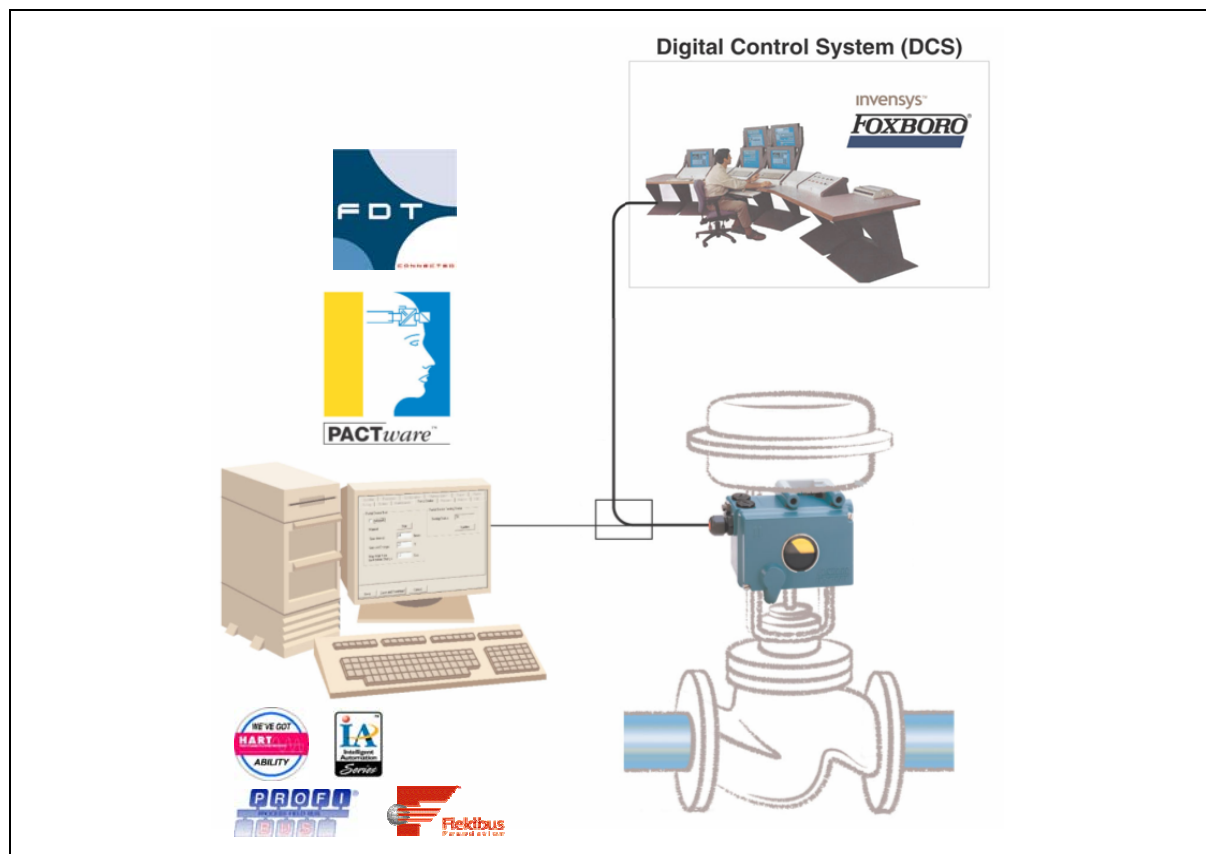


VALcare™ Valve Diagnosis

for Positioners SRD991 / SRD960



The valve diagnostic software **VALcare™** is available as Device Type Manager (DTM) for integration into control systems based on the Field Device Tool (FDT) technology such as the Foxboro IA Series System. It is designed to support methods for evaluation of the valve health, operation and configuration. The DTMs support the communication protocols HART, Profibus PA, FOUNDATION Fieldbus (FF) and FoxCom.

FEATURES

- Predictive Maintenance capabilities
- Intelligent Alarm Management
- Self-surveillance in accordance with NE107
- Service Management
- Histograms for Valve Position- and Response-History
- Data collected up to 60 months
- Data stored inside positioner memory
- Determination of Stem Friction to prevent leakage and stuck stem
- Histogram for Friction-History
- Partial Stroke Test function for ESD applications

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1 INTRODUCTION

The software available as Device Type Manager (DTM) for Field Device Tool (FDT) -compliant PC's or control systems is designed to provide the identical functionality for each Intelligent Positioner, independent of what communication protocol is used. All DTMs have the same look and feel and functionality. The following instruction shows details about the configuration, operation and diagnostics of the Intelligent Positioner.

Intelligent Positioner

The intelligent positioner is designed to operate pneumatic valve actuators. This includes versions with analog setpoint (4 to 20 mA) without communication or with superimposed HART signal; digital with FoxCom protocol, or fieldbus communication according to PROFIBUS-PA and FOUNDATION Fieldbus H1 based on IEC 1158-2 MBP acc. to FISCO. Before connecting electrical power and utilizing this program to communicate with and operate the positioner.

Before using the **VALcare™** software ensure that you have observed the following:

- All documentation such as the Product Specification Sheets (PSS) and the Master Instructions (MI) is thoroughly reviewed.
- The positioner is mounted on a valve / actuator per requirements of the MI.

2 WHAT IS FDT / DTM

The FDT/DTM concept specifies a “frame application” with a uniform platform for software tools and provides the particular advantage of a simple, standardized and common implementation and engineering environment to integrate field devices into any FDT compliant control system.

It defines interfaces and mechanisms which provide a simple method of running a type of “printer driver” for field devices, the Device Type Manager (DTM). DTM describe the field device specific software component. **VALcare™** is such a “driver” and supports the communication protocols HART, Profibus PA, FOUNDATION

Fieldbus and FoxCom. FDT supplements the DDL-technology and offers much more, a unified architecture for all devices in a plant. Benefit, the “driver” can be integrated into any FDT compliant control system.

3 CONTENTS OF **VALCARE™** SOFTWARE

The **VALcare™** -software package includes the following files:

PACTware with:

- PACTware Release 3.0
- ComDTM for the HART-Protocol (by Codewright)

srdinstall with:

- Device-DTM for SRD991 and SRD960 for HART, PROFIBUS, FOUNDATION F. and FoxCom

modeminstall with:

- ComDTM for the FoxCom- EDCOM- and IRCOM-Protocol

Hardware Requirements

A computer with Pentium II 200 MHz processor or better, XGA Graphics and a Microsoft compatible mouse or an equivalent pointing device is recommended. [1]

Disk space requirements:

PACTware.....	100 MByte
ComDTM.....	40 MByte
DeviceDTM.....	55 MByte
Main Memory.....	45 MByte.

Software Requirements

PACTware runs under the operating systems Windows NT 4.0 as of Service Pack 4, Windows 2000 and Windows XP. To print device parameter values, a Microsoft Internet Explorer as of Release 4.0 must be installed.

About the software

PACTware (Process Automation Configuration Tool) is a program which allows to select communication-capable field devices of different manufacturers from a device catalog and combine them in projects.

In accordance with the **FDT** Specification 1.2 (Field Device Tool Specification) PACTware is used as a frame program for the **VALcare™**- or any other **Device-DTM** (Device Type Manager). **VALcare™** is a full version software for predictive maintenance, diagnosis, configuration and calibration.

