ÅAC Sirius Product Family Release Notes

Rev. M

Introduction

Purpose of document

This document explains the changes that have occurred since the last release.
Any newly discovered errors or removed errata items are documented in the separate errata document [RD2].

Revision log

Rev	Date	Change description	Prepared
A	2016-10-07	First official release	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	2017-02-10	Update for release 0.9.1	M. Werner
F	2017-03-07	Update for release 0.10.0	M. Werner
G	2017-04-18	Update for release 0.11.0	M. Werner
H	2017-08-01	Update for release 0.11.1	M. Werner
I	2017-10-31	Update for release 1.0.0	M. Werner
J	2017-12-07	Update for release 1.0.1	M. Werner
K	2017-12-20	Update for release 1.0.2	M. Werner
L	2018-03-06	Update for release 1.1.0	J. Viketoft
M	2018-04-16	Update for release 1.2.0.	M. Werner

Reference documents

Rev	Document ref	Document name
RD1	205065, rev I	Sirius Product User Manual
RD2	205056, rev I	Sirius Product Family Errata

Changes for 0.6.2

Ref #	What	Why	Action to be taken by user	Affects
1598	**RX FIFO Size increased to 128. Driver API updated**	To prevent buffer overflows	Update IOCTL and symbols according to the manual	TCM-S, OBC-S
1734	**TX output polarity changed on uart 3 and 4**	Previous polarity was wrong	Harness polarity must be swapped	TCM-S
1644	**Extended address for outgoing messages corrected to 0xFF**	Previous address of 0x00 was wrong	Any workarounds must be removed	TCM-S application
1716	**X-Band pin description added to manual**	Missing before	None	TCM-S
1701	**UART now closes the line driver upon closure**	A line driver should be deactivated when not used	None	TCM-S, OBC-S
1704	**TMConfig fields in manual corrected**	Order differed between implementation and manual	None	TCM-S
1703	**TMBRSet details in manual corrected**	Old description and example was wrong	None	TCM-S

Changes for 0.7.0

Ref #	What	Why	Action to be taken by user	Affects
1514	**Version field extended from 1 byte to 4 bytes in GetHK RMAP reply and modified debug uart startup version printout format**	Unification with internal versioning scheme	Update RMAP GetHK reply handling according to new format in manual	TCM-S application
1452	**Debug UART no longer corrupts certain characters**	Increased reliability of debug output, especially if machine-parsed.	None	TCM-S, OBC-S
1738	**RTEMS updated to latest upstream prerelease version of 4.11**	To benefit from continuous bugfixing done in RTEMS upstream.	None	TCM-S, OBC-S
1545	**Applications utilising the board support package can now compile with C99 compiler standard set.**	Allows more strict compilation checks.	None	TCM-S, OBC-S

Ref #	What	Why	Action to be taken by user	Affects
1555	**tcm core app, when partition is full ENOSPC should be returned**	ENOSPC is returned when partition is full. If data to be written does not fit, ENOSPC will be returned and no data will be written.	Check status value of RMAP reply to see if write-access is successful	TCM-S application
1695	**Clarified argument type as pointer to uint32_t for GPIO IOCTL calls in manual**	Previously incorrect argument type	None	TCM-S, OBC-S
1712	**Adjust CCSDS clock divisor to generate exactly 1 Mbps**	Did not previously generate correct rate	None	TCM-S application
1737	**RTEMS timecount function modified to use "simple" timecounter implementation instead**	Reduces timecounter overhead.	None	TCM-S, OBC-S
1786	**NVRAM configuration example now included in board support package**	Allows customization of NVRAM configuration	None	TCM-S application
1460	**ADC supported sample rate and clock divisor combinations documentation extended and clarified.**	Previous limitation documentation was inaccurately conservative.	None	TCM-S, OBC-S
1926	**Errno aliases are used in the manual without numerical translation**	A table is added in user manual to clarify numerical translation.	None	TCM-S application
1785	**Mass memory download does not work**	Handling of partition pointers after power-cycle was not correct. Setting of write pointers for partitions was not correct.	User has to read errata so that first 3 blocks are not used when configuring partitions.	TCM-S application
1790	**Spacewire mode handling corrected**	Changing mode previously caused spacewire link error	None	TCM-S, OBC-S
1781	**Error handling and status handling updated in spacewire RTEMS driver**	Previously incorrect/incomplete status from spacewire transmision sequence	Update status and error handling according to manual	TCM-S, OBC-S
1505	**Handling of read buffer overflow updated in spacewire**	Spacewire driver previously triggering overflow reject if read size was insufficient for incoming packet	None	TCM-S, OBC-S
1864	**Corrected transmission sequence in spacewire**	Fixes spacewire lockup after failed transmission	None	TCM-S, OBC-S

