

Greenlight PV / Gemini

List of Problem Codes

Code	Error Log	Description	Possible Cause
P10	H2OPrsLow	Coolant pressure switch indicates low pressure.	Coolant level low. Obstruction from broken glass. Pump thermal shutoff / failure. Pressure/flow switch failure.
P11	H2ODegSens	Coolant temperature reads less than 5° C.	No H2O temp sensor on LCB-J15. H2O temp sensor defective.
P12	CplrSensor	Coupler temperature reads less than 5° C.	No coupler attached to LCB-J8. Coupler temp sensor defective.
P13	H2OPrsSens H2OFlwSens	The pressure sensor indicated pressure before the pump was turned on.	Shorted water pressure/flow sensor. Cooling system vent is blocked.
P14	HP FlwSens	Handpiece coolant flow detected during BIT before pump was turned on.	nHP=1, CB-J8 shorted. nHP=2, CB-J10 shorted. nHP=3, J8 and J10 shorted.
P15	HP DegSens	Coolant temperature reads less than 0° C.	No temp sensor on CB-J4. HP temp sensor defective.
P16	TECDegSens	Coolant temperature reads less than 0° C.	No temp sensor on CB-J5. TEC temp sensor defective.
P17	DetDegSens	Coolant temperature reads less than 5° C.	No temp sensor on LCB-JT3. TEC temp sensor defective.
P20	Lamp Start	Lamp failed to light before timeout (timeout in Bit Report).	If vLps>300 volts, lamp blown or water ionized, else if vLps<300 volts check LPS, HV xfrm, ignitor board, and cables.
P21	Lamp Out	After lamp on, lamp current fell below 3 amps.	If lamp doesn't light, see P20. LPS protection circuit. Line interruption / transients.
P22	LPS Volt	LPS feedback voltage was less than 30 volts after caps charged.	Blown F3 (30 amp) fuse. Soft start relay failed to engage. Open soft start resistors.
P30	Modulation	Modulation error. Radiation detector detected excessive light occurring between pulses.	Detector offsets not set correctly. Detector gains not set correctly.
P35	Q-Switch	During self-test at 30 amps drive, the power in Block mode was greater than 25% of the power in Gated mode.	Q-switch adjustment. Q-switch driver failure. Q-switch failure.
P36	No Power	During self-test at 30 amps drive, the power in Q-Switch off mode was less than one watt.	Defective KTP crystal or optic. Cracked YAG rod. Beam blocked.
P40	Adj Under	Actual power could not reach target power – “Exp Errr Limit” (15% default).	Misaligned or bad optics. Laser energy unstable.
P41	Adj Over	Actual power could not reach target power + “Exp Errr Limit” (15% default).	Misaligned or bad optics. Laser power unstable.
P42	Adj Time	Actual power could not reach target power +/- “Exp Errr Limit” (15% default) within a time limit.	Misaligned or bad optics. Laser power unstable.
P43	Exp Under	The radiation detector (wSrg) reads less than 50% of target power (wTrg) during an exposure.	Misaligned or bad optics. Laser power unstable.

Code	Error Log	Description	Possible Cause
P44	Exp Over	The radiation detector (wSrg) reads more than 120% of target power(wTrg).	Misaligned or bad optics. Laser power unstable.
P45	HwAlrt Pwr	The radiation detector (wSrg) reads more than 120% of the hardware comparator during an exposure.	See P44.
P46	Low Power	During PI curve test, power or PI slope was too low. (see Bit Report)	Misaligned or bad optics. Faulty lamp power supply.
P47	High Power	During PI curve test, power or PI slope was too high. (see Bit Report)	Misaligned or bad optics. Faulty lamp power supply.
P48	Det Match	The difference between the radiation and safety detector readings is greater then 20% during an exposure.	Detector offsets not correct. Detector gains not set correctly. Detectors non-linear.
P49	Det Maxed	Detector overflow. During an exposure the value read from the radiation or safety detectors was equal to the maximum value the A/D converter can read.	Detectors offsets not set. Detector gains not set correctly. Faulty A/D converter.
P50	Offset DAC	Unable to adjust offsets during BIT.	Detector offsets are not set properly.
P57	Pulse Chk	Hardware check of a pulse period.	Defective timer on LCB.
P58	Offset ADC	Detector offset error. One or more of the detector offsets is not within the range of 40 to 360 counts (+- 80% of 200 counts).	Detector offsets not set.
P60	Shutter	Shutter Error. The safety shutter could not be moved.	Faulty shutter. Faulty shutter position sensor.
P63	WL Mirr	Wavelength mirror detected position conflicts with commanded position.	Defective or disconnected WL mirror. No 24 volts on Cal Board.
P64	HW Shut	Hardware has detected an illegal shutter state.	Shutter alignment. Excessive light to shutter sensors. Shutter blade fallen off.
P71	SW State	Illegal software state.	Software error.
P72/ Halt Code: 3	AMX Error	AMX RTOS error.	Line transients. Bad LCB. Software error.
P73	AMX Exit	AMX RTOS error.	Software error.
P74	CPU Clock	20 MHz CPU clock was not within 2% of the display refresh clock.	Bad CPU crystal or Display refresh crystal.
P75	Watch Dog	Watch dog timer was not "pinged" within the time out period.	Line transients or LCB noise. Software fault.
P76	Watch Jmp	Watchdog jumper detected in released software.	Failure to remove watchdog jumper
P77	RAM	During BIT, RAM test failed	Faulty RAM.
P78	ROM	During BIT, ROM CRC check failed.	Faulty ROM.
P79	NVRAM Data	One or more critical NvRam data items have invalid values.	System Calibration not completed Faulty EEPROM on LCB (U59)
P80	Over Volt	Over voltage monitor.	One or more of the DC voltages on the LCB is out of tolerance.
P81	Under Volt	Under voltage monitor.	One or more of the DC voltages on the LCB is out of tolerance.
P82	Low 24v.	24 volts to Cal Board failed	No 24 volts to Cal Board.
P84	NVRAM Clk	Real Time Clock on NvRam reads and illegal value.	Faulty EEPROM on LCB (U59)

Code	Error Log	Description	Possible Cause
P85	Door Inlk	Remote interlock was not detected open before 25V was turned on.	Some 25 volts still present at power on. Faulty remote interlock circuitry.
P86	Line Volt	Line voltage on the secondary is outside the 120v \pm 12% limit.	System not tapped correctly. Wrong line voltage.
P90	KTP Temp	Measured KTP temperature outside 87° to 94° range.	If dgKTP=99° C., heater not connected or defective, else if dgKTP > 94° C., KPT crystal absorbance too high or misaligned optics, else if dgKTP < 87° C., PDB-VR2 circuitry misadjusted or defective.
P120	CfgIC HW	Configuration IC Hardware error. (U5 on Display Board)	U5 missing or defective. U5 installed improperly.
P121	CfgIC SW	Configuration IC Software error	U5 Unformatted. I2C com error.
P122	Cfg Data	Configuration IC Data error	U5 rev. doesn't match SW rev. I2C com error.
P125	CB I/O	Cal Board I/O error	If more than one error, Cal Board improperly connected or defective.
P126	CB FIFO	Cal Board FIFO buffer error	Cal Board connected improperly.
P127	CB CRC	Cal Board CRC error in Flash mem.	If after initial setup, bad Cal Board.
P130	VSpot Enc	Stepper motor position encoder read error.	VersaStat <i>i</i> handpiece motor or lead screw binding. VersaStat <i>i</i> handpiece cable problem VersaStat <i>i</i> controller PCB problem
P131	VSpot Pos	Unable to reach requested motor position.	VersaStat <i>i</i> handpiece motor or lead screw binding.
P132	VSpot RX	Invalid message received by VSpot controller.	Cable between VersaStat <i>i</i> controller and LCB problem. VersaStat <i>i</i> controller PCB problem LCB problem
P133	VSpot TO	Timeout occurred while wait for VSpot to move to new position.	VersaStat <i>i</i> handpiece cable removed during operation
P134	vSpotHome	Unable to reach home position.	VersaStat <i>i</i> handpiece cable removed during operation
P400	PwrDropExp	Energy cannot be maintained during exposure. (Happens only during Autotest.)	Check system power.
P410	PwrDropAdj	Energy cannot be achieved during power adjustment. (Happens only during Autotest.)	Check system power.

GreenLight / Gemini Alerts (not logged)

Displayed Text	Description	Possible Cause
Not In Ready	System was not in ready mode when footswitch was depressed.	Release the footswitch and push ready button.
Attach A Device (Gemini) Attach fiber (GreenLight)	No device is attached to the device port.	Attach a device.
Invalid device type (GM) Invalid fiber type (GL)	System does not recognize the type of device inserted.	Not a valid fiber/device signature. Open connection to device coupler
Remote Interlock Open	Remote interlock was removed.	Be sure remote interlock is inserted or external interlock is closed.
Emergency Off	Emergency off button pressed.	Turn power off and restart system
Check card Insertion	The card detection switch was activated but the system was unable to validate card.	Reinsert card. Defective card. Defective card connector.
Calibration error (GM)	Calibration exceeded 106% or is less than the minimum throughput allowed for the device being calibrated (minimum throughput for most devices is 50%)	Try another device. System calibration may not be set correctly.
No aim beam (GM)	Aim beam was not detected during calibration.	Device dirty. Low transmission device. Cold draft on thermopile. Aim beam weak.
Calibration low (GM)	The transmission of the device has dropped significantly since the last calibration or is out of range altogether.	Device dirty. Device low transmission.
Connect VersaStat I (GM)	VersaStat i is connected but is not communicating through serial cable.	Serial cable not connected else clear Alert to get problem error code.
Chiller Not Ready (GM)	An attempt had been made to go to Ready before the chiller had reached 15°C.	Wait for chiller to reach 15°C.
Handpiece cooling not connected (GM)	There was no handpiece coolant flow detected in either line.	Coolant lines not connected. Defective coolant pump. Defective flow switch.
Handpiece is Chilled (GM)	Calibration was attempted while the handpiece was < 15°C.	Turn handpiece cooling off in service and allow temp to rise > 15°C.
Joules remaining: Lasing time remaining:	The elapsed Joule count has exceeded the warning level for the fiber card (GL).	Footswitch was released after the Joules warning limit was exceeded.

