-Installation Guide-

AnyBus® Communicator

Rev 1.40
DOC. ABC-IG
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Table of Contents

1 General information

1.1 Installation items check-list

- AnyBus Communicator (AB-C) part. no AB7000
- AnyBus Communicator Configuration Pack, art no. 017620, including:
  * AB-C Configurator installation program (AbcCon) on the AB-C Resource CD (also available for download on www.hms-networks.com)
  * AB-C User Manual on the AB-C Resource CD (also available for download on www.hms-networks.com)
  * Cable for connecting a PC to the AB-C
- Fieldbus cable with connector for connecting a fieldbus to the AB-C
- Sub-network cable with DSUB9 male connector for connecting serial devices to the AB-C
- Power cable connected to a 24 V ± 10% power supply

1.2 Product overview

The figure below illustrates the connectors and switches, situated on the AB-C. The AB-C illustrated in Figure 1 below is a Profibus-DP version.
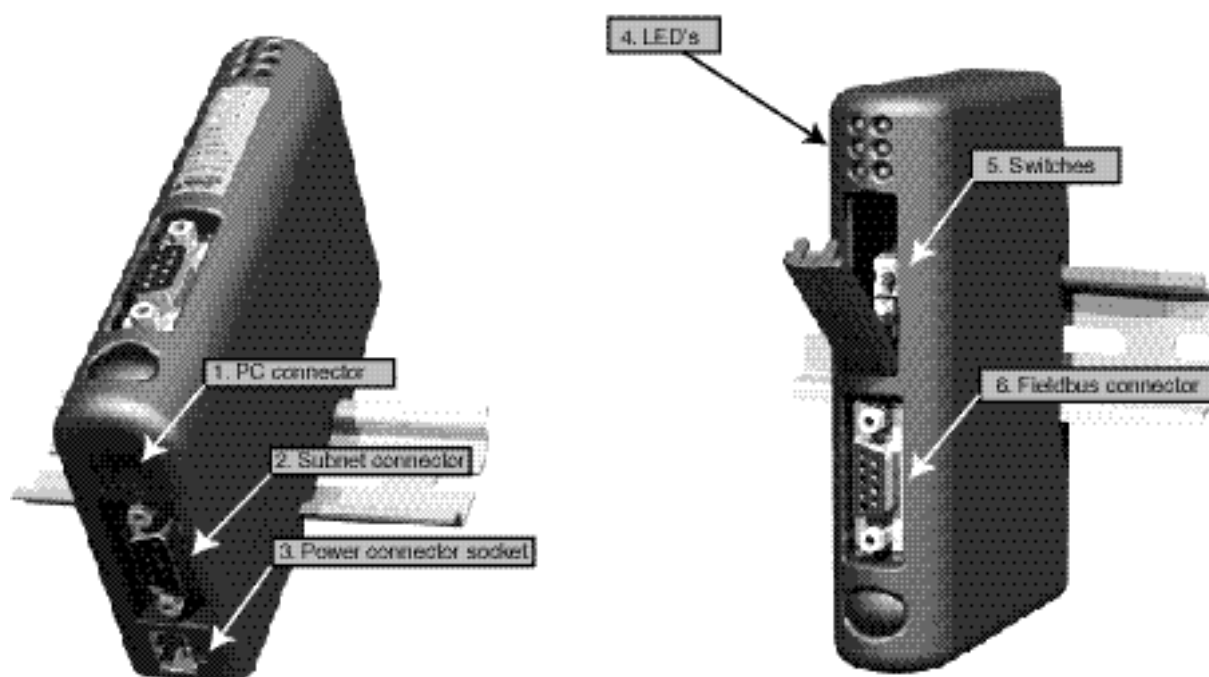

Figure 1: AnyBus Communicator overview

1.3 Further Reference

Further information about the product is available in the AB-C User Manual and the fieldbus appendices on the AB-C Resource CD.

2 General descriptions

2.1 PC-connector and PC-cable

The AbcCon Windows Configurator Tool is used to configure and monitor the AB-C with a PC. Your PC can be connected to the AB-C PC-connector through a PC-cable.

