



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.

This mmWave Studio 4.3 is designed to support TI 3rd generation low power and low cost radar devices like xWRL68xx. The mmWave DFP APIs for these devices are brand new and this version of Studio supports only these 3rd generation device APIs.

2 Release Overview

2.1 Platform and Device Support

The device and platforms supported with this release are

Supported Devices	Supported EVMs
xWRL6844 ES1.0	xWRL6844
xWRL6888 ES1.0	xWRL6888

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

2.2 Release contents and component versions

Component	Version/Details	Device	Type
FTDI Driver	2.12	NA	Binary
mmWaveStudio	4.3.1.0	NA	Executable
Documents	Release Notes mmWaveStudio User's Guide DCA1000 Quick start Guide DCA1000 Debugging Handbook LUA API Documentation	NA	PDF 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 Source Code + Docs
Platform Binaries	DCA1000 FPGA Image (v2.9)	DCA1000 EVM	Binary

2.3 Directory Structure

Directory Name	Content
docs	mmwave_studio_release_notes.pdf mmwave_studio_user_guide.pdf mmwave_studio_lua_api_documentation.pdf DCA1000_Quick_Start_Guide.pdf DCA1000_Debugging_Handbook.pdf
ftdi	FTDI Drivers
mmWaveStudio	mmWaveStudio GUI (<i>Runtime\mmWaveStudio.exe</i>) DCA1000 FPGA file (<i>PlatformBinaries\DCA1000FPGA\</i>) Reference code for DCA1000 CLI (<i>ReferenceCode\DCA1000\</i>) Reference code for FTDI Library (<i>ReferenceCode\FTDI\lib\</i>) Flash Programmer (<i>FlashProgrammer\</i>) Matlab Utility Example (<i>Scripts\MatlabExamples\</i>) Sensor Per Chirp API LUT Info (<i>PerChirpLut\</i>)

2.4 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

2.5 Licensing

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

3 Release Contents

3.1 Features and enhancements in mmWaveStudio 4.1.0

- xWRL6432 and xWRL1432 devices are TI's third generation 60GHz and 77GHz RF CMOS low power and low cost Radar sensors, there are significant changes to DFP firmware and API architecture in this device compared to TI first and second generation devices.
- For more information refer document API documentation in mmWave DFP Package.
- The key firmware and device features supported by DFP/mmWave Studio:
 - The brand new lightweight mmWaveLink APIs to configure FECSS radar front end.
 - The new FECSS powerup and power down low power APIs (Entry/Exit Deep Sleep)
 - The new FECSS clock control API (Entry/Exit sleep and slow clocks)
 - GPADC and temperature measurement APIs
 - The brand-new factory and runtime calibration strategy and supporting APIs
 - The new sensor configuration and sensor start/stop APIs
 - The new loopback and functional safety monitor APIs

3.2 Features and enhancements in mmWaveStudio 4.3.1 compared with 4.1.0 release

- xWRL68xx devices are TI's third generation 60GHz RF CMOS low power and low cost Radar sensors.
- For more information refer document API documentation in mmWave DFP Package.
- The key firmware and device features supported by DFP/mmWave Studio:
 - The new LVDS data streaming API's
 - `mws. rfEvalRxDataStreamCfg`
 - `mws. rfEvalRxDataStreamCtrl`

- mws. rfEvalRxDataStreamAdvCfg
 - Removed support for 26Mhz, 38.4Mhz XTAL frequency
 - Simplified FecDevTestPatternCtrl API as data streaming will be supported via new APIs mentioned above.
 - Firmware download supports new binary format .rig images
 - Updated UART programmer for metalmage download
 - Added RFS debug version in GUI, which updates with getFirmwareVersionAPI
 - Sop mode control with On-Board FTDI

3.3 Changes in mmWaveStudio 4.1.0 release

Refer to mmwave_studio_user_guide.pdf for all new features and APIs.
List of Changes w.r.t 4.1.0.1 previous release:

Item type	Key	Issue Details/Description
API Changes		<p>mws.monDbgTxPwrMeas:</p> <ol style="list-style-type: none"> Removed c_TxPwrNSamples from configuration structure <p>mws.monTxNRxLbCfg:</p> <ol style="list-style-type: none"> Added Bit[2] of c_MonRxTxCodesSel for High Loopback Gain Selection <p>mws.fecRfBootCal:</p> <ol style="list-style-type: none"> Added Bit[2] of c_MiscCalCtrl for Rx-Tx Calibration Override Bin Temperature Field for Tx Temperature Override values (signed byte) has been added xc_CalTempBinOverrides0, xc_CalTempBinOverrides1, xc_CalTempBinOverrides0 <p>mws.monEnableTrig:</p> <ol style="list-style-type: none"> Field w_MonitorEnable0 and w_MonitorEnable1 has been added by replacing w_MonitorEnable Monitor to Bitfield mapping has changed; refer MonitorEnableTrig API in dfp/lua api documentation for latest mapping Similar changes in mapping in response structure for MonitorStatus This API will not work with existing xWRL6432 Firmware <p>mws.monTxNRxLbCfg:</p> <ol style="list-style-type: none"> Added Bit[2] of c_MonEnaCtrl for QPSK PD measurement enable bit Added the field xh_QpskPdPower in Response Structure <p>mws.sensFrameCfg:</p> <ol style="list-style-type: none"> Added field c_MiscSetupMask in configuration structure

