

Device Management

Basic PROFIBUS DTM 6.0

System Version 6.0

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About This User Manual

General



Any security measures described in this User Manual, for example, for user access, password security, network security, firewalls, virus protection, etc., represent possible steps that a user of an 800xA System may want to consider based on a risk assessment for a particular application and installation. This risk assessment, as well as the proper implementation, configuration, installation, operation, administration, and maintenance of all relevant security related equipment, software, and procedures, are the responsibility of the user of the 800xA System.

This User Manual contains a detailed description on how to use the BasicPROFIBUS DTM. For the latest information, refer to the corresponding Release Notes.

User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

Feature Pack

The Feature Pack content (including text, tables, and figures) included in this User Manual is distinguished from the existing content using the following two separators:

Feature Pack Functionality

<Feature Pack Content>

Feature Pack functionality included in an existing table is indicated using a table footnote (*) :

*Feature Pack Functionality

Feature Pack functionality in an existing figure is indicated using callouts.

Unless noted, all other information in this User Manual applies to 800xA Systems with or without a Feature Pack installed.

Warning, Caution, Information, and Tip Icons

This User Manual 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 that could result in *electrical shock*.



Warning icon indicates the presence of a hazard that 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 that 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, fully comply with all Warning and Caution notices

Terminology

A complete and comprehensive list of Terms is included in the *System 800xA, System Guide, Functional Description (3BSE038018*)*. The listing includes terms and definitions as they apply to the 800xA system where the usage is different from commonly accepted industry standard definitions and definitions given in standard dictionaries such as ***Webster's Dictionary of Computer Terms***. Terms that uniquely apply to this instruction may be included here as part of this document.

The following is a list of terms associated with the PROFIBUS DTM/ PROFIBUS DTM Builder that one should be familiar with. The list contains terms and abbreviations that are unique to ABB or have a usage or definition that is different from standard industry usage.

Term/Acronym	Description
Basic PROFIBUS DTM	DTM for PROFIBUS devices, additionally serving as a runtime environment for device-specific DTMs, that have been built with the PROFIBUS DTM Builder
Device Type Manager (DTM)	Software component (device driver) for configuring, diagnosing, forcing, displaying the measured variables, and so on of a field device. It is familiar with the way the device works and supplies device-specific documentation.
Device Description Language (DDL)	Interpretable language for the formal description of device parameters
Frame Application (FA)	Frame application (run-time environment) in accordance with the FDT specification for operating DTMs

Term/Acronym	Description
Field Device Tool (FDT)	The FDT concept describes the interface between a frame application and the device-specific software (DTM = Device Type Manager) of the device manufacturer. It enables devices produced by different manufacturers and different fieldbuses to be integrated in a single system. Currently supporting fieldbus protocols for PROFIBUS and HART.
GUI	Graphical user interface
PROFIBUS DTM Builder	Software product consisting of a DP V1 editor to define device-specific PROFIBUS DTMs, to be executed by the Basic PROFIBUS DTM.
System Application	A software package that provides functionality in the System 800xA. System applications cooperate according to rules defined by the System 800xA architecture, using mechanism provided by the Process Portal A. They are normally bundled into System Products. To participate in Aspect Object operations, and thus be an integrated part of an System 800xA, a system application must present itself as an aspect system. When there is no risk for confusion with user application, the term application may be used instead of system application.

Related Documentation

A complete list of all documents applicable to the *System 800xA, Extended Automation System* is provided in *Released User Documents, (3BUA000263*)*. This document lists applicable Release Notes and User Instructions. It is provided in PDF format and is included on the Release Notes/Documentation media provided with your system. Released User Documents are updated with each release and a new file is provided that contains all user documents applicable for that release with their applicable document number. Whenever a reference to a specific instruction is made, the instruction number is included in the reference.

The table below contains a list of relevant documentation.

Title	Description
Basic PROFIBUS DTM, Installation (3BDD011941*).	The document describes the installation procedure for the Basic PROFIBUS DTM.
Device Management, PROFIBUS DTM Builder, (3BDD0119145*).	The document describes how to build device-specific PROFIBUS DTMs using the PROFIBUS DTM Builder.
Basic PROFIBUS DTM, Release Notes (3BDD011943*).	This document provides a brief overview on functionality and enumerates known problems encountered in the final testing of this product release.

Section 1 Introduction

Product Overview

The Field Device Tool (FDT) concept describes the interface between a frame application and the device-specific software, **Device Type Manager**, of the device manufacturer. It enables devices produced by different manufacturers and for different fieldbuses to be integrated in a single system.

The DTM is a software component, which is usually supplied by the manufacturer together with the intelligent field device. The DTM is familiar with the way the field device works (plausibility), offers graphical user dialogs, manages device configuration and diagnostics, and supplies the device-specific documentation.

ABB provides a basic DTM called the Basic PROFIBUS DTM for PROFIBUS field devices which do not have a dedicated DTM. This basic DTM enables the field devices to be operated in a frame application conforming to FDT 1.2.

The Basic PROFIBUS DTM can be used for standardized functionality of PROFIBUS devices (mainly described through the GSD-file content and device manual content). It allows configuring based only on the GSD information of a specific PROFIBUS DP/ PA or Drives device.

Furthermore, the DTM operates as a runtime environment for device-specific templates, containing additional graphical application and DPV1 (acyclic) communication.



Device-specific templates can be created by using the DTM Builder expansion. This expansion is currently not released and is for ABB internal use only. Created template files can be used with the Basic PROFIBUS DTM without limitation, unless specified otherwise.

Product Scope

The Basic PROFIBUS DTM is suitable for executing various tasks. These tasks are also referred to as applications in the following description. Most applications have a graphical user interface for data visualization and data entry.

The application can be called through a menu offered by the DTM or the FDT frame application.

Offline Mode

- **Administration**
The Administration application is available via Placeholder DTM only and allows to insert device-specific GSD files, which results in device-specific DTMs.
- **Configuration**
Offers basic configuration functions for a device type, e.g. module and channel configuration.

Online Mode

- **Online Compare**
Comparison of device and instance configuration data in online mode.

Online / Offline Mode

- **Identification**
Shows information about the connected device type
- **About DTM**
Shows information about DTM version, vendor, etc.
- **Registration**
Accessible only via Placeholder DTM. It allows to expand the Basic DTM to a DTM Builder.
- **Documentation**
Allows to open a device-specific documentation or web link, if it is configured in the Configuration application.
- **User Application (via PROFIBUS DTM Builder templates)**
User applications are optional and may be available in offline and online mode depending on the created template.

Installation

The installation and the PC requirements of the Basic PROFIBUS DTM is described in *System 800xA, Device Management Basic PROFIBUS DTM, Installation (3BDD011941*)*.

Intended User

This configuration guide is designed for application engineers and commissioning engineers. It explains how to use Basic PROFIBUS DTM in connection with a PROFIBUS DP or PA device.

Those using this guide should be familiar with the basic method of operation of the PROFIBUS protocol.

PROFIBUS Protocol Description

PROFIBUS is a field bus standard for applications in the manufacturing industry, process automation and building automation. PROFIBUS communication is defined in the standard EN 50 170. This standard is supplemented by technical guidelines published by PROFIBUS International (PI).

Further details can be found on PI's web page www.profibus.com.

The PROFIBUS family consists of three compatible versions, which are as follows:

1. PROFIBUS FMS

This version is the general solution for communication tasks at system level.

PROFIBUS FMS services open up a wide range of applications and provide a high level of flexibility.

2. PROFIBUS DP

This version is optimized for high speed and simple connection of devices. This PROFIBUS version is specially designed for communication between programmable controllers and a distributed I/O level. The PROFIBUS DP protocol supports the extension of the PROFIBUS DP V1 protocol definition. The PROFIBUS DP V1 extensions are compatible with the basic PROFIBUS DP. The use of basic PROFIBUS DP and PROFIBUS DP V1 devices is thus possible on the same bus.

3. PROFIBUS PA

This version is specially designed for process automation. PROFIBUS PA allows sensors and actors to be connected to the same bus, even in security areas.

PROFIBUS PA uses the PROFIBUS DP protocol with PROFIBUS DP V1 extensions.

Only the bus physics differ for the two versions. PROFIBUS PA uses bus physics in accordance with IEC 61158-2, where communication and the power supply take place via the common bus.

PROFIBUS PA networks can be connected to PROFIBUS DP networks via bus converters like ABB's PROFIBUS DP/PA Linking Device LD 800P.

PROFIBUS DP System Configuration

All three PROFIBUS versions (FMS, DP and PA) use a compatible bus protocol. The communication of I/O data with the connected devices (slaves) takes place via cyclic data exchange.

Each PROFIBUS DP system can contain the following three different types of device:

- **PROFIBUS DP master class 1 (DPM1)** is the central controller, which exchanges information with the slaves in a defined cycle.
- **PROFIBUS DP master class 2 (DPM2)** are programming units or operator panels. They are used during commissioning to configure the PROFIBUS DP system and for monitoring tasks.
- **PROFIBUS DP slave** is a peripheral device. The extent of the I/O data depends on the type of slave. A maximum of 244 bytes of input data and 244 bytes of output data are possible per slave. The I/O data is transferred cyclically. A slave can also be modular, i.e. contain modules.

Slave Data

Different information is required to configure a PROFIBUS DP slave on the PROFIBUS.

- The **I/O data** specifies which values are to be exchanged cyclically between the master and the slave. The I/O data is structured using the modules connected to the PROFIBUS slave.

The structure of the I/O data is specified by the vendor.

- The **standard parameters** include firstly the bus parameters which are defined in the device master data. Secondly, they include parameters, which define the modularity and the functional capabilities of the slave.
- **User parameters** are specified for each device type. They are used to parameterize the connected PROFIBUS devices. Documentation on User Parameters are present in the manuals of the respective device vendors. They are also included in the device master data, for more recent device versions.

- The **module set** is configured using the modules connected to the PROFIBUS slave.
- **Diagnostic data** shows the current state of the slave and the modules. It is defined separately by the PROFIBUS for the slave, each individual module and each channel. In addition, vendor-specific diagnostic data may exist for the slave and the modules.
- **PROFIBUS DP V1 parameters** are used to configure PROFIBUS devices. PROFIBUS DP V1 parameters are documented in the manuals of the respective device vendors or are included in the device master data for more recent device versions. These can also be imported (DTM Builder License required) via XML files if available.

Master Data

PROFIBUS devices have different performance specifications and functional capabilities (for example, the number of I/O signals and items of diagnostic data) or possible bus parameters such as transfer rate and monitoring time. These parameters are very individual for each device type and vendor. The parameters are usually documented in the manuals of the device vendor. The characteristic features are specified in the device master data.

The device master data file is made available by the vendor. This file allows DTM to read the device details of any PROFIBUS DP slave and thereby create an object with which the PROFIBUS system can be configured.

The device master data is divided into:

- **General data:**
Contains the vendor and model name, hardware version and software version, transfer rate, etc.
- **PROFIBUS DP master-related data:**
Contains all data, used only for the PROFIBUS DP master. This area does not exist for PROFIBUS DP slaves.
- **PROFIBUS DP slave-related data:**
Contains data relating to the slave (for example: parameters, number and type of modules, specification of the diagnosis, etc.).

PROFIBUS DP States

The system behavior is mainly determined by the operating state of the PROFIBUS DP master class 1 (DPM1). A distinction is made between three main states:

- **Stop:**
In this state, no data exchange takes place between the DPM1 and the PROFIBUS DP slaves.
- **Clear:**
In this state, the DPM1 reads the input information of the PROFIBUS DP slaves and keeps the outputs in fail-safe status.
- **Operate:**
In this state, data exchange takes place. In cyclic data communication, the DPM1 reads the inputs of the PROFIBUS DP slaves and writes the outputs to the PROFIBUS DP slaves. The data exchange between PROFIBUS DP master class 1 (DPM1) and the assigned PROFIBUS DP slaves are structured by the DPM1 in a defined order. During the configuration of the PROFIBUS, the assignment of a PROFIBUS DP slave to a DPM1 is specified. The structure of the data exchange between the DPM1 and the PROFIBUS DP slave is in three phases.

Configuration

During the configuration phase, each PROFIBUS DP slave receives its configuration transferred from the DPM1. The PROFIBUS DP slave compares the configuration received, with its own configuration data. Only if the configuration received matches the configuration data of the PROFIBUS DP slave, is the PROFIBUS DP slave accepted into the parameterization phase.

Therefore, the device type, format and length information and the number of inputs and outputs must tally with the current configuration. The configuration of the device is done in offline mode.

Parameterization

In the parameterization phase, the PROFIBUS DP slave receives the vendor-specific parameterization from the DPM1. The content of the vendor-specific parameterization is not standardized and is transferred in a non-structured data block. In addition, the user can start the transfer of the vendor-specific parameterization at any time.

There are two phases of parameterization -offline or online. In offline parameterization mode, a set of default parameters is configured for the device and later downloaded into the device.

In the online parameterization mode, the final data tuning is done in Online mode for the device (only available via DTM Builder license).

