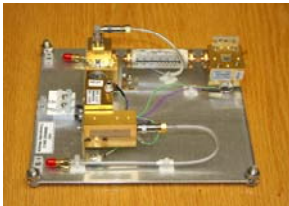


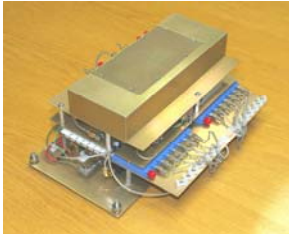
HXI Model 8300 73 GHz Multi-Static FMCW Radar Front End (“RFE”)



Tx Module



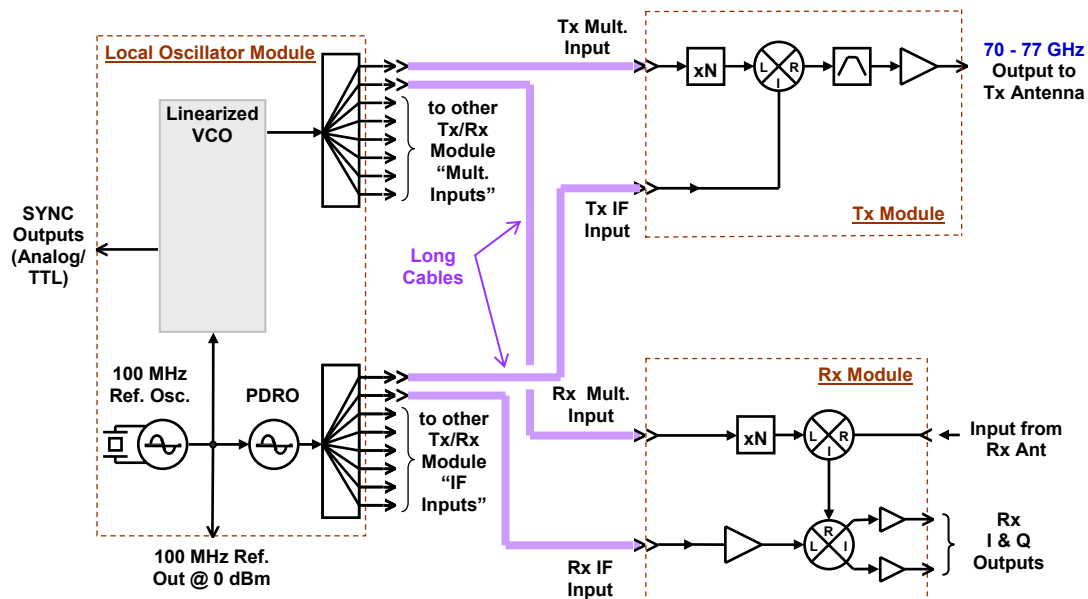
Rx Module



Local Oscillator Module

- Fully Coherent
- Closed-Loop Linearized
- 70-77 GHz FM Sweep Bandwidth
- 8 Tx and Rx Modules Simultaneously Supported, in any combination, up to 10 ft. apart - Standard
- 64 Tx and Rx Modules Simultaneously Supported, in any combination, up to 20 ft. apart - Optional
- Supports simultaneous multi-illumination, multi-look angles

The HXI 8300 Radar Front End consists of separate *Tx* and *Rx Modules*, that when integrated with the *Local Oscillator Module* (“LOM”), form the superheterodyne portion of a fully coherent, linearized, ultra-wideband, FMCW, Monostatic, Bistatic, or Multistatic, radar. The LOM directly supports a maximum of eight Tx or Rx Modules - *in any combination* - that connect via 10 ft. long small diameter coaxial cables, which also permit movement between modules during data collection. More Tx and/or Rx Modules can be added, at any time, by adding extra amplifiers and power dividers to drive the additional Modules. Switchable polarizers and antennas are also available. The RFE modules use “breadboard” construction and are intended to support lab-quality data collection efforts in indoor or sheltered outdoor environments. Miniaturized, weather-proof versions are optionally available.



RFE Architecture (only one Tx and one Rx Module shown)

Key parameters are detailed in the Table below:

RFE Parameters

<u>Parameter</u>	<u>Value</u>	<u>Notes</u>
RF output frequency sweep	70 - 77 GHz	
RF output (antenna injection) power	7 dBm (5 mW) typ.	up to 20 dBm min. (100 mW) available
Out-of-band spurious	-55 dBc max.	
FM sweep linearity	>99.99%	
FM sweep waveform	symmetrical triangle	shape is fixed
FM sweep time	164 uS up/down ramps	sweep time is fixed
Rx Noise Figure	9 dB typ.	lower Noise Figures available
Rx (-1 dB) input comp. pt.	0 dBm typ.	
Rx input damage level	>10 dBm	
Rx RF/Video gain	17.5 dB nom.	video amplifiers driving 50Ω load
Rx Video output frequency range	1 - 10 MHz, -0.8 dB BW	other bandwidths available
Rx Video output vs. target range	285 KHz/m	
Rx IQ phase balance	within ±3 deg. typ.	over operating temperature range
Rx IQ amplitude balance	±0.2 dB typ.	over operating temperature range
Rx Video (IQ) output connectors	SMA-F	
LOM Reference output	100 MHz @ 0 dBm	from low noise ovenized xtal osc.
LOM SYNC output (analog)	0-1 Volt peak into 50Ω, 50% duty cycle square wave	Rs = 50Ω; synchronous with FM sweep up/down ramps; 1V ↔ up ramp
LOM SYNC output (digital)	0-5 Volt peak TTL compatible, 50% duty cycle	Rs = 50Ω; synchronous with FM sweep up/down ramps; TTL "1" ↔ up ramp
Tx mod./LOM and Rx mod./LOM cables	7 ft. long; 0.085" dia. semi-rigid	SMA-M conn.; supplied with modules
Antenna interfaces	WR-12, UG387/U	
Operating ambient temperature	0 to +50 deg. C	wider range available
Storage temperature	-20 to +75 deg. C	
Humidity (operating/storage)	95% max. RH	non-condensing
Size: Rx module	6"W x 8" L x 3"H	approx.; miniaturized version available
Size: Tx module	6"W x 8" L x 3"H	approx.; miniaturized version available
Size: LOM	12"W x 12"L x 6"H	approx.; miniaturized version available
Weight: Rx module	2.2 lb	approx.; lighter weight version available
Weight: Tx module	1.5 lb	approx.; lighter weight version available
Weight: LOM	16 lb	approx.; lighter weight version available
DC Input power: Rx module	+12V @ 210 mA +7.5V @ 355 mA +5V @ 90 mA -7V @ 35 mA	each module; lower power ver. available
DC Input power: Tx module	+7.5V @ 520 mA	each module; lower power ver. available
DC Input power: LOM	+15V @ 60 mA +12V @ 1,360 mA +7.5V @ 1,490 mA +5V @ 520 mA -15V @ 111 mA	lower power ver. available