LabVIEW-RT PROFIBUS VISA Driver DP-Master

Getting Started

V1.35

18.05.2017

Project No.: **5303**
Doc-ID.: **LabVIEW-RT PROFIBUS VISA Driver**

Revision History

Version	Date	Description
V1.35	18.05.2017	Minor changes
V1.34	27.02.2017	KUNBUS branding
V1.33	16.02.2011	COMSOFT Function Palette location changed
V1.32	02.06.2009	Hot plugging note added
V1.31	02.06.2009	Minor fixes
V1.30	16.11.2007	RT Installation changed
V1.29	25.09.2007	DPV1 added
V1.23	03.08.2006	Configurator III Download and Monitor/Modify
V1.22	17.07.2006	Link to Configurator III changed
V1.21	13.01.2006	New install tool / Download tool upgrade
V1.2	28.07.2005	Driver modification / Example update
V1.1	01.06.2005	Express-VI modification / VI-Library update
V1.0	14.12.2004	Initial Version

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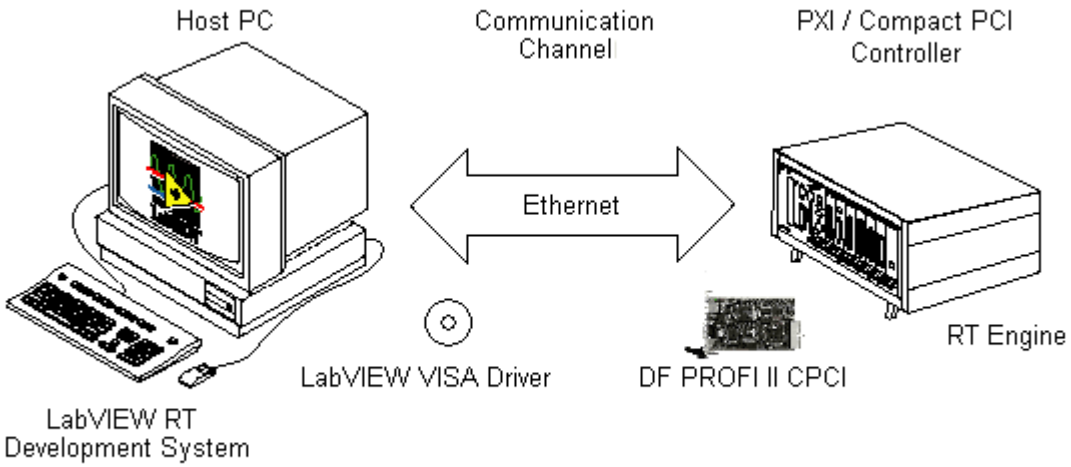
1 Introduction

This document describes the set into operation procedure of the DF PROFI II board as DP-Master.

1.1 Prerequisites:

- A DF PROFI II CPCI (Compact PCI) and **KUNBUS** LabVIEW VISA driver for LabVIEW RT on CD.
- National Instruments PXI-System with RT.
- The National Instruments LabVIEW Real-Time Development System installed on a Windows PC.
- Installed NI-VISA standard driver on the PXI- and Windows-System.



2 Installation

- Install the DF PROFI II CPCI board in the PXI-System.

Please note, that the DF PROFI II CPCI board does not support Hot Plugging. If installing/uninstalling the board the PXI system must be switched off and the power supply must be interrupted.

- Switch on the PXI-System.
- Start the Setup from the **KUNBUS** driver CD delivered with the package.
- To install the PROFIBUS LabVIEW VISA driver on the PXI system, start the NI MAX (Measurement & Automation explorer) and open the software installation wizard by right clicking the Software item of your PXI system:

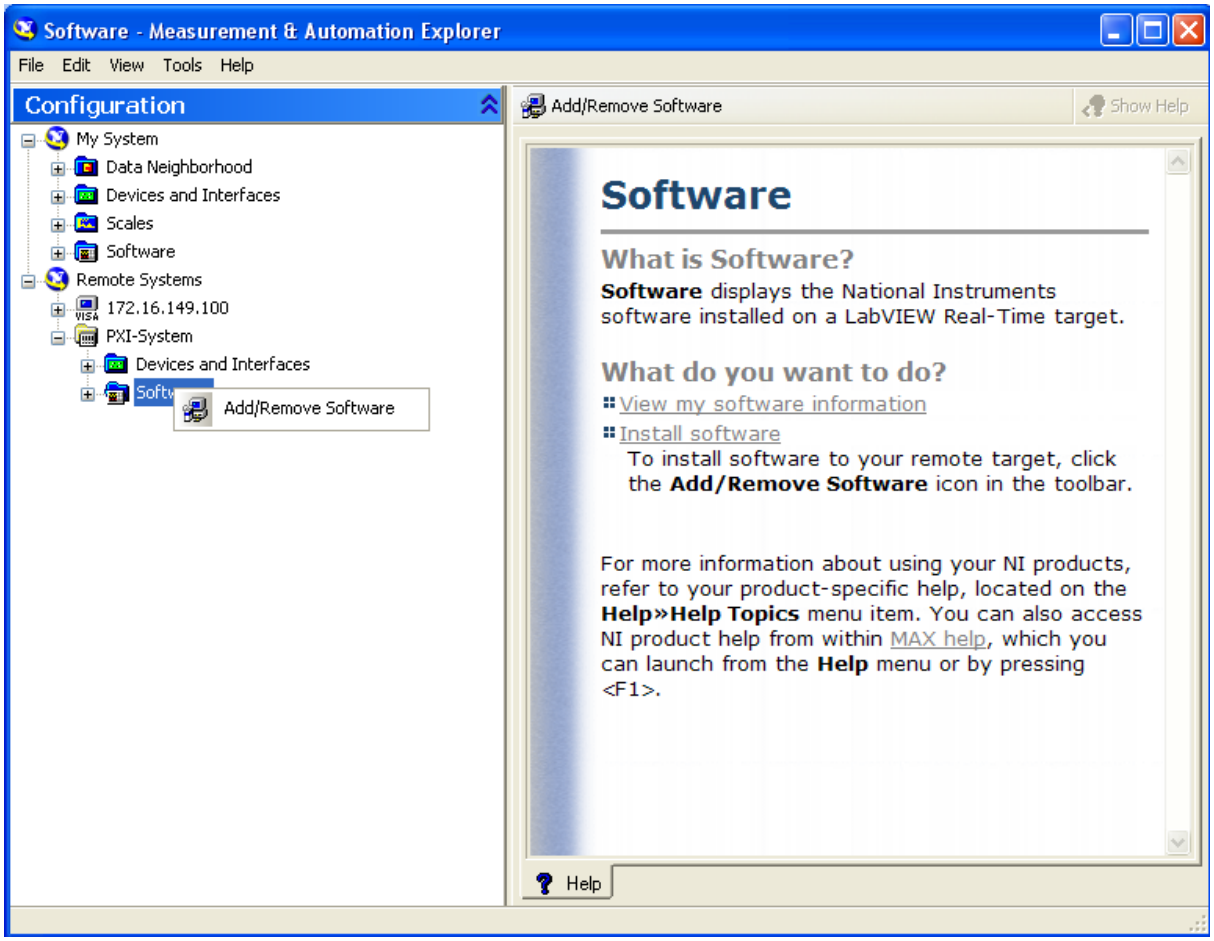


Figure 1: PXI driver installation step 1

- Right click the *KUNBUS DF PROFI II – RT Installation 1.xx* component to install it on the PXI system

