![Texas Instruments logo]

MMWAVE Studio Release Notes

1   Introduction

The mmWaveStudio GUI is designed to characterize and evaluate the TI Radar devices. The mmWave device is configured and controlled from the mmWaveStudio by sending commands to the device over SPI. ADC data is captured using DCA1000 EVM board for single chip systems. The data is processed in Matlab and the results are displayed in the GUI.

2   Release Overview

This is the 3.1.3 version of mmwavestudio

2.1.1 Platform and Device Support

The device and platforms supported with this release are

Supported Devices	Supported EVMs
AWR2944 ES2.0	AWR2944EVM DCA1000EVM
AWR2544 ES1.0	AWR2544EVM DCA1000EVM

The solution to capture raw ADC data for single chip systems is by using Booster pack along with DCA1000 EVM.

2.2.1 Release contents and component versions

Component	Version/Details	Device	Type
RadarSS Firmware	2.4.9 2.5.6	AWR2944 ES2.0 AWR2544 ES1.0	Binary
MSS Rf Eval Firmware	2.4.2	AWR2944 ES2.0/ AWR2544 ES1.0	Binary

FTDI Driver	2.12	NA	Binary
mmWaveStudio	3.1.3	NA	Executable
Documents	Release Notes mmWaveStudio User's Guide DCA1000 Quick start Guide DCA1000 Debugging Handbook	NA	PDF PDF PDF PDF
Reference Code	DCA1000 CLI source code and documentation FTDI Library Source code and documentation	NA	Source code + Docs Source Code + Docs
Matlab Examples	Single chip Matlab example for parsing ADC data	NA	Source Code
Platform Binaries	DCA1000 FPGA Image (v2.9)	DCA1000 EVM	Binary

2.3.1 Directory Structure

Directory Name	Content
docs	mmwave_studio_release_notes.pdf mmwave_studio_user_guide.pdf DCA1000_Quick_Start_Guide.pdf DCA1000_Debugging_Handbook.pdf
ftdi	FTDI Drivers
mmWaveStudio	mmWaveStudio GUI (*Runtime\mmWaveStudio.exe*) DCA1000 FPGA file (*PlatformBinaries\DCA1000FPGA*) Reference code for DCA1000 CLI (*ReferenceCode\DCA1000*) Reference code for FTDI Library (*ReferenceCode\FTDILib*) Matlab example for single chip data parsing (*MatlabExamples*) Sample Lua scripts (Single Chip) (*Scripts*) Sample JSON files (*JSONSampleFiles*)
rf_eval_firmware	RF evaluation firmware for supported Devices

2.4.1 Tools and dependencies

Below tools are required to run mmWaveStudio

Tools	Version	Download Link
Matlab Runtime Engine	8.5.1 only	download link
FTDI Driver	2.12	Included in the package

Matlab (only for Matlab examples)	R2017a or later	License Required

2.5.1 Licensing

Please refer to the mmwave_studio_manifest.html, which outlines the licensing information for mmWave Studio package.

3 Release Contents

3.1.1 Features and enhancements in mmWaveStudio 3.1.1 compared with 3.0.0 release

AWR2944 is TIs third generation 77GHz RF CMOS Radar, the new version of mmWave Studio incorporates changes to support this new device.
Features supported in this release are:
1.   Supports 4 TX and 4 Real-only RX chains.
2.   Synthesizer RF frequency supported 76 –81GHz
3.   Supports 10MHz IF bandwidth
4.   Supports 7 functional profiles
5.   Supports 266MHz/us max slope
6.   Supports programmable filter

3.1.2 Features and enhancements in mmWaveStudio 3.1.3 compared with 3.1.1 release

AWR2544 is TIs third generation 77GHz RF CMOS Radar, the new version of mmWave Studio incorporates changes to support this new device.
Features supported in this release are:
1.   Supports 4 TX and 4 Real-only RX chains.
2.   Synthesizer RF frequency supported 76 –81GHz
3.   Supports 10MHz IF bandwidth
4.   Supports 7 functional profiles
5.   Support for Autodetection of AWR2944, AWR2944P and AWR2544.

