AKD™
Fault Card

Keep all manuals as a product component during the life span of the product.
Pass all manuals to future users / owners of the product.

KOLLMORGEN

Because Motion Matters™

Record of Document Revisions:

Revision	Remarks
C, 03/2012	Faults added for 1.6, AKD BASIC, and I/O option card.
D, 08/2012	Tamagawa faults added.
E, 11/2012	Faults added for 1.8.
F, 05/2013	Added F467 and F560.
G, 09/2013	Added F127, F468, F469, F623 – F627, F829 – F832, and F901
H, 12/2013	Added warnings. Added AKD-C and AKD-N faults.

IMPORTANT NOTICE

Disclaimer

Registered Trademarks

Technical changes which improve the performance of the device may be made without prior notice.

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1. AKD Fault and Warning Messages

When a fault occurs, the drive fault relay is opened, the output stage is switched off (motor loses all torque), or the load is dynamically braked. The specific drive behavior depends on the type of fault. The LED display on the front panel of the drive shows the number of the fault that occurred. If a warning is issued prior to the fault, the warning is shown on the LED and has the same number as the associated fault. Warnings do not trip the power stage of the drive or fault relay output.

The left side of the LED displays F for a fault or n for a warning. The right side displays the fault or warning number as follows: 1-0-1-[break]. The highest priority fault is displayed on the LED, but multiple faults may be present when a fault condition is occurring. Check the AKD WorkBench Fault screen or read the status of DRV.FAULTS through the controller or HMI for the entire list of faults.

Fault	Message/Warning	Cause	Remedy
F0	N/A	Reserved.	N/A
..		1. 24V Control Power input voltage dip. or 2. Auxillary encoder 5V (X9-9) shorted.	1. Insure adequate 24V supply current capacity for the system. or 2. Check and fix X9 wiring.
F101	Firmware incompatible.	Installed firmware is not compatible with the drive hardware.	Load compatible firmware into the drive.
n101	The FPGA is a lab FPGA.	The FPGA is a lab version FPGA.	Load the released FPGA version that is compatible with the operation firmware.
F102	Resident firmware failed.	Software failure detected.	Restart drive. If issue persists, contact technical support.
n102	Operation FPGA is not a default FPGA	The FPGA minor version is larger than the operational firmware default FPGA minor version.	Load the released FPGA version that is compatible with the operational firmware.
F103	Resident FPGA failed.	Software failure detected. Load resident FPGA failure occurred (several cases according to flowchart, including incompatible image to FPGA type and fieldbus type).	Restart drive. If issue persists, contact technical support.
F104	Operational FPGA failed.	Software failure detected. Load operational FPGA failure occurred (several cases according to flowchart).	Restart drive. If issue persists, contact technical support.
F105	NV memory stamp invalid.	NV memory stamp is corrupted or invalid.	Reset the drive to default memory values using Parameter Load in WorkBench.

Fault	Message/Warning	Cause	Remedy
F106	NV memory data invalid.	NV memory data is corrupted or invalid. This fault often occurs when downloading firmware.	Reset the drive to default memory values using Parameter Load in WorkBench.
n107	Positive switch.	Positive software position limit is exceeded.	Move the load away from the limits.
n108	Negative switch.	Negative software position limit is exceeded.	Move the load away from the limits.
F121	Homing error.	Drive did not finish homing sequence.	Check homing sensor, homing mode, and homing configuration.
F123 n123	Invalid motion task. Warning issued prior to fault.	Invalid motion task.	Check motion task settings and parameters to make sure that the values entered will produce a valid motion task. Refer to the motion task documentation for additional guidance on specific causes of invalid motion tasks.
F125 n125	Synchronization lost. Warning issued prior to fault.	The fieldbus lost synchronization.	Check fieldbus connection (X5 and X6 if you are using EtherCAT; X12 and X13 if you are using CANopen) or the settings of your EtherCAT or CANopen master.
F126 n126	Too much movement. Warning issued prior to fault.	Too much movement was created during a Bode plot. Motor is unstable and is not following drive instructions.	Check that the system is closed loop stable. Refer to the system tuning guide.
F127	Incomplete Emergency Procedure.	Incomplete emergency stop procedure (problem with the emergency stop motion task).	Disconnect power from drive and check emergency stop procedure.
F128	MPOLES/FPOLES not an integer.	Ratio of motor poles to feedback poles must be a whole number.	Change to a compatible feedback device.
F129	Heartbeat lost.	Heartbeat lost.	Check CANopen cabling. Reduce bus load or increase the heartbeat update time.