Cyclic Data Exchange

The DPM1 communicates data cyclically with the assigned PROFIBUS DP slaves. For this DPV0 communication services are used.

Acyclic Data Exchange

The DTM communicates data acyclic with the PROFIBUS DP device. For the so-called DPV1 communication DPV1 services are used.



The DPV1 service parameters for the DTM are device-specific and their actual values need to be downloaded to the device separately or set in Online Parameterization mode of DTM.

Data Storage

The data (parameter) is only available temporarily in the DTM for processing. When a user interface is closed or data is buffered, the DTM saves the data permanently.

In offline mode, data is saved to the workstation computer's database as instance data. In online mode, data is saved first to the field device and then to the database. However, the DTM will only update the data in the database if the field device has accepted the data. It is always possible that, for technical reasons, a device may not be able to apply the value in the exact format in which it was entered and will therefore apply a value very similar to that entered.

Notes for Use

The Basic PROFIBUS DTM supports all UNICODE characters, except the following:

- &
- <
- >
- "
- '
- \t
- \r
- \n

These characters shall not be used in any graphical user interface (GUI).



REAL values use "." as decimal separator, independent from the language settings. The decimal separator “,” is not supported.

Section 2 Getting Started

Overview

This section uses actual examples to describe how device-specific DTM's based on the Basic PROFIBUS DTM can be created and how these DTM's are used in a FDT frame tool. Information about the FDT frame tool can be found in the tool specific instruction manuals.

In general the Basic PROFIBUS DTM based on the device-specific GSD file, delivered with the physical device type. Therefore the Basic PROFIBUS DTM provides just the supported modules and parameters required by the PROFIBUS master for cyclic communication.

Additional parameter using DPV1 services can be used only, if the Basic PROFIBUS DTM is enhanced with device-specific application files created by the device manufacturer. DPV1 services can be created with the PROFIBUS DTM Builder extension for which a special license is required.



Refer to the product specific Release Notes for detailed information.

Prerequisites and Requirements

The following requirements must be met, in order to be able to carry out the actions described in this section:

- All necessary software is installed on the related PC
 - FDT Frame tool supporting the FDT 1.2 standard
 - PROFIBUS Communication DTM (e.g. PROFIBUS USB Gateway DTM, PROFIBUS Master Gateway DTM, etc.)
 - ABB Basic PROFIBUS DTM and ABB FDT Shared Components as described in *Fieldbus, Basic PROFIBUS DTM, Installation, (3BDD011941*)*
- The user has Windows and FDT frame tool Administrator permissions.

Preparing Basic PROFIBUS DTM

After installing the Basic PROFIBUS DTM and updating the FDT frame tool's DTM catalog, a new DTM type is visible as *ABB GPB/Placeholder*.


Device	Protocol	Vendor	Group
 ABB GPB/ Placeholder	PROFIBUS_DPV1	ABB	FDT

Figure 1. Placeholder DTM

The Placeholder DTM cannot be used as device-specific DTM, but is used to create device-specific DTMs by inserting the required GSD files of the particular device types. The following applications can be executed by using the Placeholder DTM:

- Administration
- Registration
- About DTM
- Documentation

The Placeholder DTM must be instantiated in the FDT frame tool to start the import of device-specific GSD files. Follow the instructions in [Placeholder DTM and Import of device-specific GSD Files](#) on page 27.

Placeholder DTM and Import of device-specific GSD Files

The following steps need to be carried out to use the Placeholder DTM for inserting device-specific GSD files. Refer to the FDT frame tool instructions to get information, how to update the DTM catalog/list and to insert the available DTMs in the topology tree. Because of different FDT frame tool operations this document describes a general workflow only.

1. Check, that the device-specific GSD file is available on a accessible media (e.g. hard disk, floppy disk, etc.).
2. Start the FDT frame tool on the PC and update the DTM catalog/list.
3. The Basic PROFIBUS DTM is designed for PROFIBUS protocol only. As a result a PROFIBUS Communication DTM (CommDTM) has to be placed first in the FDT project.



Communication DTMs are available from different vendors, which can be checked on the FDT Groups webpage (www.fdt-jig.org). Search for “CommDTM”.

4. Insert below the PROFIBUS Communication DTM the *ABB GPB/Placeholder* DTM listed in the DTM catalog/list.

Device	Protocol	Vendor
ABB GPB/ PA YP0 Positioner TZID-C110	PROFIBUS_DPv1	ABB Automation
ABB GPB/ PA YP0 Stellungsgeber TZID-E	PROFIBUS_DPv1	ABB Automation
ABB GPB/ Placeholder	PROFIBUS_DPv1	ABB
ABB T102	PROFIBUS_DPv1	ABB Automation
ABB T104	PROFIBUS_DPv1	ABB Automation

Figure 2. Placeholder DTM in the DTM Catalog

5. Right-click on the inserted Placeholder DTM to open the DTM menu and select the *Registration* application. Check, in the DTM application, whether the Basic PROFIBUS DTM license is available (check marked). If this license is not available it has to be loaded. Click the browse button to search for and load the license file. If a license file is not available, contact ABB for support.
6. After finishing the Registration this DTM application can be closed by clicking the **[Close]** button.

- 7. Right-click the inserted Placeholder DTM to open the DTM menu and select the *Administration* application.

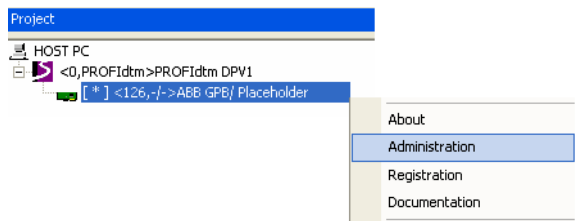


Figure 3. FDT Project and DTM Menu

- 8. The DTM application *Administration* will be opened.

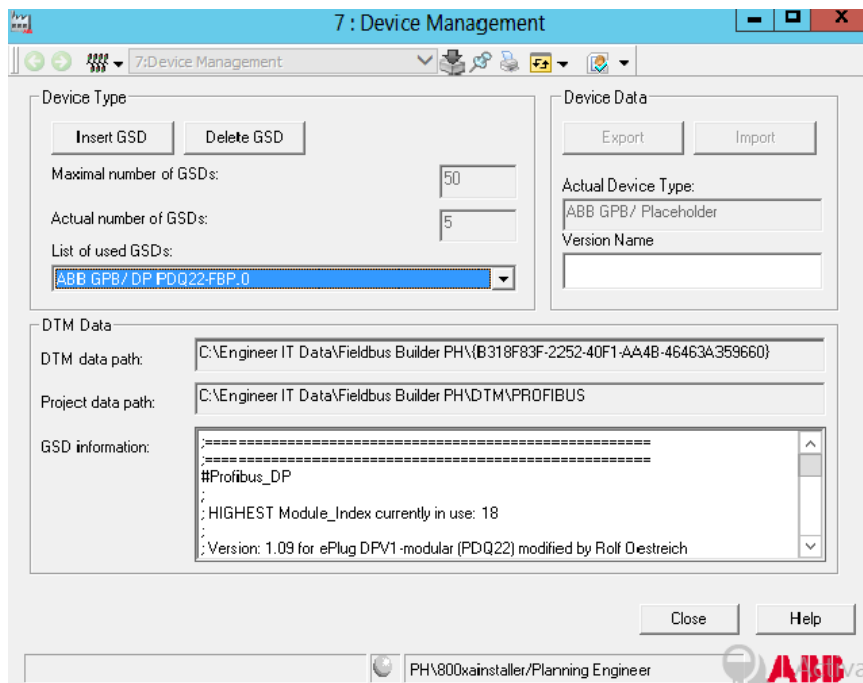


Figure 4. Administration Application

9. To import the device-specific GSD file click the **[Insert GSD]** button.
10. A new file import window will appear. Browse for and select the required GSD file.
11. Confirm selection with **[Open]** button.
12. Repeat [Step 9](#) to [Step 10](#), if additional GSD files are required to use (if all GSD files are available in one directory, they can be marked for bulk import). The inserted GSD files are listed in *List of used GSD*.

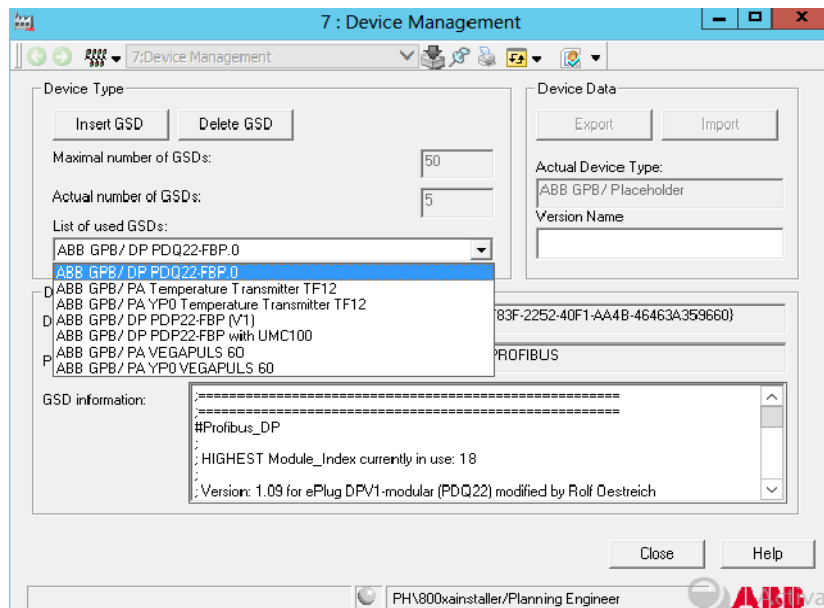


Figure 5. Inserted GSD File in the Placeholder DTM



PROFIBUS PA GSD files may be available as two different types, which are designed for a specific DP/PA Linking Device. The files differs in the file name, which normally starts with the manufacturer identification (e.g. ABB_xxxx.GSD), but could be named with **YP0** (e.g. YP00xxxx.GSD). The YP0 GSD file based on the original GSD file, but contains some modified timing parameters.

Notice that a direct inserting of **YP0** GSD files **is not** possible. Use the original device GSD file instead. The Basic PROFIBUS DTM will create the YP0 file automatically as additional device type as shown in [Figure 5](#).



This version of Basic PROFIBUS DTM allows to import up to 50 different GSD files. The additional created PA GSD files with YP0 index are not counted as GSD files.

- 13. After finishing the GSD import, the Administration application can be closed by clicking the **[Close]** button.
- 14. Remove/delete the Placeholder DTM from the FDT project (topology tree).



The Placeholder DTM has to be removed from the topology tree before going online with the FDT project, otherwise an error message could appear. The Placeholder DTM does not support any online functionality.

- 15. Start update DTM catalog/list in the FDT frame tool. The new device types based on the inserted GSD files shall be available in the catalog/list.

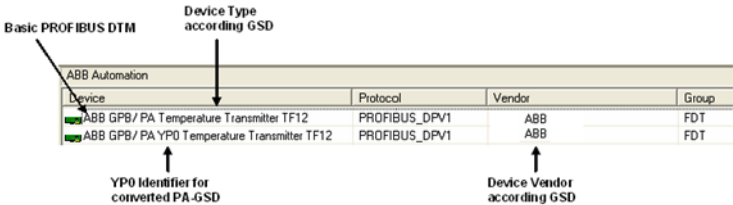


Figure 6. device-specific Basic PROFIBUS DTM in FDT Frame Tool

Utilizing device-specific Basic PROFIBUS DTM

The following steps need to be carried out to use device-specific Basic PROFIBUS DTMs. Refer to the FDT frame tool instructions to get information, how to insert DTMs in the topology tree and how to start DTM applications. Because of different FDT frame tool operation this document describes a general workflow only.



The described configuration steps below require the import of device-specific GSD files before. Follow the instructions in [Preparing Basic PROFIBUS DTM](#) on page 26, if the GSD file is not imported yet.

Create DTM topology

1. Start the FDT frame tool and open the DTM catalog/list.
2. Check that the FDT/DTM project of the frame tool is in offline mode.
3. Insert a PROFIBUS Communication DTM (CommDTM) representing the PROFIBUS master device.
4. Insert the device-specific Basic PROFIBUS DTM below the PROFIBUS Communication DTM. The device-specific Basic PROFIBUS DTM has the following identifier:

ABB GPB/ <Protocol> <Model Name>

Protocol can be DP or PA, whereas for PA two protocol types are available supporting different PROFIBUS DP/PA Linking Devices:

- **PA** - for supported transmission rates up to 93,75kbit/s
- **YP0 PA** - for supported transmission rates up to 12 Mbit/s

5. The FDT frame tool asks for a PROFIBUS address, for which the DTM shall be assigned to. Enter the valid slave address.



It is recommended to know the device addresses of each PROFIBUS device located on the PROFIBUS line. Depending on the FDT frame tool the address can be changed afterwards.

6. The topology for the DTM communication is now created. Repeat [Step 4](#) and [Step 5](#), if more device DTM shall be used.

