



Wideband Power Sensor

5012D, 5016D, 5017D, 5018D, 5019D



The RF Experts

Bird's® Wideband Power Sensor (WPS) never requires field calibration, only requires factory calibration once per year and is traceable to National Institute of Standards and Technology (NIST). The WPS measures True Average Power, Peak Power, and Duty Cycle directly with exceptional accuracy and uses these precise measurements to calculate a wide range of other important factors, such as VSWR, Return Loss, Reflection Coefficient, Crest Factor, Average Burst Power, and CCDF.

PROBLEMS AND SOLUTIONS

Downtime is necessary

- Monitor and perform maintenance for monitoring while DUT is in-service.
- Measure forward and reflected power to troubleshoot system failures.

Have analog, digital, and multi-carrier signals to measure

- Modulation independent measurements.

Tight budgets

- USB connectivity, no meter required.

Varying field tech skill levels

- Sensor plugs and plays with 5000-XT meter.

Need greater confidence in measurement

- No field calibration required.
- NIST traceable calibration



**Works with the
Bird RF Meter App!**

Free download from Google Play Store

APPLICATIONS

WPS measures: Analog Cellular, Digital Cellular, 3G, 4G, Tetra, DMR, MOTOTRBO, APCO/P25 Phase 1 & 2, Trunking, CDMA, TDMA, WCDMA, GSM, Transportation, Tactical Military, Radar, Avionics, Marine, LMR, Analog Broadcast, Digital Broadcast, GSM, GPRS, EDGE, UMTS, HSDPA, Bluetooth, Fire, GPS, NPSPAC, Paging, Public Safety, Telematics, Utilites, WIMAX and WLAN.

Measurements performed: Peak power, true average power and Duty Cycle.

Calculations Performed: VSWR, Return Loss, Reflection Co-efficient, Crest Factor, Average Burst Power and CCDF.

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GENERAL SPECIFICATIONS

Connector	N Female (Both)
Power Supply	USB Port: Less than one low-power USB load DC Input Connector: 7-18 VDC at less than 0.1A
Impedance	50 Ohms (nominal)
Weight	1.2 lb. maximum
Dimensions HxWxD	4.8" x 4.6" x 1.3"
[inches (mm)]	(122 mm x 117 mm x 33 mm)
Data Logging	Requires 5000-XT or VPM3
Operating Temps [°C(°F)]	-10° to 50°C (+14° to +122°F)
Storage Temps [°C(°F)]	-40° to +80°C (-40° to +176°F)
Mechanical Shock & Vibration	IAQ MIL-PRF-28800F class3
CE	EMC EN 61326-1-2006
INTERFACES	
DPM	DB9 proprietary interface
PC Interface (1)	RS-232, 9600 Baud, no parity, 8 data bits, 1 stop bit, DB9
PC Interface (2)	USB 2.0 Type B

Frequency Range	5012D	350 MHz - 4.0 GHz
	5016D	350 MHz - 4.0 GHz
	5017D	25 MHz - 1.0 GHz
	5018D	150 MHz - 4.0 GHz
	5019D	25 MHz - 1.0 GHz
Power Range	5012D	150 mW - 150 Watts Avg, 400 Watts Peak
	5016D	25 mW - 25 Watts Avg, 60 Watts Peak
	5017D	500mW - 500 Watts Avg, 1300 Watts Peak**
	5018D	100 mW - 25 Watts Avg, 60 Watts Peak
	5019D	100 mW - 100 Watts, 260 Watts Peak
Insertion VSWR	5012D	<1.05 from 0.35 to 2.5 GHz, <1.10 from 2.5 to 4 GHz
	5016D	<1.05 from 0.35 to 2.5 GHz, <1.10 from 2.5 to 4 GHz
	5017D	<1.05
	5018D	<1.05 from 0.35 to 2.5 GHz, <1.10 from 2.5 to 4 GHz
	5019D	<1.05
Insertion Loss	5012D	<0.05 dB from 0.35 to 1.0 GHz, <0.1 dB from 1 to 4 GHz
	5016D	<0.05 dB from 0.35 to 1.0 GHz, <0.1 dB from 1 to 4 GHz
	5017D	<0.05 dB
	5018D	<0.05 dB from 0.35 to 1.0 GHz, <0.1 dB from 1 to 4 GHz
	5019D	<0.05 dB
Directivity	5012D	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
	5016D	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
	5017D	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz
	5018D	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
	5019D	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz
AVERAGE POWER		
Average Forward Power Range	5012D	150 mW - 150 Watts Avg, 400 Watts Peak
	5016D	25 mW - 25 Watts Avg, 60 Watts Peak
	5017D	500 mW - 500 Watts Avg, 1300 Watts Peak**
	5018D	100 mW - 25 Watts Avg, 60 Watts Peak
	5019D	100 mW - 100 Watts, 260 Watts Peak
*Accuracy, Average Forward Power	5012D	± 4% of reading, + 0.05 W
	5016D	± 4% of reading, + 0.008 W
	5017D	± 4% of reading, + 0.17 W
	5018D	± 4% of reading, + 0.008 W
	5019D	± 4% of reading, + 0.04 W
Minimum Forward Power for Reflected Measurement	5012D	0.5 W
	5016D	0.1 W
	5017D	0.5 W
	5018D	0.1 W
	5019D	0.3 W
Return Loss	5012D	0.0 to 23 dB
	5016D	0.0 to 23 dB
	5017D	0.0 to 23 dB
	5018D	0.0 to 23 dB
	5019D	0.0 to 23 dB
VSWR	5012D	1.15 to 99.9
	5016D	1.15 to 99.9
	5017D	1.15 to 99.9
	5018D	1.15 to 99.9
	5019D	1.15 to 99.9

