ÅAC Sirius Product Family Errata

Rev. E

Introduction

Purpose of document

This document details the errata in the ÅAC Sirius Breadboard and its manual, RD1

Revision log

Rev	Date	Change description	Prepared
A	2016-10-07	First issue	E. Zachrisson
B	2016-11-03	Update for release 0.7.0	M. Werner
C	2017-01-03	Update for release 0.8.0	M. Werner
D	2017-02-01	Update for release 0.9.0	M. Werner
E	2017-03-07	Update for release 0.10.0	M. Werner

Reference documents

Rev	Document Ref	Document name
RD1	205065, E	Sirius Product User Manual

List of errata

Table 1 specifies which devices and what revisions that are affected by the errata described in this document.

Table 1 Affected units

Errata description	OBC-S	TCM-S w. o. Software	TCM-S w. software
System			
#1061 Error detection and recovery unverified	**All**	**All**	**All**
#2333, #2334 When sending data over the UART, the last byte isn't transmitted	**FM**	**FM**	**FM**
TCM-S Core Application			
#2102 CUC Time Fraction field of Telecommand Acceptance Report is always 0			**All**
#1576 RMAP data checksums are not checked nor generated			**All**
#1589 TCM-S Accepts TCs with bad MAPID			**All**
#1619 Download fails when sweeping packet sizes			**All**
#1788 Unable to set TM bitrate divisor to 0xFF			**All**
#1816 TC_BUFFER_CNT field is always 0 upon RMAP TCStatus readout			**All**
#1824 Unable to read CPDU index			**All**
#1839 No PUS success report is generated when sending TC to TCM-S			**All**
#1960 Power loss signal is not respected			**All**
#2238 TC derandomization does not work			**All**
#2314 TCM core application cannot handle high telecommand packet rates			**All**
#2292 TCM core application accepts tcs on all channels (except 2)			**All**
#2288 TCM core application does not send a failure report if received telecommand packet has an invalid length			**All**
GDB			
#1207 Writing and reading to non-32-bit-aligned addresses does not work	**All**	**All**	**All**
#1332 Breakpoints may change subsequent program behaviour	**All**	**All**	**All**
RTEMS			
#1452 Occasional debug uart byte misses/corruption	**All**	**All**	**All**
#1879 UART driver allows multiple opens for same device	**All**	**All**	
#1889 System flash driver allows multiple opens for same device	**All**	**All**	

#1890 Error manager driver allows multiple opens for same device	**All**	**All**	
#1891 GPIO driver allows multiple opens for same device	**All**	**All**	
#1896 CCSDS driver allows multiple opens for same device	**All**	**All**	
#1897 Watchdog driver allows multiple opens for same device	**All**	**All**	
#1898 SCET driver allows multiple opens for same device	**All**	**All**	
ADC			
#2131 Measured input current is too high	**FM**	**FM**	

System

#1061 Error detection and recovery unverified

Description	Error detection and recovery mechanisms are currently unverified outside of radiation testing for RAM, CPU and system flash, due to the lack of mechanisms of injecting errors.
Impact	Possible non-working error detection and recovery algorithms, non-working error counting registers
Suggested Workaround	None

#2333, #2334 When sending data over the UART, the last byte isn't transmitted

Description	On FM hardware, the last byte written to UART is not sent.
Impact	UART communication code developed on BB hardware cannot be directly used with FM hardware.
Suggested Workaround	Adapt code for FM by padding write data with an extra byte.

TCM-S Core Application

#2102 CUC Time Fraction Field of Telecommand Acceptance Report is always 0.

Description	The Time Fraction field of Telecommand Acceptance Reports are never updated and is always 0.
Impact	The time-stamping of Telecommand Acceptance Reports provides a resolution of one second.
Suggested Workaround	None. If the time-stamps of Telecommand Acceptance Report is used in the Ground Station, don't send several Telecommands per second to the same APID.

#1576 RMAP data checksums are not checked nor generated

Description	Due to performance reasons the incoming data CRC on RMAP commands is not checked nor is any CRC generated on

	outgoing RMAP commands.
Impact	Corrupt data packets may enter / leave the system
Suggested Workaround	Do not check data CRC on messages from the TCM Core Application.

#1589 TCM-S Accepts TCs with bad MAPID

Description	The TCM-S accepts telecommands with MAPID=1 but should only accept command with MAPID=0
Impact	TCs with wrong MAPID are accepted and routed in the system
Suggested Workaround	None.