Configuration of the device-specific Basic PROFIBUS DTM

To provide the data for cyclic communication to the PROFIBUS Master a configuration via the DTM is mandatory. Mainly the requested module(s) of the device type and the device parameters (measurement value, status, user parameter, etc.) shall be configured for a correct device communication.

Module Configuration

The following instructions describes the general workflow. For details of the *Configuration* application, refer to [Configuration](#) on page 66.

1. Start the FDT frame tool and open the created DTM project (topology tree).
2. Ensure that the project is in offline mode.
3. Select the device-specific Basic PROFIBUS DTM in the topology tree
4. Right-click to open the DTM context menu and select the *Configuration* application.

5. Switch to the *Module* tab.

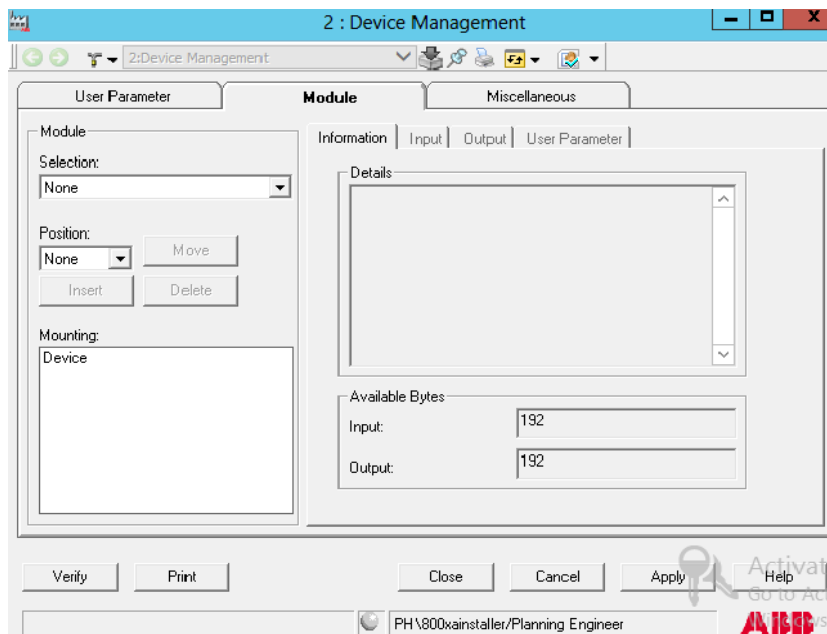


Figure 7. Module Tab window

6. Select in the Module Area the required module from pull down menu.



All listed modules are included in the device-specific GSD file, which has been imported via *Administration* application.

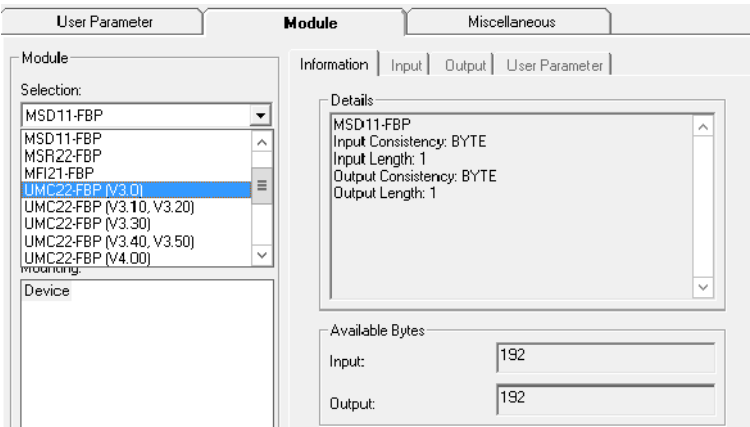


Figure 8. Selection Module window

- 7. Select the *position* for the specific module from the pull down menu. The modules, which have already been configured, are hidden and cannot be selected.

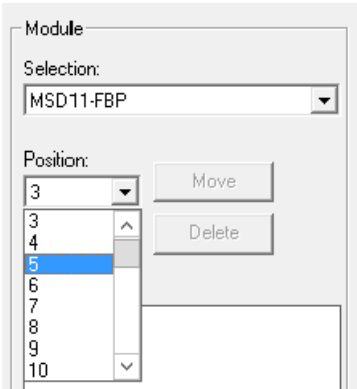


Figure 9. Position for the Specific Module



Read the device-specific documentation for detailed information about possible module types and required position. When a module with higher position number will be used, place an empty module on the lower position, if available.

Unused slots are not allowed in a configuration and if present, an error message is displayed.

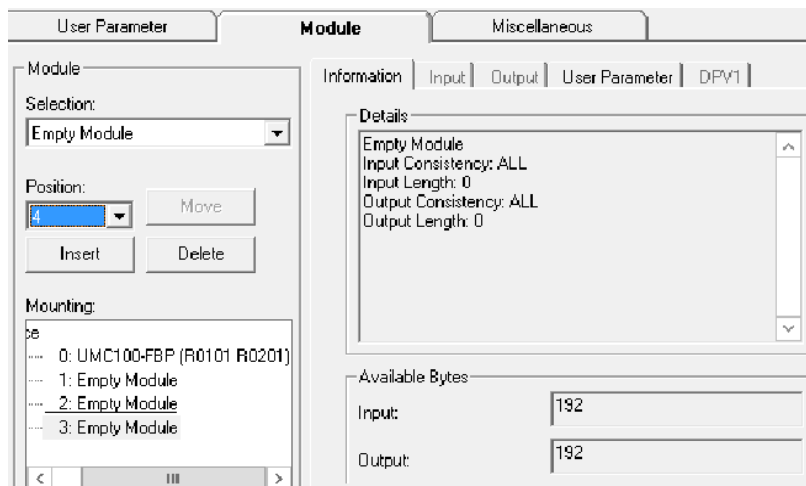


Figure 10. Selection Position window

8. Click **[Insert]** button to add the module to the device.

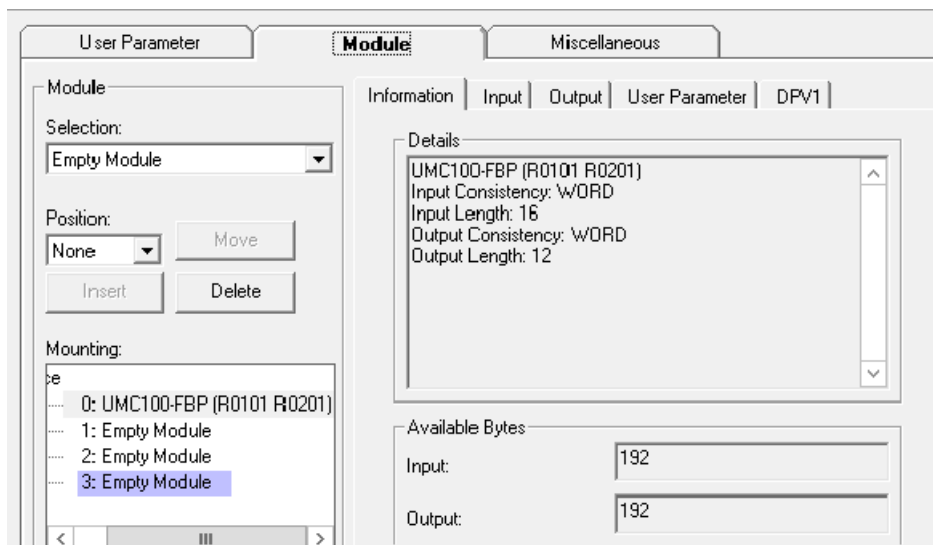


Figure 11. Information Application of a Module



After successful configuration, details of the modules and in-/output bytes available for data transmission are displayed in the **Information** tab at the *Configuration* application.

9. Repeat [Step 6](#) to [Step 8](#) till all required modules are configured.

Depending on the configured modules, input and output bytes for the measurement value and status have to be configured. The configured data will be transmitted to the frame application to establish a valid cyclic communication between the PROFIBUS master and the connected slave, for which the DTM have been configured.

10. Switch to the *Input/Output* tab.

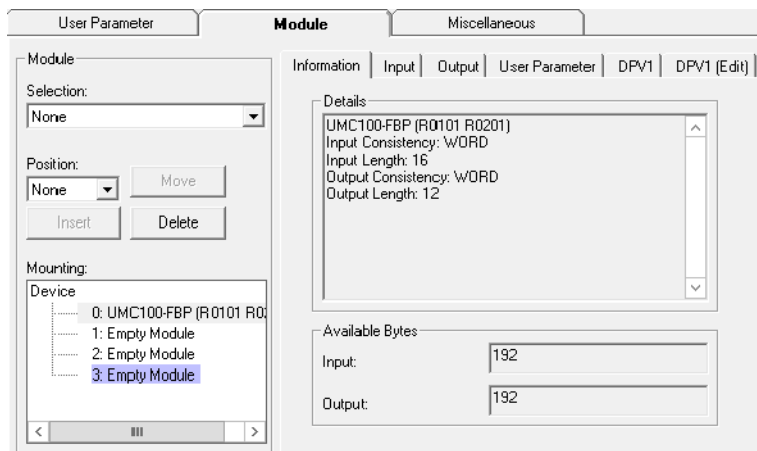


Figure 12. Module Tab with Channel Configuration

11. Configure or modify input/output channel configuration, if it is necessary. To add or remove a parameter, click with the right mouse button in the grid and select the required operation from the pull down menu.



The input/output data may be pre-configured in the GSD file. In this case default values based from the GSD file are already included. For better engineering it is recommended to change the default parameter name to the required process names.

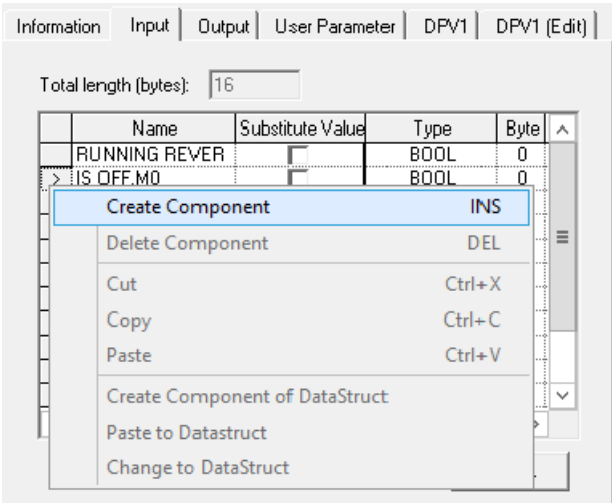


Figure 13. Configuration of Input and Output Data

- 12. A consistent configuration can be checked by clicking the [Check] button. This checks for overlapping memory areas, duplicate parameters and length of data in the currently visible DTM view. This should be done to avoid invalid or corrupt channel configuration. In case of invalid configuration a message box with a detailed error description is displayed.

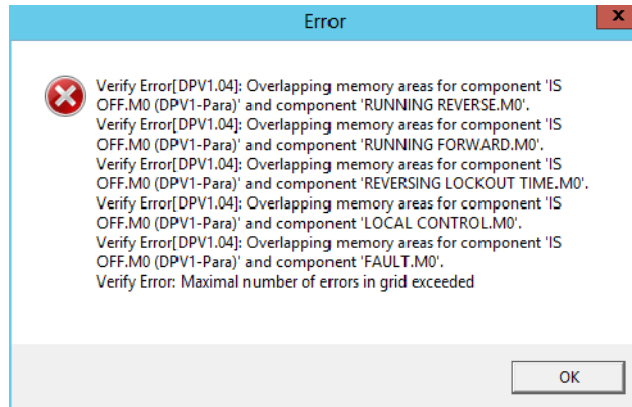


Figure 14. Error Message for Verification

13. If the check does not show errors, the configuration can be confirmed and saved to the instance data set by clicking the [**Apply**] button or [**Close**] button.



The check button verifies the entire window only, whereas the save/apply or verify button checks the complete DTM configuration before saving the configuration to the instance data set.

User Parameter Configuration

The following instructions describes the general workflow. For details of the *Configuration* application, refer to [Configuration](#) on page 66.

User parameter are included in the device-specific GSD file and allows to set initial data to the connected device. The parameter becomes valid after commissioning of the PROFIBUS master.

User parameter normally have a default set of configuration data, which allows a standard commissioning of the device. If a special device behavior/function during the commissioning phase is required (device must support this feature), the user parameter can be modified.

The Basic PROFIBUS DTM supports user parameter configuration at the device coupler (gateway) or the module type (refer to [Module Configuration](#) on page 32). Modified parameters will be set in the PROFIBUS master for initial download by confirming with **[Close]** or **[Apply]** button.

User Parameter at the device couple (Slave)

User parameter at the device coupler (slave) is the standard. Before changing the default values of the user parameters, read the user instructions of the device type carefully to know which user parameter can be modified.

1. Open the *Configuration* application of the Basic PROFIBUS DTM.
2. Select the *User Parameter* tab to open the configuration window.

