SIMATIC PDM

Version 6.0 SP1

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SIMATIC PDM
A new, standardized approach

Setting a New Standard of Integration

- Requirements
- EDD
- Device Integration
- User Interface
- Communication
- Functions
- Diagnosis
- Product
- Summery

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➔ **Customer requirements as a base of the development**
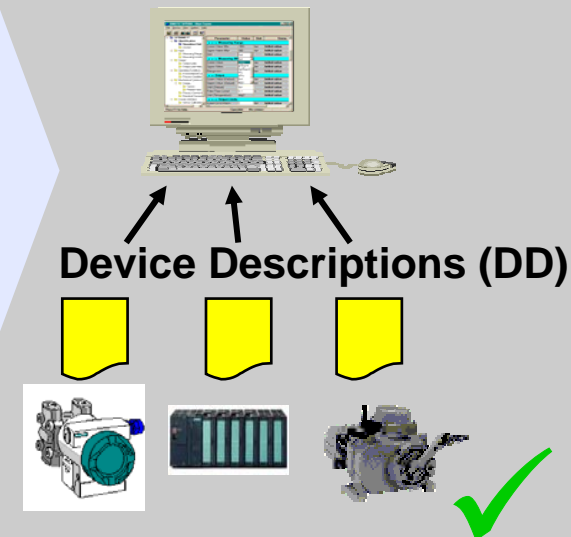
Before PDM

Different programs for operation of the associated field devices and components
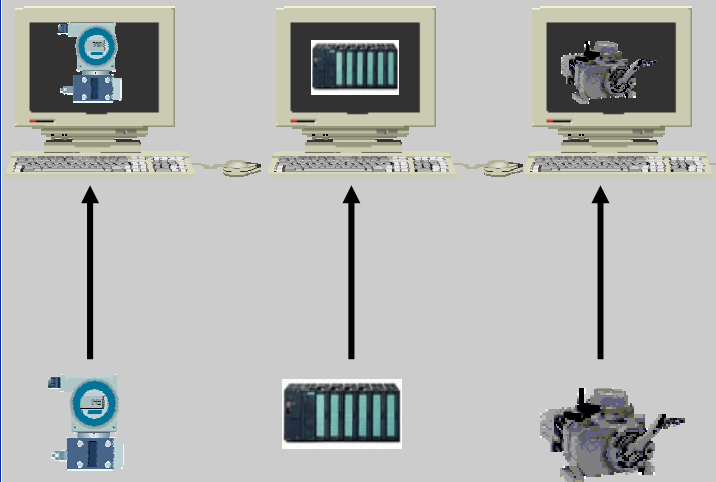
One piece of software for **standardized** operation of all field devices

Now

SIMATIC PDM for operation of all field devices and components based on EDD technology

Device Descriptions (DD)

Requirements of NAMUR

NE 105 „ Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices"

- **Uniform standards**
  - **for Device Description**
  - **for Interfaces**
- **Investment safety**
  - **Cross-Platform Compatibility of the Device Description**
  - **Compliance compatibility rules of the Device Description**
  - **Compliance compatibility rules of the Tool**
- **Standard procedure for the integration of new devices**
  - **independent of the manufacturer**
  - **independent of the communication**

NAMUR –   **N**ormen**a**rbeitsgemeinschaft für **M**eß- **u**nd **R**egelungstechnik
                    in der Chemischen Industrie
NE   – **N**AMUR - Recommendation

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SIMATIC PDM – The Process Device Manager

➔ **Customer requirements as a base of the development**

SIMATIC PDM
is the universal tool for
commissioning,
maintenance,
diagnostics
and display
for field devices and
automation components.
Can be integrated into
SIMATIC S7 / PCS 7
or run on a stand alone basis ✓

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EDD / EDDL

Setting a New Standard of Integration

Requirements

EDD

Device Integration

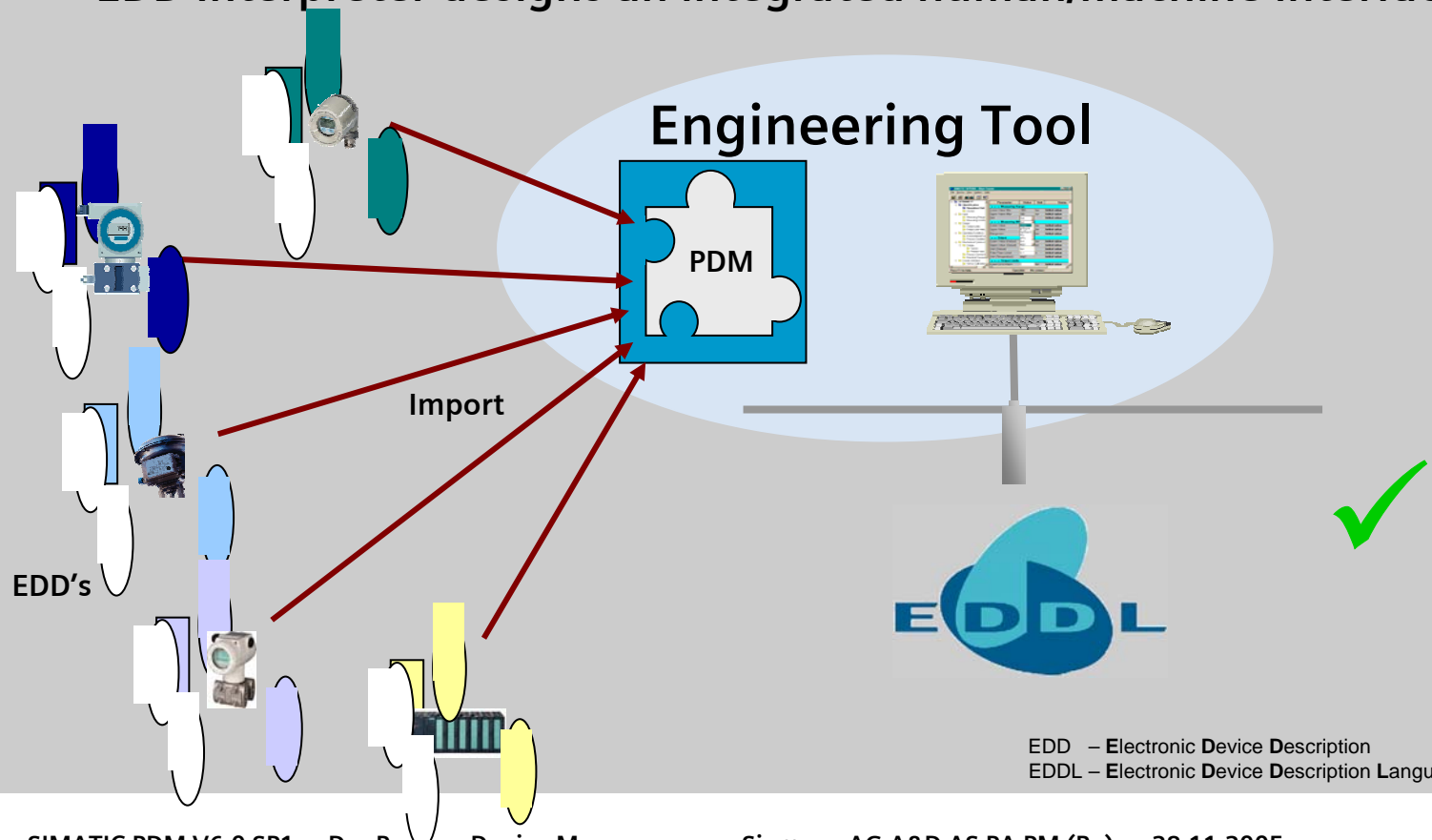User Interface

Communication

Functions

Diagnosis

Product

Summery

- EDDL is the language used for description
- EDD represents the actual device description
- EDD Interpreter designs an integrated human/machine interface

Engineering Tool

PDM

Import

EDD's

EDD – Electronic Device Description
EDDL – Electronic Device Description Language

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What is actually the EDD?

➔ **Textual description of the field devices in the language EDDL**

A composition of different information about a device generally is understood by the EDD, however:

- **Device Description (EDD)**

- **Dictionary (user languages)**

- **Helps (for operation and functions)**

- **Manuals (technical documentation)**

- **Communication Descriptions (e.g. PROFIBUS – GSD)**

- **Pictures**

EDD   – **E**lectronic **D**evice **D**escription
EDDL – **E**lectronic **D**evice **D**escription **L**anguage

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Field of application: EDD / EDDL

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

➔ **universal and also for very complex field devices**

- **Text interface ideal for devices where the diagnostic, parameterization and optimization functions are realized within the device itself. The EDD is responsible for interpretation, representation and parameterization.**
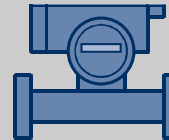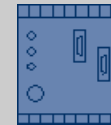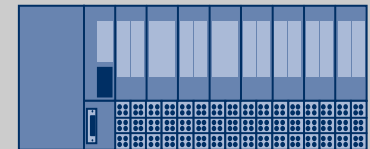
-

| Drive | Positioner | Transmitter | Switch | Remote I/O |

Strengths:

- **The description of the device parameters can be used unchanged over many years**
- **This type of device description is independent of the operating system used for the engineering**
- **The human/machine interface within an engineering system is standardized for all devices**
- **All data for all field devices is openly available for further processing**

