Specifications

Bird 4421 RF Power Meter

Frequency Range	Sensor dependent
Power Range	Sensor dependent
VSWR Display	1.0 – 199.9 max
Return Loss Display	0 to 40 dB max
Display Accuracy	± 1 on least significant digit
AC Power	115/230 Vac @ 50/60 Hz
Batteries	8 C-size Nickel Cadmium rechargeable 1.2 volt cells, 15 W max (NEDA Type 10014)
Battery Life	Minimum 8 hours continuous usage
Battery Charger	Built-in battery charger. Drained batteries require approximately 28 hours to recharge.
Display	LCD, 3 ½ digit display. Indicates mode, measurement units, battery condition, remote status, and signal increase/decrease. Self contained backlight.
Optional Interfaces	IEEE-488 GPIB RS-232
Fuse Rating	IEC (5 x 20 mm) Type T
115 Vac 230 Vac	0.25 A 0.125 A
Emissions/Immunity	EMC Directive 89/336/EEC
Safety	Low Voltage Directove 73/23/EEC
Humidity	95% ± 5% max. (noncondensing)
Altitude	Up to 10,000 feet (3,048 m)
Temperature Range	
Operating Storage	0 to 50 °C (32 to 122 °F) –20 to +50 °C (–4 to +122 °F)
Dimensions	15.5”L x 12.25”W x 4.25”H (393 x 311 x 108 mm)
Weight	9.5 lbs. (4.3 kg) nominal

☞ NOTE: Due to the wide variety of available connectors, frequency range and maximum power may be reduced. Insertion loss is specified with female N connectors. Choose connectors appropriate for the frequency and power of operation.

Specifications Common to all Sensors

Impedance	50 ohms nominal
VSWR Range	1.00 to 2.00 (40.0 to 9.5 dB Return Loss)
Sampling Rate	Approximately 2 readings/second
Calibration Technique	Calibration vs. frequency curve stored in nonvolatile memory in each sensor. Sensor output corrected at frequency of measurement within rated range.
Operating Power	Supplied by power meter via sensor cable
Connectors	Customer specified (See “Available Connectors” on page 50)
Emissions/Immunity	EMC Directive 89/336/EEC
Safety	Low Voltage Directove 73/23/EEC
Humidity	95% ± 5% max. (noncondensing)
Altitude	Up to 10,000 feet (3,048 m)
Temperature Range	
Operating	0 to 50 °C (32 to 122 °F)
Storage	–20 to +50 °C (–4 to +122 °F)
Dimensions	5.4”L x 2.5”W x 3.25”H (137 x 64 x 83 mm)
Weight, Nominal	1 lb. 13 oz. (0.8 kg)

Bird 4020 Series RF Power Sensors

Power Range	
4021, 4022	300 mW – 1 kW
4024, 4025	3 W – 10 kW
Frequency Range	
4021	1.8 – 32 MHz
4022	25 MHz – 1 GHz
4024	1.5 – 32 MHz
4025	100 kHz – 2.5 MHz
Accuracy, Fwd	± 3%
Insertion VSWR (Insertion Loss)	
4021, 4024, 4025	1.05 (0.05 dB) max
4022	1.05 (0.05 dB) max, 25 – 512 MHz 1.10 (0.13 dB) max, 512 MHz – 1 GHz
Directivity, Minimum	
4021, 4022	30 dB
4024	30dB (2.5 – 25 MHz), 28 dB (1.5 – 32 MHz)
4025	30 dB (125 – 2500 kHz), 28 dB (100 – 125 kHz)
Signal Purity	For rated accuracy no more than 1% AM Harmonics –50 dB or less

CAUTION
Changing the sensor's connectors will invalidate calibration data, and may reduce the maximum power rating of the unit.

Bird 4027A Series RF Power Sensors

Power Range	
4027A12M	300 mW – 1 kW
4027A25M	3 W – 9 kW
4027A35M	3 W – 7.5 kW
4027A60M	3 W – 6 kW
4027A100M	3 W – 5 kW
4027A150M	3 W – 4 kW
All other models	3 W – 10 kW
Frequency Range (Calibration Frequency)	
4027A250K	250 – 400 kHz (250 kHz)
4027A400K	400 – 550 kHz (400 kHz)
4027A800K	800 – 950 kHz (900 kHz)
4027A2M	1.5 – 2.5 MHz (2.0 MHz)
4027A4M	3 – 5 MHz (4.0 MHz)
4027A10M	10 – 15 MHz (13.56 MHz)
4027A12M	10 – 15 MHz (13.56 MHz)
4027A25M	25 – 30 MHz (27.12 MHz)
4027A35M	35 – 45 MHz (40.0 MHz)
4027A60M	45 – 65 MHz (60.0 MHz)
4027A100M	95 – 105 MHz
4027A150M	150 – 170 MHz
Accuracy	±2 % from maximum range to 30 % of full scale on the most sensitive range ±1 % at calibration frequency and power level
Repeatability	±1 % maximum unit to unit at calibration frequency and power level
Insertion VSWR (Insertion Loss)	1.05 (0.05 dB) max
Directivity, Minimum	
4027A12M	30 dB
All other models	28 dB
Signal Purity	For rated accuracy no more than 1% AM Harmonics –50 dB or less
Calibration Power Level	
1 kW units	700 W
All other models	1700 W