Name	Value	Type	Byte	Bit	Length	Min	Max	Comment
ConstUsrPrm0	0x80	BYTE	0	0	8			
ConstUsrPrm1	0x1	BYTE	1	0	8			
ConstUsrPrm2	0x0	BYTE	2	0	8			
ConstUsrPrm3	0x0	BYTE	7	0	8			
Block-Parameter por	Use Block-Para	UINT	3	0	8	Use Bloc	Ignore Blc	0=Use Bloc
Block-Parameter por	Use Block-Para	UINT	4	0	8	Use Bloc	Ignore Blc	0=Use Bloc
Block-Parameter por	Use Block-Para	UINT	5	0	8	Use Bloc	Ignore Blc	0=Use Bloc
Block-Parameter por	Use Block-Para	UINT	6	0	8	Use Bloc	Ignore Blc	0=Use Bloc

Figure 15. User Parameter Configuration

3. Modify the parameter included in the *Value* column to adapt special device functions. If multiple parameter settings are needed, especially for configuration work during runtime, text strings and multiple parameters can be included in the *Comment* column.



If the GSD file includes multiple configuration for user parameter, the value column and the comment column contains already the parameter settings.

For example:

The user needs a configuration for start and stop of a motor. This configuration can be done via user parameter. The user includes the parameter in the comment column like “0=On;1=Off”. Now in the value column these both parameters are selectable via context menu.

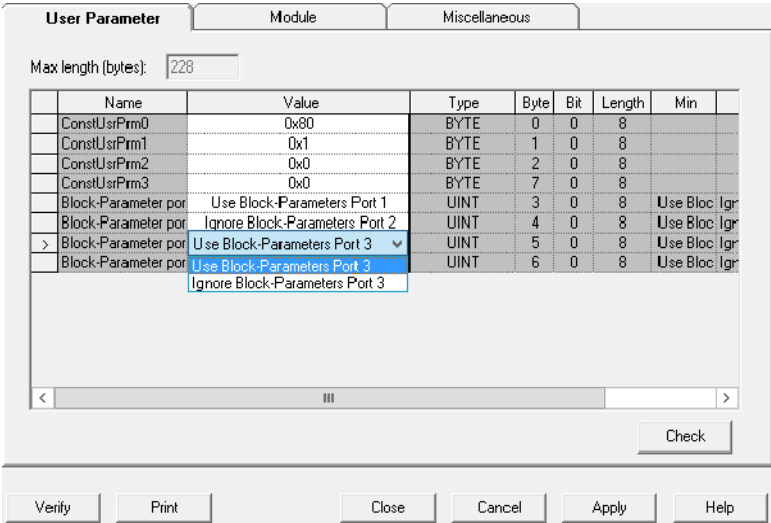


Figure 16. Multiple selection for user parameter

User Parameter at the Module

Certain device types also support an initial parametrization of the configured module type by using user parameters. The support of module related user parameter is described in the GSD file. Before changing the default values of the user parameters read the user instructions of the device type carefully, to know which user parameter can be modified.

1. Open the *Configuration* application of the Basic PROFIBUS DTM.
2. Select the *Module* tab to open the configuration window.

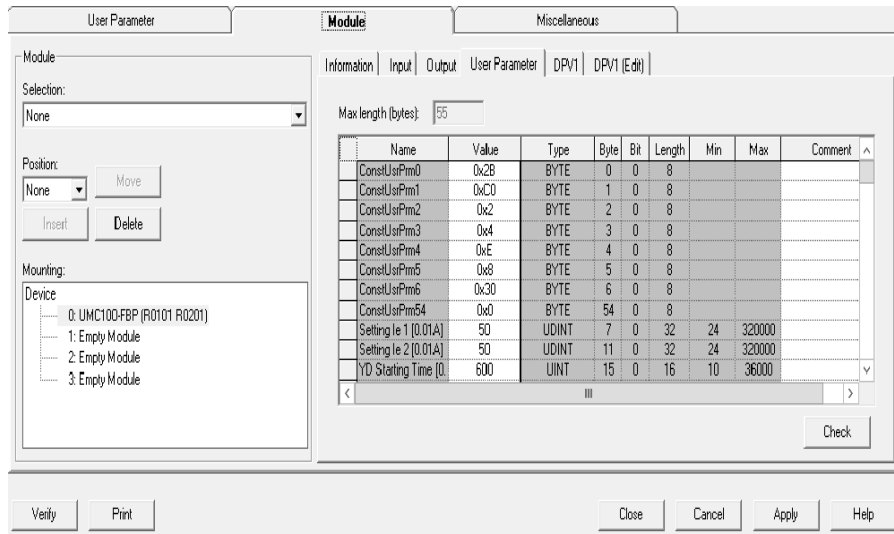


Figure 17. User Parameter at Module Type

3. Select the configured module in the *Mounting Area*. If the module type supports input/output/user parameter, the specific tab card will be enabled for usage.
4. Select the *User Parameter* tab in this application as shown in Figure 17.
5. Modify the parameter included in the *Value* column to adapt special device functions. Also refer **User Parameter at the device couple (Gateway)**.

Online Usage of the Basic PROFIBUS DTM

The device-specific Basic PROFIBUS DTM based on the GSD file alone does not allow online access to field devices, because the important acyclic DPV1 services are not available and configured. Therefore the DTM can be used in FDT frame tools/systems just to transmit the PROFIBUS master configuration with its parameter only.

To have enhanced access to connected field devices using DPV1 services, template files with those DPV1 parameter configuration is mandatory.

ABB delivered template files for specific device types via Device Integration Libraries to be used in the following ABB Systems/DCS:

- ABB Industrial IT 800xA with AC 800M Controller
- ABB Industrial IT Melody
- ABB Industrial IT Freelance 2000 with AC 800F Controller

Each system requires the FDT support, may be ordered separately from the price list. Contact the ABB Sales support for detailed information.

If device-specific templates are available, the different applications can be started via FDT frame tool by right-clicking on the device in the FDT project topology tree.

Section 3 Basic PROFIBUS DTM Application

General Overview

Most DTM applications have a graphical user interface for displaying variables, input/output parameter values or writing to the device. Certain applications (download, upload, online compare) do not require a graphical user interface. They are controlled exclusively by the FDT frame tool (DTM works in the background).

The user interface comprises a header, which is provided by the frame application. If possible, the header should contain the process point, the device name and the active application.

The DTM adds the application-specific area in the middle and two footer lines. The footer contains the standard buttons and a status bar.

The images (*screenshots*) in this document were created on a workstation with standard Windows color settings. Any other settings will result in a different image or, in extreme cases, may distort information so that it can no longer be seen on the screen.



The Basic PROFIBUS DTM additionally allows to use device-specific application, which are created by using the PROFIBUS DTM Builder. Those applications are described as *device-specific Application* in this document.

FDT Frame Tool

The DTM informs the frame application about the possible applications. The frame tool usually provides a pull-down menu for selecting an application. Depending on the user's rights or the operating state (online/offline), some applications may not be available for selection.

For more details refer to the instruction manual of the frame tool.

User Roles and Access Rights

The DTM checks the user rights when an application (Graphical User Interface) starts up. Certain users may even be barred from using some applications. If access to an application is permitted, a distinction is made between restricted access (read-only) and full access (read and write) to its functions:.

Table 1. User Roles

Application	User Roles			
	Observer	Operator	Maintenance	Planning Engineer
Administration	R	R	R/W	R/W
Identification	R	R	R/W	R/W
Configuration	-/-	R	R	R/W
Online Compare	-/-	R	R	R
Documentation	R	R	R	R
About DTM	R	R	R	R
Upload ⁽¹⁾	-/-	-/-	-/-	R/W
Download ⁽¹⁾	-/-	-/-	-/-	R/W
Registration ⁽²⁾	R	R	R/W	R/W

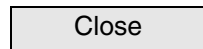
(1) Available via FDT frame tool, if supported
(2) Only required for PROFIBUS DTM Builder support

-/- = The user interface is not available for selection
R = Data output only (read)
R/W = Data input (write) and output (read)

If in addition to the roles above, a user has Administrator or OEM service rights, the role of an observer will grant the user unrestricted access to all applications.

Buttons

The following buttons are not application-specific and always have the same function.



Click the [**Close**] button to save all data and close the graphical interface. The DTM will then save the data for that application to the database and/or device.



If [**Cancel**] is clicked, the DTM will reject all data input (since the last time data was applied) and close the interface.



Click the [**Apply**] button to apply the numbers/text input and menu selections made. The DTM will save all modifications made since the last time data was applied. The interface remains open




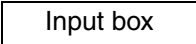
Click the [**Help**] button to access the online help for an application.

The application-specific buttons are described in the section relating to each application.

Input/Output Boxes

The input/output boxes are used to display and enter data (parameter values). Depending on the meaning of the parameter, numerical values or character strings can be entered. In some cases, these values must be selected from a list containing a fixed number of default entries.

Input and output boxes are identified by means of the background brightness. The DTM highlights the fields containing modified data. Clicking the **[Apply]**, **[Close]** or **[Cancel]** buttons and performing a save prompts the DTM to remove the highlighting.

A rectangular box with a light gray background and a thin black border. The text "Output box" is centered inside the box.A rectangular box with a white background and a thin black border. The text "Input box" is centered inside the box.

When data is entered into an input box, the DTM checks the data format, value ranges, etc. The data plausibility check can only be carried out once all data has been entered. The DTM carries out the plausibility check once the **[Apply]** or **[Close]** button has been clicked. Entries that conflict with other entries on this user interface are identified accordingly in the appropriate fields. They must be corrected before the data can be applied. Incorrect entries are displayed in **red** color.

Status Bar

The status bar at the bottom of the user interface comprises a total of three fields. The left-hand field provides the following information:

Data locked		
-------------	--	--

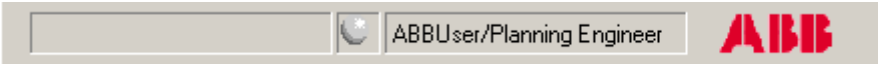


The status bar may also include other messages not described here. Those messages have been sent from higher-level DTMs like a PROFIBUS master DTM to provide additional information.

Table 2. Status Bar

Messages	Meaning
Data locked	Another user has already started an application for this device and has reserved the data record. Data can only be entered once the user has quit the application.
Start communication	The DTM tries to establish communication with the field device
Data transmission...	A request has been sent and the DTM is waiting for a reply from the field device
Stopped	The communication to the field device cannot be established. As a result the communication is stopped.

The current user name and the user role will be displayed in the right-hand field.



The field in the center of the bar contains an icon in the shape of a circle (referred to as LED in the subsequent section). Once the connection to the device is established (online mode), the LED at the middle of the status bar starts green flashing. The flashing stops, if the communication is over or no communication actions are executed.

Graphical User Applications

There are certain functions supported by the DTM, which do have a dedicated graphical user interface available via a context menu from the FDT frame tool.

After installation of the Basic PROFIBUS DTM and update of the FDT frames DTM catalog the “*ABB GPB/Placeholder*” is available as Placeholder DTM only.

The Placeholder DTM does not support any device-specific functionality, which can be established from the FDT frame tool. The main task of this DTM is to create device-specific DTMs based on the GSD file and if necessary to load a license key for enhanced functionality. The Placeholder DTM offers the following DTM applications, which are not available at device-specific DTMs based on the Basic PROFIBUS DTM:

- Administration
- Registration

The device-specific DTMs, available after inserting GSD files via Administration application, offers the following the following DTM applications:

- Identification
- Configuration
- Online Compare
- Documentation
- About DTM
- Device-specific Applications (Optional)

In the following sections each DTM application is described in detail.

Administration

The *Administration* application provides a central place for the administrator tasks like inserting / deleting GSD files, managing data paths etc.

The Administration application is accessible via Placeholder DTM only. The instance of the Placeholder DTM must be removed from the FDT/DTM project after completing the administration tasks.

The screenshot displays the Administration application window, which is organized into three main sections: Device Type, Device Data, and DTM Data.

- Device Type:** This section contains two buttons, "Insert GSD" and "Delete GSD". Below these are two input fields: "Maximal number of GSDs:" with the value "50" and "Actual number of GSDs:" with the value "6". At the bottom is a "List of used GSDs:" with a dropdown menu.
- Device Data:** This section includes "Export" and "Import" buttons. It also features two input fields: "Actual Device Type:" with the value "ABB GPB/ Placeholder" and "Version Name:" with an empty field.
- DTM Data:** This section contains three input fields: "DTM data path:" with the value "C:\Engineer IT Data\Fieldbus Builder PH\E45F28D7-C54B-4EC5-B0BF-4E1D0937F78D}", "Project data path:" with the value "C:\Engineer IT Data\Fieldbus Builder PH\DTM\PROFIBUS", and "GSD information:" with a text area containing the following text:

```
=====
;GSD File for Profibus DP (EN 50170)
=====
;
;FILENAME : Internal GSD file
;
;DEVICE : Generic PROFIBUS Device
```

At the bottom right of the window are "Close" and "Help" buttons. The status bar at the bottom shows the user "PH\800xinstaller/Planning Engineer" and the ABB logo.

