

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) (175 mm x 130 mm x 92 mm)
Weight 3 lbs. (1.4 kg)
Elements Tables 1, 2, 3, 3A, 4, 6 (pages 40-43)



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



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*
 with N Connectors 1.07 max.** to 1000 MHz
Insertion VSWR ±5% of full scale
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) (175 mm x 130 mm x 92 mm)
Weight 3 1/2 lbs. (1.6 kg)
Elements Tables 1, 2, 3, 3A, 4, 6 (pages 40-43)
 (within power/frequency range limits stated above)
Accessories Case (page 46)



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 10⁻¹ 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) (175 mm x 130 mm x 92 mm)
Weight 3 lbs. (1.4 kg)
Elements Tables 1, 2, 3, 3A, 4, 5, 6 (pages 40-43)
Accessories Case (page 46), spare batteries (page 45),
 extra QC connectors (page 44).



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) (161 mm x 131 mm x 108 mm)
Weight 3 1/4 lbs. (1.5 kg)
Elements 4305A element table below
 and 1 5/8AA table (page 42)
Accessories Case (page 46)



4305A Elements	Frequency (MHz)					
Power	.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	—	—	—	—	—



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) (175 mm x 130 mm x 92 mm)
Weight 3 lbs. (1.36 kg)
Accessories Case (page 46)



*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** 3 lbs. (1.36 kg)
- Accessories** Case (page 46)



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** 4410A: 3 lbs. (1.4 kg), 4412A: 3 1/3 lbs. (1.5 kg)
- Elements** Tables 9, 10, 11, 12 (below)
- Accessories** Case (page 46), spare battery (page 45)



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

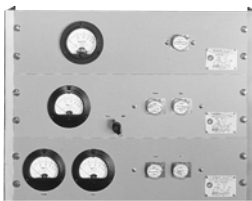
Power Range	1 W - 1000 W
Frequency Range	2 MHz - 2.3 GHz
Accuracy	10°C to 35°C ±4% reading, ±1% full scale, -20°C to 50°C ±6% reading, ±2% full scale
Peak/Avg. Ratio	In excess of 10 dB
Insertion VSWR	(with N connector) 1.05 max. to 1000 MHz
Setting Time	< 1 second
Meter	Shock mounted, linear scale with 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	3 lbs. (1.4 kg)
Elements	Special APM Series (below)
Recommended Accessories	Case (page 46)



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 (pages 40-43)



*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 QC Type (Female N normally supplied)
Connectors	Gray powder coat
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 (pages 40-43)



High Speed, FWD/RFL Alarm Wattcher® MODEL 3170A — 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 (pages 40-43)
Calibration Cycle	1 Year for element



Note: Elements calibrated to a 7/8" line section (standard) can be interchanged. Wattcher® Model 3170A 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 (page 24) QC connectors: Two (page 44) Elements: Two from Tables 1, 2, 3, 3A, 4, or 6 (pages 40-43)



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 ⁴
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 (includes connectors) (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 (pages 40-43)
Accessories	Case (page 46)



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



RF Signal Samplers

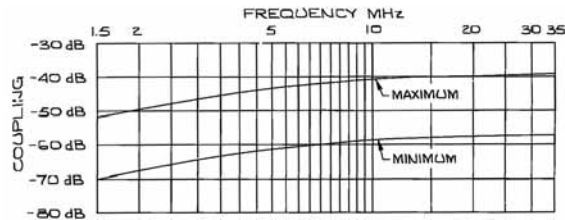
The Model 4273 (1.5 to 35 MHz, 5 kW max.) and Model 4275 (20 to 1000 MHz, 1 kW max.) are "stand-alone," wide-range THRULINE® RF coupling probes for spectrum analysis, RF signal observation on a scope, or frequency counting and control. They feature very low VSWR throughout a broad frequency and attenuation range. Insertion loss is a negligible 0.1 dB. Both Models produce an unrectified sample at the BNC port that is adjustable. Once adjusted, the setting can be locked in place. The main power connectors are Bird® QC type.

VARIABLE RF SIGNAL SAMPLERS, MODEL 4273, 4275

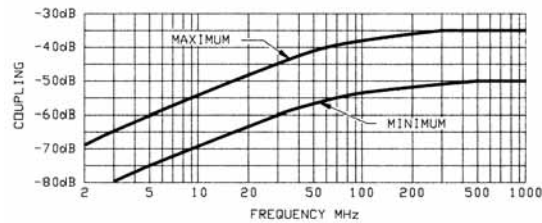
	4273	4275
Power Rating	5 kW max	1 kW max
Frequency Range	1.5 - 35 MHz	20 - 1000 MHz
Impedance	50 ohm nominal	50 ohm nominal
Insertion VSWR	with N Connectors 1.07 max	with N Connectors 1.1 max.
Insertion Loss	0.1 dB max.	2 to 512 MHz, 1.25 max. 512 to 1000 MHz 0.1 dB max. 2 to 512 MHz, 0.2 dB max. 512 to 1000 MHz
Coupling	Adjustable as shown within ± 3 dB	
Ambient Temperature Range	-40°C to +45°C	
Connectors	QC Type (Choose any two connectors from page 44)	
Finish	Bright silver plate	
Nominal Size	2 51/64" L x 2 7/8" W x 1 1/4" D, (71 mm x 73 mm x 32 mm)	
Weight	10 oz. (280 g)	



MODEL 4273



MODEL 4275





Model 4041

FIELD-STRENGTH METER MODEL 4041

	4041
Frequency Range	1 to 1000 MHz
Dynamic Range	30 dB min.
Typical Sensitivity	Full Scale deflection at 8 ft. (2 1/2 m) from a 1 W source broadcasting at 150 MHz through a quarter wave antenna
Battery Life	200 hours min.
Battery Type	One, 9V alkaline, "Transistor" battery (NEDA No. 1604A)
Ambient Temp Range	0°C to +50°C
Nominal Size	(w/o antenna) 4 3/8" L x 2 1/4" W x 1 15/16" D, (111 mm x 57 mm x 49 mm)
Weight	(includes batteries) 10 oz. (283 g)



RPK 43-4

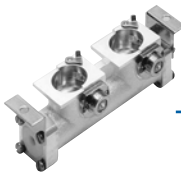
FIELD REPLACEMENT METERS

THRULINE® WATTMETER METER MOVEMENT 30µA KIT



4210A100

	RPK 43-4	4210A100
Type	3 1/2" Round Kit w/ Cable	3 1/4" Square Meter in Housing
Current	30 µA/1400 Ω	30 µA/1400 Ω
Scales	25/50/100 W	25/50/100 W
Use with Element Tables	1, 2, 3, 3A, 4, 6 (pages 40-43)	1, 2, 3, 3A, 4, 6 (pages 40-43)



THRULINE® WATTMETER COMPONENTS— Line Sections Cable 7/8" Rigid Line

	4230-018	4230-006-1	4230-059	4522-002-5
Model	4230-018	4230-006-1	4230-059	4522-002-5
Line Type	Cable	Cable	Cable	Cable
Connector Type	QC-N (F)	QC (not incld.)	QC (not incld.)	QC (not incld.)
Element Sockets	1	1	1 w/bracket	2 panel mt.
Length (Inches)	5 1/2	4	4	6 7/32
Weight (lbs.)	1 1/3	1	1 1/4	1 1/4
Use with Wattmeters	—	—	—	3128A, 4201A501, 4201A502, 4201A100, RPK 43-4

