

# Basic Guide to Communications ODVA

ControlNet™

DeviceNet™

EtherNet I/P™



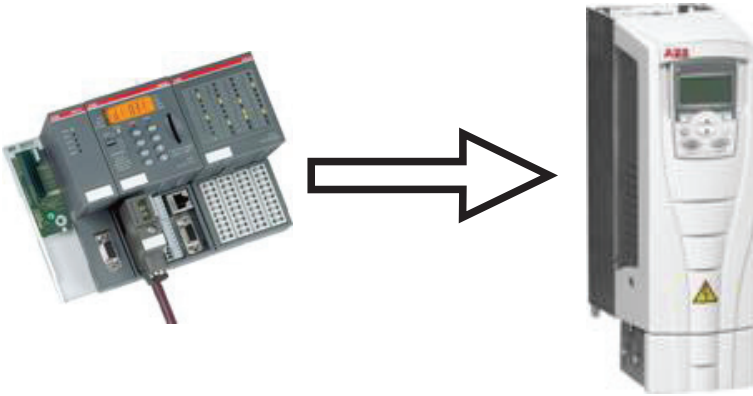
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## Trademarks

ControlNet™ is a trademark of ControlNet International, LTD.  
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# Basic Guide to Communications Overview



## Overview

This document contains an overview on how fieldbus communications are handled in ABB Drive Products. Please reference the documents below for additional information about fieldbus communications.

## Reference Documentation:

ACS350 User's Manual  
3AFE68462401

ACS355 User's Manual  
3AUA0000066143

ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

Firmware Manual ACS850  
Standard Control Program  
3AUA0000045497

ACSM1 Speed and Torque  
Control Program Firmware  
Manual  
3AFE68848261

DCS800 Firmware Manual  
3ADW000193

## Fieldbus adapters for ABB drives

There are three series of fieldbus adapters. The F-series fieldbus adapters are for ACS350, ACS355, ACS850 and ACSM1. The R-series fieldbus adapters are for ACS800, DCS800 and ACx550. Both the F-series and R-series install under the cover of the product. The N-series fieldbus adapters are for the ACS800 and DCS800 with the fiber optic option installed on the drive. The N-series are DIN-rail mountable and require 24V DC power.

### F-series for ACS350, ACS355, ACS850, ACSM1



- Plugs on the drive under the cover
- Electrical interface with drive

### R-series for ACx550, ACS800, DCS800



- Plugs on the drive under the cover
- Electrical interface with drive

### N-series for ACS800, DCS800



- DIN-rail mountable
- Optical interface with drive
- Requires DDCS option

## Available fieldbus options for ABB drives

Select the correct fieldbus module for the drive product and protocol.

	Protocol	ACS800	ACS850	ACS550	ACH550	ACS350/ ACS355	ACSM1	DCS800
Industrial	CANopen	RCAN-01	FCAN-01	RCAN-01	RCAN-01	FCAN-01	FCAN-01	RCAN-01
	DeviceNet	RDNA-01	FDNA-01	RDNA-01	RDNA-01	FDNA-01	FDNA-01	RDNA-01
	ControlNet	RCNA-01	N/A	RCNA-01	RCNA-01	N/A	N/A	RCNA-01
	EtherNet/IP	RETA-01	FENA-01	RETA-01	RETA-01	FENA-01	FENA-01	RETA-01
	InterBus	NIBA-01	N/A	N/A	N/A	N/A	N/A	NIBA-01
	Modbus® RTU	RMBA-01	FSCA-01	internal	intenal	FMBA-01, FRSA-00, panel port	FSCA-01	RMBA-01
	Modbus TCP	RETA-01, NETA-01	FENA-01	RETA-01	RETA-01	FENA-01	FENA-01	RETA-01, NETA-01
	PROFIBUS DP®	RBPA-01	FPBA-01	RBPA-01	RBPA-01	FBPA-01	FPBA-01	RBPA-01
	PROFINET I/O®	RETA-02	N/A	RETA-02	RETA-02	N/A	N/A	N/A
	EtherCAT	RECA-01	N/A	RECA-01	N/A	N/A	N/A	N/A

## Fieldbus control interface

The basic fieldbus control will communicate the following information:

The basic control interface between the fieldbus system and the drive consists of the following:

The **Control Word (CW)** is the principle means of controlling the drive from a fieldbus system. The Control Word is sent by the fieldbus controller to the drive. The drive switches between its states according to the bit-coded instructions of the Control Word.

The **Status Word (SW)** is a word containing status information, sent by the drive to the fieldbus controller.

**References (REF)** are 16 bit signed integers. A negative reference (indicating reversed direction of rotation) is formed by calculating the two's complement from the corresponding positive reference value. The contents of each reference word can be used, as speed or frequency reference or as set-point for PID controller.

**Actual Values (ACT)** are 16/32 bit words containing information on selected operations of the drive.

Most fieldbus interfaces support controlling of the drive and reading and writing drive parameters.

Control is usually done via **fast cyclic communication** or so called I/O connection.

Parameter read and write can be done with the **fast cyclic communication**, by programming the fast data to point to parameters or with **slower acyclic communication**.

Mapping of the information is fieldbus specific and may be specified by a device profile.

Device profiles are commonly specified by manufacturer organizations, who support certain fieldbus network.

# ABB drives communication profile state diagram

The state diagram below describes the start-stop function of the CONTROL WORD (CW) and STATUS WORD (SW) bits. The ABB Drives profile operates on a state machine. The flow chart shows the steps required by the state machine to operate the drive.

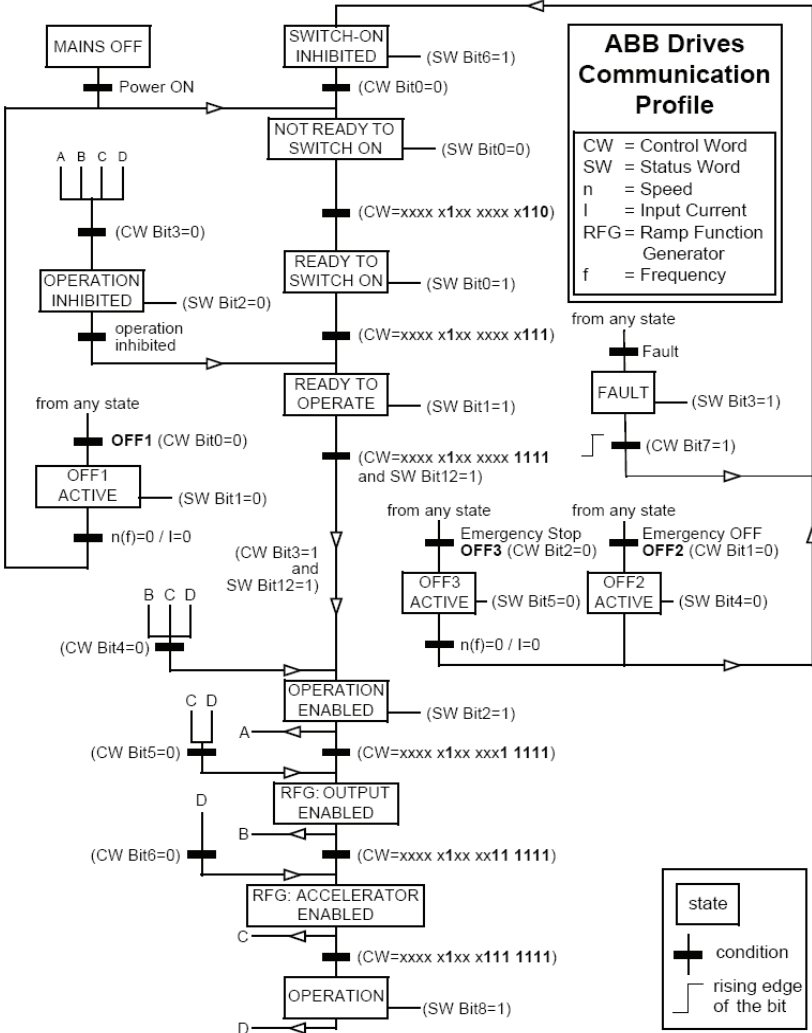


ABB State Transition Diagram

## ABB drives communication profile state diagram

To control the ABB profile state machine is to transmit a value of 1150 in decimal format (Binary:0000 0100 1111 1110), this gets the drive ready to operate.

Then transmit 1151 decimal (Binary:0000 0100 1111 1111) to drive, this will command a start and the drive will ramp up to commanded speed.

The drive will stop when 1150 decimal (Binary:0000 0100 1111 1110) is transmitted to the drives main control word.

Different ways of stopping the drive are available when utilizing the ABB drives profile.

**Coast Stop** - Once running, simply reset Bit 1 (0000 0100 1111 1101). Once this is done, to restart the drive Bit 1 must be set “1”, then cycle Bit ) to “0”, then back to a “1”. The drive will start.

**Ramp Stop** - Once running, simply reset Bit 0 (0000 0100 1111 1110) and drive will Decelerate to zero speed following the active Decal Rate (Parameter 22.03 or 22.05). To restart the drive, simply set Bit 0 to “1”.

**E-Stop (Faststop)** - Once running, reset Bit 2 (0000 0100 1111 1011) and drive will Decelerate to zero speed following the Rate in Parameter 22.07.

## Association Specific Profiles

There are multiple fieldbus association network specific profiles. The association network controls the way the profile operates for a given product type. ABB Low Voltage Drives comply with most of the association networks. The ODVA AC/DC drive profile is used with ControlNet™, DeviceNet™ and EtherNet/IP™. The PROFIdrive Profile is used with PROFIBUS DP and PROFINET I/O. The LonMark Variable Speed Motor Drive functional profile is used with LonWorks. More information on these association profiles can be located in the protocol user manual.



## ABB drives communication profile Control Word

This is the ABB drives profile main control word. The main control uses 12 of the 16 bits. The ABB drives profile has three different stop types within the main control word. Example bit 2 of the main control word is the emergency stop control for the drive.

Bit	Name	Value	STATE/Description
0	OFF1 CONTROL	1	Enter READY TO OPERATE.
		0	Stop along currently active deceleration ramp (22.03/22.05). Enter OFF1 ACTIVE; proceed to READY TO SWITCH ON unless other interlocks (OFF2, OFF3) are active.
1	OFF2 CONTROL	1	Continue operation (OFF2 inactive)
		0	Emergency OFF, coast to stop. Enter OFF2 ACTIVE; proceed to SWITCH-ON INHIBITED.
2	OFF3 CONTROL	1	Continue operation (OFF3 inactive)
		0	Emergency stop, stop within time defined by par. 22.07. Enter OFF3 ACTIVE; proceed to SWITCH-ON INHIBITED.  Warning: Ensure motor and driven machine can be stopped using this stop mode.
3	INHIBIT OPERATION	1	Enter OPERATION ENABLED. (Note: The Run Enable signal must be active; see parameter 16.01. If par. 16.01 is set to COMM. CW, this bit also activates the Run Enable signal.)
		0	Inhibit operation. Enter OPERATION INHIBITED.
4	RAMP_OUT_ZERO	1	Normal operation. Enter RAMP FUNCTION GENERATOR: OUTPUT ENABLED.
		0	Force Ramp Function Generator output to zero. Drive ramps to stop (current and DC voltage limits in force).
5	RAMP_HOLD	1	Enable ramp function. Enter RAMP FUNCTION GENERATOR: ACCELERATOR ENABLED.
		0	Halt ramping (Ramp Function Generator output held).
6	RAMP_IN_ZERO	1	Normal operation. Enter OPERATING.
		0	Force Ramp Function Generator input to zero.
7	RESET	0 - 1	Fault reset if an active fault exists. Enter SWITCH-ON INHIBITED.
		0	Continue normal operation.
8	INCHING_1	1	Not in use.
		1 - 0	Not in use.
9	INCHING_2	1	Not in use.
		1 - 0	Not in use.
10	REMOTE_CMD	1	Fieldbus control enabled.
		0	Control Word <> 0 or Reference <> 0: Retain last Control Word and Reference. Control Word = 0 and Reference = 0: Fieldbus control enabled. Reference and deceleration/acceleration ramp are locked.
11	EXT CTRL LOC	1	Select External Control Location EXT2. Effective if par. 11.02 is set to COMM.CW.
		0	Select External Control Location EXT1. Effective if par. 11.02 is set to COMM.CW.
12 ... 15	Reserved		

## ABB drives communication profile Status Word

This is the ABB drives profile main status word. The main status word uses 13 of the 16 bits except in the ACS800 drive. Bits 13 & 14 in the ACS800 are programmable by parameters 92.08 and 92.09. Example bit 8 will be active when the drive is at speed or bit 3 will be active when the drive is faulted.

Bit	Name	Value	STATE/Description
0	RDY_ON	1	READY TO SWITCH ON.
		0	NOT READY TO SWITCH ON.
1	RDY_RUN	1	READY TO OPERATE.
		0	OFF1 ACTIVE
2	RDY_REF	1	OPERATION ENABLED.
		0	OPERATION INHIBITED
3	TRIPPED	1	FAULT.
		0	No fault.
4	OFF_2_STA	1	OFF2 inactive.
		0	OFF2 ACTIVE.
5	OFF_3_STA	1	OFF3 inactive.
		0	OFF3 ACTIVE.
6	SWC_ON_INHIB	1	SWITCH-ON INHIBITED.
		0	
7	ALARM	1	Warning/Alarm.
		0	No Warning/Alarm.
8	AT_SETPOINT	1	OPERATING. Actual value equals reference value(=is within tolerance limits i.e. in speed control the speed error is less than or equal to 10% of the nominal motor speed).
		0	Actual value differs from reference value (= is outside tolerance limits).
9	REMOTE	1	Drive control location: REMOT (EXT1 or EXT2).
		0	Drive control location: LOCAL
10	ABOVE_LIMIT	1	Bit is read from the address defined by parameter 92.07 MSW B10 PTR. The default value is signal 03.14 bit 9 ABOVE_LIMIT: Actual frequency or speed value equals or exceeds the supervision limit (par. 32.02).
		0	Actual frequency or speed value is within supervision limit.
11	EXT CTRL LOC	1	External Control Location EXT2 selected.
		0	External Control Location EXT1 selected.
12	EXT RUN ENABLE	1	External Run Enable signal received.
		0	No External Run Enable signal received
13*			Bit is read from the address defined by parameter 92.08 MSW B13 PTR. By default no address has been selected.
14*			Bit is read from the address defined by parameter 92.09 MSW B14 PTR. By default no address has been selected.
15*		1	Communication error detected by fieldbus adapter module (on fiber optic channel CH0).
		0	Fieldbus adapter (CH0) communication OK.

\* For ACS800 only

## DCS800 - Main Control Word

This is the main control word for the DCS800 drive. The DCS800 drive operates on a state machine. The fieldbus will have to transmit 1142 decimals to the DCS800 drive to get the drive ready to run. Then the fieldbus will have to transmit 1143 decimals to activate the main contact for the DCS800 drive. Once the fieldbus transmits 1151 decimals to the DCS800, the drive will start. To stop the DCS800 follow the reverse order from 1151 to 1143 to 1142 decimals

Bit	15 ... 11	RemoteCmd	Inching2	Inching1	Reset	RampInZero	RampHold	RampOutZero	Run	Off2N	Off2N	On	Dec.	Hex.
Reset		1	x	x	1	x	x	x	x	x	x	x	1270	04F6
Off (before On)		1	0	0	0	x	x	x	0	1	1	0	1142	0476
On (main cont. On)		1	0	0	0	x	x	x	0	1	1	1	1143	0477
Run (with reference)		1	0	0	0	1	1	1	1	1	1	1	1151	047F
E-Stop		1	x	x	x	1	1	1	1	0	1	1	1147	047B
Start inhibit		1	x	x	x	x	x	x	x	x	0	x	1140	0474

Examples for the MainCtrlWord (7.01)

## DCS800 - Main Status Word

This is the main status word for the DCS800 drive. The main status word provides information about the status of the drive. Example bit 3 will indicate if the drive is faulted or if bit 5 is active, it will indicate that the drive was stopped by OFF type 3.

### 8.01 MainStatWord (main status word, MSW)

Bit	Name	Value	Comment
B0	RDY_ON	1	Ready to switch on
		0	Not ready to switch on
B1	RDY_RUN	1	Ready to generate torque
		0	Not ready to generate torque
B2	RDY_REF	1	Operation released (Running)
		0	Operation blocked
B3	TRIPPED	1	Fault indication
		0	No fault
B4	OFF2NSTATUS	1	OFF2 not active
		0	OFF2 (OnInhibit state) active
B5	OFF3NSTATUS	1	OFF3 not active
		0	OFF3 (OnInhibit state) active
B6	ONINHIBITED	1	OnInhibited state is active after a: - fault - Emergency Off/Coast Stop (OFF3) - E-stop (OFF2) - OnInhibited via digital input OFF2 (10.08) or E Stop (10.09)
		0	OnInhibit state not active
B7	ALARM	1	Alarm indication
		0	No alarm
B8	AT_SETPOINT	1	Setpoint/actual value monitoring in the tolerance zone
		0	Setpoint/actual value monitoring out of the tolerance zone
B9	REMOTE	1	Remote control
		0	Local control
B10	ABOVE_LIMIT	1	Speed greater than defined in SpeedLev (50.10)
		0	Speed lower or equal than defined SpeedLev (50.10)
B11 TO B15	RESERVED		

# ABB drives profile reference scaling

## ACS800

Ref. No.	Application Macro Used (par.99.02)	Range	Reference Type	Scaling	Notes
REF1	(any)	-32768 ... 32767	Speed or Frequency (not with FAST COMM)	-20000 = [par.11.05] -1 = [par.11.04] 0 = [par.11.04] 20000 = [par. 11.05]	Final reference limited by 20.01/20.02 (speed) or 20.07/20.08 (frequency)
			Speed or Frequency with FAST COMM	-20000 = [par. 11.05] 0 = 0 20000 = [par. 11.05]	Final reference limited by 20.01/20.02 (speed) or 20.07/20.08 (frequency)
REF2	FACTORY, HAND/AUTO, or SEQ CTRL	-32768 ... 32767	Speed or Freq. (not with FAST COMM)	-20000 = [par. 11.08] -1 = [par. 11.07] 0 = [par. 11.07] 20000 = [par. 11.08]	Final reference limited by 20.01/20.02 (speed) or 20.07/20.08 (frequency)
			Speed or Freq. with FAST COMM	-20000 = [par. 11.08] 0 = 0 20000 = [par. 11.08]	Final reference limited by 20.01/20.02 (speed) or 20.07/20.08 (frequency)
	T CTRL or M/F (optional)	-32768 ... 32767	Torque (not with FAST COMM)	-10000 = [par. 11.08] -1 = [par. 11.07] 0 = [par. 11.07] 10000 = [par. 11.08]	Final reference limited by par. 20.04.
			Torque with FAST COMM	-10000 = [par. 11.08] 0 = 0 10000 = [par. 11.08]	Final reference limited by par. 20.04.
	PID CTRL	-32768 ... 32767	PID Reference (not with FAST COMM)	-10000 = [par. 11.08] -1 = [par. 11.07] 0 = [par. 11.07] 10000 = [par. 11.08]	
			PID Reference with FAST COMM	-10000 = [par. 11.08] 0 = 0 10000 = [par. 11.08]	

The table above is the reference scaling for the fieldbus control. the maximum speed/frequency for reference 1 scaling is +/- 20,000. The drive will run in reverse when a negative speed is commanded. The maximum reference for reference 2 will be based on the setting of 99.02 Application Macro. Example: when the ACS800 is programmed for factory macro the maximum reference 2 is +/- 20,000; but when it is programmed for Torque control the maximum reference 2 is +/- 10,000.

## DCS800

Reference	Range	Scaling	Notes
SpeedRef(23.01)	-32768 ... 32767	-20000 = [par. 50.01] 20000 = [par. 50.01]	Final reference limited by 20.01/20.02 (RPM)
TorqRefA(25.01)	-32768 ... 32767	-10000 = [par. 50.01] 10000 = [par. 50.01]	Final reference limited by par. 20.05

The table above is the reference scaling for the fieldbus control. The maximum speed/frequency for reference 1 scaling is +/- 20,000. The drive will run in reverse when a negative speed is commanded. The maximum speed/frequency for reference 2 scaling is +/- 10,000.

## ABB drives profile reference scaling (continued)

### ACS550 and ACS350, ACS355

ABB Drives Profile (FBA)				
Ref. No.	Range	Reference Type	Scaling	Notes
REF1	-32768 ... +32767	Speed or Frequency	-20000 = [-par.1105] 0 = 0 +20000 = [par. 1105] (20000 corresponds to 100%)	Final reference limited by 1104/1105. Actual motor speed limited by 2001/2002 (speed) or 2007/2008 (frequency)
		Speed or Frequency	-10000 = [-par. 1108] 0 = 0 +10000 = [par. 1108] (10000 corresponds to 100%)	Final reference limited by 1107/1108. Actual motor speed limited by 2001/2002 (speed) or 2007/2008 (frequency)
		Torque	-10000 = [-par. 1108] 0 = 0 +10000 = [par. 1108] (10000 corresponds to 100%)	Final reference limited by 2015/2017 (torque1) or 2016/2018 (torque2).
REF2	-32768 ... +32767	PID Reference	-10000 = [-par. 1108] 0 = 0 +10000 = [par. 1108] (10000 corresponds to 100%)	Final reference limited by 4012/4013 (PID set1) or 4112/4113 (PID set2).

The table above is the reference scaling for the fieldbus control. The maximum speed/frequency for reference 1 scaling is +/- 20,000. The drive will run in reverse when a negative speed is commanded. The maximum speed/frequency for reference 2 scaling is +/- 10,000.

### ACS850

When torque or speed reference scaling is selected (by parameter 50.04 FBA REF1 MODESEL / 50.05 FBA REF2 MODESEL), the fieldbus references are 32 bit integers. The value consists of a 16 bit integer value and a 16 bit fractional value. The speed/torque reference scaling is as follows:

Reference	Scaling	Notes
Speed reference	FBA REF / 65536 (value in rpm)	Final reference limited by parameters 20.01 Maximum speed, 20.02 Minimum speed and 21.09 SpeedRef min abs.
Torque reference	FBA REF / 65536 (value in %)	Final reference is limited by torque limit parameters. 20.06...20.10.

## ABB drives profile reference scaling (continued)

### ACSM1

When torque or speed reference scaling is selected (by parameter 50.04 FBA REF1 MODESEL / 50.05 FBA REF2 MODESEL), the fieldbus references are 32 bit integers. The value consists of a 16 bit integer value and a 16 bit fractional value. The speed/torque reference scaling is as follows:

Reference	Scaling	Notes
Speed reference	FBA REF / 65536 (value in rpm)	Final reference limited by parameters 20.01 Maximum speed, 20.02 Minimum speed and 24.12 SpeedRef min abs.
Torque reference	FBA REF / 65536 (value in %)	Final reference is limited by parameters 20.06 Maximum torque and 20.07 Minimum torque.

## 32 bit Parameters

The ACS850 and ACSM1 use 16 bit and 32 bit parameter information.

Example:



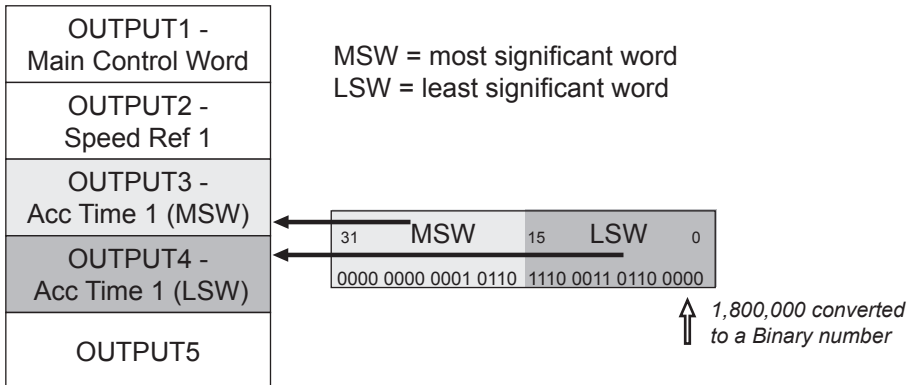
Maximum value for Acc Time 1 is  $1800.000 \times 1000 = 1,800,000$

Example:

Name / Value	Description	FbEq*				
22.02 Acc time 1	<p>Defines acceleration time 1 as the time required for the speed to change from zero to the speed value defined by parameter 19.01 Speed scaling.</p> <p>If the speed reference increases faster than the set acceleration rate, the motor speed will follow the acceleration rate.</p> <p>If the speed reference increases slower than the set acceleration rate, the motor speed will follow the reference signal.</p> <p>If the acceleration time is set too short, the drive will automatically prolong the acceleration in order not to exceed the drive torque limits.</p>					
0.000 ... 1800.000 s	Acceleration time 1.	1000 = 1 s				
22.02	Acc time 1	REAL	32	0 ... 1800	s	20.000 s

\*FbEq = Fieldbus equivalent. The scaling between the value shown on the panel and the integer used in serial communication.

When mapping a parameter, check the firmware manual to find if the parameter transmitted or received will use 16 or 32 bits. If the parameter is a 32 bit it will be split into two 16 bit parameter. The first 16 bits will be the most significant word (MSW) and the second will be the least significant word (LSW).





## 32 bit Parameters (continued)

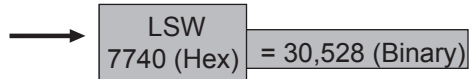
Converting a 32 bit word into two 16 bit words

The maximum value for a 16 bit signed integer is +/- 32767. The maximum value for Acc Time 1 is 1,800,000. The value of 1,800,000 will not fit into a 16 bit integer.

