

205056 Rev. D

ÅAC Sirius Product Family Errata

ÅAC Sirius Product Family Errata

Rev. D

ÅAC Errata template Rev. B.dotx



205056 Rev. D

ÅAC Sirius Product Family Errata

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 |
|-----|------------|--------------------------|---------------|
| А | 2016-10-07 | First issue | E. Zachrisson |
| В | 2016-11-03 | Update for release 0.7.0 | M. Werner |
| С | 2017-01-03 | Update for release 0.8.0 | M. Werner |
| D | 2017-02-01 | Update for release 0.9.0 | M. Werner |

Reference documents

| Rev | Document Ref | Document name |
|-----|--------------|----------------------------|
| RD1 | 205065, D | Sirius Product User Manual |



205056 Rev. D

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

| | | TCM-S | |
|--|-------|-------------------|-------------------|
| Errata description | OBC-S | w. o. Software | TCM-S w. software |
| System | | | |
| #1061 Error detection and recovery unverified | All | All | All |
| #2103 Errors from flash read in bootrom causes skipping of all remaining images | All | All | All |
| 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 |
| #1909 Data frames cannot be sent when idle frames are switched off | | | All |
| #1629 Cannot handle SpaceWire packets of maximum size | | | All |
| #1960 Power loss signal is not respected SpaceWire | | | All |
| #11EE Minimum plat gize limitation | | AU | A11 |
| GDB | All | AII | All |
| #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 | 1 | 1 | |
| #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 | |



205056 Rev. D

ÅAC Sirius Product Family Errata

| #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 |

#2103 Errors from flash read in bootrom causes skipping of all

remaining images

| Description | If an uncorrectable flash read errors are found in any attempted image, all remaining images will also be skipped, and the last fall-back safe image will be booted. |
|-------------------------|--|
| Impact | Only two images will be used in practice for redundancy safety in case of flash read errors: The selected one, and the last safety image. |
| Suggested Workaround | None |

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 | |
|-------------|--|--|
|-------------|--|--|



ÅAC Sirius Product Family Errata

| | 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 | None. |



| Workaround | |
|------------|--|
| | |

#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. |

#1909 Data frames cannot be sent when idle frames are switched off

| Description | If generation of Idle-frames is disabled, no TM frames will be generated. |
|-------------------------|---|
| Impact | No data can be send on the downlink. |
| Suggested Workaround | Don't disable generation of Idle-frames. |

#1629 Cannot handle SpaceWire packets of maximum size

| Description | Due to the TCM core app reading SpaceWire packets into a buffer of size SPWN_MAX_PACKET_SIZE at offset 128, a packet which is larger than SPWN_MAX_PACKET_SIZE - 128 will cause a buffer overflow. |
|-------------|--|
| Impact | Maximum SpaceWire packet size is less than specified |
| Suggested | Limit SpaceWire maximum packet size to |
| Workaround | SPWN_MAX_PACKET_SIZE - 128 |

#1960 Power loss signal is not respected

| | Description | The TCM core application does not avoid starting new mass | |
|-----------------------------|-------------|---|----------------------------|
| ÂAC Errata template Rev. B. | .dotx | www.aacmicrotec.com | Page 7 of 10 |



ÅAC Sirius Product Family Errata

| | 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. |

SpaceWire

#1155 Minimum pkt size limitation

| Description | Packets smaller than 4 bytes are not received correctly. |
|-------------------------|---|
| Impact | Packets small than 4 bytes cannot be used. |
| Suggested Workaround | All SpaceWire packets must have size between 4 and 65535 octets |

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. |



ÅAC Sirius Product Family Errata

#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 |

ÅAC Microtec AB

Uppsala Science Park, Dag Hammarskjölds väg 48, SE-751 83 Uppsala, Sweden. Phone: +46 18 56 01 30 www.aacmicrotec.com info@aacmicrotec.com