



 of Switzerland

Accurate  
Reliable  
Affordable

# PRODUCT CATALOG

TEST & MEASUREMENT  
INSTRUMENTS UP TO 65 GHz  
*MADE IN SWITZERLAND*



# Introduction

## ABOUT US

AnaPico is an ISO9001:2015 certified technology leader developing, manufacturing and supplying RF and MW test & measurement instruments for a wide range of civilian and governmental applications. Established in 2005 in Zurich, Switzerland, AnaPico has been heavily investing in R&D and is dedicated to creating and continuously improving its innovative and cost-efficient T&M solutions that have best-in-class performance and unique features.

**All our products are manufactured and 100% tested in Switzerland.**

Our current product offering consists of the following:

- **RF and Microwave Signal Generators up to 54 GHz**
  - analog Signal Generators with lowest phase noise
  - ultra-agile with digital modulation
  - phase-coherent multiple outputs
  - different models ranging from 2 to 54 GHz
- **Standard and customized Frequency Synthesizers**
  - wideband from 8 kHz to 20 or 43 GHz
  - ultra-compact with USB/LAN/FCP interfaces
  - fastest (<5  $\mu$ s) switching option: BCD/Binary format
- **Signal Source - & Phase Noise Analyzers up to 65 GHz**
  - highly flexible analysis of absolute and residual phase and amplitude noise, pulsed and CW
  - different models up to 7, 20, 26, 40, 50 or 65 GHz
  - transient analysis, short- and long-term stability analysis, one-step VCO characterization
  - spectral analysis

### Unique features of our products are:

- Outstanding signal purity and lowest phase noise
- High output power and fast switching speed
- Ultra-low measurement sensitivity
- Compact size and lightweight
- Low power consumption and optional battery operation
- Flexible customization of hard- and software



**AnaPico makes the difference.**

**What you can expect from us.**

At AnaPico we create Swiss made instruments with unique features. Our experienced engineering team has outstanding hardware and software skills and in partnership with our contracted distributors, AnaPico operates a growing service network in the world, offering services that meet customer expectations!

- ✓ **High reliability, superior performance instruments with low cost of ownership**
- ✓ **Short lead and service turnaround times**
- ✓ **Quick and competent after-sales support**
- ✓ **Continued hard- and software support and updates**



## SERVICES

In partnership with our contracted distributors, AnaPico operates a growing service network worldwide, offering the following services.

### Calibration

All our T&M Instruments are fully calibrated and delivered together with our calibration certificates. We recommend that our customers return the instruments to our local authorized service facilities or our headquarters in Switzerland for re-calibration every 2 years.

### Maintenance and repair

All new products of AnaPico have a standard 2-year warranty period. The warranty period is extendable up to 5 years. Our product repair and calibration service is available for 5 additional years after product phase-out.

### Product updates

Firmware and graphical user interface (GUI) software for all our products are continuously maintained and updated. They are available on our webpage and free-of-charge for our customers. Our local service facilities and partners also offer these updating services.

### Technical and logistic support

Our locally contracted distributors have trained and knowledgeable engineers and service personnel ready to help our customers with requirement clarifications, instrument trial uses, application support, and delivery and service-related logistics.



Calibration lab



R&D



Live demo

# Analog Signal Generators

## APSINX010HC & APSINXXG & APSIN6G ANALOG SIGNAL GENERATORS FROM 9 KHZ UP TO 26.5 GHZ

The APSINX010 and APSIN6G are analog RF signal generator series covering RF frequency ranges from 9 kHz to 2, 4 and 6.1 GHz. The APSINXXG is an analog signal generator series covering microwave frequency ranges from 9 kHz to 6, 12, 20 and 26.5 GHz. A combination of characteristics including good signal purity, low phase noise, fast switching speed and wide output power range, along with their very compact size, lightweight and low power consumption makes these instruments very well usable in labs, production environments and outdoor applications.



Option 1URM: 19" rack-mountable form factor



Option EB: Power bank adapter



APSINX010



APSINXXG



Option RM: 3HU 19" rack-mount kit mounting 2 portable units

## SPECIFICATIONS

	RF		Microwave
<b>Models</b>	APSIN2010HC APSIN4010HC APSIN6010HC	APSIN6G	APSIN12G APSIN20G APSIN26G
<b>Frequency Range</b>	9 kHz to 2, 4 or 6.1 GHz	9 kHz to 6 GHz	100 kHz (9 kHz with option 9K) to 12, 20 or 26.5 GHz
<b>Resolution</b>	0.001 Hz	0.001 Hz	0.001 Hz
<b>Power Range</b>	-30 to +18 dBm (-120 to +17 dBm with PE3)	-20 to +25 dBm (-120 to +25 dBm with PE3)	-20 to +15 dBm (-90 to +25 dBm with PE3/ HP) (-120 to +25 dBm with PE2/ HP)
<b>Resolution</b>	0.01 dB	0.01 dB	0.01 dB
<b>Switching Speed</b>	400 μs	300 μs (<30 μs with option FS)	300 μs (<30 μs with option FS)
<b>Phase Noise At 1 GHz</b>	at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -130 dBc/Hz at 10 MHz: -150 dBc/Hz	at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz	at 10 Hz: -80 dBc/Hz at 1 kHz: -117 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz
<b>Remote Control</b>	Ethernet, USB, GPIB		
<b>Modulation</b>	AM, FM, PM, Pulse, Chirp, AVIO (ILS, VOR)		AM, FM, PM, Pulse, Chirp, N-Pulse
<b>Sweeps</b>	List, Frequency, Power		
<b>Dimensions (W x L x H), Weight</b>	173.6 x 270.7 x 116.9 mm; [6.83 x 10.66 x 4.60 in], 2.5 kg [5.5 lbs]	173.6 x 261.7 x 116.9 mm [6.83 x 10.30 x 4.60 in], 2.5 kg [5.5 lbs]	173.6 x 261.7 x 116.9 mm; [6.83 x 10.30 x 4.60 in], 2.5 kg [5.5 lbs]



## KEY FEATURES

High output power, low phase noise
Comprehensive AM, low-distortion, wideband DC-FM, and high-speed pulse modulation
Powerful trigger and sweeping modes
DC power supply, internal / external battery operation
Touch display, web browser- or desktop application GUI

