

GX Configurator-DP 7

Configuration System
for Open Networks

User Manual

MELSOFT PROFIBUS CommDTM

About this Manual

The texts, illustrations, diagrams, and examples in this manual are only intended as aids to help explain the functioning, operation, use, and programming of the open network configuration system **MELSOFT GX Configurator-DP** and **MELSOFT PROFIBUS CommDTM**. Separate manuals are available for MITSUBISHI ELECTRIC's various series of MELSEC programmable logic controllers.

This manual is only intended for users with experience in handling automation and communication networks. For using and usage of this software only the user his own is responsible.

If you have any questions regarding the installation and operation of the software described in this manual, please do not hesitate to contact your sales office or one of your Mitsubishi distribution partners. You can also obtain information and answers to frequently asked questions from our Mitsubishi website under www.mitsubishi-automation.com.

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The IEC 61131.1 standard cited in this manual is available from the publishers Beuth Verlag in Berlin (Germany).

**User's Manual for
MELSOFT PROFIBUS CommDTM
Art. no.: 165890**

Version	Changes / Additions / Corrections
A 08/2005 ME	First issue

Typographic conventions

Use of notes

Notes containing important information are clearly identified as follows:

NOTE

| Note text

Use of examples

Examples containing important information are clearly identified as follows:

Example ▾

Example



Numbering in figures and illustrations

Reference numbers in figures and illustrations are shown with white numbers in a black circle and the corresponding explanations shown beneath the illustrations are identified with the same numbers, like this:

① ② ③ ④

Procedures

In some cases the setup, operation, maintenance and other instructions are explained with numbered procedures. The individual steps of these procedures are numbered in ascending order with black numbers in a white circle, and they must be performed in the exact order shown:

① Text

② Text

③ Text

Footnotes in tables

Footnote characters in tables are printed in superscript and the corresponding footnotes shown beneath the table are identified by the same characters, also in superscript.

If a table contains more than one footnote, they are all listed below the table and numbered in ascending order with black numbers in a white circle, like this:

① Text

② Text

③ Text

Character formatting and orientation aids

Menu names, menu commands, submenu commands, and dialogue box options are printed in **boldface** type. Examples: The menu item **New** in the menu **Project** or the options **PLC interface** and **Computer Link** in the dialogue box **Transfer-Setup**.

Please keep this manual in a place where it is always available for the users.

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1 Introduction

1.1 FDT/DTM Architecture

The Field Device Tool (FDT) technology has the objective of allowing flexible combinations of software components from different vendors for configuration and diagnosis of devices with fieldbus interfaces. It is based on the concept of drivers known from the office world, where e.g. a printer with the appropriate driver can be accessed by any word processor, without that the word processor knows the printer type or the printer knows the word processor. While the FDT concept is independent of the specific type of fieldbus, it is mostly used in combination with PROFIBUS.

There are mainly three types of components

- The **CommDTM** is a communication driver, typically for accessing a PROFIBUS master.
- The **DeviceDTM** contains the user interface with configuration and diagnostic functions for a specific field device. It requires a CommDTM to communicate with the device.
- The **FDT container** is part of a standalone application, called the **FDT framework**, and provides the framework in which both the CommDTM and the DeviceDTM are executed. The DTMs can usually not run on their own. The FDT container also offers other services like printer access, project saving and loading etc.

CommDTMs can be layered to represent a communication network consisting of several layers with different protocol. One CommDTM can for example provide access to the PROFIBUS master via Ethernet, while another CommDTM covers the communication between the master and a specific slave. The DeviceDTM for a module of that slave is then connected to the last CommDTM, using a standardized interface, which hides the underlying layers. This modular structure makes the DeviceDTM independent of changes in the communication layer.

CommDTMs, which serve as a bridge between different protocol layers, are typically called **GatewayDTMs**.

1.2 The CommDTM for QJ71PB92V

The MELSOFT PROFIBUS CommDTM is a Communication Device Type Manager (CommDTM), conforming to the Field Device Tool (FDT) specification version 1.2. It can be used with the QJ71PB92V PROFIBUS Master module for the Mitsubishi Q series PLC.

The QJ71PB92V can act as a Class1 and as a Class2 master. The CommDTM for the QJ71PB92V provides access to the MSAC2 interface of the master module. The CommDTM handles the connection to the PLC with the PROFIBUS master and the acyclic service requests, which are generated by another CommDTM or a DeviceDTM. It supports the PROFIBUS DP services CONNECT, DISCONNECT, READ, WRITE and ABORT for class2 master-slave acyclic communication (MSAC2). It also supports the 'Set Device Station Address' service to modify the FDL address of a PROFIBUS DP slave device.

MELSOFT PROFIBUS CommDTM is implemented as a Dynamic Link Library (DLL) (COM component) and cannot be started as a stand-alone application. Instead it is loaded into a FDT frame application like FieldCare.

2 Before you start

2.1 More Information

Before using the MELSOFT CommDTM, you must have installed an FDT framework compatible with FDT specification 1.2 and should be familiar with its operation.

The FDT/DTM specifications and additional documentation is available from PROFIBUS International at <http://www.profibus.org>

For information on the QJ71PB92V PROFIBUS master module, please consult the corresponding hardware manual.

2.2 Hardware Setup

The QJ71PB92V module must be inserted into a Q-series PLC rack. No special PLC program is required in order to use the CommDTM. However prior to using the CommDTM the QJ71PB92V must be configured with bus parameters by downloading a configuration from GX Configurator-DP.

