Si2183/82/81/80 All versions

Si2169/68 B/C/D

Si2167/66 B/C/D

Si2164/62/60 A4x/B/C

Si21832/822/812/802/692/682 All versions

Si21692/682 B/C/D

Si21672/662 B/C/D

Si21642/622/602 A4x/B/C

Software Release Note

Version V0.3.6.0

January 26, 2022

1 Table of Contents

2 Overview

This document describes the features and errata of the current software release for the Si2183 Digital TV demodulator and its derivatives.

This document should be used as an additional reference in conjunction with the Si2183 Data Sheet, AN620: Si2183 Programming Guide.

For implementation details, refer to the documents provided together with the source code, in the 'DOC' folders.

3 Related Parts and Firmware

Note: when indicated as 'X', the value between quotes is an ASCII character. '0' corresponds to 0x30 = 48d.
For details on the firmware changes, refer to Si2183 FW release history documents in Si2183 FTP folder documentation\SW_related.

Part Number	*Chip Marking*	*PART_INFO data*	*Firmware load method*				
		PART	*ROMID*	*PMAJOR*	*PMINOR*	*BUILD*	
Engineering samples							
Si2160-B4A	*Si2160 4A*	*60*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2162-B4A	*Si2162 4A*	*62*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2164-B4A	*Si2164 4A*	*64*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2168-C4A	*Si2168 4A*	*68*	*0*	*'4'*	*'A'*	*0*	*full download*
patch	*Si2169 4A*	*69*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2180-A4A	*Si2180 4A*	*80*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2181-A4A	*Si2181 4A*	*81*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2182-A4A	*Si2182 4A*	*82*	*0*	*'4'*	*'A'*	*0*	*full download*
Si2183-A4A	*Si2183 4A*	*83*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21642-B4A	*Si21642 4A*	*64*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21692-C4A	*Si21692 4A*	*69*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21682-C4A	*Si21682 4A*	*68*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21802-A4A	*Si21802 4A*	*80*	*0*	*'4'*	*'A'*	*0*	*full download*

Si21812-A4A	*Si21812 4A*	*81*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21822-A4A	*Si21822 4A*	*82*	*0*	*'4'*	*'A'*	*0*	*full download*
Si21832-A4A	*Si21832 4A*	*83*	*0*	*'4'*	*'A'*	*0*	*full download*
Production parts							
Si2160-B50	*Si2160 50*	*60*	*0*	*'5'*	*'0'*	*3*	*patch*
Si2160-B55	*Si2160 55*	*60*	*1*	*'5'*	*'5'*	*1*	*patch*
Si2160-B5A	*Si2160 5A*	*60*	*2*	*'5'*	*'B'*	*0*	*full download*
Si2160-B60	*Si2160 60*	*60*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si2160-B63	*Si2160 63*	*60*	*2*	*'6'*	*'3'*	*'1'*	*patch*
Si2162-B50	*Si2162 50*	*62*	*0*	*'5'*	*'0'*	*3*	*patch*
Si2162-B55	*Si2162 55*	*62*	*1*	*'5'*	*'5'*	*1*	*patch*
Si2162-B5A	*Si2162 5A*	*62*	*2*	*'5'*	*'B'*	*0*	*full download*
Si2162-B60	*Si2162 60*	*62*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si2162-B63	*Si2162 63*	*62*	*2*	*'6'*	*'3'*	*'1'*	*patch*
Si2162-B60	*Si2162 60*	*62*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si2164-B50	*Si2164 50*	*64*	*0*	*'5'*	*'0'*	*3*	*patch*
Si2164-B55	*Si2164 55*	*64*	*1*	*'5'*	*'5'*	*1*	*patch*
Si2164-B5A	*Si2164 5A*	*64*	*2*	*'5'*	*'B'*	*0*	*full download*
Si2164-B60	*Si2164 60*	*64*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si2164-B63	*Si2164 63*	*64*	*2*	*'6'*	*'3'*	*'1'*	*patch*
Si2166-C55	*Si2166 55*	*66*	*0*	*'5'*	*'5'*	*1*	*patch*
Si2167-B25	*Si2167 25*	*67*	*0*	*'2'*	*'5'*	*0*	*patch*
Si2167-C55	*Si2167 55*	*67*	*1*	*'5'*	*'5'*	*1*	*patch*
Si2168-C50	*Si2168 50*	*68*	*0*	*'5'*	*'0'*	*3*	*patch*
Si2168-C55	*Si2168 55*	*68*	*1*	*'5'*	*'5'*	*1*	*patch*
Si2168-C5A	*Si2168 5A*	*68*	*2*	*'5'*	*'B'*	*0*	*full download*

Si2168-C60	Si216860	68	2	'6'	'0'	'2'	patch
Si2168-C63	Si216863	68	2	'6'	'3'	'1'	patch
Si2168-C60	Si216860	68	2	'6'	'0'	'2'	patch
Si2169-C50	Si216950	69	0	'5'	'0'	3	patch
Si2169-C55	Si216955	69	1	'5'	'5'	1	patch
Si2169-C5A	Si21695A	69	2	'5'	'B'	0	full download
Si2169-C60	Si216960	69	2	'6'	'0'	'2'	patch
Si2169-C63	Si216963	69	2	'6'	'3'	'1'	patch
Si2169-C60	Si216960	69	2	'6'	'0'	'2'	patch
Si2180-A50	Si218050	80	0	'5'	'0'	3	patch
Si2180-A55	Si218055	80	1	'5'	'5'	1	patch
Si2180-B5A	Si21805A	80	2	'5'	'B'	0	full download
Si2180-B60	Si218060	80	2	'6'	'0'	'2'	patch
Si2181-A50	Si218150	81	0	'5'	'0'	3	patch
Si2181-A55	Si218155	81	1	'5'	'5'	1	patch
Si2181-B5A	Si21815A	81	2	'5'	'B'	0	full download
Si2181-B60	Si218160	81	2	'6'	'0'	'2'	patch
Si2182-A50	Si218250	82	0	'5'	'0'	3	patch
Si2182-A55	Si218255	82	1	'5'	'5'	1	patch
Si2182-B5A	Si21825A	82	2	'5'	'B'	0	full download
Si2182-B60	Si218260	82	2	'6'	'0'	'2'	patch
Si2183-A50	Si218350	83	0	'5'	'0'	3	patch
Si2183-A55	Si218355	83	1	'5'	'5'	1	patch
Si2183-B5A	Si21835A	83	2	'5'	'B'	0	full download
Si2183-B60	Si218360	83	2	'6'	'0'	'2'	patch

Si21602-B50	Si2160250	60	0	'5'	'0'	3	patch
Si21602-B55	Si2160255	60	1	'5'	'5'	1	patch
Si21602-C5A	Si216025A	60	2	'5'	'B'	0	full download
Si21602-C60	Si216026 0	60	2	'6'	'0'	'2'	patch
Si21602-C63	Si216026 3	60	2	'6'	'3'	'1'	patch
Si21622-B50	Si2162250	62	0	'5'	'0'	3	patch
Si21622-B55	Si2162255	62	1	'5'	'5'	1	patch
Si21622-C5A	Si216225A	62	2	'5'	'B'	0	full download
Si21622-C60	Si216226 0	62	2	'6'	'0'	'2'	patch
Si21622-C63	Si216226 3	62	2	'6'	'3'	'1'	patch
Si21642-B50	Si2164250	64	0	'5'	'0'	3	patch
Si21642-B55	Si2164255	64	1	'5'	'5'	1	patch
Si21642-C5A	Si216425A	64	2	'5'	'B'	0	full download
Si21642-C60	Si216426 0	64	2	'6'	'0'	'2'	patch
Si21642-C63	Si216426 3	64	2	'6'	'3'	'1'	patch
Si21652-B22	Si2165222	65	0	'2'	'2'	1	patch
Si21682-C50	Si2168250	68	0	'5'	'0'	3	patch
Si21682-C55	Si2168255	68	1	'5'	'5'	1	patch
Si21682-D5A	Si216825A	68	2	'5'	'B'	0	full download
Si21682-D60	Si216826 0	68	2	'6'	'0'	'2'	patch
Si21682-D63	Si216826 3	68	2	'6'	'3'	'1'	patch
Si21692-C50	Si2169240	69	0	'5'	'0'	3	patch
Si21692-C55	Si2169255	69	1	'5'	'5'	1	patch
Si21692-D5A	Si216925A	69	2	'5'	'B'	0	full download
Si21692-D60	Si216926 0	69	2	'6'	'0'	'2'	patch

