



 of Switzerland

Accurate  
Reliable  
Affordable

# PRODUCT CATALOG

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



Product	Frequency Range	Phase Noise at 1 GHz at 20 kHz	Page
<b>Analog Signal Generators</b>			
<b>Single-Channel</b>			
APSINX010	9 kHz to 6.1 GHz	-128 dBc/Hz	4
APSIN6G	9 kHz to 6 GHz	-128 dBc/Hz	4
APSINXXG	9 kHz to 26.5 GHz	-128 dBc/Hz	4
APULN	8 kHz to 40 GHz	-144 dBc/Hz	6
APMQS20	8 kHz to 20 GHz	-146 dBc/Hz	6
APLCXX	9 kHz to 54 GHz	-150 dBc/Hz	10
APHSPXX	1 kHz to 51 GHz	-155 dBc/Hz	10
<b>Multi-Channel</b>			
APMS	300 kHz to 40 GHz	-145 dBc/Hz	8
APLCXX-X	9 kHz to 54 GHz	-150 dBc/Hz	10
APHSPXX-X	1 kHz to 51 GHz	-155 dBc/Hz	10
<b>Vector Signal Generators</b>			
APVSGXX(-X)	100 kHz to 40 GHz	-145 dBc/Hz	12
<b>Frequency Synthesizers</b>			
<b>Single-Channel</b>			
APSYN140	8 kHz to 40 GHz	-145 dBc/Hz	14
APSYN420	10 MHz to 20 GHz	-128 dBc/Hz	14
APMSYN22	100 kHz to 22 GHz	-132 dBc/Hz	14
APMSYN40	1 MHz to 40 GHz	-145 dBc/Hz	14
APUASYN20	8 kHz to 20 GHz	-125 dBc/Hz	14
<b>Multi-Channel</b>			
APSYN140-X	8 kHz to 40 GHz	-145 dBc/Hz	16
APUASYN20-X	8 kHz to 20 GHz	-125 dBc/Hz	16
<b>Phase Noise Analyzers</b>			
APPH	1 MHz to 40 GHz		18
APNA	1 MHz to 65 GHz		18

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 1 kHz 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 μs) 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

**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.

# 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



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



APSINX010



APSINXXG

### SPECIFICATIONS

Models	RF		Microwave
	APSIN2010HC APSIN4010HC APSIN6010HC ▶ DOWNLOAD DATASHEET	APSIN6G ▶ DOWNLOAD DATASHEET	APSIN12G APSIN20G APSIN26G ▶ DOWNLOAD DATASHEET
Frequency Range	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
Resolution	0.001 Hz	0.001 Hz	0.001 Hz
Power Range	-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)
Resolution	0.01 dB	0.01 dB	0.01 dB
Harmonics	-30 dBc (-50 dBc with option FILT)		
Switching Speed	400 μs	300 μs (<30 μs with option FS)	300 μs (<30 μs with option FS)
Phase Noise At 1 GHz	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
Remote Control	Ethernet, USB, GPIB		
Modulation	AM, FM, PM, PULSE, Chirp, AVIO (ILS, VOR)		AM, FM, PM, PULSE, Chirp, N-Pulse
Sweeps	List, Frequency, Power		
Dimensions (W x L x H), Weight	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

