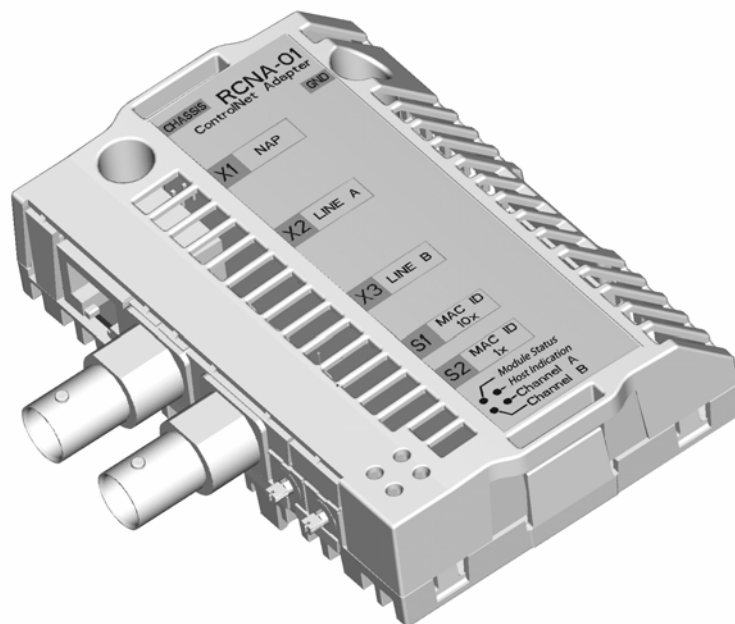


ABB Drives

User's Manual ControlNet Adapter Module RCNA-01



ControlNet Adapter Module RCNA-01

User's Manual

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Safety instructions

Overview

This chapter states the general safety instructions that must be followed when installing and operating the RCNA-01 ControlNet Adapter module.

The material in this chapter must be studied before attempting any work on the unit.

In addition to the safety instructions given below, read the complete safety instructions of the specific drive you are working on.

General safety instructions



WARNING! All electrical installation and maintenance work on the drive should be carried out by qualified electricians.

The drive and adjoining equipment must be properly earthed.

Do not attempt any work on a powered drive. After switching off the mains, always allow the intermediate circuit capacitors to discharge for 5 minutes before working on the frequency converter, the motor or the motor cable. It is good practice to check (with a voltage indicating instrument) that the drive is in fact discharged before beginning work.

The motor cable terminals of the drive are at a dangerously high voltage when mains power is applied, regardless of motor operation.

There can be dangerous voltages inside the drive from external control circuits even when the drive mains power is shut off. Exercise appropriate care when working on the unit. Neglecting these instructions can cause physical injury or death.

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Introduction

Overview

This chapter contains a description of the *User's Manual* for the RCNA-01 ControlNet Adapter module.

Intended audience

The guide is intended for the people who are responsible for installing, commissioning and using a ControlNet Adapter module with an ABB drive. The reader is expected to have a basic knowledge of electrical fundamentals, electrical wiring practices, the drive, the use of the drive control panel, and the ControlNet protocol.

What this manual contains

The installation and start-up of the RCNA-01 ControlNet Adapter module are introduced in this manual.

It is assumed that the drive is installed and ready to operate before starting the installation of the adapter module. For more information on the installation and start-up procedures of the drive, please refer to its user documentation.

Safety instructions are featured in the first few pages of this guide.

Introduction contains a short description of the guide.

Overview contains a short description of the ControlNet protocol and the RCNA-01 ControlNet Adapter module, a delivery checklist and information on the manufacturer's warranty.

Mechanical installation contains placing and mounting instructions for the module.

Electrical installation contains wiring, earthing and node address setting instructions.

Programming explains how to program the drive before the communication through the adapter module can be started.

Communication contains a description of the ControlNet functionality supported by the RCNA-01.

Fault tracing describes how to diagnose the ControlNet connection during installation, commissioning, and normal operation.

Technical data contains information on physical dimensions, configurable settings and connectors of the module and a specification of the fieldbus link.

Conventions used in this guide

Communication Module

Communication Module is a name for a device (e.g. a fieldbus adapter) through which the drive is connected to an external serial communication network (e.g. a fieldbus). The communication with the communication module is activated by a drive parameter.

Data Words

The Control Word (sometimes called the Command Word) and the Status Word, References and Actual Values (see chapter [Communication](#)) are types of data words; the contents of some data words are user-definable. For information, see the drive documentation.

Input

In this manual, the word 'input' is used to describe data flow to the ControlNet Scanner.

MacID

Every node on ControlNet network has to have a unique identifier. This node number is called MAC ID (Media Access Control Identification).

RCNA-01 ControlNet Adapter module

The RCNA-01 Adapter module is one of the optional fieldbus adapter modules available for ABB drives. The RCNA-01 is a device through which an ABB drive is connected to a ControlNet serial communication bus.

Output

In this manual, the word 'output' is used to describe data flow from the ControlNet Scanner.

Parameter

A parameter is an operating instruction for the drive. Parameters can be read and programmed with the drive control panel, or through the RCNA-01 module.

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type code and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to ABB website and selecting *Sales, Support and Service network*.

Product training

For information on ABB product training, navigate to ABB website and select *Training courses*.

Providing feedback on ABB Drives manuals

Your comments on our manuals are welcome. Go to ABB website and select *Document Library – Manuals feedback form (LV AC drives)*.

Overview

Overview

This chapter contains a short description of ControlNet network, the RCNA-01 Adapter module, a delivery checklist, and warranty information.

Further information can be obtained from www.controlnet.org.

Network overview

The media for the fieldbus is a RG-6 quad shielded cable or fibre with support for media redundancy. The RCNA-01 Adapter module supports only RG-6 quad shielded cable (coax) for the bus connection. ControlNet is flexible in topology options (bus, tree, star) to meet various application needs. The fieldbus speed is 5 Mbits/s.

ControlNet technical features summary	
Transmission technique:	Support for bus, star or tree topologies RG-6 quad shield cable Optional media redundancy Support for fibre optic cabling (Not supported by RCNA) Data rate 5 Mbit/s
Medium access:	Peer-to-peer Producer/Consumer Multicasts of both inputs and peer-to-peer data Multi-Scanner

ControlNet technical features summary	
Bus length:	250 m (coax) with 48 nodes 1000 m (coax) with two nodes 5000 m (coax) with repeaters 3000 m fibre 30000 m (fibre) with repeaters
Process data:	Time-deterministic Repeatable

The RCNA-01 ControlNet Adapter module

The RCNA-01 ControlNet Adapter module can not originate connections on its own, but a scanner node can open a connection towards it. The ControlNet protocol is implemented according to the ControlNet international specification for a Communication adapter (profile number 12).

Through the RCNA-01 ControlNet Adapter module it is possible to:

- give control commands to the drive
(Start, Stop, Run enable, etc.)
- feed a motor speed or torque reference to the drive
- give a process actual value or a process reference to the PID controller of the drive
- read status information and actual values from the drive
- read and write drive parameter values
- reset a drive fault.

A connection to the RCNA-01 ControlNet Adapter can be opened from a ControlNet scanner. The size of the connection can be up to 450 bytes in each direction.

MacID (Node address) is selected by two decimal rotary switches. The range is 1 to 99.

The module is equipped with two BNC contacts for connection to ControlNet. If redundant operation is desired, both connectors are used, otherwise connector A or B is used.

The module is also equipped with a NAP (Network access port) for temporary connection of configuration tools, e.g. a PC card. The minimum Network update time (NUT) of the module is 5 ms.

The adapter module is mounted into an option slot inside the drive. See the Hardware Manual of the drive for module placement options.

