

## Portable Wattmeters



### MODEL 43 — Portable Wattmeter

- Power Range** 100 mW - 10 kW using Bird® Plug-in Elements.\*
- Frequency Range** 450 kHz - 2.7 GHz (depending on element)
- Insertion VSWR** with N Connectors 1.05 max. to 1000 MHz
- Accuracy** ±5% of full scale
- Connectors** QC Type (Female N normally supplied)
- Finish** Light Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D, (includes connectors)
- Weight** 4 lbs. (1.8 kg)
- Elements** Tables 1, 2, 3, 3A, 4, 6



### WATTMETER 4314B — Portable Wattmeter

- Power Range** 100 mW - 10 kW using Bird® Plug-in Elements.\*
- Frequency Range** 450 kHz - 2.7 GHz (depending on element)
- Insertion VSWR** with N Connectors 1.05 max. to 1000 MHz
- Accuracy** ±5% of full scale CW, ±8% PEP
- Pulse Parameters** (min.) Pulse width 0.4 µs (100-2300 MHz), 1.5 µs (26-99 MHz) and 15 µs (2-25 MHz); repetition rate 30 pps and duty factor 1 x 10<sup>-4</sup> min.
- Battery** Two 9-Volt alkaline transistor batteries
- AC Power** 120 VAC, 60 Hz or 220 VAC, 60 Hz (using Bird® adapter)
- Connectors** QC Type (Female N normally supplied)
- Finish** Light Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D, (includes connectors)
- Weight** 4 lbs. (1.8 kg)
- Elements** Tables 1, 2, 3, 3A, 4, 5, 6
- Accessories** Case, spare batteries, extra QC connectors.



### MODEL 43P — Portable Wattmeter

#### PEAK POWER RETROFIT KIT 4300-400 — Portable Wattmeter

- Power Range** 100 mW - 10 kW using Bird® Plug-in Elements.\*
- Frequency Range** 450 kHz - 2.7 GHz (depending on element)
- Accuracy** CW Mode: ±5% full scale, Peak mode: ±8% full scale
- Modulation** Normal voice audio; or (Peak Mode) Rectangular Pulses  
Duty cycle: 2% (min),  
Repetition rate: 100 pps (min),  
Pulse width: 200 µs (min)
- Battery Life** 48 hours typical
- Weight** Adds 1 lb. to Model 43



### HIGH-POWER WATTMETER 4305A — Portable Wattmeter

- Power Range** 50 W - 25 kW using Bird® Plug-in Elements.\*
- Frequency Range** 450 kHz - 2.3 GHz (depending on element)
- Insertion VSWR** with N Connectors 1.05 max.
- Accuracy** ±5% of full scale
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 6 5/16" H x 5 1/8" W x 4 1/4" D, (includes connectors)
- Weight** 4 lbs. (1.8 kg)
- Elements** 4305A element table below and 1 5/8AA table
- Accessories** Case



### VARIABLE RF TAP 4431 — Portable Wattmeter

- Power and Frequency Range** 5 kW max. 2 - 30 MHz, 1 kW max. 30 - 1000 MHz\*\* using Bird® Plug-in Elements\*
- Insertion VSWR** with N Connectors 1.07 max.\*\* to 1000 MHz
- Accuracy** ±5% of full scale
- Insertion Loss** 0.1 dB max. (2-512 MHz), 0.2 dB max. (512-1000 MHz)\*
- RF Sample Output** Variable -15 to -70 dB from BNC (Female) port
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D, (includes connectors)
- Weight** 4 lbs. (1.8 kg)
- Elements** Tables 1, 2, 3, 3A, 4, 6 (within power/frequency range limits stated above)
- Accessories** Case



### MODEL 4304A FIXED 25-1000 MHz 5-500 WATT ELEMENT — Portable Wattmeter

- Power Ranges** 5, 15, 50, 150, 500 W, with no scale limitations except power limited to 150 W from 800-1000 MHz
- Frequency Range** 25 MHz - 1.0 GHz
- Insertion VSWR** 25-521 MHz, 1.05 max. (with UHF female conn.), 512-1000 MHz, 1.07 max.
- Insertion Loss** 25-512 MHz, 0.10 dB max. with UHF female conn., 512-1000 MHz range, 0.13 dB max.
- Accuracy** 25-100 MHz, ±7% of full scale, using correction charts. 100-512 MHz, ±6 of full scale, no correction needed. 512-1000 MHz, ±7% of full scale, no correction needed.
- Connectors** QC Type (Female N normally supplied)
- Finish** Light Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D, (includes connectors)
- Weight** 4 lbs. (1.8 kg)
- Accessories** Case