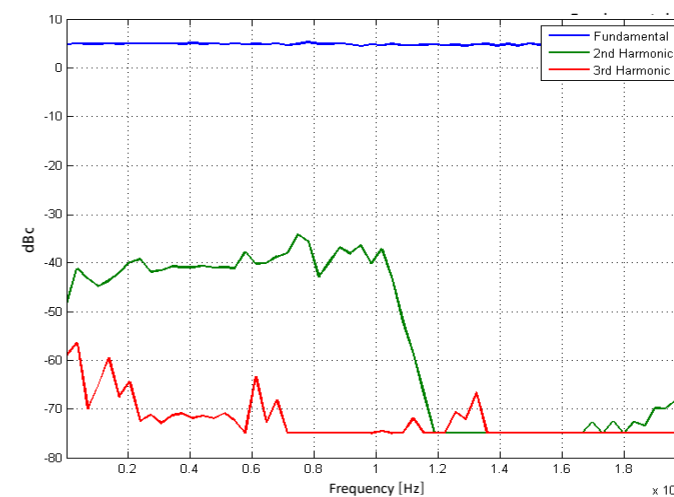
### APPLICATIONS

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

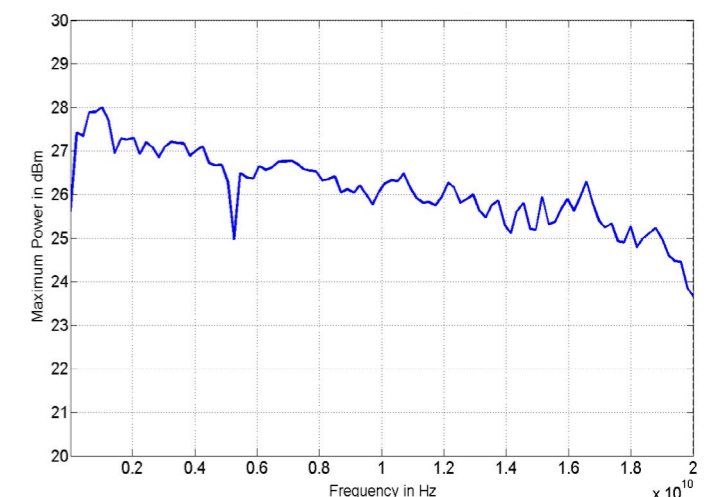
### AVAILABLE OPTIONS

		APSINX010HC	APSIN6G	APSINXXG
9K	Frequency range extension to 9 kHz (APSIN12G/20G)	-	-	✓
HP	Higher output power	-	-	✓
PE3	Mechanical step attenuator down to -90 dBm	✓	✓	✓
PE2	Mechanical step attenuator down to -120 dBm	-	-	✓
NM	Remove modulation (APSIN20G/26G)	-	-	✓
NP	Narrow pulse modulation	-	-	✓
FS	Fast switching speed	-	✓	✓
AVIO	Avionics modulation capability (VOR/ILS)	✓	✓	-
B3	Internal rechargeable battery module	✓	✓	✓
EB6	External power bank adapter cable	✓	✓	✓
1URM	19" 1HU rack-mount module	✓	✓	✓
BAG	Portable Bag	✓	✓	✓
DATA	Commercial Calibration Certificate with test data	✓	✓	✓
FLASH	MicroSD card slot for removable SD memory	✓	✓	✓
GPIB	GPIB interface	✓	✓	✓
IEC	IEC 17025 calibration with certificate	✓	✓	✓
OEM	OEM package	✓	✓	✓
REAR	Move output to the rear panel	✓	✓	✓
ReCal	Recalibration with certificate (recommended: 2-year interval)	✓	✓	✓
RM	19" 3HU rack-mount kit	✓	✓	✓
WE	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 <a href="#">▶ DOWNLOAD DATASHEET</a>	APMQS20 <a href="#">▶ DOWNLOAD DATASHEET</a>
<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 -55 to +25 dBm (with PE4) / -120 to +25 dBm (with PE2)	-20 to +15 dBm
<b>Switching Speed</b>	500 μs (30 μs with option FS)	500 μs (20 μs with option FS)
<b>Phase Noise At 1 GHz</b>	at 10 Hz: -87 dBc/Hz (-98 dBc/Hz with option LN) at 1 kHz: -130 dBc/Hz at 20 kHz: -144 dBc/Hz at 100 kHz: -148 dBc/Hz	at 10 Hz: -85 dBc/Hz at 1 kHz: -133 dBc/Hz at 20 kHz: -145 dBc/Hz at 10 MHz: -155 dBc/Hz
<b>Harmonics</b>	-48 dBc with option FILT	-40 dBc
<b>Remote Control</b>	Ethernet, USB, GPIB	Ethernet, USB
<b>Modulation</b>	PULSE, AM, FM, PM, Pulsed Chirp	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

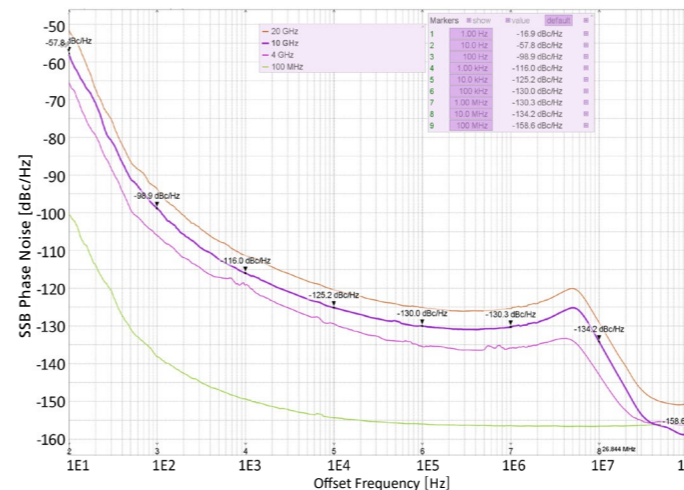
### APPLICATIONS

LO substitution in radar application	Chirp and pulse modulation for radar applications
Radar receiver testing	Automated production test

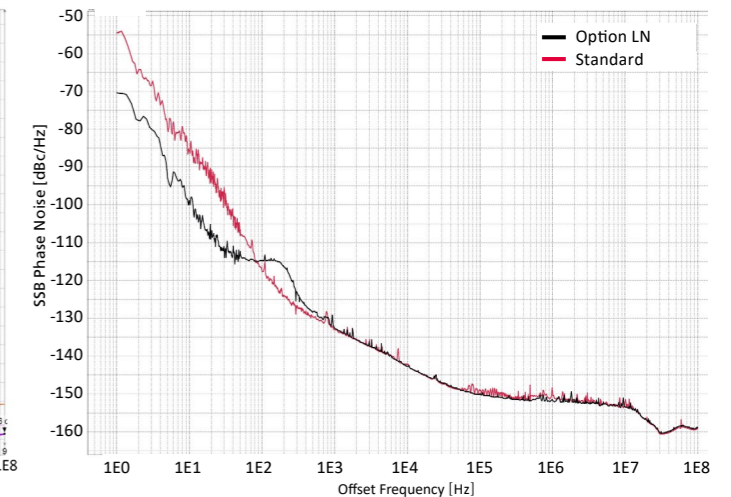
### AVAILABLE OPTIONS

		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	✓	-

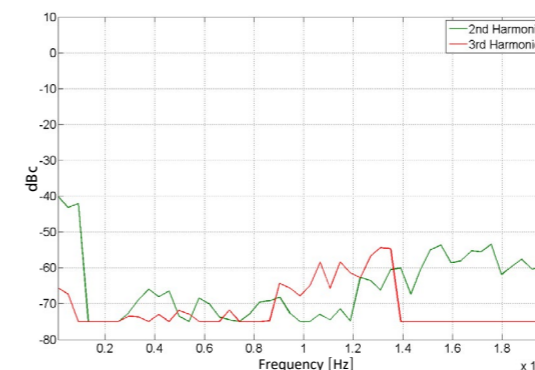
### PERFORMANCE PLOTS



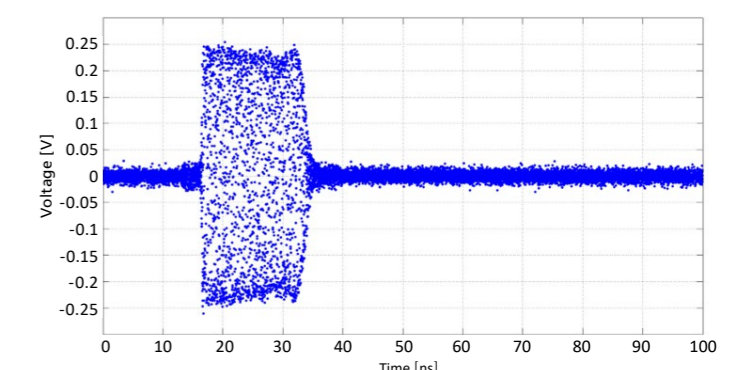
APMQS20: SSB Phase Noise Performance



Comparison: SSB phase noise performance with and without option LN



APULN: Harmonics 0 dBm with option FILT



APULN40: Pulse modulation width 20 ns at 40 GHz carrier

# Analog Signal Generators

## APMSXXG

### MULTI-CHANNEL SIGNAL GENERATORS FROM 300 KHZ UP TO 40 GHZ

#### APMSXXG

The APMSXXG is a phase-coherent, multi-channel, ultra-fast switching, and low phase noise signal generator series with a frequency range from 300 kHz to 6, 12, 20, 33 and 40 GHz. They are ideally suited for a wide range of applications where good signal quality, accurate signal level and wide output power range are required. Excellent phase noise is combined with good spurious and harmonic rejection and a leading-edge switching speed of 25  $\mu$ s with option FS.

