SVX9000 Drives

Quick Start Guide

Effective November 2011
Supersedes December 2003

CONTENT

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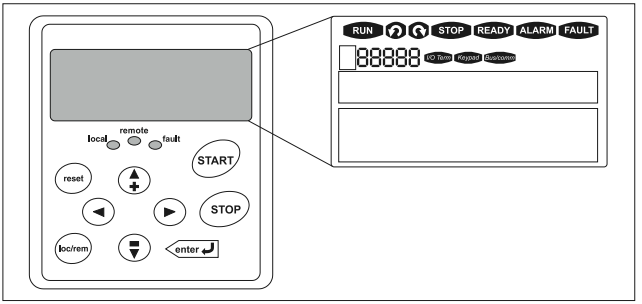
Powering Business Worldwide

STEP 1

Keypad Operation Overview



Keypad and Display

LCD Status Indicators

Indicator	Description
RUN	**Run** Indicates that the SVX9000 is running and controlling the load. Blinks when a stop command has been given but the SVX9000 is still ramping down.
	Counterclockwise Operation The output phase rotation is BAC, corresponding to counterclockwise rotation of most motors.
	Clockwise Operation The output phase rotation is ABC, corresponding to clockwise rotation of most motors.
STOP	**Stop** Indicates that the SVX9000 is stopped and not controlling the load.
READY	**Ready** Indicates that the SVX9000 is ready to be started.
ALARM	**Alarm** Indicates that there is one or more active drive alarm(s).
FAULT	**Fault** Indicates that there is one or more active drive fault(s).
I/O Term	**I/O Terminal** Indicates that the I/O terminals have been chosen for control.
Keypad	**Keypad** Indicates that the keypad has been chosen for control.
Bus/comm	**Bus/Communications** Indicates that the communications bus control has been chosen for control.

LED Status Indicators

Indicator	Description
local	**Local — Steady Illumination** Indicates that the SVX9000 is ready to be started and operated from the Local mode. **Local — Flashing** Indicates that the SVX9000 is ready for operating command to select Local or Remote operation.
remote	**Remote** Indicates that the SVX9000 is operating and controlling the load remotely. **Remote — Flashing** Indicates that the SVX9000 is ready for operating command to select Local or Remote operation.
fault	**Fault** Indicates that there is one or more active drive fault(s).

STEP 1 (Continued)

Navigation Buttons

Button	Description
START	**Start** This button operates as the START button for normal operation when the "Keypad" is selected as the active control.
enter	**Enter** This button is used in the parameter edit mode to save the parameter setting and move to the next parameter … • to reset the Fault History if pressed while in the "Fault History" menu. • to confirm the acceptance of a change. • to change a virtual button status while in the "Button" menu. • to confirm the start-up list at the end of the Start-Up Wizard. • when the "Operate" menu is active, to exit the "Operate" submenu.
STOP	**Stop** This button has two integrated operations. The button operates as STOP button during normal operation … • motor STOP from the keypad, which is always active unless disabled by the "StopButtonActive" parameter. • used to reset the active faults.
reset	**Reset** Resets the active faults.
loc/rem	**Local / Remote** Switches between LOCAL and REMOTE control for start, speed reference and reverse functions. The control locations corresponding to local and remote can be selected within an application.
◄	**Left Arrow** • navigation button, movement to left. • in parameter edit mode, exits mode, backs up one step. • cancels edited parameter (exit from a parameter edit mode). • When in "Operate" menu will move backward through menu. • At end of "Start-Up Wizard", repeats the "Start-Up Wizard" setup menu.
►	**Right Arrow** • navigation button, movement to right. • enter parameter group mode. • enter parameter mode from group mode. • When in "Operate" menu will move forward through menu.
▲ + / ▼ −	**Up and Down Arrows** • move either up or down a menu list to select the desired menu item. • editing a parameter/password, while the active digit/character is scrolled. • increase/decrease the reference value of the selected parameter. • in the "Operate" menu, will cause the display of the active reference source and value and allow its change if the keypad is the active reference source. Used to set the password (if defined) when leaving the "Operate" menu. • scroll through the "Active Faults" menu when the SVX9000 is stopped.

Menu Navigation

Navigation Tips

- To navigate within one level of a menu, use the up and down arrows.
- To move deeper into the menu structure and back out, use the right and left arrows.
- To edit a parameter, navigate to show that parameter's value, and press the right arrow button to enter the edit mode. In edit mode, the parameter value will flash.