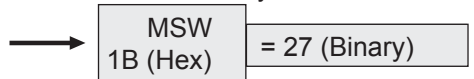
Convert 1,800,000 to a Hex number



Maximum value for the 16 bit LSW word convert to binary



Maximum value for the 16 bit MSW word convert to binary



MSW = most significant word

LSW = least significant word

# What is a data set?

One data set consists of three 16 bit words called data words. The data set will be transmitted and received by the fieldbus controller. The example below is displaying the data set from the fieldbus controller to the drive.

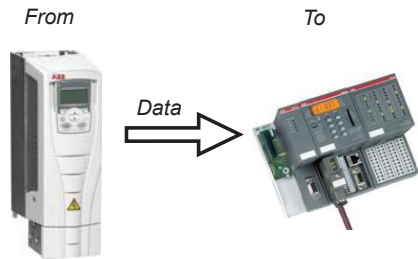
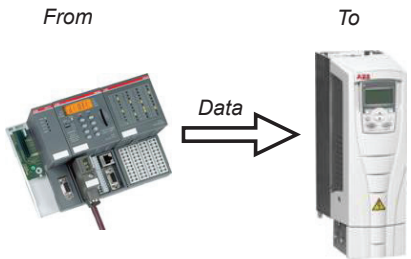
Data from fieldbus controller to drive			
	Word	Contents	Selector
Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

Word One

Word Two

Word Three

A drive product can have multiple data sets. The table below shows four data sets. The two data sets on the left (data sets 1 and 3) are from the fieldbus controller to the drive. The two on the right (data sets 2 and 4) are from the drive to the fieldbus controller.



Data from fieldbus controller to drive		
Word	Contents	Selector

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data Set 1 Example

Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

### Data Set 2 Example

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	(Fixed)
5	2nd word	Actual 1	**Par. 92.02
6	3rd word	Actual 2	Par. 92.03

### Data Set 3 Example

Index	Auxiliary Reference data set DS3		
7	1st word	Reference 3	Par. 90.01
8	2nd word	Reference 4	Par. 90.02
9	3rd word	Reference 5	Par. 90.03

### Data Set 4 Example

Index	Aux. Actual Signal data set DS4		
10	1st word	Actual 3	Par. 92.04
11	2nd word	Actual 4	Par. 92.05
12	3rd word	Actual 5	Par. 92.06

## Data set questions

Question #1 How many words will be transmitted and received if the drive is programmed for **two** data sets?

Answer: 6 words (three Input and three Output words).

Data from fieldbus controller to drive		
Word	Contents	Selector

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 1

Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

### Data set 2

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	(Fixed)
5	2nd word	Actual 1	Par. 92.02
6	3rd word	Actual 2	Par. 92.03

Question #2 How many words will be transmitted and received if the drive is programmed for **four** data sets?

Answer: 12 words (six Input and six Output words).

Data from fieldbus controller to drive		
Word	Contents	Selector

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 1

Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

### Data set 2

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	(Fixed)
5	2nd word	Actual 1	Par. 92.02
6	3rd word	Actual 2	Par. 92.03

### Data set 3

Index	Auxiliary Reference data set DS3		
7	1st word	Reference 3	Par. 90.01
8	2nd word	Reference 4	Par. 90.02
9	3rd word	Reference 5	Par. 90.03

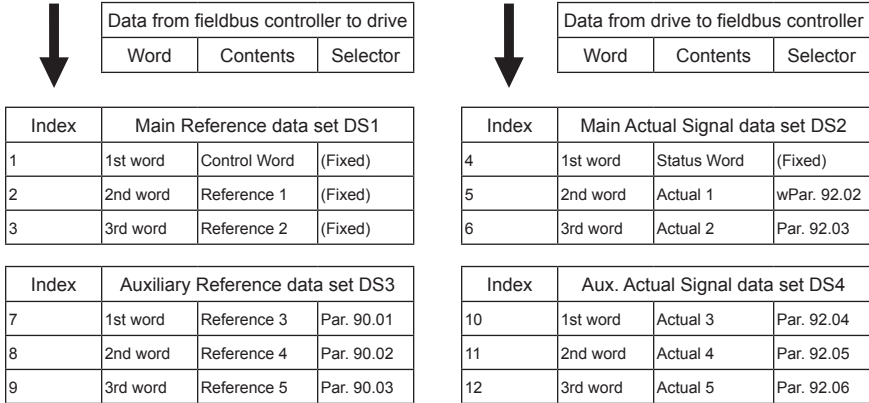
### Data set 4

Index	Aux. Actual Signal data set DS4		
10	1st word	Actual 3	Par. 92.04
11	2nd word	Actual 4	Par. 92.05
12	3rd word	Actual 5	Par. 92.06

# Index numbers - Indirect pointers

The index number is the value used to map fieldbus parameters into the drive.

Index numbers utilize indirect pointers.



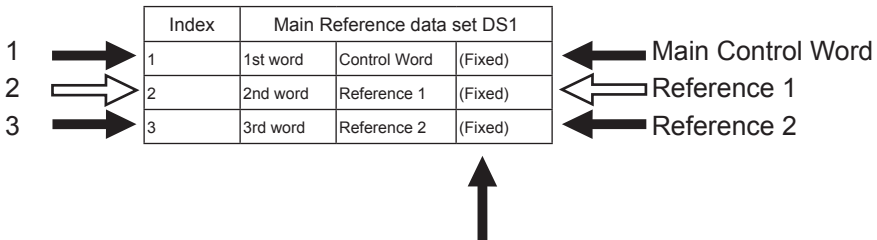
Programming the drive parameter to index number 1, the first word from the PLC will write Control Word. Programming the drive to index number 2, the second word from the PLC will write Reference 1. Programming the drive parameter to index 3, the third word from the PLC will write Reference 2.

Using index numbers.

Programming the drive to index number:

Word	Contents	Selector
1	Control Word	(Fixed)
2	Reference 1	(Fixed)
3	Reference 2	(Fixed)

The PLC will write the:



All indirect pointers are fixed and can not be changed!

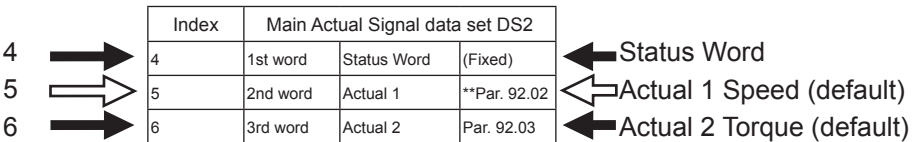
## Index numbers - Indirect pointers (continued)

Programming the drive parameter to index number 4, the first word to the PLC will be Status Word. Programming the drive to index number 5, the second word to the PLC will be Actual 1, the setting of parameter 92.02. Parameter 92.02 is the indirect pointer parameter for index 5. What every indirect parameter 92.02 is programmed to is the information that will be transmitted to the PLC.

Programming the drive to index number:

Data from drive to fieldbus controller		
Word	Contents	Selector

The PLC will read the:



## Remapping the indirect pointer

Remapping the indirect pointers can only be done in the ACS800 and DCS800 drive products. In the ACS350, ACS355 and ACx550 products all indirect pointers are fixed. In Table 1 below, the parameter 92.02 is programmed to parameter 1.02 and the drive is transmitting motor speed. In Table 2, the indirect parameter 92.02 is now programmed to parameter 1.06 and the drive now will transmit Output Power to the PLC. Programming the drive parameter to index 6 the third word from the PLC will be Actual 2.

**Table 1**

Index	Indirect parameter pointer	Indirect parameter setting (Par.92.02)	Parameter actual value 1.02
5	92.02	1.02 Speed	1200 rpm

**Table 2**

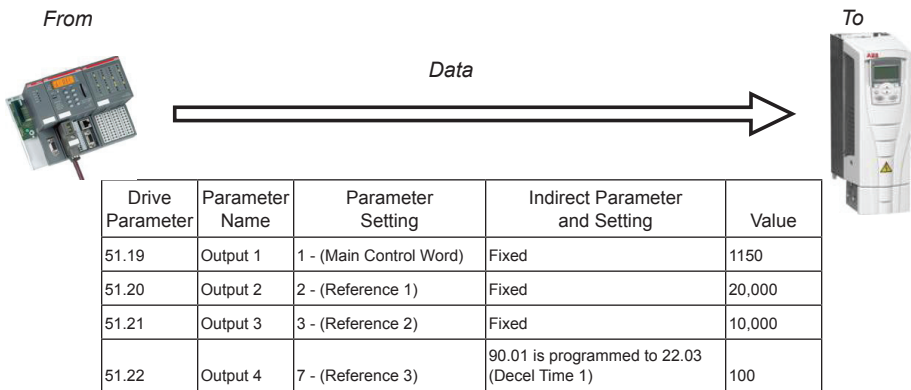
Index	Indirect parameter pointer	Indirect parameter setting (Par.92.02)	Parameter actual value 1.06
5	92.02	1.06 Power	100 Kw



## Using index numbers in Group 51 - Output

The example below shows the setup of group 51 (fieldbus parameters). The drive has been programmed to use the index number. The first output word will write Main Control Word. The second PLC word will write Reference 1; the third PLC word will write Reference 2 and the fourth PLC word will write Reference 3.

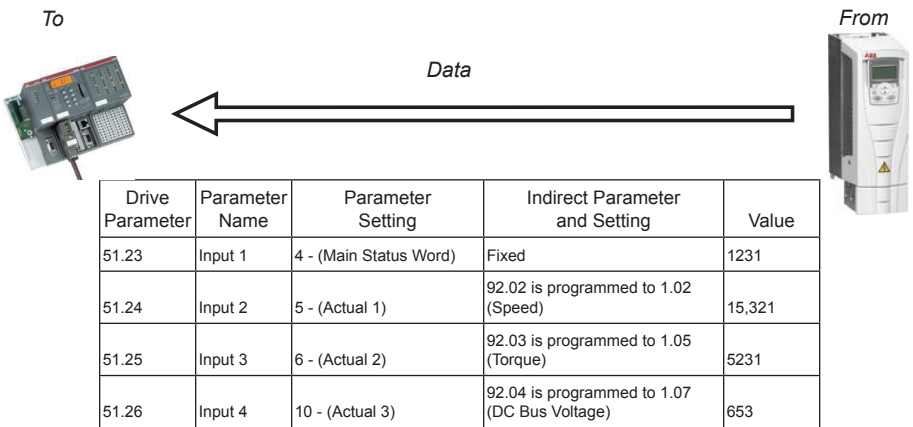
The fourth PLC word is using the indirect pointer parameter 90.01. The indirect parameter 90.01 is programmed to 22.03 (Decel Time 1). The fourth word from the PLC will write parameter 22.03 (Decel Time 1).



## Using index numbers in Group 51 - Input

The example below shows the setup of group 51 (fieldbus parameters). The drive has been programmed to use the index number. The first input word will read Main Status Word. The second PLC word will read the Speed; the third PLC word will read Torque and the fourth PLC word will read Actual 3 or DC Bus Voltage.

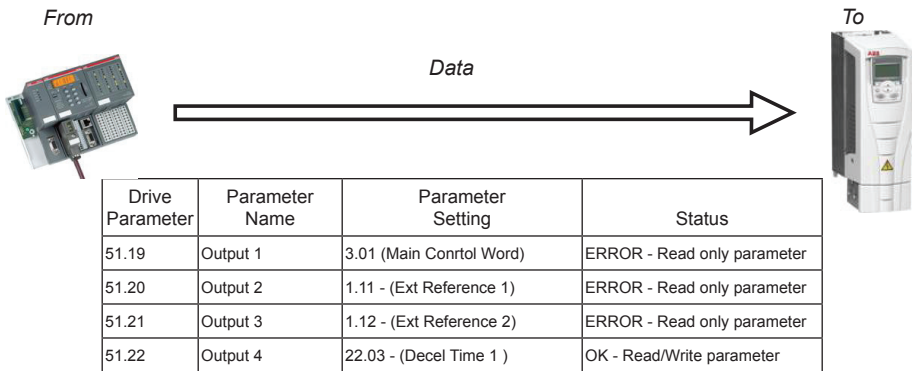
The fourth PLC word is using the indirect pointer parameter 92.04. The indirect parameter 92.04 is programmed to 1.07 (DC Bus Voltage). The fourth word from the PLC will read parameter 1.07 (DC Bus Voltage).



## Programming Group 51, Parameter Direct - Output

The example below shows the setup of group 51 (fieldbus parameters). The drive has been programmed to use parameter direct numbers. The first output word will write Main Control Word. The second PLC word will write Ext Reference 1; third PLC word will write Ext Reference 2 and the fourth PLC word will write Decel Time 1.

The PLC write output 1 - 3 will error because parameters 3.01, 1.11 and 1.12 are read only parameters. The PLC will not error on output word 4, because parameter 22.03 (Decel Time 1) is a read/write parameter.





## Using index numbers in Group 51 - Output

Parameters in group 51 are now reprogrammed to use the index numbering. Parameter 51.19 is programmed to 1, 51.20 is programmed to 2 and 51.21 is programmed to 3. The PLC can write Main Control Word, Reference 1, and Reference 2 without errors.

From



Data



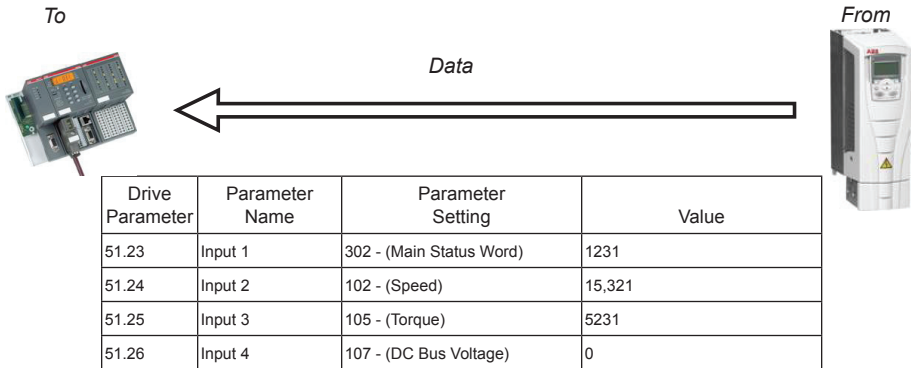
To



Drive Parameter	Parameter Name	Parameter Setting	Value
51.19	Output 1	1 - (Main Control Word)	1150
51.20	Output 2	2 - (Reference 1)	20,000
51.21	Output 3	3 - (Reference 2)	10,000
51.22	Output 4	22.03 - (Decel Time 1)	100

## Programming Group 51, Parameter Direct - Input

The example below shows the setup of group 51 (fieldbus parameters). The drive has been programmed to use the parameter number direct. The first input word will read Main Status Word; the second PLC word will read Speed; the third PLC word will read Torque and the fourth PLC word will read Actual 3 or DC Bus Voltage.



## ACS800 Data sets - How many?

The ACS800 standard drive software has 4 data sets. The table below displays the 4 data sets and their corresponding indirect pointer parameter numbers.

Data from fieldbus controller to drive		
Word	Contents	Selector

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 1

Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

### Data set 3

Index	Auxiliary Reference data set DS3		
7	1st word	Reference 3	Par. 90.01
8	2nd word	Reference 4	Par. 90.02
9	3rd word	Reference 5	Par. 90.03

### Data set 2

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	(Fixed)
5	2nd word	Actual 1	**Par. 92.02
6	3rd word	Actual 2	Par. 92.03

### Data set 4

Index	Aux. Actual Signal data set DS4		
10	1st word	Actual 3	Par. 92.04
11	2nd word	Actual 4	Par. 92.05
12	3rd word	Actual 5	Par. 92.06

## DCS800 Data sets - How many?

The DCS800 standard drive software has 8 data sets. The table below displays the 8 data sets and their corresponding indirect pointer parameter numbers.

Data from fieldbus controller to drive		
Word	Contents	Selector

### Data set 1

Index	Main Reference data set DS1		
1	1st word	Control Word	Par. 90.01
2	2nd word	Reference 1	Par. 90.02
3	3rd word	Reference 2	Par. 90.03

### Data set 3

Index	Auxiliary Reference data set DS3		
7	1st word	Reference 3	Par. 90.04
8	2nd word	Reference 4	Par. 90.05
9	3rd word	Reference 5	Par. 90.06

### Data set 5

Index	Main Reference data set DS5		
13	1st word	Reference 6	Par. 90.07
14	2nd word	Reference 7	Par. 90.08
15	3rd word	Reference 8	Par. 90.09

### Data set 7

Index	Auxiliary Reference data set DS7		
19	1st word	Reference 9	Par. 90.10
20	2nd word	Reference 10	Par. 90.11
21	3rd word	Reference 11	Par. 90.12

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 2

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	Par. 92.01
5	2nd word	Actual 1	Par. 92.02
6	3rd word	Actual 2	Par. 92.03

### Data set 4

Index	Aux. Actual Signal data set DS4		
10	1st word	Actual 3	Par. 92.04
11	2nd word	Actual 4	Par. 92.05
12	3rd word	Actual 5	Par. 92.06

### Data set 6

Index	Main Actual Signal data set DS6		
16	1st word	Actual 6	Par. 92.07
17	2nd word	Actual 7	Par. 92.08
18	3rd word	Actual 8	Par. 92.09

### Data set 8

Index	Aux. Actual Signal data set DS8		
22	1st word	Actual 9	Par. 92.10
23	2nd word	Actual 10	Par. 92.11
24	3rd word	Actual 11	Par. 92.12

## ACS550 Data sets - How many?

The ACS550 standard drive software has 2 data sets. The table below displays both data sets and their corresponding indirect pointer parameter numbers.

Data from fieldbus controller to drive		
Word	Contents	Selector

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 1

Index	Main Reference data set DS1		
1	1st word	Control Word	(Fixed)
2	2nd word	Reference 1	(Fixed)
3	3rd word	Reference 2	(Fixed)

### Data set 2

Index	Main Actual Signal data set DS2		
4	1st word	Status Word	(Fixed)
5	2nd word	Actual 1	(Fixed)
6	3rd word	Actual 2	(Fixed)

## ACS350, ACS355 Data sets - How many?

The ACS350 and ACS355 standard drive software has no data sets and uses parameter direct mapping. The ACS350 and ACS355 will always receive the Main Control Word, Reference 1 and sometimes Reference 2 (Profile Dependent). The ACS350 and ACS355 will always transmit a Main Status Word, actual Speed and sometimes the actual Torque (Profile Dependent).

## ACS850 & ACSM1 Data sets - How many?

The ACS850 & ACSM1 have a 16 bit data set and a 32 bit data set. Within the standard drive software are 2 data sets. The table below displays both data sets and their corresponding indirect pointer parameter numbers.

Data from fieldbus controller to drive		
Word	Contents	Selector

### Data set 1

Index	Main	Reference data set DS1	Size
1	1st word	Control Word (Fixed)	16 bits
2	2nd word	Reference 1 (Fixed)	16 bits
3	3rd word	Reference 2 (Fixed)	16 bits

### Data set 1

Index	Main	Reference data set DS1	Size
11	1st word	Control Word (Fixed)	32 bits
12	2nd word	Reference 1 (Fixed)	32 bits
13	3rd word	Reference 2 (Fixed)	32 bits

Data from drive to fieldbus controller		
Word	Contents	Selector

### Data set 2

Index	Main	Actual Signal data set DS2	Size
4	1st word	Status Word (Fixed)	16 bits
5	2nd word	Actual value 1 (Fixed)	16 bits
6	3rd word	Actual value 2 (Fixed)	16 bits

### Data set 2

Index	Main	Actual Signal data set DS2	Size
14	1st word	Status Word (Fixed)	32 bits
15	2nd word	Actual value 1 (Fixed)	32 bits
16	3rd word	Actual value 2 (Fixed)	32 bits

*Note! If the selected data is 32 bits long, two parameters are reserved for the transmission.*

## Protocol Information

Communication profiles are ways of conveying control commands (Control word, Status word, references and actual values) between the master station and the drive.

The ABB Drive may employ either the ODVA AC/DC (generic profile) Drive profile or the ABB Drives profile. In addition, two Transparent modes for 16 and 32 bit words respectively are available. With the Transparent modes, no data conversion takes place in the Fieldbus module.

ODVA Profile is a standard profile controlled by the ODVA. The assemblies below are one example of an ODVA profile. The speed Reference and Speed Actual will be displayed in RPM.

### Assembly Objects

I/O Assembly objects may also be referred to as Block Transfer of data. Intelligent devices realizing a Functional Profile, such as the ABB Fieldbus modules, 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.

#### ODVA - Output Assembly

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0		Net Ref	Net Ctrl			Fault Reset	Run Reverse	Run Forward
1								
2	Speed Reference (Low Byte)							
3	Speed Reference (High Byte)							

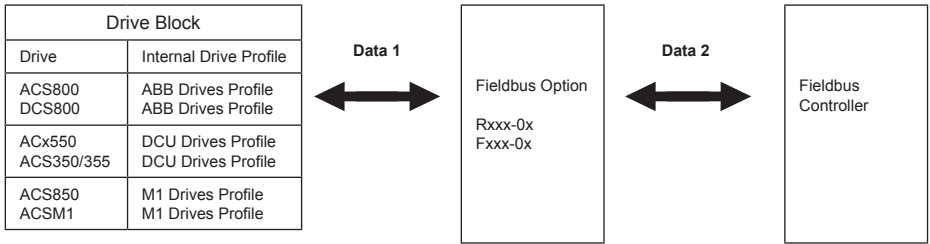
#### ODVA - Input Assembly

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 (Low Byte)							
3	Speed Actual (High Byte)							

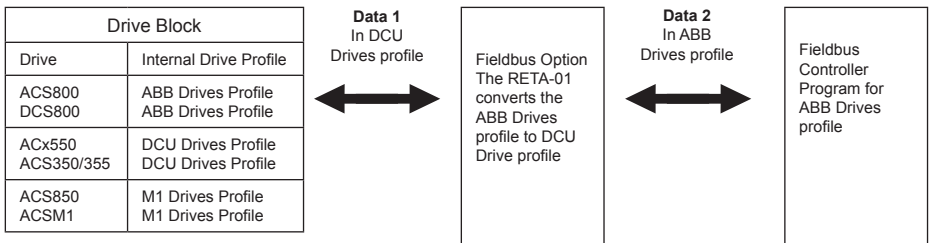
## Understanding the Data/Profile Conversion

Understanding the profile conversion between the Fieldbus controller and the ABB drive. All of ABB Drives have an internal profile used by the drive for its Main Control word, Main Status word, Speed Reference and Actual Speed. The information below will explain what happens to the communications between the Fieldbus Controller and the ABB drive.

The drive operates on a given profile in the drive. The drive block below will show what the internal drive profile is for a given product. For example the ABB ACS800 drive operates on ABB Drives profile.



In the example below the Fieldbus controller is programmed for ABB Drives Profile and the RETA-01 is installed on an ACS550 drive. The information from the Fieldbus controller to the RETA-01, or data 2 path the communications will be in ABB Drives profile. The RETA-01 will convert the ABB Drives profile to DCU Drive profile. The information from the RETA-01 to the ACS550, or data 1 path the communications will be in DCU Drives profile. This means the Main Control word in the Fieldbus Controller will not match the Main Control word parameter in the ACS550 drive bit for bit.



**Note:** Information about the DCU Drives profile can be found in the ACS350, ACS355, ACH550 and ACS550 User Manual.



# RCNA-01 ControlNet™ Adapter Module



## Overview

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

With the RCNA-01 module, the ControlNet network may employ either the ODVA AC/DC Drive profile or the ABB Drives profile. The ACS800 drive product converts the ODVA profile to the ABB Profile (detailed in the drive documentation) by the RCNA-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 the drive documentation) by the RCNA-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 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 (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 RCNA-01 uses dynamic assemblies that are configured by VSA I/O size.

## Reference Documentation:

ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

DCS800 Firmware Manual  
3ADW000193

RCNA Users Manual  
3AFE64506005

## RCNA-01 Installation, drive protocol & profile configuration

### Mechanical installation

1. Insert the RCNA-01 into its specified slot in the drive (SLOT2 for ACS550, SLOT1 for ACS800 and the DCS800)
2. Using the two mounting screws included in the module kit fasten the module to the drive.

### Electrical installation

3. Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. See the RCNA-01 User's Manual for connection and bus termination details.
4. 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.

### 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 Users/Firmware Manual of the drive for additional protocol and profile settings.

5. Power up the drive.
6. Set Parameters as follows:

**Table 1: 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.

## RCNA-01 I/O assembly instances

**Table 2: 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 3: 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 4: DCS800 Parameter Settings**

Par. No.	Parameter Name	Setting
98.02	COMM MODULE	FIELDBUS

**NOTE!** The “MODULE STATUS” LED should be green. The “MODULE OWNED” LED should be blinking green. If the network cable is connected to an active network, the green “CHANNEL A or B ” 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 RCNA-01 configuration parameters.

## RCNA-01 Network configuration

To enable communication through the ControlNet network, the module must be configured for the network. There are two ways of setting the module mac address (rotary switch settings, parameter settings); reference RCNA-01 users manual section “Electrical Installation” for more information.

**Table 4: Network configuration with drive parameters**

Par. No.	Parameter Name	Setting Range	Default Setting
51. 01	MODULE TYPE	(read-only)	ControlNet
51. 02	MODULE MACID	0...99	99
51. 03	MODULE BAUD RATE	5 = 5MBit/s	5
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...121	20
51. 07	INPUT INSTANCE	70...171	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...32	2
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

## RCNA-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 5: 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	CONTROLNET	CONTROLNET	CONTROLNET
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

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

**Table 5: 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 MotSpeedFill)	(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 VOLTAGE
51.24 INPUT I/O PAR 8	(117) DI 6-1 STATUS	(17) DsetXplus-5Val2 (902 FaultWord2)	(115) KWH COUNTER
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

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

**Table 5: 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

**\*\* 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.**

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

**Table 6: I/O Assembly Instance 21 & 71**

Drive Parameter	Example settings 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	CONTROLNET
51.02 MODULE MACID	2
51.03 MODULE BAUD RATE	(5) = 5 MBit/s
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.