Fault	Message/Warning	Cause	Remedy
F130	Secondary feedback supply over current.	5V power supply was shorted out on X9.	Check secondary feedback (X9 connection).
F131	Secondary feedback A/B line break.	Problem in secondary feedback detected.	Check secondary feedback (X9 connection).
F132	Secondary feedback Z line break.	Problem in secondary feedback detected.	Check secondary feedback (X9 connection).
F134	Secondary feedback illegal state.	Feedback signals were detected in an illegal combination.	Check secondary feedback (X9 connection).
F135 n135	Homing is needed. Warning issued prior to fault.	Attempt to issue motion task before the axis is homed. Axis must be homed before motion task can start.	Change opmode or home axis.
F136	Firmware and FPGA versions are not compatible.	The FPGA version does not match the firmware FPGA version constants.	Load the FPGA version that is compatible with the firmware.
n137	Homing and feedback mismatch.	The configured homing mode is not supported by the motor feedback type used.	Change homing mode.
F138	Instability during autotune.	Drive current (IL.CMD) or velocity feedback (VL.FB) exceeds allowable limit. This fault only occurs in BODE.MODE 5.	Change BODE.MODE if appropriate. Otherwise the motor is not stable and may require manual tuning.
F139	Target Position over short due to invalid motiontaskactivation.	The drive cannot decelerate from its current speed to reach the end point of the second motion task without moving past it. Increase the deceleration rate in the move or trigger the move earlier	Change Motion task profile and clear fault with DRV. CLRFAULTS or change the value of FAULT139.ACTION = 1 to ignore this condition.
n140	VBUS.HALFVOLT has changed. Save the parameters and reboot the drive.	The user has changed the numerical value of VBUS. HALFVOLT. This change only takes effect after a DRV.NVSAVE command and after a reboot of the AKD.	Save the parameters in the non volatile memory using the DRV.NVSAVE command and turn off/on the 24[V] power supply in order to reboot the drive or restore the original setting of VBUS.HALFVOLT.

Fault	Message/Warning	Cause	Remedy
n151	Not enough distance to move; motion exception.	For trapezoidal and customer table motion tasks: The target velocity specified in the motion task cannot be reached via using the selected acceleration and deceleration since the distance to travel is not sufficient. For a 1:1 profile: The selected acceleration and deceleration will be extended since there is too much distance to travel and the motion task would exceed its maximum allowed velocity.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check motion task settings and parameters to make sure that the values entered will produce a valid motion task.
n152	Not enough distance to move; following motion exception.	A new motion task activated, when one motion task is already active and the target position specified in the motion task parameters cannot be reached with specified target velocity, acceleration and deceleration parameters. The motion task will directly decelerate to into the target position or ramps down to velocity 0 and start another move to reach target position of the next motion task.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check motion task settings and parameters to make sure that the values entered will produce a valid motion task.
n153	Velocity limit violation, exceeding max limit.	A new target velocity calculated internally due to an exception, and is being limited due to user velocity limit.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check motion task target velocity settings and parameters to make sure that the values entered will not exceed the VL.LIMITP and VL.LIMITN setting.
n154	Following motion failed; check motion parameters.	Activation of the following motion task failed due to incompatible parameters, or motion task does not exist.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check following motion task settings and parameters to make sure that the values entered will produce a valid motion task.
n156	Target position crossed due to stop command.	The motion task crosses the target position after triggering a DRV.STOP command. This situation can happen when processing a change-on-the-fly motion task and triggering a DRV.STOP command close to the target position of the currently running motion task.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.

