Quick start-up guide ABB Drives function blocks for Siemens PLC's





List of related manuals

Drive application firmware manuals and guides	Code (English)
FPBA-01 PROFIBUS DP adapter module User's manual	3AFE68573271
PROFIBUS DP Adapter Module RPBA-01 User's manual	3AFE64504215
ACS355 drives User's manual	3AUA0000066143
ACS850 Standard Control Program Firmware manual	3AUA0000045497
ACS880 primary control program Firmware manual	3AUA0000085967
ACSM1 speed and torque control program Firmware manual	3AFE68848261
ACSM1 motion control firmware manual	3AFE68848270
ACS550-01 Drives User's manual	3AUA0000001418
ACS800 Standard Control Program Firmware Manual	3AFE64527592

You can find manuals and other product documents in PDF format on the Internet. See section *Document library on the Internet* on the inside of the back cover. For manuals not available in the Document library, contact your local ABB representative.

Quick start-up guide

ABB Drives function blocks for Siemens PLC's

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Introduction

This guide describes the configuration of ABB Drives function blocks for Siemens PLC's. ABB specific ready-made function blocks from the *ABB_DRIVES_LIB* are used.

Compatibility

This guide applies to the following libraries.

Libraries		Supported PCL series	ABB supported Drives
SIMATIC Manager version 5.5 or later	ABB_Drives_SIMACTIC_Library_ 3xx_4xx_PLC_V1.1	S7-300 & S7-400	ACS800, ACSM1,
TIA Portal version 11 and 13	ABB_Drives_TIA_Global_Library _3xx_4xx_PLC_V1.1 ABB_Drives_TIA_Global_Library _12xx_15xx_PLC_V1.1	S7-300 & S7-400 S7-1200 & S7-1500	ACS350, ACS355, ACS550, ACS850 ACS880, ACS580, ACS380

Limitations

The following limitations are valid for this guide:

- The drive must be equipped with PROFIBUS or PROFINET adapters
- PROFIBUS DP protocol: DP-V0 or DP-V1
- PROFIBUS DP communication profile: ABB drives
- All PROFIBUS DP, PROFINET and compatible ABB drives
- Application types: Speed/Frequency control or Torque control
- Supports PPO types with consistent data, example, PPO-06, 0 PKW + 10 PZD.
- All the libraries are encrypted with a passcode. If you want to edit the libraries, contact your local ABB representative for passcode.

Note! PPO types without consistent data, example, PPO-06, 0 PKW + (2+2+2+2+2) PZD or PPO-06, 0 PKW +NoCons. 10 PZD are **not** supported by *ABB_DRIVE_LIB*.

Note! The *ABB_DRIVES_LIB* can also be used for PROFINET control of ABB drives. When programming the function blocks, the drive should be considered as a PROFIBUS DP-V1 slave. Note that the hardware configuration (GSDML files) and the drive parameter settings for PROFINET slaves differ from PROFIBUS slaves.

Setup

The following figure shows an example of SIMATIC Manager/TIA portal with ABB drives and PROFIBUS module setup.



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Cyber security disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Disclaimer

ABB is not liable for personal injury, material damage or monetary losses due to non-functionality, incorrect behavior or misuse of application program and the function blocks created by ABB or third party.

Drive configuration

You can configure the drive for PROFIBUS DP or PROFINET control based on ABB specific drives library *ABB_DRIVE_LIB*.

Set the drive parameters from the drive's control panel or from drive-specific PC tool (DriveWindow Light for ACS355 and ACS550, DriveStudio for ACS850 and ACSM1, Drive Composer for ACS380, ACS580 and ACS880, and DriveWindow for ACS800).

Note! All parameter settings are based on drive default settings. If the drive was parametrized previously, return to default settings before continuing. It can be done by:

- Changing macro (and then changing back again) in parameter **99.02** for ACS355 and ACS550.
- Setting parameter **99.03** APPLIC RESTORE to **YES** in ACS800.
- Setting parameter **16.04** Param restore to **Restore defs** in ACS850 and ACSM1.
- Setting parameter **96.06** Parameter restore to **Restore defaults** in ACS380, ACS580 and ACS880.

Configuring ACS355 drives

Starting ACS355 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter **98.02** *COMM PROT SEL* to *EXT FBA*.
- 3. Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter 51.02 and the communication profile in 51.05 = 1 (ABB drives).
- 4. With parameter *30.18 COMM FAULT FUNC*, select how the drive reacts to a fieldbus communication break.
- 5. With parameter *30.19 COMM FAULT TIME*, define the time between communication break detection and the selected action.
- 6. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 54 and 55.

Note! The adapter module sets the Status word and actual value automatically in parameters *54.01* and *54.02*, and Control word and reference in parameters *55.01* and *55.02*.

- 7. Validate the settings made in parameter groups 51, 54 and 55 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 8. Set the relevant drive control parameters to control the drive according to the application.

ACS355 Minimum required parameter settings for PROFIBUS DP

Parameter	Description	Setting	Comment
98.02	COMM PROT SEL	EXT FBA	Activates fieldbus module
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.05	PROFILE	1	Communication profile ABB drives

51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
10.01	EXT 1 COMMANDS	СОММ	Fieldbus interface as source for start and stop
11.03	REF1 SELECT	COMM	Fieldbus interface as source for speed reference
16.04	FAULT RESET SEL	СОММ	Fieldbus interface as source for fault reset
(11.05)	REF1 MAX	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Starting ACS355 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *98.02 COMM PROT SEL* to *EXT FBA*.
- 3. Set the FENA configuration parameters in group 51. At the minimum, set parameters 51.01 FBA A type as Ethernet, 51.02 Protocol/Profile as PNIO ABB Pro (11), 51.04 IP configuration as Static, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 Subnet CDR as 24.
- 4. Select how the drive reacts to a fieldbus communication break with parameter *30.18 COMM FAULT FUNC.*
- 5. Define the time between communication break detection and the selected action with parameter *30.19 COMM FAULT TIME*.
- 6. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 54 and 55.

Note! The adapter module sets the Status word and actual value automatically in parameters *54.01* and *54.02*, and Control word and reference in parameters *55.01* and *55.02*.

- 7. Validate the settings made in parameter groups 51, 54 and 55 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 8. Set the relevant drive control parameters to control the drive according to the application.

ACS355 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
	•	_	
98.02	COMM PROT	EXT FBA	Activates fieldbus module
	SEL		
51.01	FBA A type	Ethernet	Fieldbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05	IP address	192.xxx.xx.xx or any other	-
51.08		required IP address.	
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR	REFRESH	Updates fieldbus settings (groups
	REFRESH		51 to 55)
10.01	EXT1	СОММ	Fieldbus interface as a source for
	COMMANDS		start and stop.
11.03	REF1 SELECT	СОММ	Fieldbus interface as a source for

			speed reference
16.04	FAULT RESET	СОММ	Fieldbus interface as a source for
	SEL		fault reset
(11.05)	REF1 MAX	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input SPEED_REF_MAX). Must be less or equal to drive parameter max speed/frequency.

ACS355 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
54.03 54.10	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0104 = actual current; 0145 = motor temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)

ACS355 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
55.03 55.10	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2202 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)

Configuring ACS380 drives

Starting ACS380 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. With parameter *50.02 FBA A comm loss func*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 FBA A comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from *50.04*.
- Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter 51.02 Node address and the communication profile in 51.05 Profile = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01 FBA A* data in1 and *53.01 FBA data out1*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter 51.27 FBA par refresh to Configure.
- 9. Save the valid parameter values to permanent memory by setting parameter *96.07 Param save manually* to *Save*.
- 10. Set the relevant drive control parameters to control the drive according to the application.

ACS380 Minimum required parameter settings PROFIBUS DS

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.05	PROFILE	1	Communication profile ABB drives
52.02	FBA data in2	Act1 16bit (5)	Actual speed as Data Word 2 from the drive
53.02	FBA data out2	Ref1 16bit (2)	Speed reference as Data Word 2 to the drive
51.27	FBA par refresh	Configure	Updates fieldbus settings (groups 50 to 57)
20.01	Ext 1 commands	Fieldbus A	Fieldbus interface as source for start and stop
22.11	Ext1 speed ref1	FB A ref1	Fieldbus interface as source for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

The minimum required parameter settings based on factory default settings.

Starting ACS380 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. With parameter *50.02 FBA A comm loss func*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 FBA A comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from *50.04*.
- Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter 51.02 Node address and the communication profile in 51.05 Profile = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01 FBA A* data in1 and *53.01 FBA data out1*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA par refresh* to *Configure*.
- 9. Save the valid parameter values to permanent memory by setting parameter *96.07 Param save manually* to *Save*.
- 10. Set the relevant drive control parameters to control the drive according to the application.

ACS380 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other required IP address.	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
52.02	FBA data in2	Act1 16bit (5)	Actual speed as Data Word 2 from the drive
53.02	FBA data out2	Ref1 16bit (2)	Speed reference as Data Word 2 to the drive
20.01	Ext 1 commands	Fieldbus A	Fieldbus interface as source for start and stop
22.11	Ext1 speed ref1	FB A ref1	Fieldbus interface as source for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input SPEED_REF_MAX). Must be less or equal to drive parameter max speed/frequency.

The minimum required parameter settings based on factory default settings.

ACS380 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
52.03 52.12	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0107 = actual current; 3501 = motor est. temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

ACS380 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
53.03 53.12	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2312 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

Configuring ACS550 drives

Starting ACS550 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *98.02 COMM PROT SEL* to *EXT FBA*.
- 3. Set the RPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter *51.02*.
- 4. With parameter *30.18 COMM FAULT FUNC*, select how the drive reacts to a fieldbus communication break.
- 5. With parameter *30.19 COMM FAULT TIME*, define the time between communication break detection and the selected action.
- 6. Define the process data transferred to and from the drive in the RPBA-01 configuration parameter group 51.

Note: The Status Word, Actual Speed, Control Word and Speed Reference are fixed in ACS550 and not necessary to set.

- 7. Validate the settings made in parameter group 51 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 8. Set the relevant drive control parameters to control the drive according to the application.

Comment Parameter Description Setting 98.02 COMM PROT EXT FBA Activates fieldbus module SEL [PB PROFIBUS DP node address of the drive 51.02 NODE NODE] ADDRESS [DP 1 for DPV1. 0 for DPV0 51.21 DP MODE MODE] 51.27 FBA PAR REFRESH Updates fieldbus settings (group 51) REFRESH 10.01 EXT 1 COMM Fieldbus interface as source for start and stop COMMANDS 11.03 **REF1 SELECT** COMM Fieldbus interface as source for speed reference 16.04 FAULT RESET COMM Fieldbus interface as source for fault reset SEL (11.05)REF1 MAX [Scale Max speed/frequency scaling value (used in function block/visualization input max] SPEED REF MAX). Must be less or equal to drive parameter max speed/frequency.

ACS550 Minimum required parameter settings for PROFIBUS DP

Starting ACS550 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *98.02 COMM PROT SEL* to *EXT FBA*.
- 3. Set the FENA configuration parameters in group 51. At the minimum, set the 51.01 FBA A type as *Ethernet*, 51.02 *Protocol/Profile* as *PNIO* ABB *Pro(11)*, 51.04 *IP configuration* as *Static*, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 Subnet CDR as 24.
- 4. With parameter *30.18 COMM FAULT FUNC*, select how the drive reacts to a fieldbus communication break.
- 5. With parameter *30.19 COMM FAULT TIME*, define the time between communication break detection and the selected action.
- 6. Define the process data transferred to and from the drive in the RPBA-01 configuration parameter group 51.

Note: The Status Word, Actual Speed, Control Word and Speed Reference are fixed in ACS550 and not necessary to set.

- 7. Validate the settings made in parameter groups 51, 54 and 55 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 8. Set the relevant drive control parameters to control the drive according to the application.

ACS550 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
98.02	COMM PROT SEL	EXT FBA	Activates fieldbus module
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other required IP address.	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
10.01	EXT 1 COMMANDS	СОММ	Fieldbus interface as source for start and stop
11.03	REF1 SELECT	СОММ	Fieldbus interface as source for speed reference
16.04	FAULT RESET SEL	СОММ	Fieldbus interface as source for fault reset
(11.05)	REF1 MAX	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Parameter	Description	Setting	Comment
51.06,51.08 ,,51.20	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0104 = actual current; 0145 = motor temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (group 51)

ACS550 More actual values or parameters to be read from drive to PLC (optional)

ACS550 More parameters to be written from PLC to drive (optional)

Parameter	Description	Setting	Comment
51.05,51.07 ,,51.19	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2202 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (group 51)

Configuring ACS580 drives

Starting ACS580 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. With parameter *50.02 FBA A comm loss func*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 FBA A comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from *50.04*.
- Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter 51.02 Node address and the communication profile in 51.05 Profile = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA par refresh* to *Configure*.
- 9. Save the valid parameter values to permanent memory by setting parameter *96.07 Parameter save maually* to *Save*.
- 10. Set the relevant drive control parameters to control the drive according to the application.

ACS580 Minimum required parameter settings for PROFIBUS DP

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.05	PROFILE	1	Communication profile ABB drives
52.02	FBA data in2	Act1 16bit (5)	Actual speed as Data Word 2 from the drive
53.02	FBA data out2	Ref1 16bit (2)	Speed reference as Data Word 2 to the drive
51.27	FBA par refresh	Configure	Updates fieldbus settings (groups 50 to 57)
20.01	Ext 1 commands	Fieldbus A	Fieldbus interface as source for start and stop
22.11	Ext1 speed ref1	FB A ref1	Fieldbus interface as source for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Starting ACS580 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. With parameter *50.02 FBA A comm loss func*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 FBA A comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from *50.04*.
- 6. Set the FENA configuration parameters in group 51. At the minimum, set the 51.01 FBA A type as *Ethernet*, 51.02 *Protocol/Profile* as *PNIO* ABB *Pro(11)*, 51.04 *IP configuration* as *Static*, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 *Subnet* CDR as 24.
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.

- 8. Validate the settings made in parameter groups 51, 54 and 55 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 9. Save the valid parameter values to permanent memory by setting parameter *96.07 Parameter save manually* to *Save*.
- 10. Set the relevant drive control parameters to control the drive according to the application.

ACS580 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profile	PNIO ABB Pro	Communication profile ABB
			drives
51.04	IP Configuration	Static (0)	-
51.05	IP address	192.xxx.xx.xx or	-
51.08		any other required	
		IP address.	
51.09	Subnet CDR	24	24 For subnet mask
			255.255.255.0
51.27	FBA PAR	REFRESH	Updates fieldbus settings
	REFRESH		(groups 51 to 55)
52.02	FBA data in2	Act1 16bit (5)	Actual speed as Data Word 2
			from the drive
53.02	FBA data out2	Ref1 16bit (2)	Speed reference as Data
			Word 2 to the drive
20.01	Ext 1	Fieldbus A	Fieldbus interface as source
	commands		for start and stop
22.11	Ext1 speed ref1	FB A ref1	Fieldbus interface as source

			for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

ACS580 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
52.03 52.12	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0107 = actual current; 3501 = motor est. temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

ACS580 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
53.03 53.12	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2312 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

Configuring ACS800 drives

Starting ACS800 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *98.02 COMM. MODULE LINK* to *FIELDBUS*.
- 3. Set the RPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter *51.02*.
- 4. With parameter *30.18 COMM FLT FUNC*, select how the drive reacts to a fieldbus communication break.
- 5. With parameter *30.19 MAIN REF DS T-OUT*, define the time between communication break detection and the selected action.
- 6. Define the process data transferred to and from the drive in the RPBA-01 configuration parameter group 51.

Note: The Status Word, Actual Speed, Control Word and Speed Reference are configured as default.

- 7. Validate the settings made in parameter group 51 by setting parameter *51.27 FBA PAR REFRESH* to REFRESH.
- 8. Set the relevant drive control parameters to control the drive according to the application.

ACS800 Minimum required parameter settings for PROFIBUS DP

Parameter	Description	Setting	Comment
98.02	COMM. MODULE LINK	FIELDBU S	Activates fieldbus module
98.07	COMM PROFILE	ABB DRIVES	Communication profile ABB drives
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.21	DP MODE	[DP MODE]	1 for DPV1, 0 for DPV0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
10.01	EXT 1 STRT/STP/DI R	COMM.C W	Fieldbus interface as source for start and stop
11.03	EXT REF1 SELECT	COMM.R EF	Fieldbus interface as source for speed reference
16.04	FAULT RESET SEL	COMM.C W	Fieldbus interface as source for fault reset
(11.05)	EXT REF1 MAXIMUM	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Starting ACS800 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *98.02 COMM. MODULE LINK* to *FIELDBUS*.
- 3. Set the FENA configuration parameters in group 51. At the minimum, set parameters 51.01 FBA A type as Ethernet, 51.02 Protocol/Profile as PNIO ABB Pro (11), 51.04 IP configuration as Static, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 Subnet CDR as 24.
- 4. With parameter *30.18 COMM FLT FUNC*, select how the drive reacts to a fieldbus communication break.
- 5. With parameter *30.19 MAIN REF DS T-OUT*, define the time between communication break detection and the selected action.
- 6. Define the process data transferred to and from the drive in the RPBA-01 configuration parameter group 51.

Note: The Status Word, Actual Speed, Control Word and Speed Reference are configured as default.

- 7. Validate the settings made in parameter groups 51, 54 and 55 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 8. Set the relevant drive control parameters to control the drive according to the application.

ACS800 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
98.02	COMM. MODULE LINK	FIELDBUS	Activates fieldbus module
98.07	COMM PROFILE	ABB DRIVES	Communication profile ABB drives
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profil e	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other required IP address.	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
10.01	EXT 1 STRT/STP/DI R	COMM.CW	Fieldbus interface as source for start and stop
11.03	EXT REF1 SELECT	COMM.REF	Fieldbus interface as source for speed reference
16.04	FAULT RESET SEL	COMM.CW	Fieldbus interface as source for fault reset
(11.05)	EXT REF1 MAXIMUM	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input SPEED_REF_MAX). Must be less or equal to drive parameter max speed/frequency.

ACS800 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
51.06,51.08 ,,51.20	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0104 = actual current; 0145 = motor temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (group 51)

ACS800 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
51.05,51.07 ,,51.19	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2202 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (group 51)

Configuring ACS850 drives

Starting ACS850 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA* enable to *Enable*.
- 3. Select how the drive reacts to a fieldbus communication break with parameter *50.02 Comm loss func*, Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 Comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for parameters 50.04...50.11.
- 6. Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter *51.02* and the communication profile in *51.05* = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 52 and 53.

Note! The adapter module sets the Status word and actual value automatically in parameters *52.01* and *52.02*, and Control word and reference in parameters *53.01* and *53.02*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA par refresh* to *Refresh*.
- 9. Set the relevant drive control parameters to control the drive according to the application.

Description Parameter Setting Comment 50.01 Fba enable Enable Activates fieldbus module 51.05 PROFILE 1 Communication profile ABB drives FB 10.01 Ext1 start func Fieldbus interface as source for start and stop 21.01 Speed ref1 sel FBA ref1 Fieldbus interface as source for speed reference 10.10 P.02.22 bit Fieldbus interface as source for fault reset Fault reset sel 8 (19.01)Speed scaling Max speed/frequency scaling value (used in [Scale max] function block/visualization input SPEED_REF_MAX). Must be less or equal to drive parameter max speed/frequency.

The minimum required parameter settings based on factory default settings.

ACS850 Minimum required parameter settings for PROFIBUS DP

Starting ACS850 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA* enable to *Enable*.
- 3. Select how the drive reacts to a fieldbus communication break with the parameter *50.02 Comm loss func*, Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 Comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for parameters 50.04...50.11.
- 6. Set the FENA configuration parameters in group 51. At the minimum, set parameters 51.01 FBA A type as Ethernet, *51.02 Protocol/Profile* as *PNIO ABB Pro (11)*, *51.04 IP configuration* as *Static*, and required IP address from parameter *51.05* to parameter *51.08* and *51.09 Subnet CDR* as 24.
- 7. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 52 and 53.

Note! The adapter module sets the Status word and actual value automatically in parameters *52.01* and *52.02*, and Control word and reference in parameters *53.01* and *53.02*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA par refresh* to *Refresh*.
- 9. Set the relevant drive control parameters to control the drive according to the application.

