

Basic Guide to Communications PTO



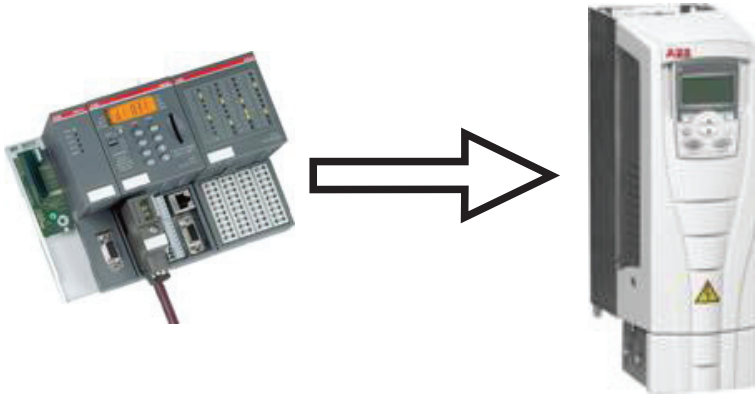
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Basic Guide to Communications Overview



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

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, 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, 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	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	N/A	RETA-01	RETA-01	FENA-01	N/A	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	N/A	RETA-01	RETA-01	FENA-01	N/A	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 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.

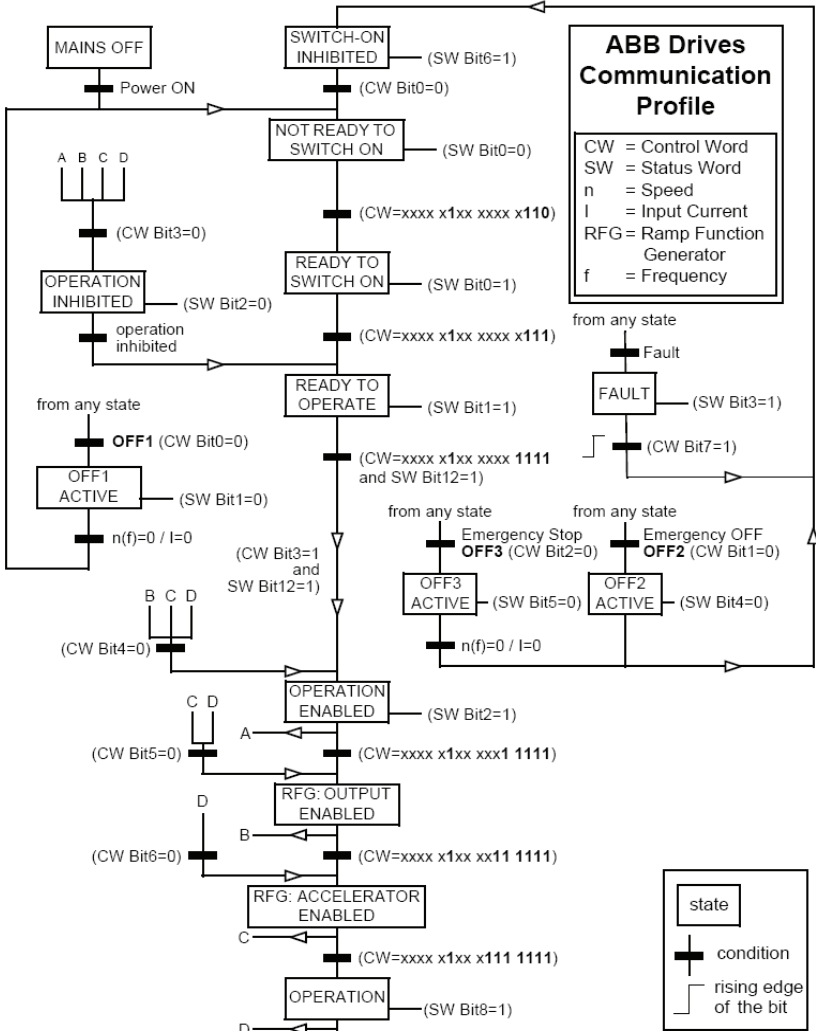


ABB State Transition Diagram

ABB drives communication profile state diagram

To control the ABB profile state machine is to transmit a value of 1150 decimals (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

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)
REF2	-32768 ... +32767	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).
		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 $1800.000 \times 1000 = 1,800,000$

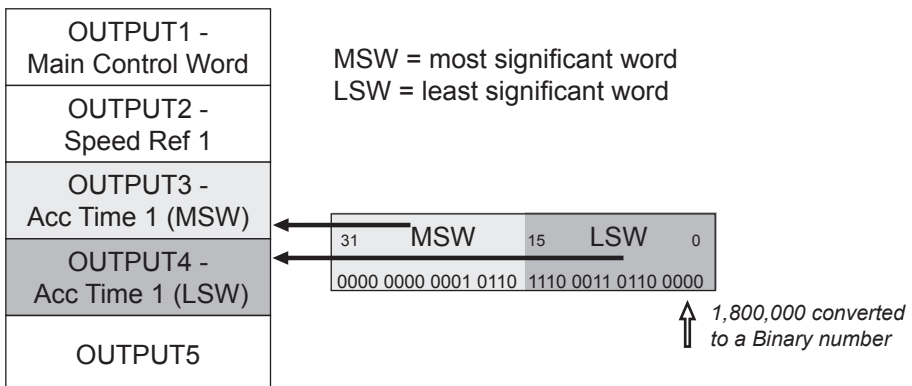
Example:

Name / Value	Description	FbEq*
22.02 Acc time 1	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. If the speed reference increases faster than the set acceleration rate, the motor speed will follow the acceleration rate. If the speed reference increases slower than the set acceleration rate, the motor speed will follow the reference signal. If the acceleration time is set too short, the drive will automatically prolong the acceleration in order not to exceed the drive torque limits.	
0.000 ... 1800.000 s	Acceleration time 1.	1000 = 1 s

22.02	Acc time 1	REAL	32	0 ... 1800	s	20.000 s
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*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)

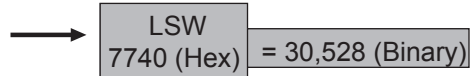
Converting a 32 bit word into two 16 bit words

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.

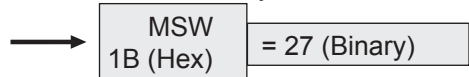
Convert 1,800,000 to a Hex number



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 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 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 from drive to fieldbus controller		
Word	Contents	Selector

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 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

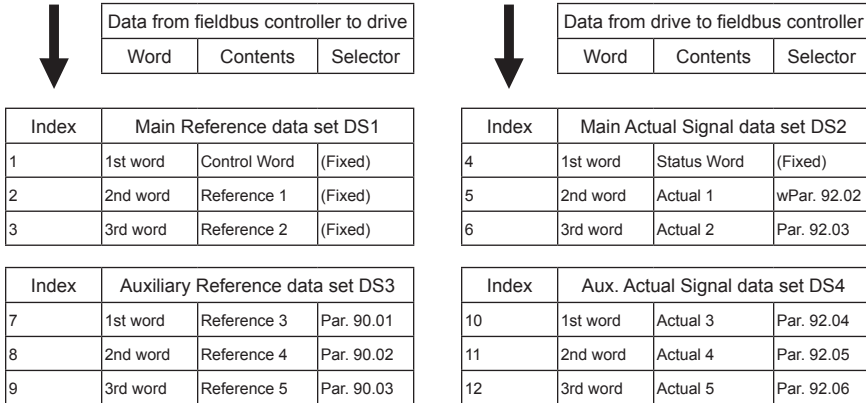
Data set 4

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.



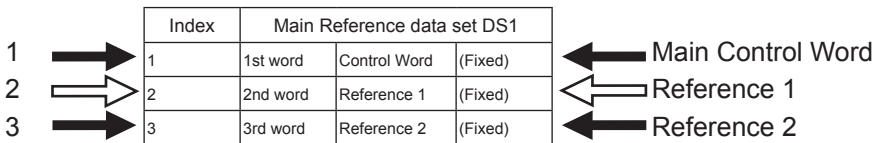
Programming the drive parameter to index number 1, the first word from the PLC will write Control Word. Programming the drive to index number 2, the second word from the PLC will write Reference 1. Programming the drive parameter to index 3, the third word from the PLC will write Reference 2.

Using index numbers.

Programming the drive to index number:

Word	Contents	Selector
------	----------	----------

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:

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

Remapping the indirect pointer

Remapping the indirect pointers can only be done in the ACS800 and DCS800 drive products. In the ACS350 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

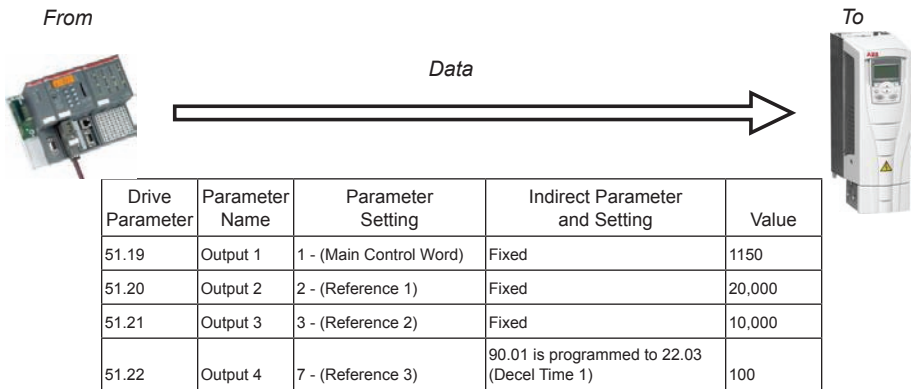
Index	Indirect parameter pointer	Indirect parameter setting (Par.92.02)	Parameter actual value 1.06
5	92.02	1.06 Power	100 Kw



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.

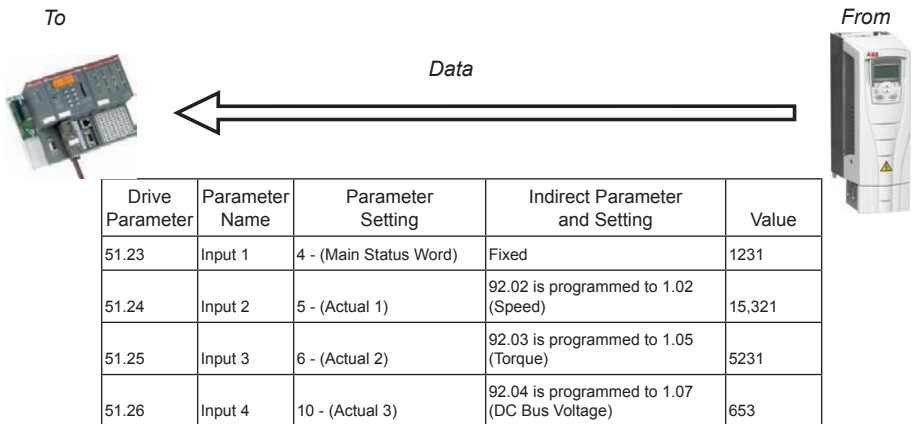
The fourth PLC word is using the indirect pointer parameter 90.01. The indirect parameter 90.01 is programmed to 22.03 (Decel Time 1). The fourth word from the PLC will write parameter 22.03 (Decel Time 1).



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.

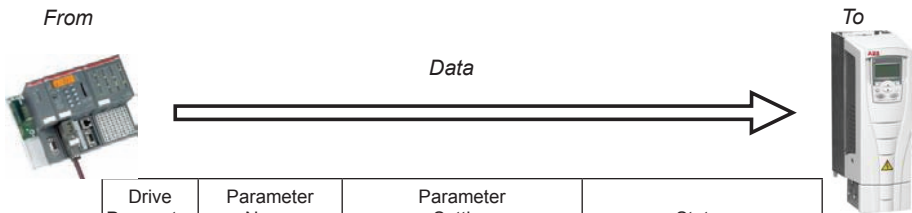
The fourth PLC word is using the indirect pointer parameter 92.04. The indirect parameter 92.04 is programmed to 1.07 (DC Bus Voltage). The fourth word from the PLC will read parameter 1.07 (DC Bus Voltage).



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.

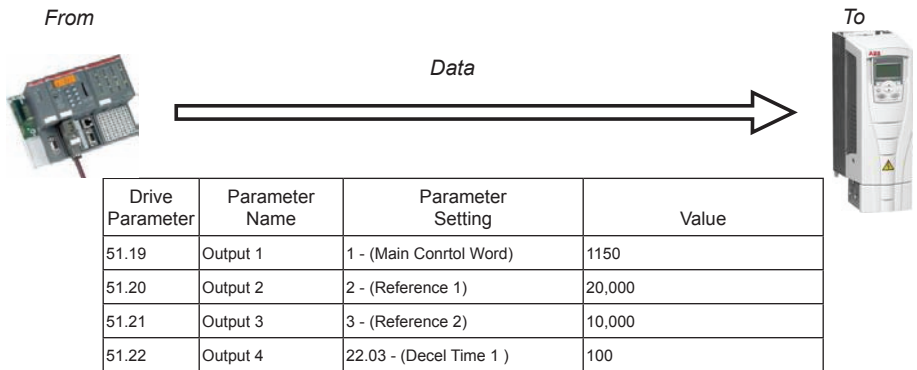
The PLC write output 1 - 3 will error because parameters 3.01, 1.11 and 1.12 are read only parameters. The PLC will not error on output word 4, because parameter 22.03 (Decel Time 1) is a read/write parameter.



Drive Parameter	Parameter Name	Parameter Setting	Status
51.19	Output 1	3.01 (Main Control Word)	ERROR - Read only parameter
51.20	Output 2	1.11 - (Ext Reference 1)	ERROR - Read only parameter
51.21	Output 3	1.12 - (Ext Reference 2)	ERROR - Read only parameter
51.22	Output 4	22.03 - (Decel Time 1)	OK - Read/Write parameter

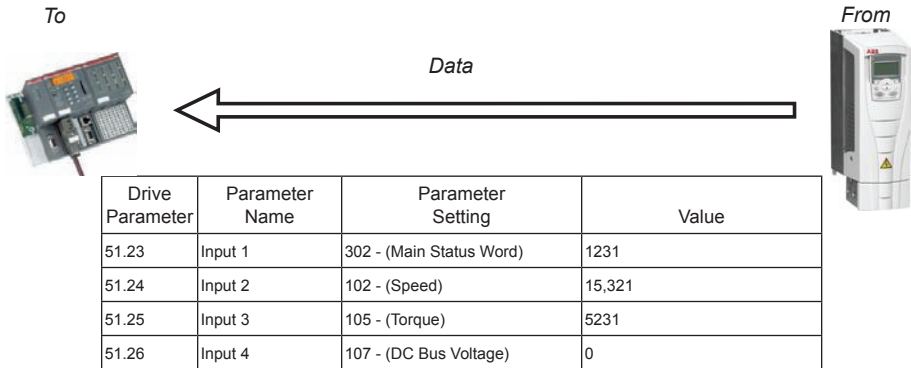
Using index numbers in Group 51 - Output

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.



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 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 from drive to fieldbus controller		
Word	Contents	Selector

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 from drive to fieldbus controller		
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 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 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 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 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 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 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 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 & ACS350 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)

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

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.

RETA-02 EtherNet Adapter Module PROFINET I/O



Overview

This chapter contains the basic start-up procedure of the ACH550/ACS550/ACS800 and DCS800 drives with the RETA-02 EtherNet Adapter module configured for PROFINET I/O. The RETA-02 EtherNet adapter module is an optional device for ABB ACH550, ACS550 and ACS800 and DCS800 drives which enables the connection of the drive to an PROFINET I/O or Modbus/TCP network. Reference the specific drive user manual and RETA-02 user manual for additional product information.

With the RETA-02 module, the PROFINET I/O network may employ either the PROFIdrive profile or the ABB Drives profile. The ACS800 drive product converts the PROFIdrive profile to the ABB Profile (detailed in the drive documentation) by the RETA-02 module. The DCS800 drive employs only ABB Drives profiles. The DCS800 drive does not support the PROFIdrive profile. The ACS550 and ACH550 both the PROFIdrive and ABB Profiles are converted to the DCU profile (detailed in the drive documentation) by the RETA-02 module.

Protocol Information

The PROFINET I/O protocol uses so-called PPOs (Parameter/Process Data Objects) in cyclic communication. Configuration of the master station requires a type definition (GSD) file. In PROFINET I/O the GSD file is written in XML based language called GSDML. RETA-02 has a GSD file, which is available from www.profinet.com, www.abb.us/drives or your local ABB representative. The filename is GSDML-Vx.x-ABB-RETA02-yyyymmdd.xml.

Reference Documentation:

User's Manual -
Ethernet Adapter Module RETA-02
3AFE68895383

ACS550-U1 Users Manual
3AUA0000001609

ACS800 Firmware Manual
3AFE64527592

DCS800 Firmware Manual
3ADW000193

RETA-02 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-02 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-02 User's Manual for connection.
5. Connect the EtherNet cable (RJ-45 connector) to the RETA-02 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-02 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.

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-02 configuration parameters.

Communication Profile Setting

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 PROFIdrive profile, parameter 98.07 needs to be programmed to "Generic Drive Profile."

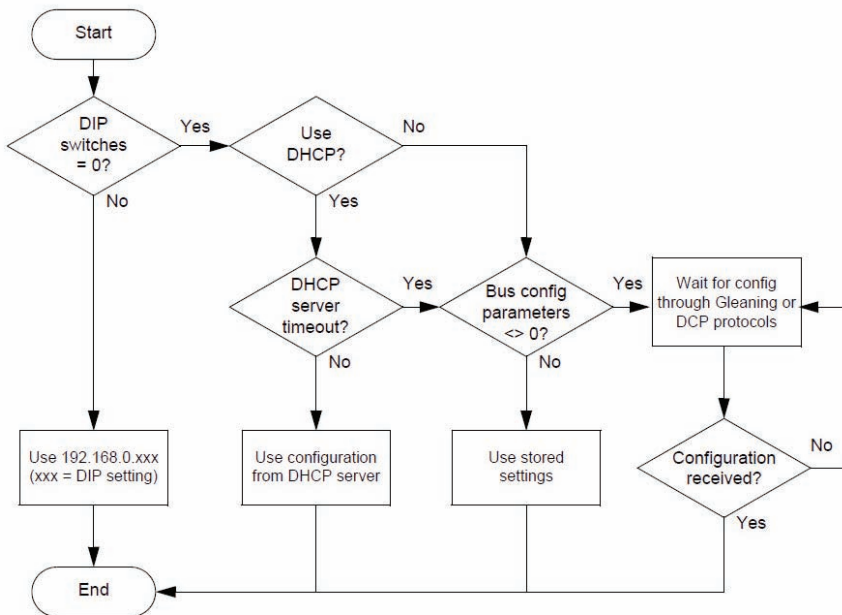
Table 3: Communication Profile Setting

Communication protocol	Communication profile	Drive profile
Modbus/TCP	ABB Drives profile	ABB Drives profile
PROFINET IO	Vendor profile	ABB Drives profile
PROFINET IO	PROFIdrive profile	Generic drive profile

RETA-02 Network configuration

Network configuration

The network configuration of the RETA-02 can be done using several methods. The following flowchart shows the sequence in which different settings are read. The table below gives detailed information on each of the different configuration methods.



DCP (Discovery and Configuration Protocol) can only be used in the PROFINET IO mode. When the module is initialized, the IP address is transferred to the PROFINET IO communication stack. If there is a need to change the IP address it should be done with a DHCP tool (like Siemens Step7). If some of the other methods is used to change the IP address, the module must be restarted to enable any changes.

RETA-02 Network configuration (continued)

Table 4: RETA-02 Configuration Network Parameters

Par. No.	Parameter Name	Setting Range	Default Setting
1	MODULE TYPE	(read-only)	PROFINET IO
2	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
3	DHCP	(0) DHCP disabled (1) DHCP enabled	(1) DHCP enabled
4	IP Address 1	0...255	0
5	IP Address 2	0...255	0
6	IP Address 3	0...255	0
7	IP Address 4	0...255	0
8	Subnet Mask 1	0...255	0
9	Subnet Mask 2	0...255	0
10	Subnet Mask 3	0...255	0
11	Subnet Mask 4	0...255	0
12	GW address 1	0...255	0
13	GW address 2	0...255	0
14	GW address 3	0...255	0
15	GW address 4	0...255 (0)	0
16	Protocol	(0) Modbus/TCP (1)PROFINET IO	(0) Modbus/TCP
17	Modbus Timeout	0...65535	0
18	Output 1	0...65535	0
19	Output 2	0...65535	0
20	Output 3	0...65535	0
21	Output 4	0...65535	0
22	Input 1	0...65535	0
23	Input 2	0...65535	0
24	Input 3	0...65535	0
25	Input 4	0...65535	0
26	In/Out 1-4 src	(0) Initial record data; (1) Bus configuration parameters; (2) Disable	(2) Disable
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-02 Examples: **ACS800,DCS800,ACS550/ACH550** - ABB Drives Profile (6 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and three additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and three additional parameters (data words). The programming of the parameters will be performed in the PROFINET I/O controller. Information on how a data sets works can be found in the Overview selection of this publication.