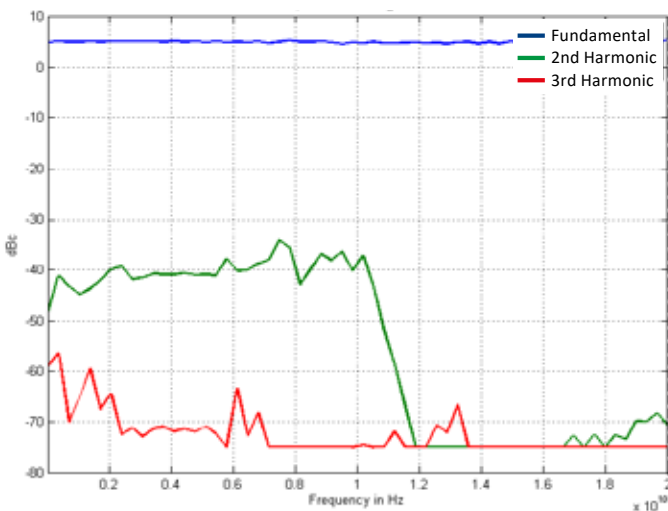
## APPLICATIONS

General purpose compact signal source
EMC / EMI testing
Service and verification
Portable, battery operated source for field operation

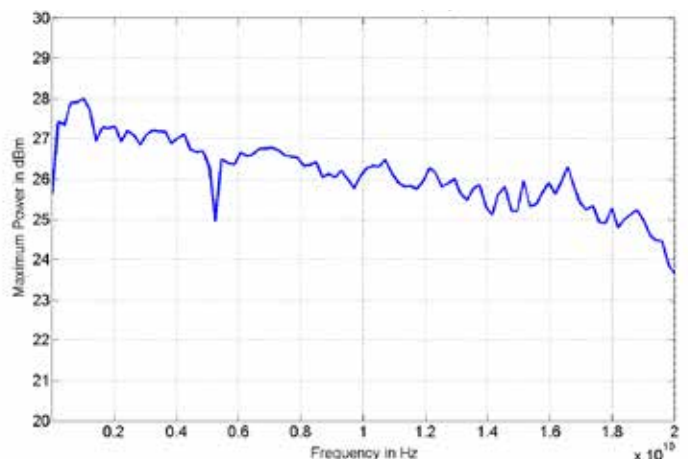
## AVAILABLE OPTIONS

		APSINX010HC	APSIN6G	APSINXXG
<b>9K</b>	Frequency range extension to 9 kHz (APSIN12G/20G)	–	–	✓
<b>HP</b>	Higher output power	–	–	✓
<b>PE3</b>	Mechanical step attenuator down to -90 dBm	✓	✓	✓
<b>PE2</b>	Mechanical step attenuator down to -120 dBm	–	–	✓
<b>NM</b>	Remove modulation (APSIN20G/26G)	–	–	✓
<b>NP</b>	Narrow pulse modulation	–	–	✓
<b>FS</b>	Fast switching speed	–	✓	✓
<b>AVIO</b>	Avionics modulation capability (VOR/ILS)	✓	✓	–
<b>B3</b>	Internal rechargeable battery module	✓	✓	✓
<b>EB6</b>	External power bank adapter cable	✓	✓	✓
<b>1URM</b>	19" 1HU rack-mount module	✓	✓	✓
<b>BAG</b>	Portable Bag	✓	✓	✓
<b>DATA</b>	Commercial Calibration Certificate with test data	✓	✓	✓
<b>FLASH</b>	MicroSD card slot for removable SD memory	✓	✓	✓
<b>GPIB</b>	GPIB interface	✓	✓	✓
<b>IEC</b>	IEC 17025 calibration with certificate	✓	✓	✓
<b>OEM</b>	OEM package	✓	✓	✓
<b>REAR</b>	Move output to the rear panel	✓	✓	✓
<b>ReCal</b>	Recalibration with certificate (recommended: 2-year interval)	✓	✓	✓
<b>RM</b>	19" 3HU rack-mount kit	✓	✓	✓
<b>WE</b>	One year warranty extension (standard: 2 years)	✓	✓	✓

## PERFORMANCE PLOTS



APSIN20G: Harmonic performance



APSIN20G: Typical maximum output power (option HP)

# Analog Signal Generators

## APULN & APMQS20

ULTRA-LOW NOISE RF MICROWAVE SIGNAL GENERATORS FROM 100 KHZ UP TO 40 GHZ

### Ultra-low noise RF Microwave Signal Generators starting from 100 kHz up to 12.75, 20, 26 or 40 GHz

The APULN is a high-performance analog signal generator (analog signal source) series covering RF and microwave frequency ranges from 100 kHz (optionally 8 kHz) to 12.75, 20, 26 and 40 GHz. A combination of characteristics such as good signal purity, ultra-low phase noise, high output power and fast switching speed, along with their very compact size, low weight and low power consumption makes these instruments very well usable in labs, manufacturing, and outdoor applications.



APULN front and rear

### APMQS20 Microwave Signal Generator from 10 MHz to 20 GHz

The APMQS20 microwave signal source modules deliver instrument-grade performance, increased functionality, and efficient power consumption at a reduced size and affordable cost. The design combines low phase noise with fast switching capability, covering a wide frequency range from 8 kHz up to 20 GHz. The low spurious and harmonic content of the signal makes it ideally suitable for many demanding applications.

The unit contains a high stability OCXO, providing accurate, power-calibrated, phase-lockable output signals.