GreenLight / Gemini Alerts (logged)

A##	Error Log	Displayed Text	Description	Possible Cause
A8	Cplr Temp	Device Port overheat	Device port temp > 75°C or rising in temp faster than 50°C/s	2 nd train misalignment. Bad fiber.
A10	H2O Level	System water low	Water level switch detects low level.	Water low. Defective, missing, or mis-wired level switch.
A11	H2O Temp	Temperature too high	DI water temp > 55°C (GreenLight) or 61°C Gemini	External water not connected (GL). Fan not functioning properly (Gemini). Poor internal water flow.
A12 (GL)	H2O HeatUp	Check water connections	BIT test failed to heat up to 38°C within 120 sec. with water valve closed.	Water valve stuck open.
A13 (GL)	H2O CoolDn	Check water connections	BIT test failed to cool down from 38°C to 36°C in 50 sec.	External water not connected. Water valve stuck closed or defective.
A14 (GM)	HPC Level	Handpiece Coolant Low	HP Coolant level switch detected low coolant level.	Coolant level low. Defective, missing, or mis-wired level switch.
A121 (GL)	Card Read	Card Read Error Remove card	Smart card software error.	CRC, authentication, password, read, or write card error. I2C com error.

GreenLight / Gemini Warnings

Code	Error Log	Description	Possible Cause
W521	Lamp Out	LPS pulse I history in the meters screen of the last 6 pulses prior to a P21	See P21.
W523	LPS Data	Software has detected an illegal or unrecognized LPS state.	Lamp feedback I > 3a. while lamp is not on. Unknown LPS state not registered in software.
W586	Line Volt	Line voltage on the secondary is outside the 120v ± 6% limit.	Line voltage low or high. System not tapped correctly.
W622	SC Invalid	Invalid smart card was read by the system	Unformatted, obsolete, or illegal card used.
W701	NVR New	A new NvRam has just been configured	New NvRam IC.
W702	NVR Update	A sector in NvRam was increased in size	Software update will add new fields and retain old values.
W703	NVR NewRev	A sector in NvRam has changed format	Software update will reset sector to default values.
W704	NVR CRC	A sector in NvRam has a CRC error.	CRC error will reset sector to default values.
W705	NVR Restor	A sector in NvRam was restored by CfgIC	Change of LCB will reset NvRam to CfgIC values.
W801	I2C State	CfgIC or smart card processing detected an illegal or unknown state.	Unknown I2C state not registered in software. I2C communication error.

Lyra/Lyra XP

List of Problem Codes/Messages

Problem Code	Error Log Text	Description	Possible Cause
Problem 10	H2O PresLow	Coolant pressure switch indicates low pressure.	Coolant level low. Leaking coolant system. Pressure switch failure.
Problem 11	H2ODegSens	Coolant temperature reads less than 5° C.	Coolant temperature sensor failure.

Problem Code	Error Log Text	Description	Possible Cause
Problem 12	CplrSensor	Coupler temperature reads less than 5° C.	Coupler temp sensor misalignment.
Problem 20	Lamp Start	Power supply failed to be enabled.	Check water pressure, water temperature and +-12 and +-24 volts.
Problem 21	Lamp Out	Power supply disabled after being enabled.	Check main PCB – U24.26.
Problem 22	---	Reserved for SCR error.	
Problem 30	Modulation	Modulation error. Radiation detector exceeded 80 counts during the low current period while in modulated mode.	Detector offsets not set correctly. Detector gains not set correctly. Lamp current cal. pot not set. Lamp current modulation signal not switching from high to low current.
Problem 31	PwrBlk Sby	Power not blocked while in Standby. Safety detector reading exceeded 0.5 Watts Peak Power when read during the high current period of lamp modulation while in Standby mode	Detector offsets not set correctly. Detector gains not set correctly. Lamp current modulation signal not switching from high to low current. Q-Switch or Q-Switch Driver not blocking correctly. Lamp current cal. pot not set. Faulty detector circuit on main PCB.
Problem 32	PwrBlk Adj	Power not blocked while adjusting power. Safety detector reading exceeded 3.0 Watts Peak Power when read during the high current period of lamp modulation while in Adjust mode.	Same as problem 31.
Problem 33	PwrBlk Rdy	Power not blocked during 2 sec. delay. Safety detector reading exceeded 0.08 Watts Peak Power when read during the high current period of lamp modulation during the 2 second ready delay before the safety shutter was opened.	Detector offsets not set correctly. Detector gains not set. Lamp current modulation signal not switching from high to low current. Q-Switch or Q-Switch Driver not blocking correctly. Lamp current calibration pot not set. Faulty detector circuit on main PCB.
Problem 34	PwrBlk Dly	Power not blocked while in Ready. Surgical detector reading exceeded 0.2 Watts Peak Power when read during the high current period of lamp modulation while in ready mode after the 2 second ready delay expired and the safety shutter was opened.	Possible user error if system was in ready mode and calibration was attempted but the cal insert was not pushed in far enough to trip the cal switch located inside the cal port. Faulty cal switch. Same as problem 31.
Problem 35	Q-Switch	During self-test the lamp current is set to 30 amps and power is measured with the Q-Switch in Block and Gated modes. If the measured power in Block mode is greater the 25% of the power in gated mode the test fails.	Q-switch adjustment. Q-switch driver failure.

Problem Code	Error Log Text	Description	Possible Cause
Problem 40	Adj Under	Power adjust under power. If laser power cannot be adjusted to within 15% of the displayed (user selected) power and the power last achieved was less than the displayed power then the displayed power will be lowered to the achievable power. If the achievable power is less than the minimum allowable power setting for the currently attached delivery device this error will be triggered.	Burned optic. Laser energy unstable. Low line current limiting maximum charging voltage.
Problem 41	Adj Over	Energy adjust over power. If laser energy cannot be adjusted to within 15% of the displayed energy then this error will be triggered.	Laser power unstable.
Problem 42	Adj Time	Energy adjust time-out. If after a time-out period laser energy was not within 15% of the user selected energy this error is triggered.	Burned optic. Laser power unstable. Low line current limiting maximum charging voltage.
Problem 43	Exp Under	Exposure under energy. The energy read from the radiation detector is 50% less than the user selected energy during an exposure. This error will occur if the pulse is too low.	Burned optic. Laser power unstable. Low line current limiting maximum charging voltage.
Problem 44	Exp Over	Exposure over energy. The energy read from the radiation detector exceeded 20% of user selected energy during an exposure. For single shot this error will occur if the single pulse is too high. For repeat exposures at least 3 pulses must be too high before this error is triggered.	Ambient temperature outside normal operating range (50-85% F) Burned optic. Laser power unstable.
Problem 45	HwAlrt Pwr	Hardware detected over energy. The energy level measured by the safety detector that is monitored continuously by a hardware comparator during exposures was greater than 20% of the user selected energy.	Refer to Problem 44. Faulty power monitor comparator on main PCB. Faulty D/A converter on main PCB.
Problem 46	Low Power	Low energy during warm-up. System generating less than 500mJ at 1050V, too little energy.	Burned optic. Faulty lamp power supply. Lamp current cal. Pot not set.

Problem Code	Error Log Text	Description	Possible Cause
Problem 47	High Power	High energy during warm-up. System generating more than 1500mJ at 750V, too much energy.	Faulty lamp power supply. Lamp current cal. Pot not set.
Problem 48	Det Match	Detector mismatch. The difference between the radiation and safety detector readings is greater then 15% during an exposure. If this error is intermittent it may occur more often in low energy settings.	Detector offsets not correct. Detector gains not set correctly. Faulty component on main PCB detector circuit. Detectors non-linear.
Problem 49	Det Maxed	Detector overflow. During an exposure the value read from the radiation or safety detectors was equal to the maximum value the A/D converter can read.	Detectors offsets not set. Detector gains not set correctly. Faulty A/D converter.
Problem 50	Offset DAC	Reserved for offset error.	
Problem 51	Gain	Detector gain error. During self test readings are taken at each gain setting from the radiation detector with the energy set to 1J. Each reading must be within 5% of the expected reading for this test to pass.	Detector gains not set correctly. Faulty component on main PCB radiation detector circuit. Note that safety detector gains are not tested, however, if a safety gain error will be detected during an exposure if the detectors do not match (Problem 48).
Problem 52	Gain 5X	See Problem 51.	See Problem 51.
Problem 53	Gain 18X	See Problem 51.	See Problem 51.
Problem 54	---	Reserved for MAX gain error.	
Problem 55	Line Curr	Line current monitor error. The line current monitor failed self-test.	Problem with line current monitor circuit on power distribution PCB. Faulty A/D converter on main PCB.
Problem 56	PwrBlkCurr	Line current exceeds its limit in Ready.	See Problem 31.
Problem 57	Pulse Chk	Hardware check of a pulse period.	Check PCB board.
Problem 58	Offset ADC	Detector offset error. One or more of the detector offsets is not within the range of 40 to 360 counts (+-80% of 200 counts).	Detector offsets not set. Faulty power down circuit on power distribution PCB.
Problem 59	Exp Dur	Reserved for duration error.	
Problem 60	Shutter	Shutter Error. The safety shutter could not be moved.	Faulty shutter. Faulty shutter position sensor.
Problem 61	---	Reserved for AEPF error.	
Problem 70	---	Reserved for AMX error.	
Problem 71	SW State	Software state error. The software attempted to change to an undefined state.	Notify engineering of possible software error.

