# mmWave Studio – Sensing Estimator

Prototype chirp designs rapidly with real-time feedback!

Load sensible default values to quickly start from a valid configuration.

Input system level parameters about the scene the sensor needs to detect. Experiment with different parameters to design the perfect chirp.

Enables saving and reloading of the work for future adjustment.

https://dev.ti.com/mmWaveSensingEstimator
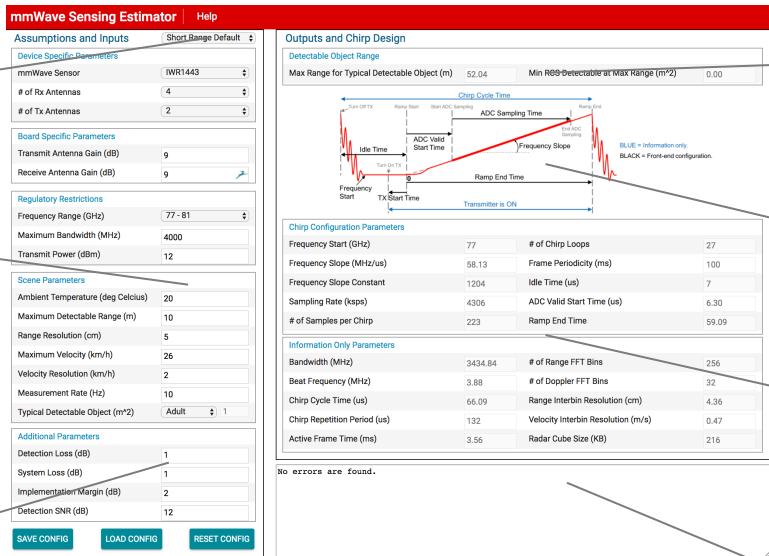
Estimates maximum range for different size objects

Visualize the chirp configuration parameters as they affect the chirp.

Calculates the chirp parameters instantly on input changes.

Detects outs of bounds inputs and provides tips on how to get back into bounds.

TEXAS INSTRUMENTS

Getting Started – Step #1

Select the default values to start with:

- Option #1: Short Range Default
  - Designed to reflect the out of box demo for proximity in short range with high resolution
- Option #2: Long Range Default
  - Designed to detect vehicle at long range

TEXAS INSTRUMENTS

Getting Started – Step #2

1. Select the device family and number of active Tx and Rx antennas.

2. Input the transmission gain of the antenna on your PCB. TI EVMs are 8dB for both.

3. Input regulatory restrictions based on where the sensor will deploy.

Assumptions and Inputs — Short Range Default

Device Specific Parameters

mmWave Sensor	xWR1443
# of Rx Antennas	4
# of Tx Antennas	2

Board Specific Parameters

Transmit Antenna Gain (dB)	8
Receive Antenna Gain (dB)	8

Regulatory Restrictions

Freqency Range (GHz)	77 - 81
Maximum Bandwidth (MHz)	4000
Transmit Power (dBm)	12

Getting Started – Step #3

1. Input the desired maximum parameters of your scene.

2. Input additional parameters to build in engineering margin into the design. Defaults are a good start for most applications

3. Optional: Save the current configuration or load an existing one from the PC.

Transmit Power (dBm)	12

Scene Parameters

Ambient Temperature (deg Celcius)	20
Maximum Detectable Range (m)	70
Range Resolution (cm)	45
Maximum Velocity (km/h)	65
Velocity Resolution (km/h)	2
Measurement Rate (Hz)	25
Typical Detectable Object (m^2)	Car ▾ 5

Additional Parameters

Detection Loss (dB)	2
System Loss (dB)	1
Implementation Margin (dB)	2
Detection SNR (dB)	12

SAVE CONFIG   LOAD CONFIG   RESET CONFIG

Getting Started – Results
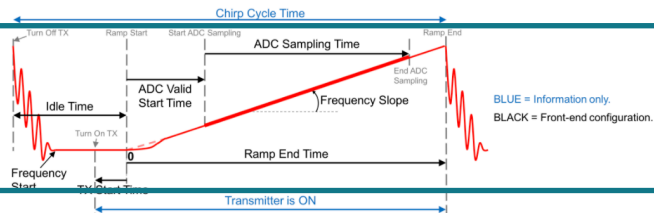
Calculated maximum detectable range for the selected typical object size.

Calculated minimum object size at the inputted maximum detectable range.

Calculated chirp cpmfog parameters for the analog front-end. For explanation of each please see the User Guide:

Getting Started – Errors & Tips

Out of bounds values are highlighted to enable rapid prototyping.

Detected errors are explained and helpful tips to correct the errors are provided.

TEXAS INSTRUMENTS