The configuration file provided is for the AWR1843 sensor from Texas Instruments, which is a 77 GHz mmWave sensor for radar applications. The file sets up the sensor parameters to control various aspects of the system, such as the radar frequency, resolution, and range. Here is a detailed explanation of each line in the config file:

**sensorStop**

This command stops the sensor if it is currently running.

**flushCfg**

This command flushes the current configuration of the sensor, ensuring a clean slate for the new configuration.

**dfeDataOutputMode** 1

This command sets the data output mode of the sensor. The number 1 indicates that the output will be in advanced frame mode. The other option is 0, which corresponds to the legacy frame mode.

**channelCfg** 15 7 0

This command configures the Rx (receive) channels.

15: Bitmap of Rx channels enabled. In this case, it enables all four Rx channels (binary 1111).

7: Bitmap of Tx (transmit) channels enabled. In this case, it enables three Tx channels (binary 111).

0: Interleaved mode for Tx channels. A value of 1 would enable non-interleaved mode.

**adcCfg** 2 1

This command configures the ADC (Analog-to-Digital Converter) of the sensor.

2: ADC output format. In this case, it is set to 16-bit real output.

1: ADC sample rate in Msps (Mega samples per second). In this case, it is set to 10 Msps.

**adcbufCfg** -1 0 1 1 1

This command configures the ADC buffer.

-1: Profile index, -1 means this command applies to all profiles.

0: Continuous mode flag. A value of 1 would enable continuous mode.

1: Chirp threshold. This is the number of chirps to store in the buffer before the buffer is made available to the DSP.

1: Threshold scale (x100). In this case, the threshold scale is set to 1.0.

1: Buffer format. In this case, it is set to 16-bit real format.

**profileCfg** 0 77 429 7 57.14 0 0 70 1 256 5209 0 0 30

This command configures a profile.

0: Profile ID.

77: Start frequency in GHz.

429: Idle time in microseconds.

7: ADC start time in microseconds.

57.14: Ramp end time in microseconds.

0: Tx output power backoff in dB.

0: Tx phase shifter.

70: Number of ADC samples.

1: Number of chirps per frame.

256: Number of loops (chirp repetitions per frame).

5209: Number of unique chirps.

0: Profile reserved value.

0: Frequency slope in MHz/us.

30: Chirp duration in microseconds.

27-29. **chirpCfg** 0 0 0 0 0 0 0 1, chirpCfg 1 1 0 0 0 0 0 4, chirpCfg 2 2 0 0 0 0 0 2

These commands configure the chirp settings. Each line configures a separate chirp.

Chirp ID: The first number in each line corresponds to the chirp ID (0, 1, and 2 in this case).

Profile ID: The second number in each line indicates the profile ID the chirp is associated with.

The next five numbers are reserved for future use and are set to 0.

The last number in each line represents the TX to enable for this chirp (1, 4, and 2 in this case).

**frameCfg** 0 1 16 0 71.429 1 0

This command configures the frame settings.

0: Profile ID.

1: Number of chirps per frame.

16: Number of active frames in the sequence.

0: Frame trigger delay in microseconds.

71.429: Frame periodicity in milliseconds.

1: Number of frames in the burst.

0: Reserved value.

**lowPower** 0 0

This command configures the low power mode.

0: LP\_ADC mode. In this case, it is set to regular operation (not low power).

0: Reserved value.

**guiMonitor** -1 1 0 0 0 0 0

This command configures the GUI monitor settings.

-1: Profile index, -1 means this command applies to all profiles.

1: Enable/disable range FFT output.

0: Enable/disable noise profile output.

0: Enable/disable range Azimuth Heat Map output.

0: Enable/disable range Doppler Heat Map output.

0: Enable/disable statistics output.

0: Reserved value.

**cfarCfg** -1 0 2 8 4 3 0 15 1

This command configures the range CFAR settings.

-1: Profile index, -1 means this command applies to all profiles.

0: CFAR instance (0 for range, 1 for Doppler).

2: Detection method (CA-CFAR, GO-CFAR, or SO-CFAR).

8: Number of guard cells.

4: Number of training cells.

3: Scaling factor.

0: Reserved value.

15: Range detection threshold in dB.

1: Peak grouping flag.

**cfarCfg** -1 1 0 4 2 3 1 15 1

This command configures the Doppler CFAR settings. The parameters have the same meanings as in the range CFAR configuration, but the CFAR instance is set to 1 for Doppler.

multiObjBeamForming -1 1 0.5

This command configures the multi-object beamforming settings.

-1: Profile index, -1 means this command applies to all profiles.

