



Anybus[®]

PROFINET Connectivity Solutions

Complete range of communication solutions enabling automation devices and machinery to communicate via Profinet.

- » Embedded Profinet Interfaces
- » Profinet to Fieldbus Gateways
- » Profinet to Ethernet Gateways
- » Profinet Protocol Converters
- » Consulting and Training



Profinet - Popular and powerful real-time Industrial Ethernet solution for Automation

Profinet is an industrial Ethernet-based networking solution for automation and control. It is similar to Profibus in that it enables distributed IO control from a PLC. It also utilizes similar engineering and maintenance techniques and it can support similar application-specific profiles such as Functional Safety and Motion Control.

Profinet has a much broader application area than Profibus and can enable plant-wide networking. It integrates readily with IT infrastructures and with the Internet. It includes solutions for integration of Profibus or any other fieldbus into an overall network architecture.

Profinet offers real time communication via industrial Ethernet

Profinet uses the same Ethernet as offices and IT departments. However, its capabilities have been enhanced to meet the far tougher environmental and Real Time conditions encountered in industrial applications. Ethernet's larger address space brings almost unlimited scalability.



Profinet also brings more capacity for advanced Real time communication including isochronous bus cycles (IRT) for motion control applications. Profinet also defines network management and redundancy features that allow the replacement of defective devices without the need to use an engineering tool.

Conformance Classes

The rich set of Profinet functionality is divided into 3 conformance classes:

CC-A: Use of the infrastructure of an existing Ethernet network, including integration of basic Profinet functions. All IT services can be used without restriction. Application areas include factory, building and process automation.



CC-B: In addition to the functions of CC-A, the scope of CC-B supports easy user-friendly device replacement without the need for an engineering tool as well as advanced diagnostic and network management. All IT services can be used without restriction. Typical applications include automation systems with a deterministic, but not isochronous bus cycle.

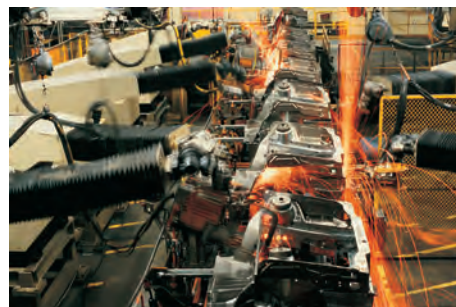
CC-C: In addition to the functions of CC-B, the scope of CC-C supports high-precision and deterministic data transmission including isochronous applications (IRT). IT services can be used within the boundaries of the remaining bandwidth of a bus cycle.

“AIDA Group” Audi, BMW, Daimler, Porsche & VW standardize on Profinet technology!

Leading German automobile manufacturers are joining forces in the AIDA group and have decided to standardize on Profinet for future installations in their body shop manufacturing sites. Profinet will be used for IO data transfer on the field level as well as for data communication between the automation systems and to the manufacturing execution system (MES).

AIDA chose Profinet because it allows Real Time communication and TCP/IP based IT communication via the same physical interface. Moreover, in the long run, AIDA intends to also integrate safety applications via ProfiSafe.

As Profinet provides a modular and scalable functionality, AIDA has defined a set of specific functional requirements that all automation devices must fulfil to be approved for usage at the plants of the AIDA member companies.