Fault	Message/Warning	Cause	Remedy
n157	Homing index pulse not found.	A homing mode with index detection is activated, and index pulse is not detected while moving across the range determined by the hardware limit switches.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n158	Homing reference switch not found.	A homing mode with reference switch detection is activated and the reference switch is not detected while moving across the range determined by the hardware limit switches.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n159	Failed to set motion task parameters	Invalid motion task parameters assignment. This warning can appear upon an MT.SET command.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check motion task settings and parameters.
n160	Motion task activation failed.	Activation of the motion task failed due to incompatible parameters, or motion task does not exist. This warning can appear upon an MT.MOVE command.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning. Check motion task settings and parameters to make sure that the values entered will produce a valid motion task.
n161	Homing procedure failed.	Homing error observed during the operation of homing procedure.	Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n163	MT.NUM exceeds limit.	This warning appears with n160. This warning is triggered when you try to trigger a motion task > 128 (such as MT.MOVE 130).	Trigger only motion tasks between 0 and 128. Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n164	Motion task is not initialized.	This warning appears with n160. This warning is triggered when you try to trigger a non-initialized motion task.	Initialize the motion task first before starting the task. Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n165	Motion task target position is out.	This warning appears with n160. This warning is triggered when you try to trigger a motion task with an absolute target position outside of the selected modulo range (see also MT.CNTL).	Move the absolute target position of the motion task within the modulo range. Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
n168	Invalid bit combination in the motion task control word.	This warning appears with n160. This warning is triggered when you try to trigger a motion task with an invalid bit combination in the motion task control word (see also MT.CNTL).	Correct the MT.CNTL setting for the specific motion task. Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.

Fault	Message/Warning	Cause	Remedy
n169	1:1 profile cannot be triggered on the fly.	This warning appears with n160. This warning is triggered when you try to trigger a 1:1 profile table motion task while another motion task is currently running.	1:1 profile table motion tasks should be started from velocity 0. Activation of any new motion or using of DRV. CLRFAULTS will clear the warning.
n170	Customer profile table is not initialized.	This warning appears with n160. This warning is triggered when you try to trigger a motion task that uses a customer profile table for generating the velocity profile and when the selected profile table is empty (see MT.CNTL and MT.TNUM.	Change the MT.TNUM parameter for this specific motion task in order to use an initialized profile table. Activation of any new motion or using of DRV.CLRFAULTS will clear the warning.
F201	Internal RAM failed.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F202	External RAM failed.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F203	Code integrity failed.	Software failure detected. FPGA register access failure occurred.	Restart drive. If issue persists, contact technical support.
F204 – F232	EEPROM failure detected.	EEPROM failure detected.	Restart drive. If issue persists, exchange drive.
F234 – F237	Control temperature sensor high. Warning issued prior to fault.	High temperature limit reached.	Check cabinet ventilation system.
F240 – F243	Power temperature sensor low. Warning issued prior to fault.	Low temperature limit reached.	Check cabinet ventilation system.
F245	External fault.	This fault is user generated and is caused by user settings.	Users can configure a digital input to trigger this fault (DINx. MODE = 10). the fault occurs according to this input setting. Clear the input to clear the fault.
F247	Bus voltage exceed allowed thresholds.	Hardware problem in bus measurement.	Troubleshoot and repair hardware problem.
F248	Option board EEPROM corrupted.	EEPROM failure detected.	Restart drive. If issue persists, exchange drive.
F249	Option board downstream checksum.	Communications with the I/O on the option board failed.	DRV.CLRFAULTS. If issue persists, contact technical support.

