Network Interface Appendix

Anybus®-CompactCom Passive RS-232

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Rev. 1.20

Connecting Devices™

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Important User Information

This document is intended to provide a good understanding of the functionality offered by Anybus CompactCom Passive RS-232 communication module. The document only describes the features that are specific to the Anybus CompactCom Passive RS-232. For general information regarding the Anybus CompactCom platform, consult the Anybus CompactCom design guides.

The reader of this document is expected to be familiar with high level software design, and communication systems in general.

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Warning:	This is a class A product. in a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
ESD Note:	This product contains ESD (Electrostatic Discharge) sensitive parts that may be damaged if ESD control procedures are not followed. Static control precautions are required when handling the product. Failure to observe this may cause damage to the product.

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About This Manual

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

Related Documents

Document	web
Anybus-CompactCom Hardware Design Guide	www.anybus.com

Document History

Summary of Recent Changes (1.01 - 1.20)

Change	Page(s)
Updated front page information	-
Updata sales and support contact info	P-3
Added notes on that the interface is not galvanically isolated	1-1, 2-2,
New template	-

Revision List

Revision	Date	Author(s)	Chapter(s)	Description
1.00	2005-09-28	PeP	-	First official release
1.01	2005-12-08	PeP	-	Minor update
1.20	2011-09-09	KeL	All	Misc. Updates

Conventions & Terminology

The following conventions are used throughout this manual:

- Numbered lists provide sequential steps
- Bulleted lists provide information, not procedural steps
- The terms 'Anybus' or 'module' is used when referring to the Anybus-CompactCom module.
- The terms 'host' or 'host application' is used when referring to the hardware and software that hosts the Anybus-CompactCom module.
- Hexadecimal values are written in the format NNNNh, where NNNN is the hexadecimal value.

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About the Anybus-CompactCom Passive RS-232

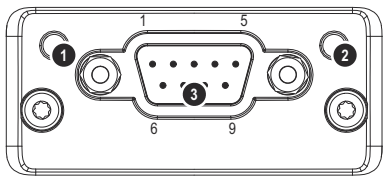
General

The Anybus-CompactCom Passive RS-232 is a physical layer converter which converts the serial host interface signals in the Anybus-CompactCom interface to RS-232.

Note: The interface of the module is not galvanically isolated.

Front View

#	Item
1	(not used)
2	Power LED
3	RS-232 Connector



Power LED

State	Indication
Off	No power
Green	Device powered

RS-232 Connector (9-pin D-sub, male)

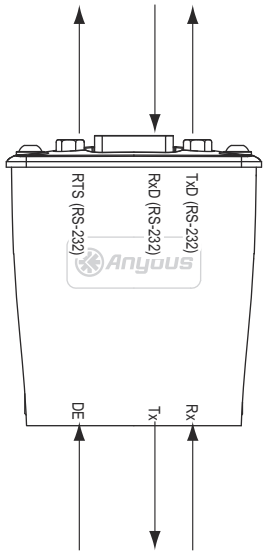
The module is designed as a DTE (Data Terminal Equipment, i.e. in order to connect the module to another DTE such as a computer, a crossover (a.k.a. null-modem) cable must be used.

Pin	Signal	Description
1	-	-
2	RxD	RS-232 level receive data input
3	TxD	RS-232 level transmit data output
4	-	-
5	GND	Signal ground
6	-	-
7	RTS	Request to Send[a]
8	-	-
9	-	-
Housing	Shield	Cable Shield

a. See 2-2 “DE (Data Enable) Behaviour”.

Operation

General



The Anybus-CompactCom Passive RS-232 is a physical layer converter for the RS-232 communication standard. Being a passive Anybus-CompactCom module, no processing is performed on the serial bitstream.

Supported Baudrates

The module supports any baudrate up to 250kbps[1]. No configuration is necessary since the module acts only on the physical layer.

Cable Considerations

The cable length and quality has great impact on the maximum possible data rate. This is more of a limitation in the RS-232 standard itself rather than a limitation in the Anybus-CompactCom module.

The maximum cable length depends on a number of factors, including how well the sender and receiver are implemented regarding rise times, and cable capacitance, inductance etc. The original RS-232 specification states a maximum cable length of 15.25 metres at data rates up to 20.0kbps, however in practice the interface can be used well outside these limitations.

The external environment has a large impact on the maximum cable lengths when using unshielded cables. In electrically noisy environments, even very short cables can pick up stray signals.

General Recommendations

- Always use good quality shielded RS-232 cable
- Do not let the RS-232 cable run parallelled close to power cables for more than 0.5m.
- Do not wrap the RS-232 cable around other signal cables.
- The module is pre-compliance tested (EMC) cable lengths up to 30m. For longer distances, use the Anybus-CompactCom RS485/422/Passive.
- For higher bitrates (>250kbps), use the Anybus-CompactCom RS485/422/Passive

1. If compatibility with other Anybus-CompactCom products is desired, it is recommended not to use baudrates beyond 115.2kbps.

Implementation Details

DE (Data Enable) Behaviour

Being a full duplex interface, RS-232 does not feature any DE functionality. However, this signal has been routed to the RTS (Request To Send) signal in the RS-232 connector to provide some degree of flow control for half duplex applications (optional).

/CA (Communication Active) Behaviour

This signal normally indicates whether the network (In this case the RS232) is able to exchange data or not. Since no such functionality exist in the RS-232 specification, this signal is tied low in the Anybus-CompactCom Passive RS-232.

Reset Behaviour

During reset, the TxD output on the RS-232 connector is held high regardless of the state of the Rx input on the host interface connector. This ensures that no erroneous data is sent accidentally through the RS-232 interface during startup etc.

Isolation

The interface between the RS232 fieldbus interface and the application interface of the module is NOT galvanically isolated.

Identification Code

As stated in the Anybus-CompactCom Hardware Design Guide, a subset of the parallel host interface signals provides a mechanism for detecting the network type of passive Anybus-CompactCom modules.

The identification code for the Anybus-CompactCom Passive RS-232 is 01h.

For more information, consult the general Anybus-CompactCom Hardware Design Guide.

Technical Specification

Protective Earth (PE) Requirements

In order to ensure proper EMC behaviour, the module must be properly connected to protective earth via the PE pad / PE mechanism described in the general Anybus-CompactCom Hardware Design Guide.

HMS Industrial Networks does not guarantee proper EMC behaviour unless these PE requirements are fulfilled.

Power Supply

Supply Voltage

The module requires a regulated 3.3V power source as specified in the general Anybus-CompactCom Hardware Design Guide.

Power Consumption

The Anybus-CompactCom RS-232 is designed to fulfil the requirements of a Class A module. For more information about the power consumption classification used on the Anybus-CompactCom platform, consult the general Anybus-CompactCom Hardware Design Guide.

The current hardware design consumes up to 22.5mA[1].

Note: It is strongly advised to design the power supply in the host application based on the power consumption classifications described in the general Anybus-CompactCom Hardware Design Guide, and not on the exact power requirements of a single product.

Environmental Specification

Consult the Anybus-CompactCom Hardware Design Guide for further information.

EMC Compliance

Tests have been performed as specified in the general Anybus-CompactCom Hardware Design Guide, with the following exception:

- EN61000-4-5 Surge immunity (test not required for cable lengths less than 30m).

1. Note that in line with HMS policy of continuous product development, we reserve the right to change the exact power requirements of this product without prior notification. Note however that in any case, the Anybus-CompactCom RS-232 will remain as a Class A module.