Problem Code	Error Log Text	Description	Possible Cause
Problem 72/ Halt Code: 3	AMX Error	AMX software error. The AMX (real time operating system) system software reported that an error occurred.	Notify engineering of possible software error.
Problem 73	---	Reserved for AMX error.	
Problem 74	CPU Clock	CPU clock error. The 20 MHz CPU clock frequency was not within 2% of the display refresh (driven by an independent quartz crystal) clock frequency.	CPU crystal not operating at the correct frequency. Display refresh crystal not operating at the correct frequency.
Problem 75	Watch Dog	Watch dog timer timed out. The system was reset because the software failed to update one of the watchdog timers.	Noise on the main control PCB caused the software to get "lost". Software fault.
Problem 76	Watch Jmp	Watchdog jumper installed when service key is not installed	Remove watchdog jumper
Problem 77	RAM	RAM error. During self test the software read a value different from the value written to a specific RAM address.	Faulty RAM.
Problem 78	ROM	ROM error. During self-test the ROM CRCC check did not pass.	Faulty ROM.
Problem 79	NVRAM Data	NVRAM Data Error One or more of the system calibration items stored in NVRAM are invalid.	System Calibration not completed Faulty LCB.
Problem 80	Over Volt	Over voltage monitor.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 81	Under Volt	Under voltage monitor.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 84	NVRAM Clk	Non-Volatile memory error. The non-volatile memory (EEPROM) on the main PCB failed the CRCC (cyclic redundancy check character) test.	Faulty EEPROM on main PCB. Faulty power down circuit on power distribution PCB.
Problem 85	Door Inlk	No remote door interlock open when 12V is shut off. Test performed during warmup.	Check main PCB.
Problem 86	Low Line Volt	Line voltage is below 188 volts.	Input line voltage is too low.
Problem 90	KTP Temp	Measured KTP temperature outside range.	KTP temp adjustment. KTP temp circuit. KTP temp sensor.
Problem 100	---	Reserved for Scanner error.	

Problem Code	Error Log Text	Description	Possible Cause
Problem 101	Scnr Pos	Scanner failed to reach requested position.	Faulty scanner position feedback circuit. Damaged scanner position encoder wheel. Faulty cable between scanner PCB and scanner connector located on front of laser. Faulty scanner cable.
Problem 102	---	Reserved for Scanner error.	
Problem 103	---	Reserved for Scanner error.	
Problem 104	Scnr StaTo	Scanner status time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 105	Scnr TxAIM	Scanner transmit aim pattern time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 106	Scnr TxTo	Scanner transmit time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before the entire message was transmitted.	Faulty component in main PCB serial communication circuit.
Problem 107	Scnr AckTo	Scanner acknowledge time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before an acknowledge message was received from the scanner PCB.	Faulty component in main PCB serial communication circuit.
Problem 108	Scnr Nak	Scanner negative acknowledge. After transmitting a message to the scanner PCB the scanner PCB replied that the message it received was invalid.	Faulty component in main PCB serial communication circuit.
Problem 109	Scnr Ack	Scanner acknowledge error. After transmitting a message to the scanner PCB the scanner replied with an invalid acknowledge character.	Faulty component in scanner PCB serial communication circuit.
Problem 110	Scnr RxTo	Scanner receive time-out. More than 1.5 seconds elapsed while waiting for a message from the scanner PCB.	Faulty component in main PCB serial communication circuit. Faulty component in scanner PCB serial communication circuit.
Problem 111	Scnr RxPkt	Scanner receive packet error. A message received from the scanner PCB did not contain the required number of bytes to qualify as a complete packet.	Faulty component in scanner PCB serial communication circuit.
Problem 112	Scnr Cksum	Scanner checksum error. A message received from the scanner PCB was invalid.	Faulty component in scanner PCB serial communication circuit.

Problem Code	Error Log Text	Description	Possible Cause
Problem 113	Scnr Task	Scanner task time-out. During an exposure more than 0.5 seconds elapsed while waiting for the scanner to move to the next spot of the scan pattern.	Problem with main PCB.
Problem 114	Scnr Err?	Scanner reported an invalid error code.	Scanner PCB software may not be the latest released revision.
Problem 115	Scnr Tuning	Scanner is not in tuning (calibration) mode.	A status report.
Problem 116	Scnr Rate	Scanning rate is too slow.	Scanner may require calibration.
Problem 120	Config IC	Error reading Configuration Chip. (U5 on Display Board)	U5 missing. U5 not configured. U5 installed improperly.
Problem 130	VSpot Enc	Stepper motor position encoder read error.	VersaStat <i>i</i> handpiece motor or lead screw binding. VersaStat <i>i</i> handpiece cable problem VersaStat <i>i</i> controller PCB problem
Problem 131	VSpot Pos	Unable to reach requested motor position.	VersaStat <i>i</i> handpiece motor or lead screw binding.
Problem 132	VSpot RX	Invalid message received by VSpot controller.	Cable between VersaStat <i>i</i> controller and LCB problem. VersaStat <i>i</i> controller PCB problem LCB problem
Problem 133	VSpot TO	Timeout occurred while wait for VSpot to move to new position.	VersaStat <i>i</i> handpiece cable removed during operation
Problem 400	PwrDropExp	Energy cannot be maintained during exposure. (Happens only during Autotest.)	Check system power.
Problem 410	PwrDropAdj	Energy cannot be achieved during power adjustment. (Happens only during Autotest.)	Check system power.
Problem 430	PwrDropAdj	Energy cannot be achieved during power adjustment. (Happens only during Autotest.)	Check system power.

Lyra/LyraXP Courtesy Messages

Displayed Text	Meaning	Possible Solutions
Not In Ready	System was not in ready mode when footswitch was depressed.	Release the footswitch and push ready button.
Attach A Device	No delivery device is attached to the device port.	Attach a device.
Device Not Recognized	System does not recognize the type of device inserted.	Be sure device is designed for the Aura System. The device may be damaged.
Remote Interlock Open	Remote interlock was removed.	Be sure remote interlock is inserted or external interlock is closed.
Calibrate Device	The device inserted requires calibration.	Calibrate device.
Calibration error	Calibration exceeded 95% or is less than the minimum throughput allowed for the device being calibrated (minimum throughput for most devices is 65%)	Try another device. System calibration may not be set correctly.
No aim beam	Aim beam was not detected during calibration.	Delivery device was not inserted into cal port correctly when cal switch was activated. Aim beam may be faulty.
Connect SmartScan	Scanner cable requires connecting prior to using the SmartScan.	Connect Scanner Cable. Scanner cannot complete motor homing sequence.
Temperature Too High	Water temperature is over 65° C.	Wait for system to cool down. When water temperature drops below 55° C the system will automatically return to Standby.
Device Port Overheat	Device output port is overheating.	Replace fiber Align laser.
Emergency Off	Emergency off button pressed.	Press Standby/Ready button to restart the laser.
Chiller not Ready Please Wait or Press Standby to Continue	Displayed when user attempts to enter Ready before chiller reaches temperature set point.	Wait for chiller become ready or press the standby button to return to standby screen.
Check Handpiece Temperature	Displayed before entering Ready mode as a reminder to check the handpiece temperature before treating.	Press Standby/Ready button to enter ready mode.
Handpiece is Chilled Using Default Calibration	Displayed if user attempts to calibrate handpiece after chiller has reached temperature set point. When chilled, condensation may form on the handpiece causing incorrect calibration measurements.	The message is cleared when the handpiece is removed from the cal port. The most recent device calibration value will be used.

Displayed Text	Meaning	Possible Solutions
Check Chiller	Displayed if laser is not receiving valid status from the chiller or if a no flow status is received from the chiller.	<p>Check that the chiller is turned on and the chiller to laser interface cable is securely connected at both ends. The screen will clear automatically if the problem is resolved.</p> <p>The user may bypass this screen by pressing the button located behind the display.</p>
<p>CAUTION! Cooling Required Continue With Alternate Cooling? YES NO</p>	User elected to bypass the "Check Chiller" screen. This screen requires user confirmation before proceeding.	<p>Select YES to bypass the "Check Chiller" screen.</p> <p>Select NO to return to the "Check Chiller" screen.</p>

Venus

List of Problem Codes/Messages

Problem Code	Error Log Text	Description	Possible Cause
Problem 10	H2O Pres	Coolant pressure switch indicates low pressure.	Coolant level low. Leaking coolant system. Pressure switch failure. Main PCB failure.
Problem 11	H2O Sensor	Coolant temperature read less than 5° C.	Coolant temperature sensor failure.
Problem 12	---	Reserved for coupler temperature error.	
Problem 20	Lamp Start	Power supply failed to be enabled.	Check water pressure, water temperature and +12 and +24 volts.
Problem 21	Lamp Out	Power supply disabled after being enabled.	Check main PCB – U24.26.
Problem 22	SCR Short	End of charge from the charging caps is absent. This indicates the SCR could be shorted in between pulses. The feedback voltage is less than 100 volts.	Check power supply, SCR board or main PCB.
Problem 30	---	Reserved for modulation error.	
Problem 31	---	Reserved for power block error.	
Problem 32	---	Reserved for power block error.	
Problem 33	---	Reserved for power block error.	
Problem 34	---	Reserved for power block error.	
Problem 40	Adj Under	Energy adjust under power. If laser energy cannot be adjusted to within 15% of the displayed energy then the displayed pulse rate will be lowered to the next slower rate. If the energy cannot be achieved at 200mJ at 3 pps, then the error will be triggered.	Burned optic. Laser energy unstable. Low line current limiting maximum charging voltage.
Problem 41	Adj Over	Energy adjust over power. If laser energy cannot be adjusted to within 15% of the displayed energy then this error will be triggered.	Laser power unstable.
Problem 42	Adj Time	Energy adjust time-out. If after a time-out period laser energy was not within 15% of the user selected energy this error is triggered.	Burned optic. Laser power unstable. Low line current limiting maximum charging voltage.

