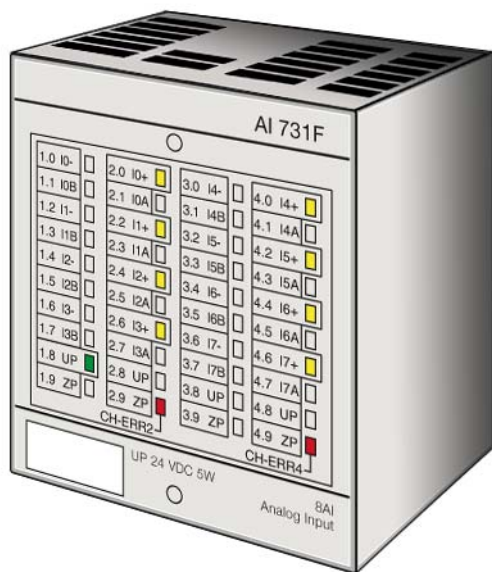
Measuring ranges**Input ranges for voltage, current and digital input**

Range	0...10 V	-10...+10V	0...20 mA	4...20 mA	Digital input	Digital value	
						decimal	hex.
Overflow	>11.7589	>11.7589	>23.5178	>22.8142		32767	7FFF
Measured value too high	11.7589 : 10.0004	11.7589 : 10.0004	23.5178 : 20.0007	22.8142 : 20.0006		32511 : 27649	7EFF : 6C01
Normal range	10.0000 : 0.0004	10.0000 : 0.0004	20.0000 : 0.0007	20.0000 : 4.0006	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	0	4	OFF	0	0000
Normal range or measured value too low	-0.0004 -1.7593	-0.0004 : : : -10.0000		3.9994 : 0		-1 -4864 -6912 : -27648	FFFF ED00 E500 : 9400
Measured value too low		-10.0004 : -11.7589				-27649 : -32512	93FF : 8100
Underflow	<0.0000	<-11.7589	<0.0000	<0.0000		-32768	8000

Input Ranges for Resistance

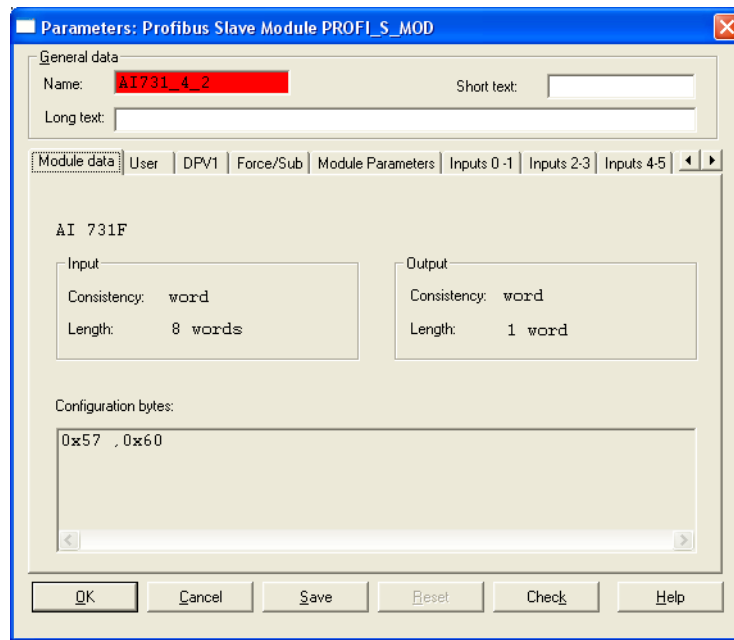
Range	Pt100 / Pt 1000 -50 °C...+70 °C	Pt100 / Pt1000 -50 °C...+400 °C	Ni1000 -50 °C...+150 °C	Digital value	
				decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 160.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C		4500 : 4001	1194 : 0FA1
			160.0 °C : 150.1 °C	1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C			800 : 701	0320 : 02BD
Normal range	:	400.0 °C	:	4000	0FA0
	:	:	150.0 °C	1500	05DC
	70.0 °C	:	:	700	02BC
	0.1 °C	0.1 °C	0.1 °C	1	0001
	0.0 °C	0.0 °C	0.0 °C	0	0000
Measured value too low	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-1 : -500	FFFF : FE0C
	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-501 : -600	FE0B : FDA8
Underflow	< -60.0 °C	< -60.0 °C	< -60.0 °C	-32768	8000

2.1.6 Analog input module (Thermocouple) AI 731F



AI731.bmp

The analog input/output module AI 731F provides 8 configurable analog inputs module wise electrically isolated.



AI731_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

Tab Module data

For further details [Tab Module data](#) on page 43.

Tab User

Name	Value	Data type
Const0	6	BYTE
Const1	0	BYTE
Const2	36	BYTE
Const5	0	BYTE
Const6	0	BYTE
Check Supply	ON	BYTE
Analog data format	Standard	BYTE
InChannel 0 configuration	Not used	BYTE
InChannel 0 checks	Plausib, cut wire, short circ.	BYTE
Noise rejection	50Hz	BYTE
Compensation channel	Internal Compensation	BYTE
InChannel 1 configuration	Not used	BYTE
InChannel 1 checks	Plausib, cut wire, short circ.	BYTE
Noise rejection0	50Hz	BYTE

AI731_User_parm.bmp

For further details [Tab User](#) on page 44.

Name Name of the input channel (I0 to I7)

Value Type of input.

Noise rejection The options available are:

50 Hz

60 Hz

none

Compensation The options available are:

Internal Compensation

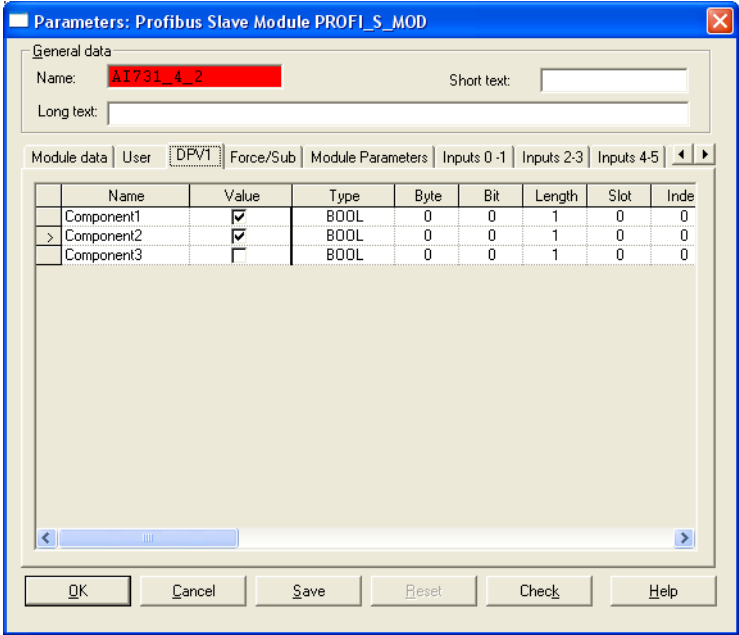
External with temperature value

An external temperature value is transferred via the IO bus to the module (output value). It can be used by every TC channel for compensation purpose.

The following values are possible:

Channel	Compensation	Default
0	1,2,3,E,I	internal
1	0,2,3,E,I	internal
2	0,1,3,E,I	internal
3	0,1,2,E,I	internal
4	5,6,7,E,I	internal
5	4,6,7,E,I	internal
6	4,5,7,E,I	internal
7	4,5,6,E,I	internal

Tab DPV1



AI731_DP1.bmp

For further details refer to [Tab DPV1](#) on page 47.

Tab Force and Substitute

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AI731_4_2

Short text:

Long text:

Module data

User

DPV1

Force/Sub

Module Parameters

Inputs 0-1

Inputs 2-3

Inputs 4-5

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
I	M2_IN0_I0	UINT	☒	0	☐	0
>	M2_IN1_I1	UINT	☒	0	☐	0
I	M2_IN2_I2	UINT	☐	0	☐	0
I	M2_IN3_I3	UINT	☐	0	☐	0
I	M2_IN4_I4	UINT	☐	0	☐	0
I	M2_IN5_I5	UINT	☐	0	☐	0
I	M2_IN6_I6	UINT	☐	0	☐	0
I	M2_IN7_I7	UINT	☐	0	☐	0
O	M2_EXT_OUT	INT			☐	0

OK

Cancel

Save

Reset

Check

Help

AI731_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 50.

Tab Module Parameters

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: AI731_4_2 Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Inputs 0-1 | Inputs 2-3 | Inputs 4-5

Check Supply: ON

Analog data format: Standard

OK Cancel Save Reset Check Help

AI731_ud1.bmp

For further details refer to [Tab Module Parameters](#) on page 51.

Tab Inputs 0-1

Parameters: Profibus Slave Module PROFIS_MOD

General data
 Name: **AI731_4_2** Short text:
 Long text:
 Module data | User | DPV1 | Force/Sub | Module Parameters | **Inputs 0-1** | Inputs 2-3 | Inputs 4-5 |
 Channel 0
 InChannel 0 configuration: Not used
 InChannel 0 checks: Plausib, cut wire, short circ.
 Compensation channel 0: Internal Compensation
 Noise rejection Channel 0: 50Hz
 Channel 1
 InChannel 1 configuration: Not used
 InChannel 1 checks: Plausib, cut wire, short circ.
 Compensation channel 1: Internal Compensation
 Noise rejection 0: 50Hz
 OK Cancel Save Reset Check Help

AI731_ud1.bmp

Input channel x configuration

Type of input channel (Voltage, Current, RTD, Thermocouple, Resistance)

Input channel x checks

Checks of the input channel

Compensation channel x

Type of compensation for thermocouple inputs (External, Internal, other channel within same group)

Noise rejection Channel x

Setting for noise rejection filter for analog input

Tab Inputs 2-3, Inputs 4-5, Inputs 6-7 are similar to the **Tab Inputs 0-1**.

Input Types Supported

The following types of Inputs are supported by this module:

Inputs

- 8 analog inputs, individually configurable for:
 - unused (default setting)
 - 0...5V, 0...10 V
 - -50...+50 mV, -500...+500 mV
 - -1...+1 V, -5...+5 V, -10 V...+10 V
 - 0...20 mA
 - 4...20 mA
 - -20...+20 mA
 - Pt100, -50 °C...+70 °C (2-wire)
 - Pt100, -50 °C...+70 °C (3-wire)
 - Pt100, -50 °C...+70 °C (4-wire)
 - Pt100, -50 °C...+70 °C (2-wire), resolution 0.01 K
 - Pt100, -50 °C...+70 °C (3-wire), resolution 0.01 K
 - Pt100, -50 °C...+70 °C (4-wire), resolution 0.01 K
 - Pt100, -50 °C...+400 °C (2-wire)
 - Pt100, -50 °C...+400 °C (3-wire)
 - Pt100, -50 °C...+400 °C (4-wire)
 - Pt100, -200 °C...+850 °C (2-wire)
 - Pt100, -200 °C...+850 °C (3-wire)
 - Pt100, -200 °C...+850 °C (4-wire)
 - Pt1000, -50 °C...+400 °C (2-wire)
 - Pt1000, -50 °C...+400 °C (3-wire)
 - Pt1000, -50 °C...+400 °C (4-wire)

- Ni1000, -50 °C...+150 °C (2-wire)
- Ni1000, -50 °C...+150 °C (3-wire)
- Ni1000, -50 °C...+150 °C (4-wire)
- Cu50 1.426, -50 °C...+200 °C (2-wire)
- Cu50 1.426, -50 °C...+200 °C (3-wire)
- Cu50 1.426, -50 °C...+200 °C (4-wire)
- Cu50 1.428, -200 °C...+200 °C (2-wire)
- Cu50 1.428, -200 °C...+200 °C (3-wire)
- Cu50 1.428, -200 °C...+200 °C (4-wire)
- 0...50 kOhm
- Thermocouples of types J, K, T, N, S
- Digital signals (digital input)

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor

In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Input

I/O editor: Mod.Addr. 7: AI 731F (AI731F)

Input Output Diagnosis

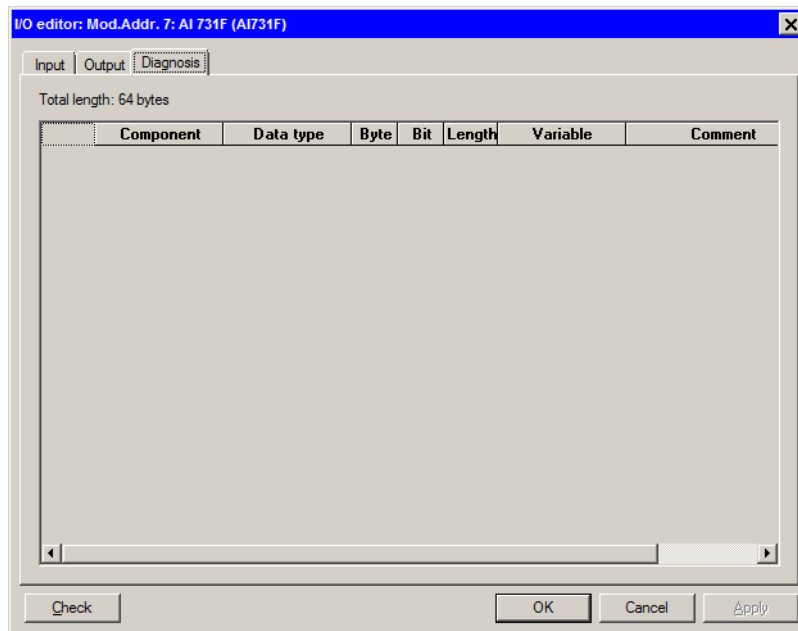
Total length: 16 bytes

Component	Data type	Byte	Bit	Length	Variable	Comment
M7_IN_I0	INT	0	0	16		
M7_IN_I1	INT	2	0	16		
M7_IN_I2	INT	4	0	16		
M7_IN_I3	INT	6	0	16		
M7_IN_I4	INT	8	0	16		
M7_IN_I5	INT	10	0	16		
M7_IN_I6	INT	12	0	16		
M7_IN_I7	INT	14	0	16		

Check OK Cancel Apply

AI731_IOEditor_Input.bmp

- Component** Output (I0 to I7) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Diagnosis

AI731_IOEditor_Diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

Measuring ranges**Input ranges for voltage, current and digital input**

Range	-50 ... +50 mV	-500 ... +500 mV	-1 ... +1 V	-5...+5 V	-10..+10 V	Com- mon Mode Voltage	Digital value	
							deci- mal	hex.
Over- flow	>58.7945	>587.9949	>1.17589	>5.8794	>11.7589		32767	7FFF
Mea- sured value too high	58.7945 : 50.0018	587.9449 : 500.0181	1.17589 : 1.00004	5.8794 : 5.0002	11.7589 : 10.0004		32511 : 27649	7EFF : 6C01
Nor- mal range	50.0000 : 0.0018	500.0000 : 0.0181	1.00000 : 0.00004	5.0000 : 0.0002	10.0000 : 0.0004	20.0000 : 0.0008	27648 : 1	6C00 : 0001
Norma l range or measu red value too low	0.0000	0.0000	0.0000	0.00000	0.0000	0.0000	0	0000
	-0.0018 : -50.0000	-0.0181 : -500,0000	-0.00004 : -1,00000	-0.0002 : -5,0000	-0.004 : -10,0000	0.0008 : -20.0000	-1 : -27648	FFFF : 9400
Mea- sured value too low	-50,0018 : -58.7945	-500.0181 : -587.9449	-1.00004 : -1.17589	-5.0002 : -5.8794	-10.0004 : -11.7589		-27649 : -32512	93FF : 8100
Under- flow	<-58.7945	<-587.9949	<-1.17589	<-5.8794	<-11.7589	<20.0000	-32768	8000

Input ranges for voltage, current and digital input

Range	0 ... +5 V	0 ... +10 V	Digital input	Digital value	
				decimal	hex.
Overflow	> 5.8794	> 11.7589		32767	7FFF
Measured value too high	5.8794 : 5.0002	11.7589 : 10.0004		32511 : 27649	7EFF : 6C01
Normal range	5.0000 : 0.0002	10.0000 : 0.0004	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	OFF	0	0000
Measured value too low	-0.0002 : -0.8794	-0.0004 : -1.1759		-1 : -4864	FFFF : ED00
Underflow	< -0.8794	< -1.7589		-32768	8000

Current input ranges

Range	-20 ... +20 mA	0 ... +20 mA	4 ... 20 mA	Digital value	
				decimal	hex.
Overflow	> 23.5178	> 23.5178	> 22.8142	32767	7FFF
Measured value too high	23.5178 : 20.0007	23.5178 : 20.0007	22.8142 : 20.0006	32511 : 27649	7EFF : 6C01

Range	-20 ... +20 mA	0 ... +20 mA	4 ... 20 mA	Digital value	
				decimal	hex.
Normal range	20.0000	20.0000	20.0000	27648	6C00
	:	:	:	:	:
	0.0001	0.0007	4.0006	1	0001
	0.0000	0.0000	4.0000	0	0000
Measured value too low	-0.0007			-1	FFFF
	:			:	:
	-20.0000			-27648	9400
Measured value too low		-0.0007	3.9994	-1	93FF
		:	:	:	:
		-3.5178	1.1852	-4864	8100
Measured value too low	-20.0007			-27649	93FF
	:			:	:
	-23.5178			-32512	8100
Underflow	< -23.5178	< -3.5178	< 1.1852	-32768	8000

Input Ranges for Resistance

Range	Pt100 -50 °C. .. +70 °C *	Pt100 / Pt1000 -50 °C... +400 °C	Pt100 -200 °C... +850 °C	Ni1000 -50 °C... +150 °C	Cu50 -200... +200 °C	Digital value	
						decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 850.0 °C	> 160.0 °C	> 200.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C				4500 : 4001	1194 : 0FA1
				160.0 °C : 150.1 °C		1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C					800 : 701	0320 : 02BD
Normal range	: : : : 70.0 °C : 0.1 °C	: 400.0 °C : : : : 0.1 °C	850.0 °C : : : : : 0.1 °C	: : : 150.0 °C : : 0.1 °C	: : 200.0 °C : : : 0.1 °C	8500 4000 2000 1500 700 : 1	2134 0FA0 07D0 05DC 02BC : 1
	0.0 °C	0.0 °C	0.0 °C	0.0 °C	:	0	0000
	-0.1 °C -50.0 °C	-0.1 °C -50.0 °C	-0.1 °C : -200.0 °C	-0.1 °C -50.0 °C :	-0.1 °C -50.0 °C** -200.0 °C**	-1 -500 -2000	FFFF FE0C F830
	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C		-50.1 °C : -60.0 °C		-501 : -600	FE0B : FDA8
Underflow	<-60.0 °C	<-60.0 °C	<-200.0 °C	<-60.0 °C	<-200.0 °C**	-32768	8000

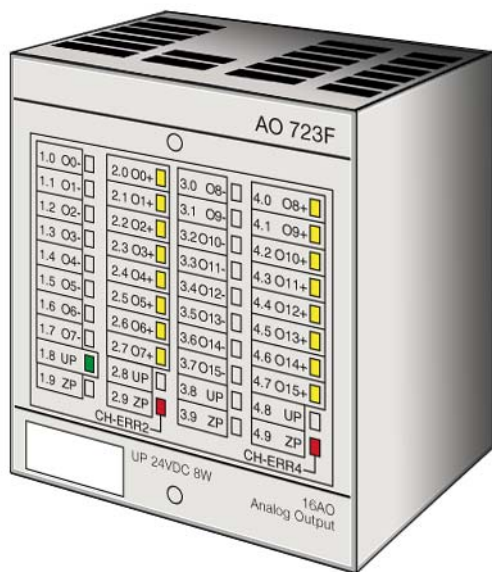
* also possible with resolution 0.01 K

** if Cu50 with 1.426, -50 °C is valid; if Cu50 with 1.428, -200,0 °C is valid

Thermocouple input ranges

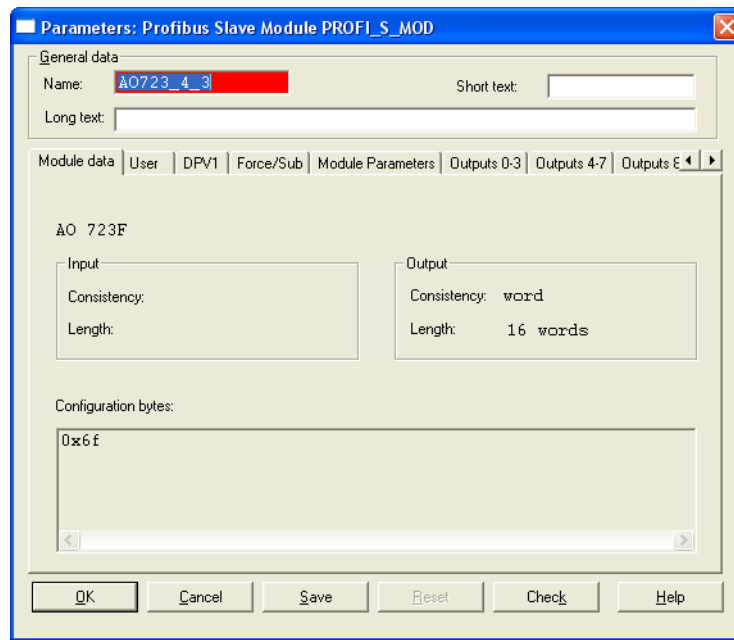
Range	Typ J -210... +1200 °C	Typ K -270... +1372 °C	Typ N -270... +1300 °C	Typ S -50... +1768 °C	Typ T -270... +400 °C	Digital value	
						decimal	hex.
Overflow	>1200.0 °C	>1372.0 °C	>1300.0 °C	>1768.0 °C	>400.0 °C	32767	7FFF
Normal range	:	:	:	1768.0 °C	:	17680	4510
	:	1372.0 °C	:	:	:	13720	3598
	:	:	1300.0 °C	:	:	13000	32C8
	1200.0 °C	:	:	:	:	12000	2EE0
	:	:	:	:	400.0 °C	4000	0FA0
	:	:	:	:	:	:	:
	0.1 °C	0.1 °C	0.1 °C	0.1 °C	0.1 °C	1	1
	0.0 °C	0.0 °C	0.0 °C	0.0 °C		0	0000
	-0.1 °C	-0.1 °C	-0.1 °C	-0.1 °C	-0.1 °C	-1	FFFF
	:	:	:	:	:	:	:
	:	:	:	-50,0 °C	:	-500	FE0C
	-210.0 °C	:	:	:	:	-2100	F7CC
	:	-270.0 °C	-270.0 °C	:	-270.0 °C	-2700	F574
Underflow	< -210.0 °C	< -270.0 °C	< -270.0 °C	< -50.0 °C	< -270.0 °C	-32768	8000

2.1.7 Analog output module AO 723F



AO723.bmp

The analog output module AO 723F provides 16 configurable analog outputs module wise electrically isolated.



