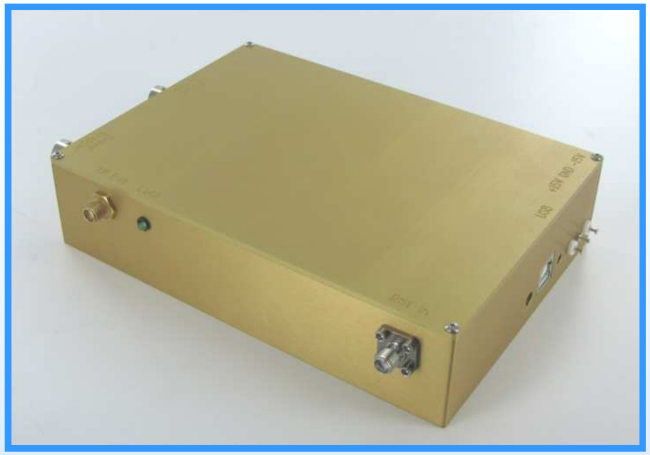
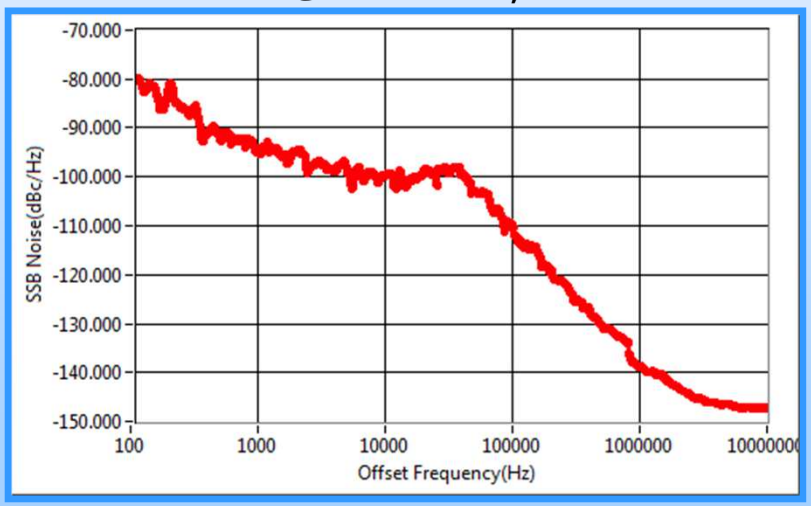
VDI Synthesizer



- 8-20GHz Synthesizer
- Fast switching speed
- Frequency sweeping
- Excellent phase noise
- USB control with software

Phase Noise @ 16.3 GHz, 10MHz Ref



Product Description

VDI synthesizers were designed specifically for VDI sources and receivers with features targeted for Terahertz applications. The frequency range of 8-20 GHz and power of 17dBm is compatible with most VDI multiplier chains. The synthesizer offers competitive phase noise and 20 Hz frequency resolution in a ~6.25x4.5x1.5" package. The frequency can be controlled by a PC through a USB connection with software provided. Stepping the continuous wave frequency using USB commands can be accomplished in 1mS for step sizes as high as 40MHz. The frequency can be continuously swept linearly across any portion of the band with resolution better than 20 Hz and step times as low as 4 nS. Phase can be similarly controlled within 0.5 degrees. Frequency step size and step time can be changed to frequency sweep over +/-25 MHz at a rate of 3 kHz and sweep from 8-20 GHz in 170 mS with minimal frequency error. A trigger output signal is provided to synchronize other instruments with the beginning of a sweep. The synthesizer can be phase locked to a 10MHz reference or optionally configured for a 100MHz reference, mounted in a single housing with the VDI multiplier chain or provided separately. The synthesizer is programmed by sending ASCII text commands over the USB, and open source code for the user interface is also provided in Labview 7.0. Customized solutions are available

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VDI Synthesizer Data Sheet

Bandwidth:	8-20GHz, SMA
Output power:	16dBm min.
Resolution:	<20Hz
Harmonics:	-12dBc
Non-harmonic spurs:	<-50dBc in CW mode
Settling time:	100kHz step settles to <20 Hz within 50uS.
Sweep rate:	>25MHz deviation at 14mS/1GHz, <25MHz at 3uS/1MHz. (Faster rates are possible with frequency error.) 16-bit control of step time, 4nS minimum. +/-25MHz peak deviation at 3kHz rate. Smaller deviations are proportionally faster up to ~100kHz maximum rate. (Faster rates are possible with frequency error.)
Phase step size	< 0.5 degrees.
CW Switching time:	<800uS communication time(incremental) + settling time + sweep time (USB commands can be repeated every 1mS.)
Frequency stability:	limited by reference oscillator
Frequency repeatability:	limited by reference oscillator
Absolute frequency accuracy:	<10Hz + reference oscillator error
Reference input:	10MHz, 10dBm, SMA, option for 100MHz
Sweep trigger output:	0-3.3V digital signal, BNC (transitions high at the beginning of the sweep up and low at the beginning of the sweep down.)
Typical phase noise	See graph on front side of handout
Interface:	USB control by ASCII text commands to FTDI chip. Open source code provided for Labview 7.0.
Size:	LxWxH: ~6.125x4.375x1.5” excluding connectors, reference oscillator, fan, and external DC power supply
DC Power:	+15V ~3A, -15V ~80mA, Separate DC power supply included with AC wall plug, consumes ~50W

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FM Option

The FM option allows uploading an arbitrary waveform to modulate phase. The waveform can be played in CW mode or while the synthesizer output is ramping up and down in frequency.

Software is included which uploads a waveform to produce sinusoidal frequency modulation and allows the user to specify peak deviation and modulation rate.

An output trigger signal provides an LVTTL (0-3.3V) square wave synchronized with the uploaded waveform.

Specifications:

- 16 bit control of phase from 0 – 2pi*n where n is an internal multiplication factor determined by the synthesizer settings. A typical value for n will be 52.
- 16 bit control of step time in multiples of 4nS. Minimum step time =4nS, maximum step time =262.14uS.
- 3dB modulation bandwidth of ~70kHz.
- BNC connector for LVTTL (0-3.3V) output trigger signal.
- Using the supplied software, FM rates between ~3Hz to >200kHz are possible with maximum peak deviations following the formula pi*n*(modulation rate) up to the 3dB bandwidth.