	<p>mws.sensFrameCfgGet:</p> <ol style="list-style-type: none"> Added field c_MiscSetupMask in configuration structure <p>mws.sensChirpPfTimeCfg:</p> <ol style="list-style-type: none"> Bit[9:0] in h_ChirpAdcStartTime is now Reserved(earlier it was ADC start time) <p>mws.fecRfRuntimeTxClpcCal:</p> <ol style="list-style-type: none"> This API had been added with command Id 0x19. Refer to ICD/lua api documentation for more details.
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

3.4 Changes in mmWaveStudio 4.3.1 compared to mmWaveStudio 4.1.0

Item type	Key	Issue Details/Description
FEATURE	MWS_LOW-56	Removed support for 26Mhz, 38.4Mhz XTAL frequency
FEATURE	MWS_LOW-57 MWS_LOW-58 MWS_LOW-59	Support of additional Tx and Rx channels for Tx Backoff, Tx power cal, in RFFact Cal API, FecRfRuntimeTxClpc API, RF power on/off API
FEATURE	MWS_LOW-60	Deprecated RDIF Clock Enable feature in RF Power On/OFF API
FEATURE	MWS_LOW-61 MWS_LOW-62 MWS_LOW-63 MWS_LOW-64 MWS_LOW-66	Support for additional Tx and Rx channels in FecRfRuntimeTxClpcCal, RF Status Get API, Rx-Tx cal data get/set, temp meas cfg/trig, MonEnableTrig, MonLivSynthFreqCfg, MonPllCtrlVltCfg, MonPmClkDcSigCfg, MonRxHpfDcSigCfg, MonTxNBbCfg, MonTxNDcSigCfg, MonTxNPwrCfg, MonTxNRxLbCfg API's. Updated Mon result addresses.
FEATURE	MWS_LOW-65	Simplified FecDevTestPatternCtrl API as data streaming will be supported
FEATURE	MWS_LOW-71	Updated c_Reserved1 in FecDevStatusGetAPI response structure to c_DeviceType (0 -> 6844, 1-> 6888)
FEATURE	MWS_LOW-73	Updated parsing logic for firmware download to new binary format .rig images
FEATURE	MWS_LOW-74	Updated UART programmer for metalimage download, removed metalImage type input
FEATURE	MWS_LOW-75	Added new DataStream API's
FEATURE	MWS_LOW-76	Updated register spaces, pre/post boot configs along with build image parsing sequence
FEATURE	MWS_LOW-78	Updated StudioLink with modified SPI API's for fast download. User needs to use uniflash for SPI based flashing which is part of SDK
FEATURE	MWS_LOW-79	Added appropriate defaults in GUI
FEATURE	MWS_LOW-80 MWS_LOW-83	Updated Reg Browse Tree for xWRL68xx
FEATURE	MWS_LOW-82	Updated PreBoot and PostBoot sequences for Firmware Download

FEATURE	MWS_LOW-84	Added provision to load image into shared ram with appropriate offsets for both eclipse and non-eclipse mode
FEATURE	MWS_LOW-87	Added RfS debug version in GUI, which updates with getFirmwareVersionAPI. Added a label to view orbit version alongside firmware version
FEATURE	MWS_LOW-88	Added new API field "c_StreamSampleWidth" in RL_DEVICE_RX_DATA_STREAM_ADV_CFG_CMD
FEATURE	MWS_LOW-89	Added SOP control of EVM through On-board FTDI by changing portD numbers
BUG	MMWAVE_DFP_LOW-703	Fixed fecRfCalDataSet and fecRfCalDataGet addresses
BUG	MWS_LOW-85	GUI callback for RF power on/off API has been fixed
BUG	MWS_LOW-86	Renamed Rx1B, Rx3B to Rx1A,Rx3A in GUI
BUG	MMWAVE_DFP_LOW-718	Fixed GUI fail for RX_EN in sensPerChirpCtrl
BUG	MMWAVE_DFP_LOW-722	Updated APPSS_API_MON_TRIG_RESPONSE_STATUS_READ_ADDR
BUG	MMWAVE_SYSVAL-562	RxDataStreamAdvCfg GUI update has been fixed
BUG	MWS_LOW-90	Fixed TxRx LB Mon response get API with proper offsets for TxIndex>0. Changed Tx Index from numericUpDown to Drop down for TxRx LB, TxPwr, Tx BB, Tx DC sig cfg monitors
BUG	MWS_LOW-68 MWS_LOW-69	Updated FecTempMeasTrigAPI response structure field names Updated FecRfBootCalAPI and FecRfRuntimeTxClpcCalAPI command structure field names for TX Power enable masks
BUG	MWS_LOW-70	Updated factory calibration data set and get API memory buffer address and size

3.5 Known issues

None.

Key	Description
-----	-------------

4 Migration Guide

Refer Section 3.2 on API changes.