EMERSON
Industrial Automation

Commander SK Trip and Status Diagnostic Codes

This document pertains to all Commander SK models

Alarm & Transient Status Indications

ıh   **Drive is inhibited(disabled) see term B4**

rd   **Drive is Ready(enabled) see term B4**

Ld	**A**	**SP**	**Fr**
% Load of Motor	**Amps to Motor**	**Speed RPM Estimated**	**Frequency Hz Being Created**

The following alarm warning and display indications will flash on the right hand display when they become active.

(See Advanced Users Guide for more information)

Table 10-16   Alarm Warnings

OUL.d
hot
br.rS

Display	Condition
OUL.d	Ixt overload (see Pr **4.15**, Pr **4.16** on page 65, Pr **4.19** on page 68 and Pr **10.17** on page 125)
hot	Heatsink/IGBT temperature too high (see Pr **5.18** on page 78, Pr **5.35** on page 80 and Pr **10.18** on page 125)
br.rS	Ixt overload on braking resistor (see Pr **10.12** on page 124, Pr **10.30** and Pr **10.31**)

Table 10-17   Display indications

AC.Lt
Lo.AC

Display	Condition
AC.Lt	Drive is in current limit (see Pr **4.07** on page 63 and Pr **10.09** on page 124)
Lo.AC	Drive is supplied from a low voltage backup supply (400V drives only) (see Pr **6.10** on page 87)

PLC   **Indicates that there is a Logic Stick (white) inserted in front cover slot and a PLC logic program is running-tells Tech Support if calling**

Commander SK Trip Codes

Trip code	Condition	Possible cause
UU	DC bus under voltage	Low AC supply voltage Low DC bus voltage when supplied by an external DC power supply
OU	DC bus over voltage	Deceleration rate set too fast for the inertia of the machine Mechanical load driving the motor
OI.AC**	Drive output instantaneous over current	Insufficient ramp times Phase to phase or phase to ground short circuit on the drives output Drive requires autotuning to the motor Motor or motor connections changed, re-autotune drive to motor
OI.br**	Braking resistor instantaneous over current	Excessive braking current in braking resistor Braking resistor value too small
O.SPd	Over speed	Excessive motor speed (typically caused by mechanical load driving the motor)
tunE	Auto tune stopped before completion	Run command removed before autotune complete
It.br	I^2t on braking resistor	Excessive braking resistor energy
It.AC	I^2t on drive output current	Excessive mechanical load High impedance phase to phase or phase to ground short circuit at drive output Drive requires re-autotuning to motor
O.ht1	IGBT over heat based on drives thermal model	Overheat software thermal model
O.ht2	Over heat based on drives heatsink	Heatsink temperature exceeds allowable maximum
th	Motor thermistor trip	Excessive motor temperature
O.Ld1*	User +24V or digital output overload	Excessive load or short circuit on +24V output
cL1	Analogue input 1 current mode, current loss	Input current less than 3mA when 4-20 or 20-4mA modes selected
SCL	Serial communications loss time-out	Loss of communication when drive is under remote control
EEF	Internal drive EEPROM trip	Possible loss of parameter values (set default parameters (see Pr 29 on page 30))
PH	Input phase imbalance or input phase loss	One of the input phases has become disconnected from the drive (applies to 200/400V three phase drives only, not dual rated drives)
rS	Failure to measure motors stator resistance	Motor too small for drive Motor cable disconnected during measurement
C.Err	SmartStick data error	Bad connection or memory corrupt within SmartStick
C.dAt	SmartStick data does not exist	New/empty SmartStick being read
C.Acc	SmartStick read/write fail	Bad connection or faulty SmartStick
C.rtg	SmartStick/drive rating change	Already programmed SmartStick read by a drive of a different rating
O.cL	Overload on current loop input	Input current exceeds 25mA
HFxx trip	Hardware faults	Internal drive hardware fault (see *Commander SK Advanced User Guide*)

* The Enable/Reset terminal will not reset an O.Ld1 trip. Use the ⊚ Stop/Reset key.

** These trips cannot be reset for 10 seconds after they occur.

See the *Commander SK Advanced User Guide* for further information on possible causes of drive trips.

Click here for

Common Commander SK Trip Codes
Possible Causes & Remedies

Commander SK HF Fault Summary

These HF (Hardware Fault) trip codes are internal to the Drive and are typically not caused by the customer. Sometimes an HF fault may occur as a result of a high electrical noise spike or vibration shock. Often, if the Drive is powered down for 1 minute and back up, the trip may be cleared and the Drive will run as normal. But if the condition presents itself again in the near future, it may be an indication that something is failing in the drive and one should begin arrangements to prepare for total failure.

