

New Information

SVReadyE

SV9000 AF Drives

SVReady™ User Manual

Multi-Purpose Control Application

Description

This supplement to your SV9000 Multi-Purpose Control Application Manual provides new programming and setup information for the SVReadyE software shipped to you.

The SVReadyE software provides —

- 3 new parameters.
 - A keypad Stop button setting that is always active by default.
 - Single-phase input capability.
 - 120V I/O option board support.
 - Fieldbus communications
 - A modified 3-wire Start/Stop.
 - A Ramp to Stop default setting.
 - “Out of the Box” default control to the control panel.
- to the Multi-Purpose Control Application program.

Additions to Page 5-10

Group 2, Input signal parameters

Code	Parameter	Range	Step	Default	Custom	Description
2.23	Option board A _{in} 1 signal inversion	0—1	1	0		0 = No inversion 1 = Inverted
2.24	Option board A _{in} 1 signal filter time	0—10s	0.01s	0.1s		0 = No Filtering
2.25	Option board A _{in} 2 signal range	0—2	1	0		0 = 0—20 mA 1 = 4—20 mA 1 = 0—10 V
2.26	Option board A _{in} 2 signal inversion	0—1	1	0		0 = No inversion 1 = Inverted
2.27	Option board A _{in} 2 signal filter time	0—10s	0.01s	0.1s		0 = No Filtering
2.28	120V I/O option board	0—1	1	0		0 = No 1 = Yes

Changes and Additions to Page 5-12

Group 3, Output and supervision parameters

Code	Parameter	Range	Step	Default	Custom	Description
3.26	Analog output offset (basic control board)	-100—100%	1	100%		
3.27	I/O expander board (opt.) analog output offset	-100—100%	1	100%		
3.28	Digital output DO1 on delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use
3.29	Digital output DO1 off delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use
3.30	Relay output RO1 on delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use
3.31	Relay output RO1 off delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use
3.32	Relay output RO2 on delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use
3.33	Relay output RO2 off delay	0.00—320.00s	0.01s	0.00s		0.00 = delay not in use

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Group 4, Drive control parameters

Code	Parameter	Range	Step	Default	Custom	Description
4.7	Stop function	0—1	1	1		0 = Coasting 1 = Ramping
4.19	Keypad stop active	0—1	1	1		0 = No 1 = Yes

Changes and Additions to Page 5-13

Group 6, Motor control parameters

Code	Parameter	Range	Step	Default	Custom	Description
6.1	Motor control mode	0—1	1	0		0 = Frequency control 1 = OL Speed control 2 = OL Torque control

Additions to Page 5-14

Group 7, Protections

Code	Parameter	Range	Step	Default	Custom	Description
7.18	Input phase supervision	0—2	2	2		0 = No action 2 = Fault
7.19	Thermistor input of I/O Expander	0—2	1	2		0 = Not Used 1 = Warning 2 = Fault
7.20	Response to fieldbus fault	0—2	1	0		0 = No Action 1 = Warning 2 = Fault

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Group 9, Protections

Code	Parameter	Range	Step	Default	Custom	Description
9.1	Torque reference selection	0—2	1	0		0 = None 1 = V_{in} 2 = I_{in}
9.2	Torque reference scaling bias	-100—100%	1	0		0 = not in use
9.3	Torque reference scaling gain	-320—320%	1	100		100 = no scaling
9.4	Torque control time constant	1—1000 ms	1 ms	128 ms		
9.5	Torque control minimum operating limit	0—10.00 Hz	0.01 Hz	3.00 Hz		