Fault	Message/Warning	Cause	Remedy
F250	Option board upstream checksum.	Communications with the I/O on the option board failed.	DRV.CLRFAULTS. If issue persists, contact technical support.
F251	Option board watchdog.	Communications with the I/O on the option board failed.	DRV.CLRFAULTS. If issue persists, contact technical support.
F252	Firmware and option board FPGA types are not compatible.	The option board FPGA is not compatible with this hardware.	Download the correct firmware file for this drive.
F253	Firmware and option board FPGA versions are not compatible	The version of the option board FPGA is not compatible with this firmware.	Download the correct firmware file for this drive.
F301 n301	Motor overheated.	Motor overheated.	Check ambient temperature. Check motor mounting heat sink capability.
F302	Over speed.	Motor exceeded VL.THRESH value.	Increase VL.THRESH or lower velocity command.
F303	Motor foldback.	Maximum motor power has been exceeded; the power has been limited to protect the motor.	Current command to the motor is too high for too long. Reduce servo gains, or reduce command trajectory aggressiveness.
F304 n304	Motor foldback. Warning issued prior to fault.	Maximum motor power has been exceeded; the power has been limited to protect the motor.	Change move profile to reduce load on motor. Check for load jamming or sticking. Check that current limits are set correctly.
F305	Brake open circuit.	Motor brake open circuit.	Check cabling and general functionality.
F306	Brake short circuit.	Motor brake short circuit.	Check cabling and general functionality.
F307	Brake closed during enable state.	Motor brake closed unexpectedly.	Check cabling and general functionality.
F308	Voltage exceeds motor rating.	Drive bus voltage exceeds the motor's defined voltage rating.	Make sure that the motor fits the driving rating.
n309	Motor I2t load. Reduce load	Motor I2t load (IL.MI2T) has exceeded the warning threshold IL.MI2TWTHRESH. This warning can only be generated in the case that the motor protection mode IL.MIMODE has been set to 1.	Reduce the load of the drive by adjusting lower acceleration / deceleration ramps.
F312	Brake released when it should be applied.	Brake disengaged unexpectedly.	Check cabling and general functionality.
F401	Failed to set feedback type.	Feedback is not connected or wrong feedback type selected.	Check primary feedback (X10 connection).

Fault	Message/ Warning	Cause	Remedy
F402	Analog signal amplitude fault.	Analog signal amplitude is too low. Analog fault (resolver signal amplitude or sin/cos amplitude).	Check primary feedback (X10 connection), resolver and sine/cos encoder only.
F403	EnDat communication fault.	General communication problem with feedback.	Check primary feedback (X10 connection), EnDat only.
F404	Hall error.	Hall sensor returns invalid Hall state (111, 000); either all Hall sensors are on or off. Legal Hall states are 001, 011, 010, 110, 100, and 101. This fault can be caused by a broken connection in any one of the Hall signals.	Check the feedback wiring; checkallfeedbackconnectors to ensure all pins are positioned correctly.
F405	BiSS watchdog fault.	Bad communication with the feedback device.	Check primary feedback (X10 connection), Biss only.
F406	BiSS multicycle fault.	Bad communication with the feedback device.	Checkprimaryfeedback(X10 connection), Biss only.
F407	BiSS sensor fault.	Bad communication with the feedback device.	Checkprimaryfeedback(X10 connection), Biss only.
F408 – F416	SFD Feedback Fault	Bad communication with the SFD device.	Check primary feedback (X10 connection). If fault persists, internal feedback failure. Return to manufacturer for repair.
F417	Broken wire in primary feedback.	In primary feedback, a broken wire was detected (incremental encoder signal amplitude).	Check feedback cable continuity.
F418	Primary feedback power supply.	Power supply fault for primary feedback.	Checkprimaryfeedback(X10 connection).
F419	Encoder init procedure failed.	Phase find procedure did not complete successfully.	Check encoder wiring, reduce/balance motor load prior to phase finding.
F420	FB3 EnDat Communications Fault.	A communication error was detected with the EnDat 2.2 device connected to the X9 connector.	Check tertiary feedback (X9 connection).
F421	SFD position sensor fault.	Sensor or sensor wiring failure inside motor.	Try resetting the fault. If it reappears return motor for repair.
F423	NV Failure, Multiturn Overflow.	The position saved in memory is corrupted.	Home axis or disable multiturn overflow. If the fault persists, send the drive for repair.