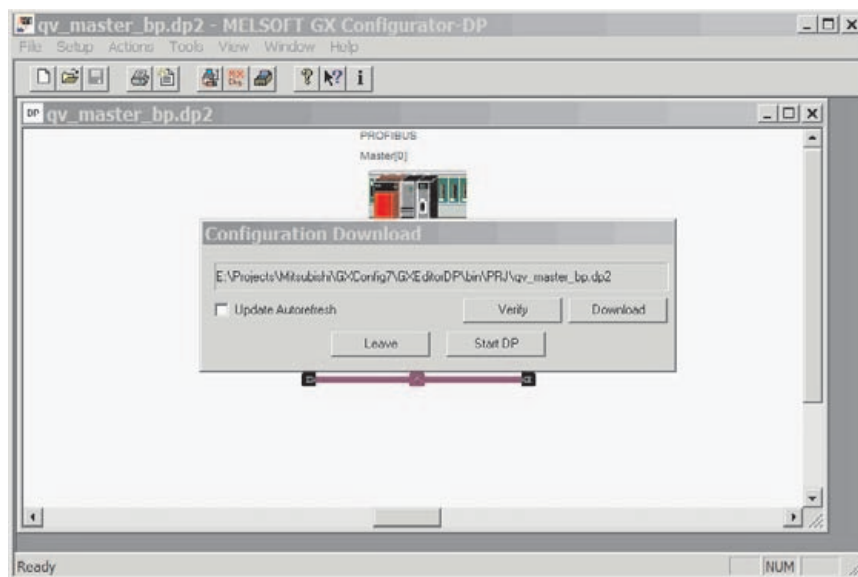


Fig. 2-1: Download of bus parameters in GXDP

3 System Requirements

3.1 Hardware Requirements

- Minimum Pentium II 350 MHz Processor
- 32MB RAM for MS Windows 98/Windows Me
- 64 MB RAM for MS Windows NT 4.0, Windows 2000 or Windows XP
- VGA compatible graphics adapter
- 17"/43 cm diag. VGA monitor
- at least 100 MB free hard disk space
- CD-ROM drive
- a serial port or other supported communication interface (USB, Ethernet) for communication with the PLC system

3.2 Software Requirements

- Windows 98 or Windows Me
- Windows NT 4.0 (at least service pack 6)
- Windows 2000 (at least service pack 2)
- Windows XP Home or Professional Edition

It is recommended to use Windows 2000 or Windows XP.

NOTES

On all platforms except Windows XP Internet Explorer 5.5 and Microsoft Installer 2.0 must be installed.

On all platforms Easysocket 8.63 and DNavI 3.41 must already be installed, e.g. by installing the latest version of GX Configurator-DP.

3.3 Copyright

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4 Installing and Uninstalling the MELSOFT PROFIBUS CommDTM

4.1 Software Installation

The installation of the CommDTM is started by double-clicking the corresponding msi-file. This starts the Microsoft Installer program, which then processes the msi-file.

To avoid conflicts with access rights, the user must select to install the CommDTM software for 'Everyone'.

Please select an empty directory for installation of the CommDTM. **Do not install the CommDTM into the same directory as GXDP!**

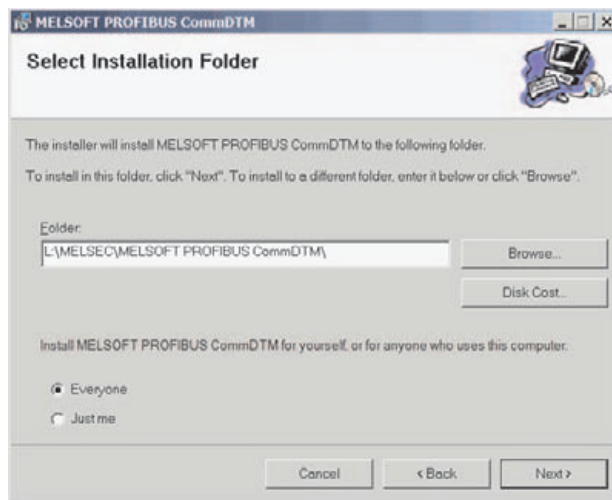


Fig. 4-1:
Installation dialog for MELSOFT PROFIBUS CommDTM

4.2 Uninstallation

Open in the control panel the 'Add/Remove Programs' system dialog and select the entry for 'MELSOFT PROFIBUS CommDTM'. If you select 'Remove', the CommDTM is uninstalled. If you select 'Change', the following dialog is displayed, offering either to repair or to uninstall the CommDTM.

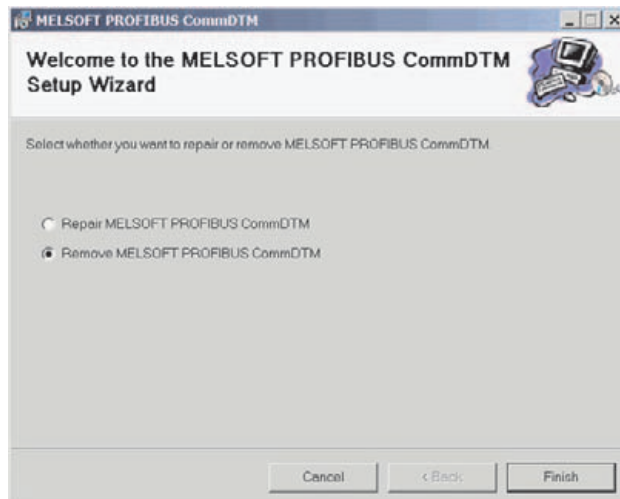


Fig. 4-2:
Dialog when selecting 'Change' in 'Add/Remove Programs'

5 Using the CommDTM

The CommDTM can only be used within an FDT application, which must conform to the FDT specification version 1.2. To better illustrate the use of the CommDTM, the following description uses the FDT application FieldCare from Endress & Hauser as example for an FDT application. The operation in other FDT frameworks may differ in certain aspects.

5.1 Update DTM Catalog

To use the CommDTM in FieldCare the DTM catalog has to be updated first. This is done by selecting **Update...** in the **DTM Catalog** menu.

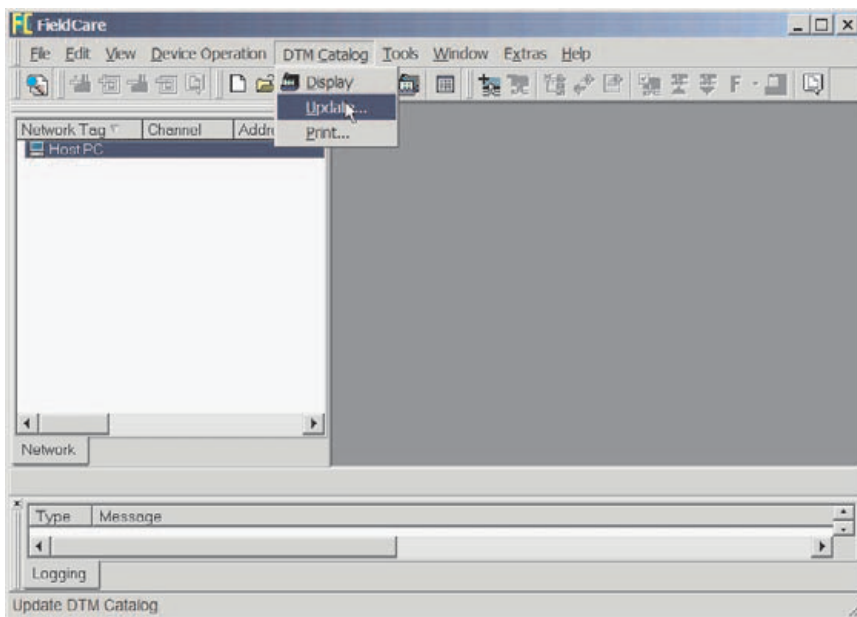


Fig. 5-1: Selecting Update DTM catalogue in FDT application FieldCare

After clicking on **Update** the catalogue is being updated. When the update has been successful the new or updated device in the left window has to be selected and moved into the right window by clicking on **Move >>**.

