

# Nighthawk™

## Benchtop Portability with ATE Performance



### Features:

- Configurable for simultaneous test of multiple connectivity standard
- Air cooled, 100 W power consumption
- 4 RF source and receive ports supporting up to 6 GHz
- Modulation/demodulation bandwidth up to 200 MHz
- Built-in low jitter clock and baseband signaling
- Source output -110 dBm to +5 dBm accuracy  $\pm 0.7$  dB
- Source settling (frequency & amplitude) <2ms
- Dynamic range enhancer (DRE) enabling up to 120 dB range
- Clock and carrier detect synchronization (CDS) modes
- New cross platform software – Unison
- Available on Diamond Series and X-Series platform

Ultra compact RF instrument (0.18 cu.ft) designed to meet all test requirements of the complete range of RF connectivity applications; WLAN (inc 802.11ac), Bluetooth, Zigbee, GPS, DVB, DAB, FM and more:

### Highlights:

- Comprehensive set of RF features at a fraction of the price of traditional RF ATE systems
- Highest throughput
- Low operating cost
- Portable between Cohu test systems

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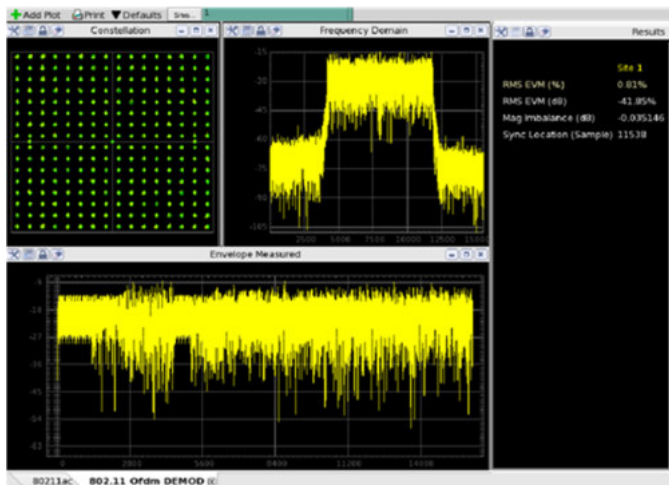
Connectivity semiconductors are high volume, price sensitive ICs used in a diverse and growing portfolio of consumer products. Future growth challenges include ever increasing performance requirements only to be matched with competitive margin pressure.

Faced with margin pressures, the only option is to stretch large old technology test systems into massive multi-site configurations. However, massive multi-site is not a true cost down alternative as those solutions raise capital cost, over time lowers capital utilization, complicates operational process, while extending time to market.

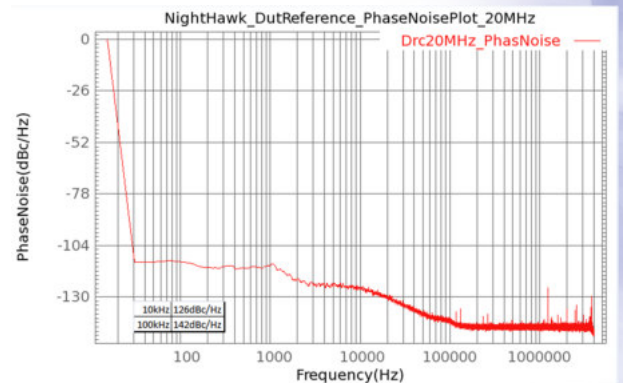
Nighthawk, the result of 30 years of RF/DSP test experience, is a true paradigm shift improving on every aspect of production test cost.

## New Technology Collapses Test Cost

Nighthawk's design leverages the same RF semiconductor innovations that enable today's consumer connectivity solutions. The goal is to match the ever shrinking semiconductor ASP with a high performance, low-priced RF test system. Nighthawk accomplishes this by embedding all required source, measure and DSP modules into a small air cooled package. This not only reduces the cost of the RF system, but replaces expensive tester instrumentation. The result is a flexible package providing true quad site parallel transceiver test capability at a fraction of the cost compared to traditional test systems. In addition, all popular connectivity modulation standards are included in the system price.



802.11ac 5.8 GHz 80MHz Bandwidth EVM Plot



## Uncompromised Feature Design

Nighthawk is the culmination of decades of DSP and RF test innovations pioneered by Xcerra.