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Standardization EDDL

Setting a New Standard of Integration

Requirements

EDD

Device Integration

User Interface
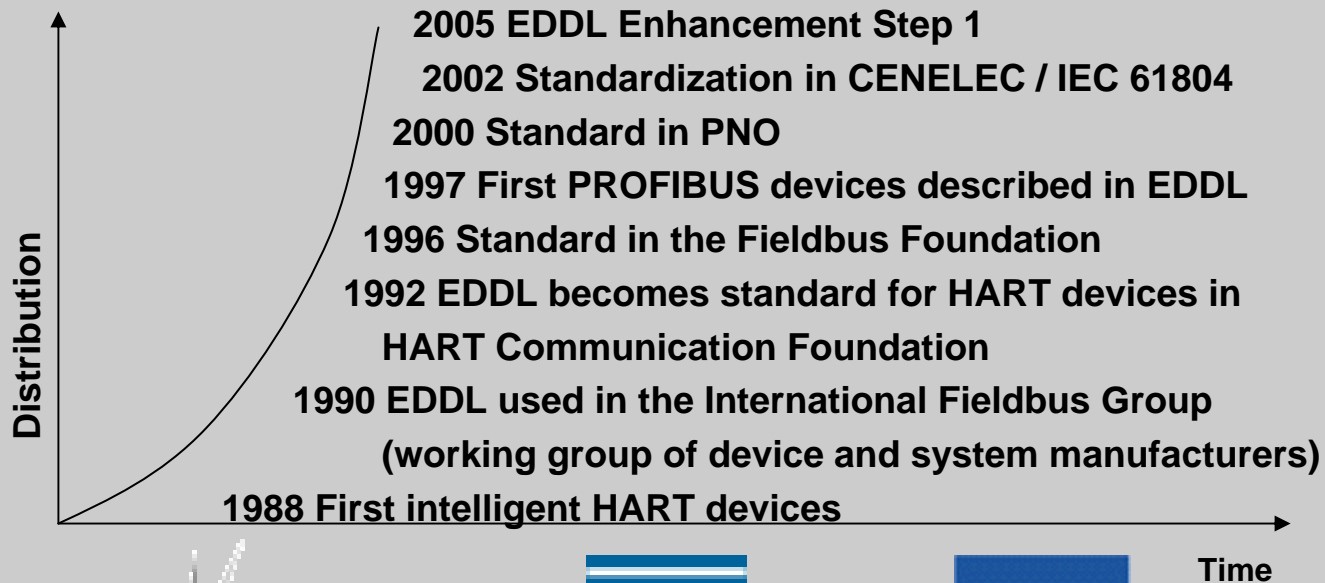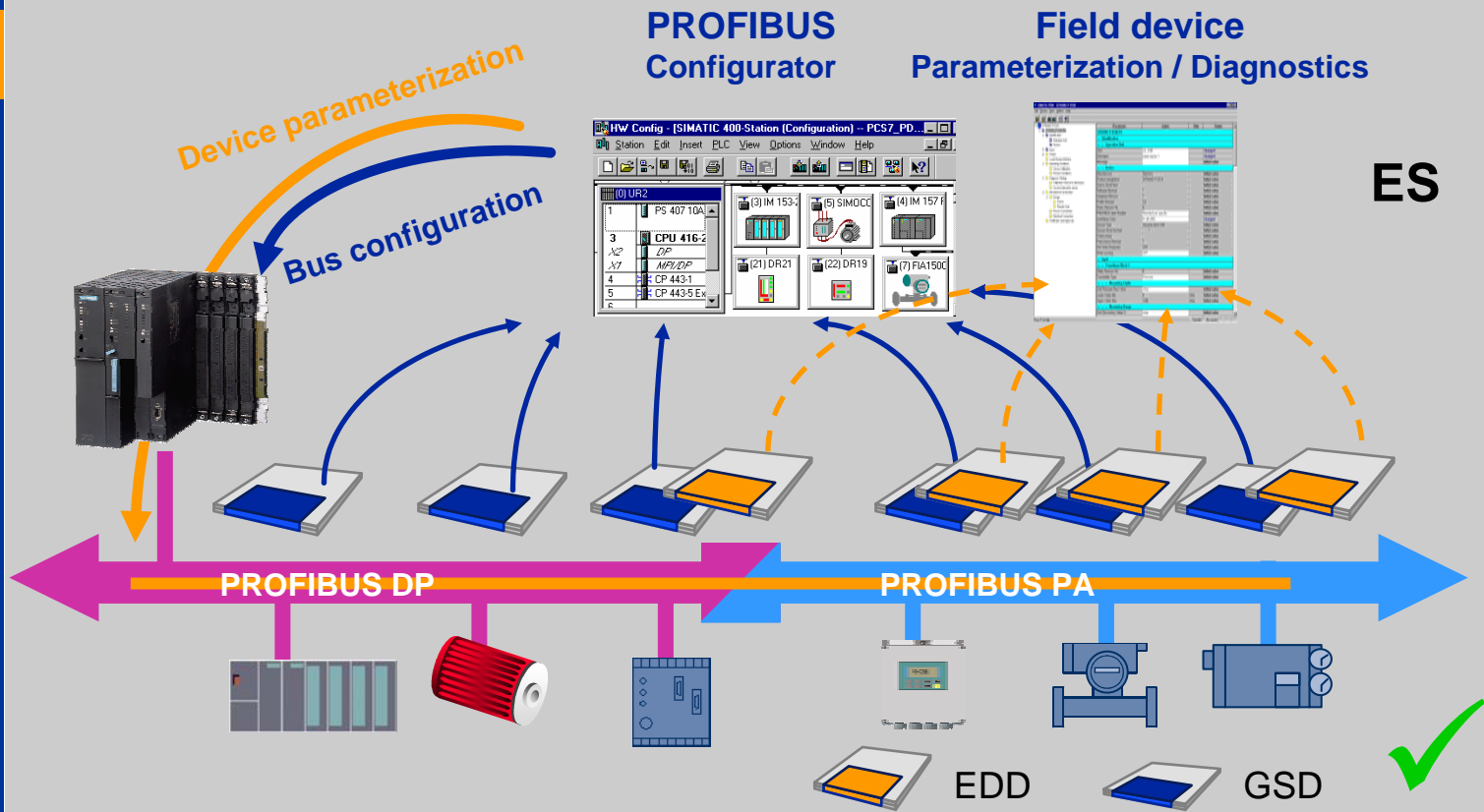
Communication

Functions

Diagnosis

Product

Summery

➔ **Worldwide a success story**

2005 EDDL Enhancement Step 1

2002 Standardization in CENELEC / IEC 61804

2000 Standard in PNO

1997 First PROFIBUS devices described in EDDL

1996 Standard in the Fieldbus Foundation

1992 EDDL becomes standard for HART devices in HART Communication Foundation

1990 EDDL used in the International Fieldbus Group (working group of device and system manufacturers)

1988 First intelligent HART devices

Distribution

Time

CENELEC **DIN** **IEC**

■ **Today, more than 1200 device types from around 110 manufacturers are already described in EDDL.**

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Integration into the system

- **GSD files contain the communication parameters**

- **EDD files contain the device parameters and visualization structure and describe the device behavior**

PROFIBUS Configurator

Field device Parameterization / Diagnostics

ES

Device parameterization

Bus configuration

PROFIBUS DP

PROFIBUS PA

EDD   GSD

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The real Problem
of Device Integration

- **EDDL is the only device description language standardized in the IEC.**
- **IEC 61804 the only standardized method for the device description.**

GSD Interpreter

DD Interpreter

System supplier

ASCII Interface
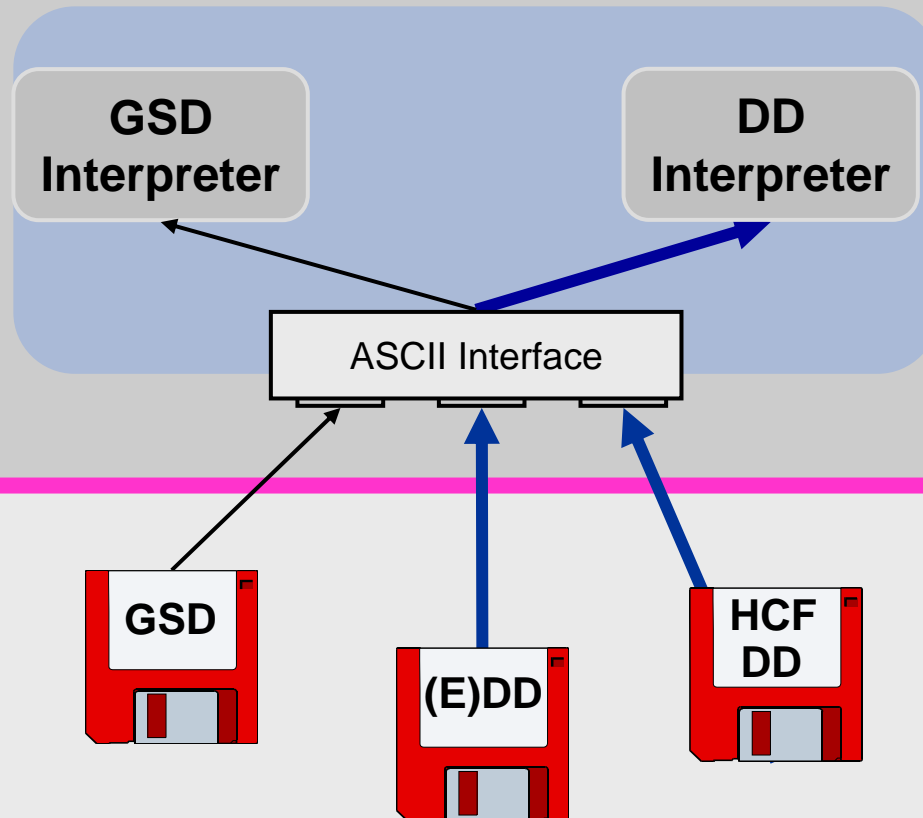
Responsibility

=> IEC 61804-2

GSD

(E)DD

HCF DD

Device Supplier

Reality

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How do you achieve a new EDD in Simatic PDM?