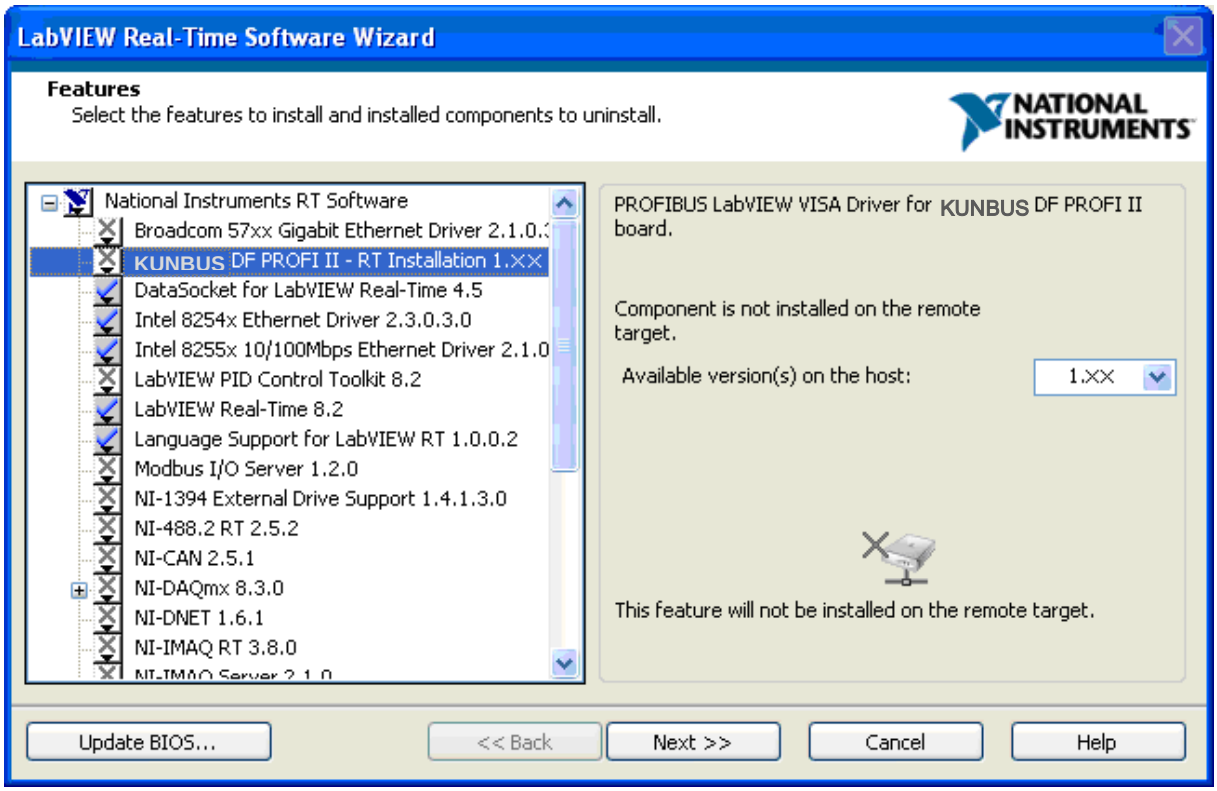


Figure 2: PXI driver installation step 2

All files are copied to the PXI system.

Note: After installation the PXI-System will restart automatically.

- Check by the NI MAX (Measurement & Automation explorer) the proper installation of the DF PROFI II board:

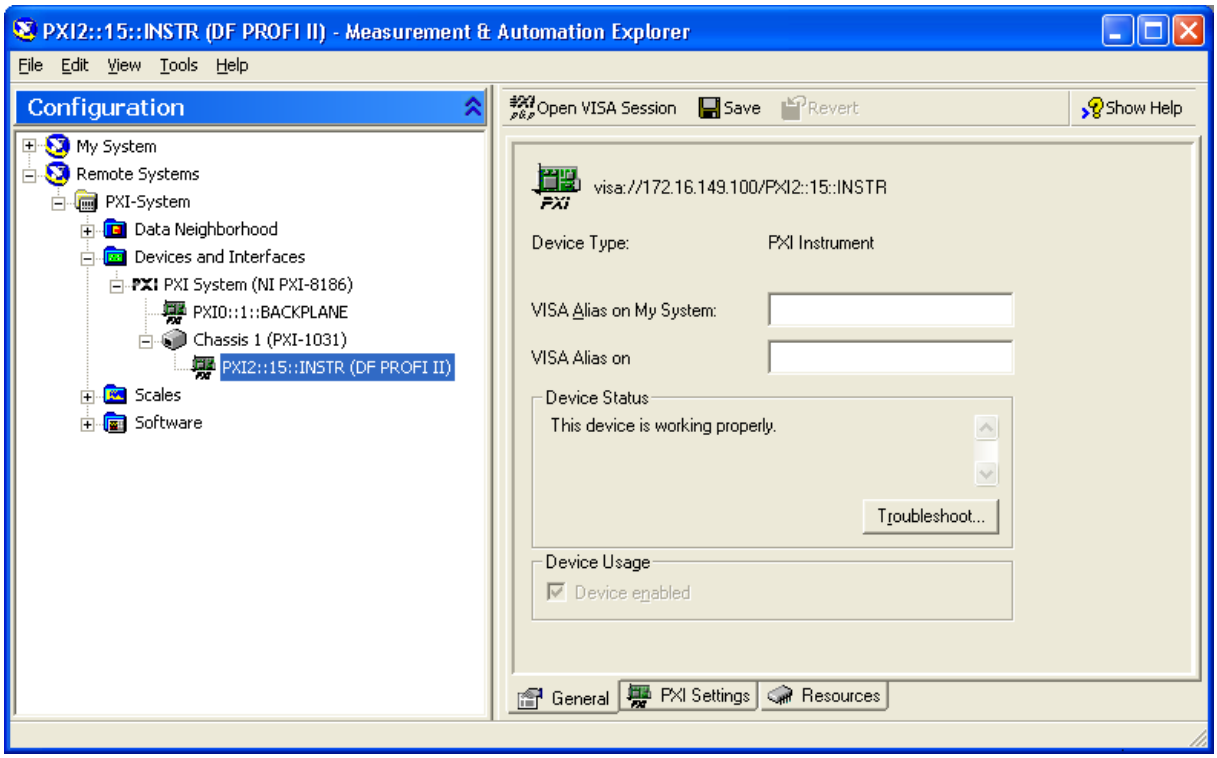


Figure 3: Measurement and Automation Explorer

- To allow the access to each PXI-System with a installed DF PROFI II board check the VISA Server permissions. Create a new server permission as described in the picture below (follow step 1 – step 4). Refer to the MAX help menu for more information.

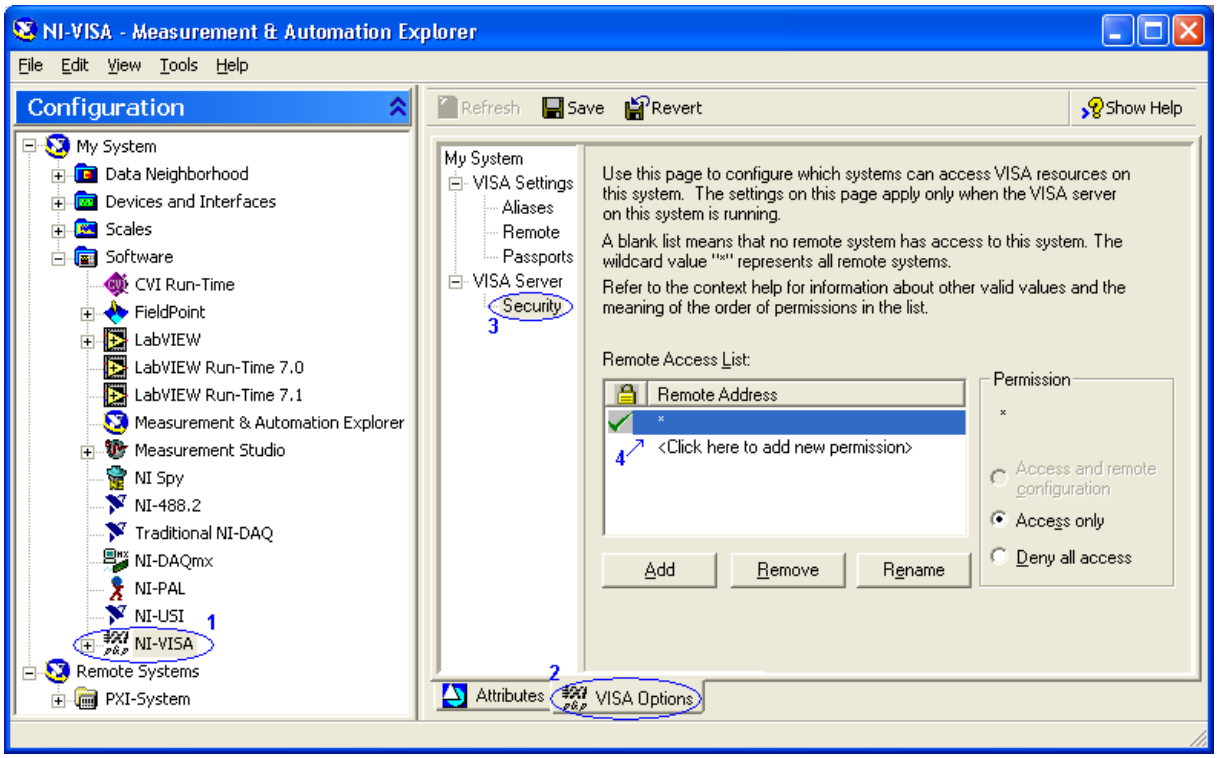


Figure 4: NI-VISA Server Security

- To find DF PROFI II boards in PXI-Systems enable the corresponding remote address (follow step 1 – step 4). Refer to the MAX help menu for more information.