Si21692-D63	*Si21692 63*	*69*	*2*	*'6'*	*'3'*	*'1'*	*patch*
Si21802-A50	*Si21802 50*	*80*	*0*	*'5'*	*'0'*	*3*	*patch*
Si21802-A55	*Si21802 55*	*80*	*1*	*'5'*	*'5'*	*1*	*patch*
Si21802-B5A	*Si21802 5A*	*80*	*2*	*'5'*	*'B'*	*0*	*full download*
Si21802-B60	*Si21802 60*	*80*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si21812-A50	*Si21812 50*	*81*	*0*	*'5'*	*'0'*	*3*	*patch*
Si21812-A55	*Si21812 55*	*81*	*1*	*'5'*	*'5'*	*1*	*patch*
Si21812-B5A	*Si21812 5A*	*81*	*2*	*'5'*	*'B'*	*0*	*full download*
Si21812-B60	*Si21812 60*	*81*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si21822-A50	*Si21822 50*	*82*	*0*	*'5'*	*'0'*	*3*	*patch*
Si21822-A55	*Si21822 55*	*82*	*1*	*'5'*	*'5'*	*1*	*patch*
Si21822-B5A	*Si21822 5A*	*82*	*2*	*'5'*	*'B'*	*0*	*full download*
Si21822-B60	*Si21822 60*	*82*	*2*	*'6'*	*'0'*	*'2'*	*patch*
Si21832-A50	*Si21832 50*	*83*	*0*	*'5'*	*'0'*	*3*	*patch*
Si21832-A55	*Si21832 55*	*83*	*1*	*'5'*	*'5'*	*1*	*patch*
Si21832-B5A	*Si21832 5A*	*83*	*2*	*'5'*	*'B'*	*0*	*full download*
Si21832-B60	*Si21832 60*	*83*	*2*	*'6'*	*'0'*	*'2'*	*patch*

Note: The "B" denotes product Revision B and "50" denotes NVM firmware revision 5.0.

4 Related Skyworks API L3 Wrapper code

The Si2183 V0.3.6.0 software delivery is provided with Skyworks API L3 Wrapper code V2.8.0. It also requires updating to Silabs_TER_Tuner V0.6.6 and above if used for ISDB-T.

5 Software

5.1 *Description*

This software release is intended for products featuring DVB-T/T2/T2Lite/C/C2/ S/S2/S2X, MCNS/DSS DTV/ISDB-T reception modes.
The features and errata of the V0.3.6.0 software are indicated in the sections below.

5.2 *Features*

- DTV frontend – terrestrial/cable/satellite
  - DVB-T
  - DVB-T2
  - DVB-T2Lite
  - DVB-C
  - DVB-C2
  - MCNS (DVB-C Annex B/ ITUJ83-B)
  - DVB-S/S2/S2X
  - DSS
  - ISDB-T

5.3 *Change Log*

5.3.1 As from V0.3.6.0 (2022/01/26)

<firmware> With FW 6_0b17 on x60 parts

5.3.2 As from V0.3.5.1 (2018/09/06)

<correction>[flags] Re-adding 'endif DEMOD_DVB-T2 ' following Si2183_TerAutoDetectOff (mistakenly removed as from v0.3.1.0). No big impact, but this created an inconsistent naming in 'define/endif' sequence, and entire removal of SILABS_API_TEST_PIPE was not possible anymore.

5.3.3 As from V0.3.5.0 (2018/08/07)

<Wrapper> Wrapper V2.8.0
<improvement>[traces] Adding explicit ISDB-T code in Si2183_L2_Tune.
Requires SiLabs_TER_Tuner V0.6.6 (with definition of L1_RF_TER_TUNER_MODULATION_ISDBT)
NB: As stated in SiLabs_TER_Tuner V0.6.6 change log, this is more a cosmetic change, to support ISDB-T in a nicer way.

5.3.4 As from V0.3.4.0 (2018/06/22)

<Wrapper> Wrapper V2.8.0
<improvement>[SCAN/Traces]
In Si2183_L2_SW_Init: activating trylock traces during blindscan (this has no effect unless ALLOW_Si2183_BLINDSCAN_DEBUG is active).
<improvement>[SCAN/Abort]
In Si2183_L2_Channel_Seek_Abort: Calling Si2183_L1_SCAN_CTRL to end a potential scan.
<improvement>[traces] Moving ddRestartTime in L2 context, to keep track of its value.
<improvement>[SILENT] In Si2183_L2_SILENT: calling Si2183_Configure to make sure GPIOs are set back to active states.

5.3.5 As from V0.3.3.1 (2018/03/21)

Documentation change only: Adding path to FW release note on FTP folder in the current document, instead of the previous naming which only referred to Si2183.

5.3.6 As from V0.3.3.1 (2018/01/05)

<new_feature><DVB_S2/GSE> Adding GSE_LITE value in possible DVBS2_STATUS.STREAM_TYPE values.

5.3.7 As from V0.3.3.0 (2018/01/04)

<improvement>[TERACOM/BER] In Si2183_storeUserProperties: Setting BER depth 10e-7.
This is not required anymore to pass Nordig (i.e. Teracom)/DBook tests due to test specification changes
<Wrapper> Wrapper V2.7.9
<firmware> With FW 6_0b11 on x60 parts
<firmware> With FW 5_5b14 on x55 parts
<firmware> With FW 5_0b17 on x50 parts
<correction>[DVB-T2/debug]
In Si2183_L2_lock_to_carrier: only checking DVB-T2 misc infos if _DVB_T2_SIGNALLING_H_ is declared (only possible with SiLabs_DVB_T2_Signalling.c/SiLabs_DVB_T2_Signalling.h files added to the project).

<correction>[SAT/UnicableII]
In Si2183_L2_Channel_Seek_Init: using front_end->unicable_mode to set the BW value in Unicable.
<improvement>[Si2183_B63_COMPATIBLE]
Adding missing comment around CHANNEL_BONDING tag, to avoid compilation error.
<improvement>[I2C/Pass-Through]
In Si2183_Configure: Setting scl_mast_slr register to avoid reduction of Thd_dat from HOST to MAST.
<compatibility>[compiler/warnings]
In Si2183_LoadFirmwareSPI_Split: i defined as unsigned int.
<compatibility>[compiler/warnings]
In Si2183_DVB_C_max_lock_ms: afc_khz defined as signed int to allow comparison with symbol_rate_baud.
<compatibility>[compiler/warnings]
In Si2183_L2_Set_Index_and_Tag: tag defined as const char*.
<compatibility>[compiler/warnings]
In Si2183_L2_Test: target, cmd and sub_cmd declared as const char*.
<compatibility>[TestPipe/chip_detect]
In Si2183_L2_Test: Now returning '83A' for Si2167D parts (only used for macro selection).

5.3.8 As from V0.3.2.0 (2017/03/06)

<Wrapper> Wrapper V2.7.8
<firmware> With FW 6_0b11 on x60 parts
<firmware> With FW 5_5b14 on x55 parts
<firmware> With FW 5_0b17 on x50 parts
<correction>[DVB-T2/debug] In Si2183_L2_lock_to_carrier: only checking DVB-T2 misc infos if _DVB_T2_SIGNALLING_H_ is declared (only possible with SiLabs_DVB_T2_Signalling.c/SiLabs_DVB_T2_Signalling.h files added to the project).
<correction>[SAT/UnicableII]
Adding unicable_mode member in Si2183_L2_Context to allow dynamic selection of the SAT scan bandwidth in Unicable II
In Si2183_L2_Channel_Seek_Init: using front_end->unicable_mode to set the BW value in Unicable
<improvement>[Si2183_B63_COMPATIBLE] Adding missing comment around CHANNEL_BONDING tag, to avoid compilation error.
<improvement>[I2C/Pass-Through] In Si2183_Configure: Setting scl_mast_slr register to avoid reduction of Thd_dat from HOST to MAST.
<compatibility>[compiler/warnings] In Si2183_LoadFirmwareSPI_Split: i defined as unsigned int.
<compatibility>[compiler/warnings] In Si2183_DVB_C_max_lock_ms: afc_khz defined as signed int to allow comparison with symbol_rate_baud.
<compatibility>[compiler/warnings] In Si2183_L2_Set_Index_and_Tag: tag defined as const char*.
<compatibility>[compiler/warnings] In Si2183_L2_Test: target, cmd and sub_cmd declared as const char*.
<compatibility>[TestPipe/chip_detect] In Si2183_L2_Test: Now returning '83A' for Si2167D parts (only used for macro selection).