➔ **Worldwide simply, quickly, safety and excellent value for money.**
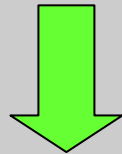
- **Decision in favor of intelligent field components**
  - **Profile use or full integration**
  - **Communication definition**
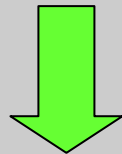
- **Order from device manufacturer**
  - **Device available with EDD (manufacturer produces EDD, if necessary using service provider)**
  - **Manufacturer declares compliance with specifications**
  - **Manufacturer declares compatibility with SIMATIC PDM (quality mark)**
  - **Device is pre-parameterized on request**
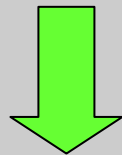
- **Delivery of device**
  - **Delivery with enclosed diskette for EDD, GSD and documentation**
  - **Provision via e-mail, Internet etc.**
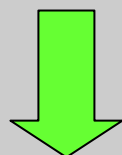
- **Import into PDM** ✓
  - **Data copied onto computer**
  - **Execution of import function in PDM**

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SIMATIC PDM
Field device integration

Setting a New Standard of Integration

- Requirements
- EDD
- **Device Integration**
- User Interface
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- Functions
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- Summery

ABB   **VEGA**   **metso** automation   **Knick**   **ROSEMOUNT**   **SICK**

Bopp&Reuther

Endress + Hauser

PEPPERL+FUCHS

SIEMENS

KROHNE   **smar**

YOKOGAWA

CEAG   **SAMSON**
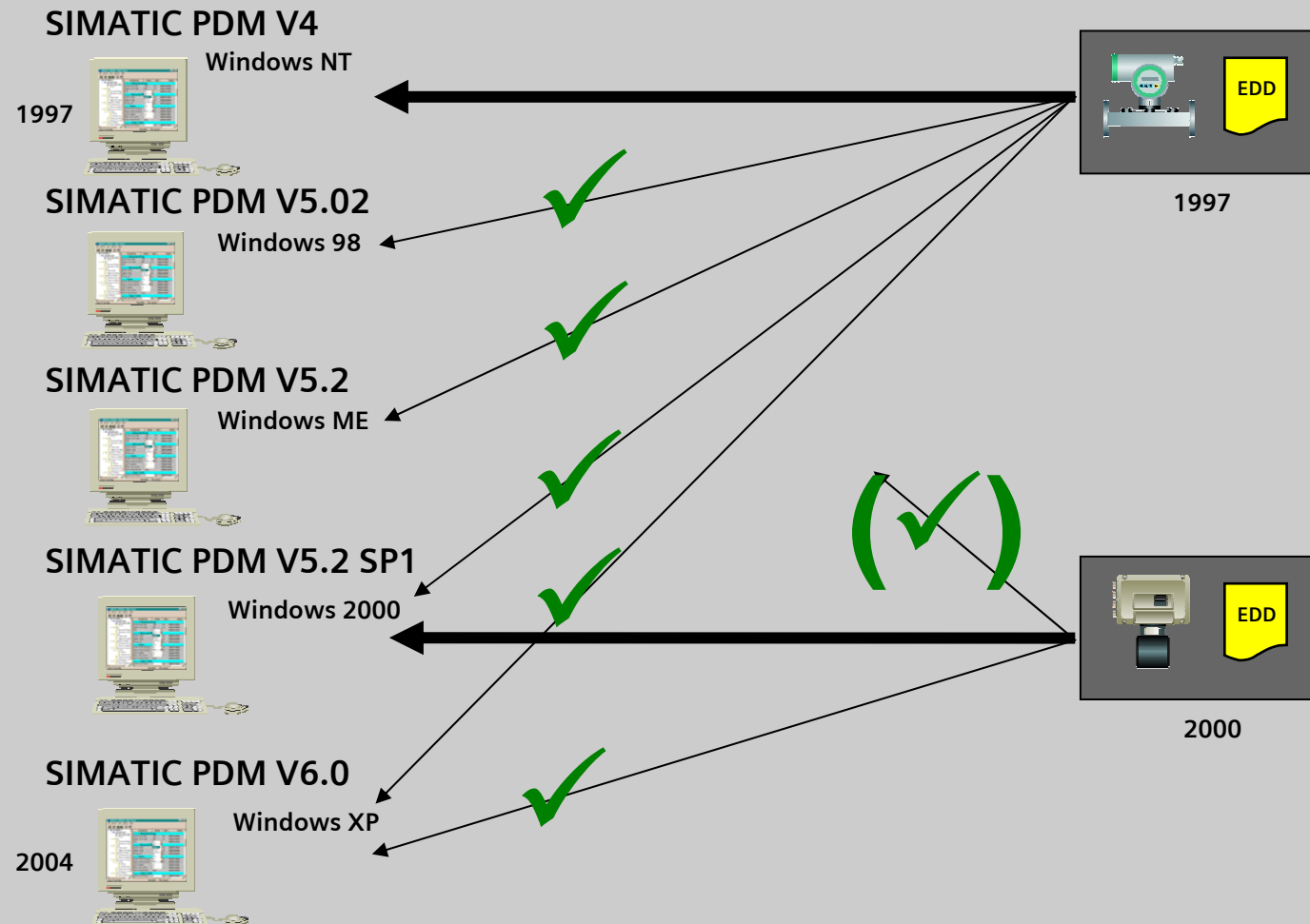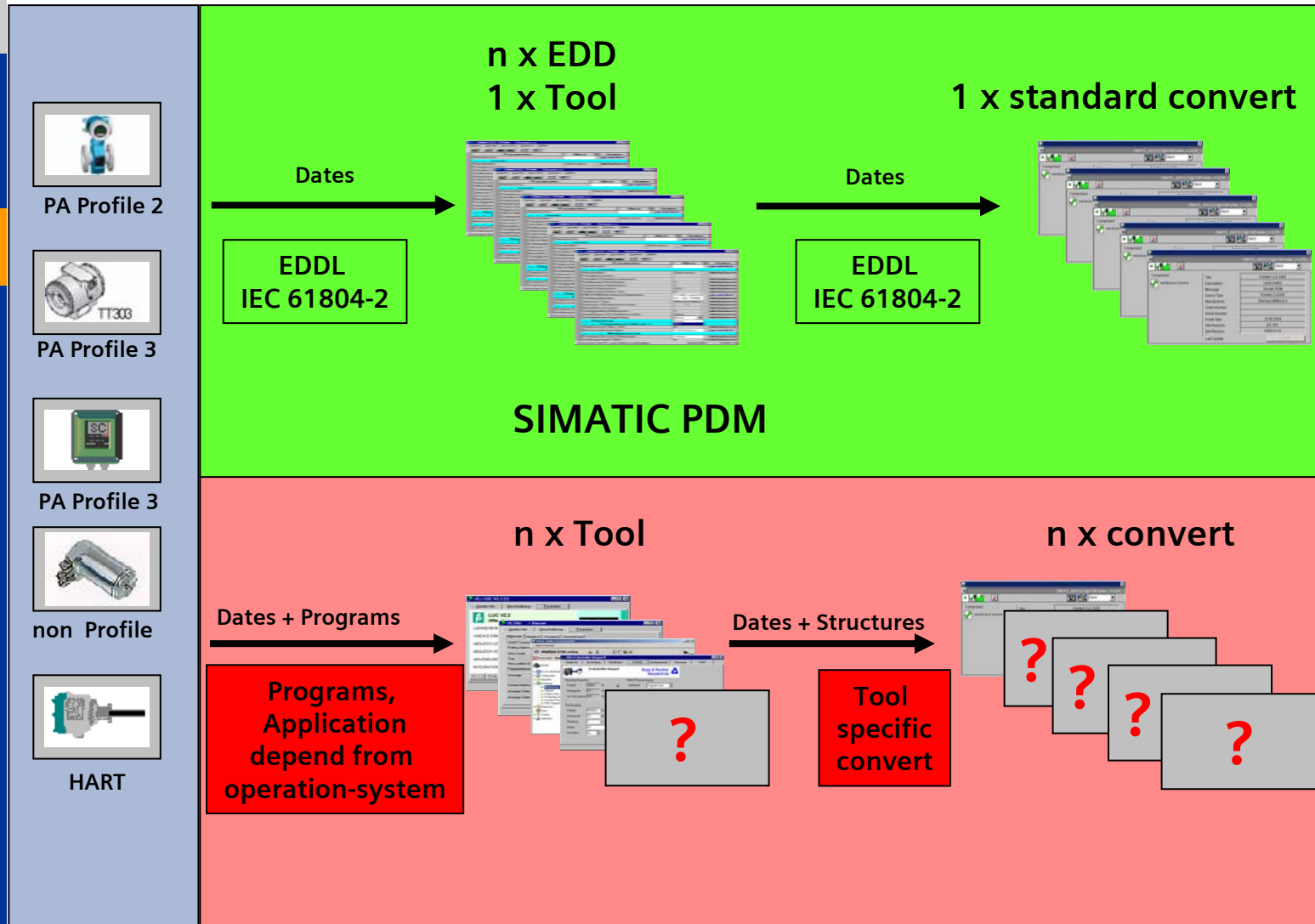
auma

WIKA   **Invensys**

SIPOS

Berthold   **Bürkert**

- Over 1200 different field device types are integrated with SIMATIC PDM
- These field devices come from more than 150 different manufacturers
- Current information on field devices that can be parameterized using SIMATIC PDM is available on the Internet

EDDL

✔

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SIMATIC PDM
simple Device Integration

➔ from CD, DVD or Internet and without PC shutdown

Setting a New Standard of Integration

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis
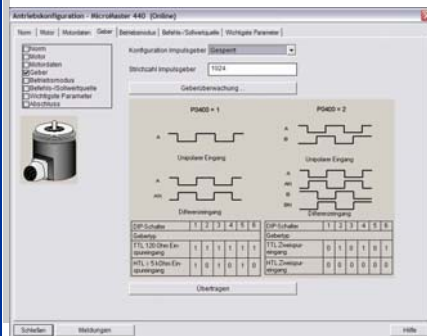
Product

Summery
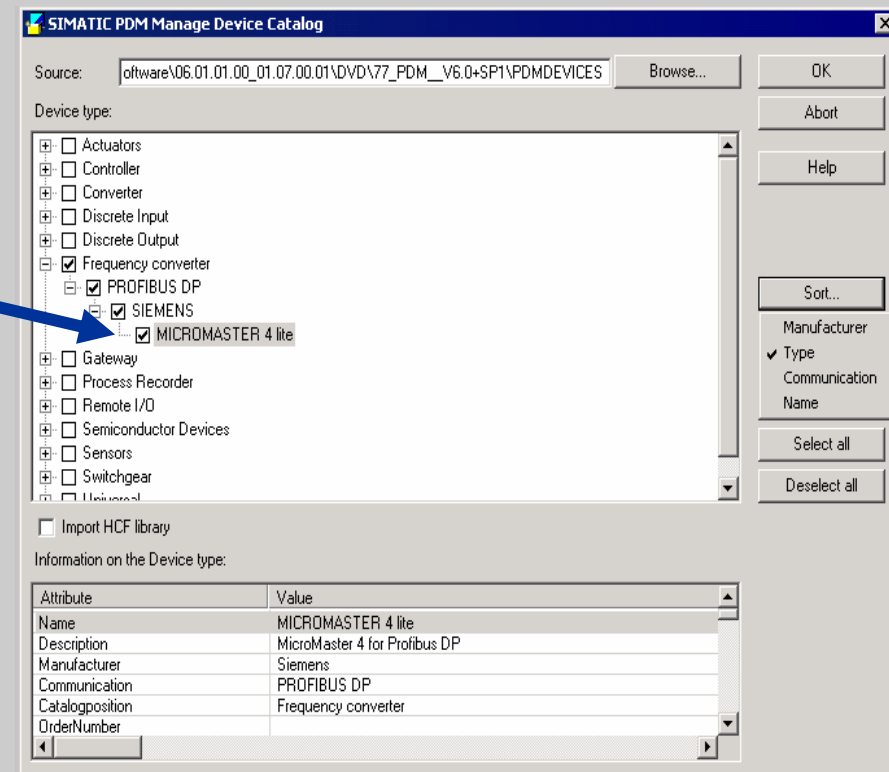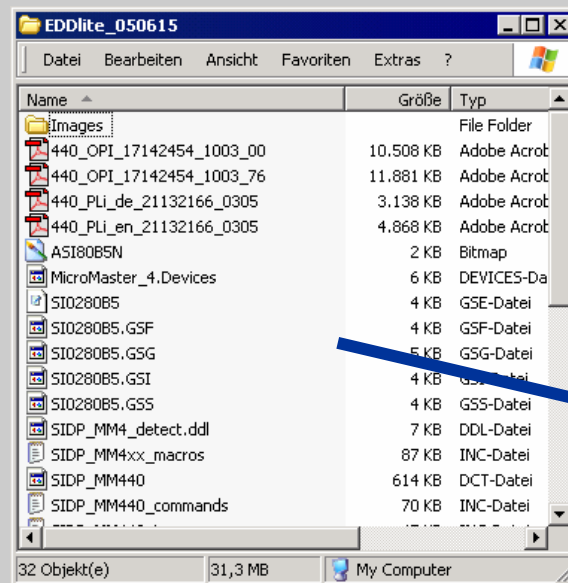
- **textual descriptions**
- **operation system-independent**
- **pure importation**