4305A Elements	Frequency (MHz)					
	45-2.5	2-30	50-125	100-250	400-1000	1100-1800
50 W	—	—	—	—	—	50K7
2500 W	—	—	2500B7	2500C7	2500E7	—
5000 W	—	—	5000B7	—	—	—
10 kW	—	10KH7	—	—	—	—
25 kW	25KP7	—	—	—	—	—

\*Quoted accuracy only when used with other Bird® Products  
\*\*Applies only when coupling is less than 30 dB



**MODEL 4308 CELLULAR SPECIALIST WATTMETER — Portable Wattmeter**

- Power Ranges** 1.5, 5, 15, 50 W, with no scale limitations
- Frequency Range** 440 MHz - 960 MHz
- Insertion VSWR** 1.05 with TNC connectors (QC Type)
- Accuracy** ±5% of full scale
- Connectors** QC Type (Female TNC normally supplied)
- Finish** Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D,  
(includes connectors) (175 mm x 130 mm x 92 mm)
- Weight** 4 lbs. (1.8 kg)
- Accessories** Case



**MULTIPOWER, ±5% READING ACCURACY 4410 SERIES— Portable Wattmeters**

- 4410A - 9V Alkaline battery**
- 4412A - Rechargeable battery**

- Power Range** 2 mW to 10 W, 20 mW to 100 W, 200 mW to 1 kW or 2 W to 10 kW full scale in one single Plug-in Element. Any Bird® Series 4410-Element may be used.
- Frequency Range** 200 kHz - 2.3 GHz CW or FM
- Insertion VSWR** with N Connectors 1.25 max. to 2300 MHz
- Accuracy** ±5% of reading for any reading above 20% of the Power Range selected for FM or CW signals without AM. This accuracy is maintained for a full 37 dB dynamic range with each 4410 Element (except No. 4410-1 200 kHz-535 kHz which is accurate to ±10% of reading, and 4410-15 1.0-1.8 GHz and 4410-16 1.8-2.3 GHz which are accurate to ±8% of reading.)
- Ambient Temperature Range** Elements 4410-1 through -8 and -10 through -16 are temperature compensated for rated accuracy from 0°C to 50°C (32°F to 122°F) and 4410-20 through -27 from 20°C to 30°C (68°F to 86°F)
- Over-Range Protection** To 120% of nominal full scale (i.e. 12 W, 120 W, 1200 W, or 12,000 W). No damage or degradation to the unit will result, regardless of the Range Selector Switch position.
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D,  
(includes connectors) (175 mm x 130 mm x 92 mm)
- Weight** 4 lbs. (1.8 kg)
- Elements** Tables 9, 10, 11, 12 (below)
- Accessories** Case, spare battery



**4410 Elements**

**Table 9 - Full-Scale Power and Frequency Ranges 0-10, 30, 100, 300 Milliwatts, 1, 3, 10 Watts**

MHz	30-50	50-88	88-108	–	150-250	225-400	400-800	800-900	900-1000
Model	4410-20	4410-21	4410-27	–	4410-23	4410-24	4410-25	4410-26	4410-28

**Table 10 - Full-Scale Power and Frequency Ranges 0-100, 300 Milliwatts, 1, 3, 10, 30, 100 Watts**

MHz	25-80	50-125	100-250	200-500	400-1000	1000-1800	1800-2300
Model	4410-10	4410-11	4410-12	4410-13	4410-14	4410-15*	4410-16*

