TwinCAT Library: Errors and other Messages

Application Note AN103

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002	2013-05-22	mvx	Add comment on bridge voltage error and new errors for firmware 1040
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1 Target and Purpose

The Triamec TwinCat library generates errors, warnings and messages, which are propagated to the user through the TwinCat Event mechanism. This application note describes all messages and suggests solutions.

2 Tria-Link Adapter Errors

The messages of SourceId 700 are related to the Tria-Link in general or the Tria-Link adapter. The following list starts with the EventId and its class. The first parameter %1 is always the nDevId of the Tria-Link adapter, see alarm 066.

065	Class:Alarm	***Tria-Link Internal Error***
	Description	This is an internal error
	Solution	Send a bug report to Triamec Motion AG
066	Class:Alarm	***Tria-Link PCI Board not found***
	Description	The Tria-Link adapter board as specified by the input Trialink.Config.nDevId in the PLC code was not found in the TwinCat System manager.
	Solution	Make sure a Tria-Link PCI board is installed and found in the TwinCat System manager entry for device DPRAM with id=nDevId.
067	Class:Alarm	***Tria-Link PCI Board: FPGA Firmware ID must be 1041 or newer***
	Description	The Tria-Link PCI board firmware is outdated
	Solution	Upgrade to a recent firmware version using the TAM System Explorer
068	Class:Alarm	***Tria-Link PCI Adapter could not be accessed***
	Description	Internal local bus communication to the PCI adapter was not possible.
	Solution	Shutdown the PC for 20s and reboot, send bug report to Triamec Motion AG.
069	Class:Alarm	***Tria-Link not closed or FastCall missing***
	Description	The Tria-Link PCI adapter was found but detected an open Tria-Link ring.
	Solution	Make sure the ring is closed and all members have gotten 24V. Check cabling.
070	Class:Alarm	***Sampling Rate of CallFast is too slow***
	Description	The sampling rate of the CallFast task in the PLC-Code must be faster or equal than 2ms.
	Solution	Adjust the sampling rate in the PLC code.
071	Class:Alarm	***Smart Sync out of bounds***
	Description	A very large mismatch between the adapter time base and the TwinCat time has been detected.
	Solution	Re-Boot the Tria-Link and send an error report to Triamec.
072	Class:Warning	***Sync Warning: Too small BufferTime or TwinCat Task Exceeded too much***
	Description	A mismatch has been detected between the adapter time base and the TwinCat time. This might be an indication of TwinCat task jitter or task Exceeds or a tight buffer time in *Trialink.FastHandler.pll.BufferTicks*.
	Solution	Make sure the TwinCat jitter is low and there are no Task Exceeds. Also make sure, BufferTicks * FastTaskTime is larger than TwinCat Jitter.

073	Class:Alarm	***Tria-Link Boot Timeout***
	Description	The Tria-Link should be booted but did not reach the end of booting.
	Solution	See solutions for error 069.
074	Class:Alarm	***Tria-Link two masters in the ring***
	Description	There are two Tria-Link masters in the ring.
	Solution	Make sure any second PCI board in the ring is configured as "Observer"
075	Class:Message	***Tria-Link down***
	Description	The Tria-Link has been turned off by the PLC code.
	Solution	Boot Tria-Link using Trialink.Execute.
076	Class:Message	***Tria-Link booting***
	Description	The Tria-Link is currently booting.
	Solution	Wait until booting has finished.
077	Class:Message	***Trialink.Config.Rootfolder is not a valid folder path***
	Description	The Tria-Link PLC configuration contains an invalid path.
	Solution	Modify PLC code

3 Tria-Link Axis Errors

The messages of sourceId 701 to 708 are related to an axis or its servo drive with logical axis numbers iAxis 1 to 8 (sourceId = 700+iAxis). The parameter %1 is always the ***logical axis ID*** number.