Group 9, Fieldbus parameters

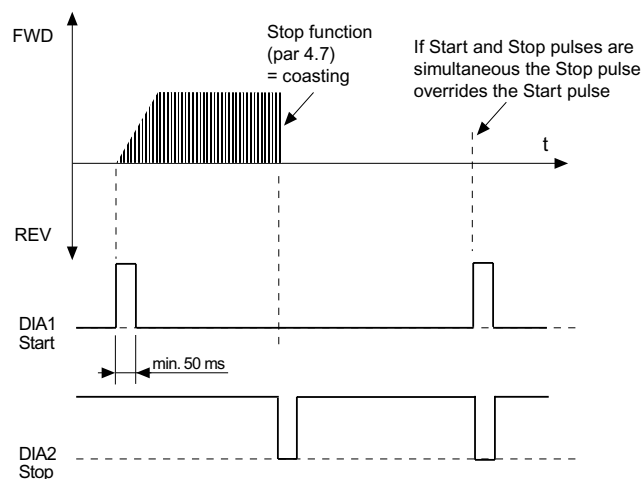
Code	Parameter	Range	Step	Default	Custom	Description
10.1	Fieldbus control select	0—1	1	0		0 = Control via I/O terminals 1 = Control via fieldbus board
10.2	DIC1 function (term. 301, fieldbus board)	0—1	0	1		0 = Fieldbus control 1 = External fault
10.3	Modbus slave address	1—247	1	1		
10.4	Baud rate	1—7	1	6		1 = 300 baud 2 = 600 baud 3 = 1200 baud 4 = 2400 baud 5 = 4800 baud 6 = 9600 baud 7 = 19200 baud
10.5	MB Parity type	0—2	1	0		0 = Fieldbus control 1 = External fault
10.6	Modbus time out	0—3600 s	1 s	0 s		0 = no time out
10.7	Profibus slave address	2—126	1	2		
10.8	Profibus baud rate	1—10	1	10		1 = 9.6 kbaud 2 = 19.2 kbaud 3 = 93.75 kbaud 4 = 187.5 kbaud 5 = 500 kbaud 6 = 1.5 Mbaud 7 = 3 Mbaud 8 = 6 Mbaud 9 = 12 Mbaud 10 = AUTO (automatic baud rate select)
10.9	Profibus PPO type	1—4	1	1		1 = PPO 1 2 = PPO 2 3 = PPO 3 4 = PPO 4
10.10	Profibus Process Data 1	0—99	1	1		
10.11	Profibus Process Data 2	0—99	1	2		
10.12	Profibus Process Data 3	0—99	1	3		
10.13	Profibus Process Data 4	0—99	1	99		
10.14	LonWorks Service Button	0—1	1	0		

Changes to Page 5-17

Parameter 2.1 Start/Stop logic selection

- 3:** 3-wire connection (pulse control):
 DIA1: closed contact = start pulse
 DIA2: **open** contact = stop pulse
 (DIA3 can be programmed for reverse command)
 See figure 2.5-3.

NOTE: If P2.1 = 0 (default), the drive will restart automatically if Run enable signal is removed and reapplied while maintaining the start input.
 If P2.1 = 3, a new start command must be issued to restart the drive if Run enable signal is removed and reapplied.



Additions to Page 5-22

2.23 Option board A_{in}1 signal inversion

Parameter 2.30 = 0, no inversion

2.24 Option board A_{in}1 signal filter time

Filters out disturbances from the incoming analog A_{in}1 signal. Long filtering time makes control response slower.

2.25 Option board A_{in}2 signal range

0 = 0—20 mA

1 = 4—20 mA

1 = 0—10 V (must be used with SV9ioC102CN)

2.26 Option board A_{in}2 signal inversion

Parameter 2.26 = 0, no inversion

2.27 Option board A_{in}2 signal filter time

Filters out disturbances from the incoming analog A_{in}1 signal. Long filtering time makes control response slower.

2.28 120V I/O option board

Supports the 120V I/O option board.

If parameter is set to "1," but the board is not installed, alarm A52 "Opt. Card not ins." will be displayed.

0 = No (board not used)

1 = Yes (board used)

Additions to Page 5-26

3.26 Analog output offset (basic control board)

3.27 I/O expander board (opt.) analog output offset

With these parameters the offsets of the basic control board and I/O-Expander analog outputs can be set. See figure 5.5-16a.