The unique phase coherent switching option adds the following feature:

- Phase-coherent switching: The phase relationship between 2 channels is deterministic
- Phase memory: After a channel switches back to a previous frequency, it behaves as if it had been continuously running at that frequency.

The APMS series has proven track record in fields such as quantum computing (QuBit manipulation and control), radar signal generation and satellite load testing.

The APMS generators come in a standard 19" 1U enclosure and offer USB and Ethernet control interfaces as well as the optional GPIB interface. Each interface allows for easy and fast communication using the SCPI 1999 command set. Remote control of the instrument can be quickly attained from any host system. A customer-supplied application programming interface (API) and programming examples for Matlab, Labview, C++ and other commercially available tools make test implementation very straightforward.



APMSXXG

#### SPECIFICATIONS

Models	APMSXXG <a href="#">▶ DOWNLOAD DATASHEET</a>
# of channels	1, 2, 3, 4
Frequency Range	300 kHz to 6, 12, 20, 33, 40 GHz
Resolution	<0.001 Hz
Power Range	-20 to +25 dBm -60 to +23 dBm (with PE4)
Switching Speed	500 $\mu$ s (25 $\mu$ s with option FS)
Phase Noise At 1 GHz	at 10 Hz: -87 dBc/Hz (-100 dBc/Hz with option LN)    at 20 kHz: -145 dBc/Hz at 1 kHz: -130 dBc/Hz    at 100 kHz: -150 dBc/Hz
Remote Control	Ethernet, USB, GPIB
Modulation	AM, FM, PM, PULSE
Sweeps	List, Frequency, Power, Phase
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]

#### KEY FEATURES

Very low phase noise	Phase coherent switching option
Fast switching	Multiple phase coherent outputs
Low harmonic distortion	Excellent channel-to-channel phase stability

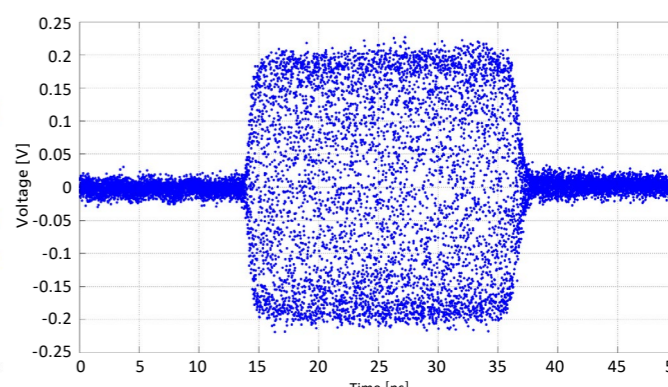
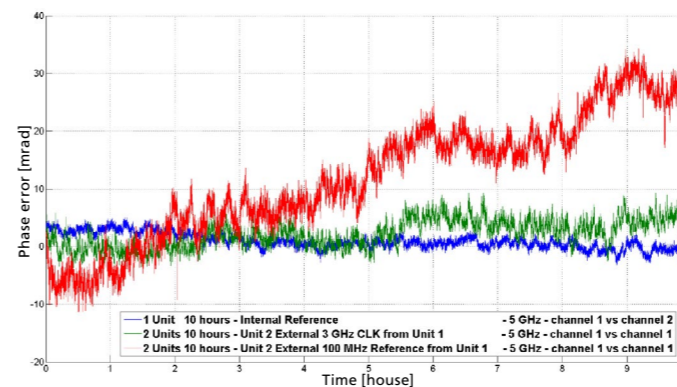
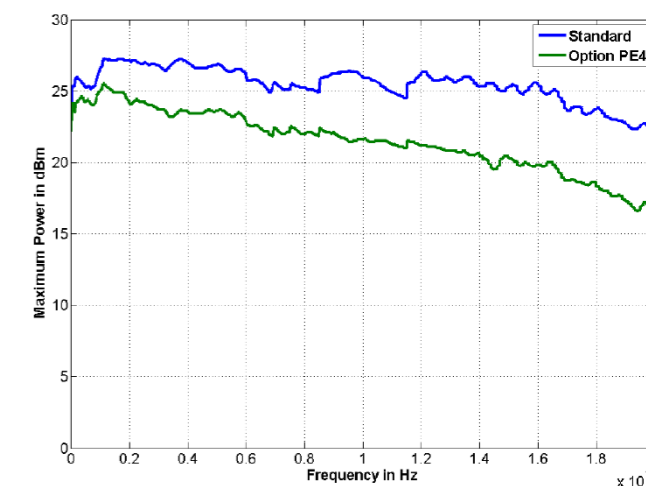
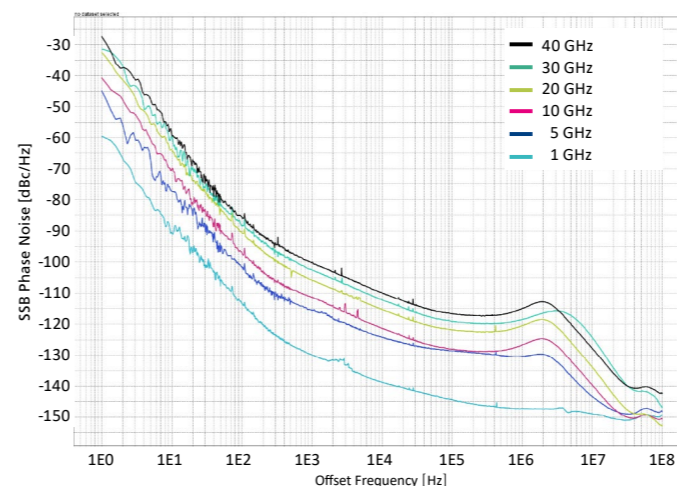
#### APPLICATIONS

Radar simulation	Phased array antenna / beamforming
Quantum computing	5G Testing
High volume automated testing	

#### AVAILABLE OPTIONS

PE4	Electrical step attenuator
PHS	Phase coherent switching
MOD	Add amplitude, frequency, phase modulation capability
FS	Ultra-fast switching speed
NEC	Fast switching speed, narrow pulse (no export control required)
LN / LN+	Enhanced close-in phase noise & further enhanced long term frequency stability
FLASH	MicroSD card slot for removable SD memory
VREF	Flexible external reference frequency support in range 1 to 250 MHz
GPIB	GPIB interface
HI	High isolation 19" 1HU casing
DATA	Commercial calibration certificate with test data (per channel)
IEC	IEC 17025 calibration with certificate

#### PERFORMANCE PLOTS



# Analog Signal Generators

## APLCXX & APLCXX-X & APHSPXX & APHSPXX-X

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

### APLCXX(-X)

The APLCXX(-X) is an agile ultra-low phase noise signal generator from 9 kHz to 12.75 GHz (APLC12), 20 GHz (APLC20), 40 GHz (APLC40) or 54 GHz (APLC50) with excellent harmonic and spurious performance.