The following tables describe the pin configuration of the PC cable:

Pin	Description
1	Not connected
2	RS232 Rx, data input to PC
3	RS232 Tx, data output from PC
4	Not connected
5	Ground
6	Not connected
7	Not connected
8	Not connected
9	Not connected

Table 1: 9-pin DSUB pin description

*Female connector
on the PC-cable*

Pin	Description
1	Signal ground
2	Signal ground
3	RS232 Rx, data input to AB-C
4	RS232 Tx, data output from AB-C

Table 2: Modular 4/4 connector
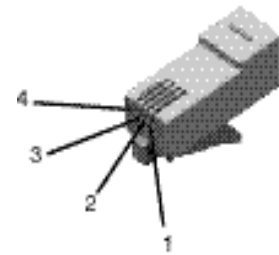
Modular 4/4 connector
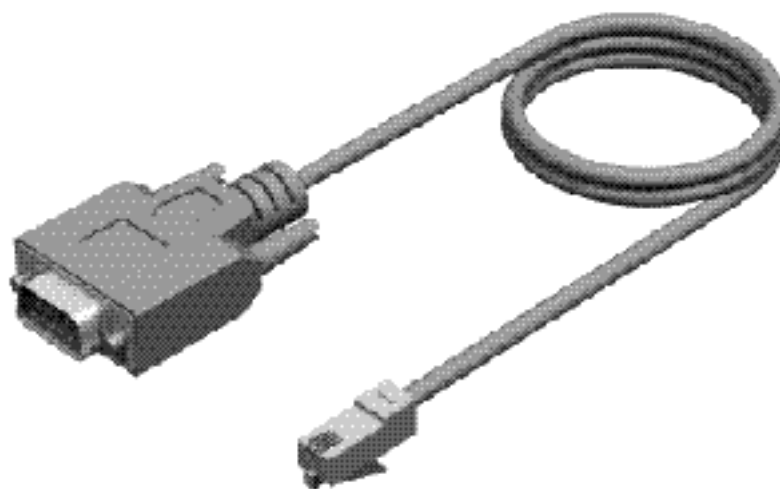
Figure 2: PC-cable

2.2 Sub-network connector

The following table describes the connector used to connect serial devices to the AB-C and all directions are stated with respect to the AB-C, i.e. RS232 Rx means data input to the AB-C.

Pin	Description
1	+5V
2	RS232 Rx
3	RS232 Tx
4	Not connected
5	Ground
6	RS422 Rx +
7	RS422 Rx -
8	RS485 + /RS422 Tx +
9	RS485 - /RS422 Tx -

Female connector on the AnyBus Communicator

Table 3: Sub-network connector pins

2.3 Power connector, 24 V

Power connector

Figure 3: Power connector on the AB-C

2.4 Additional installation information

•Use 60/75 or 75° C copper (CU) wire only
•The terminal tightening torque of 5-7 lbs-in.

3 Fieldbus specific descriptions

3.1 Profibus-DP

3.1.1 LED s

The 6 LED's can be used to monitor the product status. The LED's are numbered 1 to 6 according to Figure 4. The LED label on the product, Figure 5, states the meaning of each LED. The indication and status of each LED is described further in Table 4.
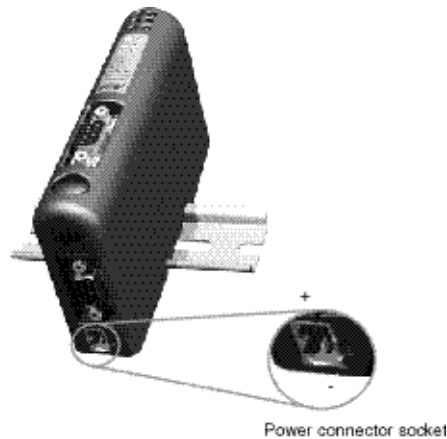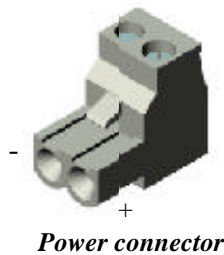

Figure 4: LED numbers

Note: If the Device status LED is flashing in a sequence starting with one or more red flashes, please note the sequence pattern and contact the HMS support department.