Problem Code	Error Log Text	Description	Possible Cause
Problem 43	Exp Under	Exposure under energy. During an exposure if the laser energy drops below 20% of the displayed energy an audible tone will be sounded and the displayed pulse rate will be lowered. If the displayed energy was already at the minimum allowed setting and pulse rate was lowered to 3 pps then this error will be triggered.	Burned optic. Laser power unstable. Low line current limiting maximum charging voltage.
Problem 44	Exp Over	Exposure over energy. The energy read from the radiation detector exceeded 20% of user selected energy during an exposure. For single shot this error will occur if the single pulse is too high. For repeat exposures at least 3 pulses must be too high before this error is triggered.	Ambient temperature outside normal operating range (50-85% F) Burned optic. Laser power unstable.
Problem 45	HwAlrt Pwr	Hardware detected over energy. The energy level measured by the safety detector that is monitored continuously by a hardware comparator during exposures was greater than 20% of the user selected energy.	Refer to Problem 44. Faulty power monitor comparator on main PCB. Faulty D/A converter on main PCB.
Problem 46	Low Power	Low energy during warm-up. System generating less than 500mJ at 1050V, too little energy.	Burned optic. Faulty lamp power supply. Lamp current cal. Pot not set.
Problem 47	High Power	High energy during warm-up. System generating more than 1500mJ at 750V, too much energy.	Faulty lamp power supply. Lamp current cal. Pot not set.
Problem 48	Det Match	Detector mismatch. The difference between the radiation and safety detector readings is greater then 15% during an exposure. If this error is intermittent it may occur more often in low energy settings.	Detector offsets not correct. Detector gains not set correctly. Faulty component on main PCB detector circuit. Detectors non-linear.
Problem 49	Det Maxed	Detector overflow. During an exposure the value read from the radiation or safety detectors was equal to the maximum value the A/D converter can read.	Detectors offsets not set. Detector gains not set correctly. Faulty A/D converter.
Problem 50	Offset DAC	One or more of the detector offsets is less than 5 counts during power on. (Happen only in BIT.)	Detector offsets not set. Faulty power down circuit on power distribution PCB. Detectors drift with temperature.

Problem Code	Error Log Text	Description	Possible Cause
Problem 51	Gain	Detector gain error. During self test readings are taken at each gain setting from the radiation detector with the energy set to 1J. Each reading must be within 5% of the expected reading for this test to pass.	Detector gains not set correctly. Faulty component on main PCB radiation detector circuit. Note that safety detector gains are not tested, however, if a safety gain error will be detected during an exposure if the detectors do not match (Problem 48).
Problem 52	---	Reserved for 5X gain error.	
Problem 53	---	Reserved for 18X gain error.	
Problem 54	---	Reserved for MAX gain error.	
Problem 55	Line Curr	Line current monitor error. The line current monitor failed self-test.	Problem with line current monitor circuit on power distribution PCB. Faulty A/D converter on main PCB.
Problem 56	No Firing	SCR did not fire or discharge the cap at the end of a pulse period.	Faulty power supply. Check SCR board.
Problem 57	Pulse Chk	Hardware check of a pulse period.	Check PCB board.
Problem 58	Offset ADC	Detector offset error. One or more of the detector offsets is not within the range of 40 to 360 counts (+-80% of 200 counts).	Detector offsets not set. Faulty power down circuit on power distribution PCB.
Problem 59	---	Reserved for duration error.	
Problem 60	Shutter	Shutter Error. The safety shutter could not be moved.	Faulty shutter. Faulty shutter position sensor.
Problem 61	---	Reserved for AEPF error.	
Problem 70	---	Reserved for AMX error.	
Problem 71	SW State	Software state error. The software attempted to change to an undefined state.	Notify engineering of possible software error.
Problem 72/ Halt Code: 3	AMX Error	AMX software error. The AMX (real time operating system) system software reported that an error occurred.	Notify engineering of possible software error.
Problem 73	---	Reserved for AMX error.	
Problem 74	CPU Clock	CPU clock error. The 20 MHz CPU clock frequency was not within 2% of the display refresh (driven by an independent quartz crystal) clock frequency.	CPU crystal not operating at the correct frequency. Display refresh crystal not operating at the correct frequency.
Problem 75	Watch Dog	Watch dog timer timed out. The system was reset because the software failed to update one of the watchdog timers.	Noise on the main control PCB caused the software to get "lost". Software fault.
Problem 76	Watch Jmp	Watchdog jumper installed when service key is not installed	Remove watchdog jumper

Problem Code	Error Log Text	Description	Possible Cause
Problem 77	RAM	RAM error. During self test the software read a value different from the value written to a specific RAM address.	Faulty RAM.
Problem 78	ROM	ROM error. During self-test the ROM CRCC check did not pass.	Faulty ROM.
Problem 79	---	Reserved for nvRam data error.	
Problem 80	Over Volt	Over voltage monitor.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 81	Undr Volt	Under voltage monitor.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 84	NVRAM	Non-Volatile memory error. The non-volatile memory (EEPROM) on the main PCB failed the CRCC (cyclic redundancy check character) test.	Faulty EEPROM on main PCB. Faulty power down circuit on power distribution PCB.
Problem 85	Door Inlk	No remote door interlock open when 12V is shut off. Test performed during warmup.	Check main PCB.
Problem 86	---	Reserved for lowline voltage error.	
Problem 90	---	Reserved for KTP temp error.	
Problem 100	---	Reserved for Scanner error.	
Problem 101	Scnr Pos	Scanner failed to reach requested position.	Faulty scanner position feedback circuit. Damaged scanner position encoder wheel. Faulty cable between scanner PCB and scanner connector located on front of laser. Faulty scanner cable.
Problem 102	---	Reserved for Scanner error.	
Problem 103	---	Reserved for Scanner error.	
Problem 104	Scnr StaTo	Scanner status time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 105	Scnr TxAIM	Scanner transmit aim pattern time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 106	Scnr TxTo	Scanner transmit time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before the entire message was transmitted.	Faulty component in main PCB serial communication circuit.

Problem Code	Error Log Text	Description	Possible Cause
Problem 107	Scnr AckTo	Scanner acknowledge time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before an acknowledge message was received from the scanner PCB.	Faulty component in main PCB serial communication circuit.
Problem 108	Scnr Nak	Scanner negative acknowledge. After transmitting a message to the scanner PCB the scanner PCB replied that the message it received was invalid.	Faulty component in main PCB serial communication circuit.
Problem 109	Scnr Ack	Scanner acknowledge error. After transmitting a message to the scanner PCB the scanner replied with an invalid acknowledge character.	Faulty component in scanner PCB serial communication circuit.
Problem 110	Scnr RxTo	Scanner receive time-out. More than 1.5 seconds elapsed while waiting for a message from the scanner PCB.	Faulty component in main PCB serial communication circuit. Faulty component in scanner PCB serial communication circuit.
Problem 111	Scnr RxPkt	Scanner receive packet error. A message received from the scanner PCB did not contain the required number of bytes to qualify as a complete packet.	Faulty component in scanner PCB serial communication circuit.
Problem 112	Scnr Cksum	Scanner checksum error. A message received from the scanner PCB was invalid.	Faulty component in scanner PCB serial communication circuit.
Problem 113	Scnr Task	Scanner task time-out. During an exposure more than 0.5 seconds elapsed while waiting for the scanner to move to the next spot of the scan pattern.	Problem with main PCB.
Problem 114	Scnr Err?	Scanner reported an invalid error code.	Scanner PCB software may not be the latest released revision.
Problem 115	---	Reserved for Scanner error.	
Problem 116	---	Reserved for Scanner error.	
Problem 400	PwrDropExp	Energy cannot be maintained during exposure. (Happen only during Autotest.)	Check system power.
Problem 430	PwrDropAdj	Energy cannot be achieved during power adjustment. (Happen only during Autotest.)	Check system power.

Venus Courtesy Messages

Displayed Text	Meaning	Possible Solutions
Not In Ready	System was not in ready mode when footswitch was depressed.	Release the footswitch and push ready button.
Foot Not Active	Footswitch is not activated when ScannerPlus is connected. Handswitch is selected and active.	Select 'FOOT' option from the Sys. Info. Screen.
Hand Not Active	Handswitch is not activated when ScannerPlus is connected. Footswitch is selected and active.	Select 'HAND' option from the Sys. Info. Screen.
Remote Interlock Open	Remote interlock was removed.	Be sure remote interlock is inserted or external interlock is closed.
Temperature Too High	Water temperature is over 65° C.	Wait for system to cool down. When water temperature drops below 55° C the system will automatically return to Standby.
Emergency Off	Emergency off button pressed.	Press Standby/Ready button to restart the laser.

Aura SL/10W/XP

List Of Problem Codes/Messages

Problem Code	Error Log Text	Description	Possible Cause
Problem 10	H2O Pres	Coolant pressure switch indicates low pressure.	Coolant level low. Leaking coolant system. Pressure switch failure. Main PCB failure.
Problem 11	H2O Sensor	Coolant temperature read less than 5° C.	Coolant temperature sensor failure.
Problem 12	CplrSensor	Coupler temperature read less than 75° C.	Coupler temperature sensor failure.
Problem 20	Lamp Start	Lamp failed to start during start up.	System has not been operated for an extended period of time. Leave the keyswitch on for 10 minutes then try again. De-ionizing filter requires replacement. Lamp power supply failed. Lamp failed. Lamp current calibration pot not set correctly. Main PCB failure.
Problem 21	Lamp out	Lamp extinguished after being lit.	Lamp power supply failed. Lamp failed. Lamp current calibration pot not set correctly. Main PCB failure.
Problem 22	---	Reserved for SCR error.	