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EDD – operation system-independent

➔ **Common life cycle of field device and device description.**

SIMATIC PDM V4
Windows NT
1997

SIMATIC PDM V5.02
Windows 98

SIMATIC PDM V5.2
Windows ME

SIMATIC PDM V5.2 SP1
Windows 2000

SIMATIC PDM V6.0
Windows XP
2004

EDD — 1997

(✓)

EDD — 2000

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Benefits of device integration via EDD

Field devices **Device tool** **Asset Management System**

n x EDD
1 x Tool

1 x standard convert

Dates

Dates

PA Profile 2

EDDL
IEC 61804-2

EDDL
IEC 61804-2

PA Profile 3

PA Profile 3

SIMATIC PDM

n x Tool

n x convert

Dates + Programs

Dates + Structures

non Profile

Programs, Application depend from operation-system

Tool specific convert

? ? ? ?

HART

?

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SIMATIC PDM V6.0 SP1 - Der Process Device Manager   Siemens AG A&D AS PA PM (Ra)   28.11.2005   15

The EDD as a versatile source of information

Engineering
- Configuration of networks, gateways and remote I/Os
- Export / import of device data
- Upload / Download
- Parameterization
- Comparison of Values

Commissioning
- Address assignment
- Measured value display
- Simulation
- Calibration, adjustment
- Online parameterization
- Device detection for a lifelist

User profiles
- For maintenance staff with limited access to device parameters
- For specialists with full access to device parameters
- For device-specific user profiles
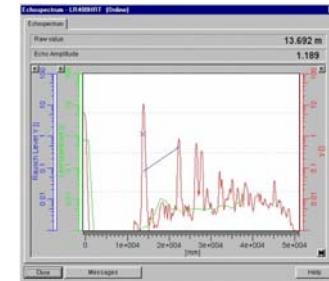
Operating phase
- Display device status and diagnostic information
- Support device replacement
- Check device identification

Help and documentation
Overview of:
- Variables, dialogs, methods
- Ranges of values, default values, units

Asset Management
- Prepare information for maintenance, repair and fault elimination

Catalog and E-commerce
- Ordering data
- Process connection
- Manufacturer information

ELECTRONIC DEVICE DESCRIPTION LANGUAGE

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SIMATIC PDM V6.0 SP1 - Der Process Device Manager   Siemens AG A&D AS PA PM (Ra)   28.11.2005   16

SIMATIC PDM
Parameter View / Online – View

Setting a New Standard of Integration

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

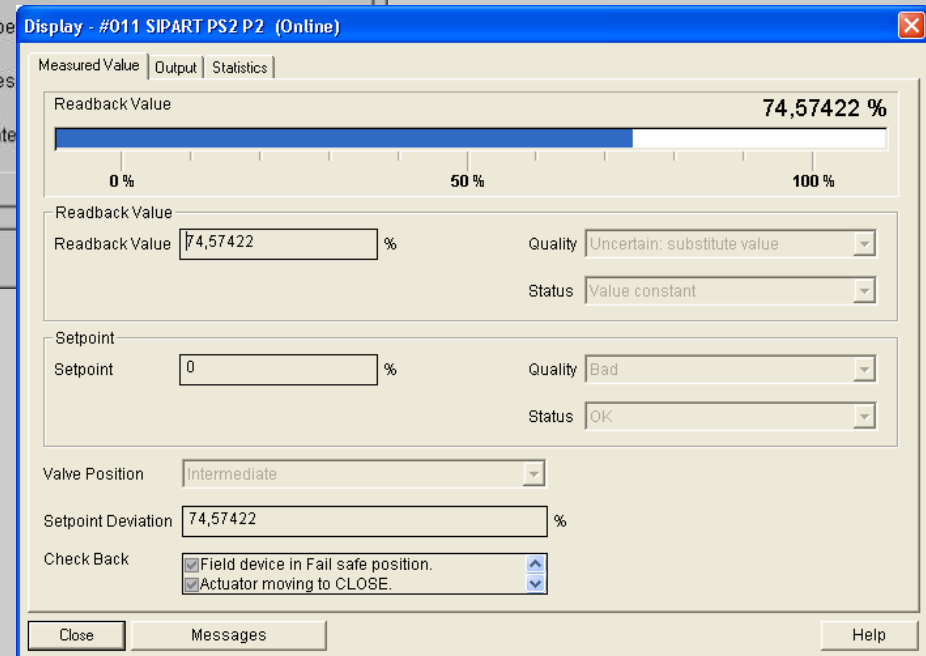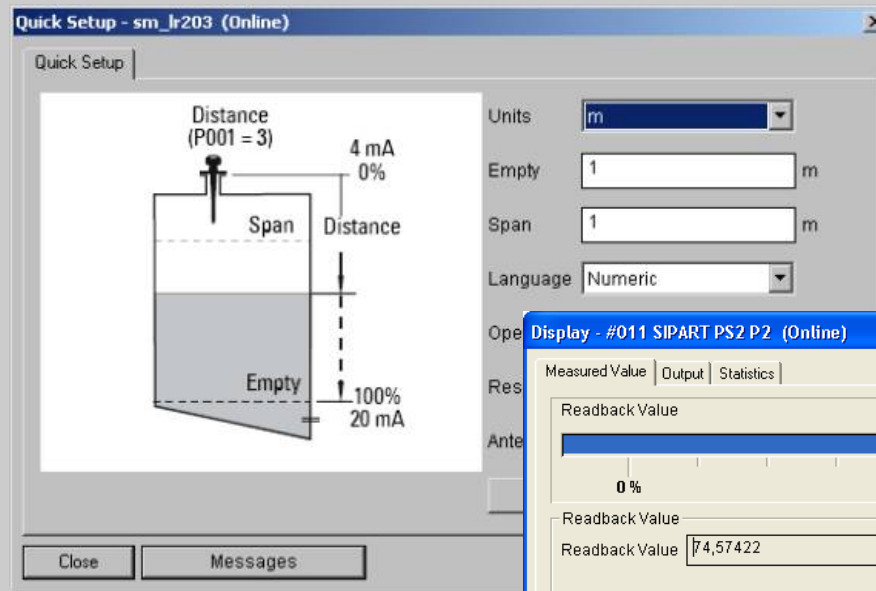Product
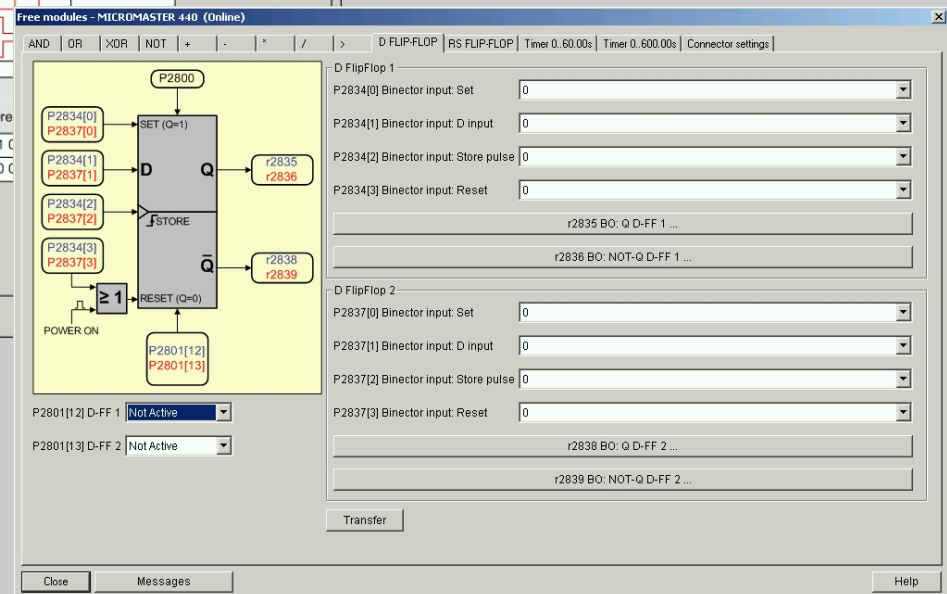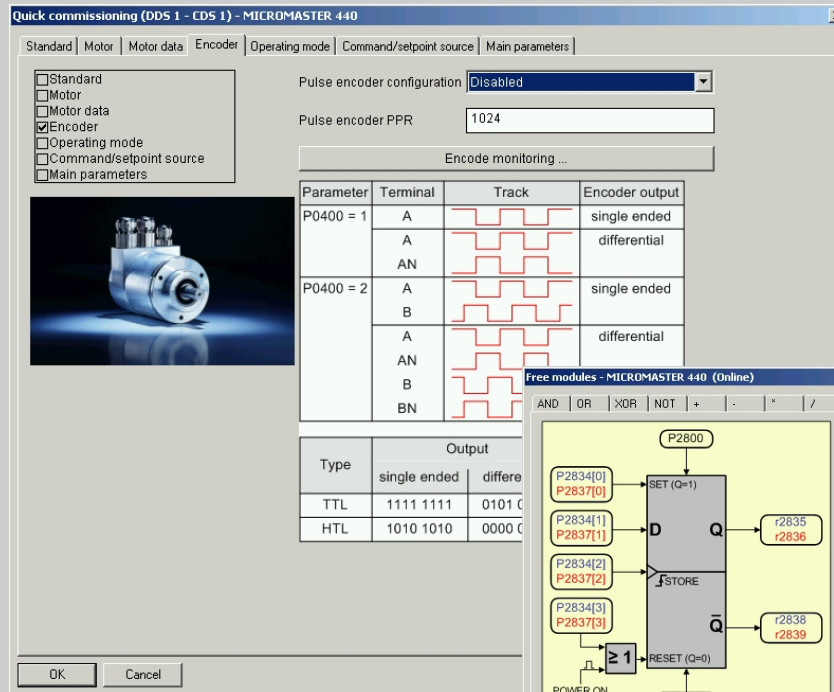
Summery