STEP 1 (Continued)

- When in edit mode, the parameter value can be changed by pressing the up or down arrow keys.
- When in edit mode, pressing the right arrow a second time will allow you to edit the parameter value digit by digit.
- To confirm the parameter change you must press the ENTER button. *The value will not change unless the ENTER button is pushed.*
- Some parameters can not be changed while the SVX9000 is running. The screen will display LOCKED if you attempt to edit these parameters while the drive is running. Stop the drive to edit these parameters. See the *SVX9000 Application Manual* for identification of these parameters specific to your chosen application.

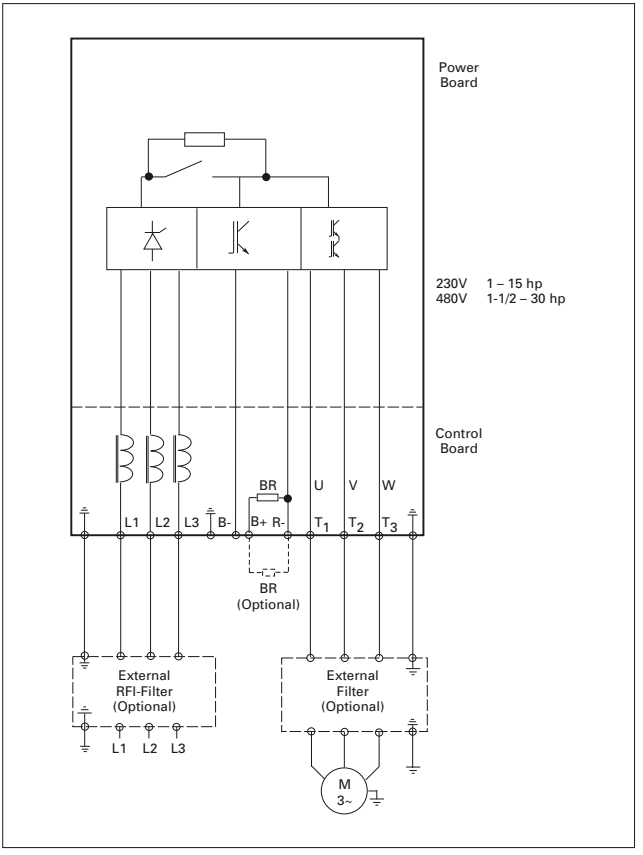
Main Menu

The data on the control keypad are arranged in menus and submenus. The first menu level consists of M1 to M8 and is called the Main Menu. The Main Menu is illustrated on **Page 7**. Some of the submenus will vary for each application choice.

STEP 2

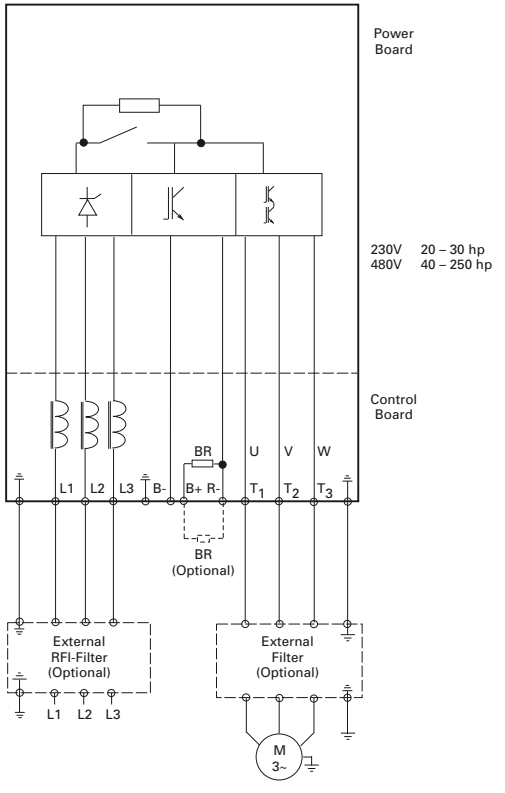
Standard Wiring Diagrams and Terminal Locations

Power and Motor Wiring Terminal Schematic for SVX9000 Drives



SVX9000 Power and Motor Wiring for Low Horsepower Drives (1 – 30 hp)

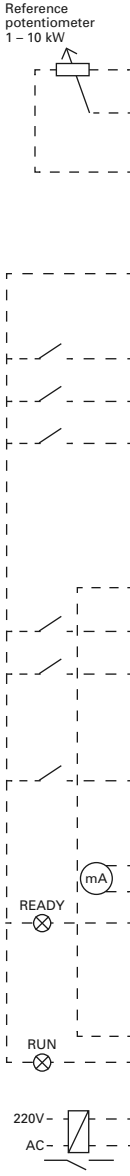
STEP 2 (Continued)



SVX9000 Power and Motor Wiring for Large Horsepower Drives (20 – 250 hp)

STEP 2 (Continued)