Problem Code	Error Log Text	Description	Possible Cause
Problem 30	Modulation	Modulation error. Radiation detector exceeded 80 counts during the low current period while in modulated mode.	Detector offsets not set correctly. Detector gains not set correctly. Lamp current cal. pot not set. Lamp current modulation signal not switching from high to low current.
Problem 31	PwrBlk Sby	Power not blocked while in Standby. Safety detector reading exceeded 0.5 Watts Peak Power when read during the high current period of lamp modulation while in Standby mode	Detector offsets not set correctly. Detector gains not set correctly. Lamp current modulation signal not switching from high to low current. Q-Switch or Q-Switch Driver not blocking correctly. Lamp current cal. pot not set. Faulty detector circuit on main PCB.
Problem 32	PwrBlk Adj	Power not blocked while adjusting power. Safety detector reading exceeded 3.0 Watts Peak Power when read during the high current period of lamp modulation while in Adjust mode.	Same as problem 31.
Problem 33	PwrBlk Rdy	Power not blocked while in Ready. Surgical detector reading exceeded 0.2 Watts Peak Power when read during the high current period of lamp modulation while in ready mode after the 2 second ready delay expired and the safety shutter was opened.	Possible user error if system was in ready mode and calibration was attempted but the cal insert was not pushed in far enough to trip the cal switch located inside the cal port. Faulty cal switch. Same as problem 31.
Problem 34	PwrBlk Dly	Power not blocked during 2 sec. delay. Safety detector reading exceeded 0.08 Watts Peak Power when read during the high current period of lamp modulation during the 2 second ready delay before the safety shutter was opened.	Detector offsets not set correctly. Detector gains not set. Lamp current modulation signal not switching from high to low current. Q-Switch or Q-Switch Driver not blocking correctly. Lamp current calibration pot not set. Faulty detector circuit on main PCB.
Problem 35	Q-Switch	Q-Switch failure. During self test the lamp drive current is set to 20 amps and power measurements are made with the Q-Switch set to off, block, and gated. The power read in block must be less than ½ the power in off and the power read in gated must be greater than or equal to twice the power read in off for the test to pass.	Q-Switch or Q-Switch Driver fault. Control PCB not switching Q-Switch Driver modes correctly.
Problem 40	Adj Under	Power adjust under power. If laser power cannot be adjusted to within 15% of the displayed (user selected) power and the power last achieved was less than the displayed power then the displayed power will be lowered to the achievable power. If the achievable power is less than the minimum allowable power setting for the currently attached delivery device this error will be triggered.	Burned optic. Laser power unstable.

Problem Code	Error Log Text	Description	Possible Cause
Problem 41	Adj Over	Power adjust over power. If laser power cannot be adjusted to within 15% of the displayed (user selected) power and the power last achieved was greater than the displayed power this error will be triggered.	Laser power unstable.
Problem 42	Adj Time	Power adjust time-out. If after a time-out period laser power was not within 15% of the user selected power this error is triggered.	Laser power unstable.
Problem 43	Exp Under	Exposure under power. During an exposure if the laser power drops below 20% of the displayed (user selected) power an audible tone will be sounded and the displayed power will be lowered. If the displayed power was already at the minimum allowed setting for the currently attached delivery device then this error will be triggered.	Burned optic. Laser power unstable.
Problem 44	Exp Over	Exposure over power. The power read from the surgical detector exceeded 20% of user selected power during an exposure. For single shot *Pulse exposures this error will occur if the single pulse is too high. For repeat or continuous exposures at least 2 pulse must be too high before this error is triggered.	Ambient temperature outside normal operating range (50-85° F) P/I curve may have a flat spot or fold-back. Laser power unstable.
Problem 45	HwAlrt Pwr	Hardware detected over power. The power level measured by the safety detector which is monitored continuously by a hardware comparator during exposures was greater than 20% of the user selected power.	Refer to Problem 44. Faulty power monitor comparator on main PCB. Faulty D/A converter on main PCB.
Problem 46	Low Power	Low power during warm-up. During the warm-up sequence two power measurements are made, the first at 16 amps and the second at 38 amps. A P/I curve is then calculated using the power levels at the two lamp current settings using the following formula: $P / I = \frac{P_2 - P_1}{38 - 16}$ Where P ₂ is the power measured at 38 amps and P ₁ is the power measured at 16 amps. Problem 46 is declared if P/I is less than 1.25.	Burned optic. Faulty lamp power supply. Lamp current cal. Pot not set. Lamp current modulation signal not switching from high to low current.
Problem 47	High Power	High power during warm-up. Refer to Problem 46 for a description of the power measurement used to detect this fault. Problem 47 is declared if P/I is greater than 10.0.	Faulty lamp power supply. Lamp current cal. Pot not set. Lamp current modulation signal not switching from high to low current.

Problem Code	Error Log Text	Description	Possible Cause
Problem 48	Det Match	Detector mismatch. The difference between the radiation and safety detector readings is greater than 15% during an exposure. If this error is intermittent it may occur more often in low power settings.	Detectors offsets not correct. Detector gains not set correctly. Faulty component on main PCB detector circuit.
Problem 49	Det Maxed	Detector overflow. During an exposure the value read from the radiation or safety detectors was equal to the maximum value the A/D converter can read.	Detectors offsets not set. Detector gains not set correctly. Faulty A/D converter.
Problem 50	Offset DAC	Detector offset error. One or more of the detector offsets is outside the range of 500 to 3500 counts.	Detector offsets not set. Faulty power down circuit on power distribution PCB. Faulty EEPROM on main PCB.
Problem 51	Gain 1X	Detector gain error. During self test readings are taken at each gain setting (except cal gain) from the radiation detector with the drive current set to 20 amps. Each reading must be within 5% of the expected reading for this test to pass.	Detector gains not set correctly. Faulty component on main PCB radiation detector circuit. Note that safety detector gains are not tested, however, if a safety gain error will be detected during an exposure if the detectors do not match (Problem 48).
Problem 52	Gain 5X	See Problem 51.	See Problem 51.
Problem 53	Gain 18X	See Problem 51.	See Problem 51.
Problem 54	Gain MAX	See Problem 51.	See Problem 51.
Problem 55	Line Curr	Line current monitor error. The line current monitor failed self-test.	Problem with line current monitor circuit on power distribution PCB. Faulty A/D converter on main PCB.
Problem 56	PwrBlkCurr	Line current exceeds its limit in Ready.	See Problem 31.
Problem 57	Pulse Chk	Pulse Width Check. A Hw timer is set 200us longer than the lamp pulse width. If Hw the timer expires and the lamp pulse is still active this error is declared	Faulty LCB.
Problem 58	Offset ADC	Offset Reading out of range. The offset reading (ADC) exceeds 20% of the expected value for 3 readings in a row	Faulty LCB.
Problem 59	Exp Dur	Exposure Duration Too Long. In Repeat Mode, the laser was still on after the duration time.	Faulty LCB.
Problem 60	Shutter	Shutter Error. The safety shutter could not be moved.	Faulty shutter. Faulty shutter position sensor.
Problem 61	AEPF	Aepf Error. The aepf could not be moved.	Faulty aepf. Fault aepf position sensorl
Problem 70	---	Reserved for AMX error.	
Problem 71	SW State	Software state error. The software attempted to change to an undefined state.	Notify engineering of possible software error.
Problem 72/ Halt Code: 3	AMX Error	AMX software error. The AMX (real time operating system) system software reported that an error occurred.	Notify engineering of possible software error.
Problem 73	---	Reserved for AMX error.	

Problem Code	Error Log Text	Description	Possible Cause
Problem 74	CPU Clock	CPU clock error. The 20 MHz CPU clock frequency was not within 2% of the display refresh (driven by an independent quartz crystal) clock frequency.	CPU crystal not operating at the correct frequency. Display refresh crystal not operating at the correct frequency.
Problem 75	Watch Dog	Watch dog timer timed out. The system was reset because the software failed to update one of the watchdog timers.	Noise on the main control PCB caused the software to get "lost". Software fault.
Problem 76	Watch Jmp	Watchdog jumper installed when service key is not installed	Remove watchdog jumper
Problem 77	RAM	RAM error. During self test the software read a value different from the value written to a specific RAM address.	Faulty RAM.
Problem 78	ROM	ROM error. During self test the ROM CRCC check did not pass.	Faulty ROM.
Problem 79	NVRAM Data	NVRAM Data Error One or more of the system calibration items stored in NVRAM are invalid.	System Calibration not completed Faulty LCB.
Problem 80	Over Volt	Over voltage monitor 1 & 2.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 81	Undr Volt	Under voltage monitor 1 & 2.	One or more of the DC voltages on the main PCB is out of tolerance.
Problem 84	NVRAM	Non-Volatile memory error. The non-volatile memory (EEPROM) on the main PCB failed the CRCC (cyclic redundancy check character) test.	Faulty EEPROM on main PCB. Faulty power down circuit on power distribution PCB.
Problem 85	Door Inlk	Remote Interlock Failed Self-Test During Warmup the 24V is turned off momentarily and a remote interlock error was not reported by the hardware	Faulty LCB.
Problem 86	---	Reserved for lowline voltage error.	
Problem 90	KTP Temp	KTP temperature out of range. KTP temperature is less than 80 degrees C or grater then 84 degrees C.	KTP heater circuit faulty. KTP thermistor faulty. KTP crystal burned.
Problem 100	Scnr Home	Scanner failed homing sequence.	Faulty scanner position feedback circuit. Damaged scanner position encoder wheel. Faulty cable between scanner PCB and scanner connector located on front of laser. Faulty scanner cable. Faulty scanner control PCB.
Problem 101	Scnr Pos	Scanner failed to reach requested position.	Faulty scanner position feedback circuit. Damaged scanner position encoder wheel. Faulty cable between scanner PCB and scanner connector located on front of laser. Faulty scanner cable.
Problem 102	Scnr BIT	Scanner failed its internal built-in test.	Faulty scanner PCB.

