The **RF** Experts

POWER SENSORS

Wideband Power Sensor

±4% ACCURACY

5012D, 5016D, 5017D, 5017D-AV, 5018D, 5019D



Exceptional Accuracy for Reliable Field Measurement

The Bird line of Wideband Power Sensors are designed specifically for worry-free field use. The WPS line never requires field calibration giving technicians confidence in field measurements. Using exceptionally accurate measurements of True Average Power, Peak Power, and Duty Cycle directly with exceptional accuracy the WPS can calculate a wide range of other important factors such as VSWR, Return Loss, Reflection Coefficient, Crest Factor, Average Burst Power, and CCDF.

Factory calibration is only required once per year and is traceable to the National Institute of Standards and Technology (NIST), providing additional confidence in sensor measurements.

Accurate in-line field measurement that never requires field calibration

PRODUCT FEATURES

- Measures True Average Power, Peak Power and Duty Cycle directly with exceptional accuracy
- Calculations performed: VSWR, Return Loss, Reflection Coefficient, Crest Factor, Average Burst Power and CCDF
- Measures Modulation independent measurements for all analog, digital, and multi-carrier signals
- Sensor plug and plays with 5000-XR Power Meter and Bird's RF Meter App

MEASUREMENT APPLICATIONS

- 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

Bird

WIDEBAND POWER SENSORS

5012D, 5016D, 5017D, 5017D-AV, 5018D, 5019D Specifications

SYSTEM

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)
Data Logging	Requires Bird RF meter software

CONNECTORS / INTERFACES

Connectors	N Female (Both)
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

ENVIRONMENTAL

Operating Temperature	-10 °C to 50 °C (14 °F to 122 °F)
Storage Temperature	-40 °C to 80 °C (-40 °F to 176 °F)

PHYSICAL

Size	4.8 in x 4.6 in x 1.3 in (120 mm x 82 mm x 97 mm)
Weight	1.2 lb (.54 kg)

CERTIFICATIONS

CE	EMC EN 61326-1-2006
Mechanical Shock & Vibration	IAQ MIL-PRF-28800F class3

STANDARD ACCESSORIES

USB Cable	5A2653-10
Instruction Book	920-5012S

OPTIONAL ACCESSORIES

Male N to Male 7/16 (DIN)	PA-MNME
Male N to Female 7/16 (DIN)	PA-MNFE
Power Supply, Intl	5A2226
Power Supply, US	5A2229
DB9 Cable, 10”	5A2264-09-MF-10
USB Interface Cable, 15 cm	5A2653-OR5NL5
Digital Power Meter	5000-XR

GENERAL MEASUREMENT

Model	Frequency Range	Power Range	Insertion VSWR	Insertion Loss	Directivity
5012D	350 MHz to 4.0 GHz	150 mW to 150 W Avg 400 W Peak	<1.05 from 0.35 to 2.5 GHz <1.10 from 2.5 to 4 GHz	<0.05 dB from 0.35 to 1.0 GHz <0.1 dB from 1 to 4 GHz	30 dB typ. (27 dB min.) up to 3.0 GHz 28 dB typ. (25 dB min.) from 3.0 to 4.0 GHz
5016D	350 MHz to 4.0 GHz	25 mW to 25 W Avg 60 W Peak	<1.05 from 0.35 to 2.5 GHz <1.10 from 2.5 to 4 GHz	<0.05 dB from 0.35 to 1.0 GHz <0.1 dB from 1 to 4 GHz	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
5017D	25 MHz to 1.0 GHz	500 mW to 500 W Avg 1300 W Peak*	<1.05	<0.05 dB	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz
5017D-AV	100 MHz to 1.3 GHz	500 mW to 500 W Avg 1300 W Peak*	<1.05	<0.05 dB	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz
5018D	150 MHz to 4.0 GHz	100 mW to 25 W Avg 60 W Peak	<1.05 from 0.35 to 2.5 GHz <1.10 from 2.5 to 4 GHz	<0.05 dB from 0.35 to 1.0 GHz <0.1 dB from 1 to 4 GHz	30 dB up to 3.0 GHz, 28 dB from 3.0 to 4.0 GHz
5019D	25 MHz to 1.0 GHz	100 mW to 100 W 260 W Peak	<1.05	<0.05 dB	28 dB up to 100 MHz, 30 dB from 100 to 1000 MHz

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

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WIDEBAND POWER SENSORS

5012D, 5016D, 5017D, 5017D-AV, 5018D, 5019D Specifications

AVERAGE POWER

Model	Average Forward Power Range	Peak Power Range	Accuracy, Average Forward Power	Minimum Forward Power for Reflected Measurement	Return Loss	VSWR
5012D	150 mW to 150 W	400 W Peak	±4% of reading, + 0.05 W	0.5 W	0.0 to 23 dB	1.15 to 99.9
5016D	25 mW to 25 W	60 W Peak	±4% of reading, + 0.008 W	0.1 W	0.0 to 23 dB	1.15 to 99.9
5017D/5017D-AV*	500 mW to 500 W	1300 W Peak	±4% of reading, + 0.17 W	0.5 W	0.0 to 23 dB	1.15 to 99.9
5018D	100 mW to 25 W	60 W Peak	±4% of reading, + 0.008 W	0.1 W	0.0 to 23 dB	1.15 to 99.9
5019D	100 mW to 100 W	260 W Peak	±4% of reading, + 0.04 W	0.3 W	0.0 to 23 dB	1.15 to 99.9

BURST AVERAGE POWER

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

PEAK ENVELOPE POWER & ACCURACY**

Model	Peak Envelope Power Range	Burst Width > 200 µs	1 µs < Burst Width < 200 µs	0.5 µs < Burst Width < 1 µs	Burst Width < 0.5 µs
5012D	4 W to 400 W	±7% of reading, + 0.20 W	±10% of reading, + 0.40 W	±15% of reading, + 0.40 W	±20% of reading, + 0.40 W
5016D	.7 W to 60 W	±7% of reading, + 0.05 W	±10% of reading, + 0.10 W	±15% of reading, + 0.10 W	±20% of reading, + 0.10 W
5017D	13.5 W to 1300 W	±7% of reading, + 0.70 W	±10% of reading, + 1.40 W	±15% of reading, + 1.40 W	±20% of reading, + 1.40 W
5018D	.7 W to 60 W	±7% of reading, + 0.05 W	±10% of reading, + 0.10 W	±15% of reading, + 0.10 W	±20% of reading, + 0.10 W
5019D	2.7 W to 260 W	±7% of reading, + 0.13 W	±10% of reading, + 0.26 W	±15% of reading, + 0.26 W	±20% of reading, + 0.26 W

COMPLEMENTARY CUMULATIVE DISTRIBUTION FUNCTION (CCDF)

Model	CCDF Measurement Range	Threshold Measurement Range	Measurement Uncertainty	Level Set Accuracy
5012D	0.1 to 100%	4.0 W to 400 W	±2%	As Peak Envelope Power Accuracy + 2.0%
5016D	0.1 to 100%	0.7 W to 25 W	±2%	As Peak Envelope Power Accuracy + 2.0%
5017D	0.1 to 100%	13.5 W to 500 W	±2%	As Peak Envelope Power Accuracy + 2.0%
5018D	0.1 to 100%	0.7 W to 25 W	±2%	As Peak Envelope Power Accuracy + 2.0%
5019D	0.1 to 100%	2.7 W to100 W	±2%	As Peak Envelope Power Accuracy + 2.0%

CREST FACTOR

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

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

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