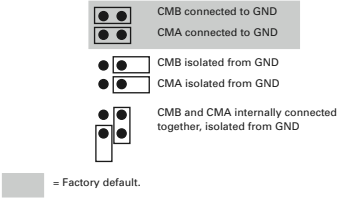
Standard Application Default I/O Configuration



Terminal		Signal	Description		
OPTA1					
1	+10V$_{ref}$	Reference output	Voltage for potentiometer, etc.		
2	AI1+	Analog input, voltage range 0 – 10V DC	Voltage input frequency reference		
3	AI1-	I/O Ground	Ground for reference and controls		
4	AI2+	Analog input, current range 0 – 20 mA	Current input frequency reference		
5	AI2-				
6	+24V	Control voltage output	Voltage for switches, etc. max 0.1A		
7	GND	I/O ground	Ground for reference and controls		
8	DIN1	Start forward (programmable)	Contact closed = start forward		
9	DIN2	Start reverse (programmable)	Contact closed = start reverse		
10	DIN3	External fault input (programmable)	Contact open = no fault Contact closed = fault		
11	CMA	Common for DIN1 – DIN3	Connect to GND or +24V		
12	+24V	Control voltage output	Voltage for switches (see #6)		
13	GND	I/O ground	Ground for reference and controls		
14	DIN4	Multi-step speed select 1	DIN4	DIN5	Frequency ref.
15	DIN5	Multi-step speed select 2	Open Closed Open Closed	Open Open Closed Closed	Ref.U_{in} Multi-step ref.1 Multi-step ref.2 Ref.I_{in}
16	DIN6	Fault reset	Contact open = no action Contact closed = fault reset		
17	CMB	Common for DIN4 – DIN6	Connect to GND or +24V		
18	AO1+	Output frequency Analog output	Programmable Range 0 – 20 mA/R_L, max. 500W		
19	AO1-				
20	DO1	Digital output READY	Programmable Open collector, I ≤ 50 mA, U ≤ 48V DC		
OPTA2					
21	RO1	Relay output 1 RUN			
22	RO1				
23	RO1				
24	RO2	Relay output 2 FAULT			
25	RO2				
26	RO2				

Note: For more information on jumper selections, see the *9000X AF Drives User Manual, Chapter 4.*

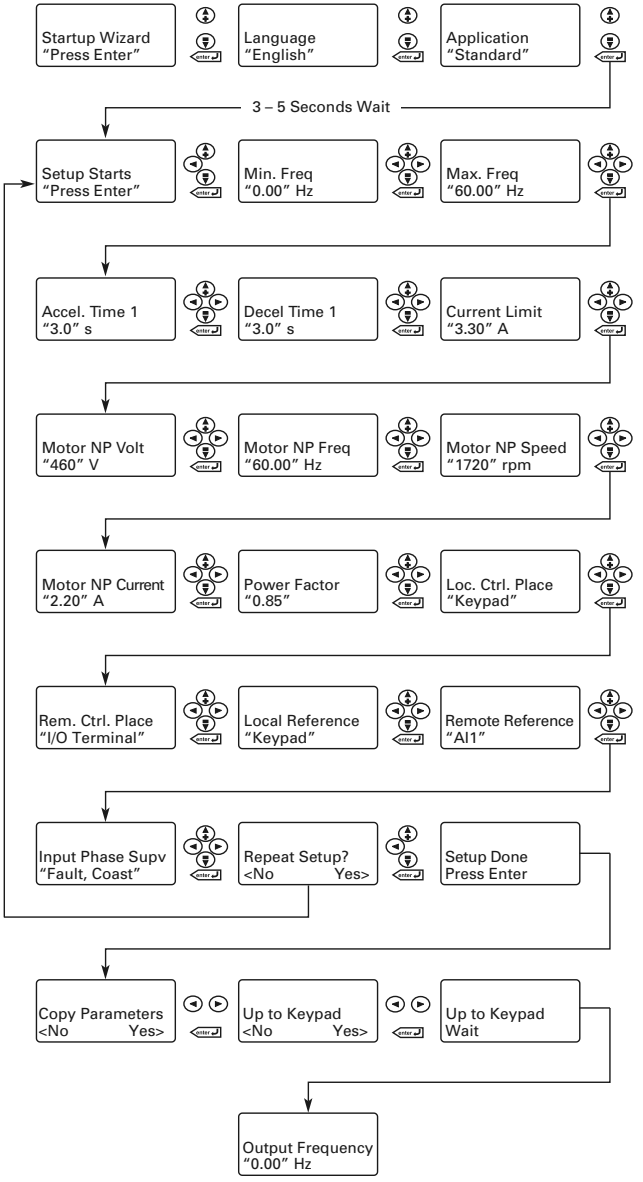
Jumper Block X3:
CMA and CMB Grounding



STEP 3

Start-Up Wizard

If the wizard is not enabled at power-up, press the STOP button for 5 secs. to enable it.



