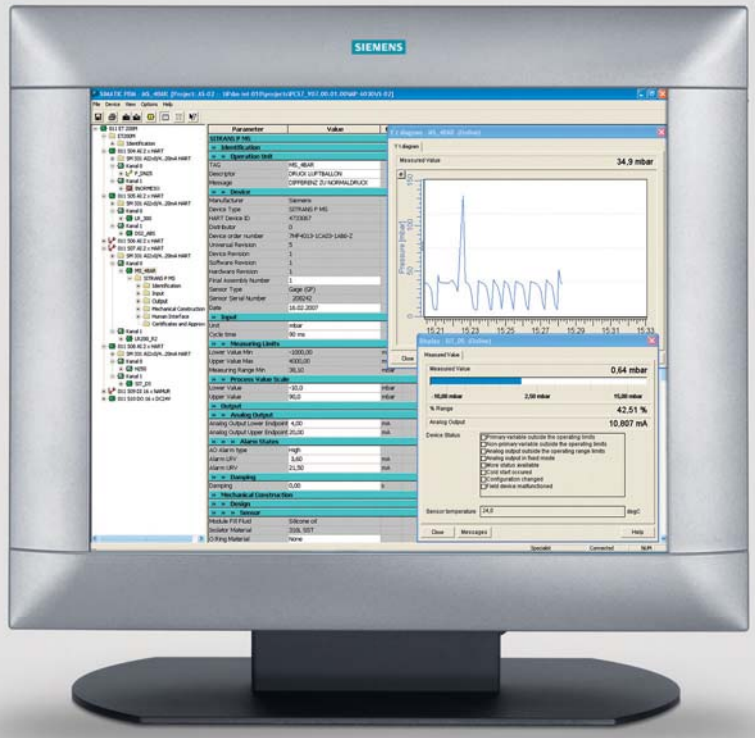
SIMATIC PDM – The Process Device Manager

The ideal tool for engineering, parameterization, commissioning, diagnostics and service

Technical brochure · April 2008



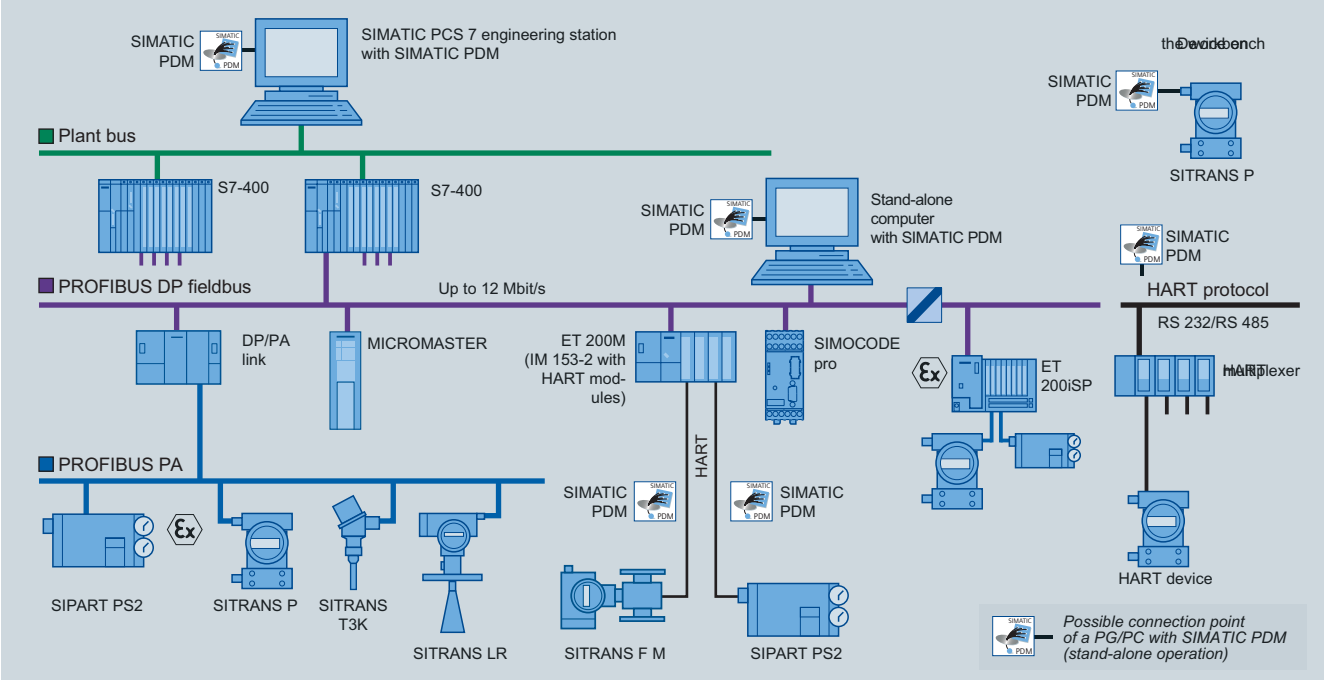
SIMATIC Software

www.siemens.com/simatic-pdm

SIEMENS

Process Device Manager SIMATIC PDM

Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameterization, commissioning, diagnostics and maintenance of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control room devices, compact controllers), which in the following sections will be referred to simply as devices.

Using *one* software, SIMATIC PDM enables the processing of more than 1 200 devices from Siemens and over 100 vendors worldwide on *one* homogeneous user interface. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface.

With respect to device integration, SIMATIC PDM is the most powerful open tool on the global market. Devices which previously were not supported can be easily integrated in SIMATIC PDM at any time by importing their device descriptions (EDD). This provides security for your investment and saves you investment costs, training expenses and consequential costs.