## RCNA-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.

**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 6: 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	CONTROLNET	CONTROLNET
51.02 MODULE MACID	2	4
51.03 MODULE BAUD RATE	(5) = 5 MBit/s	(5) = 5 MBit/s
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

RCNA-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.  
 (continued)

**Table 6: I/O Assembly Instance 121 & 171 (continued)**

Drive Parameter	ACS800	ACS550
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
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.*

# Standard ABB Drive on ControlNet™ (RCNA-01) with RSLogix™ 5000 and RSNetWorx™



## Overview

This document contains an overview on how to setup a standard ABB drive in RSLogix 5000 and RSNetWorx. The drive will be configured to vendor specific assembly (ODVA Profile). The RCNA-01 and the PLC will transmit/receive nine words.

## Reference Documentation:

RCNA-01 ControlNet Adapter Module User's Manual  
3AFE64506005

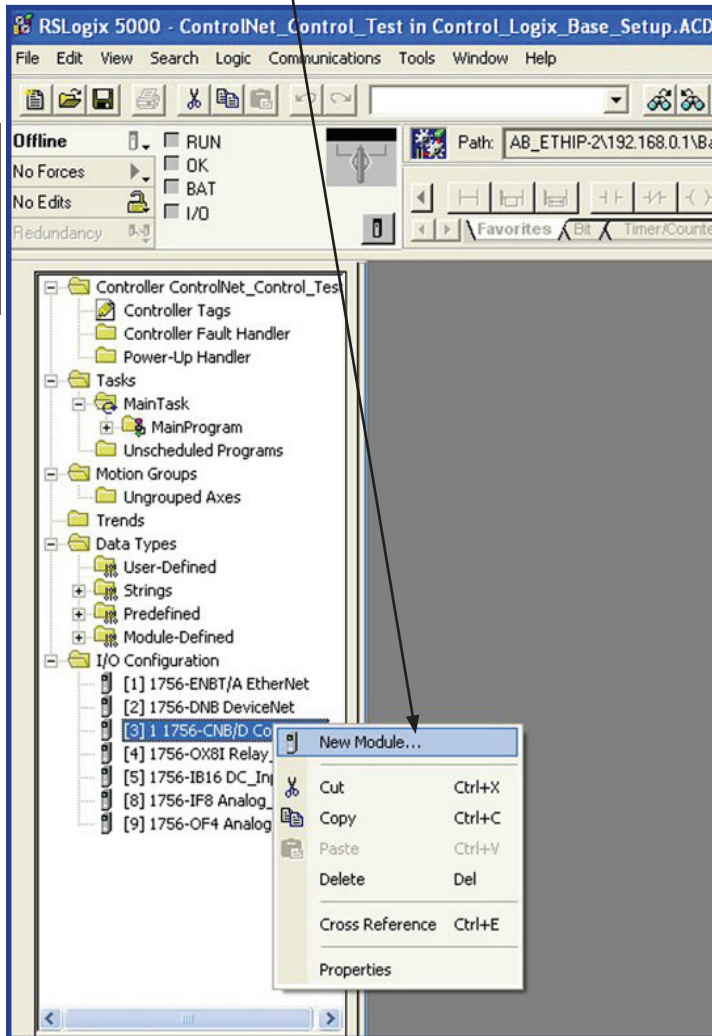
ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

DCS800 Firmware Manual  
3ADW000193

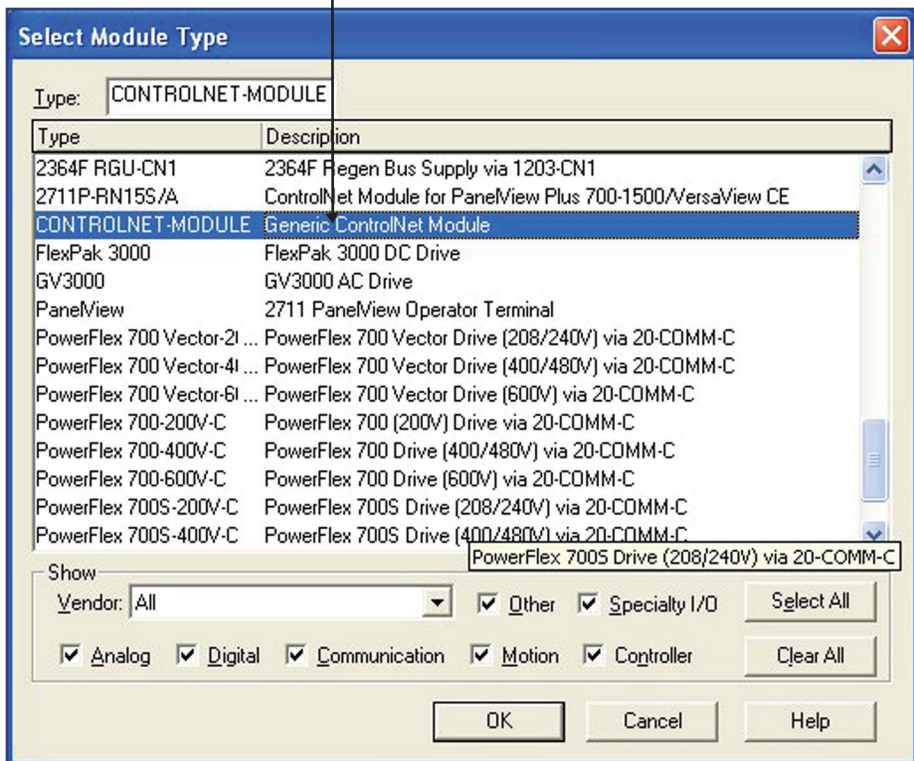
## RCNA-01 Installation

1. Open RSLogix 5000 and open or create a RSLogix 5000 program. Right click on the 1756-CNB ControlNet Module. Then, select New Module.



## RCNA-01 Installation (continued)

## 2. Select Generic ControlNet Module.



## RCNA-01 Installation (continued)

3. Program the following information. The example below is using the ABB Profile 102 and 103.

**Module Properties - ControNet (CONTROLNET-MODULE 1.1)**

Type: CONTROLNET-MODULE Generic ControlNet Module  
 Parent: ControNet

Name: RCNA\_01\_QSG  
 Description:  
 Comm Format: Data - INT  
 Node: 2

**Connection Parameters**

Parameter	Assembly Instance	Size	Bit Width
Input	103	11	(16-bit)
Output	102	9	(16-bit)
Configuration	1	0	(8-bit)
Status Input			
Status Output			

Buttons: Cancel, < Back, Next >, Finish >>, Help

*Enter the name that will be given to the RCNA-01.*

*ABB RCNA-01 uses 16 Bit words, change Comm Format to Data-INT (16 Bits).*

*Enter the Input/Output Assembly Instances.*

*Enter the Node address of the RCNA-01.*

*Configuration needs to be programmed to 1 and size to 0.*

*See next page for information on these settings.*

The following table will display Input and Output Assembly Instances and I/O memory size. Reference User Manual for the RCNA-01 Module for more information on Input/Output Assembly Instances.

Input Assembly Instances	Output Assembly Instances	Drive Parameter 51.26 Value	PLC Input Word Size	PLC Output Word Size
70	20	2	4	2
71	21	2	4	2
171	121	9	13	11
101	100	2	4	2
103	102	9	11	9

## RCNA-01 Installation (continued)

## 3. (continued)

Sets the size of the Input/Output words for the RCNA-01.

**The value of Input Assembly size, needs to equal drive parameter 51.26 plus two additional words.**

**The value of Output Assembly size, needs to be equal to drive parameter 51.26.**

**IF Input Assembly is 171, the value of Input Assembly size, needs to equal drive parameter 51.26 plus four additional words.**

**IF Output Assembly is 121, the value of Output Assembly size, needs to equal drive parameter 51.26 plus two additional words.**

**Module Properties - ControNet (CONTROLNET-MODULE 1.1)**

Type: CONTROLNET-MODULE Generic ControlNet Module  
 Parent: ControNet

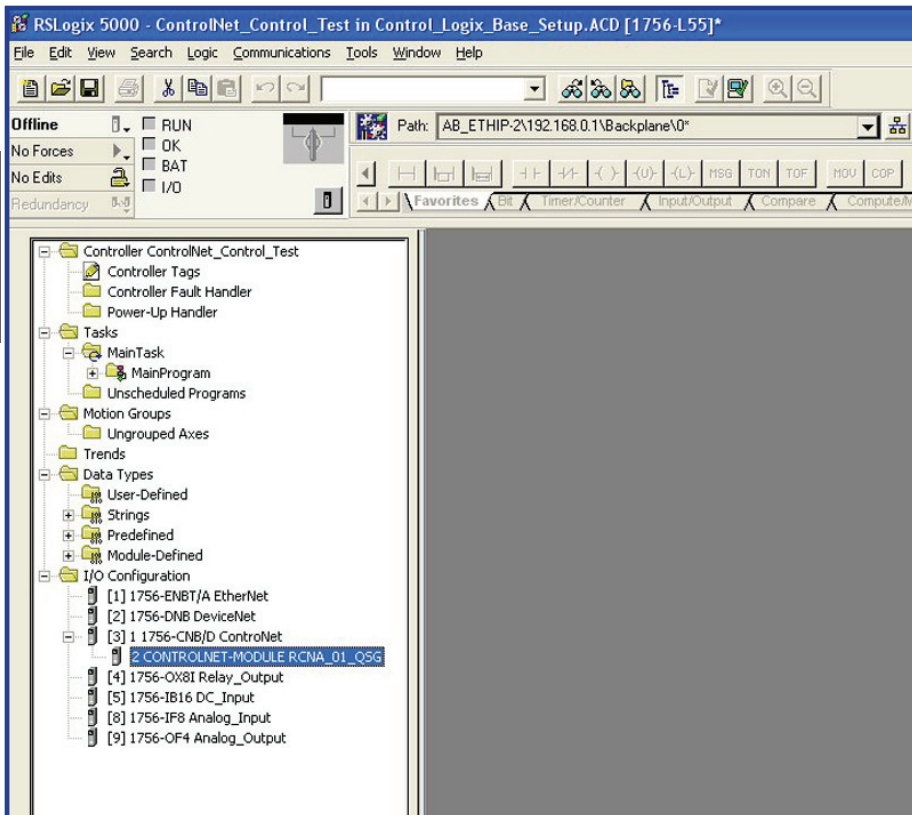
Name: RCNA\_01\_QSG  
 Description:   
 Comm Format: Data - INT  
 Node: 2

Connection Parameters		
	Assembly Instance:	Size
Input:	103	11 (16-bit)
Output:	102	9 (16-bit)
Configuration:	1	0 (8-bit)
Status Input:		
Status Output:		

Cancel < Back Next > Finish >> Help

## RCNA-01 Installation (continued)

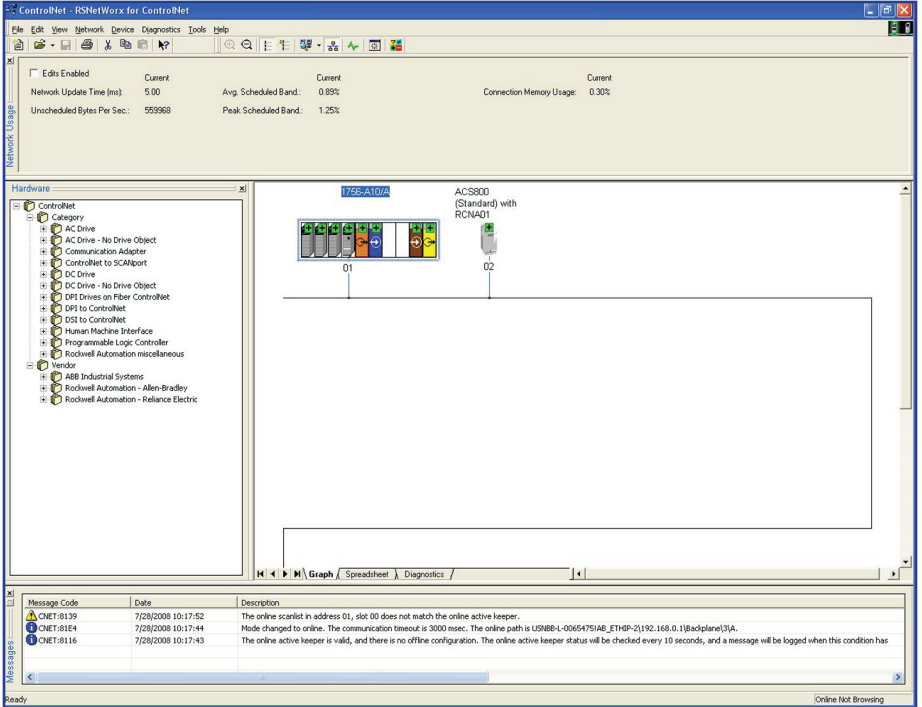
- The RCNA-01 is now added to the 1756-CNB ControlNet Scanner. Download the program to the PLC and make sure the PLC is in program mode after download.





# RCNA-01 Installation (continued)

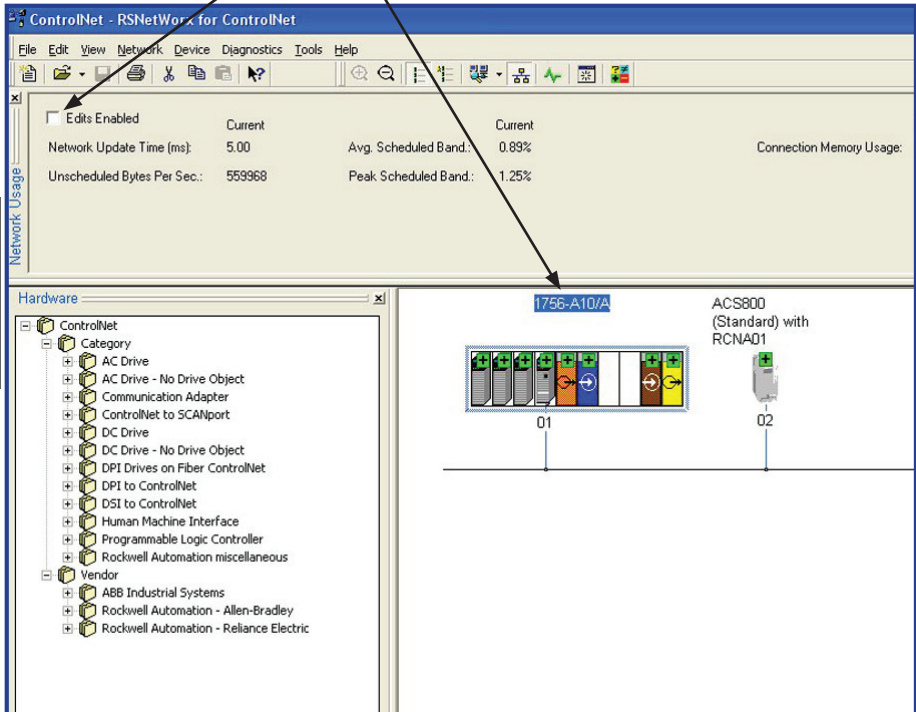
- Open RSNetWorx for ControlNet. Go online and scan the ControlNet network that needs to be configured.



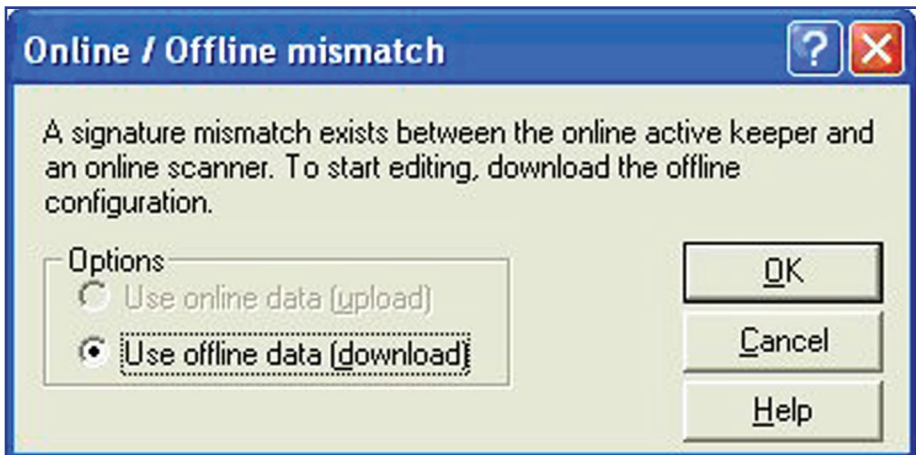
ControlNet - PLC Setup

## RCNA-01 Installation (continued)

6. Click on the 1756-xxxx.  
Then click Edits Enabled.



7. Click OK.



## RCNA-01 Installation (continued)

8. Click Network on the menu bar. Then select Properties.

The screenshot shows the ControlNet software interface. The 'Network' menu is open, and the 'Properties...' option is selected. The interface displays network usage statistics and a hardware tree view.

	Current	Pending Optimized Edits	Pending Merged Edits	Current	Pending
Scheduled Band:	0.26%	0.88%	0.88%	Connection Memory Usage:	0.00%
Scheduled Band:	1.06%	1.23%	1.23%		0.30%

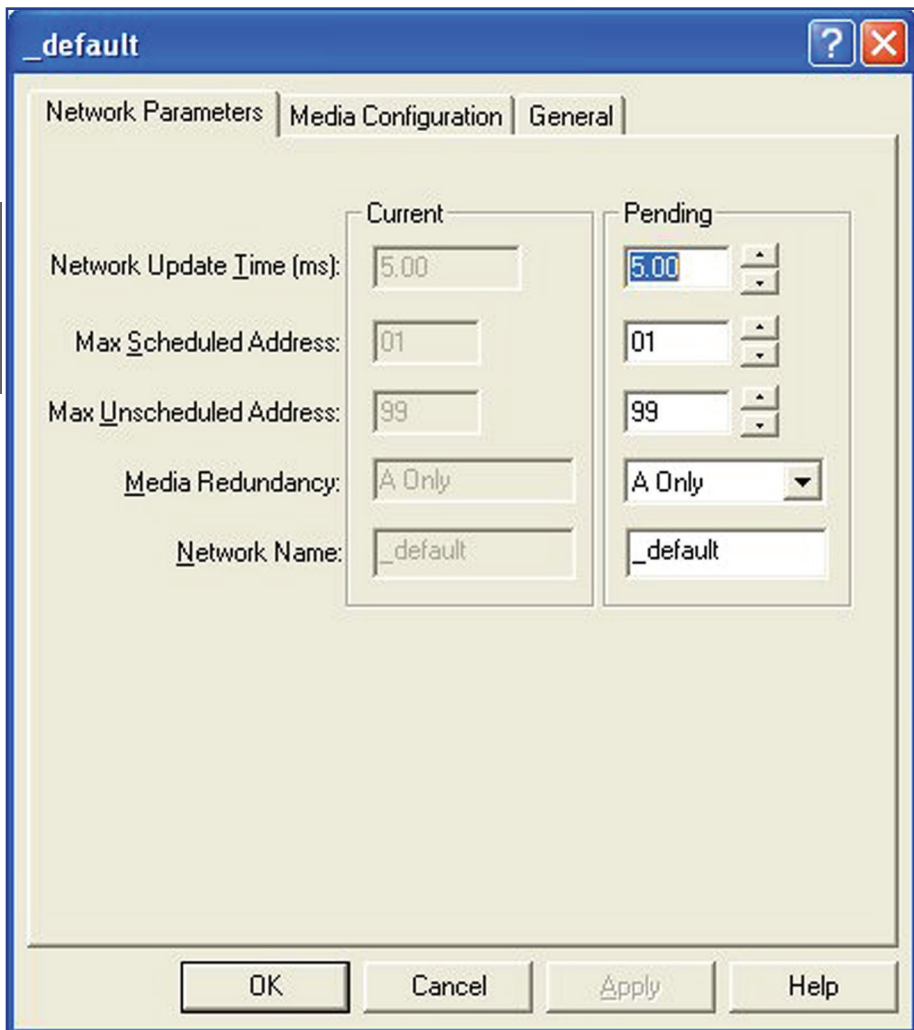
The hardware tree view shows the following structure:

- ControlNet
  - Category
    - AC Drive
    - AC Drive - No Drive Object
    - Communication Adapter
    - ControlNet to SCANport
    - DC Drive
    - DC Drive - No Drive Object
    - DPI Drives on Fiber ControlNet
    - DPI to ControlNet
    - DSI to ControlNet
    - Human Machine Interface
    - Programmable Logic Controller
    - Rockwell Automation miscellaneous
  - Vendor
    - ABB Industrial Systems
    - Rockwell Automation - Allen-Bradley
    - Rockwell Automation - Reliance Electric

The main workspace displays a network diagram with two nodes: '1756-A10/A' (labeled 01) and 'ACS800 (Standard) with RCNA01' (labeled 02). A vertical bar on the right side of the interface is labeled 'ControlNet - PLC Setup'.

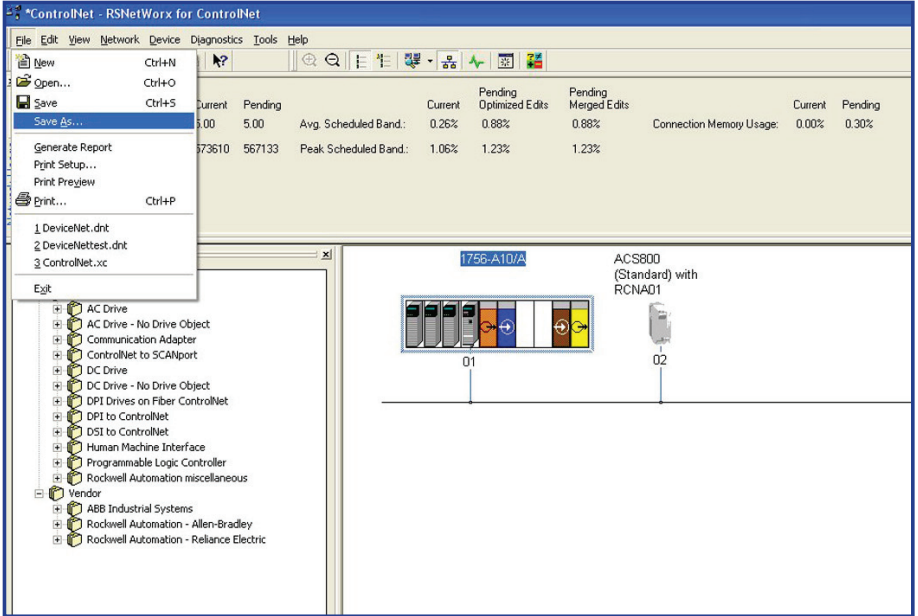
## RCNA-01 Installation (continued)

9. The Max Scheduled Address should be equal to or greater than the last address node on the ControlNet network. Click OK.

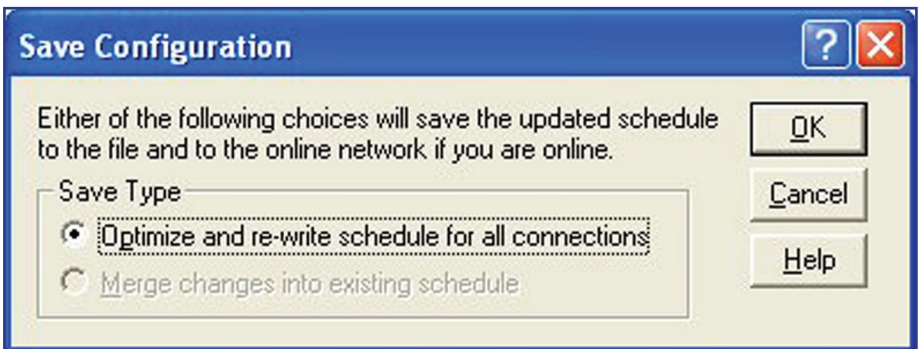


## RCNA-01 Installation (continued)

10. Click file and select Save As and name the file. RSNetWorx will then ask if the changes should be downloaded to the keeper.



11. Select OK.



12. The RCNA-01 is now a scheduled connection in the ControlNet network.

## Notes:

# 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 an 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

ACS800 Firmware Manual  
3AFE64527592

ACS550-U1 Users Manual  
3AUA0000001609

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.

**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	CONTROLNET	CONTROLNET	CONTROLNET
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 COUNTER
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.



# FDNA-01 DeviceNet™ Adapter Module



## Overview

This document contains the basic start-up procedure of the ACS350, ACS355, ACS850 and ACSM1 drives with the FDNA-01 DeviceNet Adapter Module. The FDNA-01 DeviceNet Adapter Module is an optional device for the ABB ACS350, ACS355, ACS850 and ACSM1 drive which enables the connection of the drive to a DeviceNet network. Reference the specific drive user manual and FDNA-01 user's manuals for additional product information.

With the FDNA-01 module, the DeviceNet network may employ either the ODVA AC/DC Drive profile or the ABB Drives profile. The two profiles are converted to the DCU profile for the ACS350, ACS355 (detailed in the drive documentation) by the FDNA-01 module. In addition, two Transparent modes for 16 and 32 bit words respectively are available. With the Transparent modes, no data conversion takes place.

## 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 FDNA-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 FDNA-01 uses Static assemblies (in other words, fixed groupings of different object data only).

