

Network Certification

Policies and Instructions

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Important User Information

This document is intended to provide a good understanding of the concepts and requirements associated with network certification procedures, and how they relate to embedded Anybus products.

The reader of this document is expected to be familiar with Anybus networking technology, and industrial communication systems in general.

For more information, documentation etc., please visit the HMS website, 'www.anybus.com'.

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The information in this document is subject to change. HMS Industrial Networks will under no circumstances assume liability or responsibility for any changes that any organization or company make to the pricing or to the procedures of certification.

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Trademark Acknowledgements

Anybus ® is a registered trademark of HMS Industrial Networks AB. All other trademarks are the property of their respective holders.

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P. About This Document

For more information, documentation etc., please visit the HMS website, 'www.anybus.com'.

P.1 Related Documents

Document	Author
Anybus CompactCom Software Design Guide	HMS
Anybus CompactCom Hardware Design Guide	HMS
Anybus-S Slave & Master Parallel Interface Design Guide	HMS
Anybus-S Drive Profile Design Guide	HMS
Anybus CompactCom Drive Profile Design Appendix	HMS
Anybus CompactCom Implementation Tutorial	HMS
Anybus CompactCom Network Interface Appendices	HMS
Anybus-S Network Interface Appendices	HMS

P.2 Document History

Summary of Recent Changes (3.01... 3.02)

Change	Page(s)
Removed a number of superfluous links throughout the document	-
Minor spelling corrections	-
Updated support information	P-2

Revision List

Rev.	Date	Author(s)	Changes
<=1.30	-	-	(see previous documents)
2.00	2008-01-30	PeP	Major rewrite
2.01	2008-04-17	PeP	Minor update
3.00	2012-06-25	KeL	Major rewrite
3.01	2012-08-17	KaD	Minor additions
3.02	2014-06-17	KaD	Minor update

P.3 Conventions & Terminology

The following conventions are used throughout this manual:

- Numbered lists provide sequential steps
- Bulleted lists provide information, not procedural steps
- Hexadecimal values are written in the format NNNNh, where NNNN is the hexadecimal value.
- Binary values are written in the format NNNNb, where NNNN is the binary value.
- The expression ‘A»B’ means ‘a transition from A to B’.

P.3.1 Glossary

Word	Explanation
Anybus	Anybus networking technology.
End product	Product in which the Anybus network interface is used.
Application	
Host application, host system	
Interface	Embedded Anybus network interface card from HMS.
Network interface	
Module	
Network certification	Process in which the network communication is verified to comply with network standard requirements.
Conformance tests	

P.4 Support

For general contact information and support, please refer to the contact and support pages at www.anybus.com.

1. General Information

1.1 HMS Conformance Test Policy

1.1.1 General

Certification for network compliance is an important approval for industrial communication equipment, ensuring quality and interoperability. The HMS range of embedded Anybus communication products are used all over the world by leading manufacturers of industrial automation products. To ensure that customers always can rely on HMS technology, our policy is to precertify our embedded products for network compliance¹. Certification tests are normally carried out by the network organization, in-house through the aid of tools supplied by the network organization, or with help from certain reference customers.

Declarations of network compliance can be downloaded from the HMS web site (www.anybus.com). In case a particular certificate is unavailable, this means that the certification is pending due to re-design or for other reasons that may affect certification. In such case, contact HMS for further information.

1.1.2 Scope of HMS Certification Tests

All tests are based on a typical usage scenario, and ensures network compliance under the condition that the interface is running using typical (default) operational settings.

It is important to recognize that the tests are made to verify proper operation of our network implementation and to ensure that end products utilizing it can be certified - not necessarily to enable customers to avoid certification altogether.

The inherent flexibility of the Anybus concept allows the behavior of the interface to be altered in ways which cannot possibly be catered for by the HMS certification tests. Operating the interface in ways which deviate from typical (default) operational settings invalidates HMS certification tests, and consequently a full re-certification of the end product is required. In some cases this is inevitable, e.g. when the network organisation requires that all vendors use unique network identity settings.

In case of questions, contact HMS and/or your nearest conformance test center.

1. This applies to most industrial networks, with some exceptions. Please consult the support pages at www.anybus.com for further information.