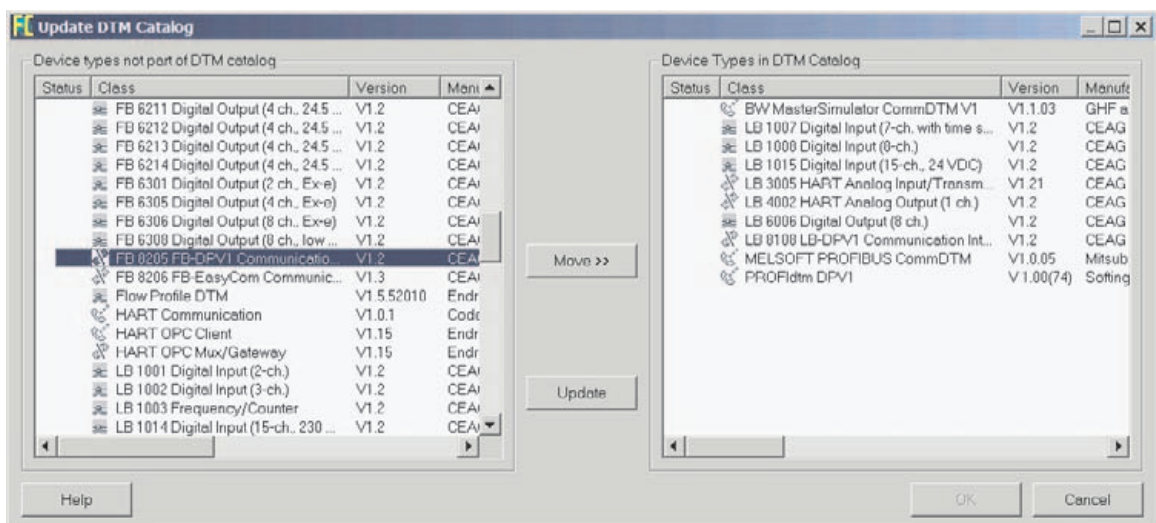


Fig. 5-2: Update DTM catalogue dialog and move new found DTMs to catalogue

5.2 Adding the CommDTM to a FieldCare project

After opening a new FieldCare project the CommDTM is added to the project by selecting the PC node in the tree on the left side and select 'Add Device' from the context menu.

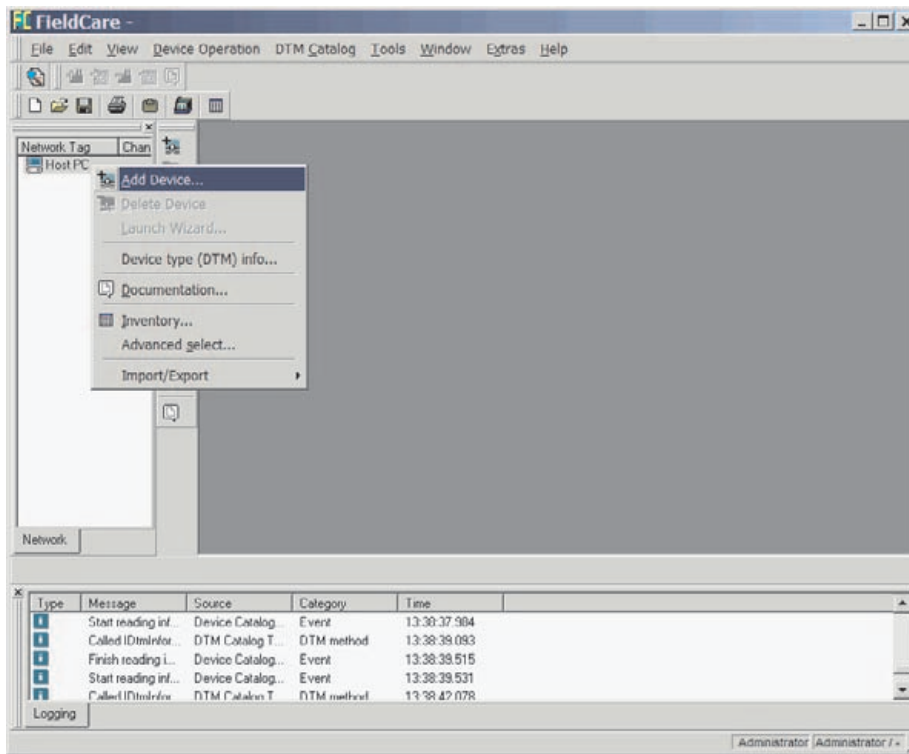


Fig. 5-3: Add Device... in context menu

The CommDTMs, which are known to the FDT framework, are presented in a list. The entry of the MELSOFT PROFIBUS CommDTM must be selected from this list.

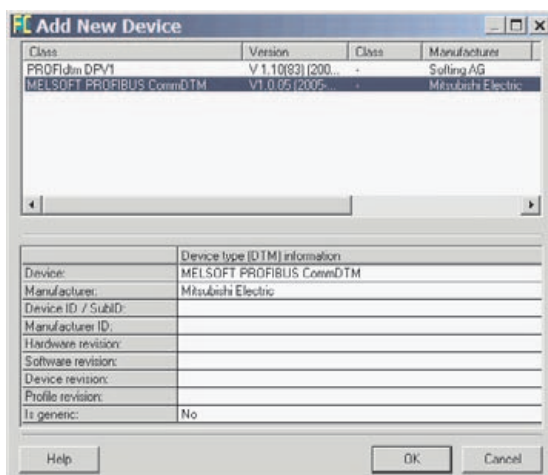


Fig. 5-4: List of CommDTMs

5.3 Configuration of the CommDTM ("Transfer Setup")

Each instance of the CommDTM represents a connection to one QJ71PB92V master module. The connection parameters must be configured before the CommDTM can access the master module. To open the configuration dialog the menu item **Configuration** is selected from the context menu of the CommDTM node.