Features include:

- Dynamic Range Enhancement (DRE) provides over 120 dB of dynamic range enhancement enabling accurate measurements under low and noisy input conditions
- 2 Millisecond frequency and amplitude settling assures optimum production throughput
- Industries widest analog bandwidth digitizer provides for accurate, single capture testing of all communication standards

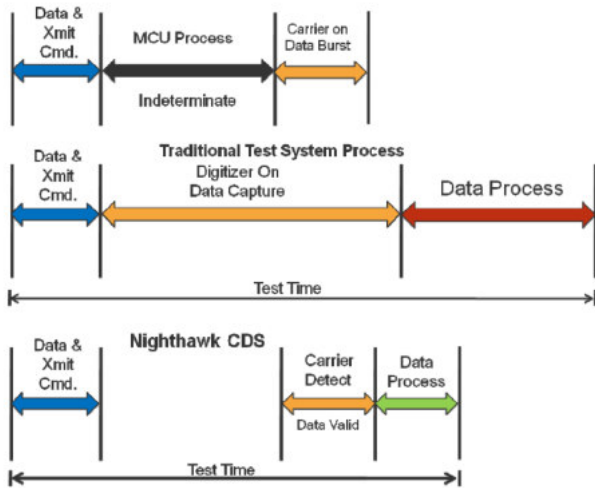
Test time is further enhanced by a powerful parallel processing FPGA providing real time Decimation and Dynamic Range Enhancement (DRE). Each of the 4 IF/Baseband digitizers are backed with extensive "test any device" 16 mega sample capture memory.



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## Carrier Detection Synchronization (CDS)

New in Nighthawk is an advanced carrier detection capability virtually eliminating excessive capture sample sets associated with transmission latency commonly encountered with embedded RF MCU devices. CDS simplifies test programming and reduces processing resulting in optimized test time.



## Source and Measure Direct Baseband Signals

Nighthawk is not just an RF carrier based system, it can directly source, measure and decode a wide variety of baseband schemes. Each of the four built in digitizers has both a 50 ohm and high independence input for flexible capture of baseband signals. Additionally, two AWG outputs are available for direct source of I-Q and other baseband formats.



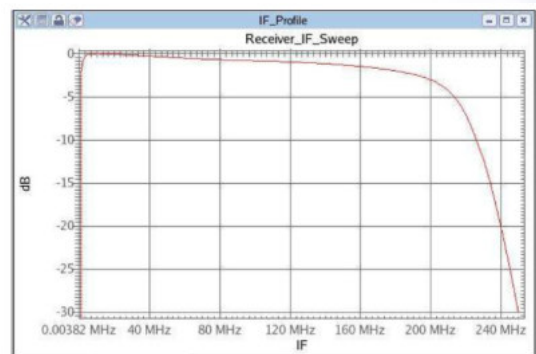
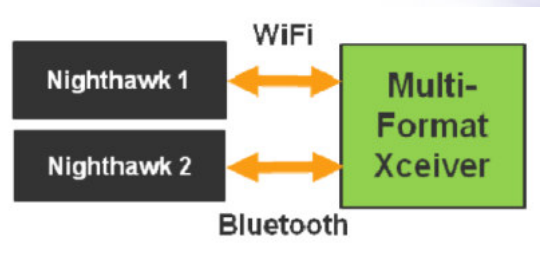
Data is captured simultaneously in all four digitizer channels resulting in virtually zero multi-site overhead.

## Concurrent Test of Multi-Site and Multiple Connectivity Formats

Configuring Nighthawk in a dual module array per test system allows either:

- Octal site testing with 8 active receiver paths or
- Each module can be programmed to test a different connectivity format

For example, a device which covers both Bluetooth and Wi-Fi formats can be tested in parallel by configuring one Nighthawk module to test the Wi-Fi standard and the other module to simultaneously test the Bluetooth standard.



Spectral plots of quad digitizers with 200MHz bandwidth

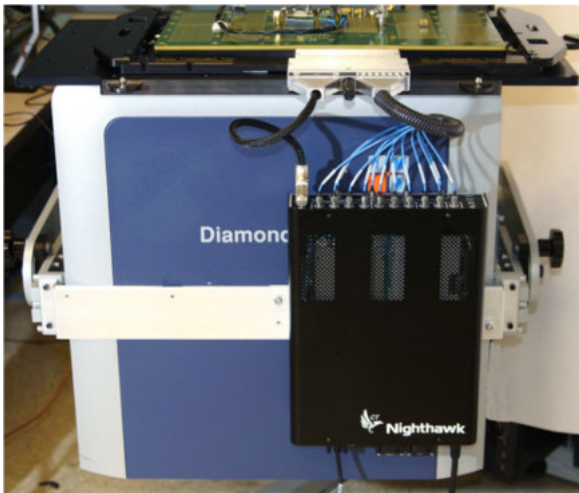
## Production Friendly Designed

Production cost and efficiency is more than just capital expense and throughput. It is the combination of factors including time to market, production utilization, reliability and flexibility.

