

Last update: August 4, 2003.
Firmware Version: 6.5.8 .

Error codes for CD Series 5

In most cases, the SERVOSTAR communicates error codes with a text message via the serial port to the host. Some error codes are also transmitted to the Status Display. The same message is saved in the EEPROM under an error history log (FLTHIST, ERR) so that nothing is lost when power is removed. Not all errors reflect a message back to the host. In these cases, the errors communicate to the Status Display only. no-message

The response of the SERVOSTAR to an error depends on the error's severity. There are three levels of severity:

- 1) Warnings, simply called errors, are not considered faults and do not disable operation
- 2) Non- fatal errors, or simply faults, that disable the drive and indicate a fault status
- 3) Fatal errors, or fatal faults, that disable almost all drive functions (including communications)

The drive is automatically disabled at the occurrence of a fault. Executing a drive disable command (DIS or K) followed by the EN command, or toggling the Remote Enable line (REMOTE) resets the fault latch, and if the fault condition is no longer present, the system. re-enables

Error Codes				
Error Code	Fault Message	Fatal	Non-Fatal	LED Display
0	.No Error		x	
1	.Power stage over temperature	x		t
2	.Over voltage	x		o
3	.Over current	x		P
4.0	.External feedback fault	x		r 0
4.1	.Resolver line break	x		r 1
4.2	.RDC error	x		r 2
4.3	.Sine Encoder init fail	x		r 3
4.4	.A/B line break	x		r 4
4.5	.Index line break	x		r 5
4.6	.Illegal halls	x		r 6
4.7	.C/D line break	x		r 7
4.8	.A/B out of range	x		r 8
4.9	.Burst pulse overflow	x		r 9
4.10	EnDat comm error	x		r 10
4.12	Hiperface comm error	x		r 12
4.13	Sw R2D Feedback Fault	x		r 13
5	.Under voltage	x		u
6	.Motor over temperature	x		H
6.1	EnDat over temperature	x		H1
7.1	.Positive analog supply fail	x		A 1
7.2	.Negative analog supply fail	x		A 2
8	.Over speed	x		J
8.1	.Over speed (1.8*VLIM)	x		J 1
9	.EEPROM failure	x		E
10	.EEPROM checksum failure	x		e
12	.Foldback	x		F

14.1	.Positive over travel fault	x		d 5
14.2	.Negative over travel fault	x		d 6
15.1	.Numeric position deviation	x		d 1
15.2	.Excessive position deviation	x		d 2
16	.Communication interface	x		c
20	Unknown command		x	
21	Unknown variable		x	
22	Checksum error		x	
23	Drive active		x	
24	Drive inactive		x	
25	Value out of range		x	
26	Value negative		x	
27	Not in proper Opmode		x	
28	Syntax error		x	
33	Auto tune failed		x	
34	Bad bandwidth		x	
35	Bad stability		x	
36	Not programmable		x	
37.01	Current loop design failed		x	
37.02	MENCRES out of range		x	
37.03	MENCOFF out of range		x	
37.04	MSPEED out of range		x	
37.05	MBEMF out of range		x	
37.06	MJ out of range		x	
37.07	ACC out of range		x	
37.08	DEC out of range		x	
37.09	DECSTOP out of range		x	
37.10	VLIM out of range		x	
37.11	VOSPD out of range		x	
37.12	VSCALE out of range		x	
37.13	O1TRIG out of range		x	
37.14	O1RST out of range		x	
37.15	DISSPEED out of range		x	
37.16	MENCTYPE out of range		x	
38	Communication error		x	
39	Not in proper Compmode		x	
40	EXT vel param warning		x	
41	Vel loop design failed		x	
42	Invalid EEPROM		x	
43	Recording active		x	
44	Rec data not available		x	
45	EEPROM is empty		x	
46	Argument must be binary		x	
47	Burnin is active		x	
48	Burnin is not active		x	
49	Conflicts with ENCOUT		x	
50	Conflicts with VLIM		x	
51	Not available		x	
52	Drive is in Hold mode		x	
53	Limit switch Hold		x	

54	Command into limit		x	
55	Drive is in Zero mode		x	
56	Motor is jogging		x	
57	Argument not divisible by 20		x	
58	Encoder init process active		x	
60	Tune failed - No rotation		x	
62,66 70,74	Tune failed - Current sat		x	
63,67 71,75	Tune failed - No vel design		x	
76	Disable during Tune		x	
77	Hold during Tune		x	
78	Low velocity limits		x	
79	Use lower bandwidth		x	
80	Drive is in Dual Fb mode		x	
81	Drive is in Gear mode		x	
82	Functionality is occupied		x	
83	Warning: A/B line not routed		x	
84	Warning: Limit sw not routed		x	
85	Move is pending		x	
90	Incorrect password		x	
91	Password protected		x	
92	Capture during Homing		x	
93	Homing during Capture		x	
94	Capture process not done		x	
95	Capture process not active		x	
96	Capture process not enabled		x	
97	ENCSTART while Aconfig		x	
98	EnDat comm error		x	
999	SERCOS test failure		x	