1: Enable/disable multi-object beamforming.

0.5: Threshold scale (x100).

**clutterRemoval** -1 0

This command configures the static clutter removal settings.

-1: Profile index, -1 means this command applies to all profiles.

0: Enable/disable static clutter removal (0 for disabled, 1 for enabled).

**calibDcRangeSig** -1 0 -5 8 256

This command configures the DC range signal calibration settings.

-1: Profile index, -1 means this command applies to all profiles.

0: Calibration mode (0 for disabled, 1 for enabled).

-5: Minimum allowed negative range bin for calibration.

8: Number of consecutive positive range bins for calibration.

256: Calibration counter.

**extendedMaxVelocity** -1 0

This command configures the extended maximum velocity settings.

-1: Profile index, -1 means this command applies to all profiles.

0: Enable/disable extended maximum velocity (0 for disabled, 1 for enabled).

**lvdsStreamCfg** -1 0 0 0

This command configures the LVDS stream settings.

-1: Profile index, -1 means this command applies to all profiles.

0: Enable/disable CBUFF LVDS output (0 for disabled, 1 for enabled).

0: Reserved value.

0: Data size (0 for 16-bit, 1 for 32-bit).

**compRangeBiasAndRxChanPhase** 0.0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0

This command compensates for range bias and Rx channel phase.

0.0: Range bias in meters.

The remaining numbers are the complex coefficients for phase compensation of each Rx channel. In this example, all coefficients are set to 1 + 0j.

**measureRangeBiasAndRxChanPhase** 0 1.5 0.2

This command sets the parameters for measuring range bias and Rx channel phase.

0: Enable/disable measurement (0 for disabled, 1 for enabled).

1.5: Target distance in meters.

0.2: Search window size in meters.

**CQRxSatMonitor** 0 3 5 121 0

This command configures the receive saturation monitor.

0: Profile index.

3: Saturation threshold.

5: Signal threshold.

121: Number of consecutive samples to monitor.

0: Enable/disable monitor (0 for disabled, 1 for enabled).

**CQSigImgMonitor** 0 127 4

This command configures the signal image monitor.

0: Profile index.

127: Number of range bins to monitor.

4: Number of consecutive samples to monitor.

analogMonitor 0 0

This command configures the analog monitor.

0: Enable/disable the analog monitor (0 for disabled, 1 for enabled).

0: Reserved value.

**aoaFovCfg** -1 -90 90 -90 90

This command configures the angle of arrival field of view.

-1: Profile index, -1 means this command applies to all profiles

**aoaFovCfg** -1 -90 90 -90 90

This command configures the angle of arrival field of view.

-1: Profile index, -1 means this command applies to all profiles.

-90: Minimum azimuth angle in degrees.

90: Maximum azimuth angle in degrees.

-90: Minimum elevation angle in degrees.

90: Maximum elevation angle in degrees.

**cfarFovCfg** -1 0 0 8.92

This command configures the range field of view for CFAR.

-1: Profile index, -1 means this command applies to all profiles.

0: CFAR instance (0 for range, 1 for Doppler).

0: Minimum range in meters.

8.92: Maximum range in meters.

**cfarFovCfg** -1 1 -1 1.00

This command configures the Doppler field of view for CFAR.

-1: Profile index, -1 means this command applies to all profiles.

1: CFAR instance (0 for range, 1 for Doppler).

-1: Minimum radial velocity in m/s.

1.00: Maximum radial velocity in m/s.

**sensorStart**

This command starts the sensor with the configured settings.

More info on **profileCfg** command:

profileCfg <profileId> <pf> <f> <startFreq> <idle> <adcStartTime> <rampEndTime> <txOutPower> <txPhaseShifter> <freqSlope> <txStartTime> <adcSamples> <adcSampleRate> <hpfCornerFreq1> <hpfCornerFreq2> <rxGain>

profileId: This is the profile index.

pf: This is the profile flag.

f: This is the frequency flag.

startFreq: Start frequency of the frequency modulated chirp in GHz.

idle: Idle time in microseconds.

adcStartTime: ADC start time in microseconds.

rampEndTime: Ramp end time in microseconds.

txOutPower: TX output power in dBm.

txPhaseShifter: TX phase shifter value.

freqSlope: Frequency slope of the frequency modulated chirp in MHz/us.

txStartTime: TX start time in microseconds.

adcSamples: Number of ADC samples.

adcSampleRate: ADC sample rate in Msps.

hpfCornerFreq1: High-pass filter corner frequency 1 in kHz.

hpfCornerFreq2: High-pass filter corner frequency 2 in kHz.

rxGain: Receiver gain in dB.