Via **ComDTM** (Communication DTM) a communication with the field devices using protocols like e.g. the HART, PROFIBUS, FOUNDATION F. or FoxCom protocol is established. [1]

VALcare™ includes Communication- and Device-DTMs:

	HART	PROFIBUS-PA	FOUNDATION F.	FoxCom / EDCOM / ICOM ✓ ³⁾
Communication-DTM	✓	¹⁾	²⁾	
Device DTM				
SRD991	✓	✓	✓	✓
SRD960	✓	✓	✓	✓

¹⁾ Communication driver distributed by softing

²⁾ Communication driver included in FBM

³⁾ Communication driver included in modeminstall.exe

Required Modems and Interfaces

HART	HART-Modem (Serial or USB)
PROFIBUS-PA	PROFICard by Softing
FOUNDATION F.	ATFBus by National Instruments
FoxCom	PC10-Modem
EDCOM	EDC82- / EDC83-Modem
IRCOM	IR-Modem (Serial or USB)

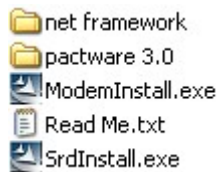
How to order

The CD-Rom for the VALcare™ Software-package can be ordered under the No.: **EW 556 932 011**.



4 INSTALLATION

The following files are available on the **VALcare™** CD-Rom.



If PACTware 3.0 is not yet installed, continue here

4.1 Installation of .net extension

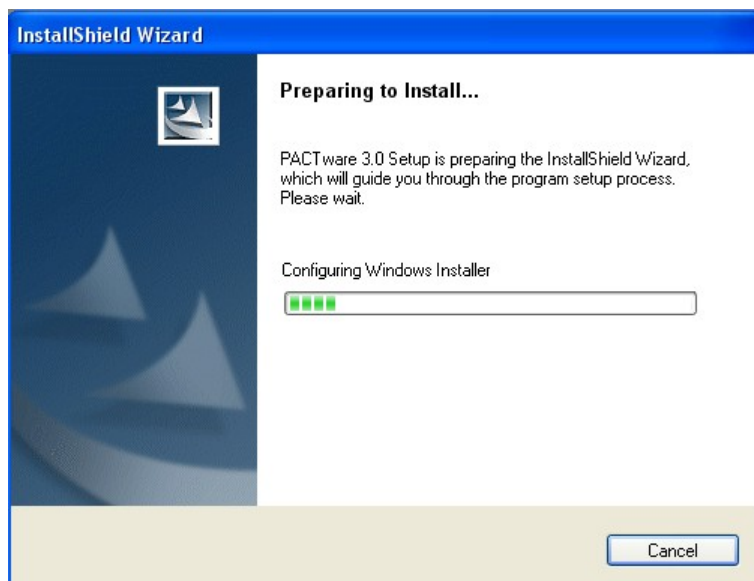
First the **.net extension** needs to be installed if your system is based on Windows NT 4.0 as of Service Pack 4, Windows 2000 or Windows XP.

4.2 Installation of PACTware

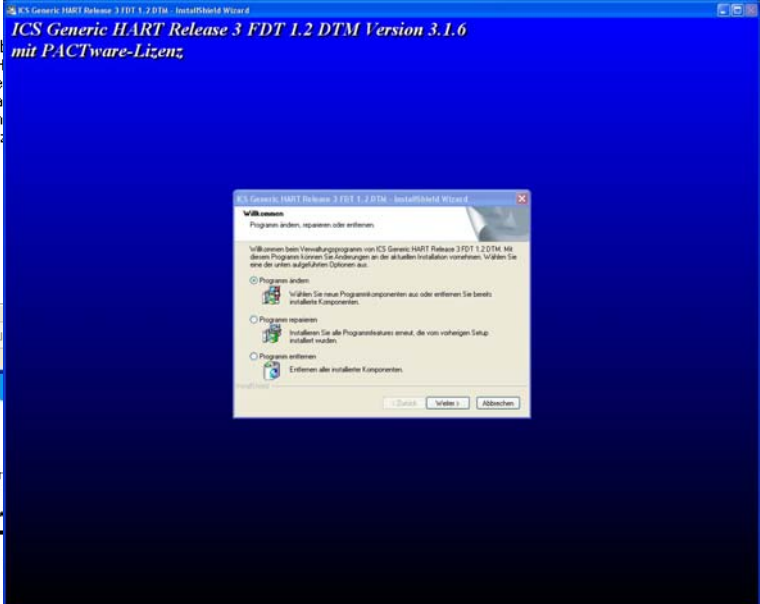
After that continue installation of **PACTware** is started by executing **setup.exe**. After selecting the installation language and confirming the license agreement either the complete or the user-defined setup must be chosen.



The user-defined setup allows to specify a target directory for PACTware and to exclude some components from the installation.



The setup wizard will guide you through the installation.



PACTware
Release 3.

If PACTware 3.0 is already installed, continue here

4.3 Installation of Comm-DTM

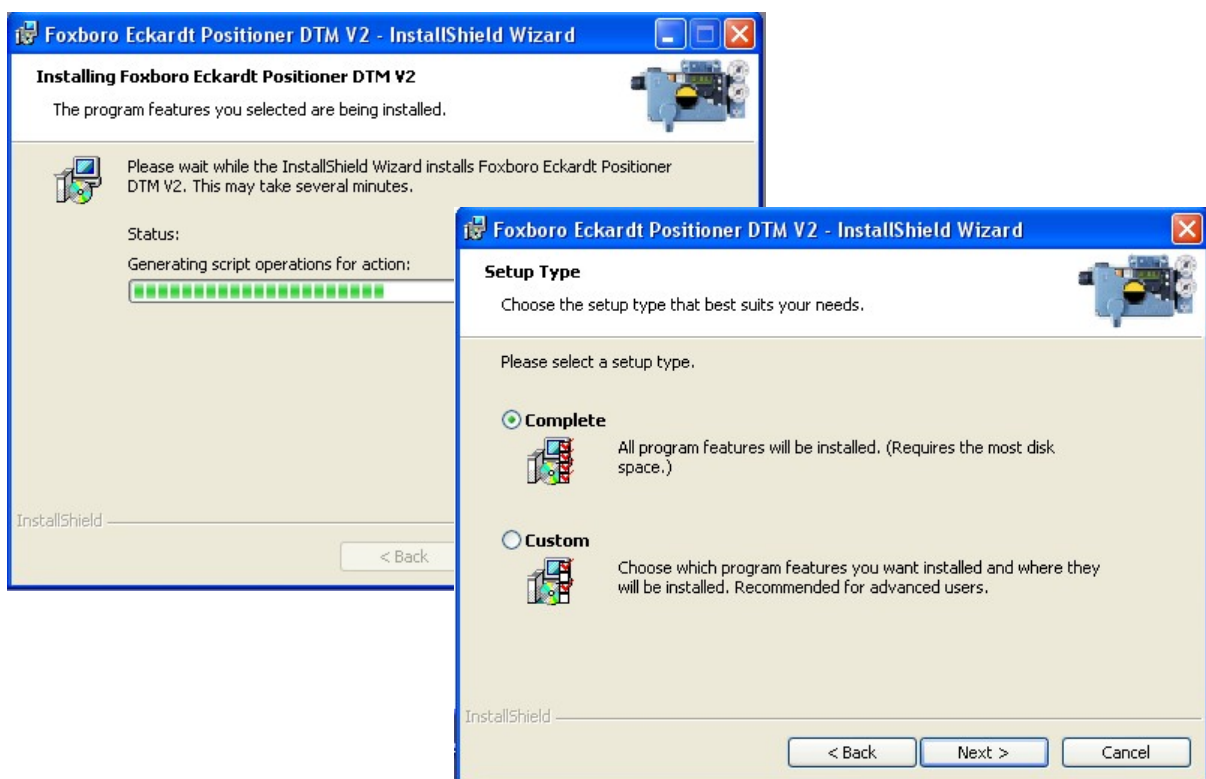
The installation of the **FoxCom-**, **EDCom-** and **IRCom-Device-DTM** is started by executing **modeminstall.exe**. After confirming the license agreement either the complete or the user-defined setup must be chosen.