Parameter	Description	Setting	Comment
50.01	Fba enable	Enable	Activates fieldbus module
51.01	FBA A type	Ethernet	Fieldbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
10.01	Ext1 start func	FB	Fieldbus interface as source for start and stop
10.10	Fault reset sel	P.02.22 bit 8	Fieldbus interface as source for fault reset
(19.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.
21.01	Speed ref1 sel	FBA ref1	Fieldbus interface as source for

ACS850 Minimum required parameter settings for PROFINET

	speed reference

ACS850 More parameters read from drive to PLC

Parameter	Description	Setting	Comment
52.03 52.12	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0104 = actual current; 0117 = motor temp 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 53)

ACS850 More parameters written from PLC to drive

Parameter	Description	Setting	Comment
53.03 53.12	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2202 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 53)

Configuring ACS880 drives

Starting ACS880 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. Select how the drive reacts to a fieldbus communication break with parameter *50.02 FBA A comm loss func*. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. Define the time between communication break detection and the selected action with parameter *50.03 FBA A comm loss t out*.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from 50.04.
- 6. Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter *51.02 Node address* and the communication profile in *51.05* = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter 51.27 FBA par refresh to Configure.
- 9. Save the valid parameter values to permanent memory by setting parameter *96.07 Param save* to **Save**.
- 10. Set the relevant drive control parameters to control the drive according to the application.

ACS880 Minimum required parameter settings for PROFIBUS DP

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.05	PROFILE	1	Communication profile ABB drives
52.02	FBA data in2	Act1 16bit (5)	Actual speed as Data Word 2 from the drive
53.02	FBA data out2	Ref1 16bit (2)	Speed reference as Data Word 2 to the drive
51.27	FBA par refresh	Configure	Updates fieldbus settings (groups 50 to 57)
20.01	Ext 1 commands	Fieldbus A	Fieldbus interface as source for start and stop
22.11	Speed ref1 selection	FB A ref1	Fieldbus interface as source for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Starting ACS880 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA A Enable* to *Enable*.
- 3. With parameter *50.02 FBA A comm loss func*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 FBA A comm loss t out*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for the rest of the parameters in group 50, starting from *50.04*.
- 6. Set the FENA configuration parameters in group 51. At the minimum, set parameters 51.01 FBA A *type* as Ethernet, 51.02 Protocol/Profile as PNIO ABB Pro (11), 51.04 IP configuration as Static, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 Subnet CDR as 24).
- 7. Define the process data transferred to and from the drive in FBA-01 configuration parameter groups 52 and 53.
- 8. **Note:** The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.
- 9. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA par refresh* to *Configure*.
- 10. Save the valid parameter values to permanent memory by setting parameter *96.07 Param save* to *Save*.
- 11. Set the relevant drive control parameters to control the drive according to the application.

ACS880 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
50.01	FBA A Enable	Enable	Activates fieldbus module
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other required IP address.	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
20.01	Ext 1 commands	Fieldbus A	Fieldbus interface as source for start and stop
22.11	Speed ref1 selection	FB A ref1	Fieldbus interface as source for speed reference
31.11	Fault reset selection	P.06.01 bit 7	Fieldbus interface as source for fault reset
(46.01)	Speed scaling	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be

	less or equal to drive parameter
	max speed/frequency.

ACS880 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
52.03 52.12	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0107 = actual current; 3501 = motor est. temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

ACS880 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
53.03 53.12	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2312 = acceleration time 1
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 57)

Configuring ACSM1 drives

Starting ACSM1 drives for PROFIBUS DP

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA ENABLE* to *Enable*.
- 3. With parameter *50.02 COMM LOSS FUNC*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 COMM LOSS T OUT*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for parameters 50.04...50.11.
- 6. Set the FPBA-01 configuration parameters in group 51. At the minimum, set the required node address in parameter *51.02* and the communication profile in *51.05* = 1 (ABB drives).
- 7. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 9. Set the relevant drive control parameters to control the drive according to the application.

ACSM1 Minimum required parameter settings for PROFIBUS DP

Parameter	Description	Setting	Comment
50.01	FBA ENABLE	Enable	Activates fieldbus module
51.02	NODE ADDRESS	[PB NODE]	PROFIBUS DP node address of the drive
51.05	PROFILE	1	Communication profile ABB drives
52.01	FBA DATA IN1	4	Status word as Data Word 1 from the drive
52.02	FBA DATA IN2	5	Actual speed as Data Word 2 from the drive
53.01	FBA DATA OUT1	1	Control word as Data Word 1 to the drive
53.02	FBA DATA OUT2	2	Speed reference as Data Word 2 to the drive
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 53)
10.01	EXT1 START FUNC	FBA	Fieldbus interface as source for start and stop
24.01	SPEED REF1 SEL	FBA REF1	Fieldbus interface as source for speed reference
10.08	FAULT RESET SEL	P.02.12 bit 8	Fieldbus interface as source for fault reset
(25.02)	SPEED SCALING	[Scale max]	Max speed/frequency scaling value (used in function block/visualization input <i>SPEED_REF_MAX</i>). Must be less or equal to drive parameter max speed/frequency.

Starting ACSM1 drives for PROFINET

- 1. Power up the drive.
- 2. Enable the communication between the adapter module and the drive by setting parameter *50.01 FBA ENABLE* to *Enable*.
- 3. With parameter *50.02 COMM LOSS FUNC*, select how the drive reacts to a fieldbus communication break. Note that this function monitors both communication between the fieldbus master and the adapter module and communication between the adapter module and the drive.
- 4. With parameter *50.03 COMM LOSS T OUT*, define the time between communication break detection and the selected action.
- 5. Select application-specific values for parameters 50.04...50.11.
- 6. Set the FENA configuration parameters in group 51. At the minimum, set parameters 51.01 FBA A type as Ethernet, 51.02 Protocol/Profile as PNIO ABB Pro (11), 51.04 IP configuration as Static, and required IP address from parameter 51.05 to parameter 51.08 and 51.09 Subnet CDR as 24.
- 7. Define the process data transferred to and from the drive in the FBA-01 configuration parameter groups 52 and 53.

Note: The adapter module sets the Status word and Control word automatically in parameters *52.01* and *53.01*.

- 8. Validate the settings made in parameter groups 51, 52 and 53 by setting parameter *51.27 FBA PAR REFRESH* to *REFRESH*.
- 9. Set the relevant drive control parameters to control the drive according to the application.

ACSM1 Minimum required parameter settings for PROFINET

Parameter	Description	Setting	Comment
50.01	FBA ENABLE	Enable	Activates fieldbus module
51.01	FBA A ype	Ethernet	Filedbus type
51.02	Protocol/Profile	PNIO ABB Pro (11)	Communication profile ABB drives
51.04	IP Configuration	Static (0)	-
51.05 51.08	IP address	192.xxx.xx.xx or any other required IP address.	-
51.09	Subnet CDR	24	24 For subnet mask 255.255.255.0
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 51 to 55)
52.01	FBA DATA IN1	4	Status word as Data Word 1 from the drive
52.02	FBA DATA IN2	5	Actual speed as Data Word 2 from the drive
53.01	FBA DATA OUT1	1	Control word as Data Word 1 to the drive
53.02	FBA DATA OUT2	2	Speed reference as Data Word 2 to the drive
10.01	EXT1 START	FBA	Fieldbus interface as source for

	FUNC	start and stop			
24.01	SPEED REF1	FBA REF1 Fieldbus interface as source for speed			
	SEL		reference		
10.08	FAULT RESET	P.02.12 bit	Fieldbus interface as source for fault reset		
	SEL	8			
(25.02)	SPEED	[Scale max]	Max speed/frequency scaling value (used in		
	SCALING		function block/visualization input		
			SPEED_REF_MAX). Must be less or equal to		
			drive parameter max speed/frequency.		

ACSM1 More parameters read from drive to PLC (optional)

Parameter	Description	Setting	Comment
52.03 52.12	Actual value or parameter of drive	GGii	GG = parameter group, ii = parameter index example, 0104 = actual current; 0117 = motor temp
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 53)

ACSM1 More parameters written from PLC to drive (optional)

Parameter	Description	Setting	Comment
53.03 53.12	Parameter of drive	GGii	GG = parameter group, ii = parameter index example, 2503 = acceleration time
51.27	FBA PAR REFRESH	REFRESH	Updates fieldbus settings (groups 50 to 53)

SIMATIC Manager

You can configure S7-300 and S7-400 series PLC using SIMATIC Manager. This chapter provides the examples for configuring S7-300 series PLC.

Setting PG/PC interface

Set PG/PC interface for online connection between PC and PLC (Ethernet connection is used in this example). For Ethernet connections, set the IP address of the PC within the same subnet as the PLC. Default IP address of a Siemens PLC is *192.168.0.1*, so set the IP address of your Ethernet port between *192.168.0.2* and *192.168.0.255* (or change the IP address of the PC). See example below (Windows 7 environment).



Figure 1 IP address

In the Options menu, click Set PG/PC Interface and choose the connected interface and click OK.

	Set PG/PC Interface
	Access Path LLDP / DCP
	Access Point of the Application:
	S7ONLINE (STEP 7) -> TCP/IP(Auto) -> Intel(R) 82579LM Gig 💌
	(Standard for STEP 7)
	Interface Parameter Assignment Used:
	TCP/IP(Auto) -> Intel(R) 82579LM Gigab Properties
	Image CCP/IP(Auto) -> HUAWEI Mobile C A Diagnostics
	UTCP/IP(Auto) -> HUAWEI Mobile C
	ICP/IP(Auto) -> Intel(R) 825791 M (
	United and a second secon
SIMATIC Manager	(Assigning Parameters for the IE-PG access to your NDIS CPS with TCP/IP Protocol (FEC: IDNG)
File PLC View Options Window Help	Interfaces
Customize	Add/Remove: Select
Simulate Modules	
Set PG/PC Interface	OK Cancel Help

Figure 2 PG/PC interface

Hardware configuration

In this example, a CPU 319F-3 PN/DP with integrated PROFIBUS DP and PROFINET IO interface is used. An ABB ACS850 drive with FPBA-01 PROFIBUS DP module is connected to the PLC via the PROFIBUS DP interface.

Starting a new project

Start a new project by choosing **New** from the **File** menu and give name and location to the project. Insert a station to the project by right-clicking the project name and choosing **Insert New Object** -> **SIMATIC 300 Station**.

New Project	X	🎝 SIMA	TIC Manage	- [ABBDrive	s_Quickstart_PB	C:\Users\\S7 project	s\ABBDrives_Quickstart_PB\	ABBDrive]
		🕘 File	Edit Inser	t PLC Vi	ew Options W	indow Help		
User projects Libraries Multiprojects		🗋 🗋 🚔	87 🛲	X 🖻 🛍	💼 🖸 💁 🛛	<u>∎</u> _ :- ::: IIII IIII	< No Filter >	- 7
Name Storage path	1		BBDrives_Qui	:kstart_P ^p	05:00	Concerta conce	Туре	
					Cut	Ctrl+X	MPI	
					Сору	Ctrl+C		
					Paste	Ctrl+V		
					Delete	Del		
					Insert New Obje	ct ≯	SIMATIC 400 Station	
					PLC	+	SIMATIC 300 Station	
J					Rename	F2	SIMATIC H Station	
Add to ourrest multiproject					Object Propertie	s Alt+Return	SIMATIC PC Station	
	-			_	1		Other Station	
	Type:						SIMATIC S5	
ABBDrives_Quickstart_PB	Project 💌						PG/PC	
	F Library						MPI	
Storage location (path):							PROFIBUS	
C:\ABBDrives_Quickstart_PB	Browse						Industrial Ethernet	
· · · · · · · · · · · · · · · · · · ·							PTP	
OK Can	cel Help						Foundation Fieldbus	
							S7 Program	

Figure 3 New project

Expand the project tree, click the **SIMATIC** station and double-click **Hardware**. The HW Config window is displayed.
🛃 SIMATIC Manager - [ABBDrives	s_Quickstart_PB C:\U	ers\\S7 projects\ABBDrives	_Quickstart_PB\ABBDrive]			
🞒 File Edit Insert PLC View Options Window Help							
🗅 😅 🎛 🛲 X 🖻 💼	💼 😨 💁 🔤 🗧	- 🏥 🏢 🗈 < No Filter	> 💽 🏹	12 🗐	588	1 1 12	
🖃 🎒 ABBDrives_Quickstart_PB	Object name	Symbolic name	Туре	Size	Author	Last modified	Comment
SIMATIC 300(1)	Hardware		Station configuration			10/31/2012 11:02:22 AM	

Figure 4 Hardware configuration

Adding Rack and CPU to the hardware

1. Use mouse drag and drop function to add a **Rail** for the SIMATIC station.

HW Config - [SIMATIC 300(1) (Configuration) ABBDrives_Quickstart_PB]		
🛍 Station Edit Insert PLC View Options Window Help		_ 8 ×
) D 📂 💱 📓 👫 🎒 👘 💼 🖬 🏜 👔 🖪 🖽 🛠		
	^	= D X
		Suchen: nt ni
	=	Profile Standard
۲ ۲	Ŧ	
(0) UR	_	
Stol Module Order number Fi M I Q Comment 1]	6ES7 390-17?70-0AA0 Available in various lengths
Press F1 to get Help.		Chg



2. Similarly, drag and drop actual CPU type to slot 2 of the rack.



Figure 6 CPU type

3. In the **Ethernet interface** pop-up window, click **New** (1) and then click **OK** (2) -> **OK** (3) to activate the Ethernet connection.

Properties - Ethernet interface PN-IO (R0/S2.3)	Properties - New subnet Industrial Ethernet
General Parameters	General
If a subnet is selected, the next available addresses are suggested.	Name: Ethemet(1) S7 subnet ID: 003A - 0005 Project path:
IP address: 192.169.0.1 Gateway Subnet mask: 255.255.0 C Use router Use different method to obtain IP address Address:	Storage location of the project: C:\Users\sejoelf\Documents\SWAP\1 Johan work\S7 projects\ABBDrives Author:
Subnet: 1 - not networked Properties	Last modified: 10/31/2012 12:30:45 PM Comment:
3 OK Cancel Help	Cancel Help



If the PROFIBUS interface window pops up, press **New** (1) and then click **OK** (2) -> **OK** (3) to activate the PROFIBUS connection. Otherwise follow instructions below these pictures.

Properties - PROFIBUS interface DP (R0/S2.2)	Properties - New subnet PROFIBUS
General Parameters	General Network Settings
Address: If a subnet is selected, the next available address is suggested.	Name: PROFIBUS(1) S7 subnet ID: 003A - 0006
Subnet: - not networked Properties Delete	Project path: ABBDrives_Quickstart_PB Storage location of the project: C:\Users\sejoelf\Documents\SWAP\1 Johan work\S7 projects\ABBDrives Author:
3 OK Cancel Help	2 OK Cancel Help

Figure 8 PROFIBUS properties

For PLCs where the PROFIBUS interface window does not appear automatically, double-click **MPI/DP** (or DP). In the pop-up window, change Interface to **PROFIBUS**. A new pop-up window opens. Click **New** to activate the PROFIBUS DP connection and then click **OK** until all pop-up windows are closed.

	Properties - MPI/DP - (R0/S2.1)
	General Addresses Operating Mode Configuration Clock
	Short Description: MPI/DP
	, , , , , , , , , , , , , , , , , , ,
	Name: MPI/DP
	Interface
🚎(0) UR	Type: MPI
1	Networked: No Properties
2 CPU 315F-2 PN/DP	Comment
X1 MPI/DP	
X2 PN-IO X2 P1 Pot 1	
3	
4	OK Cancel Help

Properties - PROFIBUS interface MPI/DP (R0/S2.1)				
General Parameters	General Network Settings			
Address: If a subnet is selected, the next	Name: PROFIEUS(1)			
available address is suggested.	S7 subnet ID: 0032 - 000C			
	Project path: CPU315_ABBDrives_QuickSt			
Subnet:	Storage location of the project: C:\Users\sejoelf\Documents\SWAP\1 Johan work\S7 projects\CPU315_/			
not networked	Author:			
Properties	Date created: 10/09/2012 02:45:30 PM			
Dejete	Last modified: 10/09/2012 02:45:30 PM			
	· · · · · · · · · · · · · · · · · · ·			
OK Cancel Help	OK Cancel Help			

Figure 9 MPI/DP

Installing GSD files for ABB drives

GSD files for ABB drives can be found in *www.abb.com/drives* or from this package. Install the GSD files (Options -> Install GSD File). Find the catalog where the GSD files are placed by clicking the **Browse** button, highlight the GSD file(s) and click **Install**. When the files are installed, click **Close**. The following GSD files are available from the ABB website.

- ABB0959.gsd for FPBA-01 PROFIBUS DP-V0
- ABB10959.gsd for FPBA-01 PROFIBUS DP-V1 (used in this example)
- ABB_0812.gsd for RPBA-01 PROFIBUS DP-V0
- ABB10812.gsd for RPBA-01 PROFIBUS DP-V1
- GSDML-V2 31-ABB-FENA-20150120.xml for PROFINET
- GSDML-V2 31-ABB-FENA-20140901.xml for PROFINET

🖳 HW Config - [SIMATIC 300(1) (Configura	ition) ABBDrives_Quickstart_PB]	Install GSD Files
🛄 Station Edit Insert PLC View 🤇	<u>D</u> ptions <u>W</u> indow <u>H</u> elp	Install GSD Files: from the directory
D 🛎 🔓 📱 🖏 🚭 🖻 🖻 1	Customize Ctrl+Alt+E	C:\Users\sejoell\Documents\SWAP\1 Johan work\S7 Library\11X00X ABB drives PB S7 FIDI Browse
	Specify Module Configure Network Symbol Table Ctrl+Alt+T Report System Error Edit Catalog Profile	File Release Version Languages A&B10959 grid
X3 PN-IO X3 P1 R Pott 1 X3 P2 R Pott 2	Install HW Updates Install GSD File	ABB Drives FPBA-01 DP-V1: ABB Drives FPBA-01 Profibus DPV1 - slave
	Find in Service & Support Create GSD file for I-Device	Install Show Log Select All Deselect All

Figure 10 Installing GSD file

Adding drives to PROFIBUS DP line

After the GSD file installation, new drive PROFIBUS DP modules appear in the hardware library. Drag and drop according to your actual fieldbus module type and desired DP mode (V0 or V1) to the PROFIBUS DP line. Set the PROFIBUS DP node address for the fieldbus module and click **OK**.

🙀 HW Config - [SIMATIC 300(1) (Configuration) ABBDrives_Quickstart_PB]			
M Station Edit Insert PLC View Options Window Help	_ 8 ×		
🗅 😂 💱 🗟 👫 🎒 👘 💼 🛯 🏜 🏙 👔 🗖 🖽 🛠			
Image: CPU 319F-3 PN/OP X7 MP/OP X7 MP/OP X8 PNAO X9.7 Port 1 X9.7 Port 2 Bhemet(1): PROFINET-IO-System (100) Device Number IP addes Device Name	Image: Standard Profile Standard Profile Standard Image: Standard	Properties - PROFIBUS interface ABB Drives FPBA-01 DP-V1 General Parameters Address: Transmission rate: 1.5 Mbps Subnet:	New Propeties Delete
Press F1 to get Help.	Chg //		

Figure 11 PROFIBUS DP

Select the drive/PROFIBUS DP node (1), drag and drop desired PPO type (2) to slot 1 of the module (3).

Note! Only PPO types with consistent data, example, PPO-06, 0 PKW + 10 PZD are supported. PPO types without consistent data, example, PPO-06, 0 PKW + (2+2+2+2+2) PZD or PPO-06, 0 PKW +NoCons. 10 PZD are not supported by *ABB_DRIVE_LIB*.

Note! If you are using DP-V1 protocol, only PPO types without Parameter data area are available (example, PPO-03, PPO-04, PPO-06).



Figure 12 PPO type



The drive automatically receives peripheral memory areas for data input and output (Process data that will be sent between the PLC and the drive). In this example, the 20 byte long peripheral memory area starts from 256. Change if needed by double-clicking PPO-XX of actual drive.



Figure 13 PPO type of actual drive

Right-click the drive (1) and choose **Object Properties** to change name (2) of the node if desired.

HW Config - [SIMATIC 300(1) (Configuration) ABBDrives_Quick Station Edit Insert PLC View Options Window Helt	start_PB]		×
	?		
Image: Second	IBUS(1): DP master system (1) I I S Properties - DP slave General General Parameter Assignment Module Order number: Family: Drives DP slave type: ABB Drives EPBA 01 f Designation: Drive I Addresses Diagnostic address: SYNC/FREEZE Capabilities IF SYNC OK OK	iuchern: yofile Standard GSD file type file): ABB10959.GSD PROFIBUS 3 IP master system (1) IV Watchdog Cancel Help	
Press F1 to get Help.			- /

Figure 14 Object properties

Repeat the procedure to add more drives if needed and then click the **Save and Compile** button.