LED Display without error code or warning message:

Fault	Fatal	Non-Fatal	LED Display flashing	LED Display steady
Watchdog (DSP)	x		≡	
Watchdog (HPC)	x			≡
No Compensation	x		- 1	
Invalid velocity controller	x		- 2	
Not initialized encoder (and attempt to enable the drive)	x		- 3	
Encoder initialization failure	x		- 4	
Auto config failure	x		- 5	
Hardware CW limit switch open		x	L 1	
Hardware CCW limit switch open		x	L 2	

Hardware CW and CCW limit switches open		x	L 3	
Software CW limit switch is tripped (PFB>PMAX & PLIM=2)		x	L4	
Software CCW limit switch is tripped (PFB<PMIN & PLIM=2)		x	L 5	
Positive and negative analog supply fail	x		A 3	
RAM failure (during init)	x			I
EPROM checksum (during init)	x			c
Altera load fail (during init)			e 1 0 1	
Altera DPRAM failure (during init)			e 1 0 2	
DSP load fail (during init)			e 1 0 3	
DSP alive failure (during init)			e 1 0 4	

Momentary (500mS) display

Situation	Display
Error in the serial communication	C
Momentary foldback	F
Test led	8.
Indexed position PTP buffer with zero velocity	b

STAT

will output a drive status summary word to the serial port. The summary word is in ASCII-hex format, prefixed by the letter 'H'. See STATUS for information on how to obtain more detailed drive status information. The format of the STAT word is described in the following table.

Bit #	Function Convention
0 (LSB)	DisableStatus 1 = drive is DISabled, 0 = drive is ENabled
1	FaultStatus 1 = fault exists, 0 = no fault exists
2	SafetyStatus 1 = safety feature triggered/inactive*, 0 = drive is safe
3	Special Mode Status 1 = Step, Burnin, or Zero is active, 0 = normal
4	Hold Mode Status 1 = drive is in hold position, 0 = drive is not in hold position

mode

5-15 not used

* CWLIM=1, CCWLIM=1, LIMDIS=1, THERMODE>0, FOLD=1, or over travel exceeded.

STATUS

will output the drive status detail words to the serial port. Five words are transferred in ASCII-HEX format, with each word preceded by the letter 'H'. The words are separated by a space.

The following tables break the status words down bit by bit (bit 15 = MSB; bit 0 = LSB; n/u = not used). For all bits, 0=false and 1=true.

STATUS Word 1: Disable Status Word

If the drive is disabled (Bit 0 of the STAT word = 1), the process(es) which have caused that disable condition will have their bits set to 1 in this word.

Bit #	Description
0 (LSB)	Remote disable (REMOTE = 0)
1	Software disable (SWEN = 0)
2	DIP switch disable (DIPEN = 0)
3	Fault disable
4	Velocity loop design failure
5	Encoder not initialized
6-15	not used

STATUS Word 2: Fault Status Word

If a fault exists (Bit 1 of the STAT word = 1), the fault(s) which exist(s) will have the corresponding bits set to 1 in this word.

Bit #	Description
0 (LSB)	Drive over temperature
1	Over voltage condition
2	Over current condition
3	Feedback loss
4	Under voltage condition
5	Motor over temperature
6	Analog supply fault
7	Over speed condition
8	EEPROM fault
9	EEPROM checksum fault
10	No comp (compensation) for the motor
11	Foldback condition
12	not used
13	Overtravel fault
14	Position deviation fault
15	Interface fault

STATUS Word 3: Safety Status Word

If safety of the drive is compromised (Bit 2 of the STAT word = 1), the condition which is causing that state has its corresponding bit set to 1 in this word.

Bit #	Description
0 (LSB)	CWLIM = 1 (motor has reached CW travel limit)
1	CCWLIM = 1 (motor has reached CCW travel limit)
2	LIMDIS = 1 (limit switch function disabled by user)
3	THERMODE > 0 (set to non-zero by the user)
4	FOLD = 1 (drive current foldback mode)
5	LIMDIS=0 & CW switch not routed (INxMODE 1)
6	LIMDIS=0 & CCW switch not routed (INxMODE 2)
7	Positive Overtravel (PFB > PMAX) with PLIM > 0
8	Negative Overtravel (PFB < PMIN) with PLIM > 0
9	MFOLD = 1 (motor current foldback mode)
10-15	not used

STATUS Word 4: Special Mode Status Word

If the drive is in a special operating mode (Bit 3 of the STAT word = 1), the special mode that the drive is in has its corresponding bit set to 1 in this word.