➔ **Common view (same look and feel for all devices)**
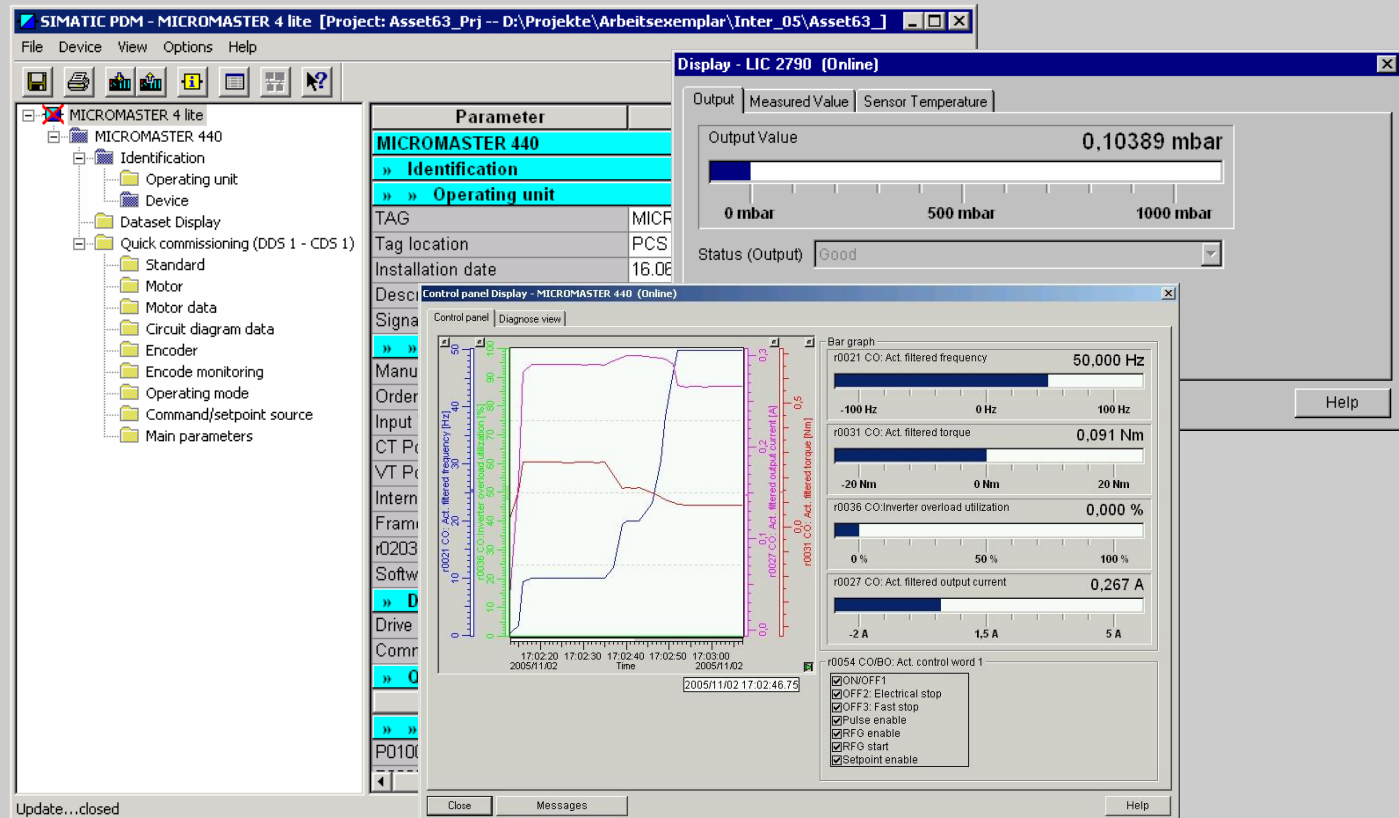
■ **Contents are defined in the Device description (EDD).**

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Online – View new
(Realization Enhancement step 1)

Setting a New Standard of Integration

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

➔ **New possibilities of graphic representation**

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Online – View new
(Realization Enhancement step 1)

➔ **New possibilities of graphic representation**

- **Integration from pictures / video sequences**

- **free possibility of combinations**

SIMATIC PDM
Properties

➔ **Diagnostic view for all field device**

Communication diagnosis

Standard diagnosis

**Detail diagnosis based on EDD
(Manufacturer information)**

Properties: Pointek CLS 2000 (TAG)

General | Device | Upload to PC/programming Device | Download to Device | Change log | Import | Diagnostics

Communication   ☑ Good
                 ☐ Failed

Device Status   ☐ Good
                 ☐ Device in test mode!
                 ☐ Local override
                 ☐ Simulation or substitute value
                 ☐ Out of service
                 ☐ Device type mismatch
                 ☐ Maintenance alarm
                 ☐ Maintenance demanded
                 ☑ Maintenance required
                 ☐ Configuration failure
                 ☐ Configuration warning
                 ☐ Configuration changed
                 ☐ Process value alarm
                 ☐ Process value warning
                 ☐ Process value tolerance

Last Check   28.06.2005 13:30:38

Message Text   >> M a i n t e n a n c e   r e q u i r e d <<
                 - Sensor is polluted
                   Pollution=51
                   Alarm Limit=66
                   Warning Limit=32
                   Time Format:
                   x day(s) y hour(s)
                   Sensor pollution exceeded the user defined warning limit
                    -> Remove sensor pollution
                 Reset pollution detection

Update diagnostics

OK   Cancel   Help

SIMATIC PDM
Integrated Help

Setting a New Standard of Integration

- Requirements
- EDD
- Device Integration
- **User Interface**
- Communication
- Functions
- Diagnosis
- Product
- Summery

➔ **Manufacturer specific documentation can integrate over EDD**

- **Help about Parameters will generate based on EDD**
- **Recommendation for documents is format .pdf**

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Simatic PDM
Process device system view

Diagnostic status at last communication

Overview of all configured SIMATIC PDM objects with:

- Object name (TAG)
- Communication status
- Diagnostic status
- Communication method

- When was the last processing
- Free text 1
- Free text 2
- Free text 3

SIMATIC PDM
Process device network view

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

➔ **Common view for stand alone application**
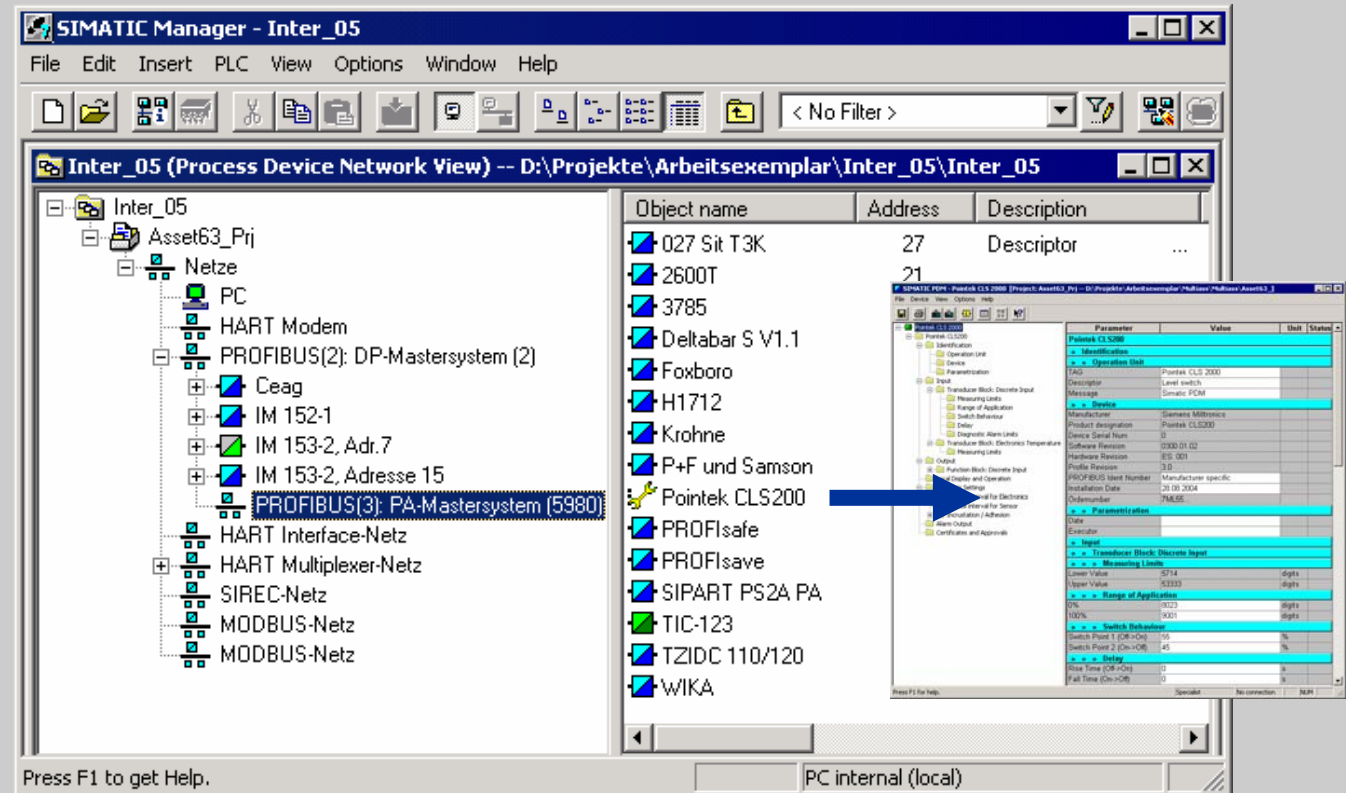
- **Represents real networks**
- **Structure can be imported from the lifelist**

