



Fieldbus Foundation™
Freedom to Choose. Power to Integrate.

Fieldbus Foundation – India Marketing Committee

Technology Event

“FF Integration into Field Devices”

Date : 21st June, 2008 (Saturday)
Venue : TROPICANA Conference Room.
Hotel : Taj Residency,
Akota Gardens,
Vadodara - 390 020 INDIA

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FF Integration into Devices

- Field devices usually have the following interfaces
 - ☞ Analog (e.g. 4-20mA)
 - ☞ HART or
 - ☞ Serial (Proprietary, PWM, Modbus)

- How to integrate FF technology into such devices?
 - ☞ New Hard- Software
 - ☞ Integration via Off the Shelf Components



FF Integration into Devices

- New Hard- and Software Development
 - 👉 Hardware development
 - 👉 FF Stack integration
 - 👉 Application Development
 - 👉 Certification (Physical Layer, Interoperability and Conformance Test)
 - ➔ Dedicated to specifics (e.g. size of temperature transmitter)

- Using Off the Shelf Integration Kit
 - 👉 Rapid integration via Piggy-Back-Board with integrated FF-stack
 - 👉 “Application Development” (Data mapping to FF)
 - 👉 Rapid Certification (Interoperability Test only)
 - ➔ Low Upfront Costs
 - ➔ Short time to market



FF Integration into Devices

■ Step 1 - Hardware Development

- 👉 Standard Hardware Base
- 👉 Renesas M16C62 (4 MHz) or any other μ Processor
- 👉 Fieldbus ASIC
 - 👉 UFC100-F1
 - 👉 Yamaha Find1+
 - 👉 Siemens SPC4-2
- 👉 MAU: discrete or others
- 👉 On-Chip-Flash: 256 kByte
- 👉 External RAM: 128 kByte





FF Integration into Devices

■ Step 2 – Integration of FF-Stack

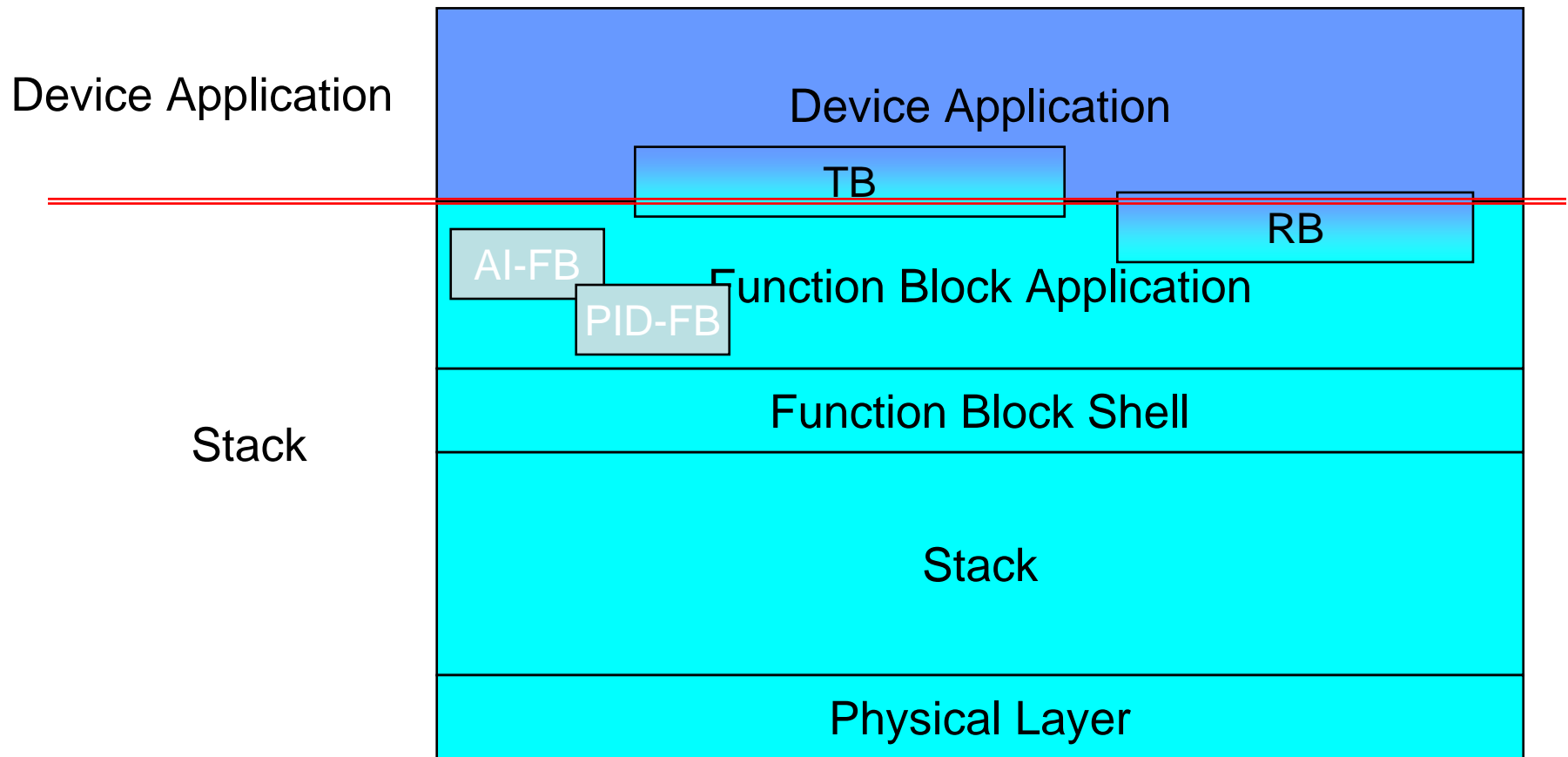
Once the hardware is developed,
the stack can be implemented into the hardware