1.2 Certified Product vs. Certified Network Interface

The Anybus concept may in certain cases allow the behavior of the network interface to be altered in ways which are not in line with network conformance requirements. For example, certain members of the Anybus CompactCom platform allow large parts of the network communication to be routed into the firmware of the host application, in which case the actual software implementation in the host application determines whether or not the network interface can be certified. In such case, certification of the end product must be made to ensure that the implementation hasn't affected network compliance. Generally, implementations of this kind require in-depth knowledge in the operating fundamentals of the network in question. To find out whether or not a certain type of implementation can be certified, contact HMS and/or your nearest conformance test centre.

Some network organisations may allow the combination of an uncertified product with a certified network interface. Although this may in some cases make it possible to sell the end product without having to perform network certification tests, this approach is generally not endorsed by HMS.

In case of questions, contact HMS and/or your nearest conformance test centre.

1.3 Network Identity Settings

Deviations from typical operational settings require the use of custom network identity settings (i.e. "Vendor ID") and, when applicable, a custom configuration file (i.e. "GSD"- or "EDS"-file). Furthermore, some network organisations require the use of custom identity settings even if using the standard operating settings. In either case, HMS recommends customization of network identity, since this significantly improves identification and troubleshooting procedures when setting up the network communication.

In case of questions, contact HMS and/or your nearest conformance test centre.

1.4 Membership and Network Logo

Generally, membership in the network organisation is a prerequisite in order to be able to certify the end product. This also applies to the network name and logo, for which the use in some cases even requires a complete certification of the end product.

As stated previously, most products, in the HMS range of embedded network interface products, are precertified for network compliance. This can, in some cases, be used as a reference for the end product, both as a statement of network conformance (when used with standard operational settings) and for the use of network logos. It must however be clearly stated in the product documentation that this applies to the network interface and not to the complete product.

2. Networks and Organizations

2.1 General Information

Certifying a device for network compliance involves contacting the network organisation to obtain information about a recommended test facility. The device must then be shipped to this facility, which then verifies that the device conforms to the network specification.

In some cases, the complexity and cost of such procedures are reduced due to the precertification of the Anybus network interface, but this differs depending on the network type and what policies and regulations that apply to that particular facility.

See also...

- “AS-Interface” on page 7
- “BACnet” on page 8
- “CANopen” on page 9
- “CC-Link” on page 10
- “ControlNet” on page 11
- “DeviceNet” on page 12
- “EtherNet/IP” on page 13
- “EtherCAT” on page 14
- “LonWorks” on page 15
- “POWERLINK” on page 16
- “PROFIBUS and PROFINET” on page 17
- “Sercos III” on page 18

2.2 AS-Interface

Products which claim AS-Interface compliance must pass conformance tests at a certified test facility. HMS embedded products for AS-Interface are successfully tested for pre-compliance and found to comply with AS-Interface specifications. Test reports etc. are available and registered at the AS-International Association.

The use of certified AS-Interface networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state AS-Interface compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility.

The fees for certification tests depend on the lab's costs.

They are fixed by the test lab in contact with the Management Committee of AS-International. You obtain the actual price from the test lab.

Price indication (2012-03-28):

Certification (Slave, Master, Electro-mechanics, Power supply)	Members^a	Non-members
Certificate after basic test	250 €	2500 €
Extension of certificate, with/without test	100 €	800 €
Certificate after changes of the product with/without test	100 €	800 €
Updates of certificates	50 €	500 €
Assignment of certificate from member to member	100 €	-
Assignment of certificate from member to non-member	on request	on request

a. For more information on how to become a member, please contact the AS-International Association.

Contact information:

- <http://www.as-interface.net>

2.3 BACnet

Manufacturers of BACnet products can prove that their devices conform to the BACnet standard ISO 16484-5/ANSI ASHRAE 135 through conformance testing at a recognized and accredited testing center.

To be able to state BACnet compliance for the end product, the final implementation will need to pass certification tests at a certified test facility.

Price indication (2012-03-28):

Test type	Fee (EUR)
Initial and recertification fee (per certification process)	300
Certification fee for each product	50
Issuing of certificates	60
Annual certification fee per certificate	120
Annual fee per certified product	24

In addition to these fees, the organization charges 105 € per hour for testing and this is mandatory. An indication from the organization states that the testing procedure will take at least 7 days.

Contact information:

- <http://www.bacnet.org>
- <http://www.big-eu.org>

2.4 CANopen

Products which claim CANopen compliance must pass conformance tests at a certified test facility. HMS embedded products for CANopen are successfully tested for precompliance and found to comply with CANopen specifications. Test reports etc. are available and registered at CAN in Automation (CiA).

The use of certified CANopen networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state CANopen compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility. Due to the vast customization possibilities found in Anybus concept, the use of such technology alone does in itself not constitute a discount on the certification fee.