Nighthawk is an air cooled unit consuming less than 100 watts of power. The ultra-low operating cost and minimal supporting infrastructure set a new operational standard for high performance RF production test.



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Diamond10 Nighthawk integration

## Design Integration Results in Optimum Production Efficiency

Nighthawk is housed in a 0.18cu.ft. enclosure (about the size of a laptop). No external RF infrastructure is required nor are there special electrical or cooling connections required.

Nighthawk's dense packaging also reduces the length of critical RF signal paths improving every aspect of RF performance.

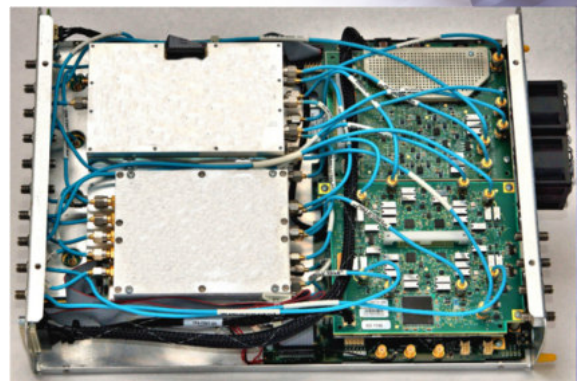
Everything is in one small package: RF sources, measure channels, processing, baseband and low jitter coherent DUT clocks.

Nighthawk power is derived from a laptop-like power adaptor operating on all common single phase voltages and frequencies.

All RF DUT board interconnects are via a single terminated connector block.

Nighthawk is factory calibrated with a one year calibration cycle, significantly improving production availability. Also, there are no expensive calibration support modules required.

Installation on Diamond Series and X-Series is less than 30 minutes. All platforms are field upgradeable without drilling holes, re-wiring or changing docking schemes. Diamond10 utilizes a single connector to make all RF and signal connections to loadboard.



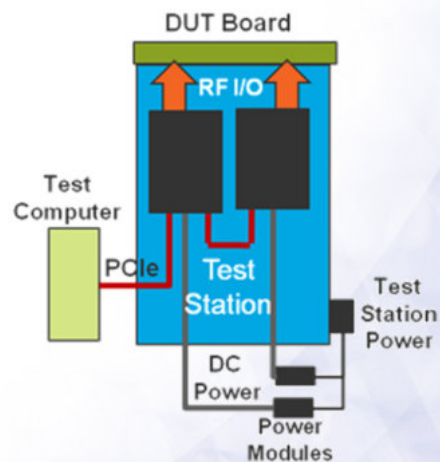
## "Always Ready" Production Profile

Nighthawk maintains an "always ready" availability profile using built-in measure circuits along with embedded factory calibration files. This eliminates the need for expensive calibration boards and extensive production robbing calibration cycles.

The robust modular design has a projected MTBF exceeding 20,000 hours. On-board diagnostics monitoring quickly find and report issues before they affect production yield.

Connectivity modulation/demodulation standard protocols are software based and are included in the price of Nighthawk system.

Nighthawk is fully integrated into the Cohu Unison Software with support of data logging, program libraries and analysis tools.



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Description	Condition	Specification*
Number of Ports	Half Duplex	4 Receive Ports/4 Source Ports
<b>Source</b>		
Level Range	@ 3 GHz	-110 dBm - +5 dBm
Accuracy	@ 3 GHz	+/-0.75dB
Resolution		0.25 dB
Settling Time	Frequency and Level	<2 ms
Modulation Bandwidth		>200 MHz
Frequency Accuracy		0.1 ppm
<b>Measure</b>		
Frequency Range		80 MHz to 6 GHz
Level Range	@ 3 GHz	-110 dBm - +30 dBm
Accuracy	@ 3 GHz	+/-0.75 dB
Receiver IF Bandwidth		>200 MHz
Measurement Type	Single Conversion Heterodyne with Real-time DSP	
Real-Time DSP Features	Digital Down Conversion, time domain averaging, decimation	
<b>Modulation &amp; Demodulation</b>		
	Pre-Correlated Library supplied by Cohu including: Bluetooth (2.0, 3.0, 4.0), FM, 802.11 (a/b/g/n/ac), Zigbee 802.15.4, DVB, DAB, GPS	
<b>Software</b>		
Environment	Unison	
Operating System	High-speed PC-based controller using a Linux operating system	

*All specifications are subject to change without notice.*