**Table 11 - Full-Scale Power and Frequency Ranges 0-1, 3, 10, 30, 100, 300, 1000 Watts**

MHz	2-30	25-80	50-200	144-520	200-1000
Model	4410-3	4410-5	4410-6	4410-7	4410-8

**Table 12 - Full-Scale Power and Frequency Ranges 0-10, 30, 100, 300, 1000, 3000, 10,000 Watts**

MHz	0.2-0.535	0.45-2.5	2-30
Model	4410-1	4410-2	4410-4

\*Accuracy is ±8% of reading



**MODEL APM-16 AVERAGE-READING POWER METER — Portable Wattmeters**

- Power Range** 1 W - 1000 W
- Frequency Range** 2 MHz - 2.3 GHz
- Accuracy** 10°C to 35°C ±4% reading, ±1% full scale, -20°C to 50°C ±6% reading, ±2% full scale
- Peak/Avg. Ratio** In excess of 10 dB
- Insertion VSWR** (with N connector) 1.05 max. to 1000 MHz
- Setting Time** < 1 second
- Meter** Shock mounted, linear scale with expanded scales of 25, 50 and 100 for full scale 1 to 1000 W readings. Mirrored scale includes 5% overrange.
- Temp. Ranges** -20°C to 50°C operating; -25°C to 65°C storage
- Humidity** 95% ±5% max. (noncondensing)
- Battery** Internal 9 volt
- Connectors** QC type (Female N normally supplied)
- Nominal Size** 6 7/8" H x 5 1/8" W x 3 5/8" D, (175 mm x 130 mm x 92 mm)
- Weight** 4 lbs. (1.8 kg)
- Elements** Special APM Series (below)
- Recommended Accessories** Case



**APM-16 Elements**

Frequency Bands (MHz)

Power Range	2-30	25-60	50-125	100-250	200-500	400-1000	950-1260	1100-1800	1700-1990	1990-2200	2200-2300
1W	—	—	APM-1B	APM-1C	—	APM-1E	APM-1J	—	APM-1L1	APM-1L2	APM-1M
2.5 W	—	—	APM-2.5B	—	APM-2.5D	APM-2.5E	APM-2.5J	APM-2.5K	APM-2.5L1	APM-2.5L2	—
5 W	APM-5H	APM-5A	APM-5B	APM-5C	APM-5D	APM-5E	APM-5J	APM-5K	APM-5L1	APM-5L2	—
10 W	APM-10H	APM-10A	APM-10B	APM-10C	APM-10D	APM-10E	APM-10J	APM-10K	APM-10L1	APM-10L2	—
25 W	—	—	APM-25B	APM-25C	APM-25D	APM-25E	—	APM-25K	APM-25L1	APM-25L2	—
50 W	—	—	—	APM-50C	APM-50D	APM-50E	APM-50J	APM-50K	APM-50L1	APM-50L2	—
100 W	APM-100H	APM-100A	APM-100B	APM-100C	APM-100D	APM-100E	APM-100J	—	APM-100L1	—	—
250 W	APM-250H	APM-250A	APM-250B	APM-250C	APM-250D	APM-250E	—	—	—	—	—
500 W	APM-500H	—	APM-500B	APM-500C	APM-500D	APM-500E	—	—	—	—	—
1000 W	APM-1000H	—	APM-1000B	APM-1000C	—	APM-1000E	—	—	—	—	—



**0.45 - 2700 MHz, Model 4521, 4522, and 4526 — Panel-Mount Wattmeters**

- Models** 4521, 4522, 4526
- Power Range** 100 mW - 10 kW using Bird® Plug-in Elements
- Frequency Range** 450 kHz - 2.7 GHz (depending on element)
- Insertion VSWR** with N Connectors 1.05 max. to 1000 MHz
- Accuracy** ±5% of full scale
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 19" W x 5 7/32" H x 1 11/16" D (483 mm x 133 mm x 43 mm)
- Weight** 3 1/2 lbs. (1.6 kg)
- Elements** Tables 1, 2, 3, 3A, 4, 6



\*Applies only when coupling is less than 30 dB  
 \*\*Quoted accuracy only when used with other Bird® Products



**2-512 MHz with Sampler Port**

**MODEL 4527 — Panel-Mount Wattmeters**

- Power Range** 100 mW to 10 kW using Bird® Plug-in Elements\*
- Frequency Range** 2 - 512 MHz (depending on element)
- Insertion VSWR** with N Connectors 1.05 max. to 512 MHz
- Accuracy** ±5% of full scale
- RF Sample Output** Fixed at -53 dB from 512 to 10 MHz, decreasing to -70 dB at 2 MHz BNC (Female) port
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 19" W x 5 7/32" H x 1 11/16" D (483 mm x 133 mm x 43 mm)
- Weight** 3 1/2 lbs. (1.6 kg)
- Elements** 2 to 512 MHz models within Tables 1, 2, 6