According to CANopen conformance policies, each CANopen node is required to have a unique CAN ID, which can be ordered from CAN in Automation (CiA) via their official website.

Price indication (2012-03-28):

Service	Fee non-CiA members	Fee CiA members ^a
Basic rate per device test session (certificate included)	500 €	300 €
Basic rate per family test session (three device test sessions and certificate included)	1167 €	700 €
Rate per hour	80 €	

a. For more information on how to become a member, please contact the CAN in Automation group.

Contact information:

- <http://www.can-cia.org/>

2.5 CC-Link

Products which claim CC-Link compliance must pass conformance tests at a certified test facility. HMS embedded products for CC-Link are successfully tested for precompliance and found to comply with CC-Link specifications.

The use of certified CC-Link networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state CC-Link compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility.

Price indication (20012-03-28):

CC-Link Conformance Test Fees

Test type	Fee (EUR)
Local Station	2800
Local Station (using Q50BD-CCV2)	2500
Intelligent Device Station	2500
Remote Device Station (Version 2.0, using MFP3)	2000
Remote Device Station (Version 1.1, using MFP3)	1800
Remote I/O Station (using MFP2 or MFP2A)	1400

CC-Link IE Conformance Test Fees

Test type	Fee (EUR)
SLMP compatible devices	500
CC-Link IE recommended wiring parts	1000

Contact information:

- <http://www.cclinkamerica.org/>
- <http://www.clpa-europe.com/>

2.6 ControlNet

Products which claim ControlNet compliance must pass conformance tests at a certified test facility. HMS embedded products for ControlNet are successfully tested for precompliance and found to comply with ControlNet specifications. Test reports etc. are available and registered at ControlNet International.

The use of certified ControlNet networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state ControlNet compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility. Due to the vast customization possibilities found in Anybus concept, the use of such technology alone does in itself not constitute a discount of the certification fee. However, using certified Anybus technology usually means that the test procedure is very easy and predictable.

According to ControlNet conformance policies, each ControlNet vendor is required to have a unique Vendor ID, which can be ordered from the ControlNet Organisation via their official website.

Price indication:

Select the Service Selection Grid available on <http://www.odva.org/> to get an indication of the price.

Contact information:

- <http://www.odva.org/>

2.7 DeviceNet

Products which claim DeviceNet compliance must pass conformance tests at a certified test facility. HMS embedded products for DeviceNet are successfully tested for precompliance and found to comply with DeviceNet specifications. Test reports etc. are available and registered at the Open DeviceNet Vendor Association (ODVA).

The use of certified DeviceNet networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state DeviceNet compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility. Due to the vast customization possibilities found in Anybus concept, the use of such technology alone does in itself not constitute a discount of the certification fee. However, using certified Anybus technology usually means that the test procedure is very easy and predictable.

According to DeviceNet conformance policies, each DeviceNet vendor is required to have a unique Vendor ID, which can be ordered from ODVA via their official website.

Price indication:

Select the Service Selection Grid available on <http://www.odva.org/> to get an indication of the price.

Contact information:

- <http://www.odva.org/>

2.8 EtherNet/IP

Products which claim EtherNet/IP compliance must pass conformance tests at a certified test facility. HMS embedded products for EtherNet/IP are successfully tested for precompliance and found to comply with EtherNet/IP specifications. Test reports etc. are available and registered at the Open DeviceNet Vendor Association (ODVA).

The use of certified EtherNet/IP networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state EtherNet/IP compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility. Due to the vast customization possibilities found in Anybus concept, the use of such technology alone does in itself not constitute a discount of the certification fee.

According to EtherNet/IP conformance policies, each EtherNet/IP vendor is required to have a unique Vendor ID, which can be ordered from ODVA via their official website.

Price indication:

Select the Service Selection Grid available on <http://www.odva.org/> to get an indication of the price.

Contact information:

- <http://www.odva.org/>

2.9 EtherCAT

Products which claim EtherCAT compliance must pass conformance tests at a certified test facility. HMS embedded products for EtherCAT are successfully tested for precompliance and found to comply with EtherCAT specifications. Test reports etc. are available and registered at EtherCAT Technology Group.

The use of certified EtherCAT networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state EtherCAT compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility.

Each EtherCAT compliant device has to implement the worldwide unique Vendor ID assigned by ETG. The EtherCAT Vendor ID Usage is governed by the ETG Vendor ID Policy and the corresponding Vendor ID agreement, which asks for conformance with the EtherCAT specifications.