The signal source is available as mountable module or in a desktop enclosure with display and front panel control.



Single-channel enclosure

### APHSPXX(-X)

The APHSPXX(-X) series offers the industry's lowest phase noise signal generators, covering a frequency range from 1 kHz to 12.75 GHz (APHSP12), 20 GHz (APHSP20), 40 GHz (APHSP40) and 51 GHz (APHSP50).

APHSP provides outstanding spurs suppression and fast switching speed. For defense applications, the unit features a pulse modulator with the shortest rise/fall time in its class.



Multi-channel enclosure

### SPECIFICATIONS

Models	APLCXX & APLCXX-X <a href="#">▶ DOWNLOAD DATASHEET</a>	APHSPXX & APHSPXX-X <a href="#">▶ DOWNLOAD DATASHEET</a>
# of channels	1, 2, 3, 4	
Frequency Range	10 MHz (9 kHz with option 9K) to 12.75, 20, 40, 54 GHz	10 MHz (1 kHz with option 1K) to 12.75, 20, 40, 51 GHz
Power Range	-20 to +20 dBm -120 to +20 dBm (with PE2)	-20 to +20 dBm -120 to +20 dBm (with PE2)
Switching Speed	500 μs (15 μs with option FS)	100 μs (5 μs with option FS)
Phase Noise At 10 GHz	at 10 Hz: -65 dBc/Hz (-85dBc/Hz with LN(+)) at 1 kHz: -122 dBc/Hz at 20 kHz: -131 dBc/Hz at 100 kHz: -133 dBc/Hz	at 10 Hz: -65 dBc/Hz (-83 dBc/Hz with LN(+)) at 1 kHz: -127 dBc/Hz at 20 kHz: -139 dBc/Hz at 100 kHz: -143 dBc/Hz
Harmonics	-50 dBc	
Non-Harmonics	f min to 4.5 GHz: -90 dBc 12.75 to 25.5 GHz: -70 dBc	4.5 GHz to 12.75 GHz: -80 dBc 25.5 to 51 GHz: -70 dBc
Modulation	AM, FM, PM, PULSE	
Sweeps	List, Frequency, Power, Phase	
Remote Control	Ethernet, USB, GPIB	
Dimensions (W x L x H), Weight	Single-Channel: 232 x 393 x 96.75 mm [9.1 x 15.5 x 3.8 in], ≤10 kg [≤22 lbs] Multi-Channel: 19" 2HU enclosure: 444 x 594 x 88 mm [17.5 x 23.4 x 3.5 in], 18 kg [39.7 lbs]	

### KEY FEATURES

	APLCXX(-X)	APHSPXX(-X)
Very low phase noise	✓	✓✓
Fast switching	✓	✓✓
Low harmonic distortion	✓	✓
Non-harmonic spurious	✓	✓
Phase coherent switching option	✓	✓
Multiple phase coherent outputs	✓	✓
Excellent channel-to-channel phase stability	✓	✓

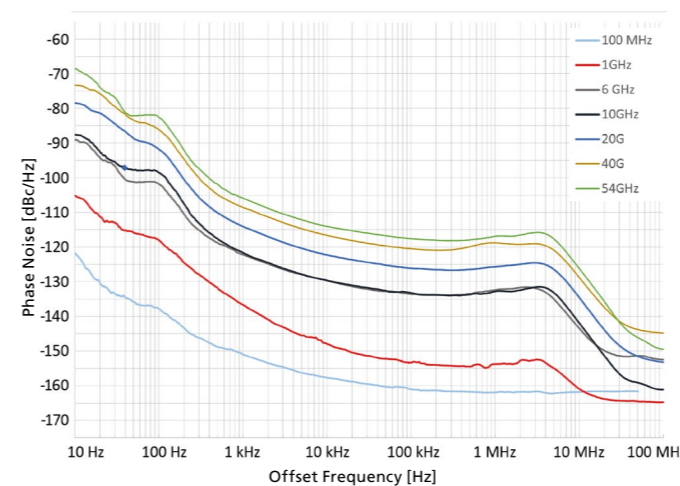
### APPLICATIONS

LO substitution	Radar pulse simulation
Receiver blocking test	Transmitter / receiver intermodulation
ADC Characterization	Quantum computing

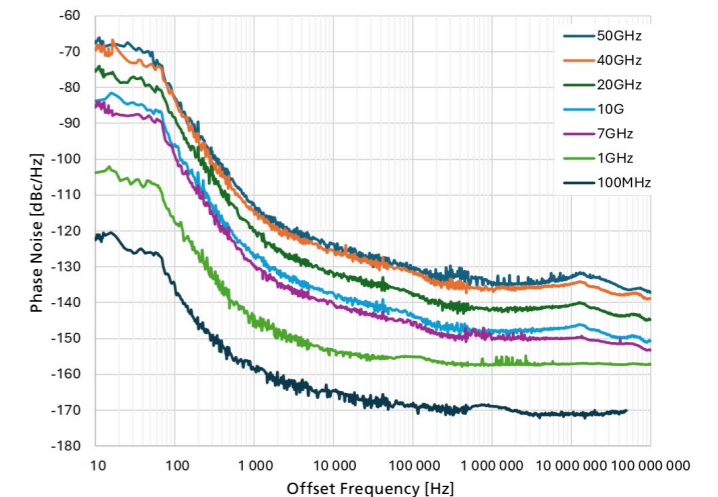
### MOST IMPORTANT AVAILABLE OPTIONS

		APLCXX(-X)	APHSPXX(-X)
1K	Frequency range extension to 1 kHz	–	✓
9K	Frequency range extension to 9 kHz	✓	–
PE2	Mechanical step attenuator down to -120 dBm	✓	✓
PHS	Phase coherent switching	✓	–
MOD	Add amplitude, frequency, phase modulation capability	✓	✓
PULSE	Pulse modulation	✓	✓
FS	Fast switching speed	✓	✓
LN / LN+	Enhanced close-in phase noise & further enhanced long term frequency stability	✓	✓
FLASH	MicroSD card slot for removable SD memory	✓	✓
VREF	Flexible external reference frequency support in range 1 to 250 MHz	✓	✓
GPIB	GPIB interface	✓	✓

