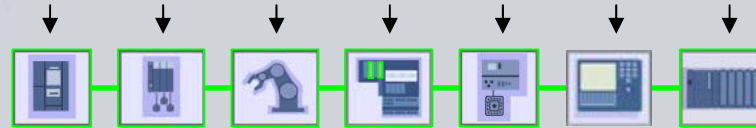


PROFINET Technology

Integration of PROFINET interface in devices



The easy way to
PROFINET

Agenda

Development Phases

Implementation

Certification

Operators

Support

... for device manufactures

- Support in all phases of the development
- Different implementation possibilities
- Quality by certification

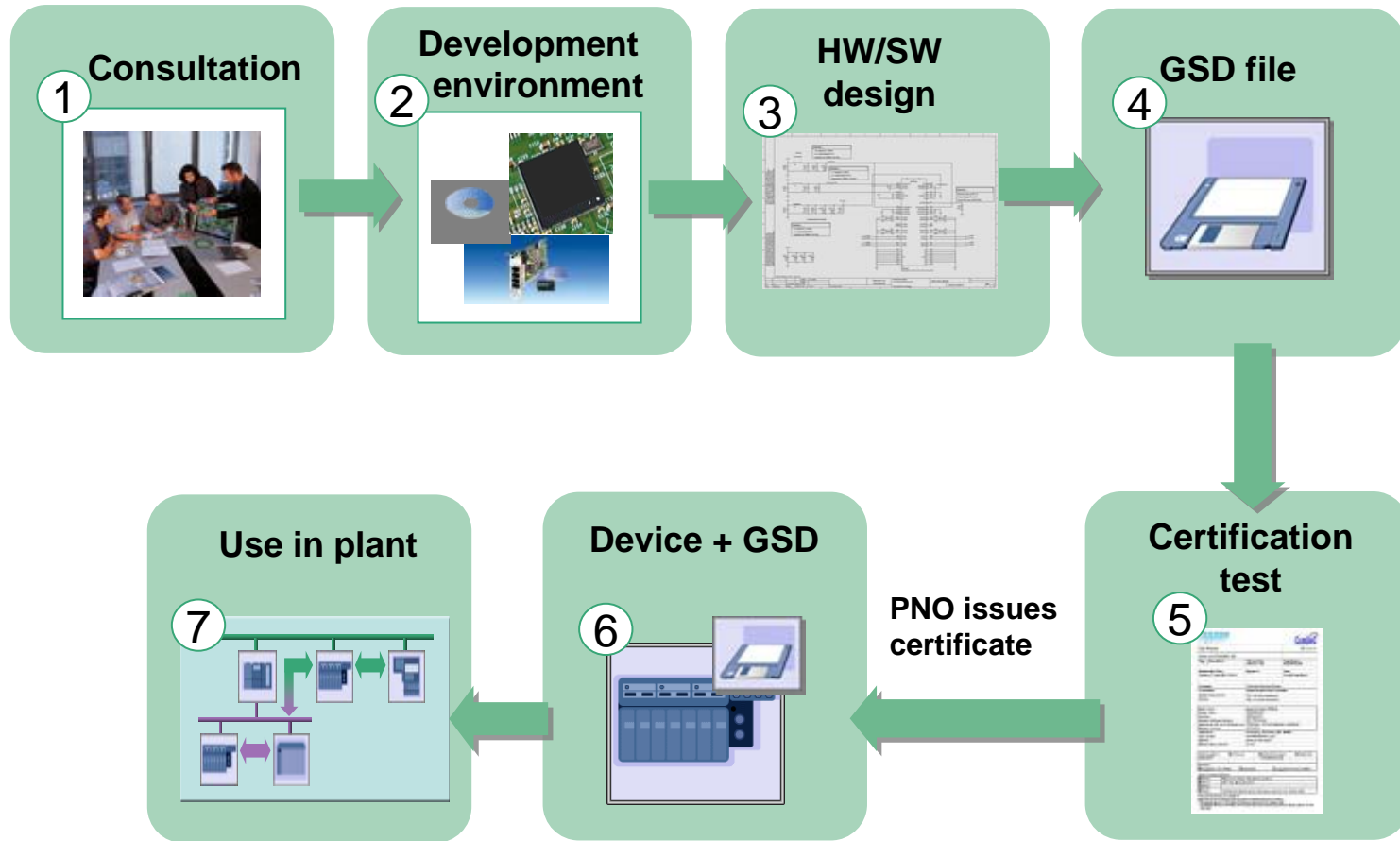
... for operators

- Training
- Support
- Worldwide



easy to implement

... the view of the device manufacturer



Agenda

Development Phases

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Agenda

Development Phases

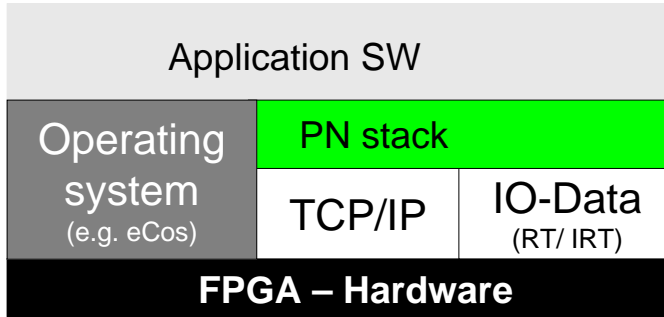
Implementation

Certification

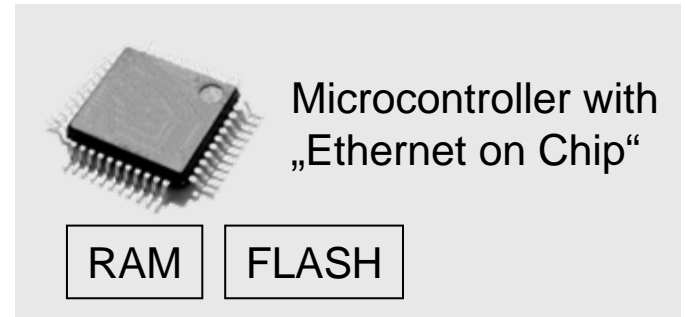
Operators

Support

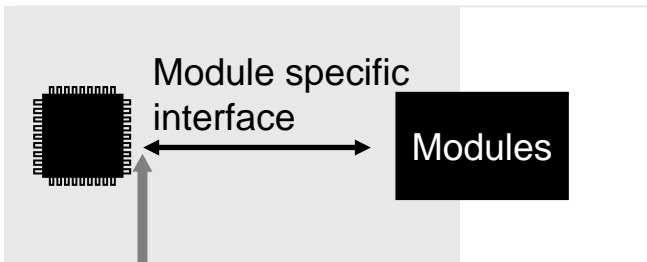
FPGA



Standard Microcontroller

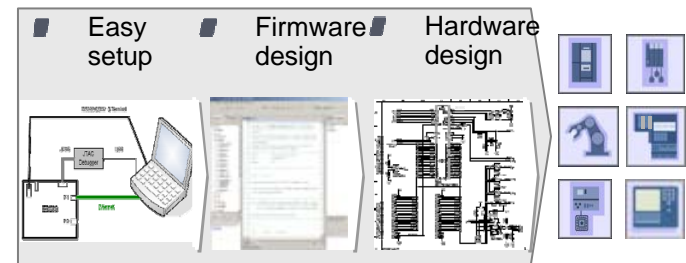


Modules and Boards



Driver SW from module manufacturer

ASIC and Development Kits



Agenda

Development Phases

Implementation

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Support

FPGA



- Flexible setup of functionality
- CPU integration
- Ethernet hardware switch
- Easy updates during development phase

Standard Microcontroller



- Cost effective
- MII and/or PHY on Chip
- No integrated hardware switch
- Software switch solution possible
- Only one Ethernet port on Chip

Modules and Boards



- Short development cycles
- Easier device certification with pre-certified modules
- High degree of flexibility
- Low development risk

ASIC and Development Kits



- Support of applications with high-performance
- Integrated hardware switch
- Support of all Conformance Classes
- PROFINET functionality in hardware

Agenda

Development Phases









Implementation

Certification

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Support

Performance & Functionalities

	Conformance Class A	Conformance Class B	Conformance Class C*
 FPGA			
 Standard Microcontroller			
 Modules			
 ASIC/ Dev. Kits <small>(Own Device Development)</small>			

*CC-C: Synchronization with IRT requires special HW support (e.g. ERTEC 200, ERTEC 400, TPS-1 and netX)