128	Class:Alarm	***Axis Internal Error***
	Description	An internal error.
	Solution	Reboot Tria-Link and send a bug report to Triamec.
129	Class:Alarm	***Axis Power RLID not supported***
	Description	The servo drive found at the specified station address is not compatible.
	Solution	Is there a second axis configuration in the PLC code that points to a single axis drive? Is the axis firmware compatible with the library version?
130	Class:Alarm	***No communication with drive***
	Description	The drive cannot be accessed through the Tria-Link.
	Solution	Check cabling, check if drive has been made persistent with the correct station address and 24V rebooted ones since.
133	Class:Alarm	***PublishAndSubscribe error***
	Description	Same as Alarm 130.
	Solution	Check usage of TL_PublishAndSubscribe with correct station numbers.
134	Class:Alarm	***Axis Power Enable but missing communication***
	Description	The drive stopped communicating.
	Solution	Reboot Tria-Link or reboot 24V and send a bug report to Triamec.
137	Class:Alarm	***Axis Power Enable Failed***
	Description	Same as Alarm 130.

140	Class:Warning	***Axis Power Enable while NotReadyToSwitchOn***
	Description	The axis is not ready to be switched on but PLC code tries to enable
	Solution	Make sure any error is cleared and no axis warnings are active.
141	Class:Warning	***Axis Move Absolute with commanded velocity zero and not discardVelocity***
	Description	A move absolute was commanded with input velocity zero and the input discardVelocity was FALSE. This command was ignored.
	Solution	Check parameters of the function block TL_MoveAbsolute.
143	Class:Alarm	***Axis Power Enable but no communication***
	Description	Same as Alarm 130.
145	Class:Alarm	***Axis Power GetBrakeConfig failed***
	Description	Same as Alarm 130.
147	Class:Alarm	***Publish Buffer Full or AboId counter overrun***
	Description	Attempt to acquire too much publish ressources
	Solution	Check usage of TL_PublishAndSubscribe in the PLC code.
148	Class:Alarm	***Axis set brake writeregister failed***
	Description	Same as Alarm 130
149	Class:Alarm	***Bad Axis Configuration: bad station or iAxis***
	Description	The PLC code configuration parameters "station" or "iAxis" are illegal.
	Solution	Correct PLC code
150	Class:Alarm	***Axis MoveAbs/MoveVel/MoveCond commandSend failed***
	Description	Same as Alarm 130.
151	Class:Alarm	***Axis MoveAbs/MoveVel Axis not ready for move***
	Description	A MoveAbsolute or MoveVelocity was commanded but the axis was not ready to move.
	Solution	Make sure the axis is enabled and is not in an error state.
152	Class:Warning	***Axis MoveAbs/MoveVel command aborted***
	Description	A MoveAbsolute or MoveVelocity command was started but ended before reaching the final state (standstill or ContinuousMotion).
	Solution	Check, if an axis error or a TAMA program or another move command has interrupted the command
153	Class:Alarm	***Axis MoveCondition MaximumDistance reached***
	Description	A moveToCondition command has reached the maximum travel distance without finding the marker or index. For example in a reference move.
	Solution	Check if the marker or index is connected and shows up at the servo drive IO.
154	Class:Alarm	***MC_SetPosition failed***
	Description	It was not possible to stop the axis before setposition or setPosition communication failed.
	Solution	Check if an emergency stop was active.

158 Class:Alarm ***Axis Endat failed***
Description Failed to read the endat Position.
Solution Make sure the encoder supports endat 2.1

170 Class:Alarm ***MC_Stop failed***
Description Same as Alarm 130.

171 Class:Alarm ***MC_Reset failed***
Description Same as Alarm 130.

178 Class:Message ***MC_MoveSync waiting for synchronization***
Description The axis should couple to the external path planner (NC) and is waiting for PLL synchronization.
Solution This should disappear as soon as the PLL has settled, 10s after booting Tri-alink.

179 Class:Alarm ***MC_MoveSync synchronization lost***
Description The synchronization of the PLL was lost while following the external path planner (NC). This might cause irregular commanded drive positions.
Solution Check for workpiece irregularities and find what caused irregular calls of the position task, e.g., check for illegal drivers.

180 Class:Alarm ***MC_MoveSync, logical axis ID not valid***
Description The logical axis ID ***iAxis*** must be between 1 and 32=TL_CH_AX_MAX.
Solution change configuration settings in the PLC code.

181 Class:Alarm ***MoveSync AboSubscribe failed***
Description Abo subscription failed. There might be too many subscriptions active.
Solution Correct PLC code.

182 Class:Alarm ***MoveSync MoveToStart failed***
Description The initial move before entering couple mode failed.
Solution Check if the dynamic settings of the axis are too fast.