- 👉 3-4 weeks time for stack implementation and testing
- 👉 Pre-certification of the device
 - 👉 Physical layer test
 - 👉 Interoperability test
 - 👉 FF-Conformance test



FF Integration into Devices

■ Step 3 – Integration of Device Application





FF Integration into Devices

■ Step 4 – Certification Process

Physical Layer Test:

Self certification of conformance of physical layer according to Specification.

Foundation Fieldbus

Conformance Test: Test of stack conformance at Fraunhofer Institute in Germany according to CTK test kit (current V2.25)

Interoperability Test: Test of device application conformance at Fieldbus Foundation according to ITK test kit (current V4.61)

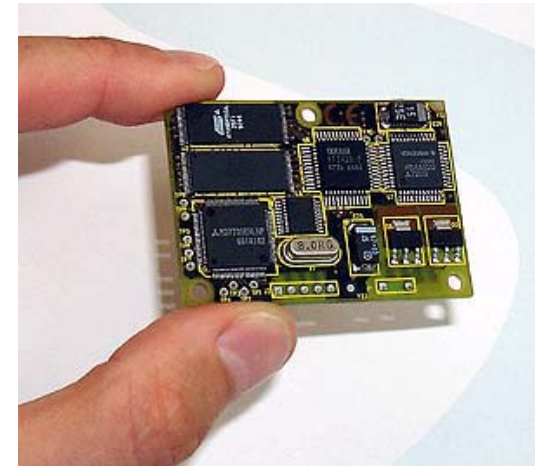


FF Integration into Devices

■ Integration via Off the Shelf Components - Motivation

Issues when developing new fieldbus device:

- 👉 Difficult / time consuming HW development
- 👉 Low-power-design; special ASICs
- 👉 Intrinsic safety requirements
- 👉 Complex fieldbus protocol
- 👉 Certification process