The setup wizard will guide you through the installation.

4.4 Installation of SRD-DTM

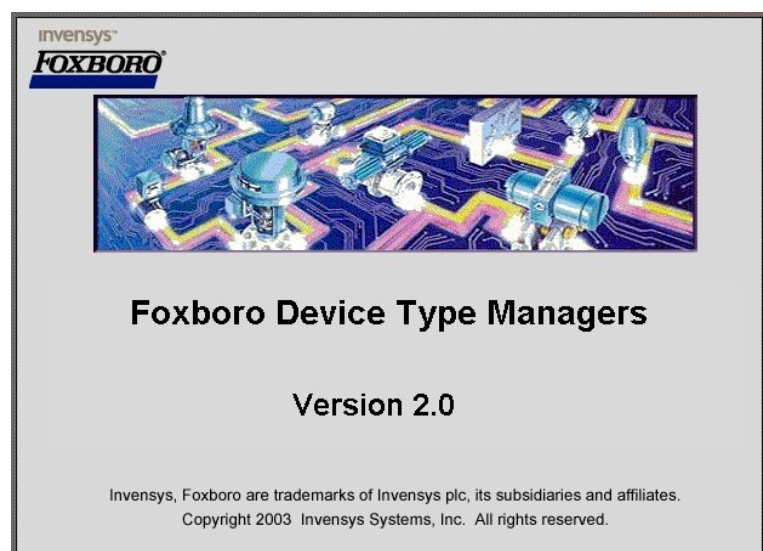
The installation of the **SRD Device-DTM** is started by executing **srdinstall.exe**. After confirming the license agreement either the complete or the user-defined setup must be chosen.

We recommend using the “**Complete**” setup.



After selecting the setup type, the Foxboro DTM install shield will open.

After completion of the setup, the install shield will close automatically.



5 STARTING PACTWARE

To start **PACTware**, execute the **PACTware 3.0** icon on your desktop.



The **PACTware Login** window will open.

To initially access the software you need to enter the User and the default Password.

Default settings:

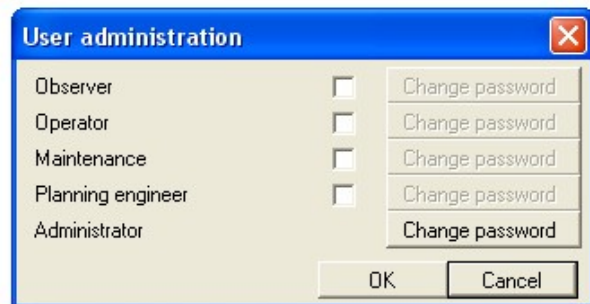
User Administrator
 Password **manager**



User Administration

To change the password, go to
 Extras → User Administration →
 change password

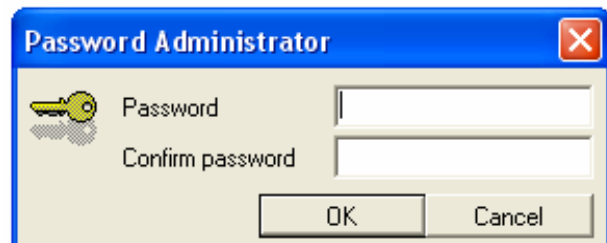
The Password Administrator will open



Password Administrator

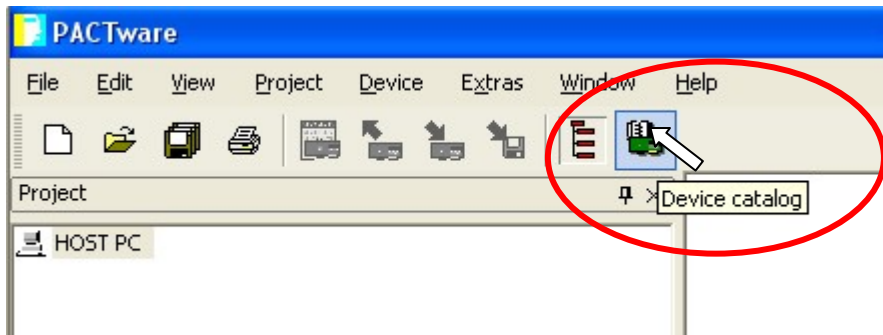
We recommend not to use a password, by entering a blank in each window and then confirm with OK.

This enables each operator to access the above PACTware Login by just confirming with OK, without entering any password.

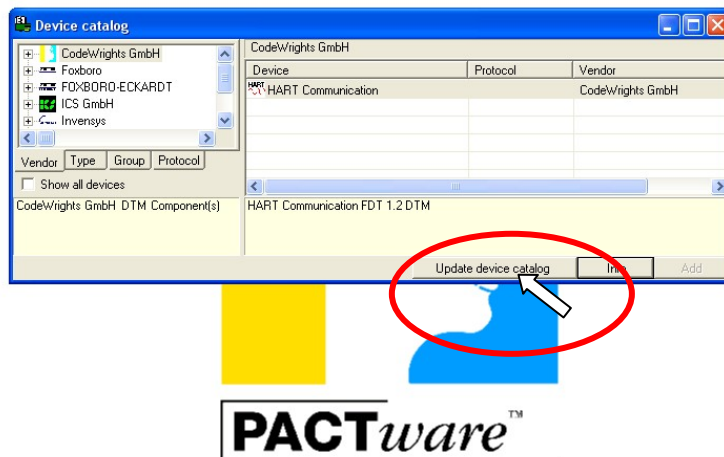


After initial installation of the Comm-DTM and SRD-DTM we recommend to **“Update the device catalog”** first, before opening a project.

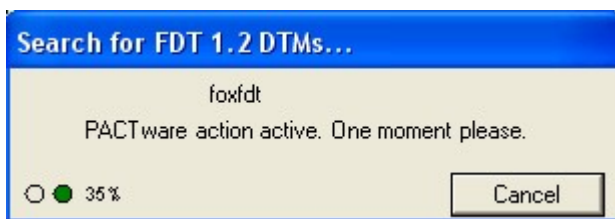
Execute the button for the Device catalog.



Then execute the button for “Update device catalog”.



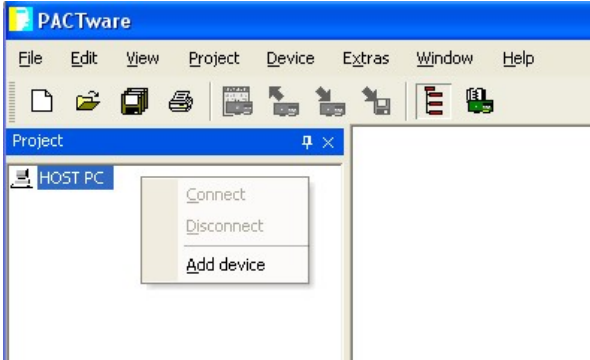
The following window will appear and scroll through all device drivers (foxfdt...), to ensure that the drivers are updated.