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BURST AVERAGE POWER

Burst Average Power Range	5012D	4W - 150 Watts Avg
	5016D	.7W - 25 Watts Avg
	5017D	13.5W - 500 Watts Avg
	5018D	.7 W - 25 Watts Avg
	5019D	2.7 W - 100 Watts Avg
Burst Width	5012D	1 μ s to 5 ms
	5016D	1 μ s to 5 ms
	5017D	1 μ s to 5 ms
	5018D	1 μ s to 5 ms
	5019D	1 μ s to 5 ms
Repetitions Rate	5012D	5 Hz, Min
	5016D	5 Hz, Min
	5017D	5 Hz, Min
	5018D	5 Hz, Min
	5019D	5 Hz, Min
Duty Cycle (D)	5012D	.002 to 1.0
	5016D	.002 to 1.0
	5017D	.002 to 1.0
	5018D	.002 to 1.0
	5019D	.002 to 1.0
*Accuracy, Burst Average Power	5012D	\pm 6% of reading, + 0.05 W
	5016D	\pm 6% of reading, + 0.008 W
	5017D	\pm 6% of reading, + 0.17W
	5018D	\pm 6% of reading, + 0.008 W
	5019D	\pm 6% of reading, + 0.04 W

PEAK ENVELOPE POWER

Peak Envelope Power Range	5012D	4.0 - 400 W
	5016D	0.7 - 60 W
	5017D	13.5 - 1300 W
	5018D	0.7 - 60 W
	5019D	2.7 - 260 W

*PEAK ENVELOPE POWER ACCURACY

burst width > 200 μs	5012D	\pm 7% of reading, + 0.20 W
	5016D	\pm 7% of reading, + 0.05 W
	5017D	\pm 7% of reading, + 0.70 W
	5018D	\pm 7% of reading, + 0.05 W
	5019D	\pm 7% of reading, + 0.13 W
1 μs < burst width < 200 μs	5012D	\pm 10% of reading, + 0.40 W
	5016D	\pm 10% of reading, + 0.10 W
	5017D	\pm 10% of reading, + 1.40 W
	5018D	\pm 10% of reading, + 0.10 W
	5019D	\pm 10% of reading, + 0.26 W
0.5 μs < burst width < 1 μs	5012D	\pm 15% of reading, + 0.40 W
	5016D	\pm 15% of reading, + 0.10 W
	5017D	\pm 15% of reading, + 1.40 W
	5018D	\pm 15% of reading, + 0.10 W
	5019D	\pm 15% of reading, + 0.26 W
burst width < 0.5 μs	5012D	\pm 20% of reading, + 0.40 W
	5016D	\pm 20% of reading, + 0.10 W
	5017D	\pm 20% of reading, + 1.40 W
	5018D	\pm 20% of reading, + 0.10 W
	5019D	\pm 20% of reading, + 0.26 W

CREST FACTOR

Crest Factor Measurement Range	5012D	150 mW - 150 Watts
	5016D	25 mW - 25 Watts
	5017D	500 mW - 25 Watts
	5018D	25 mW - 25 Watts
	5019D	100 mW - 100 Watts
*Accuracy, Crest Factor	5012D	Linear Sum of Peak and Average Power Accuracies
	5016D	
	5017D	
	5018D	
	5019D	

COMPLEMENTARY CUMULATIVE DISTRIBUTION FUNCTION (CCDF)

CCDF Measurement Range	5012D	0.1 to 100%
	5016D	0.1 to 100%
	5017D	0.1 to 100%
	5018D	0.1 to 100%
	5019D	0.1 to 100%
Threshold Measurement Range	5012D	4.0 - 400 W
	5016D	0.7 - 25 W
	5017D	13.5 - 500 W
	5018D	0.7 - 25 W
	5019D	2.7 - 100 W
Measurement Uncertainty	5012D	\pm 2%
	5016D	\pm 2%
	5017D	\pm 2%
	5018D	\pm 2%
	5019D	\pm 2%
*Level Set Accuracy	5012D	As Peak Envelope Power Accuracy + 2.0%
	5016D	
	5017D	
	5018D	
	5019D	

*for temperatures above 35°C or below 15°C add 3.0% to stated accuracies

** Derate maximum average power rating from 500W at 300MHz to 100W at 1GHZ using a straight line on a log-log scale

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STANDARD ACCESSORIES

5A2653-10	USB Cable
VPM3	Virtual Power Meter
920-5012S	Instruction Book
920-VPM3	Instruction Book

OPTIONAL ACCESSORIES

PA-MNME	Male N to Male 7/16 (DIN)
PA-MNFE	Male N to Female 7/16 (DIN)
5A2226	Power Supply, Intl
5A2229	Power Supply, US
5A2264-09-MF-10	DB9 Cable, 10"
5A2653-OR5NL5	USB Interface cable, 15 cm Long

COMPATIBLE DEVICES

	5012D	5016D	5017D	5018D	5019D
5000-EX	YES	YES	YES	YES	YES
5000-XT	YES	YES	YES	YES	YES
VPM2	YES	YES	YES	YES	YES
VPM3	YES	YES	YES	YES	YES
SA-1700 EXP	YES	YES	YES	NO	NO
SA-2500 EX	YES	YES	YES	NO	NO
SA-6000 EX	YES	YES	YES	NO	NO
SA-3600 XT	YES	YES	YES	YES	YES
SA-6000 XT	YES	YES	YES	YES	YES
SH-36S	YES	YES	YES	YES	YES
SH-361S	YES	YES	YES	YES	YES
SH-362	YES	YES	YES	YES	YES
SH-362S	YES	YES	YES	YES	YES