Figure 15 Save and compile

Adding drives to PROFINET

After the GSDML file installation, new drive PROFINET modules appear in the hardware library.

1. Drag and drop FENA-11 according to your actual fieldbus module type to the PROFINET.

💐 HW Config - [SIMATIC 300(1) (Configuration) SDMTest3]		
M Station Edit Insert PLC View Options Window Help		_ & ×
] D 🗳 ╬· ≅ 👒 ∰ ∰ 🛍 🏙 🏛 🚯 🗁 號 ஜ		
	*	
	=	Eind:
		Profile: Standard 💌
2 S CPU 317-2 PN/DP X1 MP/DP Ethemet(1): PROFINET-IO-System (100)		Additional Field Devices
X2 X2 P1 R Pot 1		⊡-⊡ ABB FENA ⊕∰ FENA-01
X2 P2 R Pot 2		⊕ <mark>→</mark> FENA-11 ⊕→ FENA-21
		⊞ Gateway
PROFIBUS(1): DP master system (1)		H™I
		Detwork Components
		E Sensors
4 III	•	E SWICCING devices
		E BI SIMATIC 400
Ethernet(1): PROFINET-IO-System (100)		E SIMATIC PC Based Control 300/
	- 1	E SIMATIC PC Station
Device Number II IP addre Device Name Order number Firmware Diagnostic address In S	C	
		6438177287445 € <u><</u>
		PROFINET IO module FENA gsdml-v2.31-abb-fena-20140901.xml
, Press F1 to get Help.		Chg //

Figure 16 FENA-11

- 2. Double-click FENA drive to set the IP address.
- 3. In the Properties window, add Device name (FENA) and click Ethernet to set the PROFINET IP address for the fieldbus module and click **OK**.

Properties - FENA		× 1
General Identification		
Short description:	FENA	
	PROFINE I IO module FENA	· · · · · · · · · · · · · · · · · · ·
Order no./ firmware:	6438177287445 / V3.0	Properties - Ethernet interface FENA
Family:	ABB FENA	General Parameters
Device name:	FENA	
GSD file:	gsdml-v2.31-abb-fena-20140901.xml	
	Change Release Number	IP address: II92:168:0.1 Gateway Subnet mask: 255.255.0 © Do not use router
Node in PROFINET IC	O system	C <u>U</u> se router
Device number:	1 PROFINET-IO-System	<u>A</u> aaress: j
IP address:	192.168.0.1 Ethemet	not networked New
Assign IP address	s via IO controller	Enemet() Properties
Comment:		Dejete
		OK Cancel Help

Figure 17 Properties

4. Select the PROFINET drive, and drag and drop the desired **PPO type (6)** to the slot 1 of the module.



The drive automatically receives peripheral memory areas for data input and output (Process data that will be sent between the PLC and the drive). In this example, the 20 byte long peripheral memory area starts from 256. Change if needed by double-clicking PPO-XX of actual drive.

5. Repeat the procedure to add more drives if needed and then click the **Save and Compile** button.

Downloading Hardware configuration

Choose **Download** from the **PLC** menu. Select your target module (actual PLC) and click **OK**. Select the node address of the PLC (the IP address in case of Ethernet connection) and click **OK**.

					Select Node Addre	255		x
					Over which station PN/DP?	address is the programmin	ng device connected to the module CPU 319F-3	
🔩 HW Config - [SIMATIC 300(1	1) (Configuration) ABBDrives_Quickstart_	PB]						
Station Edit Insert PL	C View Options Window Help				Rack:	0 -		
D 🚅 🛼 🖩 🗞 🍙	Download	Ctrl+L			Slot	2 -		
	Upload							
	Download Module Identification				Target Station:			
🚍 (0) UR	Unload Module Identification to PG					C Can be reached by	means of gateway	
1	opious module lacitimention to Folli		Select Target Module		Enter connection	to target station:		
2 CPI	Faulty Modules		T		IP address	MAC address	Module type Station name Module n	nar
X2 DP	Module Information	Ctrl+D	l'arget modules:		192.168.0.1			
X3 PN-	Operating Mode	Ctrl+I	Module	Hacks Slot				-
X3 P1 R Port	Clear/Reset		CFU STSPS FN/DF		Accessible Nodes			_
	Set Time of Day							
	Monitor/Modify							
	Update Firmware							
	Save Device Name to Memory Card		· · · · · · · · · · · · · · · · · · ·					•
	Ethernet	•	Select All				View	
	PROFIBUS	•						_
	Save Service Data			Lancel Help			Cancel Help	

Figure 18 Downloading hardware configuration

If the PLC is in RUN mode, a **Stop Target Modules** message is displayed. Click **OK** and then click **Yes** in the Download pop-up window to set the PLC in RUN mode. Verify that the PLC is in RUN mode, for instance by checking that the CPU RUN led is green.

	Stop Target Modules		×	
	The following modules will be st data.	topped for loading of the sys	tem	
22	Module	Backs	Slot	
Download 25	CPU 319F-3 PN/DP	0	2	Download (13:4363)
STATIC 300(1)				The module CPU 319F-3 PN/DP IR 0/S 21 is in the
Module: [0/2/0] CPU 319F-3 PN/DP				STOP mode. Do you want to start the module now (complete restart)?
Cancel	OK	Cancel H	lelp	Yes No

Figure 19 Download

PLC libraries for S7-300

Copying ABB_DRIVES_LIB blocks to the project

Retrieve the ABB drives function block library *ABB_DRIVE_LIB* from SIMATIC Manager. Choose **Retrieve** from the **File** menu and browse your zipped library. Click **Open** and then choose a suitable folder where to place the library, click **OK**.

SIMATIC Manager - [ABBDrives	Retrieving - Select an archive	Select destination directory
Prie Edit Insert PLC Vie New New Project' Wizard Open	Look in: 120901 S7 lib from ABB web 💽 🗲 🗈 📸 📰 🕶	
Multiproject S7 Memory Card Memory Card File	ABB_Drives_Profibus_DP_control_SimaticS7.zip	B→ S7N575 B→ S7N5 B→ S7N5 B→ S7NF B→ S7NF B→ S7NF B→ S7NF B→ S7NF B→ S7NF B→ S7NF
Save As Delete Reorganize Manage Archive	III III File name: ABB_Drives_Profibus_DP_control_SimaticS7.zip Open Files of type: PKZip 12.4-Archive (* zip) Cancel	B-STNGD B-STNGD B-STNVB B-STSTNO CK. Cancel Help

Figure 20 Retrieve library

Select all blocks from the library project, right-click and choose **Copy**. Open your project, right-click in the Blocks view and choose **Paste**.

SIMATIC Manager - [ABB_DRIVE_LIB C:\Users\sejoelf\Documents\PLC\S7\FIDRI S7 ABB Drives					TIC Manager - [ABBDrives	s_Quickstart_PB	C:\Users	s\\\$7 pro	jects\ABBDrives	s_Quickst
🔶 File Edit Insert PLC Vie	🖹 File	Edit Insert	PLC Vie	w Options	Window I	Help					
🗅 😂 🔡 🐖 👗 🛍 🛍 🔹 🗣 🐾 ⊵ 🗄 🏢 🔁 🔍 No Filter >							- A D 0	D 0- 0			
E- SABE_DRIVE_LIB	Object name	Symbolic name	Created in la		🗄 🗑 सल 🕹 🔥	43 🖪	20 9 <u>-</u>	1 2 2 3	3-8-	L < No Filter	r>
E- S7 Program(1) En Sources	5 FB500	pen Object	Ctrl+Alt+O	🖃 🎒 ABE	BDrives_Quickstart_P	tart_PB	Object name	(s	Symbolic na	ame	Created
Blocks	:s 🗗 FC501 Cu	ut	Ctrl+X		SIMATIC 300(1 🐻 CPU 319E-	J 3 PN/DP	System data	з			
	SFB4 (ору	Ctrl+C		⊡ 🗊 S7 Program(1)	gram(1)					
	SFB52 F	aste	Ctrl+V		B Sources		Cu	ıt		C	trl+X
	SFC14	elete	Del		Elo Blo	cks	Co	ру		Cf	trl+C
	SFC15 SFC20	nsert New Object	Þ				Pa	ste		C	trl+V

Figure 21 Copying libraries

Symbol Editor

Open the **Symbol Editor** from SIMATIC Manager and create symbols that you will connect to block inputs and outputs. In this example, some of the block inputs are left out since those values are set to fixed values.

Note! The variables for instance also created in a separate Data Block.

	🗟 Sym	💱 Symbol Editor - [S7 Program(1) (Symbols) ABBDrives_Quickstart_PB\SIMATIC 300(1)\CPU 💼 💷 📧										
	🗟 Sy	mbol Tal	ble Edit Insert Vie	ew Options	Window	Help – é	×					
) 😅 🖬	1 4	🕺 🖻 💼 🔛	୍ୟ 🛛 🗛 🖓 🖓	bols	✓ ½/ №?						
		Status	Symbol 🛆	Address	Data type	Comment						
	13					Logic true						
	14		SWITCH_ON_Drive1		BOOL	Switch on drive (prepare for start)						
	15		START_Drive1		BOOL	Start drive						
	16		RESET_Drive1	M 100.2	BOOL	Reset drive fault						
	17		STOPPED_Drive1	M 102.0	BOOL	Drive is stopped						
SIMATIC Manager (APPDriver Quickstart DP)	18		RUNNING_Drive1		BOOL	Drive is started						
Simaric manager - [AbbDrives_Quickstart_PD C:(Use	19		FAULT_Drive1	M 102.2	BOOL	Drive has active fault						
<u>File Edit Insert PLC View Options Window</u>	20		WARNING_Drive1	M 102.3	BOOL	Drive has active alarm						
D 🚅 😫 🛲 👗 🖻 🖻 📥 💿 🗣 🗣 🦕	21		LOCAL_CTRL_Drive1	M 102.4	BOOL	Drive is in local control mode (panel or pc tool)						
	22		SPEED_REF_Drive1			Drive speed reference (-20000 to 20000)	E					
ABBDrives_Quickstart_PB Ubject name	23		ACT_SPEED_Drive1			Drive actual speed (-20000 to 20000)						
	24		MSW_Drive1			Drive Main Status Word						
EI- Blocks	25		MCW_Drive1			Drive Main Control Word						
Symbols	26						-					
Blocks	Press F1	Press F1 to get Help. NUM										

Figure 22 Symbol editor

FB500 ABB_DRIVE_CONTROL_FB

FB500 is used to control the drive (start, stop, reset, emergency stop, speed reference, etc.).

Note! The following descriptions are just an example, there are different ways to use the Control function block.

- 1. Open **OB1**, the default Start/Main block in Siemens CPUs.
- 2. Create memory bits for Logic true and Logic false. They will be used later in the program.



Figure 23 Memory bits

3. Right-click in the next free network and choose **Insert Empty box**. Write **FB500** in the block field to create an instance of FB500.

Networ	3: Title:			Network 3: Tit	le:
	Insert Network Insert Empty Box	Ctrl+R Alt+F9		-	FB500
			-	-	<>0 *

Figure 24 FB500

Create a **unique** Data Block for the control of your drive by writing DBXXX in the field over the block (DB101 has been chosen in this example, the available number of Data blocks vary with actual CPU model). Drive status and more will be stored in this Data Block. Since it is a new Data Block, you have to generate it by clicking **Yes** in the following pop-up window.



Figure 25 DB101 data blocks

Note! If you later add more drives to the program, make sure to create new unique Data blocks for them.

4. Connect the block inputs and outputs to variables according to your application.

Note! Select a block input or output and see more information in the Info tab (1, 2). See also comments to the block inputs/outputs in the table below.



Figure 26 Connecting block input/output

Block variables and data types

Block variable	Data type	Comment
EN	BOOL	Enabling block. FALSE = block code is not executed. TRUE or unconnected = block code is executed.
PPO_TYPE	INT	The PPO type. 1, 2, 3, 4, 5 or 6; 0 = not allowed.
ADAPTER_TYPE	INT	PROFIBUS module type: FPBA-01 PROFIBUS DP module connected in the drive. 1=FPBA (or FENA), 2=RPBA (or RETA).
DRIVE_TYPE	INT	Drive type: ACS800=1, ACSM1=2, ACS350=3, ACS355=4, ACS550=5, ACS850=6, ACS880=7, ACS580=8, ACS380=9.
DPV_MODE	BOOL	FALSE=DP-V0, TRUE=DP-V1 (or PROFINET).
ADR_IN	INT	The Process Data input of the drive, the start of the address range.
ADR_OUT	INT	The Process Data output of the drive, the start of the address range.
SWITCH_ON	BOOL	FALSE=Drive control switched off, TRUE=Drive control switched on. After an EMERGENCY STOP a new rising edge of SWITCH_ON is needed before next start. SWITCH_ON also needs to be active (TRUE) for resetting drive faults.
START	BOOL	FALSE=Ramp stop with deceleration time according to drive parameter, TRUE=Start. Drive start via fieldbus requires parameter setting in the drive.
EMCY_STOP	BOOL	FALSE=Emergency stop according to emergency stop deceleration time set in drive parameter, TRUE=Normal operation.
COAST_STOP	BOOL	FALSE=Normal operation, TRUE=Coast stop (drive releases control of the motor).
EXT_CTRL	BOOL	Selection of external control location EXT2. FALSE=EXT1, TRUE=EXT2. Shifting to EXT2 via fieldbus requires parameter setting in the drive.
SPEED_REF	INT	Speed reference value: -20000 to 20000. See chapter "Drive configuration" for scaling. Setting speed reference via fieldbus requires parameter setting in the drive.

RESET	BOOL	FALSE=No operation, TRUE =Reset drive fault.
DONE	BOOL	FALSE=Block execution not finished, TRUE=Block execution finished.
ERR	BOOL	FALSE=No error, TRUE=Error occurred during block execution.
ERNO	INT	Error code when ERR=TRUE, see SIMATIC online help for SFC14 or SFC15.
STOPPED	BOOL	FALSE=Drive is not stopped, TRUE=Drive is stopped.
RUNNING	BOOL	FALSE=Drive is not running, TRUE=Drive is running and following the speed reference value.
FAULT	BOOL	FALSE=No drive fault active, TRUE=Drive fault active.
WARN	BOOL	FALSE=No drive warning active, TRUE=Drive warning active.
EXT_RUN_ENABLE	BOOL	FALSE=No external run enable signal received in the drive, TRUE=External run enable signal received in the drive.
LOCAL_CTRL	BOOL	FALSE=Remote control (normal mode), TRUE=Local control (e.g. drive control panel or pc tool in local mode)
EXT_CTRL_LOC2	BOOL	Actual control place, FALSE=EXT1, TRUE=EXT2.
ACT_SPEED	INT	Drive actual speed: -20000 to 20000. See chapter "Drive configuration" for scaling.
MSW	WORD	Drive main status word. See actual fieldbus adapter manual for detailed description.
MCW	WORD	Drive main control word. See actual fieldbus adapter manual for detailed description.

Save your program.

 IAD/STL/FBD

 Image: Electronic state

 Image: Elect

Figure 27 Save program

Setting the drive in standby mode

Set $EMCY_STOP = TRUE$ (deactivate emergency stop) and after that $SWITCH_ON = TRUE$ to set the drive in standby mode waiting for START command. To make the drive ready for start, $SWITCH_ON$ always needs a positive edge after $EMCY_STOP$ has been activated.



Figure 28 Standby mode

Setting the drive in run mode

Set the drive to the standby mode, $COAST_STOP = FALSE$ and START = TRUE to start the drive. Set the desired reference value and the drive accelerates according to used acceleration ramp time to the set reference value. When START is set to FALSE, a restart is possible when the actual speed has reached zero. If flying restart is required, COAST STOP has to be used instead.



Figure 29 Run mode

Downloading a program and setting PLC in run mode

1. Open the block view in SIMATIC Manager. Select all blocks and choose **Download** from the **PLC** menu.

🌏 SIMATIC Manager - [C	PU315_ABBDrives_QuickSt C:\Users\\S7	projects\CPU315_A	BB_Drives_Quickstart\CF	PU315_A]	
🞒 Eile Edit Insert 🖡	PLC View Options Window Help				
🗅 😂 🚼 🛲 🐰	Access Rights	+	• V	않 🛞 🖷 🗖 🔟 🕴	
🖃 🎒 CPU315_ABBDriv	Download	Ctrl+I	Object name	Symbolic name	Created in language
🖹 🔝 SIMATIC 300(Confirme	Chilly K	🚵 System data		
🖃 🛄 CPU 315F	Configure	Ctri+K	🚭 OB1		
⊡ 🚮 S7 Pro	Compile and Download Objects		🔊 FB500	ABB_DRIVE_CONTROL_FB	
- <u>D</u> Sc	Upload to PG		🚰 FC500	ACS_DRIVE_PARA	
	Unload Station to DG		🜮 FC501	ACS_DRIVE_PZD	
			🖀 DB101		
	Copy RAM to ROM		🚰 UDT1		
	Download User Program to Memory Car	rd	SFB4		
			🚰 SF852		
	Save to Memory Card		SF853		
	Retrieve from Memory Card		SFC14	DPRD_DAT	
			SFC15	DPWR_DAT	
	Manage M7 System		SFC20	BLKMOV	STL

Figure 30 Downloading PLC

2. Set the physical dip switch of the PLC in position **RUN**. Choose **Operating Mode** from the PLC menu and check that Current Operating Mode is RUN, if not then choose and click preferred Restart mode.

			Operating	Mode		×	
職 LAD/STL/FBD - [OB1	- "Main" CPU315_ABBDrives_QuickSt\	SIMATIC 300(1)\CPU 315F-	Path:	CPU315_ABBDrives_QuickS	5t\SIMATIC 300(1)\CPU 315	5F-2 PN/DP\S7 Program(2)	
🖬 File Edit Insert Pl	LC Debug View Options Window	v Help	Online:	Order number:	6ES7 315-2FH13-0AB0		
D 🚅 🔓 🔒 🎒	Download	Ctrl+L		Name:	CPU 315F-2 PN/DP		
	Select Online CPU	i i i	Current O	perating Mode:	RUN	Warm Restart	
⊡-@ Interface	Establish Connection to Configured	CPU				Cold Restart	
	CPII Mersager	-				Hot Restart	
Network 3: ACS85	Dirplay Force Valuer	Ctrl Alt E				STOP	
	Manitar/Madify Variables	CUITAILER	Current mode switch position:				
	Monitor/Modily variables				RUN		
	Module Information	Ctrl+D	Current le Beason fr	vel of protection: or current level of protection:	1		
–	Operating Mode	Ctrl+I	Last oper	ating mode:	STARTUP		
6 — 1	Clear/Reset						
set Time of Day			Update		Close Help		
	R RRNOL						

Figure 31 Operating mode

VAT table

To get an overview of your connected parameters, create a Variable Table.

1. In the SIMATIC Manager main window, Blocks view, choose **Insert New Object** and click **Variable Table**.

🍠 SIMATIC Manager - [ABBDrives	_Quickstart_PB -	- C:\Users\\S7 projects\A	BBDrives_Quickstart_PB\ABBD)rive]		
<u>File Edit Insert PLC Vie</u>	w <u>O</u> ptions <u>M</u>	<u>V</u> indow <u>H</u> elp				
D 🛩 🎥 🛲 X 🖻 💼	🔬 🤉 🖕	≞_ 15- 188 🗰 🛍 🗖	< No Filter >	7 器 🗐 🖷 🗖 🕅 🕅		
🖃 🎒 ABBDrives_Quickstart_PB	Object name	Sumbolio nomo	Crostod in Janausae	Size in the work me Type		
🗄 🗃 SIMATIC 300(1)	DB1	Cut	Ctrl+X	530 Instance		
E- CPU 319F-3 PN/DP	🕀 DB101	Сору	Ctrl+C	530 Instance		
E-sr S7 Program(1)	<table-of-contents> FB500</table-of-contents>	Paste	Ctrl+V	7902 Function		
Blocks	Blocks FC500			2466 Function		
C. Diddite	5 FC501	Delete	Del	1970 Fund		
	0B1	Insert New Object		212 Orașeization Plask		
	SFB4	Insert New Object	•	Organization Block		
	SFB52	PLC	•	Function Block		
	5FB53	Rewire		Function		
	SEC14	C		Data Block		
	SEC20	Compare Blocks		Data Type		
	System data	Reference Data	•	Veriable Table		
		Check Block Consist	ency	Variable Table		

Figure 32 Variable table

2. In the Properties – Variable Table window, give the table a suitable name and click **OK**.

Properties - Variable Tal	ble	×									
General - Part 1 General - Part 2 Attributes											
Name:	VAT1										
Symbolic Name:	VAT_Drive1										
Symbol Comment:											
Project path:											
Storage location of project:	C:\Users\sejoelf\Documents\	SWAP\1 Johan work\S7 projects\ABE									
Date created:	Code 11/09/2012 12:02:55 PM	Interface									
Last modified:	11/09/2012 12:02:55 PM	11/09/2012 12:02:55 PM									
Comment:		4 7									
ОК		Cancel Help									

Figure 33 Properties - Variable table

3. Open the Variable table and add your preferred variables (it is possible to copy directly from the Symbol Editor). Click symbol (1) to display online values. Click symbol (3) to update any modified values (2).