HF Fault Code	Brief Description
HF01 to **HF03**	Not used
HF04	Low DC bus at power up- may indicate an AC Input or pre-charge problem
HF05	No internal handshake signal from second processor (DSP) at start up
HF06	Unexpected interrupt
HF07	Watchdog failure
HF08	Interrupt crash (code overrun)
HF09 to **HF10**	Not used
HF11	Access to the EEPROM failed- tried to read stored parameter data but failed
HF12 to **HF19**	Not used
HF20	Power stage - code error Tried to read power board and read back erroneous
HF21	Power stage - unrecognized frame size
HF22	Overcurrent detection at power up- possible output short or bridge failure
HF23	DSP software overrun
HF24	Not Used
HF25	DSP Communications failure- communication from main to 2nd processor
HF26	Soft start relay failed to close; or soft start monitor failed; or braking IGBT short circuit at power up
HF27	Power stage thermistor fault
HF28	Power circuit thermistor 2 or 3 fault Internal fan fault on size 3 only
HF29	Fan failure (current too high - only on drives with a fan) **see note below**
HF30	Not used
HF31	Internal Cap Bank Fan failure- check for fan rotation/blockage Size 4 and up
HF32	Power circuit temperature feedback multiplexer failure

HF Faults are not recorded in the Drive Historical Fault Log

Additional Hardware Fault Code Information

HF04 – A low DC bus voltage was detected.

HF05 – The Digital Signal Processor (DSP) failed to produce any signal at startup

HF06, HF07, HF08 – While the user code is running, it is continuously checking that the data it is receiving is valid etc. If it detects a problem, it will trip on one of the trips codes HF06, HF07 or HF08.

HF11 – All communications attempts to the EEPROM are denied.

HF20 – A fault was detected on the power board as the Drive was powered up.

HF21 – The DSP reads a voltage from the power pcb to determine the correct Drive kW size. If the voltage is different to an expected value, the Drive will trip.

HF22 – If the drive detects an OI – overcurrent trip on power up, the Drive will trip on HF22 and not OI. Remove drive enable (B4) and motor leads and re-try.

HF23 – The user interface code (DSP based) run on different priority levels and each level has a certain time to complete its tasks. If for some reason the code cannot complete its task within the allotted time the Drive trip.

HF25 – A failure of communications between the DSP and control PCB microprocessor.

HF26 – There is a critical problem of the inrush circuit of the power board.

HF27 – The thermistor has failed or has measured a value out of tolerance.

HF28 – Power circuit thermistor 2 or 3 fault   - Internal fan fault on Size 3 only

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DSP is Digital Signal Processor - 2nd processor running in conjunction with the main drive processor.

HF29 – If the SK is fitted with a heatsink fan then it is failing and drawing excessive current.

HF29 is typically an indication that the cooling fans at the bottom of the Drive are not spinning. With power off and Drive discharged, one should check into the fan area to check for foreign debris to see that the Fan(s) can spin freely. Often times customers find shipping popcorn, tie wraps and other material in the fan area.

HF30 – DCCT wire break trip from power module

HF31 – Aux fan failure from power module- internal Cap bank fan – Size 4 and up

HF32 – Power circuit temperature feedback multiplexer failure

**WARNING: ALLOW SUFFICIENT TIME FOR THE DRIVE TO DISCHARGE
Recommended Time is 10 minutes after power down
Measure from DC+ to DC- to ensure the buss voltage has fully discharged.**

⚠ **WARNING**

DO NOT ASSUME POWER IS OFF BECAUSE THE DRIVE DISPLAY APPEARS DEAD OR NO FANS ARE HEARD. THE VOLTAGE APPLIED TO THIS DRIVE CAN BE LETHAL IF TOUCHED !

HF Faults are not recorded in the Drive Historical Fault Log

Persistent Hardware Faults are often fatal.   If powering down and letting the drive sit for 5 minutes before re-application of power does not clear the HF Fault, it would require Drive repair.

Record the drive part number and serial number and:

Contact our Repair Center at 716-774-1193

Logic Stick Oriented Trip Codes

Trip   **Condition**

t090   PLC ladder program attempted divide by zero

t091   PLC ladder program attempted access to non-existent parameter

t092   PLC ladder program attempted write to a read only parameter

t094   PLC ladder program attempted to write a value to a parameter which is out of range

t095   PLC ladder program virtual memory stack overflow

t096   PLC ladder program invalid operating system call

t097   PLC ladder program enabled with no LogicStick inserted or LogicStick removed

t098   PLC ladder program invalid instruction

t099   PLC ladder program invalid function block argument

**The last 10 trips are recorded in chronological order of occurrence within the drive.
This can be useful in overall diagnosis.**

Run Time: 0 Years, 7 Days, 20 Hours, 7 Minutes

Trip No.	Trip Code	Trip	Description
0	94	t094	PLC ladder program: out-of-range parameter write
1	94	t094	PLC ladder program: out-of-range parameter write
2	94	t094	PLC ladder program: out-of-range parameter write
3	1	UU	DC Link under voltage
4	0	no trip	no trip
5	0	no trip	no trip
6	0	no trip	no trip
7	0	no trip	no trip
8	0	no trip	no trip
9	0	no trip	no trip

Option module error status codes

Slot 1

0