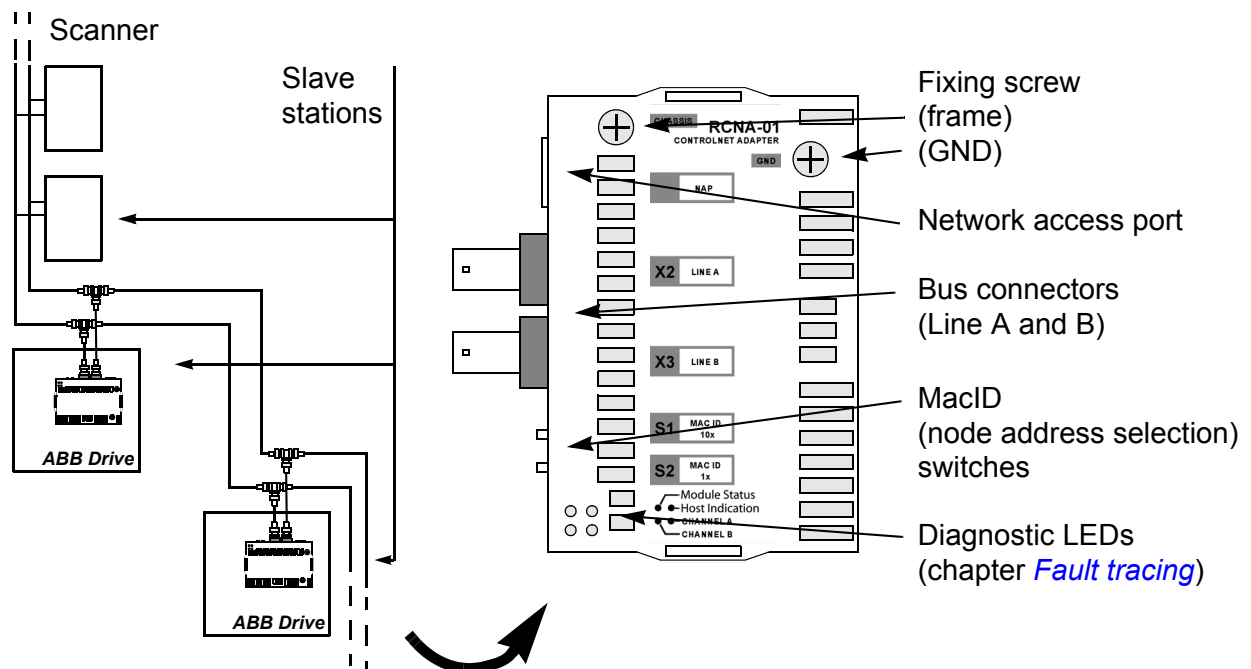


Figure 1. The construction of the ControlNet link and the layout of the RCNA-01 Adapter module

Compatibility

The RCNA-01 is compatible with all scanners working according to the ControlNet International ControlNet specifications.

Delivery check

The option package for the RCNA-01 ControlNet Adapter module contains:

- ControlNet Adapter module, type RCNA-01
- two screws (M3x10)
- this manual.

Warranty and liability information

The manufacturer warrants the equipment supplied against defects in design, materials and workmanship for a period of twelve (12) months after installation or twenty-four (24) months from date of manufacturing, whichever first occurs. The local ABB office or distributor may grant a warranty period different to the above and refer to local terms of liability as defined in the supply contract.

The manufacturer is not responsible for

- any costs resulting from a failure if the installation, commissioning, repair, alternation, or ambient conditions of the drive do not fulfil the requirements specified in the documentation delivered with the unit and other relevant documentation
- units subjected to misuse, negligence or accident
- units comprised of materials provided or designs stipulated by the purchaser.

In no event shall the manufacturer, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, losses or penalties.

If you have any questions concerning your ABB drive, please contact the local distributor or ABB office. The technical data, information and specifications are valid at the time of printing. The manufacturer reserves the right to modifications without prior notice.

Mechanical installation



WARNING! Follow the safety instructions given in this manual and in the Hardware Manual.

Mounting

The RCNA-01 is to be inserted into its option slot inside the drive. The module is held in place with plastic retaining clips and two screws. The screws also provide the earthing of the I/O cable shield connected to the module, and interconnect the GND signals of the module and the control board of the drive.

On installation of the module, the signal and power connection to the drive is automatically made through a 34-pin connector.

Mounting procedure:

- Insert the module carefully into its position inside the drive until the retaining clips lock the module into position.
- Fasten the two screws (included) to the stand-offs.
- Set the bus termination switch of the module to the required position.

Note: Correct installation of the screws is essential for fulfilling the EMC requirements and for proper operation of the module.

Electrical installation

Overview

This chapter contains:

- general cabling instructions
- instructions on setting the module node address number
- instructions for connecting the module to the ControlNet bus.



WARNING! Before installation, switch off the drive power supply. Wait five minutes to ensure that the capacitor bank of the drive is discharged. Switch off all dangerous voltages connected from external control circuits to the inputs and outputs of the drive.

General cabling instructions

Bus cables are specified in chapter [Technical data](#).

Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. Use bushings at cable entries.

MacID selection

The MacID (Node address) is set with the two rotary decimal switches in the front of the module. The range is 1 to 99. The value is read from the switches right after completion of the initialisation procedure, and they shall not be changed during operation. If changed, a minor fault will be detected and the MacID will not change until the next power-up or the module receives a 'Fieldbus Adapter parameter refresh' command from the drive.

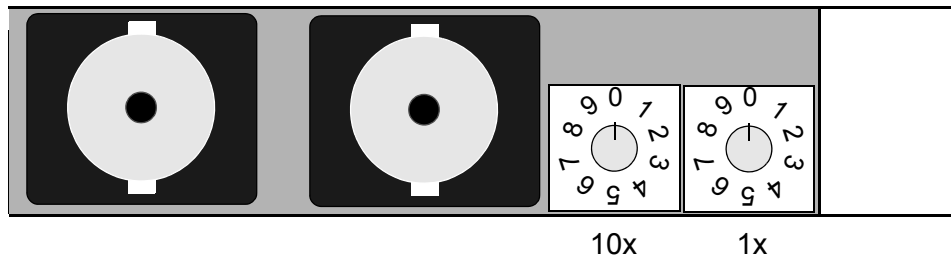


Figure 2. Node address selection

RCNA-01 connections

ControlNet connection

The bus cable is connected to the BNC connectors A and/or B on the RCNA-01. If redundant operation is desired, both connectors are used, otherwise connector A or B is used.

ControlNet bus termination

The ControlNet bus line must be terminated with 75 ohm resistor. See fieldbus details in chapter [Technical data](#).

Network access port connection

The module is also equipped with a NAP (Network access port) for temporary connection of configuration tools, e.g. a PC card. The minimum Network update time (NUT) of the module is 5 ms.

Programming

Overview

This chapter gives information on configuring the RCNA-01 ControlNet Adapter module.

Configuring the system

After the RCNA-01 ControlNet Adapter module has been mechanically and electrically installed according to the instructions in chapters [Mechanical installation](#) and [Electrical installation](#), the drive must be prepared for communication with the module and Scanner.

Please refer to the Scanner documentation for information on configuring the system for communication with the RCNA-01. Configuration (EDS) files for the RCNA-01 are available at ABB website.

ControlNet connection configuration

The detailed procedure of activating the module for communication with the drive is dependent on the drive type. (Normally, a parameter must be adjusted to activate the communication. See the drive documentation.)

As communication between the drive and the RCNA-01 is established, several configuration parameters are copied to the drive. These parameters (shown in [Table 1. The RCNA-01 configuration parameters](#)) must be checked first and adjusted if necessary. The alternative selections for these parameters are discussed in more detail below the table.

Note: The new settings take effect only when the module is powered up or when the module receives a 'Fieldbus Adapter parameter refresh' command from the drive.