8	Var - [VAT_Drive1 ABBDrives_Quickstart_PB\SIMATIC 300(1)\							👪 .Var - [VAT_Drive1 @ABBDrives_Quickstart_PB\SIMATIC 300(1)\CPU 319F-3 P									
	I	able	e <u>E</u> dit	Insert PLC Variab	ole <u>V</u> iew <u>O</u> pt	tions <u>W</u> indo	w <u>H</u> elp _	Ľ	👪 Iable Edit Insert PLC Variable View Options Window Help								
	a ×						-									Ko	
-> D 🚅 🖬 🎒 🌡 🖻 🛍 ∽ ୍ 🗙 🏪 😫 🕺 🧐 @ ⊘					Ē			Idress	Symbol	Display format	Status value	Martifu unker		<u></u>			
		A	Idress	Symbol	Display format	Status value	Modify value			M	100.0	"SWITCH ON Drive1"	BOOL	false	true		1
1		м	100.0	"SWITCH_ON_Drive1"	BOOL			2		М	100.1	"START_Drive1"	BOOL	false			1
2		М	100.1	"START_Drive1"	BOOL			3		М	100.2	"RESET_Drive1"	BOOL	false	7		
3		м	100.2	"RESET_Drive1"	BOOL			4		М	102.0	"STOPPED_Drive1"	BOOL	true		\	1
4		М	102.0	"STOPPED_Drive1"	BOOL			5		М	102.1	"RUNNING_Drive1"	BOOL	false			3
5		М	102.1	"RUNNING_Drive1"	BOOL			6		М	102.2	"FAULT_Drive1"	BOOL	false			
6		М	102.2	"FAULT_Drive1"	BOOL			7		М	102.3	"WARNING_Drive1"	BOOL	false			
7		М	102.3	"WARNING_Drive1"	BOOL			8		М	102.4	"LOCAL_CTRL_Drive1"	BOOL	false			
8		М	102.4	"LOCAL_CTRL_Drive1"	BOOL			9		Μ	102.5	"DONE_Drive1"	BOOL	true			
9		М	102.5	"DONE_Drive1"	BOOL			10		М	102.6	"ERROR_Drive1"	BOOL	false		2	
10		М	102.6	"ERROR_Drive1"	BOOL			11		MV	V 104	"SPEED_REF_Drive1"	DEC	0			
11		MV	V 104	"SPEED_REF_Drive1"	DEC			12	2	MV	V 106	"ACT_SPEED_Drive1"	DEC	0			
12		MV	V 106	"ACT_SPEED_Drive1"	DEC			13	3	MV	V 108	"MSW_Drive1"	HEX	W#16#1200			
13		MV	V 108	"MSW_Drive1"	HEX			14	L.	MV	V 110	"MCW_Drive1"	HEX	W#16#0400			
14		MV	V 110	"MCW_Drive1"	HEX			15	5	MV	V 112	"ERROR_NO_Drive1"	HEX	W#16#0000			
15		MV	V 112	"ERROR_NO_Drive1"	HEX			16	6								
16																	
Press F1 for help. ABBDrives_Quickstart_PB\SIMATIC 300(1)\\S7 Program(1) RUN											Ab: //						

Figure 34 Variable table settings

FC501 ACS_DRIVE_PZD (optional)

FC501 is used to send additional process data between the PLC and the drive. Insert a new **Empty Box** to your program and name **FC501** (FC501 *ACS_DRIVE_PZD* is included in the ABB drives library **ABB_DRIVE_LIB**).

Network 4: Additional process data - Drive 1
fc501
é <=0 <>0 ▼

Figure 35 PLC logic - FC501

Depending on actual PPO type, a certain number of data words (PZDs) are exchanged. PPO types 1 and 3 have only 2 PZDs in each direction, so FC501 (ACS_DRIVE_PZD) is not useful for those types. PPO types 2 and 4 have 6 PZDs in each direction, so a part of FC501 (PZD3 to PZD6) is useful here. PPO types 5 and 6 have 10 PZDs in each direction, so the full range of FC501 is useful for those types.

Connect the FC501 block inputs and outputs. All block inputs and outputs need to be connected.

Block variable	Data type	Comment
PZD3_OUT	INT	Write PZD3 value to the drive
PZD4_OUT	INT	Write PZD4 value to the drive
PZD5_OUT	INT	Write PZD5 value to the drive
PZD6_OUT	INT	Write PZD6 value to the drive
PZD7_OUT	INT	Write PZD7 value to the drive
PZD8_OUT	INT	Write PZD8 value to the drive
PZD9_OUT	INT	Write PZD9 value to the drive
PZD10_OUT	INT	Write PZD10 value to the drive
PZD2_SCALED	REAL	Read PZD2 (actual speed / ACT) value from the drive, the default
		scaling value corresponds to -20 000 to 20 000 -> -100 to 100
PZD3_SCALED	REAL	Read PZD3 value from the drive, the default scaling value is 1 = no scaling
PZD4_SCALED	REAL	Read PZD4 value from the drive, the default scaling value is 1 = no
		Scaling
PZD5_SCALED	REAL	Read PZD5 value from the drive, the default scaling value is 1 = no
		Scaling
PZD6_SCALED	REAL	Read PZD6 value from the drive, the default scaling value is 1 = no
		Scaling
PZD7_SCALED	REAL	Read PZD7 value from the drive, the default scaling value is $1 = no$
		Scaling
PZD8_SCALED	REAL	Read PZD8 value from the drive, the default scaling value is $1 = no$
		Scaling
PZD9_SCALED	REAL	Read PZD9 value from the drive, the default scaling value is $1 = no$
		Scaling
PZD10_SCALED	REAL	Read PZD10 value from the drive, the default scaling value is $1 =$
		no
		scaling
Drive	BLOCK_DB	Instance Data Block. The drive variable is used for identifying to
		which drive FC501 ACS_DRIVE_PZD belongs. The Instance Data
		Block of FB500 ABB_DRIVE_CONTROL_FB must correspond to
		the variable FC501 ACS DRIVE PZD drive of the same drive.

Block variable and data types for FC501

In the example below, the Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named DRIVE1 and an ACS800 with RPBA-01 PROFIBUS module has been used.



Figure 36 Data blocks of FB500

If you need to scale Process Data values, set the scaling values in the program before calling the FC501 *ACS_DRIVE_PZD* block. See example below where PZD3 has been scaled with the value 100.



Figure 37 Process data values

Scalable variables and data types

Scalable variable	Data type	Variable to which the scaling value is entered
PZD2	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD2_SCALE
PZD3	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD3_SCALE
PZD4	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD4_SCALE
PZD5	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD5_SCALE
PZD6	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD6_SCALE
PZD7	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD7_SCALE
PZD8	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD8_SCALE
PZD9	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD9_SCALE
PZD10	REAL	"DRIVE1".INTERNAL_PZD.SCALE.PZD10_SCALE

Map the fieldbus process data parameters of the drive according to the application. See chapter *Drive* configuration. See example below from an ACS355 where Current (1.04), Torque (1.05), Power (1.06), DC bus voltage (1.07) are read from drive to PLC through PZD3 to PZD6, and Constant speed 1 to 4 (12.02 to 12.05) are written from PLC to drive through PZD3 to PZD6.

54	FBA DATA IN			
01	FBA DATA IN 1	4	0	9999
02	FBA DATA IN 2	5	0	9999
03	FBA DATA IN 3	104	0	9999
04	FBA DATA IN 4	105	0	9999
05	FBA DATA IN 5	106	0	9999
06	FBA DATA IN 6	107	0	9999
07	FBA DATA IN 7	0	0	9999
08	FBA DATA IN 8	0	0	9999
09	FBA DATA IN 9	0	0	9999
10	FBA DATA IN 10	0	0	9999
55	FBA DATA OUT			
01	FBA DATA OUT 1	1	0	9999
02	FBA DATA OUT 2	2	0	9999
03	FBA DATA OUT 3	1202	0	9999
04	FBA DATA OUT 4	1203	0	9999
05	FBA DATA OUT 5	1204	0	9999
06	FBA DATA OUT 6	1205	0	9999
07	FBA DATA OUT 7	0	0	9999
08	FBA DATA OUT 8	0	0	9999
09	FBA DATA OUT 9	0	0	9999
10	FBA DATA OUT 10	0	0	9999

Figure 38 Example ACS355

FC500 ACS_DRIVE_PARA (optional)

FC500 is used to read/write extra parameters between the PLC and the drive. Insert a new **Empty Box** to your program and name it FC500 (FC500 ACS_DRIVE_PARA is included in the ABB drives library *ABB_DRIVE_LIB*).

ork 5: Parameter data - D:	rive 1
Insert Network	Ctrl+R
Insert Empty Box	Alt+F9

Figure 39 PLC logic - FC500

Connect the FC500 block inputs and outputs. All block inputs and outputs need to be connected.

Block variable	Data type	Comment
ADR_IN	INT	The beginning of the address range of the drive's:
		Parameter Identification input for DP-V0.
		Process Data input (or 0 "zero") for DP-V1 (or
		PROFINET).
ADR_OUT	INT	The beginning of the address range of the drive's:
		Parameter Identification output for DP-V0.
		Process Data output (or 0 "zero") for DP-V1 (or
		PROFINET).
READ	BUUL	edge).
WRITE	BOOL	Write the parameter value 0 -> 1 (executed on positive
		edge).
PARAM_NUM	DINT	Read/written parameter: 3 numbers = group, 2 numbers =
		Index. For example, Par 20.06 = 2006.
VALUE_IN	DINT	Parameter value to be written.
DRIVE	BLOCK_DB	Instance Data Block. The drive variable is used for
		identifying to which drive FC501 ACS_DRIVE_PZD
		belongs. The Instance Data Block of FB500
		ABB_DRIVE_CONTROL_FB must correspond to the
		variable FC501 ACS_DRIVE_PZD drive of the same drive.
DONE	BOOL	FALSE=Block execution not finished, TRUE=Block
	DOOL	
ERR	BOOL	FALSE=No error, TRUE=Error occurred during block
		Error godo whon EDD_TDUE
		EIIOI CODE WIEII ERREIRUE.
	BUUL	FALSE=NO Operation active, TRUE=Operation active.
PARAIVI_NUIVI_OUT	ו אונט	nancieci parameter number: 3 numbers = group, 2
		Read parameter value
		וופמט במומווופנטו אמועט.

Block variables and data types for FC500

In the example below, the Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* is named as DRIVE1 and an ACS800 with RPBA-01 PROFIBUS module has been used.

Note! The FB500 *ABB_DRIVE_CONTROL_FB* DPV_MODE variable defines the used protocol. You must set this variable correctly to make FC500 to work.



Figure 40 Example

TIA portal

You can configure S7-300, S7-400, S7-1200 and S7-1500 series PLC using TIA portal. This chapter provides the examples for configuring S7-300 and S7-1200 series PLC.

Configuring PC IP address

To configure PC IP address, follow these steps:

- 1. Open Control Panel -> Network and Sharing Center -> Local Area Connection in the PC.
- 2. In the Local Area Connection Status window, click **Properties**.

📮 Local Area Conne	ction Status	×
General		
Connection		
IPv4 Connectivit	y:	No Internet access
IPv6 Connectivit	y:	No Internet access
Media State:		Enabled
Duration:		10 days 01:04:57
Speed:		100.0 Mbps
D <u>e</u> tails		
Activity —		
	Sent —	Received
Bytes:	8,705,230	11,466,651
Properties	Oisable	Diagnose
		Qlose

Figure 41 LAC

3. In the Properties window, select the required **Internet Protocol Version** (for example, Internet Protocol Version 4) and click **Properties**.



Figure 42 Internet protocol

4. Assign the required IP address and click OK.

Internet Protocol Version 4 (TCP/IPv4)	Properties ?									
General										
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.										
Obtain an IP address automatical	у									
Use the following IP address:										
IP address:	192.168.0.183									
S <u>u</u> bnet mask:	255.255.255.0									
Default gateway:	· · ·									
Obtain DNS server address autom	atically									
O Use the following DNS server address of the server address of	resses:									
Preferred DNS server:										
Alternate DNS server:	· · ·									
Validate settings upon exit										
	OK Cancel									

Figure 43 Assign IP address

Configuring S7-300 PLC

To configure TIA Portal with the PLC and ABB Drive libraries, follow these steps:

- 1. Launch TIA Portal V11.
- 2. Click **Create new project** and enter the project name and path and then click **Create**.

∛ A Siem	ens - TIA-Lib-Example			_ - ×
			Tota	Illy Integrated Automation PORTAL
Start	t 崎		Create new project	
[r	Devices & and the second secon	Open existing project	Project name: Path:	TIA_Lib_Example C:\Users\abb\Desktop\ProjectDoc
		🥚 Create new project	Author:	abb
F	PLC programming	Migrate project	Comment:	^
N	Visualization	Close project		
(Online &	Welcome Tour		Create
		First steps		
		Installed software		
		Help		
		Over interface language		
▶ Pr	roject view	Opened project: C:\Users\abb\Des	ktop\ProjectDocs\TIA-Lib-Examp	ole\TIA-Lib-Example

Figure 44 New project

3. In the Start options, click **Configure a device**.



Figure 45 Configure device

4. Select Add new device in the left pane and select the required PLC and then click Add.

	Add new device		
Channall dandara	Dovice name:		
Show all devices	Device name.		
🥚 Add new device	PLC_1		
Configure networks	PLC PLC HMI PC systems	 PLC SIMATIC \$7-1200 SIMATIC \$7-300 CPU CPU 312 CPU 312 CPU 313C CPU 313C2 DP CPU 313C2 PP CPU 314C2 DP CPU 314C2 DP CPU 314C2 PP CPU 3152 PNDP CPU 3152 PNDP CPU 3172 PN CPU 3172 PN CPU 3172 PN CPU 3172 PN CPU 31752 DP CPU 3175	Device: CPU 315-2 PN/DP Crder no.: 6ES7 315-2EH14-0AB0 Version: V3.2 * Description: Work memory 384KB; 0.05ms/1000 instructions; PROFINET interface; S7 communication (loadable FBs/FCs); PROFINET CONTRoller; supports RTIRT; 2 ports; PROFINET CONTROL (Supports); multi-tier configuration up to 32 modules; constant bus cycle time; routing; firmware V3.2
00110011001			Add

Figure 46 Adding new device

New PLC device is added to hardware configuration.



Figure 47 PLC device

5. In the Device view, select **PLC_1** (PROFINET interface) and in the General tab, select **Ethernet addresses** and click **Add new subnet** to add the subnet and then set IP Address in the IP protocol.

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					IP pro	tocol											
) Set If	addres	s in the	project					
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									Su	bnet ma	isk:	255 . 25	5.255	0			
									Use IF	router	_						
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	PROFINET																
									Set PR metho	OFINET	device r	name us	ing a differ	rent			
						PROFIN	NET device na	me p	lc_1								
	<			>		C	Converted nar	me: p	lcxb1d0	ed				_			~
		Portal v	view		Overview		PLC_1					🖊 Projec	t TIA Lib E	Example	created.		

Figure 48 Assign IP

A new subnet and IP protocol is added.

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	Ethernet addresses Time-of-day synchroniz	Interface n	etworked with								aries
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				💿 Set If	address	in the	project				
	-	•			IP addres	s:	192.168	8.0.15			
				Su	bnet mas	;k: [255 . 255	5.255.0			
				Use IP	router	_					
				Rout	er addres	is: (0.0	.0.0			
		-		U Set Ir	address	using	a differen	it method			
		PROFINET									
				Set PR metho	OFINET de	evice r	name usir	ng a different			
		PRC	FINET device name	plc_1							
	< III >		Converted name:	plcxb1d0	ed						*
	Portal view	1 Overview	The PLC_1			<	Project TI	A_Lib_Exam	ole created.		

Figure 49 IP added

6. In the Device view, select PLC_1 (MPI/DP interface) which is highlighted.



Figure 50 Selecting MPI DP

7. In the General tab, select **MPI address** and in the Parameters Interface type drop-down list select **PROFIBUS** as interface to assign PROFIBUS address.

Image: Several state of the second						
	TIA_Lib_Examp	ple ▶ PLC_	1 [CPU 315-2 PN/DP]			_ # = × <
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etwor			A.C.			
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			Parameters			
	Interface type: MPI 👻					
		4	Address	PROFIBUS MPI		
		•	Highest address: Transmission speed:	31		

Figure 51 MPI PROFIBUS address change
8. In the PROFIBUS address option, click **Add new subnet** to add the interface network.

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				-		Trar	nsmission s	peed:	1.5 Mb	ps 🔻]						

Figure 52 Adding new PROFIBUS subnet

9. After **configuring** PROFINET and PROFIBUS interfaces in TIA portal, click **Network view** to view the PLC connections.

Vî	Siemens - TIA_Lib_Exa	mple	Tools			_ □ X
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	PN/IE_1					 Online tools Image: A state of the stat
	Network overview	Connections	IO commun	ication		<u>.</u>
	Y Device ▼ \$7300/ET200M st ▶ PLC_1	Type tation_1 S7300 CPU 31	/ET200M station 5-2 PN/DP	Address in subne	t Subnet Ma	aster system Commen

Figure 53 PLC connections

Installing GSD and GSDML file for S7-300 PLC

1. In the TIA portal main menu, click **Options** and then click **Install general station description files (GSD)**.



Figure 54 Installing general station description file

2. Browse and select the required GSD files for PROFIBUS or GSDML files for **PROFINET** and click **Install**.

Version	Language	Status	Info
	Default	Already installed	ABB Drives
	Version	Version Language Default	Version Language Status Default Already installed

Figure 55 Installing GSD file

3. A popup window is displayed to confirm installing the GSD file. Click **Yes**.



Figure 56 Popup window

After GSD file is installed, system prompts to close TIA portal, click **Close TIA Portal**.

nstal	ll general station d	escriptio	n file		>
Inst	allation result				
! N	Message				
0	Installation was co	mpleted su	uccessfully.		
2	Course la co	10	Incore II and distance I Fig.	Chara TA Parasi	
1	Save log		Install additional files		

Figure 57 Restart TIA portal

PLC libraries for S7-300

Adding ABB drives to PROFIBUS DP line

1. Launch TIA portal and click **Open the project view** in the **Start** options.

Note: After installing GSD files, ABB drives are added to the hardware catalog of TIA portal.

2. In the Project tree pane, double-click Device & networks.

Project tree		TIA_Lib_Example ► Devices & networks
Devices		
🖻 O O	₫	Network Connections HMI connection
📑 Add new device		
Devices & networks		PLC_1
PLC_1 [CPU 315-2 PN/DP]		CF0 315-2 PN/DF
🕨 🙀 Common data		
Documentation settings		
🕨 🐻 Languages & resources		
Online access		PROFIBUS 1
🕨 🣴 SIMATIC Card Reader		

Figure 58 Devices and network

3. From the hardware catalog pane, drag and drop the required ABB Drive to the PLC.



Figure 59 ABB Drive

4. In the ABB drive, connect PLC to the PROFIBUS interface.

TIA_Lib_Example Devic	es & networks				_ = = ×
	📇 То	pology view	📥 Networ	rk view 🛛 🚺 🛙	evice view
Network	HMI connection		📃 🔍 ± 10	0%	- 🔤
					^
PLC_1 CPU 315-2 PN/DP					≡
					
PN/IE_1		1			
	PROFIBUS_1				
	Slave_1		ADD		
	Not astic		FPBA-01		
	PL	C_1.MPI/DP inter	face_1		

Figure 60 Assign to PLC

5. Select the ABB drive (Slave_1) and click Device view to configure PROFIBUS address.

Project315_Demo Unassigned devices Si	ave_1					
	🚝 To	pology view	🔒 Netwo	rk view	Y Device v	view
Slave_1	🗄 🔍 ±			Device ove	rview	
			^		ule	
as i				9	Slave_1	
6 ³						
			-			
			-			
FPBA-01			• -			
			~			
< III > 75	i%	▼	🖸	< III		>
Slave_1 [Module]	9	Properties	🗓 Info 🔒	Diagnost	ics	
General IO tags System constants	Texts					
General	Subnet:	PROFIBUS_1			1	•
PROFIBUS address		Add new	subnet			
General DP parameters						=
Device-specific parameters Parameters						
Hex parameter assignment		_				_
Diagnostics addresses	Address:	3				•
	Highest address:	126				-

Figure 61 Configure address

6. In the Hardware catalog pane, double-click the required **PPO type**. The selected PPO type is displayed in the Device overview.

