RDNA-01 DeviceNet™ Adapter Module

Overview

This chapter contains the basic start-up procedure of the ACH550/ACS550/ ACS800 and the DCS800 drives with the RDNA-01 DeviceNet Adapter module. The RDNA-01 DeviceNet adapter module is a optional device for ABB ACH550, ACS550, ACS800 and DCS800 drives which enables the connection of the drive to an DeviceNet network. Reference the specific drive user manual and RDNA-01 user manual for additional product information.

With the RDNA-01 module, the DeviceNet network may employ either the ODVA AC/DC Drive profile or the ABB Drives profile. The ACS800 drive product converts the ODVA profile to ABB Profile (detailed in the drive documentation) by the RDNA-01 module. The DCS800 drive employs only ABB Drives profiles. The DCS800 drive does not support the ODVA profile. With the ACS550 and ACH550 both the ODVA and ABB Profiles are converted to the DCU profile (detailed in drive documentation) by the RDNA-01 module.

Assembly objects

I/O Assembly Instances may also be referred to as Block Transfer of data. Intelligent devices realizing a Functional Profile, such as the RDNA-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 (for example a Polled 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 RDNA-01 uses dynamic assemblies that are configured by VSA I/O size.

Reference Documentation:

RDNA-01 DeviceNet Adapter User's Manual
3AFE64504223

ACS550-U1 Users Manual
3AUA0000001609

ACS800 Firmware Manual
3AFE64527592

DCS800 Firmware Manual
3ADW000193

RDNA-01 Installation, drive protocol & profile configuration

Mechanical installation

1. Insert the RDNA-01 into its specified slot in the drive (SLOT2 for ACS550, SLOT1 for ACS800 and DCS800)

2. Using the two mounting screws included in the module kit fasten the module to the drive.

Electrical installation

3. The bus cable is connected to terminal block X1 on the RDNA-01. The terminal block is described in table 1 below.

Table 1: Terminal Block Connections

X1		Description	Color
1	V-	Isolated ground	Black
2	CAN_L	CAN_L bus line	Blue
3	SHLD	Network cable shield	Bare
4	CAN_H	CAN_H bus line	White
5	V+	Isolated 24V DC voltage supply	Red

Drive protocol & profile configuration

The detailed procedure of activating the drive for communication with the module is dependent on the drive type. Parameter(s) must be adjusted to activate the desired communication port.

Refer to the User/Firmware Manual of the drive for additional protocol and profile settings.

4. Power up the drive.

5. Set Parameters as follows:

Table 2: ACH550/ACS550 Parameter Settings

Par. no.	Parameter Name	Setting
98.02	COMM PROT SEL	(4) EXT FBA

NOTE! With ACH550/ACS550 the profile selection is automatic.

RDNA-01 I/O assembly instances

Table 3: ACS800 Parameter Settings

Par. No.	Parameter Name	Setting
98.02	COMM MODULE LINK	FIELDBUS
98.07*	COMM PROFILE	ABB DRIVE GENERIC CSA 2.8/3.0

** For new drives system installations select either ABB DRIVE profile or Generic Drive profile. If replacing drives with application program 2.8 and 3.0 select CSA 2.8/3.0 profile for backward compatibility.*

The communication profile setting in the table below is parameter 98.07 in the ACS800 drive product. The ACS800 is the only drive product that this drive parameter will need to be programmed. Example: the drive is programmed to use assembly instances 21 and 71, parameter 98.07 needs to be programmed to “Generic Drive Profile.”

Table 4: Possible combinations of Input & Output Assembly Instances

Output Instance	Input Instance	Communication Profile To Be Used
20	70	Generic Drive Profile
	71	Generic Drive Profile
	171	Generic Drive Profile
21	70	Generic Drive Profile
	71	Generic Drive Profile
	171	Generic Drive Profile
121	70	Generic Drive Profile
	71	Generic Drive Profile
	171	Generic Drive Profile
100	101	ABB Drive Profile
	103	ABB Drive Profile
102	101	ABB Drive Profile
	103	ABB Drive Profile

NOTE! Assembly instance 103 can be used with AC/DC drive profile if it contains only drive parameters and not data sets.