Table 5: PPO Type 4

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	PROFINET	PROFINET	PROFINET
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
51.26 In/Out 1-4 src	2 (Disable)	2 (Disable)	2 (Disable)
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

RETA-02 Examples: **ACS800,DCS800,ACS550/ACH550** - ABB Drives Profile (6 Data words In/Out) (continued)

Table 5: PPO Type 4 (continued)

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACx550
90.05 DsetXplus2Val2	n/a	(703) AuxCtrlWord2	n/a
90.06 DsetXplus2Val3	n/a	(1202) ConstSpeed1	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
92.05 AUX DS ACT4 or DsetXplus3Val2	(308) ALARM WORD 1	(101) MotSpeedFiit	n/a
92.06 AUX DS ACT5 or DsetXplus3Val3	(306) FAULT WORD 2	(108) MotTorq	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.**

RETA-02 Examples: ACS800, ACS550/ACH550 - PROFIdrive Profile (10 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and seven additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and seven additional parameters (data words). The programming of the parameters will be performed in the PROFINET I/O controller. Information on how a data sets works can be found in the Overview selection of this publication.

Table 6: PPO Type 6

Drive Parameter	Example setting for ACS800	Example setting for 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	PROFINET	PROFINET
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	17
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	(2) ETHERNET/IP ABB DRIVE	(2) ETHERNET/IP ABB DRIVE
51.26 In/Out 1-4 src	2 (Disable)	2 (Disable)
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**
90.01 AUX DS REF3 or DsetXVal1	(2204) ACCELTIME 2	n/a
90.02 AUX DS REF4 or DsetXVal2	(2205) DECELTIME 2	n/a
90.03 AUX DS REF5 or DsetXVal3	(1202) CONST SPEED 1	n/a

RETA-02 Examples: **ACS800, ACS550/ACH550** - PROFIdrive Profile (10 Data words In/Out) (continued)

Table 6: PPO Type 6 (continued)

Drive Parameter	Example setting for ACS800	Example setting for ACS550
92.02 MAIN DS ACT1 or DsetXplus1Val2	(102) SPEED	n/a
92.03 MAIN DS ACT2 or DsetXplus1Val3	(105) TORQUE	n/a
92.04 AUX DS ACT3 or DsetXplus3Val1	(305) FAULT WORD 1	n/a
92.05 AUX DS ACT4 or DsetXplus3Val2	(308) ALARM WORD 1	n/a
92.06 AUX DS ACT5 or DsetXplus3Val3	(306) FAULT WORD 2	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.**

Notes:

Standard ABB Drive on PROFINET I/O (RETA-02) with Siemens SIMATIC Step 7 Software



Overview

This document contains an overview on how to setup a standard ABB drive in Siemens SIMATIC Step7 Software on PROFINET I/O.

Reference Documentation:

RETA-02 Ethernet Adapter Module User's Manual
3AFE68895383

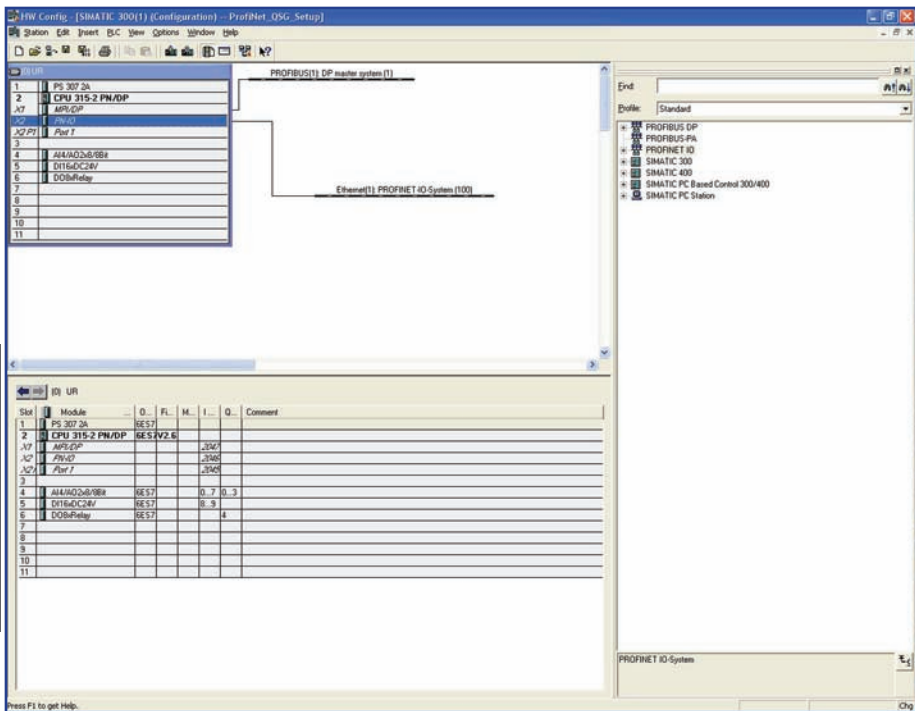
ACS550-U1 Users Manual
3AUA0000001609

ACS800 Firmware Manual
3AFE64527592

DCS800 Firmware Manual
3ADW000193

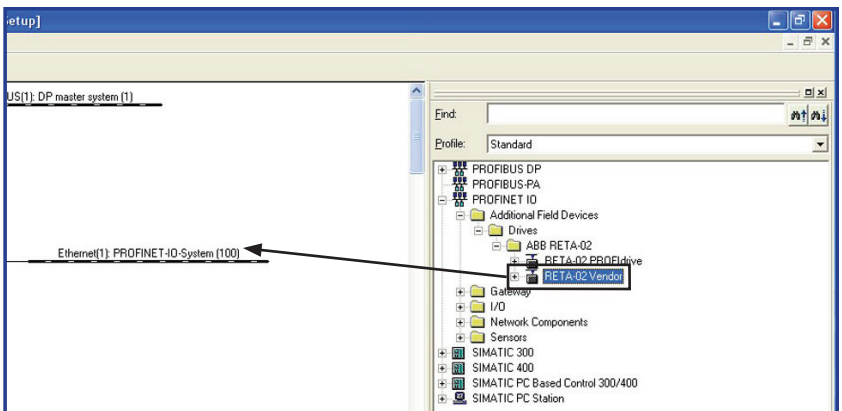
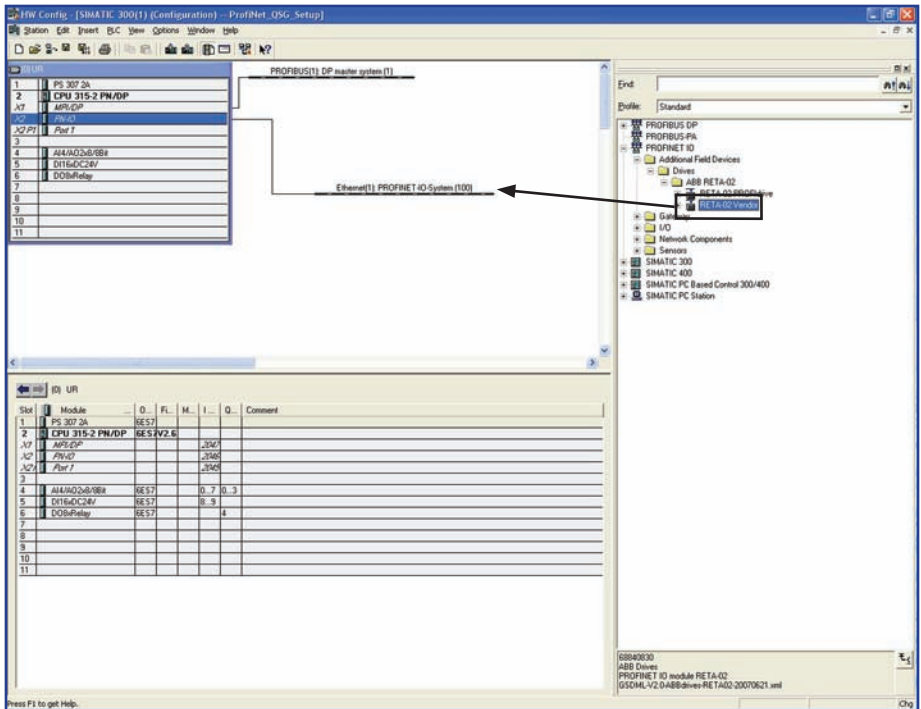
RETA-02 with SIMATIC Software Installation

1. Open SIMATIC Manager and open a SIMATIC program.
Open the Hardware Config program.



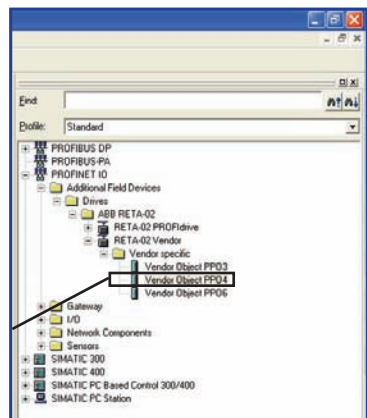
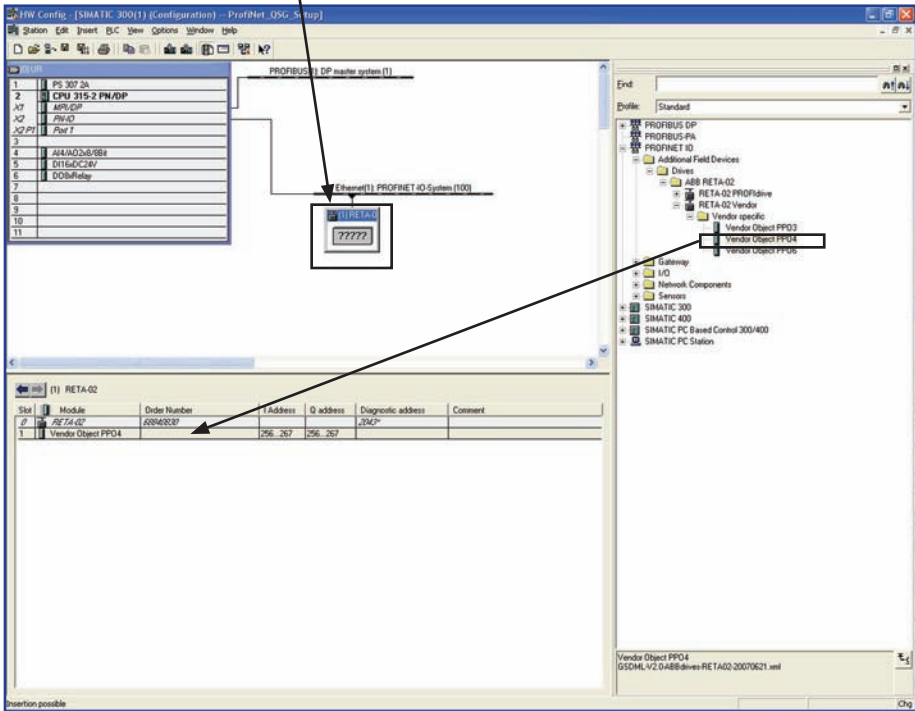
RETA-02 with SIMATIC Software Installation (continued)

- The GSD file must be installed before the RETA-02 will display in the Hardware Config. Click and drag the RETA-02 Vendor to the Ethernet (1) PROFINET I/O system.



RETA-02 with SIMATIC Software Installation (continued)

- Click and drag the Vendor Object PP04 to Slot 1.
Double click the RETA-02 to open the properties window.



RETA-02 with SIMATIC Software Installation (continued)

4. Enter the Device name for the RETA-02.

Properties - RETA-02

General | IO Cycle

Short description: RETA-02
PROFINET ID module RETA-02

Order no.: 68840830
Family: ABB RETA-02

Device name: RETA-02-QSG

GSD file: GSDML-V2.0-ABBdrives-RETA02-20070621.xml
Change Release Number...

Node / PN IO system

Device number: 1
IP address: 192.168.0.12

Assign IP address via IO controller

PROFINET-IO-System (100)
Ethernet...

Comment:

OK Cancel Help

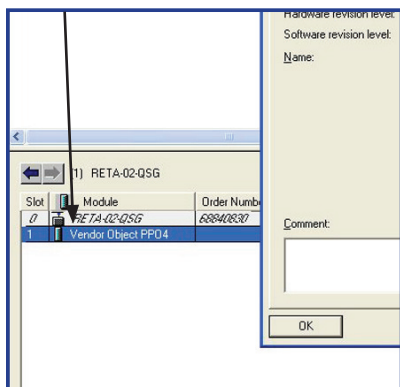
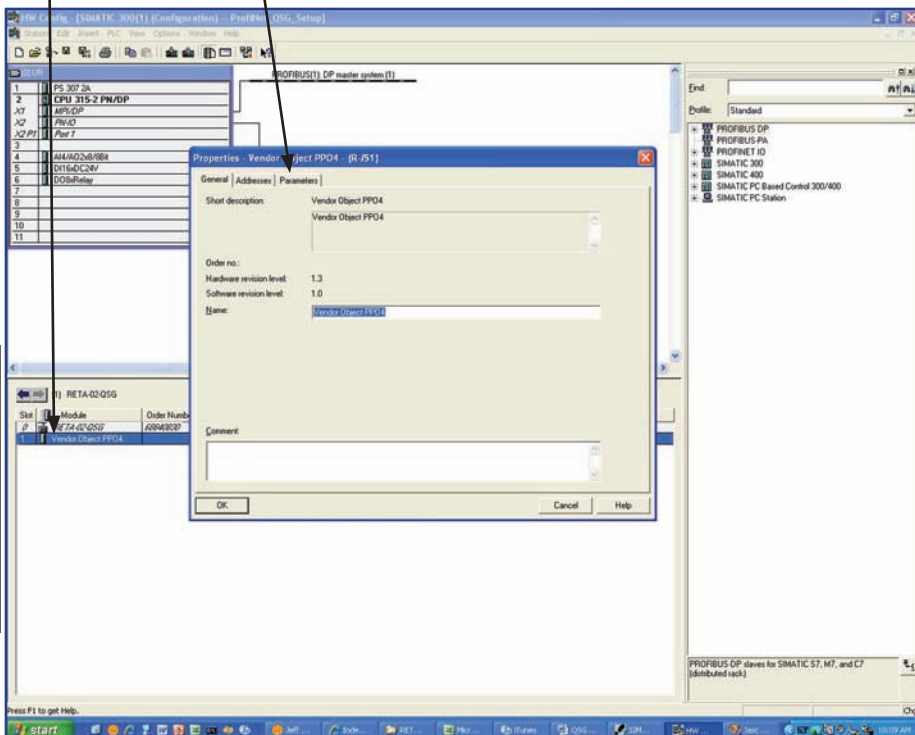
This is the IP address that will be assigned to the RETA-02.

The RETA-02 IP address can be modified by clicking the button named "Ethernet".

The IP address will be assigned by the IO controller.

RETA-02 with SIMATIC Software Installation (continued)

- Double click on Slot 1 to open the properties window.
Click on the parameter tab.



RETA-02 with SIMATIC Software Installation (continued)

6. Program the *Bus Configuration parameters* as the source for the input and output parameters. Configure the last four inputs and outputs. If *Stop Action selection* is set to *Fail-safe values*, configure them as well.

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.

This Screen is setup for ACS800 and DCS800.

Properties - Vendor Object PPO4 - (R-/S1)

General | Addresses | Parameters

Parameter	Value
Freeze	Freeze
Input/Output 1-4 parameter source	Initial record data (IO controller)
Parameter number (Output 1) = PZD3	3
Parameter number (Output 2) = PZD4	7
Parameter number (Output 3) = PZD5	8
Parameter number (Output 4) = PZD6	9
Parameter number (Input 1) = PZD3	6
Parameter number (Input 2) = PZD4	10
Parameter number (Input 3) = PZD5	11
Parameter number (Input 4) = PZD6	12
Fail safe Control Word	0
Fail safe Reference value	0
Fail safe value (Output 1) = PZD3	0
Fail safe value (Output 2) = PZD4	0
Fail safe value (Output 3) = PZD5	0
Fail safe value (Output 4) = PZD6	0

Program Input/Output 1-4 to Initial record data (IO controller) parameter.
Program Inputs PZD 3-6 and Outputs PZD 3-6

This Screen is setup for ACS550.

Properties - Vendor Object PPO4 - (R-/S1)

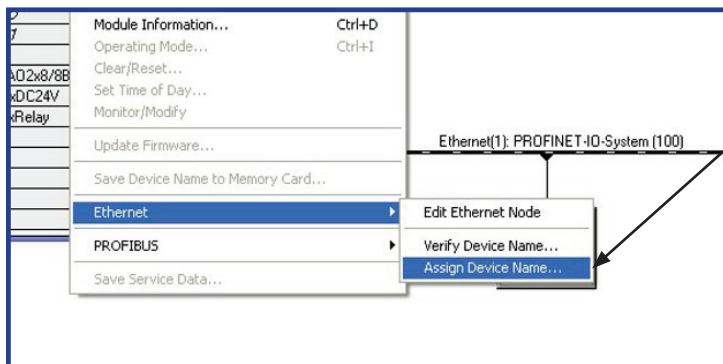
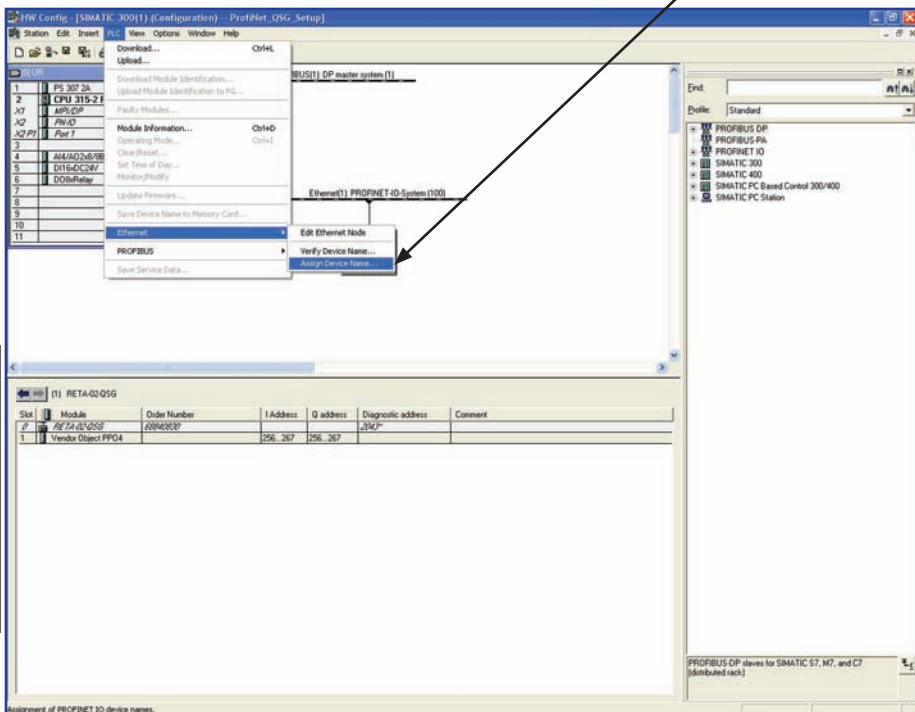
General | Addresses | Parameters

Parameter	Value
Freeze	Freeze
Input/Output 1-4 parameter source	Initial record data (IO controller)
Parameter number (Output 1) = PZD3	3
Parameter number (Output 2) = PZD4	2205
Parameter number (Output 3) = PZD5	2206
Parameter number (Output 4) = PZD6	1202
Parameter number (Input 1) = PZD3	6
Parameter number (Input 2) = PZD4	106
Parameter number (Input 3) = PZD5	107
Parameter number (Input 4) = PZD6	401
Fail safe Control Word	0
Fail safe Reference value	0
Fail safe value (Output 1) = PZD3	0
Fail safe value (Output 2) = PZD4	0
Fail safe value (Output 3) = PZD5	0
Fail safe value (Output 4) = PZD6	0

Program Input/Output 1-4 to Initial record data (IO controller) parameter.
Program Inputs PZD 3-6 and Outputs PZD 3-6

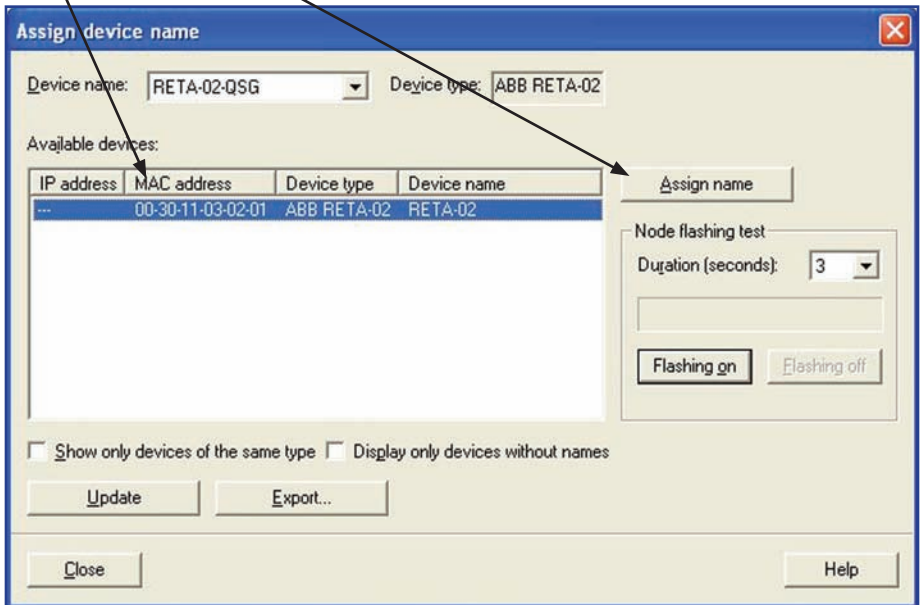
RETA-02 with SIMATIC Software Installation (continued)

7. Click PLC and select Ethernet, then select Assign Device Name.



RETA-02 with SIMATIC Software Installation (continued)

8. Click the Available device with the correct MAC address that the device name will be assigned. This will assign the name for the RETA-02. Then click Assign name.



