



# THE SMART CULTIVATOR ERROR CODE DESCRIPTIONS

ALARM MESSAGE	MEANING	POSSIBLE CAUSES
Battery Voltage Too High (Overcharging)	The battery voltage exceeds 14.7 volts.	<ul style="list-style-type: none"><li>• Loose or damaged alternator ground wire</li><li>• Loose or damaged battery ground wire</li><li>• Faulty alternator</li><li>• A battery charger was connected to the machine and it charged the battery above 14.7 volts. This is OK if only for a short period of time</li></ul>
Heartbeat Timeout	The camera computer stopped communicating with the controller for a period of time.	<ul style="list-style-type: none"><li>• Loose or damaged cable between camera and computer</li><li>• Loose or damaged cable between computer and ethernet switch</li><li>• Loose or damaged cable between ethernet switch and controller</li><li>• Faulty power wiring computer</li><li>• Faulty power wiring to ethernet switch</li><li>• Faulty power wiring to camera</li><li>• A software update was applied which caused the computer to restart</li></ul>
Stream Processing Error	The camera computer encountered an error while processing images.	<ul style="list-style-type: none"><li>• Faulty camera cable</li><li>• Software error</li></ul>
Machine Did Not Complete Initialization in the Expected Time	The camera computers failed to start or took longer than the normal amount of time to start.	<ul style="list-style-type: none"><li>• A software update was applied, which required the computers to take longer to start up</li><li>• Any of the causes for "Heartbeat Timeout" can also cause this alarm</li></ul>
Battery Sense Low	The machine controller is sensing an implausibly low battery voltage (less than 7 volts).	<ul style="list-style-type: none"><li>• Faulty connection between controller and battery voltage sense wire</li><li>• Faulty controller</li></ul>
Voltage Regulator Malfunction: Low	The machine controller is detecting a system voltage regulator output of less than 22.0 volts.	<ul style="list-style-type: none"><li>• Faulty 24V voltage regulator wiring</li><li>• Faulty 24V regulator</li></ul>
Voltage Regulator Malfunction: High	The machine controller is detecting a system voltage regulator output of greater than 25.0 volts.	<ul style="list-style-type: none"><li>• Faulty or missing ground wiring</li><li>• Faulty 24V regulator</li></ul>
Odometer Pulse Rate High	The pulse rate coming from the wheel encoder is implausibly high.	<ul style="list-style-type: none"><li>• Faulty wheel encoder wiring</li><li>• Faulty wheel encoder</li></ul>
Hydraulic Fluid Level Low	The low oil level sensor in the tank is not detecting any liquid.	<ul style="list-style-type: none"><li>• Oil level is low</li><li>• Faulty sensor wiring</li><li>• Faulty sensor</li></ul>
Oil Temperature Low	The oil temperature sensor reading is implausibly low.	<ul style="list-style-type: none"><li>• Faulty sensor wiring</li><li>• Faulty sensor</li></ul>
Oil Temperature High	The oil temperature sensor reading exceeds 115C (239F).	<ul style="list-style-type: none"><li>• Clogged radiator</li><li>• Faulty fan</li><li>• Faulty hydraulic system</li><li>• PTO pump too large</li><li>• PTO pump spinning too fast</li><li>• Faulty 12V battery</li><li>• Faulty temperature sensor wiring</li><li>• Faulty temperature sensor</li></ul>
Shift Position Sensor Glitch / Rate of Change High	The shift position sensor moved faster than should be possible.	<ul style="list-style-type: none"><li>• Sensor was just calibrated</li><li>• Loose sensing linkage</li><li>• Broken side shift bracket</li><li>• Loose module brackets</li><li>• Faulty hydraulic cylinder</li></ul>

ALARM MESSAGE	MEANING	POSSIBLE CAUSES
Shift Sensor Type Not Set	The type of side shift sensor has not been configured.	<ul style="list-style-type: none"> <li>• Incomplete configuration of machine or settings lost</li> </ul>
Side Shift CAN Module Error	The controller is unable to communicate with the side shift sensor on the CAN bus.	<ul style="list-style-type: none"> <li>• Faulty CAN bus wiring</li> <li>• Incorrect sensor type configured</li> <li>• Incorrect sensor CAN bus node ID</li> <li>• Faulty sensor</li> </ul>
Ground Pressure Sensor Malfunction (High or Low) / Module Lift Pressure Sensor Malfunction (High or Low)	The module lift manifold pressure sensor has an implausibly high or low reading.	<ul style="list-style-type: none"> <li>• Faulty sensor wiring</li> <li>• Faulty valve cartridge</li> <li>• Faulty pressure sensor</li> </ul>
Ground Height Sensor Malfunction	The height control wheel angle sensor reading is implausibly high or low.	<ul style="list-style-type: none"> <li>• Misaligned sensor puck</li> <li>• Faulty sensor wiring</li> <li>• Faulty sensor</li> </ul>
Machine Settings Uninitialized	The settings for the machine are incomplete.	<ul style="list-style-type: none"> <li>• Incomplete configuration</li> <li>• Settings were lost</li> </ul>
Plant Location Buffer Overflow	Internal software error: too many plants were received by the controller.	<ul style="list-style-type: none"> <li>• Software error</li> <li>• Implausibly high number of plants detected by vision system</li> </ul>
Latency Too High for Travel Speed	Machine being operated too fast for the camera.	<ul style="list-style-type: none"> <li>• Machine running at too fast of a speed</li> <li>• Faulty wheel encoder</li> </ul>
Modbus Communication Error	Communication problem between camera computer and main controller.	<ul style="list-style-type: none"> <li>• Faulty ethernet cable between camera and vision computer</li> <li>• Software error</li> <li>• Faulty ethernet cable between vision computer and ethernet switch</li> <li>• Faulty ethernet switch</li> <li>• Faulty ethernet cable between ethernet switch and controller</li> </ul>
High Processing Latency	Processing problem internal to the camera computer.	<ul style="list-style-type: none"> <li>• Faulty ethernet cable between camera and vision computer</li> <li>• Software error</li> <li>• Faulty ethernet cable between vision computer and ethernet switch</li> <li>• Faulty ethernet switch</li> <li>• Faulty ethernet cable between ethernet switch and controller</li> </ul>
Height Control Disabled	The height control system is disabled.	<ul style="list-style-type: none"> <li>• Incomplete configuration</li> <li>• Settings were reset</li> </ul>
Applicator Unstable Pressure or Flow Rate During Calibration	Calibration failed due to pump pressure being unstable.	<ul style="list-style-type: none"> <li>• Air in supply lines or tank empty</li> <li>• Faulty pressure regulator</li> <li>• Supply valve closed or hose clogged</li> <li>• Return valve closed or hose clogged</li> <li>• Plumbing leak</li> <li>• Air in the lines</li> <li>• Faulty pressure sensor wiring</li> <li>• Faulty pump</li> <li>• Faulty pump wiring</li> <li>• Faulty battery</li> </ul>