

# Network enable your device to

## Rockwell Automation Networks

*DeviceNet.*

*EtherNet/IP*

*ControlNet™*

**Embedded**



**Interfaces**

**Embedded**



**Chip Solutions**

**Serial**



**Gateways**

**Bridges**



**Gateways**

**Complete network solutions from the world's leading  
supplier of fieldbus interfaces**



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# About HMS

Founded in 1988, HMS has grown into the world's leading and largest supplier of industrial networking products. The success of HMS and our core product "AnyBus®" is built on innovation, and a dedication to quality, flexibility and service.

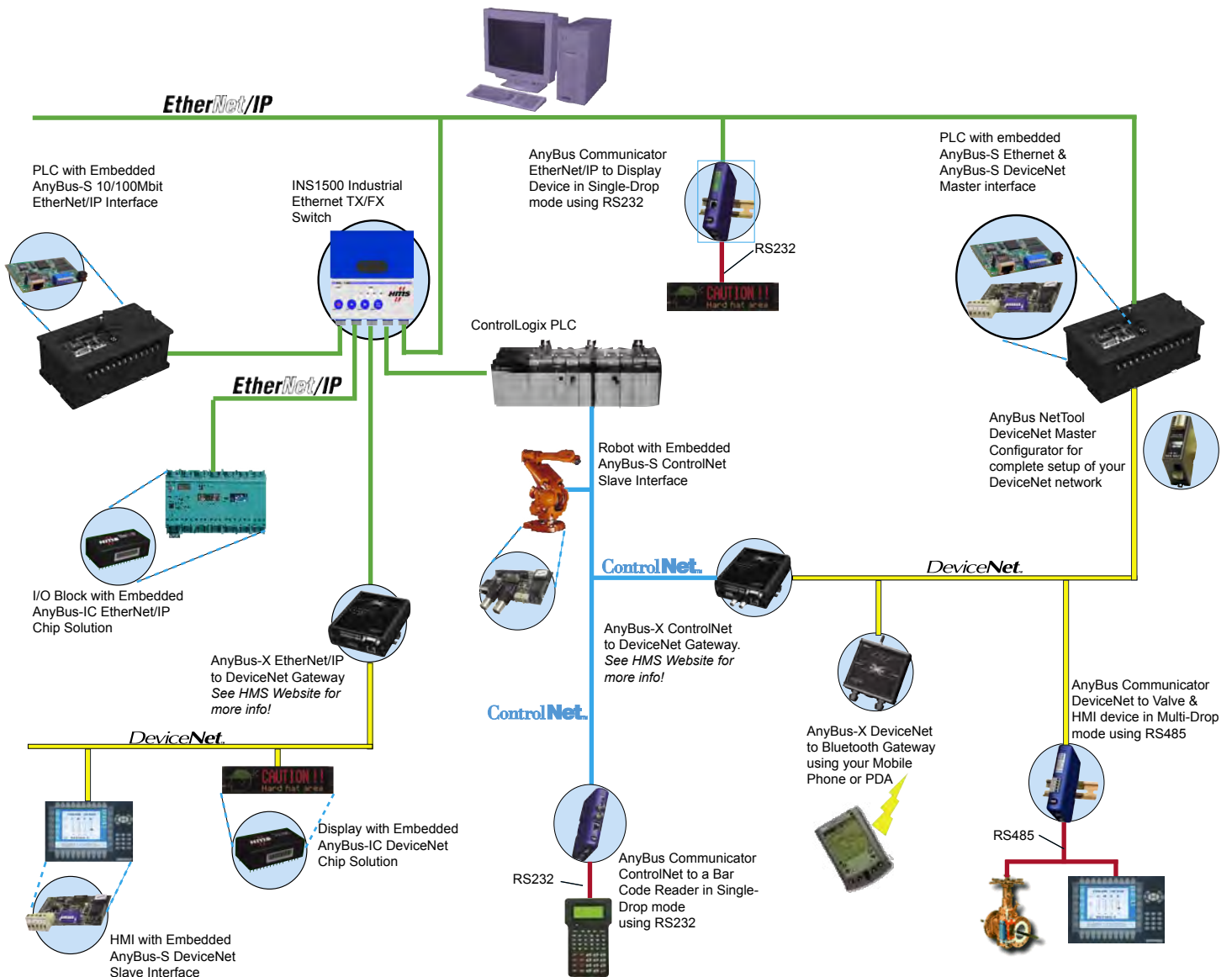
We have our own offices in Sweden, Germany, the USA and Japan. Each office serves as a regional hub and has its own organization structure to handle sales and support. We are also represented in other geographical markets by our global network of partners and distributors.