RETA-02 with SIMATIC Software Installation (continued)

- Now download the hardware configuration to the PLC.
The PLC is now communicating to the RETA-02.

The screenshot shows the SIMATIC Manager HW Config interface. The main window displays a hardware configuration for a SIMATIC 300 PLC system. The rack configuration is as follows:

Slot	Module
1	PS 307 5A
2	CPU 315-2 DP/DP
3	MP1 DP
4	PS 307 5A
5	DI16/DO16
6	DO16 Relay
7	DI16/DO16
8	
9	
10	
11	

The hardware configuration is connected to a PROFIBUS DP master system (1) and an Ethernet PROFINET IO system (100). A SIMATIC 300 station is connected to the Ethernet system. The bottom window shows a table of RETA-02-QSG modules:

Slot	Module	Order Number	I Address	Q Address	Diagnostic Address	Comment
1	RETA-02-QSG	6ES7420-0000	256	267	267	
	Vendor Object PPO4					

PROFIBUS DP slaves for SIMATIC S7, M7, and C7 (distributed rack)

Notes:

Notes:

RPBA-01 PROFIBUS DP Adapter Module



Overview

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

With the RPBA-01 module, the PROFIBUS DP network may employ either the ABB Drives profile or the PROFIdrive profile. The ACS800 drive product converts the PROFIdrive profile to the ABB Profile (detailed in the drive documentation) by the RPBA-01 module. The DCS800 drive employs only ABB Drives profiles. The DCS800 drive does not support the PROFIdrive profile. With the ACS550 and ACH550 both the PROFIdrive and ABB Profiles are converted to the DCU profile (detailed in the drive documentation) by the RPBA-01 module.

Protocol Information

The PROFIBUS DP protocol uses so-called PPOs (Parameter/Process Data Objects) in cyclic communication. The RPBA-01 PROFIBUS DP module support DP-V0 and DP-V1 communications.

Configuration of the master station requires a type definition (GSD) file. For DP-V0 communication, the file is available from www.profibus.com or an www.ABB.US/Drives (the filename is ABB_0812.GSD). For DP-V1 communication, the type definition (GSD) file name is ABB10812.GSD).

Reference Documentation:

User's Manual PROFIBUS DP Adapter Module RPBA-01
3AFE64504215

RPBA-01 Installation, drive protocol & profile configuration

Mechanical installation

1. Insert the RPBA-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 RPBA-01 User's Manual for connection and bus termination details.
4. It is recommended to use a PROFIBUS-approved D-SUB 9 connector. These connectors have a built-in termination network and inductors for station capacitance compensation.

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.

RPBA-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.

Table 3: ACS800 Parameter 98.07 Settings

Communications Profile	Parameter Setting
ABB Drives Profile	ABB Drives Profile
PROFIdrive Profile	Generic Drive Profile

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.

Table 4: DCS800 Parameter Settings

Par. No.	Parameter Name	Setting
98.02	COMM MODULE	(1) FIELDBUS

NOTE! The "HOST INDICATION" LED should be green. The "OFF-LINE" LED should be red.

RPBA-01 Network configuration

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

Table 5: Network configuration with drive parameters

Par. No.	Parameter Name	Alternative Settings	Default Setting
1	MODULE TYPE	(read-only)	PROFIBUS DP
2	NODE ADDRESS	0 to 126	3
3	BAUD RATE ¹⁾	(12000) 12 Mbit/s; (6000) 6 Mbit/s; (3000) 3 Mbit/s; (1500) 1.5 Mbit/s; (500) 500 kbit/s; (187) 187.5 kbit/s; (93) 93.75 kbit/s; (45) 45.45 kbit/s; (19) 19.2 kbit/s; (9) 9.6 kbit/s; (Read-only)	1500
4	PPO-TYPE 1)	(1) PPO 1; (2) PPO 2; (3) PPO 3; (4) PPO 4; (5) PPO 5; (6) PPO 6; (Read-only)	(1) PPO 1
5	PZD3 OUT	0 to 32767 with format xxyy, where xx = Parameter Group and yy = Parameter Index. See description below.	0
6	PZD3 IN	See PZD3 OUT above	0
7	PZD4 OUT	See PZD3 OUT above	0
8	PZD4 IN	See PZD3 OUT above	0
9	PZD5 OUT	See PZD3 OUT above	0
10	PZD5 IN	See PZD3 OUT above	0
11	PZD6 OUT	See PZD3 OUT above	0
12	PZD6 IN	See PZD3 OUT above	0
13	PZD7 OUT	See PZD3 OUT above	0
14	PZD7 IN	See PZD3 OUT above	0
15	PZD8 OUT	See PZD3 OUT above	0
16	PZD8 IN	See PZD3 OUT above	0
17	PZD9 OUT	See PZD3 OUT above	0
18	PZD9 IN	See PZD3 OUT above	0
19	PZD10 OUT	See PZD3 OUT above	0
20	PZD10 IN	See PZD3 OUT above	0
21	DP MODE	(0) DPVO; (1) DPV1	0
27	FB PAR REFRESH	REFRESH; DONE	DONE

¹⁾ The value is automatically updated (Read-only).

RPBA-01 Examples: ACS800/DCS800/ACS550/ACH550 - ABB Drives Profile - DPV0 (6 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and three additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and three additional parameters (data words). Information on how a data sets works can be found in the Overview selection 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: PPO Type 4, DP-V0

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACS550
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	PROFIBUS	PROFIBUS	PROFIBUS
51.02 NODE ADDRESS	4	4	4
51.03 BAUD RATE***	1.5***	1.5***	1.5***
51.04 PPO-TYPE***	4***	4***	4***
51.05 PZD3 OUT	3 (EXT Ref 2)	3 (Torque Ref A)	3 (EXT Ref 2)
51.06 PZD3 IN	6 (Actual Torque)	6 (Actual Torque)	6 (Actual Torque)
51.07 PZD4 OUT	7 (AUX DS REF3)	7 (DsetXplus3Val1)	2205 (ACCELER TIME 2)
51.08 PZD4 IN	10 (Actual Ref 3)	10 (DsetXplus-3Val1)	106 (POWER)
51.09 PZD5 OUT	8 (AUX DS REF4)	8 (DsetXplus2Val2)	2206 (DECELER TIME 2)
51.10 PZD5 IN	11 (Actual 4)	11 (DsetXplus3Val2)	107 (DC BUS VOLTAGE V)
51.11 PZD6 OUT	9 (AUX DS REF5)	9 (DsetXplus2Val3)	1202 (CONST SPEED 1)
51.12 PZD6 IN	12 (Actual 5)	12 (DsetXplus-3Val3)	401 (LATEST FAULT)
51.21 DP MODE****	(0) DPV0	(0) DPV0	(0) DPV0
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**	(1) REFRESH**

RPBA-01 Examples: ACS800/DCS800/ACS550/ACH550 - ABB Drives Profile - DPV0 (6 Data words In/Out) (continued)

Table 6: PPO Type 4, DP-V0 (continued)

Drive Parameter	Example setting for ACS800	Example setting for DCS800	Example setting for ACS550
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
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
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) MotTorq	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.**

***** The value is automatically updated from the PROFIBUS DP networks (Read-only)**

****** This parameter selects the PROFIBUS protocol version (DP-V0 or DP-V1).**

The selection of the protocol version is done in the fieldbus controller.

NOTE! For DP-V0, GSD file version 1 or 2 (ABB_0812.GSD) must be used.
For DP-V1, GSD file version 3 or higher (ABB10812.GSD) must be used.

RPBA-01 Examples: ACS800/ACS550/ACH550 - PROFIdrive Profile - DPV1 (10 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and seven additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and seven additional parameters (data words). Information on how a data sets works can be found in the Overview selection 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: PPO Type 6, DP-V1

Drive Parameter	Example setting for ACS800	Example setting for 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	PROFIBUS	PROFIBUS
51.02 NODE ADDRESS	4	4
51.03 BAUD RATE***	1.5***	1.5***
51.04 PPO-TYPE***	6***	6***
51.05 PZD3 OUT	3 (EXT Ref 2)	3 (EXT Ref 2)
51.06 PZD3 IN	6 (Actual Torque)	6 (Actual Torque)
51.07 PZD4 OUT	7 (AUX DS REF3)	2205 (ACCELER TIME 2)
51.08 PZD4 IN	10 (Actual Ref 3)	106 (POWER)
51.09 PZD5 OUT	8 (AUX DS REF4)	2206 (DECELER TIME 2)
51.10 PZD5 IN	11 (Actual 4)	107 (DC BUS VOLTAGE V)
51.11 PZD6 OUT	9 (AUX DS REF5)	1202 (CONST SPEED 1)
51.12 PZD6 IN	12 (Actual 5)	401 (LATEST FAULT)
51.13 PZD7 OUT	1203 (CONST SPEED 2)	1203 (CONST SPEED 2)
51.14 PZD7 IN	320 (LATEST FAULT)	401 (LATEST FAULT)
51.15 PZD8 OUT	1204 (CONST SPEED 3)	1204 (CONST SPEED 3)
51.16 PZD8 IN	109 (OUTPUT VOLTAGE)	109 (OUTPUT VOLTAGE)
51.17 PZD9 OUT	1205 (CONST SPEED 4)	1205 (CONST SPEED 4)
51.18 PZD9 IN	117 (DI6-1 STATUS)	118 (DI 1-3 STATUS)
51.19 PZD10 OUT	1206 (CONST SPEED 5)	1206 (CONST SPEED 5)

RPBA-01 Examples: ACS800/ACS550/ACH550 - PROFIdrive Profile - DPV1 (10 Data words In/Out) (continued)

Table 7: PPO Type 6, DP-V1 (continued)

Drive Parameter	Example setting for ACS800	Example setting for ACS550
51.20 PVD10 IN	303 (AUX STATUS WORD)	119 (DI 4-6 STATUS)
51.21 DP MODE****	(1) DPV1	(1) DPV1
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**
90.01 AUX DS REF3 or DsetXVal1	(2204) ACCELTIME 2	n/a
90.02 AUX DS REF4 or DsetXVal2	(2205) DECELTIME 2	n/a
90.03 AUX DS REF5 or DsetXVal3	(1202) CONST SPEED 1	n/a
92.02 MAIN DS ACT1 or DsetXplus1Val2	(102) SPEED	n/a
92.03 MAIN DS ACT2 or DsetXplus1Val3	(105) TORQUE	n/a
92.04 AUX DS ACT3 or DsetXplus3Val1	(305) FAULT WORD 1	n/a
92.05 AUX DS ACT4 or DsetXplus3Val2	(308) ALARM WORD 1	n/a
92.06 AUX DS ACT5 or DsetXplus3Val3	(306) FAULT WORD 2	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.

*** The value is automatically updated from the PROFIBUS DP networks (Read-only)

**** This parameter selects the PROFIBUS protocol version (DP-V0 or DP-V1).

The selection of the protocol version is done in the fieldbus controller.

NOTE! For DP-V0, GSD file version 1 or 2 (ABB_0812.GSD) must be used.
For DP-V1, GSD file version 3 or higher (ABB10812.GSD) must be used.

FPBA-01 PROFIBUS DP Adapter Module



Overview

This chapter contains the basic start-up procedure of the ACS350, ACS850 and ACSM1 drive with the FPBA-01 PROFIBUS DP Adapter module. The FPBA-01 PROFIBUS DP adapter module is an optional device for ABB ACS350/ACS850 and ACSM1 Drives which enables the connection of the drive to a PROFIBUS DP network. Reference the specific drive user manual and FPBA-01 user manual for additional product information.

With the FPBA-01 module, the PROFIBUS DP network may employ either the ABB Drives profile or the PROFIdrive profile. In addition, two Transparent modes for 16 bit and 32 bit words respectively are available. With the Transparent modes, no data conversion takes place.

Protocol Information

The PROFIBUS DP protocol uses so-called PPOs (Parameter/Process Data Objects) in cyclic communication. The FPBA-01 PROFIBUS DP module support DP-V0 and DP-V1 communications.

Configuration of the master station requires a type definition (GSD) file. For DP-V0 communication, the file is available from www.profibus.com or an www.ABB.US/Drives (the filename is ABB_0812.GSD). For DP-V1 communication, the type definition (GSD) file name is ABB10812.GSD).

Reference Documentation:

FPBA-01 PROFIBUS DP Adapter User's Manual
3AFE68573271

FPBA-01 Installation, drive protocol & profile configuration

Mechanical installation

1. Insert the FPBA-01 into its specified slot in the drive (ACS350 Fieldbus Adapter connection, Slot 3 for the ACS850/ACSM1)
2. Using the one mounting screw 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 FPBA-01 User's Manual for connection and bus termination details.
4. It is recommended to use a PROFIBUS-approved D-SUB 9 connector. These connectors have a built-in termination network and inductors for station capacitance compensation.

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: ACS350 Parameter Settings

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

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

FPBA-01 I/O assembly instances

Table 2: ACS850/ACSM1 Parameter Settings

Par. No.	Parameter Name	Setting
50.01	FBA ENABLE	(1) ENABLED

NOTE! *The "HOST" LED should be green if the PROFIBUS DP adapter has been enabled in the drive parameter. The "MODULE STATUS" LED should be blinking green. The "MODULE OWNED" LED should be blinking green. If the network cable is connected to an active network, the green "NETWORK" LED should also be lit. If the configuration is correct, drive parameter group 51 should appear in the parameter list of the drive and show the status of the FPBA-01 configuration parameters.*

FPBA-01 Network configuration

To enable communication through the PROFIBUS DP network, the module must be configured for the network. The way of setting the module Node address is programmed in parameter group 51; references FPBA-01 users manual section “Electrical Installation” for more information.

Table 3: FPBA-01 configuration parameters - Group A

Par. No.	Parameter Name	Alternative Settings	Default Setting
1	FBA TYPE	(Read-only)	PROFIBUS DP
2	NODE ADDRESS	0 to 126	3
3	BAUD RATE ¹⁾	(12000) 12 Mbit/s; (6000) 6 Mbit/s; (3000) 3 Mbit/s; (1500) 1.5 Mbit/s; (500) 500 kbit/s; (187) 187.5 kbit/s; (93) 93.75 kbit/s; (45) 45.45 kbit/s; (19) 19.2 kbit/s; (9) 9.6 kbit/s	1500
4	TELEGRAM TYPE *	(1) PPO 1; (2) PPO 2; (3) PPO 3; (4) PPO 4; (5) PPO 5; (6) PPO 6; (7) ST1; (8) ST2** (Read-only)	(1) PPO 1
5	PROFILE	(0) PROFIdrive; (1) ABB Drives; (2) Transparent 16; (3) Transparent 32***; (4) PROFIdrive positioning mode**	(1) ABB Drives
6	T16 SCALE	1 to 65535	100

* The value is automatically updated (Read-only)

**Only supported with an ACSM1/ACS850 drive.

Table 4: FPBA-01 configuration parameters - Group B

Par. No.	Parameter Name	Alternative Settings	Default Setting
1	DATA OUT 1 (master to drive)	0 to 9999 Format: xxxy, where xx = parameter group and yy = parameter index.	1 (Control word) or 11 (Control word 32 bit)*
2	DATA OUT 2	See DATA OUT 1 above.	0 or 2 (REF1)**
3	DATA OUT 3	See DATA OUT 1 above.	0
4	DATA OUT 4	See DATA OUT 1 above.	0
5	DATA OUT 5	See DATA OUT 1 above.	0
6	DATA OUT 6	See DATA OUT 1 above.	0
7	DATA OUT 7	See DATA OUT 1 above.	0
8	DATA OUT 8	See DATA OUT 1 above.	0
9	DATA OUT 9	See DATA OUT 1 above.	0
10	DATA OUT 10	See DATA OUT 1 above.	0
11	DATA OUT 11***	See DATA OUT 1 above.	0
12	DATA OUT 12***	See DATA OUT 1 above.	0

* Default setting if the Transparent 32 profile is used.

**Fixed setting with an ACS350 drive.

***Supported only with an ACSM1/ACS850 drive.

FPBA-01 Network configuration (continued)

Table 5: FPBA-01 configuration parameters - Group C

Par. No.	Parameter Name	Alternative Settings	Default Setting
1	DATA OUT 1 (drive to master)	0 to 9999 Format: xxyy, where xx = parameter group and yy = parameter index.	4 (Status word) or 14 (Status word 32 bit)*
2	DATA OUT 2*	See DATA OUT 1 above.	0 or 5 (ACT1)**
3	DATA OUT 3	See DATA OUT 1 above.	0
4	DATA OUT 4	See DATA OUT 1 above.	0
5	DATA OUT 5	See DATA OUT 1 above.	0
6	DATA OUT 6	See DATA OUT 1 above.	0
7	DATA OUT 7	See DATA OUT 1 above.	0
8	DATA OUT 8	See DATA OUT 1 above.	0
9	DATA OUT 9	See DATA OUT 1 above.	0
10	DATA OUT 10	See DATA OUT 1 above.	0
11	DATA OUT 11	See DATA OUT 1 above.	0
12	DATA OUT 12	See DATA OUT 1 above.	0

* *Default setting if the Transparent 32 profile is used.*

***Fixed setting with an ACS350 drive.*

****Supported only with an ACSM1/ACS850 drive.*

FPBA-01 Examples: **ACS350** - ABB Drives Profile - DPV0 (6 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and three additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and three additional parameters (data words). Information on how a data sets works can be found in the Overview selection of this publication.

NOTE! The selection of DP-V0 or DP-V1 is performed in the PROFIBUS DP Controller.

Table 6: PPO Type 4, DP-V0

Drive Parameter	Example setting for ACS350
10.01 EXT1 COMMANDS	COMM
10.03 DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM. PROT SEL	EXT FBA
51.01 MODULE TYPE	PROFIBUS
51.02 NODE ADDRESS	5
51.03 BAUD RATE***	1.5***
51.04 PPO-TYPE***	4***
51.05 PROFILE	1 (ABB Drives)
54.01 DATA IN 1	4 (STATUS WORD)*
54.02 DATA IN 2	5 (ACTUAL SPEED)*
54.03 DATA IN 3	6 (ACTUAL TORQUE)
54.04 DATA IN 4	106 (POWER)
54.05 DATA IN 5	107 (DC BUS VOLTAGE V)
54.06 DATA IN 6	104 (CURRENT)
55.01 DATA OUT 1	1 (CONTROL WORD)*
55.02 DATA OUT 2	2 (EXTERNAL REF 1)*
55.03 DATA OUT 3	3 (EXTERNAL REF 2)
55.04 DATA OUT 4	1202 (CONST SPEED 1)
55.05 DATA OUT 5	1203 (CONST SPEED 2)
55.06 DATA OUT 6	1204 (CONST SPEED 3)
51.27 FBA PAR REFRESH	(1) REFRESH**

* Programming of these parameters are fixed with an ACS350 drive.