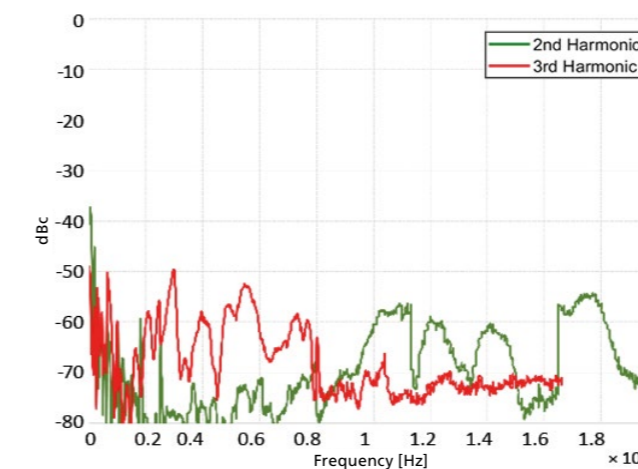
### PERFORMANCE PLOTS



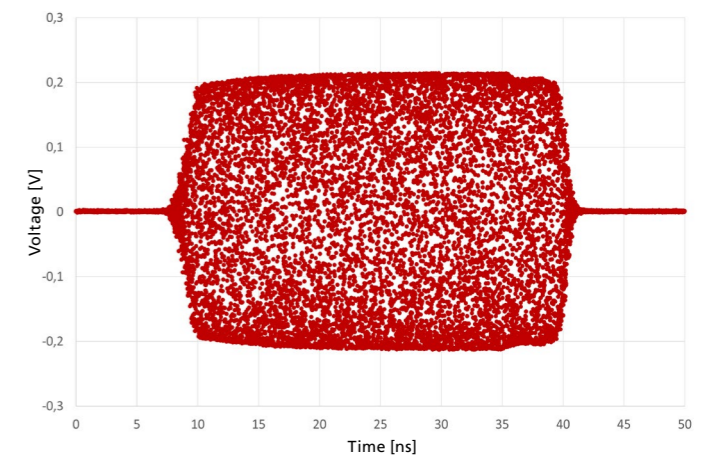
APLC: Phase noise at different frequencies, power +10 dBm, with option LN



APHSP: Phase noise at different frequencies. Power level +10 dBm, with option LN(+)



APLC: Harmonics at +10 dBm



APLC: 10 GHz pulse modulation 30 ns

# Vector Signal Generators

## APVSGXX & APVSGXX-X

### SINGLE- & MULTI-CHANNEL ULTRA-AGILE VECTOR SIGNAL GENERATORS UP TO 40 GHZ

The APVSGXX(-X) 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.

APVSGXX-X with 2, 3 or 4 channels is mounted in a 19" 2HU enclosure. Each output can be programmed independently in frequency, power, phase and modulation. The outputs are phase-coherent with excellent phase stability.



APVSGXX



APVSGXX-X

### SPECIFICATIONS

Models	APVSGXX & APVSGXX-X <a href="#">▶ DOWNLOAD DATASHEET</a>
# of channels	1, 2, 3, 4
Frequency Range	100 kHz to 4, 6, 12, 20, 40 GHz
Resolution	0.001 Hz
Power Range	-20 to +18 dBm / -120 to +15 dBm (with option PE2)
Switching Speed	500 $\mu$ s (3 $\mu$ s with option UFS)
Phase Noise At 1 GHz	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
IQ Modulation Bandwidth	400 MHz
Modulation	Digital I/Q, AM, PM, FM, PULSE, AVIO, AWGN
Remote Control	Ethernet, USB, GPIB, FCP
Sweeps	Complex lists, Frequency, Power
Dimensions (W x L x H), Weight	Single-Channel: 182 x 301 x 124 mm [7.17 x 11.85 x 4.88 in], approx. 4 kg [8.8 lbs] Multi-Channel: 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

- 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

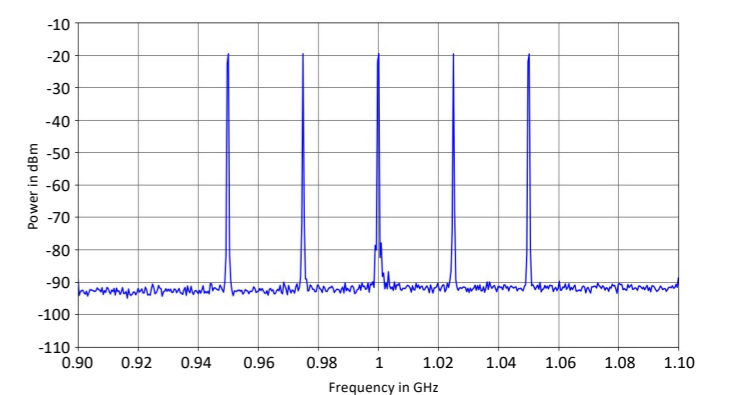
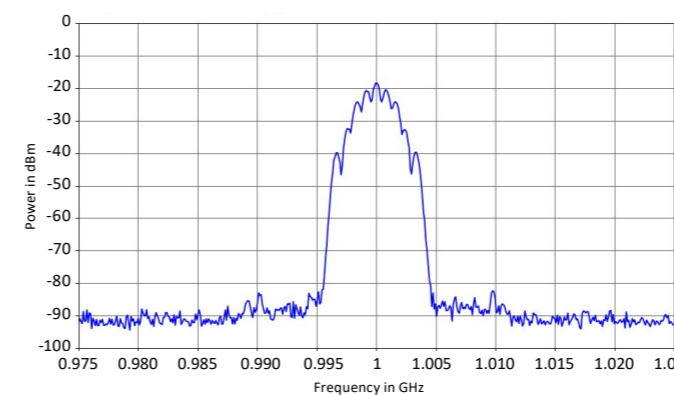
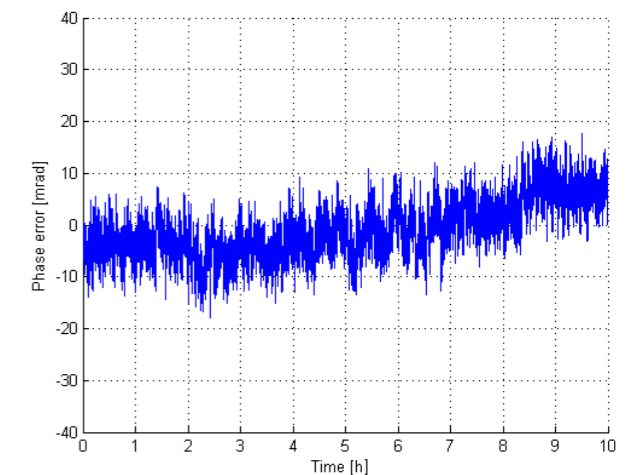
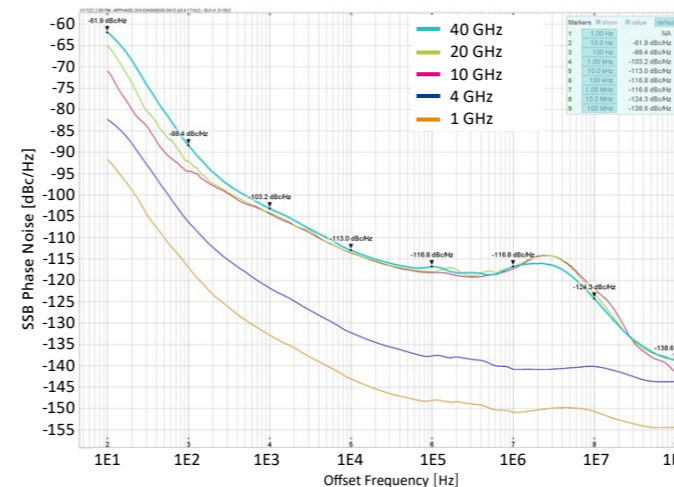
- Arbitrary IQ waveform playback
- Radar signal simulation, EW
- Phased array signal generation for beamforming
- Avionic modulation emulation
- High speed antenna testing