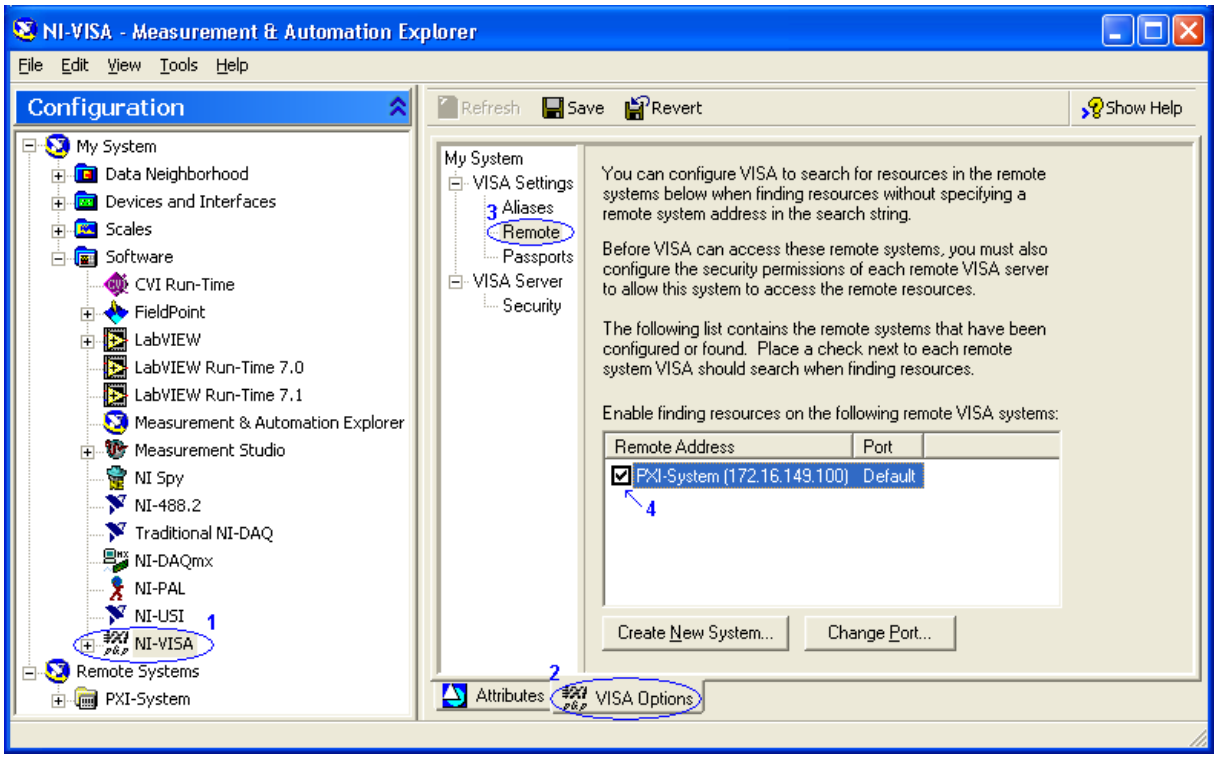


Figure 5: NI-VISA Remote Settings

Note: If the remote address is not listed, use the Create New System-button to create it manually.

3 PROFIBUS configuration

The Profibus configuration is carried out by the **KUNBUS** PROFIBUS configuration tool Configurator III.exe.

- Start Configurator III from the KUNBUS GmbH / Profibus Configurator / Configurator III menu. The Configurator allows to create the complete PROFIBUS configuration based on DP-Slave GSD-Files. Refer to the programs on line help menu for all details.
- Create and save the configuration.

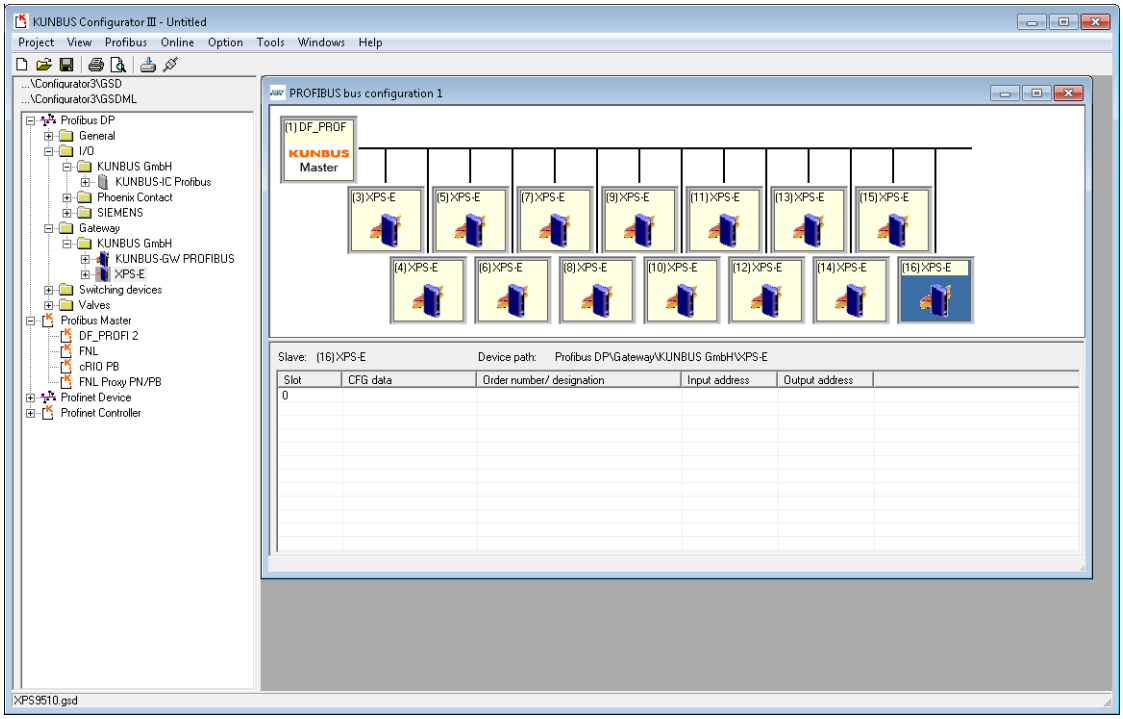


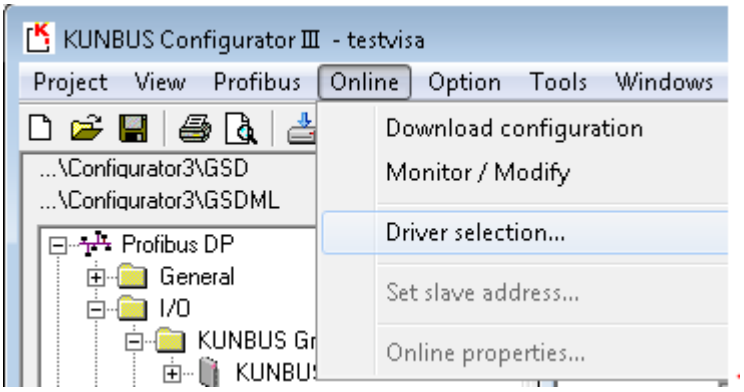
Figure 6: KUNBUS Configurator III

3.1 PROFIBUS-DP configuration download

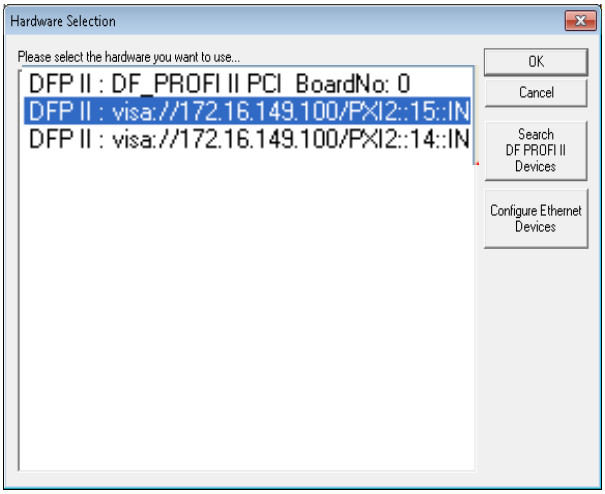
Configurator III provides an integrated download function to flash the PROFIBUS-DP configuration on the DF PROFI II board.

Proceed the following steps:

- **Select a DFPROFI II VISA board from the Online – Menu:**



The installed DF PROFI II boards are displayed:



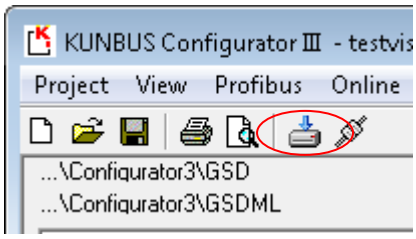
Select a DF PROFI II board and click the OK button. If nothing is displayed click the VISA-Config. button to rescan the available DF PROFI II VISA boards.

Refer to the Online – Help System of Configurator III for details of the driver selection.