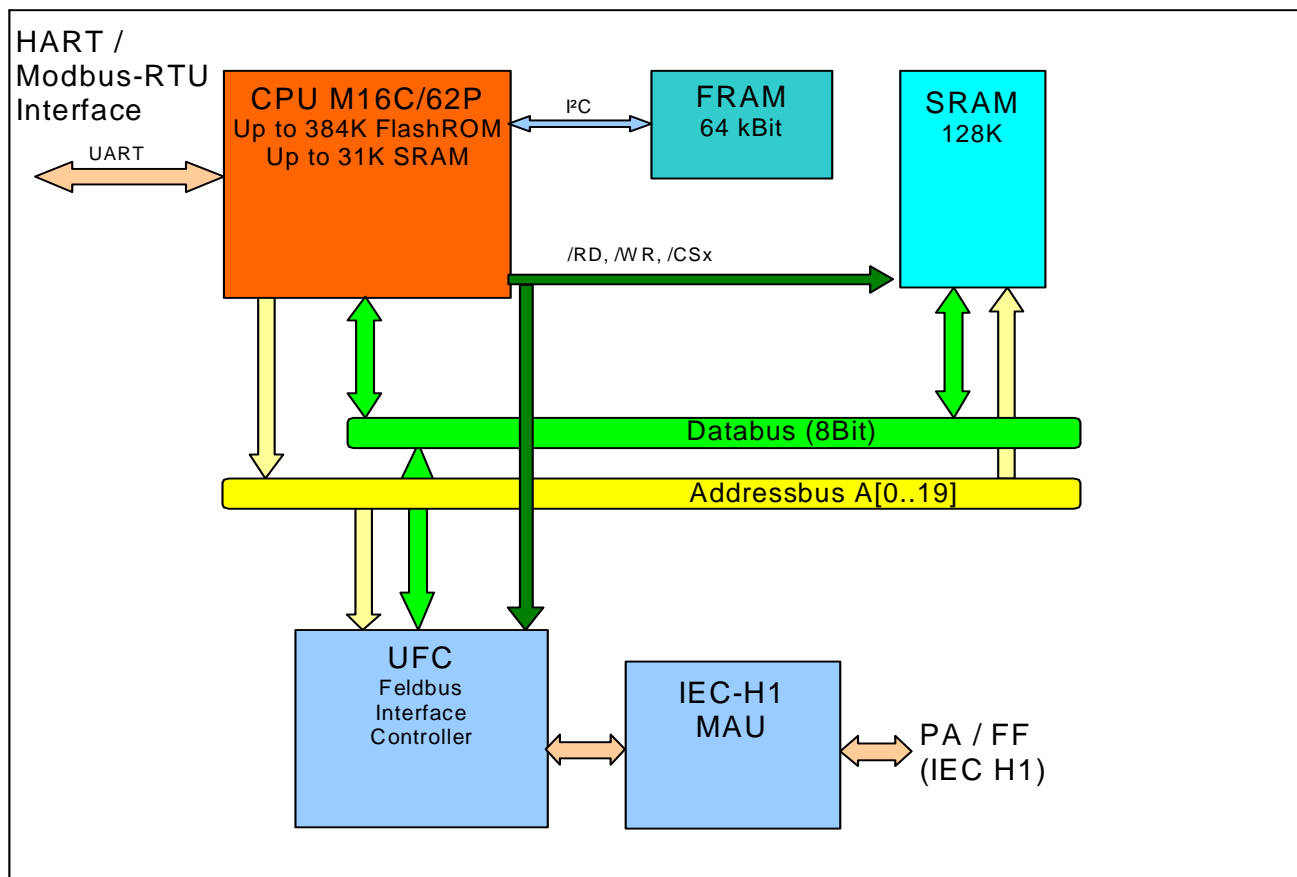


Device development can be extremely simplified when using a ready-to use, pre-certified hardware module