(support@hms-networks.com)

Figure 5: LED label

LED	Description	Indication	Status
1	Online	Green Turned off	Module is online Module is not online
2	Offline	Red Turned off	Module is offline Module is not offline
3	Not used		
4	Fieldbus diagnostics	Flashing red 1 Hz Flashing red 2 Hz Flashing red 4 Hz Turned off	Error in configuration Error in user parameter data Error in initialisation No diagnostics present
5	Subnet status	Off Flashing green Green Red	Power off Not running Running Stopped
6	Device status	Off Flashing red/green Green Flashing green	Power off Configuration missing Initialising Running

Table 4: Led descriptions

3.1.2 Profibus connector

Pin	Name	Function
Housing	Shield	Connected to PE
1	Not connected	-
2	Not connected	-
3	B-Line	Non-inverting RxD/TxD
4	RTS	Request to send
5	GND BUS	GND from RS485
6	+5 V BUS	+5 V from RS485
7	Not connected	-
8	A-Line	Inverting RxD/TxD
9	Not connected	-

Table 5: 9-pin DSUB connector

Female connector on the AnyBus Communicator

3.1.3 Profibus configuration

The hatch on the side of the AB-C covers the configuration switches. A small screwdriver can be inserted at the top of the hatch in order to remove it. When removing the hatch, please be cautious. Do not touch the circuit boards and the components.

The AB-C PDP module is equipped with two rotary switches for setting the node address. The address can be set within the range 1-99. The left switch (closest to the fieldbus connector) is the switch that sets the first of the two digits of the address (tens), whilst the right switch (closest to the LED:s), is used to set the second digit of the address (ones).

3.2 DeviceNet

3.2.1 LED s

The 6 LED's can be used to monitor the product status. The LED's are numbered 1 to 6 according to Figure 6. The LED label on the product, Figure 7, states the meaning of each LED. The indication and status of each LED is described further in Table 6.
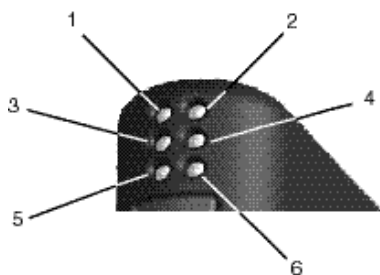
Figure 6: LED numbers

1 NW STATUS
2 MOD NW STATUS
3 NOT USED
4 NOT USED
5 SUBNET STATUS
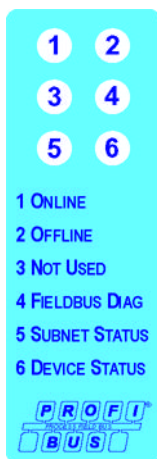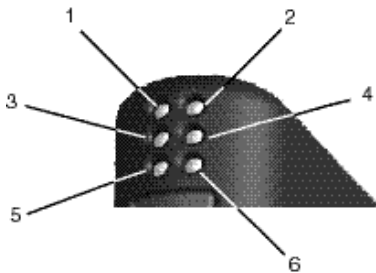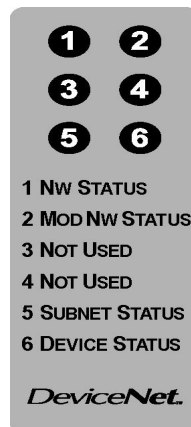6 DEVICE STATUS

DeviceNet.

Figure 7: LED label

Note: If the Device status LED is flashing in a sequence starting with one or more red flashes, please note the sequence pattern and contact the HMS support department.

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LED	Description	Indication	Status
1	Network status	Off Green Red Flashing green Flashing red	Not powered / not online Link OK online, connected Critical link failure Online not connected Connection time-out
2	Module status	Off Red Green Flashing red	No power Unrecoverable fault Device operational Minor fault
3	Not used		
4	Not used		
5	Subnet status	Off Flashing green Green Red	Power off Not running Running Stopped
6	Device status	Off Flashing red/green Green Flashing green	Power off Configuration missing Initialising Running

Table 6: DeviceNet LED's

3.2.2 DeviceNet connector

Pin	Description
1	V -
2	CAN L
3	Shield
4	CAN H
5	V +
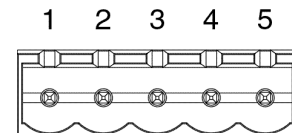
5-pin plugable screw terminal

Table 7: 5-pin plugable screw terminal on the AB-C DeviceNet module

3.2.3 DeviceNet configuration

The hatch on the side of the AB-C covers the configuration switches. A small screwdriver can be inserted at the top of the hatch in order to remove it. When removing the hatch, please be cautious. Do not touch the circuit boards and the components.