Fault	Message/ Warning	Cause	Remedy
F438 n438	Following error (numeric) Warning issued prior to fault.	Motor did not follow command values. Motor exceeded maximum allowed position following error (numeric).	Check for increased load, jamming or sticking. Is position error set too low?
F439 n439	Following error (user).	Motor did not follow command values. Motor exceeded maximum allowed position following error (user).	Check feedback commutation setup and tuning parameters.
F450	Following error (presentation).	Motor did not follow command values. Motor exceeded maximum allowed position following error (presentation).	Check feedback commutation setup and tuning parameters.
F451 n451	Feedback battery fault.	The external battery voltage is too low. The F451 fault is generated if the AKD is not powered. The n451 warning is generated if the AKD is powered. This fault can be inhibited with FAULT451.ACTION.	Check or replace the external battery.
F452	Multiturn overflow not supported with this feedback.	Non-multiturn feedback is connected while FB1.PMTSAVEEN is active.	Connect multiturn feedback to the drive or disable multiturn overflow.
F453 to F459	Tamagawa communication fault	Bas communication with the feedback device. Cabling or shielding fault, or internal feedback failure.	Check the cabling to the drive and if the problem persists then return the feedback to the manufacturer for repair.
F460	Tamagawa encoder fault (over speed)	This fault is generated when the shaft is rotated above a maximum speed that can be maintained while the external battery is powered and the drive is powered off.	Reset the fault on the drive with DRV. CLRFAULTS.
F461	Tamagawa encoder fault (counting error)	When the feedback is powered on the position (within one revolution) was incorrect because of a problem with the feedback device.	Reset the fault on the drive with DRV. CLRFAULTS. If the problem persists then clean the feedback code plate.
F462	Tamagawa encoder fault (counting overflow).	Multi-turn counter has overflowed.	Reset the fault on the drive with DRV. CLRFAULTS.
F463	Feedback overheat fault.	The temperatur of the encoder substrate exceeds overheating detection temperature during main power-on.	Reset the fault on the drive with DRV. CLEARFAULTS after temperature of encoder has lowered.
F464	Tamagawa encoder fault (multi-turn error).	Any bit-jump occurs in the multi-turn signal during main power-on.	Return to the origin. Reset the fault on the drive with DRV. CLRFAULTS.

Fault	Message/Warning	Cause	Remedy
F467	Feedback fault (See FB1.FAULTS for details).	The Hiperface DSL device malfunctioned.	Check FB1.FAULTS for detailed fault information.
F469	FB1.ENCRES is not power of two, Remote Commutation not possible.	Feedback Type 43 requires that the feedback resolution be a power of two. Feedback Type 43 is not supported for all feedback resolutions.	If the remote feedback device's resolution is a power of two, enter that value in FB1.ENCRES. Otherwise, choose a feedback device with a supported resolution (power of two) and enter that value in FB1.ENCRES.
F473	Wake and Shake. Insufficient movement.	There was less movement than defined by WS.DISTMIN.	Increase WS.IMAX and/or WS.T. Or try using WS.MODE 1 or 2.
F475	Wake and Shake. Excess movement.	WS.DISTMAX has been exceeded in WS.MODE 0. Or more than 360 degrees was traveled in WS.MODE 2.	Increase WS.DISTMAX value or reduce WS.IMAX or WS.T. Note: Wake and Shake is not supported for vertical/overhung loads.
F476	Wake and Shake. Fine-coarse delta too large.	The angle difference between the coarse and fine calculation was larger than 72 deg.	Modify WS.IMAX or WS.T and try again.
F478 n478	Wake and Shake. Overspeed.	WS.VTHRESH was exceeded.	Increase WS.VTHRESH value or reduce WS.IMAX or WS.T.
F479 n479	Wake and Shake. Loop angle delta too large.	The angle between complete loops was larger than 72 deg.	Modify WS.IMAX or WS.T and try again.
F480	Fieldbus command velocity too high.	Fieldbus command velocity exceeds VL.LIMITP	Lower fieldbus command trajectory or increase the value of VL.LIMITP
F481	Fieldbus command velocity too low.	Fieldbus command velocity exceeds VL.LIMITN	Increase fieldbus command trajectory or decrease the value of VL.LIMITN
F482	Commutation not initialized.	The motor requires the commutation initialization (there are no encoder commutation tracks, Hall sensors, etc.) and no successful Wake and Shake sequence has been performed.	Clear any faults, activate the Wake and Shake procedure (WS.ARM) and enable the drive.
F483 – F485	Wake and Shake error.	Motor U, Motor V, or Motor W phase missing. No current was detected in the phase during initialization (Mode 0 only).	Check the motor connections and WS.IMAX (very low current may produce this error).
F486	Motor velocity exceeds EMU-speed.	Motor velocity exceeds the maximum speed the emulated encoder output can generate.	Reduce value of DRV.EMUEPULSEIDTH.
F487	Wake and Shake - Validating positive movement failed	After applying a positive current, motor moved in the wrong direction.	Check motor phase wiring and motor encoder wiring is correct.