2 PN/DI	P] 🕨 Distrib	uted I/O	▶ DP-Ma	stersyst	tem (1):	PROFIBUS	6_1 ► SI	ave_1 🗕 🛛	₹∎X	Hardware cata	log 🔳	
			📲 Topol	ogy vie	w 🚠	Network	view	Device	view	Options		
Sla	ve_1		- 🖪	6	🔍 ± 🛛	00%	-					
									^	✓ Catalog		
		434								<search></search>	ivi j) init
										Filter		
										3AFE68469	9325	~
										📗 Universal n	nodule	
				6	H 400					PPO-01, 4 P	'KW + 2 PZ	D
				F	PBA-01					PPO-02, 4 P	'KW + 6 PZ	D
										PPO-03, 0 P	'KW + 2 PZ	D
										PPO-04, 0 P	'KW + 6 PZ	D
										PPO-05, 4 P	KW + 10	
1	1111								S 🗖	PPO-06, 0 P	KW + 10 P	ZD
					•					📗 PPO-07, 4 P	KW + 12	
Device	e overview	-								PPO-08, 0 P	KW + 12	
- -	Markela			Deals	Clas	Lastations	0	T		PPO-02, 4 P	'KW + (2+.	
u	Module			RACK	SIOL	2042*	Q address	App Drives		📗 PPO-04, 0 P	'KW + (2+.	=
	Slave_1			0	0	2043	256 275	ABB Drives	-FBA-U	III PPO-05, 4 P	'KW + (2+.	
	PPO-06, 0	JPKW+10	PZD_1	0	1	256275	256275	PPO-06, 0 P	(W + 1	PPO-06, 0 P	'KW + (2+.	
				0	2					PPO-07, 4 P	'KW+(2+2.	
				0	5					PPO-08, 0 P	'KW+(2+2.	
				0	4					PPO-01, 4 P	KW +NoC.	
				0	5					PPO-02, 4 P	KW +NoC.	
				0	7					PPO-03, 0 P	KW +NoC.	
				U	/					PPO-04, 0 P	KW +NoC.	

Figure 62 PPO type added

7. In the Network view, click **Not assigned** and select **PLC_1.MP/DP interface_1** to assign PLC to the ABB drive.

TIA_Lib_Example Devices & networks	_∎≡×
Topology view 🚠 Network view 🕅 De	evice view
PLC_1 CPU 315-2 PN/DP	=
PN/IE_1 PROFIBUS_1	
Slave_1 ABB Drives FPBA Not as Select master: PLC 1.MP//DP interface 1	

Figure 63 Assign to PLC

The selected PLC is assigned to the ABB drive.

TIA_Lib_Example > Devices & networks	≡×
📰 Topology view 🛛 🚠 Network view 🛛 🛐 Device view	N
💦 Network 🔛 Connections HMI connection 🔽 🐫 🔍 ± 100%	4
Image: PLC_1.DP-Mastersystem (1)) ^
PLC_1	
PN/IE_1PLC_1.DP-Mastersystem (1)	
ABB Drives FPBA PLC_1	

Figure 64 PLC assigned

8. In the Project tree pane, select **PLC_1** and then click **b** to compile.



Figure 65 Compile

Note: Before downloading the configuration to PLC, check the PC IP address. For more information, see section *Configuring PC IP address* (page 64).

9. Click III to download the configuration to PLC.



Figure 66 Download to device

Adding ABB drives to PROFINET

Note: After installing GSDML files, ABB drives are added to the hardware catalog of TIA portal.

 Select Network view, and then from the hardware catalog pane, drag and drop the required ABB Drive to the PLC PROFINET network.



Figure 67 PLC PROFINET

2. In the ABB drive, connect PLC to the PROFINET interface.

Project315_Demo + D	Devices & networks	1	_ @ = ×
📲 Topolog	yy view 🛔 Netwo	ork view 📑 Devi	ce view
Network	ions HMI connection		
			^
			≡
PLC_1			
CPU 315-2 PN/DP			
			_
PROFIBUS_1	PN/IE_1		Z et
			- vork
			► data
	FENA		
	Not assigned	FENA	
	PLC_1.PF	ROFINET interface_1	
< .	> 100%	▼	- 🖸

Figure 68 PROFINET interface

- 3. Select the ABB drive (FENA) and click Device view to configure PROFNET IP address and device name.
 - Siemens C:\Project_Docs\TIA_Project_Backups\Project315_Demo\Project315_Demo . O X Project Edit View Insert Online Options Tools Window Help Totally Integrated Automation PORTAL 🕂 💁 🖥 兄 Save project 🚇 🐰 🗐 👔 🗙 🎝 ± (? ± 🖥 🛄 🌆 🖳 🖓 🖉 Go online 🖉 Go offline 🍶 🛄 📲 🛠 🕇 Project315_Demo > Unassigned devices > FENA _ **= =** × Devices Topology view 🔥 Network view 🛐 Device view Options 80 наг 1 O I 🔟 🛃 # FENA 💌 🖽 🕎 🚮 🖽 🔍 ± Device overview **^** ✓ Catalog 📸 ... Module 🕶 🛅 Project31... inių init FENA 💣 Add n... catalog Interface Filter Device... FENA 🕨 🛅 Head module ▼ 🛅 PLC_1... I. 🕶 🛅 Module 🚺 De... 🕶 🛅 PPO Types V. Onl. Ų. PPO Ty... ç 🕨 🔜 Pro... > 75% 🕨 🎆 Tec... < T < 🚺 РРО Ту... ▶ 🐻 Ext... 🗓 Info 👔 🗓 Diagnostics Q Properties 📗 РРО Ту... tools PLC... PROFISa... • 📑 PLC... General IO tags System constants Texts 🕨 🛅 Standar... 🕨 詞 Wa.. Ð General 🕨 🔽 Onl... Catalog information 🕨 🏢 De... PROFINET interface [X1] Pro... General Name: FENA PLC... Ethernet addresses Author: abb Tex... Identification & Mainten Comment: 🕨 🛅 Loc... Advanced options 🕨 🛅 Dis... Interface options 🕨 🗽 Unass... Real time settings ົ່ພ 🕨 Port 1 [X1 P1] < III > > > Details view > Information > 🔛 Overview Portal view 📥 FENA ject Project315_Demo op
- In the General tab, click **General** to add the device name.

Figure 69 Configuring device name

• In the PROFINET interface [X1], click Ethernet address to add Subnet and IP address.



Figure 70 Ethernet address

4. In the Hardware catalog pane, double-click the required PPO type. The selected PPO type is displayed in the Device overview.

ŢΑ	Siemens - C:\Pro	ject_Docs\TIA_Project_Back	ups\Project315_D	emo\Project315_De	emo	- 0	зx
Pr	roject <u>E</u> dit <u>V</u> iew F 🎦 🔒 Save proj	/ Insert Online Optio <u>n</u> s ect 进 🐰 🏥 🗊 🗙 🛰	 ± (~! ± 🗐 🛄		Totally Integrated Aut	tomation PORTAL	_
	Project315_Der	no 🕨 Unassigned devices	FENA	_ = = ×	Hardware catalog	I I >	
Devices & networks	FENA	Topology view In No	etwork view	Y Device view overview Module FENA FENA Interface PPO Type 6_1	Options ✓ Catalog ✓ Filter • The Head module ✓ The Head module ✓ The Head module ✓ The PPO Type 3 The PPO Type 3 FPO Type 4 FPO Type 6 FPO Type 7 The PROFisafe Telegrams FTH Standard Telegrams Composition Compos	iii iii	Hardware catalog S Online tools
	4 Dentel sites				> Information		*
	Portal View	EAN OVERVIEW	000 I LINA	V Pro	oject Project315_Demo opened.		



5. In the Network view, click **Not assigned** and select **PLC_1.PROFINET interface_1** to assign PLC to the ABB drive.

Project315_Demo Devices & networks		×
🚝 Topology view 🛛 🏭 Network view 🛛 🛐 Device	view	v
PLC_1 CPU 315-2 PN/DP PROFIBUS_1		Network
FENA FENA-11 No Select IO controller PLC_1.PROFINET interface_1	~	 c data ⊥ ► 1

Figure 72 Assigning PLC PROFINET

The selected PLC is assigned to the ABB drive.

Project315_Demo > Devices & networks	∎×
🛃 Topology view 🛛 🏦 Network view 👔 Device vi	ew
💦 Network 🔛 Connections 🔣 HMI connection 💌 🕎 🖏 🔂 🔍 ±	
₽ IO system: PLC_1.PROFINET IO-System (100)	^
PLC_1 CPU 315-2 PN/DP PLC_1.PROFINET IO-Syste PROFIBUS_1 FENA FENA-11	Network data
PLC_1	
★ 100%	~

Figure 73 PLC

6. In the Project tree pane, select **PLC_1** and then click **Save** project and click **l** to compile.

Downloading configuration to PLC

- Click to download the configuration to PLC.
 In the Extended download to device window, select PG/PC interface and Connection to subnet from the drop-down list and click Load.

	configured access fi		-			C L L
	Device	Device type	Type	Address		Subnet
	PLC_1	CPU 315-2 PN/DP	PN/IE	192.168.0.	15	PN/IE_1
		CFU 315-2 FN/DF	PROFIBUS	2		PROFIBUS_1
		Ţ	ype of the PG/PC i PG/PC i Connection to 1st e	nterface: 📃 nterface: 📷 o subnet: PN/ gateway:	PN/IE Intel(R) PRO/1 IE_1	▼ 1000 PM Net▼ €
	Accessible devices i	n target subnet:	Tune	Addross		w all accessible devi
Elec	Accessible devices i Device CPU 315-2 PN/DP	n target subnet: Device type CPU 315-2 PN/DP	Type PN/IF	Address	<u>Shor</u>	w all accessible devi Target device CPU 315-2 PN/DP
	Accessible devices i Device CPU 315-2 PN/DP 	n target subnet: Device type CPU 315-2 PN/DP —	Type PN/IE PN/IE	Address 192.168. Access a	0.15 ddress	w all accessible devi Target device CPU 315-2 PN/DP —
Flash LED	Accessible devices i Device CPU 315-2 PN/DP 	n target subnet: Device type CPU 315-2 PN/DP 	Type PN/IE PN/IE	Address 192.168. Access a	0.15 ddress	w all accessible devi Target device CPU 315-2 PN/DP
Flash LED	Accessible devices i Device CPU 315-2 PN/DP 	n target subnet: Device type CPU 315-2 PN/DP 	Type PN/IE PN/IE	Address 192.168. Access a	0.15 ddress	w all accessible devi Target device CPU 315-2 PN/DP
Flash LED	Accessible devices i Device CPU 315-2 PN/DP ess 192.168.0.15	n target subnet: Device type CPU 315-2 PN/DP 	Type PN/IE PN/IE	Address 192.168. Access a	0.15 ddress	w all accessible devi Target device CPU 315-2 PN/DP



The **Load preview** window is displayed with the PLC ready for loading.

3. Select the required PLC device and click Load.

Load pro	eview	/		×
?	heck	before loading		
Status	1	Target	Message	Action
↓	0	▼ PLC_1	Ready for loading.	
	0	Device configurati	Delete and replace system data in target	Download to device
	0	Software	Download software to device	Consistent downlo 💌
				Refresh
			Finish	Load Cancel

Figure 75 Load preview

4. In the Load results window, select **Start all** and click **Finish**.

Load re	oad results X								
?	Status	and actions after downloadi	ing to device						
Status	1	Target	Message	Action					
+1	Sec.	▼ PLC_1	Downloading to device completed without error.						
		Start modules	Start modules after downloading to device.	🗹 Start all					
			Finish	Load Cancel					

Figure 76 Load results

Copying ABB drive libraries to S7-300 project

Prerequisites: Check for ABB Drive libraries available in the user PC.

1. In the main menu of TIA portal, click **Options** and click **Global libraries** and then click **Open library**.





2. Select the required ABB drive library in the file system and click OK.

🙀 Open global li	ibrary			×
Look <u>i</u> n:	BB_Drives_	TIA_Global_Library_V0.1	G 🤌 📂 🛄 -	
(Es)	Name	*	Date modified	Туре
	퉬 AdditionalFi	les	19-01-2015 11:03	File folder
Recent Places	IM 📗		19-01-2015 11:03	File folder
	퉬 System		29-01-2015 16:06	File folder
	🐌 TMP		19-01-2015 11:03	File folder
Desktop	퉬 UserFiles		19-01-2015 11:03	File folder
Libraries	ABB_Drives_	Global_Library_V0.1	28-01-2015 12:02	Siemens T
Computer				
	•	III		۴.
Network	File <u>n</u> ame:	ABB_Drives_Global_Library_V0.1		<u>O</u> pen
	Files of type:	Global library		Cancel
		Open as <u>r</u> ead-only		

Figure 78 File system

After selecting ABB drive library, a Libraries pane is displayed with the selected library at the right side of the TIA portal window.

3. Expand **ABB_Drives_Global_Library** -> **Master copies** and right-click **ABB_DRIVE_CONTROL_FB** and then click **Copy**.

M Siemens - TIA_Lib	Example			_ - ×
Project Edit View Ir 🌁 🎦 🔒 Save project	isert Online Options Tools → 블 💥 🗐 🗎 🗙 炳 ± (주 ± 📊 🖥 🛄 🗊		Fotally Integrated Automat PC	tion DRTAL
Project tree 🔳 📢			Libraries	א 💷 י
Devices			Options	
				Tas
			✓ Project library	Ś
TIA_Lib_Ex 🔺			🖄 🖽 🛛 All	
Add ne			✓ Global libraries	
			💣 🗗 🗳 🖞 🗋	🗄 🖿 🛉 🖬
Devi			ELL Buttons-and-Switches	ies
V. Onli			Monitoring-and-control-ol	ojects
👻 📴 Prog			Documentation template	s
💕 A			ABB_Drives_Global_Libra	ry_V0.1
💶 M			🕨 📴 Types	
🕨 🙀 Tech 🗸			Haster copies	
			New library	DLFB
✓ Details view			Open library	
			🖫 Save library	
Name			Save library as	
Add new block			🐀 Close library	
🖅 Main			χ Cut	Ctrl+X
			🗐 Сору	Ctrl+C
			Paste	Ctrl+V
	Properties Info Diagnostics		🗙 Delete	Del
	General Cross-references Compile		Rename	F2
Portal view	🔛 Overview	🗹 Library A	Cross-reference informatio	n Shift+F8

Figure 79 Libraries

4. In the Project tree pane, right-click Program blocks and click Paste.



Figure 80 Program blocks

ABB drive libraries are copied to PLC.



Figure 81 Copied libraries to PLC

Note: Similarly, copy other ABB drive libraries and paste it in the Program blocks.

5. In the Libraries pane, expand **ABB_Drives_Global_Library** -> **Master copies** and right-click **DRIVE** (data types) and click **Copy**.



Figure 82 Drive

6. In the Project tree pane, right-click PLC data types and click Paste.



Figure 83 Data types

Adding PLC tags to S7-300

1. In the Project tree pane, expand PLC tags and double-click **Add new tag table** to create symbols.

禍	Siemens - C:\Pro	ject_Docs\TIA_	Proj	ect_Backı	ups\Project315	_Demo\Proje	t315_Dem	0				⊐ ×
Pro	oject Edit View	Insert Onli	ne	Options	Tools	101 102 100 PT		Tota	Ily Integrated	Automat	tion	
	🖸 🔄 Save proj	ect 🔠 🔏 🗉		X -1	± (≝ ± •⊡ .		۲.			PC	RIAL	-
	Project tree			emo	PLC_1 [CPU	315-2 PN/DF	P] → PLC ta	ags 🕨 T	ag table_1 [0]			
	Devices							-	Tags 🗉 Use	er consta	ints	
	🖻 O O		a	≝∛ ≝∛	🖹 뿣 🔁							Tas
Ð				Tag	table_1							Ś
Ē	🕨 🔚 Exter	nal source fil	^		Name	Data type 👻	Address	Retain	Visible in HMI	Acces	Com	
E E	🔻 🚂 PLC ta	igs		1	<add new=""></add>]		V	V		
5	🍇 sł	iow all tags										Ē
르	📑 Ad	ld new tag t										1 <u>2</u> .
Ы	🌿 De	fault tag ta										s
	🖳 Ta	g table_1 [0]										
	🔻 🛄 PLC d	ata types										
	📑 Ad	d new data	_									
	E DF	NVE	=									
	🕨 🛄 Watch	and force t										
	🕨 📴 Onlin	e backups										
	Devic	e proxy data										
	Progr	am info										
	🖂 PLC a	arms										
	🛅 Text li	sts										
	Local	modules										
	Unassign	ed devices										
	Commor	data	*									
	<	>		<				_			>	
	> Details view					Properti	es 🛄	nfo 追	B Diagnostics			
	Portal view	11 OV	/	🔒 De	🎚 Ta 🔞 🛙	R = Ma	🗸 Libi	rary ABB_	Drives TIA Global	Library.		

Figure 84 New tag table

2. Add tag Name, Data type and Address to connect block inputs and outputs.

Vê	Siemens - TIA_Lib_Example		_ ¤ ×
P	oject <u>E</u> dit <u>V</u> iew Insert <u>O</u> nline 🍄 🎦 🔒 Save project ا 🐰 🗎	Optio <u>n</u> s <u>T</u> ools • 🖹 🗙 🏷 ± (ぞ ± 🙀 🖥 🔃 🖸 🚆 🞇	Totally Integrated Automation PORTAL
	Project tree 🛛 🔳 🖣	Example > PLC_1 [CPU 315-2 PN/DP] 🕨 PLC tags 🕨 Symbols [47] 🔔 🖬 🖬 🗙 <
	Devices		🕣 Tags 🔳 User constants 📑
		🤹 🤃 🖶 😤 🗰	
		Symbols	ŝ
Ē	Device configuration	Name	Data type Address 🔺 Retain V
a l	😼 Online & diagnostics	1 TALSE	Bool %M10.0
15	🕶 🛃 Program blocks	2 ඟ TRUE	Bool %M10.1
Ē	💕 Add new block	3 ඟ ENABLE_FB500	Bool %M99.7 🗒
H	📲 Main (OB1)	4 🐨 SWCTH_ON_D1	Bool %M100.0
	ACS_DRIVE_PARA [5 📲 START_D1	Bool %M100.1
	ACS_DRIVE_PZD [F	6 📲 RESET_D1	Bool %M100.2
	ABB_DRIVE_CONTR	7 STOPPED_D1	Bool %M102.0
	🕨 🎇 Technology objects	8 🕣 RUNNING_D1	Bool %M102.1
	External source files	9 🕣 FAULT_D1	Bool %M102.2
	🕶 🌄 PLC tags	10 🕢 WARNING_D1	Bool %M102.3
	lange Show all tags	11 📲 LOCAL_CTRL_D1	Bool %M102.4
	📑 Add new tag table	12 🕢 DONE_D1	Bool %M102.5
	💐 Default tag table [0]	13 📲 ERROR	Bool %M102.6
	Symbols [47]	14 SPEED_REF1_D1	Int %MW104
	lag table_1 [0]	15 🕢 SPEED_ACT_D1	Int %MW106
	🗢 🛅 PLC data types	16 📲 MSW_D1	Word %MW108
	📑 Add new data type	17 📲 MCW_D1	Word %MW110
	DRIVE V	18	Int %MM/117
	> Details view	Properties	Linfo Diagnostics
	Portal view Dver	🖬 Main 🗓 Tag t 🖳 Symb	Library ABB_Drives_Global_Library_V0

Figure 85 PLC tags

For information on Data types of tags, see sections *Block variables and data types* (page 53) and *Block variable and data types for FC501* (page 59) *Block variables and data types for FC500* (page 62).