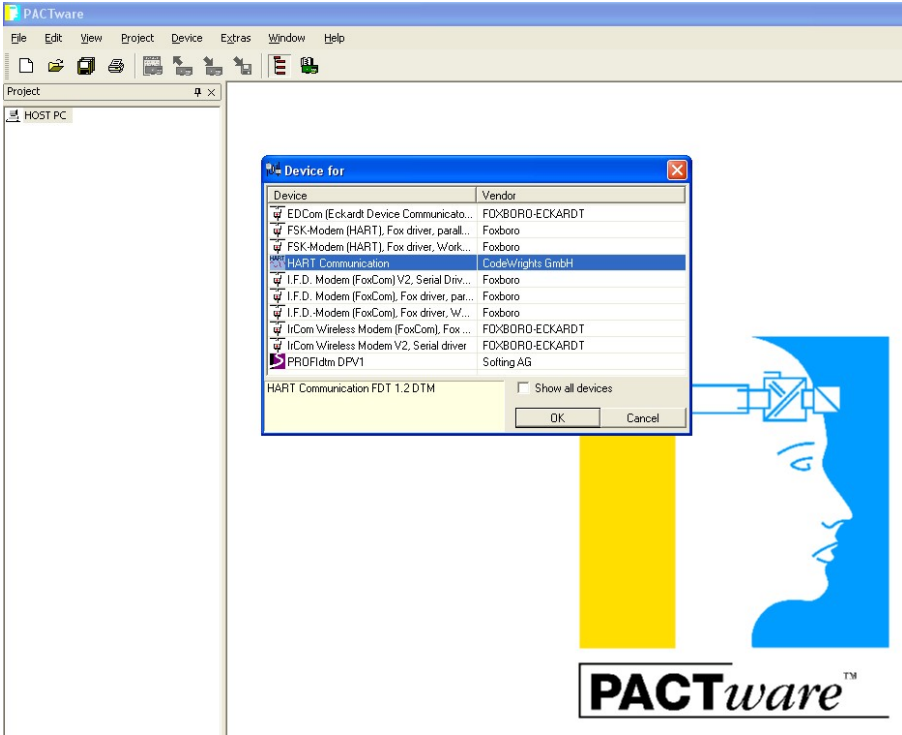
After the update a project can be opened.

6 OPENING A PROJECT

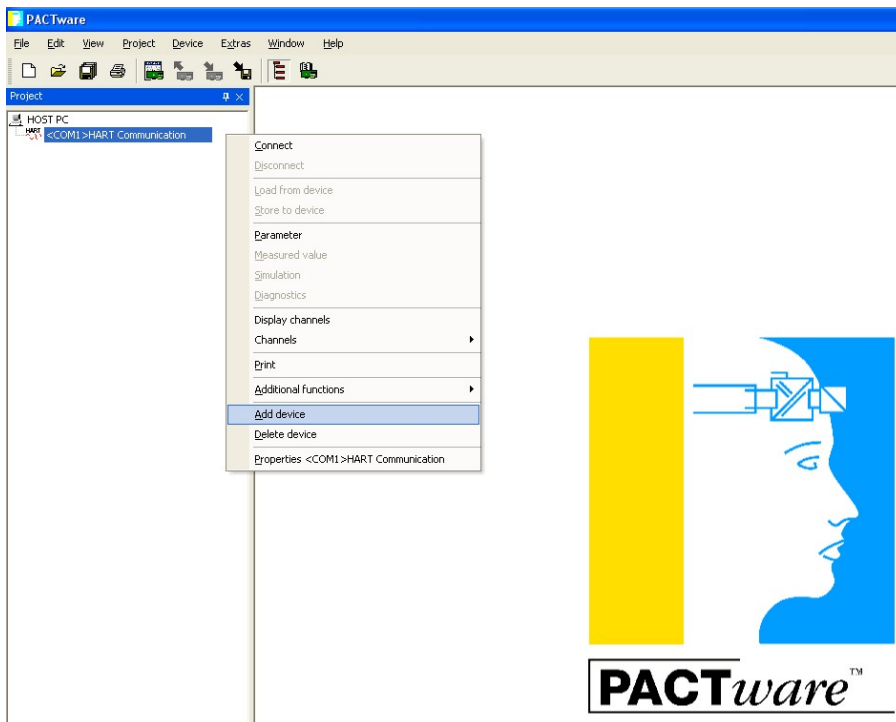
1. Start PACTware



2. Add a communication driver to the HOST PC



3. Add an device-DTM to the communication-DTM

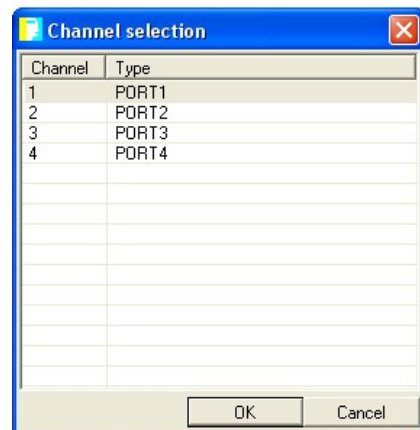


3a Selecting the port / channel

After adding the communication driver you need to address a **PORT** or channel.

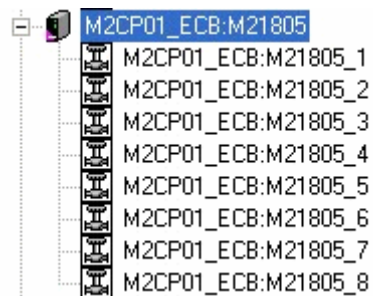
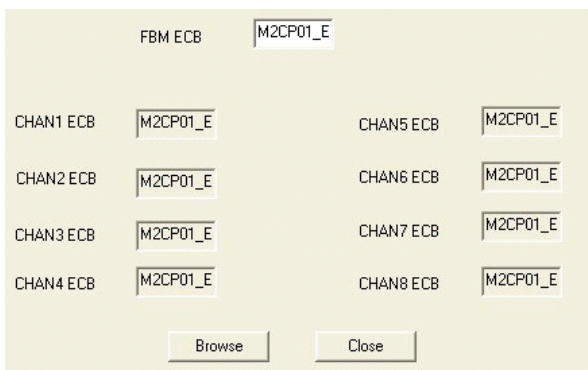
If you are running **PACTware** e.g. on a PC the PORTS are respective to your COM-Ports. In this case the standard Serial Port might be COM1 = PORT1.

If you are running PACTware e.g. on the Foxboro I/A™ Series System in connection with a FBM215 for 8 HART outputs, you will see each individual channel of the FBM.