For prices please contact the EtherCAT Test Center in Nuremberg directly.

EtherCAT Test Center (ETC), Nuremberg
c/o Beckhoff Automation GmbH
Ostendstr 196
90482 Nuremberg, Germany
Phone: +49 911 - 54056 18
Fax: +49 911 - 54056 29
E-mail: etc@beckhoff
Web: www.beckhoff.com

EtherCAT Test Center (ETC), Kyoto
EtherCAT Test Center
ASTEM RI
134 ChudojiMinami-machi, Shimogyo,
Kyoto 600-8813, Japan
Phone: +81 (75) 366 0143
Fax: +81 (75) 315 2899
E-mail: etc@testlab.astem.or.jp
Web: www.testlab.astem.or.jp

Contact information:

- <http://www.ethercat.org>

2.10 LonWorks

For technical reasons, HMS embedded products for LonWorks are not precertified for network compliance. To be able to pass certification tests, the product must implement one of the profiles defined in the LonWorks specification. Due to the nature of the Anybus concept, the actual profile is defined by the application, which means that the network interface can only be tested for network compliance in its final implementation. HMS has however made extensive analysis and verification of the Anybus LonWorks implementation to ensure compliance with the LonWorks specification.

Price indication (2012-03-28):

Product	Fee (USD)
Annual Tool License	2000
New Certification	200
Upgrades (devices replacing older devices)	100
Administrative Changes	100

Contact information:

- <http://www.lonmark.org/>

2.11 POWERLINK

Products which claim POWERLINK compliance must pass conformance tests at a certified test facility.

The use of certified POWERLINK networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state POWERLINK compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility.

The Institute of Embedded Systems at Zurich University of Applied Science is the sole provider of POWERLINK certification services.

Institute of Embedded Systems
Technikumstr. 9
P.O.Box
CH-8401 Winterthur
Tel: +41 58 934 75 25
Fax: +41 58 935 75 25
E-mail: info.ines@zhaw.ch

Price indication (2012-03-28):

Fees of €2000 per product / product group¹ are payable in advance. The EPSG will bear the cost of this fee for its members for the first product / product group. The fee includes a maximum of two days of testing through the certification site. Further additional expenditure (e.g. caused by faulty appliances or devices) will be charged at a fee of €800 per day.

Contact information:

- <http://www.ethernet-powerlink.org>
- <http://www.ines.zhaw.ch/en/>

1. Product groups are to be understood as devices in the same device family (for example Servo drives, I/O assembly groups, rotary encoders etc.) that use a common POWERLINK platform (hard- and software).

2.12 PROFIBUS and PROFINET

Products which claim PROFIBUS/PROFINET compliance must pass conformance tests at a certified test facility. HMS embedded products for PROFIBUS/PROFINET are successfully tested for precompliance and found to comply with PROFIBUS/PROFINET specifications. Test reports etc. are available and registered at the PROFIBUS Organisation (PNO).

The use of certified PROFIBUS/PROFINET networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state PROFIBUS/PROFINET compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility. The use of certified Anybus technology limits the scope of these tests and thus may make the end product eligible for a discount of the certification fee.

Price indication (2012-06-18):

Type	Price (EUR)	Price using Anybus (EUR)
Slave (Anybus-S)	2500	Approx. 1600
Slave (Anybus-IC, Anybus CompactCom)	2500	-
Master	4900	Approx. 4350

For more information please consult the Test Contract document at the ComDeC pages on <http://www.siemens.com/>

Please ask for discount when certifying an Anybus module at ComDeC.

Contact information:

- <http://www.profibus.com>

2.13 Sercos III

Products which claim Sercos III compliance must pass conformance tests at a certified test facility. HMS embedded products for Sercos III are successfully tested for precompliance and found to comply with Sercos III specifications.

The use of certified Sercos III networking technology (e.g. Anybus) does not automatically make the end product certified. To be able to state Sercos III compliance for the end product, the final implementation will need to pass further certification tests at a certified test facility.

Price indication (2012-03-28):

Fees (Slave Devices)	Non-Member Price	Member Price^a
Basic Charge	3000 Euro	2500 Euro
Handling Fee for Missing IDNs	1000 Euro	1000 Euro
Additional Test/Support	1000 Euro/day	700 Euro/day

a. For more information on how to become a member, please contact Sercos International, Sercos North America, Sercos Japan or Sercos China.

Contact information:

- <http://www.sercos.com>