Our products are manufactured in a custom built production facility at our headquarters in Sweden. By using the latest production technology and well developed logistical solutions we can fulfill our customer's requirements efficiently and effectively all over the world.



## How HMS products connect to Rockwell networks..!

The illustration below shows a typical Rockwell factory automation network and how HMS "AnyBus" products can be used within those networks for connecting your device!



[www.hms-networks.com](http://www.hms-networks.com) or [www.anybus.com](http://www.anybus.com)

# AnyBus Technology Overview

The “AnyBus” family of products provide complete, and instant fieldbus network solutions for your product irrespective of your type of product or industry.

AnyBus products can give you instant connectivity to Rockwell networks and Ten other networks with an AnyBus product that meets your products requirements for size, functionality and cost.



The choice of product depends on the host application requirements, but the products have a unique application interface that ensures interchangeability between different network modules. This “Plug and Play” feature has been the core technology for all “AnyBus” products.

You could, for example take an I/O block and design in the AnyBus-IC chip for DeviceNet. At no extra cost for indesign you can simply exchange the DeviceNet Chip for an EtherNet/IP Chip with just minimal software and connector changes to your product.

*It couldnt be easier..! One In-design..! No extra development cost..! No UL & Fieldbus certification problems..! and Multi Fieldbus Network Solutions from a proven product range used by major manufacturers of OEM products*

## CIP Protocol & AnyBus

The common Control Information Protocol (CIP) which DeviceNet, ControlNet & EtherNet/IP protocols are based on, is integrated into the respective AnyBus product. For a full list of the supported CIP features by the respective AnyBus product, please refer to the HMS website. At the website we provide full product information together with PDF User manuals for all products which are available to download free of charge! See [www.hms-networks.com/downloads\\_area.shtml](http://www.hms-networks.com/downloads_area.shtml)

## HMS & Rockwell Automation



HMS and Rockwell Automation have enjoyed a close relationship since the early days of fieldbus technology back in 1994. HMS is both a “VADP” ( Value Added Design Partner ) & Encompass Partner for Rockwell Automation. Today HMS is the world’s largest and leading third party supplier of Rockwell supported, network enabling products.

HMS’s plays an active roll within Rockwell backed user organizations such as ODVA and ControlNet International.

## CE, UL & Rockwell Network Conformance for AnyBus



All HMS AnyBus products carry the European CE mark. Although this is not mandatory for embedded AnyBus solutions, HMS policy is that all products are EMC tested and approved. HMS is a co-owner of a EMC test laboratoty in Sweden and has many years experience in this field.

The AnyBus product range has also been approved by UL (Underwriters Laboratories Inc) and have “UL & cUL” certification. The tests have been performed according to standards for industrial control equipment UL-508, with AnyBus being regarded as a Programmable Controller.

AnyBus is a recognized component marked with the RU-mark and the cRU-mark for the Canadian market. A UL approval means that UL has tested and evaluated samples of that product and determined that they meet UL’s requirements.



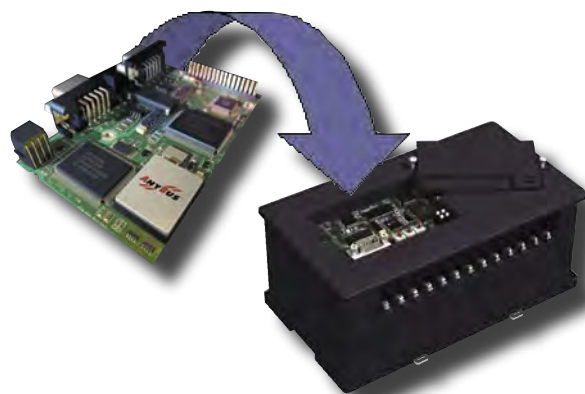
The AnyBus-S Slave product range for DeviceNet, ControlNet & EtherNet/IP has been individually tested and certified by ODVA. You can download the test conformance certificates from the HMS website free of charge.