### AVAILABLE OPTIONS

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

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

### PERFORMANCE PLOTS



# Frequency Synthesizers

## APMSYN22 & APMSYN40 & APSYN420 & APSYN140 & APUASYN20

### SINGLE-CHANNEL FREQUENCY SYNTHESIZER MODELS UP TO 43.5 GHz

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

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



### SPECIFICATIONS

Models	<a href="#">▶ DOWNLOAD DATASHEET</a>	<a href="#">▶ DOWNLOAD DATASHEET</a>	<a href="#">▶ DOWNLOAD DATASHEET</a>	<a href="#">▶ DOWNLOAD DATASHEET</a>	<a href="#">▶ DOWNLOAD DATASHEET</a>
<b>Frequency Range</b>	100 kHz to 22 GHz	1 MHz to 40 GHz	10 MHz to 20 GHz	100 kHz to 43.5 GHz	100 kHz to 20 GHz
<b>Resolution</b>	0.01 Hz	0.001 Hz	0.001 Hz	0.001 Hz	0.01 Hz
<b>Accuracy</b>	0.1 ppm	0.5 ppm	0.1 ppm	0.03 ppm	0.1 ppm
<b>Power Range</b>	-20 to +25 dBm	-10 to +23 dBm	+23 dBm	-10 to +25 dBm	0 to +18 dBm
<b>Switching Speed</b>	500 $\mu$ s (<10 $\mu$ s with option FS)	500 $\mu$ s (50 $\mu$ s with option FS)	180 $\mu$ s (25 $\mu$ s with option FS)	500 $\mu$ s (20 $\mu$ s with option FS)	500 $\mu$ s (10 $\mu$ s with option FS)
<b>Phase Noise at 1 GHz</b>	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: -82 dBc/Hz at 1 kHz: -118 dBc/Hz at 100 kHz: -128 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
<b>Remote Control</b>	Ethernet, USB			Ethernet, USB, GPIB	
<b>Modulation</b>	PULSE		FM, PM, PULSE, Chirp	FM, PM, PULSE	PULSE
<b>Sweeps</b>	List, Frequency				
<b>Dimensions (W x L x H)</b>	130 x 95 x 25 mm [5.12 x 3.74 x 0.98]	60 x 150 x 26 mm [2.36 x 5.9 x 1.02 in]	105 x 210 x 60 mm [4.13 x 8.27 x 2.36 in]	105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs]	105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs]
<b>Weight</b>	<0.6 kg [< 1.3 lbs]	0.6 kg [1.3 lbs]	< 1.0 kg [< 2.2 lbs]	< 1.0 kg [< 2.2 lbs]	< 1.0 kg [< 2.2 lbs]

### APPLICATIONS

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

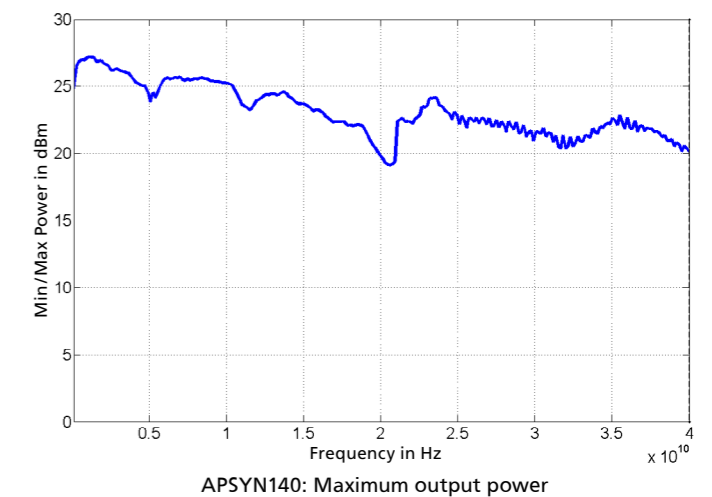
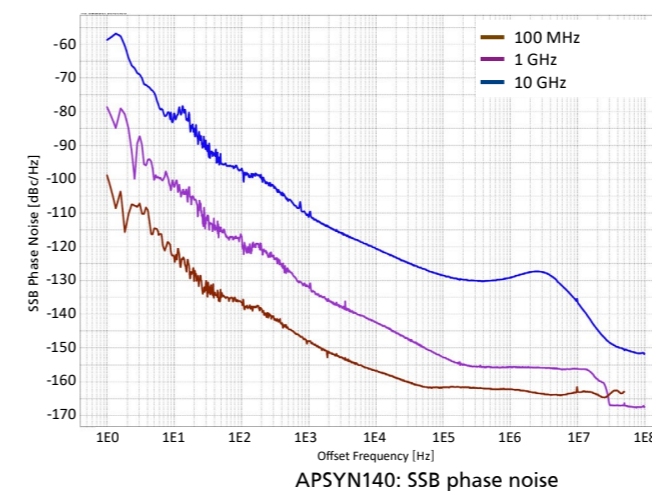
### KEY FEATURES