Table 5: DCS800 Parameter Settings

Par. No.	Parameter Name	Setting
98.02	COMM MODULE	FIELDBUS

NOTE! The “MODULE STATUS” and “HOST INDICATION” LED should be green. If the network cable is connected to an active network, the green “NETWORK STATUS” LED should also be lit or blinking. If the configuration is correct, drive parameter group 51 should appear in the parameter list of the drive and show the status of the RDNA-01 configuration parameters.

RDNA-01 Network configuration

To enable communication through the DeviceNet network, the module must be configured for the network. There are two ways of setting the module mac address (DIP switch settings, parameter settings); reference RDNA-01 user manual's section "Electrical Installation" for more information.

NOTE! Input and Output assemblies connection sizes must match parameter 51.26 VSA I/O. The Input and Output assemblies will always equal eachother. ex: parameter 51.26 is programmed to 5, Input assembly size will be 5 words and Output assembly size will be 5 words.

Table 6: Network configuration with drive parameters

Par. No.	Parameter Name	Setting Range	Default Setting
51.01	MODULE TYPE	(read-only)	DEVICENET
51.02	MODULE MACID	0...63	63
51.03	MODULE BAUD RATE	(0) 125 kBits (1) 250 kBits (2) 500 kBits	0
51.04	HW/SW OPTION	(0) Hardware (1) Software	0
51.05	STOP FUNCTION	(0) Ramp Stop (1) Coast Stop	0
51.06	OUTPUT INSTANCE	20...102	20
51.07	INPUT INSTANCE	70...103	70
51.08	OUTPUT I/O PAR 1	0...32767	0
51.09	OUTPUT I/O PAR 2	0...32767	0
51.10	OUTPUT I/O PAR 3	0...32767	0
51.11	OUTPUT I/O PAR 4	0...32767	0
51.12	INPUT I/O PAR 1	0...32767	0
51.13	INPUT I/O PAR 2	0...32767	0
51.14	INPUT I/O PAR 3	0...32767	0
51.15	INPUT I/O PAR 4	0...32767	0
51.16	OUTPUT I/O PAR 5	0...32767	0
51.17	OUTPUT I/O PAR 6	0...32767	0
51.18	OUTPUT I/O PAR 7	0...32767	0
51.19	OUTPUT I/O PAR 8	0...32767	0
51.20	OUTPUT I/O PAR 9	0...32767	0
51.21	INPUT I/O PAR 5	0...32767	0
51.22	INPUT I/O PAR 6	0...32767	0
51.23	INPUT I/O PAR 7	0...32767	0
51.24	INPUT I/O PAR 8	0...32767	0
51.25	INPUT I/O PAR 9	0...32767	0
51.26	VSA I/O SIZE	1...9	4
51.27*	FBA Par Refresh	(0) DONE (1) REFRESH	(0) DONE

** New settings take effect only when the module power is cycled or when the module receives a Fieldbus Adapter parameter refresh by setting parameter 51.27 to REFRESH*

RDNA-01 Examples: **ACS800/DCS800/ACS550/ACH550** - ABB Drives Profile (9 Data words In/Out)

The drive is programmed to use data sets to write Main control word, reference 1, reference 2 and six additional parameters. The drive is programmed to read main status word, actual 1 and actual 2 and six additional parameters. Information on how a data set works can be found in the Overview section of this publication.

NOTE! ABB recommends using the data sets and index pointers when available in the drive product. Mapping parameters directly may result in slower update times or drive faults and should be used only after all data sets are occupied.

