

PumpSmart[®]

Control Solutions

PS200 v5

Fieldbus Communication Configuration Guide



Monitoring and Control

Fieldbus Control

The use of Fieldbus control modules allows selected PumpSmart parameters and operating signals to be accessed and modified.

Fieldbus control modules are available in numerous communication protocols, including: DeviceNet, Modbus, Profibus, ControlNet and Ethernet.

Refer to the ABB Hardware Manual and Control Module manual that accompanies each Fieldbus module. Also refer to the parameter listing in Appendix A-3 in the PS200 Configuration Guide for Group 3 Status Words and PumpSmart Word and Bit Breakdown.

Any parameter changes that are made using a Fieldbus control system must be saved to the drive.

Parameter	Name	Value/Range	Note(s)
10.04	PARAMETER SAVE	DONE <i>[default]</i> SAVE	Parameters that are manually entered through the keypad are automatically saved, only parameters entered through a Fieldbus connection must be saved. To save, select SAVE and press the ENTER key or write to parameter 10.04 using digital communication to SAVE.

NOTE - Changes made to any Fieldbus parameters will be in effect only by restarting the drive or by performing a parameter refresh using parameter 31.27

Drive Control

Using a Fieldbus adapter drives can receive control information (Start, Stop, and Reference) over the network. Set up the parameters in group 12 to start /stop the drive via Fieldbus and group 16 to send a reference to the drive over Fieldbus.

Parameter Number	Parameter Name	Default value	Required Value	Available Options
12.01	START / STOP	2WIRE DI1	FIELDBUS	2 WIRE DI1 3 WIRE DI1,2 FIELDBUS
16.02	SETPOINT 1 SEL	KEYPAD	FIELDBUS	KEYPAD ANALOG INPUT FIELDBUS

Control Word

The control word is the information sent to the drive from the Fieldbus system. It is the principal means of controlling the drive from a Fieldbus system. The control word is used to start / stop the drive, reset faults on the drive and switch between references. The control word can be viewed on the keypad at parameter 3.01 MAIN CTRL WORD

Status Word

The status word is the information sent to the Fieldbus system by the drive. It gives drive status information (Enabled, Running, Stopped, Local / remote). The status word can be viewed on the keypad at parameter 3.02 MAIN STATUS WORD

Communication Profile

The communication profile determines the bit coded composition of the control and status words. The communication profile is set in parameter 31.03 COMM PROFILE. To communicate with the Fieldbus system, it is required that parameter 31.03 COMM PROFILE to be set to CSA2.8/3.0 COMM PROFILE

CSA2.8 /3.0 COMM PROFILE

Control Word
CSA 2.8/3.0

Bit	Name	Description
0	RESERVED	
1	ENALBED	0 = Coast to Stop
		1 = Enabled
2	RESERVED	
3	START/STOP	0 = Stop
		1 = Start
4	RESERVED	
5	REF SELECT	0 = Reference 1 1 = Reference 2
6	RESERVED	
7	RESERVED	
8	RESET FAULT	0 → 1
9	RESERVED	

Status Word
CSA 2.8/3.0

Bit	Name	Description
0	READY	0 = Initializing, or initialization error
		1 = Ready to start
1	ENALBED	0 = Coast to Stop
		1 = Enabled
2	RESERVED	
3	RUNNING	0 = Stopped
		1 = Running with selected setpoint
4	RESERVED	
5	REMOTE	0 = Drive in Local Mode
		1 = Drive in Remote Mode
6	RESERVED	
7	At Setpoint	0 = Drive not at Setpoint
		1 = Drive at Setpoint
8	FAULTED	0 = No active faults
		1 = A Fault is active
9	WARNING	0 = No active warning
		1 = A Warning is active
10	LIMIT	0 = Drive not at Limit
		1 = Drive at Limit

Modbus Communication

With a RMBA-01 Modbus adapter, the PS200 can interface with other systems using the Modbus protocol. Communication is half duplex and the RMBA-01 provides a galvanically-isolated RS-485 interface. The RMBA-01 Modbus module needs to be installed in slot 1 on the drive. Refer to the *Modbus Adapter Module RMBA-01 user's manual* for mechanical and electrical installation procedures.

Parameter setup

Set up the following parameters in the drive to establish basic communication between the PS200 and the control system.

Parameter Number	Parameter Name	Default value	Required Value	Available Options
30.01	FIELBUS	NO	STD MODBUS	
30.03	COMM PROFILE	CSA2.8 /3.0	CSA2.8 /3.0	
52.01	STATION NUMBER	1	USER DEFINED	Range 1 - 247
52.02	BAUD RATE	9600	USER DEFINED	600 1200 2400 4800 9600 19200
52.03	PARITY	ODD	USER DEFINED	ODD EVEN NONE1STOPBIT NONE2STOPBIT

NOTE: Changes made to any Fieldbus parameters will be in effect only by restarting the drive or by performing a parameter refresh using parameter 31.27

Register Read & Write

The drive parameters and data set information are mapped into a 4xxx register area. This holding register area can be read from an external device, and an external device can modify the register values by writing to them. There are no setup parameters for mapping the data to the 4xxx register. The mapping is pre-defined and corresponds directly to the drive parameter grouping which is being used by the local drive panel. Some parameters never allow writing (e.g. actual values), some parameters allow writing only when the drive is stopped (e.g. start / stop options), and some can be modified at any time (e.g. reference values).