5.3.9 As from V0.3.1.0 (2017/01/16)

<firmware> With FW 6_0b9 on x60 parts when CHANNEL_BONDING is NOT required
<Wrapper> Wrapper V2.7.7
<improvement>[init/AGC]
Forcing the use of AGC2 internal loop for TER and AGC1 internal loop for SAT

In Si2183_L2_TER_AGC: Forcing TER AGC settings in agc2 internal loop
In Si2183_L2_SAT_AGC: Forcing SAT AGC settings in agc1 internal loop
<improvement>[debug/registers]
Updating register codes to match Si2183 to allow using Si2183_L2_Health_Check
<improvement>[DVB-T/No_T2]
In Si2183_prepare_DD_MODE: calling Si2183_TerAutoDetect to force front_end->auto_detect_TER if the part doesn't support T2.
This is only useful when building code with DEMOD_DVB_T2 to be compatible with parts supporting T2 and parts not supporting T2.
<improvement>[DVB-C/blindscan]
Introducing Si2183_DVBC_MAX_SCAN_TIME to handle difficult DVVB-C blindscan cases where the analyzis time is higher than the DVB-C lock time
<new_feature>[DVB-T2/MPLP]
In Si2183_L2_lock_to_carrier: tracing the PLP values in case the signal is DVB-T2/MPLP (only if SiTRACES are defined). This can be useful to check the MPLP implementation in the application layer.
<correction>[Lock_abort/Handshake]
Corrected front_end->lockAbort management in Si2183_L2_lock_to_carrier and Si2183_L2_Channel_Lock_Abort (disabled is front_end->lockAbort is set to 0).
Now only setting front_end->lockAbort to 0 before leaving when front_end->lockAbort = 1.
This only had an impact on applications calling SiLabs_API_Channel_Seek_Abort while in handshake mode with front_end->handshakePeriod_ms lower than 500 ms (the amount of time needed to detect a 'never_lock' situation).
<new_feature>[test/property]
In Si2183_L2_Test: Adding a 'setProperty' option to allow setting any property.

5.3.10 As from V0.3.0.0 (2016/09/27)

<firmware> With FW 6_0b7 on x60 parts when CHANNEL_BONDING is NOT required
<improvement>[minor/unused] now using
#define Si2183_DD_TS_PINS_CMD_MASTER_FREQ_MAX 4294967295
This is only changed by principle, since it's not used anymore (was -1 before)
<compatibility>[compiler/warning]
Si2183_TRACE_COMMAND_REPLY now using (const char*)" " for the separator.
<compatibility>[compiler/warnings]
Removing test on DD_TS_PINS MASTER_FREQ (can't overload, since it's a 32 bit).
<improvement>[debug/reply]
In Si2183_pollForResponse: tracing the proper debug text
<compatibility>[compiler/warnings]
In Si2183_plot: modified traces for long int

5.3.11 As from V0.2.9.0 (2016/08/23)

<Wrapper> Wrapper V2.7.4
<new_feature>[TS/Duals/Channel_Bonding]
For Duals, CHANNEL_BONDING is now possible. It requires Wrapper V2.7.4 code with the channel bonding code and the definition of CHANNEL_BONDING in compilation flags
<firmware> With FW 6_3b3 on '80' x60 parts
<firmware> With FW 6_4b3 on x63 parts when CHANNEL_BONDING is required
<firmware> With FW 6_3b3 on x63 parts when CHANNEL_BONDING is NOT required
<firmware> With FW 6_2b2 on x60 parts when CHANNEL_BONDING is required
<firmware> With FW 6_0b6 on x60 parts when CHANNEL_BONDING is NOT required

<correction>[Si2180_B60_COMPATIBLE/ISDB-T/FW] In Si2183_PowerUpWithPatch: Correcting part_info.chiprev test for x80 parts (these are 'B' parts)
<improvement>[standard_switch]
Adding Si2183_prepare_DD_MODE to set dd_mode.auto_detect and dd_mode.modulation based on the requested standard
In Si2183_L2_switch_to_standard: Using Si2183_prepare_DD_MODE to set dd_mode.auto_detect and dd_mode.modulation
NB: This is because some customers use to call Si2183_L2_switch_to_standard without doing a lock. In this situation the demod could be inadvertently set in non-auto mode. With the changes the auto lock mode is preserved.
NB: Applications using a normal switch/lock sequence don't require these changes (which don't change their behavior when applied).
<improvement>[compatibility] In Si2183_plot: minor cosmetic changes to avoid compiler warnings with some compilers.

5.3.12 As from V0.2.8.0 (2016/06/30)

<improvement>[DVB-C2/AFC]
Changing DVB-C2 AFC range to 100 kHz, to reflect the fact that DVB-C2 has very small AFC offset once tuned (DVB-C2 is a 2-step process)
prop->dvbc2_afc_range.range_khz = 100; (default 550)
<improvement>[ISDB-T/Lock_time]
In Si2183_storeUserProperties:
prop->isdbt_mode.dl_config =
Si2183_ISDBT_MODE_PROP_DL_CONFIG_B_AND_C_LOCKED;
This is to optimize lock time in countries such as Brazil or Japan.
<new_Part>[x63]
In Si2183_PowerUpWithPatch: Adding compatibility with x63 parts.
<firmware> With FW 6_3b1 on x63 parts
<firmware> With FW 5_5b13 on x55 parts
<correction>[MCNS/lock/bw]
In Si2183_L2_lock_to_carrier: setting MCNS bw as ter_bandwidth_hz/1000000 (previously hardcoded as 8)
<correction>[DVB-T2/FEF]
In Si2183_Configure: Correcting the FEF pin settings when NOT in DVB-T2 (when MPs are in 'default' mode).
(This didn't generate issues because generally the FEF pin is also disabled when not in DVB-T).
<correction>[SAT/DiSEqC_read]
In Si2183_L2_read_diseqc_reply: Correcting the test to read DiSEqC bytes.
<improvement>[ISDB-T/test]
In Si2183_Configure: removing ISDB-T property settings (used for testing). (No effect on other standards).
<improvement>[Traces/setup]
In Si2183_Configure: Tracing the function name when tracing the media.
<improvement>[traces/blindscan]
In Si2183_L2_SW_Init: setting front_end->misc_infos = 0x00000000;
This value can be modified when scan debugging is required.
<improvement>[DVB-T2/TestPipe]
In testcode used with SiLabs_DVB_T2_Signalling.h:
Adding Si2164 and Si2167B register definitions to stay compatible with Si2183_READ/Si2183_WERITE macros (now compatible with legacy parts)
Using SiTRACE_X instead of SiTRACE whenever required to avoid compilation errors due to tag and level tracing.

5.3.13 As from V0.2.7.0 (2016/04/18)

<firmware> Correction in tags for x5B parts FW loading
<firmware> With FW 6_0b5 on X60 parts
<firmware> With FW 5_0b16 on X50 parts
<improvement>[Blindscan/traces/spectrum]
In Si2183_plot: adapted for better compatibility with various compilers. Not using floats anymore.
In Si2183_L2_Channel_Seek_Next: adding traces to help possible blindscan issues on difficult channels.
<compatibility>[x55/DVB-S2/MIS]
In Si2183_PowerUpWithPatch: setting MIS_capability field for x55 parts
<new_feature>[Debug/Spectrum/FFT]
Adding FFT tracing capability. This can be useful to avoid using a spectrum analyzer to get a view of the channel spectrum.
NB: This is only active if Si2183_FFT_CAPABILITY is defined.
<improvement>[Non_Duals]
In Si2183_downloadDDProperties: testing part_info.pmajor to avoid sending SEC_TS properties in parts not supporting this property.
<New_feature>[ISDB-T/]
Adding isdbt_mode.tradeoff field to allow a mode with KEEP_PACKET_ORDER.
<improvement>[TS/TS_freq]
dd_ts_freq_max.req_freq_max_10khz is now 14600.
<new_feature>[Debug/Spectrum/FFT]
Adding FFT tracing capability. This can be useful to avoid using a spectrum analyzer to get a view of the channel spectrum.
NB: This is only active if Si2183_FFT_CAPABILITY is defined.
<improvement>[Blindscan/SAT/Turksat] Due to low SR closely spaced channels present on Turksat it may happen that some chunks take more than 60s. To cope with this, the SAT blindscan timeout (only used in case the FW crhashes, which is not supposed to happen) is increased:
#define Si2183_SAT_MAX_SEARCH_TIME 120000
NB: This has no impact on the scan duration. It allows the Turksat channels to be detected as expected.
<improvement>[Debug/Spectrum/Traces].
Adding front_end->misc_infos in Si2183_L2_Context to pass various parameters from L3.
This will contain:

- misc_infos[7: 0] : LNB control voltage value
- misc_infos[11: 8] : LNB control tone value
- misc_infos[15:12] : Trigger FFT when Si2183_L2_Tune is called
- misc_infos[19:16] : Trace blindscan spectrum
- misc_infos[23:20] : Trace blindscan trylocks

In Si2183_L2_Tune:
If (front_end->misc_infos & 0x00001000) Trigger FFT tracing.
In Si2183_L2_Channel_Seek_Next:
Adding current frequency and front_end->misc_infos to blindscan traces.
This will allow identifying the SAT quadrant currently scanned, for instance.
If (front_end->misc_infos & 0x00010000) Trigger Spectrum tracing.
If (front_end->misc_infos & 0x00100000) Trigger Trylock tracing.
Using front_end->cumulativeScanTime to store time spent in Si2183_L2_Channel_Seek_Next (as already done for 'non-blind' scan).