## Reference Documentation:

FDNA-01 DeviceNet Adapter  
User's Manual  
3AFE68573360

ACS350 User's Manual  
3AFE68462401

ACS355 User's Manual  
3AUA0000066143

Firmware Manual ACS850 Standard  
Control Program  
3AUA0000045497

ACSM1 Speed and Torque Control  
Program Firmware Manual  
3AFE68848261

## FDNA-01 Installation

### Mechanical installation

1. Install clamping plate and fieldbus option ground plate, clamps and screws.
2. Insert the FDNA-01 into its specified slot in the drive.
3. Using the encapsulated mounting screw included in the module kit, fasten the module to the drive.

### Electrical installation

4. Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. See the FDNA-01 User's Manual for connection and bus termination details.
5. The DeviceNet bus cable is connected to terminal block X1 on the FDNA-01.

**Table 1: Terminal Block Connections**



X1		Description	Color
1	V-	Network power supply ground (0V DC)	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

## FDNA-01 Drive protocol & profile configuration

### 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.

6. Power up the drive.
7. Set Parameters as follows:

**Table 2: ACS350, ACS355 Parameter Settings**

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

**Table 3: ACS850, ACSM1 Parameter Settings**

Par. no.	Parameter Name	Setting
50.01	FBA ENABLE	(1) ENABLE

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

## FDNA-01 I/O assembly instances

The table below highlights the amount of data that will be transmitted and received from the fieldbus controller for a given profile. The column labeled Size will need to be programmed in the fieldbus controller. The Profile column states the profile (Main Control, Status Word) the drive will be using for control.

**Table 4: Input & Output Assembly Instances**

Name	Output Instance	Input Instance	Size (bytes)	Profile
Basic Speed Control	20	70	4	ODVA AC/DC Drive
Enhanced Speed Control	21	71	4	ODVA AC/DC Drive
Basic Speed and Torque Control	22	72	6	ODVA AC/DC Drive
Enhanced Speed and Torque Control	23	73	6	ODVA AC/DC Drive
Basic Speed Control plus Drive Parameters	120	170	24	ODVA AC/DC Drive
Enhanced Speed Control plus Drive Parameters	121	171	24	ODVA AC/DC Drive
Basic Speed and Torque Control plus Drive Parameters	122	172	26	ODVA AC/DC Drive
Enhanced Speed and Torqued Control plus Drive Parameters	123	173	26	ODVA AC/DC Drive
ABB Drives Profile with Set Speed	801	851	4	ABB Drives Profile
ABB Drives Profile with Set Speed and Set Torque	802	852	6	ABB Drives Profile
ABB Drives Profile with Set Speed plus Drive Parameters	901	951	24	ABB Drives Profile
ABB Drives Profile with Set Speed and Set Torque plus Drive Parameters	902	952	26	ABB Drives Profile
Transparent16 w/One	811	861	4	Transparent16 Profile
Transparent16 w/Two	812	862	6	Transparent16 Profile
Transparent16 w/One plus Drive Parameters	911	961	24	Transparent16 Profile
Transparent16 w/Two plus Drive Parameters	912	962	26	Transparent16 Profile
Transparent32 w/One	821	871	8	Transparent32 Profile
Transparent32 w/Two	822	872	12	Transparent32 Profile
Transparent32 w/One plus Drive Parameters	921	971	28	Transparent32 Profile
Transparent32 w/Two plus Drive Parameters	922	972	32	Transparent32 Profile

## FDNA-01 Network configuration

To enable communication through the DeviceNet network, the module must be configured for the network. The following parameters will need to be set according to the configuration of the DeviceNet network.

**Table 5: Network configuration with drive parameters**

Par. No.	Parameter Name	Setting Range	Default Setting
51.01	MODULE TYPE	(read-only)	DEVICENET
51.02	MAC ID	0 TO 63	63
51.03	BAUD RATE	(0) 125 kbit/s (1) 250 kbit/s (2) 500 kbit/s	(0) 125 kbit/s
51.04	RESERVED	0	0
51.05	ODVA STOP FUNCTION	(0) Ramp Stop (1) Coast Stop	(0) Ramp Stop
51.06	OUTPUT INSTANCE	See table 3	20
51.07	OUTPUT NUM PARS	1 TO 10 <sup>1</sup>	10
51.08	INPUT INSTANCE	See table 3	70
51.09	INPUT NUM PARS	1 TO 10 <sup>2</sup>	10
51.10	ODVA SPEED SCALE	See table 5	128
51.11	ODVA TORQUE SCALE	See table 6	128
51.12 ... 51.26	RESERVED	0	0
51.27*	FBA Par Refresh	(0) DONE (1) REFRESH	(0) DONE

<sup>1</sup> This parameter is only used when the Output Assembly Instance is 120, 121, 122, 123, 901 or 902. It should always be set to the default, 10, except as described in the appendix of FDANA-01 User's Manual.

<sup>2</sup> This parameter is only used when the Input Assembly Instance is 170, 171, 172, 173, 951, or 952. It should always be set to the default, 10, except as described in the appendix of the FDNA-01 User's Manual.

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

## FDNA-01 Network configuration (continued)

**Table 6: ODVA Speed Scaling**

ODVA Speed Scale Value <sup>1</sup>	Drive Parameter Speed Scale Value <sup>2</sup>	Speed Unit
-5	123	32 RPM
-4	124	16 RPM
-3	125	8 RPM
-2	126	4 RPM
-1	127	2 RPM
0 (default)	128	1 RPM
1	129	0.5 RPM
2	130	0.25 RPM
3	131	0.125 RPM
4	132	0.0625 RPM
5	133	0.03125 RPM

**Table 7: ODVA Torque Scaling**

ODVA Torque Scale Value <sup>1</sup>	Drive Parameter Torque Scale Value <sup>2</sup>	Torque Unit
-5	123	32 NM
-4	124	16 NM
-3	125	8 NM
-2	126	4 NM
-1	127	2 NM
0 (default)	128	1 NM
1	129	0.5 NM
2	130	0.25 NM
3	131	0.125 NM
4	132	0.0625 NM
5	133	0.03125 NM

<sup>1</sup> Use ODVA Speed/Torque Scale Value when reading/writing ODVA Speed or Torque scale via the AC/DC Drive Object (2Ah). When written via AC/DC Drive Object, the new value takes effect immediately.

<sup>2</sup> Use Drive Parameter Speed/Torque Scale Value when reading/writing ODVA Speed or Torque Scale via the drive panel, drive parameter object (90h) and drive configuration object (91h). When written via these methods, the new value takes effect after the drive is repowered or a "Fieldbus Adapter Parameter Refresh" is given.

FDNA-01 Examples: **ACS350, ACS355** - ABB Drives Profile (13 total Data words In/Out). Ten of the In/Out Data words are user configured by parameters in group 54 and 55.

The example will write the Main Control Word, Speed Ref, Torque Ref, Acceler Time 2 and Deceler Time 2. It will read Main status word, Actual speed, Actual Torque, Current and DC Bus Voltage.

**Table 8: I/O Assembly Instance 902 & 952**

Drive Parameter	Example setting for ACS350
10.01 EXT 1 COMMANDS	COMM
10.03 REF DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM PROT SEL	FIELDBUS
51.01 MODULE TYPE	DEVICENET
51.02 MAC ID	2
51.03 BAUD RATE	(0) 125 kbit/s
51.05 ODVA STOP FUNCTION	(0) Ramp
51.06 OUTPUT INSTANCE	902
51.07 OUTPUT NUM PARS	10
51.08 INPUT INSTANCE	952
51.09 INPUT NUM PARS	10
51.10 ODVA SPEED SCALE	128
51.11 ODVA TORQUE SCALE	128
51.27* FBA PAR REFRESH	(1) REFRESH
54.01 FB DATA INPUT 1	(104) CURRENT
54.02 FB DATA INPUT 2	(107) DC BUS VOLTAGE
54.03 ... 54.10 FB DATA INPUT	0
55.01 FB DATA OUTPUT 1	(2205) ACCELER TIME 2
55.02 FB DATA OUTPUT 2	(2206) DECELER TIME 2
55.03 ... 55.10 FB DATA OUTPUT	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.

## FDNA-01 Examples: ACS350, ACS355 - ODVA Profile (3 Data words In/Out)

The example will write the ODVA Main Control Word, Speed Ref and Torque Ref. It will read ODVA Main status word, Actual speed, Actual Torque.

**Table 9: I/O Assembly Instance 23 & 73**

Drive Parameter	Example setting for ACS350
10.01 EXT 1 COMMANDS	COMM
10.03 REF DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM PROT SEL	FIELDBUS
51.01 MODULE TYPE	DEVICENET (READ ONLY)
51.02 MAC ID	5
51.03 BAUD RATE	(0) 125 kbit/s
51.06 OUTPUT INSTANCE	23
51.08 INPUT INSTANCE	73
51.10 ODVA SPEED SCALE	128
51.11 ODVA TORQUE SCALE	128
51.27* FBA PAR REFRESH	(1) REFRESH

*\* 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.*



FDNA-01 Examples: **ACS850, ACSM1** -  
 ABB Drives Profile (13 Data words In/Out). Ten of the In/Out  
 Data words are user configured by parameter group 52 and 53.

The example will write the Main Control Word, Speed Ref, Torque Ref, Acceler  
 Time 2 and Deceler Time 2. It will read Main status word, Actual speed, Actual  
 Torque, Current and DC Bus Voltage.

**Table 10: I/O Assembly Instance 902 & 952**

Drive Parameter	Example setting for ACS850	Example setting for ACSM1
16.15 Menu set sel	Load long	n/a
10.01 Ext1 start func	FBA	FBA
21.01 Speed ref1 sel	FBA ref1	n/a
24.01 SPEED REF1 SEL	n/a	FBA REF1
50.01 Fba enable	Enable	Enable
51.01 MODULE TYPE	DEVICENET	DEVICENET
51.02 MAC ID	5	6
51.03 BAUD RATE	(0) 125 kbit/s	(0) 125 kbit/s
51.04 DRIVE PROFILE	0	0
51.06 OUTPUT INSTANCE	902	902
51.07 OUTPUT NUM PARS	10	10
51.08 INPUT INSTANCE	952	952
51.09 INPUT NUM PARS	10	10
52.01 DATA IN 1	(123) MOTOR POWER - MSW	(1.17) MOTOR TEMP
52.02 DATA IN 2	(0) MOTOR POWER - LSW	(1.04) MOTOR CURRENT - MSW
52.03 DATA IN 3	(105) MOTOR CURRENT	(0) MOTOR CURRENT - LSW
52.04 DATA IN 4	(107) DC-VOLTAGE - MSW	(107) DC-VOLTAGE - MSW
52.05 DATA IN 5	(0) DC-VOLTAGE - LSW	(0) DC-VOLTAGE - LSW
52.06 DATA IN 6	(108) ENCODER1 SPEED - MSW	(108) ENCODER1 SPEED - MSW
52.07 DATA IN 7	(0) ENCODER1 SPEED - LSW	(0) ENCODER1 SPEED - LSW
52.08 DATA IN 8	0	0
52.09 DATA IN 9	0	0
52.10 DATA IN 10	0	0
53.01 DATA OUT 1	(2204) Acc time2 - MSW	(2503) Acc time - MSW
53.02 DATA OUT 2	(0) Acc time2 - LSW	(0) Acc time2 - LSW
53.03 DATA OUT 3	(2205) Dec time2 - MSW	(2504) Dec time - MSW
53.04 DATA OUT 4	(0) Dec time2 - LSW	(0) Dec time - LSW
53.05 DATA OUT 5	(2606) Const speed sel1	(2408) CONST SPEED
53.06 DATA OUT 6	(2607) Const speed sel2	(2410) SPEED REF JOG1
53.07 DATA OUT 7	(2608) Const speed sel3	(2411) SPEED REF JOG2

FDNA-01 Examples: **ACS850, ACSM1** - (continued)  
 ABB Drives Profile (13 Data words In/Out). Ten of the In/Out  
 Data words are user configured by parameter group 52 and 53.

**Table 10: I/O Assembly Instance 902 & 952 (continued)**

Drive Parameter	Example setting for ACS850	Example setting for ACSM1
53.08 DATA OUT 8	0	0
53.09 DATA OUT 9	0	0
53.10 DATA OUT 10	0	0
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**

*\*\*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.*

**MSW** = Most Significant Word

**LSW** = Less Significant Word

## FDNA-01 Examples: **ACS850, ACSM1** - ODVA AC/DC Drives Profile (3 Data words In/Out).

The example will write the ODVA Control Word, Speed Ref and Torque Ref. It will read ODVA Main status word, Actual speed, Actual Torque.

**Table 11: I/O Assembly Instance 23 & 73**

Drive Parameter	Example setting for ACS850	Example setting for ACSM1
16.15 Menu set sel	Load long	n/a
10.01 Ext1 start func	FBA	FBA
21.01 Speed ref1 sel	FBA ref1	n/a
24.01 SPEED REF1 SEL	n/a	FBA REF1
50.01 Fba enable	Enable	Enable
51.01 MODULE TYPE	DEVICENET (READ ONLY)	DEVICENET (READ ONLY)
51.02 MAC ID	5	5
51.03 BAUD RATE	(0) 125 kbit/s	(0) 125 kbit/s
51.06 OUTPUT INSTANCE	23	23
51.08 INPUT INSTANCE	73	73
51.10 ODVA SPEED SCALE	128	128
51.11 ODVA TORQUE SCALE	128	128
51.27* FBA PAR REFRESH	(1) REFRESH	(1) REFRESH

**\*\*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.**

## Notes:

# Standard ABB Drive on DeviceNet (RDNA-01) with 1769-SDN DeviceNet™ Scanner



## Overview

This document contains an overview on how to add the ABB Drive (RDNA-01) that is programmed to nine input words and nine output words to the DeviceNet Scan List with RSNetWorx for DeviceNet. The document also contains information on how to convert 16 bit words (INT) to 32 bit words (DINT) and how to switch DINT to INT with RSLogix 5000.

## Reference Documentation:

RDNA-01 DeviceNet Adapter User's Manual  
3AFE64504223

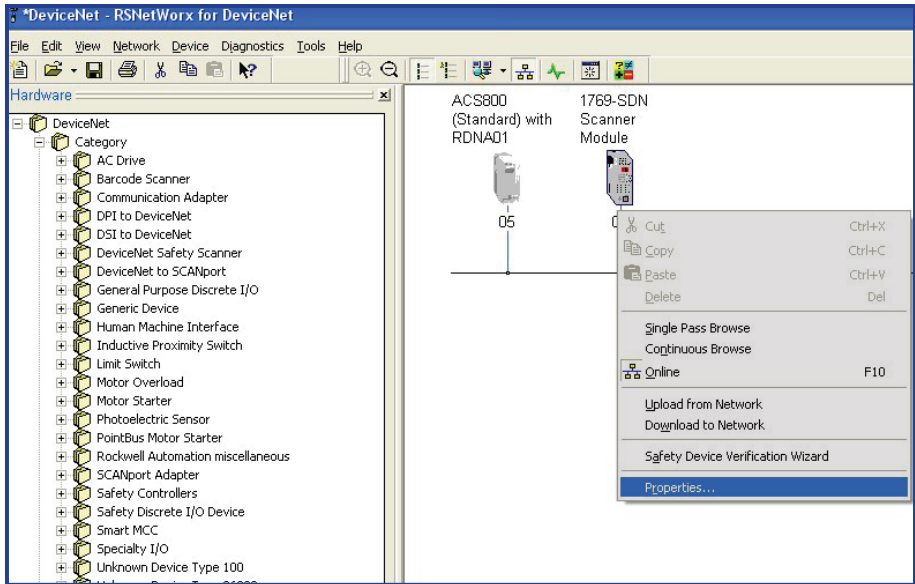
ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

DCS800 Firmware Manual  
3ADW000193

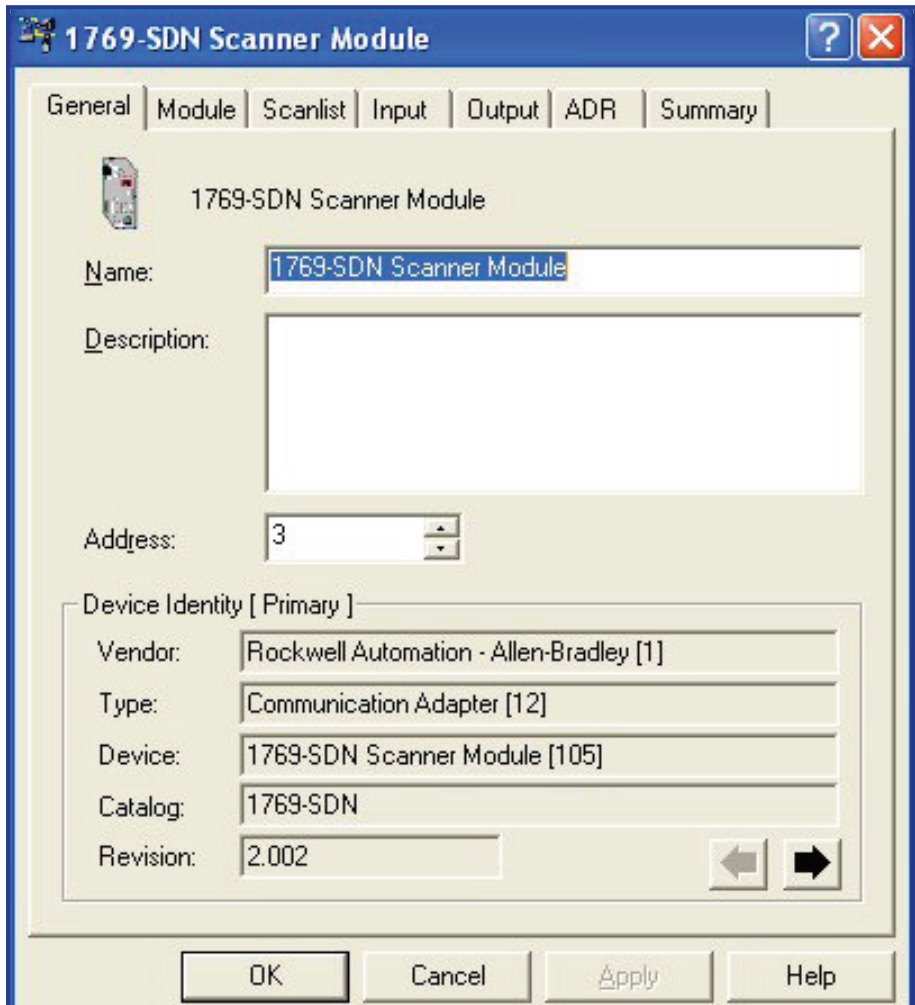
## RDNA-01 Installation

1. Go online and scan the DeviceNet network that needs to be configured. The following instructions will setup the drive to send nine words and receive nine words of information.
2. Right Click on the 1769-SDN Scanner Module and select properties.



## RDNA-01 Installation (continued)

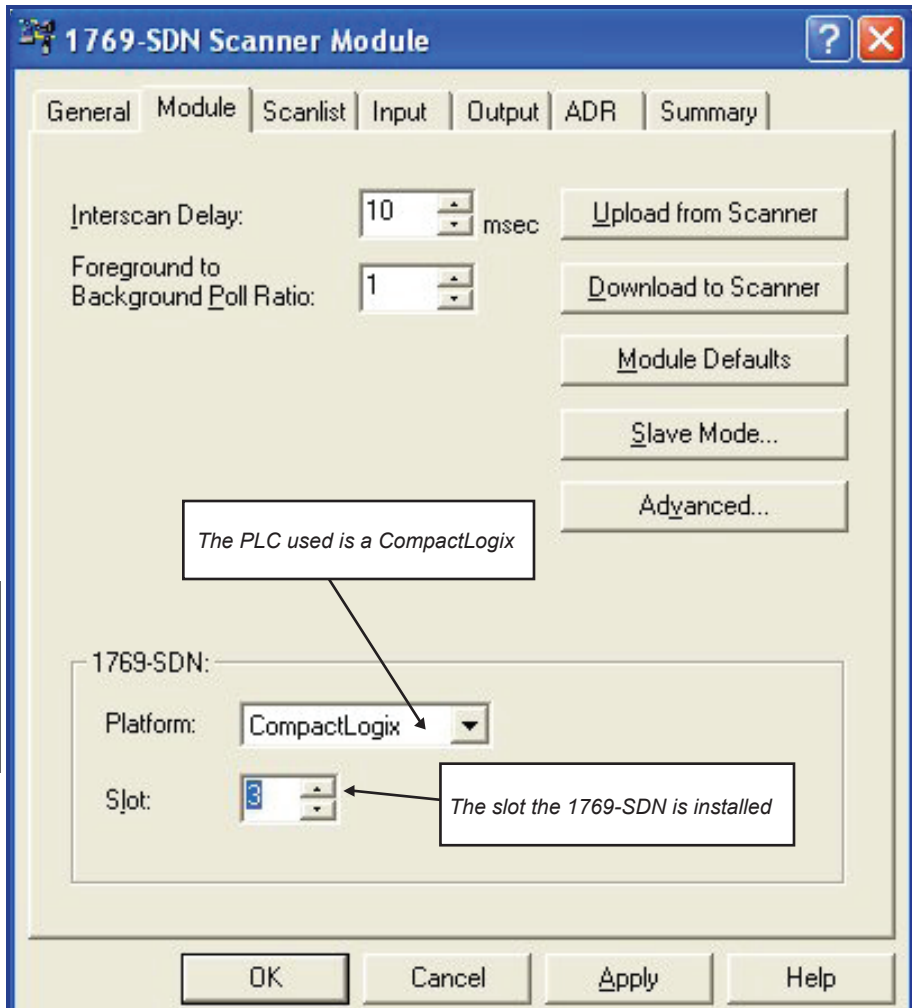
3. The following screen will open. Click the Module tab. Select upload the configuration from the scanner.



The screenshot shows a software window titled "1769-SDN Scanner Module". The window has a blue title bar with a question mark icon and a close button. Below the title bar are several tabs: "General", "Module", "Scanlist", "Input", "Output", "ADR", and "Summary". The "Module" tab is selected. The main area of the window contains the following fields and controls:

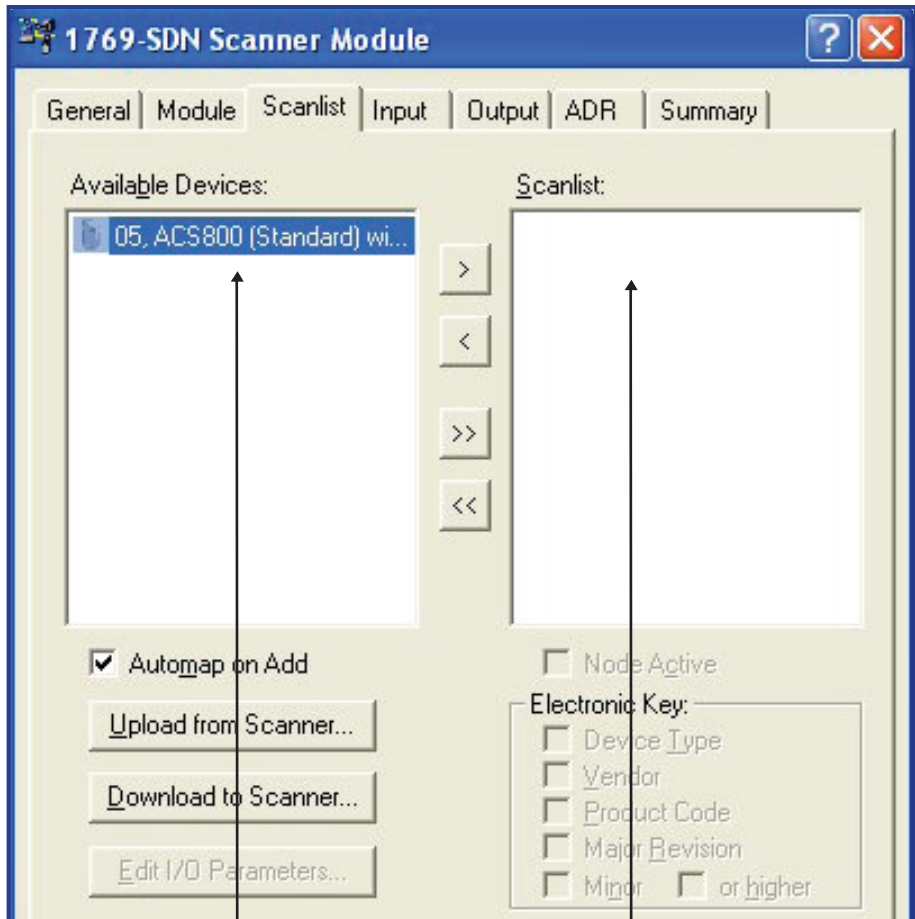
- A small icon of the scanner module and the text "1769-SDN Scanner Module".
- Name:** A text box containing "1769-SDN Scanner Module".
- Description:** A large empty text box.
- Address:** A spin box with the value "3".
- Device Identity [ Primary ]** section containing:
  - Vendor:** Rockwell Automation - Allen-Bradley [1]
  - Type:** Communication Adapter [12]
  - Device:** 1769-SDN Scanner Module [105]
  - Catalog:** 1769-SDN
  - Revision:** 2.002
- Navigation arrows (left and right) next to the revision field.
- Buttons for "OK", "Cancel", "Apply", and "Help" at the bottom.