Figure 18. Administration Application

Device Types Area

Device Type

Insert GSD

Delete GSD

Maximal number of GSDs:

50

Actual number of GSDs:

6

List of used GSDs:

Figure 19. Device Types Area

The Basic PROFIBUS DTM is based on the content of the GSD file, which the user needs to insert before he can use the DTM. This part of the application is assigned specifically for this purpose. The DTM reads the basic information as supplied by the manufacturer and uses it to configure the device / give options for the configuration of the device to the user.

Table 3. GSD Options

GSD Data	Description
Insert GSD	Invokes a dialog box for the user to select the GSD file he needs to insert. Once inserted the DTM stores the information of the GSD in its database and the user can then insert as many number of DTMs for that device type as he wants.
Delete GSD	Allows the deletion of the information stored for a GSD. First the required device (GSD) is to be selected in the list of used GSD.
Maximal Number of GSD	Displays the number of GSD files, currently supported by the Basic PROFIBUS DTM. Each GSD file counts as one device. A PROFIBUS PA GSD file, which will be available in two characteristics, are count as one device type.

Table 3. GSD Options (Continued)

GSD Data	Description
Actual Number. of GSD	This displays the number of the device types (GSDs) actually being used (inserted).
List of Used GSD	Displays the list of the devices whose GSDs are already inserted.



To avoid corrupt data in the DTM catalog/list of the frame application delete only GSD files from the list if it is confirmed that the device is not used in any FDT frame tool on the PC.

In case of multi-PC systems check that the GSD file, which shall be deleted, is not included in different projects.



The list of GSD will actually contain 2 entries per GSD file for a PA device inserted. One is the normal device name and the other appended with an YP0. YP0 marked files are specifically for the devices to be used with the PROFIBUS Linking Device supporting 12 Mbit/s transmission rate. Direct inserting of an “YP0” GSD file is prohibited.

The devices according to the inserted or deleted GSD files should be shown inside the library of the frame tool **after** update of the frame tool library (DTM catalog/list).

If the new inserted devices are not shown inside the library of the system, refer to the Instruction Guide of the frame tool for getting further information how to update the library. For example in some frame tools the library is updated only after closing and restarting the tool.

The user can select multiple GSD files in the dialog box to insert at the same time.

Device Data Area



The functionality (Export/Import of instance data) in the Device Data area is not supported by the DTM in this version. Use the export/import function provided by the FDT frame tool.

Device Data

Export Import

Actual Device Type:

ABB GPB/ Placeholder

Version Name

Figure 20. Device Data Area

Table 4. Device Data Area

Fields	Description
Export	Allows the user to export the complete data for this instance of DTM (device) that has been configured, into a file (extension.dtm). This includes the complete GSD information, configured modules, I/O parameters, user parameters, DPV1 parameters, user applications etc. This file can then be used via import to replicate this DTM
Import	Allows the import of the complete DTM data to replicate the DTM. Data can only been imported for the same device type as configured

Table 4. Device Data Area

Actual Device type	The actual device type used by this instance of the DTM
Version Name	The default version name used by the instance of the DTM (without builder license)

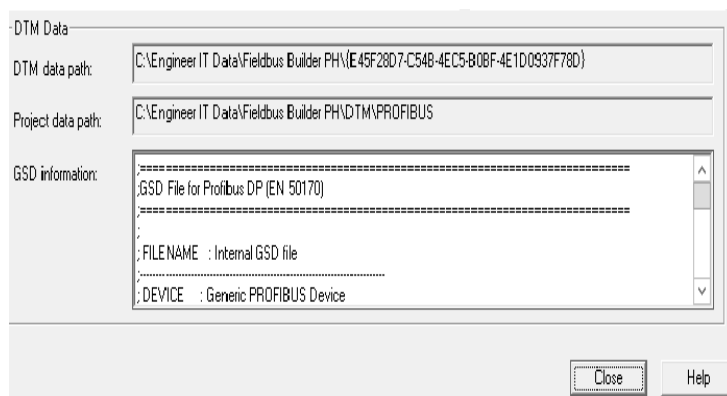
DTM Data Area

Figure 21. DTM Data Area

Table 5. DTM Data Area

Fields	Description
DTM Data Path	Displays the path used by this instance of the DTM to store device data
Project Data Path	Displays the path used by the Basic PROFIBUS DTM for the required information on the devices inserted etc.
GSD Information	The content of the actual device GSD is displayed

Registration

The *Registration* application offers a graphical view for managing particular DTM licenses. This application is accessible via Placeholder DTM only, which must be removed from the FDT/DTM project after completing the Registration tasks.

Two characteristic of licenses can be handled in this application:

- **Basic PROFIBUS DTM license**
Within this license it is possible to insert new GSD files to create device-specific DTMs. Instances of DTMs created with the basic license allows configuration for cyclic communication for PROFIBUS master.
- **PROFIBUS DTM Builder license**
This license covers the Basic PROFIBUS DTM functionality and enables additionally an editor, which allows to include DPV1 Parameter and to create device-specific applications. The builder license is associated with the computer on which the software is to be installed and operated.



Notice that the PROFIBUS DTM Builder is for ABB internal use only. For the PROFIBUS DTM Builder functionality only a limited ABB support is offered.

Licensed Product Options

☐ Basic PROFIBUS DTM

☒ PROFIBUS DTM Builder

The licensed product option is released for unlimited usage on this workplace (PC hardware). For software portation or exchange of the PC hardware please refer to the PROFIBUS DTM user instructions or online help.

Authorization

Hardware Identifier: 389808206

Registration: Valid license key present

Read License Key from File: Browse

Figure 22. Registering the license key

Identification

The Identification application provides to the user basic information about the device. This information is derived from the GSD file that is inserted in the Administration application. It consists of three tabs:

- Information
- Definition
- Bus

Information Tab

The Information Tab shows general information of the used device type.

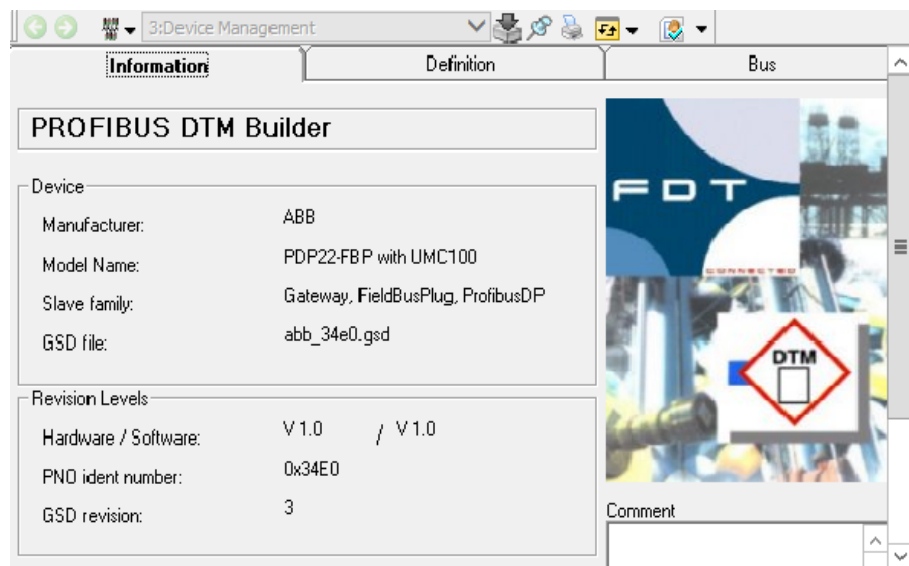


Figure 23. Information Tab

Device Area

The vendor related data are displayed.

Revision Levels Area

Table 6. vendor related data

Vendor Data	Description
Manufacturer	The Manufacturer Name
Model Name	The model of the device whose GSD used
Slave Family	The profile on which the device is based
GSD File	Name of the GSD file inserted

The device related data are displayed.

Table 7. device related data

Device Data	Description
Hardware / Software	This displays the hardware and software revision according GSD
PNO ident number	PROFIBUS identification number
GSD Revision	The GSD revision

Comments Area

Any comments or notes relating to the device can be entered in this field, which has a white background and appears underneath the image. The DTM saves the information in the corresponding instance data record.

Table 8. Comments Area

Field	Description
Comment	All characters according to the set keyboard layout. Refer to the regional options of the Window operating system.

Device Images Area

The DTM can use the device type ID (PNOID) to reference device-specific image files. The PNOID is displayed on the *Identification* application, but must be recalculated as decimal number.

Name of image file = PNOID(decimal)_0_1_9_gpb.JPG

Example:

The PROFIBUS DP device “ABB Fieldbus Plug (Quad)” has the PNOID:

“0A09” = Hex

“2569 ” = Decimal

The name of the Image is “**2569_0_1_9_gpb.JPG**”.

The images shall be stored in the *Templates* folder of the installation directory. Once a device instance has been created, the device image file is displayed instead of the default FDT/DTM logo.



For multi-user systems the image files have to be stored on every workstation on which the Basic PROFIBUS DTM is installed.

Path:

<System drive>\Program Files\ABB Industrial IT\Engineer IT\DTM\Basic PROFIBUS DTM\Templates\.....

The optimum display resolution for an image is 210 x 270 pixels. To keep file size to a minimum, the JPEG format is required.

Definition Tab

The definition Tab shows details of supported functionality of the connected device type as well as the maximum number of supported byte length and modules.

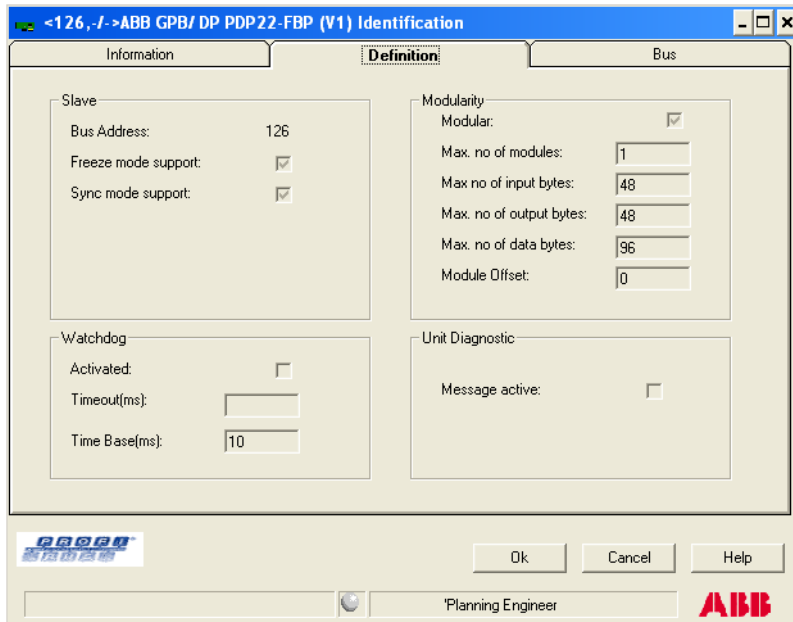


Figure 24. Definition Tab

Slave Area*Table 9. Slave Area*

Field	Description
Bus Address	This the address selected by the user when inserting the DTM. It is provided by the frame application via the parameter document. This will not be allowed to be changed by the user as it is managed by the frame application. Thus it will be simply displayed.
Freeze Mode Support	If the slave supports the freeze mode this will be enabled
Sync Mode Support	If the slave supports the sync mode this is enabled

Modularity Area*Table 10. Modularity Area*

Field	Description
Modular	If the slave is modular or a simple slave. If it is modular the box is checked
Maximum no of modules	The maximum number of the modules supported by the slave.
Max no. of input bytes	This is the maximum number of bytes allocated by the slave for input values (parameters)
Max no. of output bytes	This is maximum the number of bytes allocated by the slave for output values (parameters)
Max no. of data bytes	This is the maximum number of bytes allocated by the slave for data values (parameters)
Module Offset	Offset of the module. Here, the slot number is specified that is to appear in the configuration tool as the first slot number during configuration (used only for improved representation not within the DTM)

Watchdog Area

Table 11. Watchdog Area

Field	Description
Activated	Shows whether the watchdog is activated or not
Time out (ms)	The time in millisecond in which the watchdog expires
Time base (ms)	The time base supported by the slave in milliseconds

Unit Diagnostic Area

Table 12. Unit Diagnostic Area

Field	Description
Message Active	Shows whether Message is activated for the unit diagnostic as per the GSD file

Bus Tab

The Bus Tab particularly displays the data related to the bus parameters. The values are read from the GSD file.