	AP-SYN140	AP-SYN420	APUA-SYN20	APM-SYN22	APM-SYN40
Low phase noise	✓✓	✓	✓	✓	✓✓✓
Highly phase-synchronous and -coherent switching option	-	-	-	-	-
Fast switching down to 20 $\mu$ s	✓	✓	✓✓	✓✓✓	✓
Pulse	✓	✓	✓	✓	✓
Chirps	✓	✓	-	-	-
FM, PM	✓	✓	-	-	✓
Internal OXCO, external variable reference	✓	✓	✓	✓	✓
Single DC supply	✓	✓	✓	✓	✓

### AVAILABLE OPTIONS

	AP-SYN140	AP-SYN420	APUA-SYN20	APM-SYN22	APM-SYN40
<b>8K</b>	-	-	✓	-	-
<b>EB</b>	✓	-	✓	-	-
<b>FILT</b>	✓	-	-	-	-
<b>FS</b>	✓	✓	✓	✓	✓
<b>FCP</b>	-	-	-	-	-
<b>FM</b>	-	-	-	-	-
<b>PHS</b>	-	-	-	-	-
<b>FLASH</b>	-	-	-	-	-
<b>GPIB</b>	-	-	-	-	-
<b>HI</b>	-	-	-	-	-
<b>IEC</b>	-	-	-	-	-
<b>LN</b>	✓	-	-	-	-
<b>TOUCH</b>	✓	-	✓	-	-
<b>VREF</b>	✓	✓	-	-	-
<b>DATA</b>	-	-	-	✓	✓

### PERFORMANCE PLOTS





# Frequency Synthesizers

## APSYN140-X & APUASYN20-X

### MULTI-CHANNEL FREQUENCY SYNTHESIZER MODELS UP TO 43.5 GHz

AnaPico offers a variety of multi-channel wideband synthesizers. Starting from as low as 8 kHz they cover beyond 43.5 GHz. Depending on the requirements the APSYN and APUASYN 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



APUASYN20-X

### SPECIFICATIONS

Models	APSYN140-X <a href="#">▶ DOWNLOAD DATASHEET</a>	APUASYN20-X <a href="#">▶ DOWNLOAD DATASHEET</a>
# of channels	1, 2, 3, 4	
Frequency Range	100 kHz to 43.5 GHz	100 kHz to 20 GHz
Resolution	0.001 Hz	0.01 Hz
Accuracy	0.03 ppm	0.1 ppm
Power Range	-10 to +25 dBm	0 to +18 dBm
Switching Speed	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: -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, GPIB	
Modulation	FM, PM, PULSE	PULSE
Sweeps	List, Frequency	
Dimensions (W x L x H), Weight	Single: 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] Multi: 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs]	Single: 105 x 270 x 60 mm [4.13 x 10.63 x 2.36 in], < 1.0 kg [< 2.2 lbs] Multi: 430 x 460 x 43 mm [16.93 x 18.11 x 1.69 in], < 10 kg [< 22 lbs]

### KEY FEATURES

	APSYN140-X	APUASYN20-X
Low phase noise	✓✓	✓
Highly phase-synchronous and -coherent switching option	✓✓	✓
Fast switching down to 20 $\mu$ s	✓	✓✓✓
Pulse	✓	✓
Chirps	✓	-
FM, PM	✓	✓
Internal OCXO, external variable reference	✓	✓
Single DC supply	AC	AC

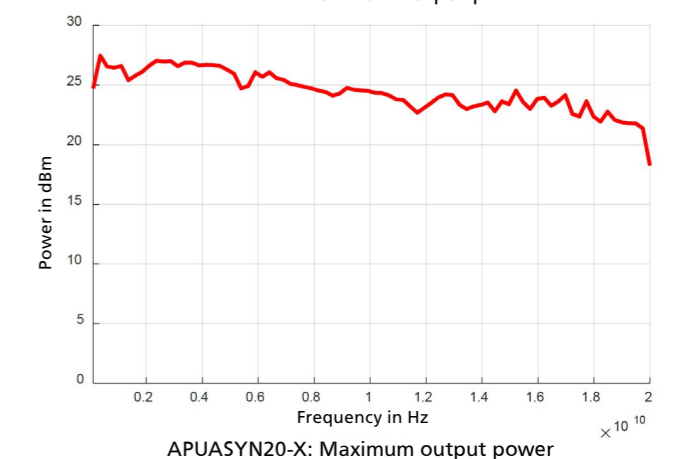
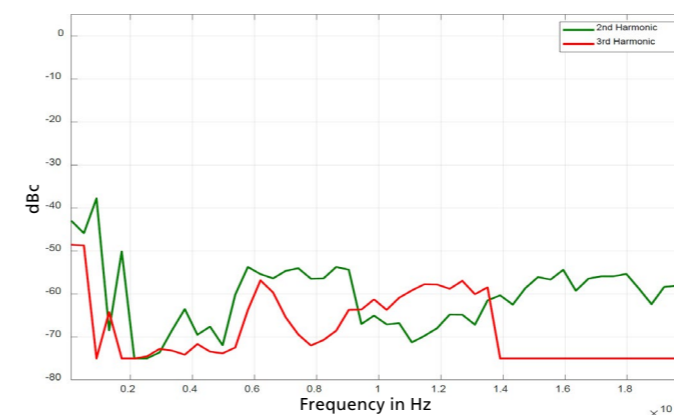
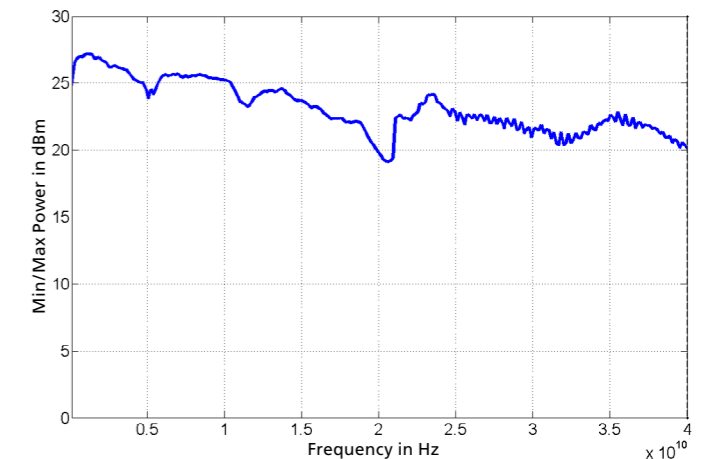
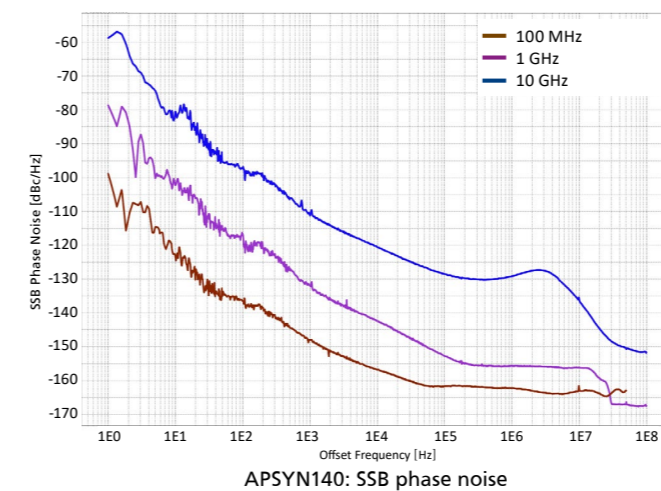
### APPLICATIONS