4. Make sure the following information below is correct.






5. Click the Scanlist tab.

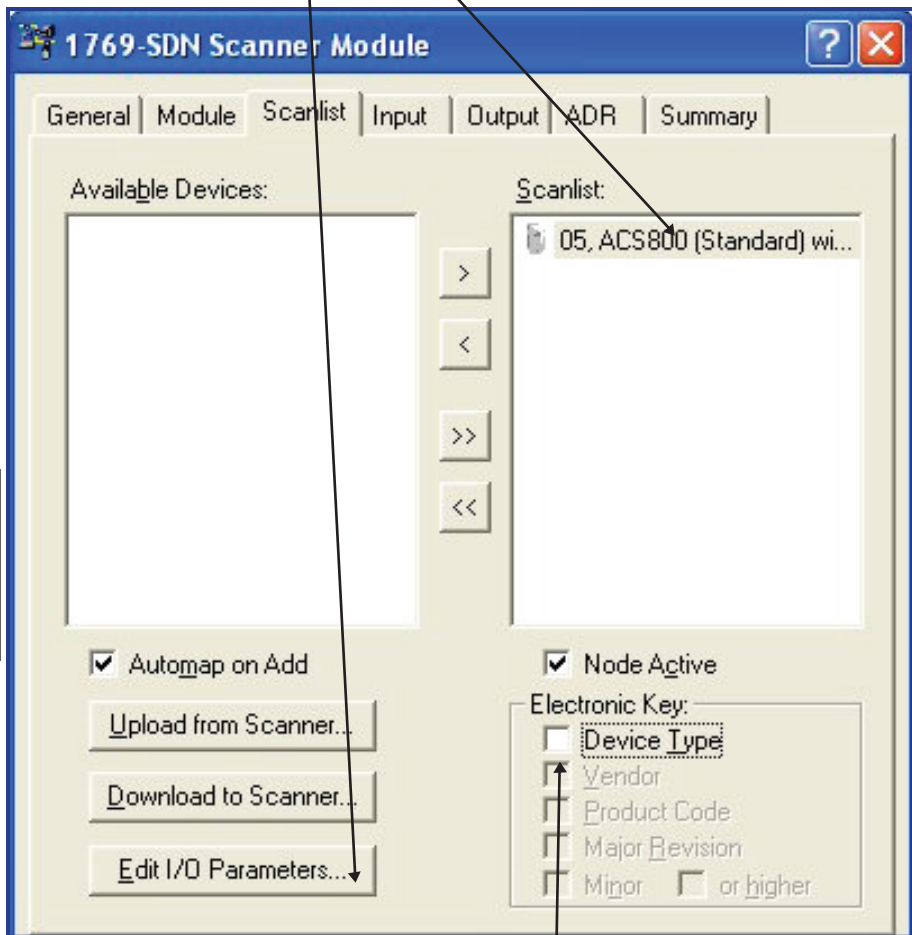


*This window displays all devices available to be added to the DeviceNet Scanner*

*This window displays all devices in the DeviceNet Scan List*

## RDNA-01 Installation (continued)

- Select a device from the available device list and click the  button. This will move the selected device into the scan list.
- Select a device under the Scan List. Click Edit I/O Parameters.



*Electronic Keying is active by default.*

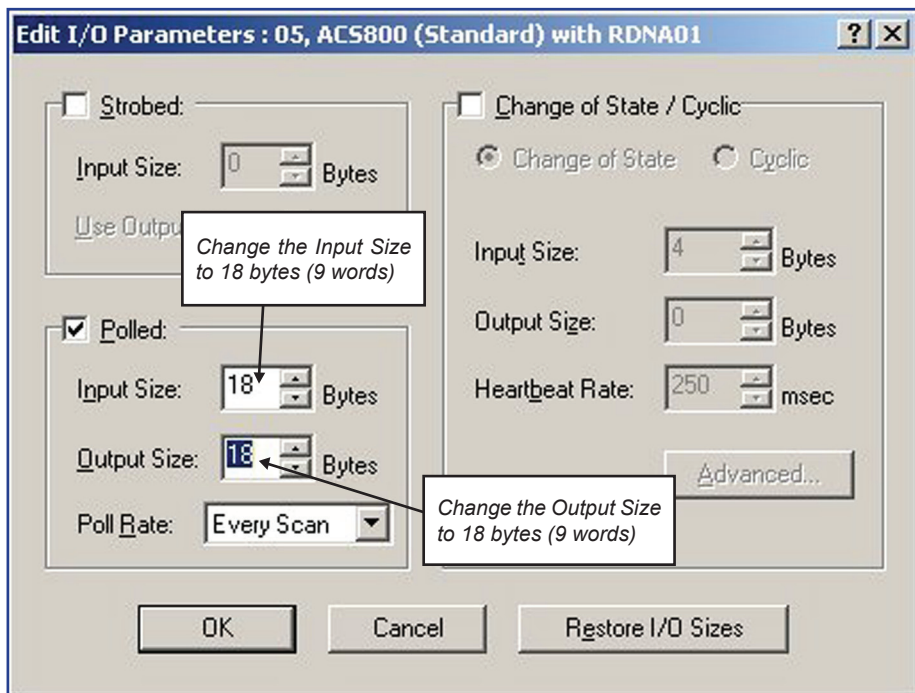
*Electronic Keying has been disabled for this example.*

## RDNA-01 Installation (continued)

8. The default I/O size is 4 bytes (2 words). This setting informs the DeviceNet scanner to the amount of data that will be sent and received. Click OK.

The drive parameter 51.26 (VSA I/O Size) will set the amount of data that will be transmitted and received by the DeviceNet scanner. The Input and Output size will need to match drive parameter 51.26 (VSA I/O Size). The example below shows the drive parameter 51.26 (VSA I/O Size) programmed to 9 words IN/OUT from the RDNA-01. The DeviceNet scanner will transmit nine words and receive nine words every scan.

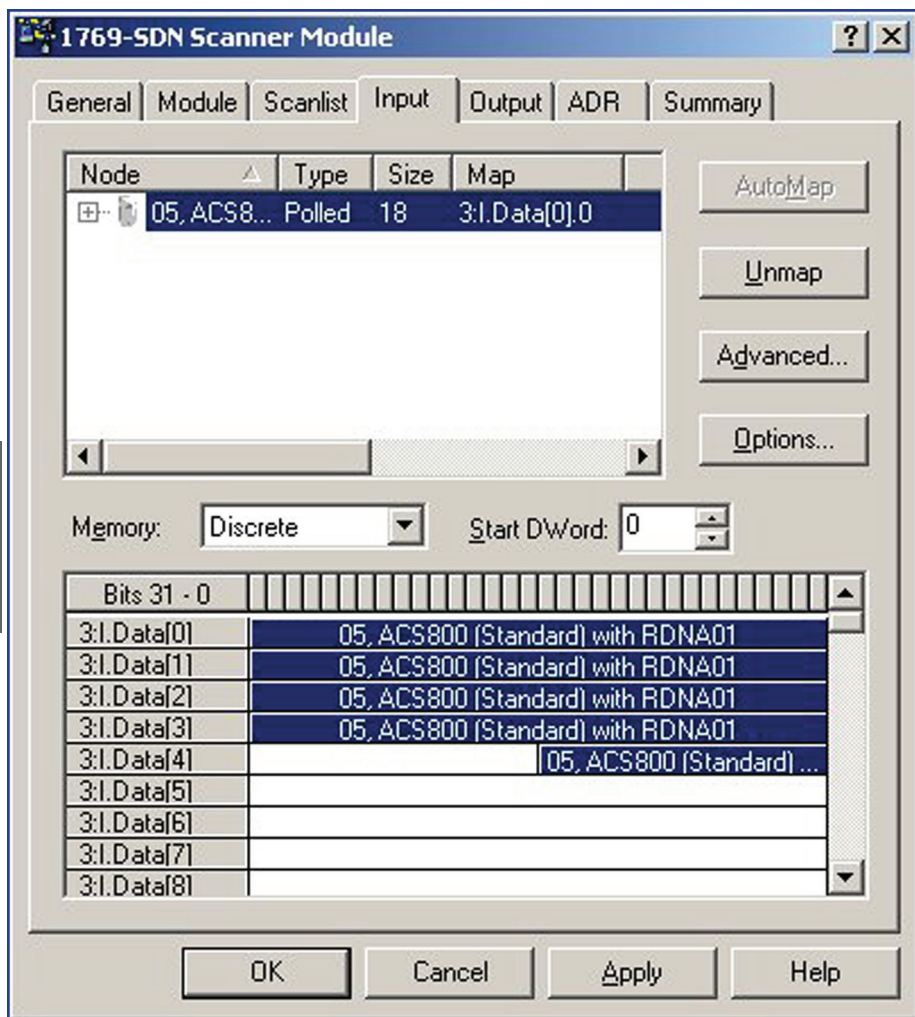
**NOTE!** If the Input Assembly is 171, the value of Input Assembly size, needs to equal drive parameter 51.26 plus two additional words. If the Output Assembly is 121, the value of Output Assembly size, needs to equal drive parameter 51.26 plus two additional words.



## RDNA-01 Installation (continued)

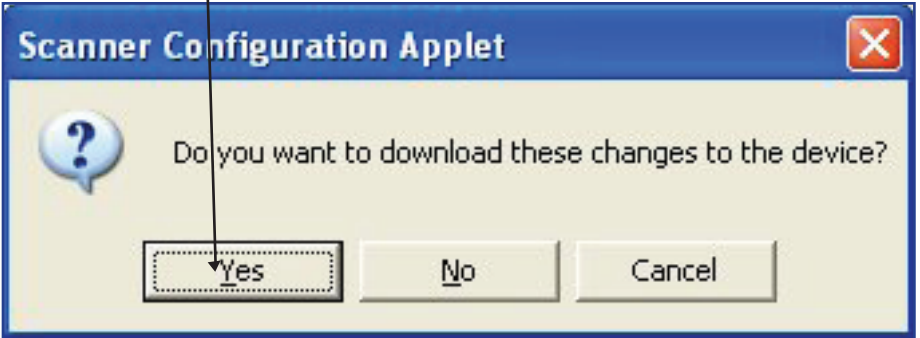
9. Select Yes from the scanner configuration pop-up messages.

The DeviceNet scanner mapped all nine input words into five 32 bit (DINT) and word five is only using 16 bits of the 32 bit word. The DeviceNet scanner did the same for the output data. The I/O data will be remapped in the PLC into 16 bit words. (INT's).



## RDNA-01 Installation (continued)

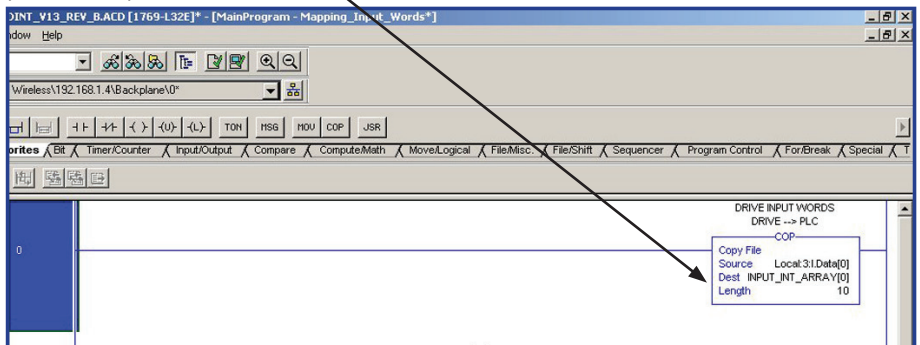
- Click Apply. Make sure the PLC is in Program Mode. Then Click Yes.



- Enter a rung with a COPY FILE instruction in RSLogix 5000. Create a PLC tag array of ten (INT) named INPUT\_INT\_ARRAY. This COPY FILE instruction will remap five (DINT) 32 bit words to ten (INT) 16 bit words.

Source (32 Bit Words)	Destination (16 Bit Words)	
LOCAL:3:I.DATA[0]	INPUT_INT_ARRAY[0]	INPUT_INT_ARRAY[1]
LOCAL:3:I.DATA[1]	INPUT_INT_ARRAY[2]	INPUT_INT_ARRAY[3]
LOCAL:3:I.DATA[2]	INPUT_INT_ARRAY[4]	INPUT_INT_ARRAY[5]
LOCAL:3:I.DATA[3]	INPUT_INT_ARRAY[6]	INPUT_INT_ARRAY[7]
LOCAL:3:I.DATA[4]	INPUT_INT_ARRAY[8]	INPUT_INT_ARRAY[9]

The length in the COPY FILE instruction refers to the Destination length (10 - INT's)

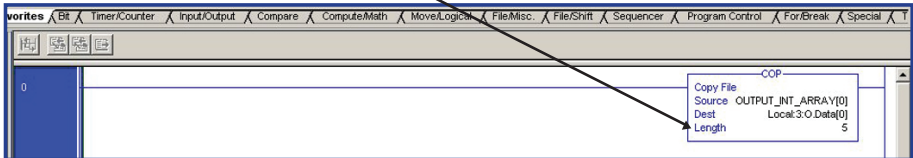


## RDNA-01 Installation (continued)

12. Enter a rung with a COPY FILE instruction in RSLogix 5000. Create a PLC tag array of ten (INT) named OUTPUT\_INT\_ARRAY. This COPY FILE instruction will remap ten (INT) 16 bit words to five (DINT) 32 bit words.

Source (16 Bit Words)		Destination (32 Bit Words)
OUTPUT_INT_ARRAY[0]	OUTPUT_INT_ARRAY[1]	LOCAL:3.O.DATA[0]
OUTPUT_INT_ARRAY[2]	OUTPUT_INT_ARRAY[3]	LOCAL:3.O.DATA[1]
OUTPUT_INT_ARRAY[4]	OUTPUT_INT_ARRAY[5]	LOCAL:3.O.DATA[2]
OUTPUT_INT_ARRAY[6]	OUTPUT_INT_ARRAY[7]	LOCAL:3.O.DATA[3]
OUTPUT_INT_ARRAY[8]	OUTPUT_INT_ARRAY[9]	LOCAL:3.O.DATA[4]

The length in the COPY FILE instruction refers to the Destination length (5 - DINT's)



A sample INT to DINT RSLogix 5000 PLC program (see also page 95) can be found at:  
<http://www.abb.us/cawp/usabb046/b1345d44862f8ff7852575630073c2b8.aspx>

# Standard ABB Drive on DeviceNet (FDNA-01) with 1769-SDN DeviceNet™ Scanner



## Overview

This document contains an overview on how to add the ABB Drive (FDNA-01) that is programmed to three input words and three output words to the DeviceNet Scan List with RSNetWorx for DeviceNet. The document will assist in remapping the 16 bit words to 32 bit words.

## Reference Documentation:

FDNA-01 DeviceNet Adapter User's Manual  
3AFE68573360

User's Manual ACS350 Drives  
3AFE68462401

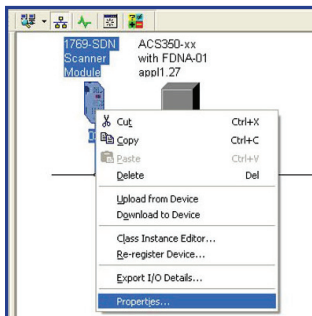
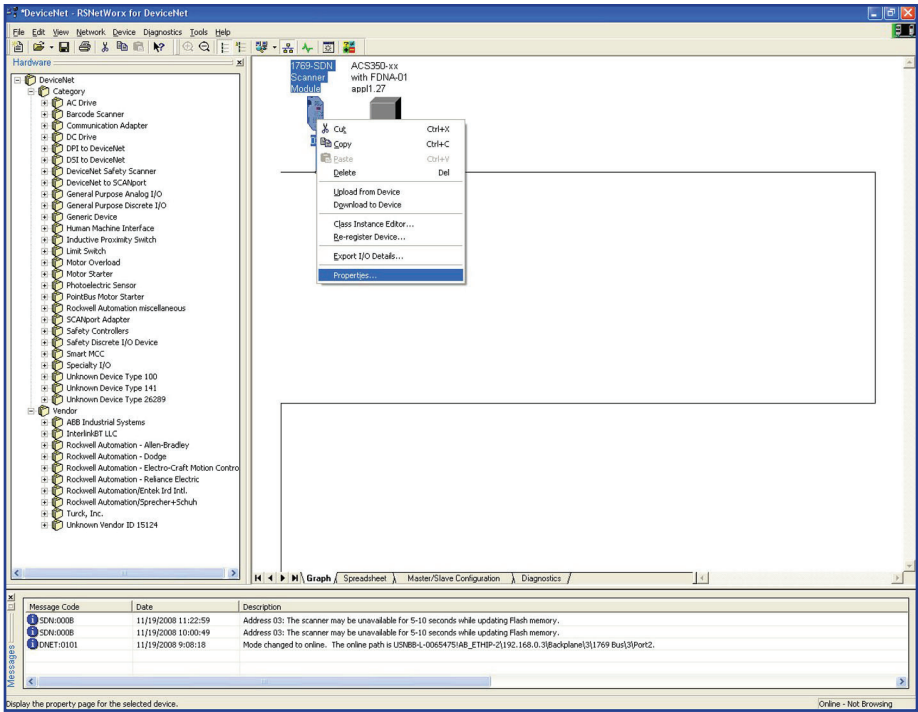
ACS355 User's Manual  
3AUA0000066143

Firmware Manual  
ACS850 Standard Control Program  
3AUA0000045497

Firmware Manual  
ACSM1 Speed and Torque Control Program  
3AFE68848261

# FDNA-01 Installation

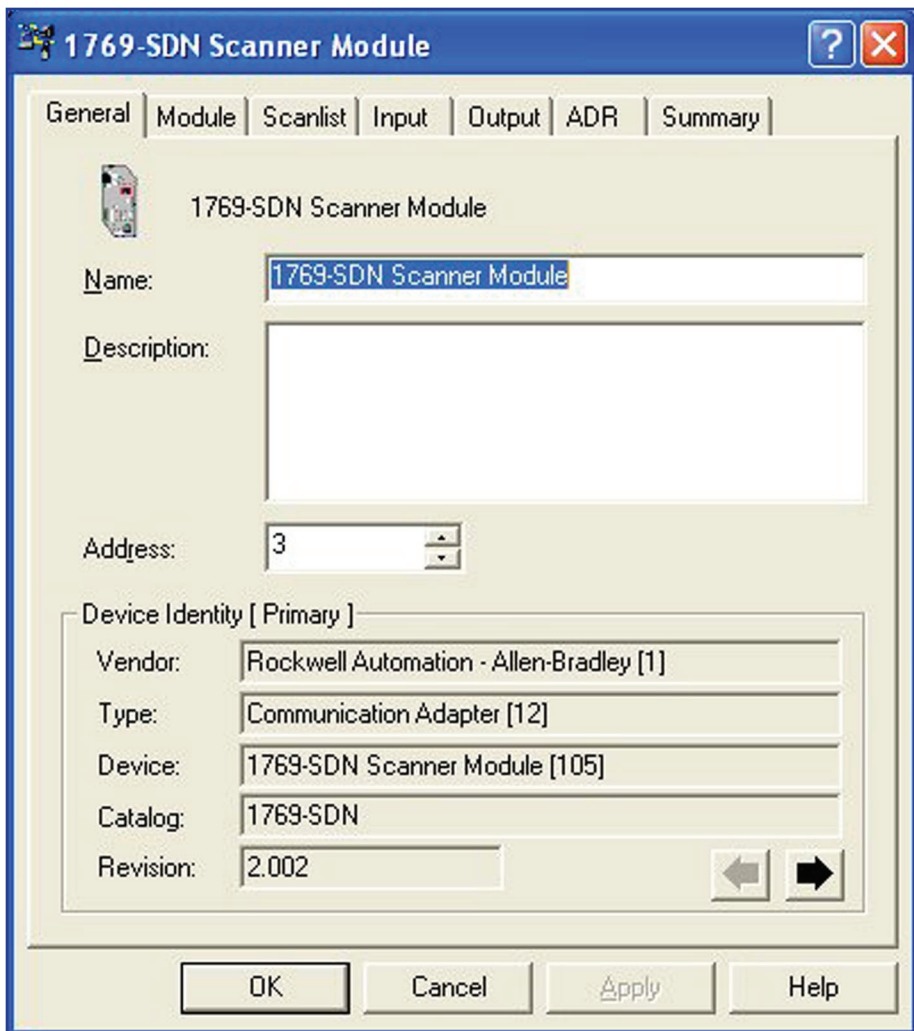
1. Go online and scan the DeviceNet network that needs to be configured. The following instructions will setup the drive to send 13 words and receive 13 words of information.
2. Right Click on the 1769-SDN Scanner Module and select properties.





## FDNA-01 Installation (continued)

- The following screen will open. Click the Module tab. Select upload the configuration for the scanner.



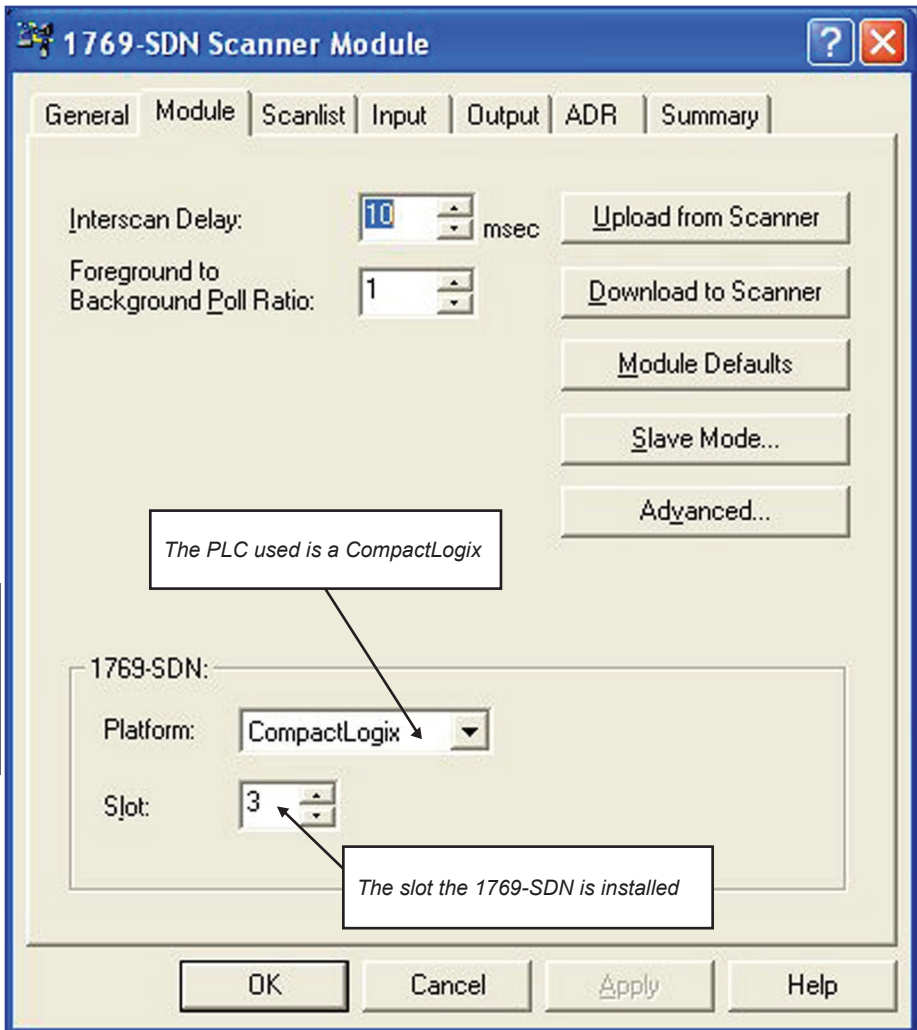
The screenshot shows a software window titled "1769-SDN Scanner Module". The window has a blue title bar with a question mark icon and a close button. Below the title bar are several tabs: "General", "Module", "Scanlist", "Input", "Output", "ADR", and "Summary". The "Module" tab is currently selected. The main area of the window contains the following fields and controls:

- Name:** A text box containing "1769-SDN Scanner Module".
- Description:** A large empty text area.
- Address:** A numeric spinner box set to "3".
- Device Identity [ Primary ]:** A section containing several fields:
  - Vendor:** Rockwell Automation - Allen-Bradley [1]
  - Type:** Communication Adapter [12]
  - Device:** 1769-SDN Scanner Module [105]
  - Catalog:** 1769-SDN
  - Revision:** 2.002

At the bottom of the window are four buttons: "OK", "Cancel", "Apply", and "Help".