The AnyBus-S DeviceNet Master, AnyBus Communicator and AnyBus-IC product ranges have been self-tested by HMS in our own test laboratory and found to comply with ODVA Protocol Conformance Test Software Version A12.

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# Embedded AnyBus-S High Performance Interfaces

The AnyBus-S modules are designed for integration into industrial field devices that need to communicate with other automation equipment. It has its own high performance microprocessor which handles the entire communication protocol independently of the application running in the field device.



## Typical Applications



**PLC's**



**Inverters**



**HMI's**



**Robots**



**Instruments**

All AnyBus-S modules have a generic application interface supporting up to Max. 512 bytes of I/O data with direct access and additional Max. 2048 bytes of input and output data with in-direct access. This is more than required by standard fieldbus protocols such as DeviceNet, and ControlNet and provides a reserve for future technologies and additional functionality in the field device. In addition to the I/O data, the application interface provides another 256 bytes for parameters, configuration data and control commands.

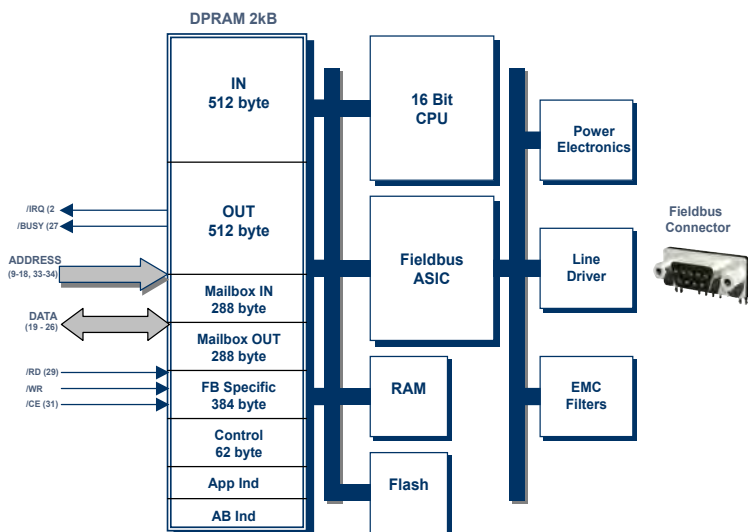
Data and parameters which are not supported by all fieldbus systems are located in the fieldbus-specific part of the application interface. Data exchange between the AnyBus-S and the field device is handled by control registers. These specify the size of the I/O area and the watchdog interval between the module and the device. In addition, the application software can interrogate data such as the fieldbus type, vendor information, the software and hardware versions and the serial number of the module.

## Powerful 2 Kbyte DPRAM



The application interface between the AnyBus-S module and the field device consists of a on-board 2 Kbyte Dual-Port RAM.

The DPRAM is subdivided into memory areas for input data, output data, mailbox in, mailbox out. Control and handshake registers are fully independent of the fieldbus protocol used and is the same for all AnyBus-S modules. Accordingly, the application software in the fieldbus device does not need to be modified when changing from one network type to another. It is only necessary to exchange the AnyBus module. Specific fieldbus information can be read/written to in the fieldbus specific data area reserved on the module.



AnyBus-S System Overview Picture

### Embedded AnyBus-S DeviceNet Master Interface Card



- Dual Port (DPRAM) parallel interface
- Complete DeviceNet 2.0 scanner implementation according to ODVA
- Group 2 Client/Server / UCMM support
- Baud rate 125-500 kbit/s
- Optically isolated DeviceNet interface
- Max 512 bytes of input & 512 bytes output data.
- Manages up to 63 DeviceNet slaves
- Configuration via NetTool or RSnetworkx
- DeviceNet supported features: Explicit Peer to Peer Messaging, Configuration consistency value, Bit Strobe, Polling, Cyclic and Change of State