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Simatic PDM
Hardware project (integrated)

➔ **Common view for integrated application in Simatic**
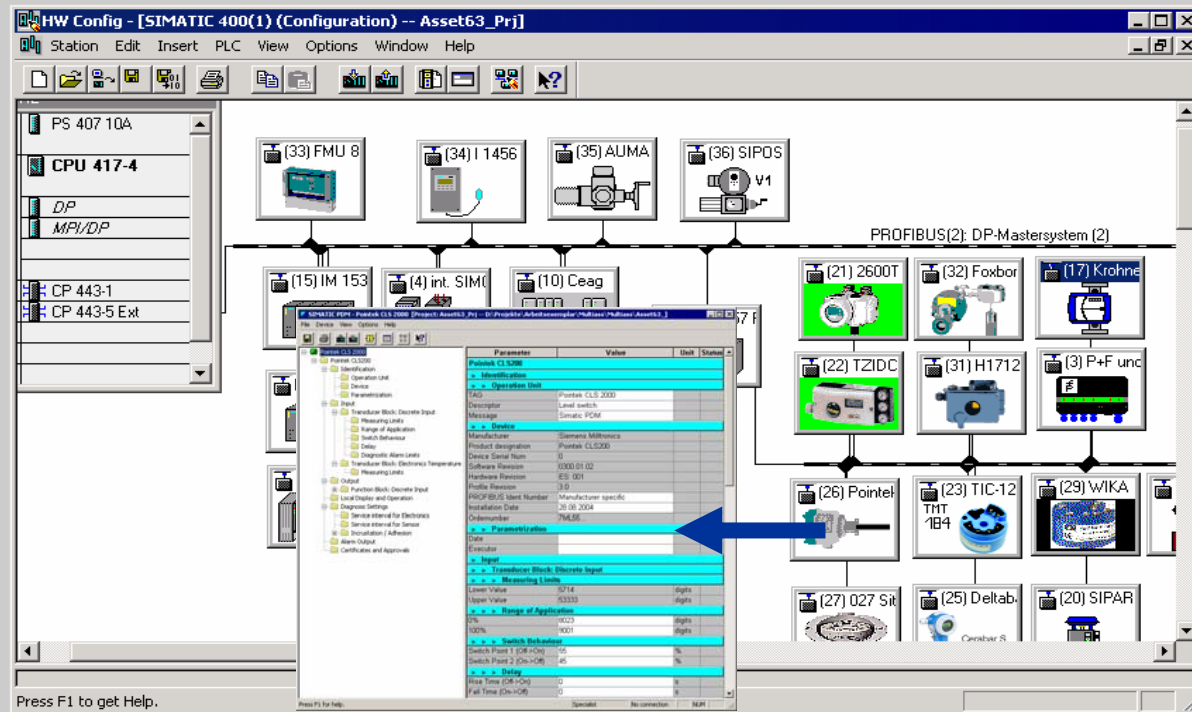
- **Simatic PDM can be started directly from hardware project view Step 7 in Simatic S7 and Simatic PCS 7**
- **Project wide connections to the field devices**

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SIMATIC PDM
Parameter view （Device view）

Setting a New
Standard
of Integration

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

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SIMATIC PDM
Parameter view (Multi view)

Setting a New Standard of Integration

- Requirements
- EDD
- Device Integration
- **User Interface**
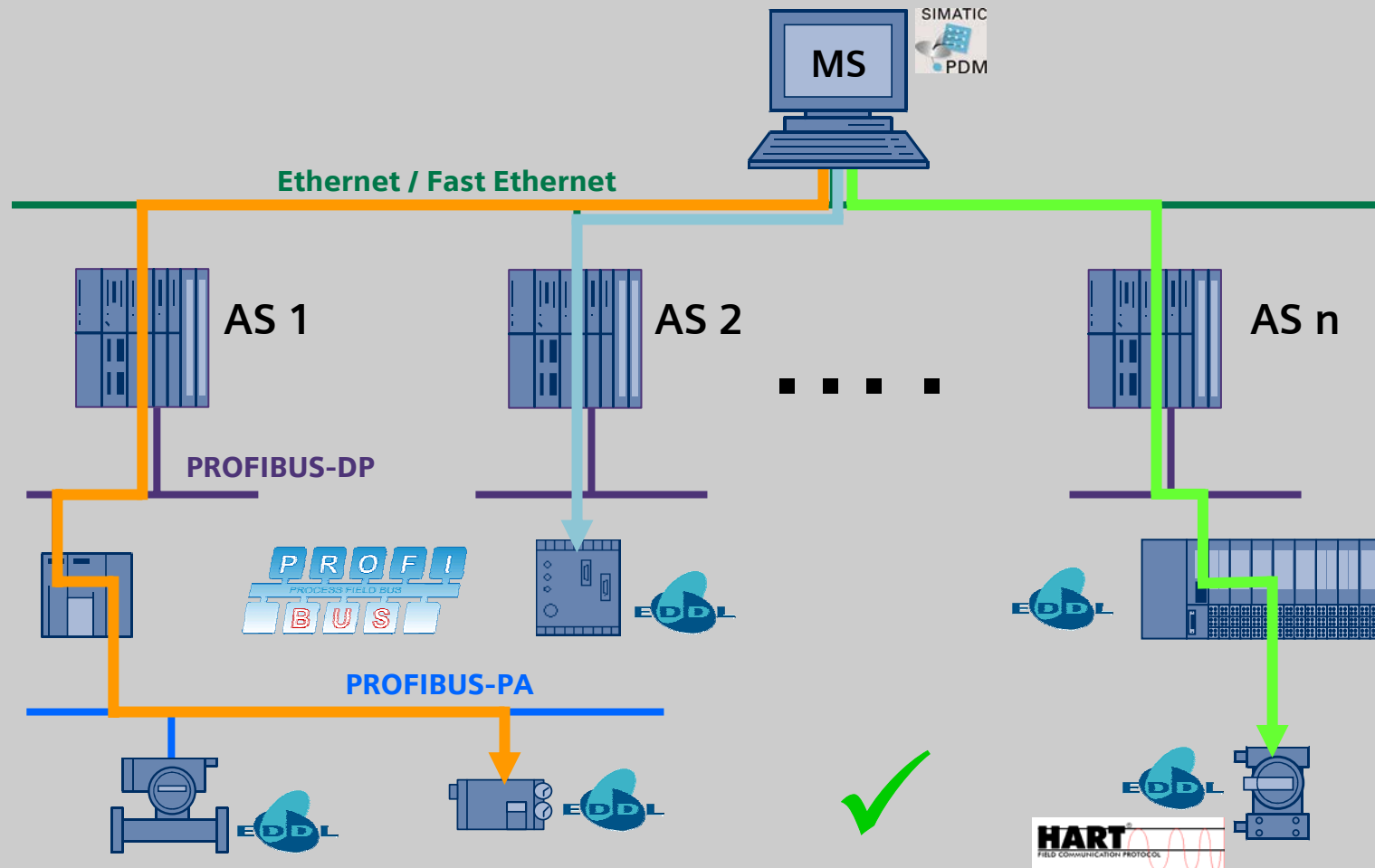- Communication
- Functions
- Diagnosis
- Product
- Summery

SIMATIC PDM - Pointek CLS200 [Project: Asset63_Prj -- D:\Projekte\Arbeitsexemplar\Inter_05\Asset63_]

File   Device   View   Options   Help

- PROFIBUS(2): DP-Mastersystem (2)
  - Ceag
  - IM 152-1
  - IM 153-2, Adr.7
    - ET200M
    - AI2xHART, Ex
      - Analog Input (HART)
      - Kanal 0
        - TK-H
          - SITRANS TK-H
            - Identification
            - Input
            - Output
      - Kanal 1
    - AO2xHART, Ex
  - IM 153-2, Adresse 15
- PROFIBUS(3): PA-Mastersystem
  - 027 Sit T3K
  - 2600T
  - 3785
  - Deltabar S V1.1
  - Foxboro
  - H1712
  - Krohne
  - P+F und Samson
  - Pointek CLS200
    - Pointek CLS200
      - Identification
      - Input
      - Output
      - Local Display and Operation
      - Diagnosis Settings
      - Alarm Output
      - Certificates and Approvals
  - PROFIsafe
  - PROFIsave
  - SIPART PS2A PA
  - TIC-123
  - TZIDC 110/120
  - WIKA
- AUMA MATIC and VARIOMATI
- FMU 860/861
- I 1456

Callout labels:
- PROFIBUS DP Net work
- Remote I/O ET 200M
- Analog modul (HART)
- HART – Field device
- DP/PA – Link device
- PROFIBUS PA Field device
- Grouping of device parameters
- PROFIBUS DP Field devices

Parameter table values:

|	Value	Unit	Status
Pointek CLS200			Initial v
Descriptor	.		

» » Device

Manufacturer	Siemens Milltronics
Product designation	Pointek CLS200
Device Serial Num	0
Software Revision	0300.01.02

PROFIBUS Ident Number	Manufacturer specific
Installation Date	28.08.2005
Ordernumber	7ML55...