Register mapping

The drive parameters are mapped to the 4xxx area such that:

- 40001 – 40096 are reserved for data sets.
- 40101 – 49999 are reserved for parameters.

In this mapping, the thousands and hundreds correspond to the group number, while the tens and ones correspond to the parameter number within a group.

Example: Parameter 12.01 will reside at address location 41201.

Data communication from Control System to the PS200

Apart from the control word and references (setpoints) the PS200 can be setup to receive data for 3 drive parameters. These parameters can be setup in group 92.

Contents	Register Address	Selection
Control Word	40001	Fixed
Reference 1 (Setpoint 1)	40002	Fixed
Reference 2 (Setpoint 2)	40003	Fixed
AUX DS REF3	40007	Value written to parameter based on setting of Parameter 90.01
AUX DS REF4	40008	Value written to parameter based on setting of Parameter 90.02
AUX DS REF5	40009	Value written to parameter based on setting of Parameter 90.03

Example: If parameter 92.01 is set 1401 (Maximum Speed) then by writing to register 40007 the value of parameter 14.01 can be changed. The same function can be performed by writing to register 40102.

Data from the PS200 to the Control System

Apart from the status word, the PS200 can be setup to send information on 5 preset drive parameters. These parameters can be setup in group 92.

Contents	Register Address	Selection
Status Word	40004	Fixed
Actual Signal 1	40005	Value returned based on setting of Parameter 92.02
Actual Signal 2	40006	Value returned based on setting of Parameter 92.03
Actual Signal 3	40010	Value returned based on setting of Parameter 92.04
Actual Signal 4	40011	Value returned based on setting of Parameter 92.05
Actual Signal 5	40012	Value returned based on setting of Parameter 92.06

Example: If parameter 92.02 is set 102 (Motor Speed) then register 40005 will always contain the value for parameter 1.02 MOTOR SPEED. The same function can be performed by polling register 40102.

Parameter setup

Set up the following parameters in the drive to establish basic communication between the PS200 and the control system.

Parameter Number	Parameter Name	Default value	Required Value	Available Options
30.01	FIELBUS	NO	FIELDBUS	NO FIELDBUS STD MODBUS ADVANT
30.03	COMM PROFILE	CSA2.8 /3.0	CSA2.8 /3.0	CSA2.8 / 3.0 ABB DRIVES GENERIC
31.01	MODULE TYPE		RPBA-01	This parameter configures the module automatically by the Fieldbus adapter. No action is required by the user unless changes to the default settings are desired
31.02	NODE ADDRESS	1	USER DEFINED	0 to 126
31.03	BAUD RATE	1500	USER DEFINED	12000 = 12 Mbit/sec 6000 = 6 Mbit/sec 3000 = 3 Mbit/sec 1500 = 1.5Mbit/sec 500 = 500 Kbit/sec 187 = 1.5Mbit/sec 93 = 93.75 Kbit/sec 45 = 45.45 Kbit/sec 19 = 19.2 Kbit/sec 9 = 9.6 Kbit/sec
31.04	PPO TYPE	1	USER DEFINED	PPO TYPE 1 PPO TYPE 2 PPO TYPE 3 PPO TYPE 4 PPO TYPE 5

NOTE - Changes made to any Fieldbus parameters will be in effect only after restarting the drive or by performing a parameter refresh using parameter 31.27

Devicenet and ControlNet Communication

With a RDNA-01 Devicenet adapter, the PS200 can communicate over a network that is using the Devicenet protocol. The RDNA-01 Devicenet adapter needs to be installed in slot 1 on the drive. The PS200 is considered a slave on the devicenet network. Refer to the *Devicenet Adapter Module RDNA-01 user's manual* for mechanical and electrical installation procedures.

With a RCNA-01 ControlNet adapter, the PS200 can communicate over a network that is using the ControlNet protocol. The RCNA-01 ControlNet adapter needs to be installed in slot 1 on the drive. The PS200 is considered a slave on the ControlNet network. Refer to the *ControlNet Adapter Module RCNA-01 user's manual* for mechanical and electrical installation procedures.

EDS File

The EDS file identifies the properties of the device to the Devicenet or ControlNet network and can be downloaded at www.itm.com. Refer to DCS / PLC documentation for instructions on installation of the EDS file.

Mac ID Selection

The Mac ID for the PS200 can be either set by using the node address selectors or by setting the address in parameter 31.02. Each device on the network should have a unique Mac ID. When parameter 31.04 is set to Hardware (0) the Mac ID is set using the dip switches only. Refer to the *user's manual* and see chapter: Electrical installation.