FF Integration into Devices

■ Integration via Off the Shelf Components

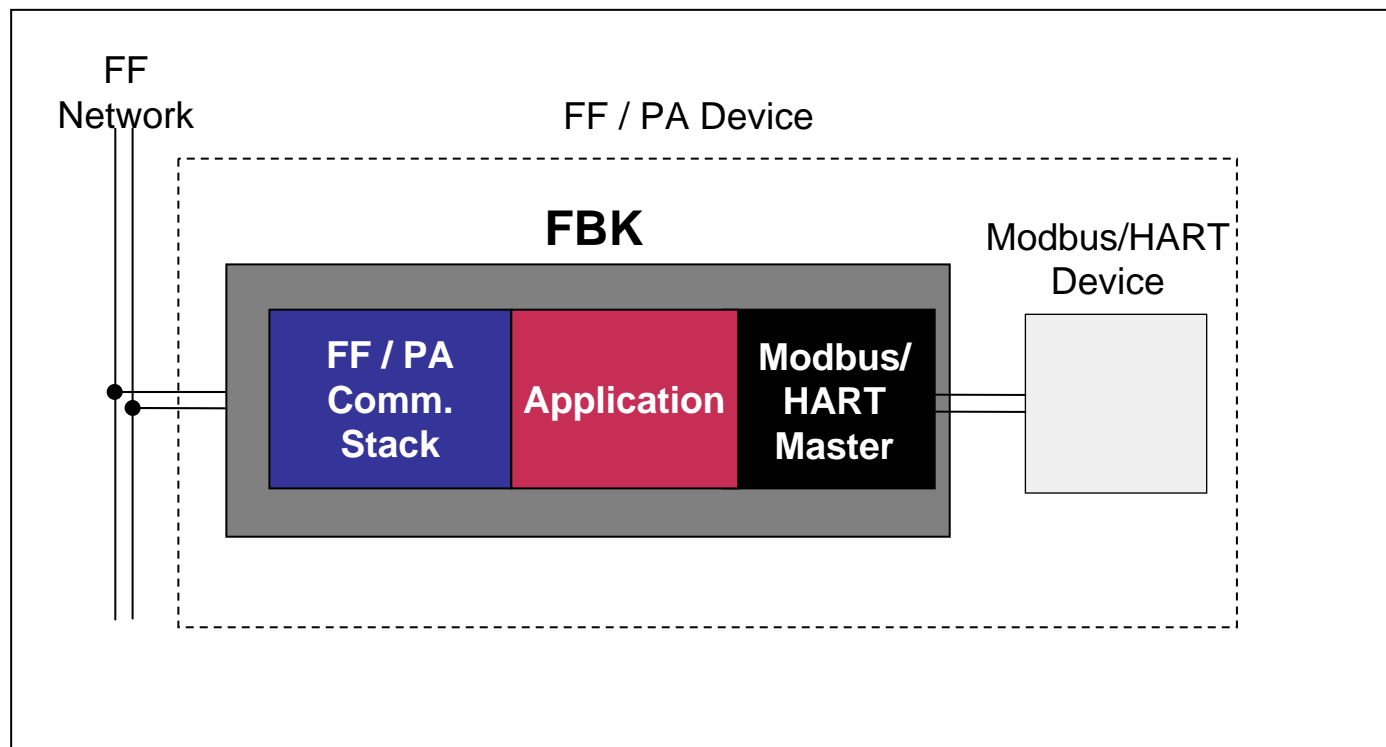


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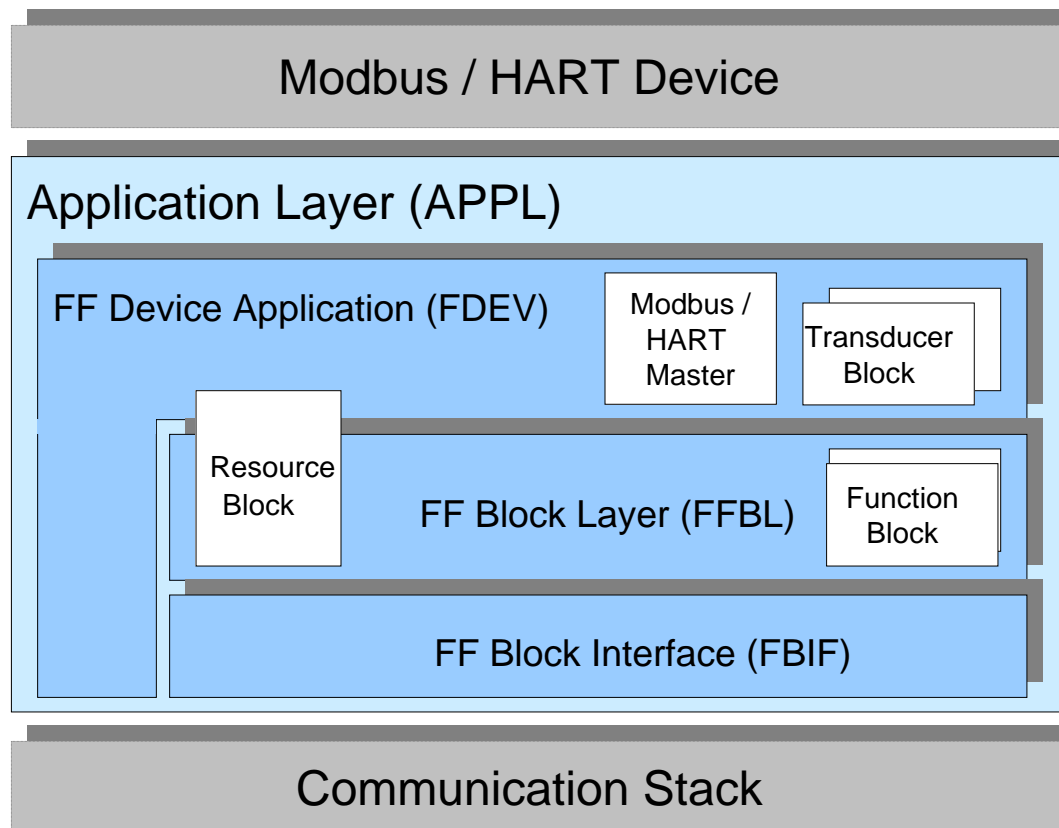
■ Integration via Off the Shelf Components – SW Architecture





