TEXAS INSTRUMENTS

RemoTI™ 1.4.0 Resource Guide

Contents

Notices

- **This software contains Movea SmartMotion® libraries. As indicated in the Texas Instruments Software License Agreement, the license with respect to these libraries is for development purposes only. Any product containing these libraries may not be distributed until you obtain a distribution license from Movea. Please contact Movea at sales@movea.com or visit the Movea website.**

- This software release supports the following ZigBee RF4CE specifications
  - ZigBee RF4CE Specification Version 1.01 (January, 2010)
  - ZigBee Remote Control Public Application Profile Specification Version 1.1.0 (November 2010)
  - ZigBee RF4CE: ZRC Profile Specification Version 2.0 (September 4th, 2014)
  - ZigBee RF4CE Generic Device Profile Version 2.0 (September 4th, 2014)

- The sample applications in this release is supported with the **CC2533 RF4CE Development Kit**

- The library files and project files have been built and tested with IAR Embedded Workbench for 8051, Version 9.20.2 (see errata section bellow) on a Windows XP machine and Windows-7 64 bit machine. Please note that newer or older versions of IAR Embedded Workbench may not work properly with this release.

- The non-volatile memory map (OSAL SNV) implemented by the sample applications of this release is not compatible with images of RemoTI releases version 1.1 and older. When a new application image is downloaded onto a device loaded with an incompatible prior release via Over-The-Air download or Serial Bootloader, all of the non-volatile data, including the pairing table, will be erased.

- All IAR projects must be configured with the "Location for constants and strings" set to "ROM mapped as data" if banked, and set to "CODE memory" if non-banked, in order to be compatible with the RemoTI stack libraries.

Documentation Guide

- **User Guides** (Located in the folder <Install Directory>\Documents\User Guides)

CC2533 RF4CE Development Kit Quick Start Guide	This document provides instructions to use the CC2533 development kit out of the box.

- **Developer's guide**

RemoTI Network Processor Developer's Guide	*Located in the Texas Instruments wiki server.* This document explains the RemoTI network processor application and customization to add a new command set.
RemoTI Developer's Guide	*Located in the Texas Instruments wiki server.* This document provides more information on the RF4CE protocol features and their usage with the RemoTI software.
RemoTI Advance Remote Developer's Guide	*Located in the Texas Instruments wiki server.* This document provides more information on the RF4CE protocol features and their usage with the RemoTI software.

- **Software API** (Located in the folder <Install Directory>\Documents\API)

RemoTI API	This document lists the Application Programming Interface (API) for the RemoTI software stack.
HAL Driver API	This document lists the API for the Hardware Abstraction Layer (HAL) drivers.
RemoTI OSAL API	This document lists the API for the Operating System Abstraction Layer (OSAL) software.
RemoTI Network Processor Interface Specification	This document contains the serial interface specification for the RemoTI network processor.

- **Application Notes** (Available at the **RemoTI product folder webpage.** Note that more application notes will be added over time.)

RemoTI Power Consumption	This application note measures power consumption on the CC253x remote control.
RemoTI Host Processor Sample Application and Porting Guide	This application note demonstrates the RemoTI network processor interface running a simple host processor application on the MSP430FG5438 Experimenters board using a CC253x Evaluation Module (EM).
RemoTI SimpleApp	This application note demonstrates as simple target and controller node application running on the SmartRF05 hardware platform.

RemoTI Coexistence Testing	This application note discusses WiFi co-existence and provides performance test data using the CC253x in the presence of Wi-Fi interference.
RemoTI Win32 Simple Console Application	This application note describes the features in RF4CE technology that enable it to perform well even in the presence of strong interference. Actual testing is performed using the RemoTI development kit and sample application.

Other Useful Resources on the Web

- The **TI RF4CE homepage** page contains detailed information on the TI RF4CE solution.

- The **RF4CE** Wiki pages contain example and valuable information for developers.

- The **SmartRF Protocol Packet Sniffer** is a free tool that functions as a single channel sniffer with ZigBee RF4CE packet decodes.

- The **RemoTI for RF4CE Remote Controls Forum** is an online forum for engineers working with TI RF4CE products. Users can post questions and browse posts from other TI RF4CE users.

- The **ZigBee® Alliance Home Page** includes ZigBee RF4CE and other related specifications as well as certification policies.

- The **CC2533 Product Page** includes the CC2533 User's Guide, datasheet, and antenna reference designs among many other resources.