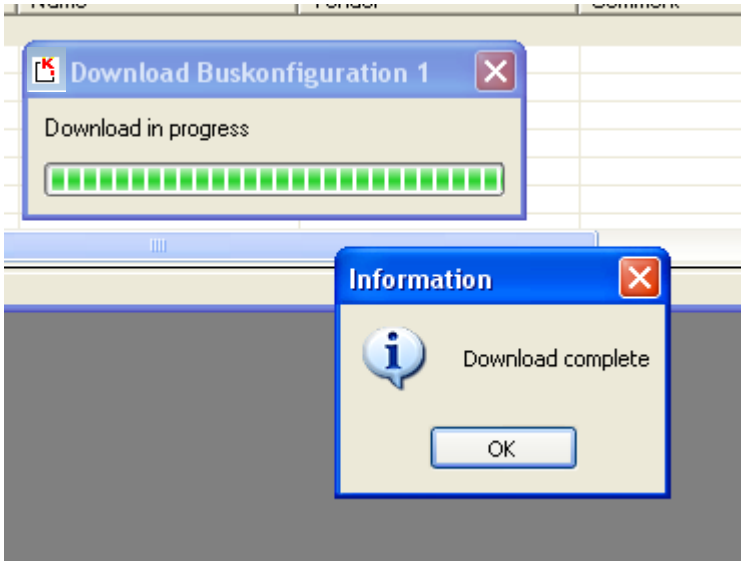
- **Download the PROFIBUS configuration**

Click the Download Symbol in the tool bar of Configurator III :

The PROFIBUS-DP configuration is



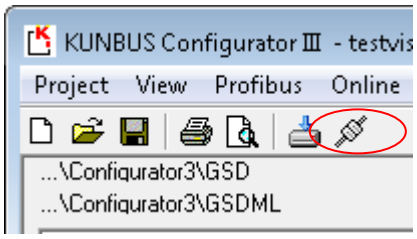
downloaded to the DF PROFI II board:



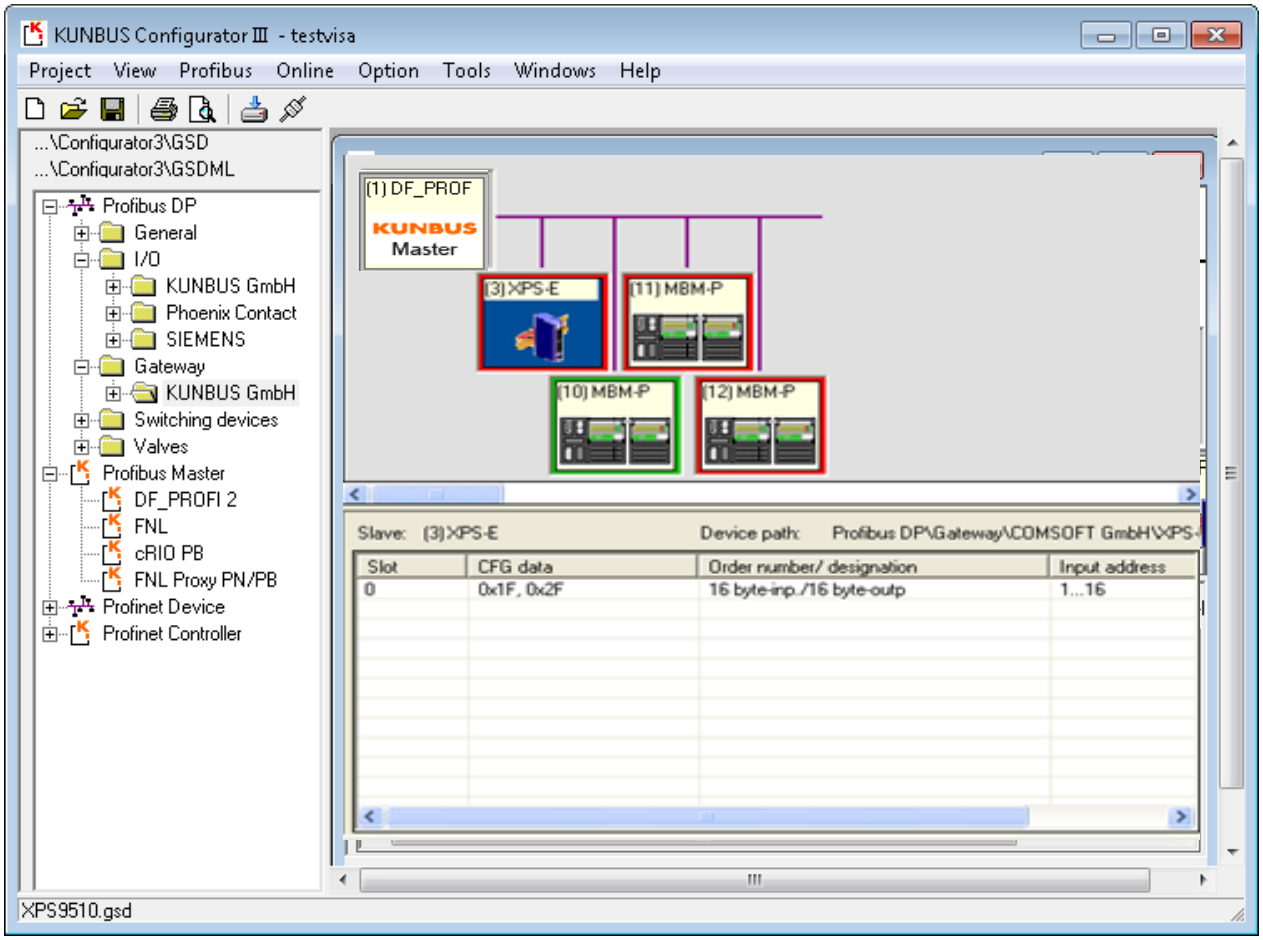
3.2 Configurator III Monitor/Modify mode

With the Monitor/Modify mode of the Configurator III the flashed PROFIBUS-DP configuration can be tested immediately. Please note that the configured DP-Slaves must be connected to the DF PROFI II board.

Click the Monitor/Modify symbol of the Toolbar of Configurator III:



Configurator III displays the PROFIBUS-Network in Online mode:



Configurator III displays the status of every DP-Slave (coloured frame) and allows to monitor and modify the I/O data by clicking the DP-Slaves. For further details please refer to the online help system of Configurator III.

4 PROFIBUS menu and example

The delivery package includes standard VIs to initialize the PROFIBUS and to access the DP-Slaves I/O and diagnostic data. For a successful communication see the PROFIBUS example program. Refer to the LabVIEW Context Help for details.

4.1 PROFIBUS-DP-Master menu

The **KUNBUS** DF PROFI II menu is located in:

- KUNBUS Library
- PROFIBUS VISA Driver 

- DF PROFI II DP-Master 

Figure 7: PROFIBUS-DP-Master menu

- DF PROFI II DPV1 Services 

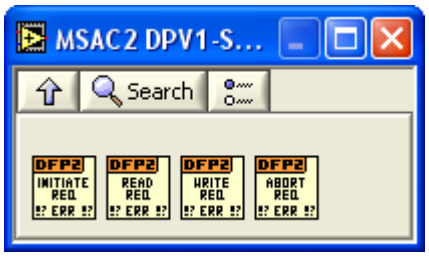


Figure 8: PROFIBUS-DPV1 Services menu

For an easy access to a single DP-Slave a DP-Master Express VI is available. The Express VI can be found in the **KUNBUS** DF PROFI II menu under:

- DP-Master Express 

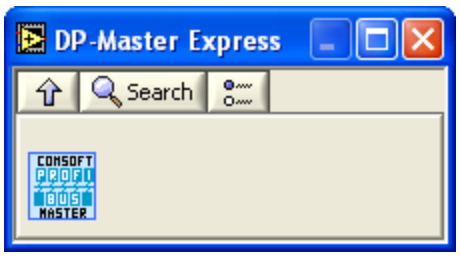


Figure 9: PROFIBUS-DP-Master Express menu

4.2 PROFIBUS-DP-Master example

The DFP2_DP-MasterExample program shows all configured DP-Slaves, their communication state, the I/O-data and the diagnostic data:

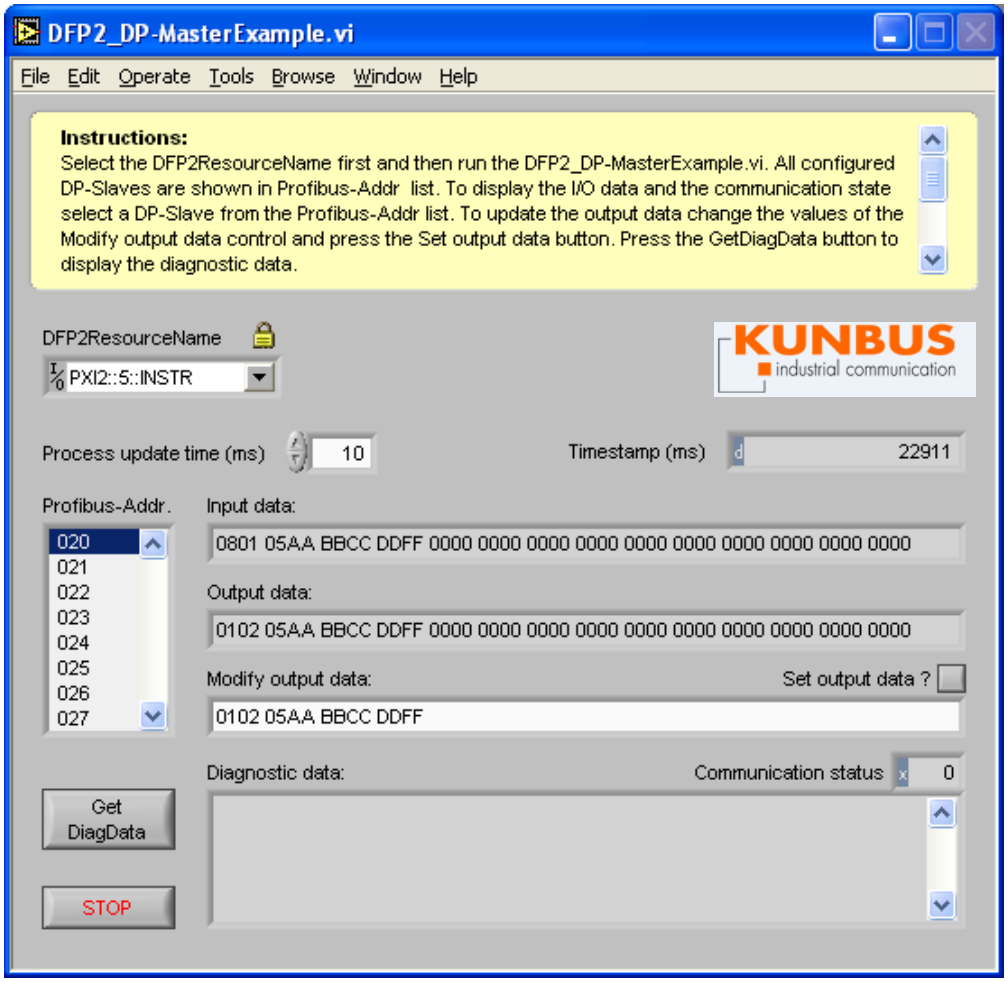


Figure 10: PROFIBUS-DP-Master example front panel

The VI's block diagram shows the simple steps how to access the DP-Slaves:

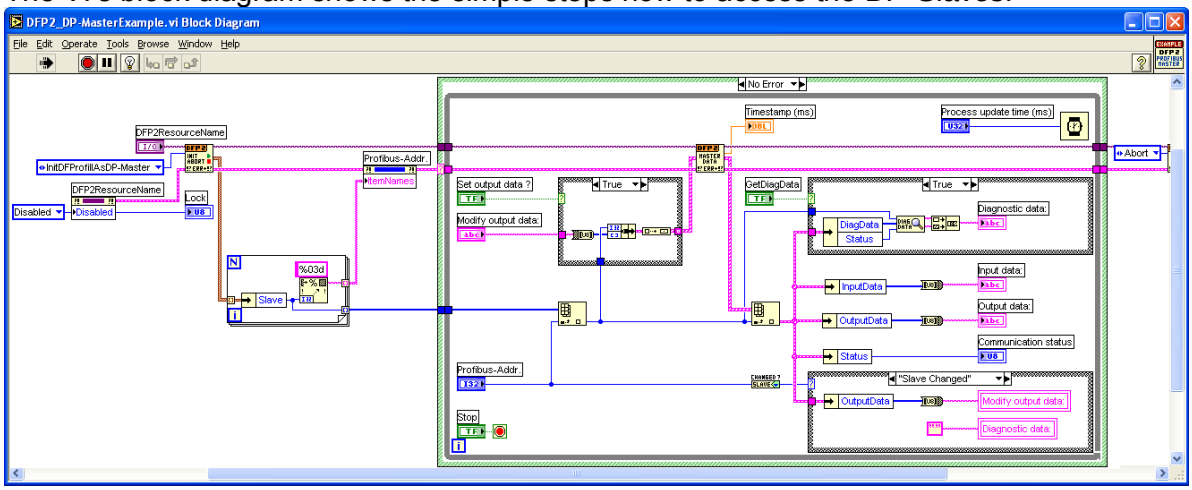


Figure 11: PROFIBUS-DP-Master example block diagram

5 PROFIBUS-DP-Master Express VI

For an easy access to a single DP-Slave a PROFIBUS-DP-Master Express VI 

is available. If dropping the Express-VI to the block diagram a configuration dialog opens to enter the DF PROFI II board and the PROFIBUS address of the DP-Slave:

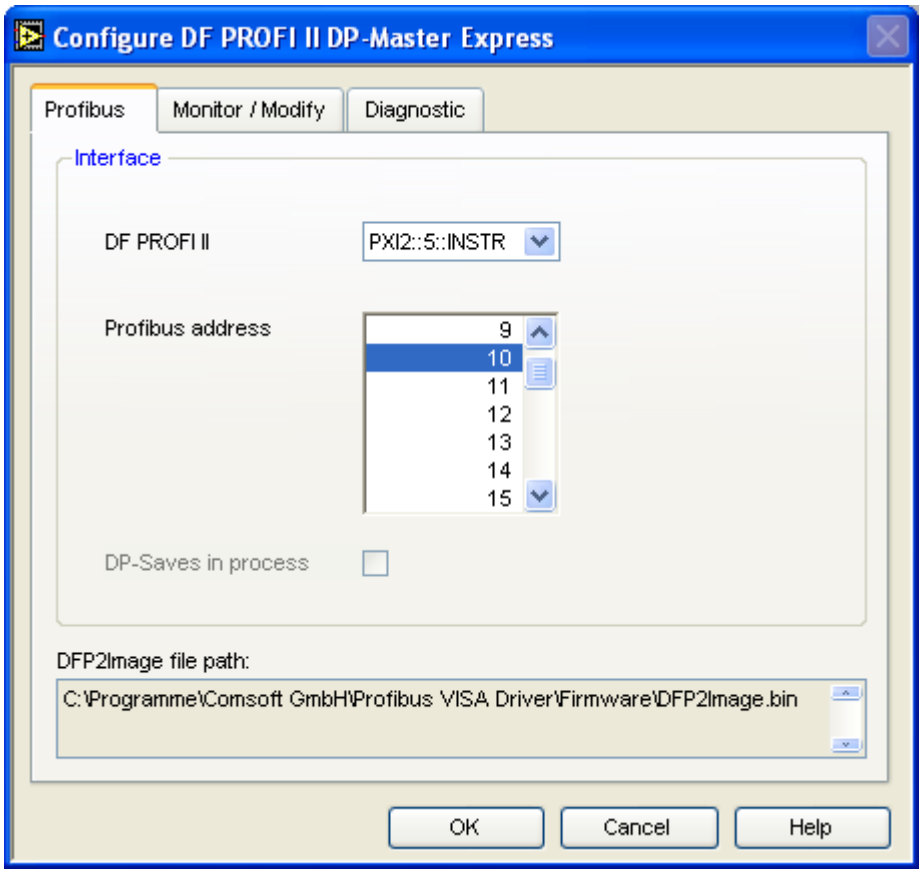


Figure 12: DP-Master Express PROFIBUS

The Monitor/Modify-Tab shows the input and output data as well as the communication status of the DP-Slave. The output data can be modified by clicking directly in the value field and entering new data. The data must be entered in the same format as displayed, otherwise they will be ignored:

