Features

- 10MHz to 15GHz (20GHz) 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”0.485”

Electrical Specifications

Note: The Valon 5015/5019 is **NOT** USB powered.
You may purchase a Valon **PS6V-1** power supply kit.

DC Input

Input Voltage Range	
Operational Max	+15V (minimum voltage at the module power connector)
Operational Min	+5.0V (synthesizer remains locked and serial port ok)
Hardware Reset Threshold	16V for >10sec. Resets the synthesizer to factory default settings.
No Damage	+16V to -16V (reverse protected)
Input Power	5 Watts normal operation 500mW Standby (power down)
DC Input Connector	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 is supplied with synthesizer, additional cables available for purchase.

RF Synthesizer Specifications

Frequency Range	10MHz to 15GHz (5015) 10MHz to 20GHz (5019)
Frequency Increment	1Hz for frequency less than 4294.967MHz 10 Hz for frequency greater than 4294.967MHz 20Hz for frequency greater than 15GHz (5019)
Frequency Lock Time	<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.

Phase Noise	Typical phase noise (+6dB max.) *Note that phase noise at <100Hz offset can be improved typically > 15dB with external high stability reference.							
	10Hz	**100Hz**	**1kHz**	**10kHz**	**100kHz**	**1MHz**	**10MHz**	
0.1GHz	-90	-100	-127	-135	-140	-145	-155	dBc/Hz
0.5GHz	-80	-87	-118	-130	-132	-143	-155	
1GHz	-74	-84	-114	-125	-127	-138	-150	
2GHz	-70	-77	-108	-118	-122	-132	-150	
3GHz	-64	-73	-105	-116	-120	-127	-148	
4GHz	-62	-70	-102	-114	-117	-126	-144	
6GHz	-60	-65	-95	-109	-112	-121	-142	
8GHz	-55	-65	-95	-105	-110	-120	-140	
10GHz	-55	-65	-94	-104	-107	-120	-140	
13GHz	-50	-65	-91	-102	-106	-112	-134	
15GHz	-45	-62	-90	-101	-104	-112	-133	
17GHz	-30	-64	-88	-99	-102	-110	-130	
20GHz	-30	-64	-88	-99	-101	-110	-130	
Harmonics	The 5015/5019 output waveform is a clipped sine wave. Odd harmonics are typically <-12dBc, even harmonics are typically <-20dBc.							
Sub Harmonics	Sub harmonics (f/2 and f/4) are typically <-50dBc for output frequencies up to 15GHz (5015). Sub harmonics (f/2) are typically <-15dBc for output frequencies from 15GHz to 20GHz (5019).							
Spurious	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.							
Output Return loss	Min.(dB)			Typical(dB)				
10~ 100MHz	>6			10dB				
50MHz ~ 10GHz	>10			12				
10GHz ~ 15GHz	>6			8				
15GHz ~19GHz	>8			12				
RF Connectors	SMA Female							

RF Output Power Range*	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	
RF Output Power Accuracy				
1GHz~15GHz	±0.7dBm +10dBm ~ -20dBm and ±0.9dBm > +10dBm or <-20dBm			
15GHz ~20GHz	±1.0dBm +10dBm ~ -20dBm and ±1.5dBm > +10dBm or <-20dBm			
RF Output Power Resolution	<0.1dB			

**Revision 4 or later*

AM Depth	Modulation depth adjustable from 0.0dB (CW) 20dB
AM Frequency	1Hz to 2kHz, 1Hz resolution
AM Waveform	50% duty cycle square wave

Reference Frequency

Internal Reference	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
External Reference		50Ω nominal impedance
	Frequency Range	5MHz to 100MHz, typical max 120MHz (must be a multiple of 0.5MHz)
	Input power range	-10dBm min. to +13dBm max.
External Reference Connector		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.
Reference Output		10MHz buffered internal reference +9dBm ± 1dB SMA Female 50Ω nominal impedance ac coupled 5MHz to 120 MHz +9dBm buffered external reference when external reference is selected
EFC Electronic frequency Control at external reference input		Pulling range >±10ppm Voltage ±3V Input resistance 20kΩ Frequency response 0Hz~>5kHz