Fault	Message/Warning	Cause	Remedy
F489	Wake and Shake - Validating negative movement failed.	After applying a negative current, motor moved in the wrong direction.	Check motor phase wiring and motor encoder wiring is correct.
F490	Wake and Shake - Validating Comm. angle timed out.	During one of the W&S validation stages the drive stopped responding to commands.	Contact customer support.
F491	Wake and Shake - Validating Comm. angle moved too far - Bad Comm Angle.	After applying a current, the motor moved too far (>15 electrical degrees).	This indicates a poor motor phase angle was found by Wake and Shake. Revise Wake and Shake parameters, and re-run Wake and Shake.
F492	Wake and Shake - Validating Comm. angle required more than MOTOR.ICONT.	A current larger than MOTOR.ICONT was used to excite the motor.	This indicates one of the following: 1. Phase angle is incorrect due to a bad wake and shake. 2. Motor has very high friction, requiring high current to break free. 3. Motor power cable is disconnected or improperly wired.
F493	Invalid commutation detected – motor accelerating in the wrong direction. Motor phase may be incorrect.	The velocity of the motor exceeded WS.CHECKV and the sign of the current was not equal to the sign of motor acceleration or the sign of motor velocity for a period of time larger than WS.CHECKT.	1. Check motor phase wiring 2. Reconfigure wake and shake (if mode 0 or 1 is used). 3. Re-run wake and shake to determine correct communication angle.
F501 n501	Bus over voltage.	Bus voltage too high. Usually, this problem is load related.	Reduce load or change motion profile. Check system regen capacity; add capacity if needed. Check mains voltage.
F502	Bus under voltage. Warning issued prior to fault.	Bus voltage below threshold value.	Check mains voltage.
F503 n503	Bus capacitor overload. Warning issued prior to fault.	Single phase AC input on a drive only rated for three-phase input or excessive single-phase power load.	Check mains voltage.
F504 – F518	Internal supply voltage fault.	Internal supply voltage fault detected.	Check wiring for electromagnetic compatibility (EMC). If issue persists exchange drive.
F519	Regen short circuit.	Regen resistor short circuit.	Regen IGBT short circuit. Contact technical support.
F521 n521	Regen over power.	Too much power stored in regen resistor.	Either get larger regen resistor or use DC bus sharing to dissipate power.

Fault	Message/ Warning	Cause	Remedy
F523	Bus over voltage FPGA.	Bus over voltage hard fault.	Check mains voltage and check system brake capacity.
F524 n524	Drive foldback.	Maximum drive power has been exceeded. The power has been limited to protect the drive.	Motion requires too much power. Change profile to reduce load.
F525	Outputovercurrent.	Current exceeds drive peak.	Check for short or feedback faults.
F526	Currentsensorshort circuit.	Current sensor short circuit.	Restart drive. If issue persists, contact technical support.
F527	Iu current AD converter stuck.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F528	Iv current AD converter stuck.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F529	Iu current offset limit exceeded.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F530	Iv current offset limit exceeded.	Hardware failure detected.	Restart drive. If issue persists, contact technical support.
F531	Power stage fault.	Hardware failure detected.	Restart drive. If issue persists, replace drive.
F532	Drive motor parameters setup incomplete.	Before a motor can be enabled, you must configure a minimum set of parameters. These parameters have not been configured.	Issue the command DRV.SETUPREQLIST to display the list of the parameters that you must configure. Configure these parameters either manually or automatically. You can manually configure these parameters in three ways: (1) set each parameter individually; (2) use the setup wizard to select the motor; or (3) select the motor type from the motor data base in the Motor window (MOTOR.AUTOSET must be set to 0 (OFF)). If you use the Motor window, you must first select the feedback type. If the motor has Biss Analog, Endat, or SFD feedback (feedback with memory), then these parameters are set automatically when MOTOR.AUTOSET is set to 1 (ON).
F534	Failedtoreadmotor parameters from feedback device.	Motor either does not have motor feedback memory, or the motor feedback memory is not programmed properly so the parameters cannot be read.	Try to read parameters again by clicking the Disable and Clear Faults button, or by using DRV.CLRFAULTS. If this attempt is not successful, then set MOTOR.AUTOSET to 0 (false) and program the parameters using the setup wizard or manually set up the parameters. If the motor has motor memory (Biss Analog, Endat, and SFD motors have motor memory), return the motor to have the memory programmed.