Table 7: I/O Assembly Instance 102 & 103

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACx550
10.01 EXT1 COMMANDS	COMM.CW	MainCtrlWord	COMM
10.03 DIRECTION	REQUEST	N/A	REQUEST
11.03 REF1 SELECT	COMM.REF	SpeedRef2301	COMM
16.04 FAULT RESET SEL	COMM.CW	N/A	COMM
98.02 COMM. PROT SEL	FIELDBUS	Fieldbus	EXT FBA
98.07 COMM PROFILE	ABB DRIVES*	N/A	N/A
51.01 MODULE TYPE	DEVICENET	DEVICENET	DEVICENET
51.02 MODULE MACID	2	3	4
51.03 MODULE BAUD RATE	(5) = 5 MBit/s	(5) = 5 MBit/s	(5) = 5 MBit/s
51.04 HW/SW OPTION	(1) Software	(1) Software	(1) Software
51.05 STOP FUNCTION	(1) Coast Stop	(1) Coast Stop	(1) Coast Stop
51.06 OUTPUT INSTANCE	102	102	102
51.07 INPUT INSTANCE	103	103	103
51.08 OUTPUT I/O PAR 1	(1) Main Control Word	(1) Main Control Word	(1) Main Control Word
51.09 OUTPUT I/O PAR 2	(2) Reference 1	(2) Speed Ref	(2) Reference 1
51.10 OUTPUT I/O PAR 3	(3) Reference 2	(3) Torq Ref A	(3) Reference 2
51.11 OUTPUT I/O PAR 4	(7) AUX DS REF3	(7) DsetXplus3Val1 (702) AuxCtrlWord	(2208) EMERG DEC TIME
51.12 INPUT I/O PAR 1	(4) Status Word	(4) Status Word	(4) Status Word
51.13 INPUT I/O PAR 2	(5) Actual Ref 1 (Speed)	(5) Actual Motor (Speed)	(5) Actual Ref 1 (Speed)
51.14 INPUT I/O PAR 3	(6) Actual Ref 2 (Torque)	(6) Actual Torque	(6) Actual Ref 2 (Torque)
51.15 INPUT I/O PAR 4	(10) Actual Ref 3 (305 FAULT WORD 1)	(10) DsetXplus-3Val1 (802 Auxiliary Status Word)	(106) POWER
51.16 OUTPUT I/O PAR 5	(8) AUX DS REF4	(8) DsetXplus2Val2 (703 AuxCtrlWord2)	(2204) ACCEL TIME 2

RDNA-01 Examples: **ACS800/DCS800/ACS550/ACH550** - ABB Drives Profile (9 Data words In/Out) (continued)

Table 7: I/O Assembly Instance 102 & 103 (continued)

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACx550
51.17 OUTPUT I/O PAR 6	(9) AUX DS REF5	(9) DsetXplus2Val3	(2205) DECEL TIME 2
51.18 OUTPUT I/O PAR 7	(1203) CONST SPEED 2	(13) DsetXplus-4Val1	(1202) CONST SPEED 1
51.19 OUTPUT I/O PAR 8	(1204) CONST SPEED 3	(14) DsetXplus-4Val2	(1203) CONST SPEED 2
51.20 OUTPUT I/O PAR 9	(1205) CONST SPEED 4	(15) DsetXplus-4Val3	(1204) CONST SPEED 3
51.21 INPUT I/O PAR 5	(11) Actual 4 (308 ALARM WORD 1)	(11) DsetXplus3Val2 (101 MotSpeedFilt)	(104) CURRENT
51.22 INPUT I/O PAR 6	(12) Actual 5 (306 FAULT WORD 2)	(12) DsetXplus-3Val3 (108 MotTorq)	(105) TORQUE
51.23 INPUT I/O PAR 7	(114) OP HOUR COUNTER	(16) DsetXplus-5Val1 (901 FaultWord1)	(109) OUTPUT VOLT-AGE
51.24 INPUT I/O PAR 8	(117) DI 6-1 STATUS	(17) DsetXplus-5Val2 (902 FaultWord2)	(115) KWH COUN-TER
51.25 INPUT I/O PAR 9	(121) RO 3-1 STATUS	(18) DsetXplus-5Val3 (903 FaultWord3)	(128) PID 1 SETPNT
51.26 VSA I/O SIZE	9	9	9
51.27 FBA PAR REFRESH **	(1) REFRESH**	(1) REFRESH**	(1) REFRESH**
90.01 AUX DS REF3 or DsetXVal1	(2204) ACCELTIME 2	(701) MainCtrlWord	N/A
90.02 AUX DS REF4 or DsetXVal2	(2205) DECELTIME 2	(2301) SpeedRef	N/A
90.03 AUX DS REF5 or DsetXVal3	(1202) CONST SPEED 1	(2501) TorqRefA	N/A
90.04 DsetXplus2Val1	N/A	(702) AuxCtrlWord	N/A
90.05 DsetXplus2Val2	N/A	(703) AuxCtrlWord2	N/A
90.06 DsetXplus2Val3	N/A	(1202) Const-Speed1	N/A
90.07 DsetXplus4Val1	N/A	(1203) Const-Speed2	N/A
90.08 DsetXplus4Val2	N/A	(1204) Const-Speed3	N/A
90.09 DsetXplus4Val3	N/A	(1205) Const-Speed4	N/A
92.01 DsetXplus1Val1	N/A	(801) MainStatWord	N/A
92.02 MAIN DS ACT1 or DsetXplus1Val2	(102) SPEED	(104) MotSpeed	N/A