5.3.14 As from V0.2.6.0 (2016/02/03)

<Wrapper> Wrapper V2.7.1

<firmware> With FW 6_0b3 on X60 parts, to avoid potential DVB-S blindscan misses if checking fec_lock (regression in FW as from 6_0b).
<firmware> With FW 5_5b11 on X55 parts, to avoid potential DVB-S blindscan misses if checking fec_lock (regression in FW as from 5_5b6).
<correction>[DVB-S/blindscan/fec_lock] Correction done in FW.
Background info on the regression: To avoid rare false DVB-S lock on LTE signals, and additional level of lock checking has been implemented.
The check consists in making sure that at least one valid TS packet has been received (when locked in DVB-S).
If this is not the case, fec_lock is reported as '0' while demod_lock is '1'.
This is OK for 'lock_to_carrier' but not for DVB-S blindscan.
The new FWs correct this, coming back to the previous behavior during SAT blindscan.
NB: This has an effect on the application only under the following conditions:
SAT blindscan
Locked on DVB-S following a call to 'SeekNext' --> 'SeekNext' returns 1.
The application is calling the status function and then checking status->fec_lock before accepting the channel.
No issue for applications relying on the return value of 'SeekNext'.
No issue for applications performing a 'lock_to_carrier' once a carrier has been detected using 'SeekNext'.
<compatibility>[compilation/FW_load] Adding tests on 'legacy' flags for FW loading.
Previous versions required at least one Si2183 or Si2180 flag to be defined.

5.3.15 As from V0.2.5.0 (2016/01/13)

<wrapper> Wrapper V2.7.0
<firmware> With FW 6_0b2 in SPI mode on X60 parts
<New_feature>[Config/DriveTS] In Si2183_storeUserProperties, TS property drive default values are commented. Default values are set in Si2183_L1_API_Init and can be controlled using SiLabs_API_TS_Strength_Shape.
<improvement>[DVB-C/lock_timeout] In Si2183_DVB_C_max_lock_ms: Changes to avoid value overflow when afc_freq above 192 kHz, while still using no floats.

5.3.16 As from V0.2.4.0 (2015/12/03)

<wrapper> Wrapper V2.6.7
<New_feature>[Config/TS] In Si2183_L1_API_Init: setting TS property default values, such that they can be controlled using SiLabs_API_TS_Config and not get overwritten when calling Si2183_storeUserProperties.
In Si2183_storeUserProperties, TS property default values are commented.
Default values are set in Si2183_L1_API_Init and can be controlled using SiLabs_API_TS_Config.

5.3.17 As from V0.2.3.0 (2015/11/27)

<wrapper> Wrapper V2.6.7
<firmware> With FW 6_0b2 on X60 parts.
<new_feature>[init/force_full_init] Adding new defines to be used in the force-full_init value (instead of using only 0 or 1).
<new_feature>[init/force_full_init]
In Si2183_L2_switch_to_standard: using new defines for force_full_init (instead of using only 0 or 1). This is useful to allow setting up the entire frontend in any mode using a single call to Si2183_L2_switch_to_standard.

```
#define Si2183_SKIP_DEMOD_INIT      0x02 (useful if demod already initialized using broadcast_i2c)
#define Si2183_FORCE_TER_TUNER_INIT 0x04 (useful to initialize the TER tuner while the final standard is
SLEEP or a SAT standard)
#define Si2183_FORCE_SAT_TUNER_INIT 0x08 (useful to initialize the SAT tuner while the final standard is
SLEEP or a TER standard)
#define Si2183_FORCE_DEMOD_INIT     0x10 (useful to initialize the TER tuner while the final standard is
SLEEP)
#define Si2183_USE_TER_CLOCK        0x20 (useful with Si2183_FORCE_DEMOD_INIT if using the TER clock)
#define Si2183_USE_SAT_CLOCK        0x40 (useful with Si2183_FORCE_DEMOD_INIT if using the SAT clock)
```

Most changes are only done if force_full_init > 1 (i.e. the new flags are used).
Other changes consist in only sending tuner commands when tuners are active, to cope with the new features.

Use cases:

Normal call with no init:

```
SiLabs_API_switch_to_standard  (fe[0], standard, 0 );
```

Normal call with init forced (parts actually initialized depend on standard):

SiLabs_API_switch_to_standard (fe[0], standard, 1);

New: Only going through the demodulator init then putting it in SLEEP mode, assuming that the TER clock is already on:

```
SiLabs_API_switch_to_standard  (fe[0], SILABS_SLEEP, Si2183_FORCE_DEMOD_INIT | Si2183_USE_TER_CLOCK );
```

New: Dual front_end init using Broadcast_i2c, then putting both frontends in SLEEP after initializing all parts:

```
    SiLabs_API_Demods_Broadcast_I2C(fes, 2 );
    SiLabs_API_switch_to_standard  (fe[0], SILABS_SLEEP, Si2183_SKIP_DEMOD_INIT |
Si2183_FORCE_SAT_TUNER_INIT | Si2183_FORCE_TER_TUNER_INIT );
    SiLabs_API_switch_to_standard  (fe[1], SILABS_SLEEP, Si2183_SKIP_DEMOD_INIT |
Si2183_FORCE_SAT_TUNER_INIT | Si2183_FORCE_TER_TUNER_INIT );
```

<improvement>[traces]
In Si2183_standardName: now also returning a string for ANALOG.
In Si2183_Media: tracing the value of standard when it's unknown.
In Si2183_L2_switch_to_standard: tracing the state of all parts when complete.
<improvement>[dual/triple/quad/broadcast_i2c]
In Si2183_L1_POWER_UP: only check CTS after POWER_UP / RESET. This is because after FW download using broadcast_I2C the response will not be 0x80.

5.3.18 As from V0.2.2.0 (2015/11/19)

<wrapper> Wrapper V2.6.6
<correction>[dual/triple/quad/broadcast_I2c] In Si2183_PowerUpUsingBroadcastI2C: Only loading FW in broadcast_I2C mode. StartFirmware now done in normal mode.
<improvements>[traces/dual/triple/quad/broadcast_I2c] In Si2183_PowerUpWithPatch: tracing which parts of the function are skipped when using broadcast_I2C to load FW in several parts at once.
<improvement>[spectrum/plot] In Si2183_plot: Correcting frequency values displayed in Unicable
<improvement>[traces/blindscan] In Si2183_L2_Channel_Seek_Next: Tracing symbol rate value when locked
<improvement>[traces/duals/die] In Si2183_Configure: also tracing the die value (used to identify duals). Mainly useful when using duals.
<compatibility>[Testpipe/IQ] Making Si2183_L2_Get_Constellation_IQ compatible with all API-controlled parts.
<comments>[debug bytes] In Si2183_pollForResponse, adding comments related to debug bytes meaning when ERR is raised.

This can help understand the reason for the error.
For instance, '0x10' means 'BAD_COMMAND' and will happen when issuing a SAT command while in TER or when issuing a command not supported by the part.

5.3.19 As from V0.2.1.0 (2015/11/06)

<wrapper> Wrapper V2.6.5
<new_feature>[DUALS/TS_Bonding] Upgrading Si2183_L1_DD_TS_PINS to allow channel bonding
<traces>[ISDB-T] Si2183_L1_GetCommandResponseString: tracing isdbt_status.emergency_flag

5.3.20 As from V0.2.0.0 (2015/10/12)

<wrapper> Wrapper V2.6.4
<improvement>[Dual/robustness] In Si2183_L2_switch_to_standard: making sure the i2c pass through is disabled before returning. This helps when there are execution errors accessing the TER or SAT tuner (this should not happen, but may occur during development).
This is to prevent the i2c bus from being stalled in a dual/triple/quad) situation where both pass through should never be enabled simultaneously.
NB: Using dedicated INDIRECT_I2C _CONNECTION settings the application can avoid this situation (the recommendation is to use a single pass through).

5.3.21 As from V0.1.9.0 (2015/10/06)

<wrapper> Wrapper V2.6.3
<testpipe>[DVB-C2/EWS] In Si2183_L2_Test: adding capability to retrieve the DVB-C2 EWS bit information.
<improvement>[Traces] In Si2183_PowerUpUsingBroadcastI2C: using SiTRACE_X since the function uses several demods.
<improvement>[traces/SET_PROPERTY] In Si2183_L1_SET_PROPERTY: tracing prop and data values on a single line, to reduce the amount of trace lines.