Note: The grouping, numbering, and adjustment procedure of parameters vary from drive to drive. See the drive documentation for information.

Control locations

ABB drives can receive control information from multiple sources including digital inputs, analogue inputs, the drive control panel and a communication module (e.g. RCNA-01). ABB drives allow the user to separately determine the source for each type of control information (Start, Stop, Direction, Reference, Fault Reset, etc.). In order to give the fieldbus Scanner the most complete control over the drive, the communication module must be selected as source for this information. See the user documentation of the drive for information on the selection parameters.

Table 1. The RCNA-01 configuration parameters

Fieldbus par. no.	Parameter name	Alternative settings	Default setting
1	MODULE TYPE*	ControlNet	ControlNet
2	Module MacID	0...99	99
3	Module Baud rate	5 = 5 MBit/s	5
4	HW/SW Option	0 = Hardware 1 = Software	0
5	Stop Function	0 = Ramp stop 1 = Coast stop	0
6	Output Instance	20 ... 121	20
7	Input Instance	70 ... 171	70
8	Output I/O Par 1	0 ... 32767	0
9	Output I/O Par 2	0 ... 32767	0
10	Output I/O Par 3	0 ... 32767	0
11	Output I/O Par 4	0 ... 32767	0

12	Input I/O Par 1	0 ... 32767	0
13	Input I/O Par 2	0 ... 32767	0
14	Input I/O Par 3	0 ... 32767	0
15	Input I/O Par 4	0 ... 32767	0
16	Output I/O Par 5	0 ... 32767	0
17	Output I/O Par 6	0 ... 32767	0
18	Output I/O Par 7	0 ... 32767	0
19	Output I/O Par 8	0 ... 32767	0
20	Output I/O Par 9	0 ... 32767	0
21	Input I/O Par 5	0 ... 32767	0
22	Input I/O Par 6	0 ... 32767	0
23	Input I/O Par 7	0 ... 32767	0
24	Input I/O Par 8	0 ... 32767	0
25	Input I/O Par 9	0 ... 32767	0
26	VSA I/O Size	1 ... 32	2

* Parameter 1 (MODULE TYPE) is read-only.

Note: The Default values are used when the module is connected to the drive for the first time. The parameters in the fieldbus group must be set up for the current application.

01 MODULE TYPE

Shows the connected communication option module type.

02 Module MacID

Selects the MAC ID for the node.

0 ... 99

On a ControlNet network, each node is identified by a unique node number. This node number is between 0 and 99, and it is called MAC ID.

Note: When parameter 04 HW/SW Option is set to 0=HW this parameter is read-only and its value is set by rotary switches. See chapter [Electrical installation](#).

03 Module Baud rate

Indicates the baud rate of the ControlNet interface. The baud rate is fixed to 5 MBit/s.

5 = 5 MBit/s

04 HW/SW Option

Defines the selection source of module MacID.

0 = selection of MAC ID via the rotary switches enabled.

1 = selection of MAC ID via parameter 02 and via the ControlNet Object enabled (see chapter [Communication sub-section ControlNet Object, Class 0xF0](#)).

05 Stop Function

Defines the method for stopping the motor.

0 = Ramp stop: the motor decelerates along the active deceleration ramp.

1 = Coast stop: the motor comes to a stop by coasting.

06 Output Instance

07 Input Instance

These parameters define the preferred output and input assemblies respectively.

The instances 20, 70, 21 and 71 are so-called Drive Profile instances as defined in the ControlNet specification (AC/DC Drive profile). The instances 121 and 171 correspond to instances 21 and 71, but contain additional space for user-mapped data. The instances 100, 101, 102 and 103 are so-called vendor-specific instances as defined by ABB, i.e. the control word, status word, speed reference and speed actual value are defined by the ABB Drives communication profile.

The static/dynamic property indicates whether the data length of the instance is fixed or adjustable.

Output instances		
Instance	Assembly	Static/Dynamic
20	Basic speed control output	Static
21	Extended speed control output	Static
100	User transparent assembly	Static
102	Vendor specific assembly	Dynamic
121	Extended speed control plus drive parameters	Dynamic

Input instances		
Instance	Assembly	Static/Dynamic
70	Basic speed control input	Static
71	Extended speed control input	Static
101	User transparent assembly	Static
103	Vendor specific assembly	Dynamic
171	Extended speed control plus drive parameters	Dynamic

The following table shows the possible combinations of output and input instances.

Possible instance combinations		
Output instance	Input instance	Communication profile to be used
20	70	Generic Drive profile
	71	Generic Drive profile
	103	Generic Drive profile
	171	Generic Drive profile
21	70	Generic Drive profile
	71	Generic Drive profile
	103	Generic Drive profile
	171	Generic Drive profile

Possible instance combinations		
Output instance	Input instance	Communication profile to be used
100	101	ABB Drives profile
	103	ABB Drives profile
102	101	ABB Drives profile
	103	ABB Drives profile
121	70	Generic Drive profile
	71	Generic Drive profile
	103	Generic Drive profile
	171	Generic Drive profile

Selecting an invalid combination will reset the module and automatically configure the instances as follows:

- 1) If the output instance is invalid, instance **20** will be selected.
- 2) If the output instance is valid, but the input instance is invalid, the default input instance will be selected as follows:

Output instance	Default input instance
20	70
21	71
100	101
102	103
121	171

08 Output I/O Par 1

Defines the data word or drive parameter that can be set with Assembly object instances 102 and 121 (see chapter [Communication](#) subsection [VENDOR SPECIFIC assembly](#)).

The content is defined by a decimal number in the range of 0 to 32767 as follows:

0	not used
1 - 99	data set area of the drive
101 - 9999	parameter area of the drive
10000 - 32767	not supported by the drive

The data set area is allocated as follows:	
1	data set 1 word 1
2	data set 1 word 2
3	data set 1 word 3
4	data set 2 word 1
5	data set 2 word 2
6	data set 2 word 3
7	data set 3 word 1
...	
99	data set 33 word 3

The parameter area is allocated as follows:

Parameter number with format xxyy, where xx is the parameter group number (1 to 99) and yy is the parameter number index inside the group (01 to 99).

09 to 11 Output I/O Par 2 to Output I/O Par 4

See parameter [08 Output I/O Par 1](#).

12 Input I/O Par 1

Defines the data word or drive parameter that can be read with Assembly object instances 103 and 171 (see chapter [Communication](#) subsection [VENDOR SPECIFIC assembly](#)).

The content is defined by a decimal number in the range of 0 to 32767 as follows:

0	not used
1 - 99	data set area of the drive
101 - 9999	parameter area of the drive
10000 - 32767	not supported by the drive

The data set area is allocated as follows:	
1	data set 1 word 1
2	data set 1 word 2
3	data set 1 word 3
4	data set 2 word 1
5	data set 2 word 2
6	data set 2 word 3
7	data set 3 word 1
...	
99	data set 33 word 3

The parameter area is allocated as follows:

Parameter number with format xxyy, where xx is the parameter group number (1 to 99) and yy is the parameter number index inside the group (01 to 99).

13 to 15 Input I/O Par 2 to Input I/O Par 4

See parameter [12 Input I/O Par 1](#).

16 to 20 Output I/O Par 5 to Output I/O Par 9

See parameter [08 Output I/O Par 1](#).

21 to 25 Input I/O Par 5 to Input I/O Par 9

See parameter [12 Input I/O Par 1](#).

26 VSA I/O Size

Defines the number of user-mapped data words in Vendor Specific assemblies (instances 102, 103, 121 and 171). The value of this parameter directly specifies the size (in words) of instances 102 and 103, whereas the size of instances 121 and 171 will be the value of this parameter plus two words.

1 ... 32

Note: The Vendor Specific ControlNet Configuration object, Class 0x91, is activated when the VSA I/O size is set to 10 or larger.