APMQS20

## SPECIFICATIONS

Models	APULN	APMQS20
<b>Frequency Range</b>	100 kHz (8 kHz with opt. 8K) to 12.75, 20, 26, or 40 GHz	10 MHz (8 kHz with option 8K) to 20 GHz
<b>Resolution</b>	0.001 Hz	0.001 Hz
<b>Power Range</b>	-20 to +25 dBm -80 to +25 dBm (with PE4) / -120 to +25 dBm (with PE5)	-20 to +15 dBm
<b>Switching Speed</b>	500 μs (20 μs with option FS)	1 ms (15 μs with option FS)
<b>Phase Noise At 1 GHz</b>	at 10 Hz: -87 dBc/Hz (-100 dBc/Hz with option LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz	at 10 Hz: -87 dBc/Hz at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 10 MHz: -155 dBc/Hz
<b>Harmonics</b>	-50 dBc with option FILT	-45 dBc
<b>Remote Control</b>	Ethernet, USB, GPIB	Ethernet, USB
<b>Modulation</b>	Pulse, AM, FM, PM, Pulsed Chirp	FM, PM, Pulse
<b>Sweeps</b>	List, Frequency, Power	
<b>Dimensions (W x L x H), Weight</b>	174 x 290 x 113 mm [6.85 x 11.42 x 4.45 in], 2.5 kg [5.5 lbs]	177.8 x 127 x 25.4 mm [7.0 x 5.0 x 1.0 in], < 1.0 kg [< 2.2 lbs]

## KEY FEATURES APULN

Excellent signal purity: Low phase noise and low spurious
Advanced pulse modulation 20 ns pulse width (digital ALC)
Low aging rate 0.02 ppm year
Broadband and fast CHIRP modulation
Combination of low-phase noise / fastest switching
Powerful and easy to use touch-display control
Portable operation from external 24V DC power bank
Remote control via Labview drivers, API programming library

## KEY FEATURES APMQS20

APMQS20 is a replacement for the QuickSyn models
Combination of low-phase noise and low spurs
Fast-switching speed
Outstanding power level accuracy
Communication capabilities through USB, LAN, and SPI ports



## APPLICATIONS

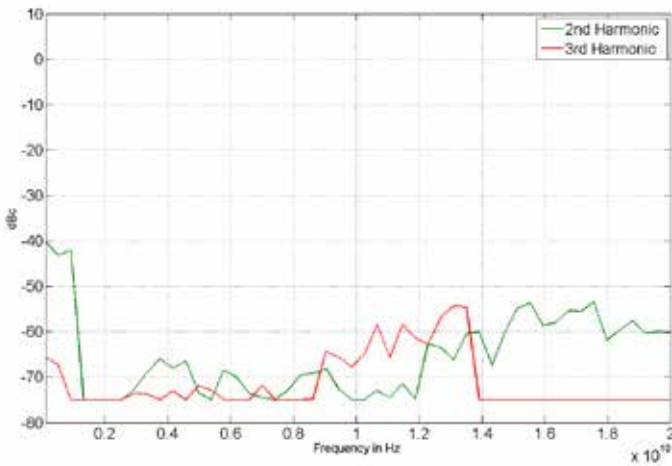
LO substitution in radar application  
Radar receiver testing

Chirp and pulse modulation for radar applications  
Automated production test

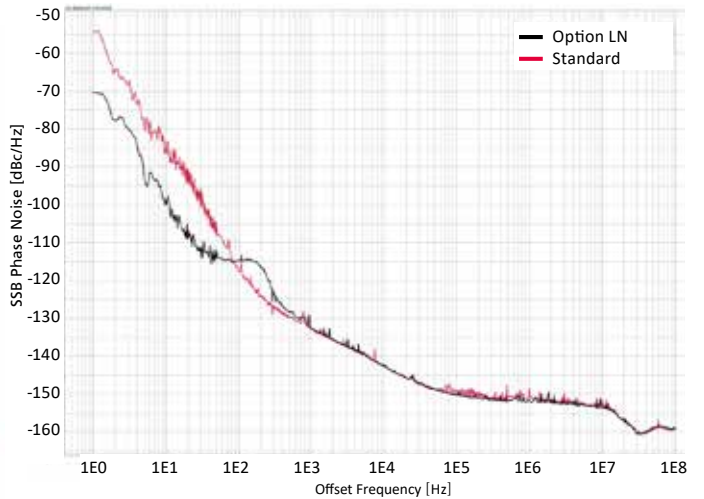
## AVAILABLE OPTIONS

		APULN	APMQS20
<b>8K</b>	Frequency range extension to 8 kHz	✓	✓
<b>PE / PE2</b>	Mechanical step attenuator down to -90 dBm / -120 dBm	✓	-
<b>PE4</b>	Electrical step attenuator	✓	-
<b>MOD</b>	Analog modulation	✓	-
<b>LN</b>	Enhanced close-in phase noise & frequency stability	✓	-
<b>LN+</b>	Enhanced close in phase noise & further enhanced long term frequency stability	✓	-
<b>FILT</b>	Enhanced harmonic rejection	✓	-
<b>FS</b>	Fast switching speed	✓	✓
<b>1URM</b>	19" 1HU rack-mount module	✓	-
<b>BAG</b>	Portable Bag	✓	-
<b>EB</b>	External power bank adapter cable	✓	-
<b>FLASH</b>	MicroSD card slot for removable SD memory	✓	-
<b>GPIB</b>	GPIB interface	✓	-
<b>RM</b>	19" 3HU rack-mount kit	✓	-
<b>VREF</b>	Variable external reference	✓	-

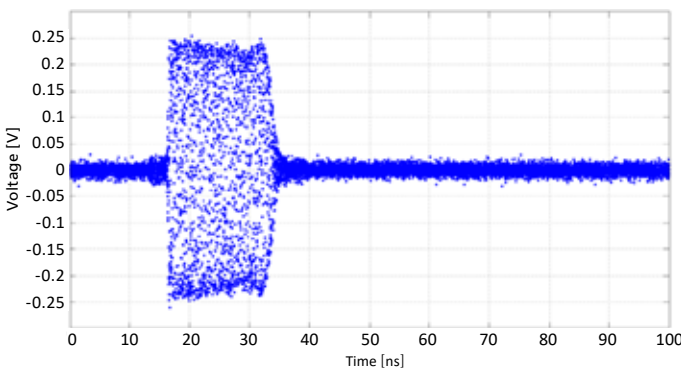
## PERFORMANCE PLOTS



APULN: Harmonics 0 dBm with option FILT



Comparison: SSB phase noise performance with and without option LN



APULN40: Pulse modulation width 20 ns at 40 GHz carrier



Web browser GUI

# Signal Generators

## APMSXXG & APLCXX-X & APVSGXX-X

### MULTI-CHANNEL SIGNAL GENERATORS FROM 9 KHZ UP TO 54 GHZ

#### Analog: APMSXXG-X & APLCXX-X

The multi-channel models are phase-coherent, ultra-fast switching, and ultra-low phase noise signal generators with a frequency range from 100 kHz to 54 GHz. Option FS provides a leading-edge switching speed down to 25  $\mu$ s. The multi-channel systems come in a standard 19" 1U or 2U (up to 4 channels) enclosure and offer USB and LAN and GPIB interface. Each interface allows for easy and fast communication using the SCPI 1999 command set.