Bird 4027F Series RF Power Sensors

Power Range	100 W – 10 kW
Frequency Range	
4027F2M	1.8 – 2.2 MHz
4027F10M	12 – 15 MHz
Power Accuracy	
15 to 35 °C (59 to 95 °F)	± 1%
0 to 50 °C (32 to 122 °F)	± 3%
Harmonic Rejection, Minimum	
4027F2M	frequency > 3.8 MHz: 30 dB 3.6 – 3.8 MHz: 26 dB
4027F10M	frequency > 25 MHz: 30 dB
Low Frequency Rejection, Minimum (4027F10M Only)	
frequency < 1 MHz	30 dB
AM Rejection	
< 5 kW, 10% AM	< 0.2% error
5 – 10 kW, 10% AM	< 1% error
Insertion VSWR (Insertion Loss)	1.05 (0.05 dB) max
Directivity, Minimum	28 dB
Calibration Power Level	1700 W nominal
Calibration Frequencies	
4027F2M	1.80, 2.00, 2.20 MHz
4027F10M	12.0, 13.56, 15.0 MHz

IEEE-488 Interface Module

Logic Levels	Meets all IEEE Standard 488-1978 specifications
Modes of Operation	Switch and bus selectable
Talk Only	Allows the 4421 to send to the bus keyboard-initiated measurements only
Addressable	Allows the 4422 to be addressed as talker or listener under the command of an IEEE-488 bus controller
Connector	Standard IEEE-488 bus type
Humidity	95% ± 5% maximum (non-condensing)
Altitude	Up to 10,000 feet (3,048 m)
Temperature Range	
Operating Storage	32 to 122º F (0 to 50º C) –4 to +122º F (–20 to +50º C)
Dimensions	6.5”L x 4.5” W (165.1 x 114.3 mm)
Weight	0.5 lbs (0.227 kg) nominal

RS-232 Interface Module

Logic Levels	Meets all EIA Standard RS-232-C specifications
Modes of Operation	Switch and bus selectable
Talk Always	Allows the 4421 to send to the bus keyboard-initiated measurements only
Addressable	Allows the 4421 to be commanded by an RS-232 interface controller
Connector	RS-232 Interface Type
Humidity	95% ± 5% maximum (non-condensing)
Altitude	Up to 10,000 feet (3,048 m)
Temperature Range	
Operating Storage	32 to 122º F (0 to 50º C) –4 to +122º F (–20 to +50º C)
Dimensions	6.5”L x 4.5” W (165.1 x 114.3 mm)
Weight	0.5 lbs (0.227 kg) nominal

SPECIFICATIONS

Overall specifications for the Model 4421 RF Power Meter are listed in Table I-1.

ADDITIONAL OPTIONS

In addition to the two interface options, there are currently a number of other options. These are:

- Nickel cadmium batteries (1.2 volt "C" cells)
- Alkaline-manganese dioxide (1.5 volt, "C" cells)

The above-listed options are discussed at appropriate places in this manual. It should be noted that a built-in charger is provided on all power meters to recharge batteries.

CAUTION

WHEN USING ALKALINE BATTERIES, IT IS NECESSARY TO DISABLE THE POWER METER'S BATTERY CHARGER, AS DESCRIBED IN PARAGRAPH 1-30 OF THIS MANUAL.

Table I-1. SPECIFICATIONS FOR MODEL 4421 RF POWER METER

Power Ranges	Power Sensor dependent[1]
Operating Power	• 115/230 Vac, 50/60 Hz • 8 alkaline-manganese dioxide 1.5 volt cells (NEDA Type 14A).
Battery Life	Minimum 8 hours continuous use. • 8 nickel cadmium 1.2 volt cells (NEDA Type 10014). Built-in charger is provided as standard.
Battery Life	Minimum 8 hours continuous use.
Size	16"L × 12"W × 4½"H (406 × 305 × 114mm)
Weight (with batteries)	11 lbs. (5kg)
Display	LCD, 3½ digit display with indications of mode, measurement units, battery condition, programming status, and input signal increase/decrease. Self-contained backlight provided.
Display Accuracy	±1 on least significant digit
VSWR Range	1.0 - 199.9[2]
Return Loss	0-40dB[2]
Interfaces (optional)	IEEE-488 RS-232
Fuses	Outside on ac line: 3 AG, ¼ ampere, 250 volt Inside on Power Module: 3 AG, 1 ampere, 250 volt

[1] See Paragraph 3-11 for available power ranges.
[2] Maximum indicated reading is Power Sensor dependent.

Users may wish to refer to Table I-2, where the specific model numbers for each version are listed. (Read from left to right.)

Table I-2. BASIC MODEL NUMBERS

Model Number *	Interface:		Batteries:	
	-488	-232	Alk.	NiCad
4421-101	no	no	0	0
4421-102	no	no	0	8
4421-103	no	no	8	0
4421-104	no	yes	0	0
4421-105	no	yes	0	8
4421-106	no	yes	8	0
4421-107	yes	no	0	0
4421-108	yes	no	0	8
4421-109	yes	no	8	0

* A suffix P on the model number indicates the power meter can be rack mounted (for example 4421P-101).

Note: to field install any of the above model numbers for rack mount application, order P/N 4421-250 Rack Mount Kit.