STEP 4

Operating & Programming Menu Navigation

Main Menu

The data on the control keypad are arranged in menus and submenus. The first menu level consists of M1 to M8 and is called the Main Menu. The structure of these menus and their submenus is illustrated below. Some of the submenus will vary for each application choice.

Main Menu Navigation

Menu Navigation:

Up Arrow — The up arrow advances to the next menu item.
For example, pressing the up arrow once will advance from M1 to M2.

Down Arrow — The down arrow backs up to the previous menu item.
For example, pressing the down arrow once will back up from M2 to M1.

Right Arrow — The right arrow will advance to the next level in the menu.
For example, pressing the right arrow once will advance from M2 to R2.1.

Left Arrow — The left arrow will back up one level in the menu structure.
For example, pressing the left arrow once will back up from R2.1 to M2.

- **M1 Parameters**
  - G1.1
  - . . .
  - G1.x
- **M2 Keypad Control**
  - R2.1 Keypad Reference
  - P2.2 Keypad Direction
  - . . .
  - P2.x Stop Button Active
- **M3 Active Faults**
  - A3.1 Active Fault 1
    - T3.1.1 Operation Days
    - . . .
    - T3.1.13 Zero Speed
  - . . .
  - A3.x Active Fault x
- **M4 Fault History**
  - H4.1 Most Recent Fault
    - T4.1.1 Operation Days
    - . . .
    - T4.1.13 Zero Speed
  - . . .
  - H4.1.x Oldest Saved Fault
- **M5 System Menu**
  - S5.1 Language
  - S5.2 Application
  - S5.3 Copy Parameters
  - S5.4 Compare Parameters
  - S5.5 Security
  - S5.6 Keypad Settings
  - S5.7 Hardware Settings
  - S5.8 System Information
- **M6 Expander Boards**
  - G6.1 Slot A Board
  - . . .
  - G6.5 Slot E Board
- **M7 Monitor**
  - V7.1 Output Frequency–0.00 Hz
  - V7.2 Frequency Reference–0.00 Hz
  - . . .
  - M7.1x Multimonitor
    - N7.1x.1
- **M8 Operate Mode**
  - O1 Output Frequency–0.0 Hz
  - O2 Freq Reference–0.0 Hz
  - . . .
  - Ox . . .

Note: Enter Key — Holding the "Enter" key for more than 3 seconds will allow you to go directly to the programming mode.

STEP 4 (Continued)

Operate Menu — M8

The Operate Menu provides a easy to use method of viewing key numerical Monitoring Menu items. Some applications also support the setting of reference values in this menu. The items displayed vary by application. The table below is an example for the Standard application.

Operate Menu Items — Standard Application Example

Code	Signal Name	Unit	Description
O.1	Output Frequency	Hz	Output frequency
O.2	FreqReference	Hz	Frequency reference
O.3	Motor Speed	rpm	Calculated motor speed
O.4	Motor Current	A	Measured motor current
O.5	Motor Torque	%	Calculated torque based on nominal motor torque
O.6	Motor Power	%	Calculated power based on nominal motor power
O.7	Motor Voltage	V	Calculated motor voltage
O.8	DC-Bus Voltage	V	Measured DC-bus voltage
O.9	Unit Temperature	°C	Heatsink temperature
O.10	MotorTemperature	%	Calculated motor temperature based on the motor nameplate information and the calculated motor load
R1	Keypad Reference	Hz	Keypad frequency reference setting

The menu is navigated by using the left and right arrow buttons. If a reference level is available for setting, the up and down arrow buttons adjust the value. To exit the Operate Menu to access the other menus, depress the ENTER button for 2 seconds. While in the other menus, if there is no keypad activity, the display will return to the Operate Menu after 30 seconds.

STEP 4 (Continued)

