

Appendix B

Processor Module Error and Status Codes

All AutoMax Processor module error and status codes (displayed on the two seven-segment LEDs on the faceplate) are listed below, organized first by error type and second, in numerical/alphabetical order.

Processor Overload

00 CPU overload

Corrective action: move one or more application tasks to other Processor modules in the rack, or make scan times longer.

Power-Up Diagnostics

The following error codes are displayed while the Processor module performs power-up diagnostics.

0.0.	EPROM failed
0.1.- 0.3.	Bad CPU
0.4.	Internal bus error test failure
0.5.	Parity test failure
0.6.	External bus error test failure
0.7.	Processor in the wrong slot
1.0. - 1.6.	RAM failure
2.0.	I/O protection failure
2.1.	PIO failed
2.2.	PC accelerator failed
2.3.	8253 timer/counter failed
2.4.	SIO failure
2.5.	Communications interrupt failed
2.6.	SIO interrupt failed
2.7.	8253 counter/timer interrupt failed
2.8.	Local watchdog failed
3.0.	Bad backplane
3.1.	Multibus parity test failure
4.0. - 4.5.	Common memory RAM failure
4.6.	Common memory system watchdog failure
5.0.	Processors with incompatible EPROMs in the rack.

Corrective action: replace the Processor, or replace the Common Memory module if error codes 4.0.- 4.6. remain on.

Run Time Errors

02 Task or Configuration checksum failure

Corrective action: clear the error in the error log. This will also clear the LEDs. Reload the parameter files and application tasks to the UDC module in the slot referenced in the error log.

Runbase Booting

The following status/error codes are displayed while you load the runbase, or operating system, onto the Processor module(s). All of the following codes except 6.5. apply to the top port of the Processor module, labeled "Programmer/Port B".

- 5.1. Incompatible runbase downloaded
- 6.0. Unexpected interrupt on upper port of Processor
- 6.1. Parity error
- 6.2. Receiver overrun
- 6.3. Framing error
- 6.4. Serial port fatal error
- 6.5. Illegal interrupt on lower port of Processor
- 6.6. Transmit interrupt error
- 6.7. Runbase integrity lost
- 6.8. Bad runbase checksum
- 6.9. Transmit buffer error
- 7.0. Multi-Processor runbase download in progress
- 7.1. Disconnect time-out during download
- 7.2. Spurious interrupt received

Corrective action: 6.3. may be caused by attempting AutoMax Online PROGRAMMING functions before the runbase is loaded onto the Processor module(s) in the rack. In this case, exit the Online PROGRAMMING menu and download the runbase. 7.0 is a status message only. For all other error codes, cycle power and try to load the runbase again.

Loading the Runbase over the Network

- 8.0. Bad message length specified for network message
- 8.1. Bad destination drop
- 8.2. Transmitting drop inactive
- 8.3. Destination port unallocated
- 8.4. Destination port busy
- 8.5. Did not receive expected response
- 8.6. Spurious network interrupt received
- 8.7. Network message is being transmitted

Corrective action: 8.0. and 8.1. are caused by a failed Processor in the leftmost slot. For 8.2., check the coax cable; then try replacing the network module. For 8.3. - 8.5., check the destination Network module, then the leftmost Processor in the destination rack. For 8.6. and 8.7., cycle power and try to load the runbase again.

Miscellaneous Process Errors

- 8.8. Processor failure

Corrective action: replace Processor module.

STOP ALL Error Codes

The following hardware and software error codes cause all tasks running in the rack to stop.

- 10. Event count underflow
 - too many WAITs (max. 32768)
 - not enough SETs (BASIC tasks)
- 11. Event count overflow
 - too many SETs (max. 32767)
 - not enough WAITs (BASIC tasks)
- 12. Hardware event time-out
 - interrupt time exceeded programmed time-out limit in a Control Block task

- 13 Runbase boot error
 - a check on the runbase failed
- 14 Processor overlap limit exceeded
 - ran out of processing capacity (time)
- 15 External watchdog time-out detected
 - another Processor in the same rack stopped
- 17 Address error detected
 - caused by a read/write to an invalid address
- 18 Spurious interrupt or hardware failure
- 19 Power failure detected
- 1A Watchdog on this Processor failed
- 1b Hardware event count limit exceeded
 - too many interrupts set without being acknowledged
 - program too long
 - collective scans too fast
- 1C Illegal instruction detected
 - runbase software fault
 - bad processor module
 - bad EPROMs
- 1d Privilege violation detected
 - runbase software fault
 - bad processor module
- 1E Un-implemented instruction detected
 - runbase software fault
 - bad processor module
- 1F Illegal interrupt detected
 - runbase software fault
 - bad processor module
- 31 Bus error
 - attempt to access invalid address
- 32 Define channel error
 - problem in application software
- 33 Define scan error
 - hardware fault
- 34 Memory integrity lost
 - hardware fault
- 35 DC drive CML block initialization error
- 36 Communication between drive Processor and I/O controller lost
- 37 DC drive I/O controller run-time board error
 - hardware fault
- 38 UDC module generated a STOP ALL
- 39 UDC module interrupt allocation failed
- 3A Processor OS incompatible with UDC OS

Corrective action: correct the problem in application software. Try to reset by cycling power and re-loading configuration and application tasks. Replace the Processor module. For error code 31, see J-3650; for error code 37, see J-3669. For error code 17: If you define bits in a register that is also defined as a register, neither the bits nor the register can be forced. For error code 38, examine the error logs for all UDC tasks in the rack. Error code 38 can be caused by enabling CCLK on more than one module in the rack. Verify that CCLK is enabled on only one module in the rack. For error code 39, cycle power to the rack and re-load the configuration and application tasks. For error code 3A, check OS compatibility.