Problem Code	Error Log Text	Description	Possible Cause
Problem 103	Scnr HomTo	Scanner time-out during homing sequence.	Faulty scanner position feedback circuit. Damaged scanner position encoder wheel.
Problem 104	Scnr StaTo	Scanner status time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 105	Scnr TxAIM	Scanner transmit aim pattern time-out.	Faulty component in scanner PCB serial communications circuit. Faulty serial communications cable.
Problem 106	Scnr TxTo	Scanner transmit time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before the entire message was transmitted.	Faulty component in main PCB serial communication circuit.
Problem 107	Scnr AckTo	Scanner acknowledge time-out. After transmitting a message to the scanner PCB more than 0.5 seconds elapsed before an acknowledge message was received from the scanner PCB.	Faulty component in main PCB serial communication circuit. Faulty component in scanner PCB serial communication circuit.
Problem 108	Scnr Nak	Scanner negative acknowledge. After transmitting a message to the scanner PCB the scanner PCB replied that the message it received was invalid.	Faulty component in main PCB serial communication circuit.
Problem 109	Scnr Ack	Scanner acknowledge error. After transmitting a message to the scanner PCB the scanner replied with an invalid acknowledge character.	Faulty component in scanner PCB serial communication circuit.
Problem 110	Scnr RxTo	Scanner receive time-out. More than 1.5 seconds elapsed while waiting for a message from the scanner PCB.	Faulty component in main PCB serial communication circuit. Faulty component in scanner PCB serial communication circuit.
Problem 111	Scnr RxPkt	Scanner receive packet error. A message received from the scanner PCB did not contain the required number of bytes to qualify as a complete packet.	Faulty component in scanner PCB serial communication circuit.
Problem 112	Scnr Cksum	Scanner checksum error. A message received from the scanner PCB was invalid.	Faulty component in scanner PCB serial communication circuit.
Problem 113	Scnr Task	Scanner task time-out. During an exposure more than 0.5 seconds elapsed while waiting for the scanner to move to the next spot of the scan pattern.	Problem with main PCB.
Problem 114	Scnr Err??	Scanner reported an invalid error code.	Scanner PCB software may not be the latest released revision.
Problem 115	---	Reserved for Scanner error.	
Problem 116	---	Reserved for Scanner error.	
Problem 130	VSpot Enc	Stepper motor position encoder read error.	VersaStat <i>i</i> handpiece motor or lead screw binding. VersaStat <i>i</i> handpiece cable problem VersaStat <i>i</i> controller PCB problem
Problem 131	VSpot Pos	Unable to reach requested motor position.	VersaStat <i>i</i> handpiece motor or lead screw binding.

Problem Code	Error Log Text	Description	Possible Cause
Problem 132	VSpot RX	Invalid message received by VSpot controller.	Cable between VersaStat <i>i</i> controller and LCB problem. VersaStat <i>i</i> controller PCB problem LCB problem
Problem 133	VSpot TO	Timeout occurred while wait for VSpot to move to new position.	VersaStat <i>i</i> handpiece cable removed during operation
Problem 400	Pwr DropExp	Power cannot be maintained during expousre.	Check system power.
Problem 430	Pwr DropAdj	Power cannot be achieved during power adjustment.	Check system power.

Aura Courtesy Messages

Displayed Text	Meaning	Possible Solutions
Not In Ready	System was not in ready mode when footswitch was depressed.	Release the footswitch and push ready button.
Attach A Device	No delivery device is attached to the device port.	Attach a device.
Device Not Recognized	System does not recognize the type of device inserted.	Be sure device is designed for the Aura System. The device may be damaged.
Remote Interlock Open	Remote interlock was removed.	Be sure remote interlock is inserted or external interlock is closed.
Calibrate Device	The device inserted requires calibration.	Calibrate device.
Calibration error	Calibration exceeded 95% or is less than the minimum throughput allowed for the device being calibrated (minimum throughput for most devices is 65%)	Try another device. System calibration may not be set correctly.
No aim beam	Aim beam was not detected during calibration.	Delivery device was not inserted into cal port correctly when cal switch was activated. Aim beam may be faulty.
Connect SmartScan	Scanner cable requires connecting prior to using the SmartScan.	Connect Scanner Cable. Scanner cannot complete motor homing sequence.
Temperature Too High	Water temperature is over 65° C.	Wait for system to cool down. When water temperature drops below 55° C the system will automatically return to Standby.
Device Port Overheat	Device output port is overheating.	Replace fiber Align laser.
Emergency Off	Emergency off button pressed.	Press Standby/Ready button to restart the laser.
Chiller not Ready Please Wait or Press Standby to Continue	Displayed when user attempts to enter Ready before chiller reaches temperature set point.	Wait for chiller become ready or press the standby button to return to standby screen.
Check Handpiece Temperature	Displayed before entering Ready mode as a reminder to check the handpiece temperature before treating.	Press Standby/Ready button to enter ready mode.
Handpiece is Chilled Using Default Calibration	Displayed if user attempts to calibrate handpiece after chiller has reached temperature set point. When chilled, condensation may form on the handpiece causing incorrect calibration measurements.	The message is cleared when the handpiece is removed from the cal port. The most recent device calibration value will be used.

Displayed Text	Meaning	Possible Solutions
Check Chiller	Displayed if laser is not receiving valid status from the chiller or if a no flow status is received from the chiller.	Check that the chiller is turned on and the chiller to laser interface cable is securely connected at both ends. The screen will clear automatically if the problem is resolved. The user may bypass this screen by pressing the button located behind the display.
CAUTION! Cooling Required Continue With Alternate Cooling? YES NO	User elected to bypass the "Check Chiller" screen. This screen requires user confirmation before proceeding.	Select YES to bypass the "Check Chiller" screen. Select NO to return to the "Check Chiller" screen.

Orion List Of Problem Codes/Messages

Screen Message	Code	Level	Log	Comments
System error. If the problem persists, contact Customer Service.	A01	Warn	Logged	Battery low. System will use default setting for exposure tone volume. Error log will be lost.
System error. If the problem persists, contact Customer Service.	A02	Warn	Logged	Shutter position error. The safety shutter is not working properly.
System error. If the problem persists, contact Customer Service.	A03	Warn	Logged	L attenuator thruput is 20% out of spec. Error shows up at end of warmup cycle.
System error. If the problem persists, contact Customer Service.	A04	Warn	Logged	Unexpected exposure. Light detected on safety detector when exposure not active.
System error. If the problem persists, contact Customer Service.	A05	Warn	Logged	Detector mismatch. Detectors may not be adjusted properly.
System error. If the problem persists, contact Customer Service.	A06	Warn	Logged	Hardware 20% over power fault during exposure. System sees too much power at the safety detector during an exposure.

System error. If the problem persists, contact Customer Service.	A07	Warn	Logged	Exposure over duration. Exposure ON time is too long.
System error. If the problem persists, contact Customer Service.	A08	Warn	Logged	Exposure under interval. Exposure OFF time is too short.
System error. Adjust power. If the problem persists, contact Customer Service.	A09	Warn	Logged	Power adjust over power. Cannot adjust power to within the specified window. User can choose a different power level.
System error. Adjust power. If the problem persists, contact Customer Service.	A10	Warn	Logged	Power adjust under power. Cannot adjust power to within the specified window. User can choose a different power level.
System error. If the problem persists, contact Customer Service.	A11	Warn	Logged	Warm-up over power. Minimum power is higher than spec. power. System returns to startup screen. User must restart the system.
System error. If the problem persists, contact Customer Service.	A12	Warn	Logged	Warm-up low power. Maximum power is lower than spec. power. System returns to startup screen. User must restart the system.
Device port overheating. Replace the device with a new one.	A13	Warn	Logged	Device coupler overheat. The device connector is usually burnt or damaged.
FiberLife is not functioning. To continue, lower power is recommended. If the problem persists, contact Customer Service.	A14	Warn	Logged	Fiberlife malfunction. Fiberlife is not connected properly or is active even though the laser is not generating light. This message is usually displayed when the key is first turned on if Fiberlife isn't working. However, if this error occurs during operation, Fiberlife will be automatically disabled.
Calibration error. System will assume default transmission for the attached delivery device.	A15	Warn	Logged	Calibration over power. Calibration measured fiber transmission greater than 110% during calibration. This is an unlikely error that indicates a possible detector problem.
System overheated. Ensure air vents are clear. Allow system to cool down before continuing.	A16	Warn	Logged	Water temp too high. Water temperature > 155 degrees F. This message will remain on the screen until the water temperature falls below 140 degrees F. At that time the system will automatically return to STANDBY.

Aim beam not available. System can be used without an aim beam. If the problem persists, contact Customer Service.	A17	Warn	Logged	Aim beam malfunction. Either the aim diode or detector circuit is bad.
KTP/532 not available. To proceed with Nd:YAG/1064 only, restart the laser. If the problem persists, contact Customer Service.	A18	Warn	Logged	Warm-up select KTP error. KTP could not be selected during warm-up.
Nd:YAG/1064 not available. To proceed with KTP/532 only, restart the laser. If the problem persists, contact Customer Service.	A19	Warn	Logged	Warm-up select YAG error. YAG could not be selected during warm-up.
Wavelength not available. If the problem persists, contact Customer Service.	A20	Warn	Logged	Wavelength mirror error. KTP or YAG could not be selected by the user after warm-up completed or wavelength mirror failed after warm-up.
SmartScan™ error. If the problem persists, contact Customer Service.	A21	Warn	Logged	SmartScan failed homing sequence.
SmartScan™ error. If the problem persists, contact Customer Service.	A22	Warn	Logged	SmartScan position error. SmartScan failed to reach correct position.
SmartScan™ error. If the problem persists, contact Customer Service.	A23	Warn	Logged	SmartScan communication error. Return message invalid.
SmartScan™ error. If the problem persists, contact Customer Service.	A24	Warn	Logged	SmartScan failed P.O.S.T. SmartScan failed power on self test during startup.
SmartScan™ not connected. Turn the key switch OFF before connecting the SmartScan electronic cable. If the problem persists, contact Customer Service.	A25	Warn	Not Logged	SmartScan not connected. This error occurs when a SmartScan fiber is connected when the SmartScan electronic cable is not connected.
The typical energy dose for LDD has been delivered.	A26	Warn	Not Logged	LDD joules warning #1. Message appears when 1250 Joules are accumulated.