Parameters — M1

Standard Parameters — M1

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.1.1	Min frequency	0.00	Par. 1.1.2	Hz	0.00		101	
P1.1.2	Max frequency	Par. 1.1.1	320.00	Hz	60.00		102	**NOTE**: If f_{max} > than the motor synchronous speed, check suitability for motor and drive system.
P1.1.3	Acceleration time 1	0.1	3000.0	s	3.0		103	
P1.1.4	Deceleration time 1	0.1	3000.0	s	3.0		104	
P1.1.5	Current limit	0.1 x I_H	2 x I_H	A	I_L		107	
P1.1.6 ①	Nominal voltage of the motor	180	690	V	P: 230V P: 460V P: 575V		110	
P1.1.7 ①	Nominal frequency of the motor	30.00	320.00	Hz	60.00		111	Check the rating plate of the motor.
P1.1.8 ①	Nominal speed of the motor	300	20 000	rpm	1720		112	The default applies for a 4-pole motor and a nominal size frequency converter.
P1.1.9 ①	Nominal current of the motor	0.1 x I_H	2 x I_H	A	I_H		113	Check the rating plate of the motor.
P1.1.10 ①	Power Factor	0.30	1.00		0.85		120	Check the rating plate of the motor.
P1.1.11	Local Control Place	1	3		2		171	**1** = I/O Terminal **2** = Keypad **3** = Fieldbus
P1.1.12	Remote Control Place	1	3		1		172	**1** = I/O Terminal **2** = Keypad **3** = Fieldbus
P1.1.13 ①	Local reference	0	3		2		173	**0** = AI1 **1** = AI2 **2** = Keypad **3** = Fieldbus
P1.1.14 ①	Remote reference	0	3		0		174	**0** = AI1 **1** = AI2 **2** = Keypad **3** = Fieldbus
P1.1.15	Identification	0	2		0		631	**0** = Not used **1** = V/Hz **2** = V/Hz with boost
P1.1.16	V/Hz Opt	0	1		0		109	**0** = Not used **1** = Automatic torque boost
P1.1.17	Preset speed 1	0.00	Par. 1.1.2	Hz	10.00		105	Speeds preset by operator.
P1.1.18	Preset speed 2	0.00	Par. 1.1.2	Hz	40.00		106	

① Parameter value can only be changed after the drive has been stopped.

STEP 4 (Continued)

Input Signals — M1 → G1.2

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note		
P1.2.1 [1]	Start/Stop logic	0	6		0		300		**DIN1**	**DIN2**
								0	Start fwd	Start rvs
								1	Start/Stop	Rvs/Fwd
								2	Start/Stop	Run enable
								3	Start pulse	Stop pulse
								4	Fwd [3]	Rvs [3]
								5	Start [3]/ Stop	Rvs/ Fwd
								6	Start [3]/ Stop	Run enable
P1.2.2 [1]	DIN3 function	0	7		1		301	**0** = Not used **1** = Ext. fault. closing cont. **2** = Ext. fault. opening cont. **3** = Run enable **4** = Acc./Dec. time select. **5** = Force CP to Remote [4] **6** = Rvs (if par. 1.2.1 = 3)		
P1.2.3	Current reference offset	0	1		1		302	**0** = 0 – 20mA **1** = 4 – 20mA		
P1.2.4	Reference scaling minimum value	0.00	Par. 1.2.5	Hz	0.00		303	Selects the frequency that corresponds to the min. reference signal 0.00 = No scaling		
P1.2.5	Reference scaling maximum value	0.00	320.00	Hz	0.00		304	Selects the frequency that corresponds to the max. reference signal 0.00 = No scaling		
P1.2.6	Reference inversion	0	1		0		305	**0** = Not inverted **1** = Inverted		
P1.2.7	Reference filter time	0.00	10.00	s	0.10		306	**0** = No filtering		
P1.2.8 [2]	AI1 signal selection				A.1		377	TTF programming method used.		
P1.2.9 [2]	AI2 signal selection				A.2		388	TTF programming method used.		

[1] Parameter value can only be changed after the drive has been stopped.
[2] Use TTF method to program these parameters.
[3] Rising edge required to start.
[4] CP = control place.

Output Signals — M1 → G1.3

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.3.1 [1]	Analog output 1 signal selection	0			A.1		464	TTF programming method used.
P1.3.2	Analog output function	0	8		1		307	**0** = Not used **1** = Output freq. (0 – f_{max}) **2** = Freq. reference (0 – f_{max}) **3** = Motor speed (0 – Motor nominal speed) **4** = Motor current (0 – I_{nMotor}) **5** = Motor torque (0 – T_{nMotor}) **6** = Motor power (0 – P_{nMotor}) **7** = Motor voltage (0 – U_{nMotor}) **8** = DC-Bus volt (0 – 1000V)
P1.3.3	Analog output filter time	0.00	10.00	s	1.00		308	**0** = No filtering

[1] Parameter value can only be changed after the drive has been stopped.