Communication

Overview

This chapter describes the ControlNet communication protocol for the RCNA-01 and the configuration of the scanner. For detailed information on ControlNet communication, refer to ControlNet specifications.

Introduction to ControlNet

The interface from the fieldbus towards the RCNA-01 is based on the standard ControlNet objects and vendor specific objects.

The RCNA-01 has the following objects included:

Object Name	Class
Identity Object	0x01
Assembly Object	0x04
Connection Manager Object	0x06
ControlNet Object	0xF0
Motor Data Object	0x28
Control Supervisor Object	0x29
AC/DC Drive Object	0x2A
Vendor Specific Object	0x90
Vendor Specific ControlNet Configuration	0x91

Object modelling and functional profiles

One of the main features of ControlNet is object modelling. A group of objects can be described with a Functional Profile. The RCNA-01 realises the ControlNet International AC/DC Drive Functional Profile with additional features.

Assembly object

I/O Assembly Instances may also be referred to as Block Transfer of data. Intelligent devices realising a Functional Profile, such as the RCNA-01, have several objects. Since it is not possible to transmit more than one object data through a single connection, it is practical and more efficient to group attributes from different objects into a single I/O connection using the Assembly object. The Assembly object acts as a tool for grouping these attributes.

The Assembly selections described above are in fact Instances of the Assembly object class. The RCNA-01 uses Static assemblies (in other words, fixed groupings of different object data only), except for the Vendor Specific Assembly. These are predefined and cannot be changed.

The following tables describe the predefined assembly instances supported by the RCNA-01.

Note: Add 4 extra bytes (2 words) to all the input assemblies; for example, the total size of Input Assembly Instance 70 is 4 bytes + 4 extra bytes = 8 bytes. For output assemblies, the extra bytes must not be added.

The configuration parameter 26 VSA I/O SIZE must be configured without these extra bytes.

BASIC SPEED CONTROL assembly

The BASIC SPEED CONTROL assembly is defined by the ControlNet AC/DC Drive Profile. The format of the output assembly is:

Instance 20 (Output assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0						Fault reset		Run fwd
1								
2	Speed Reference (Low Byte) *							
3	Speed Reference (High Byte) *							

* Scaling of Speed Reference is configured by Speed Scale attribute in AC/DC-Drive Object (class 0x2A, instance 0x01, attribute 0x16), and it defaults to 1 rpm.

The format of the input assembly is:

Instance 70 (Input assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0						Running 1		Faulted
1								
2	Speed Actual Value (Low Byte) *							
3	Speed Actual Value (High Byte) *							

* Scaling of Speed Actual Value is configured by Speed Scale attribute in AC/DC-Drive Object (class 0x2A, instance 0x01, attribute 0x16), and it defaults to 1 rpm.

Note: If the BASIC SPEED CONTROL or the EXTENDED SPEED CONTROL assembly is used, it must be ensured that the fieldbus is selected as the drive control source and fieldbus specific (Generic Drive profile) Control/Status Word format is selected instead of ABB Drives profile.

EXTENDED SPEED CONTROL assembly

The EXTENDED SPEED CONTROL assembly is defined by the ControlNet AC/DC Drive Profile. The format of the output assembly is:

Instance 21 (Output assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0		NetRef	NetCtrl			Fault Reset	Run Reverse	Run Forward
1								
2	Speed Reference (Low Byte) *							
3	Speed Reference (High Byte) *							

* See [BASIC SPEED CONTROL assembly](#) for information on speed reference scaling.

The format of the input assembly is:

Instance 71 (Input assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	At Reference	Ref From Net	Ctrl From Net	Ready	Running Reverse	Running Forward	Warning	Faulted
1	Drive State							
2	Speed Actual Value (Low Byte) *							
3	Speed Actual Value (High Byte) *							

* See [BASIC SPEED CONTROL assembly](#) for information on speed actual value scaling.

USER TRANSPARENT assembly

USER TRANSPARENT assembly allows the use of the ABB Drives communication profile. The format of the output assembly is:

Instance 100 (Output assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Control Word (Low Byte)							
1	Control Word (High Byte)							
2	Speed Reference (Low Byte) *							
3	Speed Reference (High Byte) *							

* Refer to Drive User's Manual for scaling.

The format of the input assembly is:

Instance 101 (Input assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Status Word (Low Byte)							
1	Status Word (High Byte)							
2	Speed Actual Value (Low Byte) *							
3	Speed Actual Value (High Byte) *							

* Refer to Drive User's Manual for scaling.

VENDOR SPECIFIC assembly

VENDOR SPECIFIC assembly allows the use of the ABB Drives communication profile. The format of the output assembly is:

Instance 102 (Output assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Output I/O 1 (Low Byte)							
1	Output I/O 1 (High Byte)							
2	Output I/O 2 (Low Byte)							
3	Output I/O 2 (High Byte)							
4	Output I/O 3 (Low Byte)							
5	Output I/O 3 (High Byte)							
6	Output I/O 4 (Low Byte)							
7	Output I/O 4 (High Byte)							
8	Output I/O 5 (Low Byte)							
9	Output I/O 5 (High Byte)							
10	Output I/O 6 (Low Byte)							
11	Output I/O 6 (High Byte)							
12	Output I/O 7 (Low Byte)							
13	Output I/O 7 (High Byte)							
14	Output I/O 8 (Low Byte)							
15	Output I/O 8 (High Byte)							
16	Output I/O 9 (Low Byte)							
17	Output I/O 9 (High Byte)							

The value of Output I/O 1 to 9 sets the data word or drive parameter defined by Output I/O Par 1 to 9 respectively. See chapter [Programming](#).

Output I/O 10 to 32 can be configured through the Vendor Specific ControlNet Configuration object, Class 0x91.

Note: the max number of output I/O's supported by the drive depends on the drive type and application.

The format of the input assembly is:

Instance 103 (Input assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Input I/O 1 (Low Byte)							
1	Input I/O 1 (High Byte)							
2	Input I/O 2 (Low Byte)							
3	Input I/O 2 (High Byte)							
4	Input I/O 3 (Low Byte)							
5	Input I/O 3 (High Byte)							
6	Input I/O 4 (Low Byte)							
7	Input I/O 4 (High Byte)							
8	Input I/O 5 (Low Byte)							
9	Input I/O 5 (High Byte)							
10	Input I/O 6 (Low Byte)							
11	Input I/O 6 (High Byte)							
12	Input I/O 7 (Low Byte)							
13	Input I/O 7 (High Byte)							
14	Input I/O 8 (Low Byte)							
15	Input I/O 8 (High Byte)							
16	Input I/O 9 (Low Byte)							
17	Input I/O 9 (High Byte)							

The value of Input I/O 1 to 9 is read from the data word or drive parameter defined by Input I/O Par 1 to 9 respectively. See chapter [Programming](#).

Input I/O 10 to 32 can be configured through the Vendor Specific ControlNet Configuration object, Class 0x91.

Note: the max number of output I/O's supported by the drive depends on the drive type and application.

Note: If the BASIC SPEED CONTROL or the EXTENDED SPEED CONTROL assembly is used, it must be ensured that the fieldbus is selected as the drive control source and fieldbus specific (Generic Drive profile) Control/Status Word format is selected instead of ABB Drives profile.