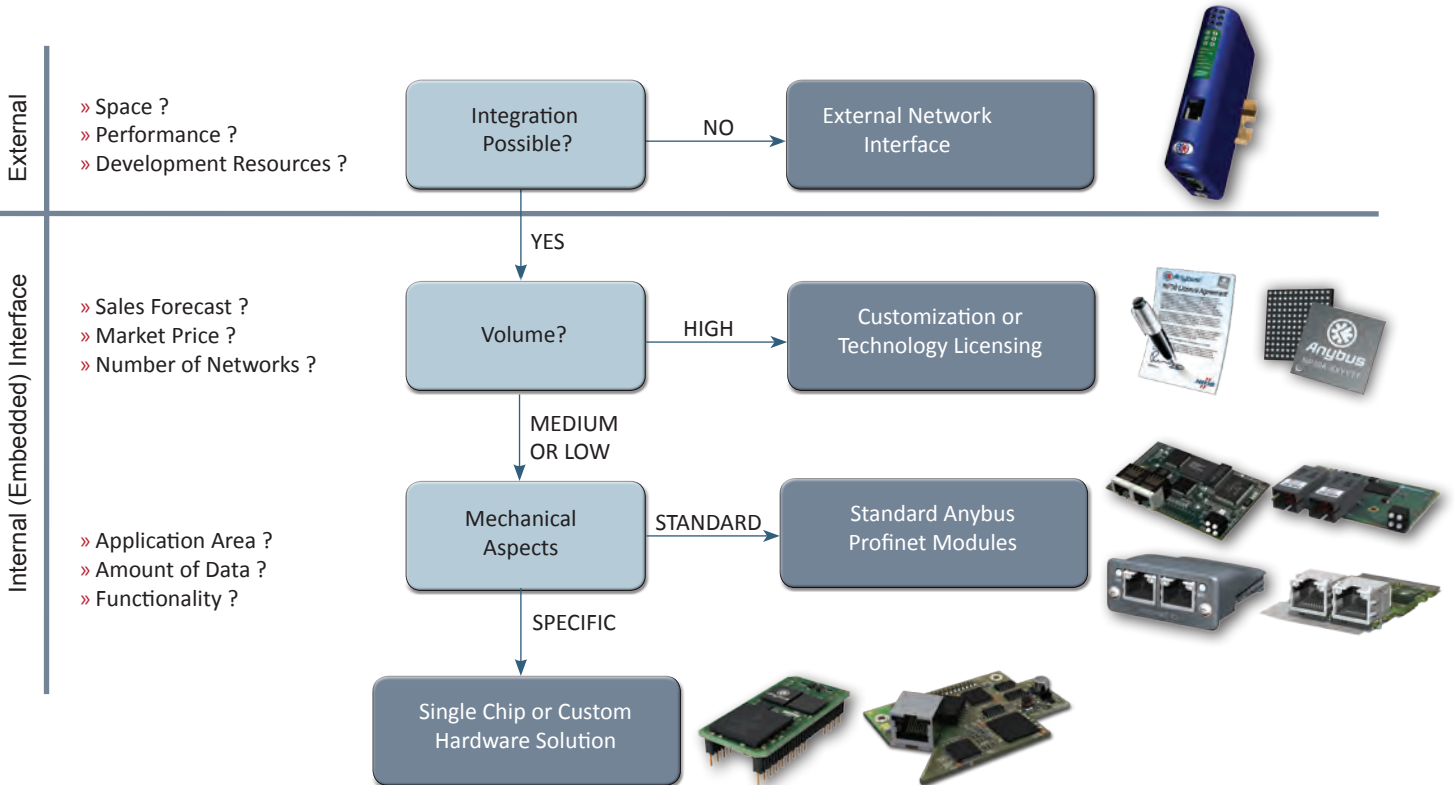


MAIN “AIDA” REQUIREMENTS

- » Conformance Class B or C
- » Profinet Interfaces with Integrated Switch
- » Support for “Fast Start-Up”
- » Network management and redundancy
- » Usage of specific AIDA connectors if device is installed outside of a cabinet
- » 100 Mbit/s full duplex RJ45 copper interface
- » Fiber Optic Interface with SCRJ connections only for VW
- » Profinet Certification
- » Profinet Real Time and TCP/IP data transfer via the same physical network interface
- » ProfiSafe Integration (in the long run) for devices that need safe I/O signals

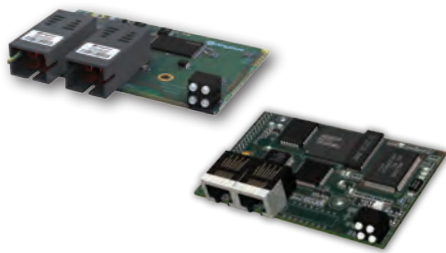
Find the right Profinet solution for your automation devices!