FB500 ABB_DRIVE_CONTROL_FB

FB500 is used to control the drive (start, stop, reset, emergency stop, speed reference, etc.).

Note! The following description is an example, there are different ways to use the Control function block.

1. In the Program blocks, double-click **Main [OB1]** and create memory bits for Logic true and Logic false.

Project tree			OB1] 🗕 🖬 🖬 🗙
Devices			
			n 🗖
			· •••
- Dann clabal tib a			
Add new devic	esung 🔨	⊣⊢⊣⊢⊕ ∰ ↦ ᅼ	
📥 Devices & netv	works		
▼ 📄 PLC 1 [CPU 31	5-2 P	Network 1:	
Device conf	figura	Comment	
😵 Online & dia	agno		
👻 🔜 Program blo	ocks	%M0.1 %M0.1 "Tao 1" "Tao 1"	"FALSE"
Add new	block		
Main [OB	11		~ / ~
ACS DRIV	VE_P =		
ACS_DRIV	VE_P		
- ABB_DRIV	VE_C	▼ "FALSE" %M10.0	
abb_driv	VE_C	"Tag_1" %M0.1	
🕨 🔚 System b	blocks		
🕨 📴 Technology	obje	 Network 2: 	
🕨 🔚 External sou	urce f	Comment	
🗢 🌄 PLC tags			
🍇 Show all	tags	%MO.0	%M10.1
📑 Add new	/ tag t	"Tag_2"	"TRUE"
💥 Default t	ag ta		-()
💺 Symbols	[47]		
🕨 📑 PLC data typ	pes	%M0.0	
🕨 詞 Watch and f	force	"Tag_2"	
Program inf	fo		
PLC alarms	~		~
<	>	× 100% ▼	· · · · Ý · · · · · · · · ·

Figure 86 Logic TRUE/FALSE

2. Right-click in the next free network and choose Insert empty box.

N	etwork 3:	
Cor	nment	
	Define tag	Ctrl+Shift+I
	Rename tag	Ctrl+Shift+U
	Rewire tag	Ctrl+Shift+P
Ж	Cut	Ctrl+X
Ē	Сору	Ctrl+C
Ē	Paste	Ctrl+V
×	Delete	Del
	Go to	•
	Cross-reference	information
ьġ	Insert network	Shift+F2
??	Insert empty box	Shift+F5
	Insert input	Ctrl+Shift+3

Figure 87 Inserting empty box

3. Write FB500 in the block field to create an instance of FB500.



Figure 88 Instance of FB500

4. Create a **unique** Data block for the control of the drive by enabling **Manual** option and by selecting the Number.

Comment			
	<	m>	
	"ABB_DRIVE_	CONTROL_FB"	Call options X
	EN	ENO	Data block
	PPO_TYPE	DONE	Name ABB_DRIVE_CONTROL_FB_DB
	ADAPTER_TYPE	ERR	DB Number 1
	DRIVE_TYPE	ERNO	Single 🔿 Manual
	DPV_MODE	STOPPED	Automatic
	ADR_IN	RUNNING	The called function block caves its data in its own instance
	ADR_OUT	FAULT	data block.
	SWITCH_ON	WARN	
	START	EXT_RUN_	
	EMCY_STOP	ENABLE	More
	COAST_STOP	LOCAL_CTRL	
· ·	EXT_CTRL	EXT_CTRL_LOC2	
	SPEED_REF	ACT_SPEED	
	RESET	MSW	OK Cancel
		MCW	

Figure 89 FB500 DB1

Drive status and more will be stored in this Data block. Since it is a new Data block, you have to generate it by clicking **OK** in the Call options window.

Note! If you add more drives to the program, make sure to create new unique Data blocks.

5. Connect the block inputs and outputs to variables according to your application.



Figure 90 Assigned variables

Note! Select a block input or output and see more information in the Info.

For more information on block variables and data types, see Block variables and data types (page

<mark>53</mark>).

6. Click Save to save to the project.



Figure 91 Save project

Adding watch and force tables

1. In the Project tree, expand Watch and force tables and double-click Add new watch table and provide a suitable name and click **OK**.

Project tree			315-2 P	N/DP] ► V	Vatch a	nd force table	s 🕨 Watch table_	1 – P – X
Devices								
🖆 O O 🖆								
		-	i	Name		Address	Display format	Monitor value
lags 🔤 Show all tags	~	. 1			=	<add new=""></add>		
📑 Add new tag table								
🎬 Default tag table [3]								
line [47]								
PLC data types								
🕶 뻱 Watch and force tables								
Add new watch table								
Force table								
😛 Watch table_1								
📴 Program info								
🖂 PLC alarms								
Text lists								

Figure 92 Watch and force tables

2. Open Watch table and add your required variables (for example, FB500 variables). It is possible to copy directly from the PLC tags.

Project tree		PLC_1	[CPU 315-2 PN/DP]	→ Watch	n and force tabl	es 🕨 Watch	table_DB1_FB50	0 _	₽≡×
Devices									
B O O		17 L.	91 18 17 m m						
		i	Name	Address	Display format	Monitor value	Modify value	9	
▼ □ PLC_1 [CPU 315-2 PN/DP]	~	1	"FALSE"	%M10.0	Bool				1
Device configuration		2	"TRUE"	%M10.1	Bool				Ē
😼 Online & diagnostics		3	"ENABLE_FB500"	%M99.7	Bool 💌		TRUE		
Program blocks		4	"SWICTH_ON_D1"	%M100.0	Bool		TRUE		
Technology objects		5	"START_D1"	%M100.1	Bool		TRUE		
External source files		6	"RESET_D1"	%M100.2	Bool		TRUE		
🕨 🔚 PLC tags		7	"STOPPED_D1"	%M102.0	Bool				
PLC data types		8	"RUNNING_D1"	%M102.1	Bool				
🕶 🥅 Watch and force tables		9	"FAULT_D1"	%M102.2	Bool				
💕 Add new watch table	=	10	"WARNING_D1"	%M102.3	Bool				
DPV1_DRIVE1_FC500		11	"LOCAL_CTRL_D1"	%M102.4	Bool				
Force table		12	"DONE_D1"	%M102.5	Bool		FALSE		
Watch table_DB1_FB500		13	"ERROR"	%M102.6	Bool				
🔠 Watch table_FC501		14	"SPEED_REF1_D1"	%MW104	DEC_signed		14567		
🔤 Program info		15	"SPEED_ACT_D1"	%MW106	DEC_signed				
M PLC alarms		16	"MSW_D1"	%MW108	Hex				
Text lists		17	"MCW_D1"	%MW110	Hex				
Local modules		18	"ERN_D1"	%MW112	Hex				

Figure 93 Watch table FB500

- Click to display the online values.
 Click A to update modified values.

FC501 ACS_DRIVE_PZD

FC501 is used to send additional process data between the PLC and the drive.

Depending on actual PPO type, a certain number of data words (PZDs) are exchanged. PPO types 1 and 3 have only 2 PZDs in each direction, so FC501 (*ACS_DRIVE_PZD*) is not useful for those types. PPO types 2 and 4 have 6 PZDs in each direction, so a part of FC501 (PZD3 to PZD6) is useful here. PPO types 5 and 6 have 10 PZDs in each direction, so the full range of FC501 is useful for those types.

- 1. Right-click in the next free network and choose **Insert empty box**.
- 2. Write **FC501** in the block field to create an instance of FC501.

rk 4:			
it			
TUO			
	rk 4: It OUT	out	TK 4:

Figure 94 FC 501

3. Connect the FC501 block inputs and outputs. All block inputs and outputs need to be connected.

In the example below, the Instance Data block of FC501 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB* and an ACS355 with FPBA-01 PROFIBUS module is been used.

	%FC5	01	
	"ACS_DRIV	VE_PZD"	
	EN	ENO	
%MW132 "PZD3_OUT" —	PZD3_OUT	PZD2_SCALED	%MD184 "PZD2_SCALED"
%MW134 "PZD4_OUT" —	PZD4_OUT	PZD3_SCALED	%MD182 "PZD3_SCALED"
%MW136 "PZD5_OUT" —	PZD5_OUT	PZD4_SCALED	%MD154 "PZD4_SCALED"
%MW138 "PZD6_OUT" —	PZD6_OUT	PZD5_SCALED	%MD158 PZD5_SCALED*
%MW140 "PZD7_OUT" —	PZD7_OUT	PZD6_SCALED	%MD162 PZD6_SCALED*
%MW142 "PZD8_OUT" —	PZD8_OUT	PZD7_SCALED	%MD166 PZD7_SCALED*
%MW144 "PZD9_OUT" —	PZD9_OUT	PZD8_SCALED	%MD170 PZD8_SCALED
%MW146 "PZD10_OUT" —	PZD10_OUT	PZD9_SCALED	%MD174 PZD9_SCALED*
%DB1 "ABB_DRIVE_ CONTROL_FB_DB" —	Drive	PZD10_SCALED	%MD178 PZD10_SCALED

Figure 95 Example FC501

For more information on block variables and data types, see section *Block variable and data types for FC501* (page 59).

If you want to scale Process Data values, set the scaling values in the program before calling FC501 *ACS_DRIVE_PZD* block. See example below where PZD3 is scaled with the value 100.



Figure 96 Scaling process data values

For more information on mapping fieldbus process data parameters of the drive according to the application, see section *Scalable variables and data types* (page 61).

FC500 ACS_DRIVE_PARA

FC500 is used to read/write extra parameters between the PLC and the drive.

- 1. Right-click in the next free network and choose **Insert empty box**.
- Write FC500 in the block field to create an instance of FC500 (FC500 ACS_DRIVE_PARA is included in the ABB library ABB_DRIVE_LIB).

▼ Network 5:
Comment
FC500
<no tags="" used=""></no>

Figure 97 FC500

3. Connect the FC500 block inputs and outputs. All block inputs and outputs need to be connected.

For more information on block variables and data types, see section *Block variables and data types for FC500* (page 62).

In the example below, the Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB* and an ACS355 with FPBA-01 PROFIBUS module has been used.



Figure 98 Example FC500

4. In the Project tree, right-click PLC_1 (CPU) and select **Properties** for executing read/write parameter value (0 -> 1 (executed on positive edge).

Project tree		4
Project tree	ш	`
Devices		
	a	,
	_	
▼ 🗖 ABB Global I	ib testing	~
Add new d	evice	
H Devices &	networks	
▼ PLC_1 [CP	U 315-2 PN/DP]	
Dev	Open	
况 Onli	Open in new editor	
👻 🛃 Prog \chi	Cut	Ctrl+X
📑 A 💼	Сору	Ctrl+C
= 1 - N 💼	Paste	Ctrl+V
■ ^ ×	Delete	Del
📲 A 🏠	Rename	F2
- 1	Go to device	
= - A	Go to library	
2 📷 4	Co to Topology view	
🕨 📑 Tech 📻	Go to network view	
	Compile Developed to device	•
	Download to device	CteluK
′ /	Go offline	Ctrl+M
	Online & diagnostics	Ctrl+D
▶ 📑 PLC	Receive alarms	
👻 🥅 Wat	Show force values	
📑 A 🛄	Start Simulation	
E F AD	Compara	
	Compare	,
💵 Prog	Cross-reference informat	ion Shift+F8
M PLC	Assignment list	
Text	Constructure Cross-references	FS
	crossierences	
Dotaila viu - 0	Print	Ctrl+P
 Details vie 	Print preview	
🔹 Portal vie 🔯	Properties	Alt+Enter

Figure 99 Clock memory properties

5. In the PLC_1 (CPU) window, click **Clock memory** and enable **Clock memory**, assign memory address (example, 600) and click **OK**.

PLC_1 [CPU 315-2 PN/I	DP]				×
General					
General	^	Clock momony			
MPI/DP interface [X1]		Clock memory			
PROFINET interface					
Startup				🛃 Clock memory	
Cycle			Memory byte:	600	
Clock memory	≡	•	memory byte.		
Interrupts					
Diagnostics system		•			
System diagnostics					
Clock					
Web server					
Retentive memory					
Protoction	\mathbf{r}				
					>
			Oł	Cancel	

Figure 100 Clock memory

Error codes for FB500 and FC500

The DP-V0 ERROR table

Tas	k ca	nnot be executed, follow by error number
0	=	Illegal parameter number
1	=	Parameter value cannot be changed
2	=	Lower or upper limit violated
3	=	Erroneous subindex
4	=	No array
5	=	Incorrect data type
6	=	Setting not allowed (can only be reset)
7	=	Descriptive element cannot be changed
9	=	Descriptive data not available
11	=	No parameter changes rights
15	=	Text array not available
17	=	Task cannot be executed due to operating status
		(e.g. parameter is currently read-only)
18	=	Other error
101	=	Vendor specific error
102	=	Request not supported
103	=	Request cannot be completed due to communication error
110	=	Failure during write to non-volatile memory
111	=	Request aborted due to time-out
120	=	Parameter cannot be mapped to PZD
		(size mismatch or non-existent
121	=	Parameter cannot be mapped to PZD (end of memory)
122	=	Parameter cannot be mapped to PZD (multiple PZD write)
130	=	Cannot map Control Word bit
		(parameter 933-937, e.g. double mapping of bits)
140	=	Cannot change mode to TORQUE (trequency is used)
150	=	Internal buffer overflow

160 = Internal communication error

The DP-V1 ERROR table

Error #	Meaning	Used at
00h	Impermissible parameter number	Access to unavailable parameter
01h Parameter value cannot be changed		Change access to a parameter value that cannot be changed
02h	Low or high limit exceeded	Change access with value outside the limits
03h	Invalid subindex	Access to unavailable subindex
04h	No array	Access with subindex to non-indexed parameter
05h	Incorrect data type	Change access with value that does not match the data type of the parameter
06h	Setting not permitted (can only be reset)	Change access with value unequal to 0 when this is not permitted
07h	Description element cannot be changed	Change access to a description element that cannot be changed
09h	No description data available	Access to unavailable description (parameter value is available)
0Bh No operation priority		Change access rights without rights to change parameters
0Fh	No text array available	Access to text array that is not available (parameter value is available)

Error #	Meaning	Used at		
11h	Request cannot be executed because of operating mode	Access is temporarily not possible for reasons that are not specified in detail		
14h	Value impermissible	Change access with a value that is within limits but is not permissible for other long-term reasons (parameter with defined single values)		
15h	Response too long	The length of the current response exceeds the maximum transmittable length		
16h	Parameter address impermissible	Illegal value or value that is not supported for the attribute, number of elements, parameter number or sub-index, or a combination		
17h	Illegal format	Write request: Illegal format or format of parameter data that is not supported		
18h	Number of values inconsistent	Write request: Number of values of parameter data does not match number of elements at the parameter address		
65h FF	Manufacturer-specific error area	-		
65h	Vendor-specific error	Vendor-specific error		
66h	Request not supported	Request not supported		
67h	Communication error	Request cannot be completed because of communication error		
6Eh	Non-volatile error	Failure during write to non-volatile memory		
6Fh	Time-out error	Request aborted because of timeout		
78h	PZD map failure	Parameter cannot be mapped to PZD (size mismatch or non-existent)		
79h	PZD memory failure	Parameter cannot be mapped to PZD (out of memory)		
7Ah	Multiple PZD map	Parameter cannot be mapped to PZD (multiple PZD write)		
82h	Control word bit map	Cannot map Control word bit (parameter 933937, e.g. double mapping of bits)		
8Ch	Set torque mode error	Cannot change mode to TORQUE (frequency is used)		
90h	Illegal Request ID	The request ID of the response is illegal		
96h	Internal buffer	Buffer overflow		
A0h	Internal communication	Communication error between module and drive		

Configuring S7-1200 and S7-1500 PLC

In the following example, S7-1200 PLC is configured. Similarly, you can configure S7-1500 PLC.

To configure TIA Portal with the PLC and ABB Drive libraries, follow these steps:

- 1. To configure S7-1200 PLC, follow steps 1-3 in *Configuring S7-300 PLC*.
- 2. Select Add new device in the left pane and select the required PLC and then click Add.



Figure 101 Adding new device S7-1200

New PLC device is added to hardware configuration.



Figure 102 PLC device S7-1200

3. Select the required slot in the rack and drag-and-drop the PROFIBUS module from the Hardware catalog to the slot.



Figure 103 PROFIBUS configuration

PROFIBUS module is added to the slot.



Figure 104 PROFIBUS module

Note: The user can select the desired version of the PROFIBUS module in the information pane.

Hardware ca	atalog	a 🗉 🕨
Options		
✓ Catalog		
		ini jini
Filter		
• 🛅 DQ		^
DI/DQ		
🕨 🥅 AI		
🕨 🧾 AQ		
AI/AQ		
🛨 🛅 Commu	nications modules	
🕨 🕨 🛅 Indus	trial Remote Communication	
- PROF	IBUS	
• 🛄 CN	M1242-5	
- CN	A 1243-5	≡
	6GK7 243-5DX30-0XE0	
✓ Informati	ion	
Device:	t	
	CM 1243-5	
Article no.:	6GK7 243-5DX30-0XE0	
Version:	V1.3	
Description:		
CM 1243-5 co connecting SI PROFIBUS, DP communicatio	mmunications module for MATIC S7-1200 to master, PG/OP on, S7 communication	

Figure 105 PROFIBUS module version info
4. In the Device view, select **PLC_1** (PROFINET interface) and in the General tab, select **Ethernet** addresses and click **Add new subnet** to add the subnet and then set IP Address in the IP protocol.



Figure 106 Assign IP protocol

5. In the Device view, select PLC_1 (DP interface). In the General tab, select PROFIBUS address and click Add new subnet to add the subnet and then assign PROFIBUS address.

Kiemens - C:\Project_Docs\TIA_Project_	_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200	_ - ×
<u>P</u> roject <u>E</u> dit <u>V</u> iew Insert <u>O</u> nline Op	otions Tools Window Help Totally Integrated Automa	ation
📑 🎦 🔚 Save project 🔳 🐰 🗐 🗎	🗙 🏷 ± (4 ± 🗟 🗓 🗓 🖳 🖉 🕼 💋 Go online 🖉 Go offline b 🕼 🖟 🕼 🖉 🗡 📩 🦻	ORTAL
Project tree 🔲 🖣	TIA_Lib_\$7-1200 → PLC_1 [CPU 1212C DC/DC/DC]	∎≡× ∢
Devices	🛃 Topology view 🛛 👪 Network view 🛛 🛐 Device	view 📃
	🔐 PLC_1 💌 🖽 🖾 🕼 🖽 🍳 ±	a Har
orks		A dva
₹ TIA_Lib_\$7-1200	103 102 101 1 2 3	
Add new device	Rack 0	cata
Devices & networks	STEMINE SAUCE SAUCE	
Device configuration		Ē
□ Q. Online & diagnostics ■	lung ill count) 🗄 🔽
 Program blocks 		9
Add new block		line
Main [OB1]		
Data_block_1 [DB1]		N
External source files		
PLC tags	DP Interface [Module]	
PLC data types	General IO tags System constants Texts	as
Watch and force tables	General PROFIBILS address	× Š
Contine backups	PROFIBUS address	
Program info	Operating mode Interface networked with	
Log Device proxy data Taxt lists	Subpet: PPOEIRUS 1	- bra
Local modules		ries
<	Add new subnet	
✓ Details view	Parameters	
Name	Address: 2	•
	Highest address: 126	
	Transmission speed: 1.5 Mbps	
		×
		*
Portal view Overview	🛗 PLC_1 🥃 Data_block_1 🔹 Main 💙 Project TIA_Lib_S7-1200 created.	

Figure 107 DP interface

6. After **configuring** PROFINET and PROFIBUS interfaces in TIA portal, click **Network view** to view the PLC connections.

TIA_Lib_S7-1200 → Devices & networks				_∎≡×
	📇 To	opolo	gy view 🖁 🖁 Network vi	ew 🛐 Device view
Network Connections			Network overview Co	nnections
	^		\Upsilon Device	Туре
	≡		 S7-1200 station_1 	S7-1200 station
PLC 1			CM 1243-5	CM 1243-5
CPU 1212C			PLC_1	CPU 1212C DC/DC/DC
PN/IE_1		_		
PROFIBUS_1		4		

Figure 108 PROFIBUS and PROFINET configurations

Installing GSD file for S7-1200 PLC

To install GSD file, see section Installing GSD file for S7-300 PLC (page 75).