Agenda

Development
Phases

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- **The classification into conformance classes allows:**
 - Easy choice of components with required properties by the end user/system integrator
 - Secured functional scope in the device class
 - Basis for certification

- **There are three Conformance Classes defined**
 - Class A
 - Class B
 - Class C

Agenda

Development Phases

Implementation

Certification

Operators

Support

▪ Class C:

- Highest deterministic data transfer
- Certified devices and network components
- Topmost performance

▪ Class B:

- Certified devices and network components
- Topology determination and upload
- Comfortable Diagnostics, redundancy

▪ Class A:

- Standard Ethernet Network components
- Certified Devices and Controller

■ Application Class:	non isochronous	non isochronous	Non iso. + isochronous
■ Communication Class:	TCP/IP, RT	TCP/IP, RT	TCP/IP, RT, IRT
■ Redundancy:	RedClass 1 optional	RedClass 1 mandatory RedClass 2 optional	RedClass 1, 2, 3 mandatory

Agenda

Development Phases

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Support

Protocols	Profiles	Functions
Defined way to transfer data within a network	A Profile is a special and optional add-on, tunneling data by using the standard protocol	A function is an optional configurable change of the device behavior
<p>TCP (Transmission Control Protocol)</p> <p>UDP (User Datagram Protocol)</p> <p>DHCP (Dynamic host config. Protocol)</p> <p>SNMP (simple network mgmt protocol)</p> <p>LLDP (Link Layer Discovery Protocol)</p> <p>MRP (Media Redundancy Protocol)</p> <p>...</p>	<p>PROFenergy</p> <p>PROFIsafe</p>	<p>Fast Start Up (FSU)</p> <p>Ident. & Maint. (I&M)</p>

The PROFINET Technology has a core functionality. Additionally there are optional expandable protocols, profiles or functions (modular communication technology)

Agenda

Development Phases

Implementation

Certification

Operators

Support



- Certification according to proven system by accredited test laboratories
- Certification as a prerequisite for market introduction of PROFINET products
- Complete testing scenario with uniform testing range and uniform testing system
 - Test for compliance with specification
 - Test for interoperability with other PROFINET devices