### Embedded AnyBus-S DeviceNet Slave Interface Card



- Dual Port (DPRAM) parallel and serial interfaces available
- Complete DeviceNet 2.0 adapter implementation according to ODVA, Group 2 only server
- DIP switch select baud rate & MACID
- Baud rate 125-500 kbit/s
- Optically isolated DeviceNet interface
- Max 512 bytes of input & 512 bytes output data
- DeviceNet supported features: Bit Strobe, Polling, Cyclic & Change of State

### Embedded AnyBus-S DeviceNet AC/DC Interface Card



- Same standard & DeviceNet supported features as AnyBus-S Slave
- Supports Max 65 Kbytes of vendor specific parameter data
- Fully configurable vendor specific object up to 99 instances with up to 256 attributes each
- Data size for each vendor specific attribute configurable from 1 to 4 bytes
- 21 DeviceNet specific parameters with texts included in the module
- Support for Torque and Speed control
- Support for all mandatory and optional parameters required by the profile.
- Drive specific configurations via Config Tool



# Embedded AnyBus-S High Performance Interfaces

## DeviceNet Master Configuration Tool



The AnyBus NetTool-DN is a comprehensive DeviceNet Configuration Tool that allows configuration and maintenance of your complete DeviceNet Network.

The AnyBus NetTool-DN works with AnyBus-S Master/Scanners and lets users configure, manage and troubleshoot multiple DeviceNet networks or network component on a DeviceNet network at the same time.

The AnyBus NetTool-DN consists of a Windows 32-bit graphical network configuration software and a DIN rail mountable adapter that connect a PC, via RS232, to the DeviceNet cable. Rockwell's own "RS Network" can also be used to configure the DeviceNet Master.

### "IT Functions" for AnyBus EtherNet/IP products



**Dynamic Web Browser:** All AnyBus Ethernet products contain a web-server. Each web page that can be accessed at this web server is stored in the file system in the module. The web server supports SSI & Java scripts which can be used to display data in a customized fashion.

**FTP/Flash Disk:** An onboard 1,4Mbyte Flash disc is fully accessible for the user. This can be used to store user defined web pages, pre-defined e-mails or other files such as User Manuals in PDF format.

**SMTP Emails:** E-mails can be configured to send based on certain events or values in the module, for example an alarm or overflow value. In addition to the 20 pre-defined e-mails, any amount of emails can be sent via the mailbox interface.

**Security Features:** This has three levels, "Admin, User & IP". These login rights can be assigned to access the module together by also defining which IP numbers can be permitted.

**Configuration:** The can be done by various ways. Via On-Board DIP switches, through the web-browser, through the Mailbox interface from HOST application and from DHCP/BOOTP, HICP ( From HMS configuration tool ) & ARP (From DOS, Unix machine)

### KEY FEATURES

- » Credit card size interfaces
- » Interchangeable plug and play interfaces for Rockwell & other networks with only ONE in-design
- » On-board Microprocesor
- » 2Kb DPRAM
- » 512 bytes of Cyclic I/O data
- » Mailbox interface 2048 bytes with extra 256 bytes for parameter data
- » Galvanically isolated fieldbus interface
- » Handles entire fieldbus protocol separatley
- » Contains all software drivers required for easy implementation
- » Possibility to customize hardware to customer configuration

### AC/DC Drive Profile Support for DeviceNet & ControlNet Slaves

This extended software functionality makes it easier for drive manufacturers to make their products comply to the latest communication standards for drives. The AnyBus module does not only contain the complete AC/DC profile, it is also fitted with an application interface that is the same irrespective of what fieldbus is used.