PLC libraries for S7-1200

Adding ABB drives to PROFIBUS DP line

1. Launch TIA portal and click **Open the project view** in the **Start** options.

Note: After installing GSD files, ABB drives are added to the hardware catalog of TIA portal.

2. In the Project tree pane, double-click **Device & networks**.

Connections HMI connection
‼ Connections HMI connection 🔽 🖳 🖳 🔍 🛨
1 PROFIBUS_1
1

Figure 109 Devices and network for S7-1200

3. From the hardware catalog pane, drag and drop the required ABB Drive to the PLC.

TIA_Lib_S7-1200 > Devices & networks	×∎ י	Hardware catalog
🚝 Topology view 🛛 🏪 Network view 🛛 🏦 Device vi	ew	Options
R Network Connections HMI connection		
	^	✓ Catalog
PLC_1	≡	🛃 Filter
CPU 1212C		Image:
		Detecting & Monitoring
		Distributed I/O
		Field devices
		 Other field devices
PROFIBUS_1		✓ Im PROFINET IO
		Drives
		Encoders
	- No	🕨 🛅 Gateway
Slave_1	10 %	Ident Systems
ABB Drives FPBA	, Å	Sensors
Not assigned FPBA-01	- 5	✓ ☐ PROFIBUS DP
		🕶 🛅 Drives
		🕶 🛅 ABB Oy
		✓ Im ABB
		ABB Drives FPBA-01 DP-V0
		🕶 <u> </u> ABB Drives FPBA-01 DP-V1
		3AFE68469325

Figure 110 ABB drive and PLC

4. Double-click Slave_1 to navigate the device view for adding required PPO type.

TIA_Lib_S7-1200 Unassigned devices Slave_1	_ # = X	Hardware catalog
🛃 Topology view	h Network view	Options
🔐 Slave_1 💌 🖽 🖽 🕰 🔩 🗨	Device overview	
	Module	✓ Catalog
	Slave_1	
	=	🖌 Filter
Aner		3AFE68469325
		📗 Universal module
		📗 PPO-01, 4 PKW + 2 PZD
		PPO-02, 4 PKW + 6 PZD
		PPO-03, 0 PKW + 2 PZD
		📗 PPO-04, 0 PKW + 6 PZD
• FPBA-01		PPO-05, 4 PKW + 10 PZD
		📗 PPO-06, 0 PKW + 10 PZD
	•	PPO-07, 4 PKW + 12 PZD
	-	PPO-08, 0 PKW + 12 PZD

Figure 111 PPO type for S7-1200

5. Double-click on the required PPO type in the catalog to add in the Device overview.

TIA_Lib_S7-1200 → Unassigned devices → Slave_1	_ # # ×	Hardware catalog 🛛 🗐 🛽
🛃 Topology view	h Network view 🅅 Device view	Options
🔐 Slave_1 📰 🖽 🔛 🚱 😫 🔍 🔩	Device overview	
<u>^</u>	Y Module	✓ Catalog
	Slave_1	ini j
	PPO-06, 0 PKW + 10 PZD_1	🖌 Filter
Gave		3AFE68469325
		Universal module
		PPO-01, 4 PKW + 2 PZD
		PPO-02, 4 PKW + 6 PZD
ADD		PPO-03, 0 PKW + 2 PZD
		PPO-04, 0 PKW + 6 PZD
• FPBA-U1		PPO-05, 4 PKW + 10 PZD
		PPO-06, 0 PKW + 10 PZD
	•	PPO-07, 4 PKW + 12 PZD
	-	PPO-08, 0 PKW + 12 PZD
	•	PPO-02, 4 PKW + (2+2+2) PZD
		PPO-04, 0 PKW + (2+2+2) PZD
		PPO-05, 4 PKW + (2+2+2+2

Figure 112 PPO type

6. Click **Slave_1** and in the General tab, select **PROFIBUS address** and select the already configured PROFIBUS interface and then set PROFIBUS address for slave.

TIA_Lib_\$7-1200 →	Unassigned devices 🕨 Slave_1		×
		🖁 Topology view 🔒 Network view 🛛 🕅 Device view	v
H Slave_1		Device overview	
		Module	
		Slave_1	
		PPO-06, 0 PKW + 10 PZD_1	
	and the second sec		
	2		
		•	
		7	-
		-	
			-
	FPBA-01		
	100%		
	100%		· ·
Slave_1 [Module]		Properties 14 Info 1 Diagnostics	
General IO tag	s System constants Texts	S	
 General 			^
PROFIBUS address			- ≡
General DP para	Interface networked with		
Device-specific p			
Hex parameter assi	Subnet:	PROFIBUS_1	
Watchdog	-	Add new subnet	
Diagnostics addres			
-	Parameters		
	Address:	3	
	Highest address:	126 💌	
< III >	Transmission speed:	1.5 Mbps	~

Figure 113 PROFIBUS address

7. Click **Network view** to see the configured Slave_1.

TIA_Lib_S7-1200 → Devices & networks	
	🚆 Topology view 🛛 晶 Network view
Network Connections HMI connection	🔽 👯 👯 🛄 🔍 ±
PLC_1 CPU 1212C	ABB Drives FPBA
	Not assigned FPBA-01
PN/IE_1	
PROF	IBUS_1

Figure 114 Configured slave

8. In the ABB drive, click **Not assigned** and select **PLC_1.CM 1243-5.DP interface** to assign PLC to the ABB drive.

TIA_Lib_\$7-1200 → Devices & networks	
Network Connections HMI connection	Image: Topology view Image: Network view ▼ Image: Topology view Image: Network view
PLC_1 CPU 1212C	Slave_1 ABB Drives FPBA
PN/IE_1 P	ROFIBUS_1

Figure 115 Assign PLC to ABB drive

The selected PLC is assigned to the ABB drive.

TIA_Lib_S7-1200 → Devices & networks	_ - 7 -
🛃 Topology	view 🛔 Network view 🛐 Device view
Network . Connections HMI connection	🔽 👯 🗒 🔍 ± 🔤
	A Master system: PLC_1.DP-Mastersystem (1)
	=
PLC_1 CPU 1212C	Slave_1 ABB Drives FPBA
	CM 1243-5
PLC_1.DP-Ma	astersystem (1)

Figure 116 PLC assigned to ABB drive

9. In the Project tree pane, select **PLC_1** and then click **b** to compile.



Figure 117 Compile

Note: Before downloading the configuration to PLC, check the PC IP address. For more information, see section *Configuring PC IP address* (page 64).

Adding ABB drives to PROFINET

- 1. Follow steps 1 and 2 of Adding ABB drives to PROFIBUS DP line.
- 2. From the hardware catalog pane, drag and drop the required PROFINET ABB Drive to the PLC.



Figure 118 FENA drive

3. In the ABB drive, connect PLC to the PROFINET interface.

Ж	Siemens - C:\Project_Docs\TIA_Project_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200	_ 1	□ ×
P	roject Edit View Insert Online Options Tools 🕨 Totally Integrated Automatio * 💁 🔒 Save project 🚇 🐰 🗐 🗊 🗙 🎝 ± 🜁 🖞 🕼 🖳 🖬 🖳 🖬 🖉 POR	n TAI	L
Þ	TIA_Lib_S7-1200 → Devices & networks	×	\bullet
ices & networks	Image: Topology view Image: Topology view <t< td=""><td></td><td>Hardware catalog</td></t<>		Hardware catalog
Dev	PROFIBUS_1	Network data	Online tools
	FENA FENA-11 Not assigned		m Tasks
	Image: State of the state o		*

Figure 119 Connecting PLC and FENA drive

4. Select the ABB drive (FENA) and click Device view to configure PROFNET IP address and device name.

•	In the General tab, click General to add the device name.

VA	Siemens - C:\Project_Docs\TIA_Project_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200	_ I	⊐×
<u>P</u> r	oject Edit View Insert Online Options Tools > Totally Integrated Automation	n TAL	_
	TIA_Lib_S7-1200 → Unassigned devices → FENA _ ■ T	X	
	😴 Topology view 🛛 🚠 Network view 🛛 🛐 Device view	v	••
10	🔐 FENA 💌 🖽 🔣 🚱 ± 🔂 Device overview		Haro
& networks	Module	ce	dware cata
Devices (log 🕞 (
			Online tools
	FENA [Module]		
	General IO tags System constants Texts	_	
	General General General	-	asks
	PROFINE 1 interface [X1] General Same: FENA		
	Ethernet addresses		
	Identification & Mainten	*	
		>	-
	♦ Portal view		

Figure 120 Device name

In the PROFINET interface [X1], click Ethernet address to add Subnet and IP address.
 Mi Siemens - C:\Project_Docs\TIA_Project_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200



Figure 121 Ethernet address

5. In the Hardware catalog pane, double-click the required PPO type. The selected PPO type is displayed in the Device overview.

VĄ	Siemens - C:\Project_Do	ocs\TIA_Project_Backups\	TIA_Lib_\$7-1200\	TIA_Lib_\$7-1200	_ [×
Pr	oject <u>E</u> dit <u>V</u> iew Inser 🖥 🎦 🔚 Save project ا	t <u>O</u> nline Optio <u>n</u> s Too	ols ► ™± 🖥 🛄 🔟	Tot	ally Integrated Automation PORTAI	_
	TIA_Lib_\$7-1200 → U	Inassigned devices 🕨	FENA	_ = = ×	Hardware catalog 🛛 🗐 🔳 🕨	
		🚽 Topology view 🛛 🖁	Network view	Device view	Options	
	FENA	▼ 🖽 🕎 🥁		Device overview		Har
orks	36			Madula	✓ Catalog	wb
etwo	HE .			▼ FENA	ini ini	Fe
s n				Interface	Filter	ata
s				PPO Type 6_1	Head module	leg
evic					🕶 🛅 Module	
ă		FENA			🕶 🛅 PPO Types	2
					PPO Type 3	9
					PPO Type 4	lii
					PPO Type 6	et
					PPO Type 7	ols
					PROFIsate Telegrams	ľ
					Standard lelegrams	
						H
						sks
			~			
	< III > 100%		9 🗐 👘	< III >		
		Reporties 1	Info 追 🗓 Diag	pnostics 🛛 🗖 🗏 🔺	> Information	-
	Portal view	Overview	ENA	🗸 Project TIA_I	Lib_S7-1200 opened.	

Figure 122 PPO type

6. In the Network view, click **Not assigned** and select PLC_1.PROFINET interface_1 to assign PLC to the ABB drive.



Figure 123 PROFINET interface

TIA_Lib_S7-1200 → Devices & networks		_∎■×	Hardware catalog 💦 🗊 🖡 🕨 🕨
	📱 Topology view 🛛 🖁 Network view	Device view	Options
Network	▼ ₩ ₩ ₩ Φ ±		
	IO system: PLC_1.PROFINET	IO-System (100) 🛕	✓ Catalog
		=	Tini Lini
PLC_1	Slave_1		🛃 Filter
CPU 1212C	ABB Drives FPBA		Controllers
	CM 1245-5		▶ 🛅 HMI
			PC systems
PLC 1 PROFINET IO-Syste			Drives & starters
	PROFIBUS 1		Network components
		- et	Detecting & Monitoring
		- vort	Distributed I/O
		÷ ÷	Field devices
		- 5	 Other field devices
FENA			✓ Im PROFINET IO
FENA-11			▼ ☐ Drives
PLC_1			🕶 📊 ABB Oy
			✓ Im ABB FENA
			FENA-01
			FENA-11
			FENA-21

The selected PLC is assigned to the ABB drive.

Figure 124 PROFINET module

7. In the Project tree pane, select PLC_1 and then click **Save** project and click **b** to compile.

Downloading configuration to S7-1200 PLC

Click 💾	to down	oad the configuration to PLC.	
🚻 Siemens - C	NProject_Docs	TIA_Project_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200	-
Project Edit	View Insert project 昌 🎖	Online Options Tools → Totally Integrated Automation 【 通 通 ★ うま (** 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ו דא
Project tree		TIA_Lib_S7-1200 → Devices & networks	i X
Dovicos		Download to device	,
Devices			,
		💦 Network 🛄 Connections HMI connection 💌 🖭 🕄 🗄	
yort		4 IO system: PLC_1.PROFINET IO-System (100)	
A_Lib_\$7-120	•		
Add new de	vice	PIC 1	
Devices & n	etworks =	CPU 1212C ABB Drives FPBA	
	1212	CM 1243-5	- 2
	ontigu		- 1
	blocks		
Add u	ew bl	PLC_1.PROFINET IO-Syste	
The Main	IOB11	PROFIBUS_1	
Data	block		
Technole	ay ob	🖳 Properties 🚺 🚺 🚺 Diagnostics 📃 🖛	
External	sourc 👻	General i Cross-references Compile	
<	>		
✓ Details v	view	Show all messages	
		Compiling completed (errors: 0; warnings: 0)	
Name		! Path Description	4
Device cor	figuration 🔺		1
😵 Online & d	iagnostics 🔳		
🔒 Program b	ocks	rogram blocks Main (OB1) Plack was successfully compiled	
	×	Wain (ODT) Block Was successfully compiled.	

Figure 125 Download

From the Extended download to device window, select PG/PC interface and Connection to subnet from the drop-down list and click Load.

	Configured acce	ss nodes of "PLC_1"					
	Device	Device type	Slot	Туре	Address	Sub	net
	PLC_1	CPU 1212C DC/D	1 X1	PN/IE	192.168.0.3	PN/	IE_1
	CM1243-5	CM 1243-5	101 2	PROFIBUS	2	PRO	DFIBUS_1
		Type of the PG/PC inte	rface:	PN/IE			•
		PG/PC inter	face:	Broadcom I	NetXtreme Gigabit Eth	ernet	• 🖲 🖸
		Connection to interface/su	bnet:	PN/IE_1			- 💎
		1st gate	eway:				- 💎
	Compatible devi	ices in target subnet:			🛃 Show all compa	tible devices	
	Device	Device type	Туре	A	ddress	Target	device
	PLC_1	CPU 1212C DC/D	PN/IE	1	92.168.0.3	PLC_1	
F 207	-	-	PN/IE	Α	ccess address	-	
at							
Flash LED							
						<u>s</u>	tart search
Online status informatio	n:						
	compatible devices	of 2 accessible devices fou	nd.				1
Scan completed. 1							_
 Scan completed. 1 Retrieving device in 	formation						
 Scan completed. 1 Retrieving device in Scan and information 	formation on retrieval comple	ted.					•
Scan completed. 1 Retrieving device in Scan and informati Display only error m	formation on retrieval comple essages	ted.					•

Figure 126 Load

3. Select the required PLC device and click **Load**.

Load pre	eview				×
? c	heck l	before	loading		
Status	1	Targe	t	Message	Action
† <mark>1</mark>	0	👻 PL	.C_1	Ready for loading.	
	0	•	Device configurati	Delete and replace system data in target	Download to device
	0	•	Software	Download software to device	Consistent downlo 💌
					Refresh
				Finish	Load Cancel

Figure 127 Load preview

4. In the Load results window, select **Start all** and click **Finish**.

Loa	d res	ults			×
	s	tatus a	and actions after download	ing to device	
St	atus	1	Target	Message	Action
	₩.		▼ PLC_1	Downloading to device completed without error.	
			Start modules	Start modules after downloading to device.	🗹 Start all
				Finish	Load Cancel

Figure 128 Load results

Copying ABB drive libraries to S7-1200 project

Prerequisites: Check for the ABB Drive libraries available in the user PC.

1. In the main menu of TIA portal, click **Options** and click **Global libraries** and then click **Open library**.





2. Select the required ABB Drive library in the file system and click Open.



Figure 130 File system

After selecting ABB drive libraries, a Libraries pane is displayed with the selected libraries at the right side of the TIA portal window.



Figure 131 Global libraries pane

Following are the libraries available for S7-1200 series:

- ABB_DRIVE_CONTROL_FB (FB500)
- ACS_DRIVE_PARA (FB501)
- ACS_DRIVE_PZD (FB502)
- POKE (FC1, supported block for FB501 and FB502)
- POKE_BLK (FC2, supported block for FB501 and FB502)

Note! POKE and POKE_BLK are SCL language blocks used in FB501 and FB502. Copy these blocks to Program blocks, if not compilation errors are generated while compiling FB501 and FB502 blocks.

3. Expand ABB_Drives_TIA_Global_Library -> Master copies and right-click ABB_DRIVE_CONTROL_FB and then click Copy



Figure 132 Libraries

4. In the Project tree pane, right-click Program blocks and click Paste.



Figure 133 Program blocks

Similarly, copy other ABB drive libraries and paste it in **Program blocks**.



Figure 134 ABB drive libraries

5. In the Libraries pane, expand **ABB_Drives_TIA_Global_Library** -> **Master copies** and rightclick **DRIVE** (data types) and click **Copy**.



Figure 135 Drive data types

6. In the Project tree pane, right-click PLC data types and click Paste.



Figure 136 PLC data types

Note: After copying the libraries, right-click and click Close library in the global libraries pane.



Figure 137 Closing library

Adding PLC tags to S7-1200

1. In the Project tree pane, expand PLC tags and double-click Add new tag table to create symbols.

V۵	Siemens - C:\Project_Docs\TIA_Project	ct_B	ac	kups\TIA	_Lib_\$7-12	00\TIA_Lib_\$7-1	200			_ C	зx
Er	oject <u>E</u> dit <u>V</u> iew <u>I</u> nsert <u>O</u> nline (Optic	ns.	Tools	•	÷.		Totally Inte	grated Auto	omation	
	🛉 🎦 🛃 Save project 📕 🐰 💷 👔	×		ງ ະ ("ະ	* 🖥 🔛	ᡌݠᇛ╵				PORTAL	-
	Project tree		◀	C_1	[CPU 1212	C DC/DC/DC] 🕨				_ = = ×	
	Devices							🕣 Tags	🗉 User co	onstants	
			ł		÷ 📑 🖏	ΩX.					Tas
P		_		Tag	table_1						ks
Ē	▼ 🛅 TIA_Lib_S7-1200		^		Name			Data type	Address	Retain	
E E	💕 Add new device			1	<add r<="" td=""><td>new></td><td></td><td></td><td></td><td></td><td>Ш</td></add>	new>					Ш
b	📥 Devices & networks										151
12	▼ 🛐 PLC_1 [CPU 1212C DC/DC/DC]										P .
12	Device configuration		=								S
	🛂 Online & diagnostics										
	Program blocks										
	Technology objects										
	External source files										
	🔻 🎑 PLC tags										
	lange Show all tags										
	💣 Add new tag table										
	💥 Default tag table [29]										
	le Symbols [212]										
	lag table_1 [0]										
	PLC data types										
	Watch and force tables										
	🕨 🙀 Online backups										
	Program info	- r	~		:					>	
	> Details view					Reporties	1	nfo 追 🎖 Dia	gnostics		1
	Portal view Derview	v		💺 Tag	table_1		✓ The	library was closed			

Figure 138 New tags table for S7-1200

2. Add tag Name, Data type and Address to connect block inputs and outputs.

🌃 Siemens - C:\Project_Docs\TIA_Project_Backups\TIA_Lib_S7-1200\TIA_Lib_S7-1200 💷 🗖											
Project	t <u>E</u> dit View Insert Online Op Galactic Contraction Contra	otio <u>n</u> s X)	<u>T</u> ools 2 (~ 1	ŀ		Totally Inte	grated	Automati PO	on RT/	٩L
Pro	oject tree		◀	[Cl	PU	1212C DC/DC/DC] PLC tag	ıs ► Symbol	ls [212] 🗕 🗖		×
	Devices						🕣 Tags	🗉 Us	er consta	nts	1
-	00	•	•	÷.	ñ¢	🖻 😤 🗰					as
2		_		S	ymł	pols					Ks
i i i	🔻 🛃 Program blocks		^			Name	Data type		Address 🔺		
E .	📑 Add new block			1	-	FALSE	Bool		%M10.0		~
ligo	🏣 Main [OB1]			2	-	TRUE	Bool		%M10.1		
ā.	POKE [FC1]			3	-	EMG_Stop	Bool		%M10.2		ie i
F	POKE_BLK [FC2]			4	-	Coast_Stop	Bool		%M10.3		S S
	ABB_DRIVE_CONTROL_FB		=	5	-	ENABLE_FB500_D1	Bool		%M99.7		
	ACS_DRIVE_PARA [FB501]			6	-	SWICTH_ON_D1	Bool		%M100.0		
	ACS_DRIVE_PZD [FB502]			7	-	START_D1	Bool		%M100.1		
	🕨 🙀 Technology objects			8	-	RESET_D1	Bool		%M100.2		
	External source files			9	-	STOPPED_D1	Bool		%M102.0		
	🔻 浸 PLC tags			10	-	RUNNING_D1	Bool		%M102.1		
	🗞 Show all tags			11	-	FAULT_D1	Bool		%M102.2		
	💣 Add new tag table			12	-	WARNING_D1	Bool		%M102.3		
	<table-of-contents> Default tag table [29]</table-of-contents>			13	-	LOCAL_CTRL_D1	Bool		%M102.4		
	la Symbols [212]			14	-	DONE_D1	Bool		%M102.5		
	🍓 Tag table_1 [0]			15	-	ERROR	Bool		%M102.6		
	PLC data types			16	-	SPEED_REF1_D1	Int		%MW104		
	Watch and force tables			17	-	SPEED_ACT_D1	Int		%MW106		~
<		>	Ť		<					>	
>	Details view					Properties	🔒 🗓 Diag	gnostic	s ī		^
•	Portal view 🔛 Over	b Dev	vi		Mai	in 🖳 Sym 🗸 The libi	rary was closed.				