APMSXXG-X

#### Vector: APVSG-X

The multi-channel phase-coherent vector signal sources operate effectively up to 40 GHz, with each channel offering 400 MHz IQ modulation bandwidth. The APVSG-X includes a powerful GUI for IQ data synthesis but also supports playback third-party IQ file formats. An precise timing system facilitates the time-synchronous playback of multiple streams. Streaming of pulse description words (PDWs) in combination of ultra-fast frequency hopping across the entire frequency range allows for the creation of complex radar signal scenarios. The phase-calibration option ensures a true zero offset for all channels across the frequency or power range of the APVSG-X.



APVSG-X, APLCXX-X

## SPECIFICATIONS

Models	Analog		Vector
	APMSXXG	APLCXX-X	APVSGXX-X
# of channels	1, 2, 3, 4		
Frequency Range	300 kHz to 6, 12, 20, 33, 40 GHz	9 kHz to 20, 40, 54 GHz	100 kHz to 4, 6, 12, 20, 40 GHz
Power Range	-20 to +25 dBm -60 to +23 dBm (with PE4)	-20 to +20 dBm -110 to +20 dBm (with PE2)	-20 to +18 dBm -120 to +15 dBm (with PE2)
Switching Speed	500 $\mu$ s (25 $\mu$ s with option FS)	500 $\mu$ s (20 $\mu$ s with option FS)	500 $\mu$ s (1 $\mu$ s with option UFS)
Phase Noise At 1 GHz	at 10 Hz: -87 dBc/Hz (-100 dBc/Hz with LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz	at 10 Hz: -85 dBc/Hz (-100 dBc/Hz with LN(+)) at 1 kHz: -140 dBc/Hz at 20 kHz: -150 dBc/Hz at 100 kHz: -152 dBc/Hz	at 10 Hz: -87 dBc/Hz (-100 dBc/Hz with LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz
Remote Control	Ethernet, USB, GPIB		Ethernet, USB, GPIB, FCP
Modulation	AM, FM, PM, Pulse		Digital IQ (400 MHz), Analog, AVIO, AWGN
Sweeps	List, Frequency, Power, Phase		Complex lists, Frequency, Power
Dimensions (W x L x H), Weight	19" 1HU enclosure: 440 x 470 x 44 mm [17.3 x 18.5 x 1.7 in], 10 kg [22 lbs]	19" 2HU enclosure: 444 x 572 x 86 mm [17.5 x 22.5 x 3.4 in], 18 kg [39.7 lbs]	19" 2HU enclosure: 444 x 572 x 86 mm [17.5 x 22.5 x 3.4 in], 18 kg [39.7 lbs]

## KEY FEATURES

	APMSXXG	APLCXX-X	APVSG-X
Very low phase noise	✓✓	✓✓✓	✓✓
Fast switching	✓	✓✓	✓✓✓
Low harmonic distortion	✓	✓✓	✓✓
Phase coherent switching option	✓	✓	✓
Multiple phase coherent outputs	✓	✓	✓
Excellent channel-to-channel phase stability	✓✓✓	✓✓✓	✓✓✓
Digital modulation	-	-	✓





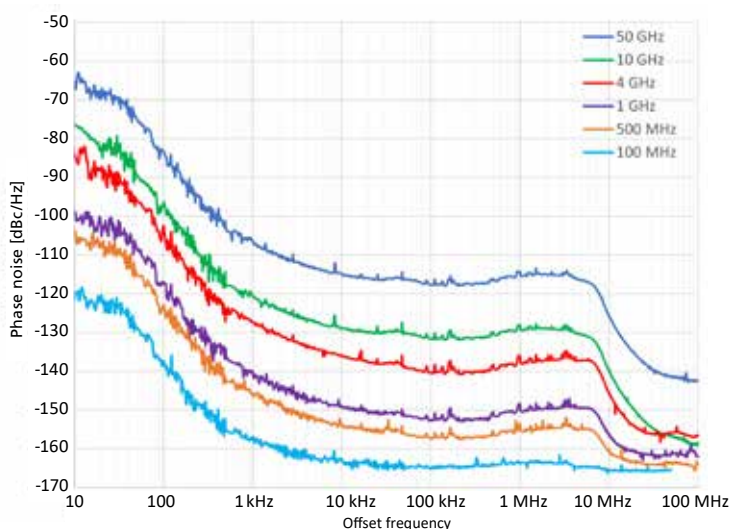
## APPLICATIONS

	APMSXXG	APLCXX-X	APVSG-X
Radar simulation	✓	✓	✓✓✓
Quantum computing	✓	✓	✓✓
High volume automated testing	✓✓	✓✓	✓✓
Phased array antenna / beamforming	✓	✓	✓✓✓
Electronic warfare	-	-	✓✓✓
5G Testing	✓	✓	✓✓