** 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.

*** The value is automatically updated for the PROFIBUS DP networks (Read-only)

FPBA-01 Examples: ACS850/ACSM1 - ABB Drives Profile - DPV0 (6 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and three additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and three additional parameters (data words). Information on how a data sets works can be found in the Overview selection of this publication.

NOTE! The selection of DP-V0 or DP-V1 is performed in the PROFIBUS DP Controller.

Table 7: PPO Type 4, DP-V0

Drive Parameter	Example setting for ACS800	Example setting for ACS550
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	PROFIBUS	PROFIBUS
51.02 NODE ADDRESS	5	6
51.03 BAUD RATE***	1.5***	1.5***
51.04 PPO-TYPE***	4***	4***
51.05 PROFILE	1 (ABB Drives)	1 (ABB Drives)
52.01 DATA IN 1	4 (STATUS WORD)*	4 (STATUS WORD)*
52.02 DATA IN 2	5 (ACTUAL SPEED)*	5 (ACTUAL SPEED)*
52.03 DATA IN 3	6 (ACTUAL TORQUE)	6 (ACTUAL TORQUE)
52.04 DATA IN 4	123 (MOTOR POWER) - MSW	1.17 (MOTOR TEMP)
52.05 DATA IN 5	0 (MOTOR POWER) - LSW	1.04 (MOTOR CURRENT) - MSW
52.06 DATA IN 6	105 (MOTOR CURRENT)	0 (MOTOR CURRENT) - LSW
53.01 DATA OUT 1	1 (CONTROL WORD)*	1 (CONTROL WORD)*
53.02 DATA OUT 2	2 (EXTERNAL REF 1)*	2 (EXTERNAL REF 1)*
53.03 DATA OUT 3	3 (EXTERNAL REF 2)	3 (EXTERNAL REF 2)
53.04 DATA OUT 4	2204 (Acc time2) - MSW	2503 (Acc time) - MSW
53.05 DATA OUT 5	0 (Acc time2) - LSW	0 (Acc time2) - LSW
53.06 DATA OUT 6	2606 (Const speed1)	2408 (Const speed)
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**

MSW = Most Significant Word

LSW = Less Significant Word

* Programming of these parameters are fixed with an ACS850/ACSM1 drive.

** 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.

*** The value is automatically updated for the PROFIBUS DP networks (Read-only)

FPBA-01 Examples: **ACS350** - PROFIdrive Profile - DPV1 (10 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and seven additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and seven additional parameters (data words). Information on how a data sets works can be found in the Overview selection of this publication.

NOTE! The selection of DP-V0 or DP-V1 is performed in the PROFIBUS DP Controller.

Table 8: PPO Type 6, DP-V1

Drive Parameter	Example setting for ACS350
10.01 EXT1 COMMANDS	COMM
10.03 DIRECTION	REQUEST
11.03 REF1 SELECT	COMM
16.04 FAULT RESET SEL	COMM
98.02 COMM. PROT SEL	EXT FBA
51.01 MODULE TYPE	PROFIBUS
51.02 NODE ADDRESS	5
51.03 BAUD RATE***	1.5***
51.04 PPO-TYPE***	4***
51.05 PROFILE	0 (ProfiDrive)
54.01 DATA IN 1	4 (STATUS WORD)*
54.02 DATA IN 2	5 (ACTUAL SPEED)*
54.03 DATA IN 3	6 (ACTUAL TORQUE)
54.04 DATA IN 4	106 (POWER)
54.05 DATA IN 5	107 (DC BUS VOLTAGE V)
54.06 DATA IN 6	104 (CURRENT)
54.07 DATA IN 7	109 (OUTPUT VOLTAGE)
54.08 DATA IN 8	130 (PID 1 FBK)
54.09 DATA IN 9	132 (PID 1 DEVIATION)
54.10 DATA IN 10	401 (LAST FAULT)
55.01 DATA OUT 1	1 (CONTROL WORD)*
55.02 DATA OUT 2	2 (EXTERNAL REF 1)*
55.03 DATA OUT 3	3 (EXTERNAL REF 2)
55.04 DATA OUT 4	1202 (CONST SPEED 1)
55.05 DATA OUT 5	1203 (CONST SPEED 2)
55.06 DATA OUT 6	1204 (CONST SPEED 3)
55.07 DATA OUT 7	1205 (CONST SPEED 4)
55.08 DATA OUT 8	1206 (CONST SPEED 5)
55.09 DATA OUT 9	1207 (CONST SPEED 6)

FPBA-01 Examples: **ACS350** - PROFIdrive Profile - DPV1 (10 Data words In/Out) (continued)

Table 8: PPO Type 6, DP-V1 (continued)

Drive Parameter	Example setting for ACS350
55.10 DATA OUT 10	1208 (CONST SPEED 7)
51.27 FBA PAR REFRESH	(1) REFRESH**

* Programming of these parameters are fixed with an ACS850/ACSM1 drive.

** 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.

*** The value is automatically updated from the PROFIBUS DP networks (Read-only)

FPBA-01 Examples: ACS850/ACSM1 - PROFIdrive Profile (10 Data words In/Out)

The drive is programmed to use data sets to write Main control word, Reference 1, Reference 2 and seven additional parameters (data words). The drive is programmed to read Main Status word, Actual 1 and Actual 2 and seven additional parameters (data words). Information on how a data sets works can be found in the Overview selection of this publication.

NOTE! The selection of DP-V0 or DP-V1 is performed in the PROFIBUS DP Controller.

Table 9: PPO Type 6, DP-V1

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	PROFIBUS	PROFIBUS
51.02 NODE ADDRESS	5	6
51.03 BAUD RATE***	1.5***	1.5***
51.04 PPO-TYPE***	4***	4***
51.05 PROFILE	0 (ProfiDrive)	0 (ProfiDrive)
52.01 DATA IN 1	4 (STATUS WORD)*	4 (STATUS WORD)*
52.02 DATA IN 2	5 (ACTUAL SPEED)*	5 (ACTUAL SPEED)*
52.03 DATA IN 3	6 (ACTUAL TORQUE)	6 (ACTUAL TORQUE)
52.04 DATA IN 4	123 (MOTOR POWER) - MSW	1.17 (MOTOR TEMP)
52.05 DATA IN 5	0 (MOTOR POWER) - LSW	1.04 (MOTOR CURRENT) - MSW
52.06 DATA IN 6	105 (MOTOR CURRENT)	0 (MOTOR CURRENT) - LSW
52.07 DATA IN 7	107 (DC-VOLTAGE) - MSW	107 (DC-VOLTAGE) - MSW
52.08 DATA IN 8	0 (DC-VOLTAGE) - LSW	0 (DC-VOLTAGE) - LSW
52.09 DATA IN 9	108 (ENCODER1 SPEED) - MSW	108 (ENCODER1 SPEED) - MSW
52.10 DATA IN 10	0 (ENCODER1 SPEED) - LSW	0 (ENCODER1 SPEED) - LSW
53.01 DATA OUT 1	1 (CONTROL WORD)*	1 (CONTROL WORD)*
53.02 DATA OUT 2	2 (EXTERNAL REF 1)*	2 (EXTERNAL REF 1)*
53.03 DATA OUT 3	3 (EXTERNAL REF 2)	3 (EXTERNAL REF 2)
53.04 DATA OUT 4	2204 (Acc time2) - MSW	2503 (Acc time) - MSW
53.05 DATA OUT 5	0 (Acc time2) - LSW	0 (Acc time2) - LSW
53.06 DATA OUT 6	2205 (Dec time2) - MSW	2504 (Dec time) - MSW
53.07 DATA OUT 7	0 (Dec time2) - LSW	0 (Dec time) - LSW

FPBA-01 Examples: **ACS850/ACSM1** - PROFIdrive Profile (10 Data words In/Out) (continued)

Table 9: PPO Type 6, DP-V1 (continued)

Drive Parameter	Example setting for ACS850	Example setting for ACSM1
53.08 DATA OUT 8	2606 (Const speed sel1)	2408 (CONST SPEED)
53.09 DATA OUT 9	2607 (Const speed sel2)	2410 (SPEED REF JOG1)
53.10 DATA OUT 10	2608 (Const speed sel3)	2411 (SPEED REF JOG2)
51.27 FBA PAR REFRESH	(1) REFRESH**	(1) REFRESH**

MSW = Most Significant Word

LSW = Less Significant Word

* Programming of these parameters are fixed with an ACS850/ACSM1 drive.

** 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.

*** The value is automatically updated from the PROFIBUS DP networks (Read-only)

Notes:

Standard ABB Drive on PROFIBUS DP (RPBA-01) with Siemens SIMATIC Step7 Software



Overview

This document contains an overview on how to setup a standard ABB drive in Siemens SIMATIC Step7 Software. The drive will be configured to vendor specific and PROFIdrive profile. The RPBA-01 and the PLC will transmit/receive up to ten words.

Reference Documentation:

User's Manual PROFIBUS DP Adapter Module RPBA-01
3AFE64504215

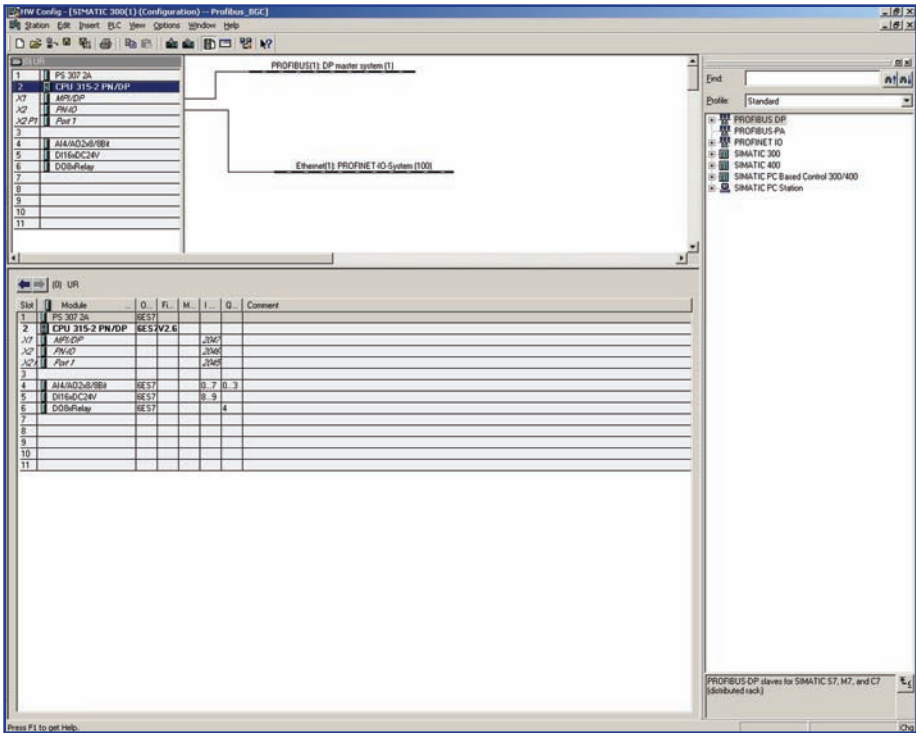
ACS550-U1 Users Manual
3AUA0000001609

ACS800 Firmware Manual
3AFE64527592

DCS800 Firmware Manual
3ADW000193

RPBA-01 Installation

1. Open SIMATIC Manager and open the SIMATIC program.
Open the Hardware Config program.



RPBA-01 Installation (continued)

- The GSD file must be installed before the RPBA-01 will display in the Hardware Config.
Click and drag the RPBA-01 to the PROFIBUS (1): DP master system (1).

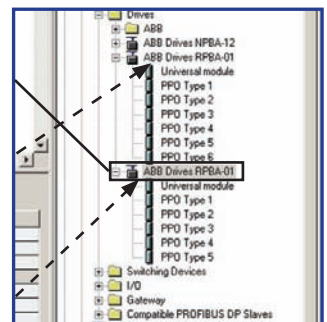
The screenshot shows the HW Config interface for a SIMATIC 300 station. The main window displays a rack configuration with modules: PS 307 2A, CPU 315-2 PN/DP, and DP V1. A PROFIBUS (1) DP master system (1) is connected to the CPU. The hardware catalog on the right shows the 'ABB Drives RPBA-01' module being selected. A callout box provides instructions on selecting the correct PPO type for DP-V1 or DP-V0.

Slot	Module	Q	F	M	I	O	Comment
1	PS 307 2A						
2	CPU 315-2 PN/DP	RES	N2	6			
3	DP V1						
4	AI/AO/DI/DO	RES			0	7	0
5	DI16xDC24V	RES			8	9	
6	DO8xRelay	RES			4		

RPBA-01 with PPO1 - PPO6 is DP-V1

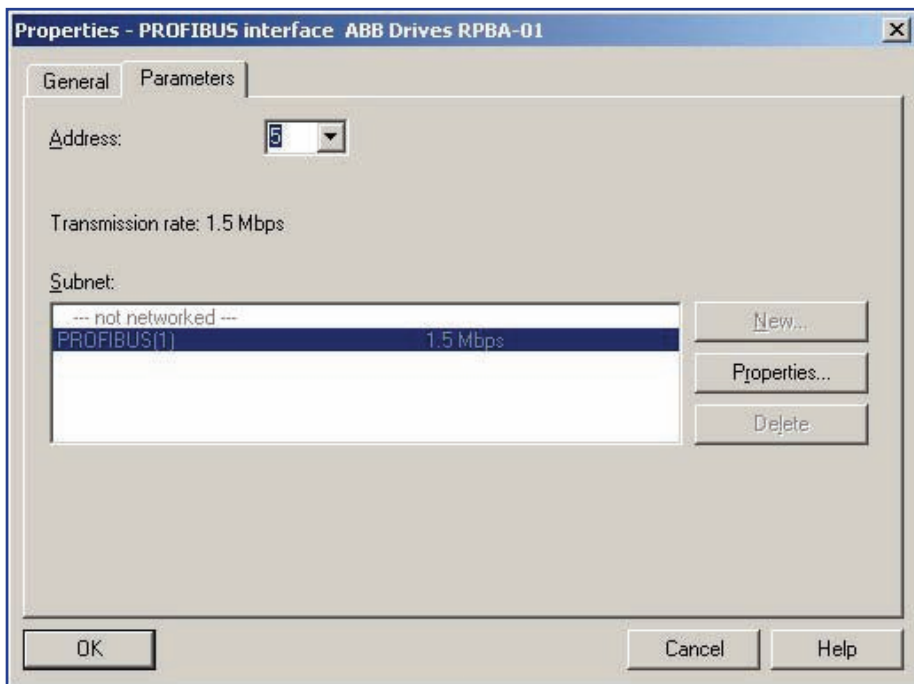
RPBA-01 with PPO1 - PPO5 is DP-V0

Selecting the following RPBA-01 will select DP-V0 or DP-V1 for the network.



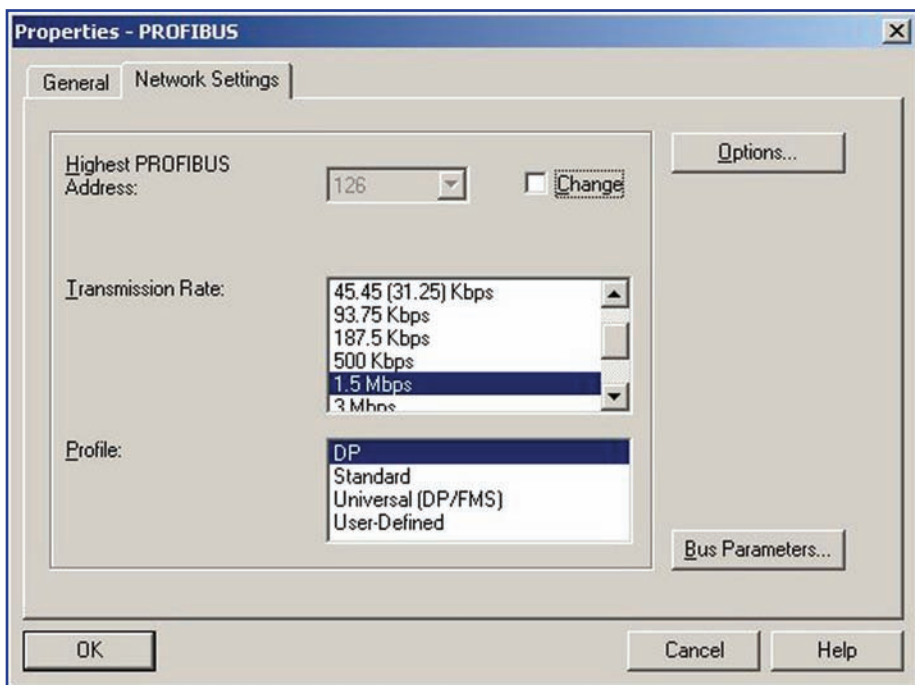
RPBA-01 Installation (continued)

3. Program the node address for the RPBA-01. Click Properties.



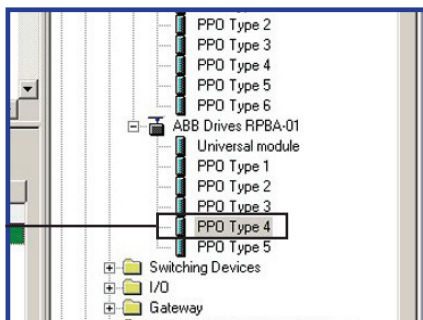
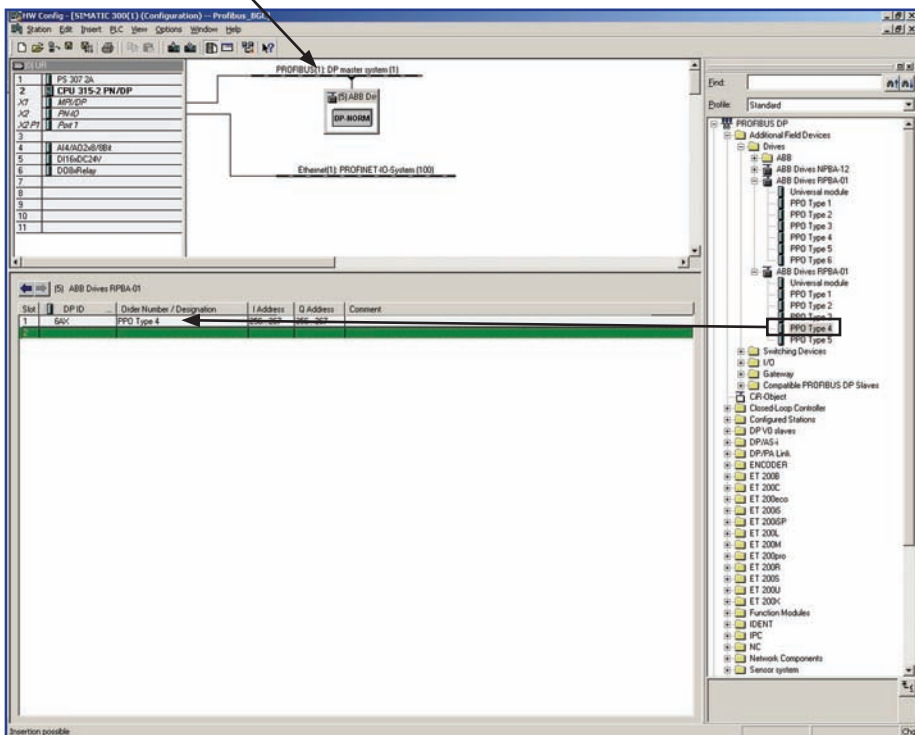
RPBA-01 Installation (continued)

- The screen below is where the Transmission Rate for the network would be adjusted. Click OK when finished.