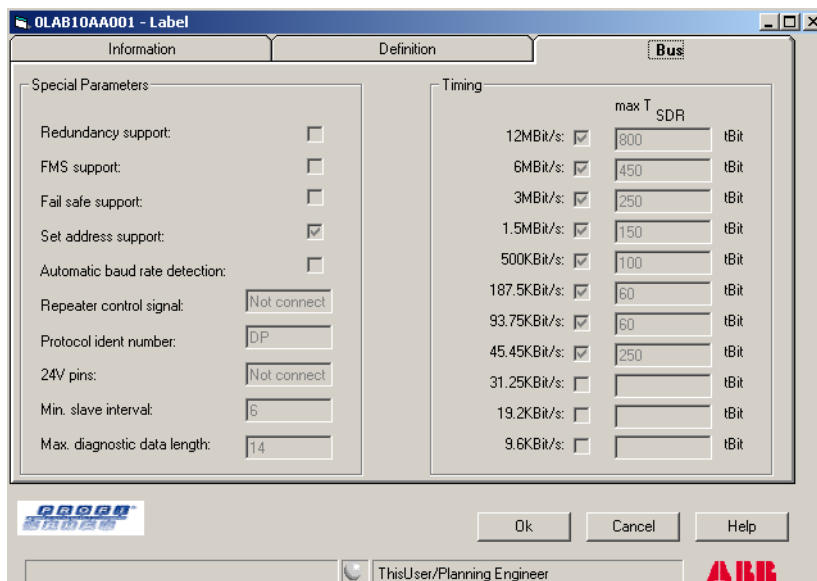


Figure 25. Bus Tab of Identification

Special Parameters Area*Table 13. Special Parameters Area*

Field	Description
Redundancy Support	Indicates whether or not the device supports redundant transfer technology
FMS Support	Indicates whether or not an FMS/DP compound device relates to the device. DP device or FMS/DP compound device
Fail safe Support	Indicates whether or not the slave accepts a data telegram without data instead of a data telegram with data. It is set to 0 in the PROFIBUS DP master class 1 CLEAR state. A data telegram without data is not accepted or a data telegram without data is accepted
Set Address Support	Indicates, whether or not the device permits bus address definition via the PROFIBUS (Function Set_Slave_Add). The bus address can only be updated directly on the device or the bus address can be updated on the device and via the PROFIBUS
Automatic Baud Rate Detection	A set of bus parameters can be calculated depending on the devices connected. There are two options for specifying the bus times. This is set by this option 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 or 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

Table 13. Special Parameters Area (Continued)

Field	Description
Repeater Control Signal	This value indicates the slot signal level CNTR-P 0 Not connected 1 RS485 2 TTL
Protocol Ident Number	This value indicates the device protocol identification. 1 PROFIBUS DP 16 ... 255 Vendor specific
24 V pins	This value indicates the meaning of the slot signals M24V and P24V 0 Not connected 1 Input 2 Output
Min Slave Interval	This value indicates the least time interval between two slave list call-ups. The time basis for the value is 100 µs
Max diagnostic data length	The maximum length (in bytes) for the diagnostic data

Timing Area

This frame lists the various transmission rates supported by the device along with the respective TSDR. With the stated transmission rate, a slave must respond at the latest within the time displayed (TSDR).

Configuration

The configuration application allows the user to configure the various DPV0 and DPV1 (if available as device-specific template file) parameters for the device. This is available only in the offline mode as the user is not allowed to make any changes in online.

It also allows configuring the modular slaves. The application is designed in a way that it allows segregating the different parameters as per the modules and also it allows the user to define the I/O data channels.

The application contains 2 additional buttons as follows:



This allows the user to check the parameters for errors. These include duplicate parameter names, overlapping memory areas etc. This check is done for all the parameters in all the tabs of this application.



The same functionality is in [**Apply**] in which the data is saved, too. By [**Verify**] the data is not saved.



This allows the user to print the persistent parameters and their values to a connected printer.

DPV1 Tab

The DPV1 Tab is visible only, if *DPV1 Parameter enabled at device coupler* is enabled in the tab card *Miscellaneous*. Only the value column of DPV1 parameter can be modified, if available as template.

Name	Value	Type	Byte	Bit	Length	API	Size	Index	Access	Load	Load seq	Pres	Min	Max	Dpc-Access	DPC-Shortname	Print	Comment
Current factor	100	UseOS	0	0	16	0	1	2	Rw	5	5	100	64000					
Current factor dummy		VisibleString	2	0	6	0	1	2	Rw	5	5							
Set current 1	50	UseOS	0	0	32	0	1	1	Rw	2	2	24	32000					
Set current 1 value		VisibleString	4	0	4	0	1	1	Rw	2	2							
Set current 1 dummy		UseOS	0	0	32	0	1	3	Rw	3	3	24	32000					
Set current 2	50	UseOS	0	0	32	0	1	3	Rw	3	3							
Set current 2 value		VisibleString	4	0	4	0	1	3	Rw	3	3							
Set current 2 dummy		UseOS	0	0	32	0	1	4	Rw	4	4	0	3					
Tip class	1	UseOS	0	0	7	0	1	4	Rw	4	4							
Tip class dummy		VisibleString	1	0	7	0	1	6	Rw	6	6	0	7					
Phase loss protection	0	UseOS	0	0	8	0	1	6	Rw	6	6							
Phase loss protection dummy		VisibleString	1	0	7	0	1	6	Rw	6	6							
Low Current Thresh	10	UseOS	0	0	8	0	1	8	Rw	8	8	1	20					
Low Current Thresh dummy		VisibleString	1	0	7	0	1	8	Rw	8	8							
High Current Thresh	30	UseOS	0	0	8	0	1	9	Rw	9	9	20	160					
High Current Thresh dummy		VisibleString	1	0	7	0	1	9	Rw	9	9							
Cooling Time	1200	UseOS	0	0	16	0	1	10	Rw	10	10	300	65000					
Cooling Time value		VisibleString	1	0	15	0	1	10	Rw	10	10							

Figure 26. DPV1 Tab



As standard (with Basic PROFIBUS DTM license) the following parameters are read-only. Parameters can be modified or created with the DTM Builder license only (OEM or ABB internal use).

Table 14. DPV1 Tab

Field	Description
Name	Name of the parameter
Value	The value in decimal notation. The 16# notation is not allowed to use here. Can be modified with the Basic DTM license.

Table 14. DPV1 Tab (Continued)

Field	Description
Type	The data type (PROFIBUS data types) to be selected from the drop down list
Byte	The byte position of the first byte within a structured byte field
Bit	The bit position of the first bit within a structured bit field
Length	The total length in bit or byte depending on the data type of the parameter
API	This is another form of addressing used along with slot and index. Thus a space is provided for the user to enter the API value, which can be used for the parameters. This value will only be used during connect and disconnect to a device
Slot	The position of the parameter in the device
Index	The index of the parameter in the specified slot
Access	The type of access read/write selectable via a drop down list
Load	The value <i>Load</i> is to identify whether the parameter is loaded with the operation download or not.
Load Sequence	This is used to define the sequence in which the parameters are loaded via the download functionality. The value entered is taken as the sequence. In case of a structured parameter the sequence of the header is the same as the sequence of the parameters contained
Persistent	Persistent data is stored within the database of the frame application.
Min Value	The minimum value the parameter can have
Max Value	The maximum value the parameter can have
OPC Access	Whether the parameter is accessible via OPC Server PROFIBUS/HART (only available in the Device Management of 800xA Systems)

Table 14. DPV1 Tab (Continued)

Field	Description
OPC Short Name	The short name of the OPC variable
Visibility	The parameter can be viewed based on the selected visibility value. The visibility values are Visible, Hidden and Online Visible (only available with PROFIBUS DTM Builder license).
Print	Prints the selected parameters
Comment	A free text that a user can enter for his reference

There are few additional buttons available on the grid.



The **[Check]** button checks only the DPV1 parameters while **[Verify]** button does it for the entire application for all the parameters (I/O, user parameters DPV1 etc.). Neither of them saves the data. Data is saved only by the **[Apply]** and **[Close]** buttons.

Table 15. Additional Buttons

Buttons	Description
Check	It checks for the correctness of the parameters added. This includes checking for duplicate names, memory overlapping areas etc.
Import	Allows the user to import an xml file containing the list of parameters (only available with PROFIBUS DTM Builder license).
Export	Allows the user to export the configured set of parameters to an xml file which can be used at a later date or for other devices (only available with PROFIBUS DTM Builder license).

The grid is locked when the license is not set to PROFIBUS DTM Builder or the imported DPV1 parameter file is a read-only file or the user does not have sufficient rights. In this case only the data in the *value* column are changeable.

For **Bulk Data Management** it is possible to insert the new values for the parameters in the grid and set the load flag and then download all these values into the device in one group.

User Parameters Tab

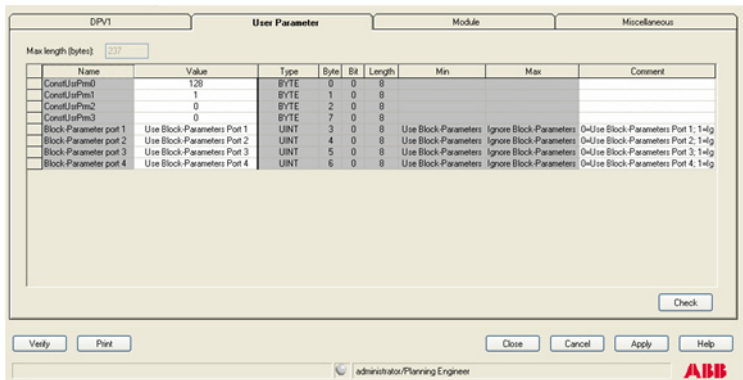


Figure 27. User Parameters in Parameter

The User Parameter Tab displays a grid, which is populated with the parameters defined in the GSD file. The user cannot define own parameters. The specific information for the user parameters of the device is available from the device manual (documentation).

The various values that need to be configured for each user parameter are also shown. The data types available are the basic PROFIBUS data types. These can be configured using the drop down list.

The *Value* column is provided for the user to enter the value for the user parameter. If multiple parameter settings are needed, especially for configuration work during runtime, text strings and multiple parameters can be included in the *Comment* column.

Max Length Byte displays the size of the parameter of the longest module.



If the GSD file includes multiple configuration for user parameter, the value column and the comment column contains already the parameter settings.

Example:

The user needs a configuration for use and ignore of block parameters. This configuration can be done through the user parameter. The user includes the parameter in the comment column like "0=Use Block parameters port; 1= Ignore Block parameters port ". Now, in the value column these both parameters are selectable through context menu.

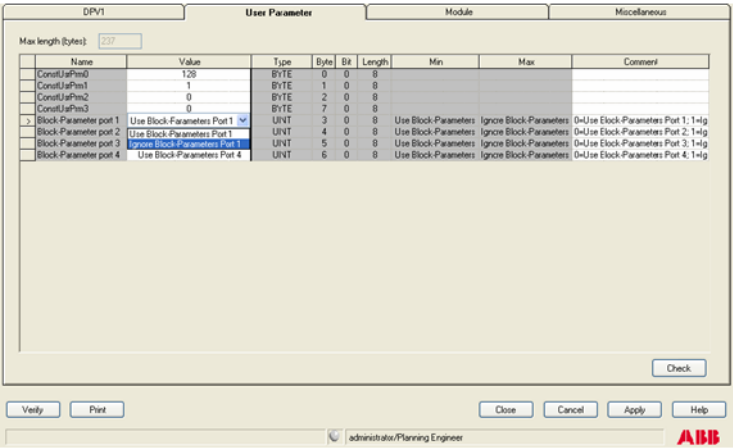


Figure 28. Multiple selection for user parameter

In brief the following attributes are required to be supplied for each parameter:

Table 16. User Parameters Tab

Field	Description
Name	Name of the parameter (not modifiable in the first version)
Value	The value in decimal notation. For date type <i>Octet String</i> use value notation like <i>0A11</i> . The <i>16#</i> notation is not allowed to use here.
Data Type	The data type (PROFIBUS data types) to be selected from the drop down list (not modifiable)
Byte	The byte position of the first byte within a structured byte field (not modifiable)
Bit	The bit position of the first bit within a structured bit field (not modifiable)
Length	The total length (not modifiable)
Min	The minimum value a parameter can have
Max	The maximum value a parameter can have
Comment	A free text that a user can enter for his reference

Module Tab

The module tab is specifically meant for the modular device. It allows the user to enter the modules at different positions and define the input/output parameters.

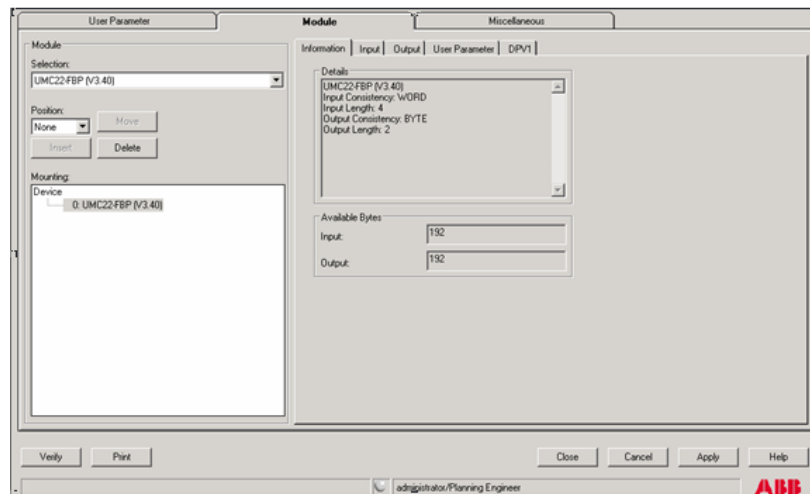


Figure 29. Module Tab in Configuration

On the left the drop down list *Selection* displays a list of the modules available for the device (this information is as per the GSD file and cannot be modified). After selecting the module the user can select the position to which the module is assigned and can then use the **[Insert]** button to insert the module.