RDNA-01 Examples: **ACS800/DCS800/ACS550/ACH550** - ABB Drives Profile (9 Data words In/Out) (continued)

Table 7: I/O Assembly Instance 102 & 103 (continued)

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACx550
92.03 MAIN DS ACT2 or DsetXplus1Val3	(105) TORQUE	(209) TorqRef2	N/A
92.04 AUX DS ACT3 or DsetXplus3Val1	(305 FAULT WORD 1)	(802) AuxStatWord	N/A
92.05 AUX DS ACT4 or DsetXplus3Val2	(308 ALARM WORD 1)	(101) MotSpeedFilt	N/A
92.06 AUX DS ACT5 or DsetXplus3Val3	(306 FAULT WORD 2)	(108) Mot-Torq	N/A
92.07 DsetXplus5Val1	N/A	(901) FaultWord1	N/A
92.08 DsetXplus5Val2	N/A	(902) FaultWord2	N/A
92.09 DsetXplus5Val3	N/A	(903) FaultWord3	N/A

** This parameter is only in the ACS800 product.*

*** New settings take effect only when the module power is cycled or when the module receives a Fieldbus Adapter parameter refresh by setting parameter 51.27 to REFRESH.*

RDNA-01 Examples: **ACS800/ACS550/ACH550** - Generic Drive Profile (2 Data words In/Out)

Table 8: I/O Assembly Instance 21 & 71

Drive Parameter	Example setting for ACS800, ACx550
10.01 EXT1 COMMANDS	COMM.CW
10.03 DIRECTION	REQUEST
11.03 REF1 SELECT	COMM.REF
16.04 FAULT RESET SEL	COMM.CW
98.02 COMM PROT SEL	FIELDBUS
98.07 COMM PROFILE	GENERIC*
51.01 MODULE TYPE	DEVICENET
51.02 MODULE MACID	2
51.03 MODULE BAUD RATE	(0) 125 Kbits
51.04 HW/SW OPTION	(1) Software
51.05 STOP FUNCTION	(1) Coast Stop
51.06 OUTPUT INSTANCE	21
51.07 INPUT INSTANCE	71
51.08 OUTPUT I/O PAR 1	(0)**
51.09 OUTPUT I/O PAR 2	(0)**
51.10 OUTPUT I/O PAR 3	(0)**
51.11 OUTPUT I/O PAR 4	(0)**
51.12 INPUT I/O PAR 1	(0)**
51.13 INPUT I/O PAR 2	(0)**
51.14 INPUT I/O PAR 3	(0)**
51.15 INPUT I/O PAR 4	(0)**
51.16 OUTPUT I/O PAR 5	(0)**
51.17 OUTPUT I/O PAR 6	(0)**
51.18 OUTPUT I/O PAR 7	(0)**
51.19 OUTPUT I/O PAR 8	(0)**
51.20 OUTPUT I/O PAR 9	(0)**
51.21 INPUT I/O PAR 5	(0)**
51.22 INPUT I/O PAR 6	(0)**
51.23 INPUT I/O PAR 7	(0)**
51.24 INPUT I/O PAR 8	(0)**
51.25 INPUT I/O PAR 9	(0)**
51.26 VSA I/O SIZE	2
51.27 FBA PAR REFRESH	(1) REFRESH***

** This parameter is only in the ACS800 product.*

*** When output instance 20 or 21 and input instance 70 or 71 are selected the Input & Output I/O Parameters 51.08 - 51.25 MUST be set to the default value of (0)*

**** New settings take effect only when the module power is cycled or when the module receives a Fieldbus Adapter parameter refresh by setting parameter 51.27 to REFRESH.*

RDNA-01 Examples: **ACS800/ACS550/ACH550** - ODVA Profile (11 total Data words In/Out). Nine of the In/Out Data words are user configured by parameters in group 51.

The example will write the Main Control Word, Speed Ref, and nine user configured parameters. It will read Main status word, Actual speed, and nine user configured parameters. The Assembly Instance 121 & 171 the Main Control, Speed Ref, Main status word, Actual speed do not have to be programmed in group 51 Input/Output I/O parameters.