Possible applications of SIMATIC PDM

- System-integrated
  in a SIMATIC PCS 7 / STEP 7 configuration environment, e.g. on a SIMATIC PCS 7 engineering system or
- Stand-alone
  as a service tool on a mobile PC
  - on PROFIBUS or
  - with direct connection to the device

SIMATIC PDM software and hardware requirements	
Supported operating systems	■ Microsoft Windows 2000 Professional with SP1 or higher ■ Microsoft Windows XP Professional SP1/SP2
Language support	■ GUI in 5 languages (German, English, French, Spanish and Italian) ■ Device description language according to implementation by vendor
Hardware requirements	■ PG/PC/notebook with processor in accordance with the operating system requirements ■ 256 MB main memory or more ■ 210 MB vacant memory on hard disk or more

Functions

SIMATIC PDM core functions

- Setting and modification of device parameters
- Comparing (e.g. project and device data)
- Plausibility testing of inputs
- Device identification and testing
- Device status indication with operating modes, alarms and states
- Simulation
- Diagnostics (standard, detail)
- Management (e.g. networks and PCs)
- Export/import (parameter data, reports)
- Commissioning functions, e.g. measuring circuit tests of device data
- Device replacement (lifecycle management)
- Global and device-specific modification logbook for user operations (audit trail)
- Device-specific calibration reports
- Graphic presentations of echo envelope curves, trend displays, valve diagnostics results etc.
- Presentation of integrated manuals
- Document manager for integration of up to 10 multimedia files

Support of plant management

SIMATIC PDM particularly supports operative plant management through:

- Uniform presentation and operation of devices
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Graded user privileges including password protection

Communications and routing

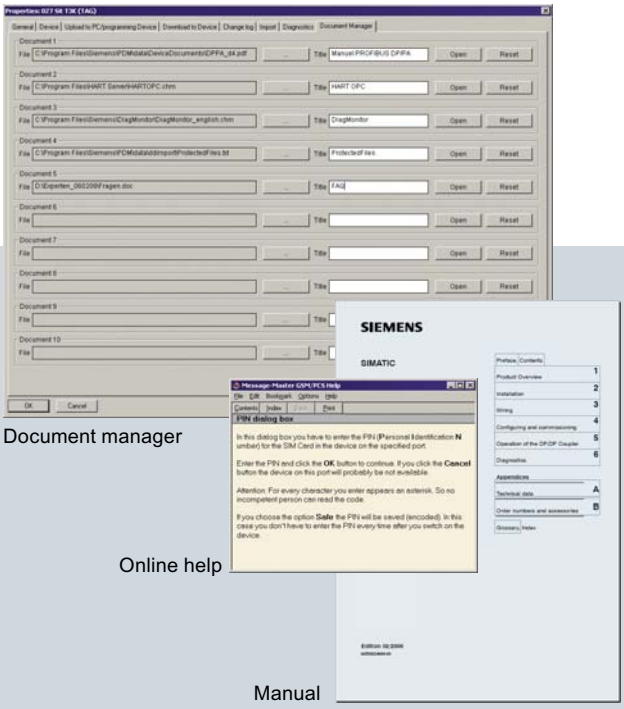
SIMATIC PDM supports several communication protocols and components for communicating with devices that have the following interfaces:

- PROFIBUS DP/PA interface
- HART interface
- Modbus interface
- Special interface from Siemens

Further communication protocols on request.

From the central engineering system of the SIMATIC PCS 7 process control system, one can use SIMATIC PDM to navigate to the connected devices via the various bus systems and remote I/Os. Throughout the plant, every device which can be parameterized per EDD can be processed using this routing functionality. The following processing functions are available:

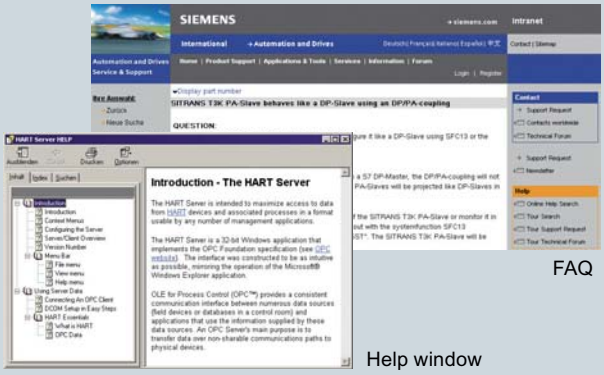
- Read diagnostics information from the device
- Modify device settings
- Adjust and calibrate devices
- Monitor process values
- Create simulation values
- Reparameterize device.



Document manager

Online help

Manual



FAQ

Help window

Engineering

Clearly structured engineering with appropriately matched views

The ergonomic operator interface of SIMATIC PDM satisfies the requirements of the directives VDI/VDE GMA 2187 and IEC 65/349/CD. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Expansion of the device description language EDDL also allows display elements to be shown perfectly.

Operators are provided with several views of the project and the devices to be processed, and their application depends on the procedure and mode of use of the Process Device Manager (stand-alone or integrated):

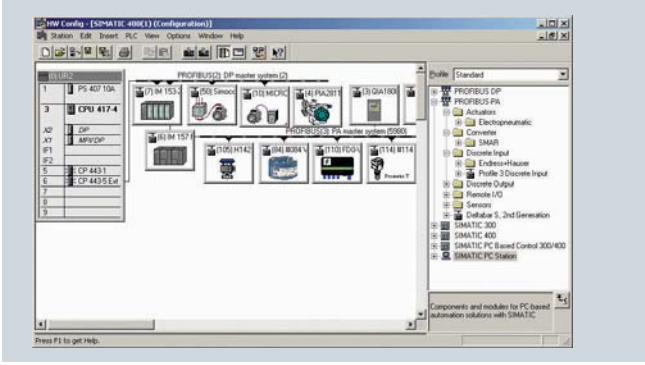
- **Hardware project view**
  (for the tool integrated in SIMATIC PCS 7 / STEP 7)
  View of SIMATIC PCS 7/S7 hardware project from which the SIMATIC PDM parameterization GUI can be directly opened for the devices; devices are configured using HW-Config, and displayed graphically or in tabular form.