BASIC STOP ALL Error Codes

The following error codes are caused by problems in BASIC tasks and cause all tasks to stop.

40	Too many RETURNS from GOSUBs (or RETURN without GOSUB)
41	Illegal jump into a FOR loop
42	NEXT statement does not match current FOR
43	Invalid START EVERY statement
44	Invalid EVENT statement
45	STOP statement executed in application software (causes a STOP ALL/CLEAR)
46	SET or WAIT attempted with no event definition
47	Task stack overflow
48	GOSUBs not balanced at END statement
49	Insufficient space for channel buffer
4A	Attempted to execute undefined opcode
4B	Attempted to execute non-executable opcode
4C	Attempted to execute illegal opcode
4D	RESTORE to non-DATA statement line number
4E	Attempted to take square root of a negative number
4F	Attempted RESUME without being in an ON ERROR handler

Corrective action: correct the problem in application software. Error code 47 can be caused by performing a PUT on a closed port, PRINT statements, GOSUB without RETURN, and deeply-nested subroutines. Error code 4A can be caused by attempting to use Ethernet functions with the standard operating system loaded. To use Ethernet functions, you must load the Ethernet operating system.

Multibus[™] and Processor Bus STOP ALL Error Codes

50	Onboard parity error
51-54	Onboard bus error or access violation
55	Multibus parity error during read access
56-58	Multibus access violation or bus error
60	Network interrupt allocation failed
61	Network receiving queue overflow
62	Network transmit queue underflow

Corrective action: reset by cycling power and re-loading configuration and application tasks. If the small green LED labeled "OK" on the Processor module faceplate is off, replace the Processor module. Correct any incorrect accesses in application software. Systematically swap out hardware modules. For error codes 55-58, if none of the above correct the problem, try replacing the backplane.

AutoMax Drive-Related Error Codes

The following error codes indicate a power circuit or external drive system fault. They apply only to systems that incorporate DCS 5000 micro-regulators. After correcting the problem, reset the Processor module by cycling power and re-loading the configuration task and application tasks to clear the error code. Note that these error codes also appear in the Error Log for the Processor.

80	Instantaneous overcurrent fault - armature current exceeded IOC_THRESH value in CML task
81	Line sync loss fault
82	Tach loss fault - 40% armature phase angle with less than 5% tach feedback
83	Overspeed/overvoltage fault - CML task OSV_FDBK exceeded OSV_THRESH number
84	Hardware overspeed fault - drive analog module potentiometer setting exceeded by input voltage
85	External IET fault - external fault input triggered
86	Phase rotation fault - incorrect phasing
87	Shorted SCR detected in power module

Corrective action: troubleshoot power circuit and external drive system. These errors do not cause a Stop All and do not require re-loading the configuration or application tasks.

Configuration Error Codes

The following error codes usually indicate a discrepancy between the actual hardware configuration and the I/O definitions in the configuration for the rack.

E0	TASK specified in configuration uninstalled, at wrong priority, of wrong type, on wrong Processor module; wrong spelling of TASK
E1	Invalid configuration, configuration not successfully downloaded.
E2	I/O referenced in configuration is missing.
E3	I/O referenced in configuration is missing. Invalid configuration, configuration not successfully downloaded.
E4	Error building task, insufficient memory in Processor Module. Invalid configuration, configuration not successfully downloaded.
E5	Error building task, insufficient memory in Processor Module. Invalid configuration, configuration not successfully downloaded.
E6	I/O referenced in configurations is missing. Error building task, insufficient memory in Processor Module.
E7	Invalid configuration, configuration not successfully downloaded. I/O referenced in configuration is missing. Invalid configuration, configuration not successfully downloaded.
E8	Error installing application task, common symbol could not be resolved, insufficient memory in Processor Module.
E9	Error installing application task, common symbol could not be resolved, insufficient memory in Processor Module. Invalid configuration, configuration not successfully downloaded.

- EA Error installing application task, common symbol could not be resolved, insufficient memory in Processor Module. I/O referenced in configuration is missing.
- Eb Error installing application task, common symbol could not be resolved, insufficient memory in Processor Module. I/O referenced in configuration is missing. Invalid configuration, configuration not successfully downloaded.
- EC Error building task; and error installing application task, common symbol could not be resolved, insufficient memory in Processor Module.
- Ed Error building task; and error installing application task, common symbol could not be resolved, insufficient memory in Processor Module. Invalid configuration not successfully downloaded.
- EE Error building task; and error installing application task, common symbol could not be resolved, insufficient memory in Processor Module. I/O referenced in configuration is missing.
- EF Common variable forced by another Processor Module.

Corrective action: verify that the configuration correctly describes the physical configuration of the system and the tasks installed on the Processor module(s). Reset by cycling power and re-loading the configuration and application tasks. For error code EF, un-force the variable and do a STOP ALL from the AutoMax Online PROGRAMMING menu.

Fatal Errors

The following error codes usually indicate that the runbase is not functioning correctly. If any of these error codes appears, the configuration and all application tasks are deleted from the Processor module.

- F0-F9 Fatal error
- FA-FF Fatal error

Corrective action: cycle power. Re-load the configuration and all application tasks. Replace the Processor module.

Informational Messages

The following codes signify a particular condition, not necessarily an error.

- dd This Processor module has successfully completed power-up diagnostics and is waiting for other Processor modules to complete their diagnostics
- L0 The runbase needs to be loaded onto the rack
- b0 Rack configuration is being validated
- d0 Application task installation in progress
- d1 Waiting on synchronizing event (in a rack with multiple Processors)
- d2 Waiting on mutual exclusion lock (in a rack with multiple Processors)

Corrective action for b0 and d0 that do not change or disappear: re-load configuration and application tasks.