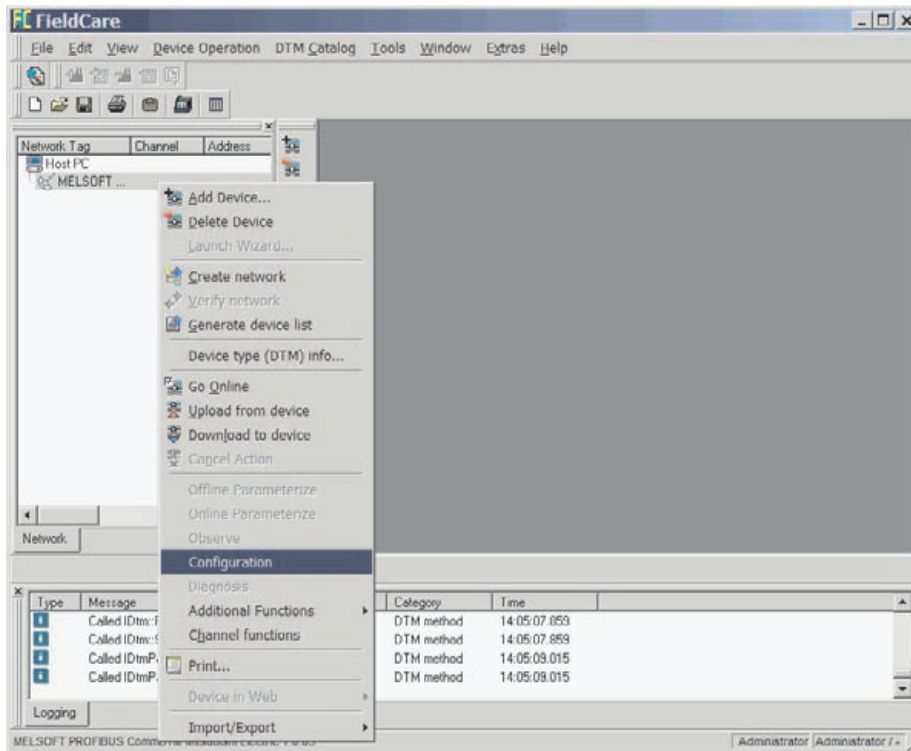


Fig. 5-5: Menu item Configuration in context menu

5.4 Defining a new network path

The configuration of a CommDTM can hold several network paths, which represent different master modules or different connections to the same master module.

A new network path is created by pressing the 'Define' button in the transfer setup dialog. If no network path has been defined yet, the definition is started automatically, when the dialog is opened.

The selected network path is deleted, when the 'Delete' button is pressed.

Only connections to Q series PLCs can be configured. The following connections between PC and PLC are supported:

- COM port RS232 to Q-CPU
- USB port to Q-CPU
- Ethernet interface to QJ71E71

Additionally a second-level MELSECNET network can be selected.

5.4.1 Network Name

In the text field enter a label for the network

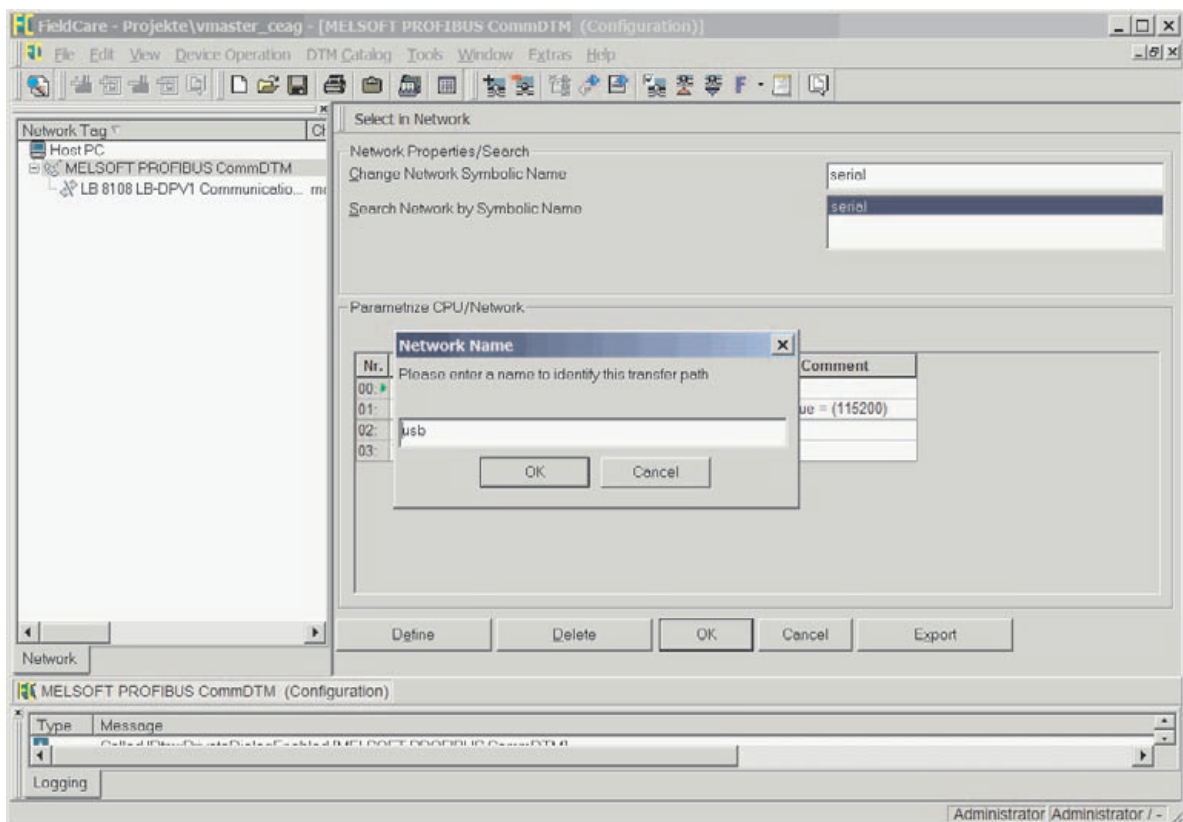


Fig. 5-6: Network Name dialog in menu item Configuration

The network label is used to identify the settings for one transfer path and must therefore be unique.

5.4.2 Unit Selection

Select a MELSECNET unit your PC is connected to. You can either access the PLC via the CPU port with a special programming cable or via an Ethernet board. Below the serial connection is selected.

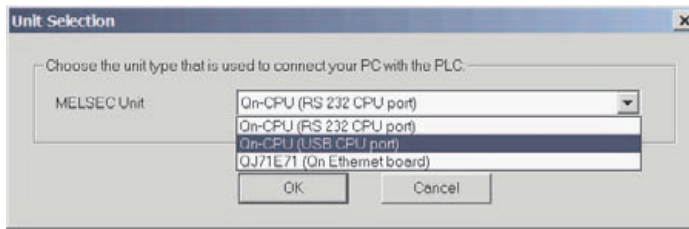


Fig. 5-7:
Unit Selection in menu item Configuration

5.4.3 Network Selection

After selecting the network module, define the MELSEC network across which the host CPU of the PROFIBUS master module can be accessed. The PROFIBUS master module can either be installed together with the target CPU on the same rack or on a remote CPU rack accessible across MELSECNET/10. Below the local installation is selected.