- **Process device network view**
  (preferably for stand-alone use)
  Project view for clear representation of the hierarchical hardware structure with all networks, communications components and devices. This can be automatically produced by scanning the actual plant. The parameterization data gained in the stand-alone version of SIMATIC PDM can be imported into a SIMATIC PCS 7/S7 project.

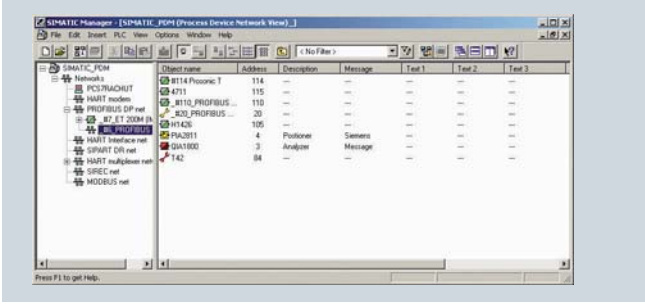
- **Process device plant view**
  View of all devices/TAGs present in the project (independent of the communications path used) with additional information on the diagnostics state of the devices and communications paths. Uniform symbols are used to display the diagnostics state of all devices.

- **Parameter view**
  View of device parameters with a wide variety of functions:
  - Parameterization functions, e.g. engineering unit, measuring range
  - Online functions, e.g. display values, charts, diagnostics
  - Calibration functions, e.g. zero, runtimes of valves
  - Comparison functions, e.g. devices / saved configuration data
  - Export/import functions, e.g. parameters, projects
  - Logging functions

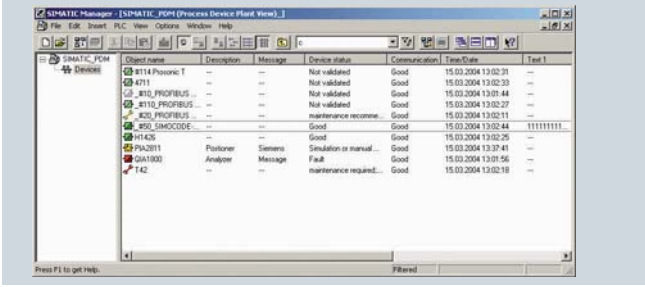
- **Lifelist view for commissioning and service**
  Single or cyclically generated network view for the identification, diagnostics and online parameterization of devices



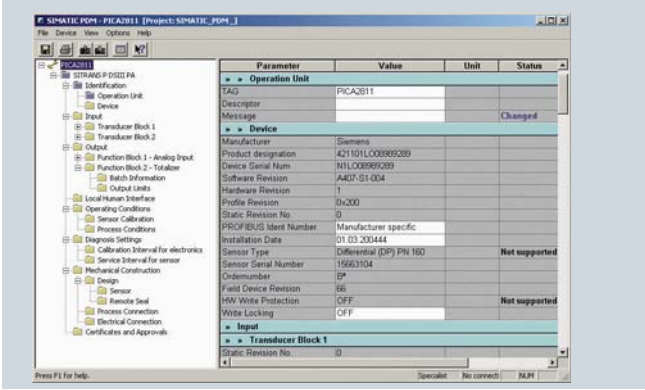
Hardware project view



Process device network view



Process device plant view



Parameter view

Device integration

Device integration made easy

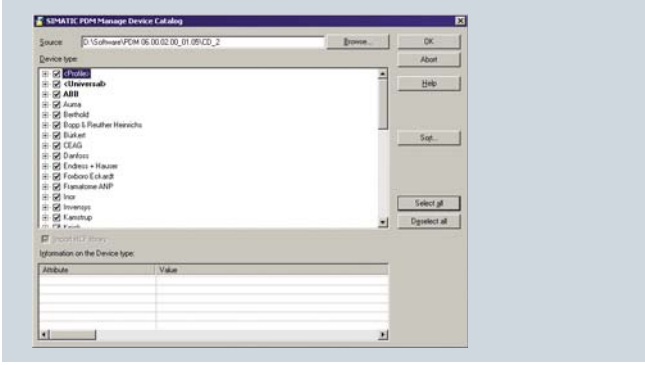
SIMATIC PDM supports all devices which are defined by means of the Electronic Device Description (EDD). Based on EN 50391 and IEC 61804 , EDD is the most widely used standardized technology for device integration. It is also a directive of the established organizations for PROFIBUS (PNO: PROFIBUS International) and HART (HCF: HART Communication Foundation).

Devices are integrated directly in SIMATIC PDM by means of their EDD or the current HCF catalog. The device is described in the EDD in terms of its functions and construction using the Electronic Device Description Language (EDDL) specified by PNO. SIMATIC PDM automatically creates its GUI with the specific device information using this description.

The advantages of the EDD as a text-based device description are quite clear:

- Independent of the operating system
- Forms an inseparable function unit together with the device
- Long-term stability throughout the complete device life-cycle, yet can be modified and/or extended at any time
- Contents can be individually matched to any device by the vendor
- The device vendor is provided with a wide scope of possibilities for generating unique features, e.g.
  - Implementation of vendor-specific diagnostics functions in addition to standard diagnostics
  - Integration of own documents and help functions
  - Implementation of plans for device-specific handling sequences, e.g. commissioning, calibration, servicing

The current SIMATIC PDM device catalog covers more than 1 200 devices from over 100 manufacturers worldwide. Furthermore, the devices of all manufacturers can be integrated at any time by simply importing their EDD into the SIMATIC PDM. It is thus possible to keep the device range up-to-date at all times and to add to the number of vendors and devices supported by SIMATIC PDM. If you would like to use any devices which cannot be found in the SIMATIC PDM device catalog, we will be glad to help you integrate them.



SIMATIC PDM device import

Contact addresses

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Parameter view

Central device view with uniform representation

The parameter view rapidly provides a comprehensive overview of a device. It has a clear layout.

