

# THRULINE® RF DIRECTIONAL WATTMETERS

**Multipower Level, Superior Sensitivity**



Each **4410 Series** power element has seven overlapping power levels to reduce the number of elements you need.

## MULTIPOWER, $\pm 5\%$ READING ACCURACY

## 4410 SERIES

Our 4410 Series high-sensitivity wattmeters are solid choices for field-service applications where the greater dynamic range of the plug-in elements substantially reduce the number of elements needed to cover multiple power and frequency ranges. The 4410 series is also well-suited to laboratory work where power levels as low as 2 milliwatts must be measured with high accuracy.

Each 4410 Series wattmeter plug-in element is capable of reading seven different power ranges covering 0.002\* to 10,000 watts. The power ranges of the different elements overlap and include: 0.002–10 W, 0.02–100 W, 0.2–1000 W and 2–10,000 W. All ranges are in frequency bands from 200 kHz to 2300 MHz. Any one of the seven power ranges is selected by a rotary switch located on the front of the wattmeter. Forward and reflected power measurements are accomplished by rotating the element. See Element Tables 9 through 12 on page 25.

Exceptional  $\pm 5\%$  of reading accuracy is achieved via a built-in temperature compensation circuit. This stated accuracy applies from 100% of full scale down to 20% of full scale across all seven ranges.

Two portable models are available:

**Model 4410A** powered by a 9-volt alkaline, transistor-type, battery.

**Model 4412 AC** powered with rechargeable NiCd battery.

### Models: 4410A and 4412

**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 to 2.3 GHz CW or FM.

**Insertion VSWR:** with N Connectors 1.25 max. to 2300 MHz

**Accuracy:**  $\pm 5\%$  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  $\pm 10\%$  of reading, and 4410-15 1.0–1.8 GHz and 4410-16 1.8–2.3 GHz which are accurate to  $\pm 8\%$  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° to 122°F), and 4410-20 through 27 from 20°C to 30°C (68° to 86°F).

**Over-Range Protection:** To 120% of nominal full scale (i.e. 12 W, 120 W, 1,200 W, or 12,000 W). No damage or degradation to the unit will result, regardless of the Range Selector Switch position.

**Battery Life:** Model 4410A: 24 hrs. min. with standard 9 V alkaline "transistor" battery (NEDA No. 1604A supplied). Model 4412: 7 hrs. min. (rechargeable).

**AC Power:** Models 4412: 105–125/210–250 Vac, 50/60 Hz with integral selector switch

**Connectors:** QC Type (Female N normally supplied)

**Finish:** Gray powder coat

**Nominal Size:** (includes connectors) 6 $\frac{7}{8}$ " H  $\times$  5 $\frac{1}{8}$ " W  $\times$  3 $\frac{5}{8}$ " D, (175 mm  $\times$  130 mm  $\times$  92 mm)

### Weight:

Model 4410A: 3 lbs. (1.4 kg).

Model 4412: 3 $\frac{1}{3}$  lbs. (1.5 kg)

**Elements:** Tables 9, 9A, 10, 11, 12 on page 25

**Recommended Accessories:** Case (page 22), spare battery (page 61), extra QC-connectors (page 60).