5.3.22 As from V0.1.8.0 (2015/09/21)

<wrapper> Wrapper V2.6.2
<firmware> With FW 6_0b1 on X60 parts, with proper GET_REV return values.
<improvement>[FW/updating]
Setting a generic FW name for each part's FW while '#including' the FW file.
In Si2183_PowerUpWithPatch:
Hardcoding PMAJOR/PMINOR/PBUILD values used to check against PART_INFO values before loading FW. This removes the need to have these values set in FW files.
Computing nb of lines to load based on the generic FW name.
All these changes remove the need to change Si2183_PowerUpWithPatch when updating the FW.
<improvement>[DVB-C/timeout] In Si2183_DVB_C_max_lock_ms: changing swt formula to better match legacy devices. Changing default swt_coef to 14 (previously 13) and offset back to 100.

5.3.23 As from V0.1.7.0 (2015/08/14)

<wrapper> Wrapper V2.6.2
<firmware> With FW 6_0b1 on X60 parts
<firmware> With FW 5_Bb5 on X5A parts
<firmware> With FW 5_5b7 on X55 parts
<improvement>[power_consumption/Tuner_standby] In Si2183_L2_switch_to_standard: on first init, setting the SAT tuner and TER tuner to STANDBY when they are only used as clock sources, to save power. This is done only if SAT_TUNER_STANDBY_WITH_CLOCK and

TER_TUNER_STANDBY_WITH_CLOCK are defined, because all tuners may not have the capability to continue driving a clock while in standby.
<improvement>[DVB-C/timeout] In Si2183_DVB_C_max_lock_ms: changing swt formula to avoid overflows. Changing default swt_coef to 13 (previously 11).
<improvement>[DVB_T2/MPLP/Seek] In Si2183_L2_Channel_Seek_Next: calling Si2183_L1_DVBT2_PLP_SELECT to set the PLP selection mode to 'auto'.
The previous version required this to be done at MW level during a DVB-T2 scan with multiple PLPs.
<compatibility>[Xtal/Cap/SUPERSET]
In Si2183_L2_SW_Init: setting default value of start_clk.tune_cap. It can be overwritten later on by calling SiLabs_API_XTAL_Capacitance if different values need to be used for different platforms (i.e. when using Xtals with different internal capacitance).
In Si2183_WAKEUP: only forcing start_clk.tune_cap when not driving a xtal. Otherwise, use the value set in Si2183_L2_SW_Init and possibly overwritten by a call to SiLabs_API_XTAL_Capacitance.

5.3.24 As from V0.1.6.0 (2015/07/02)

<wrapper> Wrapper V2.6.1
<improvement>[DVB-T/T2/ISDB-T/never lock] In Si2183_L2_lock_to_carrier: checking rsqstat_bit5 instead of rsqint_bit5
rsqstat_nit5 is the 'never lock' flag for DVB-T/T2 and ISDB-T.
This flag is raised:
- In DVB-T when correlation with TPS cannot be achieved
- In DVB-T2 when P1 symbol is not detected
- In auto_T_T2 when neither P1 nor TPS are detected.
- In ISDB-T when TMCC correlation cannot be achieved.
rsqint_bit5 signals the transition from 0 to 1 of rsqstat_bit5, and is cleared using 'INTACK_CLEAR'.
While checking rsqint_bit5 with 'INTACK_CLEAR' the transition can be cleared inadvertently if it occurs during the execution of DD_STATUS (rate around 4%). In this case, Si2183_L2_lock_to_carrier would return 0 (i.e 'not locked') after the timeout instead of on rsqatat_bit5 (i.e. 'never lock') rising. No big impact on the application, but may help reduce scan time for customers using 'lock_to_carrier' instead of 'Seek_Init/Seek_Next' for T/T2/ISDB-T installation.
<compatibility>[SILABS_SUPERSET/TER/SAT]
Replacing tags in Si2183_L1_SendCommand2 and Si2183_L1_GetCommandResponseString to allow compiling for TER-only or SAT-only
Replacing tags in several functions to allow compiling for TER-only or SAT-only
Si2183_storeUserProperties
Si2183_downloadSCANProperties
Si2183_PackProperty
Si2183_UnpackProperty
Si2183_L1_GetCommandResponseString
Si2183_storePropertiesDefaults
Si2183_L1_PropertyText
Si2183_Configure
Si2183_L2_SW_Init
Si2183_L2_Set_Index_and_Tag
Si2183_L2_HW_Connect
<compatibility>[SILABS_SUPERSET/NO_TER] Removing AGC2 trace in Si2183_L2_Channel_Seek_Next because it uses the TER agc

5.3.25 As from V0.1.5.0 (2015/06/15)

<wrapper> Wrapper V2.6.0
<firmware> With FW 5_Bb3 on X5A parts
<improvement>[DVB-C2/Seek]
In Si2183_L2_Channel_Seek_Next:
DD_RESTART following DVBC2_CTRL/ACTION_START, to completely restart the lock for each new freq.
Waiting 2 ms to have dvbc2_ctrl.tuned_rf_freq processed by the part before DD_RESTART.
<improvement>[SILABS_SUPERSET/Standards]
Replacing 'DEMOD_xyz' by either 'TERRESTRIAL_FRONT_END' or 'SATELLITE_FRONT_END' to better allow standard-by-standard compilation when using SILABS_SUPERSET.
In Si2183_L2_switch_to_standard: Regrouping TER and SAT flags to limit the number of '#ifdef' lines. Some 'case' blocks can also be re-written for better readability, considering that all 'modulation' values are defined even when not compiling with all standards, and this doesn't impact the code size a lot.

5.3.26 As from V0.1.4.0 (2015/06/04)

<wrapper> Wrapper V2.5.9
<new_feature>[DVB-S2/Gold_Sequences] Adding Si2183_L1_DVBS2_PLS_INIT to allow locking on all Gold Sequences in DVB-S2.
NB: Not compiled by default.
Called with:
pls_detection_mode = Si2183_DVBS2_PLS_INIT_CMD_PLS_DETECTION_MODE_MANUAL
pls = x_init value returned by the SiLabs_API_SAT_Gold_Sequence_Init function implemented at wrapper level.
<correction>[Typo/DVB-C2]
In Si2183_L2_Channel_Seek_Next: Correcting calls to Si2183_L1_DVBC2_STATUS: using Si2183_DVBC2_STATUS_CMD_INTACK_CLEAR.
<compatibility>[Tizen/int&char] explicitly declaring all 'int as 'signed int' and all 'char' as 'signed char'.
This is because Tizen interprets 'int' as 'unsigned int' and 'char' as 'unsigned char'.
All other OSs interpret 'int' as 'signed int' and 'char as 'signed char', so this change doesn't affect other compilers.
To compare versions above V0.1.3.0 with older versions:
Do not compare whitespace characters
Either filter 'signed' or replace 'signed int' with 'signed' and 'signed char' with 'char' in the newer code first.
(take care to use 3 spaces in the string to be replaced)
<improvement>[DVB-C2/T_T2/TER_Tuner]
In Si2183_L2_Tune: Selecting internal LIF in TER tuner when in 1.7 MHz or C2. Using ZIF for other cases (T or T2 above 1.7 MHz).
With the previous code, LIF was selected if using AUTO_DETECT/AUTO_T_T2 after tuning in DVB-C2 (which is using LIF).

5.3.27 As from V0.1.3.0 (2015/06/01)

<new_feature>[Broadcast_i2c/demods]
Adding '#defines' for broadcast i2c.
Adding TER_tuner_config_done in Si2183_L2_Context.
Adding Si2183_PowerUpUsingBroadcastI2C to load FW in several demodulators using the broadcast i2c mode. (only used for 'multiple' designs).

In Si2183_PowerUpWithPatch: using api->load_control to run onliy selected parts of the function, depending on the progress of the Si2183_PowerUpUsingBroadcastI2C function.
In Si2183_L2_SW_Init: Setting TER_tuner_config_done to 0. This is a new flag used to separate TER tuner init and TER tuner configuration. The TER tuner init is identical, but the configuration differs depending on the front_end, so these need to be treated separately.
In Si2183_L2_switch_to_standard: Checking TER_tuner_config_done flag to do the TER tuner configuration only when needed (once and after broadcast i2c).
SiLabs_TER_Tuner_DTV_OUT_TYPE and SiLabs_TER_Tuner_DTV_AGC_SOURCE moved out of the TER tuner init code (this can now be bypassed if using broadcast i2c).
In Si2183_L1_API_Init: Setting api->load_control to Si2183_SKIP_NONE to get the same behavior as previously by default.