Each device can be directly selected, processed and loaded. All device functions can be addressed.

Visualization and handling of the parameter view are uniform for all devices, independent of the type, vendor or communication:

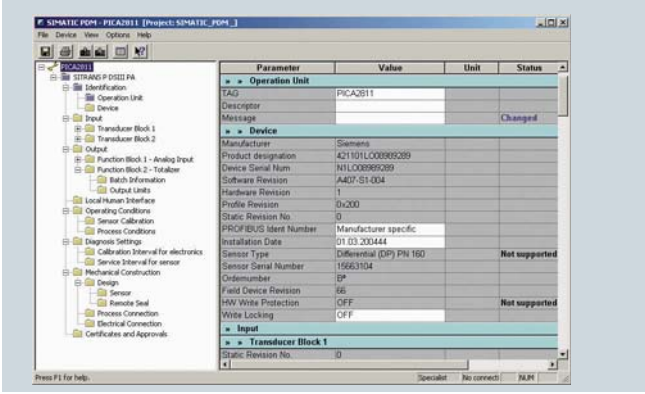
- Working window divided into two sections with navigation window (left) and parameter window with parameter name, value, engineering unit and status
- Toolbar for general functions
- Menu with device functions

Different languages can be selected as desired by the user (standard language: English).

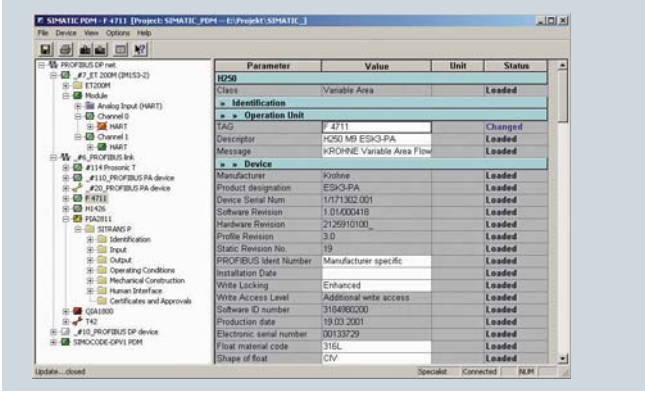
The device structure and contents are defined by the device description provided by the vendor.

Parameters which can be read and written have a white background, and are clearly differentiated from read-only values with a gray background. Modifications, invalid values, initial values and read/write status are explicitly identified by color and text.

Depending on the selection, the navigation window of the parameter view is focused either on a single device or displays the device within the hierarchical network structure (multiview). Multiview is very convenient for displaying complete networks or modular components such as remote I/O with connected HART field devices.



Parameter view - single



Parameter view - Multiview

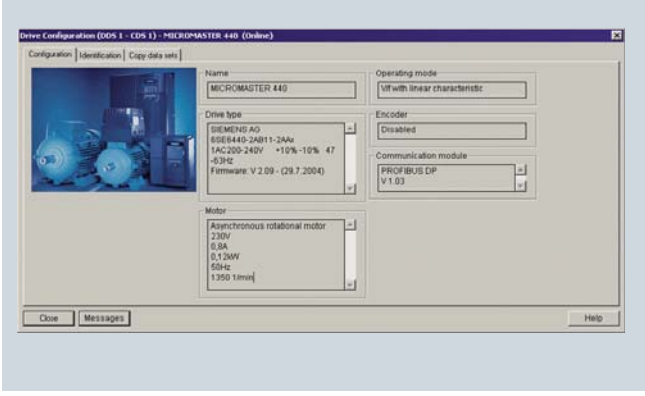
Informative online displays

SIMATIC PDM offers numerous possibilities for online communication with the devices. Values/parameters that can be visualized and accessed online are defined by the respective device vendor using the electronic device description (EDD). The representation is carried out using standardized online displays which are optimally matched to different functions with respect to the device descriptions, and also partially permit online access dependent thereon.

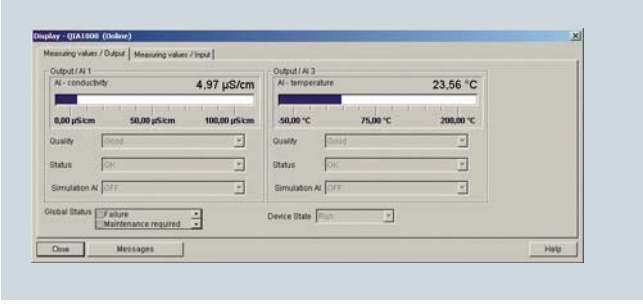
Examples of online functions which can then be implemented:

- Monitoring of process value
- Monitoring of raw measured values
- Monitoring of device-internal status or wear values
- Calibration functions
- Zero settings
- Slave pointer
- Trend curves with several variables
- X/Y curves, e.g. envelope curves for radar level meters
- Diagnostics states
- Resetting to factory settings
- Operating mode switchover
- Online parameterization
- Simulation of process variables, states and diagnostics messages
- Classification of device-specific diagnostics