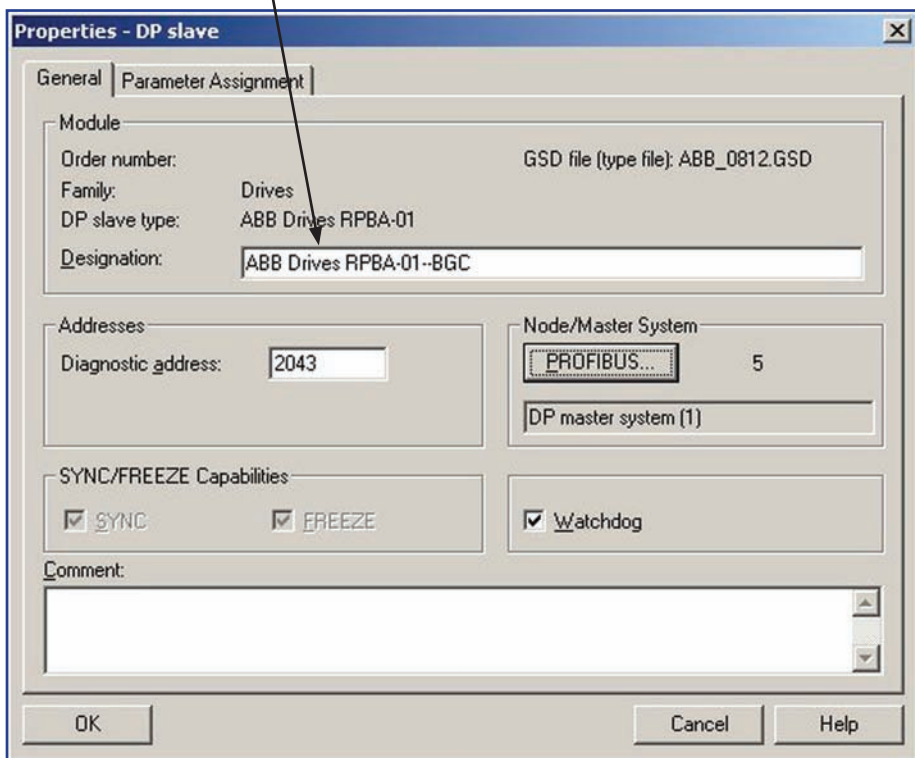
RPBA-01 Installation (continued)

- Click and drag the Vendor Object PP04 to Slot 1.
Double click the (5) ABB Drive - RPBA-01 to open the properties window.



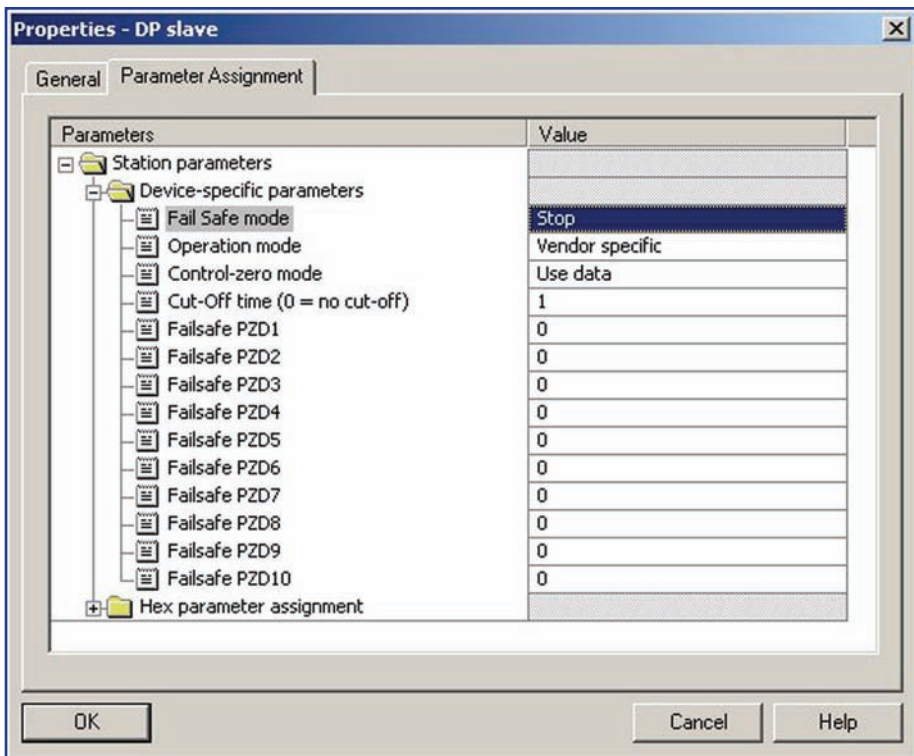
RPBA-01 Installation (continued)

6. Enter the Device name for the RPBA-01. Click the Parameter Assignment tab.



RPBA-01 Installation (continued)

7. Adjust the following Station parameters for the drives application.



Fail-safe mode. Defines the action taken when the PLC is switched from “RUN” to “STOP” mode.

00 = STOP (default)

01 = LAST SPEED

02 = USE FAIL-SAFE. The values of the PZDs are defined by Failsafe PZD1 – PZD10.

Operation mode. Determines which control/status word and reference/actual values are used.

00 = PROFIDRIVE (i.e. Generic drive profile)

01 = VENDOR SPECIFIC (i.e. ABB Drives profile) (default).

Control zero mode. Defines the action taken if a PROFIBUS telegram containing only zeros is received.

00 = USE FRAME (default). Note that, with this setting, the drive might not be stopped (if it is running) since also bit 10 (Remote Command) in the control word is zero. However, the other PZD.s may still be updated, but have the value zero.

01 = IGNORE

RPBA-01 Installation (continued)

- Now download the hardware configuration to the PLC.
The PLC is now communicating with the RPBA-01.

The screenshot shows the SIMATIC Manager interface for configuring a SIMATIC 300 station. The main window displays a rack configuration with the following modules:

Slot	Module
1	PS 307 2A
2	CPU 315-2 PN/DP
3	MPU DP
4	PS 307
5	DI16xDC24V
6	DO16xRelay
7	
8	
9	
10	
11	

The network diagram shows the CPU 315-2 PN/DP connected to a PROFIBUS DP master system (1) and an Ethernet PROFNET IO-System (100).

The table below the rack configuration lists the ABB Drives RPBA-01-8GC:

Stat	DP ID	Order Number / Designation	I Address	Q Address	Comment
1	8GC	PPO Type 4	256..267	256..267	
2					

The right-hand pane shows a tree view of the hardware configuration, including the ABB Drives RPBA-01 and its various PPO types (PPO Type 1 through PPO Type 6).

Notes:

Standard ABB Drive on PROFIBUS DP (FPBA-01) with Siemens SIMATIC Step7 Software



Overview

This document contains an overview on how to setup a standard ABB drive in Siemens SIMATIC Step7 Software. The drive will be configured to vendor specific and PROFIdrive profile. The FPBA-01 and the PLC will transmit/receive ten words.

Reference Documentation:

User's Manual PROFIBUS DP Adapter Module FPBA-01
3AFE68573271

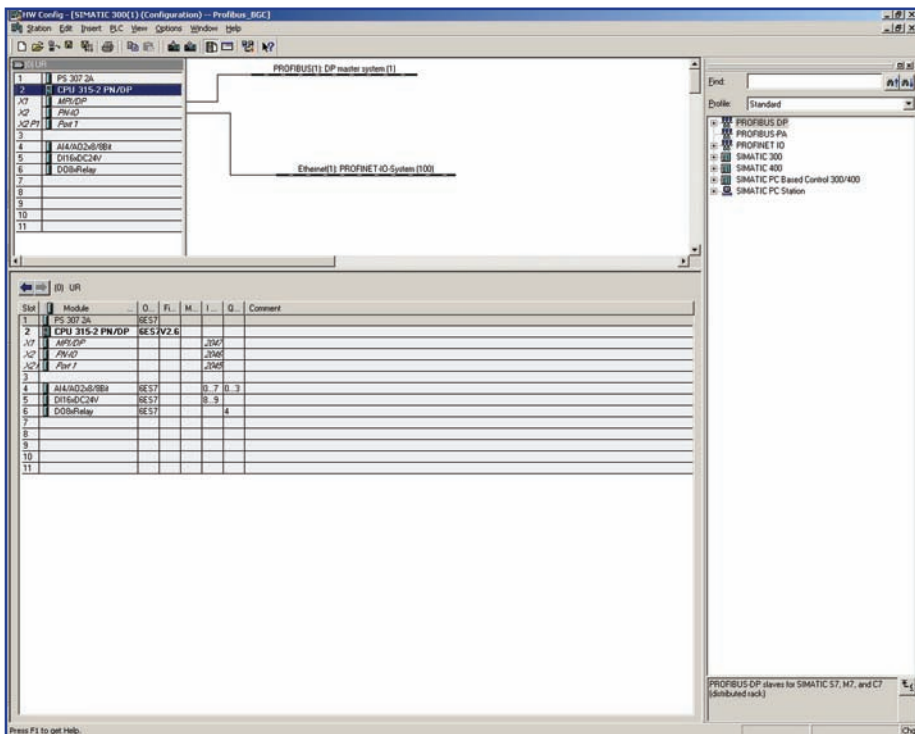
User's Manual ACS350 Drives (0.37.22 kW, 0.5.30 HP)
3AFE68462401

Firmware Manual ACS850 Standard Control Program
3AUA0000045497

ACSM1 Speed and Torque Control Program Firmware Manual
3AFE68848261

FPBA-01 Installation

1. Open SIMATIC Manager and open the SIMATIC program.
Open the Hardware Config program.



FPBA-01 Installation (continued)

- The GSD file must be installed before the FPBA-01 will display in the Hardware Config.
Click and drag the FPBA-01 to the PROFIBUS (1): DP master system (1).

The screenshot shows the SIMATIC Manager HW Config interface. On the left, a rack configuration table is visible. The main workspace shows a PROFIBUS DP master system (1) connected to a PROFIBUS DP slave system (100). A callout box points to the slave system, indicating that two FPBA-01 drives are being installed.

Slot	Module	Q	Fl.	M.	I	Q	Comment
1	PS 307 5A						
2	CPU 315-2 PN/DP	6ES7					
X7	MPV-DP						
X7	PNV-D						
X7	PNV-T						
3							
4	AI/AO-DI/DO	6ES7		0	7	0	3
5	DI16xDC24V	6ES7			8	3	
6	DO8xDC12V	6ES7				4	
7							
8							
9							
10							
11							

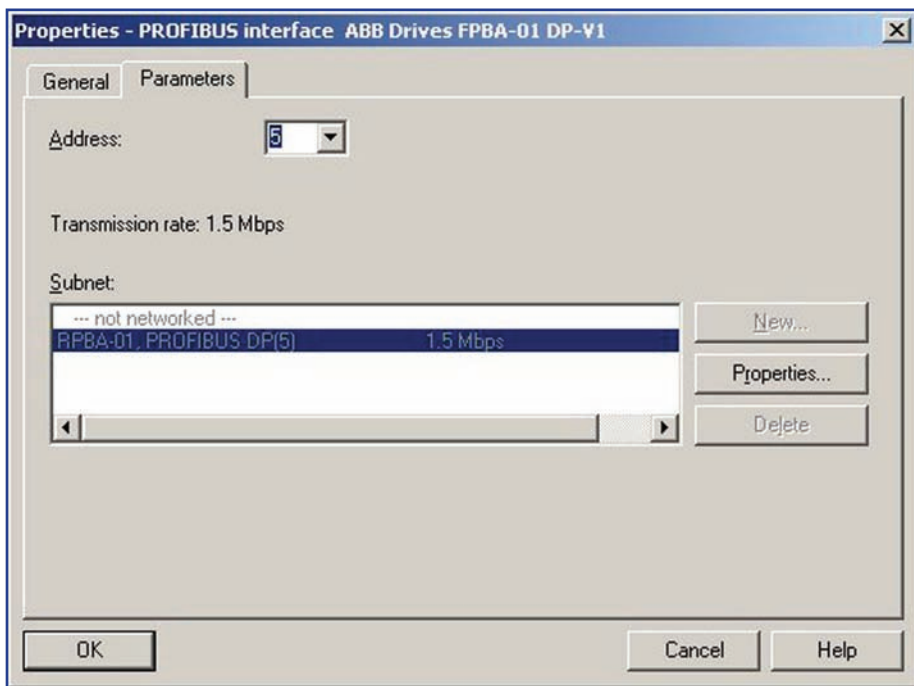
There are two FPBA-01. One is for DP-V0 and the other one is for DP-V1.

Selecting the following FPBA-01 will select DP-V0 or DP-V1 for the network.

This close-up view of the HW Config tree shows the 'PROFIBUS DP' section expanded. Under 'Additional Field Devices', the 'Drives' folder is selected, and two ABB drives are highlighted: 'ABB Drives FPBA-01 DP-V0' and 'ABB Drives FPBA-01 DP-V1'. Other drives like 'ABB Drives NPBA-T2' and 'ABB Drives RPBA-01' are also visible in the tree.

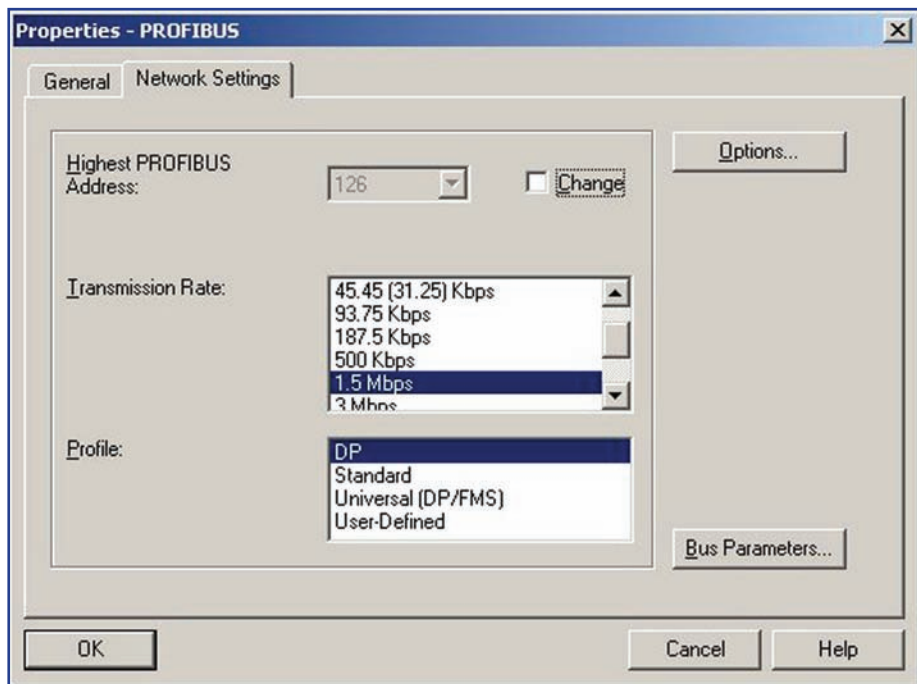
FPBA-01 Installation (continued)

3. Program the node address for the FPBA-01. Click Properties.



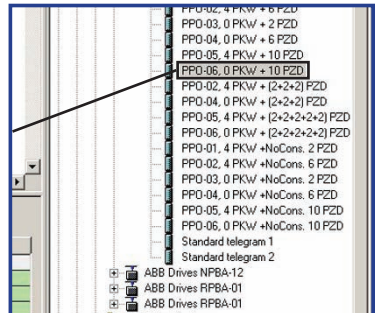
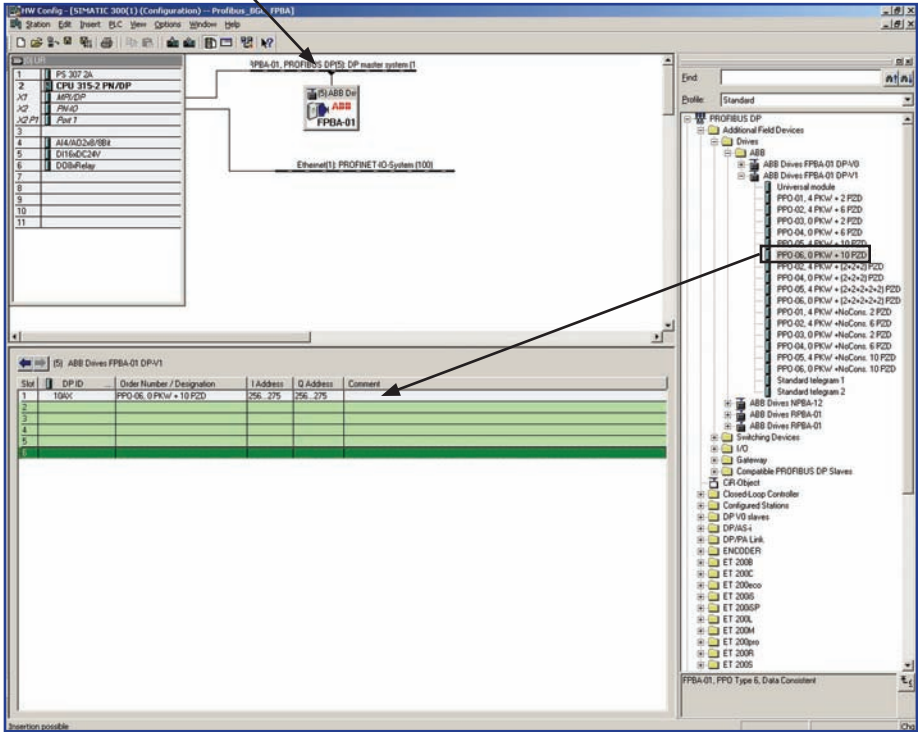
FPBA-01 Installation (continued)

- The screen below is where the Transmission Rate for the network would be adjusted. Click OK when finished.



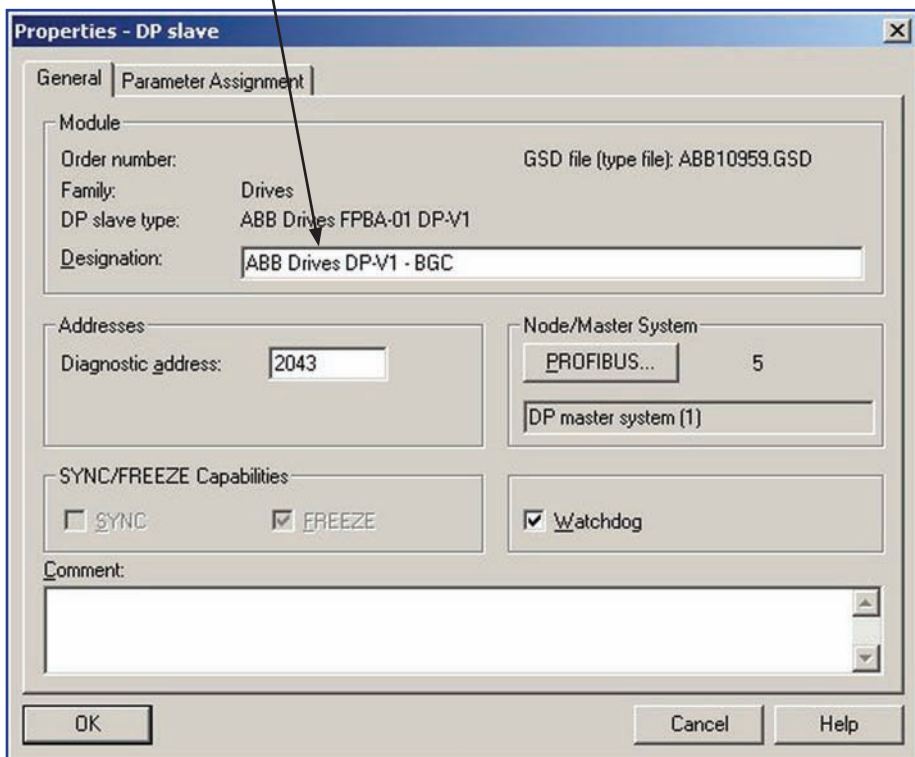
FPBA-01 Installation (continued)

- Click and drag the Vendor Object PP06 to Slot 1.
Double click the (5) ABB Drive - FPBA-01 to open the properties window.



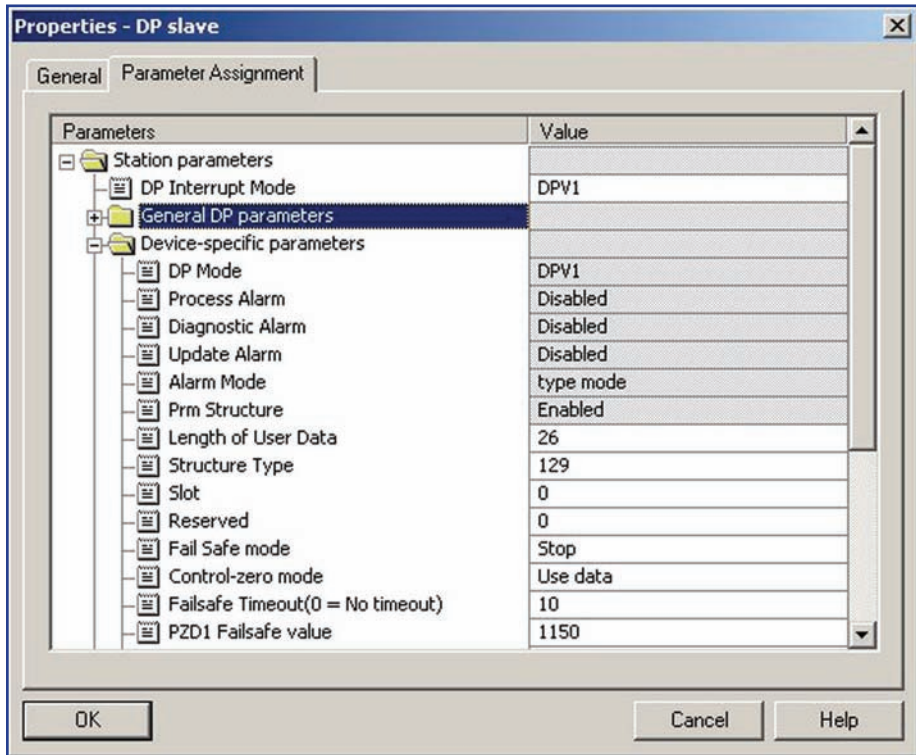
FPBA-01 Installation (continued)

6. Enter the Device name for the FPBA-01. Click the Parameter Assignment tab.



FPBA-01 Installation (continued)

7. Adjust the following Station parameters for the drives application.



Fail-safe mode. Defines the action taken when the PLC is switched from “RUN” to “STOP” mode.

