

ANT_S212_nrf52810_nrf52832_6.1.1 release notes

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ANT_S212_nrf52810_nrf52832_6.1.1

The ANT_S212_nrf52810_nrf52832_6.1.1 SoftDevice is a production release for the **nRF52810 & nRF52832** platforms.

Notes

- This S212 release has changed the Application Programming Interface (API) and/or memory requirements from the previous S212 production release (ANT_S212_nrf52832_5.0.0). This requires applications to be recompiled.

SoftDevice Properties

- This version of the SoftDevice contains the Master Boot Record (MBR) version 2.4.1 (DRGN-10680). This MBR version is compatible with previous MBR versions.
- The combined MBR and SoftDevice memory requirements for this version is as follows:
 - Flash: **72kB** (0x12000 bytes)
 - RAM: **2.94kB** (0xB80 bytes)
- The Firmware ID of this SoftDevice is 0xBC

New functionality

- **SoftDevice**
 - SoftDevice can now use external low-swing and full-swing low-frequency (32.768kHz) clocks.

Changes

- **SoftDevice**
 - The MBR 2.4.1 is a minor backward compatible configuration update of the MBR for this release. There were no bugs resolved in this update, only minor build configuration option changes (DRGN-10680)

Bug Fixes

- **ANT**
 - Fixed an issue where synchronous channels would be erroneously blocked while running high duty search in a dense environment.
 - Fixed an issue where the ANT stack would stall while running an ANT master channel, ANT high duty search, and BLE activity at the same time.

Limitations

- **SoftDevice**
 - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (FORT-809).
 - Synthesized low frequency clock source is not tested or intended for use with the ANT stack.

- Internal RC oscillator clock source is not tested or intended for use with the ANT stack.
- Applications must not modify the `SEVONPEND` flag in the `SCR` register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.
- Flash write operations may exceed the timeout provided when performed with certain protocol operations (e.g. ANT Continuous Scan).

Known Issues

- **SoftDevice**
 - The MWU protection may become disabled in certain cases if application ISR is interrupted by SoftDevice ISR (DRGN-10361).
 - If the application requests an earliest possible Radio Timeslot and the timeslot is blocked, the SoftDevice will repeat the same request until it times out, thereby blocking the main context and the lower application interrupt priority levels. A workaround is to increase the timeout of the Radio Timeslot request to make it able to fit after the event that is blocking the request (DRGN-10402).

ANT_S212_nrf52832_5.0.0

The ANT_S212_nrf52832_5.0.0 Softdevice is the fourth production release of the S212 for the nRF52 platform.

SoftDevice Properties

- The SoftDevice Specification for the S212 is available on the [ANT website](#)
- This version of the SoftDevice contains the Master Boot Record (MBR) version 2.2.0
 - This version of the MBR is compatible with the previous versions.
- The combined MBR and SoftDevice memory requirements for this version is as follows:
 - Flash: **72kB** (0x12000 bytes)
 - RAM: **2.94kB** (0xB80 bytes)

New functionality

- **SoftDevice**
 - The RC oscillator accuracy can now be set to any of the defined NRF_CLOCK_LF_ACCURACY values, and there is no default anymore. In other words, the nrf_clock_lf_cfg_t::accuracy parameter now has the same functionality when used with the RCOSC clock source as with the XTAL clock source (DRGN-8666).

Changes

- **SoftDevice**
 - It is now possible to set RCOSC accuracy to 500 ppm or 250 ppm when calling sd_softdevice_enable and using nrf_clock_lf_cfg_t::source=NRF_CLOCK_LF_SRC_RC. nrf_clock_lf_cfg_t::xtal_accuracy can be configured to NRF_CLOCK_LF_XTAL_ACCURACY_250_PPM or NRF_CLOCK_LF_XTAL_ACCURACY_500_PPM (DRGN-8838). All other values for xtal_accuracy will default to 500 ppm.
 - Interrupt priority 5 is now available to the application (DRGN-8853).
 - Added definitions for timing constraints that must be taken into account when using the NRF_RADIO_SIGNAL_CALLBACK_ACTION_EXTEND action with the Radio Timeslot API (DRGN-8931).

Bug fixes

- **SoftDevice**
 - Fixed an issue where the SoftDevice might assert in some cases if the application delayed pulling of SoftDevice events (DRGN-8823).
 - Fixed an issue where the SoftDevice could trigger a BusFault when forwarding a HardFault to the application (DRGN-8604).

Limitations

- **SoftDevice**
 - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (FORT-809).
 - Synthesized low frequency clock source is not tested or intended for use with the ANT stack.
 - Internal RC oscillator clock source is not tested or intended for use with the ANT stack.
 - Applications must not modify the SEVONPEND flag in the SCR register when running in priority levels higher than 6 (priority level numerical values lower than 6) as this can lead to undefined behavior.
 - Flash write operations may exceed the timeout provided when performed with certain protocol operations (e.g. ANT Continuous Scan).