183 Class:Alarm ***MoveSync Coupling failed***
Description Entering coupled mode failed
Solution Make sure, the commanded position of the NC/CNC is the same as the actual position of the drive in the very moment, the coupling command is issued (axis tracking).

184 Class:Alarm ***MoveSync SetPosition failed***
Description For unknown reasons, the SetPosition command within coupling failed.
Solution This is a special configuration. Please consult Triamec.

185 Class:Message ***Searching Switch***
Description The axis is currently searching for an IO, e.g., an end marker switch or a measurement tool signal.

186 Class:Message ***Searching Index***
Description The axis is currently searching for an encoder index.

187 Class:Alarm ***Tama Programm used for homing is not running***

	Description	The asynchronous TAMA VM has to be enabled.
	Solution	Load the appropriate tama program used for homing and enable 'start asynchronous Tama virtual machine' in the start up settings (Tam System Explorer).
188	Class:Alarm	***Tama VM used for homing is not ready***
	Description	To start the homing sequence, the Tama state has to be IDLE.
	Solution	Check if the correct Tama program is loaded and if the Tama VM is enabled.
189	Class:Alarm	***Tama homing error***
	Description	The Tama VM used for homing is in error state.
	Solution	Check if the Tama program and verify if the precondition to run the homing sequence are fulfilled.
190	Class:Alarm	***TIOB bad logical axis ID***
	Description	Same as 180
261	Class:Warning	***Bridge Voltage warning***
	Description	The bridge voltage is not within the specified range in *General/Parameters/PowerBridgeVoltageUpperLimit* and ...*LowerLimit*.
	Solution	Check, if the power supply is on.
262	Class:Message	***SafeTorqueOff (STO) is active***
	Description	The STO feature is active. The drive may currently not be enabled.
	Solution	Close the STO connector, e.g., the door.
264	Class:Alarm	***PLL not locked***
	Description	An unknown error has disturbed the PLL of the drive
	Solution	Clear the axis error and send a bug report to Triamec.
265	Class:Alarm	***Computing time error***
	Description	Something exceeded the drive controller calculation time.
	Solution	Check if a TAMA program is consuming too much calculation load.
266	Class:Alarm	***I2t Limit***
	Description	The I2t limit of the motor or drive has been reached
	Solution	Clear the axis error and reduce the dynamic settings of the path controller. Check the parameter *Environment/MotorNominalCurrent*.
267	Class:Alarm	***Current Limit Motor or Drive***
	Description	The limit of the current vector is succeeded (motor or drive).
	Solution	Same as Alarm 266 but check the parameter *Environment/MotorPeakCurrent*
268	Class:Alarm	***Bridge Voltage error***
	Description	Same as Warning 261, but because it was enabled before, this was considered an error. This error may also show up, if the application tries to enable an axis before the power supply reached its stable voltage during startup or before its internal inrush-current-relay turned on.
	Solution	Clear the axis error, check if the power supply is on.
269	Class:Alarm	***Bridge Overcurrent or Midvoltage out of range***

	Description	This can be one of two errors: Either the limit of the power bridge current is succeeded. This is a hard limit to prevent damage in a short situation. Or the midvoltage controller of a TSP350/TSP700 detected a deviation from midvoltage.
	Solution	Make sure there is no short of the motor and in case of a TSP350/TSP700 check cabling of the DCBus.
270	Class:Alarm	***Temperature Limit***
	Description	A temperature sensor of the drive (motor or internal) has reached the limit
	Solution	Make sure there is enough cooling of the drive or the motor
271	Class:Alarm	***Voltage out of range***
	Description	At least one operating voltage is out of range
	Solution	Check if the encoder shorts its supply voltage. Otherwise the drive hardware might be damaged.
272	Class:Alarm	***External error***
	Description	A software error has been triggered
	Solution	This is application specific. Consider if a TAMA code feature triggers this error.
273	Class:Alarm	***No valid Tama Code***
	Description	The tama code in the servo drive is not valid
	Solution	Download and activate a valid tama code.
274	Class:Alarm	***PERSISTENT parameters are NOT compatible with running firmware***
	Description	This is a special firmware upgrade situation
	Solution	Reload configuration and make the drive persistent again
275	Class:Alarm	***While executing a Tama program, the program memory became full during heap allocation***
	Description	A TAMA program allocated too much heap.
	Solution	Check memory allocated using the command "*new*" in the C# code.
276	Class:Alarm	***While executing a Tama program, an attempt was made to divide by zero***
	Description	This is a TAMA application code problem
	Solution	Prevent division by zero
277	Class:Alarm	***While executing a Tama program, an object property was requested, but there was a null reference***
	Description	This is a TAMA application code problem.
	Solution	Prevent calling null reference
278	Class:Alarm	***While executing a Tama program, an array element index was outside the range of the array***
	Description	This is a TAMA application code problem
	Solution	Make sure index boundaries are maintained.
279	Class:Alarm	***While executing a Tama program, Tama program state was corrupted. This value is returned when an unknown operation code is encountered***
	Description	This is a TAMA specific problem.
	Solution	Send a bug report to Triamec.