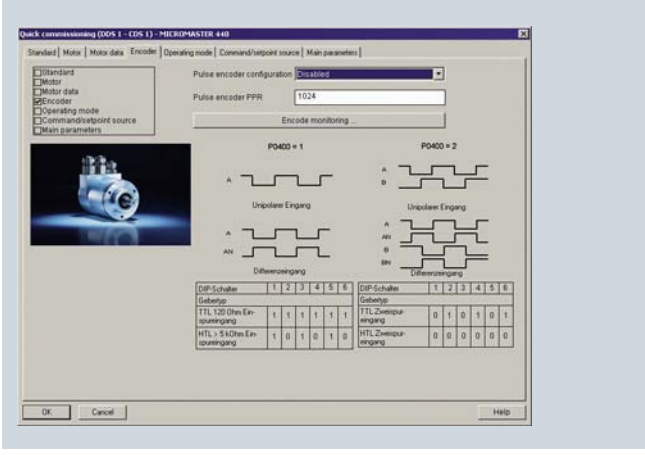
Trend display



MICROMASTER configuration data sheet

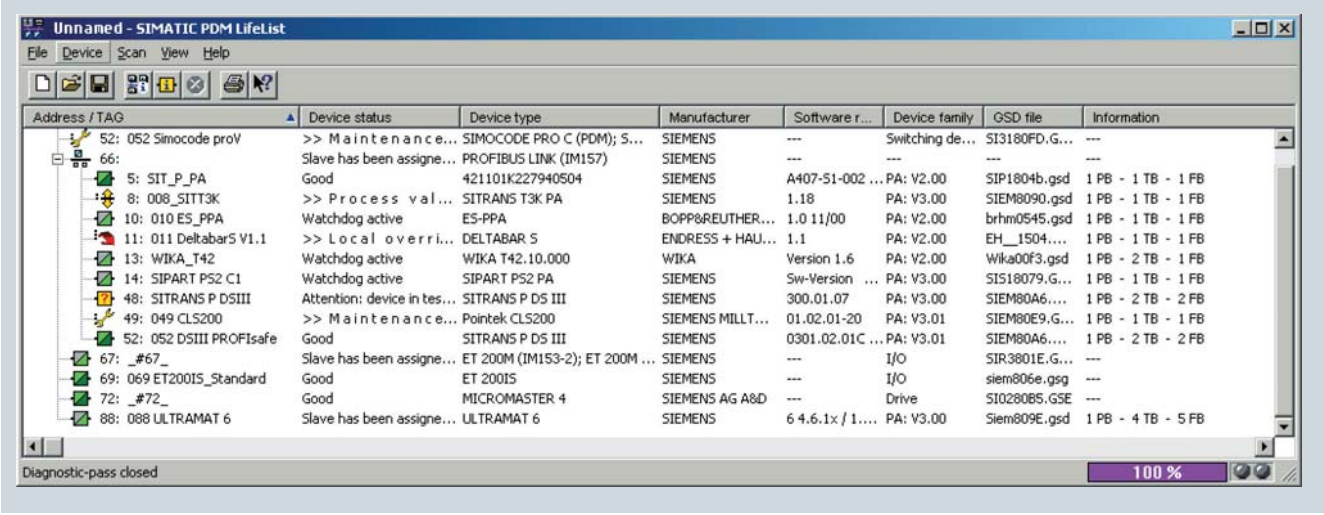


Process value display



MICROMASTER drive configuration

Lifelist



Lifelist

User-friendly view for service and commissioning

The lifelist is a network view for identification, diagnostics and online parameterization of devices. It is created online. It can be activated once or cyclically. As a result of its special orientation, the lifelist is an ideal working environment for service and commissioning.

It permits scanning of PROFIBUS DP and PROFIBUS PA segments including subordinate structures, and displays these in a clear form. It is also possible to include HART devices that are connected through a HART modem. Hence it is no longer absolutely necessary to have a knowledge of the plant structure during a service engagement.

The lifelist is not just a display and source of information, it provides much more:

- The parameterization interface of the devices can be called directly from the lifelist without having to open a project. All the offline and online functions of the devices are thus immediately available.
- Addresses and TAGs can be directly modified online in the lifelist.
- Existing projects can be matched using the lifelist.
- The contents of the lifelist can be exported as an XML file.
- The lifelist can be transferred easily into a PDM stand-alone project.

The lifelist displays the following information for the devices and all connected components:

- Addresses
- TAG
- Device type
- Device status
- Vendor
- Software version
- Profile version.

The device status (diagnostics information) is identified by meaningful, easily recognizable and uniform symbols for all devices.

If an EDD exists for a device, the determined diagnostics information is compiled using this device description. This also means increased convenience since the diagnostics information is language-dependent and can be displayed together with additional device-specific information such as cause of fault, effect of fault, and references for troubleshooting. Otherwise the diagnostics information is displayed as stored in the PROFIBUS GSD.

The lifelist offers two levels for scanning the PROFIBUS:

- Scan for identification of connected devices
- Scan for device identification with option for additional determination of diagnostics state and device status.

HART OPC server

Recording of structures of HART multiplexer networks

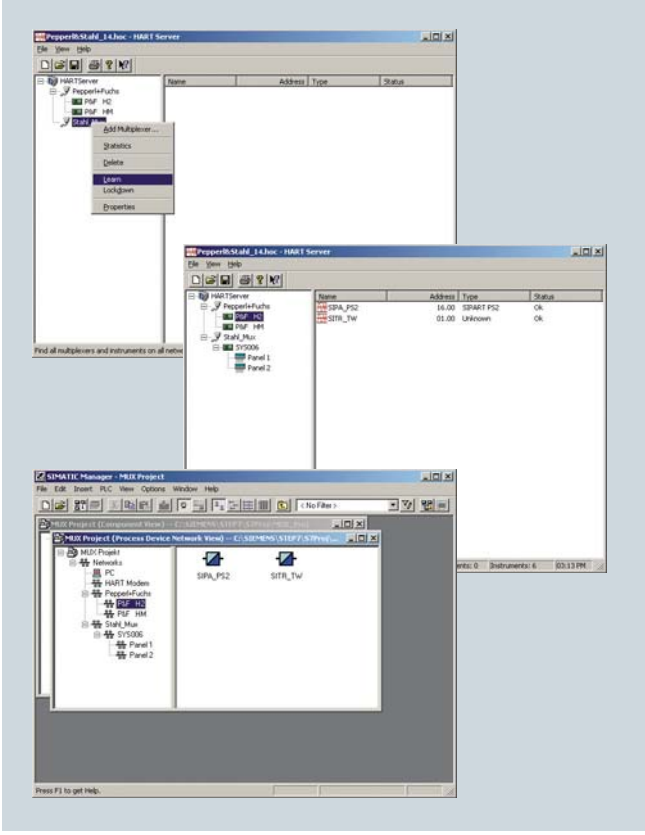
The original HART OPC server is provided together with SIMATIC PDM. In particular with the stand-alone version, this optional software component provides excellent support for service and commissioning.