EXTENDED SPEED CONTROL PLUS DRIVE PARAMETERS assembly

EXTENDED SPEED CONTROL PLUS DRIVE PARAMETERS assembly allows the use of ControlNet AC/DC Drive Profile with additional user-mapped parameters. The format of the output assembly is:

Instance 121 (Output assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0		NetRef	NetCtrl			Fault Reset	Run Reverse	Run Forward
1								
2	Speed Reference (Low Byte) *							
3	Speed Reference (High Byte) *							
4	Output I/O 1 (Low Byte)							
5	Output I/O 1 (High Byte)							
6	Output I/O 2 (Low Byte)							
7	Output I/O 2 (High Byte)							
8	Output I/O 3 (Low Byte)							
9	Output I/O 3 (High Byte)							
10	Output I/O 4 (Low Byte)							
11	Output I/O 4 (High Byte)							
12	Output I/O 5 (Low Byte)							
13	Output I/O 5 (High Byte)							
14	Output I/O 6 (Low Byte)							
15	Output I/O 6 (High Byte)							
16	Output I/O 7 (Low Byte)							
17	Output I/O 7 (High Byte)							
18	Output I/O 8 (Low Byte)							
19	Output I/O 8 (High Byte)							
20	Output I/O 9 (Low Byte)							
21	Output I/O 9 (High Byte)							

* See [BASIC SPEED CONTROL assembly](#) for information on speed reference scaling.

The value of Output I/O 1 to 9 sets the data word or drive parameter defined by Output I/O Par 1 to 9 respectively. See chapter [Programming](#).

Input I/O 10 to 32 can be configured through the Vendor Specific ControlNet Configuration object, Class 0x91.

Note: The maximum number of input I/O's supported by the drive depends on the drive type and application.

The format of the input assembly is:

Instance 171 (Input assembly)								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	At Refer- ence	Ref From Net	Ctrl From Net	Ready	Running Reverse	Running Forward	Warn- ing	Faulted
1	Drive state							
2	Speed Actual Value (Low Byte) *							
3	Speed Actual Value (High Byte) *							
4	Input I/O 1 (Low Byte)							
5	Input I/O 1 (High Byte)							
6	Input I/O 2 (Low Byte)							
7	Input I/O 2 (High Byte)							
8	Input I/O 3 (Low Byte)							
9	Input I/O 3 (High Byte)							
10	Input I/O 4 (Low Byte)							
11	Input I/O 4 (High Byte)							
12	Input I/O 5 (Low Byte)							
13	Input I/O 5 (High Byte)							
14	Input I/O 6 (Low Byte)							
15	Input I/O 6 (High Byte)							
16	Input I/O 7 (Low Byte)							
17	Input I/O 7 (High Byte)							
18	Input I/O 8 (Low Byte)							
19	Input I/O 8 (High Byte)							
20	Input I/O 9 (Low Byte)							
21	Input I/O 9 (High Byte)							

* See [BASIC SPEED CONTROL assembly](#) for information on speed actual value scaling.

The value of Input I/O 1 to 9 is read from the data word or drive parameter defined by Input I/O Par 1 to 9 respectively. See chapter [Programming](#).

Input I/O 10 to 32 can be configured through the Vendor Specific ControlNet Configuration object, Class 0x91.

Note: The maximum number of output I/O's supported by the drive depends on the drive type and application.

Class objects

Legend	Data type
UINT8	Unsigned Integer 8 bit
UINT16	Unsigned Integer 16 bit
SINT16	Signed Integer 16 bit
UINT32	Unsigned Integer 32 bit
BOOL	Boolean value

Identity Object, Class 0x01

This object provides identification of and general information about the device.

Services Supported

Service Code No.	Service Name
0x01	Get attribute all
0x05	Reset

Class attributes

ID#	Attribute name	Services	Description	Default, Min, Max	Data type
0x01	Vendor ID	Get	Identification of the device vendor	46	UINT16
0x02	Device Type	Get	Identification of the general product type	2	UINT16
0x03	Product Code	Get	Assigned vendor code to describe the device	Drive dependent (e.g. 101)	UINT16
0x04	Revision	Get	Revision of the item the Identity Object represents		Array [UINT8 UINT8]
0x05	Status	Get	Summary Status of the Device	0, 0, 255	UINT16
0x06	Serial Number	Get	Serial Number of the DeviceNet module	N/A, N/A, N/A	UINT32
0x07	Product Name	Get	Product identification, Max 32 characters	RCNA-01 and ACSxxx	Short String

*Attribute explanations***Vendor ID**

Vendor IDs are managed by ControlNet International. The ABB Vendor ID is 46.

Device Type

The list of device types is managed by ControlNet International. It is used to identify the device profile that a particular product is using.

Product Code

Every ABB drive type or application of the drive has a dedicated product code.

Revision

Revision attribute, which consists of Major and Minor Revisions, identifies the Revision of the item the Identity Object is representing.

Status

This attribute represents the current status of the entire device. Its value changes as the state of the device changes. The Status attribute is a WORD, with the following bit definitions:

Bit(s)	Type/Name	Definition
0	Owned	TRUE indicates the device (or an object within the device) has an owner. Within the Master/Slave paradigm the setting of this bit means that the Predefined Master/Slave Connection Set has been allocated to a master. Outside the Master/Slave paradigm the meaning of this bit is to be defined.
1		Reserved, set to 0.
2	Configured	TRUE indicates the application of the device has been configured to do something that differs from the “out-of-box” default. This does not include configuration of the communications.
3		Reserved, set to 0.
4, 5, 6, 7		Vendor-specific
8	Minor Recoverable Fault	TRUE indicates the device detected a recoverable problem. The problem does not cause the device to go into a faulted state.
9	Minor Unrecoverable Fault	TRUE indicates the device detected a unrecoverable problem. The problem does not cause the device to go into a faulted state.
10	Major Recoverable Fault	TRUE indicates the device detected a problem which caused the device to go into the “Major Recoverable Fault” state.
11	Major Unrecoverable Fault	TRUE indicates the device detected a problem which caused the device to go into the “Major Unrecoverable Fault” state.
12,13, 14,15		Reserved, set to 0.

Serial Number:

This attribute is a number used in conjunction with the Vendor ID to form a unique identifier for each device on ControlNet.

Product Name:

This text string should represent a short description of the product/product family represented by the product code in attribute 3.

Assembly Object, Class 0x04

The Assembly Object binds attributes of multiple objects which allows data to or from each object to be sent or received over a single connection. Assembly objects can be used to bind input data or output data. The terms “input” and “output” are defined from the network’s point of view. An input will produce data on the network and an output will consume data from the network.

Services Supported

Service Code No.	Service Name
0x0E	Get Attribute Single
0x10	Set Attribute Single

Only the instances selected by configuration parameters 06 (Output Instance) and 07 (Input Instance) can be accessed through this class. Write requests (Set service) are rejected if the assembly instance is linked with an active I/O connection and the scanner is in Run mode. Writes to the instances containing actual data from drive will have no effect.

Instance	Attribute	Service	Description
0x14 (20)	3	Get/Set	Accesses assembly instance 20 as a byte array.
0x15 (21)	3	Get/Set	Accesses assembly instance 21 as a byte array.
0x46 (70)	3	Get/Set	Accesses assembly instance 70 as a byte array. Set has no effect, since instance 70 contains actual data from the drive.
0x47 (71)	3	Get/Set	Accesses assembly instance 71 as a byte array. Set has no effect, since instance 71 contains actual data from the drive.
0x64 (100)	3	Get/Set	Accesses assembly instance 100 as a byte array.
0x65 (101)	3	Get/Set	Accesses assembly instance 101 as a byte array. Set has no effect, since instance 101 contains actual data from the drive.
0x66 (102)	3	Get/Set	Accesses assembly instance 102 as a byte array.
0x67 (103)	3	Get/Set	Accesses assembly instance 103 as a byte array. Set has no effect, since instance 103 contains actual data from the drive.
0x79 (121)	3	Get/Set	Accesses assembly instance 121 as a byte array.
0xAB (171)	3	Get/Set	Accesses assembly instance 171 as a byte array. Set has no effect, since instance 171 contains actual data from the drive.