Known Issues

- **SoftDevice**
 - When the SoftDevice is enabled the IRQ priorities of SD_EVT_IRQn and RADIO_NOTIFICATION_IRQn (SWI2_IRQn and SWI1_IRQn respectively) are set to a default of 6. This differs from previous versions of the SoftDevice, as well as what is specified in the SoftDevice Specification. It is suggested to explicitly set these priorities in the application after the SoftDevice is enabled.

ANT_S212_nrf52832_4.0.2

The ANT_S212_nrf52832_4.0.2 SoftDevice is the third production release of the S212 for the nRF52 platform.

SoftDevice Properties

- The SoftDevice Specification for the S212 is available on the [ANT website](#)
- This version of the SoftDevice contains the Master Boot Record (MBR) version 2.1.0
 - The changes from the previous version are header file modifications only.
- The combined MBR and SoftDevice memory requirements for this version is as follows:
 - Flash: **72kB** (0x12000 bytes)
 - RAM: **2.56kB** (0xA80 bytes)

New functionality

- **SoftDevice**
 - The SoftDevice now supports sleep clock accuracy values less than 20 ppm as a peripheral (DRGN-8158).
- **ANT**
 - A new API function, `sd_ant_channel_open_with_offset`, has been added to allow the start time of the channel to be configured. When used, the channel will start at a specified offset from the time of the API call instead of a fixed offset relative to existing channels. This can be used to manage spacing between multiple master channels on the same device in use cases where channel diversity is required for high traffic environments.
 - A new API function, `sd_ant_channel_radio_crc_mode_set`, has been added that allows the CRC to be configured to three bytes instead of the default two. This change reduces the reception of invalid packets in noisy environments. This mode is incompatible with existing devices using the default two byte CRC mode.
 - ANT channels can now run at a faster rate. This can also improve performance in some multi-channel use cases.

	V 2.0.1	V 4.0.2
Master Channel	224 Hz	270 Hz
Master Tx Only Channel	442 Hz	1129 Hz

Changes

- **SoftDevice**
 - `SWI3` is no longer reserved for use by the SoftDevice and is available for the application (DRGN-8367).

- The `sd_power_ramon_set()`, `sd_power_ramon_clr()`, and `sd_power_ramon_get()` SoftDevice APIs have been replaced with `sd_power_ram_power_set()`, `sd_power_ram_power_clr()`, and `sd_power_ram_power_get()`, so the application now has access to the registers `RAM[x].POWER` instead of the deprecated `RAMON/RAMONB` (DRGN-8117).
- **ANT**
 - When receiving acknowledged messages, if the previous message has not been handled the ANT stack will no longer acknowledge the message and generate an event message for the application (`EVENT_RX_DATA_OVERFLOW`). Bug fixes
- **SoftDevice**
 - `sd_softdevice_enable()` now returns an error code if called with `fault_handler` set to `NULL` or to an invalid function pointer. If the application returns from the `fault_handler` function, the SoftDevice will do an `NVIC_SystemReset()` (DRGN-7122).
 - It is no longer required to clear `INTENSET` for `TIMER0` before the timeslot ends, if the application uses `TIMER0` inside a timeslot scheduled with the Radio Timeslot API (DRGN-7776).
 - The `SVCALL` macro can now be used with the GCC C++ compiler as well (DRGN-8028).
 - The `sd_power_pof_threshold_set` API has been fixed to support all the new levels that were introduced in nRF52 (DRGN-8348).
- **ANT**
 - Fixed an issue that caused `sd_softdevice_disable` to block for an extended period of time if there were ANT channels running.
 - Fixed an issue that caused a divide by zero fault if the channel period is set to 0. `sd_ant_channel_period_set` will now return an error when called with a channel period of zero.
 - Fixed an issue where an encryption session could be desynchronized if a second encrypted master channel is started on the same device.
 - Fixed an issue where encryption negotiation would complete erroneously if acknowledged messages are sent or received on other channels.
 - Fixed an issue where high duty search could cause an assert in certain scenarios.
 - Fixed an issue where `sd_ant_enable()` could return success if memory size provided was insufficient for the channel configuration in certain scenarios.

Limitations

- **SoftDevice**
 - If Radio Notifications are enabled, flash write and flash erase operations initiated through the SoftDevice API will be notified to the application as Radio Events (FORT-809).
 - Synthesized low frequency clock source is not tested or intended for use with the ANT stack.
 - Internal RC oscillator clock source is not tested or intended for use with the ANT stack.

- Applications must not modify the `SEVONPEND` flag in the `SCR` register when running in priority level 2 or 3 as this can lead to undefined behavior.
- Flash write operations may exceed the timeout provided when performed with certain protocol operations (e.g. ANT Continuous Scan).