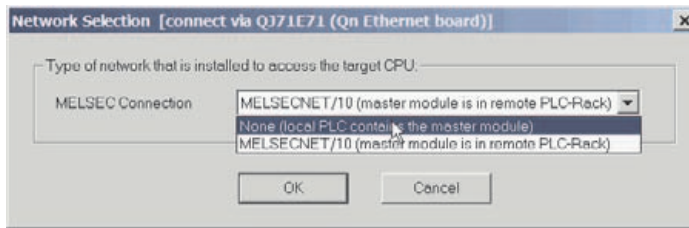


Fig. 5-8:
Network Selection in menu item Configuration

The parameters of the network connection are set to default values. Now you can edit the values directly in the network properties table.

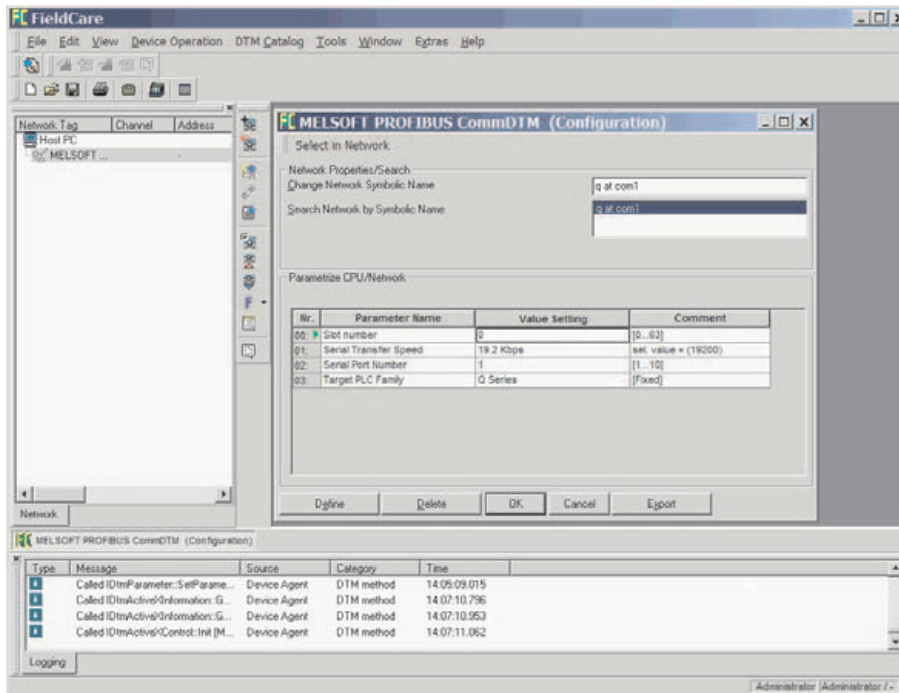


Fig. 5-9:
Editing values for network connection

Note

For QJ71PB92V modules choose 115,2 Kbps for transfer speed in serial connections to achieve maximum performance)

5.5 Attaching devices

After creating an instance of MELSOFT PROFIBUS CommDTM, the user can add a different DTM to the CommDTM by selecting it from the DTM catalog.

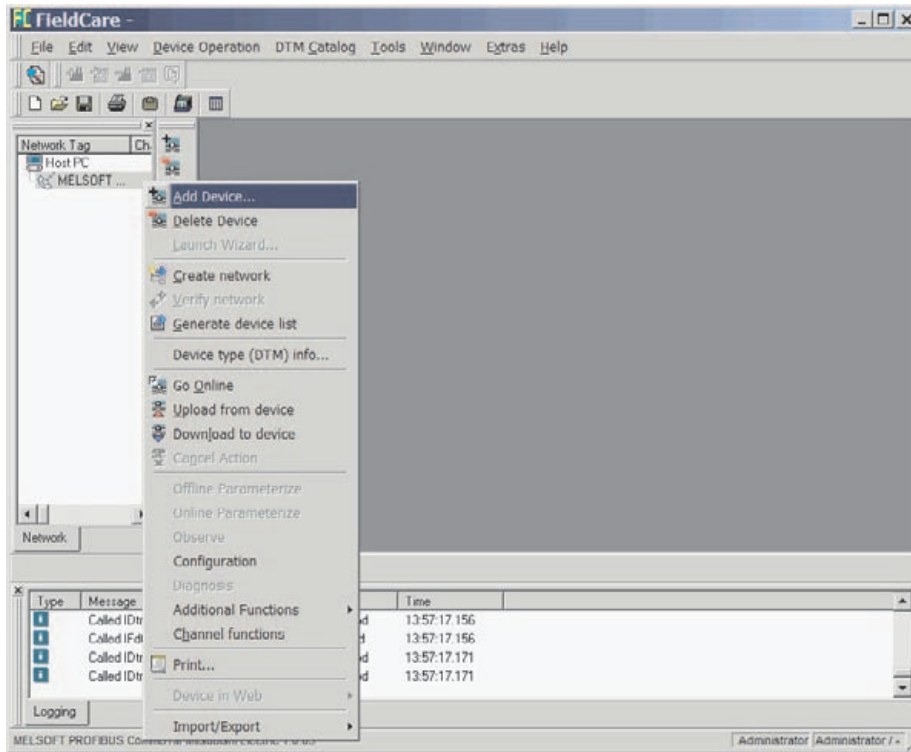


Fig. 5-10: Add DP slave DTM

Typically the FDT framework will only show those DTMs, which match the interface provided by the underlying CommDTM, in our case a PROFIBUS DPV1 interface.

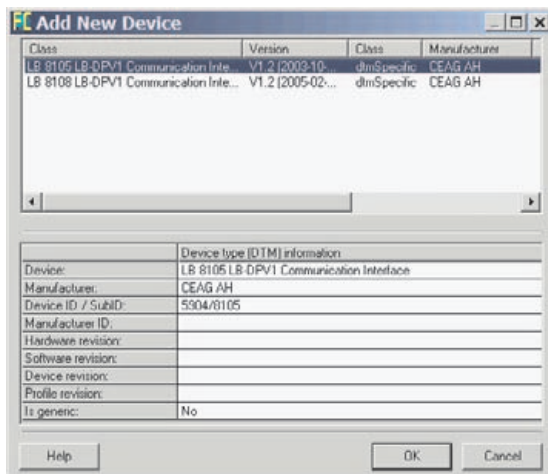


Fig. 5-11: Select DTM from Catalog

When the FDL address of the DTM for the DP slave, which is added, has the default value 126, the user is asked to assign a new FDL address.