HART multiplexer networks can be scanned using the HART OPC server, and their structures displayed clearly. The structures can be automatically imported into a SIMATIC PDM project or used to adapt existing projects. For servicing, it is therefore unnecessary to have knowledge of the HART multiplexer network structure.

A further function of the HART OPC server is reading of the device identification which immediately assigns the correct device description to the SIMATIC PDM.

The HART OPC server supports single-stage and multi-stage multiplexers, e.g. P&F multiplexers or MTL multiplexers.

Detailed information on which types of multiplexer are supported by the HART OPC server can be obtained directly from the vendors or from the HART Communication Foundation.



Integration of HART OPC server in SIMATIC PDM

Asset Management

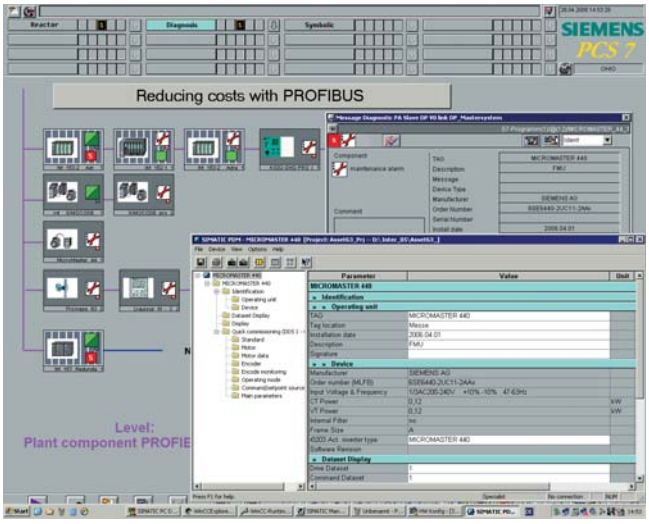
Asset management encompasses all activities and measures for maintaining or enhancing the value of a plant. This includes not only plant management, process management and process optimization but also and above all value-maintaining and value-enhancing maintenance and servicing, i.e. asset management at plant level.

SIMATIC PDM is particularly predestined for asset management at plant level on account of its extensive functionality for the configuration, parameterization, commissioning, diagnostics and maintenance of intelligent field devices and components.

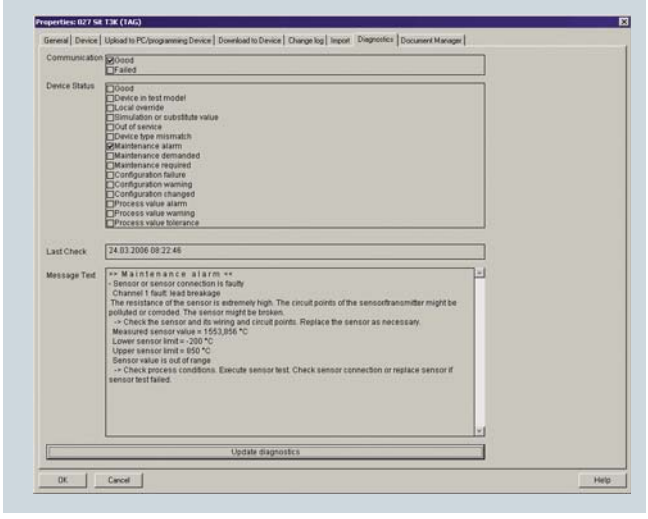
Asset management systems require a great deal of basic data in order to provide informative and reliable results. In real plants these data are highly heterogeneous and unstructured, which makes them very difficult to access. SIMATIC PDM is able to determine the device data relevant to asset management at plant level, and to transfer them in XML format through a uniform interface to higher-level asset management systems. The basis for this is the electronic device descriptions (EDD) which are autonomous of the operating system. Collecting the data and interpreting the results are independent of the device type, i.e. it makes no difference whether the device is an actuator or sensor, or a PROFIBUS or HART device.

However, SIMATIC PDM is far more than just a collector of data for higher-level asset management systems. It also provides a variety of own asset management functions:

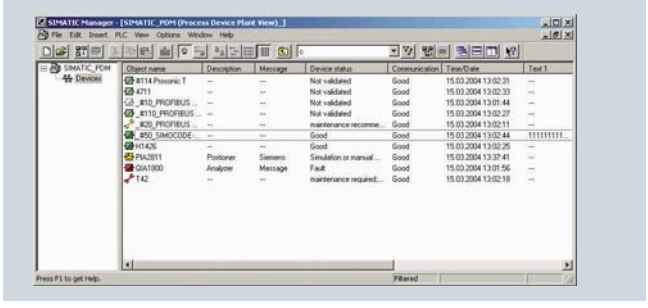
- Determination of differences between the offline data and the current parameters in the device
- Multilingual presentation of diagnostics data read from the devices (device-specific data and profile data)
- Uniform presentation and identification of diagnostics and status data of all devices with uniform symbols
- Data transfer to an asset management system activated by a request from there
- Comprehensive logging functions
- Export interface for all data



Call of SIMATIC PDM in the SIMATIC PCS 7 maintenance station



Detailed diagnostics display of a device in SIMATIC PDM



Process device plant view with diagnostics status display

Practical functions

Exporting and importing of data

SIMATIC PDM can readily export configuration and parameterization data and import them again. In this manner, data can be exchanged e.g. between various projects or computers. Data are always exported in XML format. Importing is possible in different manners:

- As modified import: exported data are edited outside the SIMATIC PDM project, and then inserted into the project at the same position.
- As additive import: exported data are inserted into the SIMATIC PDM project at a different position, independent of whether identical objects already exist in the project.