Changes for 0.8.0

Ref #	What	Why	Action to be taken by user	Affects
1360	**Mass memory DMA added**	Performance increase in conjunction with massmem read/write operations.	None	TCM-S
1497	**O3 optimisation enabled by default**	Increased performance.	None	TCM-S, OBC-S
1680	**SCET now supports syncing subsecond to external PPS source**	Old implementation did not meet requirements.	None	TCM-S, OBC-S
2034	**SCET driver has an updated API**	Old implementation did not meet requirements and had multiple ways of doing operations.	Check ioctl/read/write operations and ensure the application uses the updated API	TCM-S, OBC-S
1796	**CLCW fields "NoRfAvailable" and "NoBitLock" now reports correct status**	Previously these fields were constant.	None	TCM-S
1797	**Missing RMAP message for TC_VALID and CA_LOCK**	Requirement. Solved in conjunction with #1796	None	TCM-S application
1798	**New TCM RMAP command for configuration and reading of VC0 timestamps**	Requirement	None	TCM-S application
1900	**TCM Core App tasks synchronised at initialisation**	Avoids risk of passing data to a task not ready from init	None	TCM-S application
1953	**TCM Core App stability when reading/writing to mass memory via SpW improved**	Previously caused application lockup.	None	TCM-S application
1980	**SpW communication no longer stops after packet to invalid logical address**	Previously caused application lockup.	None	OBC-S, TCM-S
2017	**TMTSControl RMAP command reply size changed from 6 to 1**	Previous command reply size was incorrect, and included garbage data.	None	TCM-S application
2018	**VC0 interrupt no longer prints debug output**	Output was not intended for release build.	None	TMC-S application

Ref #	What	Why	Action to be taken by user	Affects
2060	**TM Pseudo Randomizer is now default enabled**	Requirement. In previous release, the TM Pseudo Randomizer was disabled default.	Might affect settings/configuration in ground-station equipment	TCM-S application
2092	**CCSDS detect signals must now be connected for proper operations of CCSDS interface**	Hardware difference.	When using FM boards the UMBI/TRX1/TRX2 detect signals in the pigtail needs to be grounded for correct operation. E. g. if the TRX1 interface is to be used, the detect pin 24 must be grounded (active low)	TCM-S
1548	**MMStatus RMAP command reply size and content corrected**	Previous size and data was incorrect	None	TCM-S application

Changes for 0.9.0

Ref #	What	Why	Action to be taken by user	Affects
1750	**TCM FM UART3 is now connected to XBAND and UART4 to SBAND**	Different hardware implementation between Bread board and FM board	nv_config configuration must be updated to swap UART 3 with UART 4	TCM-S
1774	**The selected telecommand clock, data and enable signals are now forwarded through the mux to the BCH decoder, rejecting data and clock on inactive data paths**	Old implementation did not allow for connecting both the umbilical and radio interface	None	TCM-S
2144	**UART software queue overflow warning has been lowered in severity**	Avoid excessive warnings on debug output	None	TCM-S, OBC-S

Changes for 0.9.1

This release only included updated SoC designs, the BSP was not updated.

Ref #	What	Why	Action to be taken by user	Affects
2250	**System-on-Chip asynchronous FIFO implementation updated**	Previously caused stability issues for high-throughput spacewire and mass memory read/write operations	None	TCM-S, OBC-S

Changes for 0.10.0

Ref #	What	Why	Action to be taken by user	Affects
2103	**Bootrom now correctly utilises all available software images**	Previous bug caused bootrom to skip all remaining images except the last safe image if an error was found	None	TCM-S, OBC-S

Changes for 0.11.0

Ref #	What	Why	Action to be taken by user	Affects
1873	**CCSDS TM performance is greatly improved**	Previous performance did not meet requirements.	PUS packets sent to the TCM-S for storage and subsequent download must follow certain rules. Download RMAP command has an updated API. See RD1 for detailed information.	TCM-S core application
2102	**Removed from RD2 errata**	Root cause has been fixed	None	TCM-S core application
2153	**MM Download is now able to read more data while TM is sending**	Increased downlink performance.	PUS packets sent to the TCM-S for storage and subsequent download must follow certain rules. Download RMAP command has an updated API. See RD1 for detailed information.	TCM-S core application