The typical energy dose for LDD has been exceeded by 25%. To continue may cause overheating of the SpineStat.	A27	Warn	Not Logged	LDD joules warning #2. Message appears when 1550 Joules are accumulated.
The typical energy dose for LDD has been exceeded by 50%. Do not continue using the SpineStat. Contact Customer Service for more information.	A28	Warn	Not Logged	LDD joules warning #3. Message appears when 1875 Joules are accumulated.
Autotest Done.	A29	Warn	Logged	Autotest Done Service only function. Errors (if any) are logged in the system diagnostic screen.
Autotest Started.	A30	Warn	Logged	Autotest Start Service only function.
Autotest Reset.	A31	Warn	Logged	Autotest Reset Service only function.
System error. If the problem persists, contact Customer Service.	A32	Warn	Logged	Configuration board failure. System configuration board not connected or not programmed correctly.
Aim beam not available. This device requires an aim beam. Choose another device. If the problem persists, contact Customer Service.	A33	Warn	Logged	Aim beam malfunction. Either the aim diode or detector circuit is bad.
System error. If the problem persists, contact Customer Service.	A34	Warn	Logged	Power detected in LoMod.
System error. Power cannot be adjusted for this device. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	A35	Warn	Logged	CW power not available. This message is displayed if a device that requires CW power is attached and during system warm-up CW power could not be adjusted within system limits.
System error. If the problem persists, contact Customer Service.	A36	Warn	Not Logged	Software error. Text not found. User should never see this error.
System error. If the problem persists, contact Customer Service.	A37	Warn	Logged	Hardware 40% over power fault during exposure. System sees too much power at the safety detector during exposure.

System error. If the problem persists, contact Customer Service.	A38	Warn	Logged	Software 20% over power fault during exposure. System sees too much power at the radiation detector during exposure.
System error. If the problem persists, contact Customer Service.	A39	Warn	Logged	Too little power (less than 40mW peak) seen at the radiation detector.
System error. If the problem persists, contact Customer Service.	A40	Warn	Logged	0.3X gain change fault during warmup. User must restart the system.
System error. If the problem persists, contact Customer Service.	A41	Warn	Logged	M attenuator thruput is 20% out of spec. Error shows up at end of warmup cycle.
System error. If the problem persists, contact Customer Service.	A42	Warn	Logged	H attenuator thruput is 20% out of spec. Error shows up at end of warmup cycle.
System error. If the problem persists, contact Customer Service.	A43	Warn	Logged	L attenuator not moving. User must restart the system.
System error. If the problem persists, contact Customer Service.	A44	Warn	Logged	M attenuator not moving. User must restart the system.
System error. If the problem persists, contact Customer Service.	A45	Warn	Logged	H attenuator not moving. User must restart the system.
System error. If the problem persists, contact Customer Service.	A46	Warn	Logged	Radiation detector saturated during exposure.
System error. If the problem persists, contact Customer Service.	A47	Warn	Logged	Safety detector saturated during exposure.
System error. If the problem persists, contact Customer Service.	A48	Warn	Logged	xxx% over power detected at end of each pulse. xxx = 20 during apps and used in single shot only. xxx varies during autotest until it max out at 20.
System error. If the problem persists, contact Customer Service.	A49	Warn	Logged	xxx% under power detected at end of each pulse. xxx = 20 during apps and used in single shot only. xxx varies during autotest until it max out at 20.

System error. If the problem persists, contact Customer Service.	A50	N/A	Logged	System detected foldback at this power level, pulse width and current setting. Error recorded only once after power on. Not shown to customers.
System error. If the problem persists, contact Customer Service.	A51	Warn	Logged	4X gain change fault during warmup. User must restart the system.
System error. If the problem persists, contact Customer Service.	A52	Warn	Logged	20X gain change fault during warmup. User must restart the system.
System error. If the problem persists, contact Customer Service.	A53	Warn	Logged	100X gain change fault during warmup. User must restart the system.
System error. If the problem persists, contact Customer Service.	A54	Warn	Logged	Surgical detector offset is not zero, more than 3 counts
System error. If the problem persists, contact Customer Service.	A55	Warn	Logged	Radiation detector offset is not zero, more than 3 counts
SmartScan™ error. If the problem persists, contact Customer Service.	A56	Warn	Logged	Serial cable between main PCB and scanner PCB not connected.
SmartScan™ error. If the problem persists, contact Customer Service.	A57	Warn	Logged	SmartScan communication error while sending data.
SmartScan™ error. If the problem persists, contact Customer Service.	A58	Warn	Logged	SmartScan communication error while receiving data.
SmartScan™ error. If the problem persists, contact Customer Service.	A59	Warn	Logged	SmartScan communication error while waiting for acknowledgement.
System Error. If the problem persists, contact Customer Service.	A60	N/A	Logged	CW power not available. Logged as information for in-house use. Not shown to customers.
System error. If the problem persists, contact Customer Service.	A61	Warn	Loggred	AEPF position error. The AEPF is not moving in and out properly.
AEPF is ON Connect AEPF cable and Attach AEPF to microscope. OR Press OK to disable.	A62	Warn	Not Logged	AEPF is not connected to the connector at the back of the console. Either connect the AEPF cable or press OK to disable the AEPF.

<p>System error.</p> <p>Turn the key switch OFF and back ON to try again.</p> <p>If the problem persists, contact Customer Service.</p>	F01	Restart	Logged	<p>Water flow fault.</p> <p>System senses there is no water flow when the pump is on.</p>
<p>Coolant level too low.</p> <p>Fill reservoir with de-ionized or sterile water.</p> <p>If the problem persists, contact Customer Service.</p>	F02	Restart	Logged	<p>Water level fault.</p>
<p>Water temperature too high.</p> <p>The laser is shut down for cooling. Leave the laser ON, to cool.</p> <p>If the problem persists, contact Customer Service.</p>	F03	Restart	Logged	<p>Water temp fault.</p> <p>Water temperature > 165 degrees F. This message will remain on the screen until the water temperature falls below 140 degrees F. At that time the system will automatically return to the startup screen. It is very unlikely the user will ever see this message since the system is stopped when message A16 is displayed (temperature > 155).</p>
<p>System error.</p> <p>Leave the laser ON for 5 minutes before restarting.</p> <p>If the problem persists, contact Customer Service.</p>	F04	Restart	Logged	<p>Lamp start fault.</p>
<p>System error.</p> <p>Turn the key switch OFF and back ON to try again.</p> <p>If the problem persists, contact Customer Service.</p>	F05	Restart	Logged	<p>Hardware interlock fault.</p> <p>Main hardware interlock found open but no error was detected.</p>
<p>System error.</p> <p>Turn the key switch OFF and back ON to try again.</p> <p>If the problem persists, contact Customer Service.</p>	F06	Restart	Logged	<p>Footswitch wiring fault.</p>
<p>System error.</p> <p>Turn the key switch OFF and back ON to try again.</p> <p>If the problem persists, contact Customer Service.</p>	F07	Restart	Logged	<p>Watchdog timer circuit not enabled. Check TP14 for ground signal.</p>

System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F08	Restart	Logged	Software - Message error
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F09	Restart	Logged	Software - Message error
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F10	Restart	Logged	Software - Message error
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F11	Restart	Logged	Software - Message error
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F12	Restart	Logged	Key off fault. Hardware fault.
EMERGENCY OFF	F13	Restart	Not Logged	Emergency off. If user has not pressed the Emergency Off button, then this is a hardware fault.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F14	Restart	Logged	Invalid system configuration. System configuration board not connected or not programmed correctly and configuration on the SL control board is invalid.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F15	Restart	Logged	Lamp extinguishes during application. User must restart the system. Check lamp and power supply.

System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F16	Restart	Logged	Second water level switch open by itself. First level switch is still ok. Check the hardware interlock chain or the flow switch.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F17	Restart	Logged	Watchdog hardware reset.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F18	Restart	Logged	Watchdog software reset by task APPS.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F19	Restart	Logged	Watchdog software reset by task PWR.
System error. Turn the key switch OFF and back ON to try again. If the problem persists, contact Customer Service.	F20	Restart	Logged	Watchdog software reset by task EH.
Screen filled with 1's	N/A	Restart	Not Logged	System RAM test failure.
Screen filled with 2's	N/A	Restart	Not Logged	System VIDEO RAM test failure.
Screen filled with 3's	N/A	Restart	Not Logged	System ROM test failure.

Orion Courtesy Messages

Screen Message	Code	Level	Log	Comments
Coolant level low. Fill reservoir with de-ionized or sterile water.	I01	Info	Not Logged	Water level warning.
System overheating. Ensure air vents are clear.	I02	Info	Not Logged	Water temp too high. Water temperature greater than 140 degrees F. System beeps and displays this message. Usually this will occur during an exposure since exposures are what heat up the system. Exposure will continue. Message will remain on screen until system cools down.
Remote interlock open. Close interlock.	I03	Info	Not Logged	Remote interlock open. Remote (door) Interlock. System will not allow user to enter READY or start an exposure.
Delivery device not attached. Attach a device to the laser.	I04	Info	Not Logged	No device attached. System will not allow user to enter READY or start an exposure.
Delivery device not recognized. Try a different delivery device.	I05	Info	Not Logged	Device not recognized. The attached device may not be signed correctly. System will not allow user to enter READY or start an exposure.
The attached delivery device cannot deliver this wavelength.	I06	Info	Not Logged	No wavelength for device.
System not READY. Release footswitch.	I07	Info	Not Logged	Footswitch-not in ready.
System must be in READY for two seconds before starting an exposure. Release footswitch.	I08	Info	Not Logged	2 second ready delay. STANDBY will flash for 2 seconds after pressing Ready.
This device cannot be calibrated.	I09	Info	Not Logged	Calibration not allowed.
Calibrate device. OR Press OK to continue. Calibration: 85%	I10	Info	Not Logged	Calibration required. Occurs as soon as a device is attached that requires calibration. However the user can press OK to bypass calibration and use the default value that is displayed on the screen.
CALIBRATION In Progress, Please Wait.	I11	Info	Not Logged	Calibration in process.
Calibration Error Low transmission. Try again or try a new device.	I12	Info	Not Logged	Calibration low power. Calibration unsuccessful due to: i. transmission too low. ii. detector reads too little power.
Calibration discontinued. Try again.	I13	Info	Not Logged	Calibration aborted. Calibration aborted due to: i. device removed from Cal. pod. ii. system state change.