FF Integration into Devices

- **Integration via Off the Shelf Components – SW Architecture**
Details of Application Layer (APPL)





FF Integration into Devices

- Integration via Off the Shelf Components – Pre-Implementation
 - ☞ Be familiar with your device
 - ☞ Be / become familiar with FF and FB applications
 - ☞ Think about / specify device parameters to be communicated
 - ☞ Think about / specify the mapping of parameters
 - ☞ How many / which blocks?
 - ☞ Which block parameters shall hold which device information?
 - ☞ Multiple channels or multiple blocks?



FF Integration into Devices

- Integration via Off the Shelf Components – Implementation Steps
 - 👉 Create GenVFD script and Device description for your device
 - 👉 Compile DD using Tokenizer => .FFO, .SYM files
 - 👉 Generate application layout from script and tokenized DD
 - 👉 Define schedule for cyclic and acyclic communication
 - 👉 Fill interface functions of transducer block
 - 👉 Compile application
 - 👉 Test



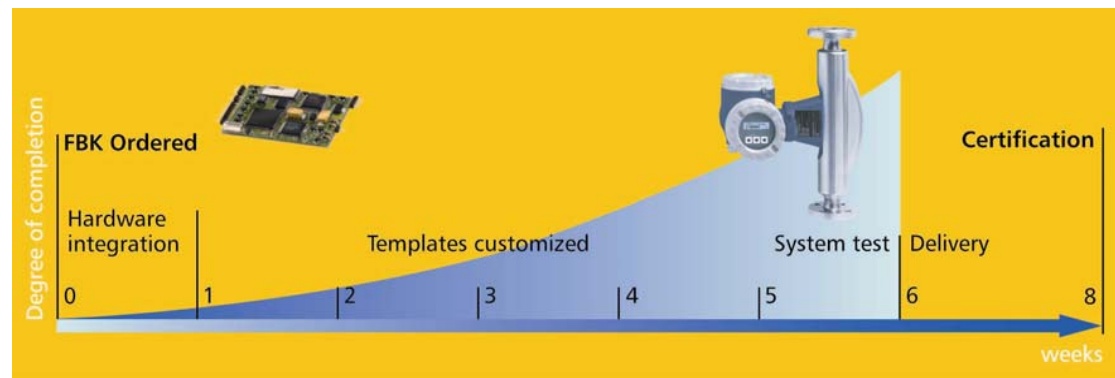
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■ Integration via Off the Shelf Components – Certification Process

Use of pre-certified components reduce time & costs

Interoperability Test: Test of device application conformance at Fieldbus Foundation according to ITK test kit (current V5.0)