STEP 4 (Continued)

Output Signals — M1 → G1.3 (Continued)

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.3.4	Analog output inversion	0	1		0		309	**0** = Not inverted **1** = Inverted
P1.3.5	Analog output minimum	0	1		0		310	**0** = 0 mA **1** = 4 mA
P1.3.6	Analog output scale	10	1000	%	100		311	
P1.3.7	Digital output 1 function	0	16		1		312	**0** = Not used **1** = Ready **2** = Run **3** = Fault **4** = Fault inverted **5** = FC overheat warning **6** = Ext. fault or warning **7** = Ref. fault or warning **8** = Warning **9** = Reversed **10** = Preset speed 1 **11** = At speed **12** = Mot. regulator active **13** = OP freq. limit 1 superv. **14** = Remote Control Active **15** = Thermistor fault/warng **16** = Fieldbus input data
P1.3.8	Relay output 1 function	0	16		2		313	Same as parameter 1.3.7
P1.3.9	Relay output 2 function	0	16		3		314	Same as parameter 1.3.7
P1.3.10	Output frequency limit 1 supervision	0	2		0		315	**0** = No limit **1** = Low limit supervision **2** = High limit supervision
P1.3.11	Output frequency limit 1; Supervised value	0.00	320.00	Hz	0.00		316	
P1.3.12 ①	Analog output 2 signal selection	0			0.1		471	TTF programming method used.
P1.3.13	Analog output 2 function	0	8		4		472	Same as parameter 1.3.2
P1.3.14	Analog output 2 filter time	0.00	10.00	s	1.00		473	**0** = No filtering
P1.3.15	Analog output 2 inversion	0	1		0		474	**0** = Not inverted **1** = Inverted
P1.3.16	Analog output 2 minimum	0	1		0		475	**0** = 0 mA **1** = 4 mA
P1.3.17	Analog output 2 scaling	10	1000	%	100		476	

① Parameter value can only be changed after the drive has been stopped.

STEP 4 (Continued)

Drive Control Parameters — M1 ➔ G1.4

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.4.1	Ramp 1 shape	0.0	10.0	s	0.0		500	**0** = Linear **>0** = S-curve ramp time
P1.4.2	Ramp 2 shape	0.0	10.0	s	0.0		501	**0** = Linear **>0** = S-curve ramp time
P1.4.3	Acceleration time 2	0.1	3000.0	s	10.0		502	
P1.4.4	Deceleration time 2	0.1	3000.0	s	10.0		503	
P1.4.5 ①	Brake chopper	0	4		0		504	**0** = Disabled **1** = Used when running **2** = External brake chopper **3** = Used when stopped/ running **4** = Used when running (no testing)
P1.4.6	Start function	0	1		0		505	**0** = Ramp **1** = Flying start
P1.4.7	Stop function	0	3		1		506	**0** = Coasting **1** = Ramp **2** = Ramp+Run enable coast **3** = Coast+Run enable ramp
P1.4.8	DC braking current	0.00	I_L	A	0.7 x I_H		507	
P1.4.9	DC braking time at stop	0.00	600.00	s	0.00		508	**0** = DC brake is off at stop
P1.4.10	Frequency to start DC braking during ramp stop	0.10	10.00	Hz	1.50		515	
P1.4.11	DC braking time at start	0.00	600.00	s	0.00		516	**0** = DC brake is off at start
P1.4.12	Flux brake	0	1		0		520	**0** = Off **1** = On
P1.4.13	Flux braking current	0.1 x I_H	I_L	A	I_H		519	

① Parameter value can only be changed after the drive has been stopped.

Prohibit Frequencies — M1 ➔ G1.5

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.5.1	Skip frequency range 1 low limit	0.00	Par. 1.5.2	Hz	0.00		509	
P1.5.2	Skip frequency range 1 high limit	0.00	Par. 1.1.2	Hz	0.0		510	**0** = Skip frequency range 1 not used
P1.5.3	Skip frequency acc./dec. ramp	0.1	10.0		1.0		518	

STEP 4 (Continued)

Motor Control Parameters — M1 → G1.6

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.6.1 ①	Motor control mode	0	1/6		0		600	**SVX:** **0** = Frequency control **1** = Speed control **Additionally for SPX:** **2** = Torque control **3** = Closed loop speed ctrl **4** = Closed loop torque ctrl
P1.6.2 ①	V/Hz optimization	0	1		0		109	**0** = Not used **1** = Automatic torque boost
P1.6.3 ①	V/Hz ratio selection	0	3		0		108	**0** = Linear **1** = Squared **2** = Programmable **3** = Linear with flux optim.
P1.6.4 ①	Field weakening point	8.00	320.00	Hz	60.00		602	
P1.6.5 ①	Voltage at field weakening point	10.00	200.00	%	100.00		603	n% x U_{nmot}
P1.6.6 ①	V/Hz curve midpoint frequency	0.00	Par. 1.6.4	Hz	60.00		604	
P1.6.7 ①	V/Hz curve midpoint voltage	0.00	100.00	%	100.00		605	n% x U_{nmot} Parameter max. value = par. 2.6.5
P1.6.8 ①	Output voltage at zero frequency	0.00	40.00	%	1.30		606	n% x U_{nmot}
P1.6.9	Switching frequency	1.0	Varies	kHz	Varies		601	See **Table 8-12** on page 57 for exact values
P1.6.10	Overvoltage controller	0	2		1		607	**0** = Not used **1** = Used (no ramping) **2** = Used (ramping)
P1.6.11	Undervoltage controller	0	1		1		608	**1** = Yes **2** = No
P1.6.12	Load Drooping	0.00	100.00		0.00		620	Drooping % of nominal speed at nominal torque
P1.6.13	Identification	0	1		0		631	**0** = Not used **1** = OL v/f Ratio **2** = OL v/f and Boost