<new_feature>[DVB-S2/Multiple_Input_Stream]
Adding MIS_capability field in L1_Si2183_Context
In Si2183_PowerUpWithPatch: Setting MIS_capability flag to 1 for parts supporting this feature.
In Si2183_L2_lock_to_carrier: Using plp_id input parameter as isi_id when in DVB-S2. (if supporting MIS). Setting stream selection to 'auto' if isi_id (i.e. plp_id parameter) is '-1' (same behavior as for plp_id it T2 or C2).
In Si2183_L2_Channel_Seek_Init: Forcing DVB-S2 stream selection to 'auto' (if supporting MIS).
In Si2183_L1_API_Init: Setting api->MIS_capability to 0 by default.

<new_feature>[DVB-C2/Seek]
Changing values of DVB-C2 min and max lock times (200 min, 1000 max).
In Si2183_L2_Channel_Seek_Init: Taking into account DVB-C2 case.
In Si2183_L2_Channel_Seek_Next: Improved DVB-C2 scan. DVB-C2 Seek now using 'NOT_DVBC2' API flag.

<new_feature>[ISDB-T/AC_data]
Adding 'filtering' to Si2183_ISDBT_AC_SELECT_PROP

<improvement>[comments]
In Si2183_L2_lock_to_carrier: Adapting comment to indicate the use of the plp_id for DVB-C2 PLP and DVB-S2 ISI id.

<improvement>[DVB-C2/Lock]
In Si2183_L2_lock_to_carrier:
proper DVB-C2 lock sequence, with reduced traces.

<improvement>[traces/commands_responses]
In all Commands with response fields: Adding a call to Si2183_TRACE_COMMAND_REPLY to trace command response fields.
In Si2183_L1_GetCommandResponseString: Reworking the function to trace meaningful fields only:
Command response fields are meaningful only if CTS is 1 and ERR is 0
If ERR is 1, trace ERR only
If CTS is 0, trace CTS only
This only changes the traces, and has no impact on the API behavior.
Adding Si2183_TRACE_COMMAND_REPLY (active when SiTRACES and Si2183_GET_COMMAND_STRINGS are both defined)

<improvement>[traces/DiSEqC]
In Si2183_L1_DD_DISEQC_SEND: tracing DiSEqC bytes on a single line. This is to add all command response fields to traces and ease debug.

Defining Si2183_TRACE_COMMAND_REPLY macro.

5.3.28 As from V0.1.2.0 (2015/05/18)

<firmware> With FW 4_4b26 on X40 parts
<wrapper> Wrapper V2.5.7
<new_feature>[ISDB-T/AC_data]

- Adding Si2183_ISDBT_AC_BITS_CMD function to retrieve ISDB-T AC data.
- Adding Si2183_L1_ISDBT_AC_BITS to retrieve ISDB-T AC data.
- Adding ISDBT_AC_SELECT property

<improvement>[DVB-C/MCNS/BLINDSCAN]

- Adding cable_lock_afc_range_khz in Si2183_L2_Context
- Setting prop->dvbc_afc_range.range_khz back to 100 kHz in Si2183_storeUserProperties, since this needs to be set to 200 only during DVB-C blindscan/blindlock (to improve blindscan/blinlock performance in presence of N-1 ACI). This is now handled at L2 level.
- In Si2183_L2_Channel_Seek_Init: storing user-selected DVB-C/MCNS afc range and using 200 kHz for DVB-C blindlock/blindscan.
- In Si2183_L2_Channel_Seek_End: reverting to user selected DVB-C/MCNS afc rabnge when ending DVB-C blindlock/blindscan.

<improvement>[minor/DEMOD_INFO] DEMOD_INFO RESERVED field coded on 8 bits, as in API description (no functional impact).
<improvement>[traces/SET_REG/GET_REG] In Si2183_L1_DD_GET_REG/Si2183_L1_DD_SET_REG: formatting traces for better text alignment
<improvement>[traces] In Si2183_L2_Channel_Seek_Next: scan delays traced with consistent formatting, for easier reading.
<compatibility>[spectrum/plot] in Si2183_plot: function compatible with Si2164_A, Si2167_B, Si2183_A and Si2183_B
<compatibility>[Si2167B/SAT blindscan] In Si2183_L2_Channel_Seek_Init and Si2183_L2_Channel_Seek_End: updates to load dedicated FW for SAT blindscan when using Si2167B
<new_feature>[FEF/FEF_MODE_TUNER_AUTO_FREEZE] Adding code to allow using only 'TUNER_AUTO_FREEZE', when available in the TER tuner.

5.3.29 As from V0.1.1.0 (2015/04/21)

<wrapper> With wrapper V2.5.6
<firmware> With FW 5_Bb2 on X5A parts
<firmware> With FW 5_5b5 on X55 parts
<new_feature>[TER_TUNER/DTV_INTERNAL_ZIF] Adding calls to SiLabs_TER_Tuner_DTV_INTERNAL_ZIF_DVBT to select the best internal IF configuration for the TER tuners. NB: requires updating the TER tuner wrapper to SiLabs_TER_Tuner_V0.5.1.
<new_Part>[chiprev/3] In Si2183_L2_Test: Adding compatibility with ROM2 parts.
<new_feature>[SPI/split] Adding Si2183_LoadFirmwareSPI_Split to allow sending FW over SPI in smaller portions (min SPI buffer size is currently 1024 bytes)
<compatibility>[AUTO_T_T2] In Si2183_TerAutoDetect: not setting front_end->auto_detect_TER for parts not supporting DVB-T2.
<improvement>[traces] In Seek functions: adding dedicated traces to show the delays between DD_RESTART and the decision (lock/never lock) or the timeout as well as the cumulative durations corresponding to these.
<improvement>[traces] Adding cumulativeScanTime, cumulativeTimeoutTime, nbTimeouts and nbDecisions to Si2183_L2_Context

5.3.30 As from V0.1.0.0 (2015/04/02)

<new_Part>[Si2183_B5B] In Si2183_PowerUpWithPatch: Adding compatibility with Si2183_B5B.
<wrapper> With wrapper V2.5.6
<firmware> With FW 6_0b1 on X60 parts
<firmware> With FW 5_3b4 on Si2180 X50 parts
<firmware> With FW 5_5b4 on X55 parts (except Si2180)
<firmware> With FW 5_Bb1 on X5B parts
<improvement>[traces] In Si2183_PowerUpWithPatch and Si2183_LoadFirmwareSPI: typo correction with proper function name
<improvement>[SILENT/DUAL] Si2183_L2_SILENT updated to properly handle duals, taking into account pin usage restrictions:
Die A can control MP_A, MP_C, GPIO1
Die B can control MP_B, MP_D, GPIO0
<improvement>[SLEEP/switch_to_standard] In Si2183_L2_switch_to_standard: setting DD_MODE only when dtv_demod_needed = 1, to avoid calling this when in SLEEP mode.
<compatibility>[Si2165D] In Si2183_L2_Test, option 'demod/chip_detect': allowing detection of a non API-controlled part, by default considered being Si2165D. This assumes that the TER tuner address is 0xC0, to match Skyworks EVBs.
<new_part> Adding support for Si2167B-22 (requires the compilation flag 'Si2167B_22_COMPATIBLE')
<new_feature>[DVB-T2/FEF] In CONFIG_PINS: allow using GPIOx for FEF freeze
<new_feature>[DVB-C2/EWBS] In DVBC2_STATUS: adding ewbs field (for emergency warnings)
<new_feature>[DVB-C/NO_DVB_C] In DVBC_STATUS: adding notdvbc flag
<new_feature>[DVB-S2/MULTISTREAM] Adding Si2183_DVBS2_STREAM_INFO and Si2183_DVBS2_STREAM_SELECT commands
<new_feature>[RECEIVER/GET_REV] In Si2183_GET_REV: adding rx flag (to indicate that the part is a receiver)
<new_feature>[DVB-S2/MULTISTREAM] Adding Si2183_DVBS2_STREAM_INFO and Si2183_DVBS2_STREAM_SELECT commands
<compatibility>[SILABS_SUPERSET] declaring signed int Si2183_L1_GET_REG for all media
<improvement>[traces] In Si2183_L1_SetProperty: tracing property fields from prop instead of propShadow, to trace the final values of the property fields instead of the previous ones
<improvement>[DVB-C/BLINDSCAN] setting prop->dvbc_afc_range.range_khz to 200 kHz, to follow FW changes.

5.3.31 As from V0.0.9.0 (2015/02/27)

No functional change compared to V0.0.8.0. All changes are in header files.

<new_feature>[superset] Changing tags to allow SILABS_SUPERSET use (one code, all configs)
Using TERRESTRIAL_FRONT_END instead of DEMOD_DVB_T (there are products with ISDB-T and not DVB-T)
Using SATELLITE_FRONT_END instead of DEMOD_DVB_S_S2_DSS (for consistency with the above)

NB: Adding the SILABS_SUPERSET mode requires declaring the following compilation flags when not using SILABS_SUPERSET:

- **TERRESTRIAL_FRONT_END**
- **SATELLITE_FRONT_END**

<new_feature>[FW/From File] Moving definition of FW structure to allow using a pointer to the structure in the L1_Si2183_Context.