Embedded AnyBus-S ControlNet Slave Interface Card	Embedded AnyBus-S EtherNet/IP Interface Card	Technical Specifications	
<ul style="list-style-type: none"> <li>&gt;DPRAM parallel interface.</li> <li>&gt;Complete ControlNet 2.0 adapter implementation according to ControlNet International</li> <li>&gt;Network Access Port (NAP) RG-6 quad shielded cable</li> <li>&gt;Media redundancy</li> <li>&gt;Baud rate 5Mbit/s</li> <li>&gt;MacID node address setting</li> <li>&gt;ControlNet supported features: Multicasts of both input and peer-to peer data</li> </ul>	<ul style="list-style-type: none"> <li>&gt;Dual Port (DPRAM) parallel interface</li> <li>&gt;IP address settings configurable with on-board DIP switches, webpage or ARP.</li> <li>&gt;EtherNet/IP level 2 I/O Server CIP (ControlNet &amp;DeviceNet)</li> <li>&gt;Transparent socket interface</li> <li>&gt;Transformer isolated Ethernet interface</li> <li>&gt;Included IT functions such as, Email, Dynamic webserver, FTP</li> </ul>	Mechanical Dimensions	2.13" x 3.38" x 0.59"
		Operating Temperature	0 - 70° C
		Power Supply	+5V 300 - 450mA
		EMC Compliance	EN50081-2 EN50082-2
		UL & cUL Compliance	E209168
		DeviceNet Test Cert.	Comm Adap 12
		ControlNet Test Cert.	Comm Adap 12
		EtherNet/IP Test Cert.	Comm Adap 12

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# Embedded AnyBus-IC Single Chip Interfaces

The AnyBus-IC is the first single-chip controller for industrial networks. It is optimized for lower/medium-end devices, where small size and optimal price / performance ratio is important.

The AnyBus-IC contains all analog and all digital components necessary to implement a network interface. A powerful 16/32 bit micro-controller with Flash memory and RAM, a network protocol chip and all necessary analog components including opto-couplers, a DC/DC converter and bus drivers are integrated in a single housing of only 0.81" in size.

## Typical Applications



**Micro Drives**



**I/O Blocks**



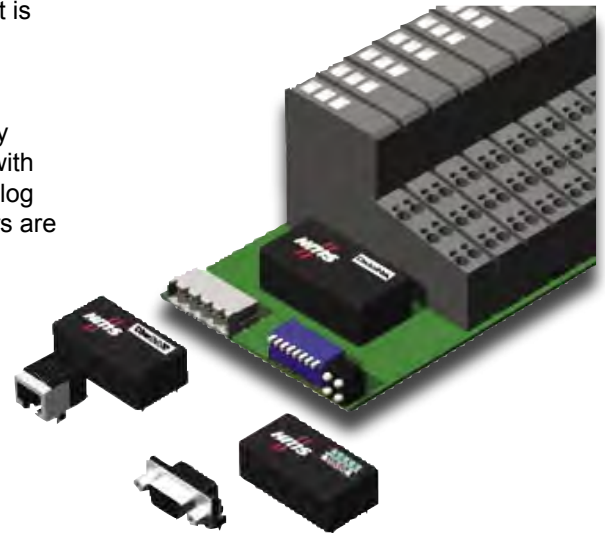
**Small HMI's**



**Bar Code Readers**



**Valve Blocks**



## The fastest way to network your device!

The AnyBus-IC considerably simplifies development work required to implement a network interface and reduces the space requirements to an absolute minimum. Device manufacturers only have to add the desired network connectors - the AnyBus-IC contains all other components of the network interface.

## Using the AnyBus-IC in intelligent devices with a micro controller

When used in intelligent devices, which typically have their own micro controller, the AnyBus-IC is connected to this processor via a serial 2-wire TTL interface (SCI). A simple data exchange protocol (Modbus based) is used to connect the AnyBus-IC and the microprocessor of the field device. The AnyBus-IC handles the network protocol. Thus, the microprocessor in the manufacturer's device is not tasked unnecessarily with bus handling.

## The AnyBus-IC in a stand alone operation in processor-less devices

For use in simple processor-less devices such as valve terminals and modular I/Os, the AnyBus-IC has a clocked shift register interface (SSC) which can be connected to up to 128 input signals and 128 output signals. The AnyBus-IC automatically detects how many I/O signals are available during the Power-On phase. This makes it very easy to implement variable I/O configurations such as those typically used in modular I/O devices.