Interface

USB	**Micro-B socket** 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.
Ethernet	10BASE-T/100BASE-TX compliant with IEEE 802.3. 8-pin Hirose 2mm connector or optional external RJ-45 module (Valon ETH-1) and cable adapter.
USER PORT	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. Lock detect output. Connector: Hirose DF11-8DP-2DS Mates with Hirose DF11-8DS-2C plug and pre-crimped wire H3BXT-10112-** (Digi-Key) **Valon LMS-2** LIST Mode switch and cable accessory is also available.
Selectable Baud Rates	USB, serial TTL: 9600, 19200, 38400, 57600,115200, 230400, 460800, 921600

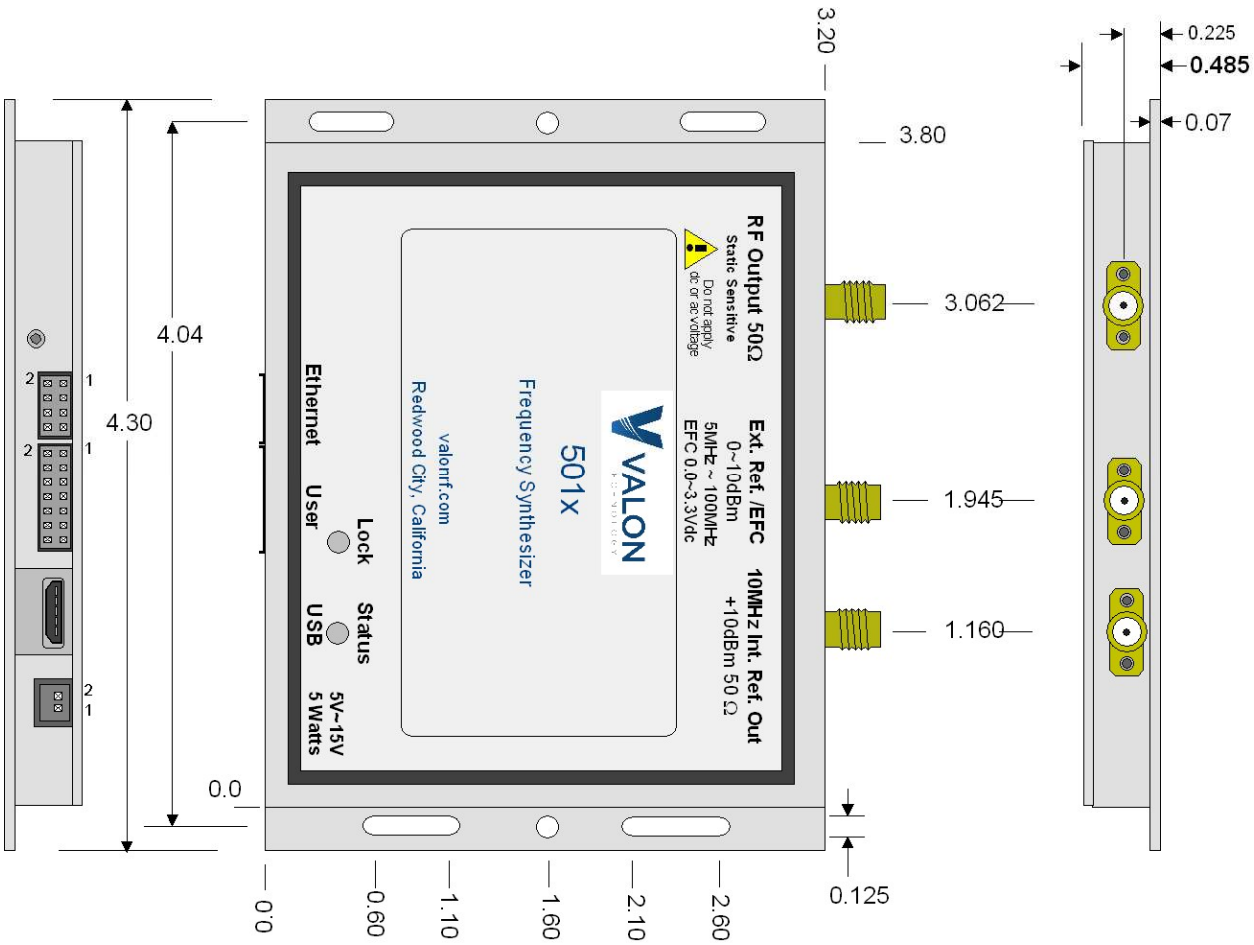
Environmental

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, 165gMaterial: 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 for details and pricing.