     Below features are only valid for 2544 devices:
1.   Supports 1ns Resolution of ADC Start Time
     - This 1ns resolution can be enabled/disabled from **StaticConfig-> Radar Miscellaneous Control** section which will allow to set ADC start time in 1 ns under **AdvChirpCfg->Chirp Configuration** section.
2.   Supports multiple profiles for Synth Frequency Monitor (Live Mode)
     - This live mode can be enabled/disabled from **AnalogRxMon->Profile Enable Bit Mask Live Mode** section which will allow to set the live mode for profile 0 & 1.
3.   Support for Inter-Chirp Jitter Mitigation
     - It can be enabled/disabled from **StaticConfig-> Radar Miscellaneous Control** section.
4.   Support for Chirp Parameter Enable/Disable in Advanced Chirp Configuration

- Chirp param can be enabled/disabled from **AdvChirpCfg-> Param Control** section.
5. Support to enable/disable OSCCLKOUTETH to provide reference clock for external ethernet PHY
    - It can be enabled/disabled from **StaticConfig->OscClkOutEth Configs** section.
6. Support for new FRC DCC clock monitor
    - Clock Pair 6 in **DCBISTMon->DCC Monitoring Config** section will enable/disable this monitor.

3.2.1   Changes in mmWaveStudio 3.1.1 compared with 3.0.0 release

Item type	Key	Issue Details/Description
FEATURE	MMWSTUDIO-604	Added support for 4th TX channels to support AWR2944 device in lua APIs and GUI.
FEATURE	MMWSTUDIO-595	Added support for AWR2944 device specific features.
BUG	MMWSTUDIO-598	Fixed various bugs related to AWR2944 studio features.
BUG	MMWSTUDIO-617	Removed rampgen calculator from mmWave Studio GUI
BUG	MMWSTUDIO-522	Removed All cascade support and examples from mmWave Studio GUI

3.2.2   Changes in mmWaveStudio 3.1.3 compared with 3.1.1 release

Item type	Key	Issue Details/Description
FEATURE	MMWSTUDIO-626	Added support for Profile Bit Mask Live Mode for Multiple Synth Freq Monitor Profiles.
FEATURE	MMWSTUDIO-628	Added support for enabling 1ns ADC Start Time Resolution.
FEATURE	MMWSTUDIO-629	Added Support for Inter-Chirp Jitter Mitigation Enable/Disable.
FEATURE	MMWSTUDIO-630	Added Support for OscClkOutEth, with Enable, Divider Programming and Drive Value Setting.
FEATURE	MMWSTUDIO-631	Added Support for Param Control in Advanced Chirp Config
FEATURE	MMWSTUDIO-632	Added Support for FRC Clock Source Addition, and measured value in Dual Clock Comp Report.
FEATURE	MMWSTUDIO-627	Added Support for Recognition for AWR2944, AWR2944P and AWR2544.
FEATURE	MMWSTUDIO-637	Support for RS232 operation on 50MHz XTAL.
FEATURE	MMWSTUDIO-647	Support for setting LVDS value automatically on device detection for AWR2944 and AWR2544.

3.2.1 Limitations

- The MATLAB post-processing only works with the following value of CQ configuration
  - CQ0 – 132
  - CQ1 – 132
  - CQ2 – 72
- Only non-Interleaved mode is supported for AWR2944 device.
- The MATLAB post processing is not supported in Studio for advance frame config API
- The MATLAB post processing is not supported in Studio for advance chirp config API

3.3.1 Known issues

Key	Description
MMWSTUDIO-216	Font on Connect tab overlap on some Windows 7 PC
MMWSTUDIO-577	The frame period validity error check implemented in Studio for advance chirp config has dependency on legacy frame config API as well. Workaround: Make sure the frame period in legacy frame config is well relaxed while using advance frame config API.
MMWSTUDIO-624	The Resolution of start frequency LUT dither in GUI is in GHz, the user needs to feed inputs in GHz unit even though range of dither is in few hundred MHz
MMWAVE_SYSVAL-250	The Delay Comp Field in Digital compensation API may not take right LSB field in ADC low power mode, refer AWR2944 mmWave ICD for appropriately updating this field.
MMWAVE_SYSVAL-249	The MATLAB post processing feature is not enabled for advance chirp config API in Studio.