AnfData ComDeC itm

Certification is mandatory for PROFINET

PIC Phoenix Testlab

Agenda

Development Phases

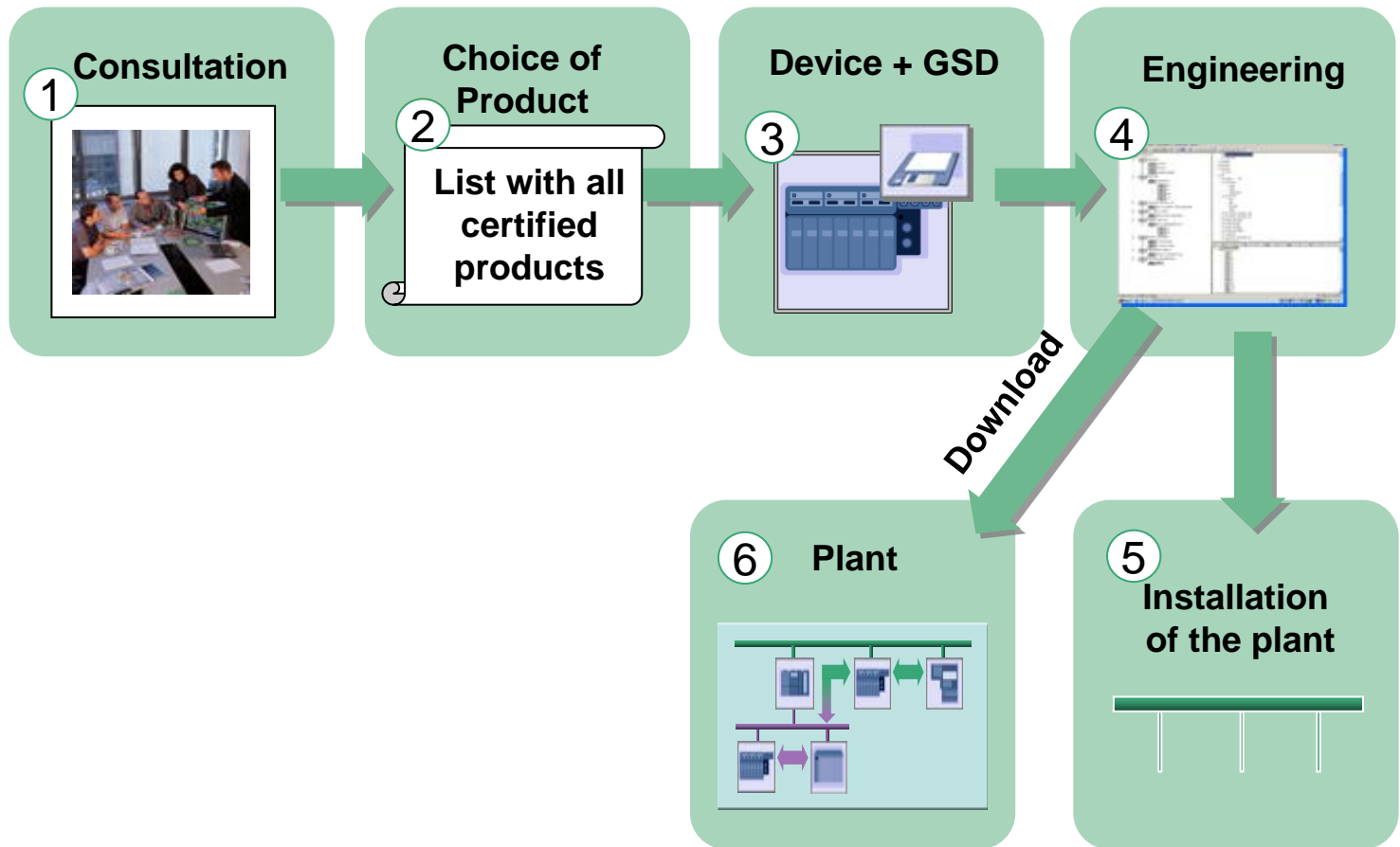
Implementation

Certification

Operators

Support

... the view of the plant operator



Agenda

Development
Phases

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Support

Goal: To establish a worldwide standardized training program for:

- Certified PROFINET Engineer
- Certified PROFINET Installer
- Certified PROFIsafe Designer

Stipulations:

- Uniform learning target
- Required learning aids
- Standardized examination catalogue
- Guidelines for Training Centers
- Accreditation procedure for the Training Centers

Hardware - Software - Consulting - Implementation

- Trainings and consulting of the PROFINET Competence Centers
- Implementation of PROFINET-Stacks incl. porting and configuration
- Hardware and/or software development
- Project Management
- Error analysis
- Certification
- And more...

Agenda

Development Phases

Implementation

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Operators

Support



and others...

Agenda

Development Phases

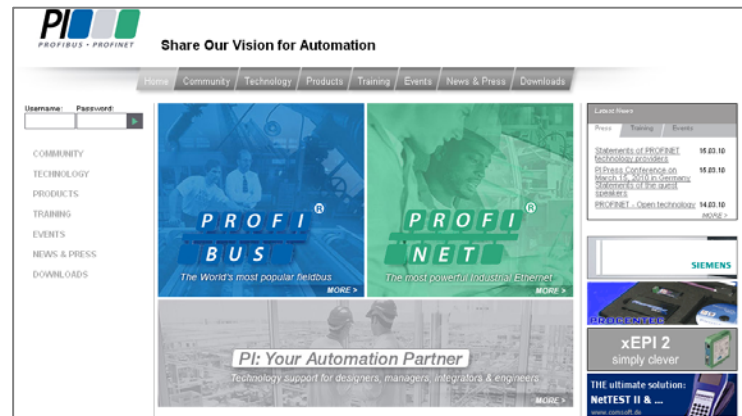
Implementation

Certification

Operators

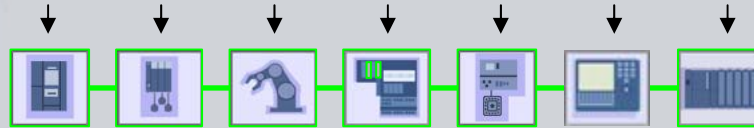
Support

- PROFINET Technology Flyer
- PROFINET System Description
- Book: “Industrial Communication with PROFINET”
- www.profinet.com
 - downloads
 - trainings



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