AO723_Mod_data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

Tab Module data

For further details [Tab Module data](#) on page 43.

Tab User

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: AO723_4_3 Short text:

Long text:

Module data User DPV1 Force/Sub Module Parameters Outputs 0-3 Outputs 4-7 Outputs 8-15

Length: 42 bytes

Name	Value	Data type
Const0	5	BYTE
Const1	231	BYTE
Const2	39	BYTE
Check Supply	ON	BYTE
Analog data format	Standard	BYTE
Behaviour outputs at comm. fault	Last value unlimited	BYTE
OutChannel 0 configuration	Not used	BYTE
OutChannel 0 checks	Plausib, cut wire, short circ.	BYTE
OutChannel 0 Substitute value	0	WORD
OutChannel 1 configuration	Not used	BYTE
OutChannel 1 checks	Plausib, cut wire, short circ.	BYTE
OutChannel 2 configuration	Not used	BYTE
OutChannel 2 checks	Plausib, cut wire, short circ.	BYTE
OutChannel 3 configuration	Not used	BYTE

OK Cancel Save Reset Check Help

AO723_User_para1.bmp

For further details refer to [Tab Module data](#) on page 43.

Name Name of the output channel (O0 to O15)

Value Type of output.
From O0 to O3 both current and voltage outputs are possible.
From O4 to O7 only voltage outputs are possible.



If one of the *Last value* options are selected for *Behavior outputs at comm. fault* then the substitute value for Channel 0 and Channel 8 should be zero.

Tab DPV1

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: AO723_4_3 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Outputs 0-3 Outputs 4-7 Outputs 8-15

	Name	Value	Type	Byte	Bit	Length	Slot	Index
>	Comp1	☐	BOOL	0	0	1	0	0
	Comp2	☐	BOOL	0	0	1	0	0
	Comp3	☐	BOOL	0	0	1	0	0

OK Cancel Save Reset Check Help

AO723_DP11.bmp

For further details refer to [Tab DPV1](#) on page 47.

Tab Force and Substitute

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name:AO723_4_3Short text:

Long text:

Module data

User

DPV1

Force/Sub

Module Parameters

Outputs 0-3

Outputs 4-7

Outputs 8-15

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
☐	M3_OUT_00	UINT			☐	0
☐	M3_OUT_01	UINT			☐	0
☐	M3_OUT_02	UINT			☐	0
☐	M3_OUT_03	UINT			☐	0
☐	M3_OUT_04	UINT			☐	0
☐	M3_OUT_05	UINT			☐	0
☐	M3_OUT_06	UINT			☐	0
☐	M3_OUT_07	UINT			☐	0
☐	M3_OUT_08	UINT			☐	0
☐	M3_OUT_09	UINT			☐	0
☐	M3_OUT_010	UINT			☐	0
☐	M3_OUT_011	UINT			☐	0
☐	M3_OUT_012	UINT			☐	0
☐	M3_OUT_013	UINT			☐	0
☐	M3_OUT_014	UINT			☐	0
☐	M3_OUT_015	UINT			☐	0

OK

Cancel

Save

Reset

Check

Help

AO723_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 50.

Tab Module Parameters

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: AO723_4_3 Short text: Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Outputs 0-3 | Outputs 4-7 | Outputs 8

Check Supply: ON

Analog data format: Standard

Behaviour outputs at comm. fault: Last value unlimited

Substitute Values

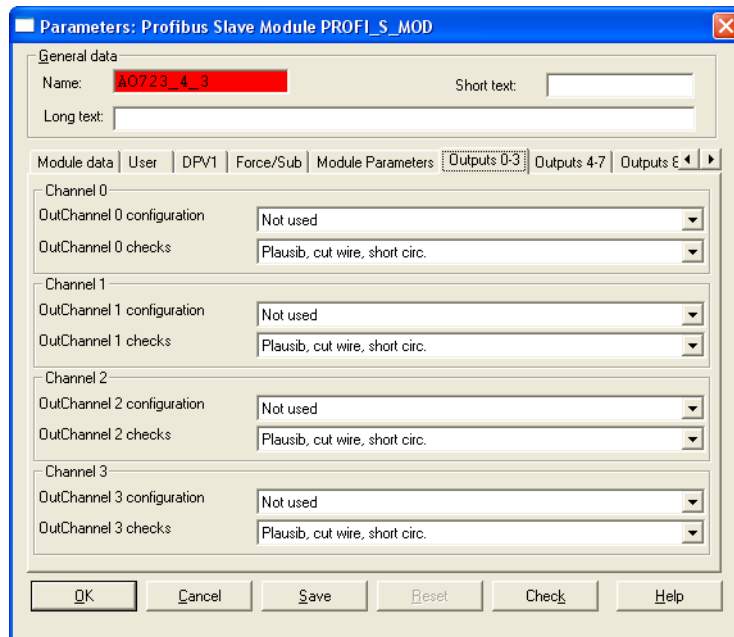
OutChannel 0 Substitute value: 0

OutChannel 8 Substitute value: 0

OK Cancel Save Reset Check Help

AO723_ud1.bmp

For further details refer to [Tab Module Parameters](#) on page 51.

Tab Outputs 0-3

AO723_ud2.bmp

For further details refer to [Tab Outputs 0-3](#) on page 53.

Tab Outputs 4-7, Tab Outputs 8-11 and Tab Outputs 12-15 are similar to **Tab Outputs 0-3**.

Output Types Supported

The following types of Outputs are supported by this module:

Inputs

- 16 analog outputs, individually configurable for:
 - unused (default setting)
 - -10 V...+10 V
 - 0...20 mA
 - 4...20 mA

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Output

Component	Data type	Byte	Bit	Length	Variable	Comment
M0_OUT_00	INT	0	0	16		Output 00
M0_OUT_01	INT	2	0	16		Output 01
M0_OUT_02	INT	4	0	16		Output 02
M0_OUT_03	INT	6	0	16		Output 03
M0_OUT_04	INT	8	0	16		Output 04
M0_OUT_05	INT	10	0	16		Output 05
M0_OUT_06	INT	12	0	16		Output 06
M0_OUT_07	INT	14	0	16		Output 07
M0_OUT_08	INT	16	0	16		Output 08
M0_OUT_09	INT	18	0	16		Output 09
M0_OUT_10	INT	20	0	16		Output 10
M0_OUT_11	INT	22	0	16		Output 11
M0_OUT_12	INT	24	0	16		Output 12
M0_OUT_13	INT	26	0	16		Output 13
M0_OUT_14	INT	28	0	16		Output 14
M0_OUT_15	INT	30	0	16		Output 15

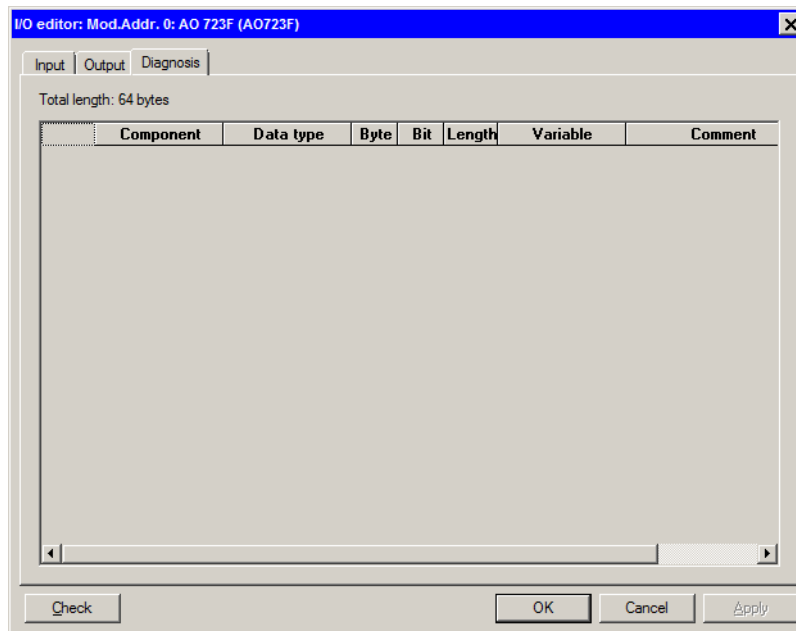
AO723_IOEditor_Output.bmp

Component Output (O0 to O15) that is to be edited.

Data type: The data type (REAL or BOOL) of the component.

Variable: The variable name.

Comment: Comment for the component.

Tab Diagnosis

AO723_IOEditor_Diag.bmp

Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

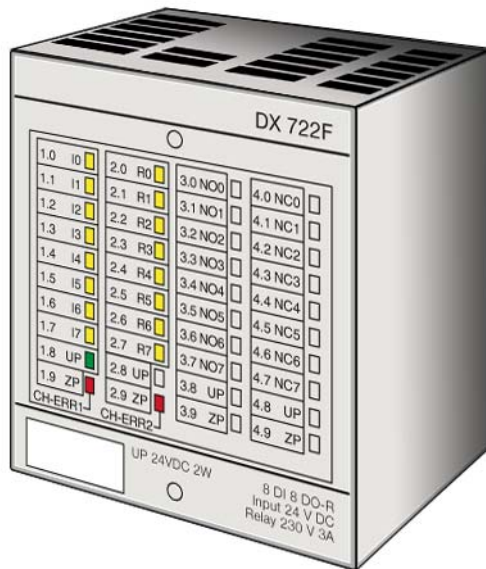
Variable: The variable name.

Comment: Comment on the component diagnosis.

Measuring ranges**Input ranges for voltage, current and digital input**

Range	-10 ... +10 V	0 ... 20 mA	4 ... 20 mA	Digital value	
				decimal	hex.
Overflow	0 V	0 mA	0 mA	> 32511	> 7EFF
Measured value too high	11.7589 V : 10.0004 V	23.5178 mA : 20.0007 mA	22.8142 mA : 20.0006 mA	32511 : 27649	7EFF : 6C01
Normal range	10.0000 V : 0.0004 V	20.0000 mA : 0.0007 mA	20.0000 mA : 4.0006 mA	276 : 1	6C00 : 0001
	0.0000 V	0.0000 mA	4.0000 mA	0	0000
	-0.0004 V : -10.0000 V	0 mA : 0 mA	3.9994 mA 0 mA 0 mA	-1 -6912 -27648	FFFF E500 9400
Measured value too low	-10.0004 V : -11.7589 V	0 mA : 0 mA	0 mA : 0 mA	-27649 : -32512	93FF : 8100
Underflow	0 V	0 mA	0 mA	< -32512	< 8100

2.1.8 Digital input, Digital output module DX 722F



DX722.bmp

The digital input/output module DX 722F is designed for connecting 8 digital inputs 24V DC, module wise electrically isolated and 8 relay output signals.

Module data

Parameter: Profibus Slave Modul PROFI_S_MOD

Allgemeine Daten

Name: DX 722F 1-4 Kurztext: Langtext:

Modul-Daten | User | DPV1 | Force/Ersatzw. | IO Parameters | Info

DX 722F

Eingangsdaten

Konsistenz: byte

Länge: 1 byte

Ausgangsdaten

Konsistenz: byte

Länge: 1 byte

Konfigurations-Bytes:

0x10, 0x20

OK Abbrechen Speichern Rücksetzen Plausibilisieren Hilfe

DX722_Module_data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: Free text of up to 12 characters can be entered.

Long text: Free text of up to 30 characters can be entered.

Tab Module data

Data for the module is displayed in this tab.

Input data

Consistency The consistency of the data transfer from the module to the slave is displayed.

Length The length of the data transferred from the module to the slave is displayed.

Output data

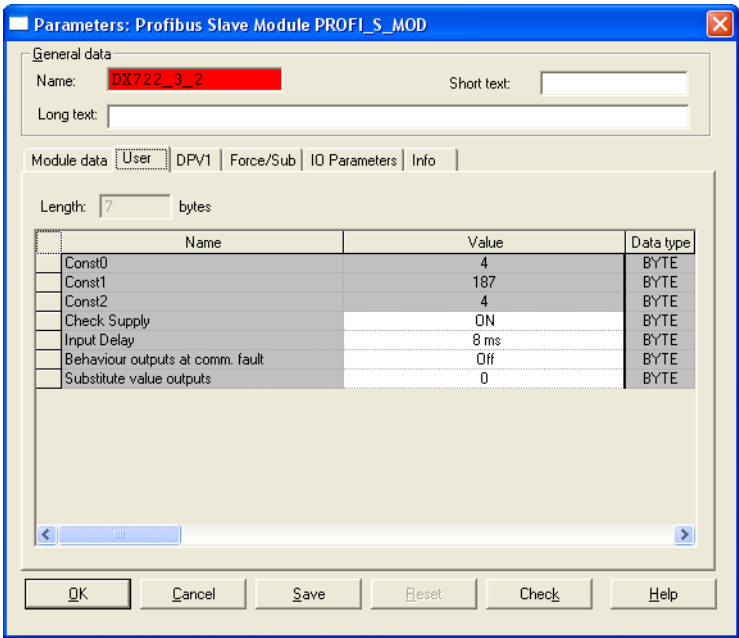
Consistency The consistency of the data transfer from the slave to the module is displayed.

Length The length of the data transferred from the slave to the module is displayed.

Configuration bytes

The sequence of bytes for the configuration of the module specified in the device master data file.

Tab User



DX722_User_Param.bmp

Length Displays the number of bytes used for parameter setting. Is generated by the system and cannot be edited.

Name Name of the user parameter.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.

Check supply

When this function is activated, the process voltage (supply voltage) is checked by the module. If the voltage is low or no voltage is applied, an alarm is generated.

ON Checking of supply voltage is enabled.

OFF Checking of supply voltage is disabled.

Input delay

With activated supply checking, the input delay for the alarm can be defined here. The following values can be selected:

0.1 ms for quick processes with frequently changing signal

1 ms for slower processes

8 ms if spikes are to be filtered out reliably

32 ms if low-pass behavior is wanted.

Behavior outputs at comm. fault

This module allows configuring the behavior of outputs at communication error

Substitute value

The configured substitute value is used.

Data type

Freelance data type of the component.

For data which is described as a bit field, Freelance data types such as BYTE or WORD are used. The PROFIBUS data type bit is changed to the Freelance data type BOOL.

Byte, Bit, Length

The values for Byte, Bit and Length describe the position of the Freelance data type in the parameter block. The bit fields defined in this way always start at bit 0 in the Freelance data type.

Byte

Number of the first byte in the parameter block.

Bit

Number of the first bit in the start byte of the parameter block.

Length

Length of the bit field in the parameter block.

Min / Max

The “Min” and “Max” columns are required for input in the dialog editor. Thus input elements such as combobox or radio button can be configured in the dialog editor. After the user parameters have been defined, individual parameterization tabs can be created with the dialog editor.

- Comments

Comments on the description of the component. The allocation of comments is optional.
- OPC Access

☒ The user parameter can be accessed via OPC.
- OPC Shortname

Alias of the user parameter if it is accessible on the OPC server.

Tab DPV1

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DX722_3_2

Short text:

Long text:

Module data

User

DPV1

Force/Sub

IO Parameters

Info

	Name	Value	Type	Byte	Bit	Length	Slot	Inde
	Comp1	☒	BOOL	0	0	1	0	0
>	Comp2	☒	BOOL	0	0	1	0	0
	Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

Check

Help

DX722_DP1.bmp

Name Name of the DPV1 parameter.



If the DPV1 parameter is described in the device master data file, the name is taken from the device master data file. The parameter name cannot subsequently be changed. A parameter defined in the device master data file cannot be deleted.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.

Data type Freelance data type of the component.

<i>Byte, Bit</i>	the values for byte and bit describe the position of the Freelance data type within a structured byte field. For simple data types and non-structured byte fields, the values for byte and bit should be 0.
<i>Byte</i>	Number of the first byte in the structured byte field.
<i>Bit</i>	Number of the first bit in the start byte of the structured byte field.
<i>Length</i>	Length of the DPV1 parameter. For simple data types the length is stated in bits, while for BYTE Arrays and UserDS bytes are used



The length of BYTE Arrays and UserDS is stated in bytes. The fields for entering the length of BYTE Arrays are therefore highlighted in color.

<i>Slot, Index</i>	The values for slot and index are used to address the DPV1 parameter in the device. For further information, please see the device manual of the respective vendor.						
<i>Slot</i>	Slot number for addressing a slot in the PROFIBUS device Permissible range: 0 .. 254 (255 = Reserved.)						
<i>Index</i>	Index for addressing the desired data within a slot. Permissible range: 0 .. 254 (255 = Reserved.)						
<i>Access</i>	The value specifies the access to the DPV1 parameter on the PROFIBUS device. <table> <tr> <td>R/W</td><td>Read and write access to the parameter.</td></tr> <tr> <td>R</td><td>Read access only to the parameter.</td></tr> <tr> <td>W</td><td>Write access only to the parameter.</td></tr> </table> W Addressing is configured and loaded in the device. R Addressing is first read from the device object directory in commissioning mode and then used for all further device accesses. This addressing is only possible if the device supports reading from the object directory. For further information, please see the vendor's manual.	R/W	Read and write access to the parameter.	R	Read access only to the parameter.	W	Write access only to the parameter.
R/W	Read and write access to the parameter.						
R	Read access only to the parameter.						
W	Write access only to the parameter.						

Load The value specifies whether the parameter is loaded with Load all DPV1 Parameters or not.



A DPV1 parameter which cannot be written cannot be loaded with Load all DPV1 Parameters either.

Parameters which have been defined as structured data types or BYTE Arrays can only be written if no gaps were left during definition of the data type.

Load-Seq. The value specifies the sequence in which the DPV1 parameters are loaded with Load all DPV1 Parameters.

Min / Max The "Min" and "Max" columns are required for input in the dialog editor. Thus input elements such as combobox or Radio-Button can be configured in the dialog editor.
After the DPV1 parameters have been defined, individual parameterization tabs can be created with the dialog editor.