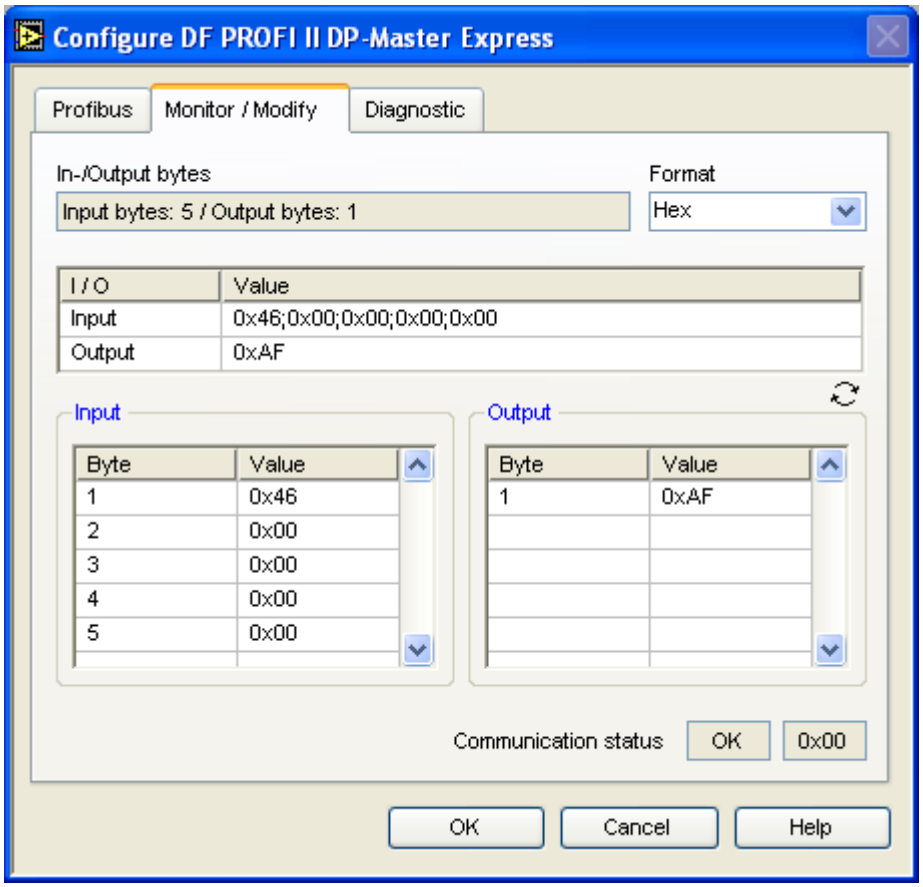


Figure 13: DP-Master Express Monitor/Modify

Note: Before using the monitor/modify-mode a available DF PROFI II and a valid PROFIBUS address must be selected.

The Diagnostic-Tab shows the diagnostic data transmitted by the DP-Slave. The data are displayed in clear text for the standard PROFIBUS diagnostic data and in hexadecimal format for the extended diagnostic data:

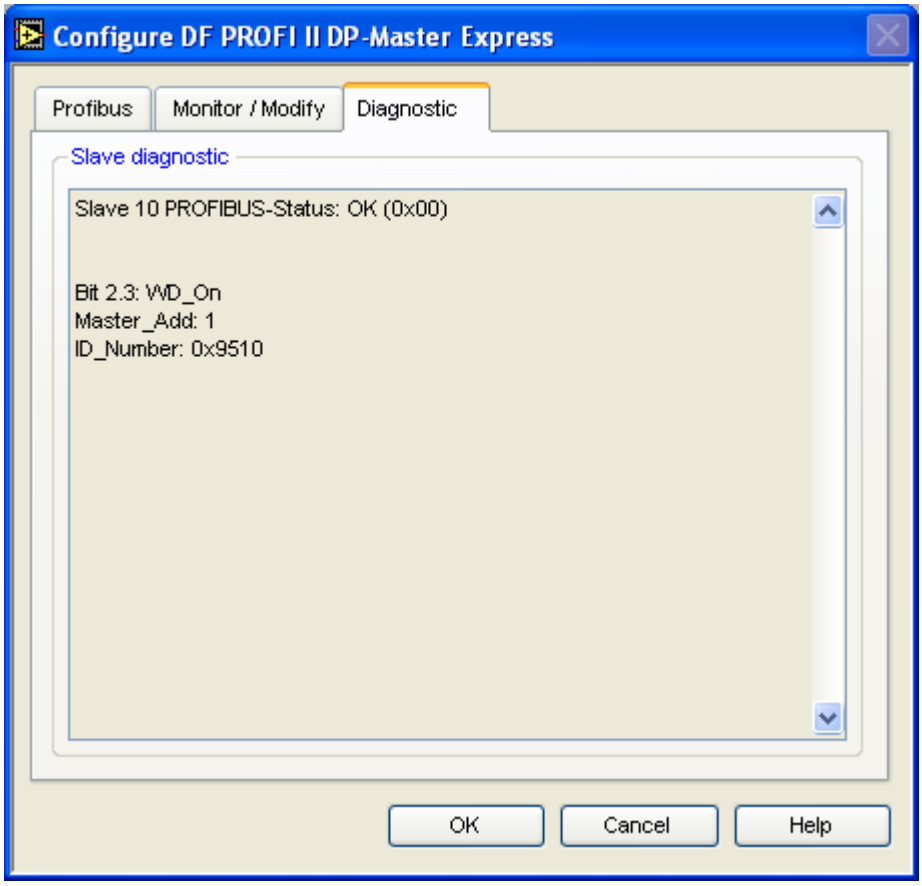


Figure 14: DP-Master Express diagnostic

After configuration the PROFIBUS Express VI provides all necessary DP-Slave data:

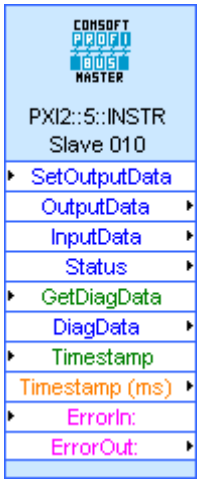


Figure 15: DP-Master Express VI

To change the properties double click the Express VI

6 PROFIBUS-DPV1

To access the DPV1 variables of a DP Slave the DF PROFI II board supports the acyclic DPV1 protocol as Master Class 2. To exchange acyclic data with a DP Slave the following steps are necessary:

- Start the cyclic data traffic with the DP Slaves
- Establish a DPV1 connection to the DP Slave (Initiate_Req)
- Read or Write acyclic DPV1 data (Read_req, Write_Req)
- Abort the DPV1 connection to the DP Slave

For the DPV1 data structure of the DP Slave refer to the users guide of the DP Slave.

6.1 Stand alone operation of the DF PROFI II board as DP Master Class 2

The actual version of the PROFIBUS VISA driver board does still not support a stand alone operation as DPV1 Master Class 2. If the DF PROFI II board shall be used as DPV1 Master Class II a DPV0 configuration must be downloaded storing the correct DP Master configuration with one dummy DP Slave that is not existent.

6.2 Initiate_Req

Establishes a DPV1 connection to the DP Slave.