Ref #	What	Why	Action to be taken by user	Affects
2176	**Time synchronisation support added. SCET time is no longer possible to set directly**	In order to support time synchronization against a time master. Current slave-only configuration for time sync does not allow syncing time without qualified PPS.	Time synchronisation needs PPS input and SCETTime messages, see RD1 for detailed information.	TCM-S core application
2291	**Added to RD2 errata**	Issue has been detected	None	TCM-S core application
2292	**Removed from RD2 errata**	Root cause has been fixed	None	TCM-S core application
2334	**UART RS422/RS485 driver circuits are now enabled for a longer time after a transmission. Erratum has been removed.**	The last bytes of an UART transmission in RS485 mode may get truncated due to premature disabling.	None	TCM-S FM, OBC-S FM
2345	**Download command implementation changed to use 4-byte length (from previous 8).**	Previous implementation did not match API design.	Download commands needs to be changed to use 4-byte length.	TCM-S core application
2361	**Watchdog is now disabled during system image programming**	If the watchdog was enabled there was a risk of failing the flash procedure due to a watchdog reboot	None	TCM-S, OBC-S
2364	**Watchdog is now disabled during NVRAM programming**	If the watchdog was enabled there was a risk of failing the NVRAM update due to a watchdog reboot	None	TCM-S, OBC-S
2365	**Telecommand and telemetry configuration from NVRAM**	Previously many configurations were hard coded in the TCM-S core application, now they are configurable in the NVRAM	Updated NVRAM configuration must be reviewed and flashed onto the TCM-S FM board.	TCM-S core application
2370	**Memory scrubber is now enabled after error manager driver initialization**	Previously the error manager initialization function disabled the memory scrubber.	None	TCM-S, OBC-S

Changes for 0.11.1

This release only included updated BSPs; the SoC designs were not updated.

Ref #	What	Why	Action to be taken by user	Affects

Ref #	What	Why	Action to be taken by user	Affects
2396	**UART driver write synchronisation improved**	Previous implementation could result in undefined behaviour in case of frequent and/or erroneous input traffic in combination with output.	None	TCM-S, OBC-S

Changes for 1.0.0

Ref #	What	Why	Action to be taken by user	Affects
2346	**Mass memory driver now exposes functionality for writing mass memory page spare areas.**	Functionality is needed to allow metadata writing in new TCM core app massmem handler implementation.	None.	TCM-S
1591	**Mass memory handler in TCM core app has been redesigned.**	New implementation handles discovered bad blocks during operation, implements direct and circular mode partitions.	Storage to, download from, and partition configuration of the mass memory on the TCM core app needs to be updated to follow new API and behaviour. See RD1 for detailed information.	TCM-S core application
1763	**Telemetry user interface robustness improved.**	In previous implementation, no check was done if TM was enabled prior to sending which could lead to hanging application.	None	TCM-S core application
2416	**RMAP write reply address handling corrected.**	Previous implementation could cause RMAP reply messages with certain path lengths to be invalid and therefore not sent correctly.	None	TCM-S core application
2471	**Spacewire pass-through traffic is now always propagated.**	Previous implementation blocked pass-through spacewire traffic through the spacewire router unless the spacewire driver was opened by software.	None	TCM-S, OBC-S
2426	**System flash driver has been redesigned.**	Harmonized driver API for system flash with the mass memory flash driver, including better support for application bad block management.	Application code using the system flash driver needs to be updated to follow the new API. See RD1 for detailed information.	TCM-S, OBC-S

Ref #	What	Why	Action to be taken by user	Affects
1788 1589 1816 1839 2143 2288 2294 2382 1889	**Removed from RD2 errata.**	Root causes have been fixed.	None	TCM-S core application
2431 2488 2493 2495	**Added to RD2 errata**	Issue has been detected	See RD2.	TCM-S core application
1529 2295 2383 2343 2363 2398 2406 2408 2409 2411	**Stability of CCSDS telecommands and telemetry handling improved.**	Previous implementation exhibited several stability and consistency problems in various telecommand and telemetry scenarios.	None	TCM-S, TCM-S core application
1447 1543 2356	**Cleanup/corrections of CCSDS driver.**	Removal of duplicate definitions in bare-metal and RTEMS-driver. Adaptions to new RTL.	Application code using the CCSDS driver needs to be updated to follow the new API. See RD1 for detailed information.	TCM-S

Changes for 1.0.1

This release only included an updated TCM-S core application. The SoC designs and the BSPs was not updated.