In a DeviceNet network, each node in the network has a Mac ID (the address in the network). The Mac ID is a number between 0 and 63. Each node's Mac ID has to be unique, since it is used to address the node.
In a DeviceNet network it is also possible to configure the Baudrate, the following baud rates is possible to use in a network: 125, 250 and 500 kbit / sec. All nodes in the network have to communicate with the same baudrate.

On the AB-C DeviceNet module, it is possible to set the Mac ID and the Baud rate with a physical DIP-switch. Dip 1 and 2 are used to configure the Baud rate and dips 3 to 8 are used to configure the node address (Mac ID). Dip 1 is the most significant bit on the dipswitch.

When a switch is in the 'ON' or 'Closed' position, the modules interprets it as a logic '1'.

3.2.3.1 Node address

Switches 3 to 8 are used to set the node address. Switch 3 is the MSB, and switch 8 is LSB.

Address	sw. 3	sw. 4	sw. 5	sw. 6	sw. 7	sw. 8
0	OFF	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	ON	ON
...	...	...	...	...	...	...
62	ON	ON	ON	ON	ON	OFF
63	ON	ON	ON	ON	ON	ON

Table 8: Node address settings

3.2.3.2 Baudrate

There are three different baudrates for DeviceNet; 125k, 250k, 500kbit/s. Choose one of them by setting dip switch 1 and 2 before configuring.

Baud rate, bits/sec.	sw. 1	sw. 2
125k	OFF	OFF
250k	OFF	ON
500k	ON	OFF
Reserved	ON	ON

Table 9: Baud rate settings

3.2.3.3 Termination

DeviceNet uses termination resistors at each physical end of the bus. The termination resistor should be 121 ohm. This should be connected between CAN_H and CAN_L on the bus.

3.3 Ethernet

3.3.1 LED s

The 6 LED's can be used to monitor the product status. The LED's are numbered 1 to 6 according to Figure 8. The LED label on the product, Figure 9, states the meaning of each LED. The indication and status of each LED is described further in the tables below.
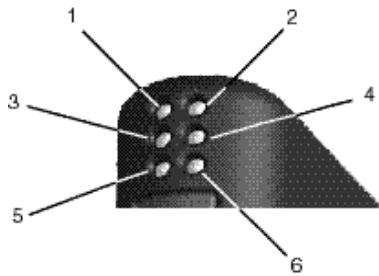

Figure 8: LED numbers

Figure 9: LED label

Note: If the Device status LED is flashing in a sequence starting with one or more red flashes, please note the sequence pattern and contact the HMS support department.

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LED 1	Colour	Frequency	Description
STATUS LED	Green	1 Hz	Indicates that the used IP address not is set by the values on the dip-switches.
	Red	1 Hz	The Ethernet MAC address is not correct. The module will not be able to initialize. Please contact your supplier.
	Red	2 Hz	The module failed to load Ethernet configuration from the FLASH.
	Red	4 Hz	Internal error. Please contact your supplier.

Table 10: LED 1 - Status LED

LED 2	Colour	Frequency	Description
Modbus/TCP Connection LED	Green	-	Indicates the number of Modbus/TCP connections that are established to the module. The LED flashes to indicate the number of connections. Ex: If three connections are established, then this LED flashes three times, then off for a short period, then flashes three times again and so on.

Table 11: LED 2 - Modbus/TCP connection LED

LED 3	Colour	Frequency	Description
LINK LED	Green	Steady on	Indicates that the module is connected to an Ethernet network.

Table 12: LED 3 - Link LED

LED 4	Colour	Frequency	Description
ACTIVITY LED	Green	-	Flashes from green to off when a packet is received or transmitted.