00 = STOP (default)

01 = LAST SPEED

02 = USE FAIL-SAFE. The values of the PZDs are defined by Failsafe PZD1 – PZD10.

Operation mode. Determines which control/status word and reference/actual values are used.

00 = PROFIDRIVE (i.e. Generic drive profile)

01 = VENDOR SPECIFIC (i.e. ABB Drives profile) (default).

Control zero mode. Defines the action taken if a PROFIBUS telegram containing only zeros is received.

00 = USE FRAME (default). Note that, with this setting, the drive might not be stopped (if it is running) since also bit 10 (Remote Command) in the control word is zero. However, the other PZD.s may still be updated, but have the value zero.

01 = IGNORE

FPBA-01 Installation (continued)

8. Now download the hardware configuration to the PLC.
The PLC is now communicating with the FPBA-01.

The screenshot shows the SIMATIC Manager configuration window for a SIMATIC 300 PLC. The hardware rack is configured as follows:

Slot	DP-ID	Order Number / Designation	I Address	Q Address	Comment
1	IGWX	PPD 06 0 PKW + 10 PZO	556..275	556..275	
2					
3					
4					
5					
6					

The network diagram shows the CPU 315-2 DP/DP connected to the FPBA-01 PROFIBUS DP/PS DP master system (1) via an Ethernet(1) PROFINET-ID-System (100). The hardware catalog on the right shows the following components:

- PROFIBUS DP
- PROFIBUS PA
- PROFINET ID
- SIMATIC 300
- SIMATIC 400
- SIMATIC PC Based Control 300/400
- SIMATIC PC Station

PROFIBUS DP slaves for SIMATIC S7, M7, and CT (distributed rack)

Notes:

Standard ABB Drive on PROFIBUS DP (RPBA-01) with ABB AC500 PLC with CoDeSys software



Overview

This document contains an overview on how to setup a standard ABB drive in ABB AC500 PLC with CoDeSys software. The drive will be configured to vendor specific and PROFIdrive profile. The RPBA-01 and the PLC will transmit/receive up to ten words.

Reference Documentation:

User's Manual PROFIBUS DP Adapter Module RPBA-01
3AFE64504215

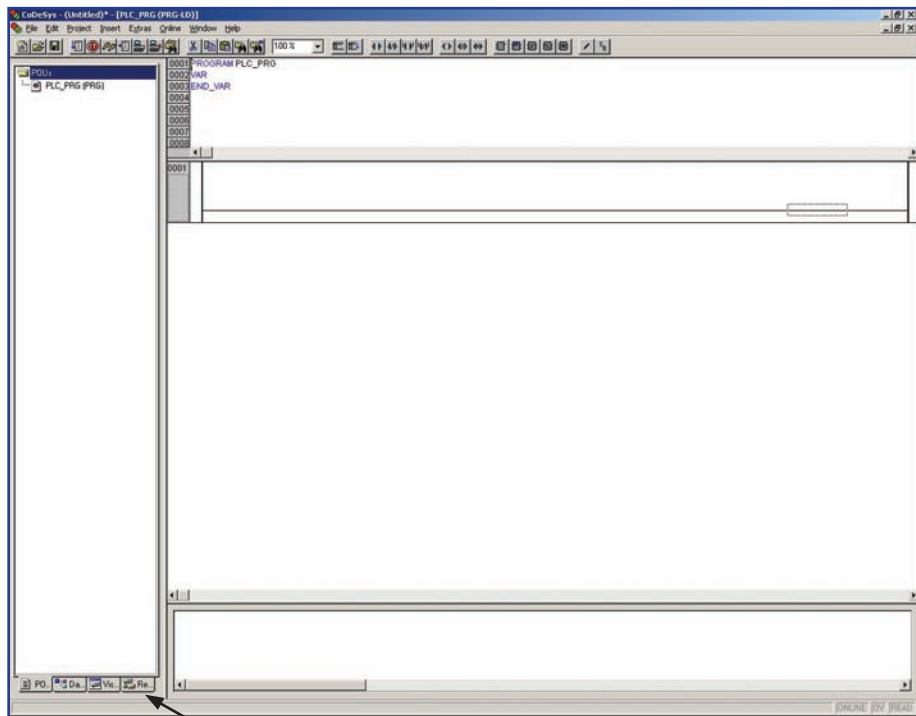
ACS550-U1 Users Manual
3AUA0000001609

ACS800 Firmware Manual
3AFE64527592

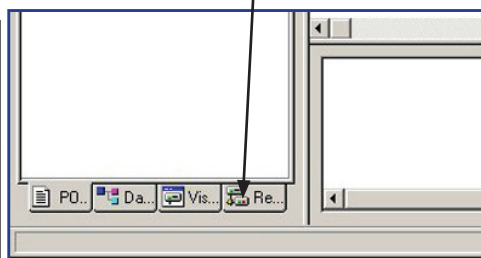
DCS800 Firmware Manual
3ADW000193

RPBA-01 Installation

1. Open CoDeSys and open a AC500 program.
Configure the PLC Hardware.
2. The GSD file must be installed before the SYCON.net software.
The RPBA-01 GSD files will need to be installed in the following location:
C:\ProgramFiles\HilscherGmbH\SYCONnet\ABBPBGenericSlaveDTM\GSD

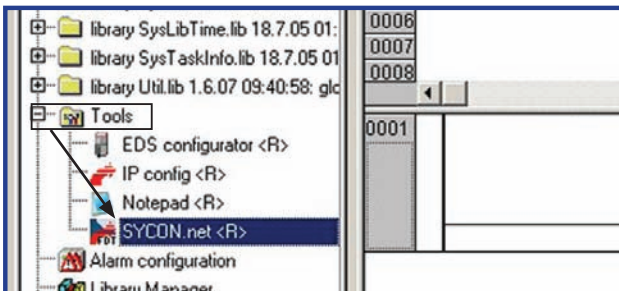
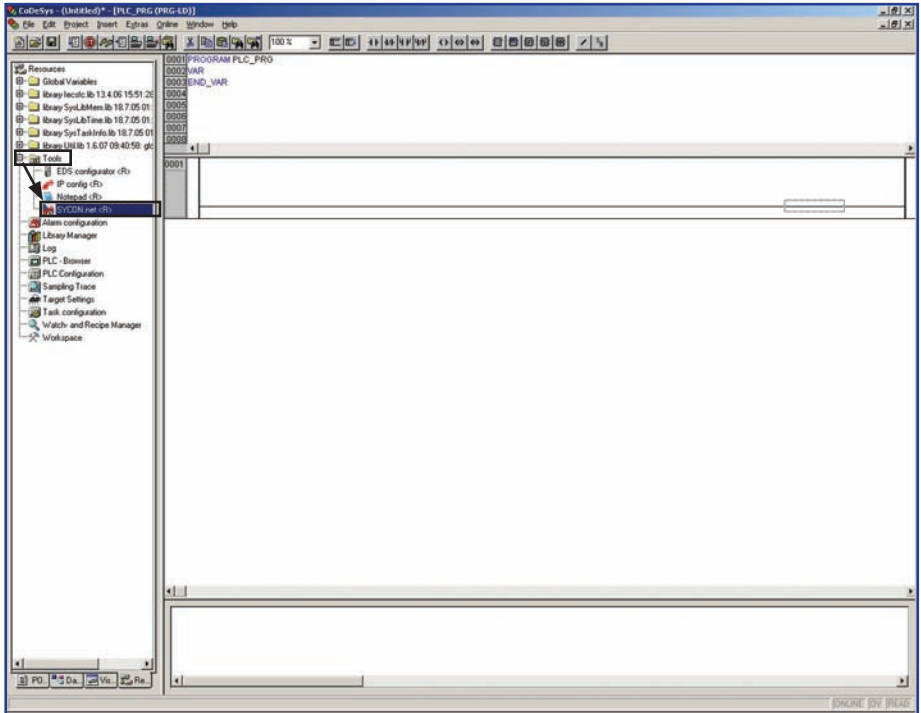


3. Click the Resource tab.



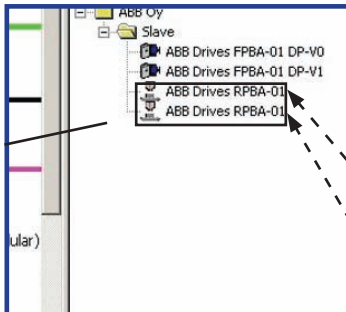
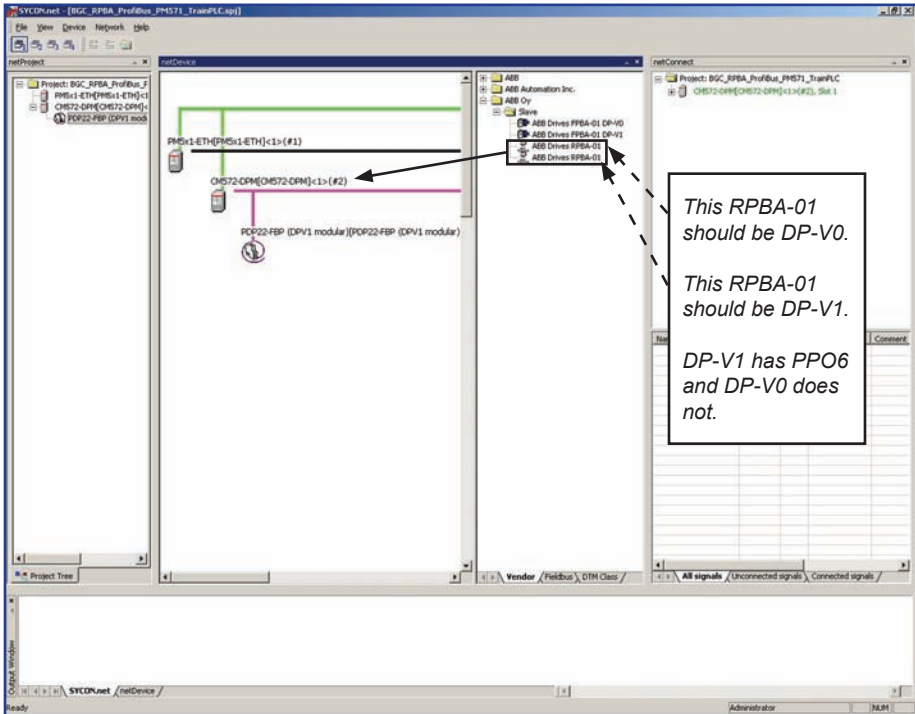
RPBA-01 Installation (continued)

- Click tools and then click on SYCON.net. This will launch the SYCON.net software to configure the PROFIBUS network.



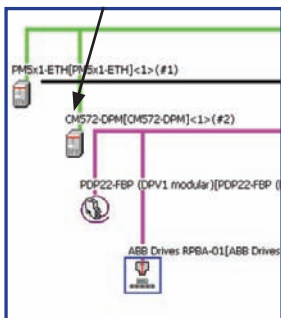
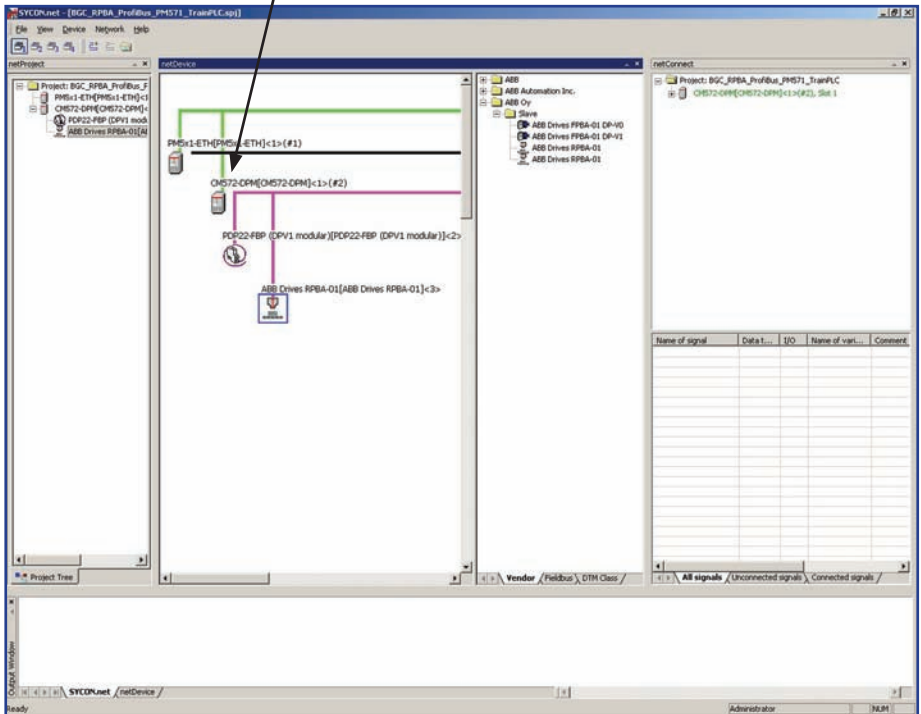
RPBA-01 Installation (continued)

5. The PLC hardware should already be configured. There should be two RPBA-01 under ABB Oy then Slave.
Click and drag the RPBA-01 to CM572.



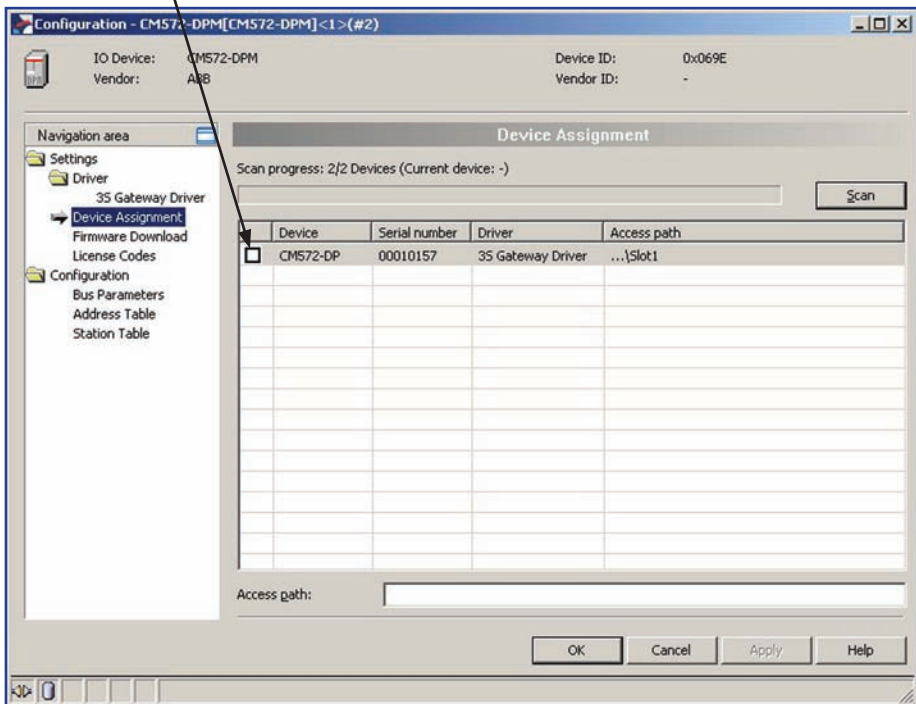
RPBA-01 Installation (continued)

- Double click on the CM572.



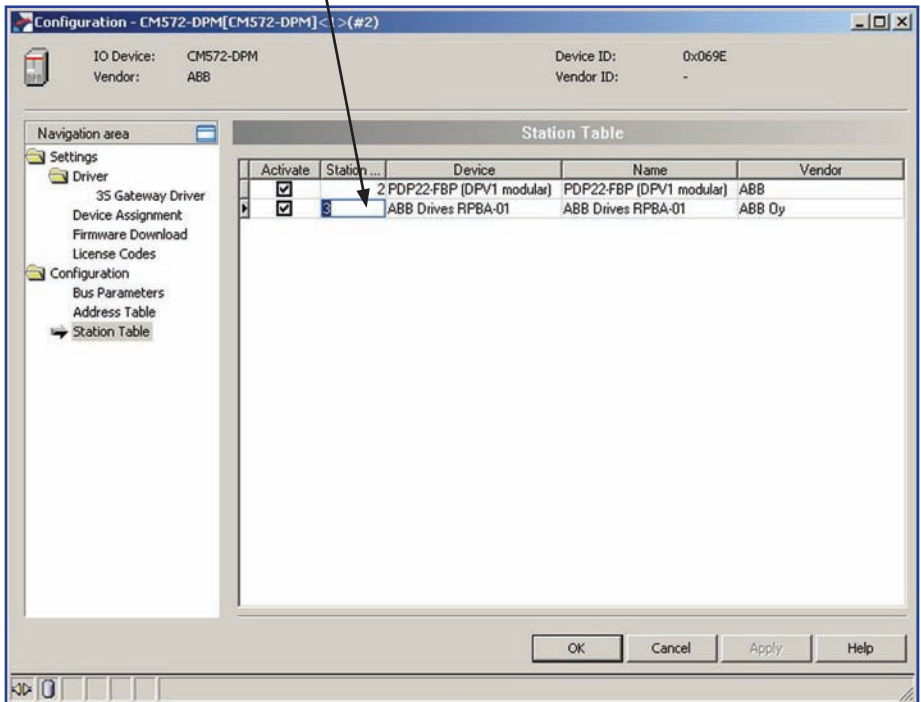
RPBA-01 Installation (continued)

7. Click the box next to the CM572-DP. This is the path used to download to the CM572-DP.



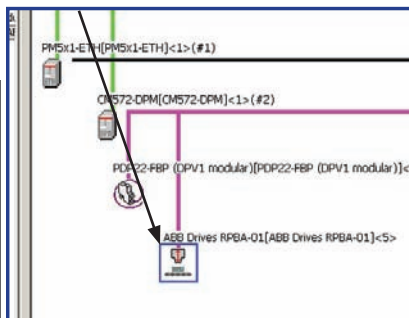
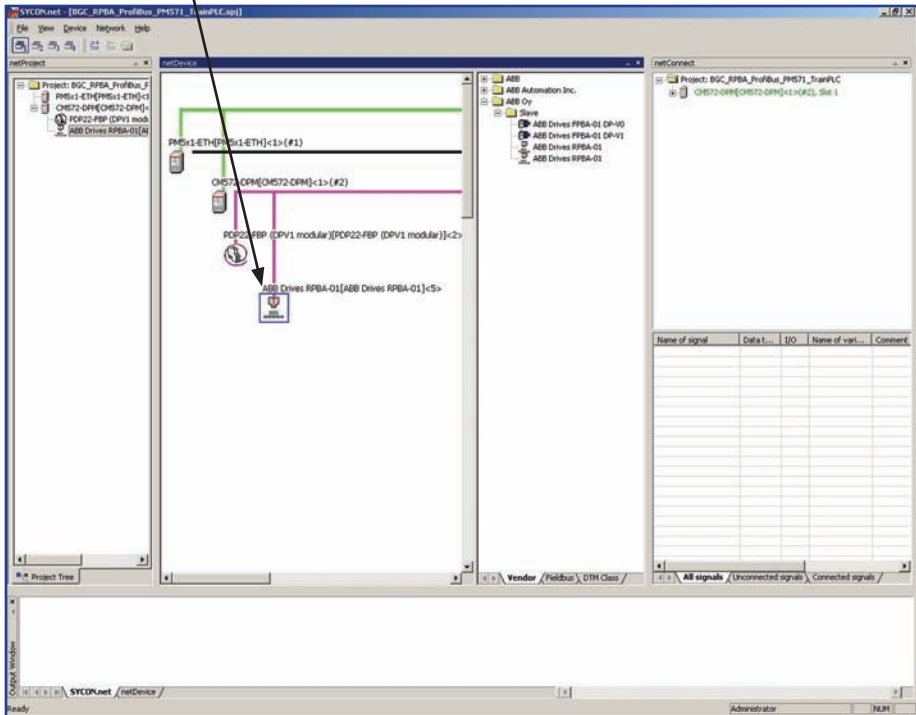
RPBA-01 Installation (continued)

- Click Configuration and then click Station Table. Program the node address of the RPBA-01. Then click Apply and then click OK.



