

Portable Wattmeters

Thruline® RF Directional



43

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 includes connectors	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	Tables 1, 2, 3, 4, 6



43P (with Peak Power Retrofit Kit 4300-400)

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)
Connectors	QC Type (Female N normally supplied)
Battery (Life)	48 hours typical
Weight	Adds 1 lb. to Model 43



4431 (Variable RF TAP)

Power Range	5 kW max. 2 - 30 MHz
Frequency Range	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 includes connectors	6 7/8" H x 5 1/8" W x 3 5/8" D, (175 mm x 130 mm x 92 mm)
Weight	3 1/2 lbs. (1.6 kg)
Elements	Tables 1, 2, 3, 4, 6 (within power/frequency range limits stated above)
Accessories	Case

*Quoted accuracy only when used with other Bird® Products

**Applies only when coupling is less than 30 dB

Portable Wattmeters

Thruline® RF Directional



4314C (P EP, Single Element)

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 ⁻⁴ 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 includes connectors	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	Tables 1, 2, 3, 4, 5, 6
Accessories	Case, spare batteries, extra QC connectors.



4305A (High-Power)

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 includes connectors	6 5/16" H x 5 1/8" W x 4 1/4" D, (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
Accessories	Case

4305A ELEMENT SELECTION GUIDE

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

Portable Wattmeters

Thruline® RF Directional



4304A (Fixed 25-1000 MHz 5-500 Watt Element)

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, $\pm 7\%$ of full scale, using correction charts. 100-512 MHz, $\pm 6\%$ of full scale, no correction needed. 512-1000 MHz, $\pm 7\%$ of full scale, no correction needed.
Connectors	QC Type (Female N normally supplied)
Finish	Light Gray powder coat
Nominal Size includes connectors	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. (1.36 kg)
Accessories	Case



4308 (Cellular Specialist)

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	$\pm 5\%$ of full scale
Connectors	QC Type (Female TNC normally supplied)
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 includes connectors	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. (1.36 kg)
Accessories	Case

Portable Wattmeters

Thruline® RF Directional



4410 Series (Multipower)

Battery	4410A - 9V Alkaline Battery 4412A-Rechargeable Battery
Power Range	300 mW - 1 kW or 2 W - 10 kW full scale in one single Plug-in Element
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 Temp. 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)
Over-Range	To 120% of nominal full scale
Protection	(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 includes connectors	6 7/8" H x 5 1/8" W x 3 5/8" D, (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 10, 11, 12 (below)
Accessories	Case, spare battery

4410 ELEMENT SELECTION GUIDE

TABLE 10	Full-Scale Power and Frequency Ranges 0-100, 300 Milliwatts, 1, 3, 10, 30, 100 Watts						
Frequency Bands (MHz)							
	25-80	50-125	100-250	200-500	400-1000	1000-1800	1800-2300
	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				
Frequency Bands (MHz)					
	2-30	25-80	50-200	144-520	200-1000
	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		
Frequency Bands (MHz)			
	0.2-0.535	0.45-2.5	2-30
	4410-1	4410-2	4410-4

*Accuracy is ±8% of reading

Portable Wattmeters

Thruline® RF Directional



APM-16 (Average Reading Power Meter)

Power Range	1 W - 1000 W
Frequency Range	2 MHz - 1000 MHz
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

ELEMENT SELECTION GUIDE

	Frequency Bands (MHz)						
	2-30	25-60	50-125	100-250	200-500	400-800	800-960
1 W	—	—	APM-1B	APM-1C	—	APM-1E-400	APM-1E-800
2.5 W	—	—	APM-2.5B	—	APM-2.5D	APM-2.5E-400	APM-2.5E-800
5 W	APM-5H	APM-5A	APM-5B	APM-5C	APM-5D	APM-5E-400	APM-5E-800
10 W	APM-10H	APM-10A	APM-10B	APM-10C	APM-10D	APM-10E-400	APM-10E-800
25 W	—	—	APM-25B	APM-25C	APM-25D	APM-25E-400	APM-25E-800
50 W	—	—	—	APM-50C	APM-50D	APM-50E-400	APM-50E-800
100 W	APM-100H	APM-100A	APM-100B	APM-100C	APM-100D	APM-100E-400	APM-100E-800
250 W	APM-250H	APM-250A	APM-250B	APM-250C	APM-250D	APM-250E-400	APM-250E-800
500 W	APM-500H	—	APM-500B	APM-500C	APM-500D	APM-500E-400	APM-500E-800
1000 W	APM-1000H	—	APM-1000B	APM-1000C	—	APM-1000E-400	APM-1000E-800

Portable Wattmeters

Thruline® RF Directional



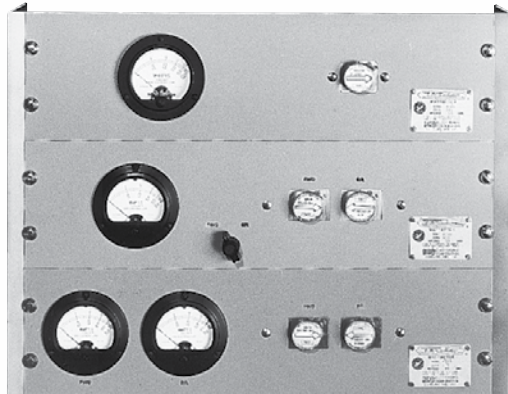
4391A (Rugged, RF Power Analyst®)