Finding the right Profinet solution for your device depends on a variety of factors. The guide below explains which considerations need to be taken into account and what connectivity solutions HMS recommends!



Integrate a ready-made Profinet interface into your devices!

Anybus-S



Interchangeable credit card sized modules provide Profinet IO device functionality from CC-A to CC-C including IRT communication. Further features include TCP/IP socket interface, Web, E-Mail and FTP server. The modules allow usage of specific AIDA connectors and are available with a RJ45 copper interface or with a SCRJ fiber optic interface.

Anybus-CC



Plug-in CompactFlash card sized Anybus-CC modules provide enhanced network flexibility. Profinet functionality spans CC-A and CC-B with integrated 2-port Switch. Further features include TCP/IP socket interface, Web, E-Mail and FTP server. The modules provide a serial and a parallel Dual Port Ram application interface and require only a single 3.3 Volt power supply.

Anybus-IC



DIL32 socket sized Anybus-IC modules provide basic Profinet functionality according to CC-A. The modules can be used with various connectors including IP65 versions. Further features include TCP/IP socket interface, Web, E-Mail and FTP server. The modules support stand alone operation and can directly control up to 128 bit of digital inputs and outputs.

Let our Profinet knowledge work for you!

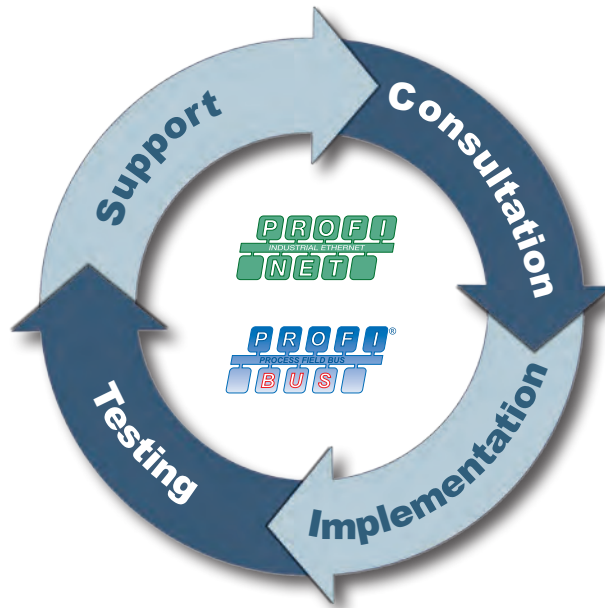
With more than 20 years of experience, HMS has a sound knowledge of industrial communication. HMS is in the forefront of technology and works closely together with the fieldbus user organizations and their conformance testing sites.

HMS recognizes Profibus and Profinet as leading technologies and with our deep technical knowledge, HMS GmbH in Germany has been accredited as a Profibus and Profinet Competence Center. Here, we provide qualified Profinet technology trainings and offer our customers individual assistance before, during and after their development of a Profinet interface based on our Anybus technology.



HMS is an accredited Profibus & Profinet Competence Center

	<h3>Support</h3>
<ul style="list-style-type: none"> » International support network » Free telephone and E-mail support » Application notes » Step-by-step instructions 	
	<h3>Testing</h3>
<ul style="list-style-type: none"> » Tests with real PLC » Test / adjustment of GSD File » Pre-certification Tests 	



	<h3>Consultation</h3>
<ul style="list-style-type: none"> » Profinet technology trainings » Assistance to find the optimal interface methods » Developer seminars 	
	<h3>Implementation</h3>
<ul style="list-style-type: none"> » Ready-to-use communication modules » Customized solutions » Application notes » Examples in source code 	

Easy migration of devices from Profibus to Profinet

Thanks to our interchangeable communication modules, the migration from Profibus towards Profinet is really easy. The Anybus communication module handles all protocol features and the application interface between your automation device and the communication module remains stable. This saves up to 70% of development cost and shortens the time-to-market for your automation devices.