### KEY FEATURES

- » Very small size 1.65 x 0.82 x 0.60 inches ( L x W x H )
- » 32 bytes of Input & 32 bytes of Output data + extra parameter data
- » SSC parallel interface for data exchange (data in, data out, clock, load)
- » SCI serial interface with Modbus RTU
- » Internal galvanic isolation
- » Interchangeability between DeviceNet, EtherNet/IP & other networks
- » PC Configuration port interface

### Embedded AnyBus-IC DeviceNet Single Chip Solution



- > SCI interface with (Modbus RTU protocol)
- > SSC interface for data exchange (data in, data out, clock, load)
- > Configuration and monitoring via PC configuration port
- > CE, UL & cUL marked
- > Baud rate 125-500 kbit/s
- > DeviceNet Supported features:  
I/O Slave messaging - Bit strobe, Polling, Cyclic & Change of State (COS)
- > Supports FLASH field upgrades

### Embedded AnyBus-IC EtherNet/IP Single Chip Solution



- > SCI interface with (Modbus RTU protocol)
- > SSC interface for data exchange (data in, data out, clock, load)
- > Configuration and monitoring via PC configuration port
- > 10/100 Mbit/s
- > EtherNet/IP level 2 I/O Server CIP (ControlNet & DeviceNet)
- > Transparent socket interface
- > Transformer isolated Ethernet interface
- > Included IT functions such as, Email, Dynamic webserver, FTP.. See AnyBus-S

### Technical Specifications

Mechanical Dimensions	1.65" x 0.82" x 0.60"
Operating Temperature	-5 - +55° C
Power Supply	+5V 300 - 450mA
EMC Compliance	EN50081-2 EN50082-2
UL & cUL Compliance	E209168
Application connector	32 pin DIL connector

[www.hms-networks.com](http://www.hms-networks.com) or [www.anybus.com](http://www.anybus.com)

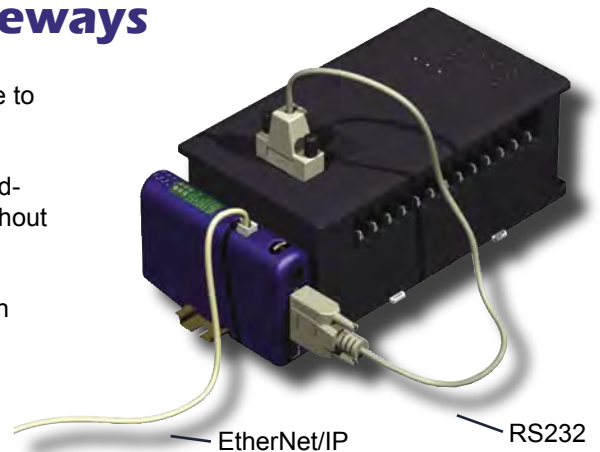
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# AnyBus Communicator Serial Gateways

The AnyBus Communicator enables external connectivity for your device to Rockwell networks via the serial protocols RS232/RS422/RS485.

The AnyBus Communicator incorporates AnyBus-S technology in a stand-alone ready-to-use product, enabling integration of industrial devices without loss of functionality, control and reliability.

This is valid both when retro-fitting to existing equipment as well as when setting up new installations.



## Almost any device with a serial connection can be connected..!

AnyBus Communicator can connect almost any product with a serial communication interface to fieldbus networks through the AnyBus Communicator Modbus RTU Master mode and Generic Data mode.

In Modbus Master mode the user can choose to work with pre-configured Modbus commands and/or fully user-definable transactions based upon request – response communication. For all products that have been designed with serial Modbus communication or similar, AnyBus Communicator provides a Modbus RTU Master mode that is fully compliant with the Modbus specification.

The Generic Data Mode is based upon producer-consumer communication. In its simplest form, Generic Data Mode handles simple message routing between the serial device and the fieldbus master level, without sorting or processing the data in any way. However, in Generic Data Mode it is also possible to perform some of the intelligent processing in AnyBus Communicator such as CRC checksum calculations, which don't need to be transferred over the fieldbus. This saves engineering time and improves data throughput.

This takes communication between the serial sub-network and the fieldbus network one step further since AnyBus Communicator performs advanced data processing only exchanging user-defined data with the fieldbus master.

Together, these two modes make AnyBus Communicator a powerful, configurable and flexible network product for handling data to and from a serial sub-network.

