

## Features

- 10MHz to 15GHz frequency range
- Low phase noise -104dBc/Hz -10kHz @ 10GHz
- Calibrated output power up to +17dBm
- Wide input voltage range: 5V~15Vdc @ 6W
- USB, Ethernet, TTL serial, interfaces.
- 12V POE (w/optional Ethernet adapter)
- External reference 5MHz to >100MHz
- Compact 3.2"x4.3"x0.485"



## Electrical Specifications

Note: The 5015 is **NOT** USB powered. You may purchase a Valon **PS6V-1** power supply kit.

### DC Input

<b>Input Voltage Range</b>	+16V to -16V (reverse protected)
Absolute Max	+15v
Operational Max	+4.5V (minimum voltage at the module power connector)
Operational Min	+3.5V (synthesizer remains locked and serial port ok)
Very low voltage operation	16V for >10sec resets the synthesizer to factory default settings
Hardware Reset Threshold	
<b>Input Power</b>	5 Watts normal operation 500mW Standby (power down)
<b>DC Input Connector</b>	Hirose DF3A-2P-2DS Mates with Hirose DF3-2S-2C plug and pre-crimped wire H2BXT-10112-R4 (red) and H2BXT-10112-B4 (black). 20" dc cable s supplied with synthesizer, additional cables available.

## RF Synthesizer Specifications

<b>Frequency Range</b>	10MHz to 15GHz
<b>Frequency Increment</b>	1Hz for frequency less than 4294.967MHz 10 Hz for frequency greater than 4294.967MHz 20Hz for frequency greater than 15GHz
<b>Frequency Lock Time</b>	<400uS Lock time is from the time the frequency command is sent, or a frequency step in sweep mode, or input from User Port in List mode to a stable Lock Detector output.

<b>Phase Noise</b>	Typical phase noise (+6dB max.) *Note that phase noise at <100Hz offset can be improved typically > 15dB with external high stability reference.							
	<b>10Hz</b>	<b>100Hz</b>	<b>1kHz</b>	<b>10kHz</b>	<b>100kHz</b>	<b>1MHz</b>	<b>10MHz</b>	
0.5GHz	-75	-90	-118	-130	-132	-143	-155	dBc/Hz
1GHz	-70	-84	-114	-125	-127	-138	-150	dBc/Hz
2GHz	-61	-77	-108	-118	-122	-132	-150	dBc/Hz
3GHz	-58	-78	-105	-116	-120	-127	-148	dBc/Hz
4GHz	-53	-74	-102	-114	-117	-126	-144	dBc/Hz
6GHz	-50	-70	-98	-109	-112	-121	-142	dBc/Hz
8GHz	-51	-70	-95	-105	-108	-120	-141	dBc/Hz
10GHz	-50	-68	-94	-104	-107	-120	-140	dBc/Hz
13GHz	-40	-68	-91	-102	-106	-112	-134	dBc/Hz
15GHz	-35	-66	-90	-101	-104	-112	-133	dBc/Hz
17GHz	-30	-64	-88	-99	-102	-110	-130	dBc/Hz
20GHz	-30	-64	-88	-99	-101	-110	-130	dBc/Hz
<b>Harmonics</b>	The 5015 /5019 output waveform is a clipped sine wave. Odd harmonics are typically <-12dBc, even harmonics are typically <-20dBc.							
<b>Sub Harmonics</b>	Sub harmonics(f/2 and f/4) are typically <-50dBc for output frequencies up to 15GHz .Sub harmonics (f/2)are typically <-15dBc for output frequencies from 15GHz to 20GHz.							
<b>Spurious</b>	Non-Harmonic spurious typically <-60dBc including fraction-N spurs and boundary spurs. The 5015/5019 also has four user selectable spur reduction modes. See section 6.10.4.							
<b>Output Return loss</b>	Min.(dB)		Typical(dB)					
10~ 100MHz	>6		10dB					
50MHz ~ 10GHz	>10		12					
10GHz ~ 15GHz	>6		8					
15GHz ~19GHz	>8		12					
<b>RF Connectors</b>	SMA Female							

<b>RF Output Power Range</b>	Max dBm	Typical Max dBm	Min dBm	
10MHz ~ 100MHz	>+12	+17	<-30	
100MHz ~5GHz	>+16	+18	<-30	
5GHz ~ 10GHz	>+15	+16	<-30	
10GHz ~ 15GHz	>+14	+15	<-30	
<b>RF Output Power Accuracy</b>	1GHz~15GHz ±0.7dBm +10dBm ~ -20dBm and ±0.9dBm > +10dBm or <-20dBm			
<b>RF Output Power Resolution</b>	<0.1dB			

<b>Reference Frequency</b>		
<b>Internal Reference</b>	Frequency	10.000MHz
	Initial Accuracy	± 2ppm (23°C) can be zeroed with reference trim command
	Temperature Stability	±0.5ppm -20°C to +70°C (case temp)
	Reference Trim Range	± 10ppm
	Reference Trim Resolution	0.02ppm
<b>External Reference</b>	50Ω nominal impedance	
	Frequency Range	5MHz to 100MHz, typical max 120MHz
	Input power range	-10dBm min. to +13dBm max.
<b>External Reference Connector</b>	SMA Female 50Ω nominal impedance Note: Ext input is ac coupled to synthesizer but dc coupled to internal VCTCXO control circuit. See Operations Manual for details.	
<b>EFC</b>	Pulling range >±10ppm	
Electronic frequency Control at external reference input	Voltage ±3V Input resistance 20kΩ Frequency response 0Hz~>5kHz	