Read Elem. Used to configure HART commands.

Module Name of the associated module.

DPV1 parameter can be accessed via OPC. The name of the DPV1 parameter is used as an OPC name. If the name contains space characters or special characters, it is recommended that an alias be defined. Some OPC clients cannot resolve names with space characters or special characters.

OPC Access ☒ The user parameter can be accessed via OPC.

OPC Shortname

Alias of the user parameter if it is accessible on the OPC server.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: DX722_3_2 Short text: Long text:

Module data User DPV1 Force/Sub IO Parameters Info

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
I	M2_IN_I0	BOOL	☒		☐	
I	M2_IN_I1	BOOL	☐		☐	
I	M2_IN_I2	BOOL	☐		☐	
I	M2_IN_I3	BOOL	☐		☐	
I	M2_IN_I4	BOOL	☐		☐	
I	M2_IN_I5	BOOL	☐		☐	
I	M2_IN_I6	BOOL	☐		☐	
I	M2_IN_I7	BOOL	☐		☐	
O	M2_OUT_R0	BOOL			☐	
O	M2_OUT_R1	BOOL			☐	
O	M2_OUT_R2	BOOL			☐	
O	M2_OUT_R3	BOOL			☐	
O	M2_OUT_R4	BOOL			☐	
O	M2_OUT_R5	BOOL			☐	
O	M2_OUT_R6	BOOL			☐	
O	M2_OUT_R7	BOOL			☐	

OK Cancel Save Reset Check Help

DX722_Force_Sub.bmp

Component Name of the component for which force values and default values are specified.

Type Data type of the component for which force values and default values are specified.

Hold last value This option can be selected for analog inputs, only.
☒ In the event of a fault the last valid value is held.
☐ The last value is not used.

Substitute value This option can be selected for analog inputs, only.
 In the event of a fault, the substitute value entered here is further processed.



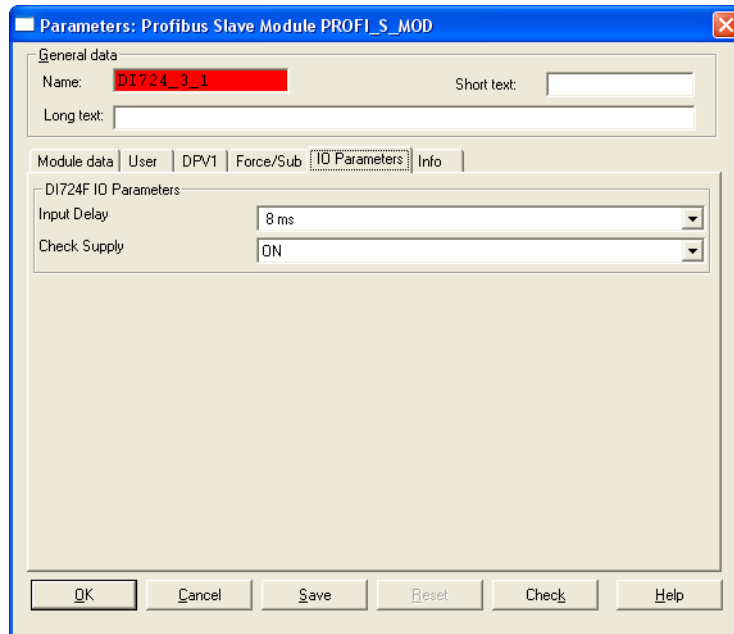
If both Hold last value is checked and a Substitute value is also given, then in the event of a fault the last value is held.

Force active Specifies whether the configured force value is used.

- ☒ Forcing is enabled.
- ☐ Forcing is disabled.

Force value The value entered here is further processed when forcing is on.

Tab IO Parameters



DI724_ud1.bmp

Input Delay Delay for the Digital Input channels

Check Supply Enable/disable supervision of power supply

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input

Component	Data type	Byte	Bit	Length	Variable	Comment
M5_IN_10	BOOL	0	0	1		Input 10
M5_IN_11	BOOL	0	1	1		Input 11
M5_IN_12	BOOL	0	2	1		Input 12
M5_IN_13	BOOL	0	3	1		Input 13
M5_IN_14	BOOL	0	4	1		Input 14
M5_IN_15	BOOL	0	5	1		Input 15
M5_IN_16	BOOL	0	6	1		Input 16
M5_IN_17	BOOL	0	7	1		Input 17

DX722_IOEditor_Input.bmp

- Component** Input (I0 to I7) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Output

I/O editor: Mod.Addr. 5: DX 722F (DX722F)

Input **Output** Diagnosis

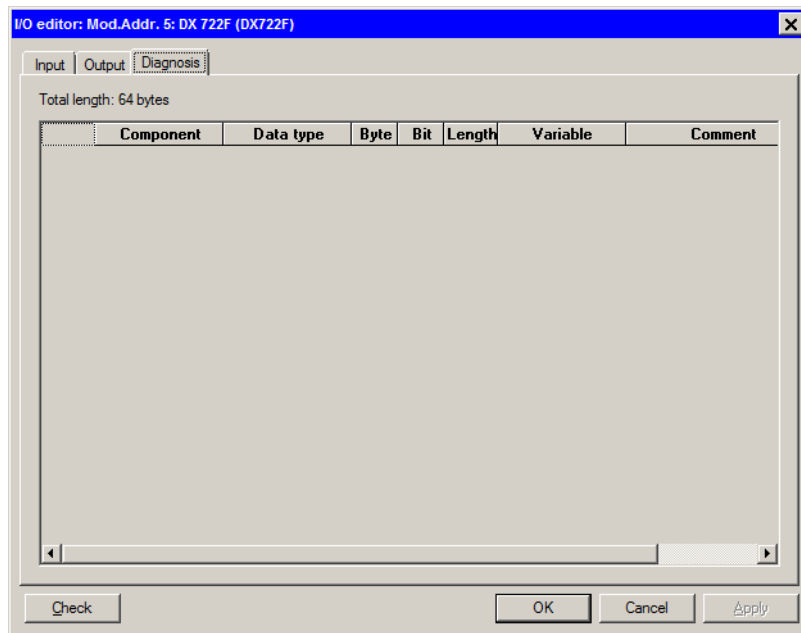
Total length: 1 bytes

	Component	Data type	Byte	Bit	Length	Variable	Comment
	M5_OUT_R0	BOOL	0	0	1		Output R0
	M5_OUT_R1	BOOL	0	1	1		Output R1
	M5_OUT_R2	BOOL	0	2	1		Output R2
	M5_OUT_R3	BOOL	0	3	1		Output R3
	M5_OUT_R4	BOOL	0	4	1		Output R4
	M5_OUT_R5	BOOL	0	5	1		Output R5
	M5_OUT_R6	BOOL	0	6	1		Output R6
	M5_OUT_R7	BOOL	0	7	1		Output R7

Check OK Cancel Apply

DX722_IOEditor_Output.bmp

- Component* Output (O0 to O7) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

Tab Diagnosis

DX722_IOEditor_Diag.bmp

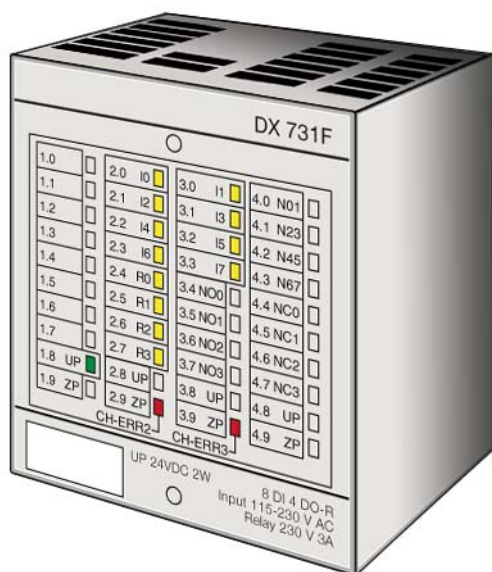
Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

2.1.9 Digital input, Digital output module DX 731F



DX731.bmp

The digital input/output module DX 731F is designed for connecting 8 digital inputs 120/230V AC, module wise electrically isolated and 4 relay output signals.

Tab Module data

Parameter: Profibus Slave Modul PROFIS_MOD

Allgemeine Daten

Name: **DX722F-1-4** Kurztext:

Langtext:

Modul-Daten | User | DPV1 | Force/Ersatzw. | IO Parameters | Info

DX 722F

Eingangsdaten

Konsistenz: byte

Länge: 1 byte

Ausgangsdaten

Konsistenz: byte

Länge: 1 byte

Konfigurations-Bytes:

0x10 , 0x20

OK Abbrechen Speichern Rücksetzen Plausibilisieren Hilfe

DX731_Mod_data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DX731_3_3 Short text: Long text:

Module data User DPV1 Force/Sub IO Parameters Info

Length: 7 bytes

Name	Value	Data type
Const0	4	BYTE
Const1	182	BYTE
Const2	4	BYTE
Check Supply	ON	BYTE
Input Delay	20 ms	BYTE
Behaviour outputs at comm. fault	Off	BYTE
Substitute value outputs	0	BYTE

OK Cancel Save Reset Check Help

DX731_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

Tab DPV1

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: DX731_3_3 Short text: Long text:

Module data User DPV1 Force/Sub IO Parameters Info

Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1	☒	BOOL	0	0	1	0	0
Comp2	☒	BOOL	0	0	1	0	0
Comp3	☐	BOOL	0	0	1	0	0

OK Cancel Save Reset Check Help

DX731_DP1.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DX731_3_3 Short text:

Long text:

Module data | User | DPV1 | Force/Sub | IO Parameters | Info

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force value
I	M3_IN_I0	BOOL	☐	☐	☐	☐
I	M3_IN_I1	BOOL	☐	☐	☐	☐
I	M3_IN_I2	BOOL	☐	☐	☐	☐
I	M3_IN_I3	BOOL	☐	☐	☐	☐
I	M3_IN_I4	BOOL	☐	☐	☐	☐
I	M3_IN_I5	BOOL	☐	☐	☐	☐
I	M3_IN_I6	BOOL	☐	☐	☐	☐
I	M3_IN_I7	BOOL	☐	☐	☐	☐
O	M3_OUT_R3	BOOL	☐	☐	☐	☐
O	M3_OUT_R2	BOOL	☐	☐	☐	☐
O	M3_OUT_R1	BOOL	☐	☐	☐	☐
O	M3_OUT_R0	BOOL	☐	☐	☐	☐

OK Cancel Save Reset Check Help

DX731_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 141.

Tab IO Parameters

DX731_ud1.bmp

For further details refer to [Tab IO Parameters](#) on page 142

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input

I/O editor: Mod.Addr. 3: DX 731F (DX731F)

Input Output Diagnosis

Total length: 1 bytes

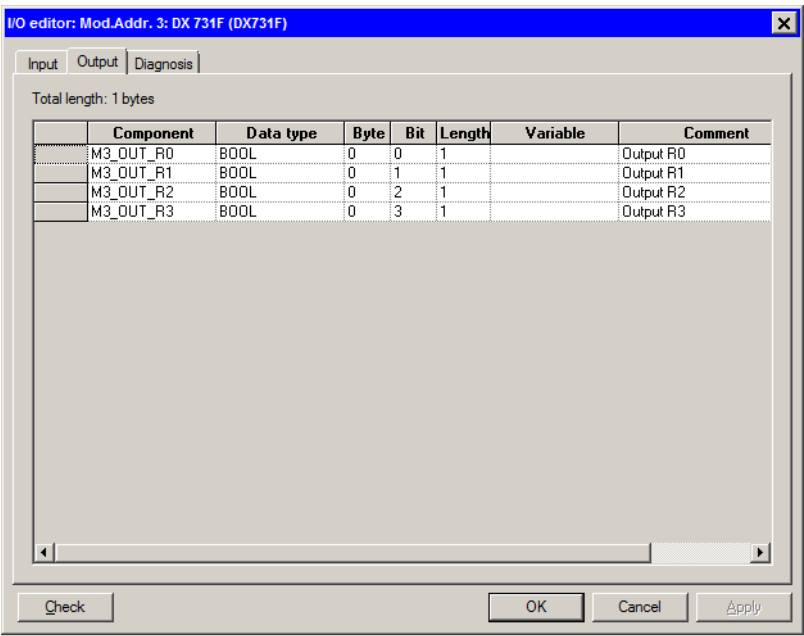
	Component	Data type	Byte	Bit	Length	Variable	Comment
	M3_IN_I0	BOOL	0	0	1		Input I0
	M3_IN_I1	BOOL	0	1	1		Input I1
	M3_IN_I2	BOOL	0	2	1		Input I2
	M3_IN_I3	BOOL	0	3	1		Input I3
	M3_IN_I4	BOOL	0	4	1		Input I4
	M3_IN_I5	BOOL	0	5	1		Input I5
	M3_IN_I6	BOOL	0	6	1		Input I6
	M3_IN_I7	BOOL	0	7	1		Input I7

Check OK Cancel Apply

DX731_IOEditor_Input.bmp

- Component* Input (I0 to I7) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

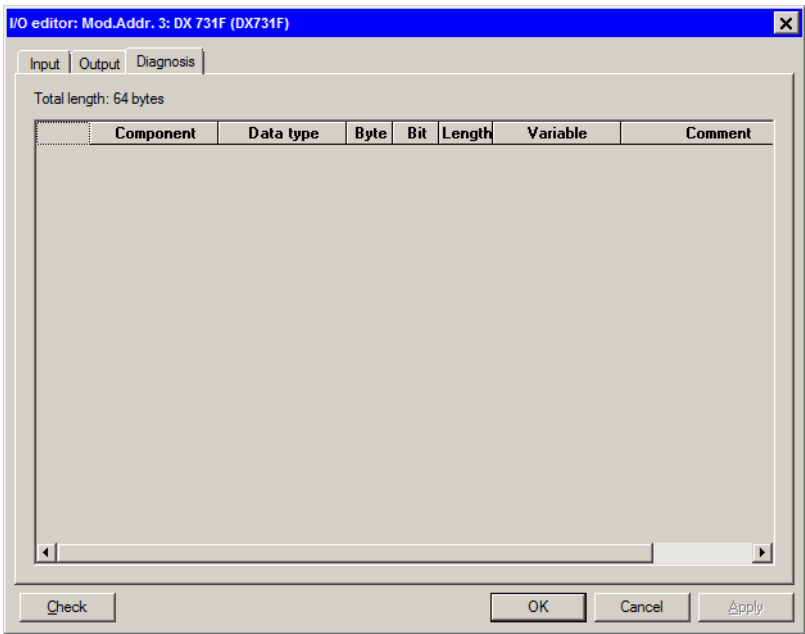
Tab Output



DX731_IOEditor_Output.bmp

- Component* Output (O0 to O3) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

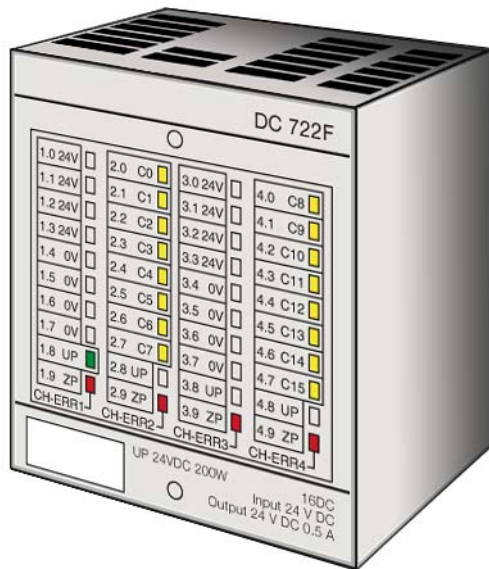
Tab Diagnosis



DX731_I/OEditor_Diag.bmp

- Component:* Name of the channel error type. Diagnostic components are available from Channel 0 to 63.
- Data type:* The data type of the component.
- Variable:* The variable name.
- Comment:* Comment on the component diagnosis.

2.1.10 Digital input/output module DC 722F



DC722F_perspektive.bmp

The digital input/output module DC 722F is designed for connecting 16 configurable 24 V DC input/output signals.

Tab Module data

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **DC722_2_2** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Info

DC 722F

Input

Consistency: byte

Length: 2 bytes

Output

Consistency: byte

Length: 2 bytes

Configuration bytes:

0x11, 0x21

OK Cancel Save Reset Check Help

DC722_Mod_Data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROFIBUS_MOD

General data

Name: DC722_2_2 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Info

Length: 9 bytes

Name	Value	Data type
Const0	4	BYTE
Const1	197	BYTE
Const2	6	BYTE
Check Supply	ON	BYTE
Input Delay	8 ms	BYTE
Detect short circ. at outputs	ON	BYTE
Behaviour outputs at comm. fault	Off	BYTE
OutChannel 0 Substitute value	0	WORD

OK Cancel Save Reset Check Help

DC722_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

Tab DPV1

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name:DC722_2_2Short text:

Long text:

Module data

User

DPV1

Force/Sub

Module Parametes

Info

	Name	Value	Type	Byte	Bit	Length	Slot	Inde
	Comp1	☒	BOOL	0	0	1	0	0
>	Comp2	☒	BOOL	0	0	1	0	0
	Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

Check

Help

DC722_DP1.1.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DC722_2_2 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Info

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force va
I	M2_IN_C0	BOOL	☒	☐	☐	☐
I	M2_IN_C1	BOOL	☒	☐	☐	☐
>	M2_IN_C2	BOOL	☐	☐	☐	☐
I	M2_IN_C3	BOOL	☐	☐	☐	☐
I	M2_IN_C4	BOOL	☐	☐	☐	☐
I	M2_IN_C5	BOOL	☐	☐	☐	☐
I	M2_IN_C6	BOOL	☐	☐	☐	☐
I	M2_IN_C7	BOOL	☐	☐	☐	☐
I	M2_IN_C8	BOOL	☐	☐	☐	☐
I	M2_IN_C9	BOOL	☐	☐	☐	☐
I	M2_IN_C10	BOOL	☐	☐	☐	☐
I	M2_IN_C11	BOOL	☐	☐	☐	☐
I	M2_IN_C12	BOOL	☐	☐	☐	☐
I	M2_IN_C13	BOOL	☐	☐	☐	☐
I	M2_IN_C14	BOOL	☐	☐	☐	☐
I	M2_IN_C15	BOOL	☐	☐	☐	☐
Q	M2_OUT_C0	BOOL	☐	☐	☐	☐

OK Cancel Save Reset Check Help

DC722_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 141.