» Simply remove the Profibus module

While Profibus and Profinet are quite different from their physical interfaces and protocols, they offer the same core functionality from the users point of view. This makes a smooth migration possible and protects your investment. The interchangeable Anybus modules fully support this approach and moreover you can use the full range of Anybus modules to connect your devices to 18 different industrial networks.



» Insert the Profinet module

Migrating plants and machinery to Profinet with an X-gateway!

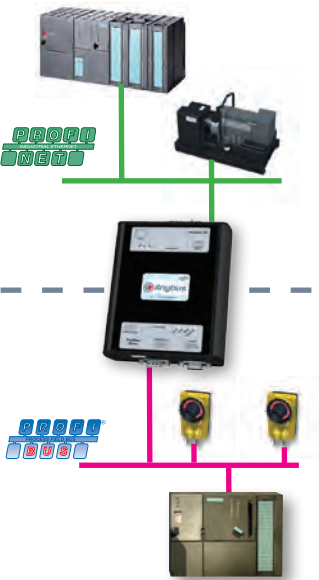
As Profinet will not replace the well established fieldbusses short-term, there is a huge need to integrate existing fieldbus network segments into new installations based on Profinet or other industrial Ethernet solutions.



Anybus X-gateways from HMS fulfill user requirements. They permit an easy way to couple exiting network segments and new installed Profinet based segments without the need for major changes in the existing PLC programs. HMS offers more than 200 X-gateway combinations and thus can bridge between almost any two industrial networks. X-gateways provide a transparent exchange for IO data and parameter between the two networks and help system integrators to achieve full control over their machinery even across network barriers. The following illustrations explain typical uses for Anybus X-gateways.

Integration of an existing Profibus network segment

In this case, an existing Profibus based segment of a complex machinery with a local PLC shall interact with a new Profinet based part of the plant.

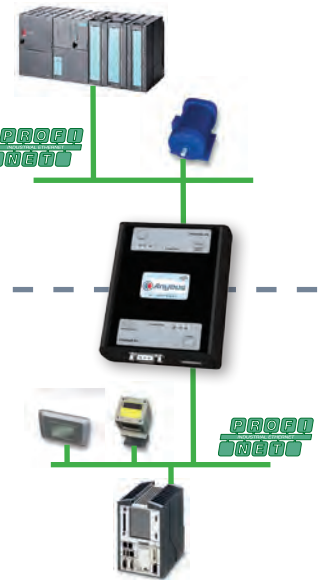


Solution

In this application the X-gateway is used to transfer selected I/O data and parameters between the two parts of the plant for synchronization and control. Both network interfaces of the X-gateway have slave functionality.

De-coupling of two Profinet segments

In this case, Profinet has been used in both parts of the machine. However, the two parts have been built by 2 different sub-suppliers and there is a need for a well defined interface between the two parts.

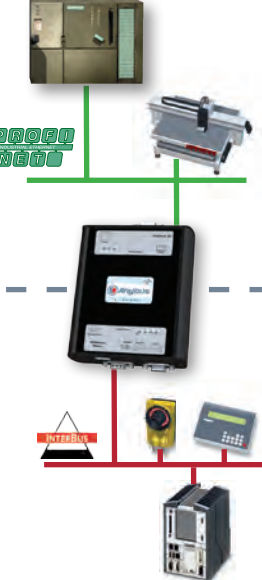


Solution

In this application the X-gateway is used to create a well defined interface between the 2 parts of the machine allowing the 2 sub-suppliers to setup and test their parts independent from each other.

Integration of an existing Interbus segment into Profinet

In this case, an existing Interbus based segment shall be integrated into a new Profinet based segment. The Phoenix PLC on the Interbus network shall remain unchanged.