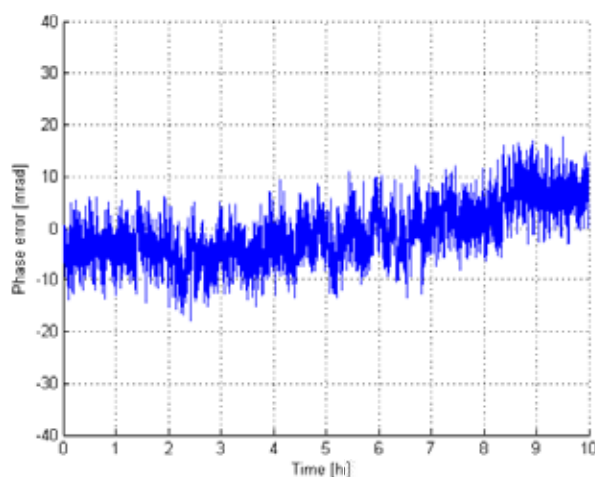
## AVAILABLE OPTIONS

		APMSXXG	APLCXX-X	APVSG-X
<b>9K / 100K</b>	Frequency range extension to 9 kHz / 100 kHz	-	✓ / -	- / ✓
<b>PE / PE2</b>	Mechanical step attenuator down to -90 / -120 dBm	-	- / ✓	✓
<b>PE4</b>	Electrical step attenuator	✓	-	✓
<b>PHS</b>	Phase coherent switching	✓	✓	✓
<b>MOD</b>	Add amplitude, frequency, phase modulation capability	✓	✓	✓
<b>PDW</b>	Pulse descriptor word	-	-	✓
<b>IVM</b>	Internal vector modulations	-	-	✓
<b>AWGN</b>	Additive white gaussian noise generation, bandwidth selective	-	-	✓
<b>FS / UFS</b>	Ultra-fast switching speed	✓ / -	✓ / -	- / ✓
<b>NEC</b>	Fast switching speed, narrow pulse (no export control required)	✓	-	-
<b>LN / LN+</b>	Enhanced close-in phase noise & further enhanced long term frequency stability	✓	✓	✓
<b>SYNC</b>	Multiple device synchronization	-	-	✓
<b>AIQ</b>	External analog IQ inputs (per channel)	-	-	✓
<b>FCP</b>	Fast control port	-	-	✓
<b>FILT</b>	Enhanced harmonic rejection	-	-	(✓)
<b>FLASH / SD</b>	MicroSD card slot for removable SD memory / IQ data storage	✓ / -	✓ / -	- / ✓
<b>VREF</b>	Flexible external reference frequency support in range 1 to 250 MHz	✓	✓	✓
<b>GPIB</b>	GPIB interface	✓	✓	✓
<b>HI</b>	High isolation 19" 1HU casing	✓	-	-
<b>DATA</b>	Commercial calibration certificate with test data (per channel)	✓	✓	✓
<b>IEC</b>	IEC 17025 calibration with certificate	✓	✓	✓

## PERFORMANCE PLOTS



APLC: Phase noise at different frequencies, power +10 dBm, option LN



APVSG40-4: 38 GHz phase stability between Ch1 and Ch2 within 10h of operation

# Vector Signal Generators

## APVSG

### SINGLE-CHANNEL ULTRA-AGILE VECTOR SIGNAL GENERATORS UP TO 40 GHz

The APVSG is an ultra fast-switching vector-modulated signal source covering a continuous frequency range with models from 100 kHz to 4, 6, 12, 20 or 40 GHz.

The standard APVSG enables outstanding ultra-fast CW frequency sweeping, chirping, intra-pulse modulation, pulse shaping, all with very low phase noise. A high performance internal IQ modulator enables customized modulation waveforms and supports dedicated modulation schemes including avionics modulation.

Streaming of pulse description words (PDWs) in combination of ultra-fast frequency hopping across the entire frequency range allows for the creation of complex radar signal scenarios.

The compact unit is fully controllable from its dedicated GUI or the touch panel display.



Front view



Rear view

## SPECIFICATIONS

<b>Frequency Range Resolution</b>	100 kHz to 4, 6, 12, 20, 40 GHz 0.001 Hz
<b>Power Range</b>	-20 to +18 dBm / -120 to +15 dBm (with option PE2)
<b>Switching Speed</b>	500 $\mu$ s (1 $\mu$ s with option UFS)
<b>Phase Noise At 1 GHz</b>	at 10 Hz: -87 dBc/Hz (-100 with option LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -145 dBc/Hz at 100 kHz: -150 dBc/Hz
<b>RF Modulation Bandwidth</b>	400 MHz
<b>Modulation</b>	Digital I/Q, AM, PM, FM, Pulse, AVIO, AWGN
<b>Remote Control</b>	Ethernet, USB, GPIB, FCP
<b>Sweeps</b>	Complex lists, Frequency, Power
<b>Dimensions (W x L x H), Weight</b>	182 x 301 x 124 mm [7.17 x 11.85 x 4.88 in], approx. 4 kg [8.8 lbs]

## KEY FEATURES

Very low WVM
Ultra-fast switching and frequency hopping
500 MS IQ data rates, up to 512 MS deep internal playback memory
Various digital modulation standards supported
Pulse descriptor word streaming from memory or FCP (fast control port)
Supports third-party IQ file formats

## APPLICATIONS

Arbitrary IQ waveform playback
Radar signal simulation, EW
Phased array signal generation for beamforming
Avionic modulation emulation
High speed antenna testing

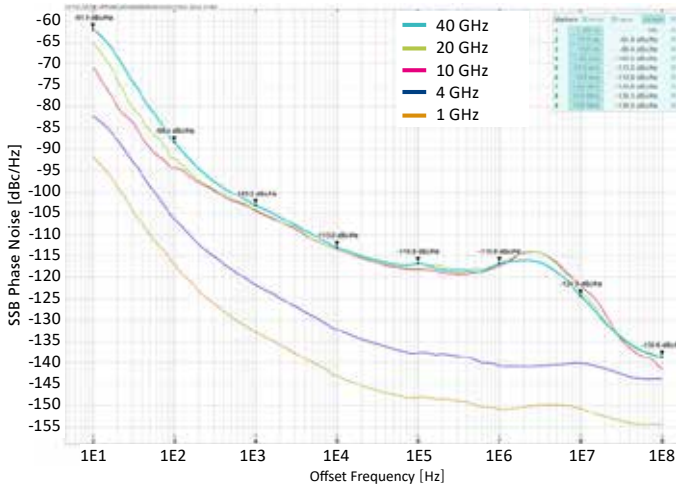


## AVAILABLE OPTIONS

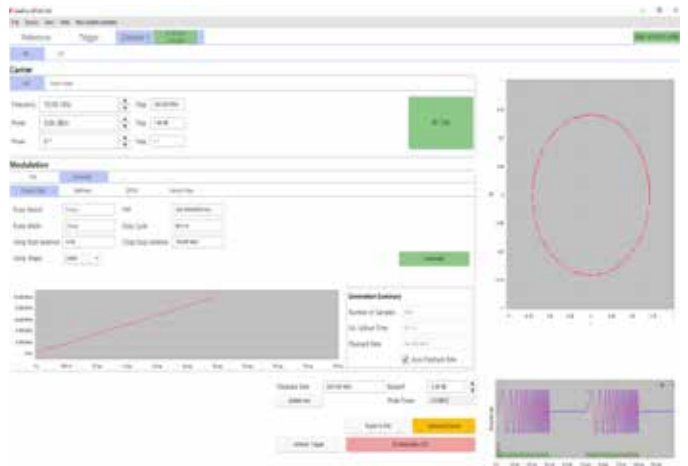
<b>UFS</b>	Ultra-fast switching speed
<b>PDW</b>	Pulse descriptor word
<b>FCP</b>	Fast control port
<b>AWGN</b>	Additive white gaussian noise generation, bandwidth selective
<b>PE4</b>	Electrical step attenuator
<b>PE</b>	Mechanical step attenuator (down to -90 dBm)
<b>PE2</b>	Mechanical step attenuator (down to -120 dBm)
<b>AIQ</b>	External analog IQ Inputs
<b>LN</b>	Enhanced close-in phase noise & frequency stability
<b>LN+</b>	Enhanced close in phase noise & further enhanced long term frequency stability