On a successful insertion the details of the module are displayed in the right side *Information*. This is the description as provided by the manufacturer in the GSD

file. At the bottom right the available number of bytes for input/output is displayed (again as defined by the manufacturer in the GSD file).

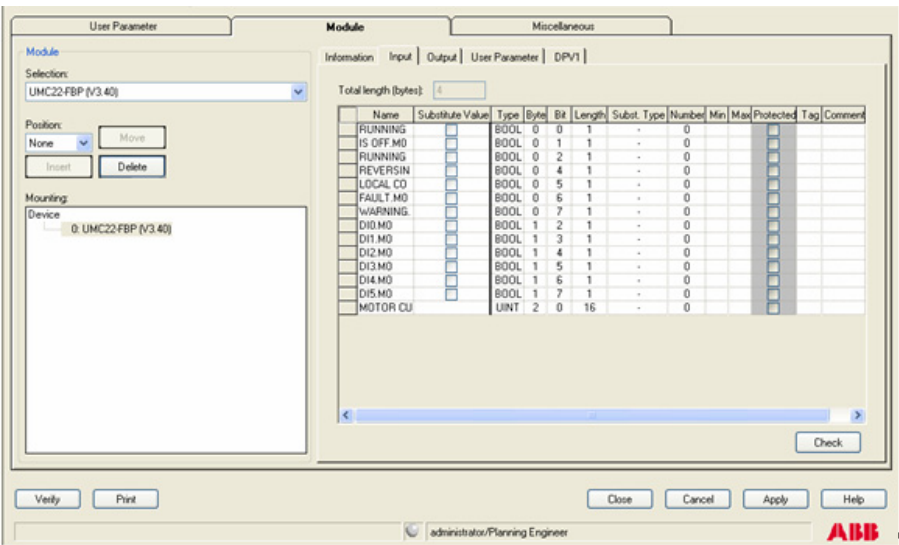


Figure 30. Module Tab in Configuration: Channel Configuration

If the number of bytes (input/output) is greater than zero, the user can select the input/output tabs respectively. The top of the tab displays the total number of bytes that can be configured for the same module. The grid available is similar to the DPV1 grid with the following fields:



For modules, supporting extended identifier format, the initial channel configuration is automatically done by the DTM. This configuration can be modified by the user. This modification will be saved and is included for further module configuration of the same device type.



Without channel configuration the DTM does not provide the configured modules to the FDT frame tool. To provide a PROFIBUS master configuration via Basic PROFIBUS DTM, at least one module configuration must be done.

Table 17. Module Tab

Field	Description
Name	Name of the parameter
Substitute Value	In case of any errors (also in the communication) the value entered here is taken as substitute value.
Type	The data type (PROFIBUS data types) to be selected from the drop down list
Byte	The byte position of the first byte within a structured byte field
Bit	The bit position of the first bit within a structured bit field
Length	The total length
Number	A number from 1 to 64 to identify the channel for the diagnosis. 0 is the default value. Channel diagnosis is device-specific and should be available from the device vendor, e.g. in the device-specific user instructions. For more details get in contact with your device supplier.

Table 17. Module Tab (Continued)

Field	Description
Protected	Whether the channel is protected by channel assignment in the frame application or not. This flag can be set by the frame application only.
Tag	A meaningful tag attached to the channel. If nothing is inserted the default name of the channel is taken.
Comment	A free text that a user can enter for his reference

The Input, Output, and the User Parameter tab are similar in nature. They allow the user to enter the output and input parameters and user parameters specific to this module. The user parameters are read from the GSD file and only the value of the parameter can be changed.

If the DPV1 parameter for module configuration is enabled in the Miscellaneous tab, additionally this DPV1 parameter tab is visible in the module tab. The configuration can be done for each module individual.

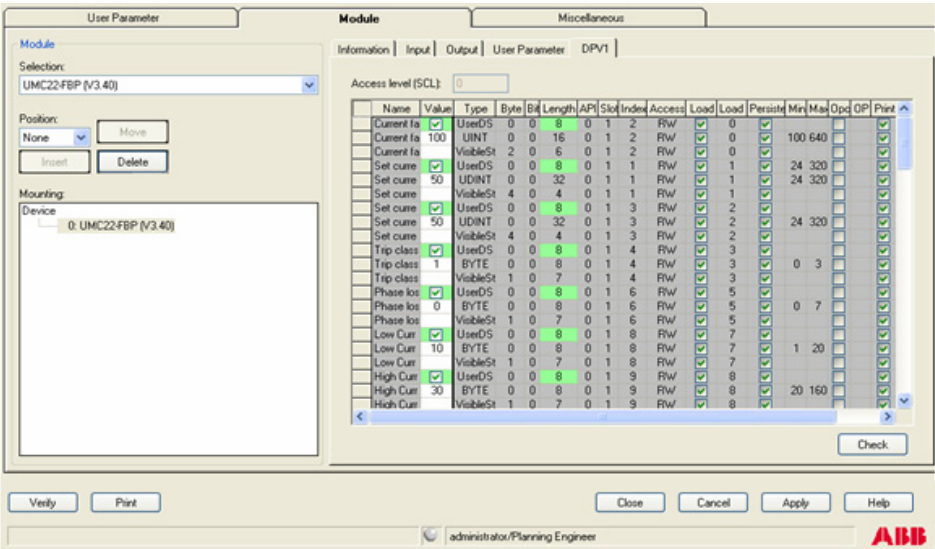


Figure 31. Module DPV1 Tab

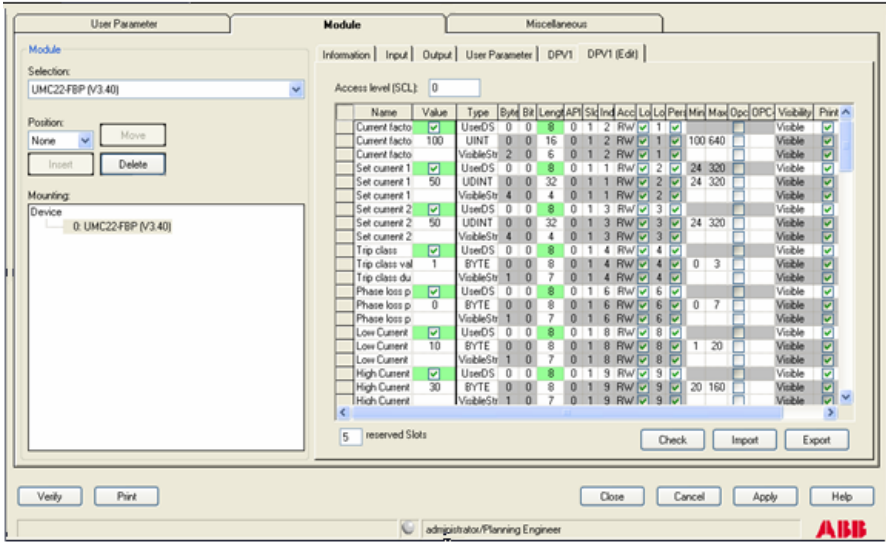


Figure 32. Module DPV1 Tab with Builder License

The **[Check]** button at the lower end can be used to check for the overlapping memory areas, duplicate parameters and length of data.



To avoid corrupt data it is not possible to save the module configuration of the DTM until channel names are unique. A message is presented to the user to inform him about duplicate names he has to change before data is saved by **[Close]** or **[Apply]**.

Miscellaneous Tab

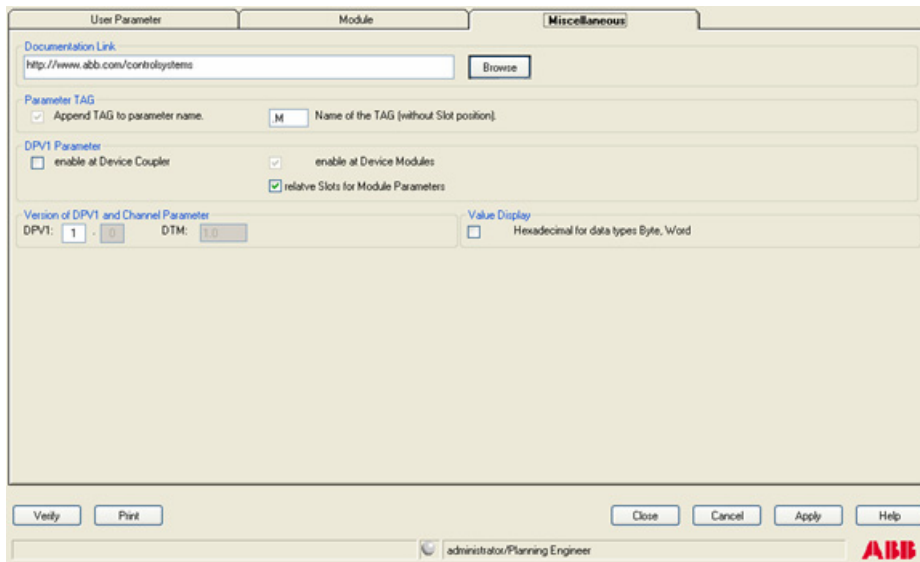


Figure 33. Miscellaneous Tab in Configuration

This tab allows the following configuration:

- Configuration of a specific user documentation link
- Automatic appendices of a TAG to parameter names
- Activation of DPV1 parameter tabs (only for PROFIBUS DTM Builder)
- Version designation for template files (only for PROFIBUS DTM Builder)
- Adjustment of display view

Documentation Link Area

The user has the possibility to insert a link, which can refer to the specific device user documentation. A link can refer to a product documentation on the harddisk (e.g. pdf file) as well as web links. The link is saved by clicking the [**Apply**] button. The inserted link can be opened via *Documentation* application selectable in the DTM menu.

Parameter TAG Area

Enabling the check box will map the given TAG name as a suffix to the specific parameter name in the Module tab. This can be done for all channels as well as for the DPV1 parameter if applicable. Suffix needs to have also a separator, recommended is a “.”.

For example:

TAG name is “.M”. Then the channel name for the specific channel from the module on position 2 is “ChannelName.M2”



The channel number is automatically appended to the suffix name.

DPV1 Parameter Area

To activate DPV1 parameter tabs, either for the complete device or for each single module, the DPV1 support must be enabled in the Miscellaneous tab.

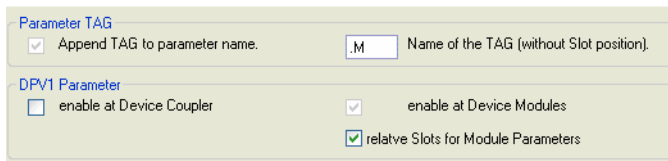
Use the check boxes in the DPV1 Parameter frame to enable the certain tabs.

When the *enable at Device Coupler* check box gets selected, it activates the DPV1 parameter tab for the complete device. After activation, a new tab card is visible as shown in the Configuration application.

A screenshot of a software configuration window titled 'Parameter TAG' and 'DPV1 Parameter'. The 'Parameter TAG' section has a checkbox 'Append TAG to parameter name.' which is unchecked, and a text input field 'Name of the TAG (without Slot position)'. The 'DPV1 Parameter' section has three checkboxes: 'enable at Device Coupler' (checked), 'enable at Device Modules' (unchecked), and 'relative Slots for Module Parameters' (unchecked).

Figure 34. Enable at Device Coupler

When the *enable at Device Module* check box gets selected. it activates the DPV1 parameter tabs for the modules inside the Module tab.



The screenshot shows a configuration window with two sections. The 'Parameter TAG' section has a checked checkbox 'Append TAG to parameter name.' and a text box containing '.M' with the label 'Name of the TAG (without Slot position)'. The 'DPV1 Parameter' section has an unchecked checkbox 'enable at Device Coupler', a checked checkbox 'enable at Device Modules', and a checked checkbox 'relative Slots for Module Parameters'.

Figure 35. Enable at Device Module



DPV1 Parameter can be activated with the PROFIBUS DTM Builder license only. If already DPV1 parameters are included in the DPV1 grid (via template files from the device vendor), the tab cannot be deactivated.

Value Display Area

If the check box is marked, all parameters of data type Byte, Word or DWord are displayed in hexadecimal notation e.g. 16#0A in the following applications:

- Observation (only available with DTM Builder license)
- Parametrization (only available with DTM Builder license)
- device-specific applications (Templates, if applicable)

Version of DPV1 and Channel Parameter Area



Version designation can be changed with the PROFIBUS DTM Builder license only.

Each saved parameter file of the DTM Builder contains two version information:

- A major version, which offers the possibility to create different XML files for the same device type (PNO ID).
- A minor version, which includes a version information in the existing XML file. Only the internal version information is changed to the adjusted number.