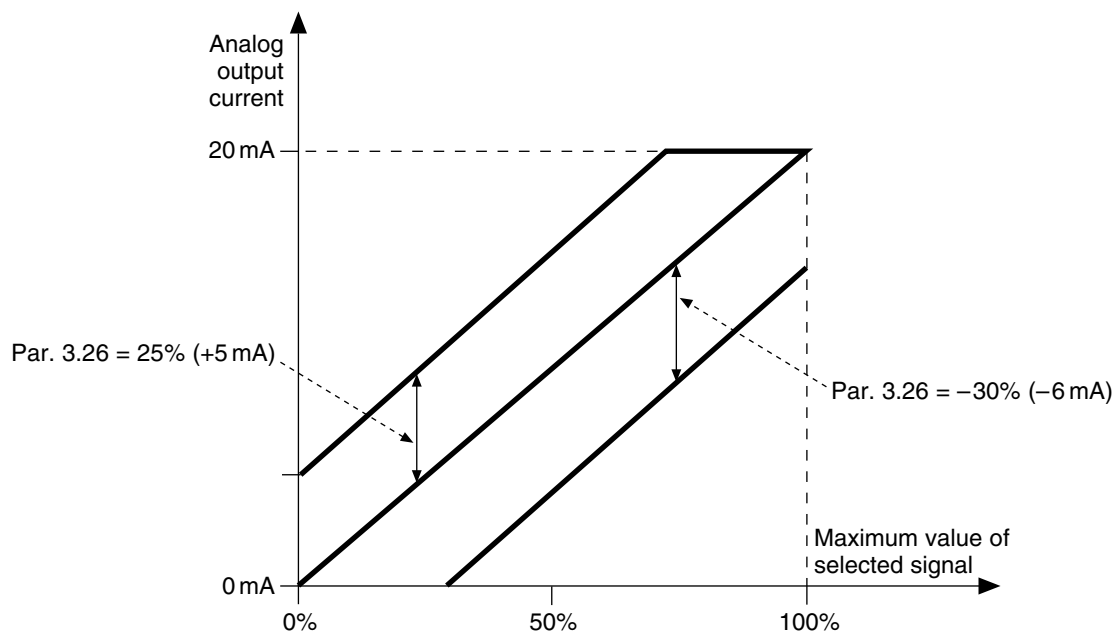


Figure 5.5-16a: Analog Output Offset

3.28 Digital output DO1 on delay

3.29 Digital output DO1 off delay

3.30 Relay output RO1 on delay

3.31 Relay output RO1 off delay

3.32 Relay output RO2 on delay

3.33 Relay output RO2 off delay

With these parameters it is possible to set on and off delays for the digital and relay outputs. See figure 5.5-16b.

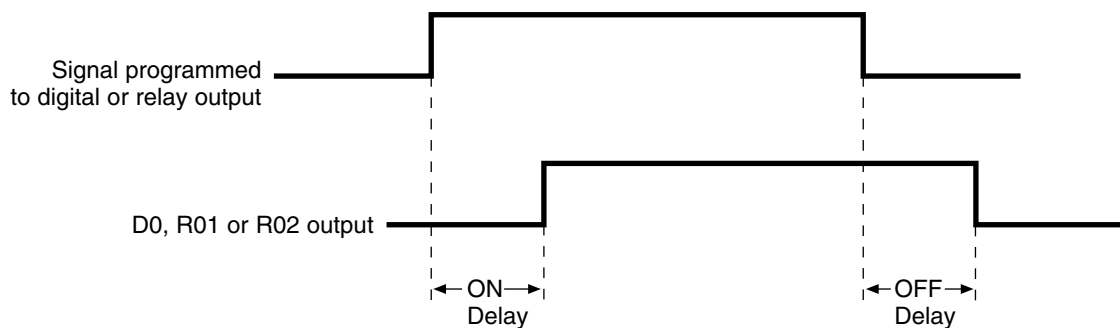


Figure 5.5-16b: Digital and relay output On and Off delays.

Additions to Page 5-29**4.19 Keypad stop active**

When set to “Yes,” the keypad Stop button will always be active. If set to “No,” the keypad Stop button is active only when the keypad is the active control source.

0 = No (keypad Stop button deactivated when remote control is active)

1 = Yes (keypad Stop button is always active)

Changes and Additions to Page 5-29**6.1 Motor control mode**

0 = Frequency control (V/Hz): The I/O terminal and panel references are frequency references and the drive controls the output frequency (output frequency resolution = 0.01 Hz)

1 = Speed Control The I/O terminal and panel references are speed references and the drive controls the motor speed (control accuracy $\pm 0.5\%$)

2 = Torque control The I/O terminal and panel references are torque references and the drive controls the motor torque (control accuracy $\pm 0.5\%$; proper tuning required: motor nameplate values, v/Hz setting)

Additions to Page 5-37**7.18 Input phase supervision**

Setting this parameter to “0” disables phase supervision in order to disable the phase loss fault.

0 = No Action

2 = Fault

**WARNING:**

If the Phase Supervision is disabled in order to use the drive with a single phase input source, the drive must be properly sized for single phase application. Contact your Cutler-Hammer Representative for sizing information.

7.19 Thermistor input of I/O Expander

0 = Not Used

1 = Warning

2 = Fault

The thermistor connected to the thermistor input of the I/O expander board supervises the temperature of the motor. With parameter 7.19 the response of the drive can be programmed when the thermistor indicates overtemperature.