5.3.32 As from V0.0.8.0 (2015/02/05)

<wrapper> Wrapper V2.5.5
<firmware> With FW 5_0b15 on X50 parts (full download for ES parts, patch for production parts)
<firmware> With FW 5_5b3 on X55 parts (except Si2180)
<new_feature>[FW_from_table] In Si2183_L2_SW_Init/Si2183_PowerUpWithPatch: Adding the capability to load FW from a table, either over I2C or over SPI.
NB: In Si2183_L2_SW_Init: The corresponding lines using 'realloc' need to be commented if dynamic memory allocation is not allowed.
<improvement>[DD_RESTART/fast i2c] In Si2183_L1_DD_RESTART: Wait at least 10 ms after DD_RESTART to make sure the DSP is started. (otherwise some commands may not succeed, especially when using TS_FREQ_RESOL=FINE).
<improvement>[SAT/AFC_RANGE] In Si2183_storeUserProperties: SAT afc_range set to 5000 instead of 4000 previously. This is to adapt the afc range to the new behavior of the FW, which is now returning 'no lock' as soon as the frequency error is above the selected afc_range. (The previous FW behavior lead to a 25% margin on afc_range, so 4000 corresponded to max 5000 in reality.)

5.3.33 As from V0.0.7.0 (2015/01/22)

<wrapper> Wrapper V2.5.4
<new_feature>[SPI/Logs]
Adding spi_download_ms and i2c_download_ms in Si2183_L1_Context.
In Si2183_L1_API_Init: setting api->spi_download_ms and api->i2c_download_ms to 0;
These values will be used to monitor the FW download times in SPI and I2C modes
In Si2183_LoadFirmware: storing the FW download time in I2C mode
In Si2183_LoadFirmware_16: storing the FW download time in I2C mode
In Si2183_LoadFirmwareSPI: storing the FW download time in SPI mode
In Si2183_L2_Test : Adding the "download" "duration" option to display the FW download times
<improvement>[Properties/Traces] In Si2183_L1_SetProperty: tracing property text in all cases, not only when it works. This makes it easier to identify properties generating errors.
<improvement>[Switch/DSS] In Si2183_L2_switch_to_standard: Setting auto mode to 'AUTO_DVB_S_S2_DSS' only if new_standard is DSS.

<new_feature>[SPI/logs]

5.3.34 As from V0.0.6.0 (2015/01/16)

<wrapper> Wrapper V2.5.3
<new_Part>[Si2166_C55] In Si2183_PowerUpWithPatch: Adding compatibility with Si2167_C55 and Si2166_C55.
<firmware> With FW 5_0b14 on X50 parts (full download for ES parts, patch for production parts)
<firmware> With FW 5_5b2 on X55 parts (except Si2180)
<firmware> With FW 5_3b2 on Si2180 X50 parts
<new_feature> [DD_RESTART] Adding Si2183_DD_RESTART_EXT_CMD
<new_feature> [DVB-S2/STATUS] Adding fields in DVBS2_STATUS_CMD_REPLY
unsigned char roll_off;
unsigned char ccm_acm;
unsigned char sis_mis;
unsigned char num_is;
<compatibility>[Si2167B/SAT] In Si2183_L1_DVBS_STATUS: compiling code for SAT FREQ OFFSET workaround only when Si2167B_20_COMPATIBLE is defined
<new_feature> [DD_RESTART] Adding Si2183_DD_RESTART_EXT_CMD
<new_feature> [DVB-S2/STATUS] Adding fields in DVBS2_STATUS_CMD_REPLY

<compatibility>[Duals/Si216x2] In Si2183_downloadDDProperties: Setting 'dual' properties only for Si216x2 parts.
<new_feature>[TS/CLOCK] Adding Si2183_DD_TS_FREQ_MAX_PROP
<improvement>[Code_size] Adding a textBuffer in Si2183_L1_Context used when filling text strings.
<improvement>[scan/not_blind] In Si2183_L2_Channel_Seek_Next: Checking front_end->seek_abort flag to allow an abort.
The previous version only allowed seek aborting when in blind mode (for SAT and DVB-C).
The previous version only allowed seek aborting when in blind mode (for SAT and DVB-C).
<improvement>[suspend/resume] In Si2183_L2_send_diseqc_sequence: Storing DiSEqC parameters in L1 context to allow saving them during 'resume'.
<improvement>[SPI/SPIoverGPIF] In Si2183_LoadFirmwareSPI: using new Cypress feature to load FW in SPI mode using GPIF (typical FW download time below 80 ms).
<improvement>[DVB-C/timeout] In Si2183_L2_lock_to_carrier; resetting front_end->searchStartTime after tuning is complete (if tuning), to be tuner-independent in the lock timeout management.
<improvement>[DVB-C/porting] In Si2183_DVB_C_max_lock_ms: removing float use.
<improvement>[SEEK/NO_DVBT2] In Si2183_L2_Channel_Seek_Next:
Not allowing AUTO_DETECT in DVB-T for parts not supporting DVB-T2. This is done using the front_end->auto_detect_TER flag, which should not be '1' for parts not supporting T2.
<improvement>[SEEK/DSS] In Si2183_L2_Channel_Seek_Next and Si2183_L2_lock_to_carrier
Added compatibility with DSS, with no impact on AUTO_DVB_S_S2_DSS mode:
AUTO_DVB_S_S2_DSS is only used if the standard is explicitly DSS. This is because otherwise the auto lock is a bit slower, while most platforms don't need to support DSS.

5.3.35 As from V0.0.5.0 (2014/11/21)

<wrapper> Wrapper V2.5.1
<new_Part>[Si2183/X55] Adding FW download code for X55 parts
<firmware> With FW 5_0b12 on X50 parts (full download for ES parts, patch for production parts)
<firmware> With FW 5_5b1 on X55 parts

<improvement>[code_checker] adding lines to avoid code checker warnings:
In Si2183_L2_Channel_Seek_Next: setting flags to 0 by default (overwritten later on in the function)
<improvement>[POWER_UP] In Si2183_L1_POWER_UP; Adding 10ms delay after a power up to be sure the firmware is ready to receive a command
<improvement>[warnings/Si2167B] In Si2183_L1_DVBS2_STATUS: declaring variables used for FREQ OFFSET workaround only if Si2167B_20_COMPATIBLE is defined
<improvement>[Code_size] Using the textBuffer in Si2183_L1_Context when filling text strings:

- In Si2183_L2_SW_Init (buffer init)
- In Si2183_L2_switch_to_standard and Si2183_L2_Test
- In Si2183_L1_API_Init
- In Si2183_L1_DD_TS_PINS
- In Si2183_L1_SetProperty and Si2183_L1_SetProperty2

<improvement>[blindscan/debug] In Si2183_plot: (only when ALLOW_Si2183_BLINDSCAN_DEBUG is declared).

- Spectrum traces now working (register definitions where those of "pmajor = '4'" parts)
- Compatibility with Si2164 parts (with pmajor = '4').
- Removing unused variables.

<improvement>[SAT/TONE] In Si2183_storeUserProperties: Setting api->prop->dd_diseqc_freq.freq_hz to 0 to select 'envelop mode'
<improvement> [TS_spurious/DUAL] In Si2183_storeUserProperties: adapting parallel TS for no TS interference (from field experience):

```
prop->dd_sec_ts_setup_par.ts_data_strength                    =     3;
prop->dd_sec_ts_setup_par.ts_data_shape                       =     2;
prop->dd_sec_ts_setup_par.ts_clk_strength                     =     3;
prop->dd_sec_ts_setup_par.ts_clk_shape                        =     2;

prop->dd_ts_setup_par.ts_data_strength                        =     3;
prop->dd_ts_setup_par.ts_data_shape                           =     2;
prop->dd_ts_setup_par.ts_clk_strength                         =     3;
prop->dd_ts_setup_par.ts_clk_shape                            =     2;
```

5.3.36 As from V0.0.4.0 (2014/09/05)

<wrapper> Wrapper V2.5.0
<firmware> With FW 5_6b1 (full download for Si2180 parts only, without T2/C2/S2)
<firmware> With FW 5_0b8 (full download for ES parts, patch for production parts)

<correction>[lock/MPLP] In Si2183_L2_lock_to_carrier: using plp_id = plp_id to avoid compiler warning when not used while keeping plp_id value. (regression introduced in V0.0.3.0 with 'plp_id = 0;')

<improvement>[NOT_a_DUAL] In Si2183_downloadDDProperties: skipping DD_SEC_TS property settings if demod is a single (to avoid raising unnecessary API errors).
<improvement>[code_checker/Si2167B] In Si2183_L1_DVBS2_STATUS: returning with an error if fe_clk_freq register is read as '0'.
NB: this would happen only if:
- The part is a Si2167B
- i2c communication is suddenly broken after properly retrieving the DVB-S2 status response.
<improvement>[code_checker] adding lines to avoid code checker warnings:

- In Si2183_L2_lock_to_carrier: setting default values for min_lock_time_ms and min_lock_time_ms (overwritten later on in the function).
- In Si2183_L2_Channel_Seek_Init: returning ERROR_Si2183_ERR in case dd_mode.modulation doesn't match any valid standard (this is not possible by design).
- In Si2183_L2_Channel_Seek_Init: setting front_end->searchStartTime before leaving the function (overwritten later on inside Si2183_L2_Channel_Seek_Next).
- In Si2183_L2_Set_Invert_Spectrum: setting inversion to 0 by default (overwritten later on in the function).