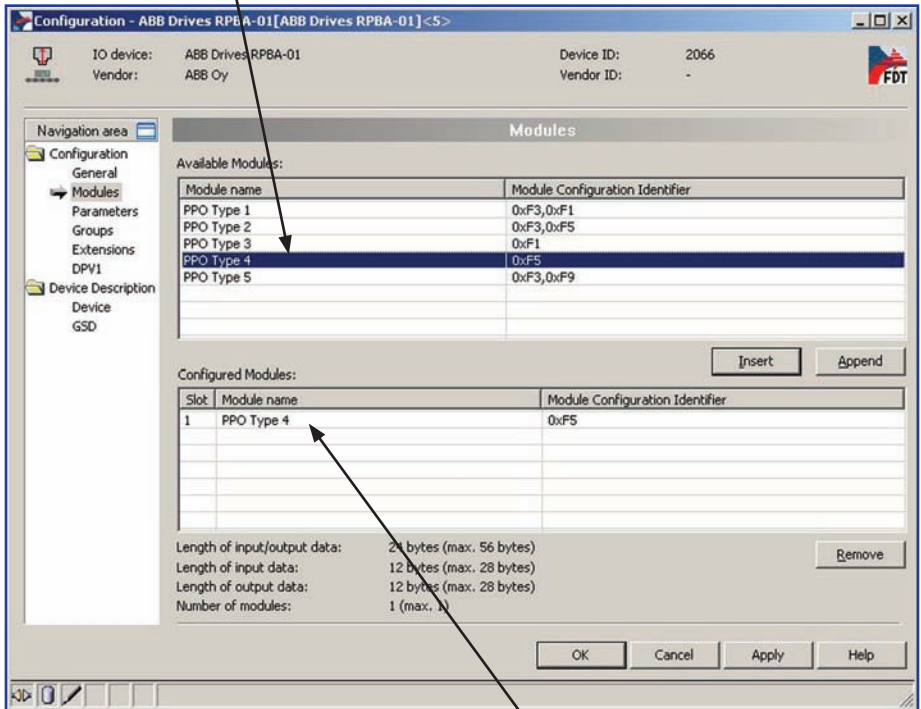
RPBA-01 Installation (continued)

9. Double-click the ABB Drive RPBA-01.



RPBA-01 Installation (continued)

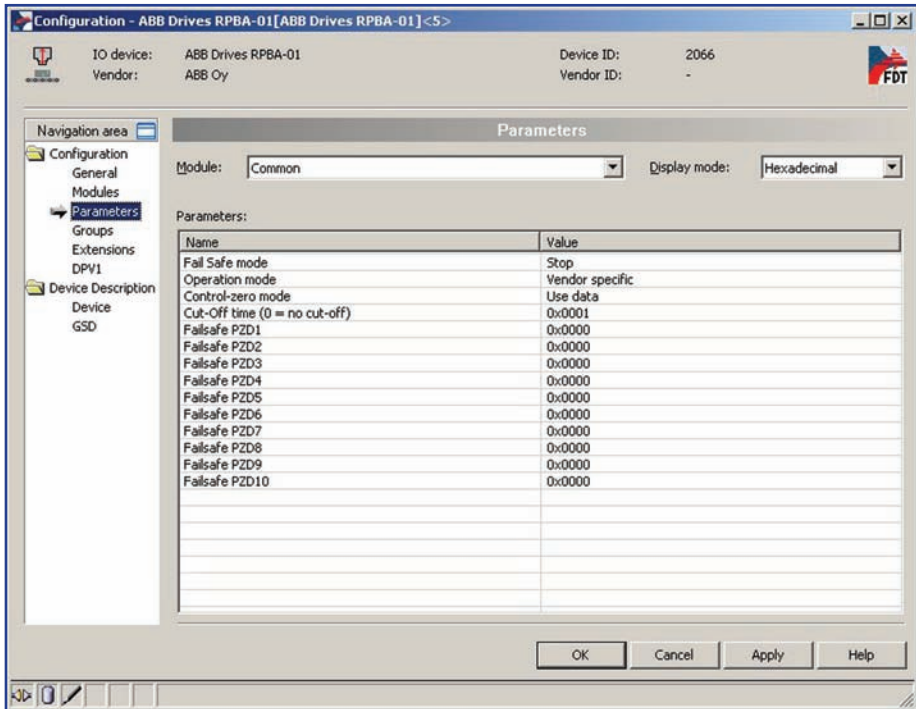
10. Click PPO Type 4 and then click Insert.



11. The PPO Type 4 should have moved into Slot 1.

RPBA-01 Installation (continued)

12. Click the Parameters tab and adjust the following parameters for the application. Then click OK.



Fail-safe mode. Defines the action taken when the PLC is switched from “RUN” to “STOP” mode.

00 = STOP (default)

01 = LAST SPEED

02 = USE FAIL-SAFE. The values of the PZDs are defined by Failsafe PZD1 – PZD10.

Operation mode. Determines which control/status word and reference/actual values are used.

00 = PROFIDRIVE (i.e. Generic drive profile)

01 = VENDOR SPECIFIC (i.e. ABB Drives profile) (default).

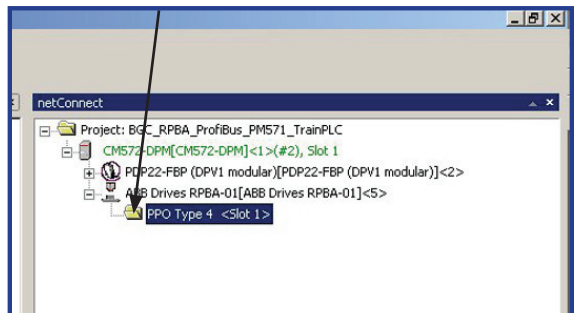
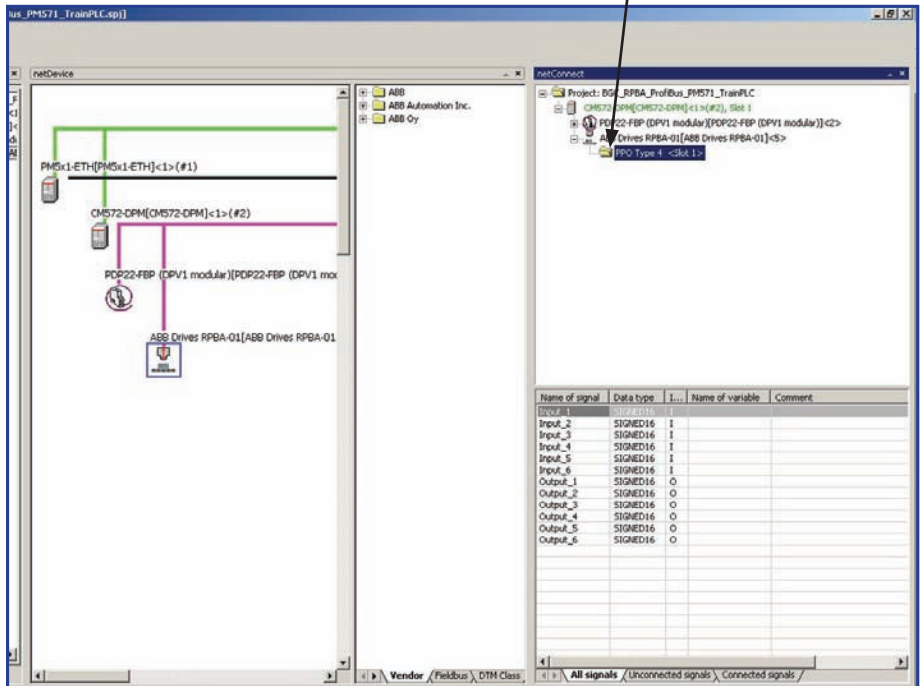
Control zero mode. Defines the action taken if a PROFIBUS telegram containing only zeros is received.

00 = USE FRAME (default). Note that, with this setting, the drive might not be stopped (if it is running) since also bit 10 (Remote Command) in the control word is zero. However, the other PZD.s may still be updated, but have the value zero.

01 = IGNORE

RPBA-01 Installation (continued)

- Click the "+" by the CM572-DPM in the netConnect window.
Click the "+" by the ABB Drives RPBA-01.
Click the PPO Type 4 under the ABB Drives RPBA-01.



RPBA-01 Installation (continued)

14. In the column Name of Variables, enter the variables names for the six Input/Output words that will be transmitted and received from the RPBA-01.

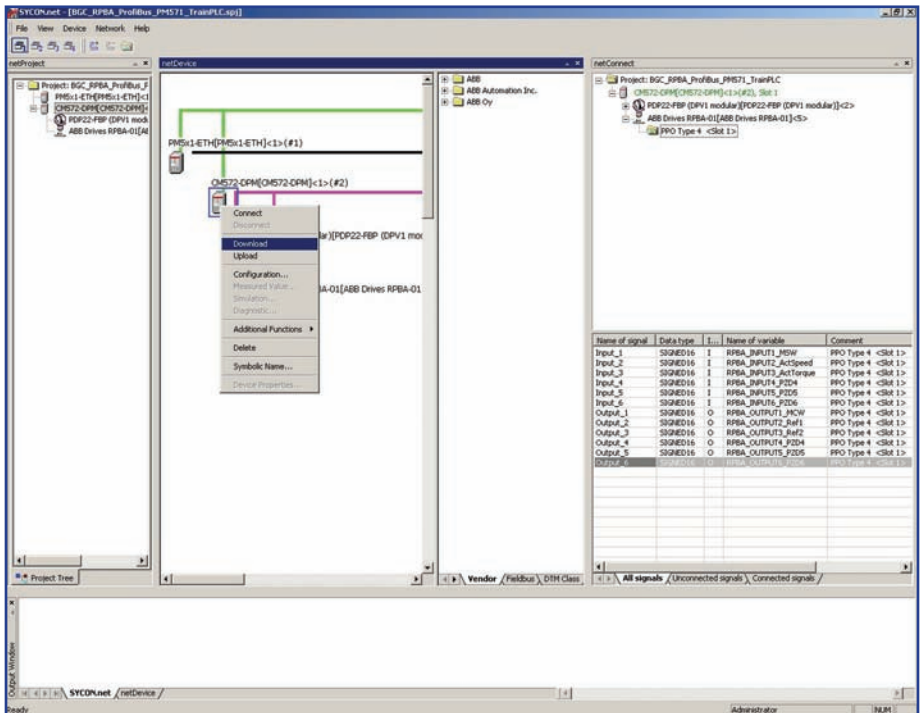
The screenshot shows the netConnect software interface. On the left is a project tree with folders for ABB, ABB Automation Inc., and ABB Oy. The main window displays a project named 'netConnect' with a tree structure including 'CMS72-DPM', 'PDP22-FBP', 'ABB Drives RPBA-01', and 'PPO Type 4'. Below the tree is a table with the following data:

Name of signal	Data type	I...	Name of variable	Comment
Input_1	SIGNED16	I	RPBA_INPUT1_MSWS	PPO Type 4 <Slot 1>
Input_2	SIGNED16	I	RPBA_INPUT2_ActSpeed	PPO Type 4 <Slot 1>
Input_3	SIGNED16	I	RPBA_INPUT3_ActTorque	PPO Type 4 <Slot 1>
Input_4	SIGNED16	I	RPBA_INPUT4_PZD4	PPO Type 4 <Slot 1>
Input_5	SIGNED16	I	RPBA_INPUT5_PZD5	PPO Type 4 <Slot 1>
Input_6	SIGNED16	I	RPBA_INPUT6_PZD6	PPO Type 4 <Slot 1>
Output_1	SIGNED16	O	RPBA_OUTPUT1_MCWS	PPO Type 4 <Slot 1>
Output_2	SIGNED16	O	RPBA_OUTPUT2_Ref1	PPO Type 4 <Slot 1>
Output_3	SIGNED16	O	RPBA_OUTPUT3_Ref2	PPO Type 4 <Slot 1>
Output_4	SIGNED16	O	RPBA_OUTPUT4_PZD4	PPO Type 4 <Slot 1>
Output_5	SIGNED16	O	RPBA_OUTPUT5_PZD5	PPO Type 4 <Slot 1>
Output_6	SIGNED16	O	RPBA_OUTPUT6_PZD6	PPO Type 4 <Slot 1>

RPBA-01 Installation (continued)

15. Right click on the CM572-DPM and then click Connect. Then click Download. This will download the PROFIBUS configuration to the PROFIBUS scanner.

NOTE! The AC500 PLC will need to be in “Stop” mode.



16. Once the download is done, right click the CM572-DPM and Disconnect.
17. Close the SYCON.net program and save file on closing.
18. Switch the PLC from “Stop” to “Run” mode. The PLC is now communicating to the RPBA-01.

Notes:

Standard ABB Drive on PROFIBUS DP (FPBA-01) with ABB AC500 PLC with CoDeSys software



Overview

This document contains an overview on how to setup a standard ABB drive in ABB AC500 PLC with CoDeSys software. The drive will be configured to vendor specific and PROFIdrive profile. The FPBA-01 and the PLC will transmit/receive ten words.

Reference Documentation:

User's Manual PROFIBUS DP Adapter Module FPBA-01
3AFE68573271

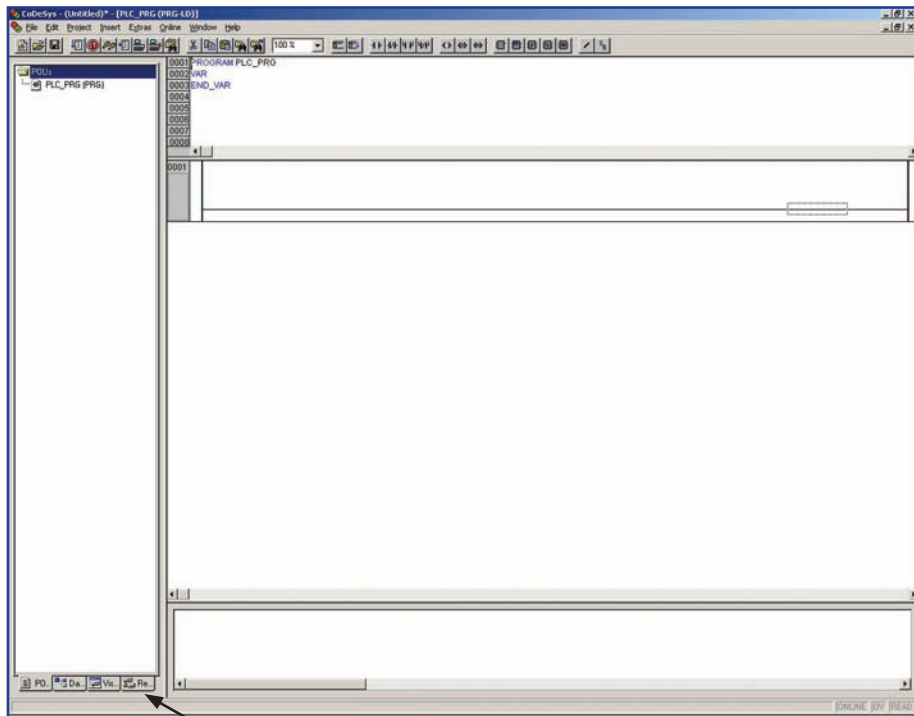
User's Manual ACS350 Drives (0.37.22 kW, 0.5.30 HP)
3AFE68462401

Firmware Manual ACS850 Standard Control Program
3AUA0000045497

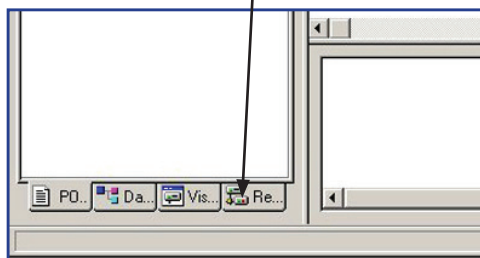
ACSM1 Speed and Torque Control Program Firmware Manual
3AFE68848261

FPBA-01 Installation

1. Open CoDeSys and open an AC500 program.
Configure the PCL Hardware.
2. The GSD file must be installed before the SYCON.net software.
The FPBA-01 GSD files will need to be installed in the following location:
C:\ProgramFiles\HilscherGmbH\SYCONnet\ABBPBGenericSlaveDTM\GSD

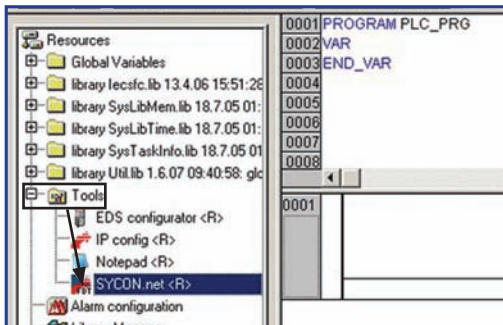
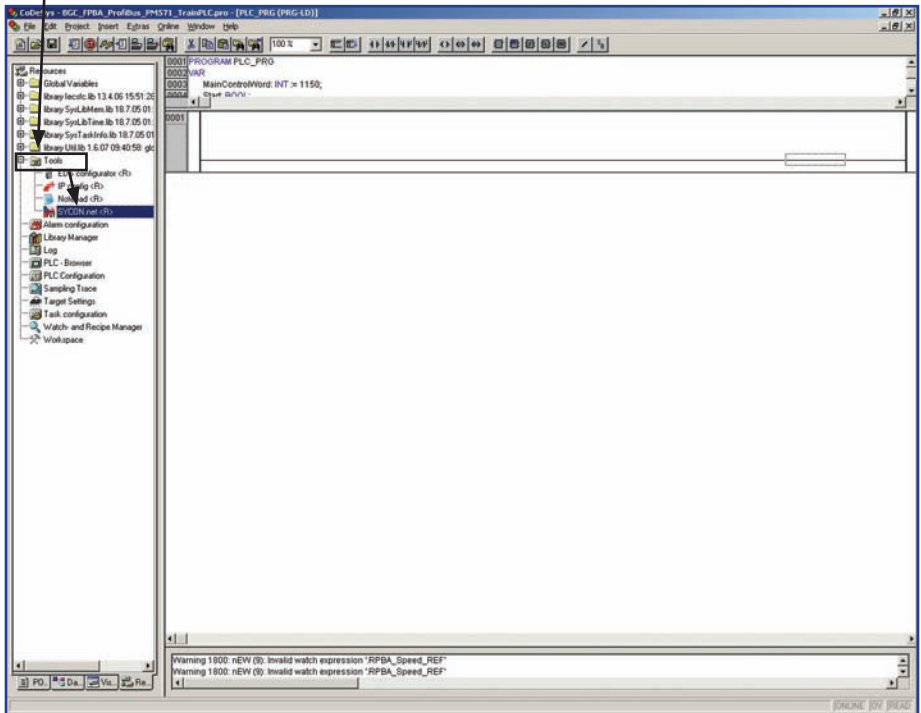


3. Click the Resource tab.



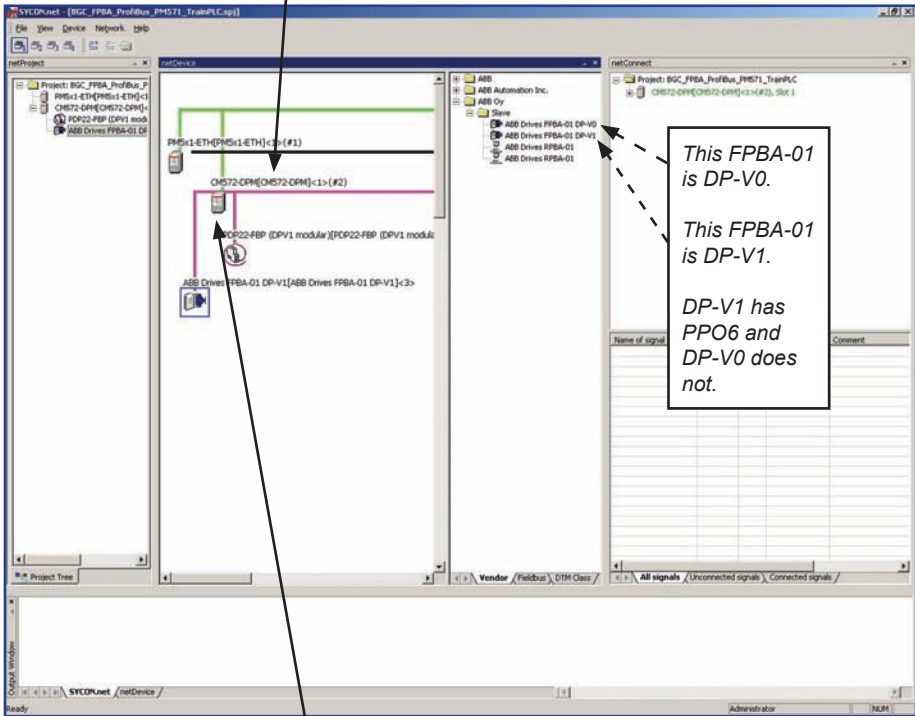
FPBA-01 Installation (continued)

- Click Tools and then click on SYCON.net. This will launch the SYCON.net software to configure the PROFIBUS network.