Tab Module Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DC722_2_2 Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Info

Check Supply: ON

Input Delay: 8 ms

Detect short circ. at outputs: ON

Output Behaviour

Behaviour outputs at comm. fault: Off

Substitute Value

OutChannel 0 Substitute value: 0

OK Cancel Save Reset Check Help

DC722_ud1.bmp

For further details refer to [Tab IO Parameters](#) on page 142

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

Tab Input

I/O editor: Mod.Addr. 4: DC 722F (DC722F)

Input Output Diagnosis

Total length: 2 bytes

	Component	Data type	Byte	Bit	Length	Variable	Comment
	M4_IN_C0	BOOL	0	0	1		Input C0
	M4_IN_C1	BOOL	0	1	1		Input C1
	M4_IN_C2	BOOL	0	2	1		Input C2
	M4_IN_C3	BOOL	0	3	1		Input C3
	M4_IN_C4	BOOL	0	4	1		Input C4
	M4_IN_C5	BOOL	0	5	1		Input C5
	M4_IN_C6	BOOL	0	6	1		Input C6
	M4_IN_C7	BOOL	0	7	1		Input C7
	M4_IN_C8	BOOL	1	0	1		Input C8
	M4_IN_C9	BOOL	1	1	1		Input C9
	M4_IN_C10	BOOL	1	2	1		Input C10
	M4_IN_C11	BOOL	1	3	1		Input C11
	M4_IN_C12	BOOL	1	4	1		Input C12
	M4_IN_C13	BOOL	1	5	1		Input C13
	M4_IN_C14	BOOL	1	6	1		Input C14
	M4_IN_C15	BOOL	1	7	1		Input C15

Check OK Cancel Apply

DC722_IOEditor_input.bmp

- Component* Input (I0 to I15) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

Tab Output

I/O editor: Mod.Addr. 4: DC 722F (DC722F)

Input

Output

Diagnosis

Total length: 2 bytes

	Component	Data type	Byte	Bit	Length	Variable	Comment
	M4_OUT_C16	BOOL	0	0	1		Output C16
	M4_OUT_C17	BOOL	0	1	1		Output C17
	M4_OUT_C18	BOOL	0	2	1		Output C18
	M4_OUT_C19	BOOL	0	3	1		Output C19
	M4_OUT_C20	BOOL	0	4	1		Output C20
	M4_OUT_C21	BOOL	0	5	1		Output C21
	M4_OUT_C22	BOOL	0	6	1		Output C22
	M4_OUT_C23	BOOL	0	7	1		Output C23
	M4_OUT_C24	BOOL	1	0	1		Output C24
	M4_OUT_C25	BOOL	1	1	1		Output C25
	M4_OUT_C26	BOOL	1	2	1		Output C26
	M4_OUT_C27	BOOL	1	3	1		Output C27
	M4_OUT_C28	BOOL	1	4	1		Output C28
	M4_OUT_C29	BOOL	1	5	1		Output C29
	M4_OUT_C30	BOOL	1	6	1		Output C30
	M4_OUT_C31	BOOL	1	7	1		Output C31

Check

OK

Cancel

Apply

DC722_IOEditor_output.bmp

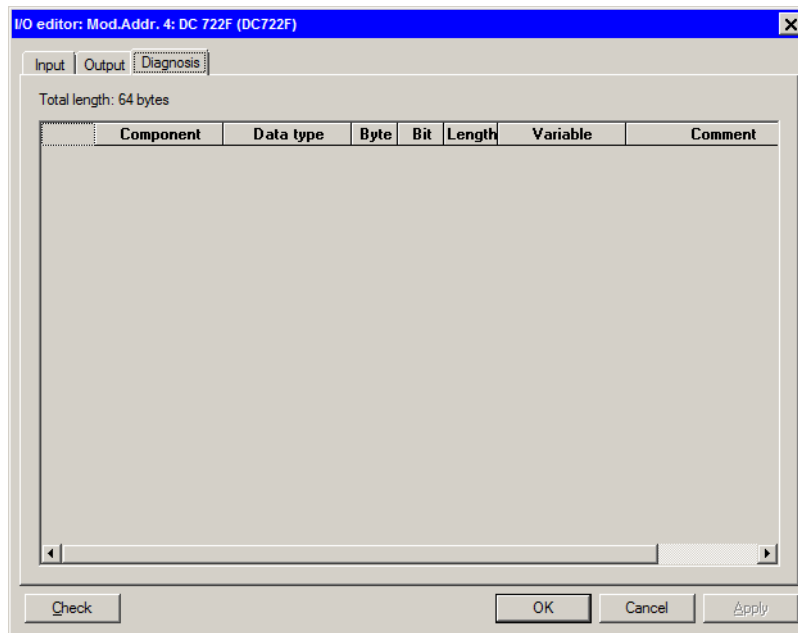
- Component

Output (O0 to O15) that is to be edited.
- Data type:

The data type (REAL or BOOL) of the component.
- Variable:

The variable name.
- Comment:

Comment for the component.

Tab Diagnosis

DC722_IOEditor_Diag.bmp

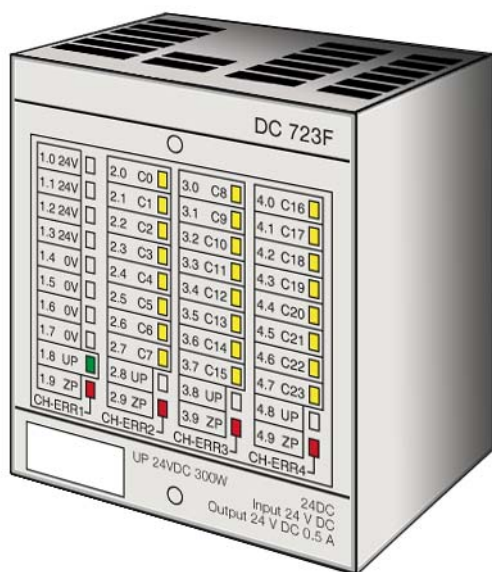
Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

2.1.11 Digital input/output module DC 723F



DC723F_perspektive.bmp

The digital input/output module DC 723F is designed for connecting 24 configurable 24 V DC input/output signals.

Tab Module data

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: **DC723_2_3** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Info

DC 723F

Input

Consistency: byte

Length: 3 bytes

Output

Consistency: byte

Length: 3 bytes

Configuration bytes:

0x12, 0x22

OK Cancel Save Reset Check Help

DC723_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DC723_2_3 Short text:

Long text:

Module data User DPV1 Force/Sub Module Parameters Info

Length: 11 bytes

Name	Value	Data type
Const0	4	BYTE
Const1	192	BYTE
Const2	8	BYTE
Check Supply	ON	BYTE
Input Delay	8 ms	BYTE
Detect short circ. at outputs	ON	BYTE
Behaviour outputs at comm. fault	Off	BYTE
Substitute value output	0	DWORD

OK Cancel Save Reset Check Help

DC723_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

Tab DPV1

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: DC723_2_3 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Info

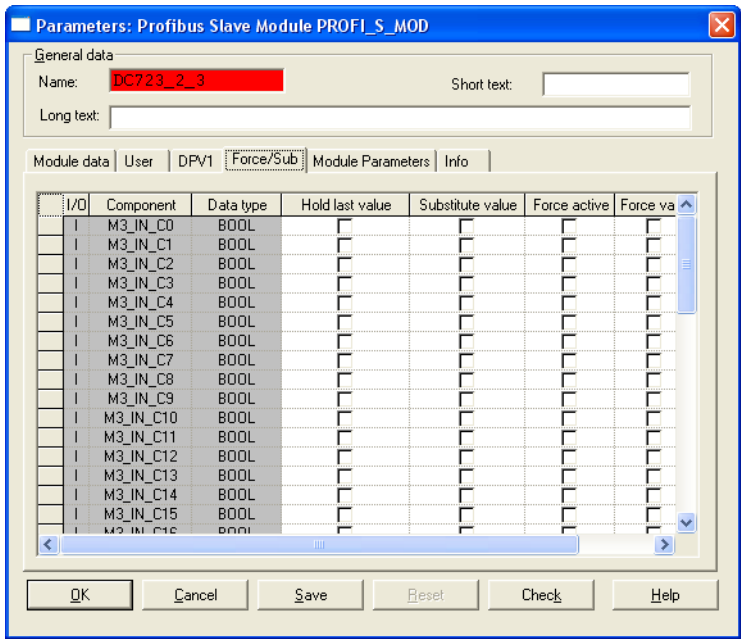
Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1	☐	BOOL	0	0	1	0	0
Comp2	☐	BOOL	0	0	1	0	0
Comp3	☐	BOOL	0	0	1	0	0

OK Cancel Save Reset Check Help

DC723_DPV1.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value



DC723_Force_Sub.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 141.

Tab Module Parameters

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: DC723_2_3 Short text: Long text:

Module data User DPV1 Force/Sub Module Parameters Info

Module Parameters

Check Supply ON

Input Delay 8 ms

Detect short circ. at outputs ON

Output Behaviour

Behaviour outputs at comm. fault Off

Substitute value output 0

OK Cancel Save Reset Check Help

DC723_ud1.bmp

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

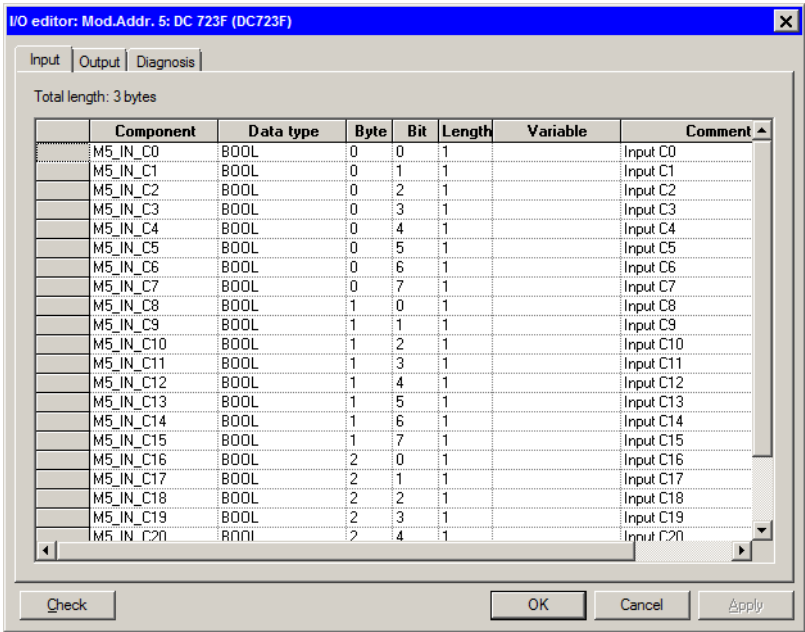
I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

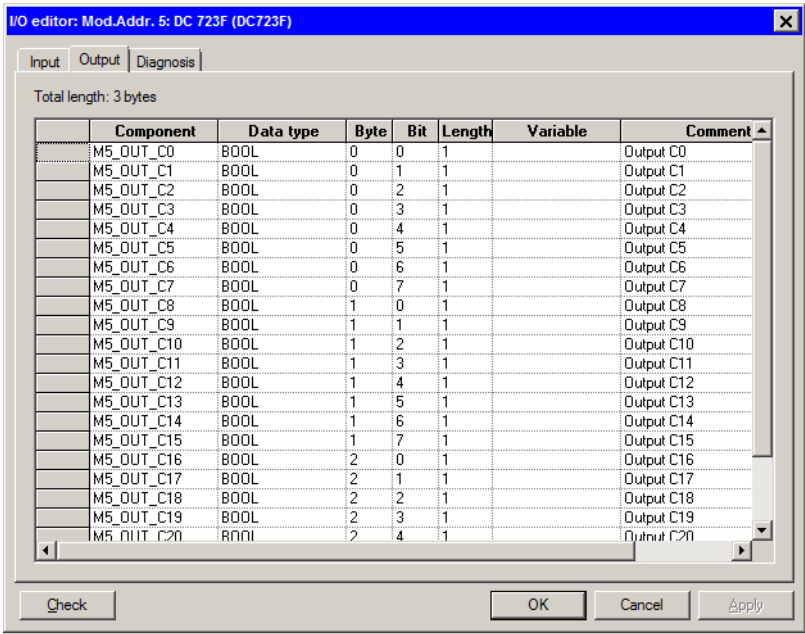
Tab Input



DC723_IOEditor_input.bmp

- Component* Input (I0 to I23) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

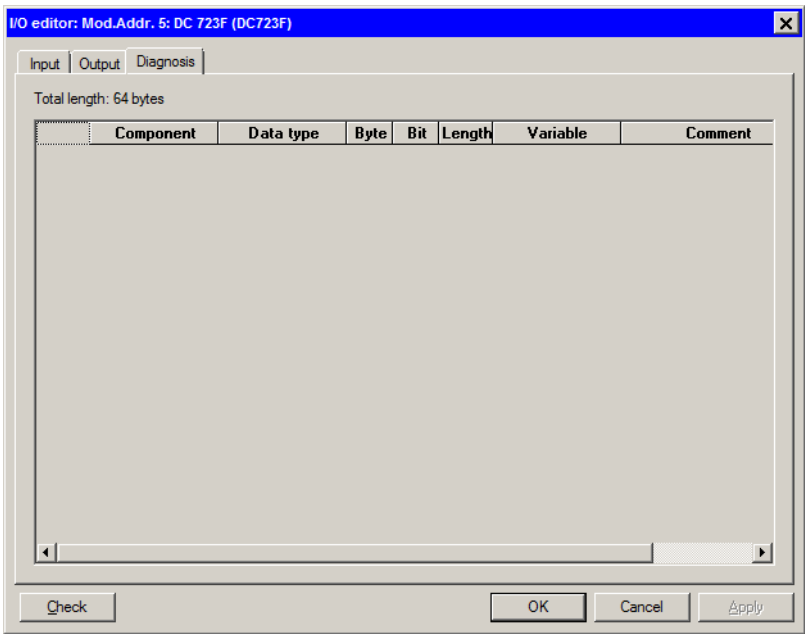
Tab Output



DC723_IOEditor_output.bmp

- Component* Output (O0 to O23) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

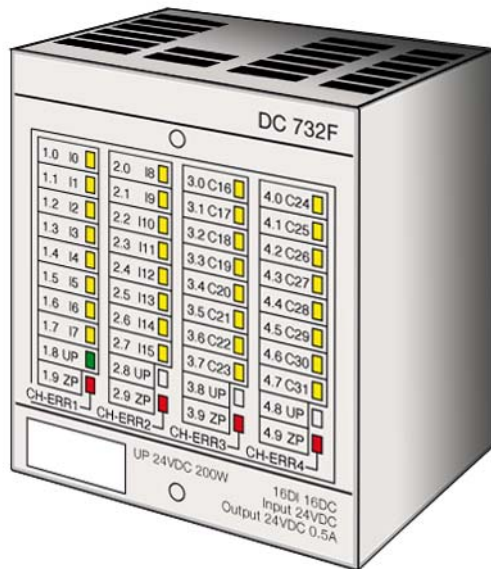
Tab Diagnosis



DC723_IOEditor_Diag.bmp

- Component:* Name of the channel error type. Diagnostic components are available from Channel 0 to 63.
- Data type:* The data type of the component.
- Variable:* The variable name.
- Comment:* Comment on the component diagnosis.

2.1.12 Digital input/output module DC 732F



DC732F_perspektive.bmp

The digital input/output module DC 732F is designed for connecting 16 digital inputs 24 V DC, 16 configurable digital inputs/outputs, module wise electrically isolated.

Tab Module data

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **DC732_2_1** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | IO Parameters | Info

DC 732F

Input:

Consistency: byte

Length: 4 bytes

Output:

Consistency: byte

Length: 2 bytes

Configuration bytes:

0x13 , 0x21

OK Cancel Save Reset Check Help

DC732_Mod_data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: DC732_2_1 Short text: Long text:

Module data User DPV1 Force/Sub IO Parameters Info

Length: 9 bytes

Name	Value	Data type	Byte	Bit	Length	Min.	Comment	OPC A
Const0	4	BYTE	0	0	8	4		
Const1	177	BYTE	1	0	8	177		
Const2	6	BYTE	2	0	8	6		
Check Supply	ON	BYTE	3	0	8			
Input Delay	8 ms	BYTE	4	0	8			
Detect short cir	ON	BYTE	5	0	8			
Behaviour outp	Off	BYTE	6	0	8			
OutChannel 0	0	WORD	7	0	16	0		

OK Cancel Save Reset Check Help

DC732_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

Tab DPV1

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DC732_2_1

Short text:

Long text:

Module data

User DPV1

Force/Sub

IO Parameters

Info

Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1	☒	BOOL	0	0	1	0	0
Comp2	☒	BOOL	0	0	1	0	0
Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

Check

Help

DC732_DP1.v1.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value

Parameters: Profibus Slave Module PROFIBUS_MOD

General data

Name: DC732_2_1 Short text: Long text:

Module data User DPV1 Force/Sub IO Parameters Info

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force va
I	M1_IN_10	BOOL	☒	☐	☐	☐
I	M1_IN_11	BOOL	☒	☐	☐	☐
>	M1_IN_12	BOOL	☐	☐	☐	☐
I	M1_IN_13	BOOL	☐	☐	☐	☐
I	M1_IN_14	BOOL	☐	☐	☐	☐
I	M1_IN_15	BOOL	☐	☐	☐	☐
I	M1_IN_16	BOOL	☐	☐	☐	☐
I	M1_IN_17	BOOL	☐	☐	☐	☐
I	M1_IN_18	BOOL	☐	☐	☐	☐
I	M1_IN_19	BOOL	☐	☐	☐	☐
I	M1_IN_20	BOOL	☐	☐	☐	☐
I	M1_IN_21	BOOL	☐	☐	☐	☐
I	M1_IN_22	BOOL	☐	☐	☐	☐
I	M1_IN_23	BOOL	☐	☐	☐	☐
I	M1_IN_24	BOOL	☐	☐	☐	☐
I	M1_IN_25	BOOL	☐	☐	☐	☐
I	M1_IN_26	BOOL	☐	☐	☐	☐
I	M1_IN_27	BOOL	☐	☐	☐	☐
I	M1_IN_28	BOOL	☐	☐	☐	☐
I	M1_IN_29	BOOL	☐	☐	☐	☐
I	M1_IN_30	BOOL	☐	☐	☐	☐
I	M1_IN_31	BOOL	☐	☐	☐	☐
I	M1_IN_32	BOOL	☐	☐	☐	☐
I	M1_IN_33	BOOL	☐	☐	☐	☐
I	M1_IN_34	BOOL	☐	☐	☐	☐
I	M1_IN_35	BOOL	☐	☐	☐	☐
I	M1_IN_36	BOOL	☐	☐	☐	☐
I	M1_IN_37	BOOL	☐	☐	☐	☐
I	M1_IN_38	BOOL	☐	☐	☐	☐
I	M1_IN_39	BOOL	☐	☐	☐	☐
I	M1_IN_40	BOOL	☐	☐	☐	☐
I	M1_IN_41	BOOL	☐	☐	☐	☐
I	M1_IN_42	BOOL	☐	☐	☐	☐
I	M1_IN_43	BOOL	☐	☐	☐	☐
I	M1_IN_44	BOOL	☐	☐	☐	☐
I	M1_IN_45	BOOL	☐	☐	☐	☐
I	M1_IN_46	BOOL	☐	☐	☐	☐
I	M1_IN_47	BOOL	☐	☐	☐	☐
I	M1_IN_48	BOOL	☐	☐	☐	☐
I	M1_IN_49	BOOL	☐	☐	☐	☐
I	M1_IN_50	BOOL	☐	☐	☐	☐
I	M1_IN_51	BOOL	☐	☐	☐	☐
I	M1_IN_52	BOOL	☐	☐	☐	☐
I	M1_IN_53	BOOL	☐	☐	☐	☐
I	M1_IN_54	BOOL	☐	☐	☐	☐
I	M1_IN_55	BOOL	☐	☐	☐	☐
I	M1_IN_56	BOOL	☐	☐	☐	☐
I	M1_IN_57	BOOL	☐	☐	☐	☐
I	M1_IN_58	BOOL	☐	☐	☐	☐
I	M1_IN_59	BOOL	☐	☐	☐	☐
I	M1_IN_60	BOOL	☐	☐	☐	☐
I	M1_IN_61	BOOL	☐	☐	☐	☐
I	M1_IN_62	BOOL	☐	☐	☐	☐
I	M1_IN_63	BOOL	☐	☐	☐	☐
I	M1_IN_64	BOOL	☐	☐	☐	☐
I	M1_IN_65	BOOL	☐	☐	☐	☐
I	M1_IN_66	BOOL	☐	☐	☐	☐
I	M1_IN_67	BOOL	☐	☐	☐	☐
I	M1_IN_68	BOOL	☐	☐	☐	☐
I	M1_IN_69	BOOL	☐	☐	☐	☐
I	M1_IN_70	BOOL	☐	☐	☐	☐
I	M1_IN_71	BOOL	☐	☐	☐	☐
I	M1_IN_72	BOOL	☐	☐	☐	☐
I	M1_IN_73	BOOL	☐	☐	☐	☐
I	M1_IN_74	BOOL	☐	☐	☐	☐
I	M1_IN_75	BOOL	☐	☐	☐	☐
I	M1_IN_76	BOOL	☐	☐	☐	☐
I	M1_IN_77	BOOL	☐	☐	☐	☐
I	M1_IN_78	BOOL	☐	☐	☐	☐
I	M1_IN_79	BOOL	☐	☐	☐	☐
I	M1_IN_80	BOOL	☐	☐	☐	☐
I	M1_IN_81	BOOL	☐	☐	☐	☐
I	M1_IN_82	BOOL	☐	☐	☐	☐
I	M1_IN_83	BOOL	☐	☐	☐	☐
I	M1_IN_84	BOOL	☐	☐	☐	☐
I	M1_IN_85	BOOL	☐	☐	☐	☐
I	M1_IN_86	BOOL	☐	☐	☐	☐
I	M1_IN_87	BOOL	☐	☐	☐	☐
I	M1_IN_88	BOOL	☐	☐	☐	☐
I	M1_IN_89	BOOL	☐	☐	☐	☐
I	M1_IN_90	BOOL	☐	☐	☐	☐
I	M1_IN_91	BOOL	☐	☐	☐	☐
I	M1_IN_92	BOOL	☐	☐	☐	☐
I	M1_IN_93	BOOL	☐	☐	☐	☐
I	M1_IN_94	BOOL	☐	☐	☐	☐
I	M1_IN_95	BOOL	☐	☐	☐	☐
I	M1_IN_96	BOOL	☐	☐	☐	☐
I	M1_IN_97	BOOL	☐	☐	☐	☐
I	M1_IN_98	BOOL	☐	☐	☐	☐
I	M1_IN_99	BOOL	☐	☐	☐	☐
I	M1_IN_100	BOOL	☐	☐	☐	☐
I	M1_IN_101	BOOL	☐	☐	☐	☐
I	M1_IN_102	BOOL	☐	☐	☐	☐
I	M1_IN_103	BOOL	☐	☐	☐	☐
I	M1_IN_104	BOOL	☐	☐	☐	☐
I	M1_IN_105	BOOL	☐	☐	☐	☐
I	M1_IN_106	BOOL	☐	☐	☐	☐
I	M1_IN_107	BOOL	☐	☐	☐	☐
I	M1_IN_108	BOOL	☐	☐	☐	☐
I	M1_IN_109	BOOL	☐	☐	☐	☐
I	M1_IN_110	BOOL	☐	☐	☐	☐
I	M1_IN_111	BOOL	☐	☐	☐	☐
I	M1_IN_112	BOOL	☐	☐	☐	☐
I	M1_IN_113	BOOL	☐	☐	☐	☐
I	M1_IN_114	BOOL	☐	☐	☐	☐
I	M1_IN_115	BOOL	☐	☐	☐	☐
I	M1_IN_116	BOOL	☐	☐	☐	☐
I	M1_IN_117	BOOL	☐	☐	☐	☐
I	M1_IN_118	BOOL	☐	☐	☐	☐
I	M1_IN_119	BOOL	☐	☐	☐	☐
I	M1_IN_120	BOOL	☐	☐	☐	☐
I	M1_IN_121	BOOL	☐	☐	☐	☐
I	M1_IN_122	BOOL	☐	☐	☐	☐
I	M1_IN_123	BOOL	☐	☐	☐	☐
I	M1_IN_124	BOOL	☐	☐	☐	☐
I	M1_IN_125	BOOL	☐	☐	☐	☐
I	M1_IN_126	BOOL	☐	☐	☐	☐
I	M1_IN_127	BOOL	☐	☐	☐	☐
I	M1_IN_128	BOOL	☐	☐	☐	☐
I	M1_IN_129	BOOL	☐	☐	☐	☐
I	M1_IN_130	BOOL	☐	☐	☐	☐
I	M1_IN_131	BOOL	☐	☐	☐	☐
I	M1_IN_132	BOOL	☐	☐	☐	☐
I	M1_IN_133	BOOL	☐	☐	☐	☐
I	M1_IN_134	BOOL	☐	☐	☐	☐
I	M1_IN_135	BOOL	☐	☐	☐	☐
I	M1_IN_136	BOOL	☐	☐	☐	☐
I	M1_IN_137	BOOL	☐	☐	☐	☐
I	M1_IN_138	BOOL	☐	☐	☐	☐
I	M1_IN_139	BOOL	☐	☐	☐	☐
I	M1_IN_140	BOOL	☐	☐	☐	☐
I	M1_IN_141	BOOL	☐	☐	☐	☐
I	M1_IN_142	BOOL	☐	☐	☐	☐
I	M1_IN_143	BOOL	☐	☐	☐	☐
I	M1_IN_144	BOOL	☐	☐	☐	☐
I	M1_IN_145	BOOL	☐	☐	☐	☐
I	M1_IN_146	BOOL	☐	☐	☐	☐
I	M1_IN_147	BOOL	☐	☐	☐	☐
I	M1_IN_148	BOOL	☐	☐	☐	☐
I	M1_IN_149	BOOL	☐	☐	☐	☐
I	M1_IN_150	BOOL	☐	☐	☐	☐
I	M1_IN_151	BOOL	☐	☐	☐	☐
I	M1_IN_152	BOOL	☐	☐	☐	☐
I	M1_IN_153	BOOL	☐	☐	☐	☐
I	M1_IN_154	BOOL	☐	☐	☐	☐
I	M1_IN_155	BOOL	☐	☐	☐	☐
I	M1_IN_156	BOOL	☐	☐	☐	☐
I	M1_IN_157	BOOL	☐	☐	☐	☐
I	M1_IN_158	BOOL	☐	☐	☐	☐
I	M1_IN_159	BOOL	☐	☐	☐	☐
I	M1_IN_160	BOOL	☐	☐	☐	☐
I	M1_IN_161	BOOL	☐	☐	☐	☐
I	M1_IN_162	BOOL	☐	☐	☐	☐
I	M1_IN_163	BOOL	☐	☐	☐	☐
I	M1_IN_164	BOOL	☐	☐	☐	☐
I	M1_IN_165	BOOL	☐	☐	☐	☐
I	M1_IN_166	BOOL	☐	☐	☐	☐
I	M1_IN_167	BOOL	☐	☐	☐	☐
I	M1_IN_168	BOOL	☐	☐	☐	☐
I	M1_IN_169	BOOL	☐	☐	☐	☐
I	M1_IN_170	BOOL	☐	☐	☐	☐
I	M1_IN_171	BOOL	☐	☐	☐	☐
I	M1_IN_172	BOOL	☐	☐	☐	☐
I	M1_IN_173	BOOL	☐	☐	☐	☐
I	M1_IN_174	BOOL	☐	☐	☐	☐
I	M1_IN_175	BOOL	☐	☐	☐	☐
I	M1_IN_176	BOOL	☐	☐	☐	☐
I	M1_IN_177	BOOL	☐	☐	☐	☐
I	M1_IN_178	BOOL	☐	☐	☐	☐
I	M1_IN_179	BOOL	☐	☐	☐	☐
I	M1_IN_180	BOOL	☐	☐	☐	☐
I	M1_IN_181	BOOL	☐	☐	☐	☐
I	M1_IN_182	BOOL	☐	☐	☐	☐
I	M1_IN_183	BOOL	☐	☐	☐	☐
I	M1_IN_184	BOOL	☐	☐	☐	☐
I	M1_IN_185	BOOL	☐	☐	☐	☐
I	M1_IN_186	BOOL	☐	☐	☐	☐
I	M1_IN_187	BOOL	☐	☐	☐	☐
I	M1_IN_188	BOOL	☐	☐	☐	☐
I	M1_IN_189	BOOL	☐	☐	☐	☐
I	M1_IN_190	BOOL	☐	☐	☐	☐
I	M1_IN_191	BOOL	☐	☐	☐	☐
I	M1_IN_192	BOOL	☐	☐	☐	☐
I	M1_IN_193	BOOL	☐	☐	☐	☐
I	M1_IN_194	BOOL	☐	☐	☐	☐
I	M1_IN_195	BOOL	☐	☐	☐	☐
I	M1_IN_196	BOOL	☐	☐	☐	☐
I	M1_IN_197	BOOL	☐	☐	☐	☐
I	M1_IN_198	BOOL	☐	☐	☐	☐
I	M1_IN_199	BOOL	☐	☐	☐	☐
I	M1_IN_200	BOOL	☐	☐	☐	☐
I	M1_IN_201	BOOL	☐	☐	☐	☐
I	M1_IN_202	BOOL	☐	☐	☐	☐
I	M1_IN_203	BOOL	☐	☐	☐	☐
I	M1_IN_204	BOOL	☐	☐	☐	☐
I	M1_IN_205	BOOL	☐	☐	☐	☐
I	M1_IN_206	BOOL	☐	☐	☐	

Tab IO Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **DC732_2_1** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **IO Parameters** | Info

Module Parameters

Check Supply: **ON**

Input Delay: **8 ms**

Detect short circ. at outputs: **ON**

Output Behaviour

Behaviour outputs at comm. fault: **Off**

OutChannel 0 Substitute value: **0**

OK Cancel Save Reset Check Help

DC732_ud1.bmp

For further details refer to [Tab IO Parameters](#) on page 142

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

I/O Editor

In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Input

I/O editor: Mod.Addr. 4: DC 732F (DC732F)

Input Output Diagnosis

Total length: 4 bytes

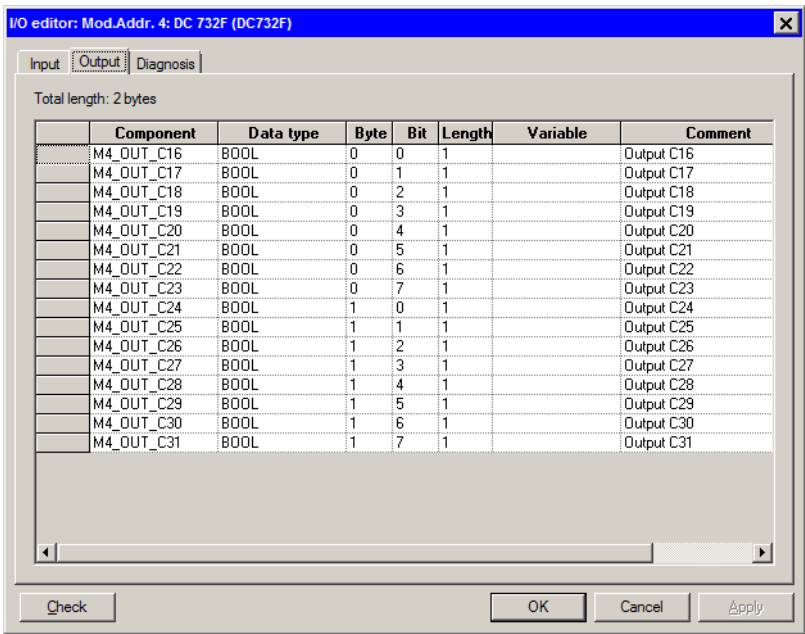
Component	Data type	Byte	Bit	Length	Variable	Comment
M4_IN_I0	BOOL	0	0	1	Input I0	
M4_IN_I1	BOOL	0	1	1	Input I1	
M4_IN_I2	BOOL	0	2	1	Input I2	
M4_IN_I3	BOOL	0	3	1	Input I3	
M4_IN_I4	BOOL	0	4	1	Input I4	
M4_IN_I5	BOOL	0	5	1	Input I5	
M4_IN_I6	BOOL	0	6	1	Input I6	
M4_IN_I7	BOOL	0	7	1	Input I7	
M4_IN_I8	BOOL	1	0	1	Input I8	
M4_IN_I9	BOOL	1	1	1	Input I9	
M4_IN_I10	BOOL	1	2	1	Input I10	
M4_IN_I11	BOOL	1	3	1	Input I11	
M4_IN_I12	BOOL	1	4	1	Input I12	
M4_IN_I13	BOOL	1	5	1	Input I13	
M4_IN_I14	BOOL	1	6	1	Input I14	
M4_IN_I15	BOOL	1	7	1	Input I15	
M4_IN_C16	BOOL	2	0	1	Input C16	
M4_IN_C17	BOOL	2	1	1	Input C17	
M4_IN_C18	BOOL	2	2	1	Input C18	
M4_IN_C19	BOOL	2	3	1	Input C19	
M4_IN_C20	BOOL	2	4	1	Input C20	

Check OK Cancel Apply

DC732_IOEditor_Input.bmp

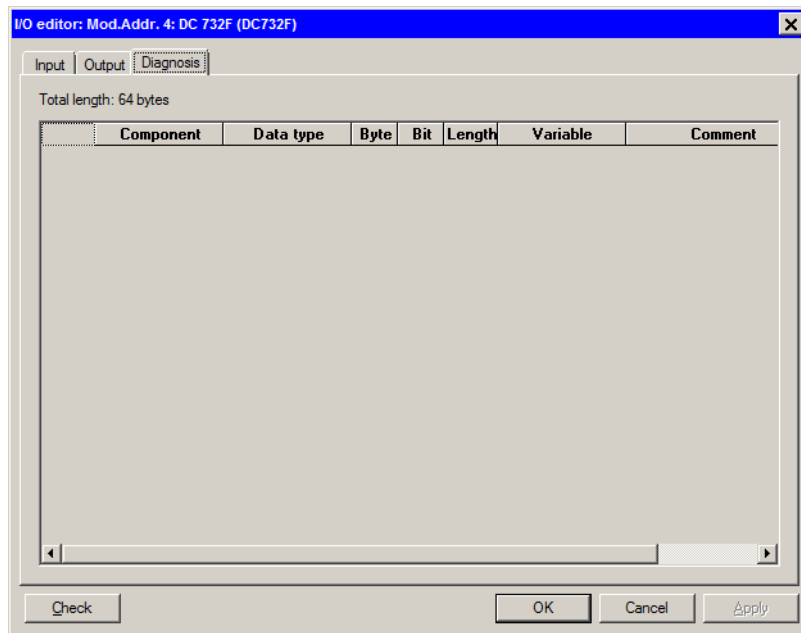
- Component** Input (I0 to I15) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Output



DC732_IOEditor_Output.bmp

- Component** Output (O0 to O15) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Tab Diagnosis

DC732_IOEditor_Diag.bmp

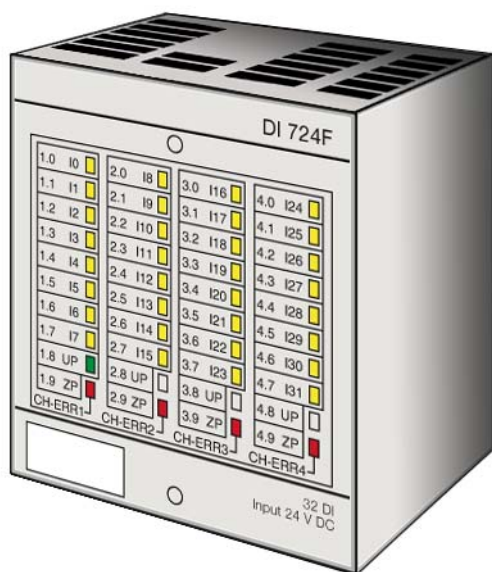
Component: Name of the channel error type. Diagnostic components are available from Channel 0 to 63.

Data type: The data type of the component.

Variable: The variable name.

Comment: Comment on the component diagnosis.

2.1.13 Digital input module DI 724F



DI724F_perspektive.bmp

The digital input module DI 724F is designed for connecting 32 binary 24 V DC input signals, module wise electrically isolated.

Tab Module data

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: **DI724_3_1** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | IO Parameters | Info

DI 724F

Input

Consistency: byte

Length: 4 bytes

Output

Consistency:

Length:

Configuration bytes:

0x13

OK Cancel Save Reset Check Help

DI724_Mod_Data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: DI724_3_1

Short text:

Long text:

Module data

User

DPV1

Force/Sub

IO Parameters

Info

Length: 5 bytes

Name	Value	Data type	Byte	Bit	Length	Min.	Max.
Const0	3	BYTE	0	0	8	3	3
Const1	233	BYTE	1	0	8	233	233
Const2	2	BYTE	2	0	8	2	2
Check Supply	ON	BYTE	3	0	8		
Input Delay	8 ms	BYTE	4	0	8		

OK

Cancel

Save

Reset

Check

Help

DI724_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

Tab DPV1

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: DI724_3_1

Short text:

Long text:

Module data

User

DPV1

Force/Sub

IO Parameters

Info

	Name	Value	Type	Byte	Bit	Length	Slot	Inde
	Comp1	☒	BOOL	0	0	1	0	0
>	Comp2	☒	BOOL	0	0	1	0	0
	Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

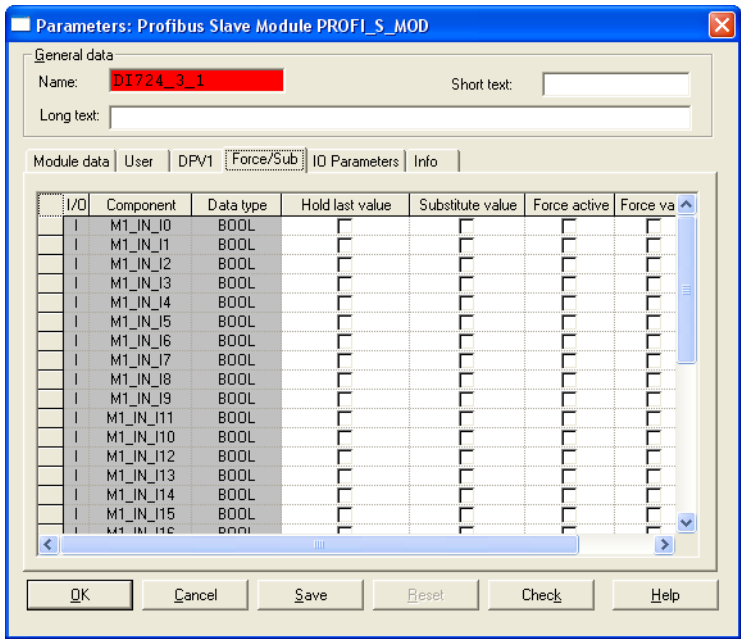
Check

Help

DI724_DP11.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value



DI724_force.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 141.

Tab IO Parameters

DI724_ud1.bmp

For further details refer to [Tab IO Parameters](#) on page 142

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

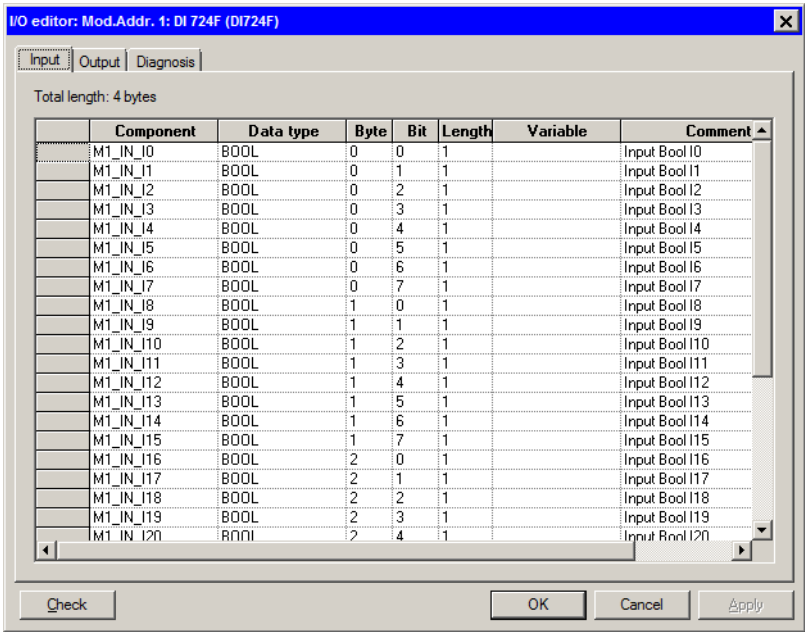
I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data. See also *Engineering Manual, System Configuration, Hardware Structure*.