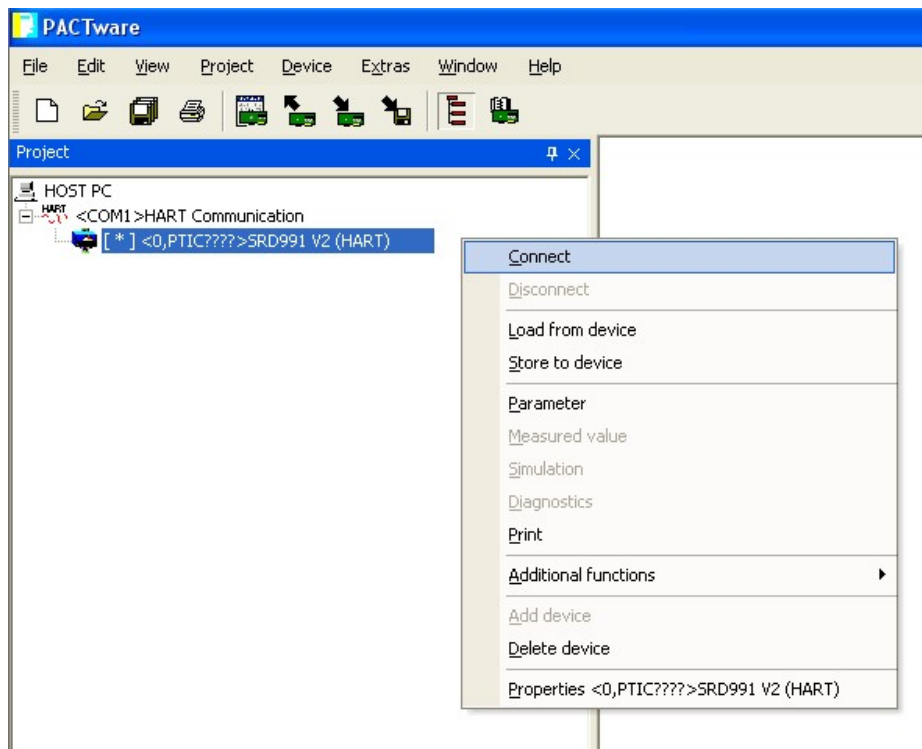


The displayed example represents the 8 channels (CHAN1...8) of a Field Bus Module (FBM) connected to a Control Processor (CP).

After browsing the channels of the individual FBM you will be able to assign a field device to each I/O.

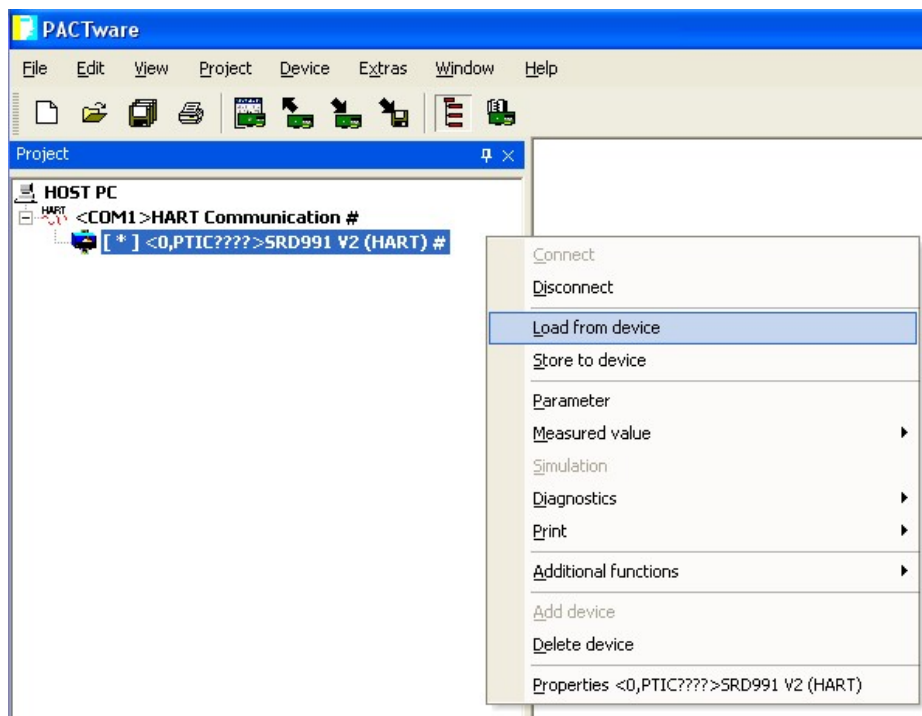


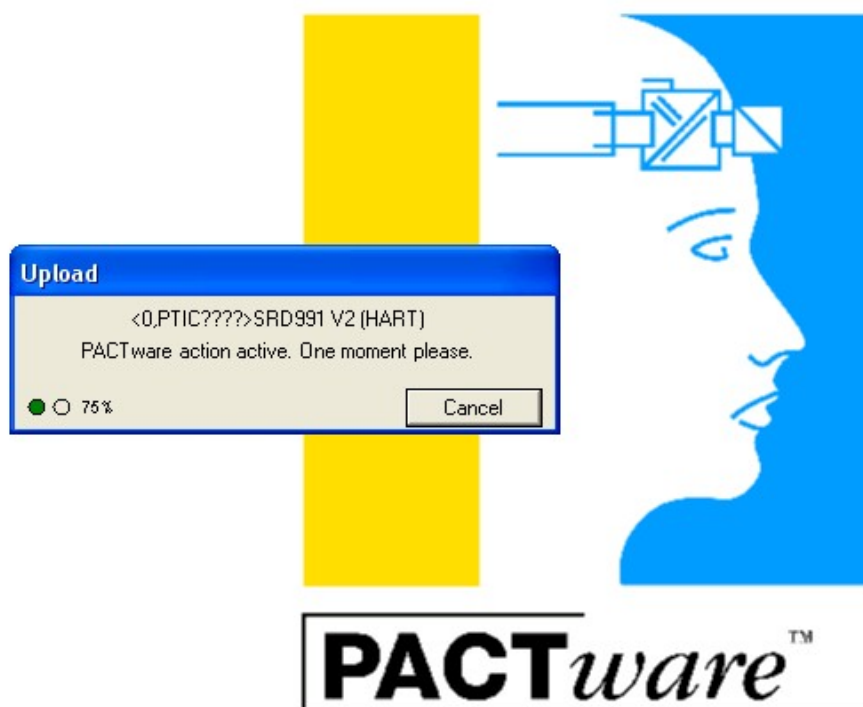
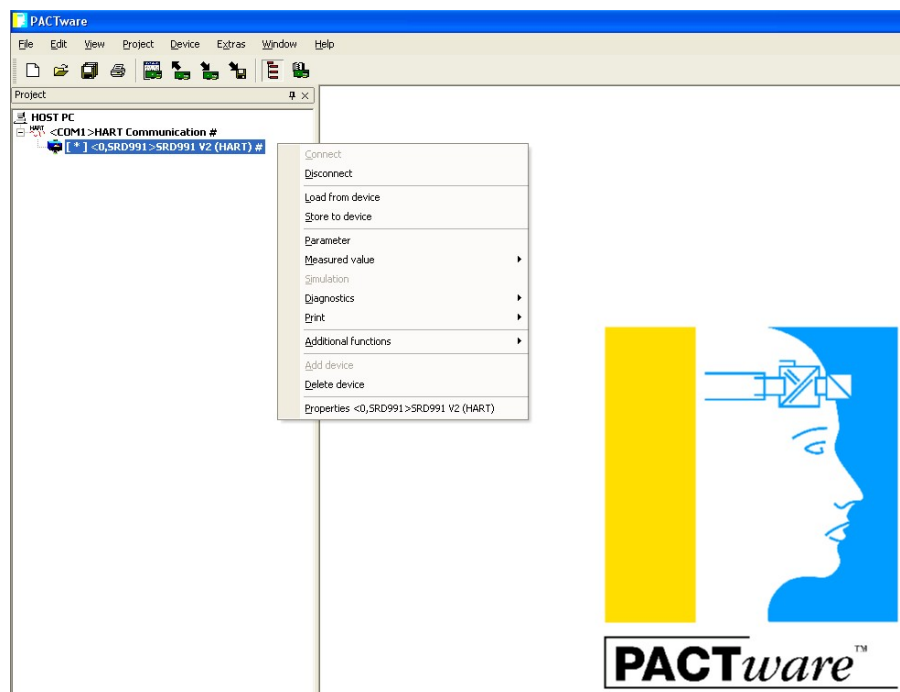
4. Connect the device



The “drivers” are successfully connected when the line turns bold and a pound sign “#” is added to each line.