**High Speed, FWD/RFL Alarm Wattmeter®**

**MODEL 3170B — Wattcher® Single Carrier RF Monitoring System**

- Power Range** 100 mW to 10 kW using Bird® Plug-in Elements\*
- Frequency Range** 450 kHz - 2.7 GHz
- Insertion VSWR** with N connectors 1.05 max. to 1000 MHz, 1.1 max. to 2700 MHz
- Accuracy** ±5% of full scale
- Meter Scales** FWD and RFL 25, 50, 100 W
- Alarms** Front Panel Buzzer, "Active" and "Trip" LEDs for forward/reflected
- Response Time** 25 µs max.
- Activate Forward** 73 µs to 50 ms nominal (adjustable) monitor delay
- Front Panel Controls** Reset push-button, adjust FWD/RFL alarm levels screw, element sockets
- Rear Panel Features** DC FWD/RFL signal inputs, main and remote meter drive outputs, external 12-16 VDC supply input, alarm in/out, reset in/out, AC line voltage selector, fuse, IEC 320 AC receptacle.
- Inputs/Outputs** TTL compatible +5 V logic. Outputs for remote meter
- AC Power** 115/230 VAC, 50/60 Hz @ 56 mA
- DC Power** 12.7 to 16.0 VDC @ 400 mA max.
- Connectors** QC Type (Female N normally supplied)
- Finish** Gray powder coat
- Nominal Size** 19" W x 5 7/32" H x 9 5/16" D (483 mm x 133 mm x 237 mm)
- Weight** 7 lbs. (3.2 kg)
- Required Products** Elements: Two from Tables 1, 2, 3, 3A, 4, or 6
- Calibration Cycle** 1 Year for element



**Note:** Elements calibrated to a 7/8" line section (standard) can be interchanged. Wattcher® Model 3170B is at interim 7/8" line section.



**100 mW - 10 kW Wattcher®**

**MODEL 3128A — Wattcher® Single Carrier RF Monitoring System**

- Power Range** 100 mW to 10 kW using Bird® Plug-in Elements\*
- Frequency Range** 450 kHz - 2.7 GHz
- Accuracy** ±5% of full scale
- Meter Scales** FWD and RFL 25, 50, 100 W
- Meter Sensitivity** 30 µA/1400 Ω
- Alarms** Front Panel Buzzer and red LED
- Front Panel Controls** Reset push-button, reflected power limit display button, adjust alarm level recessed screw
- Rear Panel Features** FWD/RFL DC signal inputs (BNC), DC power/remote reset connector, DPDT interlock relay connector, fail-safe/nonfail-safe selector, alarm buzzer disable, AC line voltage selector, safety fuses and IEC 320 AC receptacle.
- Cable** Includes two 25 ft. DC cables
- AC Power** 115/230 VAC, 50/60 Hz @ 0.125A
- DC Power** 9 - 16 VDC @ 1A
- Finish** Gray powder coat
- Nominal Size** 19" W x 5 7/32" H x 3 3/4" D (483 mm x 133 mm x 95 mm)
- Weight** 5 lbs. (2.28 kg)
- Required Products** Line Section: 4522-002-5  
QC connectors: Two  
Elements: Two from Tables 1, 2, 3, 3A, 4, or 6



**Rugged, RF Power Analyst®**

**MODEL 4391A — Portable Wattmeter**

- Power Range** 100 mW to 10 kW using Bird® Plug-in Elements\*
- Frequency Range** 450 kHz - 2.7 GHz
- Insertion VSWR** with N connectors 1.05 max. to 1000 MHz
- Accuracy** **Power Readings:** ±5% of full scale CW, ±8% PEP  
**VSWR:** ±10% of reading  
**% Modulation:** (CW power 1/3 or more of full scale) ±5% (0-90%), ±10% (90-100%)
- Usable Over-range** to 120% of scale (CW, PEP, SWR and Return Loss)
- Sampling Rate** 2 to 3 readings per second
- Display** 3 1/2 digit, 0.3" LED strobed
- Modulation Frequency** 25 to 10,000 Hz (Audio)
- Pulse Parameters** (min.) Pulse width 0.8 µs (100-2700 MHz), 1.5 µs (26-99 MHz) and 15 µs (2-25 MHz)  
Repetition Rate 25 PPS, and Duty Factor 1 x 10<sup>-4</sup>
- Return Loss** ±0.3 dB to corresponding SWR value
- Battery Life** 8 hours (rechargeable)
- AC Power** 100-130/200-260 V, 50/60 Hz, 6 W
- Connectors** QC Type (Female N normally supplied)
- Finish** Blue vinyl with silver anodized side panels
- Nominal Size** 9 9/16" L x 5 7/32" W x 4 5/16" H (243 mm x 158 mm x 110 mm)
- Weight** 5 3/4 lbs. (2.6 kg)
- Elements** Select two elements in a 10:1 power ratio from Tables 1, 2, 3, 3A, 4, 5, 6 and 14
- Accessories** Case



\*Quoted accuracy only when used with other Bird® products.