Changing the major version results in a new XML file of the specific device type. Change the major version, if new functionality is available for a device type with the same PNO ID.

The minor version saves the version information in the existing XML file. The minor version helps to have an internal versioning, if changes of the XML file have been performed.



Minor version cannot be modified by the user. A configuration change results in a new minor version inside the XML file.

Online Compare



The Online Compare application includes parameter only, if DPV1 templates are available for the specific device type. Otherwise this application does not provide any data to read and compare data of the connected device type.

Online compare allows to identify the difference between the values residing in the instance database of the FDT frame tool and the device. Instance database is the storage place that is used by the DTM to store the persistent parameters.

The user can invoke online compare to compare the values in the local database and the device.

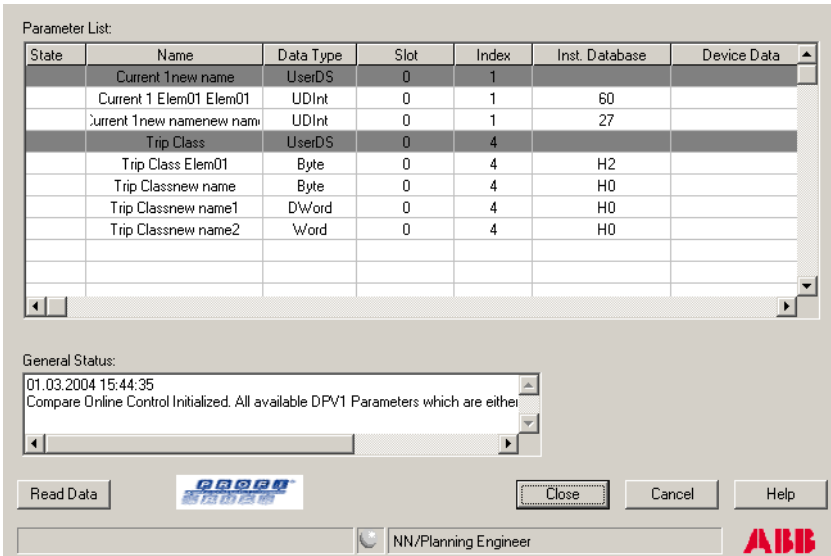


Figure 36. Online Compare

As the figure shows, the user gets a list of the DPV1 parameters configured (only readable and persistent). Their data type, slot and index are shown, too. The next two columns are for the local data and device data. Of course, the device data is

empty as of now as the user needs to fire a read to get all the values from the device (via the **[Read Data]** button). The general status box displays the status of the read.

Once the connection is established the LED in the centre of the status bar flashes. Once the values are read they are displayed in the device data column.

If the values of the two columns (instance data and device data) differ, the extreme left column “State” highlights it via an icon. This is shown in the following figure.

Parameter List:

State	Name	Data Type	Slot	Index	Inst. Database	Device Data
	Current 1 new name	UserDS	0	1		
!	Current 1 Elem01 Elem01	UDInt	0	1	60	50
	Current 1 new namenew name	UDInt	0	1	27	27
	Trip Class	UserDS	0	4		
	Trip Class Elem01	Byte	0	4	H2	H2
	Trip Classnew name	Byte	0	4	H0	H0
	Trip Classnew name1	DWord	0	4	H0	H0
!	Trip Classnew name2	Word	0	4	H0	H1B

General Status:

01.03.2004 15:51:41
Read Request complete

Read Data

Close Cancel Help

Read Request complete NN/Planning Engineer

Figure 37. Online Compare: Result



The values must have been downloaded at least once for the online comparison to be successful. Also the parameter configuration should be identical to the one existing in the device, if not then online compare will not succeed.



The comparison of float values takes into account a band of 1% for them to be assumed equal.

This application does not allow any editing.

Documentation

Refer to [Miscellaneous Tab](#).

About DTM

For general information directly related to the product software, select the *About DTM* menu item. It contains all the information needed to identify the Basic PROFIBUS DTM software version and user data entered during software installation.

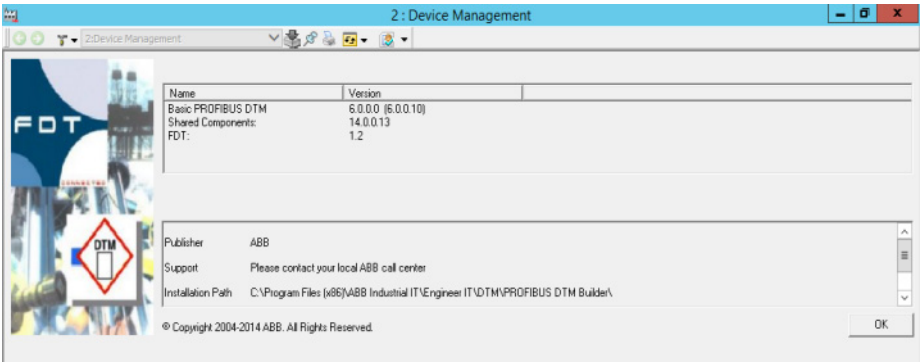


Figure 38. About DTM

Name/Version

For any queries about the product, it is essential to provide the name of the internal software component and the version. The build indices in brackets are also important.

Table 18. About DTM

Component	Description
Basic PROFIBUS DTM	Version and build index of the <i>Basic PROFIBUS DTM</i>
Shared Components	Version and build index of the <i>FDT Shared Component</i>
FDT	The DTM was developed in accordance with specification FDT1.2

Details

This field contains important information about DTM vendor, support, installation path and the licensee, which was entered during installation.

Device-specific Applications (Optional)

As described in this document the Basic PROFIBUS DTM can be extended with device-specific applications, based on template files. These applications are available for the user according to the user rights and online/offline mode of the DTM.

If the DTM starts and it detects such a device-specific application for a device in the template pool, it will provide this application accessible as a function of its DTM.

Example for a user defined application in offline mode:

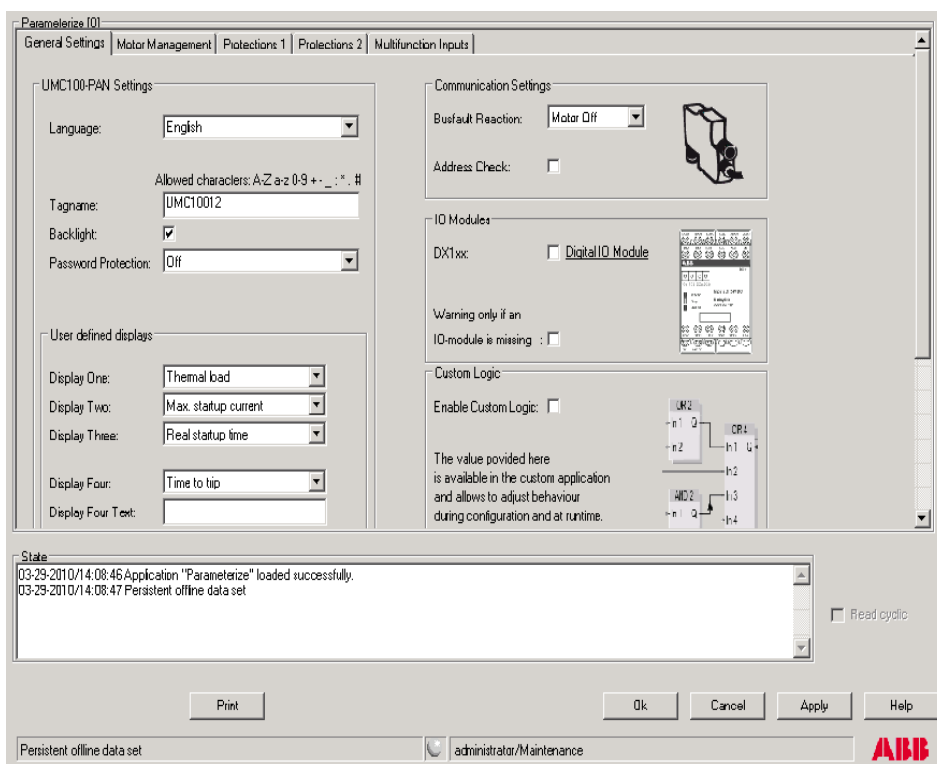


Figure 39. User Defined Application (Offline Mode)

In offline mode the device-specific application will start with the last stored values for the persistent data. Here the user can now change these default values and store them to the device instance database. The parameter in the instance database can be written to the device either by a download or a write action. For download or write action the DTM must be switched to online mode.

Example for a device-specific application in online mode:

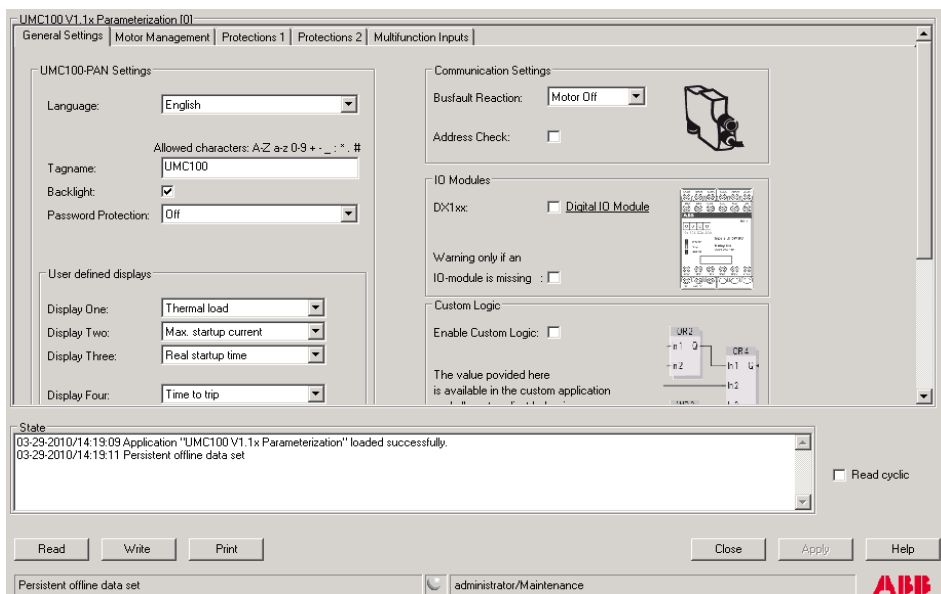


Figure 40. User Defined Application (Online Mode)

The online view of device-specific applications offers two buttons to read or write device data. If DPV1 parameters are read-only parameters the value field is disabled and greyed.

Furthermore each application view offers a check box to enable cyclic read access. The interval of the cyclic read is 5 seconds. This interval is automatically recalculated and extended if all the values cannot be read in 5 seconds.

FDT Interface Support

This section contains a list of functions supported by this DTM, which is specified in the FDT specification as interface description.

OPC Access

If the OPC access flag within the DPV1 parameter grid is set, these parameters can be accessed from the ABB OPC Server PROFIBUS/HART (only available in ABB 800xA Systems).

The OPC Server will request a list of accessible DPV1 parameters from the DTM, then it will start the reading and/or writing of these parameters.

Print

If supported by the frame application, the DTM allows the user to print out the actual set of persistent stored data and their actual values.

Audit Trail

For purposes of data logging within the frame applications audit trail function, the DTM provides in offline mode as well as in online mode the changed data with time stamp and user information. Additionally the start and end of complete functions such as download and upload of the device are logged.



The frame application has to provide the optional FDT audit trail to use this function of the DTM.

Export/Import

For purposes of data export and import of the DTM from one project to another project of the same frame application, the DTM provides the functions export and import for the frame application.

The important data of the DTM are exported to a data stream, which is under control of the frame application and imported from this stream.

Appendix A Data Types



Data Types requiring parameter sets are limited to ASCII 0 - 255 only. This mainly includes letter (small / capital) and numbers.

1. **Unsigned8 (Byte)**
See DPV1-Ext., 10.5.1.2 (Code 5).
Value Range: 0 ... 255
2. **Unsigned16**
See DPV1-Ext., 10.5.1.2 (Code 6).
Value Range: 0 ... 65535
3. **Unsigned32**
See DPV1-Ext., 10.5.1.2 (Code 7).
Value Range: 0 ... 4294967295
4. **Real**
See DPV1-Ext., 10.5.1.3 (Code 8).
Value Range: refer to IEEE Std 754 Short Real Number (32 bits).



In case the number read from device is an *Infinity* or *Not a Number* it is displayed

H7FFFFFFF For +QNAN or +Infinity

HFF7FFFFFFF For -QNAN or -Infinity

Additionally a message is displayed in the general status box as +QNAN error with the parameter name

5. **VisibleString**
See DPV1-Ext., 10.5.1.4 (Code 9).
VisibleString is a field of characters. All characters must be less than 0x80.

6. **OctetString**

See DPV1-Ext., 10.5.1.5 (Code 10).

OctetString is a field of characters. All characters have no limit in range.

7. **Word**

Value Range: 0 – HFFFF

8. **Dword**

Value Range: 0 - HFFFFFFFF

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