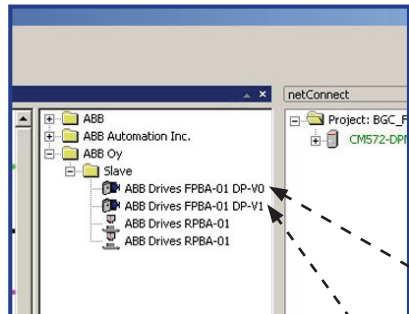


FPBA-01 Installation (continued)

5. The PCL hardware should already be configured. There should be two FPBA-01 under ABB Oy then Slave.
Click and drag the FPBA-01 DP-V1 to CM572.

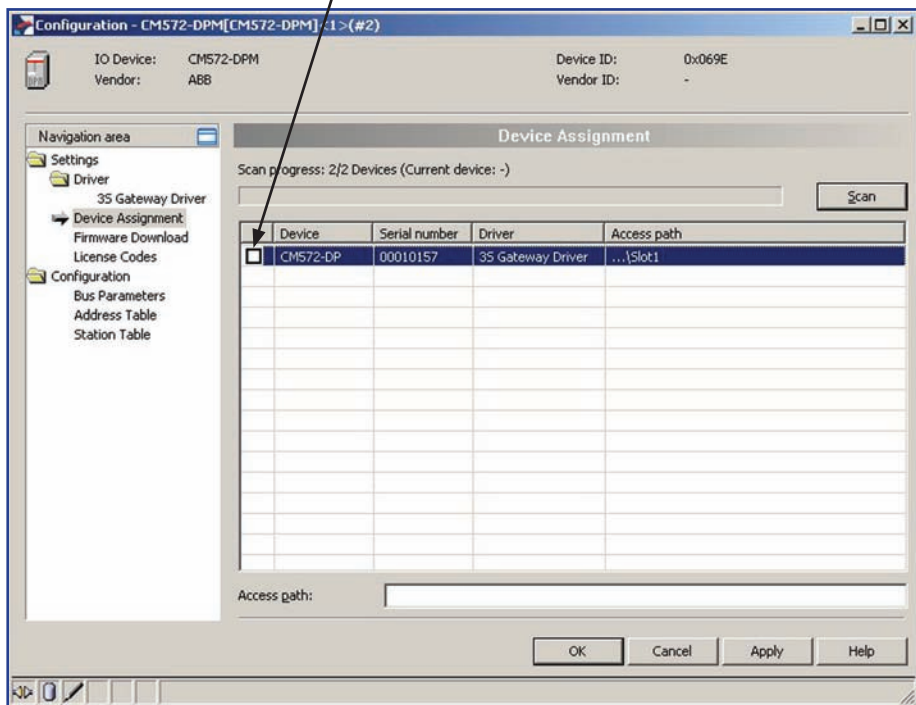


6. Double click on the CM572.



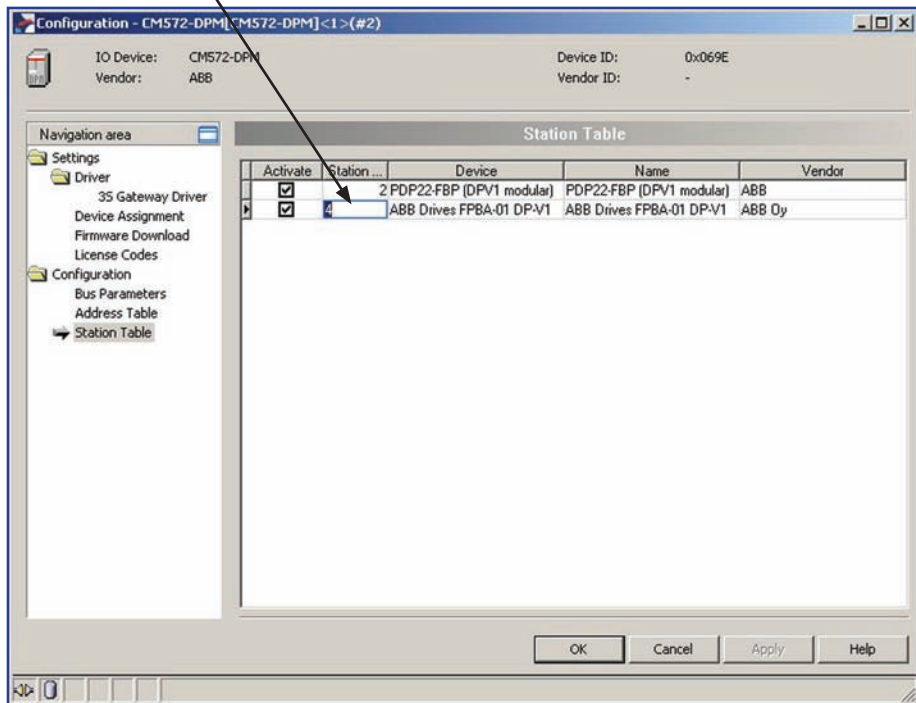
FPBA-01 Installation (continued)

7. Click the box next to the CM572-DP. This is the path used to download to the CM572-DP.



FPBA-01 Installation (continued)

- Click Configuration and then click Station Table. Program the node address of the FPBA-01. Then click Apply and then click OK.



FPBA-01 Installation (continued)

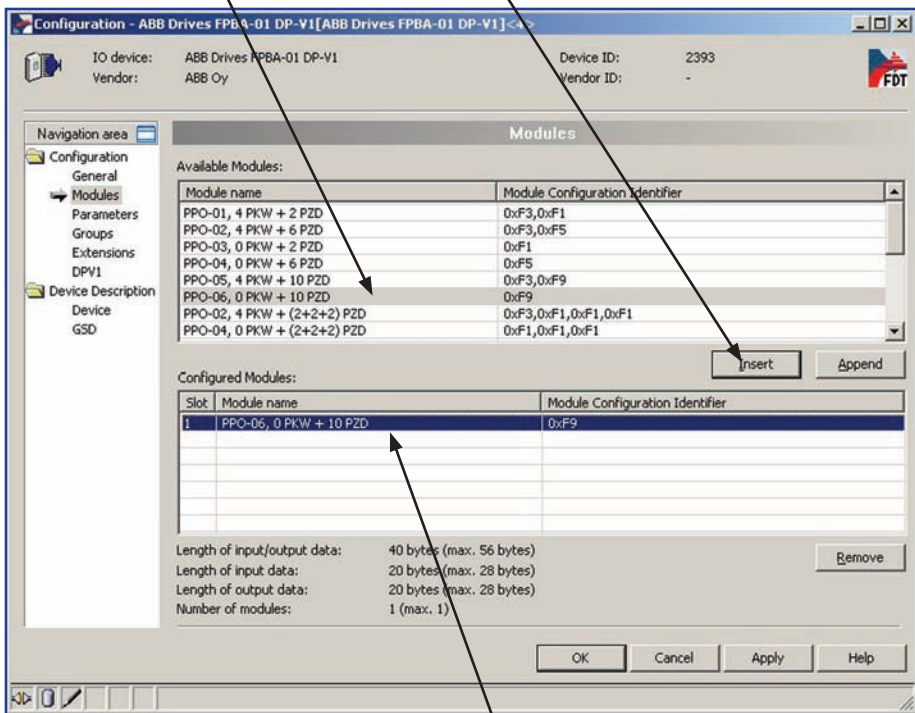
- Double click the ABB Drive FPBA-01.

The screenshot shows the SYCONet software interface. The main window displays a network diagram with several modules: PM5x1-ETH, CM572-CPM, PCP22-FBP, and ABB Drive FPBA-01 DP-V1. A double-click arrow points to the ABB Drive FPBA-01 DP-V1 module. The right-hand side of the interface shows a 'netConnect' window with a project tree and a table of signal connections.

Name of signal	Data t...	NO	Name of vari...	Comment
Input_1	SIGME...	1		
Input_2	SIGME...	1		
Input_3	SIGME...	1		
Input_4	SIGME...	1		
Input_5	SIGME...	1		
Input_6	SIGME...	1		
Input_7	SIGME...	1		
Input_8	SIGME...	1		
Input_9	SIGME...	1		
Input_10	SIGME...	1		
Output_1	SIGME...	0		
Output_2	SIGME...	0		
Output_3	SIGME...	0		
Output_4	SIGME...	0		
Output_5	SIGME...	0		
Output_6	SIGME...	0		
Output_7	SIGME...	0		
Output_8	SIGME...	0		
Output_9	SIGME...	0		
Output_10	SIGME...	0		

FPBA-01 Installation (continued)

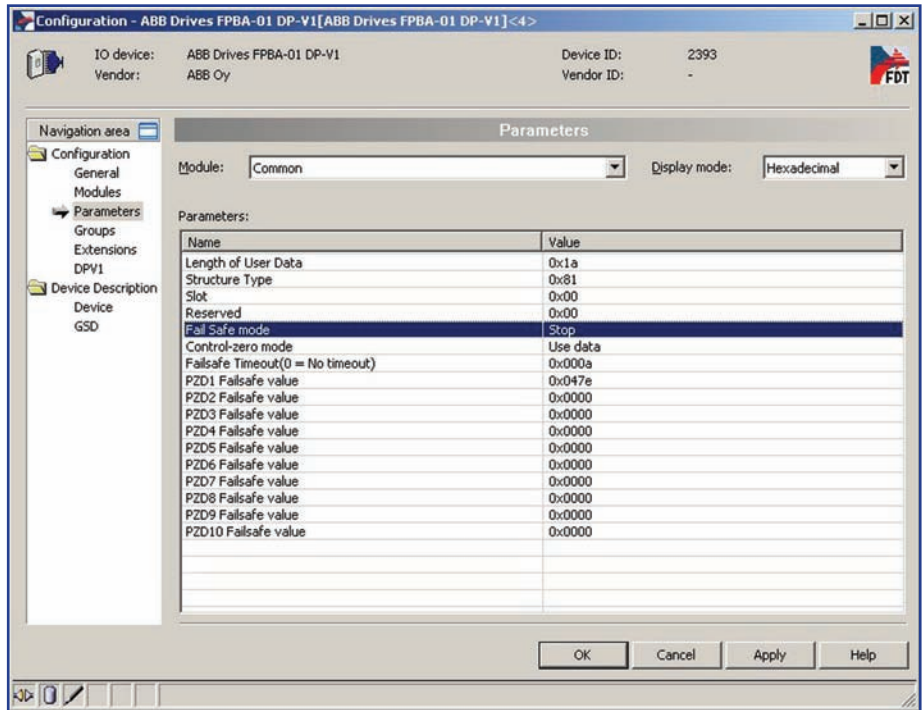
10. Click PPO-6 and then click Insert.



11. The PPO-6 should have moved into Slot 1.

FPBA-01 Installation (continued)

12. Click the Parameters tab and adjust the following parameters for the application. Then click OK..



Fail-safe mode. Defines the action taken when the PLC is switched from “RUN” to “STOP” mode.

00 = STOP (default)

01 = LAST SPEED

02 = USE FAIL-SAFE. The values of the PZDs are defined by Failsafe PZD1 – PZD10.

Operation mode. Determines which control/status word and reference/actual values are used.

00 = PROFIDRIVE (i.e. Generic drive profile)

01 = VENDOR SPECIFIC (i.e. ABB Drives profile) (default).

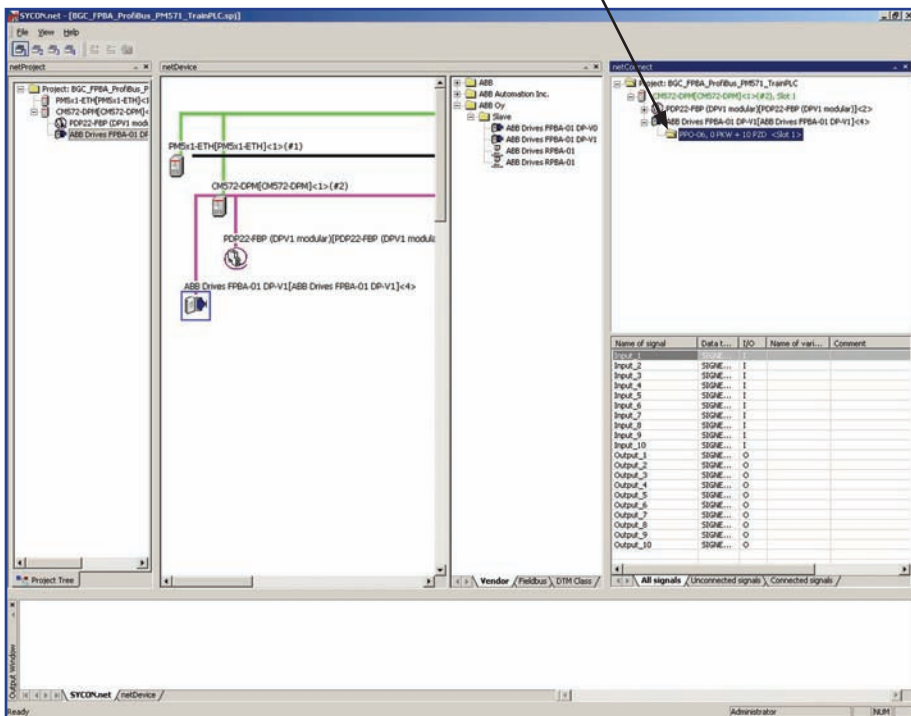
Control zero mode. Defines the action taken if a PROFIBUS telegram containing only zeros is received.

00 = USE FRAME (default). Note that, with this setting, the drive might not be stopped (if it is running) since also bit 10 (Remote Command) in the control word is zero. However, the other PZD.s may still be updated, but have the value zero.

01 = IGNORE

FPBA-01 Installation (continued)

13. Click the "+" by the CM572-DPM in the netConnect window.
 Click the "+" by the ABB Drives FPBA-01.
 Click the PPO-6 under the ABB Drives FPBA-01.



FPBA-01 Installation (continued)

14. In the column Name of Variables, enter the variables names for the ten Input/Output words that will be transmitted and received from the FPBA-01.

The screenshot shows the PROFIBUS - PLC Setup software interface. The left pane displays a project tree with the following structure:

- ABB
 - ABB Automation Inc.
 - ABB Oy
 - Slave
 - ABB Drives FPBA-01 DP-V0
 - ABB Drives FPBA-01 DP-V1
 - ABB Drives RPBA-01
 - ABB Drives RPBA-01

The right pane shows the 'netConnect' configuration window. The project is 'BGC_FPBA_Profibus_PM571_TrainPLC'. The configuration includes:

- CM572-DPM[CM572-DPM]<1>(<#2>, Slot 1
- PDP22-FBP (DPV1 modular)[PDP22-FBP (DPV1 modular)]<2>
- ABB Drives FPBA-01 DP-V1[ABB Drives FPBA-01 DP-V1]<4>
- PPO-06, 0 PKW + 10 PZD <Slot 1>

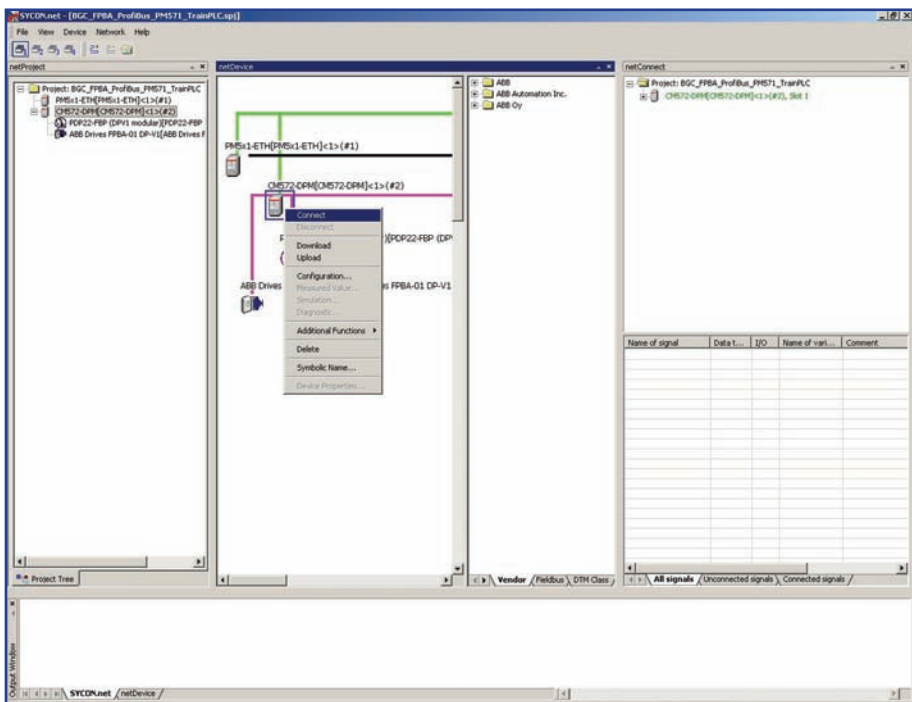
The table below shows the signal variables configuration:

Name of signal	Data type	I/O	Name of variable	Comment
Input_1	SIGNED16	I	FPBA_INPUT1_MSW	PPO-06, 0 PKW + 10 PZD <
Input_2	SIGNED16	I	FPBA_INPUT2_ActSpeed	PPO-06, 0 PKW + 10 PZD <
Input_3	SIGNED16	I	FPBA_INPUT3_ActTorque	PPO-06, 0 PKW + 10 PZD <
Input_4	SIGNED16	I	FPBA_INPUT4_PZD4	PPO-06, 0 PKW + 10 PZD <
Input_5	SIGNED16	I	FPBA_INPUT5_PZD5	PPO-06, 0 PKW + 10 PZD <
Input_6	SIGNED16	I	FPBA_INPUT6_PZD6	PPO-06, 0 PKW + 10 PZD <
Input_7	SIGNED16	I	FPBA_INPUT7_PZD7	PPO-06, 0 PKW + 10 PZD <
Input_8	SIGNED16	I	FPBA_INPUT8_PZD8	PPO-06, 0 PKW + 10 PZD <
Input_9	SIGNED16	I	FPBA_INPUT9_PZD9	PPO-06, 0 PKW + 10 PZD <
Input_10	SIGNED16	I	FPBA_INPUT10_PZD10	PPO-06, 0 PKW + 10 PZD <
Output_1	SIGNED16	O	FPBA_OUTPUT1_MCW	PPO-06, 0 PKW + 10 PZD <
Output_2	SIGNED16	O	FPBA_OUTPUT2_REF1	PPO-06, 0 PKW + 10 PZD <
Output_3	SIGNED16	O	FPBA_OUTPUT3_REF2	PPO-06, 0 PKW + 10 PZD <
Output_4	SIGNED16	O	FPBA_OUTPUT4_PZD4	PPO-06, 0 PKW + 10 PZD <
Output_5	SIGNED16	O	FPBA_OUTPUT5_PZD5	PPO-06, 0 PKW + 10 PZD <
Output_6	SIGNED16	O	FPBA_OUTPUT6_PZD6	PPO-06, 0 PKW + 10 PZD <
Output_7	SIGNED16	O	FPBA_OUTPUT7_PZD7	PPO-06, 0 PKW + 10 PZD <
Output_8	SIGNED16	O	FPBA_OUTPUT8_PZD8	PPO-06, 0 PKW + 10 PZD <
Output_9	SIGNED16	O	FPBA_OUTPUT9_PZD9	PPO-06, 0 PKW + 10 PZD <
Output_10	SIGNED16	O	FPBA_OUTPUT10_PZD10	PPO-06, 0 PKW + 10 PZD <

The bottom status bar shows: Vendor / Fieldbus \ DTM Class / All signals / Unconnected signals \ Connected signals /

- Right click on the CM572-DPM and then click Connect.
Then click Download. This will download the PROFIBUS configuration to the PROFIBUS scanner.

NOTE! The AC500 PLC will need to be in "Stop" mode.



- Once the download is done, right click the CM572-DPM and Disconnect.
- Close the SYCON.net program and save file on closing.
- Switch the PLC from "Stop" to "Run" mode.
The PLC is now communicating to the FPBA-01.

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