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: $\pm 5\%$ of full scale CW, $\pm 8\%$ PEP VSWR: $\pm 10\%$ of reading % Modulation: (CW power 1/3 or more of full scale) $\pm 5\%$ (0-90%), $\pm 10\%$ (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	25 to 10,000 Hz (Audio)
Pulse Parameters	(min.) Pulse width 0.8 μ s (100-2700 MHz), 1.5 μ s (26-99 MHz) and 15 μ s (2-25 MHz) Repetition Rate 25 PPS, and Duty Factor 1×10^{-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, 4, 5, 6 and 14
Accessories	Case

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

Panel Mount Wattmeters

Thruline® RF Directional



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)
Weight	3 lbs. (1.36 kg)
Elements	Tables 1, 2, 3, 4, 6

*Applies only when coupling is less than 30 dB

**Quoted accuracy only when used with other Bird® Products



4527 (2-512 MHz with Sampler Port)

Power Ranges	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
includes connectors	(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

Field Replacement Meter

Thruline® Wattmeter Movement Kit



RPK 43-4

Type	3 1/2" Round Kit w/ Cable
Current	30 μ A/1400 Ω
Scales	25/50/100 W
Use with Element Tables	1, 2, 3, 4, 6



4210A100

Type	3 1/4" Square Meter in Housing
Current	30 μ A/1400 Ω
Scales	25/50/100 W
Use with Element Tables	1, 2, 3, 4, 6

Rigid Line Sections

Thruline® Wattmeter Components



1 5/8" LINE SECTIONS

	Connector Type	Line Size (Inches)	Element Sockets	Length (Inches)	Weight
4715-000	EIA Flg.	1 5/8"	2	6.75	3.25
4723-000	UnFlg. (Rec. 0.438")	1 5/8"	2	6.38	1.5
4723-020	UnFlg. (Flush)	1 5/8"	2	6.38	1.5



3 1/8" LINE SECTIONS

	Connector Type	Line Size (Inches)	Element Sockets	Length (Inches)	Weight
4610-000	EIA Flg.	3 1/8"	2	7.03	7.25
4801-100	UnFlg. (Rec. 0.438")	3 1/8"	2	6.5	4.25
4802-000	UnFlg. (Flush)	3 1/8"	2	6.5	4.25



4 1/16" LINE SECTIONS

	Connector Type	Line Size (Inches)	Element Sockets	Length (Inches)	Weight
4642-010	Flg. (MYAT)	4 1/16"	2	8.13	8.88



6 1/8" LINE SECTIONS

	0.0556 in	Line Size (Inches)	Element Sockets	Length (Inches)	Weight
4905-000	EIA Flg.	6-1/8"	2	10.22	17
4909-000	UnFlg. (Rec. 0.438")	6-1/8"	2	9.63	12.75

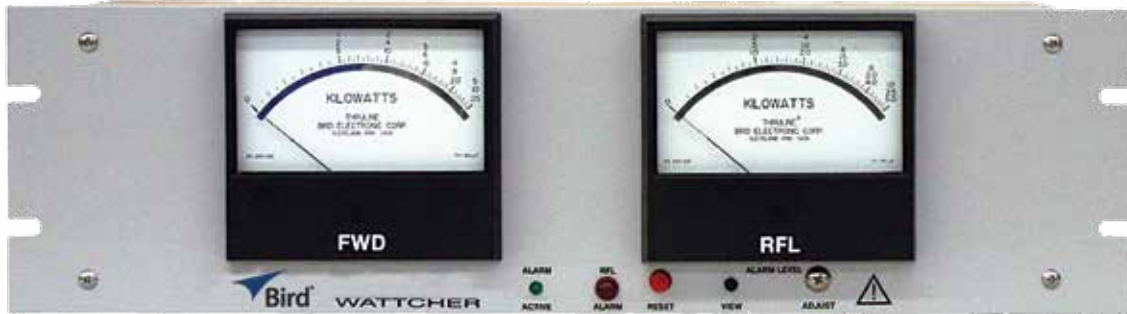


7/8" LINE SECTIONS

	Connector Type	Line Size (Inches)	Element Sockets	Length (Inches)	Weight
4230-018	N-Type (F)	7/8"	1	5 1/2	1 1/3
4230-006-1	QC (not included)	7/8"	1	4	1
4230-059	QC (not included)	7/8"	1 w/bracket	6 7/32	1 1/4
4522-002-5	QC (not included)	7/8"	2 panel mt.	6.38	1 1/4

Rigid Line Wattmeters

3127 & 6810 Series



3127 Series SELECTION GUIDE

	Type	Scales	DC Cable (Ft.)	Uses Line Section
3127-035	Single 4-1/2" rectangular on panel	5/10/25 kW	25	Double Socket
3127-055	Single 4-1/2" rectangular on panel w/fwd. and rfl. switch	5/10/25 kW	25	Double Socket
3127-040	Dual 4-1/2" rectangular on panel	5/10/25 kW	25	Double Socket
3127-080	Single 4-1/2" rectangular on panel w/fwd. and rfl. switch	15/30/60 kW	25	Double Socket
3127-075	Dual 4-1/2" rectangular on panel	15/30/60 kW	25	Double Socket



6810 Series SELECTION GUIDE

	Type	Scales	DC Cable (Ft.)	Uses Line Section
6810-220	4-1/2" rectangular in housing w/fwd. and rfl. switch	5/10/25 kW	10	Double Socket
6810-230	4-1/2" rectangular in housing w/fwd. and rfl. switch	15/30/60 kW	10	Double Socket
6810-250	4-1/2" rectangular in housing w/fwd. and rfl. switch	8/80 kW	10	Double Socket
6810-265	4-1/2" rectangular in housing	8/80 kW	10	Single Socket
6810-307	4-1/2" rectangular in housing	15/30/60 kW	10	Single Socket
6810-309-7	4-1/2" rectangular in housing	5/10/25 kW	10	Single Socket