<b>100K</b>	Frequency range extension to 100 kHz
<b>MOD</b>	Analog modulations (AM, PM, FM, Pulse)
<b>IVM</b>	Internal digital modulation schemes
<b>AVIO</b>	Avionic modulations
<b>VREF</b>	Variable reference input
<b>SD</b>	MicroSD card slot for non-volatile storage of IQ data
<b>SYNC</b>	Multiple device synchronization
<b>GPIB</b>	GPIB interface
<b>EB</b>	External power bank adapter cable
<b>BAG</b>	Portable bag
<b>ReCal</b>	Recalibration with certificate (recommended: 2-year interval)
<b>WE</b>	One year warranty extension (standard: 2 years)

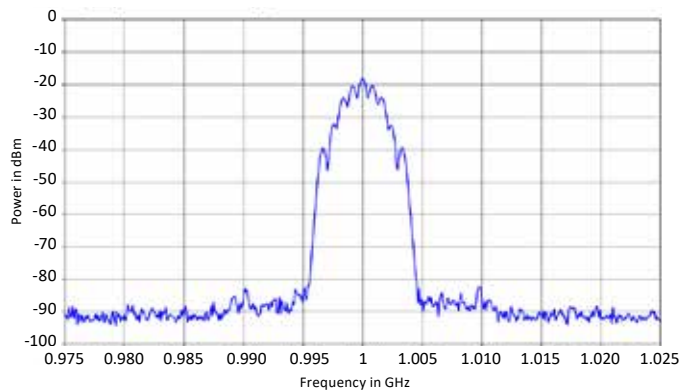
## PERFORMANCE PLOTS



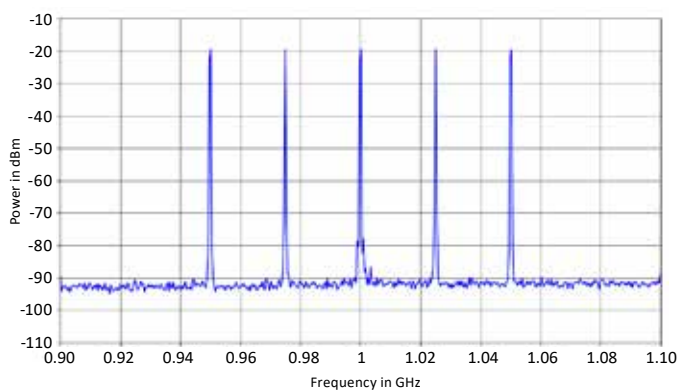
APVSG: phase noise (without option LN)



APVSG: GUI



APVSG: DME Spectrum (X channel, raised cosine filter)



APVSG: Multi-Tone 100 MHz bandwidth

# Frequency Synthesizers

## APSYN & APUASYN & APMSYN

### LOW NOISE FREQUENCY SYNTHESIZERS MODELS UP TO 43.5 GHz

AnaPico offers a variety of single- and multi-output wideband synthesizers. Starting from as low as 8 kHz they cover beyond 43.5GHz. Depending on the requirements the APSYN and APMSYN series can offer exceptional phase noise, high output power, adjustable output amplitudes, harmonic filtering and extremely fast switching.

The devices are available in compact flange mount enclosures or in standard 1URM chassis. The instruments are controlled via SCPI command language using USB, Ethernet or GPIB. Drivers and API are supplied.



APSYN140-X



APSYN420



APUASYN20-X



APMSYN22



APMSYN40

## SPECIFICATIONS

Models	Single-channel			Single- and multi-channel	
	APSYN420	APMSYN22	APMSYN40	APSYN140(-X)	APUASYN20(-X)
# of channels	1			1, 2, 3, 4	
Frequency Range	10 MHz to 20 GHz	100 kHz to 22 GHz	1 MHz to 40 GHz	100 kHz to 43.5 GHz	100 kHz to 20 GHz
Resolution	0.001 Hz	0.01 Hz	0.001 Hz	0.001 Hz	0.01 Hz
Accuracy	0.1 ppm	0.1 ppm	0.5 ppm	0.03 ppm	0.1 ppm
Power Range	+23 dBm	-20 to +25 dBm	-10 to +23 dBm	-10 to +25 dBm	0 to +18 dBm
Switching Speed	180 $\mu$ s (25 $\mu$ s with option FS)	500 $\mu$ s (<10 $\mu$ s with option FS)	500 $\mu$ s (50 $\mu$ s with option FS)	500 $\mu$ s (20 $\mu$ s with option FS)	500 $\mu$ s (10 $\mu$ s with option FS)
Phase Noise at 1 GHz	at 10 Hz: -82 dBc/Hz at 1 kHz: -118 dBc/Hz at 100 kHz: -128 dBc/Hz at 10 MHz: -150 dBc/Hz	at 10 Hz: -87 dBc/Hz at 1 kHz: -122 dBc/Hz at 100 kHz: -132 dBc/Hz at 10 MHz: -155 dBc/Hz	at 10 Hz: -80 dBc/Hz at 1 kHz: -125 dBc/Hz at 100 kHz: -140 dBc/Hz at 10 MHz: -150 dBc/Hz	at 10 Hz: -100 dBc/Hz at 1 kHz: -127 dBc/Hz at 100 kHz: -144 dBc/Hz at 10 MHz: -155 dBc/Hz	at 10 Hz: -85 dBc/Hz at 1 kHz: -115 dBc/Hz at 20 kHz: -125 dBc/Hz at 10 MHz: -155 dBc/Hz
Remote Control	Ethernet, USB			Ethernet, USB, GPIB	
Modulation	FM, PM, Pulse, Chirp	Pulse		FM, PM, Pulse	Pulse
Sweeps	List, Frequency				
Dimensions (W x L x H), Weight	105 x 210 x 60 mm [4.13 x 8.27 x 2.36 in] < 1.0 kg [< 2.2 lbs]	130 x 95 x 25 mm [5.12 x 3.74 x 0.98] < 0.6 kg [< 1.3 lbs]	60 x 150 x 26 mm [2.36 x 5.9 x 1.02 in] 0.6 kg [1.3 lbs]	<b>Single:</b> 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] <b>Multi:</b> 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs]	<b>Single:</b> 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] <b>Multi:</b> 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs]