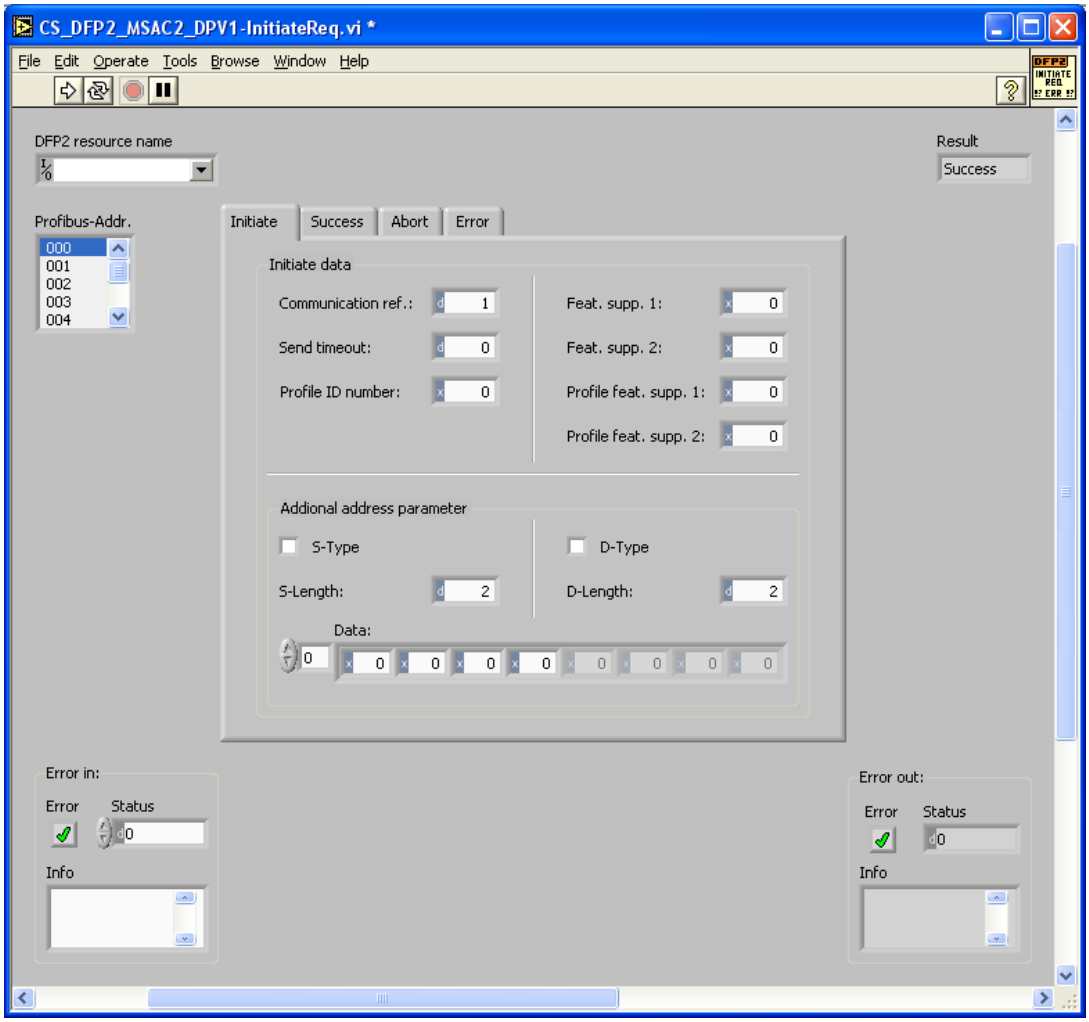


Figure 16: DPV1 Initiate_Req front panel

- Select the DFP2 resource name and the PROFIBUS address of the DP Slave.
- Enter the value **1000** for the parameter **Send timeout**. Send timeout sets the internal timers for the connection monitoring and the response timeout. The Send timeout value is assigned in multiples of **10 mS,** 1000 means 10000 mS or 10 s.
- Leave all other parameters unchanged.
- Run the VI. After the VI terminated, the status value in the Error out block must be set to a value of 87, what means that the DPV1 connection was successfully established to the DP Slave.

6.3 Read_Req

Reads a variable of a DP Slave DPV1.

The DPV1 variables of a DP Slave are selected by the parameters **Slot number and Index.** Refer to the documentation of the DP Slave for a detailed description of all available variables.

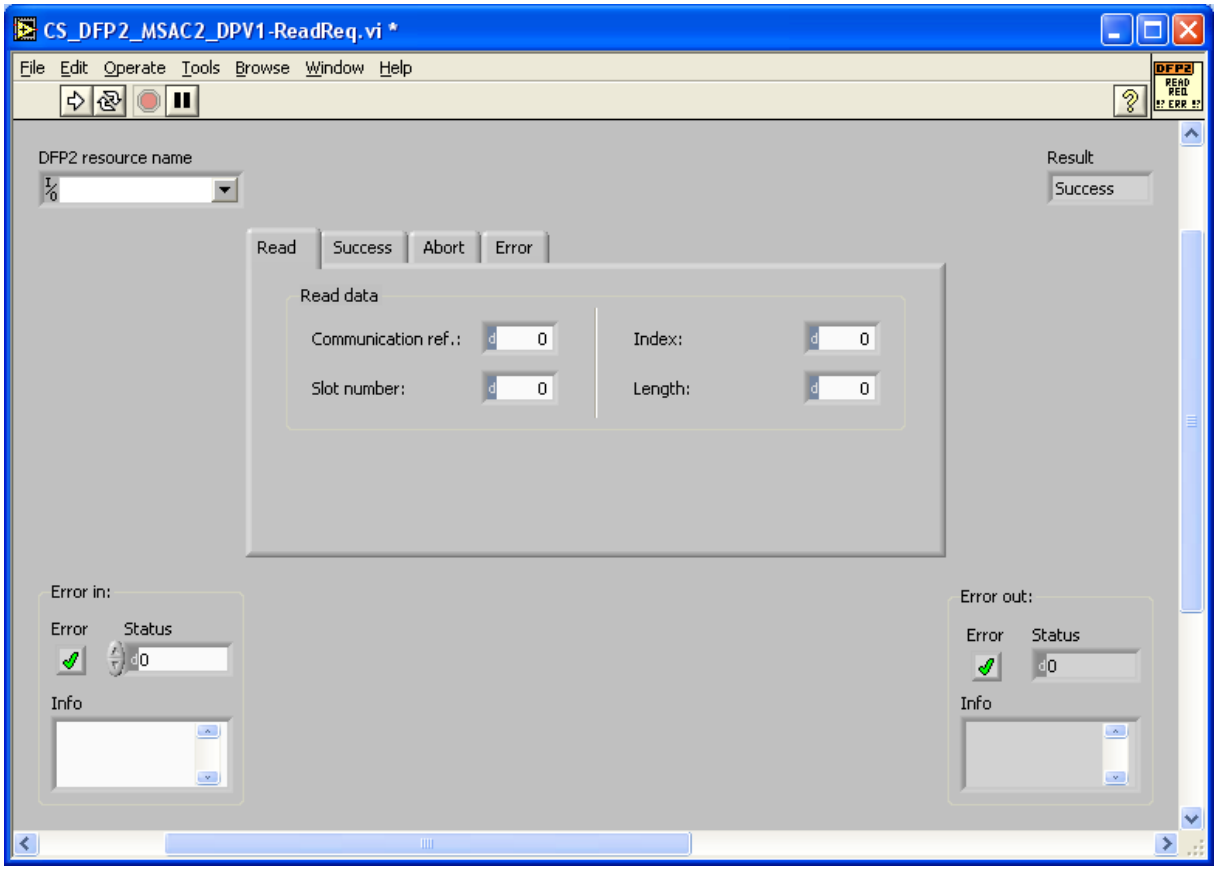


Figure 17: DPV1 Read_Req front panel

- Select the DFP2 resource name.
- Enter the identical value (1) for **Communication ref** as used for Initate_Req.
- Enter the **Slot Number**, **Index** and **Length** for the DPV1 variable to be read. To enter the DP Slave address is not necessary, this is decoded via the **Communication ref** parameter, which was assigned as 1 during connection setup.
- Run the VI. After the VI has terminated, the status value in the ErrorOut block must be set to a value of 94, what means that Data have been successfully read from the DP Slave.

- If you check the Data section in the **Success** tab the data read from the DP Slave are displayed.

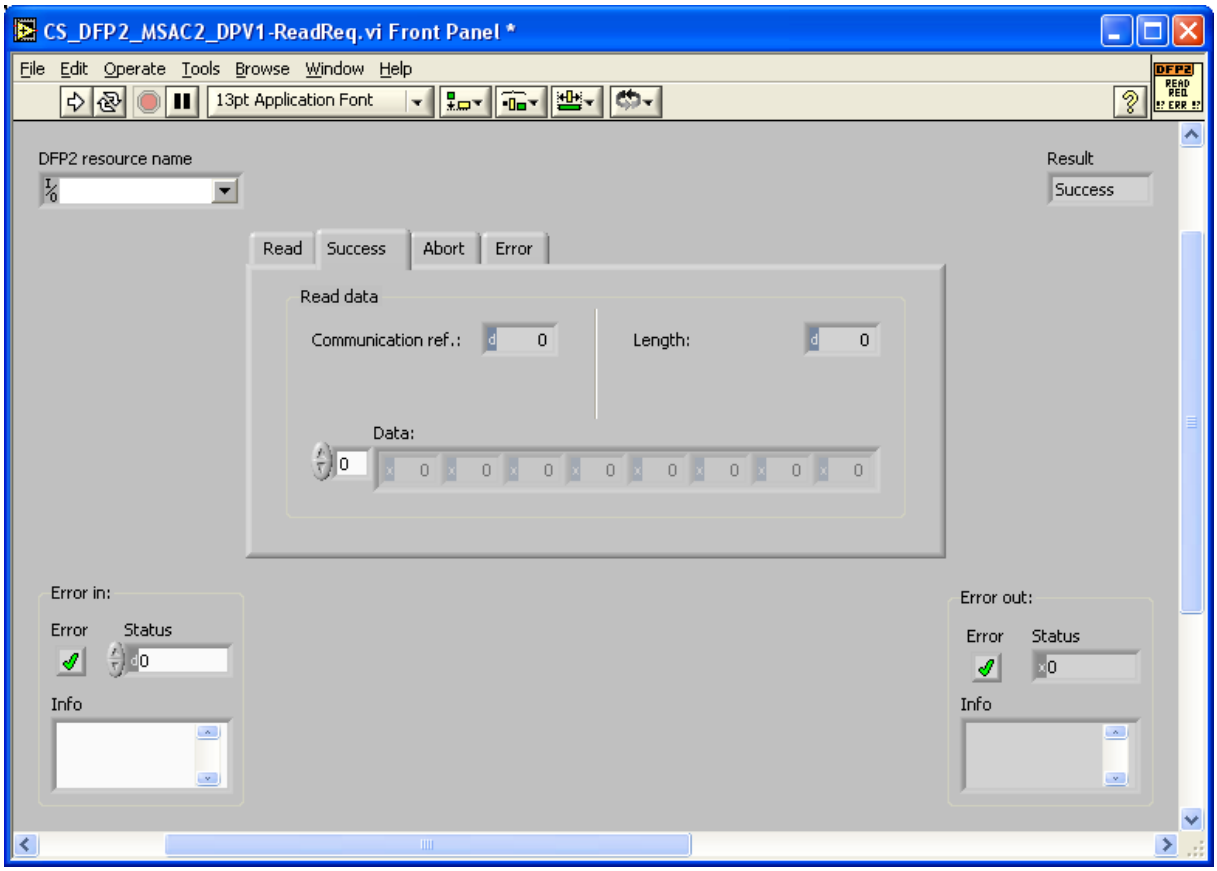


Figure 18: DPV1 Read_Req Success Tab front panel

6.4 Write_Req

Writes variable to a DP Slave DPV1.