* Note: Set the node address selectors to 0 if using parameter 31.02 for node address selection

Baud Rate

The baud rate for the network should be set up using parameter 31.03. This is user selectable but every node on the network be setup to communicate at the same baud rate.

VSA I/O

Parameter 31.26 defines the length of the vendor specific assembly in words.

Output I/O Par

These are the data words / parameters that can be written to with the assembly object instance 102.

Input I/O Par

These are the data words / parameters that can be read with the assembly object instance 103.

The drive parameters and data set information are mapped in a XYY format. In this mapping, the XX corresponds to the group number, while the YY corresponds to the parameter number within the group.

Parameter setup

Parameter Number	Parameter Name	Default value	Required Value	Available Options
30.01	FIELBUS	NO	FIELDBUS	NO FIELDBUS STD MODBUS ADVANT
30.03	COMM PROFILE	CSA2.8 / 3.0	CSA2.8 / 3.0	CSA2.8 / 3.0 ABB DRIVES GENERIC
31.01	MODULE TYPE		RDNA-01	This parameter configures the module automatically by the Fieldbus adapter. No action is required by the user unless changes to the default settings are desired
31.02	MAC ID	63	USER DEFINED	0 to 63
31.03	BAUD RATE	0	USER DEFINED	0 = 125 kbit/sec 1 = 250 kbit/sec 2 = 500 kbit/sec
31.04	HW/SW Option	0	USER DEFINED	0 = Hardware 1 = Software
31.05	Stop Function	0	USER DEFINED	0 = Ramp Stop 1 = Coast Stop
31.06	Output Instance	20	102	None
31.07	Input Instance	70	103	None
31.26	VSA I/O Size	4	USER DEFINED	1 to 9

NOTE - Changes made to any Fieldbus parameters will be in effect only after restarting the drive or by performing a parameter refresh using parameter 31.27

Ethernet Communication

With a RETA-01 Ethernet adapter, the PS200 can communicate over a network using the Modbus TCP or Ethernet IP protocols. The RETA-01 Ethernet adapter needs to be installed in slot 1 on the drive. Refer to the *Ethernet Adapter Module RETA-01 user's manual* for mechanical and electrical installation procedures.

Parameter setup

Parameter Number	Parameter Name	Default value	Required Value	Available Options
30.01	FIELBUS	NO	FIELDBUS	NO FIELDBUS STD MODBUS ADVANT
30.03	COMM PROFILE	CSA2.8 / 3.0	CSA2.8 / 3.0	CSA2.8 / 3.0 ABB DRIVES GENERIC
31.01	MODULE TYPE		RETA-01	This parameter configures the module automatically by the Fieldbus adapter. No action is required by the user unless changes to the default settings are desired
31.02	COMM RATE	(0) Auto Negotiate	USER DEFINED	0 = Auto Negotiate 1 = 100 Mbit /s , full duplex 2 = 100 Mbit /s , half duplex 3 = 10 Mbit /s , full duplex 4 = 10 Mbit /s , half duplex
31.03	DHCP	(1) DHCP ENABLED	USER DEFINED	0 = DHCP Disabled 1 = DHCP Enabled
31.04	IP ADDRESS 1	0	USER DEFINED	0 - 255
31.05	IP ADDRESS 2	0	USER DEFINED	0 - 255
31.06	IP ADDRESS 3	0	USER DEFINED	0 - 255
31.07	IP ADDRESS 4	0	USER DEFINED	0 - 255
31.08	SUBNET MASK 1	0	USER DEFINED	0 - 255
31.09	SUBNET MASK 2	0	USER DEFINED	0 - 255
31.10	SUBNET MASK 3	0	USER DEFINED	0 - 255
31.11	SUBNET MASK 4	0	USER DEFINED	0 - 255
31.12	GW ADDRESS 1	0	USER DEFINED	0 - 255
31.13	GW ADDRESS 2	0	USER DEFINED	0 - 255
31.14	GW ADDRESS 3	0	USER DEFINED	0 - 255
31.15	GW ADDRESS 4	0	USER DEFINED	0 - 255
31.16	PROTOCOL	MODBUS TCP	USER DEFINED	(0) = MODBUS TCP (1) = ETHERNET AC/DC (2) = ETHERNET IP / TRANSPERENT
31.19	OUTPUT 1	0	USER DEFINED	0 – 65535
31.20	OUTPUT 2	0	USER DEFINED	0 – 65535
31.21	OUTPUT 3	0	USER DEFINED	0 – 65535
31.22	OUTPUT 4	0	USER DEFINED	0 – 65535
31.23	INPUT 1	0	USER DEFINED	0 – 65535
31.24	INPUT 2	0	USER DEFINED	0 – 65535
31.25	INPUT 3	0	USER DEFINED	0 – 65535
31.26	INPUT 4	0	USER DEFINED	0 – 65535

NOTE(s) - Changes made to any Fieldbus parameters will be in effect only by restarting the drive or by performing a parameter refresh using parameter 31.27

Input and Output parameters are only effective if the Ethernet I/P protocol is selected in Parameter 31.16.



Monitoring and Control