## KEY FEATURES

	AP-SYN140	AP-SYN420	APUA-SYN20	APM-SYN22	APM-SYN40	AP-SYN140-X	APUA-SYN20-X
Low phase noise	✓✓	✓	✓	✓	✓✓✓	✓✓	✓
Highly phase-synchronous and -coherent switching option	–	–	–	–	–	✓✓	✓
Fast switching down to 20 μs	✓	✓	✓✓	✓✓✓	✓	✓	✓✓✓
Pulse	✓	✓	✓	✓	✓	✓	✓
Chirps	✓	✓	–	–	–	✓	–
FM, PM	✓	✓	–	–	✓	✓	✓
Internal OCXO, external variable reference	✓	✓	✓	✓	✓	✓	✓
Single DC supply	✓	✓	✓	✓	✓	AC	AC

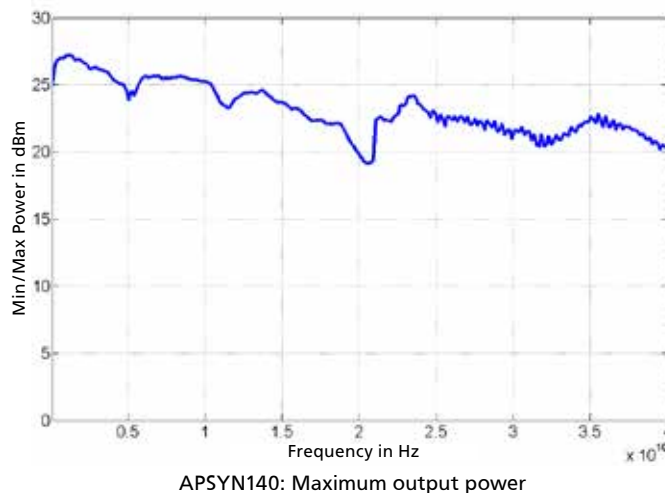
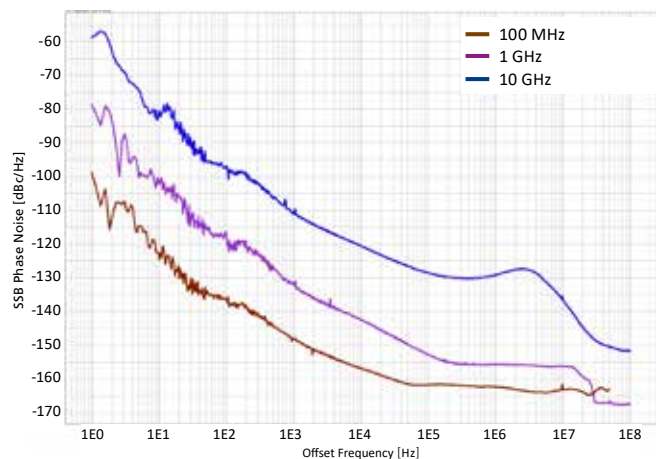
## APPLICATIONS

	AP-SYN140	AP-SYN420	APUA-SYN20	APM-SYN22	APM-SYN40	AP-SYN140-X	APUA-SYN20-X
Automated Testing	✓	✓	✓	✓	✓	✓	✓
Test equipment LO	✓✓	✓✓	✓	✓	✓✓	✓	✓✓
Wireless infrastructure	✓	✓	✓	✓	✓	✓	–
Military and Aerospace	✓	✓	✓	✓	✓	✓	✓

## AVAILABLE OPTIONS

		AP-SYN140	AP-SYN420	APUA-SYN20	APM-SYN22	APM-SYN40	AP-SYN140-X	APUA-SYN20-X
<b>8K</b>	Frequency range extension to 8 kHz	–	–	✓	–	–	✓	✓
<b>EB</b>	External power bank adapter cable	✓	–	✓	–	–	–	–
<b>FILT</b>	Harmonic filtering (available with TOUCH)	✓	–	–	–	–	✓	–
<b>FS</b>	Fast switching speed	✓	✓	✓	✓	✓	✓	✓
<b>FCP</b>	Fast control port	–	–	–	–	–	–	✓
<b>FM</b>	Frequency/Phase Modulation	–	–	–	–	–	✓	–
<b>PHS</b>	Phase coherent switching	–	–	–	–	–	✓	–
<b>FLASH</b>	MicroSD card slot for removable SD memory	–	–	–	–	–	✓	✓
<b>GPIB</b>	GPIB interface	–	–	–	–	–	✓	✓
<b>HI</b>	High isolation 19" 1HU casing	–	–	–	–	–	✓	✓
<b>IEC</b>	IEC 17025 calibration with certificate	–	–	–	–	–	✓	✓
<b>LN</b>	Enhanced phase noise & frequency stability	✓	–	–	–	–	✓	–
<b>TOUCH</b>	Enclosure with touch display control	✓	–	✓	–	–	–	–
<b>VREF</b>	Variable external reference	✓	✓	–	–	–	✓	–
<b>DATA</b>	Commercial Calibration Certificate with test data	–	–	–	✓	✓	✓	✓

## PERFORMANCE PLOTS



# Phase Noise Analyzers

## APPH & APNA

### SIGNAL SOURCE ANALYZERS FROM 1 MHZ UP TO 65 GHZ

The APPH is a fully contained phase noise analyzer with models up to 7, 26, 40, 50 and 65 GHz. It offers an indispensable set of measurement functions for evaluating signal sources ranging from VHF to microwave frequencies, both active and passive non-self-oscillating devices like amplifiers, or frequency dividers. A mixed-signal system architecture with a FPGA cross-spectrum engine enables very fast signal processing and ultra-low phase noise sensitivity.

Built-in programmable power supplies and low-noise tuning voltages make the unit extremely flexible and easy to use.