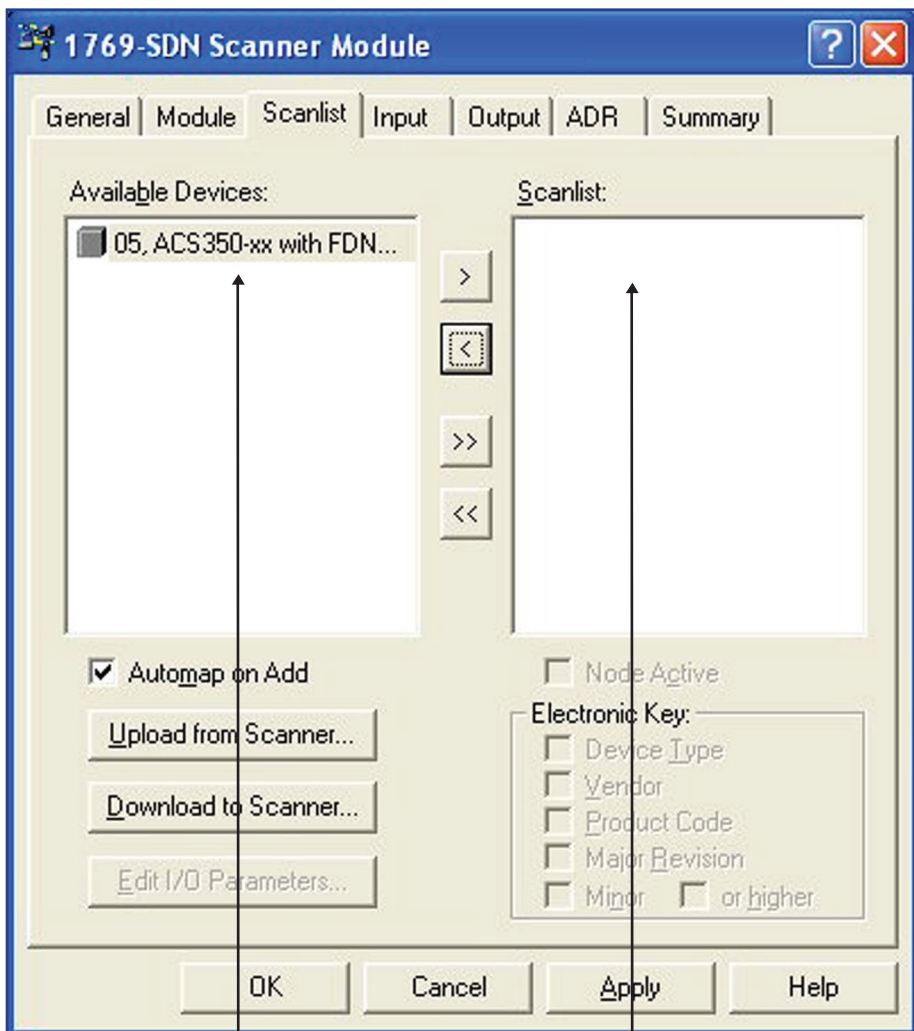
## FDNA-01 Installation (continued)

4. Make sure the following information below is correct.



## FDNA-01 Installation (continued)


- Click the Scanlist tab.

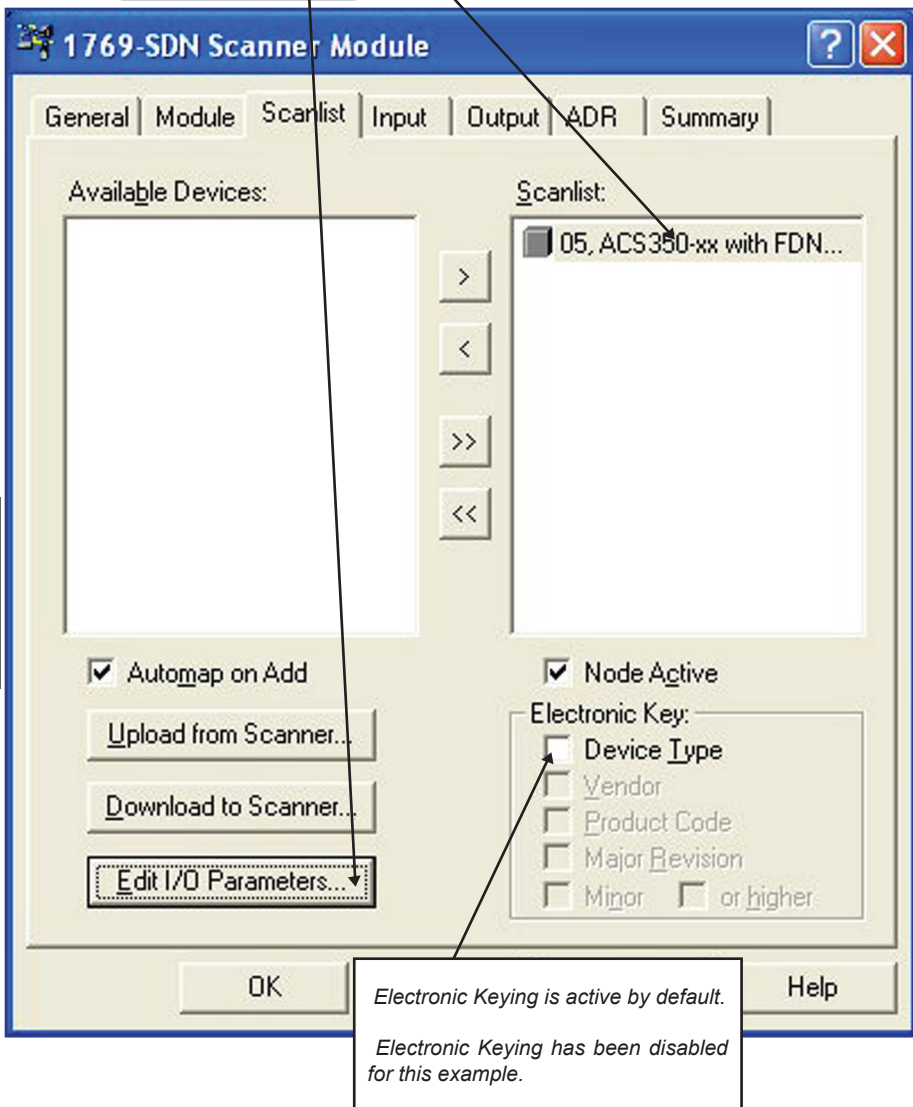


*This window displays all devices available to be added to the DeviceNet Scanner*

*This window displays all devices in the DeviceNet Scan List*

## FDNA-01 Installation (continued)

6. Select a device from the available device list and click the  button. This will move the selected device into the scan list.
7. Select a device under the Scan List. Click Edit I/O Parameters.



## FDNA-01 Installation (continued)

The table below highlights the amount of data that will be transmitted and received from the fieldbus controller for a given profile. The column labeled Size will need to be programmed in the fieldbus controller. The Profile column states the profile (Main Control, Status Word) the drive will be using for control.

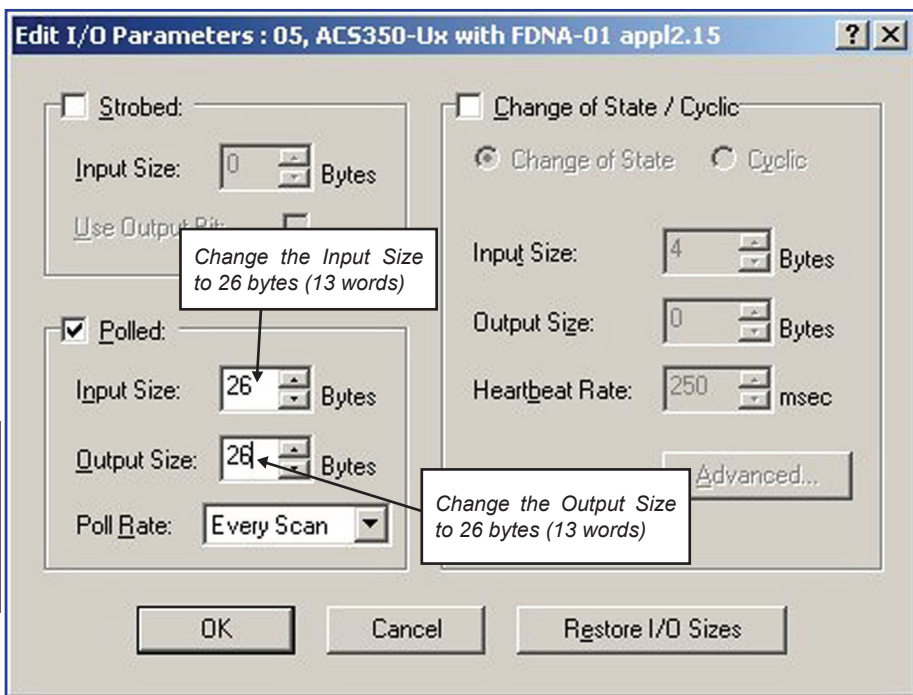
**Table 1: Input & Output Assembly Instances**

Name	Output Instance	Input Instance	Size (bytes)	Profile
Basic Speed Control	20	70	4	ODVA AC/DC Drive
Enhanced Speed Control	21	71	4	ODVA AC/DC Drive
Basic Speed and Torque Control	22	72	6	ODVA AC/DC Drive
Enhanced Speed and Torque Control	23	73	6	ODVA AC/DC Drive
Basic Speed Control plus Drive Parameters	120	170	24	ODVA AC/DC Drive
Enhanced Speed Control plus Drive Parameters	121	171	24	ODVA AC/DC Drive
Basic Speed and Torque Control plus Drive Parameters	122	172	26	ODVA AC/DC Drive
Enhanced Speed and Torqued Control plus Drive Parameters	123	173	26	ODVA AC/DC Drive
ABB Drives Profile with Set Speed	801	851	4	ABB Drives Profile
ABB Drives Profile with Set Speed and Set Torque	802	852	6	ABB Drives Profile
ABB Drives Profile with Set Speed plus Drive Parameters	901	951	24	ABB Drives Profile
ABB Drives Profile with Set Speed and Set Torque plus Drive Parameters	902	952	26	ABB Drives Profile
Transparent16 w/One	811	861	4	Transparent16 Profile
Transparent16 w/Two	812	862	6	Transparent16 Profile
Transparent16 w/One plus Drive Parameters	911	961	24	Transparent16 Profile
Transparent16 w/Two plus Drive Parameters	912	962	26	Transparent16 Profile
Transparent32 w/One	821	871	8	Transparent32 Profile
Transparent32 w/Two	822	872	12	Transparent32 Profile
Transparent32 w/One plus Drive Parameters	921	971	28	Transparent32 Profile
Transparent32 w/Two plus Drive Parameters	922	972	32	Transparent32 Profile

## FDNA-01 Installation (continued)

8. The default I/O size is 4 bytes (2 words). This setting informs the DeviceNet scanner to the amount of data that will be sent and received. Click OK.

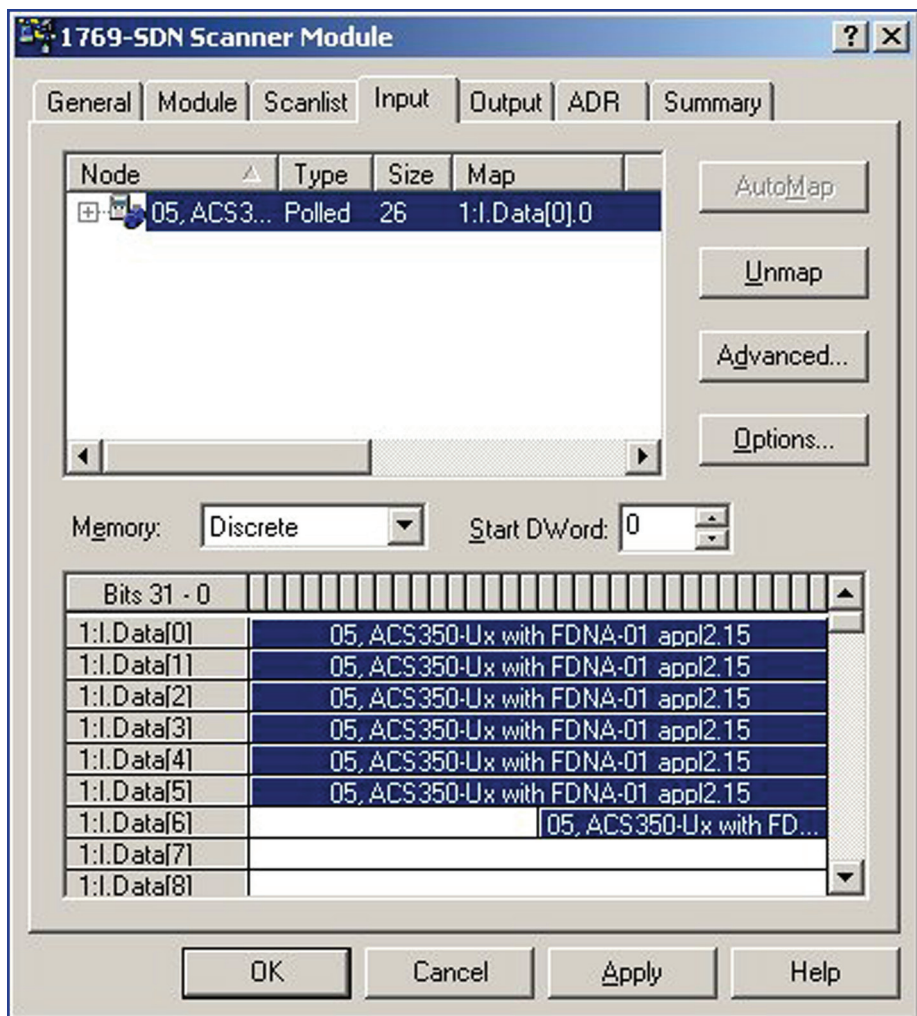
The example below uses input assembly instance 952 and output assembly instance of 902. The input size will be programmed to 26 bytes and the output size will be programmed to 26 bytes.



## FDNA-01 Installation (continued)

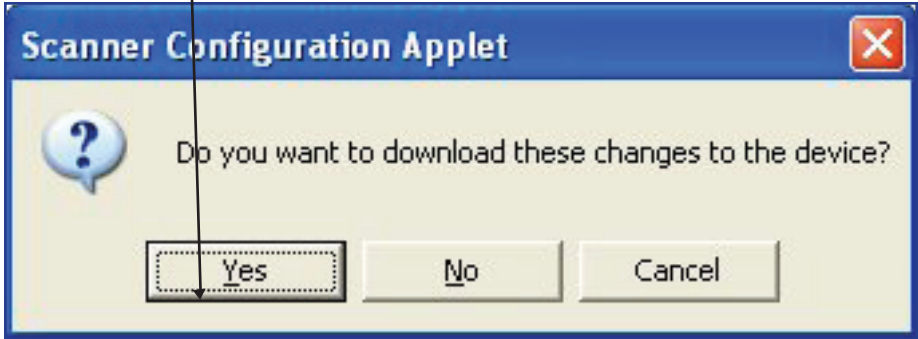
9. Select Yes from the scanner configuration pop-up messages.

The DeviceNet scanner mapped all 13 input words into seven 32 bit (DINT) and word seven is only using 16 bits of the 32 bit word. The DeviceNet scanner did the same thing for the output data. The I/O data will be remapped in the PLC into 16 bit words (INT's).



## FDNA-01 Installation (continued)

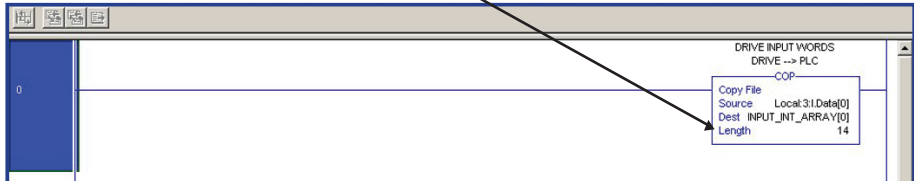
10. Click Apply. Make sure the PLC is in Program Mode.  
Then Click Yes.



11. Enter a rung with a COPY FILE instruction in RSLogix 5000. Create a PLC tag array of fourteen (INT) named INPUT\_INT\_ARRAY. This COPY FILE instruction will remap 7 (DINT) 32 bit words to 14 (INT) 16 bit words.

Source (32 Bit Words)	Destination (16 Bit Words)	
LOCAL:3.I.DATA[0]	INPUT_INT_ARRAY[0]	INPUT_INT_ARRAY[1]
LOCAL:3.I.DATA[1]	INPUT_INT_ARRAY[2]	INPUT_INT_ARRAY[3]
LOCAL:3.I.DATA[2]	INPUT_INT_ARRAY[4]	INPUT_INT_ARRAY[5]
LOCAL:3.I.DATA[3]	INPUT_INT_ARRAY[6]	INPUT_INT_ARRAY[7]
LOCAL:3.I.DATA[4]	INPUT_INT_ARRAY[8]	INPUT_INT_ARRAY[9]
LOCAL:3.I.DATA[5]	INPUT_INT_ARRAY[10]	INPUT_INT_ARRAY[11]
LOCAL:3.I.DATA[6]	INPUT_INT_ARRAY[12]	INPUT_INT_ARRAY[13]

The length in the COPY FILE instruction refers to the Destination length (14 - INT's)



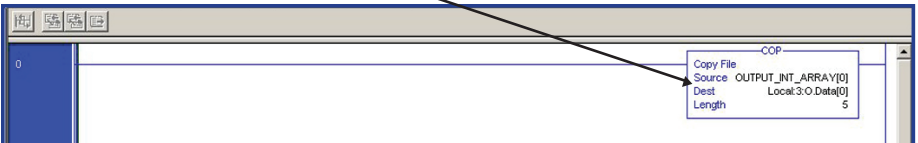


## FDNA-01 Installation (continued)

12. Enter a rung with a COPY FILE instruction in RSLogix 5000. Create a PLC tag array of fourteen (INT) named OUTPUT\_INT\_ARRAY. This COPY FILE instruction will remap 14 (INT) 16 bit words to 7 (DINT) 32 bit words.

Source (16 Bit Words)		Destination (32 Bit Words)
OUTPUT_INT_ARRAY[0]	OUTPUT_INT_ARRAY[1]	LOCAL:3.O.DATA[0]
OUTPUT_INT_ARRAY[2]	OUTPUT_INT_ARRAY[3]	LOCAL:3.O.DATA[1]
OUTPUT_INT_ARRAY[4]	OUTPUT_INT_ARRAY[5]	LOCAL:3.O.DATA[2]
OUTPUT_INT_ARRAY[6]	OUTPUT_INT_ARRAY[7]	LOCAL:3.O.DATA[3]
OUTPUT_INT_ARRAY[8]	OUTPUT_INT_ARRAY[9]	LOCAL:3.O.DATA[4]
OUTPUT_INT_ARRAY[10]	OUTPUT_INT_ARRAY[11]	LOCAL:3.O.DATA[5]
OUTPUT_INT_ARRAY[11]	OUTPUT_INT_ARRAY[13]	LOCAL:3.O.DATA[6]

The length in the COPY FILE instruction refers to the Destination length (7 - DINT's)



A sample INT to DINT RSLogix 5000 PLC Program can be found at:  
<http://www.abb.us/cawp/usabb046/b1345d44862f8ff7852575630073c2b8.aspx>

## Notes:

# RETA-01 EtherNet Adapter Module

## EtherNet/IP™



### Overview

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

With the RETA-01 module, the EtherNet 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 RETA-01 module. The DCS800 drive employs only ABB Drives profiles. The DCS800 drive does not support the ODVA profile. The ACS550/ACH550 both ODVA/ABB Profiles are converted to the DCU profile (detailed in drive documentation) by the RETA-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 RETA-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 RETA-01 uses dynamic assembly sizes.

### Reference Documentation:

User's Manual -  
EtherNet Adapter Module RETA-01  
3AFE64539736

ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

DCS800 Firmware Manual  
3ADW000193

## RETA-01 Installation, drive protocol & profile configuration

### Preliminary preparation

1. Before installation, write down the MAC ID of the module (Printed on a sticker located on the back of the module)

### Mechanical installation

2. Insert the RETA-01 into its specified slot in the drive (SLOT2 for ACS550, SLOT1 for ACS800 and DCS800)
3. Using the two mounting screws included in the module kit fasten the module to the drive.

### Electrical installations

4. Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs. See the RETA-01 User's Manual for connection and bus termination details.
5. Connect the EtherNet cable (RJ-45 connector) to the RETA-01 module.
6. Power up the drive.

### Activating the adapter & 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.

**Table 1: 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.

## RETA-01 I/O assembly instances

**Table 2: ACS800 and DCS800 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.

**Table 3: DCS800 and DCS800 Parameter Settings**

Par. No.	Parameter Name	Setting
98.02	COMM MODULE	FIELDBUS

**NOTE!** The “MODULE STATUS” LED should be green. If the network cable is connected to an active network, the green “LINK/ACTIVITY” 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 RETA-01 configuration parameters.

## I/O assembly instances

**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.

The communication profile setting in the table above 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.”

## RETA-01 Network configuration

### Network configuration

To enable communication through the EtherNet network, the module must be configured for the network. There are numerous ways of setting the module IP address (DIP switch settings, DHCP/BOOTP, parameter settings, gleaning, EtherNet/IP); references RETA-01 user manual's section "Network configuration" for more information.

**Table 5: RETA-01 Configuration Network Parameters**

Par. No.	Parameter Name	Setting Range	Default Setting
51.01	MODULE TYPE	(read-only)	ETHERNET
51.02	COMM RATE	(0) Auto-negotiate (1) 100 Mbit/s, full duplex (2) 100 Mbit/s, half duplex (3) 10 Mbit/s, full duplex (4) 10 Mbit/s, half duplex	(0) Auto-negotiate
51.03	DHCP	(0) DHCP disabled (1) DHCP enabled	(1) DHCP enabled
51.04	IP Address 1	0...255	0
51.05	IP Address 2	0...255	0
51.06	IP Address 3	0...255	0
51.07	IP Address 4	0...255	0
51.08	Subnet Mask 1	0...255	0
51.09	Subnet Mask 2	0...255	0
51.10	Subnet Mask 3	0...255	0
51.11	Subnet Mask 4	0...255	0
51.12	Gateway Address 1	0...255	0
51.13	Gateway Address 2	0...255	0
51.14	Gateway Address 3	0...255	0
51.15	Gateway Address 4	0...255	0
51.16	Protocol	(0) Modbus/TCP (1) EtherNet/IP AC/DC communication profile (2) EtherNet/IP ABB Drives communication profile	(0) Modbus/TCP
51.17	Modbus Timeout	0...65535	0
51.18	Stop Function	(0) Ramp stop (1) Coast stop	(0) Ramp stop
51.19	Output 1	0...65535	0
51.20	Output 2	0...65535	0

## RETA-01 Network configuration (continued)

**Table 5: RETA-01 Configuration Network Parameters (continued)**

Par. No.	Parameter Name	Setting Range	Default Setting
51.21	Output 3	0...65535	0
51.22	Output 4	0...65535	0
51.23	Input 1	0...65535	0
51.24	Input 2	0...65535	0
51.25	Input 3	0...65535	0
51.26	Input 4	0...65535	0
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*

## RETA-01 Examples: ACS800/DCS800/ACS550/ACH550 - ABB Drives Profile (4 Data words In/Out)

The drive is programmed to use data sets to write Main control word, reference 1, reference 2 and one additional parameter. The drive is programmed to read main status word, actual 1 and actual 2 and one 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 6: 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	ETHERNET	ETHERNET	ETHERNET
51.02 Comm rate	(0) Auto-negotiation	(0) Auto-negotiation	(0) Auto-negotiation
51.03 DHCP	(0) Disabled	(0) Disabled	(0) Disabled
51.04 IP address 1	192	192	192
51.05 IP address 2	168	168	168
51.06 IP address 3	0	0	0
51.07 IP address 4	15	16	17
51.08 Subnet mask 1	255	255	255
51.09 Subnet mask 2	255	255	255
51.10 Subnet mask 3	255	255	255
51.11 Subnet mask 4	0	0	0
51.12 GW address 1	192	192	192
51.13 GW address 2	168	168	168
51.14 GW address 3	0	0	0
51.15 GW address 4	1	1	1
51.16 Protocol	(2) ETHERNET/IP ABB DRIVE	(2) ETHERNET/IP ABB DRIVE	(2) ETHERNET/IP ABB DRIVE
51.19 Output 1	(1) Main Control Word	(1) Main Control Word	(1) Main Control Word
51.20 Output 2	(2) Reference 1	(2) Reference 1	(2) Reference 1



## RETA-01 Examples: ACS800/DCS800/ACS550/ACH550 - ABB Drives Profile (4 Data words In/Out)

**Table 6: I/O Assembly Instance 102 & 103 (continued)**

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACx550
51.21 Output 3	(3) Reference 2	(3) Reference 2	(3) Reference 2
51.22 Output 4	(7) AUX DS REF3	(7) AUX DS REF3	(2205) ACCEL TIME 2
51.23 Input 1	(4) Status Word	(4) Status Word	(4) Status Word
51.24 Input 2	(5) Actual Ref 1 (Speed)	(5) Actual Ref 1 (Speed)	(5) Actual Ref 1 (Speed)
51.25 Input 3	(6) Actual Ref 2 (Torque)	(6) Actual Ref 2 (Torque)	(6) Actual Ref 2 (Torque)
51.26 Input 4	(10) Actual Ref 3 (305 FAULT WORD 1)	(10) DsetXplus-3Val1 (802) Auxiliary Status Word)	(106) POWER
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
92.01 DsetXplus1Val1	N/A	(801) MainStatWord	N/A
92.02 MAIN DS ACT1 or DsetXplus1Val2	(102) SPEED	(104) MotSpeed	N/A
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

\* 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.

## RETA-01 Examples: ACS800/ACS550/ACH550 - ODVA Drives Profile (2 Data words In/Out)

**Table 7: I/O Assembly Instance 21 & 71**

Drive Parameter	Example setting for ACS800
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	ETHERNET
51.02 Comm rate	(0) Auto-negotiation
51.03 DHCP	(0) Disabled
51.04 IP address 1	192
51.05 IP address 2	168
51.06 IP address 3	0
51.07 IP address 4	15
51.08 Subnet mask 1	255
51.09 Subnet mask 2	255
51.10 Subnet mask 3	255
51.11 Subnet mask 4	0
51.12 GW address 1	192
51.13 GW address 2	168
51.14 GW address 3	0
51.15 GW address 4	1
51.16 Protocol	(1) EtherNet/IP AC/DC
51.19 Output 1	(0)**
51.20 Output 2	(0)**
51.21 Output 3	(0)**
51.22 Output 4	(0)**
51.23 Input 1	(0)**
51.24 Input 2	(0)**
51.25 Input 3	(0)**
51.26 Input 4	(0)**
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.