Figure 139 Symbols

For information on Data types of tags, see sections *Block variables and data types for FB500* (page 130), *Block variables and data types for FB501* (page 135) and *Block variables and data types for FB502* (page 141).

FB500 ABB_DRIVE_CONTROL_FB

FB500 is used to control the drive (start, stop, reset, emergency stop, speed reference, etc.).

Note! The following description is an example, there are different ways to use the Control function block.

1. In the Program blocks, double-click **Main [OB1]** and create memory bits for logic True and logic False.



Figure 140 Logic TRUE/FALSE

2. Right-click in the next free network and choose Insert empty box.

N	etwork 3:	
Cor	mment	
	Define tag	Ctrl+Shift+I
	Rename tag	Ctrl+Shift+U
	Rewire tag	Ctrl+Shift+P
Ж	Cut	Ctrl+X
È	Сору	Ctrl+C
Ē	Paste	Ctrl+V
×	Delete	Del
	Go to	•
	Cross-reference i	nformation
ьġ	Insert network	Shift+F2
??	Insert empty box	Shift+F5
	Insert input	Ctrl+Shift+3

Figure 141 Inserting empty box

3. Write FB500 in the block field to create an instance of FB500.

,	Network 3:
	Comment
	FB500
	<no tags="" used=""></no>

Figure 142 Instance of FB500

4. Create a **unique** Data block for the control of the drive by enabling **Manual** option and by selecting the Number.





Drive status, inputs and outputs of the function block are stored in this Data block. Since it is a new Data block, you have to generate it by clicking **OK** in the pop-up window.

Note! If you add more drives to the program, make sure to create new unique Data blocks.

5. Connect the block inputs and outputs to variables according to your application.

Note! Select a block input or output and see more information in the Info.

Block variables and data types for FB500

Block variable	Data type	Comment
EN	BOOL	Enabling block. FALSE = block code is not executed. TRUE or unconnected = block code is executed.
PPO_TYPE	INT	The PPO type. 1, 2, 3, 4, 5 or 6; 0 = not allowed.
ADAPTER_TYPE	INT	PROFIBUS module type: FPBA-01 PROFIBUS DP module connected in the drive. 1=FPBA (or FENA), 2=RPBA (or RETA).
DRIVE_TYPE	INT	Drive type: ACS800=1, ACSM1=2, ACS350=3, ACS355=4, ACS550=5, ACS850=6, ACS880=7, ACS580=8, ACS380=9.
DPV_MODE	BOOL	FALSE=DP-V0 ¹ , TRUE=DP-V1 ² (or PROFINET).
ADR_IN	HW_IO	Hardware ID of the module from which the data is to be read. The hardware ID can be found in the properties of the module in the device view or system constants (PLC tags -> Default tag table -> System constants).
ADR_OUT	HW_IO	Hardware ID of the module to which the data is to be written. The hardware ID can be found in the properties of the module in the device view or system constants (PLC tags -> Default tag table -> System constants).
SWITCH_ON	BOOL	FALSE=Drive control switched off, TRUE=Drive control switched on. After an EMERGENCY STOP a new rising edge of SWITCH_ON is needed before next start. SWITCH_ON also needs to be active (TRUE) for resetting drive faults.
START	BOOL	FALSE=Ramp stop with deceleration time according to drive parameter, TRUE=Start. Drive start via fieldbus requires parameter setting in the drive.
EMCY_STOP	BOOL	FALSE=Emergency stop according to emergency stop deceleration time set in drive parameter, TRUE=Normal operation.
COAST_STOP	BOOL	FALSE=Normal operation, TRUE=Coast stop (drive releases control of the motor).
EXT_CTRL	BOOL	Selection of external control location EXT2. FALSE=EXT1, TRUE=EXT2. Shifting to EXT2 via fieldbus requires parameter setting in the drive.

¹To work on library block in DP-V0 mode, user need to configure the drive with DP-V0 GSD file in hardware configuration of TIA portal.

² To work on library block in DP-V1 mode, user need to configure the drive with DP-V1 GSD file in hardware configuration of TIA portal.

SPEED_REF	INT	Speed reference value: -20000 to 20000. See chapter "Drive
		configuration" for scaling. Setting speed reference via fieldbus requires
		parameter setting in the drive.
RESET	BOOL	FALSE=No operation, TRUE =Reset drive fault.
DONE	BOOL	FALSE=Block execution not finished, TRUE=Block execution finished.
ERR	BOOL	FALSE=No error, TRUE=Error occurred during block execution.
ERNO	INT	Error code when ERR=TRUE, see SIMATIC online help for SFC14 or
		SFC15.
STOPPED	BOOL	FALSE=Drive is not stopped, TRUE=Drive is stopped.
RUNNING	BOOL	FALSE=Drive is not running, TRUE=Drive is running and following the
		speed reference value.
FAULT	BOOL	FALSE=No drive fault active, TRUE=Drive fault active.
WARN	BOOL	FALSE=No drive warning active, TRUE=Drive warning active.
EXT_RUN_ENAB	BOOL	FALSE=No external run enable signal received in the drive,
LE		TRUE=External run enable signal received in the drive.
	DOOL	
	BOOL	FALSE=Remote control (normal mode), IRUE=Local control (e.g. drive
		control panel of period in local mode)
EXT_CTRL_LOC	BOOL	Actual control place, FALSE=EXT1, TRUE=EXT2.
2		
		Drive estual encode 20000 to 20000. Case sharter "Drive configuration"
ACI_SPEED		Drive actual speed: -20000 to 20000. See chapter Drive configuration
		for scaling.
MSW	WORD	Drive main status word. See actual fieldbus adapter manual for detailed
		description.
MOW		
	WURD	Drive main control word. See actual fieldbus adapter manual for detailed

Example 1: The Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB_1* and an ACS355 with FPBA-01 PROFIBUS module in DP-V0 mode has been used.



Figure 144 Example FPBA-01

Example 2: The Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB* and an ACS880 with FENA-11 PRONET module has been used.



Figure 145 Example FENA-11

6. Click Save to save to the project.



Figure 146 Save project

After saving and compiling, download the program to a PLC.

To set the drive in standby mode and run mode, see sections *Setting the drive in standby mode* (page 55) and *Setting the drive in run mode* (page 55).

To add watch and force tables, see section Adding watch and force tables (page 98).

FB501 ACS_DRIVE_PARA

FB501 is used to read/write extra parameters between the PLC and the drive.

- 1. Right-click in the next free network and choose **Insert empty box**.
- 2. Write **FB501** in the block field to create an instance of FB501 (*FC500 ACS_DRIVE_PARA* is included in the ABB library ABB_DRIVE_LIB).

•	Network 3:
	Comment
	FB501 IN OUT ***



3. Create a **unique** Data block by enabling **Manual** option and by selecting the Number.





Drive parameter number, its value are stored in the Data block. Since it is a new Data block, you have to generate it by clicking **OK** in the following pop-up window.

4. Connect the FB501 block inputs and outputs.

Block variables and data types for FB501

Block variable	Data	Comment
	type	
ADR_IN	HW_IO	 Hardware ID of the module from which the data is to be read. The hardware ID can be found in the properties of the module in the device view or system constants (PLC tags -> Default tag table -> System constants). DP-V0: Hardware ID of the module must be provided and DPV_Mode flag should be False in FB500 block. DP-V1 (or PROFINET): Hardware ID or 0 and
		<i>DPV Mode</i> flag must be <i>True</i> in FB500 block.
ADR_OUT	HW_IO	 Hardware ID of the module to which the data is to be written. The hardware ID can be found in the properties of the module in the device view or system constants (PLC tags -> Default tag table -> System constants). DP-V0: Hardware ID of the module must be provided and DPV_Mode flag should be False in FB500 block. DP-V1 (or PROFINET): Hardware ID or 0 and
		<i>DPV_Mode</i> flag must be <i>True</i> in FB500 block
READ	BOOL	Read the parameter value 0 -> 1 (executed on positive edge).
WRITE	BOOL	Write the parameter value 0 -> 1 (executed on positive edge).
PARAM_NUM	DINT	Read/written parameter: 3 numbers = group, 2 numbers = Index. For example, Par 20.06 = 2006.
VALUE_IN	DINT	Parameter value to be written.
DRIVE	DB_ANY	Instance Data Block. The drive variable is used for identifying to which drive FB501 ACS_DRIVE_PARA belongs. The Instance Data Block of FB500 ABB_DRIVE_CONTROL_FB must correspond to the variable FB501 ACS_DRIVE_PARA.
THIS_BLOCK_DB	DB_ANY	Instance data block of FB501. Note: POKE (FC1) and POKE_BLK (FC2) are used in FB501 block logic to exchange data between FB500 and FB501.
DONE	BOOL	FALSE=Block execution not finished, TRUE=Block execution finished.
ERR	BOOL	FALSE=No error, TRUE=Error occurred during block execution.
ERNO	WORD	Error code when ERR=TRUE.
BUSY	BOOL	FALSE=No operation active, TRUE=Operation active.
PARAM_NUM_OUT	DINT	Handled parameter number: 3 numbers = group, 2 numbers = index; for example, Par 20.06 = 2006.
VALUE OUT	DINT	Read parameter value.

To configure ADR_IN and ADR_OUT inputs in DP-V0, user has to provide the hardware ID of the PPO type which is configured.

² roject1200PLC ▶	PLC_1 [CPU 1212C DC/DC/DC] > Distribute	d I/O ♪	DP-Mas	tersystem (1): PROFI	BUS_1 →	Slave	_3	
			📇 Торо	ology view 🛛 🏪 Ne	twork vie	w [🅇 Devi	ce view
Slave_3	🔽 🖽 🔛 🗮 🔍 ±		Device	overview				
			**	Module		Rack	Slot	I address
				Slave_3		0	0	
	3			PPO-05, 4 PKW + 10	PZD_2_1	0	1	276283
	daver			PPO-05, 4 PKW + 10	PZD_2_2	0	2	336355
					(0	3	
		1			(0	4	
						0	5	
					(0	6	
	РРВА-01							
<	> 100%	•	<					>
PPO-05, 4 PKW + 10	PZD_2_1 [Module]		🔍 Pr	operties 🚺 Info	追 🎖 Di	agnost	tics	
General IO ta	ags System constants Texts							
General I/O addresses	Hardware identifier							
Hardware identifier	Hardware identifier							
	Hardware identifier:	283						

Figure 149 ADR_IN input in DP-V0

Project tree			U 121	2C DC/DC/DC] PLC tags	Default	t tag table [46]		ТX
Devices				🕣 Tags 🔳 Use	r constan	its 🗶 System	m constants	;
	1	·					E	3
)efau	t tag table				
▼ 1 PLC_1 [CPU 1212C DC/DC/	^	•	N	ame		Data type	Value	
Device configuration		29		lave_1~PPO-060_PKW_+_10_PZ	ZD_1	Hw_SubModule	291	^
Q Online & diagnostics		30	ء چ	lave_2~Head		Hw_Interface	294	
🕨 🛃 Program blocks		31	<u>,</u> 9	lave_2~DPSlave		Hw_DpSlave	292	
🕨 🙀 Technology objects		32	ء چ	lave_2~PPO_Type_5_2_1		Hw_SubModule	295	
External source files	_	33	ء 👳	lave_2~PPO_Type_5_2_2		Hw_SubModule	296	
🔻 🚂 PLC tags	=	34	ء چ	lave_3~Head		Hw_Interface	282	
lage Show all tags		35		lave_3~DPSlave		Hw_DpSlave	280	
📫 Add new tag table		36	2 چ	lave_3~PPO-054_PKW_+_10_PZ	ZD_2_1	Hw_SubModule	283	
💥 Default tag table [46]		37	7 📮 Slave_3~PPO-054_PKW_+_10_PZD_2_2 Hw_SubM				284	~
Symbols [212]			<				:	>
PLC data types		Slav	/e 3~	PPO- Proportion 7	Info 🔒	Diagnostic		
Watch and force tables					, inito 🛄	Diagnostic	s	
🕨 📴 Online backups		Ge	enera					
🔤 Program info			Con	stant				~
Device proxy data		5	C	noral				
Text lists		- <u>a</u>	G	eneral				
Local modules		a vi		Name	Claure 2 D		10 970 2 1	_
Distributed I/O		8		Name.	Slave_S~FI	-0-054_FKW_+_	10_F20_2_1	-
🕨 🙀 Common data 🛛 👻		E E		Data type:	Hw_SubMo	odule		_
< III >		ĝ		Value:	283			-
> Details view			<				:	>

Figure 150 System constants

For further information, see the examples.

Example 1: The Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB_1* and instance data block of FB501 *ACS_DRIVE_PARA* has been named *ACS_DRIVE_PARA_DB_1* and ACS355 with FPBA-01 PROFIBUS module in DP-V0 mode has been used.



Figure 151 Example FB501 DP-V0



Figure 152 Example FB501 DP-V0

Example 2: The Instance Data Block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB* and instance data block of FB501 has been named *ACS_DRIVE_PARA_DB* and ACS355 with FENA-11 PROFINET module has been used.



Figure 153 FB501 PROFINET

5. In the Project tree, right-click PLC_1 (CPU) and select **Properties** to execute read/write parameter value (0 -> 1 (executed on positive edge).

Project tree					
Devices					
B O O B					
🔻 📋 LibTestProject1200P	LC				
💣 Add new device					
📩 Devices & netwo	rks				
🔻 🧖 PLC_1 [CPU 1212	C DC/DC/DC]			
🕎 Device config	Open			Export module la	abeling strips
🞖 Online & diag	Open ir	n new editor		Properties	Alt+Enter
🕨 🛃 Program bloc	Open b	lock/PLC data type	F7		
🕨 🙀 Technology o	X Cut		Ctrl+X		
🕨 🔚 External sour	🛅 Copy		Ctrl+C		
🕨 🛺 PLC tags	💼 Paste		Ctrl+V		
PLC data type	X Delete		Del		
Watch and for	Renam	e	F2		
🕨 🛐 Online backu	The second second	pologyview			
Program info		etwork view			
Device proxy		curon new			
Text lists	Compil	e	•		
Local module	Downlo	ad to device	•		
Distributed I/0	Backup	from online device			

Figure 154 Clock memory properties

6. In the PLC_1 (CPU) window, click **System and clock memory** and enable **Enable the use of clock memory byte**, assign memory address (example, 600) and click **OK**.

General IO tags	Syste	n constants Texts	
r General Project information	^	Always 0 (low):	
PROFINET interface		Clock memory bits	of clock memory
AI 2 High speed counters (HSC)		Address of clock memory byte (MBx): 600	
Pulse generators (PTO/PWM) Startup	•	10 Hz clock: %M600.0 5 Hz clock: %M600.1	
Communication load		2.5 Hz clock: %M600.2 (Clock_2	2.5Hz)
Web server Time of day		1.25 Hz clock: %M600.4 (Clock_1	.25Hz)
Protection	~	< III	>

Figure 155 Clock memory

After saving and compiling, download the program to a PLC.

FB502 ACS_DRIVE_PZD

FB502 is used to send additional process data between the PLC and the drive.

Depending on actual PPO type, a certain number of data words (PZDs) are exchanged. PPO types 1 and 3 have only 2 PZDs in each direction, so FB502 (*ACS_DRIVE_PZD*) is not useful for those types. PPO types 2 and 4 have 6 PZDs in each direction, so a part of FB502 (PZD3 to PZD6) is useful here. PPO types 5 and 6 have 10 PZDs in each direction, so the full range of FB502 is useful for those types.

- 1. Right-click in the next free network and choose **Insert empty box**.
- 2. Write **FB502** in the block field to create an instance of FB502.

•	Network 4:
	Comment
	FB502

Figure 156 FB502

3. Create a **unique** Data block by enabling **Manual** option and by selecting the Number.

🔻 🕃 Neti	work 3:			
Com	ment			Call options X
		<pre></pre> <pre>%FE %ACS_DF EN PZD3_OUT PZD4_OUT PZD5_OUT PZD6_OUT PZD7_OUT PZD8_OUT PZD9_OUT PZD9_OUT PZD10_OUT </pre>	<pre>?> S502 INVE_PZD" ENO PZD2_SCALED PZD3_SCALED PZD4_SCALED PZD6_SCALED PZD6_SCALED PZD7_SCALED PZD8_SCALED PZD9_SCALED</pre>	Data block Name ACS_DRIVE_PZD_DB Number Image: Comparison of the second seco
		Drive THIS_BLOCK_DB	PZD10_SCALED	 OK Cancel



Drive additional process data values are stored in the Data block. Since it is a new Data block, you have to generate it by clicking **OK** in the following pop-up window.

4. Connect the FB502 block inputs and outputs.

	2 1	
Block variable	Data type	Comment
PZD3_OUT	INT	Write PZD3 value to the drive
PZD4_OUT	INT	Write PZD4 value to the drive
PZD5_OUT	INT	Write PZD5 value to the drive
PZD6_OUT	INT	Write PZD6 value to the drive
PZD7_OUT	INT	Write PZD7 value to the drive
PZD8_OUT	INT	Write PZD8 value to the drive
PZD9_OUT	INT	Write PZD9 value to the drive
PZD10_OUT	INT	Write PZD10 value to the drive
PZD2_SCALED	REAL	Read PZD2 (actual speed / ACT) value from the drive, the default
	DEAL	scaling value corresponds to -20 000 to 20 000 -> -100 to 100
PZD3_SCALED	REAL	Read P2D3 value from the drive, the default scaling value is 1 = no scaling
PZD4_SCALED	REAL	Read PZD4 value from the drive, the default scaling value is 1 = no
PZD5_SCALED	REAL	Read PZD5 value from the drive, the default scaling value is 1 = no Scaling
PZD6_SCALED	REAL	Read PZD6 value from the drive, the default scaling value is 1 = no Scaling
PZD7_SCALED	REAL	Read PZD7 value from the drive, the default scaling value is 1 = no Scaling
PZD8_SCALED	REAL	Read PZD8 value from the drive, the default scaling value is 1 = no Scaling
PZD9_SCALED	REAL	Read PZD9 value from the drive, the default scaling value is 1 = no Scaling
PZD10_SCALED	REAL	Read PZD10 value from the drive, the default scaling value is 1 = no scaling
Drive	DB_ANY	Instance Data Block. The drive variable is used for identifying to which drive FB502 ACS_DRIVE_PZD belongs. The Instance Data Block of FB500 ABB_DRIVE_CONTROL_FB must correspond to the variable FB502 ACS_DRIVE_PZD.
THIS_BLOCK_DB	DB_ANY	Instance data block of FB502. Note: POKE (FC1) and POKE_BLK (FC2) are used in FB502 block logic to exchange data between FB500 and FB502.

Block variables and data types for FB502

In the example below, the Instance Data block of FB500 *ABB_DRIVE_CONTROL_FB* has been named *ABB_DRIVE_CONTROL_FB_DB_1* and instance Data block of FB502 has been named *ACS_DRIVE_PZD_DB_1* and ACS355 with FPBA-01 PROFIBUS module is been used.



Figure 158 Example FB502

If you want to scale Process Data values, set the scaling values in the program before calling FB502 *ACS_DRIVE_PZD* block. See example below where PZD3 is scaled with the value 100.



Figure 159 Scaling process data values

For more information on mapping fieldbus process data parameters of the drive according to the application, see section *Scalable variables and data types* (page 61).

After saving and compiling, download the program to a PLC.

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to <u>www.abb.com/searchchannels</u>.

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For information on ABB product training, navigate to <u>new.abb.com/service/training</u>.

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