» » Parametrization

» » » Measuring Limits

Lower Value	5714	digits
		digits
100%	8844	digits

» » » Switch Behaviour

| Switch Point 1 (Off->On) | 55 | % |
| Switch Point 2 (On->Off) | 45 | % |

» » » Delay

| | | s |
| | | s |

Press F1 for help.   Specialist   No connection   NUM

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SIMATIC PDM
Connecting points

Engineering Station ES

Operator Station

Maintenance Station

Ethernet

S7- 400H

S7- 400

S7- 400

PROFIBUS DP 45,45 kBit/s

PROFIBUS PA

PROFIBUS DP   redundant

PROFIBUS DP

DP/PA Link

ET 200M

ET 200iSP

HART-Multiplexer / Interface

PROFIBUS PA

RS232/ RS485

Possible SIMATIC PDM connecting point

Any device with any communication type on the work bench
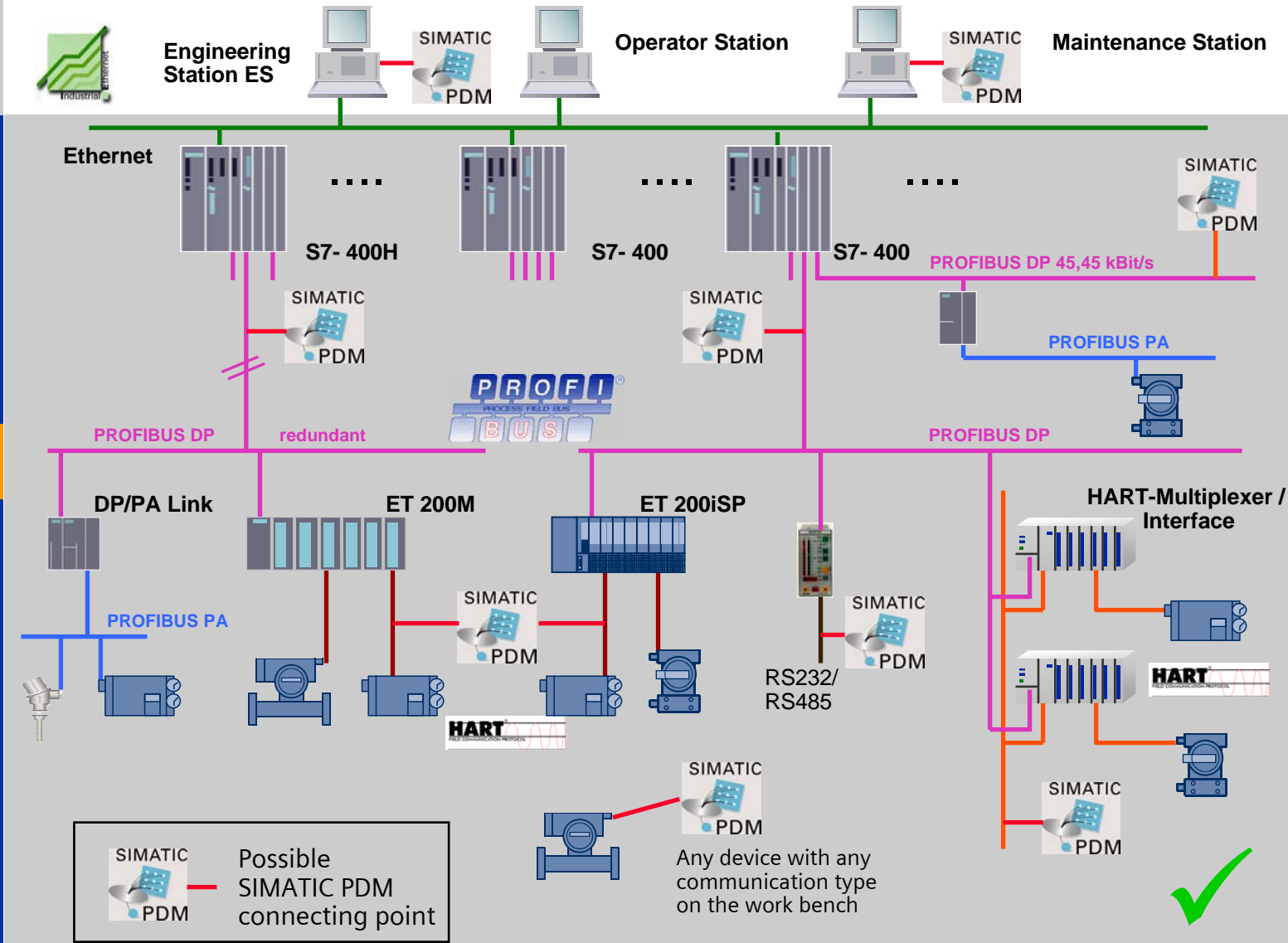
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Simatic PDM
Communication via Ethernet

→ Central parameterizing /configuration of field devices

Ethernet / Fast Ethernet

MS

SIMATIC PDM

AS 1

AS 2

AS n

PROFIBUS-DP

PROFI BUS

PROFIBUS-PA

EDDL

HART FIELD COMMUNICATION PROTOCOL

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Simatic PDM
Communication check

➔ Sure Communication

- **Checks when establishing a connection include**
  - **Whether the device type matches**
  - **Whether it is the same device**
  - **Whether modifications have been made on the device, which have not been saved in the project**

- **If the connection breaks down, there is an automatic attempt to establish a new connection**

- **Faults are displayed and logged**

✔

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Simatic PDM
Im- and Export

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

➔ **XML is the universal interface for im- and export**

- **Access to Office environment**
- **Tool for conversion to csv file (Excel) is included on the PDM CD**
- **Export with HTML – display information (View e. g. with MS Internet Explorer)**
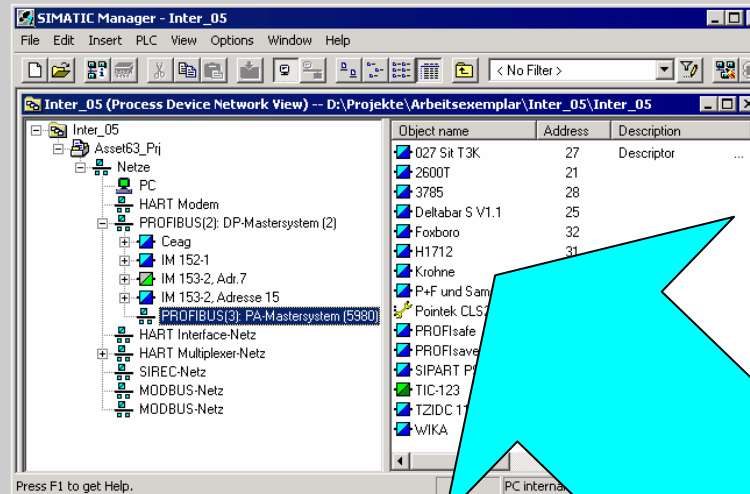
- **It is possible to export:**
  - **Lifelist**
  - **Projects**
  - **Net works**
  - **Stations**
  - **Field devices (Parameters)**
  - **Audit trail protocol**
  - **Calibration Protocols (Check protocol)**
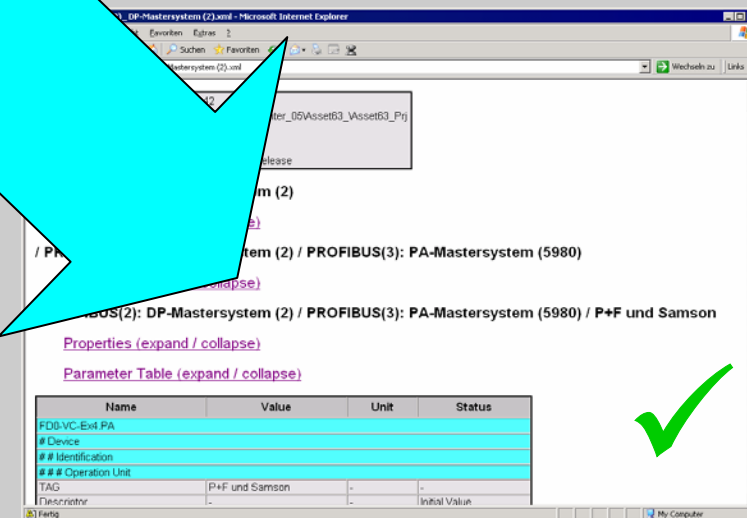
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SIMATIC PDM
Export of Data

➔ **It is the many small points which form the product**
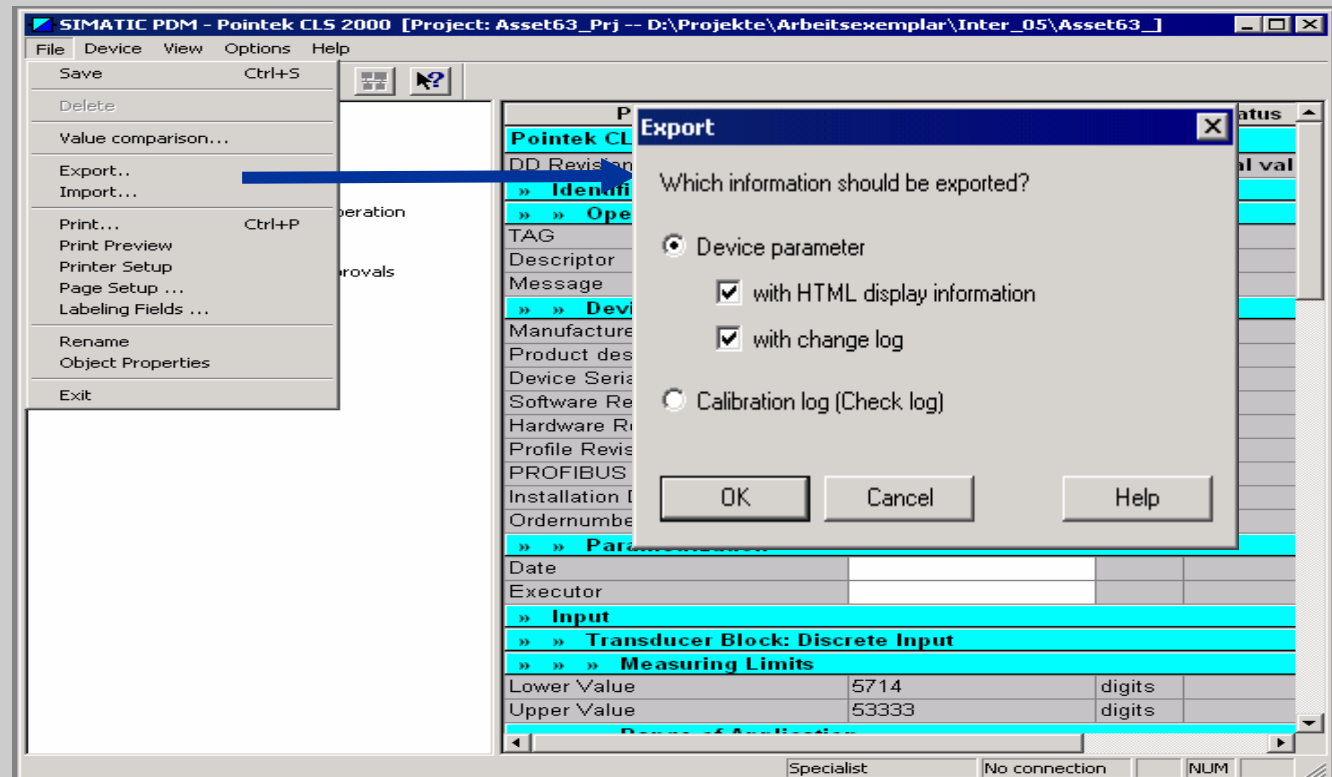
- **Display as HTML in the Internet Explorer**