**RETA-01 Examples: ACS800/ACS550/ACH550 -**  
**ODVA Drives Profile (6 Data words In/Out). Four 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 four user configured parameters. It will read Main status word, Actual speed, and four 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.

**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 8: I/O Assembly Instance 121 & 171**

Drive Parameter	ACS800	ACx550
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	ETHERNET	ETHERNET
51.02 Comm rate	(0) Auto-negotiation	(0) Auto-negotiation
51.03 DHCP	(0) Disabled	(0) Disabled
51.04 IP address 1	192	192
51.05 IP address 2	168	168
51.06 IP address 3	0	0
51.07 IP address 4	15	15
51.08 Subnet mask 1	255	255
51.09 Subnet mask 2	255	255
51.10 Subnet mask 3	255	255
51.11 Subnet mask 4	0	0
51.12 GW address 1	192	192
51.13 GW address 2	168	168
51.14 GW address 3	0	0
51.15 GW address 4	1	1
51.16 Protocol	(1) Ethernet/IP AC/DC	(1) Ethernet/IP AC/DC
51.19 Output 1	(3) Reference 2**	(3) Reference 2**
51.20 Output 2	(7) AUX DS REF3	(2208) EMERG DEC TIME

RETA-01 Examples: **ACS800/ACS550/ACH550** - (continued)  
 ODVA Drives Profile (6 Data words In/Out). Four of the In/Out  
 Data words are user configured by parameters in group 51.

**Table 8: I/O Assembly Instance 121 & 171 (continued)**

Drive Parameter	ACS800	ACx550
51.21 Output 3	(8) AUX DS REF4	(2204) ACCEL TIME 2
51.22 Output 4	(9) AUX DS REF5	(2205) DECEL TIME 2
51.23 Input 1	(6) Actual Ref 2 (Torque)**	(6) Actual Ref 2 (Torque)**
51.24 Input 2	(10) Actual Ref 3 (305 FAULT WORD 1)	(106) POWER
51.25 Input 3	(11) Actual 4 (308 ALARM WORD 1)	(104) CURRENT
51.26 Input 4	(12) Actual 5 (306 FAULT WORD 2)	(105) TORQUE
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
92.04 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.

\*\* Minimum connection size for assembly 121&171 is 3 words transmitted and received. Parameter 51.19 and 51.23 must be programmed to a value other than zero.

\*\*\* 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.

# FENA-01 EtherNet Adapter Module



## Overview

This document contains the basic start-up procedure of the AC350 drives with the FENA-01 EtherNet Adapter Module. The FENA-01 EtherNet Adapter Module is an optional device for the ABB ACS350, ACS355 drive which enables the connection of the drive to an EtherNet/IP or Modbus/TCP network. Reference the specific drive user manual and FENA-01 user's manuals for additional product information.

With the FENA-01 module, the EtherNet network may employ either the ODVA AC/DC Drive profile or the ABB Drives profile. The two profiles are converted to the DCU profile (detailed in the drive documentation) by the FENA-01 module. In addition, two Transparent modes for 16 and 32 bit words respectively are available. With the Transparent modes, no data conversion takes place.

## 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 FENA-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 FENA-01 uses Static assemblies (in other words, fixed groupings of different object data only).

## Reference Documentation:

Hardware Manual  
EtherNet Adapter Module FENA-01  
3AUA0000022986

Protocol Manual -  
EtherNet/IP EtherNet  
Adapter Module FENA-01  
3AUA0000033371

ACS350 User's Manual  
3AFE68462401

ACS355 User's Manual  
3AUA0000066143

## FENA-01 Installation

### Preliminary preparation

1. Before installation, write down the MAC ID of the module (Printed on a sticker located on the front of the module)

### Mechanical installation

2. Install clamping plate and fieldbus option ground plate, clamps and screws.
3. Insert the FENA-01 into its specified slot in the drive.
4. Using the mounting screw included in the module kit fasten the module to the drive.

### Electrical installation

5. Connect the EtherNet cable (RJ-45 connector) to the FENA-01 module. Arrange the bus cables as far away from the motor cables as possible. Avoid parallel runs.

## FENA-01 Drive protocol & profile configuration

### 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.

6. Power up the drive.
7. Set Parameters as follows:

**Table 1: ACS350, ACS355 Parameter Settings**

Par. No.	Parameter Name	Setting
98.02	COMM PROT SEL	(4) EXT FBA
51.02	PROTOCOL/PROFILE	MODBUS/TCP: (0) ABB DRIVES CLASSIC (1) ABB DRIVES ENHANCED (2) TRANSPARENT 16-BIT (3) TRANSPARENT 32-BIT  ETHERNET/IP: (100) ODVA AC/DC DRIVE (101) ABB DRIVES PROFILE (102) TRANSPARENT 16-BIT (103) TRANSPARENT 32-BIT

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

## FENA-01 I/O assembly instances

## I/O assembly instances

The table below highlights the amount of data that will be transmitted and received from the fieldbus controller for a given profile. The size column will need to be programmed in the fieldbus controller. The column labeled Profile states the profile (Main Control, Status Word) the drive will be using for control.

**Table 2: Input & Output Assembly Instances**

Name	Output Instance	Input Instance	Size (bytes)	Profile
Basic Speed Control	20	70	4	ODVA AC/DC Drive
Enhanced Speed Control	21	71	4	ODVA AC/DC Drive
Basic Speed and Torque Control	22	72	6	ODVA AC/DC Drive
Enhanced Speed and Torque Control	23	73	6	ODVA AC/DC Drive
Basic Speed Control plus Drive Parameters	120	170	24	ODVA AC/DC Drive
Enhanced Speed Control plus Drive Parameters	121	171	24	ODVA AC/DC Drive
Basic Speed and Torque Control plus Drive Parameters	122	172	26	ODVA AC/DC Drive
Enhanced Speed and Torque Control plus Drive Parameters	123	173	26	ODVA AC/DC Drive
ABB Drives Profile w/Set Speed	1	51	4	ABB Drives Profile
ABB Drives Profile w/Set Speed and Set Torque	2	52	6	ABB Drives Profile
ABB Drives Profile w/Set Speed plus Drive Parameters	101	151	24	ABB Drives Profile
ABB Drives Profile w/Set Speed and Set Torque plus Drive Parameters	102	152	26	ABB Drives Profile
Transparent16 w/One	11	61	4	Transparent16 Profile
Transparent16 w/Two	12	62	6	Transparent16 Profile
Transparent16 w/One plus Drive Parameters	111	161	24	Transparent16 Profile
Transparent16 w/Two plus Drive Parameters	112	162	26	Transparent16 Profile
Transparent32 w/One	21	71	8	Transparent32 Profile
Transparent32 w/Two	22	72	12	Transparent32 Profile
Transparent32 w/One plus Drive Parameters	121	171	28	Transparent32 Profile
Transparent32 w/Two plus Drive Parameters	122	172	32	Transparent32 Profile



## FENA-01 Network configuration

### Network configuration

To enable communication through the EtherNet network, the module must be configured for the network. There are numerous ways of setting the module IP address (DHCP/BOOTP, parameter settings, gleaning); references FENA-01 EtherNet/IP Protocol user manual's section "Drive configuration" for more information.

**Table 3: Network configuration with drive parameters**

Par. No.	Parameter Name	Setting Range	Default Setting
51.01	FBA TYPE	(Read-only)	ETHERNET
51.02	PROTOCOL/ PROFILE	Modbus/TCP: (0) ABB Drives Classic (1) ABB Drives Enhanced (2) Transparent 16-bit (3) Transparent 32-bit  EtherNet/IP (100) ODVA AC/DC Drive (101) ABB Drives Profile (102) Transparent 16-bit (103) Transparent 32-bit	(0) Modbus/TCP - ABB Drives Classic
51.03	COMMRATE	(0) Auto-negotiate; (1) 100 Mbps, Full Duplex (2) 100 Mbps, Half Duplex (3) 10 Mbps, Full Duplex (4) 10 Mbps, Half Duplex	(0) Auto-negotiate
51.04	IP CONFIGURATION	(0) Static IP (1) Dynamic IP (DHCP)	(1) Dynamic IP (DHCP)
51.05	IP ADDRESS 1	0...255	0
51.06	IP ADDRESS 2	0...255	0
51.07	IP ADDRESS 3	0...255	0
51.08	IP ADDRESS 4	0...255	0
51.09	SUBNET CIDR	1...31	1
51.10	GW ADDRESS 1	0...255	0
51.11	GW ADDRESS 2	0...255	0
51.12	GW ADDRESS 3	0...255	0
51.13	GW ADDRESS 4	0...255	0
51.14 - 19	Reserved	N/A	N/A
51.20	Control Timeout	0...65535	0
51.21	Idle Action	(0) Off-line (1) On-line	0
51.22	ODVA Stop Function	(0) Ramp (1) Coast	0
51.23	ODVA Speed Scale	0...255	128

## FENA-01 Network configuration & subnet masks

**Table 3: Network configuration with drive parameters**

Par. No.	Parameter Name	Setting Range	Default Setting
51.24	ODVA Torque Scale	0...255	128
51.25 -26	Reserved	N/A	N/A
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*

### Subnet masks

Subnet masks are used for splitting networks into smaller networks called subnets. A subnet mask is a 32-bit binary number that is used to split the IP Address into a network address and host address. Subnet masks are typically represented in either dotted-decimal notation or the more compact CIDR notation (Classless Inter-Domain Routing).

**Table 4: Parameter 51.09 SUBNET CIDR**

Dotted Decimal	CIDR	Dotted Decimal	CIDR
255.255.255.254	31	255.254.0.0	15
255.255.255.252	30	255.252.0.0	14
255.255.255.248	29	255.248.0.0	13
255.255.255.240	28	255.240.0.0	12
255.255.255.224	27	255.224.0.0	11
255.255.255.192	26	255.224.0.0	10
255.255.255.128	25	255.128.0.0	9
255.255.255.0	24	255.0.0.0	8
255.255.254.0	23	254.0.0.0	7
255.255.252.0	22	252.0.0.0	6
255.255.248.0	21	248.0.0.0	5
255.255.240.0	20	240.0.0.0	4
255.255.224.0	19	224.0.0.0	3
255.255.192.0	18	192.0.0.0	2
255.255.128.0	17	128.0.0.0	1
255.255.0.0	16		

## FENA-01 Network configuration

**Table 5: ODVA Speed Scaling**

ODVA Speed Scale Value <sup>1</sup>	Drive Parameter Speed Scale Value <sup>2</sup>	Speed Unit
-5	123	32 RPM
-4	124	16 RPM
-3	125	8 RPM
-2	126	4 RPM
-1	127	2 RPM
0 (default)	128	1 RPM
1	129	0.5 RPM
2	130	0.25 RPM
3	131	0.125 RPM
4	132	0.0625 RPM
5	133	0.03125 RPM

**Table 6: ODVA Torque Scaling**

ODVA Torque Scale Value <sup>1</sup>	Drive Parameter Torque Scale Value <sup>2</sup>	Torque Unit
-5	123	32 NM
-4	124	16 NM
-3	125	8 NM
-2	126	4 NM
-1	127	2 NM
0 (default)	128	1 NM
1	129	0.5 NM
2	130	0.25 NM
3	131	0.125 NM
4	132	0.0625 NM
5	133	0.03125 NM

<sup>1</sup> Use ODVA Speed/Torque Scale Value when reading/writing ODVA Speed or Torque scale via the AC/DC Drive Object (2Ah). When written via AC/DC Drive Object, the new value takes effect immediately.

<sup>2</sup> Use Drive Parameter Speed/Torque Scale Value when reading/writing ODVA Speed or Torque Scale via the drive panel, drive parameter object (90h) and drive configuration object (91h). When written via these methods, the new value takes effect after the drive is repowered or a "Fieldbus Adapter Parameter Refresh" is given.

## FENA-01 Example: ACS350, ACS355 - ABB Drives Profile - (13 Data Words In/Out)

The example will write the Main Control Word, Speed Ref, Torque Ref, Acceler Time 2 and Deceler Time 2. It will read Main status word, Actual speed, Actual Torque, Current and DC Bus Voltage

**Table 7: I/O Assembly Instance 102 & 152**

Drive Parameter	Example setting for ACS350
10.01 EXT1 COMMANDS	COMM
10.03 REF DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM. PROT SEL	FIELDBUS
51.01 MODULE TYPE	ETHERNET (READ ONLY)
51.02 PROTOCOL/PROFILE	(101) ABB DRIVES PROFILE
51.03 COMM RATE	(0) AUTO NEGOTIATE
51.04 IP CONFIGURATION	(0) STATIC IP
51.05 IP ADDRESS	192
51.06 IP ADDRESS	168
51.07 IP ADDRESS	0
51.08 IP ADDRESS	2
51.09 SUBNET MASK	24
51.10 GW ADDRESS	0
51.11 GW ADDRESS	0
51.12 GW ADDRESS	0
51.13 GW ADDRESS	0
51.20 CONTROL TIMEOUT	0
51.21 IDLE ACTION	0
51.22 ODVA STOP FUNCTION	(0) RAMP
51.23 ODVA SPEED SCALE	128
51.24 ODVA TORQUE SCALE	128
54.01 FB DATA INPUT 1	(104) CURRENT
54.02 FB DATA INPUT 2	(107) DC BUS VOLTAGE
54.03 ... 54.10 FB DATA INPUT	0
55.01 FB DATA OUTPUT 1	(2205) ACCELER TIME 2
55.02 FB DATA OUTPUT 2	(2206) DECELER TIME 2
55.03 ... 55.10 FB DATA OUTPUT	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*

## FENA-01 Example: ACS350, ACS355 - ODVA AC/DC Drives Profile (3 Data words In/Out)

**Table 8: I/O Assembly Instance 23 & 73**

Drive Parameter	Example setting for ACS350, ACS355
10.01 EXT 1 COMMANDS	COMM
10.03 REF DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM PROT SEL	FIELDBUS
51.01 MODULE TYPE	ETHERNET (READ ONLY)
51.02 PROTOCOL/PROFILE	(100) ODVA AC/DC Drive
51.03 COMM RATE	(0) AUTO NEGOTIATE
51.04 IP CONFIGURATION	(0) STATIC IP
51.05 IP ADDRESS	192
51.06 IP ADDRESS	168
51.07 IP ADDRESS	0
51.08 IP ADDRESS	2
51.09 SUBNET MASK	24
51.10 GW ADDRESS	0
51.11 GW ADDRESS	0
51.12 GW ADDRESS	0
51.13 GW ADDRESS	0
51.20 CONTROL TIMEOUT	0
51.21 IDLE ACTION	0
51.22 ODVA STOP FUNCTION	(0) RAMP
51.23 ODVA SPEED SCALE	128
51.24 ODVA TORQUE SCALE	128
51.27* FBA PAR REFRESH	(1) REFRESH

\* *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*

## FENA-01 Example: ACS350, ACS355 - ODVA AC/DC Drives Profile (13 Data words In/Out)

**Table 9: I/O Assembly Instance 123 & 173**

Drive Parameter	Example setting for ACS350
10.01 EXT 1 COMMANDS	COMM
10.03 REF DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM PROT SEL	FIELDBUS
51.01 MODULE TYPE	ETHERNET (READ ONLY)
51.02 PROTOCOL/PROFILE	(100) ODVA AC/DC Drive
51.03 COMM RATE	(0) AUTO NEGOTIATE
51.04 IP CONFIGURATION	(0) STATIC IP
51.05 IP ADDRESS	192
51.06 IP ADDRESS	168
51.07 IP ADDRESS	0
51.08 IP ADDRESS	2
51.09 SUBNET MASK	24
51.10 GW ADDRESS	192
51.11 GW ADDRESS	168
51.12 GW ADDRESS	0
51.13 GW ADDRESS	1
51.20 CONTROL TIMEOUT	0
51.21 IDLE ACTION	0
51.22 ODVA STOP FUNCTION	(0) RAMP
51.23 ODVA SPEED SCALE	128
51.24 ODVA TORQUE SCALE	128
51.27* FBA PAR REFRESH	(1) REFRESH
54.01 FB DATA INPUT 1	(104) CURRENT
54.02 FB DATA INPUT 2	(107) DC BUS VOLTAGE
54.03 ... 54.10 FB DATA INPUT	0
55.01 FB DATA OUTPUT 1	(2205) ACCELER TIME 2
55.02 FB DATA OUTPUT 2	(2206) DECELER TIME 2
55.03 ... 55.10 FB DATA OUTPUT	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

# Standard ABB Drive on EtherNet/IP™ (RETA-01 or FENA-01) with RSLogix® 500 Software



## Overview

This document contains an overview on how to setup a standard ABB drive in RSLogix 500 on EtherNet/IP.

## Reference Documentation:

Hardware Manual EtherNet Adapter Module FENA-01  
3AUA0000022986

Protocol Manual - EtherNet/IP EtherNet Adapter Module  
FENA-01, 3AUA0000033371

User's Manual - EtherNet Adapter Module RETA-01,  
3AFE64539736

ACS350 User's Manual  
3AFE68462401

ACS355 User's Manual  
3AUA0000066143

ACS550-U1 Users Manual  
3AUA0000001609

ACS800 Firmware Manual  
3AFE64527592

DCS800 Firmware Manual  
3ADW000193

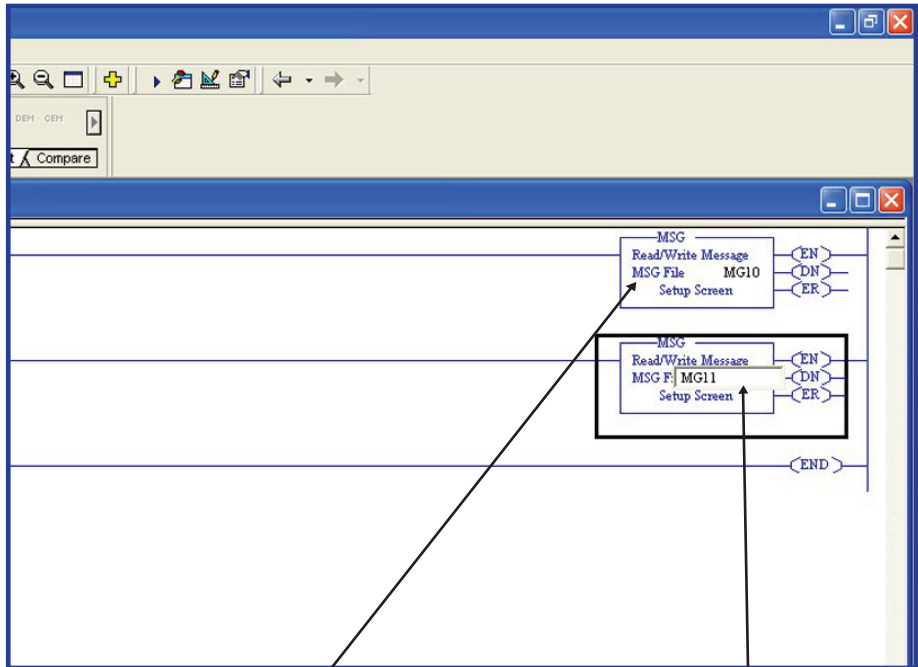
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**NOTE!** RSLogix 500 and the PLC processor must support Class 3 messaging.

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## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation

1. Open RSLogix® 500 and open a RSLogix® 500 program. A message instruction will need to be added to write the output assembly and to read the input assembly. Name the MSG.



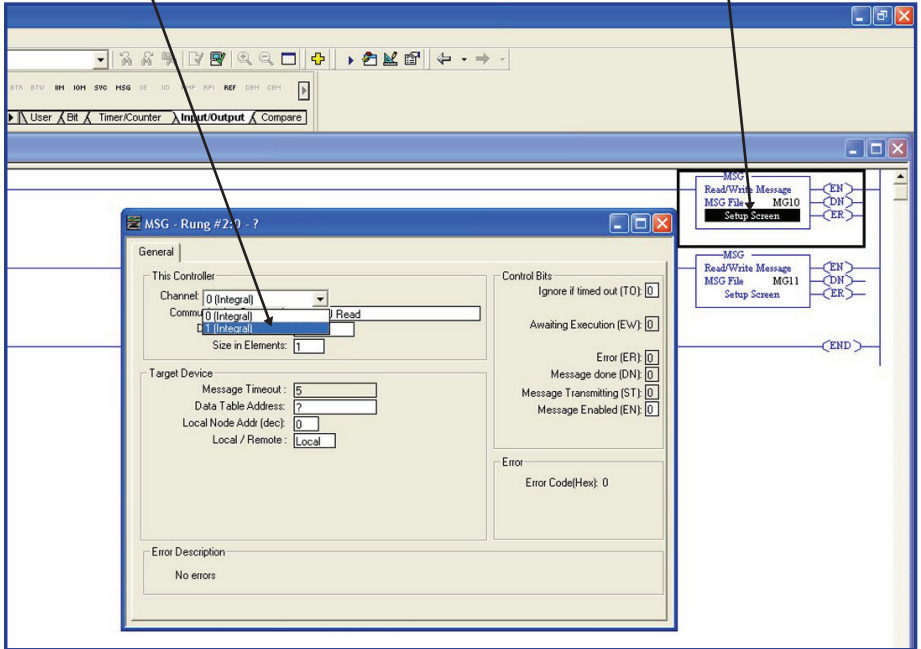
The **write** message for the Quick Start Guide is named **MG10:0**

The **read** message for the Quick Start Guide is named **MG11:0**



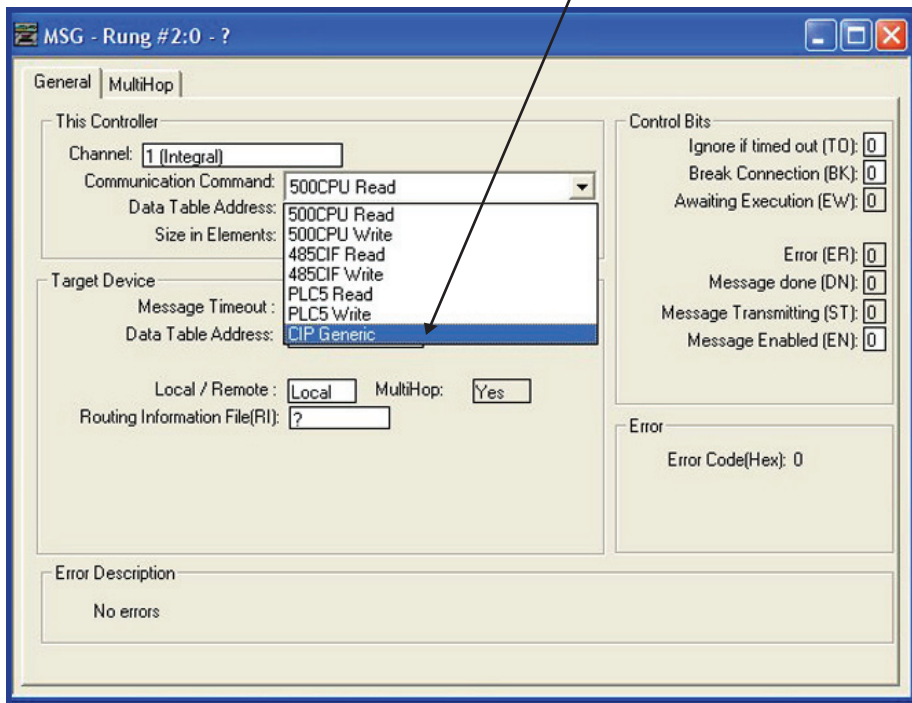
## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

- Setting up the write message MG10:0. Click the **Setup Screen** button. **Change Channel** to 1.



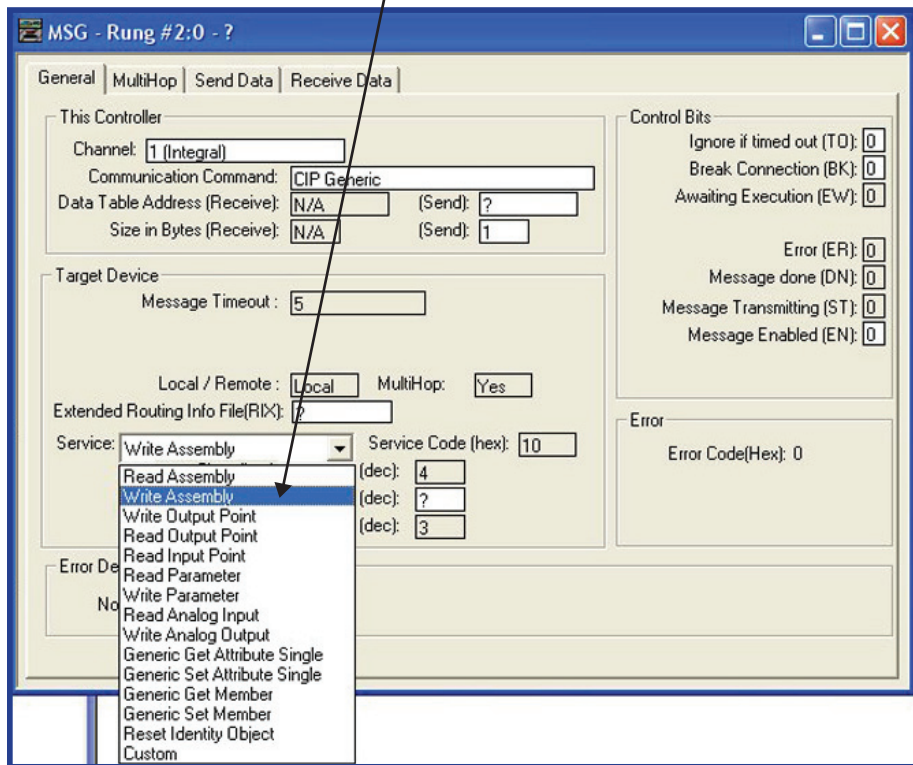
## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

### 3. Program Communication Command to **CIP Generic**



## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

### 4. Program the service to **Write Assembly**



## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

- Program the following information. In the example below, the drive will use assembly 21 (Write).