	APSYN140-X	APUASYN20-X
Automated Testing	✓	✓
Test equipment LO	✓	✓✓
Wireless infrastructure	✓	-
Military and Aerospace	✓	✓

### AVAILABLE OPTIONS

		APSYN140-X	APUASYN20-X
8K	Frequency range extension to 8 kHz	✓	✓
FILT	Harmonic filtering (available with TOUCH)	✓	-
FS	Fast switching speed	✓	✓
FCP	Fast control port	-	✓
FM	Frequency/Phase Modulation	✓	-
PHS	Phase coherent switching	✓	-
FLASH	MicroSD card slot for removable SD memory	✓	✓
GPIB	GPIB interface	✓	✓
HI	High isolation 19" 1HU casing	✓	✓
IEC	IEC 17025 calibration with certificate	✓	✓
LN	Enhanced phase noise & frequency stability	✓	-
VREF	Variable external reference	✓	-
DATA	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	<b>APPH6040</b> <b>APPH20G</b> <b>APPH40G</b> <a href="#">▶ DOWNLOAD DATASHEET</a>	<b>APNA20</b> <b>APNA50</b> <b>APNA60</b>
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

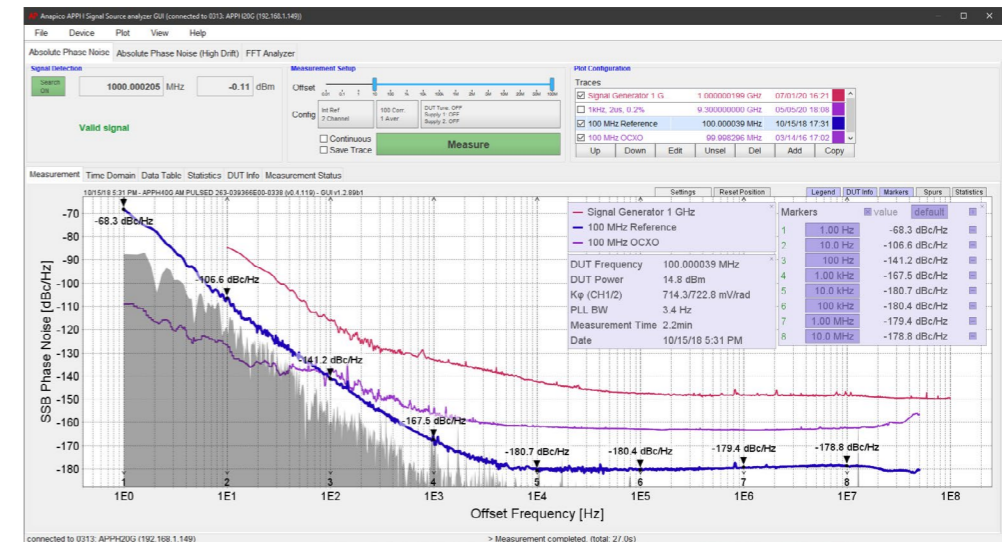
- Ultra-low phase noise crystal oscillator analysis
- Versatile phase noise and amplitude noise analysis
- Analysis of pulsed signals
- High-speed production testing of phase noise
- Additive phase noise characterization of amplifiers, transmitters, mixers
- Time stability analysis of clocks
- VCO testing

## 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

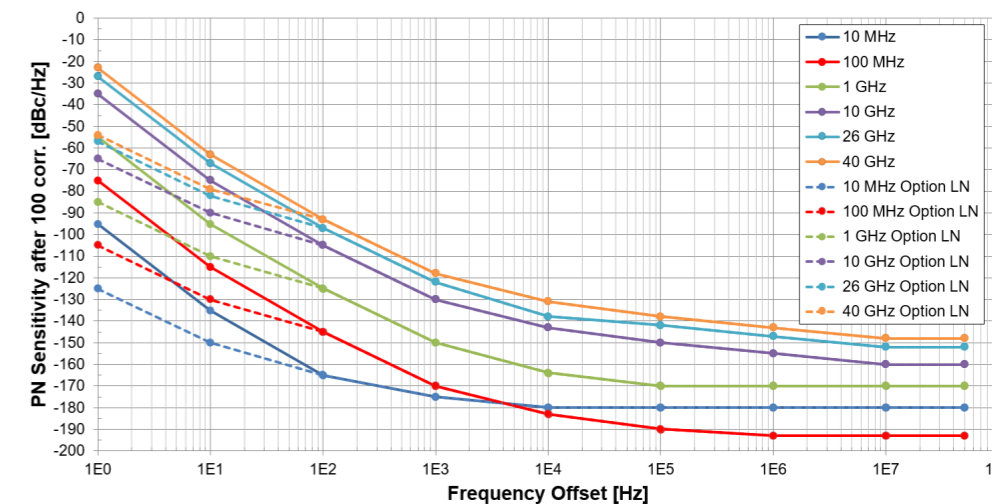
<b>PS18</b>	Accessory: 4-18 GHz mechanical phase shifter
<b>PULSE</b>	Pulsed signal measurement
<b>ReCal</b>	Recalibration with certificate (recommended: 2-year interval)
<b>SPEC</b>	Spectrum monitoring
<b>TRAN</b>	Transient analysis
<b>TSTAB</b>	Time stability analysis
<b>VCO</b>	VCO characterization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



 of Switzerland

*Accurate*  
*Reliable*  
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