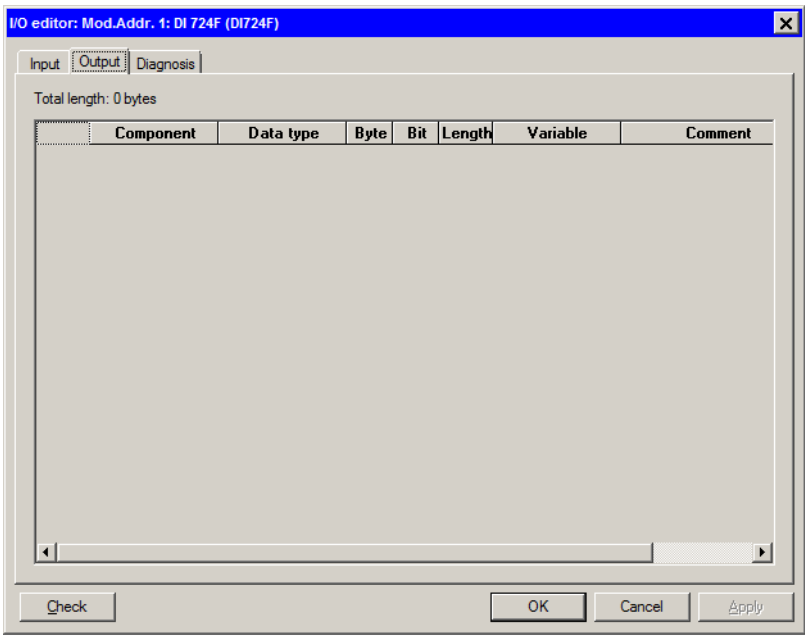
Tab Input



DI724_IOEditor_input.bmp

- Component** Input (I0 to I31) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

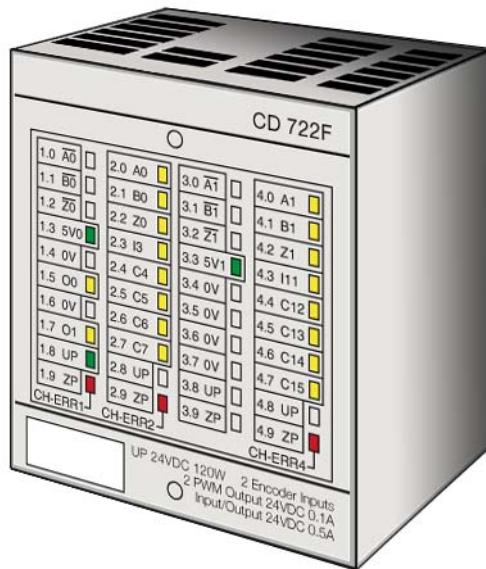
Tab Diagnosis



DI724_IOEditor_diag.bmp

- Component:* Name of the channel error type. Diagnostic components are available from Channel 0 to 63.
- Data type:* The data type of the component.
- Variable:* The variable name.
- Comment:* Comment on the component diagnosis.

2.1.14 Frequency input/PWM output Module CD 722F



CD722F_perspektive.bmp

The Frequency Input Module CD 722F is designed for connecting 2 encoder inputs with 2 integrated 5-V-Power supplies for the encoders, 2 PWM outputs, 2 digital inputs 24V DC, 8 configurable digital inputs/outputs 24V DC, module-wise electrically isolated.

Tab Module data

Parameters: Profibus Slave Module PROFI_S_MOD

General data

Name: **CD722_3_4** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Encoder Input 1 | Encoder Input 2 |

CD 722F

Input

Consistency: word

Length: 12

Output

Consistency: word

Length: 16 words

Configuration bytes:

0x5b, 0x6f

CD722_mod.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

For further details refer to [Tab Module data](#) on page 135.

Tab User

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **CD722_3_4** Short text:

Long text:

Module data **User** DPV1 Force/Sub Module Parameters Encoder Input 1 Encoder Input 2

Length: bytes

Name	Value	Data type
Const0	7	BYTE
Const1	14	BYTE
Const2	42	BYTE
Check Supply	ON	BYTE
Input Delay	8 ms	BYTE
Mode Counter 0	No counter	BYTE
Freq limit FC0	No filter	BYTE
Input level FC0	0-24 VDC	BYTE
SSI 0 frequency	200 kHz	BYTE
SSI 0 resolution in bit	16	BYTE
SSI 0 code type	Binary	BYTE
SSI 0 polling time	10	BYTE
5V sensor 0 supply	OFF	BYTE
Mode Counter 1	No counter	BYTE

OK Cancel Save Reset Check Help

CD722_User_Para.bmp

For further details refer to [Tab User](#) on page 136.

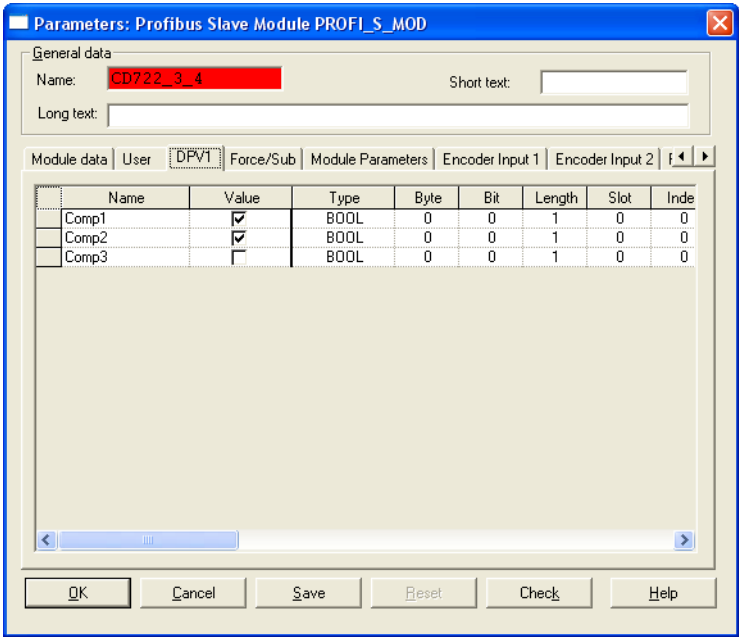
User Parameter Definitions

Name	Values (Default Values in Bold)
Const0 (ID - MSB)	ID = 1806
Const1 (ID -LSB	
Const2 (IO Parameter Length)	42
Check Supply	0= OFF 1=ON
Input Delay	0= 0.1ms 1= 1 ms 2= 8 ms 3= 32 ms
Mode Counter x (Where x=0,1)	0 = No counter 1 = 1-1 U/D counter(A) 2 = 2-1 U/D w.release input(B) 3 = 3-2 U/D counters (A,B) 4 = 4-2 U/D (A,B on fall. edges) 5 = 5-1 U/D dyn set (B)/rising edge 6 = 6-1 U/D dyn set (B)/falling edge 8 = 8-1 U/D with rel.(B),0 X detec. 20 = 11-1 Incremental encoder 21 = 12-1 Incremental encoder X2 22 = 13-1 Incremental encoder X4 30 = 14-1 SSI, absolute encoder 40 = 15-1 Time frequency meter (Z)
Freq Limit FCx (Where x=0,1)	0 = No filter 1 = 50 Hz 2 = 500 Hz 3 = 5 kHz 4 = 20 kHz

Name	Values (Default Values in Bold)
Input Level x (Where x=0,1)	0 = 0-24 VDC 1 = 0-5 VDC 2 = Differential 3 = Sine 1 Vpp
SSI x Frequency (Where x=0,1)	2 = 200 kHz 2 = 500 kHz 4 = 1 MHz
SSI x Resolution in Bit (Where x=0,1)	8..32 (Default value =16)
SSI x Code Type (Where x=0,1)	0 = Binary
SSI x Polling Time (Where x=0,1)	1..255 (Default Value =10)
5V Sensor x Supply (Where x=0,1)	0= OFF 1=ON
Detection SC and sensors	0= OFF 1=ON
Behavior Outputs at Comm. fault	0 = Off 1 = Last value unlimited 2 = Substitute value unlimited 6 = Last value 5 sec 7 = Substitute value 5 sec 11 = Last value 10 sec 12 = Substitute value 10 sec
Substitute Value	0..65535
Channel config Output Ox (Where x=0,1)	0 = Digital output 1 = Pulse 2 = PWM

Name	Values (Default Values in Bold)
Channel Config Input Ix (where x=3,11)	0 = Digital input 6 = TOUCH 1 = RESET 2 = RESET 2nd 16bit counter 3 = SET 5 = RPI
Channel Config Input Ix (where x=4,5,6,7,12,13,14,15)	0 = Digital input 1 = RESET 2 = RESET 2nd 16bit counter 3 = SET 5 = RPI
Channel Config Output Cx (where x=4,5,6,7,12,13,14,15)	0 = Digital output 3 = ENDV

Tab DPV1



CD722_DP1V1.bmp

For further details refer to [Tab DPV1](#) on page 138.

Tab Force and Substitute Value

The screenshot shows the 'Parameters Profibus Slave Module PROFI_S_MOD' window. The 'General data' section has 'Name: CD722_3_4'. The 'Module data' section includes tabs for 'User', 'DPV1', 'Force/Sub', 'Module Parameters', 'Encoder Input 1', and 'Encoder Input 2'. The 'Module Parameters' tab is active, displaying a table of I/O components.

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force va
I	M4_IN_PWM	WORD	☐	16#0	☐	16#0
I	M4_IN_CO_ST	WORD	☐	16#0	☐	16#0
I	M4_IN_CO_TO	DWORD	☐	16#0	☐	16#0
I	M4_IN_CO_32B	DWORD	☐	16#0	☐	16#0
I	M4_IN_C1_ST	WORD	☐	16#0	☐	16#0
I	M4_IN_C1_TO	DWORD	☐	16#0	☐	16#0
I	M4_IN_C1_32B	DWORD	☐	16#0	☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0
O	M4_OUT_DWO	DWORD	☐		☐	16#0
O	M4_OUT_WOR	WORD	☐		☐	16#0

At the bottom are buttons for OK, Cancel, Save, Reset, Check, and Help.

CD722_force.bmp

For further details refer to [Tab Force and Substitute Value](#) on page 141.

Tab Module Parameters

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **CD722_3_4** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | **Module Parameters** | Encoder Input 1 | Encoder Input 2 |

Module Parameters

Check Supply:

Input Delay:

Detection SC and sensors:

Output Behaviour

Behaviour outputs at comm. fault:

Substitute value:

CD722_ud1.bmp

For further details refer to [Tab Module Parameters](#) on page 51.

Input Delay Delay for the Digital Input channels

Detection SC and sensors

Enable/disable short-circuit detection of sensor supply

Tab Encoder Input 1

Parameters: Profibus Slave Module PROFIS_MOD

General data

Name: **CD722_3_4** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Encoder Input 1** | Encoder Input 2 |

Encoder Input 1

5V sensor 0 supply	OFF
Freq limit FCO	No filter
Input level FCO	0-24 VDC
Mode Counter 0	No counter
SSI 0 code type	Binary
SSI 0 frequency	200 kHz
SSI 0 polling time	10
SSI 0 resolution in bit	16

This tab allows the user to configure the settings for the encoder channels (2 channels)

5V sensor 0 supply

Enable/disable the 5V Power Supply for the sensor

Freq Limit FCO

Frequency setting for the filter

Input Level FCO

Input voltage type (0-24VDC, 0-5VDC, differential, Sine 1vPP)

Mode Counter 0

Select the type of counter (1-1 Up/down counter, Incremental encoder etc.)

SSI 0 code type

Binary code type

SSI 0 frequency

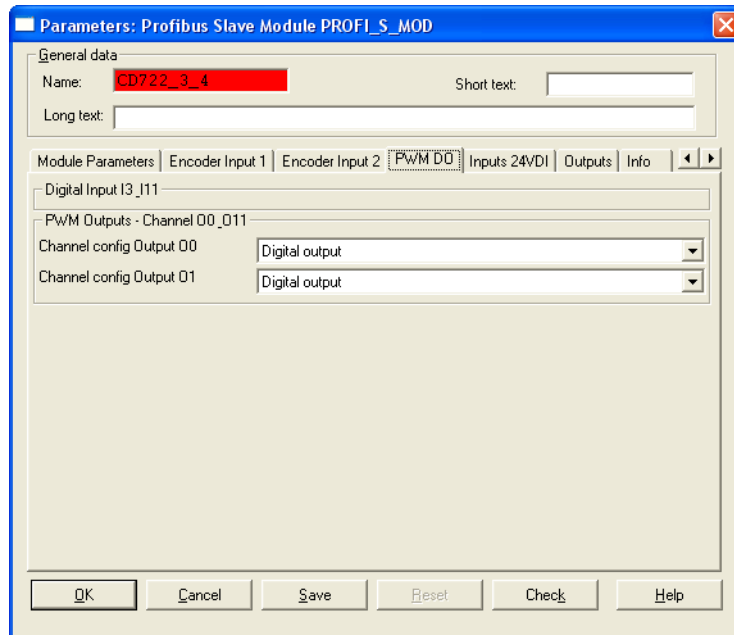
Setting for input Frequency (200 kHz, 1MHz)

SSI 0 Polling Time

Setting for Polling time

SSI 0 resolution bit

Number of bits resolution (e.g.16)

Tab Encoder Input 2 is similar to **Tab Encoder Input 1**.**Tab PWM DO**

CD722_ud4.bmp

This tab allows the user to configure the 2 PWM digital output channels.

Channel config Output 00 and 01

Type of the output channel (Digital output, Pulse output or PWM Output)

Tab Inputs 24VDI

Parameters: Profibus Slave Module PROFIS_MOD

General data
 Name: **CD722_3_4** Short text:
 Long text:

Module Parameters | Encoder Input 1 | Encoder Input 2 | PWM DO | **Inputs 24VDI** | Outputs | Info

Digital Inputs I3..I11
 Channel config Input I3: Digital input
 Channel config Input I11: Digital input

Configurable Inputs
 Channel config Input I4: Digital input
 Channel config Input I5: Digital input
 Channel config Input I6: Digital input
 Channel config Input I7: Digital input
 Channel config Input I12: Digital input
 Channel config Input I13: Digital input
 Channel config Input I14: Digital input
 Channel config Input I15: Digital input

OK Cancel Save Reset Check Help

CD722_ud5.bmp

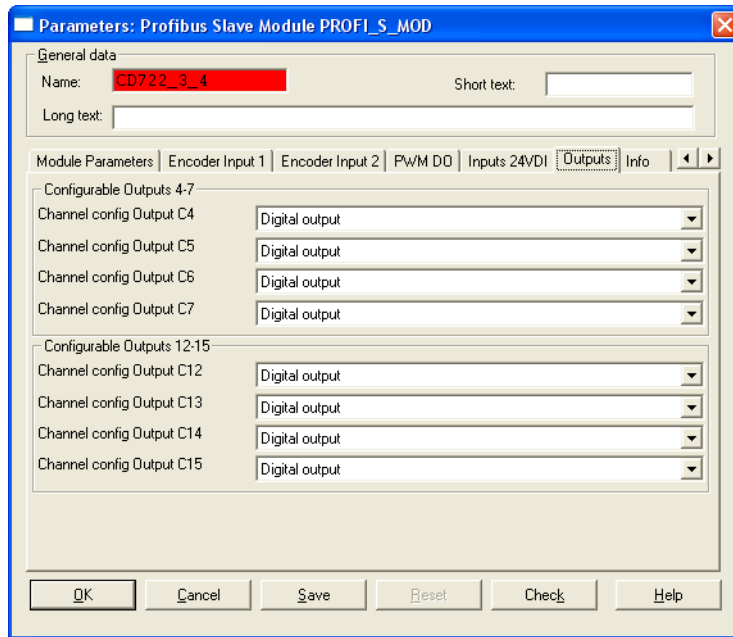
This tab allows the user to configure the 2 digital input channels and 8 channels configurable as digital input channels.

Channel Config Input Ix

Type of digital input (eg. Touch, reset, SET, RPI etc.)

x = 3,11,4,5,6,7,12,13,14,15

Tab Outputs



CD722_ud6.bmp

This tab allows the user to configure the 8 configurable digital channels as output channels.

Channel Config Output Cx

Type of digital output (ENDV)
x = 4,5,6,7,12,13,14,15

Tab Info

This tab displays information on the version of the GSD and the S700 Template.

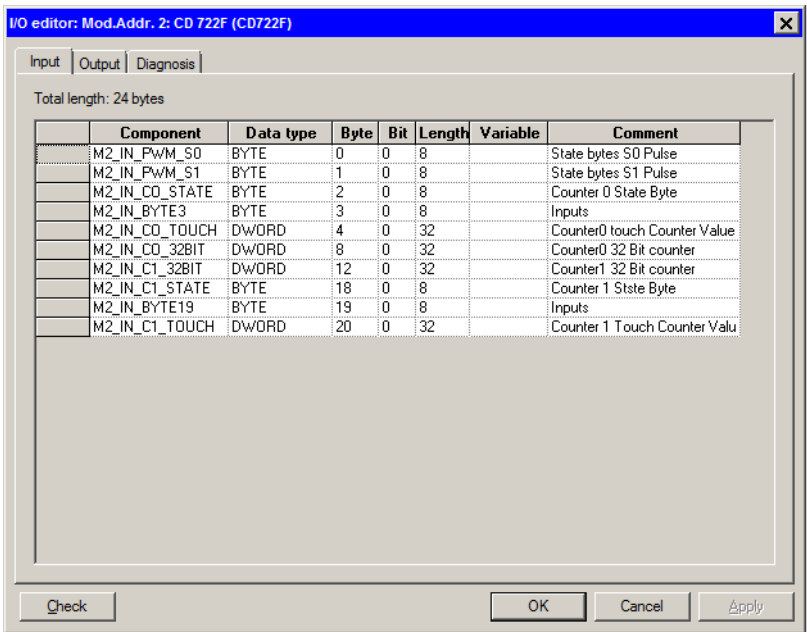
I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Input



CD722_IOEditor_Input.bmp

- Component** Output (I0 to I1) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

Inputs - 24 Bytes

07	06	05	04	03	02	01	00	Decimal Bit
PWM Status S0/S1 % Pulse MSB								Input Byte0
PWM Status S0/S1 % Pulse LSB								Input Byte1
Counter C0 Status Byte								Input Byte2
C7	C6	C5	C4	I3	Z0	B0	A0	Input Byte3
Counter C0 Touch Counter Value HIGH WORD MSB								Input Byte4
Counter C0 Touch Counter Value HIGH WORD LSB								Input Byte5
Counter C0 Touch Counter Value LOW WORD MSB								Input Byte6
Counter C0 Touch Counter Value LOW WORD LSB								Input Byte7
Counter C0 32 Bit Counter HIGH WORD MSB								Input Byte8
Counter C0 32 Bit Counter HIGH WORD LSB								Input Byte9
Counter C0 32 Bit Counter LOW WORD MSB								Input Byte10
Counter C0 32 Bit Counter LOW WORD LSB								Input Byte11
Counter C1 32 Bit Counter Value HIGH WORD MSB								Input Byte12
Counter C1 32 Bit Counter Value HIGH WORD LSB								Input Byte13
Counter C1 32 Bit Counter Value LOW WORD MSB								Input Byte14
Counter C1 32 Bit Counter Value LOW WORD LSB								Input Byte15
Reserve								Input Byte16
Reserve								Input Byte17
Counter C1 Status Byte								Input Byte18
C15	C14	C13	C12	C11	Z1	B1	A1	Input Byte19
Counter C1 Touch Counter HiGH WORD MSB								Input Byte20
Counter C1 Touch Counter HiGH WORD LSB								Input Byte21

Counter C1 Touch Counter LOW WORD MSB	Input Byte22
Counter C1 Touch Counter LOW WORD LSB	Input Byte23

Tab Output

I/O editor: Mod.Addr. 2: CD 722F (CD722F)

Input

Output

Diagnosis

Total length: 32 bytes

	Component	Data type	Byte	Bit	Length	Variable	Comment
	M2_OUT_WORD0	WORD	0	0	16		PwM Frequency 0
	M2_OUT_WORD2	WORD	2	0	16		PwM Duty Cycle/Pulse
	M2_OUT_WORD4	BYTE	4	0	8		PwM Control byte
	M2_OUT_WORD8	WORD	8	0	16		PwM Frequency 1
	M2_OUT_WORD10	WORD	10	0	16		PwM Duty cycle/Pulse
	M2_OUT_WORD12	WORD	12	0	16		PwM Control byte/Output
	M2_OUT_WORD16	DWORD	16	0	32		Counter 0 Settings
	M2_OUT_BYTES20	BYTE	20	0	8		Counter 0 Control byte
	M2_OUT_BYTES21	BYTE	21	0	8		Output C4-C7
	M2_OUT_WORD22	WORD	22	0	16		Counter 0 Reserved
	M2_OUT_WORD24	DWORD	24	0	32		Counter1 Settings
	M2_OUT_DWORD	BYTE	28	0	8		Counter 1 Control byte/C
	M2_OUT_WORD29	BYTE	29	0	8		Outputs C12..C15
	M2_OUT_WORD30	WORD	30	0	16		Counter 1 Reserved

Check

OK

Cancel

Apply

CD722_IOEditor_Output.bmp

- Component

Output (O0 to O7) that is to be edited.
- Data type:

The data type (REAL or BOOL) of the component.
- Variable:

The variable name.
- Comment:

Comment for the component.