Program the address where the data that is in the PLC will be written to the drive.

Enter the number of bytes the message will write to the drive.

Enter RIX # for the PLC to use.

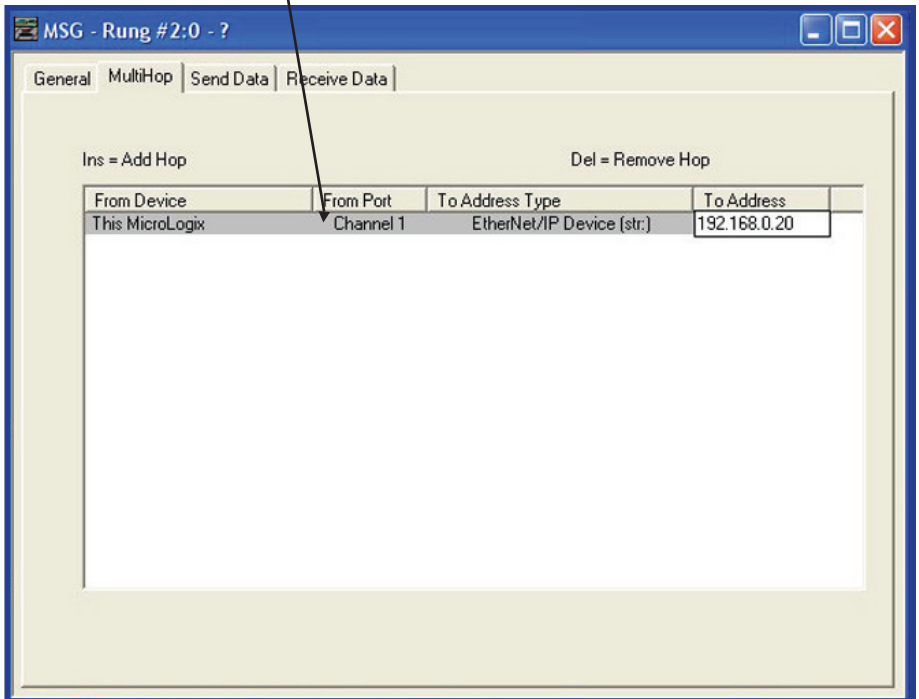
Enter the Output Assembly number here.

Input Assembly Instances	Output Assembly Instances	Typical PLC Byte Size
70	20	4 (Bytes)
71	21	4 (Bytes)
171	121	12 (Bytes)
101	100	4 (Bytes)
103	102	8 (Bytes)

Reference RETA-01 User Manual's section "Communication" for more information on Input/Output Assembly Instances.

## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

- Click the MultiHop tab.  
Enter the IP Address for the RETA-01 or FENA-01.



## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

7. Program the same kind of information for the read message.  
The example below the drive will use assembly 71 (Read.)

*Program the address where the data that is read from the drive will be placed in the PLC.*

*Enter the number of bytes the message will read from the drive.*

*Enter RIX # for the PLC to use.*

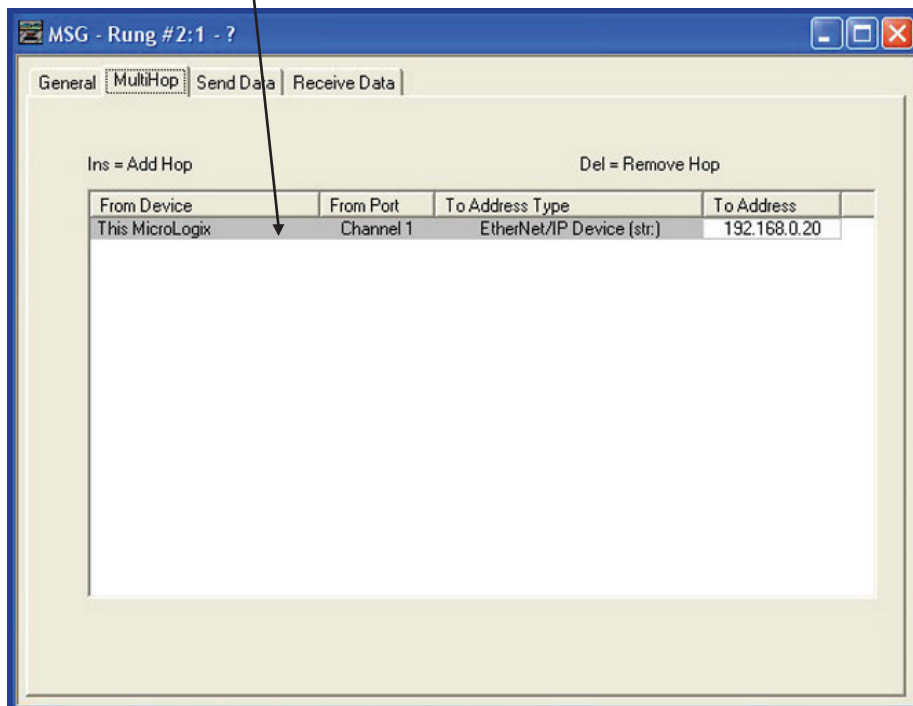
*Enter the Input Assembly number here.*

Input Assembly Instances	Output Assembly Instances	Typical PLC Byte Size
70	20	4 (Bytes)
71	21	4 (Bytes)
171	121	12 (Bytes)
101	100	4 (Bytes)
103	102	8 (Bytes)

Reference RETA-01 User Manual's section "Communication" for more information on Input/Output Assembly Instances.

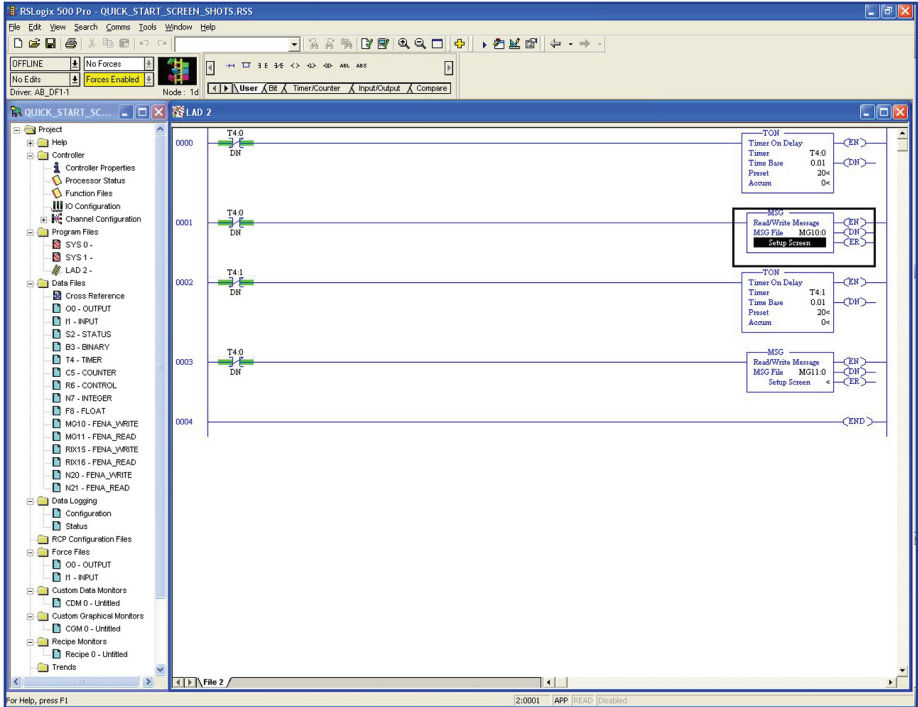
## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

8. Click the **MultiHop** tab.  
Enter the **IP Address** for the RETA-01 or FENA-01.



## (RETA-01 or FENA-01) with RSLogix® 500 Software Installation (continued)

9. Message timing will need to be added to program. See examples below for timing using timers.



A sample RSLogix 500 PLC Program can be found at:  
<http://www.abb.us/cawp/usabb046/b1345d44862f8ff7852575630073c2b8.aspx>



# Standard ABB Drive on EtherNet/IP (RETA-01) with RSLogix® 5000 Software



## Overview

This document contains an overview on how to setup a standard ABB drive in RSLogix 5000 on EtherNet/IP.

## Reference Documentation:

Users Manual, EtherNet Adapter Module RETA-01  
3AFE64539736

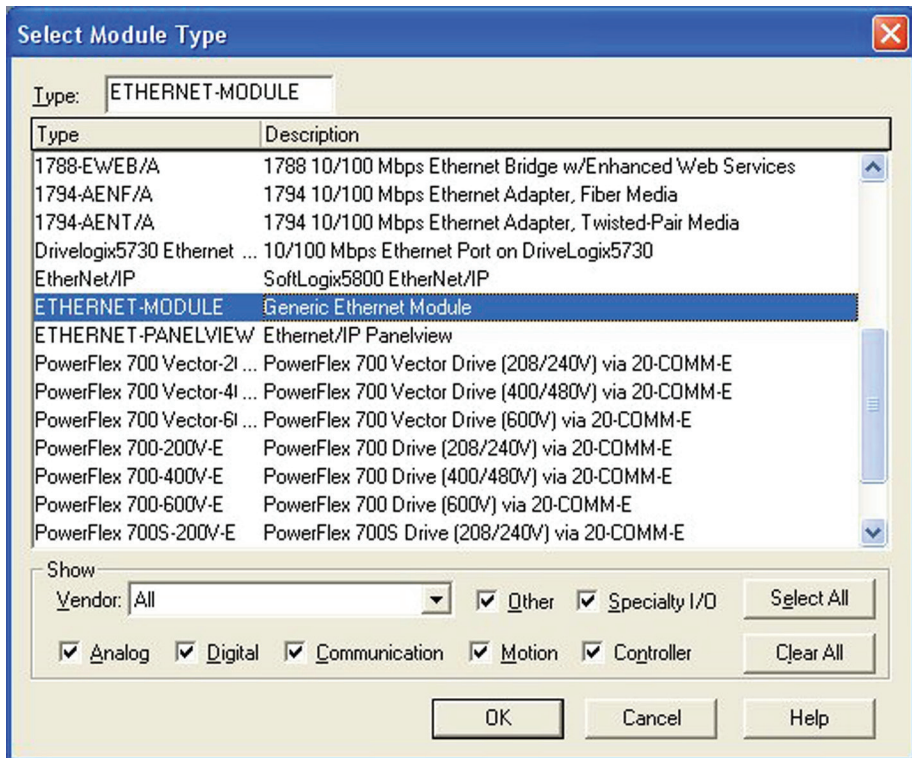
## Installation

1. Open RSLogix® 5000 and open a RSLogix® 5000 program. Right click on the 1769-L32E EtherNet Port LocalENB. Click on New Module.

The screenshot displays the RSLogix 5000 software interface. The left pane shows the project tree under 'I/O Configuration', with 'CompactBus Local' expanded to show four modules: [1] 1769-IF4XOF2/A Analo, [2] 1769-IQ6XOW4/B Rela, [3] 1769-SDM/B DeviceNet, and [4] 1769-MODULE Profibus. The '1769-L32E Ethernet Port LocalENB' module is selected, and a context menu is open over it, showing options: 'New Module...', 'Cut', 'Copy', 'Paste', 'Delete', and 'Cross Reference'. The top toolbar and status bar are also visible.

## (RETA-01 with RSLogix® 5000 Software Installation (continued))

- Select Module Type: ETHERNET-MODULE.



- Program the following information below. The example shown is using the ABB Profile Assembly Instances 102 and 103. The following table will display Input and Output Assembly Instances and PLC I/O Memory size.

Input Assembly Instances	Output Assembly Instances	Typical PLC Word Size Settings
70	20	2
71	21	2
171	121	6
101	100	2
103	102	4

Reference RETA-01 User Manual's section "Communication" for more information on Input/Output Assembly Instances.

## (RETA-01 with RSLogix® 5000 Software Installation (continued))

4. Enter the following information. The example shown is using the ABB Profile Assembly Instances 102 and 103. The PLC will transmit and receive four words.

*Enter the name that will be given to the RETA-01*

*Sets the size of the Input/Output words for the RETA-01*

**Module Properties - LocalENB (ETHERNET-MODULE 1.1)**

Type: ETHERNET-MODULE Generic Ethernet Module  
 Vendor: Allen-Bradley  
 Parent: LocalENB  
 Name: RETA\_01  
 Description:   
 Comm Format: Data - INT  
 Address / Host Name  
 IP Address: 192 . 168 . 0 . 50  
 Host Name:   
 Connection Parameters  
 Assembly Instance: Input: 103, Output: 102, Configuration: 1  
 Size: Input: 4 (16-bit), Output: 4 (16-bit), Configuration: 0 (8-bit)  
 Status Input:   
 Status Output:   
 Buttons: Cancel, < Back, Next >, Finish >>, Help

*ABB RETA-01 uses 16 Bit words, change Comm Format to Data - INT (16Bits)*

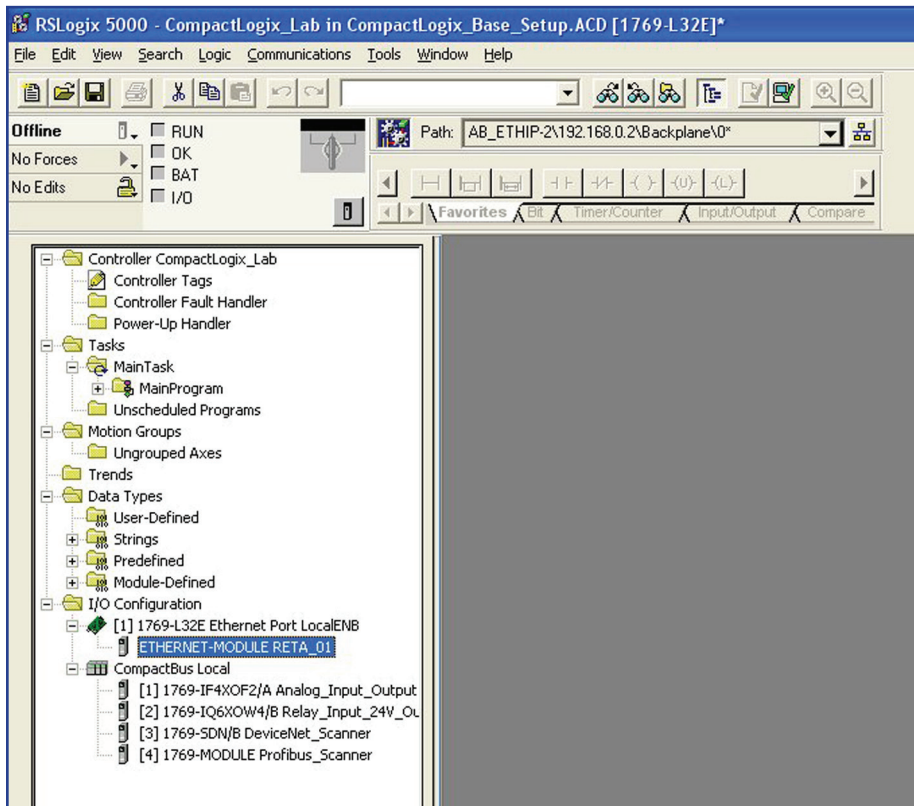
*Enter the IP address of the RETA-01*

*Configuration needs to be programmed to 1 and size to 0*

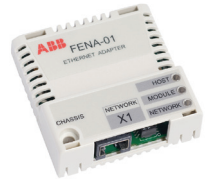
5. Click Finish.

## (RETA-01 with RSLogix® 5000 Software Installation (continued)

6. The RETA-01 is now added to the PLC I/O.



# Standard ABB Drive on EtherNet/IP™ (FENA-01) with RSLogix® 5000



## Overview

This document contains an overview on how to setup a standard ABB drive in RSLogix 5000 on EtherNet/IP.

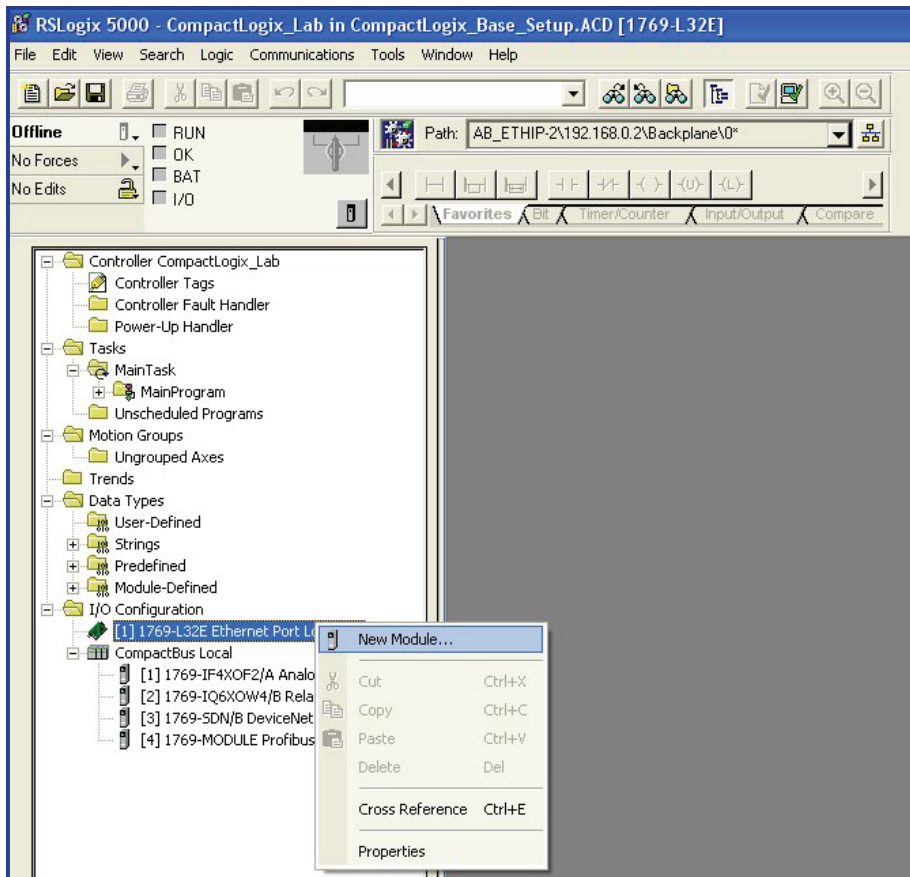
## Reference Documentation:

Hardware Manual EtherNet Adapter Module FENA-01  
3AUA0000022986

Protocol Manual - EtherNet/IP EtherNet Adapter Module FENA-01  
3AUA0000033371

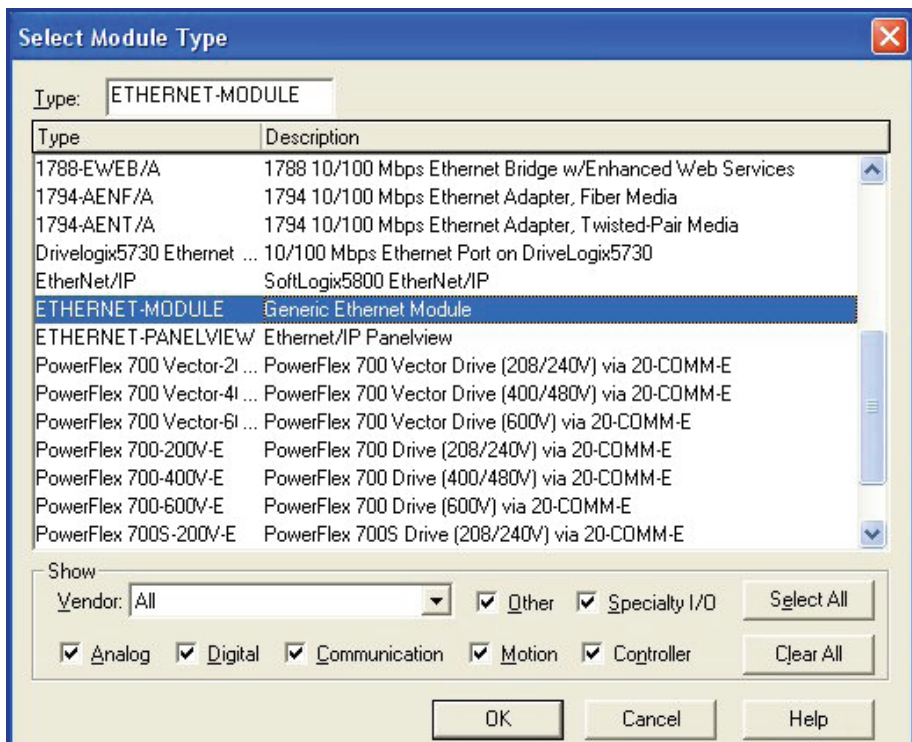
## (FENA-01 with RSLogix® 5000 Software Installation

1. Open RSLogix® 5000 and open a RSLogix® 5000 program. Right click on the 1769-L32E EtherNet Port LocalENB. Click on New Module.



## (FENA-01 with RSLogix® 5000 Software Installation (continued))

2. Select Module Type: ETHERNET-MODULE.



## (FENA-01 with RSLogix® 5000 Software Installation (continued))

3. Program the following information below. The example shown is using the ABB Profile Assembly Instances 102 and 152. The following table will display Input and Output Assembly Instances and PLC I/O Memory size.

Input Assembly Instances	Output Assembly Instances	PLC Word Settings
70	20	2
71	21	2
72	22	3
73	23	3
170	120	12
171	121	12
172	122	13
173	123	13
51	1	2
52	2	3
151	101	12
152	102	13
61	11	2
62	12	3
161	111	12
162	112	13

*Reference Protocol Manual - EtherNet/IP EtherNet Adapter Module FENA-01 3AUA0000033371 section "Communication" for more information on Input/Output Assembly Instances.*



## (FENA-01 with RSLogix® 5000 Software Installation (continued))

4. Enter the following information. The example shown is using the ABB Profile Assembly Instances 102 and 152. The PLC will transmit and receive 13 words.

The screenshot shows the 'Module Properties' dialog for an 'ETHERNET-MODULE Generic Ethernet Module'. The 'Name' field is 'FENA\_01'. The 'Comm Format' is set to 'Data - INT'. The 'Address / Host Name' section has 'IP Address' selected with the value '192 . 168 . 0 . 48'. The 'Connection Parameters' section shows 'Input' and 'Output' assembly instances of 152 and 102 respectively, both with a size of 13 (16-bit). The 'Configuration' is set to 1 and 'Status Input' is 0.

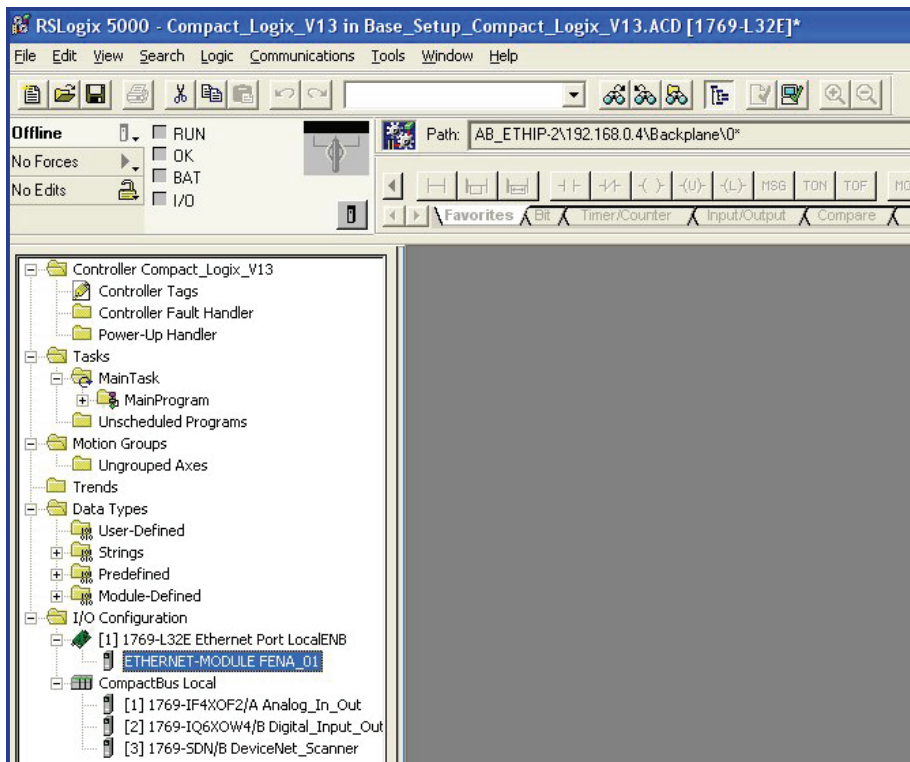
Callout boxes provide the following instructions:

- Top Left:** Enter the name that will be given to the FENA-01 (points to the Name field).
- Top Middle:** Enter Input and Output Assembly Instances numbers. (points to the Input and Output fields).
- Top Right:** Sets the size of the Input/Output words for the FENA-01 (points to the Size fields).
- Bottom Left:** ABB FENA-01 uses 16 Bit words, change Comm Format to Data - INT (16Bits) (points to the Comm Format dropdown).
- Bottom Middle:** Enter the IP Address of the FENA-01 (points to the IP Address field).
- Bottom Right:** Configuration needs to be programmed to 1 and size to 0 (points to the Configuration and Status Input fields).

5. Click Finish.

## (FENA-01 with RSLogix® 5000 Software Installation (continued))

6. The FENA-01 is now added to the PLC I/O.



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