ControlNet Object, Class 0xF0

Services Supported

Service Code No.	Service Name
0x05	Reset
0x0E	Get Attribute Single
0x4C	Get and Clear

Class attributes

ID#	Attribute name	Services	Description	Value	Data type
0x02	Max instance	Get	Maximum instance number	Node specific	UINT

Instance 0x01, Attributes

ID#	Attribute name	Services	Description	Data type
0x81	Current link config	Get Attribute Single	Current link configuration parameters	Struct of 34 bytes
0x82	Diagnostic counters	Get_Attribute_Single Get_And_Clear	Diagnostic counters	Struct of 42 bytes
	Buffer errors		Buffer event counter	UINT
	Error log		Bad Mac frame log	Byte[8]
	Event counters		Diagnostic counters	Struct of 32 bytes
	Good frames transmitted		Good Mac frames transmitted (LSB first)	Byte[3]
	Good frame received		Good Mac frames received (LSB first)	Byte[3]
	Selected channel frame errors		Framing errors detected on active receive channel	USINT
	Channel A frame errors		Framing errors detected on channel A	USINT
	Channel B frame errors		Framing errors detected on channel B	USINT
	Aborted frames transmitted		MAC frames aborted during transmission (transmit underflows)	USINT
	Highwaters		LCC transmit underflow and LCC receiver underflow	USINT

ID#	Attribute name	Services	Description	Data type
	NUT overflow		No unscheduled time in NUT (all time used for scheduled transmissions)	USINT
	Slot overloads		More scheduled data queued for one NUT than allowed by sched_max_frame parameter.	USINT
	Blockages		Single Lpacket size exceeds sched_max_frame parameter.	USINT
	Non concurrence		Two or more nodes could not agree whose turn it is to transmit.	USINT
	Aborted frames received		Incomplete MAC frames received.	USINT
	Lonely counter		Number of times nothing heard on network for 8 or more NUT's.	USINT
	Duplicate Node		Mac frame received from node with local nodes MacID.	USINT
	Noise hits		Noise detected that locked modem rx PLL.	USINT
	Collisions		Rx data heard just when transmit started.	USINT
	Mod MAC ID		MAC ID of the current moderator node.	USINT
	Non lowman mods		Moderator frames heard from non-lowman nodes.	USINT
	Rouge count		Rouge events detected.	USINT
	Unheard moderator		MAC frames being heard but no moderators being heard.	USINT
	Vendor specific			USINT
	Reserved		Reserved	Byte[4]
	Vendor specific			USINT

ID#	Attribute name	Services	Description	Data type
	Vendor specific			USINT
	Reserved		Reserved	Byte
0x83	Station status		Station status	Struct of 6 bytes
	SMAC ver		MAC implementation	USINT
	Vendor specific			USINT
	Channel state		Channel LED's redundancy warning and active bits	Byte
0x84	Mac ID	Get_Attribute_Single	Mac ID switch and current settings	Struct of 4 bytes
	Mac ID current		Current Mac ID	USINT
	Mac ID switches		Mac ID switch setting	USINT
	Mac ID changed		Mac ID switch setting changed since reset	BOOL
	Reserved		Reserved	USINT
0x86	Error log	Get_Attribute_Single	Driver firmware buffer error counts and troublesome node list	Struct of 10 bytes
	Buffer errors		Buffer event counter	UINT
	Error log			Byte[8]

Motor Data Object, Class 0x28

This object serves as a database for motor parameters.

Services Supported

Service Code No.	Service Name
0x0E	Get Attribute Single
0x10	Set Attribute Single

Instance 0x01, Attributes

ID#	Attribute name	Services	Description	Motor Type	Default, Min, Max	Data type
0x03	Motor Type	Get	1 - PM DC Motor 2 - FC DC Motor 3 - PM Synchronous Motor 4 - FC Synchronous Motor 5 - Switched Reluctance Motor 6 - Wound Rotor Induction Motor 7 - Squirrel Cage Induction Motor 8 - Stepper Motor 9 - Sinusoidal PM BL Motor 10 - Trapezoidal PM BL Motor	AC/DC	7, 1, 10	UINT
0x06	Rated Current	Get/Set	Rated Stator Current from motor nameplate.	AC/DC		UINT
0x07	Rated Voltage	Get/Set	Rated Base Voltage from motor nameplate.	AC/DC		UINT
0x08	Rated Power	Get/Set	Rated Power at Rated Frequency	AC/DC		UINT
0x09	Rated Frequency	Get/Set	Rated Electrical Frequency	AC		UINT
0x0C	Pole Count	Get	Number of poles in the motor	AC		UINT
0x0F	Base Speed	Get/Set	Nominal Speed at rated frequency from nameplate	AC/DC		UINT

Control Supervisor Object, Class 0x29

The object models all the management functions for devices within the 'Hierarchy of Motor Control Devices'. The behaviour of motor control devices is described in [Table 2. Run/Stop event matrix](#) and [Figure 3. State transition diagram](#).

Services Supported

Service Code No.	Service Name
0x05	Reset
0x0E	Get Attribute Single
0x10	Set Attribute Single

Instance 0x01, Attributes

ID#	Attribute name	Services	Description	Data type
0x03	Run 1 ¹⁾	Get, Set	0 = Stop, 1 = Run	BOOL
0x04	Run 2 ²⁾	Get, Set	0 = Stop, 1 = Run	BOOL
0x05	Net Control ²⁾	Get, Set	0 = Local Control, 1 = Network Control	BOOL
0x06	State	Get	1 = Start/up, 2 = Not_ready, 3 = Ready, 4 = Enabled, 5 = Stopping, 6 = FaultStop, 7 = Faulted	UINT8
0x07	Running 1 ³⁾	Get	0 = Stopped, 1 = Running	BOOL
0x08	Running 2 ⁴⁾	Get	0 = Stopped, 1 = Running	BOOL
0x09	Ready	Get	1 = Ready, Enabled or Stopping 0 = Other state	BOOL
0x0A	Faulted	Get	0 = Not faulted, 1 = Fault occurred	BOOL
0x0B	Warning	Get	0 = No Warnings present, 1 = Warning	BOOL
0x0C	FaultRst	Get, Set	0 → 1 Fault Reset	BOOL
0x0D	Fault Code	Get	The fault that caused the last transition to the Faulted state.	UINT16
0x0F	CtlFromNet	Get	0 = NetControl disabled 1 = NetControl enabled	BOOL
0x11	Force Fault	Get, Set	0 → 1 Force a fault	BOOL
0x12	Force Status	Get	0 = Not Forced Non-zero = Forced	BOOL

Communication

ID#	Attribute name	Services	Description	Data type
0x14	Net Idle	Get, Set	Action taken when the master goes to idle state in Generic drive profile 0 = Stop 1 = Freeze (keep running) 2 = Fault	UINT8

- 1) Supported only with assembly instances 20, 21 and 121
- 2) Supported only with assembly instances 21 and 121
- 3) Supported only with assembly instances 70, 71 and 171
- 4) Supported only with assembly instances 71 and 171

Table 2. Run/Stop event matrix

RunFwd	RunRev	Trigger event	Run type
0	0	Stop	N/A
0 → 1	0	Run	RunFwd
0	0 → 1	Run	RunRev
0 → 1	0 → 1	No Action	N/A
1	1	No Action	N/A
0 → 1	1	Run	RunRev
1	1 → 0	Run	RunFwd