280	Class:Alarm	***Position error limit***
	Description	The position following error has succeeded the maximum distance allowed.
	Solution	Make sure the axis is free to move and check the parameter *PositionController/PositionErrorLimit*.
281	Class:Alarm	***id error limit***
	Description	The current vector exceeded to much from the commanded current.
	Solution	Make sure, the path planner does not command too fast accelerations or jerks. Check the parameter *CurrentController/CurrentErrorLimit*.
282	Class:Alarm	***iq error limit***
	Description	Same as Alarm 281
283	Class:Alarm	***id iq error limit***
	Description	Same as Alarm 281
284	Class:Alarm	***enable no motor axis***
	Description	The servo drive configuration does not contain a motor type definition
	Solution	Make sure, there is a valid Triamec configuration on the drive
285	**Class:Alarm**	***Analog Encoder Amplitude too low***
	Description	**The analog encoder amplitude (sin2+cos2) was too low. This is an indication that the encoder is not connected, or one of the signal lines is damaged.**
	Solution	**Repair the encoder**
286	Class:Alarm	***Encoder Shorted***
	Description	The power supply of the encoder is shorted.
	Solution	Repair the encoder or its cable.
287	Class:Alarm	***Digital Output Shorted***
	Description	A digital output is shorted.
	Solution	Repair the device attached to the digital output or its cable.
288	Class:Alarm	***Motor Continous Current Limit***
	Description	The continuous current limit (I2t) of the motor was reached.
	Solution	Reduce the current or the dynamic settings of the path planner.
289	Class:Alarm	***Power Bridge Continous Current Limit***
	Description	The continuous limit of the power bridge was reached.
	Solution	Reduce the current or the dynamic settings of the path planner.
290	Class:Alarm	***Hardware monitor on the device is not running***
	Description	This is an internal error
	Solution	Reboot 24V and send a bug report to Triamec
293	Class:Alarm	***SafeTorqueOff (STO) error***
	Description	The STO state was detected while the drive was enabled. This causes an error
	Solution	Clear error. PLC code may disable the axis before entering STO mode.
294	Class:Alarm	***SafeTorqueOff (STO) is inconsistent (only one contact is closed)***
	Description	The STO state was entered, but only one channel (one pair of contacts) where opened. This is illegal.

	Solution	Make sure STO always opens both channels.
295	Class:Alarm	***SafeTorqueOff (STO) The startup test of the safety circuit failed***
	Description	The boot test of the safety circuit failed.
	Solution	The drive needs to be repaired.
296	Class:Alarm	***SafeTorqueOff (STO) Pulse test failure***
	Description	The internal pulse test of the STO channels failed.
	Solution	The drive needs to be repaired.
297	Class:Alarm	***SafeTorqueOff (STO) Temperature limit***
	Description	The STO circuit detected a temperature failure and entered the safe state.
	Solution	Make sure temperatures are within the limits and reset the error.
298	Class:Alarm	***Motor Peak Current Limit***
	Description	The current of a motor phase reached the peak limit of the motor.
	Solution	Reduce the peak currents or the dynamic settings of the path planner.
299	Class:Alarm	***Power Bridge Peak Current Limit***
	Description	The current of a motor phase reached the peak limit of the power bridge.
	Solution	Same as for 298.
300	Class:Alarm	***Encoder Configuration Error***
	Description	The encoder parameters are inconsistent.
	Solution	Check the encoder settings.
301	Class:Alarm	***Option Module Failure***
	Description	An option module has been configured but is either missing or not functional.
	Solution	Contact Triamec after verifying that the option module is installed.