Table 9: I/O Assembly Instance 121 & 171

Drive Parameter	ACS800	ACS550
10.01 EXT1 COMMANDS	COMM.CW	COMM
10.03 DIRECTION	REQUEST	REQUEST
11.03 REF1 SELECT	COMM.REF	COMM
16.04 FAULT RESET SEL	COMM.CW	COMM
98.02 COMM PROT SEL	FIELDBUS	EXT FBA
98.07 COMM PROFILE	GENERIC*	N/A
51.01 MODULE TYPE	DEVICENET	DEVICENET
51.02 MODULE MACID	2	4
51.03 MODULE BAUD RATE	(0) 125 Kbits	(0) 125 Kbits
51.04 HW/SW OPTION	(1) Software	(1) Software
51.05 STOP FUNCTION	(1) Coast Stop	(1) Coast Stop
51.06 OUTPUT INSTANCE	121	121
51.07 INPUT INSTANCE	171	171
51.08 OUTPUT I/O PAR 1	(3) Reference 2	(3) Reference 2
51.09 OUTPUT I/O PAR 2	(7) AUX DS REF3	(2204) ACCEL TIME 2
51.10 OUTPUT I/O PAR 3	(8) AUX DS REF4	(2205) DECEL TIME 2
51.11 OUTPUT I/O PAR 4	(9) AUX DS REF5	(1202) CONST SPEED 1
51.12 INPUT I/O PAR 1	(6) Actual Ref 2 (Torque)	(6) Actual Ref 2 (Torque)
51.13 INPUT I/O PAR 2	(10) Actual Ref 3 (305 FAULT WORD 1)	(106) POWER
51.14 INPUT I/O PAR 3	(11) Actual 4 (308 ALARM WORD 1)	(104) CURRENT
51.15 INPUT I/O PAR 4	(12) Actual 5 (306 FAULT WORD 2)	(105) TORQUE
51.16 OUTPUT I/O PAR 5	(1203) CONST SPEED 2	(1203) CONST SPEED 2
51.17 OUTPUT I/O PAR 6	(1204) CONST SPEED 3	(1204) CONST SPEED 3
51.18 OUTPUT I/O PAR 7	(1205) CONST SPEED 4	(1205) CONST SPEED 4
51.19 OUTPUT I/O PAR 8	(1206) CONST SPEED 5	(1206) CONST SPEED 5
51.20 OUTPUT I/O PAR 9	(1207) CONST SPEED 6	(1207) CONST SPEED 6

RDNA-01 Examples: **ACS800/ACS550/ACH550** - (continued) ODVA Profile (11 total Data words In/Out). Nine of the In/Out Data words are user configured by parameters in group 51.

Table 9: I/O Assembly Instance 121 & 171 (continued)

Drive Parameter	ACS800	ACS550
51.21 INPUT I/O PAR 5	(114) OP HOURCOUNTER	(109) OUTPUT VOLTAGE
51.22 INPUT I/O PAR 6	(117) DI 6-1 STATUS	(115) KWH COUNTER
51.23 INPUT I/O PAR 7	(121) RO 3-1 STATUS	(128) PID 1 SETPNT
51.24 INPUT I/O PAR 8	(135) MOTOR 1 TEMP	(141) MWH COUNTER
51.25 INPUT I/O PAR 9	(143) MOTOR RUN TIME	(145) MOTOR TEMP
51.26 VSA I/O SIZE	9**	9**
51.27 FBA PAR REFRESH	(1) REFRESH***	(1) REFRESH***
90.01 AUX DS REF3	(2204) ACCELTIME 2	N/A
90.02 AUX DS REF4	(2205) DECELTIME 2	N/A
90.03 AUX DS REF5	(1202) CONST SPEED 1	N/A
92.02 MAIN DS ACT1	(102) SPEED	N/A
92.03 MAIN DS ACT2	(105) TORQUE	N/A
92.04 AUX DS ACT3	(305) FAULT WORD 1	N/A
92.05 AUX DS ACT4	(308) ALARM WORD 1	N/A
92.06 AUX DS ACT5	(306) FAULT WORD 2	N/A

** This parameter is only in the ACS800 product.*

*** The value of this parameter should not include Main Control, Speed Ref, Main status word, Actual speed for Assembly 121 & 171.*

**** New settings take effect only when the module power is cycled or when the module receives a Fieldbus Adapter parameter refresh by setting parameter 51.27 to REFRESH.*