Table 13: LED 4 - Activity LED

| LED 5	Indication	Description
SUBNET STATUS LED	Off Flashing green Green Red	Power off Not running Running Stopped

Table 14: LED 5 - Subnetwork Status

LED 6	Indication	Description
DEVICE STATUS LED	Off Flashing red/green Green Flashing green	Power off Configuration missing Initialising Running

Table 15: LED 6 - Device Status LED

3.3.2 RJ 45 connector

Connector pin	Signal	Description
1	TD+	Positive Transmit Data
2	TD-	Negative Transmit Data
3	RD+	Positive Receive Data
4	NC	No connection
5	NC	No connection
6	RD-	Negative Receive Data
7	NC	No connection
8	NC	No connection
Casing	PE	Protective earth

Table 16: RJ45 Ethernet connector
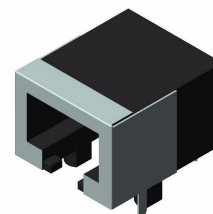
3.3.3 Configuration

3.3.3.1 Node address

The hatch on the side of the AB-C covers the configuration switches. A small screwdriver can be inserted at the top of the hatch in order to remove it. When removing the hatch, please be cautious. Do not touch the circuit boards and the components.

The Ethernet MAC ID is permanent, and cannot be changed by the user. The IP-address is configured at the initialization of the module. For more information about how to set the IP-address for the module, please refer to the AnyBus-S Ethernet/Modbus TCP fieldbus appendix.

3.3.3.2 Termination

The Ethernet module uses twisted-pair cables, and do not need an external terminator.

3.4 CANopen

3.4.1 LED s

The 6 LED's can be used to monitor the product status. The LED's are numbered 1 to 6 according to Figure 10. The LED label on the product, Figure 11, states the meaning of each LED. The indication and status of each LED is described further in the tables below.
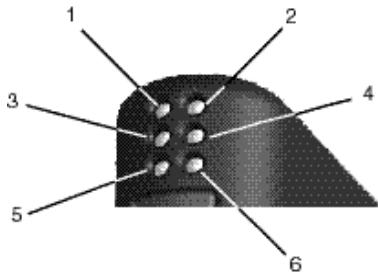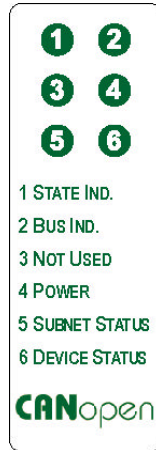

Figure 10: LED numbers

Figure 11: LED label

Note: If the Device status LED is flashing in a sequence starting with one or more red flashes, please note the sequence pattern and contact the HMS support department.

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LED number 3 is not used on the AB-C CANopen module.

LED 1	Colour	Frequency	Description
STATE INDICATION	Green	1 Hz	Module in 'Pre-Operational' state
	Green	2 Hz	Module in 'Prepared' state
	Green	Steady on	Module in 'Operational state'
	Red	1 Hz	Bus initialisation failed

Table 17: LED 1 - State indication

LED 2	Colour	Frequency	Description
BUS INDICATION	Green	1 Hz	Bus off / error passive
	Green	Steady on	Bus running
	Red	1 Hz	Other error
	Off	-	Power off or module not initialised

Table 18: LED 2 - Bus indication

LED 4	Colour	Frequency	Description
POWER	Green	Steady on	Module has power

Table 19: LED 4 - Power

3.4.2 D-SUB connector

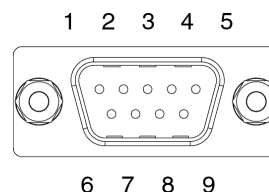| Connector pin	Signal	Description
1	-	Reserved
2	CAN_L	CAN_L Bus line (dominant low)
3	CAN_GND	CAN ground
4	-	Reserved
5	CAN_SHLD	Optional CAN Shield
6	GND	Optional ground
7	CAN_H	CAN_H Bus line (dominant high)
8	-	Reserved
9	CAN_V+	Optional CAN external power supply

Table 20: D-SUB connector

3.4.3 Configuration

3.4.3.1 Node address

The hatch on the side of the AB-C covers the configuration switches. A small screwdriver can be inserted at the top of the hatch in order to remove it. When removing the hatch, please be cautious. Do not touch the circuit boards and the components. The network node address is set with two rotary switches on the option board (ADDRESS_HIGH and ADDRESS_LOW), or with the 'FIELDBUS_SPECIFIC_INIT' telegram during startup of the module. Possible node address if you use the dip switches are between 1 - 99 in decimal format.
The node address is calculated in the following way:
Node address = (ADDRESS_HIGH * 10) + (ADDRESS_LOW * 1)

Note: Pdo 3 - 8 only have default cobid's if the node address is less than 64.
Note: The node address cannot be changed during operation.

