

APPENDIX A: LED BLINK CODES

Note: In some cases, several different exceptions types display the same blink code. In this case, connect ClearPath to a PC running MSP to see specific exception type.

LED Activity	Exception Type	Affect on Motion	Servo Status	How to Clear Exception	Status or Exception Message Reported in UI
No LED Activity	N/A	N/A	Servo off	N/A	No (or low) Power Verify power is correctly wired and within specified voltage range.
Yellow – on solid	N/A	N/A	Servo off	N/A	Status: Disabled Motor power is turned off.
Yellow - flicker	N/A	N/A	Servo on	N/A	Status: Performing Commutation Start-up
Green - flicker	N/A	N/A	Servo on	N/A	Status: Enabled Motor power is on. ClearPath will respond to motion commands.
Yellow - 2 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	User Stop ESC key or button was pressed by the user.
Yellow - 2 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Motor Enable Conflict The hardware inputs did not match the active software override inputs when the motor was enabled via the hardware enable line.
Yellow - 3 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Max Bus Voltage Exceeded Probable cause: high AC line voltage, large regenerated voltage upon deceleration.
Yellow - 3 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Power Event Detected Probable cause: Dropped AC phase; Bus volts under operating voltage.
Yellow - 4 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Command Speed Too High Probable cause: commanded speed/velocity is beyond motor spec.
Yellow - 4 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Tracking Error Limit Exceeded Possible causes: excessive friction, mechanical misalignment, vel/accel too high, low DC bus voltage.
Yellow - 4 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	RMS Torque Limit Exceeded Possible causes: excessive friction, mechanical misalignment, duty cycle too high, undersized motor.

Yellow - 4 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Excessive Bus Current Probable cause: bad tuning, low bus voltage.
Yellow - 5 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Excessive Motor Temp Possible causes: ambient temperature too high for motor load; poor cooling; fan not running (if used).
Yellow - 6 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Momentary Low Bus Voltage Power supply drooped below 18V, insufficient current capabilities, and/impedance too high.
Yellow - 7 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Old Config File Version Probable cause: Firmware updated after config file was saved. Create or load new config file.
Yellow - 7 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Motor Phase Overload Phase current is beyond allowed ADC limit. Probable cause: incorrect tuning or wrong config file.
Yellow - 7 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Hard Stop Gave Way A mechanical hard stop was detected during homing but it gave way before homing was completed.
Yellow - 7 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Excessive Bus Current Probable cause: bad tuning, low bus voltage.
Yellow - 7 blinks	Shutdown	Disallows motion	Servo off	Toggle Enable input	Commutation Startup Error DC bus too low for proper commutation start-up. Possible causes: brown out, incorrect power supply voltage, supply configured for higher AC line voltage.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	Velocity Set Too High Velocity/speed limit exceeds motor's factory-set maximum speed.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	RAS Change Rejected Unexpected error. Contact Teknic for work-around or new firmware.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	Step Input Timing Error Possible causes: Step input pulse width too short, electrical noise, loose connection, shorted wires.

Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	Speed Too High For RAS Unexpected error. Contact Teknic for work-around or new firmware.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	MagAlign Distance Error Distance traveled does not match expected value. Possible cause: motor against an end stop, incorrect motor settings.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	MagAlign Direction Error Direction traveled is incorrect. Probable cause: external forces during MagAlign procedure.
Yellow - strobe	Shutdown	Disallows motion	Servo off	Toggle Enable input	DSP Watchdog Restart Firmware problem. Re-flash firmware with same or newer firmware version. Return unit to Teknic if problem not solved.
Green/Yellow alternating	Lockdown	Disallows motion	Servo on	Toggle Enable input	Travel Limits Violated (lockdown) Commanded position is on the wrong side of the home position.
Green/Yellow alternating	Lockdown	Disallows motion	Servo on	Toggle Enable input	Travel Limits Violated (lockdown) Commanded position is beyond the Max Travel from Home position as specified in Homing Setup.
Green/Yellow alternating	Lockdown	Disallows motion	Servo on	Toggle Enable input	Motor Enable Conflict The hardware inputs did not match the active software override inputs when the motor was enabled via the hardware enable line.
Green – 2 blinks	Warning	Allows motion (if cause is no longer present)	Servo on	Auto-clears at start of next move if cause is no longer present	Travel Limits Violated (warning) Commanded position is on the wrong side of the home position.
Green – 2 blinks	Warning	Allows motion (if cause is no longer present)	Servo on	Auto-clears at start of next move if cause is no longer present	Travel Limits Violated (warning) Commanded position is beyond the Max Travel from Home position as specified in Homing Setup.
Green – 2 blinks	Warning	Allows motion (if cause is no longer present)	Servo on	Auto-clears at start of next move if cause is no longer present	Move Buffer Underrun Possible causes: move increments too small or sent too slowly.
Green - 3 blinks	Alert	Allows motion	Servo on	Auto-clears when cause is no longer present	Torque Saturation Power supply may be insufficient for application, torque Limit may be set too low for command. Try lowering acceleration.

Green - 3 blinks	Alert	Allows motion	Servo on	Auto-clears when cause is no longer present	Voltage Saturation Available bus voltage maxed out. Commanded speed may exceed motor spec. Try lowering speed.
Green - 3 blinks	Alert	Allows motion	Servo on	Auto-clears when cause is no longer present	Over Speed Commanded speed exceeds motor max speed limit. Try lowering speed.
Green - 3 blinks	Alert	Allows motion	Servo on	Auto-clears when cause is no longer present	Over Temp Internal electronics above shutdown threshold. Add fan.
Green - 3 blinks	Alert	Allows motion	Servo on	Auto-clears when cause is no longer present	Power Event Detected (warning) Probable cause: Dropped AC phase; Bus volts under operating voltage.
Red Toggle	Motor Failure	Disallows Motion	Servo off	Not clearable	Motor Has Failed Return to Teknic for repair or replacement.

If ClearPath shows no LED activity

During operation, if ClearPath DC bus voltage droops below approximately 18VDC, the following will occur:

- ClearPath will go into a shutdown state.
- The LED will turn off. Note: ClearPath will continue to communicate if voltage remains high enough.
- The LED will remain off. Toggling the Enable *will not* clear this shutdown.

Once voltage returns to approximately 20VDC or higher:

- ClearPath will remain in a shutdown state but the LED will “wake up” and flash a yellow blink code 6 (see table above for complete description of this exception code).
- At this point, toggle the enable to clear the shutdown.