<renaming>[config_macros] SW_INIT_Si21682_EVB_Rev1_0_Si2183 renamed as SW_INIT_Si21682_EVB_Rev1_0_41A_83A (for GUI purposes).

Wrapper as from V2.5.0
<new_feature>[I2C/Tuners_Direct] In SiLabs_API_XXX_Tuner_I2C_Enable / SiLabs_API_XXX_Tuner_I2C_Enable: using a special value (100) to allow having direct connection to tuners (without demod pass-through).
API CONFIG in such case:
SiLabs_API_TER_tuner_I2C_connection(front_end, 100);
SiLabs_API_SAT_tuner_I2C_connection(front_end, 100);

<new_feature>[Test_Pipe/LNBH26] in Silabs_API_Test: adding 'lnbh26' 'a_b' '0/1' option to select which LNB controller is used (LNBH26 is a dual).
<new_feature>[CONFIG/tracing] Adding all configuration fields in SILABS_FE_Context (to enable configuration checking after init).
NB: This allows removing some previous code used to avoid compilation warnings, since all fields are not used.
Adding SiLabs_API_Config_Infos. This function is useful to check the configuration parameters based on the related function name.
Use "Full" for the function name to get the entire configuration.

Config macros
Renaming macros:

Si21682_EVB_Rev1_0_Si2164 becomes Si21682_EVB_Rev1_0_41A_64A
Si21682_EVB_Rev1_0_Si21652B becomes Si21682_EVB_Rev1_0_41A_67B
Si21682_EVB_Rev1_0_Si2183 becomes Si21682_EVB_Rev1_0_41A_83A
Si21662_EVB_Rev1_0_Si2167B becomes Si21662_EVB_Rev1_0_67B

Console code

<correction>[T2_lock_mode] In Silabs_UserInput_Lock, using T2_lock_mode in the call to SiLabs_API_lock_to_carrier.

<improvement>[config/TER_only/SAT_only]: In main: if tuner i2c address is 0x00, skip config for TER or SAT respectively.

5.3.37 As from V0.0.3.0 (2014/08/14)

<wrapper> Wrapper V2.4.7
<firmware> With FW 5_0b7 (full download for ES parts, patch for production parts)
<correction/TESTPIPE> In Si2183_L2_Read_L1_Misc_Data: storing djb_alarm_comm in the proper field.
<improvement>[TERACOM/BER] In Si2183_storeUserProperties: adding caution message to warn the user that BER settings are overwritten at L3 Wrapper level.
<new_feature/DISEQC> Adding dd_diseqc_param.input_pin field
<new_feature/TS_SERIAL/D7> Adding dd_ts_mode.serial_pin_selection, to allow routing serial TS on Dx (DO is used by default)
<improvement/MCNS> mcns_symbol_rate.rate set by default at 5361, a MCNS-compatible SR.

5.3.38 As from V0.0.2.0 (2014/07/18)

<firmware> With FW 5_0b5 (full download for ES parts, patch for production parts)
<wrapper> Wrapper V2.4.6
<new_feature>[SiLOGS] In Si2183_PowerUpWithPatch: Adding new lines for logging the build options and some important lines. CAUTION: Requires updating Si_I2C to V3.4.8, or '#define SiLOGS SiTRACE'.
<correction>[LOAD_FW] In Si2183_PowerUpWithPatch: Correcting part_info.pminor check (incorrectly compared to Si2183_PATCH16_5_0b4_PMAJOR).

<improvement> In Si2183_L1_DD_EXT_AGC_SAT/Si2183_L1_DD_EXT_AGC_TER: removing range checks on agc1_kloopl/agc2_kloop, since these will always be within range due to their type. This may have generated warnings with some compilers when DEBUG_RANGE_CHECK is defined.
<improvement>[TERACOM/BER] In Si2183_storeUserProperties: adding caution message to warn the user that BER settings are overwritten at L3 Wrapper level.

5.3.39 As from V0.0.1.0 (2014/06/20)

<wrapper> Wrapper V2.4.5
<TER_Tuner_Wrapper> TER Tuner API V0.4.0
<firmware> With FW 5_0b4 (full download for ES parts, patch for production parts)
Define Si2183_A50_COMPATIBLE for production parts
Define Si2167_B25_COMPATIBLE for Si2167_B25 parts
Define Si2183_ES_COMPATIBLE for Engineering Samples
<new_feature>[TER_Tuner/Config] In Si2183_L2_switch_to_standard:
Calling SiLabs_TER_Tuner_DTV_OUT_TYPE and SiLabs_TER_Tuner_DTV_AGC_SOURCE instead of TER_TUNER_AGC_EXTERNAL
Adding TER_tuner_agc_input and TER_tuner_if_output to L1 context, to configure the TER IF interface.

NB: To take benefit of this modification, update your TER Tuner wrapper to V0.4.1 or above, to get access to the SiLabs_TER_Tuner_DTV_OUT_TYPE and SiLabs_TER_Tuner_DTV_AGC_SOURCE functions.

NB: No change required for existing applications, since this is only useful to use LIF_IF1 with Skyworkss TER tuners, when compared with the previous versions which by default uses LIF_IF2.

5.3.40 As from V0.0.0.4 (2014/05/28)

<wrapper> Wrapper V2.4.2
<firmware> With FW 4_Ab4
Now prepared to use the 16 bytes download FWs (requires Si2183_A50_COMPATIBLE)
<TER_Tuner_API>[V0.3.9] Using TER-Tuner API V0.3.9, to benefit from the 1.7 MHz filtering feature (not available with all TER tuners).
<improvement>[TER_BW/1.7MHz] In Si2183_L2_Tune:
Now using SILABS_BW enum as defined in SiLABS_TER_TUNER API V0.3.9, to use the 1.7 MHz filtering feature in Skyworks TER tuners whenever possible.

5.3.41 As from V0.0.0.3

<wrapper> Wrapper V2.4.1
<improvement> [Src_code_GUIs] In Si2183_L2_Test: more complete testpipe 'demod help'
<correction>[Tuner_i2c] In Si2183_L2_Tune: Moving 'UNICABLE_COMPATIBLE' line around the closing bracket after disabling the SAT tuner i2c.
The previous version didn't disable the tuner i2c with the following compilation flags:
UNICABLE_COMPATIBLE NOT defined
INDIRECT_I2C_CONNECTION defined
<correction> [SILENT/SLEEP/ANALOG] In Si2183_L2_switch_to_standard: Adding dtv_demod_sleeping flag to more easily handle the 'sleep' mode, which can occur upon a clock source change in DTV, or when going to 'ANALOG' or 'ATV'. The WAKEUP sequence is required in the first case, not in the second case.
<improvement> [Unicable/Multi-Treading/Multiple frontends] In Si2183_L2_TER_FEF_SETUP: removing I2C pass-through enable/disable.
This is only called from switch_to_standard, and the i2c pass-through is already enabled when calling this function.
The change removes nested i2c pass-through enable/disable calls.
These had generally no consequences, except for duals when several tuners use the same i2c address.
<improvement> [BLINDSCAN/DEBUG/SPECTRUM] In Si2183_L2_Channel_Seek_Init:
front_end->demod->prop->scan_sat_config.scan_debug = 0x03; (the previous value of 0x07 doesn't work anymore.

5.3.42 As from V0.0.0.1

<correction>[Tuner_i2c] In Si2183_L2_Tune: Moving 'ifdef UNICABLE_COMPATIBLE' line around the closing bracket after disabling the SAT tuner i2c.
The previous version didn't disable the tuner i2c with the following compilation flags:
UNICABLE_COMPATIBLE NOT defined
INDIRECT_I2C_CONNECTION defined

5.3.43 As from V0.0.0.0

Initial version (based on Si2164 code V0.3.4)