Changes from previous version (1.3.1)

Enhancements
- Added support for ZRC2.0 and GDP2.0 profiles.
- Updated Target emulator tools to support ZRC2.0 and GDP 2.0 features.
- RemoTI API has been updated to better serve the new ZRC2.0 and GDP2.0 profiles.
- HEAP memory now uses all remaining RAM left available by the application
- New Frequency Adaptive algorithm: improves RF co-existence performance.

Bug fixes
- Improve SNV management to prevent pairing failure for corner cases.
- Now possible to rewrite a page if a word fails in the boot loader.
- Corrected an issue in the network layer preventing the pairing from succeeding if a lower priority task was running for too long.
- Corrected a problem in SPI driver that prevented MRDY and CS signal from being combined.

Errata and other information

Errata
- No software errata for this sdk

Other information
- Due to size constraints, for platforms with 64kB of flash, some configurations have turned off optional features for the ZRC 2.0 profile. The polling client and identify client are disabled. This is done by setting the compilation directive DISABLE_ZRC_POLL_IDENTIFY_NOTIFY in the project preprocessor options. This concerns the CC2533F64-originator-HEX (with serial bootloader), and the CC2533F64-originator-SBL (binary file creation for SBL). This optional feature can be enabled again by doing the following:
  - Removing the DISABLE_ZRC_POLL_IDENTIFY_NOTIFY compile directive from the project options
  - Changing the maximum capacity of the pairing table from 5 to 2

IAR 9.20.2 behavior for multi-file compilation
- An issue has been found with the latest IAR 9.20.2 IDE. When building the RNP project for 64kB devices, IAR does not link that project after the first compilation. This is linked to the multi-file compilation option that is being used to help the RemoTI stack fit in 64kB of flash. To resolve this, the project needs to be re-built a second time in order for the linker to be called. This issue can be avoided entirely by using the IAR command line compilation interface as described in the IAR documentation.

Pre generated images

The RemoTI 1.4 sdk comes with some pre-built images; the table below presents the connection pins for each network processor images:

	Bus
RNP_CC2531F256-Originator_SBL.bin	
RNP_CC2531F256-Originator_SBL.hex	USB-CDC
RNP_CC2531F256-Recipient_SBL.bin	
RNP_CC2531F256-Recipient_SBL.hex	

	Bus	MISO	MOSI	CLK	CS	MRDY	SRDY
RNP_CC2533F64-Originator_SPI_PORT1_ALT0.bin							
RNP_CC2533F64-Originator_SPI_PORT1_ALT0_SBL.hex							
RNP_CC2533F64-Recipient_SPI_PORT1_ALT0.hex							
RNP_CC2533F96-Originator_SPI_PORT1_ALT0.bin						P0.3	P0.4
RNP_CC2533F96-Originator_SPI_PORT1_ALT0_SBL.hex							
RNP_CC2533F96-Recipient_SPI_PORT1_ALT0.bin							
RNP_CC2533F96-Recipient_SPI_PORT1_ALT0_SBL.hex	SPI	P1.7	P1.6	P1.5	P1.4		
RNP_CC2533F64-Originator_SPI_PORT1_ALT1.bin							
RNP_CC2533F64-Recipient_SPI_PORT1_ALT1.hex							
RNP_CC2533F64-Originator_SPI_PORT1_ALT1_SBL.hex							
RNP_CC2533F96-Originator_SPI_PORT1_ALT1.bin						P1.3	P1.2
RNP_CC2533F96-Originator_SPI_PORT1_ALT1_SBL.hex							
RNP_CC2533F96-Recipient_SPI_PORT1_ALT1.bin							
RNP_CC2533F96-Recipient_SPI_PORT1_ALT1_SBL.hex							

	Bus	RX	TX
RNP_CC2533F64-Originator_UART_PORT0.bin			
RNP_CC2533F64-Originator_UART_PORT0_SBL.hex			
RNP_CC2533F64-Recipient_UART_PORT0.hex			
RNP_CC2533F96-Originator_UART_PORT0.bin		P0.2	P0.3
RNP_CC2533F96-Originator_UART_PORT0_SBL.hex			
RNP_CC2533F96-Recipient_UART_PORT0.bin			
RNP_CC2533F96-Recipient_UART_PORT0_SBL.hex	UART		
RNP_CC2533F64-Originator_UART_PORT1.bin			
RNP_CC2533F64-Originator_UART_PORT1_SBL.hex			
RNP_CC2533F64-Recipient_UART_PORT1.hex			
RNP_CC2533F96-Originator_UART_PORT1.bin		P1.6	P1,7
RNP_CC2533F96-Originator_UART_PORT1_SBL.hex			
RNP_CC2533F96-Recipient_UART_PORT1.bin			
RNP_CC2533F96-Recipient_UART_PORT1_SBL.hex			

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