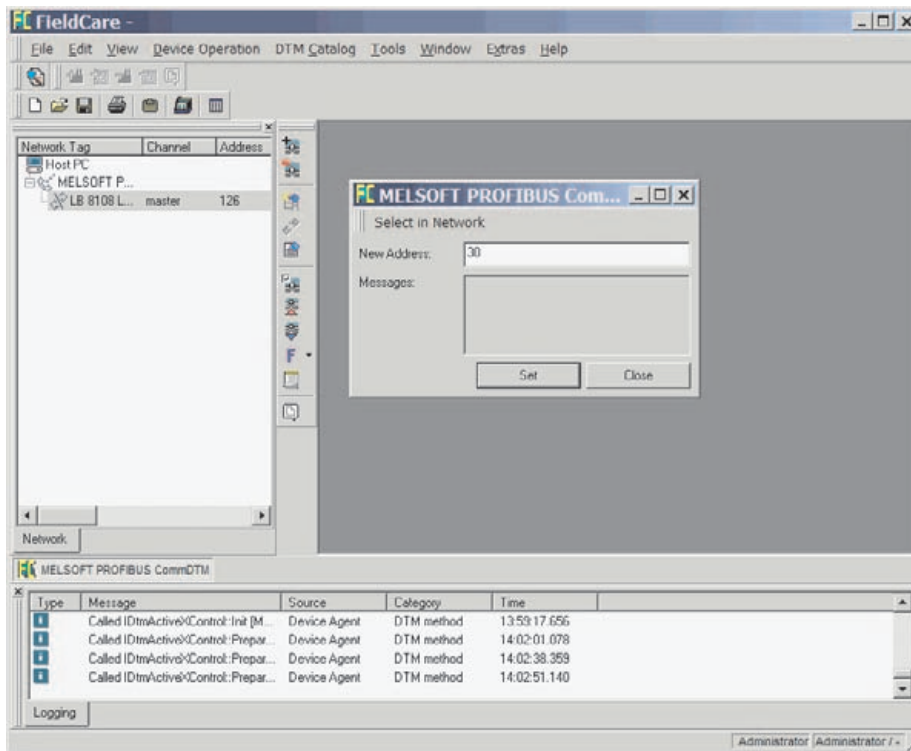


Fig. 5-12: Setting new FDL address for a DP slave DTM

In the same way additional DTMs for other DP slave devices, for modules of DP slaves or for HART devices can be added.

5.6 Going online

To actually connect a DTM to the device, the DTM node is selected and the context menu opened. When 'Go Online' is selected from the menu, the DTM and all underlying DTMs are connected to their respective devices.

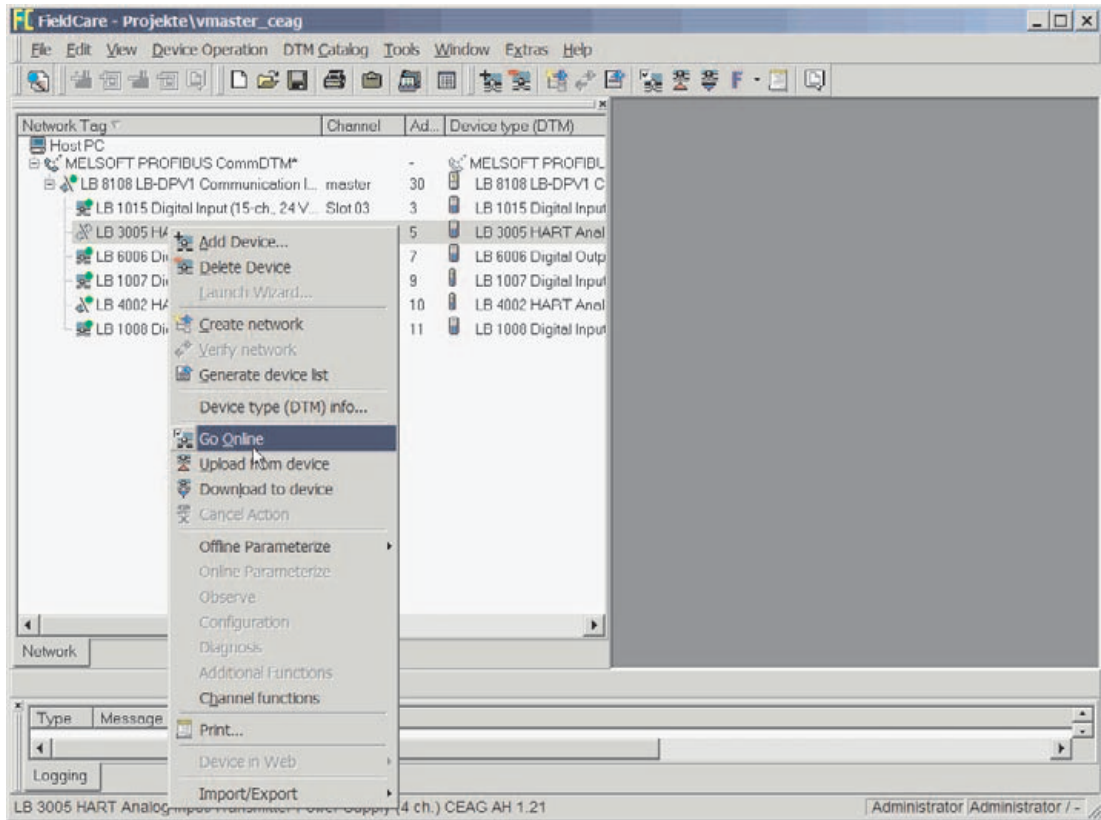


Fig. 5-13: Connecting DTM to device ('Go Online')

When the device is connected the online functions in the menu of the respective DeviceDTM are enabled.

5.7 Additional Functions

In the menu **Additional Functions** the user can select functionality provided by the MELSOFT PROFIBUS CommDTM e.g. to set the physical device address. Mark device and 'right-click' on mouse to open the context menu. Select Additional functions and choose the required MELSOFT PROFIBUS CommDTM function.

5.7.1 Edit DTM Station Addresses

To change the configured address of a device in the corresponding DeviceDTM, which is attached to the CommDTM, the **Edit DTM Station Addresses** item is selected from the CommDTM's context menu. In a table all DTMs connected to the CommDTM, are listed with the presently configured address. When a device entry is selected, the user can assign a new FDL address, which results in an update of the DeviceDTM.

