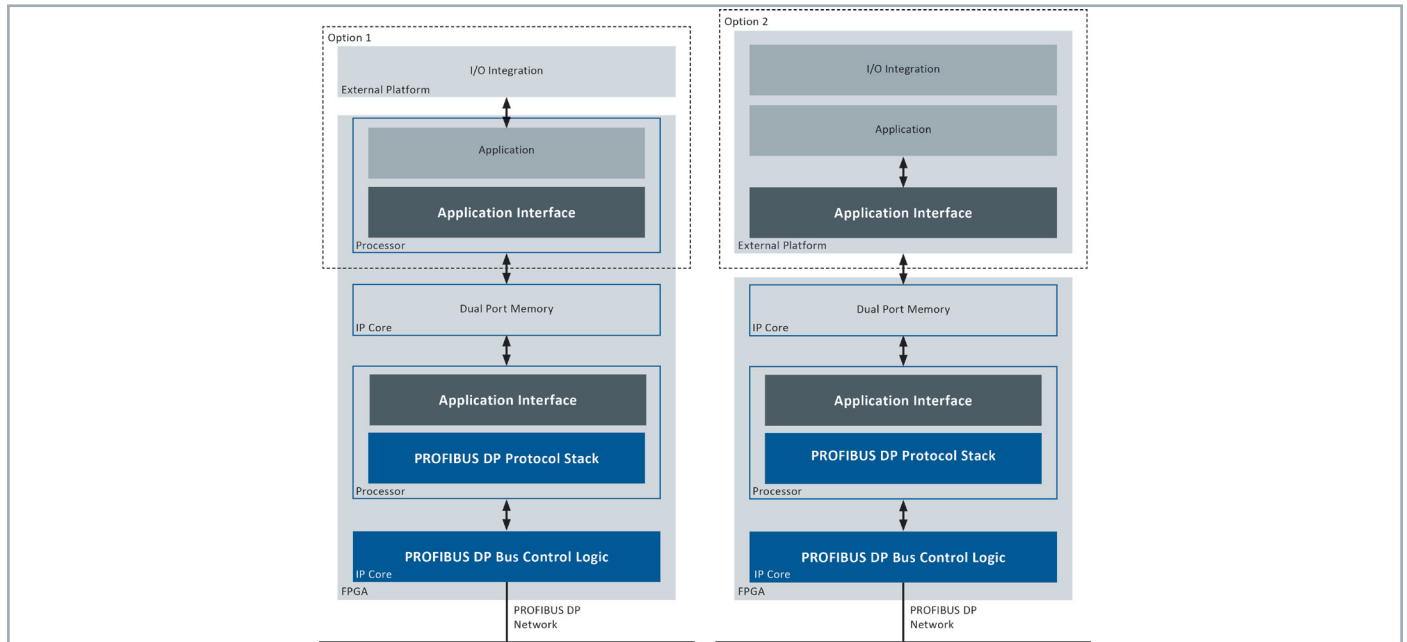


PROFIBUS DP Slave for Altera FPGA

Integration of PROFIBUS DP into Field Devices

The PROFIBUS DP Slave IP Core and the protocol software executed inside the FPGA comprise all digital functions required for implementing a PROFIBUS DP slave. The product thus eliminates the need for a specific additional fieldbus controller ASIC.



Minimum Development Effort

- Combination of all components required for implementing a PROFIBUS DP Slave on a Field Programmable Gate Array (FPGA)
- PROFIBUS DP bus control logic implemented as loadable IP Core
- PROFIBUS DP protocol stack ready-to-use on soft core processor within FPGA
- Including PROFIBUS versions DP (exchange of cyclic data and diagnosis) and DP-V1 (acyclic data exchange and extended diagnosis)

One API For Quick Integration

- Simple Device Application Interface (SDAI) designed as efficient protocol abstraction layer to use different protocols with same application
- PROFIBUS, PROFINET IRT, EtherCAT, EtherNet/IP, POWERLINK and Modbus TCP using the same API
- Device application software running on second processor inside the FPGA or on separate external host processor

Space-Saving and Future-Proof Implementation

- Provision of complete bus control logic for accessing PROFIBUS DP network
- Handling of all time-critical parts of PROFIBUS DP Data Link Layer and cyclic data exchange
- No dependency on fieldbus controller ASIC and its vendor

Flexible, Scalable and Low-Maintenance Solution

- Possibility to use different protocols alternatively or in parallel, also with multiple channels
- Easily extendible] by customer-specific functions thanks to FPGA technology
- Easy integration of future versions
- Same license model for all protocols

Technical Data

Hardware	Qsys Subsystem	<ul style="list-style-type: none">• IP Core with PROFIBUS DP bus control logic• 1 Nios II IP Core for protocol processing• DPRAM (4 KB) interface to application• Memory-mapped bridges for Flash and RAM
	PROFIBUS Clocks	16 MHz, 84 MHz
	Nios II Clock	Configurable (default: 75 MHz)
Software	PROFIBUS Functionality	<ul style="list-style-type: none">• PROFIBUS DP Slave• PROFIBUS DP, PROFIBUS DP-V1• Cyclic services• Sync / Freeze• Input / output data: up to 244 Bytes each• Configuration / parameter / diagnosis data: up to 244 Bytes each• Acyclic Read / Write (Master Class 1 and Class 2)• Up to 3 simultaneous Master Class 2 connections• Automatic baud rate recognition• Identification & Maintenance services (IMO)• Modular slave with up to 64 modules• Support of dynamic I/O configuration change by Slave application• Diagnostic alarms and Pull/Plug alarms• Support of redundancy switch over command
Conformity	Tested with PROFIBUS DP Tester Software	
System Requirements	FPGA Type	Altera Cyclone IV or V (and SoC)
	FPGA Resources	Approximately 5,000 ALMs, 32 M10k memory blocks
	Memory	Code and initialized data: approximately 470 KB
Licensing	Per Unit Base or Annual Base	

Scope of Delivery

IP Core	<ul style="list-style-type: none">• PROFIBUS DP Slave IP, Qsys subsystem for PROFIBUS Slave• Sample FPGA design
Software	<ul style="list-style-type: none">• PROFIBUS DP Slave stack, binary format• Sample application for "Evaluation Kit Altera Cyclone V E"• Sample device description file (GSD)• Sample projects for Siemens PLCs and Softing configurator
Documentation	PROFIBUS Slave user manual, SDAI manual (electronic format)

Order Numbers

ISL-YY-015320	Per Unit License for One Slave Device (security EEPROM, packing unit: 250 pieces)
LAA-NN-019320	Annual Product License Fee (right to sell an unlimited number of a single customer product for one year)

Additional Products and Services

SIA-NN-018101	PROFIBUS DP Integration Workshop
TRA-PB-TECH	PROFIBUS Technology Training
DDA-NN-006014	PROFIBUS Tester 5 (BC-700-PB)



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