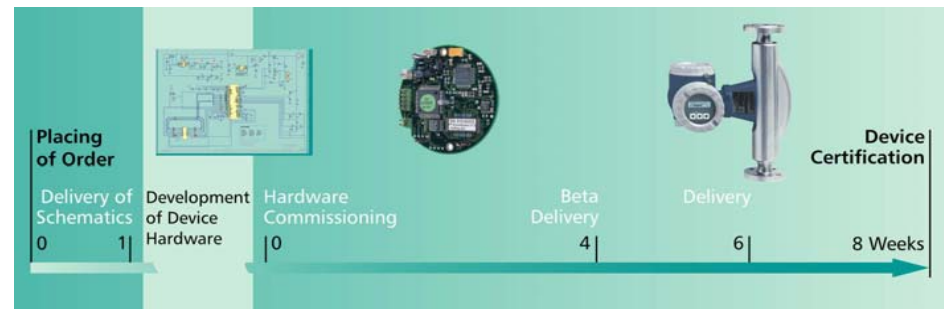
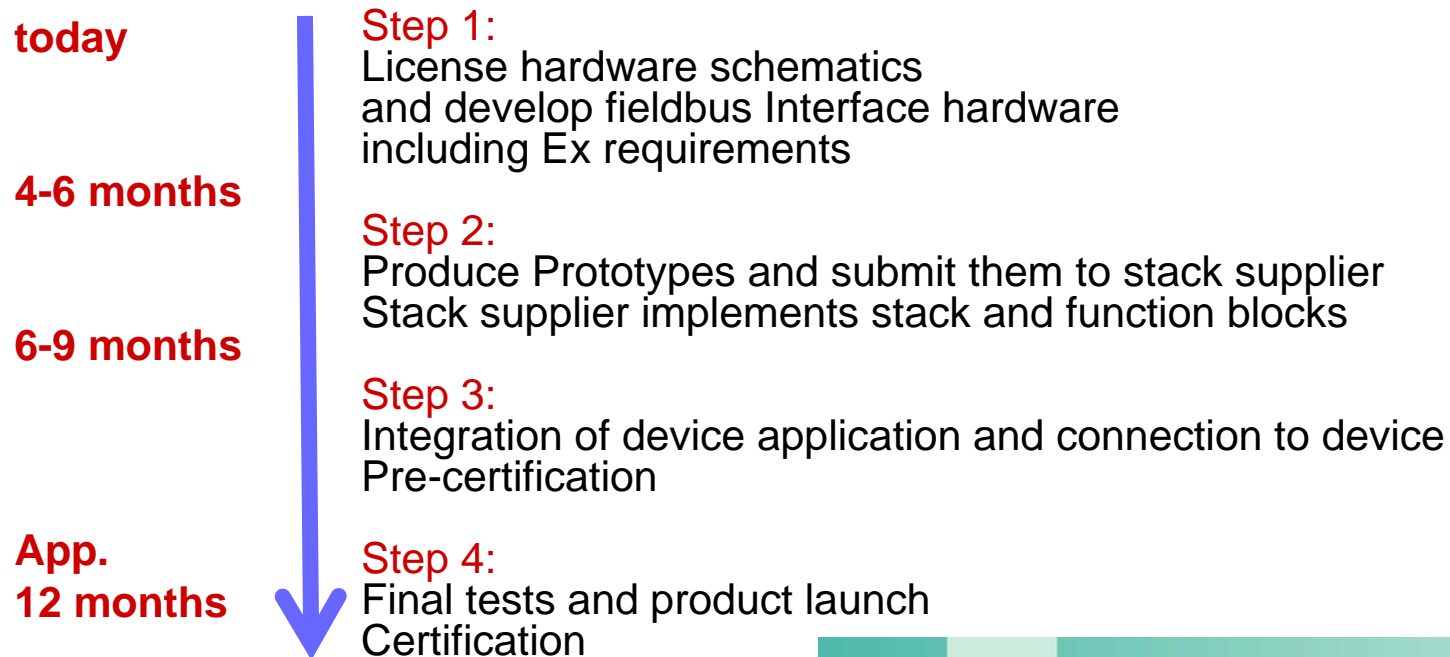


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FF Integration into Devices

■ Integration via new hard and software – Timeline



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FF Integration into Devices

■ Integration via off the shelf components – Timeline

today

Step 1:

Submit Specification of Device Application
(e.g. HART-Commands)

1 month

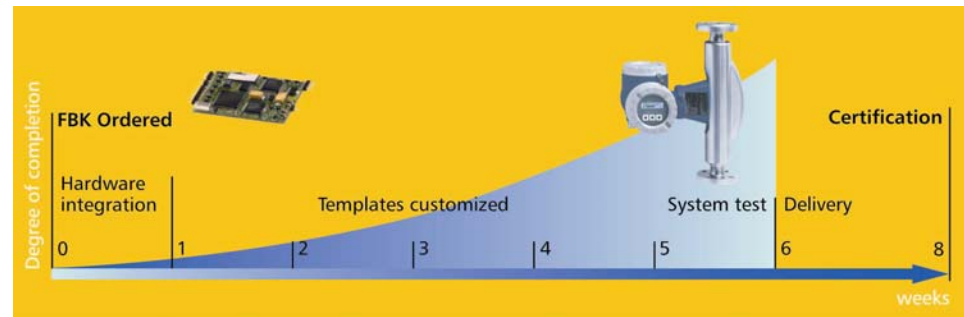
Step 2:

Receive Fieldbus Implementation Kit and Software

2 months

Step 3:

Pre-certification (ITK)
Certification (Interoperability Test only)



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FF Integration into Devices

Lab Equipment

- 👉 FF Technology Training.
- 👉 FF Starter Kit.
- 👉 FF-Bus Analyser (in depth bus analyser)
- 👉 FF-Network Configuration Tool.

Available at www.fieldbus-shop.com



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Questions ???



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