- **Display with XML - Parser**

- **Conversation in CSV – Format possible**

✔

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SIMATIC PDM
Asset Management integrated

➔ **Provision and preparation of information for the Simatic PCS 7 Maintenance station**

Setting a New
Standard
of Integration

Requirements

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Summery

Data via Simatic PDM

Simatic PDM

Simatic PDM
Diagnosis / Diagnosis classification

➜ **Any diagnosis found out is classified**

- **Communication status**
  - good / fault
  - Device – assignment fault

- **Process status**
  - Device status (unchecked, deactivated)
  - Process limits (Tolerant, Warning, Alarm)

- **Maintenance status**
  - Maintenance request
  - Maintenance demand
  - Maintenance alarm

- **Configuration status**
  - Fault / Warning
  - Change

- **Operate mode**
  - locale function check / manual
  - Simulation
  - Out of order

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Simatic PDM
Diagnostic symbols (Principle)

➔ **expressive and graphical representation**

- Unchecked
- Communication interrupted
- Configuration error
- Maintenance alarm
- Maintenance demand
- Maintenance required
- Simulation
- Good
- Communication good
- Device has no diagnostics
- Device passive
- Unchecked

- **The device diagnostics are the basis**
  - **Described in EDD**
  - **Described in value status (quality code)**

- **Symbol is used at all relevant points**
  - **Process device system view**
  - **Lifelist**
  - **Parameter view**
  - **Multiview**

- **Only displayed for available information from the field device**

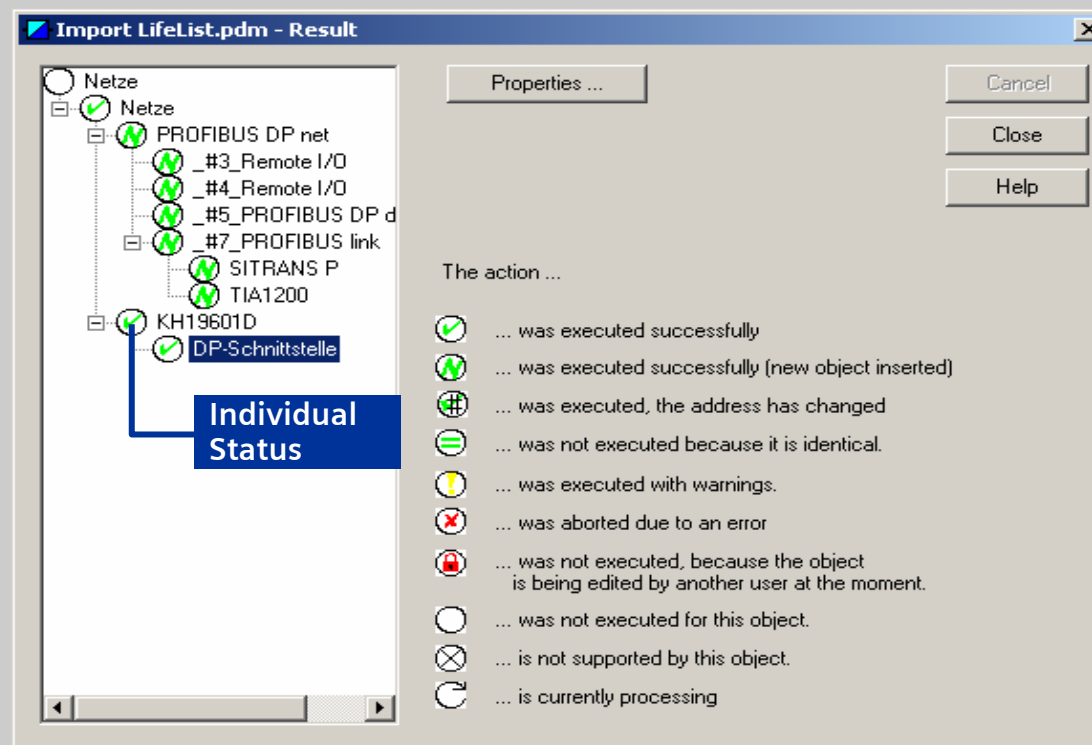- **The device manufacturer is responsible for the information content** ✔

Simatic PDM
Status from PDM - Functions

➔ **System functions are supervised**

- **Status of load functions**
- **Status of set operations**
- **Status of export and import functions**

Individual Status

Simatic PDM
Value comparison

➔ **Identification of local changes**

Requirements

EDD

Device Integration

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Summery

■ **Comparison of offline data with the online data in the device**

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Simatic PDM
Lifelist

➔ Ideal for commissioning, service and maintenance

- **For PROFIBUS (DP/PA) – Networks, including sub-networks**
- **Integrate in Simatic S7 / PCS 7 for PROFIBUS PA**
- **For HART - modem**
- **Field devices can be parameterized from the lifelist**

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Simatic PDM
Product structure

→ The product structure orientates itself to customer requirements

Setting a New
Standard
of Integration

Requirements

EDD

Device Integration

User Interface

Communication

Functions

Diagnosis

Product

Summery

Functionality

- **Single Point**
  - **Point to Point**
- **Basic**
  - **Base Functionality**
- **Service**
  - **Ideal for service uses**
  - **Protocol-/ extended diagnostic Functions**
- **Simatic S 7**
  - **Ideal for uses in Simatic S7**
  - **Integration in Step 7**
- **Simatic PCS 7**
  - **Ideal for uses in Simatic PCS 7**
  - **Routing in the System**

- **Options**
  - **Tag – Options**
  - **HART - Multiplexer**

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SIMATIC PDM – The Process Device Manager

Setting a New
Standard
of Integration

Requirements

EDD

Device Integration

User Interface
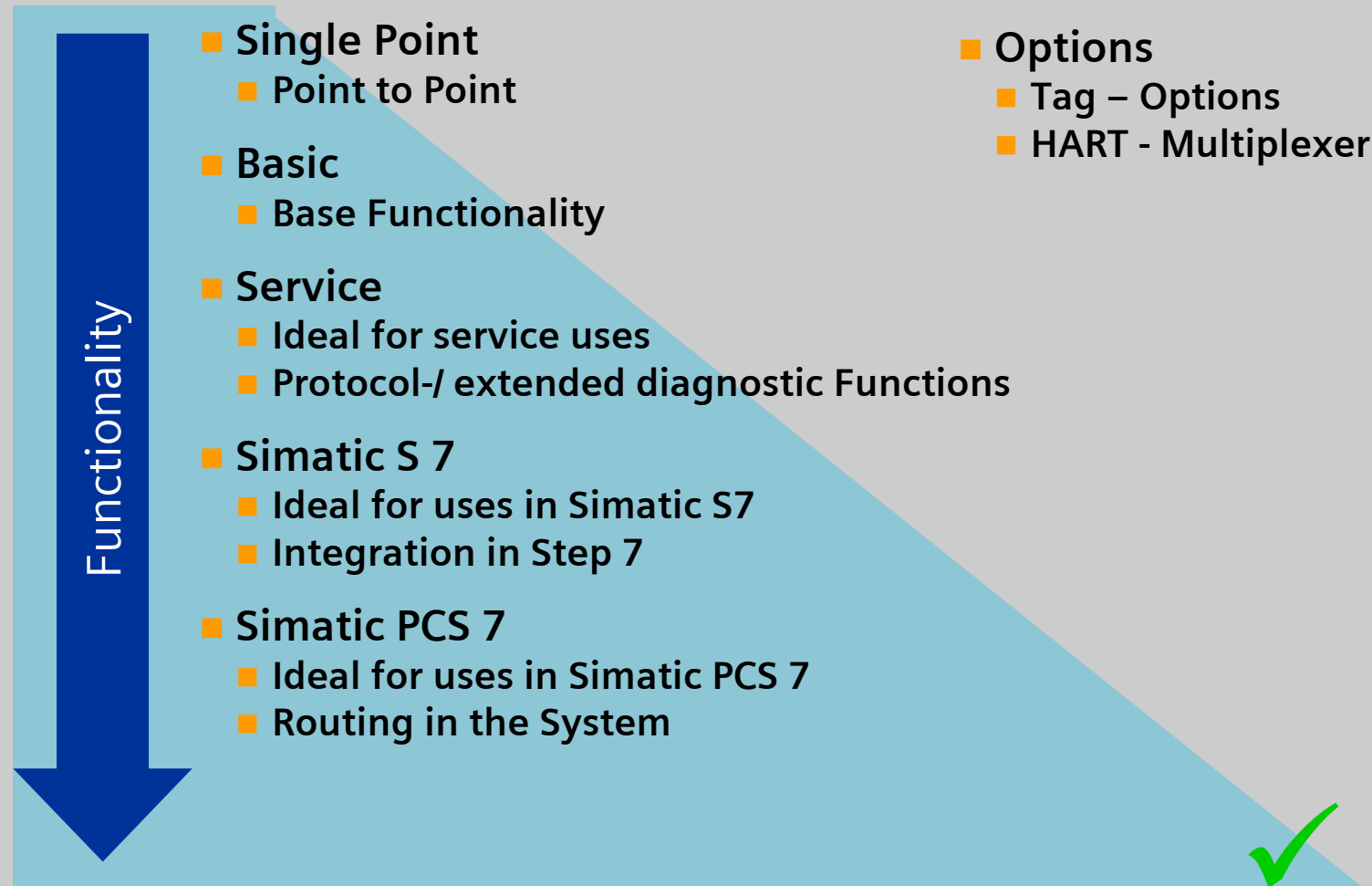
Communication

Functions

Diagnosis

Product

Summery

SIMATIC PDM
is the
most powerful
manager for process devices
in the global market
in terms of device integration

✓

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Contacts

- **SIEMENS AG   Customer Support**
  - **City   D-90475 Nürnberg**
  - **Tel.:   +49 (0) 180 50 50 222**
  - **Fax: +49 (0) 180 50 50 223**
  - **E-mail: techsupport@ad.siemens.de**

- **Internet**
  - **General information**
    - **http://pcs.khe.siemens.de/pdm**

  - **Customer Support**
    - **http://www.siemens.com/automation/service&support**
    - **http://www.ad.siemens.com/csinfo**

  - **Subsequent installation of field devices**
    - **individual from field device manufacturers**
    - **or**
    - **http://pcs.khe.siemens.de/pdm**

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