7.20 Response to fieldbus fault

0 = No Action

1 = Warning

2 = Fault

A warning or a fault with the appropriate message on the display is generated by the fieldbus card if an error occurs in the physical layer of the fieldbus system.

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Torque Control

Torque control can be activated either by setting parameter 6.1 to torque control or with digital input DIA3 (parameter 2.2=10). The torque reference source is selected with parameter 9.1, and reference scaling is selected with parameters 9.2 and 9.3.

9.1 Torque reference selection

Defines the source for the torque reference value:

0 = None

1 = V_{in}

2 = I_{in}

9.2 Torque reference scaling bias

9.3 Torque reference scaling gain

The additional scaling function can be used for scaling the torque reference. The torque reference is always fed to the torque controller even if it is not activated.

$$T_{ref. out} = gain \times T_{ref. in} + bias$$

9.4 Torque control time constant

Defines the time constant for the torque controller. A short time constant means fast response.

9.5 Torque control minimum operating limit

Defines the frequency limit below which the drive operates normally in frequency control mode. The internal torque calculation is inaccurate at low speeds (<nominal slip of the motor). It is recommended to operate in frequency control mode at low speeds. The reference value in frequency controlled mode is selected with parameter 1.5.

Fieldbus Control

Fieldbus control can be activated with parameter 10.1. Then both the frequency or speed reference and the Start/Stop and Reverse control comes from the fieldbus.

The first two parameters in group 10 concern all fieldbuses. Parameters 10.3 - 10.6 are only for Modbus, parameters 10.7 - 10.13 only for Profibus and 10.14 only for LonWorks.

10.1 Fieldbus control

Defines the active control source:

0 = control via I/O terminals

1 = control via Fieldbus board

10.2 DIC1 Function

0 = Fieldbus control, contact open = Active control source is I/O terminals

contact closed = Active control source is fieldbus board

1 = External Fault, closing contact = Fault is shown and motor is stopped when the input is active

Parameters 10.3 - 10.6 for Modbus protocol only

10.3 Slave address

Defines slave device address. Maximum value for this parameter is 274 and minimum is 1.

10.4 Baud Rate

1 = 300 baud

2 = 600 baud

3 = 1200 baud

4 = 2400 baud

5 = 4800 baud

6 = 9600 baud

7 = 19200 baud

10.5 Parity type

1 = None

2 = Even

3 = Odd

10.6 Modbus time-out

The Modbus time-out defines how long the Fieldbus board waits for a message from a master device and is specified in seconds.

Time can be set between 0 - 3600 s. Time 0 s = no time out

Parameters 10.7 to 10.13 for Profibus DP protocol only.**10.7 Profibus slave address**

Defines slave device address. Maximum value for this parameter is 126 and minimum is 2.

10.8 Profibus baud rate

- 1 = 9.6 kbaud
- 2 = 19.2 kbaud
- 3 = 93.75 kbaud
- 4 = 187.5 kbaud
- 5 = 500 kbaud
- 6 = 1.5 Mbaud
- 7 = 3 Mbaud
- 8 = 6 Mbaud
- 9 = 12 Mbaud
- 10 = AUTO (automatic baud rate select)

10.9 Profibus PPO Type

Selection of profibus PPO type.

- 1 = PPO 1 (parameter data 8 bytes, Control data 4 bytes)
- 2 = PPO 2 (parameter data 8 bytes, Control data 4 bytes)
- 3 = PPO 3 (Control data 4 bytes)
- 1 = PPO 4 (Control data 12 bytes)

10.10 Profibus process Data 1**10.11 Profibus process Data 2****10.12 Profibus process Data 3****10.13 Profibus process Data 4**

Selection of Profibus process data source

Value	1...22	Number of actual value (=n1 ... n2 in monitor page)
	99	Active fault code

Parameter 10.14 for LonWorks protocol only**10.14 LonWorks service button**

Changing the value of this parameter from 0 to 1 or vice versa and pressing the Enter button causes the unique LonWorks ID number to be sent to the network.

Monitoring Menu

The SVReadyE Multi-purpose control application has the following additional monitoring parameters.

Data Number	Unit Name	Description
V21	Reference Frequency	Frequency reference
V22	Torque Reference	Torque reference when torque control is in use
V23	Optional Digital Inputs	
V24	Fieldbus Status	