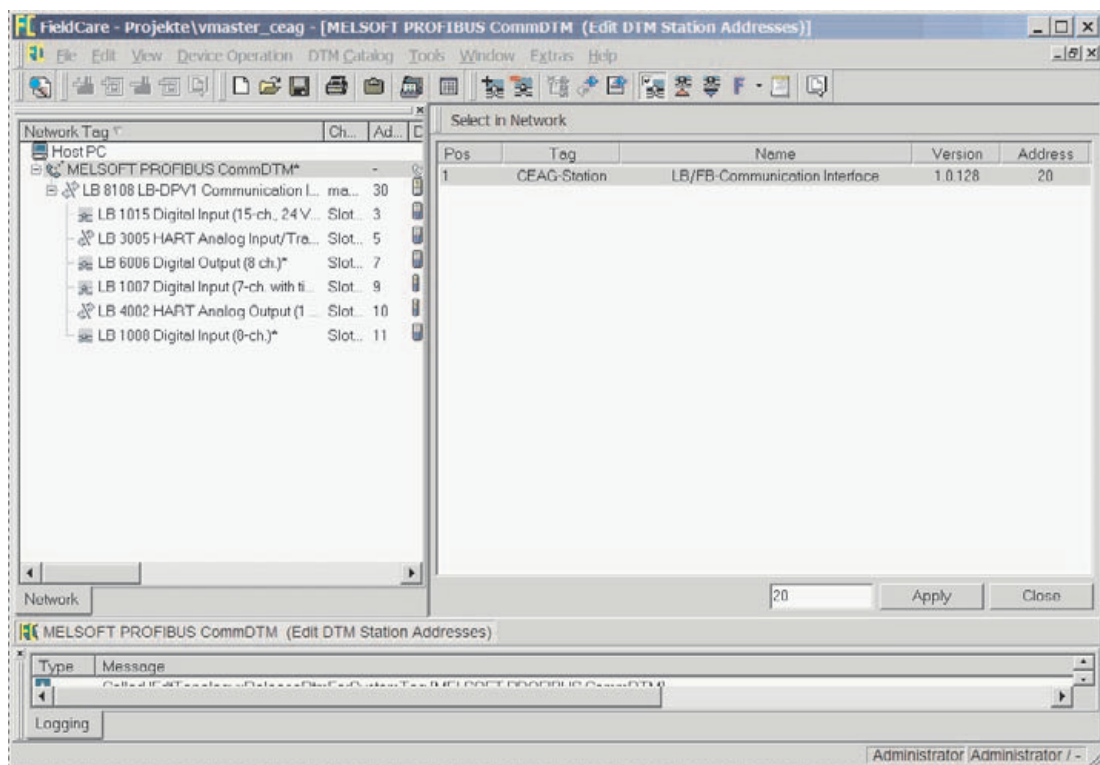


Fig. 5-14: Input mask for Edit DTM Station Addresses

5.7.2 Set Device Station Address

It is possible to change the physical PROFIBUS address of a slave device actually connected to the bus, if the respective DP slave supports this service.

It is recommended to change the FDL address of a slave only, if there is no communication with that slave pending, either via DP V0 from the class 1 master or from a DeviceDTM of that slave.

To change the address of a slave the user must enter the current and the new FDL address.

As precaution the service requires also the ident number of the slave. The ident number can usually be found in the manual or in the GSD file of the slave. When the user enters the FDL address, which is to be changed ('Old Address'), the commDTM tries to retrieve the ident number from a DeviceDTM, which has the same FDL address as that entered as 'Old Address' configured. This procedure only works, if a DeviceDTM has already been added for that slave and if the FDL address of the DeviceDTM is correctly set. If a ident number has been retrieved, it is displayed in the 'Ident No.' field. In case the ident number is incorrect or no ident number has been found, the user must enter the ident number before pressing 'Set'.

NOTE

If the ident number does not match that of the slave, the 'Set Device Station Address' may still return successfully, although the FDL address has actually not been changed.

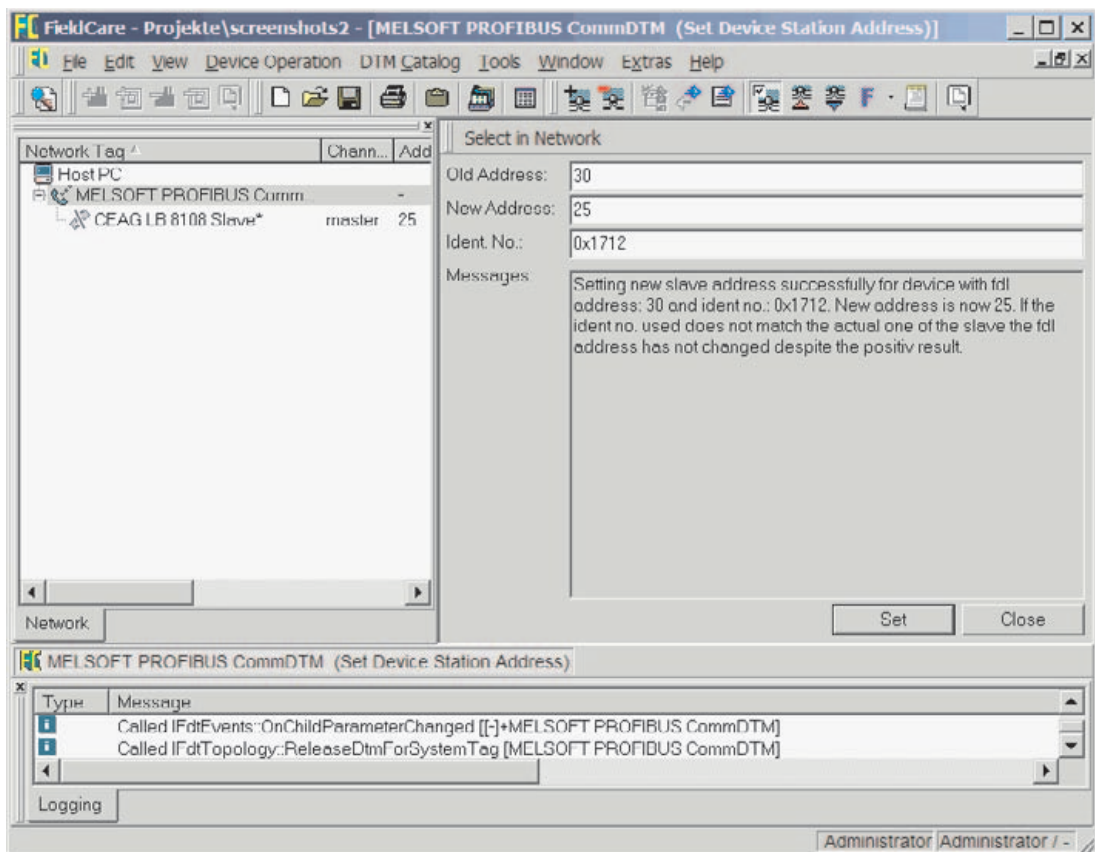


Fig. 5-15: Input mask for Set Device Station Address

6 Troubleshooting

6.1 After update of DTM Catalogue the installed CommDTM is not listed

Situation:

After successful installation of the MELSOFT PROFIBUS CommDTM on the engineering PC and updating the DTM catalogue in FieldCare the user cannot find the CommDTM in the list of the new found devices.