### KEY FEATURES

- » RS232/422/485 selection possible
- » Contains an AnyBus-S Slave interface with same standard fieldbus features
- » Supports Modbus RTU Master mode
- » Supports generic data mode
- » Multi-drop up to 31 nodes
- » Possibility to implement customer specific protocols
- » ABC Config Tool for easy PC configuration

### Technical Specifications

Mechanical Dimensions	4.72" x 2.95" x 1.06"
Operating Temperature	-5 - +55° C
Power Supply	+24 VDC
EMC Compliance	EN50081-2, EN50082-2
UL & cUL Compliance	E209168
Mechanical Rating	IP20

#### AnyBus Communicator DeviceNet - Serial Gateway

*DeviceNet.*



- Baud rate 125-500 kbit/s
- Complete DeviceNet 2.0 adapter implementation according to ODVA, Group 2 only server
- Included ABC Config Tool for easy PC setup
- Sub-network baud rate configurable up to 57.6 kbit/s
- Optically isolated DeviceNet interface
- Max 512 bytes of input & 512 bytes output data
- DeviceNet supported features: I/O Slave Messaging - Bit Strobe, Polling, Cyclic & Change of State (COS)

#### AnyBus Communicator EtherNet/IP - Serial Gateway

*EtherNet/IP*



- Baud rate 10/100 Mbits/s
- EtherNet/IP level 2 I/O Server CIP (ControlNet & DeviceNet)
- Included ABC Config Tool for easy PC setup
- Transparent socket interface
- Sub-network baud rate configurable up to 57.6 kbit/s
- Transformer isolated Ethernet interface
- Included IT functions such as, Email, Dynamic webserver, FTP

#### AnyBus Communicator ControlNet - Serial Gateway

*ControlNet.*



- Baud rate 5Mbit/s
- Complete ControlNet 2.0 adapter implementation according to ControlNet International
- Included ABC Config Tool for easy PC setup
- Sub-network baud rate configurable up to 57.6 kbit/s
- Network Access Port (NAP) RG-6 quad shielded cable
- Media redundancy
- Baud rate 5Mbit/s
- MacID node address setting
- ControlNet supported features: Multicasts of both input and peer-to-peer data

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## Global technical support when you need it!

The AnyBus Support Centers are located in all HMS offices. They play a crucial role for HMS and our customers by providing free information and technical support regarding AnyBus and fieldbus configurations before, during and after purchase.

Each AnyBus office has a designated support engineer and through signing up at "Club AnyBus" have free access to our "Online Technical Forum" where we can respond to your AnyBus or fieldbus question on a daily basis.

## Let HMS assist you with your In-Design!

To assist you with the In-Design of your AnyBus-S interface, HMS can provide support by helping you with a wide range of aspects such as; develop the hardware for the carrier board, evaluate schematics, and how it is designed, give advice and information on which fieldbus networks would be best suited to the product, what connector is the best and so on.

## Need help certifying your product..?

The AnyBus-S is EMC, UL, cUL pre-certified and has also has full fieldbus conformance. This gives your product a significant advantage when it comes to product certification. To assist you with product certification HMS can pre-test your product and handle all the work involved with fieldbus certification and advise on technical content for product manuals.



### Try the AnyBus-S for yourself!

Order the AnyBus Evaluation Board and your chosen AnyBus-S module today, online via the HMS webshop. The Evaluation kit comes with sample code and makes it easy for you to write own code and test it on the 8051-application processor.



HMS Online  
Webshop



Normal delivery: 5 working days  
Orders accepted via major credit cards

### Try the AnyBus-IC for yourself!

Order the AnyBus-IC Starterkit for Profibus, DeviceNet or Ethernet. A CD containing manuals, sample code, schematics and serial cable are also provided. Order directly online at the HMS webshop. See [www.hms-networks.com](http://www.hms-networks.com)



HMS Online  
Webshop



Normal delivery: 5 working days  
Orders accepted via major credit cards

### Try the AnyBus Communicator!

Order AnyBus Communicator for Profibus, DeviceNet, Ethernet, CANopen, LonWorks & Modbus Plus separately or together with the ABC Resource CD and PC cable, directly online at the HMS webshop. See [www.hms-networks.com](http://www.hms-networks.com)



HMS Online  
Webshop



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