Ref #	What	Why	Action to be taken by user	Affects
2514	**MMDownloadStatus command is now available.**	Previously this command was unavailable due to an invalid command definition.	None	TCM-S core application
2511	**Ensure download handles telemetry being disabled, or simultaneous reconfiguration.**	Previously, a lockup could be triggered either when download was attempted when telemetry was disabled, or when a reconfiguration was initiated during on-going download.	None	TCM-S core application

Changes for 1.0.2

This release only included an updated TCM-S core application. The SoC designs and the BSPs was not updated.

Ref #	What	Why	Action to be taken by user	Affects
2519	**A workaround has been added in the TCM-S core application which sets the RMAP data CRC byte of received command to zero after it has been checked.**	An issue has been discovered in the CCSDS IP where a 0xF5 idle padding byte after the PUS telemetry packet would cause telemetry inconsistencies and software lockups. This provides a workaround for this issue.	None	TCM-S core application

Changes for 1.1.0

SoC info in this release incorrectly contains the 1.0.0 version number, the SoC info timestamps, 0x5a8ed6ca for OBC, 0x5a9947ea for TCM, may be used instead to uniquely distinguish them.

Ref #	What	Why	Action to be taken by user	Affects
2477	**BSP example code updated.**	Now includes more examples for ÅAC-specific BSP drivers.	None.	TCM-S, OBC-S
2519	**CCSDS telemetry handling of padding bytes improved, workaround from 1.0.2 removed.**	Previous implementation could cause issues when padding bytes (0xF5) appeared at certain locations in telemetry,	None.	TCM-S, TCM-S core application
2510	**Documentation for TMConfig, TMBRControl RMAP reply format updated.**	Previous documentation specified incorrect size for bitrate (was 1 octet, should be 2), and incorrect location for OCF flag.	Make sure reply handling for TMConfig, TMBRControl expects correct format.	TCM-S core application
2553	**Documentation for partition config format updated.**	Previous documentation specified incorrect numeric values for partition types.	Make sure reply handling for MMPartitionConfig RMAP command expects correct format.	TCM-S core application
2521	**Mass memory handling for MMFree commands has been updated.**	Previous implementation caused free operations in unused data which was supposed to do nothing to report failures or potentially mark some previously freed data as used.	None.	TCM-S core application
2520	**Telemetry handling updated.**	Previous implementation could block the MMStopDownloadData reply from being sent, and telemetry reconfiguration from being initiated, if incoming telemetry fully saturated the telemetry handler.	None.	TCM-S core application
2217	**Unlocking write protection of the protected area in the SPI RAM "NVRAM" is now done when the debugger is connected, instead of via an ioctl() call.**	Ensure strict protection during flight.	Adapt non-flight code to avoid issuing unlock memory ioctl() calls.	TCM-S, OBC-S, TCM-S core application
2243	**ADC driver temperature conversion helper functions updated to use 32bit type.**	Previous implementation used a 16bit signed type to store temperature in milli-Celcius, which limited the range to circa -33 to +33 C,	Update code using the ADC driver temperature conversion helper to follow the new API.	TCM-S, OBC_S

Ref #	What	Why	Action to be taken by user	Affects
2243	**HKData RMAP reply format changed.**	Type extension of the ADC temperature value (see above), and reordering to ensure type alignment.	Update replay handling for HKData RMAP commands to expect new format.	TCM-S core application

Changes for 1.2.0

This release did not include any SoC design updates for the OBC.

Ref #	What	Why	Action to be taken by user	Affects
2195	**Software upload support added to core application.**	Allow software update during flight.	None.	TCM-S core application
2195	**Software upload support library added to BSP.**	Facilitate customer integration of software upload.	None	OBC-S
2586	**Software upload example application added to OBC-S BSP.**	Facilitate customer integration of software upload.	None.	OBC-S
1893	**NVRAM RTEMS driver read() and EDAC error reporting API modified.**	Add support for multi-threaded use of NVRAM driver with multiple open file descriptors.	Application code using the NVRAM/SPI RAM driver needs to be updated to follow the new API. See RD1 for detailed information.	TCM-S, OBC-S