Solution:

- Open a DOS command window in the installation directory of the CommDTM
- Execute the following command: **regsvr32 profiv1commdtm.dll**
- Restart FieldCare and select in menu item **DTM Catalog** → **Update...**
→ now the new installed CommDTM should be found

6.2 Fails to connect to QJ71PB92V

Situation:

When selecting 'Go online' from the CommDTM context menu, the connection cannot be established

Solution:

Because the CommDTM has no function for a separate communication test, start GX Configurator-DP (GXDP), define the same network path and press the 'Test PLC' button. If this fails as well, follow the procedure of troubleshooting communication failures in GXDP, i.e. check the cabling, the number of the COM port or the IP addresses, the slot index of the PROFIBUS master module.

6.3 DeviceDTM cannot connect to corresponding DP slave

Situation:

The CommDTM can connect to the PROFIBUS master, but the DeviceDTM fails to access the corresponding DP slave. The following error message is displayed instead:

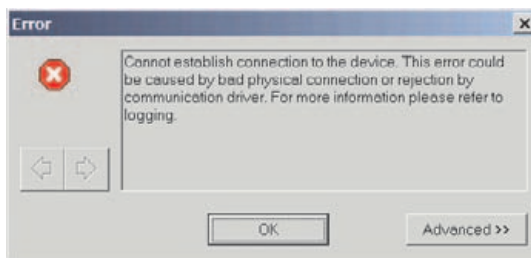


Fig. 6-1:
DeviceDTM fails to connect to DP slave

Solution:

First check the FDL address configured in the DeviceDTM, then compare this with the actual address of the slave.

6.4 Failure to set the station address of a DP slave

Situation:

The CommDTM is connected to the PROFIBUS master, but the user fails to change the FDL address of connected slave. An error message is displayed instead.

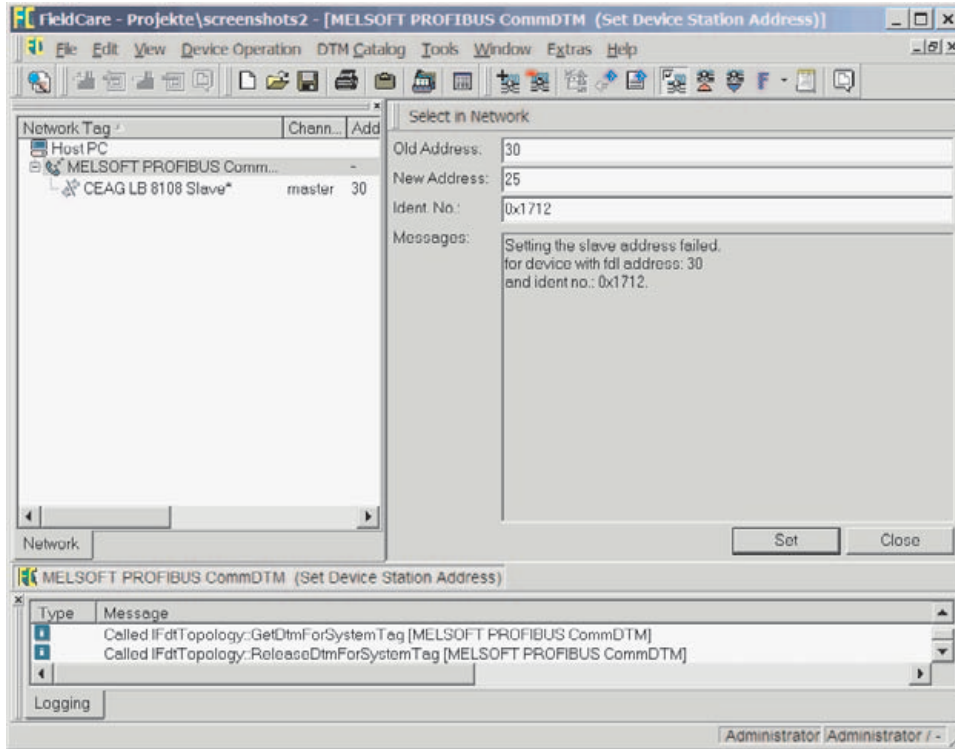


Fig. 6-2: Error Message after executing 'Set Device Station Address'

Solution:

Go offline with all CommDTMs, which are accessing the respective slave. Then change the address and go online again.

6.5 Ongoing Communication with DP slave fails

Situation:

While communication between DeviceDTM and slave has been running for a while, the following message box is displayed:

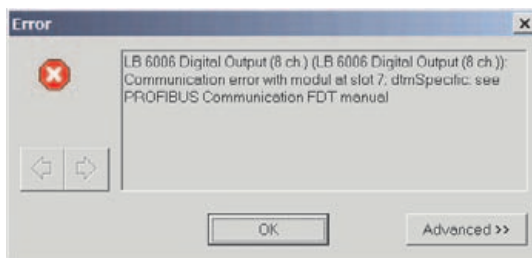


Fig. 6-3: Communication failure

Solution:

Close the message box by pressing 'Ok', set the DeviceDTM offline, which caused the error message, then go online again.

7 Glossary

COM	Common Object Model a technology developed by Microsoft® for interfacing software modules independent of their implementation
DLL	Dynamic Link Library file format for software modules, which can be used by an application (executable)
DP V0	Profile of the PROFIBUS DP fieldbus protocol for cyclic I/O data exchange
DP V1	Profile of the PROFIBUS DP fieldbus protocol, which supports acyclic read/write operations from a PROFIBUS master to a slave station
DTM	Device Type Manager Hardware specific software module containing device specific logic and user interface
FDT	Field Device Tool Engineering tool with runtime environment for DTMs
PROFIBUS	PROcess Field BUS family of fieldbus protocol profiles (FMS, DP V0, DP V1, DP V2), which use a common network layer and a token based protocol

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