3.4.3.2 Baudrate

The baudrate is configured with one decimal rotary switch, or with the 'FIELDBUS_SPECIFIC_INIT' telegram during start-up. See table below for supported baudrates.

Switch setting	Baudrate
0	Not available
1	10 kbit/s
2	20 kbit/s
3	50 kbit/s
4	125 kbit/s
5	250 kbit/s
6	500 kbit/s
7	800 kbit/s
8	1 Mbit/s
9	Not available

Table 21: Baudrate switch settings

Note: The baudrate can not be changed during operation

3.4.3.3 Termination

CANopen uses standard CAN termination on the first and last node on the network. The termination resistor should be 120 ohm. This should be connected between CAN_H and CAN_L on the bus. Note that the termination is only used when the AnyBus-S module is the first or last node on the bus.

3.5 Modbus Plus

3.5.1 LED s

The 6 LED's can be used to monitor the product status. The LED's are numbered 1 to 6 according to Figure 12. The LED label on the product, Figure 13, states the meaning of each LED. The indication and status of each LED is described further in the tables below.
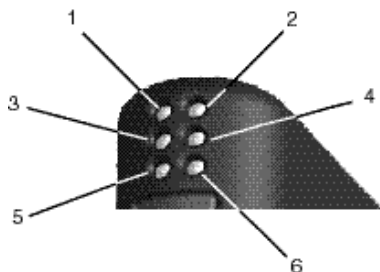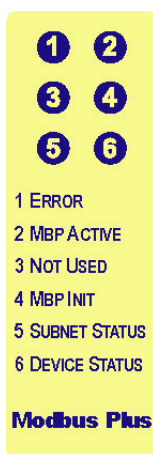

Figure 12: LED numbers

1 ERROR
2 MBP ACTIVE
3 NOT USED
4 MBP INIT
5 SUBNET STATUS
6 DEVICE STATUS

Modbus Plus

Figure 13: LED label

Note: If the Device status LED is flashing in a sequence starting with one or more red flashes, please note the sequence pattern and contact the HMS support department.

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The AnyBus-C Modbus Plus module has two fieldbus specific and two standard (stacked) indication LED's. The functionality of these LED's is described below:

LED no.	Indication	Description
1	Active Red	**ERROR;** This LED is indicating that the communication is not OK.

Table 22: AB-C Modbus Plus LED's

LED no.	Indication	Description
2	Green	**MBP Active;** This diagnostic flashes in different patterns depending on the modules' health. **Indicating different Node Status:** Flash every 160 ms **This node works normal, receiving and passing token:** Flash every 1 s **This node is in MONITOR_OFFLINE state:** 2 flashes, off 2 s **This node is in MAC_IDLE never-getting-token state:** 3 flashes, off 1.7 s **This node is not hearing any other nodes:** 4 flashes, off 1.4 s This node has heard a valid packet that has a duplicated-node-address sent from another node on the network, using the same Node ID.
3	-	Not Used
4	Active solid green	MBP Init; This LED indicating if the peer interface is initialised.

Table 22: AB-C Modbus Plus LED's

3.5.2 D-SUB connector

D-SUB	Name
1	Cable Shielding
2	MBP Line B
3	MBP Line A
Housing	PE

Table 23: D-SUB connector

3.5.3 Configuration

3.5.3.1 Node ID (Address) S1

The hatch on the side of the AB-C covers the configuration switches. A small screwdriver can be inserted at the top of the hatch in order to remove it. When removing the hatch, please be cautious. Do not touch the circuit boards and the components.

The Node ID on the Modbus Plus node is set before power on. Any change of Node ID during power on is not valid until next power cycle. The address is set in binary format. The Node address is also configurable with the fieldbus specific mailbox messages.

1 MSB	2	3	4	5	6 LSB	Function
ON	ON	ON	ON	ON	ON	Node address set to 1
ON	ON	ON	ON	ON	OFF	Node address set to 2
ON	ON	ON	ON	OFF	ON	Node address set to 3
-	-	-	-			
OFF	OFF	OFF	OFF	OFF	ON	Node address set to 63
OFF	OFF	OFF	OFF	OFF	OFF	Node address set to 64

Table 24: Switch settings for Node ID

Note: The node address cannot be changed during operation.