5. Load data from device



6. A progress bar indicates that the data is loaded from the device**7. The Project is now active**

7 MENU STRUCTURE

7.1 Communication-DTM for HART, FoxCom and PROFIBUS and FOUNDATION Fieldbus

- Connect
- Disconnect
- Load from device
- Store to device
- Parameter
- Mesured value
- Simulation
- Diagnostics
- Display channels
- Channels ▶

- Print
- Additional functions ▶
 - Compare offline
 - Compare online
 - Set value
 - Scan List
 - Save As Template
 - Load From...
 - Audit Trail
 - DTM Documentation
 - Parameter List
 - Save As...
 - Write device data to file
- Add device
- Delete device
- Properties

7.2 SRD-DTM for HART, FoxCom and PROFIBUS...

7.2.1 SRD-DTM before 01.07.2005

Connect		
Disconnect		
Load from device		
Store to device		
Parameter		
Mesured value	▶	Trend Viewer Measurement
Simulation		
Diagnostics	▶	Status List (NE107) Status Detail
Print	▶	Configuration Simulation
Additional functions	▶	Compare offline Compare online
		Set value ▶ Angle Temp Pos Feedback Output 1 Press Air Supply Restore Factory Analog
		Scan List Reset Counters Reset Status Write Protect Reset Valve Diagnosis Change Mode Reset device Endpoints Autostart PC20 Import Save As Template Load From... Audit Trail DTM Documentation Parameter List Save As... Write device data to file
Add device		
Delete device		
Properties		

7.2.2 SRD-DTM from 01.07.2005

- Connect
- Disconnect
- Load from device
- Store to device
- Parameter
 - Mesured value ▶ Trend Viewer
Measurement
- Simulation
- Diagnostics ▶ Status List (NE107)
Status Detail
- Print ▶ Configuration
Simulation
- Additional functions ▶ Compare offline
Compare online
Set value
 - ▶ Angle
 - Temp
 - Pos Feedback
 - Output 1 Press
 - Air Supply
 - Restore Factory
 - Analog
 - Management ▶ Reset Counters
Go Offline
Language Download
Reset Status
Write Protect
Reset Valve Diagnosis
Go Local
Reset Device
Go Online
Change Device Type
 - Asset Management ▶ Endpoints
Autostart
- Audit Trail
- PC20 Import
- Save As Template
- Load From...
- DTM Documentation
- Parameter List
- Save As...
- Write device data to file
- Add device
- Delete device
- Properties

7.3 SRD-DTM for FOUNDATION Fieldbus from 02.09.2005

Connect		
Disconnect		
Load from device		
Store to device		
Parameter	▶ Configuration	▶ FF Parameter Configure Device
Parameter		
Mesured value	▶ Trend Viewer Measurement	
Simulation		
Diagnostics	▶ Status List (NE107) Status Detail	
Print	▶ Configuration Simulation	
Additional functions	▶ Compare offline Compare online	
	Set value	▶ Angle Temp Language Download Pos Feedback Output 1 Press Output 2 Press Air Supply Restore Factory Change Device Type Restore Valve Specific Parameter Analog
	Management	▶ Reset Counters Go Offline Reset Status Write Protect Reset Valve Diagnosis Go Local Go Online Restart Device
	Audit Trail	
	Endpoints	
	Autostart	
	Set Setpoint	
	PC20 Import	
	Save As Template	
	Load From File...	
	DTM Documentation	
	Parameter List	
	Save As File...	
	Write device data to file	
Add device		

7.4 Parameter

Alarms

Position Alarms

High High
High
Low
LowLow

Alarm deadband
Control difference

Temperature units
Temperature
Travel sum
Cycle counter

Limit
Time
°C / °F

Characterization

Linear
Equal-percentage
Invers-equal-percentage
Custom / Custom curve values

Configuration

Valve Type
Actuator Type
Valve stem movement

linear left-mounted
linear right-mounted
rotary ccw
rotary cw

Spring type

closes
opens

Amplifier type

single
double
spool

Control action

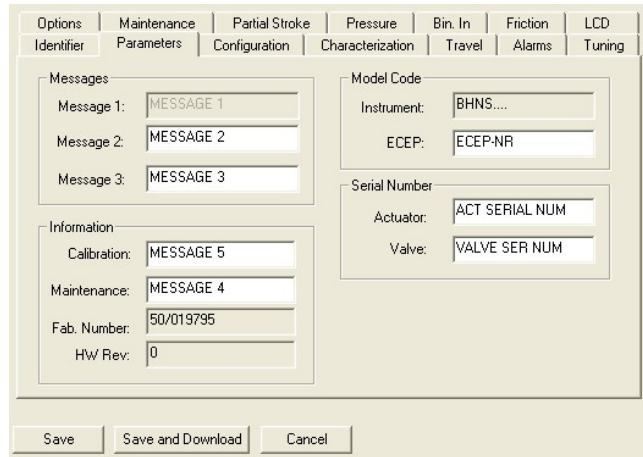
direct
reverse

Setpoint source
Split range (for analog)
Power Up function
Fail safe

Friction

Upper Limit
Lower limit
Spring Range

Unit
Range



Cont'd Parameter

Identifier

Device
 Serial number
 Firmware
 Last calibration
 Tag-

number
 name
 date

LCD

Text orientation
 Text language

Maintenance

History Interval History 1 thru 4
 Service Interval

Options

LCD
 Pressure sensors
 Pos Transmitter

Direct / Reverse
 Alarm Output Logic Namur
 Binary
 Position Alarm Output High
 Output Low

BinOut 1 / 2

Logic of Output Namur
 Binary
 Position Alarm Output High
 Output Low
 Output Signal Active for
 HiHiAlarm
 HiAlarm
 LoAlarm
 LoLoAlarm

BinIn 1 / 2

Logic of Input
 Goto 0%
 Goto 100%
 Set Status for input 1
 Set Status for input 2
 Configure Text

Potentiometer

Parameter

Information
 Messages
 Modelcode
 Serial number

Cont'd Parameter**Partial Stroke**

Activation Start
Manual / Automatic
Time Interval
Setpoint change
Max. wait time for setpoint change

Pressure

Air supply	units
	scaling
Output pressure	units
	scaling
Lower alarm limit	

Travel

Response Time	T63-time
Cutoff	low / high
Travel Limits	low / high
Travel position limits	mm / inch / degree

Tuning

P-gain
I-time
Travel time limits / stroke-time
Control gap

7.5 Diagnosis Detail

Overview before 02.09.2005

- Temp High
- Temp Low
- Invalid Configuration
- Travel Sum Limit
- Cycle Count Limit
- Input Loop Trim
- Feedback Trim
- No Autostart done
- Position High High Alarm
- Position High Alarm
- Position Low Alarm
- Position Low Low Alarm
- Control Difference Out of Limit (OOL)
- Air Supply Pressure Alarm
- Output Pressure Alarm