Outputs - 32 Bytes

07	06	05	04	03	02	01	00	Decimal Bit
PWM 0 Frequency MSB								Output Byte 0
PWM 0 Frequency LSB								Output Byte 1
PWM 0 Duty Cycle/ Pulse MSB								Output Byte 2
PWM 0 Duty Cycle/ Pulse LSB								Output Byte 3
PWM 0 Control Byte								Output Byte 4
Reserved								Output Byte 5
Reserved MSB								Output Byte 6
Reserved LSB								Output Byte 7
PWM 1 Frequency MSB								Output Byte 8
PWM 1 Frequency LSB								Output Byte 9
PWM 1 Duty Cycle/ Pulse MSB								Output Byte 10
PWM 1 Duty Cycle/ Pulse LSB								Output Byte 11
PWM 1 Control Byte								Output Byte 12
			O1				O0	Output Byte 13
Reserved MSB								Output Byte 14
Reserved LSB								Output Byte 15
Counter C0 Settings HIGH WORD MSB								Output Byte 16
Counter C0 Settings HIGH WORD MSB								Output Byte 17
Counter C0 Settings LOW WORD MSB								Output Byte 18
Counter C0 Settings LOW WORD MSB								Output Byte 19
Counter C0 Control Byte								Output Byte 20

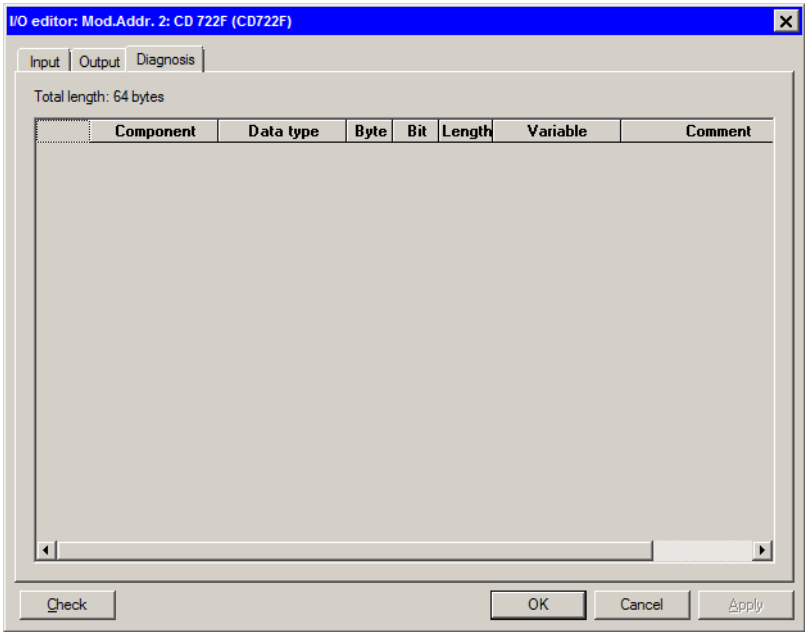
C7	C6	C5	C4					Output Byte 21
Reserve MSB								Output Byte 22
Reserve LSB								Output Byte 23
Counter C1 Settings HIGH WORD MSB								Output Byte 24
Counter C1 Settings HIGH WORD MSB								Output Byte 25
Counter C1 Settings LOW WORD MSB								Output Byte 26
Counter C1 Settings LOW WORD MSB								Output Byte 27
Counter C1 Control Byte								Output Byte 28
C15	C14	C13	C12					Output Byte 29
Reserve MSB								Output Byte 30
Reserve LSB								Output Byte 31

C0-C1	Counter 0 & Counter 1
PWM 0-1	PWM Outputs 0 & 1
O0-O1	Digital Outputs
I3, I11	Digital Inputs
C4...7 D12...15	Digital Configurable Channels

PWM Control Byte							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
EN_PWM							

Counter Control Byte							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	EN_TOUCH						EN_COUNTER

Tab Diagnosis



CD722_IOEditor_Diag.bmp

- Component:* Name of the channel error type. Diagnostic components are available from Channel 0 to 63.
- Data type:* The data type of the component.
- Variable:* The variable name.
- Comment:* Comment on the component diagnosis.

PMW configuration

Operands for PWM/Pulse Function

Input information for the PWM/Pulse output	Output information for the user program
PWM frequency 0	Output word 0
PWM duty cycle/pulse C0	Output word 2

Input information for the PWM/Pulse output	Output information for the user program
PWM frequency C1	Output word 8
PWM duty cycle/pulse C1	Output word 10
PWM Control Byte C0	Output byte 3
PWM Control Byte C1	Output byte 12
PWM/Pulse Outputs	Output byte 13
O0 -Bit 0	Output bit 13.0
O1-Bit 4	Output bit 13.4

Meaning of the input information for the PWM/Pulse function		
PWM Frequency C0	WORD	Frequency of channel O0 Unit: Hz or 10Hz (depending on bit 0 of PWM control byte 0)
PWM Frequency C1	WORD	Frequency of channel O1 Unit: Hz or 10Hz (depending on bit 0 of PWM control byte 1)
PWM Duty cycle/pulse C0	WORD	PWM duty cycle of channel O0 in 1/10 of percentage or Number of pulses to be send on channel O0
PWM Duty cycle/pulse C1	WORD	PWM duty cycle of channel O1 in 1/10 of percentage or Number of pulses to be send on channel O1
PWM control byte 0	BYTE	Control byte for the PWM/Pulse output O0: Depending on operating modes, the different bits of PWM control byte 0 are used to manage and control the counting (see below table)

Meaning of the input information for the PWM/Pulse function		
PWM control byte 1	BYTE	Control byte for the PWM/Pulse output O1: Depending to operating modes, the different bits of PWM control byte 1 are used to manage and control the counting (see below table)
PWM/Pulse Outputs	BYTE Bit 0 Bit 1-3 Bit 4 Bit 5-7	Outputs for PWM/Pulse output: Output O0 Digital outputs unused Output O1 Digital outputs unused

Control Bytes (0 and 1) Functions	
Byte	Meaning
Bit 0	FALSE = frequency multiplier x1 is enable TRUE = frequency multiplier x10 is enable
Bit 1	Not used
Bit 2	Not used
Bit 3	Start pulse emission, if one rising edge => start pulse emission on channel O0 or O1
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	FALSE = PWM/Pulse function is disabled TRUE = PWM/Pulse function is enabled

Output information of the PWM/Pulse	Input information for the user program
State Byte S0 % pulse	Input byte 0
State Byte S1 % pulse	Input byte 1
Meaning of the output information of the PWM/Pulse:	

Output information of the PWM/Pulse	Input information for the user program	
State Byte S0 % pulse	BYTE	Percentage of pulses already sent on channel O0
State Byte S1 % pulse	BYTE	Percentage of pulses already sent on channel O1

Counter Configuration - Operands for Counting Functions

Operating modes for counters 0 and 1, configuration table:	
Internal value	Operating modes of counter
0	No counter / No PWM (default value)
1	1-1 UpDown counter (A)
2	2-1 UpDown with release input
3	3-2 UpDown counters (A, B)
4	4-2 UpDown (A, B on falling edges)
5	5-1 UpDown dynamic set (B) / rising edge
6	6-1 UpDown dynamic set (B) / falling edge
7	not used
8	8-1 UpDown with release (B), 0 cross detection
9	not used
10	not used
11	11-1 Incremental encoder
12	12-2 Incremental encoder X2
13	13-1 Incremental encoder X4
14	14-1 SSI, absolute encoder
15	15-1 Time frequency meter

Meaning of the input information for the counter		
Counter settings 0	DWORD	Dependent on Control bit 0 of output counter 0 - SET value for the counter 0 If bit 0 = FALSE, the counter can be set to a start value. The start value is loaded into the counter by the user program using the SET signal. - END value for the counter 0 If bit 0 = TRUE, the end value for the counter is stored as comparison value into the module by the user program. The counter compares continuously whether the programmed end value is greater than or equal to its actual counter value or not. When the counter value reaches its programmed end value, the binary outputs C4 to C7 (output counter 0) can be set permanently. This value of the double word variable is loaded into the counter 0. Note: In mode 2 16 bit counters, the higher word is the value for counter A and the lower word is the value for counter B.
Counter settings 1	DWORD	Dependent on Control bit 0 within output counter 1 - SET value for the counter 1 If bit 0 = FALSE, the counter can be set to a start value. The start value is loaded into the counter by the user program using the SET signal. - END value for the counter 1 If bit 0 = TRUE, the end value for the counter is stored as comparison value into the module by the user program. The counter compares continuously whether the programmed end value is greater than or equal to its actual counter value or not. When the counter value reaches its programmed end value, the binary outputs C12 to C15 (output counter 1) can be set permanently. This value of the double word variable is loaded into the counter 0. Note: In mode 2 16 bit counters, the higher word is the value for counter A and the lower word is the value for counter B.

Meaning of the input information for the counter		
Control byte 0	BYTE	Control byte for the counter 0: Depending on operating modes, the different bits of Control byte 0 are used to manage and control the counting (see below table)
Control byte 1	BYTE	Control byte for the counter 1: Depending on operating modes, the different bits of Control byte 1 are used to manage and control the counting (see below table)
Output counter 0	BYTE	Outputs for the counters 0:
	Bit 0	Select SET/END value: FALSE= SET and TRUE = END
	Bit 1-3	Digital outputs unused
	Bit 4	Digital output C4, can be configured to indicate END value
	Bit 5	Digital output C5, can be configured to indicate END value
	Bit 6	Digital output C6, can be configured to indicate END value
	Bit 7	Digital output C7, can be configured to indicate END value
Output counter 1	BYTE	Outputs for the counters 1:
	Bit 0	Select SET/END value: FALSE= SET and TRUE = END
	Bit 1-3	Digital outputs unused
	Bit 4	Digital output C12, can be configured to indicate END value
	Bit 5	Digital output C13, can be configured to indicate END value
	Bit 6	Digital output C14, can be configured to indicate END value
	Bit 7	Digital output C15, can be configured to indicate END value

Control Bytes (0 and 1) Functions (used by operative modes)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bit 0	EN : FALSE = counter disabled EN : TRUE = counter enabled	X	X	X	X	X	X		X			X	X	X	X	X
Bit 1	SET : TRUE = set the counter A or EN_0 : TRUE = enable time capture on falling edge or SET : TRUE = set end value (with bit 0 of output byte set to TRUE)	X	X			X	X		X			X	X	X		X
Bit 2	RESET : TRUE = reset counter A or EN_1 : TRUE = enable time capture on rising edge	X	X	X	X	X	X		X			X	X	X		X
Bit 3	UP/DOWN : FALSE = up counter A; UP/DOWN : TRUE = down counter A or FREQ : FALSE = time measure mode; FREQ : TRUE = frequency and rotation per minute (RPM) mode			X	X											X
Bit 4	RESET : TRUE = reset counter B or RPI: reference point indicator or RESET_NEW : TRUE = time, frequency, rotation per minute (RPM) is reset and parameter output NEW is cleared			X	X							X	X	X		X

Control Bytes (0 and 1) Functions (used by operative modes)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bit 5	UP/DOWN : FALSE = up counter; UP/DOWN : TRUE = down counter or UP/DOWN : FALSE = up counter B; UP/DOWN : TRUE = down counter B	X	X			X	X		X							
Bit 6	EN_TOUCH : FALSE = no catch operation; EN_TOUCH : TRUE = enable next catch operation	X	X	X	X	X	X		X			X	X	X	X	
Bit 7	EDGE_TOUCH : FALSE = catch on falling edge; EDGE_TOUCH : TRUE = catch on rising edge	X	X	X	X	X	X		X			X	X	X	X	

Meaning of the Output information for the counter		
32 bit counter 0	DWORD	Actual value of the counter 0
32 bit counter 1	DWORD	Actual value of the counter 1
Touch counter value 0	DWORD	Touch/catch value of the counter 0
Touch counter value 1	DWORD	Touch/catch value of the counter 1
State byte 0	BYTE	State byte for the counter 0: Depending to operating modes, the different bits of state byte 0 are used to display and control the counting (see below table)
State byte 1	BYTE	State byte for the counter 1: Depending to operating modes, the different bits of state byte 1 are used to display and control the counting (see below table)

Meaning of the Output information for the counter		
Input counter 0 (Input Byte 3)	BYTE	Inputs for the counters 0
	Bit 0	State corresponding to input A
	Bit 1	State corresponding to input B
	Bit 2	State corresponding to input Z
	Bit 3	State corresponding to input I3
	Bit 4	State corresponding to input I4
	Bit 5	State corresponding to input I5
	Bit 6	State corresponding to input I6
	Bit 7	State corresponding to input I7
Input counter 1 (Input Byte 19)	BYTE	Inputs for the counters 1
	Bit 0	State corresponding to input A
	Bit 1	State corresponding to input B
	Bit 2	State corresponding to input Z
	Bit 3	State corresponding to input I11
	Bit 4	State corresponding to input I12
	Bit 5	State corresponding to input I13
	Bit 6	State corresponding to input I14
	Bit 7	State corresponding to input I15

Status Bytes (0 and 1) Functions (used by operative modes)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bit 0	CF : TRUE = when end value of counter is reached The CF bit is cleared if the counter was disabled or a Set/Reset operation was executed. CF : TRUE = zero crossover indicator	X	X			X	X					X	X	X	X	
Bit 1	Not used	X	X		X	X	X		X			X	X	X		
Bit 2	RDY_TOUCH : TRUE = new catch/touch value available	X	X			X	X		X			X	X	X	X	
Bit 3	OVERFLOW counter : TRUE = overflow or OVERFLOW counter A : TRUE = overflow 0000H <--> FFFFH (65535)	X	X			X	X					X	X	X	X	
Bit 4	SET INPUT counter : TRUE = logical OR function on all inputs (I3 to I7 or I11 to I15) configured as SET input or OVERFLOW counter B : TRUE = overflow 0000H <--> FFFFH (65535)	X	X			X	X		X			X	X	X	X	
Bit 5	RESET INPUT counter : TRUE = logical OR function on all inputs (I3 to I7 or I11 to I15) configured as RESET input or RESET INPUT counter A : TRUE = logical OR function on all inputs (I3 to I7) configured as RESET input	X	X			X	X		X			X	X	X	X	

Status Bytes (0 and 1) Functions (used by operative modes)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Bit 6	NEW : TRUE = new timing value is available or RDY_RPI : TRUE = when the RPI operation is done											X	X	X		X
Bit 7	RESET INPUT counter B : TRUE = logical OR function on all inputs (I11 to I15) configured as RESET input			X	X											

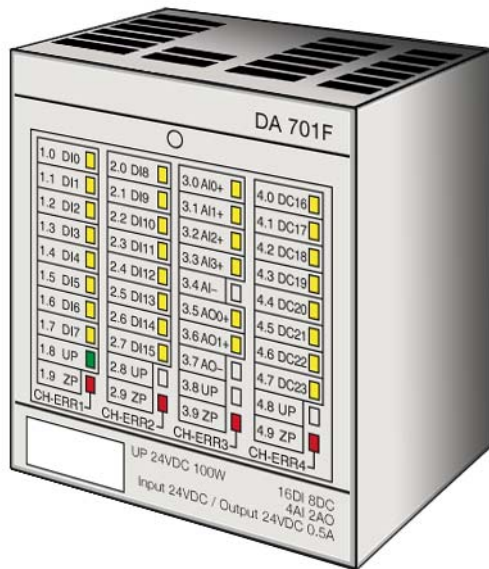
Example to configure a PWM Output 0 and read it in a Counter 0 as input

S. No.	Step Description	Values/Observation
Step -1: PWM output O0 Configuration		
1	Configure O1 as PWM Output in the Parameters	
2	Define a Word / INT for Output Bytes - (0,1) for Defining PWM0 Frequency (eg. 5000 Hz = 5000)	The frequency is from 1 to 100 KHz. In order to select frequencies greater than 32767 Hz (word limitation), At manual selection, it depends on bit 0 of "control byte". If bit 0 of "control byte"=TRUE, the frequency multiplier x10 is enabled.
3	Define a Word / INT for Output Bytes - (2,3) for Defining PWM0 Duty Cycle	(0-100% = 0-1000) For eg. 75Hz =750

4	Define a Byte for Output Byte 4 to define the PWM0 Control Byte. Use the PWM0 Control Byte - Bit 7 to Enable or Disable the PWM output	eg. Value 128 written to this byte will enable the PWM Output Value 0 written to this byte will disable the PWM output =>Can be verified by the LED Status of the Output O1 and Input Byte 0 for PWM will update status of PWM0
5	Define the Input Byte 0 and read it cyclically	Input Byte 0 for PWM will update the Percentage of pulses already sent on channel O0
Step 2: Wiring a PWM 0 output to Counter 0 Input		
	Physically connect a wire between O0 1.5 --> 2.0 A0 Terminals	
Step3: Configure Counter 0		
1	Configure Mode Counter 0 = 1-1 U/D counter(A) in the Parameters	
2	Configure a Byte for Output Byte20 - Counter C0 Output Byte	
3	Enable Bit 0 of Output Byte 20 (Counter0 Output Byte)	Value =0/1
4	Configure a DWORD from Input Byte 8 (8,9,10,11)	The Counter starts counting if the Output Byte 20-- bit 0 (Enable Counter) is set to 1. Output Byte 20 is set to 0, then the counter stops counting
TOUCH Counter - To store an instantaneous value of counter in a separate DWORD Register		
1	Inputs I3 can be used as an TOUCH Input trigger for Counter 0	
2	Configure I3 for TOUCH in the parameters	
3	Configure a DWORD from Input Byte 4,5,6,7 to read the Touch Counter value	
4	Set the Bit 6 of Counter 0 Control Byte to 1	Value = 65 (0100001) (Enabling counter and Enabling TOUCH operation)

5	When the Input Terminal/ channel I3 is set to 1 (24VDC input), the Current counter 0 value (DWORD Value from Input Byte 8,9,10,11) will be captured in Touch Counter Value (Input Bytes 4,5,6,7) in a rising edge	The Current Counter 0 Value will be copied to Touch Counter Dword
SET/ RESET Counter - Set the counter to a preset value		
1	Inputs I3, C4, C5, C6, C7 can be used as an SET/ RESET Input trigger For Counter 0	
2	Configure I3 for SET/RESET in the parameters	
3	Configure a DWORD from Counter C0 Settings- Output Bytes 16,17,18,19 to write the Preset value for counter from the program	
4	Set the Bit 1 of Counter 0 Control Byte to 1	Value = 2 (10) (Enabling counter and Setting the Counter) Value= 4 (100) (Resetting the counter)
5	When the Input Terminal/ channel I3 is set to 1 (24VDC input), the Current counter 0 Settings value (DWORD Value from Output Byte 16,17,18,19) will be copied to Counter 0 32 Bit Counter Value (Input Bytes 8,9,10,11) in a rising edge	Resetting the Counter will reset the Counter 0 Value to 0

2.1.15 Analog/Digital input/output module DA 701F



DA701F_perspektive.bmp

The Digital analog input/output module DA 701F provides 4 configurable analog inputs and 2 configurable analog outputs module wise electrically isolated.

Tab Module data

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **DA701_5_3** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | Analog Inputs | Analog Outputs

DA 701F

Input

Consistency: word

Length: 6 words

Output

Consistency: word

Length: 4 words

Configuration bytes:

0x55 , 0x63

OK Cancel Save Reset Check Help

DA701_Mod_Data.bmp

General data

Name: Full name of the module. The name is taken over from the tree structure.

Short text: You can enter free text of up to 12 characters.

Long text: You can enter free text of up to 30 characters.

Module data

Data for the module is displayed in this tab.

Input data

Consistency The consistency of the data transfer from the module to the slave is displayed.

Length The length of the data transferred from the module to the slave is displayed.

Output data

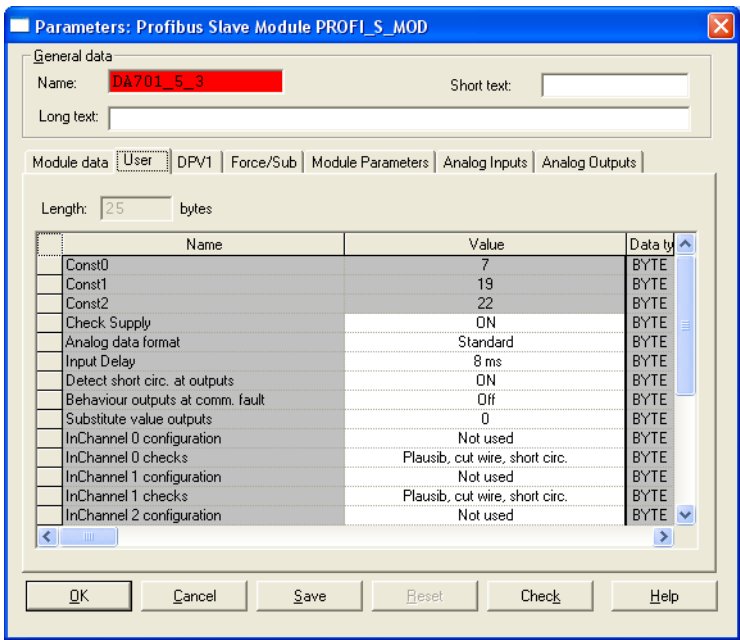
Consistency The consistency of the data transfer from the slave to the module is displayed.