① Parameter value can only be changed after the drive has been stopped.

Output Signals — M1 → G1.3

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.7.1	Response to reference fault	0	6		6		700	**0** = No response **1** = Warning **2** = Warning+ Previous Freq. **3** = Wrng+ PresetFreq 1.7.2 **4** = Fault.stop acc. to 1.4.7 **5** = Fault.stop by coasting **6** = Fault, Restart

STEP 4 (Continued)

Protections — M1 → G1.7

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.7.2	Reference fault frequency	0.00	Par. 1.1.2	Hz	0.00		728	
P1.7.3	Response to external fault	0	3		2		701	**0** = No response **1** = Warning **2** = Fault.stop acc. to 1.4.7 **3** = Fault.stop by coasting
P1.7.4	Input phase supervision	0	3		3		730	
P1.7.5	Response to undervoltage fault	1	3		0		727	
P1.7.6	Output phase supervision	0	3		2		702	
P1.7.7	Earth fault protection	0	3		2		703	
P1.7.8	Thermal protection of the motor	0	3		2		704	
P1.7.9	Motor ambient temperature factor	-100.0	100.0	%	0.0		705	
P1.7.10	Motor cooling factor at zero speed	0.0	150.0	%	40.0		706	
P1.7.11	Motor thermal time constant	1	200	min	45		707	
P1.7.12	Motor duty cycle	0	100	%	100		708	
P1.7.13	Stall protection	0	3		0		709	**0** = No response **1** = Warning **2** = Fault.stop acc. to 1.4.7 **3** = Fault.stop by coasting
P1.7.14	Stall current	0.1	I_{nMotor} x 2	A	I_L		710	
P1.7.15	Stall time limit	1.00	120.00	s	15.00		711	
P1.7.16	Stall frequency limit	1.0	Par. 1.1.2	Hz	25.0		712	
P1.7.17	Underload protection	0	3		0		713	**0** = No response **1** = Warning **2** = Fault.stop acc. to 1.4.7 **3** = Fault.stop by coasting
P1.7.18	Field weakening area load	10	150	%	50		714	
P1.7.19	Zero frequency load	5.0	150.0	%	10.0		715	
P1.7.20	Underload protection time limit	2	600	s	20		716	
P1.7.21	Response to thermistor fault	0	3		2		732	**0** = No response **1** = Warning **2** = Fault.stop acc. to 1.4.7 **3** = Fault.stop by coasting
P1.7.22	Response to fieldbus fault	0	3		2		733	See P1.7.21
P1.7.23	Response to slot fault	0	3		2		734	See P1.7.21
P1.7.24	FB MCW Bit 15	0	2		0		771	**0** = No action **1** = Fault low **2** = Fault high

STEP 4 (Continued)

Auto Restart Parameters — M1 ➔ G1.8

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.8.1	Wait time	0.10	10.00	s	0.50		717	
P1.8.2	Trial time	0.00	60.00	s	30.00		718	
P1.8.3	Start function	0	2		0		719	**0** = Ramp **1** = Flying start **2** = According to par. 1.4.6
P1.8.4	Number of tries after undervoltage trip	0	10		0		720	
P1.8.5	Number of tries after overvoltage trip	0	10		0		721	
P1.8.6	Number of tries after overcurrent trip	0	3		0		722	
P1.8.7	Number of tries after reference trip	0	10		0		723	
P1.8.8	Number of tries after motor temperature fault trip	0	10		0		726	
P1.8.9	Number of tries after external fault trip	0	10		0		725	
P1.8.10	Number of tries after underload fault trip	0	10		0		738	

Keypad Control — M2

This menu provides the parameters for the setting of the keypad frequency reference, the selection of motor direction when in keypad operation, and when the STOP button is active.