Overview from 02.09.2005

- Service Management
- Process
- Hardware
- Calibration
- Alarms
- Friction

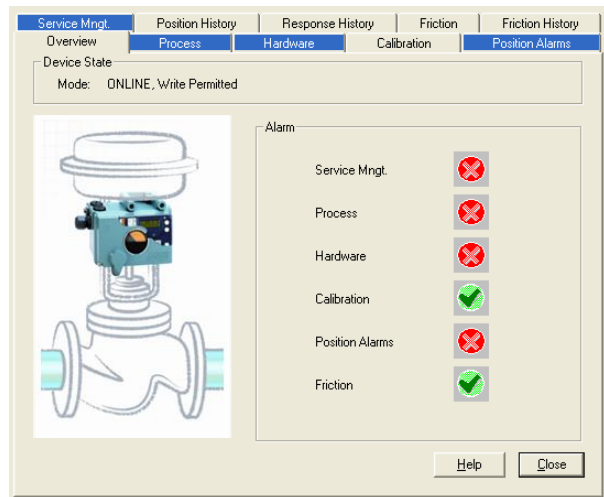
Alarms

- Position High High Alarm
- Position High Alarm
- Position Low Alarm
- Position Low Low Alarm

Process

- Temp High
- Temp Low
- Maximum Temperature
- Minimum Temperature
- Power Supply Low
- Power Supply High
- Air Supply Pressure Alarm
- Output Pressure Alarm
- Partial Stroke Testing Status

- Not Done
- Running
- OK
- Restricted
- Error



Cont'd Diagnosis Detail

Hardware

- RAM Error
- EEPROM Error
- ROM Error
- AD Converter Error
- Actuator Out of Range (OOR)
- Control Difference Out of Limit (OOL)
- Current Loop I/P Module
- Potentiometer
- Option Board

Calibration

- Autostart done
- Invalid Configuration
- Input Current Calibration
- Feedback Calibration

Position Alarms

- High High Alarm
- High Alarm
- Low Alarm
- Low Low Alarm

Service Management

- Status of Service Interval
- Actual Time in Operation
- Time Since Last Service
- Cycle Counter
- Travel Sum
- Service Reminder Limit
- Cycle Count Limit
- Full Stroke Limit

Position History

- Graph

Response History

- Graph

Friction

- Measured Value
- Maximum Value
- Minimum Value
- Average
- High Friction Alarm Status
- Low Friction Alarm Status
- Upper Alarm Limit
- Lower Alarm Limit
- Average Reference
- Reference Time-stamp

Friction History

- Graph

8 PROFIBUS CONFIGURATIONS

8.1 Comm-DTM

We recommend using the communication DTM for Profibus distributed by softing. This driver is not included in the modemininstall.exe or the srinstall.exe.

The driver can be downloaded and updated from: <http://www.softing.com>, but requires a USB-dongle that has to be purchased from Softing directly. In addition an interface (PROFICard by softing) to connect the PC or workstation to a Profibus DP segment coupler is required.

We recommend to use the following DPV1 parameters for setting up the Comm-DTM.

Settings:

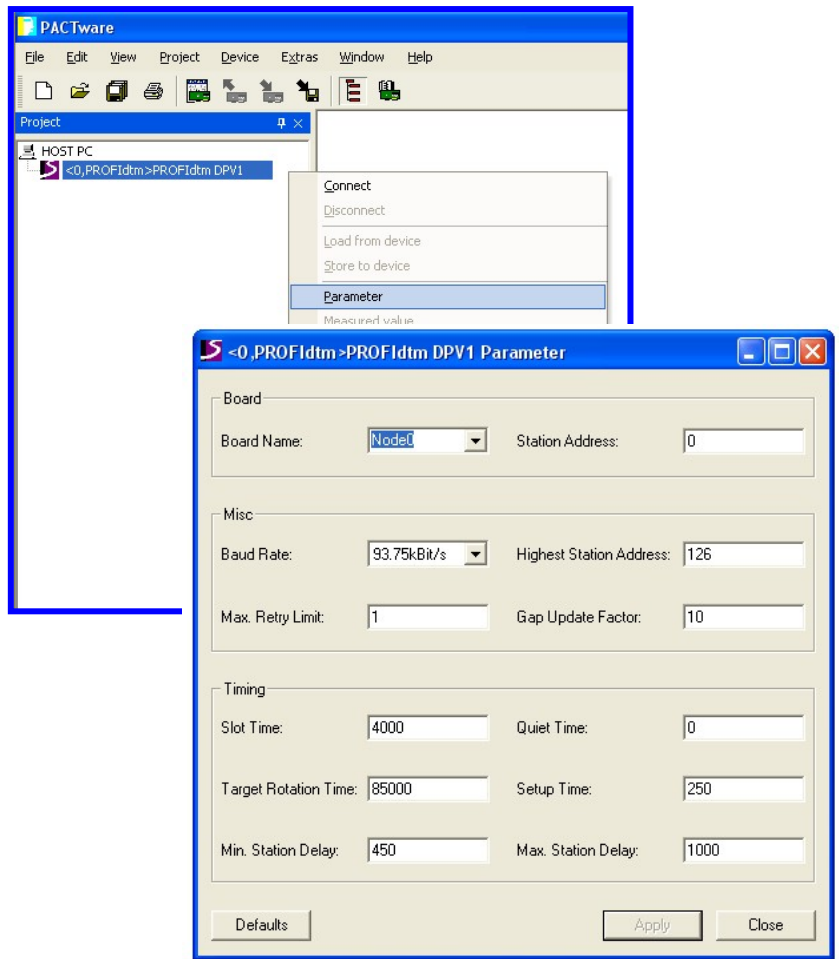
The settings can be found under Parameter for the Comm-DTM (<0, PROFIdtm>PROFIdtm DPV1).

Misc

Baud Rate: 93.75 kBits/s
 Highest Station Address: 126
 Max. retry Limit: 1
 Gap Update Factor: 10

Timing

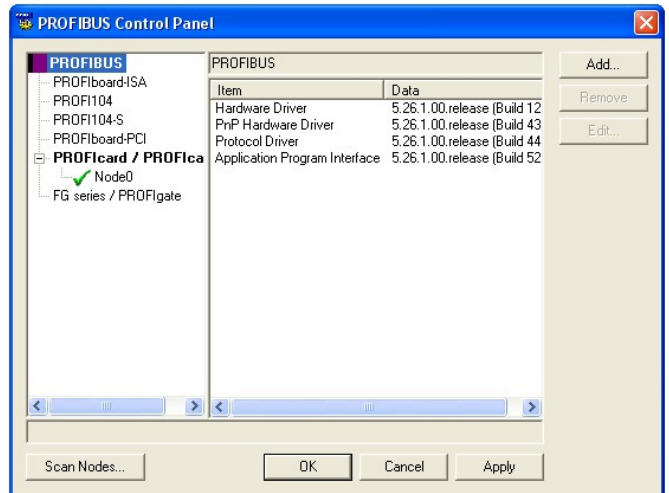
Slot Time: 4000
 Quiet Time: 0
 Target Rotation Time: 85000
 Setup Time: 250
 Min. Station delay: 450
 Max. Station delay: 1000



Profibus Control panel

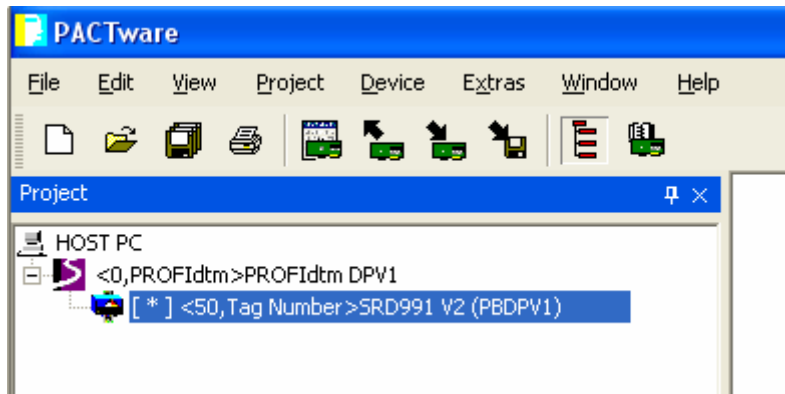
The Profibus Control panel can be found under Start → Control Panel → PROFIBUS.