Examples of effective utilization of data exporting and importing:

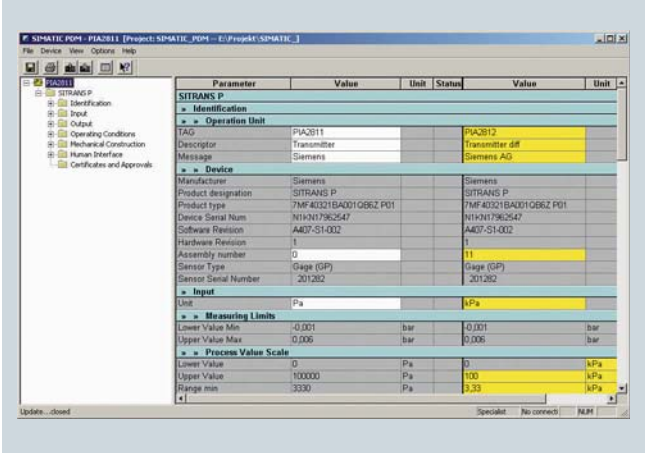
- Generation of parameter Typicals (default parameter settings) for device types
- Transfer of parameters read out of the devices by SIMATIC PDM into the office world (e.g. Excel spreadsheets)
- Determination of plant configurations, and transfer of structure and parameter settings to a project

Data comparison

SIMATIC PDM offers the facility for comparing parameters and settings, and to then decide what should be imported or adjusted. The compared objects and differences are clearly and unambiguously identified in color (see picture above).

The following comparison functions are available:

- Comparison of offline data in the project database with the actual device data
- Comparison of offline data of two different devices in the project database
- Comparison of data of two different devices



Data comparison between two devices

Logging and documentation

A SIMATIC PDM system function enables an individual calibration report to be produced for each integrated field device. The parameterization data are automatically imported into this report.

Internet links and documents, e.g. device manuals, integrated into the device description by the vendor can be simply and rapidly accessed using the parameter view's help menu.

Up to 10 individual multimedia files (text, charts, video, audio) can be additionally enclosed with each device by means of a documentation manager which is also integrated in the parameter view's help menu. These files can be assigned to individual measuring points specific to the plant.

User groups and access protection

SIMATIC PDM supports two groups of users:

- A maintenance engineer can modify the operating data.
- A specialist has the authority to access all parameters and functions. A freely-selectable password can be assigned to specialists in order to provide protection against unauthorized access.

Design

	SIMATIC PDM stand-alone			SIMATIC PDM systemintegriert	
	Minimum configuration	Components for individual configuration	Predefined product configurations		
Product name	**SIMATIC PDM Single Point**	**SIMATIC PDM Basic**	**SIMATIC PDM Service**	**SIMATIC PDM S7**	**SIMATIC PDM PCS 7**
TAGs included in scope of delivery	1	4	128	128	128
TAG expansions	Cannot be expanded	**TAG options** 128 TAGs 512 TAGs 1 024 TAGs 2 048 TAGs and/or PowerPacks	**PowerPacks** von 128 auf 512 TAGs von 512 auf 1 024 TAGs von 1 024 auf 2 048 TAGs von 2 048 auf unlimited TAGs		
Option "Integration in STEP 7/PCS 7"		Can be ordered as option	Can be ordered as option	Included in scope of supply	Included in scope of supply
Option "Routing through S7-400"		Can be ordered as option	Can be ordered as option	Can be ordered as option	Included in scope of supply
Option "Communication through standard HART multiplexer"		Can be ordered as option	Can be ordered as option	Can be ordered as option	Can be ordered as option

Customer-oriented product structure

A customer-oriented product structure enables adaptation of the scope of functions and the performance of SIMATIC PDM to the individual requirements. The customer can select either SIMATIC PDM Single Point (the minimum configuration), one of the application-specific and predefined product configurations (SIMATIC PDM Service, S7 or PCS 7), or produce his own desired configuration from the individual components available (see table). The selection depends on the environment of use:

- System-integrated in a SIMATIC S7/PCS 7 configuration environment
- Stand-alone as service tool for operation on a mobile computer on the PROFIBUS or with direct connection to the device.

The functions of the predefined product configurations SIMATIC PDM Service, S7 and PCS 7 can be expanded by PowerPacks, SIMATIC PDM Basic also using TAG options. On the other hand, SIMATIC PDM Single Point cannot be expanded.

With the scalable product configurations, the scale extends from 4 TAGs (SIMATIC PDM Basic) over 128, 512, 1 024, 2 048 TAGs up to unlimited TAGs.

A TAG corresponds to a SIMATIC PDM object, which represents individual field devices or components within a project, e.g. transmitters, positioners, switching devices or remote I/Os. TAGs are also relevant to diagnostics with the lifelist of SIMATIC PDM. Each detected device with diagnostics capability, whose detailed diagnostics is implemented by the device description (EDD), is counted here as a TAG.

SIMATIC PDM Single Point

This low-cost minimum configuration with handheld functionality is matched to the processing of exactly one field device via a point-to-point coupling. All device functions are supported as defined in the device description.

SIMATIC PDM Basic

This is the basic component for generation of individual SIMATIC PDM configurations from individual components. It contains all functions required for operating and parameterizing the devices, and the communication routes enabled for PROFIBUS DP/PA, HART communication (modem, RS 232 and PROFIBUS) and Modbus.

SIMATIC PDM Basic without TAG expansion can manage projects with as many as 4 TAGs and, provided the system requirements are met, can be used for stand-alone operation on any computers (PCs/notebooks) with local connection to bus segments or direct connection to the device.

SIMATIC PDM Service

This is a product configuration specially predefined for servicing use for projects with up to 128 TAGs. It offers service technicians all functions of SIMATIC PDM Basic, permitting use of modification logbook, calibration report and detailed diagnostics in the lifelist.