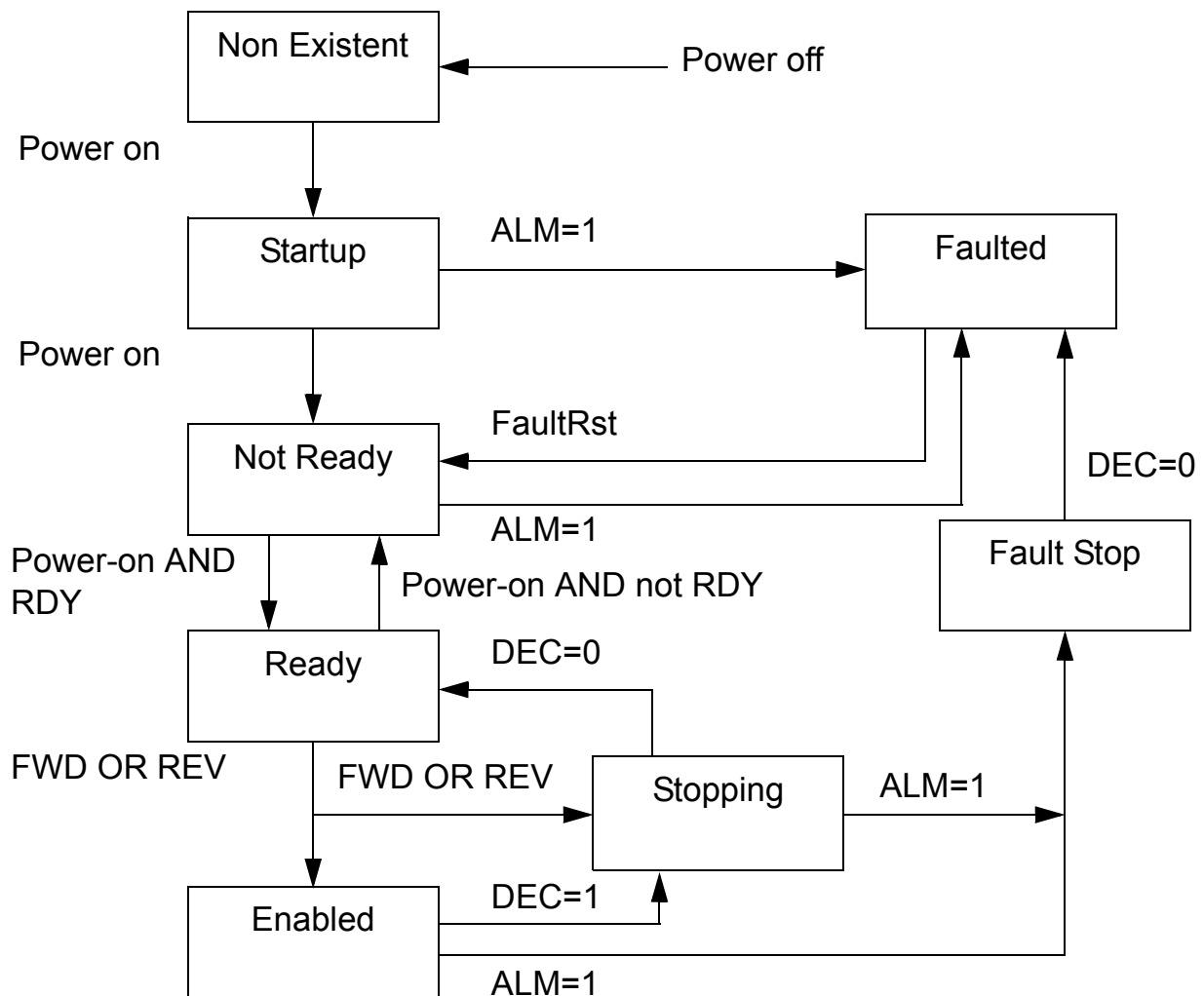


Figure 3. State transition diagram

AC/DC-Drive Object, Class 0x2A

This object models the functions specific to an AC or DC Drive.

Services Supported

Service Code No.	Service Name
0x0E	Get Attribute Single
0x10	Set Attribute Single

Instance 0x01, Attributes

ID#	Attribute name	Services	Description	Data type
0x03	At Reference	Get	Frequency arrival	BOOL
0x04	NetRef ²⁾	Get, Set	Requests torque or speed reference to be local or from the network. 0 = Set Reference not DN Control 1 = Set Reference at DN Control Note that the actual status of torque or speed reference is reflected in attribute 29, RefFromNet.	BOOL
0x06	Drive mode	Get, Set	0 = Vendor specific 1 = Open Loop Speed 2 = Closed Loop Speed 3 = Torque Control	UINT8
0x07	Speed Actual	Get	Units RPM/2 ^{SpeedScale}	SINT16
0x08	SpeedRef	Get, Set	Units RPM/2 ^{SpeedScale}	SINT16
0x12	AccelTime	Get, Set	Units msec/2 ^{TimeScale}	UINT16
0x13	DecelTime	Get, Set	Units msec/2 ^{TimeScale}	UINT16
0x16	Speed Scale	Get, Set	Speed scaling factor	UINT8
0x17	Current Scale	Get, Set	Current scaling factor	UINT8
0x18	Torque Scale	Get, Set	Torque scaling factor	UINT8
0x1A	Power Scale	Get, Set	Power scaling factor	UINT8
0x1B	Voltage Scale	Get, Set	Voltage scaling factor	UINT8
0x1C	Time Scale	Get, Set	Time scaling factor	UINT8
0x1D	Ref From Net	Get	Reflecting attribute 4	BOOL
0x1F	Field I or IV	Get, Set	Always to be set to 0	-

²⁾ Supported only with assembly instance 21

Vendor Specific Object, Class 0x90

Services Supported

Service Code No.	Service Name
0x0E	Get Attribute Single
0x10	Set Attribute Single

Instance 0x00, Attributes

ID#	Attribute name	Services	Description	Data type
0x02	Max instance	Get	Maximum number of instances in this Class	UINT16

The Vendor Specific Object, Class 0x90, enables access of drive parameter and data sets.

To access drive parameters *Instance* and *Attribute* correspond to the drive parameter Group and Index in the following way.

- *Instance* = parameter Group (1...99)
- *Attribute* = parameter Group (1...99)

For example, Parameter 99.01 is accessed as follows:

- *Class* = 144 = 0x90
- *Instance* = 99 = 0x63
- *Attribute* = 1 = 0x01

To access data sets *Instance* is always 100. *Attribute* corresponds to a specific data word.

For example, data set 2 word 1 is accessed as follows

- *Class* = 144 = 0x90
- *Instance* = 100 = 0x64
- *Attribute* = 4 = 0x04

Instance 0x01, Attributes

ID#	Attribute name	Services	Description
0x01	Parameter Index	Get, Set	Group 1 Index 1
0x02	Parameter Index	Get, Set	Group 1 Index 2
...			
0x63	Parameter Index	Get, Set	Group 1 Index 99

Instance 0x02, Attributes

ID#	Attribute name	Services	Description
0x01	Parameter Index	Get, Set	Group 2 Index 1
0x02	Parameter Index	Get, Set	Group 2 Index 2
...			
0x63	Parameter Index	Get, Set	Group 2 Index 99

⋮

Instance 0x63, Attributes

ID#	Attribute name	Services	Description
0x01	Parameter Index	Get, Set	Group 99 Index 1
0x02	Parameter Index	Get, Set	Group 99 Index 2
...			
0x63	Parameter Index	Get, Set	Group 99 Index 99

Instance 0x64, Attributes

ID#	Attribute name	Services	Description
0x01	Data word index	Get, Set	Data Set 1 Word 1
0x02	Data word index	Get, Set	Data Set 1 Word 2
0x03	Data word index	Get, Set	Data Set 1 Word 3
0x04	Data word index	Get, Set	Data Set 2 Word 1
0x05	Data word index	Get, Set	Data Set 2 Word 2
0x06	Data word index	Get, Set	Data Set 2 Word 3
0x07	Data word index	Get, Set	Data Set 3 Word 1
...			
0x63	Data word index	Get, Set	Data Set 33 Word 3

Vendor Specific ControlNet Configuration, Class 0x91

This object is used when more I/O data than listed in [Table 1. The RCNA-01 configuration parameters](#) of the Configuration chapter needs to be handled. In this object 32 words of Input and Output data can be used. The configuration of the I/O parameters in this object is identical to the configuration of the I/O parameters in Table 1. Please note this class is only used when configuration parameter “VSA I/O size” is set to 10 or larger.