Ensure that you see a green ✓ in front of the Node. If you do not see other than that, such as a red ✗, the PROFICard is not active. Contact softing for assistance.



8.2 SRD-DTM

Connect the SRD-DTM for Profibus as shown below and described under “Opening a Project”.



After selecting the device driver from the device catalog, a window will automatically open to edit the bus address for his specific unit. The default slave address is 126.

The following addresses are reserved for the Master or default: 0, 1 and 126.



After selecting the bus address, each line will show the address for the Master and Slave first. See the following example:

<0, PROFIdtm>PROFIdtm DPV1	(0: Node 0)
<50, Tag Number> SRD991 V2 (PBDPV1)	(50: Bus Address)

8.3 Data Screen

For Profibus devices an additional Data Screen may be opened to display additional Profibus specific parameters. For viewing the Profibus Data select **View – Profibus Data**. This function opens a modeless dialog. The displayed information is updated approximately once every two seconds.

Fields	Description
Readback	The actual position of the actuator/valve within the travel span in units of PV-SCALE.
Position D	The current position of the acutator/valve (discrete). Possible values are: NOT INITIALIZED (before an autostart has been performed), CLOSED, OPENED and INTERMEDIATE.
FB-Mode	Actual Mode of the Function Block.
SP	Setpoint SP in units of PV-SCALE. This setpoint is used as desired value , when the function block is in Mode AUTO and the status of SP is ok (e.g. Good (Non Cascade) = 0x80).
RCAS_IN	Setpoint RCAS_IN in units of PV-SCALE. This setpoint is normally transmitted by a DCS-System. This setpoint is used as desired value , when the function block is in Mode RCAS and the status of RCAS_IN is ok (e.g. Good (Cascade) = 0xC0).
RCAS_OUT	Setpoint RCAS_OUT in units of PV-SCALE with status, which is used as input for the function block algorithm. Depending on the mode of the function block contains the setpoint SP or RCAS_IN. RCAS_OUT is offered for the DCS-System or other function blocks.
OUT	Output Setpoint of the function block in units of OUT-SCALE with status. It is valid, when the function block is in mode AUTO or RCAS. In mode MAN, this value can be specified by the operator/engineer.

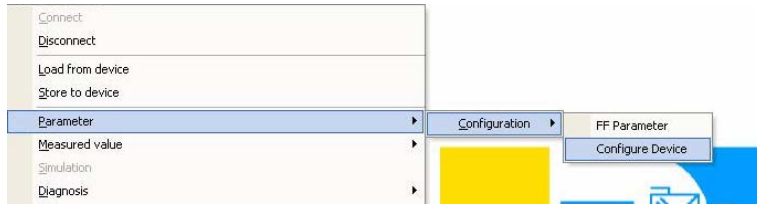
8.4 Profibus Function Block Page

For the detailed configuration of the Profibus Function Block parameters the Profibus Function Block Page is used.

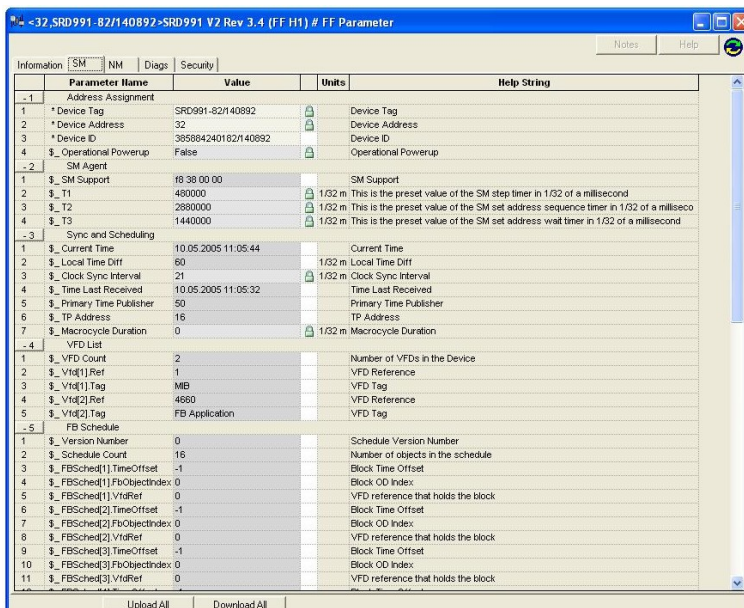
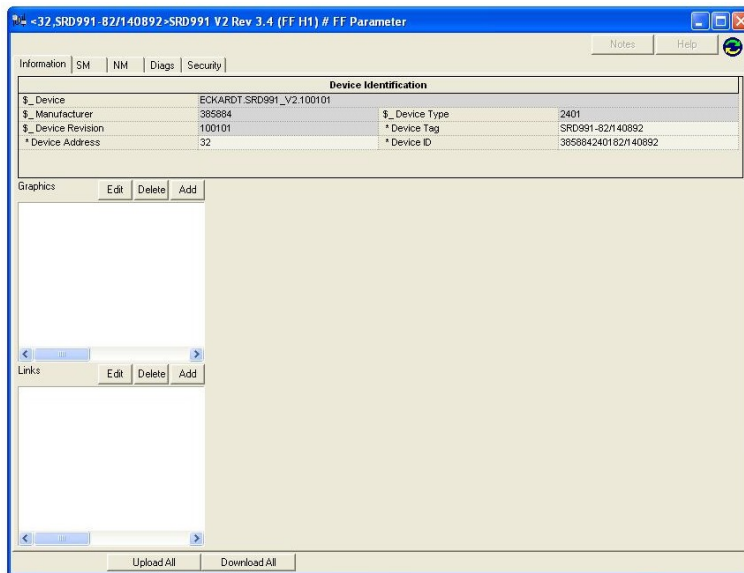
Fields	Entries
Target Mode	Contains the desired mode of the function block.
PV-SCALE:	Conversion of a process value in the defined engineering units to a normalized value in percent as the input value of the function block. It contains the high and low scale values, engineering units code, and number of digits to the right of the decimal point. As default, PV-PSCALE is configured to percent, meaning that the Variables SP, Readback, RCAS_IN und RCAS_OUT, which are depending on PV-SCALE, are displayed in the range 0-100%.
OUT-SCALE:	Conversion of the normalized Output Signal (in percent) of the function block to the OUT parameter in the defined engineering units. It contains the high and low scale values, engineering units code, and number of digits to the right of the decimal point. As default, OUT-SCALE is configured to percent, meaning that the Variable OUT is displayed in the range 0-100%.
Simulation	Allows definition of a value and a status. When Simulation is enabled, this value and status is given in Readback instead of the real position of the actuator/valve. This set of parameters is intended only for commissioning and maintenance reasons.

9 FOUNDATION FIELDBUS CONFIGURATIONS

Configuration of FF-specific parameters.



9.1 Listing of FF parameter



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