Keypad Control Parameters — M2

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P2.1	Control place	0	3		0		1685	**0** = Keypad L/R **1** = Local **2** = Remote **3** = I/O force
R2.1	Keypad reference	Par. 1.1.1	Par. 1.1.2	Hz				
P2.3	Direction (on keypad)	0	1		0		123	**0** = Forward **1** = Reverse
P2.4	Stop button	0	1		1		114	**0** = Limited function of Stop button **1** = Stop button always enabled
P2.5	Operate menu hide	0	1		0		1688	**0** = No **1** = Yes

Other Menus — M3 to M6

Menus M3 to M6 provide information on the Active Faults, Fault History, System Menu settings and the Expander Board setup. These menu items are explained in detail in Chapter 5 of the *SVX9000 User Manual*.

STEP 5

Faults and Fault Codes

Code/Fault Directory

Fault Code	Fault
1	Overcurrent
2	Overvoltage
3	Ground (Earth) Fault
5	Charging Switch
6	Emergency stop
7	Saturation trip
8	System fault
9	Undervoltage
10	Input line supervision
11	Output phase supervision
12	Brake chopper supervision
13	SVX9000 undertemperature
14	SVX9000 overtemperature
15	Motor stalled

Fault Code	Fault
16	Motor overtemperature
17	Motor underload
22	EEPROM checksum fault
24	Counter fault
25	Microprocessor watchdog fault
26	Startup prevented
29	Thermistor fault
31	IGBT temperature (hardware)
32	Fan heat sink
34	CAN bus communication
36	Control unit
37	Device change (same type)
38	Device added (same type)
39	Device removed

Fault Code	Fault
40	Device unknown
41	IGBT temperature
42	Brake resistor overtemperature
43	Encoder fault
44	Device change (different type)
45	Device added (different type)
50	Analog input I_{in} < 4 mA (for the signal range 4 to 20 mA)
51	External fault
52	Keypad communication fault
53	Communication bus fault
54	Slot fault
56	PT100 board temperature fault
—	—
—	—

STEP 6

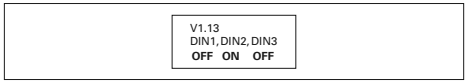
Monitoring Menu — M7

The Monitoring Menu items are meant for viewing parameter values during operation. Monitored values are updated every 0.3 sec. Monitored items are identified by item numbers V7.1 to V1.xx, where "xx" varies by application. The table below provides an example of the monitored values for the **Standard** application.

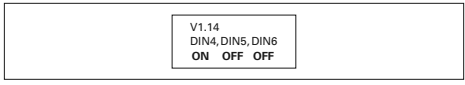
Monitored parameters are not editable from this menu (See Parameter Menu [M1] to change parameter values).

Monitoring Menu Items — Standard Application Example

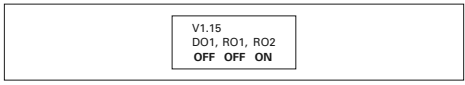
Code	Signal Name	Unit	Description
V7.1	Output Frequency	Hz	Output frequency
V7.2	Frequency reference	Hz	Frequency reference setting
V7.3	Motor speed	rpm	Calculated motor speed
V7.4	Motor current	A	Measured motor current
V7.5	Motor torque	%	Calculated torque based on nominal motor torque
V7.6	Motor power	%	Calculated power based on nominal motor power
V7.7	Motor voltage	V	Calculated motor voltage
V7.8	DC bus voltage	V	Measured DC-bus voltage
V7.9	Unit temperature	°C	Heatsink temperature
V7.10	Calculated motor temperature	°C	Calculated motor temperature based on the motor nameplate information and the calculated motor load
V7.11	Analog Input 1	V	Voltage input at Terminals AI1+ and GND
V7.12	Analog input 2	mA	Current input at Terminals AI2+ and AI2-
V7.13	DIN1, DIN2, DIN3	—	Digital input status (see figure below)
V7.14	DIN4, DIN5,DIN6	—	Digital input status (see figure below)
V7.15	DO1, RO2, RO3	—	Digital and relay output status (see figure below)
V7.16	Analog I_{out}	mA	Current output at Terminals AO1+ and AO1-
V7.17	Multimonitor		(See below)



Digital Inputs — DIN1, DIN2, DIN3 Status



Digital Inputs — DIN4, DIN5, DIN6 Status



Digital and Relay Outputs — DO1, RO1, RO2 Status

Multimonitor (V7.17)

This parameter allows the viewing and selection (if allowed by System menu item, P5.5.4) of three simultaneously monitored items from the Monitored Menu Items shown in the table above. Use the right arrow key to select the item to be modified and then the up or down arrow keys to select the new item. Press the ENTER key to accept the change.

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Eaton Corporation
Electrical Sector
1111 Superior Ave.
Cleveland, OH 44114
United States
877-ETN-CARE (877-386-2273)
Eaton.com

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