The full set of functions includes:

- absolute and residual phase noise measurement of CW and pulse modulated signals
- amplitude noise measurement of CW and pulse modulated signals
- time stability measurements including Allan deviation
- cross-spectrum FFT analysis with 100 MHz bandwidth
- transient measurements
- oscillator test bench
- spectrum monitoring



APPH40G



Option LO offers access to internal LO's and individual RF channels

## SPECIFICATIONS

Models	APPH6040 APPH20G APPH40G	APNA20 APNA50 APNA60
Frequency Range	1 MHz to 7, 26 or 40 GHz	1 MHz to 20, 50 or 65 GHz
Input Power Range	-15 to +20 dBm	
Phase Noise Sensitivity	-190 dBc/Hz	
Analysis Range	0.01 Hz to 100 MHz	
Measurements	Phase noise (absolute & additive, CW, pulsed or burst-mode), amplitude noise (CW & pulsed), jitter, allan deviation, transients of frequency / power / phase, spectrum monitoring, VCO test bench	Phase noise (absolute & additive, CW, pulsed), amplitude noise (CW & pulsed), jitter, transients of frequency / power / phase, allan deviation
Dimensions (W x L x H), Weight	468.0 x 341.0 x 152.5 [18.4 x 13.5 x 6.0 in] without handle, 11 kg [24.3 lbs]	

## KEY FEATURES

All-in-one compact measurement system
Measurements down to -190 dBc/Hz
Offset range from 0.01 Hz to 100 MHz
Highest flexibility & dynamic range by selectable internal or external references
Programmable low noise power supplies
Powerful GUI and programming interface

## APPLICATIONS

Ultra-low phase noise crystal oscillator analysis
Versatile phase noise and amplitude noise analysis
Analysis of pulsed signals
High-speed production testing of phase noise
Additive phase noise characterization of amplifiers, transmitters, mixers
Time stability analysis of clocks
VCO testing

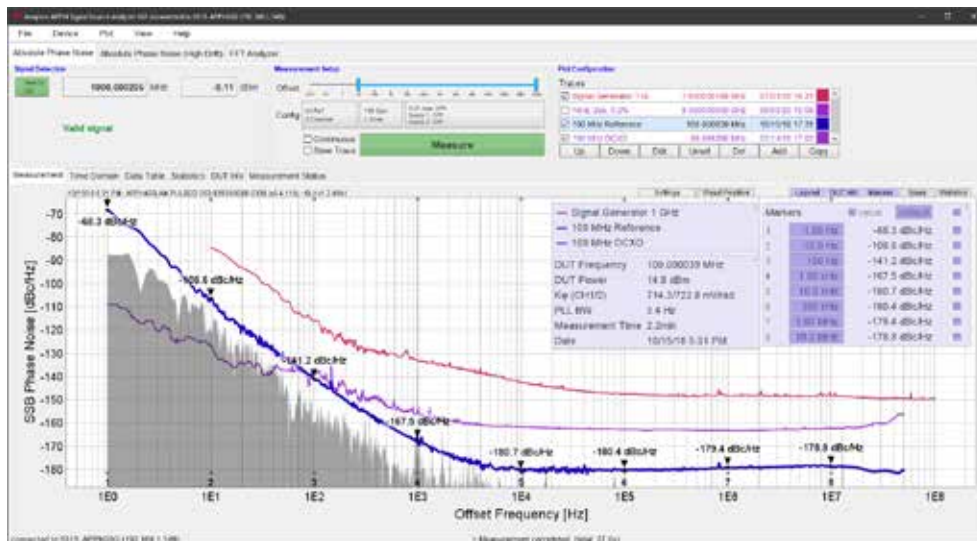


## AVAILABLE OPTIONS

<b>AM</b>	Amplitude noise measurements
<b>APN</b>	Additive phase noise measurement
<b>APNS</b>	Accessory: Traceable AM / PN noise standard
<b>BURST</b>	Burst mode phase noise measurement
<b>GPIB</b>	GPIB interface
<b>LN</b>	Ultra-low noise internal sources
<b>LO</b>	Access to internal references for residual phase noise measurements
<b>PS06</b>	Accessory: 1-6 GHz mechanical phase shifter

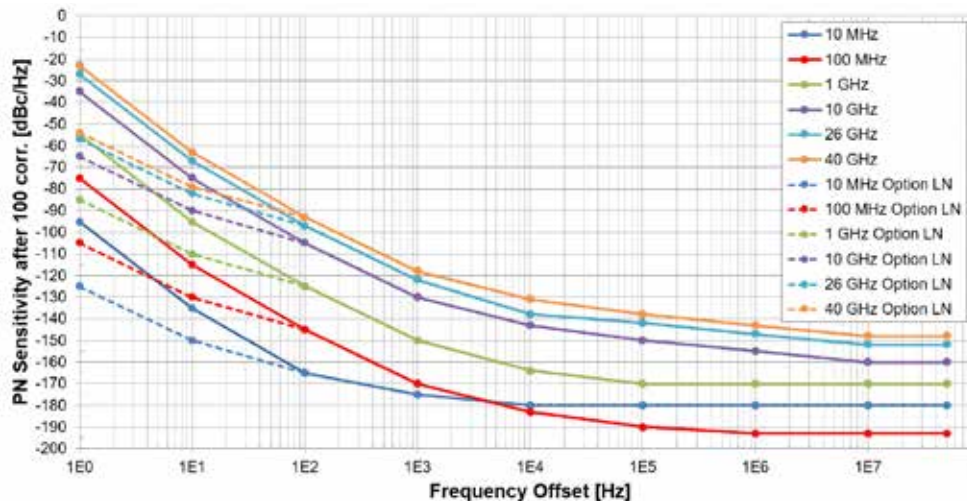
<b>PS18</b>	Accessory: 4-18 GHz mechanical phase shifter
<b>PULSE</b>	Pulsed signal measurement
<b>ReCal</b>	Recalibration with certificate (recommended: 2-year interval)
<b>SPEC</b>	Spectrum monitoring
<b>TRAN</b>	Transient analysis
<b>TSTAB</b>	Time stability analysis
<b>VCO</b>	VCO characterization
<b>WE</b>	One year warranty extension (standard: 2 years)

## GRAPHICAL USER INTERFACE



APPH GUI: flexible desktop application to perform measurements via USB and ethernet

## PERFORMANCE PLOTS



APPH: Phase noise sensitivity after 100 correlation



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*Affordable*

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