Solution

In this application the X-gateway is used to transfer selected I/O data and parameters between the two parts of the plant for synchronization and control. Both network interfaces of the X-gateway have slave functionality.

Integration of a group of DeviceNet devices into Profinet.

























In this case, a small group of devices with a DeviceNet interface shall be directly controlled from the Profinet PLC.









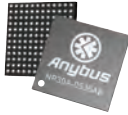
Solution

In this application the X-gateway is used to pass the control and status data of the DeviceNet enabled drives directly via Profinet to the Siemens PLC. On the DeviceNet side the X-gateway is equipped with a Scanner interface therefore not requiring an additional DeviceNet enabled PLC as a Master.

Anybus X-gateway - Profinet Selection Matrix!

	AS-Interface Master	Profibus-Dp Master	DeviceNet Scanner	EtherNet/IP Scanner	EtherNet/IP adapter	Modbus-TCP slave	Profinet IO device	EtherCAT slave	Profibus slave	DeviceNet adapter	ControlNet adapter	FIPIO slave	Interbus slave	Interbus FO slave	CANopen slave	Modbus-RTU slave	Modbus Plus slave	CC-Link slave	Lonworks slave	Modbus-RTU master
	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No	Part No
Profinet IO 1-port 	 AB7648	 AB7646	 AB7647	 AB7670	 AB7649	 AB7650	 AB7651	 AB7684	 AB7652	 AB7653	 AB7654	 AB7655	 AB7656	 AB7657	 AB7658	 AB7659	 AB7660	 AB7661	 AB7662	 AB7013
Profinet IO 2-port  Q1 2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	 AB7913	N/A	N/A	N/A	 AB7914	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Anybus Embedded - Profinet Selection Matrix!

	Anybus-CC 1-port	Anybus-CC 2-port	Anybus-S 1-port	Anybus-S 2-port	Anybus-S F.Optic	Anybus-IC
Features						
Conformance Class	IO Device, Class A	IO Device, Class B	IO Device, Class A	IO Device, Class C	IO Device, Class C	IO Device, Class A
Profinet Interface	1-port, RJ45	2-port, RJ45	1-port, RJ45	2-port, RJ45	2-port, SCRJ, Fiber Optic	1-port - RJ45, M8, M12
Integrated Switch	NO	YES	NO	YES	YES	NO
PNO Certificate	YES	YES	YES	YES	Pending	YES
Media Redundancy MRP	NO	YES	NO	YES	YES	NO
Fast Start-up	NO	YES	NO	YES	YES	NO
TCP/IP Communication	YES	YES	YES	YES	YES	YES
Web Server, Email, FTP	YES	YES	YES	YES	YES	YES
Diagnostic LED's	YES	YES	YES	YES	YES	Possible
Central SW Management	YES	YES	YES	YES	YES	YES
Topology Recognition LLDP	YES	YES	YES	YES	YES	YES
Network Management SNMP	YES	YES	YES	YES	YES	YES
HMS Order Code	AB6215 AB6315 (Without Housing)	AB6221 AB6321 (Without Housing)	AB4392	AB4474	AB4571	AB6005
	<p>Individual and customized versions of standard Anybus communication modules possible. Standard Anybus Modules are available for 18 different industrial networks including all important fieldbus and industrial Ethernet systems, USB, wireless and serial.</p>					



About HMS

HMS Industrial Networks is the leading independent supplier of network technology for automation devices. HMS develops and manufactures solutions for interfacing automation devices to industrial networks.

Development and manufacturing takes place at the head office in Halmstad, Sweden. Local sales, support and training is provided by the branch offices in Chicago, Beijing, Karlsruhe, Milan, Mulhouse and Tokyo and by a global distribution network spanning 30 countries. HMS employs over 150 people and reports revenues of €33 million during 2008. HMS is a public listed company on the NASDAQ OMX Nordic exchange in Stockholm, ISIN-code: SE0002136242

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