Fault	Message/Warning	Cause	Remedy
F535	Power-board over-temperature fault.	The power-board temperature sensor indicates more than 85 °C.	Reduce the load of the drive or ensure better cooling.
F536	Standby power supply fault.	Standby volatage circuit overloaded.	Check total 24 V power load of AKD-N in the strings (sum of drive and motor brake supply).
F537	Precharge fault.	Precharge process could not be performed in a reasonable amount of time.	Look for a shortcut in the string (cable) or replace hardware.
F541	AC input phase 1 missing.	Mains supply failure detected, phase L1 missed.	Check power connector and power source.
F542	AC input phase 2 missing.	Mains supply failure detected, phase L2 missed.	Check power connector and power source.
F543	AC input phase 3 missing.	Mains supply failure detected, phase L3 missed.	Check power connector and power source.
F545	String current over peak limit.	String current is higher than AKD-C rated peak current.	Lower AKD-N current limits to prevent overdrawing AKD-C current.
F546	String current over continuous limit.	String current is higher than AKD-C rated continuous current (I^2T).	Lower AKD-N current limits to prevent overdrawing AKD-C current.
F560	Regen near capacity, could not prevent over voltage.	An F501 Bus Over Voltage has occured while the Regen Resistor was at or above 75% of its dissipation capacity.	Increase the size of regen resistor to be able to dissipate more power.
F561	More than 8 AKD-Ns connected at string 2.	Too many drives on string 2.	Reduce NSDs on string 2 to 8 or less.
F562	More than 8 AKD-Ns connected at string 1.	Too many drives on string 1.	Reduce NSDs on string 1 to 8 or less.
F564	Number of nodes on string 1 has decreased.	Drive has been removed from string 1.	Investigate AKD-N EtherCat communication. Determine where network connection failed.
F565	Number of nodes on string 2 has decreased.	Drive has been removed from string 2.	Investigate AKD-N EtherCat communication. Determine where network connection failed.

Fault	Message/Warning	Cause	Remedy
n601	Modbus data rate is too high.	Modbus controller data rate is too high.	Reduce data rate.
F602	Safe torque off.	Safe torque off function has been triggered.	Reapply supply voltage to STO if safe to do so.
n603	OPMODE incompatible with CMDSOURCE.	This warning is generated when the drive is enabled and the gearing command source is selected at the same time as torque or velocity opmode.	Select a different DRV.OPMODE and DRV.CMDSOURCE combination.
n604	EMUEMODE incompatible with DRV.HANDWHEELSRC.	Emulated encode mode is incompatible with the selected handwheel source.	Select a compatible emulated encode mode or change handwheel source.
F621	Control Board CRC fault.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F623	Power Board CRC fault.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F624	Power Board Watchdog fault.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F625	Power Board Communication fault.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F626	Power Board FPGA not configured.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F627	Control Board Watchdog fault.	Communications with the Power Board Failed	DRV.CLRFAULTS. If issue persists If issue persists, contact technical support.
F628	AKD-C front door packet not received on String 1.	A data packet has not been received by the AKD-N or AKD-C (string 1).	Check cables and clear the fault.
F629	AKD-C front door packet not received on String 2.	A data packet has not been received by the AKD-C (string 2).	Check cables and clear the fault.
F701	Fieldbus runtime.	Runtime communication fault.	Check fieldbus connections (X11), settings, and control unit.
F702 n702	Fieldbus communication lost.	All fieldbus communication was lost.	Check fieldbus connections (X11), settings, and control unit.
F703	Emergency timeout occurred while axis should disable.	Motor did not stop in the timeout defined.	Change timeout value, change stop parameters, improve tuning.