Note: All input and output parameters must be set via Class 0x91.

Services Supported

Service Code No.	Service Name
0x05	This Reset command will clear all attributes in one instance to zero. I.e. a reset of Class 91, Instance 1 will set all output parameters to zero.
0x0E	Get Attribute Single
0x10	Set Attribute Single

Instance and Attributes

Two instances are supported by Class 0x91:

- Instance 1 for Output parameters.
- Instance 2 for Input parameters.

Instance 0x01, Attributes

ID#	Attribute name	Default, Min, Max	Data type
0x01	Output I/O parameter 1	0, 0, 32767	UINT16
0x02	Output I/O parameter 2	0, 0, 32767	UINT16
0x03	Output I/O parameter 3	0, 0, 32767	UINT16
0x04	Output I/O parameter 4	0, 0, 32767	UINT16
...			
0x20	Output I/O parameter 32	0, 0, 32767	UINT16

Communication

Instance 0x02, Attributes

ID#	Attribute name	Default, Min, Max	Data type
0x01	Input I/O parameter 1	0, 0, 32767	UINT16
0x02	Input I/O parameter 2	0, 0, 32767	UINT16
0x03	Input I/O parameter 3	0, 0, 32767	UINT16
0x04	Input I/O parameter 4	0, 0, 32767	UINT16
...			
0x20	Input I/O parameter 32	0, 0, 32767	UINT16

Fault tracing

RCNA-01 status codes

The status of the ControlNet module is indicated by a 'fieldbus status' parameter in the drive application program (refer to the drive documentation).

IDLE

The drive could not initiate communication with the ControlNet Module.

EXECUT. INIT

The module is initialising and performing self-test.

TIME-OUT

The ControlNet Module has stopped communicating with the drive.

CONFIG ERROR

The ControlNet Module has not accepted the configuration file downloaded from the drive. Check compatibility of module and drive file version number.

OFF-LINE

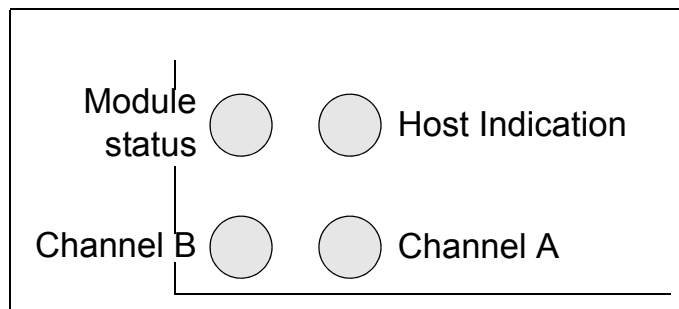
The module has completed its power-up sequence, and is waiting for a ControlNet Scanner or the Manager software to establish a connection.

ON-LINE

The ControlNet module is connected and communicating with a ControlNet Scanner or Manager software.

RESET

The drive has initiated a reset command to the module.



Name	Colour	Function
Channel A and Channel B	A and B: OFF	Steady - Module is not initialised.
	A and B: RED	Steady - Faulted unit, must be restarted or repaired
	A and B: RED/GREEN	Alternating - Self testing bus controller
	A and B: RED	Flashing - Incorrect node configuration, duplicate MacID etc.
	A or B: OFF	Steady - Channel is disabled, depending on network configuration.
	A or B: GREEN	Steady - Normal operation of channel
	A or B: GREEN	Flashing - Temporary errors (node will self correct) or node is not configured to go on-line
	A or B: RED	Flashing - Media fault or no other nodes on the network
	A or B: RED/GREEN	Alternating - Incorrect network configuration
Host Indication	GREEN	Flashing - Module is waiting for initialisation.
	GREEN	Steady - Module is initialised.
	RED	Steady - Major fault, module must be restarted

Module status Channel B Host Indication Channel A		
Name	Colour	Function
Module status	GREEN	Steady - Link functional
	GREEN	Flashing - Waiting for PLC connection
	RED	Steady - Link lost permanently.
	RED	Flashing - Link lost temporarily

Installation problems

Verify all the connections on the module:

- Check that the ControlNet cables are connected to the BNC connectors as described in chapter [Electrical installation](#).
- Check that the RCNA-01 module is properly inserted into the option slot.
- Check the fastening of the RCNA-01 module with the 2 screws.

Drive setup

The fieldbus parameter group is not shown on the panel:

- Enable the RCNA-01 by setting the appropriate drive parameter.

The RCNA-01 is using default values:

- Verify that the fieldbus parameter group is set up correctly. If so, turn off and on the power to the drive or issue a 'Fieldbus Adapter parameter refresh' command. This will make the module re-read its setup parameters.

Drive actual values can be read, but the control commands (start/stop or reference) do not go through:

- Check that the control location parameters of the drive are set to use the RCNA-01 as the source of the required command.
- Check that the drive is in REMOTE control.

PLC programming

The PLC program is beyond ABB Drives support. Contact the manufacturer for assistance.

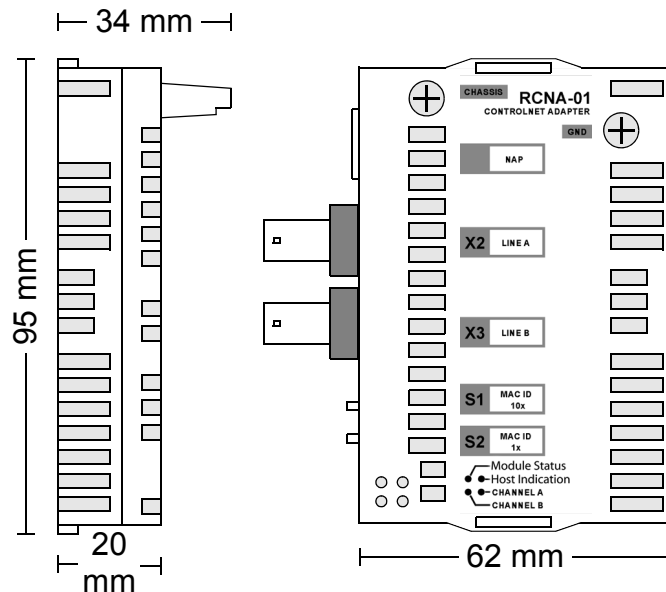
Scanner fault indications

Refer to scanner documentation.

Technical data

RCNA-01

Enclosure:



Mounting: Into an option slot inside the drive

Degree of protection: IP 20

Settings: Through drive parameters and/or rotary switches

Ambient conditions: The applicable ambient conditions specified for the drive in its *Hardware Manual* are in effect.

Connectors:

- 34-pin parallel bus connector
- Two BNC contacts for ControlNet connection
- NAP, Network Access Port for temporary connection of configuration tools

Current consumption:

- 260 mA max. (5 V), supplied by the control board of the drive

General:

- Estimated min. lifetime: 100 000 h
- All materials are UL/CSA approved
- Complies with EMC Standards EN 50081-2 and EN 50082-2

Fieldbus link

Compatible devices: Any ControlNet scanner

Medium: RG-6 quad shielded cable (coax)

- Termination: 75 Ω , 1%, Metal Film, 1/4 W
- Maximum Bus Length: 250 m (48 nodes), 1000 m (2 nodes) or 5000 m (with repeaters)

Topology: Bus, star or tree

Transfer rate: 5 MBit/s

Protocol: ControlNet