3.5.3.2 Source ID (Address) S2

The AnyBus-S Modbus Plus module uses one source ID address from 1 -64 to configure what node it will extract the global data from, sent during the token pass. The amount of extracted data is set by the initialisation, which will be described later. The Source address is also configurable with the fieldbus specific mailbox messages, along with the GDB offset.
The address is set in binary format.

1 MSB	2	3	4	5	6 LSB	Function
ON	ON	ON	ON	ON	ON	Source ID address set to 1
ON	ON	ON	ON	ON	OFF	Source ID address set to 2
ON	ON	ON	ON	OFF	ON	Source ID address set to 3
-	-	-	-			
OFF	OFF	OFF	OFF	OFF	ON	Source ID address set to 63
OFF	OFF	OFF	OFF	OFF	OFF	Source ID address set to 64

Table 25: Switch settings for Source ID

Note: The source address cannot be changed during operation.

4 Windows software installation

To install the AbcCon, simply run setup.exe and follow the instructions on the screen. The setup.exe file is available for download on: www.hms-networks.com, or provided in the ABC Configuration Pack, art. no 017620, together with the PC cable.

5 Instructions for using the AB-C with a DIN-rail

1.   Snap the AB-C on the DIN-rail. In figure 10 it is demonstrated how the AB-C should be snapped on and removed from the DIN-rail.

* To "snap the AB-C on" to the DIN-rail, first press the AB-C downwards to compress the spring on the DIN- rail, and then push the AB-C against the DIN-rail as to make it snap on. (Figure 14; A)

* To "snap the AB-C off" from the DIN-rail, push the AB-C downwards and out from the DIN-rail, as to make it snap off from the DIN-rail. (Figure 14; B)
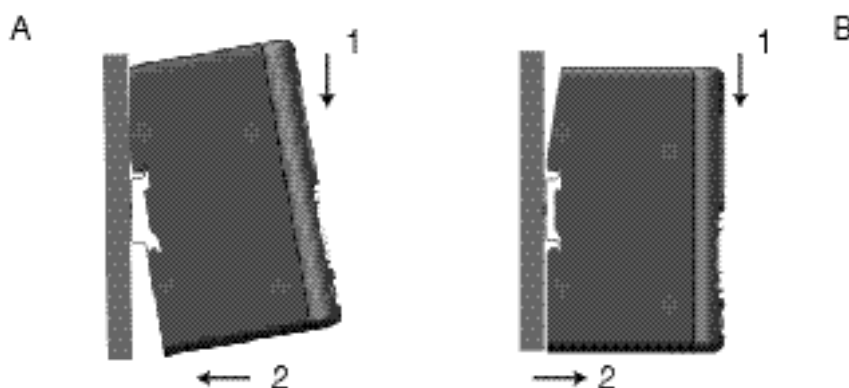
Figure 14: How to use the AB-C with a DIN-rail

The succeeding steps are:

2.   Connect the fieldbus cable
3.   Connect the serial subnetwork cable
4.   Connect the power cable and apply power
5.   Connect a PC using the PC cable and start the configuration tool program (the AbcCon)
6.   Configure the AB-C using the AbcCon and download the configuration
            For a pre-configured AB-C, steps 5 and 6 can be omitted

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6 Technical specifications

Operating temperature: +5°C to 55°C.

Humidity: -5 to 95% non-condensing.

Dimensions: 120 mm x 75 mm x 27 mm (L x W x H)

Power supply: Power: 24V±10%. Maximum power consumption is 280 mA on 24V. Typically around 100 mA.

Mechanical: Plastic housing with snap-on connection to DIN-rail.

UL: This unit is open type listed by the Underwriters Laboratories, UL. The certificate is valid when the unit is installed in a switch cabinet or equivalent. The certification has been documented by UL in file E 214107.

EMC:

CE-mark:	Certified according to European standards unless otherwise is stated.
Emission:	According to EN 50081-2:1993
Immunity:	According to EN 61000-6-2:1999

System requirements for the Configurator software:

Pentium 133 MHz or higher
10 MB free space on hard drive
8 MB RAM
Win95/98/NT/2000/ME
Internet Explorer 4.01 SP1.

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The product warranty is valid if the instructions in this Installation Guide and the User Manual are followed correctly. ANYBUS® is a registered trademark of HMS Industrial Networks AB. All other trademarks are the property of their respective holders. For more information about the AnyBus Communicator please refer to the AnyBus Communicator User Manual.

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