Bit #	Description
-------	-------------

- 0 (LSB) Drive is in Step mode (see STEP)
- 1 Drive is in Burnin mode (factory function)
- 2 Drive is in Zeroing mode (see ZERO)
- 3-15 not used

STATUS Word 5: Hold Mode Status Word

If the drive is in Hold mode (Bit 4 of the STAT word = 1), the condition which caused the drive to enter Hold mode has its corresponding bit set to 1 in this word.

- | Bit # | Description |
|---------|---|
| 0 (LSB) | User request (user set HOLD = 1) |
| 1 | DIP switch setting (DIP switch 7 = 1) |
| 2 | Drive is in Active disable state |
| 3 | Limit switch(es) tripped: 1. Command is in direction of tripped switch (not in current mode) with drive enabled; or 2. Both limit switches are activated. |
| 4 | User input switch hold (INxMODE=19) |
| 5 | Internal hold request during homing process. |
| 6-10 | SERCOS hold related bits |
| 11 | Analog position hold |
| 12-15 | not used |

STATUS2

will output drive status detail words to the serial port. Six words are transferred in ASCII-HEX format, with each word preceded by the letter 'H'.

The following tables break the status words down bit by bit (bit 15 = MSB; bit 0 = LSB; n/u = not used). For all bits, 0=false and 1=true.

STATUS2 Word 1: Feedback Loss Status Word

If the drive has experienced a feedback loss fault (Bit 3 of STATUS Word 2 = 1), the condition which caused that fault will have its bit set to 1 in this word.

- | Bit # | Description |
|---------|--|
| 0 (LSB) | Resolver line break |
| 1 | Resolver/Digital Converter Error bit (following err) |
| 2 | Sine encoder board initialization failed |
| 3 | Line break of encoder A/B input |
| 4 | Line break of encoder index input |
| 5 | Illegal halls state |
| 6 | Line break of encoder C/D input (sine encoder) |
| 7 | A/B lines out of range (sine encoder) |
| 8 | Burst overflow (sine encoder) |
| 9 | external encoder (hand wheel) line break |
| 10 | EnDat communication error |
| 11 | Hiperface communication error |
| 12 | Software resolver sine/cosine signals out of range |
| 13-15 | not used |

STATUS2 Word 2: Analog Supply Fault Status Word

If the drive has experienced an analog supply fault (Bit 6 of STATUS Word 2 = 1), the condition which caused that fault will have its bit set to 1 in this word.

Bit #	Description
0 (LSB)	Positive analog supply fault
1	Negative analog supply fault
2-15	not used

STATUS2 Word 3: Position Deviation and Over Travel Fault Status Word

If the drive has experienced position deviation or over travel fault (Bit 14 of STATUS Word 2 = 1), the condition which caused that fault will have its bit set to 1 in this word.

Bit #	Description
0 (LSB)	Internal Numerical Position Deviation
1	Pos. Error (PE) exceeded max PE limit (PEMAX)
2	Positive Overtravel (PFB > PMAX) with PLIM=1
3	Negative Overtravel (PFB < PMIN) with PLIM=1
4-15	not used

STATUS2 Word 4: Limit Switches Status Word

If the drive has experienced a limit switch fault (Bit 3 of STATUS Word 5 = 1), the condition which caused that fault will have its bit set to 1 in this word.

Bit #	Description
0 (LSB)	CW Limit Switch tripped (CWLIM=1)
1	CCW Limit Switch tripped (CCWLIM=1)
2-15	not used

STATUS2 Word 5: Encoder Initialization Failure Word

If the encoder initialization process was failed, the condition which caused that fault will have its bit set to 1 in this word.

Bit #	Description
0 (LSB)	Too little (less than one rev) or too much (more than one rev) motion
1	Phase A current doesn't fit the commanded current
2	Phase A current and phase C current doesn't match
3	At least one of the limit switches was tripped
4	Wake-No-Shake process failed because of internal time-out
5	Wake-No-Shake too high velocity or too much motion (more than quarter of a rev)
6	Wake-No-Shake internal verification failed
7	Wake-No-Shake below minimum required movement
8-15	not used

STATUS2 Word 6: Over Speed Fault Status Word

If the drive has experienced an over speed fault (Bit 7 of STATUS Word 2 = 1), the condition which caused that fault will have its bit set to 1 in this word.

Bit #	Description
0 (LSB)	Velocity above VOSPD
1	Velocity above 1.8*VLIM
2-15	not used