Calibration error. Aim beam not detected.	I14	Info	Logged	System does not see an aim beam during calibration. This could happen if someone puts a fiber (or a finger) into the cal port that isn't connected to the output coupler.
Calibration successful. Transmission XX%.	I15	Info	Not Logged	Calibration success.
NOTICE Power has just dropped.	I16	Info	Logged	Exposure under power. Power has dropped during an exposure. System lowers the displayed power, beeps, displays this message, and continues the exposure.
On/Off Test In Progress.	I17	Info	Not Logged	On/off test start. Service function.
C A U T I O N Autotest In Progress. Press Any Key To Stop Test.	I18	Info	Not Logged	Autotest active. Service function. Laser light will be emitted if fiber attached.
CALIBRATION 1. Center the aim beam. 2. Close the window. 3. Press START.	I19	Info	Not Logged	Special cal. seq. Prompt for calibrating the micro-manipulator.
Shutter Test In Progress	I20	Info	Not Logged	Shutter test active. Service function.
AEPF : OFF	I21	Info	Not Logged	AEPF status in APPS mode. Notify the user that AEPF is disabled.

50X/70X/8XX

List Of Problem Codes/Messages

L011	External Cooling Water Flow Interrupted
L012	Internal Cooling Water Flow Interrupted
L013	Internal Water Flow Fault
L020	Water Temperature Too High (Hardware Switch-140F)
L021	Water Temperature Too High (Software Switch-150F)
L030	Cooling Water Level Too Low
L040	Laser Lamp Access Cover Open
L051	Laser Power Supply Failure
L052	Lamp Did Not Start
L060	ALE Runaway Problem

D010	No Delivery Device Attached
D020	System Not Configured For The Delivery Device Attached
D021	Delivery Devices Attached To Both Delivery Device Ports
D030	Optic Coupler Connected Backwards
D040	Delivery Device Attached Is Not Calibrated
D041	Calibration Not Allowed For The Delivery Device Attached
D042	LDD Total Energy Reaches Recommended Number Of Joules
D043	LDD Total Energy Exceeds by 25%
D044	LDD Total Energy Exceeds by 50%
D045	Microbeam Calibration Thruput Notice
D050	Delivery Device Is Not Connected To The Correct Port

D060	Fiber Connector/High Temperature Warning
D070	FiberLife™ Feature Malfunction

W010	Delivery Device Is Not For Use With Nd:YAG/1064
W011	Delivery Device Is Not For Use With KTP/532
W021	YAG Surgical Power Seen While In KTP
W022	KTP Surgical Power Seen While In YAG
W030	YAG Is Not Configured For The Model
W031	KTP Is Not Configured For The Model

E011	Microbeam Or AESF Is Not Properly Attached
E020	Automatic Eye Safety Filter (AESF) Malfunction
E021	AESF Hardware Redundancy Circuit Failure

E012	AESF Defeated; but Connected & Attached (50X & 70X)
E013	AESF Is Not Properly Attached for Ophthostats (50X & 70X)
E014	AESF Is Not Properly Attached for Endostats (50X & 70X)
E015	AESF Defeated; but Connected Only and Not Attached (50X & 70X)

E012	AESF Is Not Properly Attached To The Eyepiece (80X)
E013	Not Applicable (80X)
E014	AESF Is Not Connected To The System Cable (80X)
E015	Not Applicable (80X)

J010	Undetermined System Configuration
J020	Low Batteries
J030	Incorrect Checksum
J040	FiberLife™ Incorrect Setup

P010	KTP Low Laser Power
P020	KTP Power Adjust Too Long
P031	KTP Minimum Power Too High (> 1W)
P032	KTP Maximum Power Too Low (< 5W)

P110	YAG Low Laser Power
P120	YAG Power Adjust Too Long
P131	YAG Minimum Power Too High (> 5W)
P132	YAG Maximum Power Too Low (< 20W)

S010	Clock Fault
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S020	KTP Software Over Power Fault
S021	KTP Hardware Over Power Exposure Fault
S022	KTP Hardware Over Duration Exposure Fault
S023	KTP Hardware Under Interval Exposure Fault
S024	KTP Power Detectors Mismatch Fault
S025	Hardware Exposure Circuit Fault
S026	Q-switch Driver Intermittant

S031	KTP Aim Power > 4mW
S032	KTP Gain Change Fault
S033	KTP Modulate Power Not Within 2 & 15 Watts
S034	KTP Light Valve Not Functional
S035	KTP Calibration Shutter Blade Fell Off
S036	KTP Aim Detector Not Functional
S041	KTP Motor Circuit Fault
S042	KTP Surgical Attenuator Malfunction
S043	Footswitch Wiring Fault
S044	Footswitch Hardware Redundancy Circuit Failure

S051	KTP Safety Shutter Cannot Open
S052	KTP Safety Shutter Cannot Close
S053	KTP Safety Shutter Not In The Correct Position
S054	KTP Safety Shutter Blade Fell Off
S055	KTP Safety Shutter Cable Not Connected Or Both Sensors Blocked

S061	Exposure Shutter Cannot Open
S062	Exposure Shutter Cannot Close
S063	Exposure Shutter Not In The Correct Position
S064	Exposure Shutter Blade Fell Off
S065	Exposure Shutter Cable Not Connected Or Both Sensors Blocked

S071	Calibration Shutter Cannot Open
S072	Calibration Shutter Cannot Close
S073	Calibration Shutter Not In The Correct Position
S074	Calibration Shutter Blade Fell Off
S075	Calibration Shutter Cable Not Connected Or Both Sensors Blocked

S081	Aperture Not In The Beam Path (small aperture)
S082	Aperture Not Out The Beam Path (large aperture)
S083	Aperture Not In The Correct Position
S084	Aperture Motor Assembly Fault
S085	Aperture Cable Not Connected Or Both Sensors Blocked

S120	YAG Software Over Power Fault
S121	YAG Hardware Over Power Exposure Fault
S122	YAG Hardware Over Duration Exposure Fault
S123	YAG Hardware Under Interval Exposure Fault
S124	YAG Power Detectors Mismatch Fault
S132	YAG Gain Change Fault

S151	YAG Safety Shutter Cannot Open
S152	YAG Safety Shutter Cannot Close
S153	YAG Safety Shutter Not In The Correct Position
S154	YAG Safety Shutter Blade Fell Off
S155	YAG Safety Shutter Cable Not Connected Or Both Sensors Blocked

S181	Laser Mirror Not Out The Beam Path (KTP mode)
S182	Laser Mirror Not In The Beam Path (YAG mode)
S183	Laser Mirror Not In The Correct Position
S184	Laser Mirror Motor Assembly Fault
S185	Laser Mirror Cable Not Connected Or Both Sensors Blocked

S191	Beam Mirror Cannot Open (YAG or KTP @ microbeam port)
S192	Beam Mirror Cannot Close (KTP @ endodstat port)
S193	Beam Mirror Not In The Correct Position
S194	Beam Mirror Motor Assembly Fault
S195	Beam Mirror Cable Not Connected Or Both Sensors Blocked

S210	ALE Current Control Fault
S220	Water Temperature Too High (Software switch-130F)

C010	Delivery Device Transmission Too Low
C020	Unable To Calibrate - Too Much Light
C030	Unable To Calibrate - Light Unsteady
C040	Unable To Calibrate - Too Little Light
C050	KTP Calibration Pot Zero Level Error
C150	YAG Calibration Pot Zero Level Error

**Power & Timing Decoding Chart
For the 8XX Laser Systems**

POWER (watts)

	KTP	YAG
0	0.05	5.0
1	0.06	6.0
2	0.07	7.0
3	0.08	8.0
4	0.09	9.0
5	0.10	10.0
6	0.12	11.0
7	0.14	12.0
8	0.16	13.0
9	0.18	14.0
10	0.20	15.0
11	0.25	16.0
12	0.30	17.0
13	0.35	18.0
14	0.40	19.0
15	0.45	20.0
16	0.50	22.0
17	0.60	24.0
18	0.70	26.0
19	0.80	28.0
20	0.90	30.0
21	1.00	32.0
22	1.20	34.0
23	1.40	36.0
24	1.60	38.0
25	1.80	40.0
26	2.00	42.0
27	2.50	44.0
28	3.00	46.0
29	3.50	48.0

POWER (watts)

	KTP	YAG
30	4.00	50.0
31	4.50	52.0
32	5.00	54.0
33	6.00	56.0
34	7.00	58.0
35	8.00	60.0
36	9.00	62.0
37	10.0	64.0
38	11.0	66.0
39	12.0	68.0
40	13.0	70.0
41	14.0	72.0
42	15.0	74.0
43	16.0	76.0
44	17.0	78.0
45	18.0	80.0
46	19.0	82.0
47	20.0	84.0
48	22.0	86.0
49	24.0	88.0
50	26.0	90.0
51	28.0	92.0
52	30.0	94.0
53	32.0	96.0
54	34.0	98.0
55	36.0	100.0
56	38.0	-
57	40.0	-

TIMING (seconds)

	KTP	YAG
0	0.01	0.10
1	0.02	0.20
2	0.05	0.50
3	0.10	1.00
4	0.20	2.00
5	0.50	3.00
6	1.00	4.00
7	CONT	5.00
8	-	10.0
9	-	CONT