2. AKD BASIC Faults

AKD BASIC faults are caused by runtime errors in the program view.

Fault	Message/Warning	Cause	Remedy
F801	Runtime: Divide by zero.	User program attempted to divide by zero.	
F802	Runtime: Stack Overflow.	User program contains an infinite recursion or incorrectly declared array.	
F803	Runtime: Insufficient memory.	User program creats an excessive demand for memory.	
F804	Runtime: No interrupt handler defined.	User program is missing an interrupt service routine, but an interrupt is being called.	
F805	Runtime: Interrupt error.	User program contains an error in an interrupt routine.	
F806	Runtime: Max string length exceeded.	User program attempted to use a string exceeding 255 characters.	
F807	Runtime: String overflow.	User program has a programming exception causing excessive string usage.	
F808	Runtime: Array out of bounds.	User program exception caused an array to exceed its bounds.	Clear Fault, Fix user program, recompile, download and attempt to run the program again.
F809	Runtime: Feature not supported.	User program contains a feature that the current firmware version does not support.	
F810	Runtime: Internal firmware/hardware error.	User program attempted to perform an action that causes a firmware or hardware error.	
F812	Runtime: Parameter not supported.	User program calls a parameter that is not supported by the firmware.	
F813	Runtime: Parameter access error.	User program contains a parameter access error.	
F814	Runtime: Data not found.	User program attempted writing an invalid recorder parameter.	
F815	Runtime: Data invalid.	User program attmpted executing an invalid command.	
F816	Runtime: Data too high.	User program contains a parameter that is above the accepted range.	
F817	Runtime: Data too low.	User program contains a parameter that is below the accepted range.	

Fault	Message/Warning	Cause	Remedy
F818	Runtime: Param type out of range.	User program attempted to write a value which was out of a parameter's range.	
F819	Runtime: Data not divisible by 2.	User program executed a function that requires it to be divisible by two.	
F820	Runtime: Invalid position modulo setting.	User program contains an incorrectly configured modulo setting.	
F821	Runtime: Cannot read from command.	User program attempted to perform a read of parameter that is a command or statement.	
F823	Runtime: Enable drive first.	User program is attempting to execute a motion that requires the drive to be enabled.	
F824	Runtime: DRV.OPMODE must be 2 (position).	User program is attempting to execute motion that requires the drive to be in program mode.	
F825	Runtime: DRV.CMDSOURCE must be 5 (program).	User program is attempting to execute motion that requires the drive to be in position mode.	Clear Fault, Fix user program, recompile, download and attempt to run the program again.
F826	Cannot execute during a move	User program is attempting an invalid execution during a move.	
F827	Writing to read-only parameter.	User program attempted writing to a read-only parameter.	
F828	Disable Drive first.	User program is attempting to execute a function that requires the drive to be disabled.	
F829	Opcode not supported - upgrade firmware.	User program contains unsupported Opcode.	
F830	No negative values allowed.	User program uses illegal negative value.	
F831	BASIC program is invalid. May need firmware upgrade.	User program contains invalid c.	
F832	BASIC program is missing.	User program is missing.	
F901	Too many cams.	User program contains too many cams.	

About Kollmorgen

Kollmorgen is a leading provider of motion systems and components for machine builders. Through world-class knowledge in motion, industry-leading quality, and deep expertise in linking and integerating standards and custom products, Kollmorgen delivers breakthrough solutions that are unmatched in performace, reliability, and ease-of-use, giving machine builders an irrefutable marketplace advantage.

For assistance with your application needs visit www.kollmorgen.com or contact us at:

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