## Interface

<b>USB</b>	<b>Micro-B socket</b> FTDI virtual com port 9600, 8, N,1,N default, see selectable baud rates below See FTDI for drivers for your computer. Note: The Configuration Manager GUI will automatically configure the USB port and switch to 115200 baud rate.
<b>Ethernet</b>	10BASE-T/100BASE-TX compliant with IEEE 802.3. 8-pin Hirose 2mm connector or optional external RJ-45 module and cable adapter.
<b>USER PORT</b>	3.3V TTL TXD & RXD serial, 5-bit List Mode parallel, Sweep trigger in, Sweep step out, Sweep enable out. All 3.3V TTL Hi-Z input, 200 ohm output. Optional SPI control with SCL MISO MOSI SEL (custom available on request) Lock detect output. Connector: Hirose DF11-8DP-2DS Mates with Hirose DF11-8DS-2C plug and pre-crimped wireH3BXT-10112-** (Digi-Key) <b>LSW-1</b> LIST Mode switch and cable accessory is also available.
<b>Selectable Baud Rates</b>	USB, serial TTL: 9600, 19200, 38400, 57600,115200, 230400, 460800, 921600

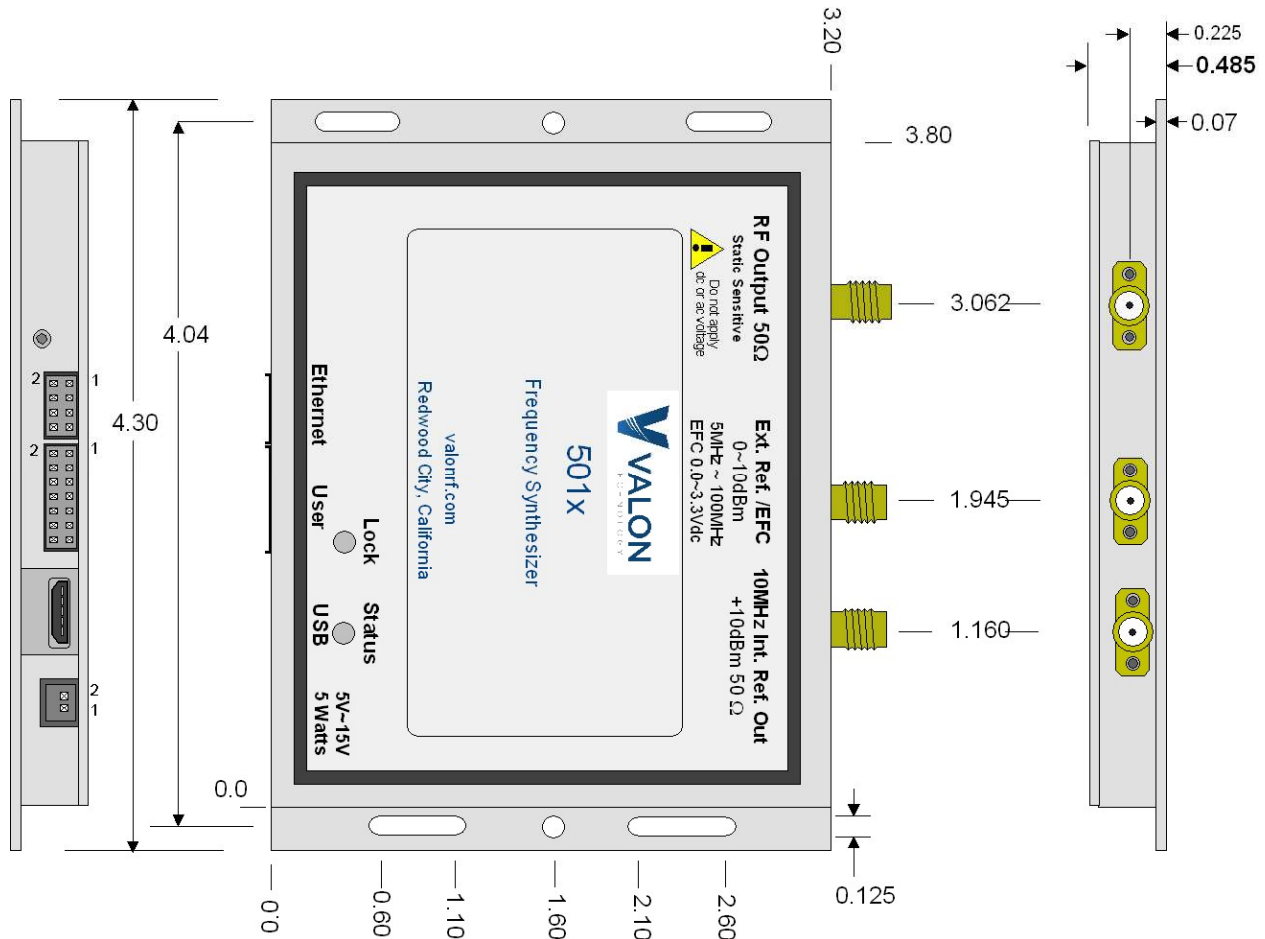
## Environmental

Operational full specifications:	-0°C~+60°C (case temperature, heat sink required)
No damage functional:	-20°C~+70°C (case temperature)
Humidity:	5%~95% minimal condensation allowed
IP rating:	50 No water protection.

## Mechanical Dimensions

3.2"x 4.3"L x 0.485"

Weight: 0.37lbs, 165g  
Material: AL-6061-T6  
Finish: Clear Alodine (conductive)



### Available Accessories:

- ETH-1 Ethernet Adapter**
- ETH-2 PoE 12V Injector**
- PS6V-1 Power Supply Kit**
- LMS-2 List Mode Selector Switch and Cable Assembly**

Visit 5015/5019 Accessory page at [www.ValonRF.com](http://www.ValonRF.com) for details and pricing.