SIMATIC S7

SIMATIC PDM S7 is a predefined product configuration for projects with up to 128 TAGS, and is matched for use of SIMATIC PDM in a SIMATIC S7 configuration environment. SIMATIC PDM S7 combines the scope of functions of SIMATIC PDM Basic supplemented by modification logbook, calibration report and detailed diagnostics in the lifelist with the functionality for integration of PDM in HW-Config.

SIMATIC PDM PCS 7

SIMATIC PDM PCS 7 is a predefined product configuration for integration into the engineering system (engineering toolset) and the maintenance station of SIMATIC PCS 7, and is designed for projects with up to 128 TAGs. SIMATIC PDM PCS 7 expands the scope of functions of SIMATIC PDM Basic supplemented by modification logbook, calibration report and detailed diagnostics in the lifelist by the functions for integration of PDM in HW-Config and routing from the central engineering system to field devices.

SIMATIC PDM option "Integration in STEP 7/PCS 7"

This option is required for using SIMATIC PDM within a SIMATIC S7 or SIMATIC PCS 7 project with local connection to the PROFIBUS. SIMATIC PDM can then be started directly from the hardware project (HW-Config).

SIMATIC PDM option "Routing through S7-400"

This option is required additive to the option "Integration in STEP7/PCS 7" when SIMATIC PDM is to be used in a central engineering system for SIMATIC S7/PCS 7 with Ethernet bus link to the automation systems for the plant-wide configuration, parameterization, commissioning and diagnostics of field devices.

Option "Communication through standard HART multiplexer"

This option enables SIMATIC PDM to use the HART OPC server for communicating with HART field devices through HART multiplexers.

TAG options

TAG options can be used to expand SIMATIC PDM Basic from 4 TAGs up to 128, 512, 1 024 or 2 048 TAGs.

PowerPacks

TAG expansions are also possible using PowerPacks. The number of TAGs can then be increased from 128 to 512, 1 024 and 2 048 up to unlimited TAGs.

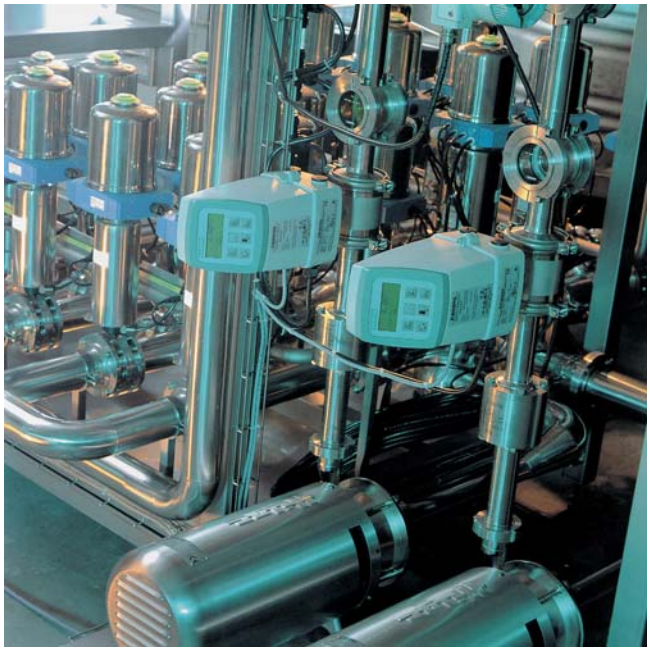
Benefits

General product features

- Powerful software with uniform GUI and comprehensive functions for engineering, parameterization, commissioning, diagnostics and maintenance of field devices and components
- Simple and intuitive operation of all integrated devices based on a common GUI and operator prompting in 5 languages (German, English, French, Spanish and Italian)
- Access control by means of user groups and password protection
- Uniform, simple and easily recognizable diagnostics symbols for all devices
- Archiving of all parameter, maintenance and diagnostics information in a consistent database
- Can be used in stand-alone mode or integrated in the central SIMATIC PCS 7/S7 engineering system

Device integration and communication

- Global leader for device integration:
  - More than 1 200 different field devices and components from over 100 vendors worldwide
  - Almost all PROFIBUS PA devices are integrated
  - Almost all HART devices are integrated
  - Simple integration of new field devices and components by importing their device description (EDD) which is independent of the operating system
  - Existing device descriptions can be updated quickly and easily.
- Numerous options for communication with the devices, e.g. using PROFIBUS DP/PA, HART communication (modem, RS 232 and PROFIBUS) or Modbus:
  - With local connection of SIMATIC PDM on a bus segment or directly to the device
  - From a central engineering system with SIMATIC PDM using "Routing through S7-400"



Detail functions

- Access to all parameters as well as all diagnostics and maintenance information of a device
- Comparison of parameter sets (e.g. reference and actual parameters, or online/offline data of two devices)
- Display of process values with status
- Simulation of process values for loop tests
- Determination, processing and presentation of device data for asset management
- Global and device-specific modification logbook (audit trail)
- Device-specific calibration report
- Homogenous and consistent help texts for the devices, generated from the device descriptions
- Integration of up to 10 multimedia files per document manager

User advantages and rationalization potential

- Increased degree of standardization through conformant device descriptions (EDD) based on an internationally standardized language (EDDL)
- Rationalization of configuration and parameterization using convenient export and import functions
- High plant availability through device parameters which can be modified online
- Low training requirements through intuitive operator prompting as well as functions which are easy to learn, operate and understand

SIMATIC PDM device list

A device list with a representative cross-section of field devices and components which can be parameterized with SIMATIC PDM as well as further information on the topic of automation technology can also be found in our ordering and download form on the Internet:
www.siemens.com/simatic/printmaterial

Get more information

Comprehensive information concerning the SIMATIC PCS 7 process control system is available on the Internet at:
www.siemens.com/simatic-pcs7

For further details, see SIMATIC Guide manuals:
www.siemens.com/simatic-docu

You can order more publications on the subject of SIMATIC at:
www.siemens.com/simatic/printmaterial

For further technical documentation, see our Service & Support portal:
www.siemens.com/automation/support

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