Length The length of the data transferred from the slave to the module is displayed.

Configuration bytes

The sequence of bytes for the configuration of the module specified in the device master data file.

Tab User



DA701_User_Para.bmp

Length Displays the number of bytes used for parameter setting. Is generated by the system and cannot be edited.

Name Name of the user parameter.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.

<i>Check supply</i>	When this function is activated, the process voltage (supply voltage) is checked by the module. If the voltage is low or no voltage is applied, an alarm is generated. ON Checking of supply voltage is enabled. OFF Checking of supply voltage is disabled.
<i>Input delay</i>	With activated supply checking, the input delay for the alarm can be defined here. The following values can be selected: 0.1 ms for quick processes with frequently changing signal 1 ms for slower processes 8 ms if spikes are to be filtered out reliably 32 ms if low-pass behavior is wanted.
<i>Behavior outputs at comm. fault</i>	This module allows configuring the behavior of outputs at communication error
<i>Substitute value</i>	The configured substitute value is used.
<i>Data type</i>	Freelance data type of the component. For data which is described as a bit field, Freelance data types such as BYTE or WORD are used. The PROFIBUS data type bit is changed to the Freelance data type BOOL.
<i>Byte, Bit, Length</i>	The values for Byte, Bit and Length describe the position of the Freelance data type in the parameter block. The bit fields defined in this way always start at bit 0 in the Freelance data type.
<i>Byte</i>	Number of the first byte in the parameter block.
<i>Bit</i>	Number of the first bit in the start byte of the parameter block.
<i>Length</i>	Length of the bit field in the parameter block.
<i>Min / Max</i>	The "Min" and "Max" columns are required for input in the dialog editor. Thus input elements such as combobox or radio button can be configured in the dialog editor. after the user parameters have been defined, individual parameterization tabs can be created with the dialog editor.

- Comments

Comments on the description of the component. The allocation of comments is optional.
- OPC Access

☒ The user parameter can be accessed via OPC.
- OPC Shortname

Alias of the user parameter if it is accessible on the OPC server.

Tab DPV1

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: DA701_5_3

Short text:

Long text:

Module data

User

DPV1

Force/Sub

Module Parameters

Analog Inputs

Analog Outputs

Name	Value	Type	Byte	Bit	Length	Slot	Inde
Comp1	☐	BOOL	0	0	1	0	0
Comp2	☐	BOOL	0	0	1	0	0
Comp3	☐	BOOL	0	0	1	0	0

OK

Cancel

Save

Reset

Check

Help

DA701_DP1.bmp

Name Name of the DPV1 parameter.



If the DPV1 parameter is described in the device master data file, the name is taken from the device master data file. The parameter name cannot subsequently be changed. A parameter defined in the device master data file cannot be deleted.

Value The cold start value is configured in this column. In commissioning mode, the current values are displayed in this column.

Data type Freelance data type of the component.

<i>Byte, Bit</i>	The values for byte and bit describe the position of the Freelance data type within a structured byte field. For simple data types and non-structured byte fields, the values for byte and bit should be 0.
<i>Byte</i>	Number of the first byte in the structured byte field.
<i>Bit</i>	Number of the first bit in the start byte of the structured byte field.
<i>Length</i>	Length of the DPV1 parameter. For simple data types the length is stated in bits, while for BYTE Arrays and UserDS bytes are used.



The length of BYTE Arrays and UserDS is stated in bytes. The fields for entering the length of BYTE Arrays are therefore highlighted in color.

<i>Slot, Index</i>	The values for slot and index are used to address the DPV1 parameter in the device. For further information, please see the device manual of the respective vendor.						
<i>Slot</i>	Slot number for addressing a slot in the PROFIBUS device Permissible range: 0 .. 254 (255 = Reserved.)						
<i>Index</i>	Index for addressing the desired data within a slot. Permissible range: 0 .. 254 (255 = Reserved.)						
<i>Access</i>	The value specifies the access to the DPV1 parameter on the PROFIBUS device. <table> <tr> <td>R/W</td><td>Read and write access to the parameter.</td></tr> <tr> <td>R</td><td>Read access only to the parameter.</td></tr> <tr> <td>W</td><td>Write access only to the parameter.</td></tr> </table> W Addressing is configured and loaded in the device. R Addressing is first read from the device object directory in commissioning mode and then used for all further device accesses. This addressing is only possible if the device supports reading from the object directory. For further information, please see the vendor's manual.	R/W	Read and write access to the parameter.	R	Read access only to the parameter.	W	Write access only to the parameter.
R/W	Read and write access to the parameter.						
R	Read access only to the parameter.						
W	Write access only to the parameter.						

Load The value specifies whether the parameter is loaded with Load all DPV1 Parameters or not.



A DPV1 parameter which cannot be written cannot be loaded with Load all DPV1 Parameters either.

Parameters which have been defined as structured data types or BYTE Arrays can only be written if no gaps were left during definition of the data type.

Load-Seq. The value specifies the sequence in which the DPV1 parameters are loaded with Load all DPV1 Parameters.

Min / Max The "Min" and "Max" columns are required for input in the dialog editor. Thus input elements such as combobox or Radio-Button can be configured in the dialog editor.
After the DPV1 parameters have been defined, individual parameterization tabs can be created with the dialog editor.

Read Elem. Used to configure HART commands.

Module Name of the associated module.

DPV1 parameter can be accessed via OPC. The name of the DPV1 parameter is used as an OPC name. If the name contains space characters or special characters, it is recommended that an alias be defined. Some OPC clients cannot resolve names with space characters or special characters.

OPC Access ☒ The user parameter can be accessed via OPC.

OPC Shortname

Alias of the user parameter if it is accessible on the OPC server.

Tab Force and Substitute Value

I/O	Component	Data type	Hold last value	Substitute value	Force active	Force va
I	M3_IN_DI0	BOOL	☒		☐	
I	M3_IN_DI1	BOOL	☐		☐	
I	M3_IN_DI2	BOOL	☐		☐	
I	M3_IN_DI3	BOOL	☐		☐	
I	M3_IN_DI4	BOOL	☐		☐	
I	M3_IN_DI5	BOOL	☐		☐	
I	M3_IN_DI6	BOOL	☐		☐	
I	M3_IN_DI7	BOOL	☐		☐	
I	M3_IN_DI8	BOOL	☐		☐	
I	M3_IN_DI9	BOOL	☐		☐	
I	M3_IN_DI10	BOOL	☐		☐	
I	M3_IN_DI11	BOOL	☐		☐	
I	M3_IN_DI12	BOOL	☐		☐	
I	M3_IN_DI13	BOOL	☐		☐	
I	M3_IN_DI14	BOOL	☐		☐	
I	M3_IN_DI15	BOOL	☐		☐	
I	M3_IN_DI16	BOOL	☐		☐	

AX722_Force_Sub.bmp

Component Name of the component for which force values and default values are specified.

Type Data type of the component for which force values and default values are specified.

Hold last value This option can be selected for analog inputs, only.
☒ In the event of a fault the last valid value is held.
☐ The last value is not used.

Substitute value This option can be selected for analog inputs, only.
In the event of a fault, the substitute value entered here is further processed.



If both Hold last value is checked and a Substitute value is also given, then in the event of a fault the last value is held.

Force active Specifies whether the configured force value is used.

- ☒ Forcing is enabled.
☐ Forcing is disabled.

Force value The value entered here is further processed when forcing is on.

Tab Module Parameters

This tab allows the user to set the parameters for the Digital I/Os in the module.

IO Parameters

Check Supply Enable/disable supervision of power supply

Behavior outputs at comm.fault

Set the behavior of output channels on PROFIBUS communication failure, e.g. Last value or Substitute value

Analog data format

Data format for the analog values

Detect short circ. at outputs

Enable/disable detection of short circuit at the output channels

Input Delay

Delay for the Digital Input channels

Tab Analog Inputs

Parameters: Profibus Slave Module PROF1_S_MOD

General data

Name: **DA701_S_3** Short text:

Long text:

Module data | User | DPV1 | Force/Sub | Module Parameters | **Analog Inputs** | Analog Outputs

Input Channel 0

InChannel 0 configuration:

InChannel 0 checks:

Input Channel 1

InChannel 1 configuration:

InChannel 1 checks:

Input Channel 2

InChannel 2 configuration:

InChannel 2 checks:

Input Channel 3

InChannel 3 configuration:

InChannel 3 checks:

OK Cancel Save Reset Check Help

DA701_ud2.bmp

For further details refer to [Tab Inputs 0-3](#) on page 52.

Tab Analog Outputs

Parameters: Profibus Slave Module PROFIS_MOD

General data
 Name: DA701_5_3 Short text:
 Long text:
 Module data | User | DPV1 | Force/Sub | Module Parameters | Analog Inputs | **Analog Outputs**

Output Channel 0
 OutChannel 0 configuration: Not used
 OutChannel 0 checks: Plausib, cut wire, short circ.
 OutChannel 0 Substitute value: 0

Output Channel 1
 OutChannel 1 checks: Plausib, cut wire, short circ.
 OutChannel 1 configuration: Not used
 OutChannel 1 Substitute value: 0

OK Cancel Save Reset Check Help

DA701_ud2.bmp

For further details refer to [Tab Outputs 0-3](#) on page 53.

Input/Output Types Supported

The following types of Input/Outputs are supported by this module:

Inputs

- Digital Inputs
 - 16 (24 V DC; delay time configurable through software)
- Configurable digital inputs/outputs
 - 8 (24 V DC, 0.5 A max)

Analog inputs

- 4 (configurable through software), resolution 12 bits plus sign, voltage, current and RTD input

Analog outputs

- 2 (configurable through software), resolution 12 bits plus sign, voltage, current and RTD output

I/O Editor



In Configuration mode, right-click on the module > **I/O editor**

With the I/O editor, it is possible to define the individual components for inputs, outputs and diagnostic data.

Tab Input

I/O editor: Mod.Addr. 3: DA 701F (DA701F)

Input | Output | Diagnosis

Total length: 12 bytes

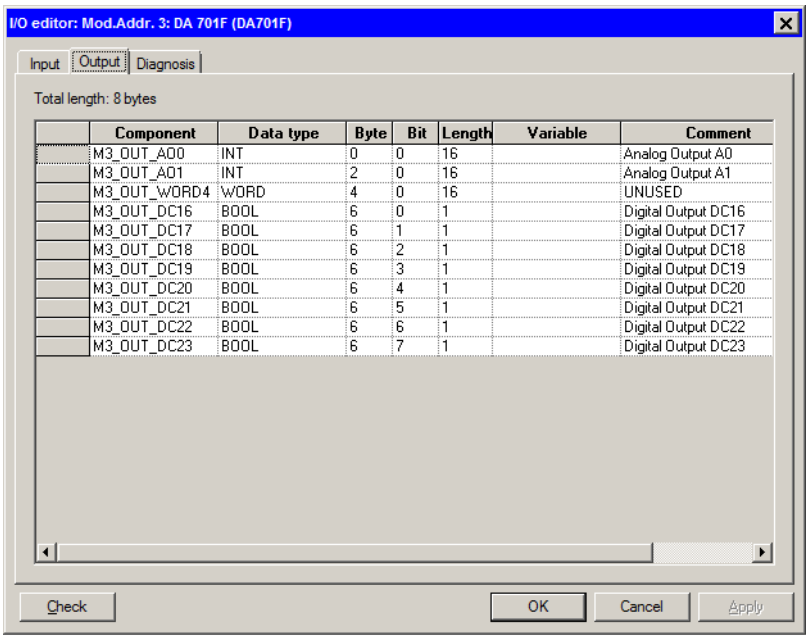
	Component	Data type	Byte	Bit	Length	Variable	Comment ^
	M3_IN_D10	BOOL	0	0	1		Digital Input D10
	M3_IN_D11	BOOL	0	1	1		Digital Input D11
	M3_IN_D12	BOOL	0	2	1		Digital Input D12
	M3_IN_D13	BOOL	0	3	1		Digital Input D13
	M3_IN_D14	BOOL	0	4	1		Digital Input D14
	M3_IN_D15	BOOL	0	5	1		Digital Input D15
	M3_IN_D16	BOOL	0	6	1		Digital Input D16
	M3_IN_D17	BOOL	0	7	1		Digital Input D17
	M3_IN_D18	BOOL	1	0	1		Digital Input D18
	M3_IN_D19	BOOL	1	1	1		Digital Input D19
	M3_IN_D110	BOOL	1	2	1		Digital Input D110
	M3_IN_D111	BOOL	1	3	1		Digital Input D111
	M3_IN_D112	BOOL	1	4	1		Digital Input D112
	M3_IN_D113	BOOL	1	5	1		Digital Input D113
	M3_IN_D114	BOOL	1	6	1		Digital Input D114
	M3_IN_D115	BOOL	1	7	1		Digital Input D115
	M3_IN_AI0	INT	2	0	16		Analog Input AI0
	M3_IN_AI1	INT	4	0	16		Analog Input AI1
	M3_IN_AI2	INT	6	0	16		Analog Input AI2
	M3_IN_AI3	INT	8	0	16		Analog Input AI3
	M3_IN_DF16	BOOL	10	0	1		Digital Input DF16

Check OK Cancel Apply

DA701_IOEditor_Input.bmp

- Component** Output (I0 to I3) that is to be edited.
- Data type:** The data type (REAL or BOOL) of the component.
- Variable:** The variable name.
- Comment:** Comment for the component.

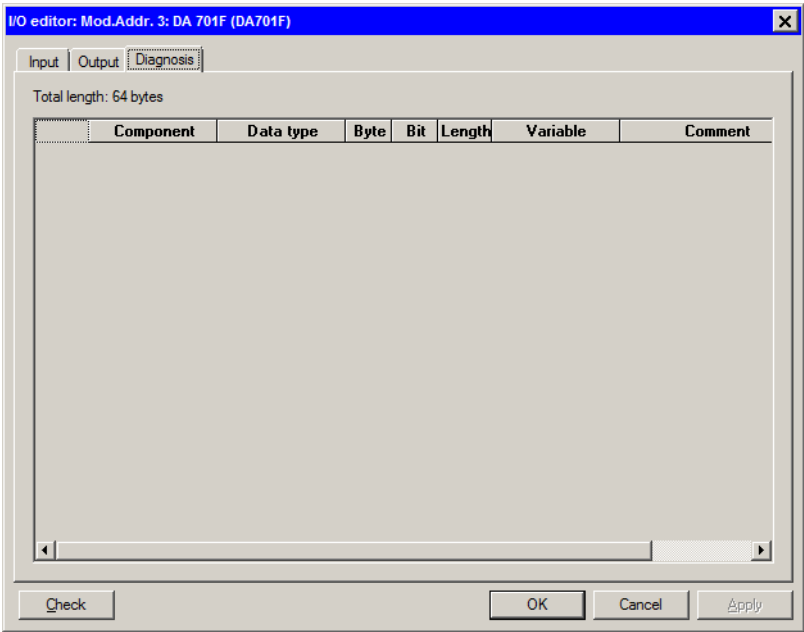
Tab Output



DA701_IOEditor_Output.bmp

- Component* Output (O0 to O1) that is to be edited.
- Data type:* The data type (REAL or BOOL) of the component.
- Variable:* The variable name.
- Comment:* Comment for the component.

Tab Diagnosis



DA701_IOEditor_Diag.bmp

- Component:* Name of the channel error type. Diagnostic components are available from Channel 0 to 63.
- Data type:* The data type of the component (see table).
- Variable:* The variable name.
- Comment:* Comment on the component diagnosis.

Name	Data type	Conf.	Access	Comment
Parameter definition mask				
CheckSupply	BOOL			
EASid	INT	no	RO	Module location
SrvNO	STRING8	no	RO	Firmware version
HrvNo	STRING8	no	RO	Module hardware version

Name	Data type	Conf.	Access	Comment
Ident	STRING8	no	RO	ID number of the module type
ModName	STRING8	no	RO	Name of the module type
Diagnostic data				
STA	UDINT	no	RO	Bit-coded state
CHSTA	UDINT	no	RO	CHannel STAtE, i.e. the state (overflow, underflow or short-circuit) of the respective channel
NDR	BOOL	no	RO	New Data Ready, module is active, cyclic data transfer is in progress
ERR	BOOL	no	RO	Module defective
STI0 -STI23	INT	no	RO	Stands for SStatus Input
I0 - I23	REAL	no	RO	
O0 - O23	REAL	no	RO	

Measuring ranges**Input ranges for voltage, current and digital input**

Range	0... 10V	-10... +10V	0... 20mA	4... 20mA	Digital input	Digital value	
						decimal	hex.
Overflow	>11.7589	>11.7589	>23.5178	>22.8142		32767	7FFF
Measured value too high	11.7589 : 10.0004	11.7589 : 10.0004	23.5178 : 20.0007	22.8142 : 20.0006		32511 : 27649	7EFF : 6C01
Normal range	10.0000 : 0.0004	10.0000 : 0.0004	20.0000 : 0.0007	20.0000 : 4.0006	ON	27648 : 1	6C00 : 0001
	0.0000	0.0000	0	4	OFF	0	0000
Normal range or measured value too low	-0.0004 -1.7593	-0.0004 : : : : -10.0000		3.9994 : 0 : : :		-1 -4864 -6912 : -27648	FFFF ED00 E500 : 9400
Measured value too low		-10.0004 : -11.7589				-27649 : -32512	93FF : 8100
Underflow	<-1.7589	<-11.7589	<0.0000	<-1.1858		-32768	8000

Input Ranges for Resistance

Range	Pt100 / Pt1000 -50 °C... +70 °C	Pt100 / Pt1000 -50 °C... +400 °C	Ni1000 -50 °C... +150 °C	Digital value	
				decimal	hex.
Overflow	> 80.0 °C	> 450.0 °C	> 160.0 °C	32767	7FFF
Measured value too high		450.0 °C : 400.1 °C		4500 : 4001	1194 : 0FA1
			160.0 °C : 150.1 °C	1600 : 1501	0640 : 05DD
	80.0 °C : 70.1 °C			800 : 701	0320 : 02BD
Normal range	: : 70.0 °C : 0.1 °C	400.0 °C : : : : 0.1 °C	: : 150.0 °C : : : : 0.1 °C	4000 1500 700 : 1	0FA0 05DC 02BC : 0001
	0.0 °C	0.0 °C	0.0 °C	0	0000
	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-0.1 °C : -50.0 °C	-1 : -500	FFFF : FE0C
Measured value too low	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-50.1 °C : -60.0 °C	-501 : -600	FE0B : FDA8
Underflow	< -60.0 °C	< -60.0 °C	< -60.0 °C	-32768	8000

Output Ranges Voltage and Current

Range	-10... +10 V	-0... 20 mA	4... 20 mA	Digital value	
				decimal	hex.
Overflow	0 V	0 mA	0 mA	> 32511	> 7EFF
Measured value too high	11.7589 V : 10.0004 V	23.5178 mA : 20.0007 mA	22.8142 mA : 20.0006 mA	32511 : 27649	7EFF : 6C01
Normal range	10.0000 V : 0.0004 V	20,0000 mA : 0.0007 mA	20.0000 mA : 4.0006 mA	27648 : 1	6C00 : 0001
	0.0000 V	0.0000 mA	4.0000 mA	0	0000
	-0.0004 V : -10.0000 V	0 mA : 0 mA	3.9994 mA 0 mA 0 mA	-1 -6912 -27648	FFFF E500 9400
Measured value too low	-10.0004 V : -11.7589 V	0 mA : 0 mA	0 mA : 0 mA	-27649 : -32512	93FF : 8100
Underflow	0 V	0 mA	0 mA	< -32512	< 8100

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