The DPV1 variables of a DP Slave are selected by the parameters **Slot number and Index**. Refer to the DP Slave's documentation for a detailed description of all available DPV1 variables.

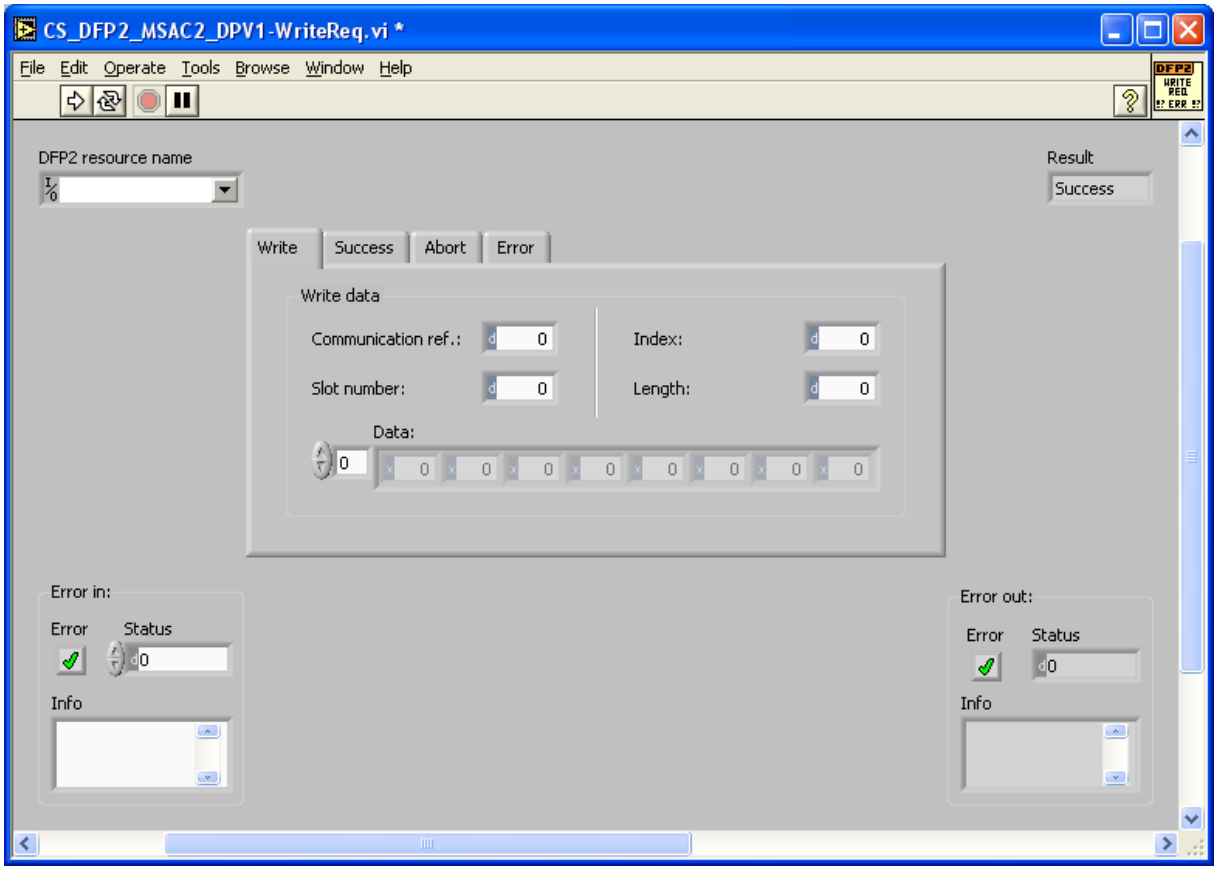


Figure 19: DPV1 Write_Req front panel

- Select the DFP2 resource name.
- Enter the identical value (1) for **Communication ref** as used for Initate_Req.
- Enter the **Slot Number**, **Index** and **Length** for the DPV1 variable to be written. To enter the DP Slave address is not necessary, this is decoded via the **Communication ref** parameter, which was assigned as 1 during connection setup.
- Enter the data to be written in the **Data** field. The length is automatically adjusted according to the entered data.
- Run the VI. After the VI has terminated, the status value in the Error out block must be set to a value of 95, what means that Data have been successfully written to the DP Slave.

6.5 Abort_Req

Terminates the connection with a DP Slave.

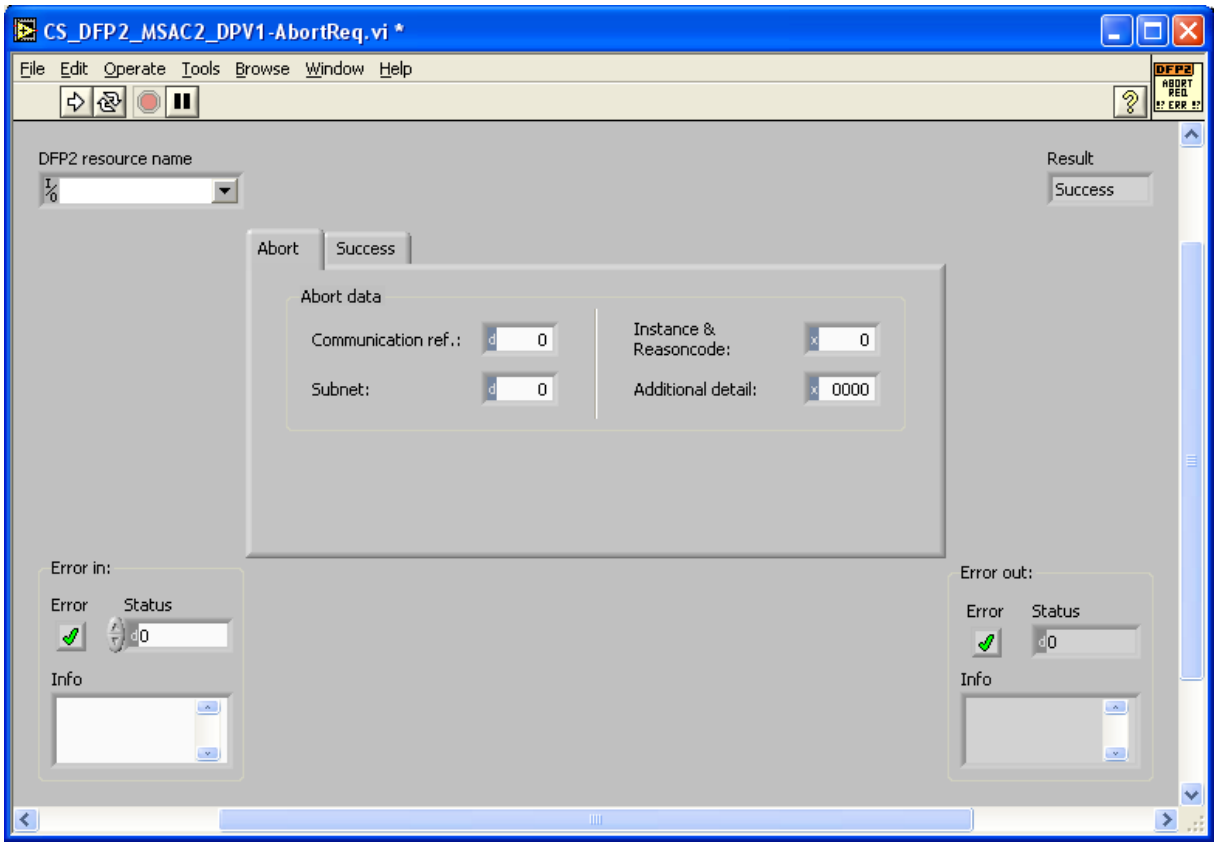


Figure 20: DPV1 Abort_Req front panel

- Select the DFP2 resource name.
- Enter the identical value (1) for **Communication ref** as used for Initate_Req. To enter the DP Slave address is not necessary, this is decoded via the **Communication ref** parameter, which was assigned as 1 during connection setup.
- Leave all other parameters unchanged.
- Run the VI. After the VI has terminated, the status value in the ErrorOut block must be set to a value of 130, what means that the DP Slave is successfully disconnected.