#1619 Download fails when sweeping packet sizes

Description	When downloading packets of size 50k or larger from Mass Memory, the download fails and the TCM-S throws a bus-error and crashes.
Impact	Downloading PUS packets of size 50 k or larger will not work.
Suggested Workaround	Don't use PUS packet larger than 20k.

#1788 Unable to set TM bitrate divisor to 0xFF

Description	Setting different bitrates up to 0xFE by a RMAP command works, but setting a value of 0xFF has no effect
Impact	Setting a bitrate to 0xFF over RMAP is not working
Suggested Workaround	Don't use a TM divisor of 0xFF. If needed, do required configurations of the downlink of the Ground Station Equipment.

#1816 TC_BUFFER_CNT field is always 0 upon RMAP TCStatus readout

Description	When performing the RMAP TCStatus command via RMAP the TC_BUFFER_CNT aka Length of the last received TC frame field is always zero.
Impact	The reported length of the last received TC is not valid
Suggested Workaround	None.

#1824 Unable to read CPDU index

Description	The CPDU index is cleared upon CPDU-interrupt, so the TCM-S application cannot read the last activated CPDU-index.
Impact	Not possible to get CPDU index by RMAP-command.
Suggested Workaround	None.

#1839 No PUS success report is generated when sending TC to TCM-S

Description	When a TC with an APID addressed for the TCM-S application, no success report is generated.
Impact	When sending a TC to the TCM-S, no information if the command was received will be reported to the Ground Station
Suggested Workaround	None.

#1960 Power loss signal is not respected

Description	The TCM core application does not avoid starting new mass memory or NVRAM program/erase operation when the power loss signal is received.
Impact	Result of operations triggered during power loss is unknown.
Suggested Workaround	None.

#2238 TC derandomization does not work

Description	The TCM core application is unable to interpret derandomized telecommand packets
Impact	Randomization of telecommands does not work
Suggested Workaround	Do not randomize the telecommand data.

#2314 TCM core application cannot handle high telecommand packet rates

Description	The TCM core application cannot handle high packet rates
Impact	If a high number of packets are sent back to back the tcm core application will be unable to handle them all and even treat incoming packets as corrupt
Suggested Workaround	Do not send telecommand packets at a high packet rate

#2292 TCM core application accepts tcs on all channels (except 2)

Description	The TCM core application is too liberal and accepts all channels except 2 (which is routed to hardware)

Impact	Invalid channels are not filtered out
Suggested Workaround	Do not expect commands sent on invalid virtual channels to be filtered out

#2288 TCM core application does not send a failure report if received telecommand packet has an invalid length

Description	If a telecommand packet is sent but with an invalid length the packet is indeed dropped in the tcm core application but not failure report is sent.
Impact	No failure report is sent
Suggested Workaround	Do not expect a failure report when sending a command with invalid length.

GDB

#1207 Writing and reading to non-32-bit-aligned addresses does not work

Description	The debugger interface to the OpenRISC CPU does not support byte writing and reading on non-32-bit-aligned addresses
Impact	When using gdb single bytes cannot be manipulated nor observed.
Suggested Workaround	Align all writes and read on a 32 bit data word basis, i.e. step the address by 4 and write 32 bits at a time.

#1332 Breakpoints may change subsequent program behaviour

Description	When using breakpoints, the execution of code may show unreliable results around the location of the breakpoint, which is not representative of execution without breakpoints.
Impact	Breakpoints cannot in general be reliably used as a pause point for subsequent stepping or execution.
Suggested Workaround	None.

RTEMS

#1452 Occasional debug uart byte misses/corruption

Description	When using the debug UART with RTEMS, occasional byte misses and case changes are seen in the received output
Impact	Debug UART cannot be reliably be used for machine parsing.
Suggested Workaround	None.

#1879 UART driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1889 System flash driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1890 Error manager driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1891 GPIO driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1896 CCSDS driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1897 Watchdog driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.
Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

#1898 SCET driver allows multiple opens for same device

Description	The RTEMS driver does not block multiple opens of the same device.

Impact	Multiple opens of the same device may lead to conflicts in data handling.
Suggested Workaround	Enforce single opens per device on application layer.

ADC

#2131 Measured input current is too high

Description	On FM boards the measured input current is about 10x too high
Impact	Measured input current is wrong
Suggested Workaround	For a rough estimate, divide the measured current by 10

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