

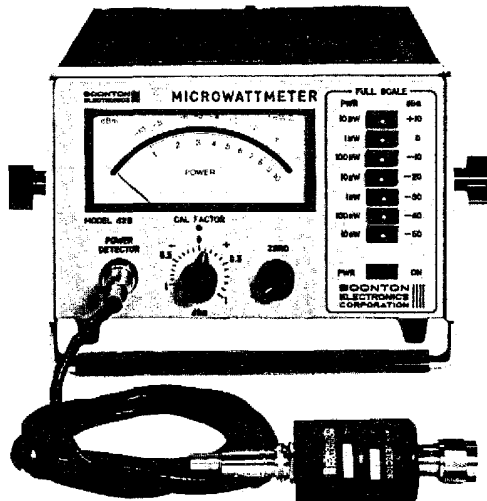
BOONTON

POWER METERS

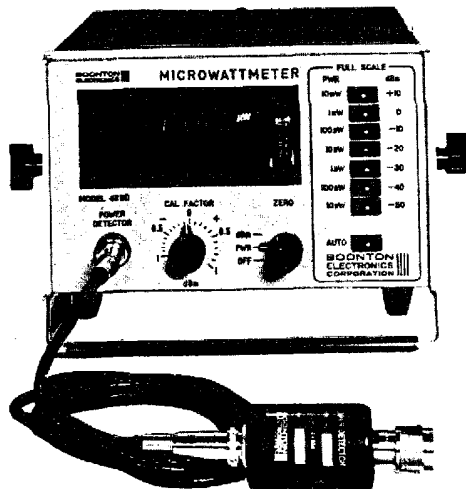
RF Microwattmeter

Model 42B/BD/C/CD

- Frequency Range, 100 kHz to 18 GHz.
- Power Range, 1 nW (–60 dBm) to 100 mW (+20 dBm), sensor dependent.
- IEEE-488 Bus Compatible Using Model 10A.



42 B/C



42 BD/CD

Description

The Models 42B/BD/C/CD high frequency power meters are virtually drift free and cover a dynamic range of 70 dB from 1 nW to 100 mW (–60 to +20 dBm) depending on what series sensors are used with the instruments.

The 42B and 42C are analog RF Microwattmeters and have as standard a quasi-linear dBm scale uppermost and a non-linear lower power scale below.

The 42BD and 42CD are digital RF Microwattmeters. Both digital versions have as standard a 3½ digit LED power display and a vertical front panel edgometer, calibrated in dBm. This analog meter allows simple adjustment of instrument zero, and is additionally useful for peaking or nulling applications or for following rapidly changing signals.

Sensors

The 41-4 and 41-5 series sensors are used with the 42 series instruments. The 41-4 series sensors covers the range from 10 nW (–50 dBm) to 10 mW (+10 dBm) full scale, and works with "B" suffix instruments. The 41-5 series sensors covers the range from 100 nW (–40 dBm) to 100 mW (+20 dBm) full scale and works with "C" suffix instruments. Refer to the Power Meter Sensors section for a more detailed description of the sensors.

Low Noise

The 42 series instruments are designed and constructed to hold noise from all sources to a minimum. The sensor cable is of special low-noise design; a vigorous flexing causes only momentary, minor deflection on the most sensitive range of the instrument. The sensor is not sensitive to shock or vibration; even sharp tapping on its barrel causes no visible deflection on any range.

Zero Adjustment

Zero adjustment is normally not required on the upper ranges. For measurement on the lower ranges, the ZERO control is adjusted on the instrument's most sensitive range before using. This control balances out small thermal voltages in the sensing elements and, once adjusted, requires only infrequent checking during the course of subsequent measurements.

Calibration-Factor Adjustment

A panel mounted control allows the sensitivity of the instrument to be adjusted to correct for the frequency response and mismatch errors of the sensor. Calibration is in the form of indicated power to incident power.

The front panel scale for the control is graduated in 0.1 dB steps; the resolution of the control, however, is 0.01 dB (as indicated by the digital display).

Analog Output

The 42 Series power meters have a rear panel DC output, that provides a DC output voltage proportional to the power being measured. The current capability of 1 mA in 1000 ohms is extremely stable. The DC output can be used for driving a plotter or recorder, or for connection to an oscilloscope for swept frequency measurements.

BCD Output

The 42BD/CD provides a bit-parallel digital-serial binary-coded-decimal output (4-line, 8-4-2-1), for connection to an external system. Ranges can also be remotely controlled and the BCD output can be triggered in synchronism with some system event. All input and output connections are made at the card-edge connector at the rear of the instrument case.

Programmable

The 42 Series power meter commands, standard and optional, are fully programmable by utilizing the proper logic levels. The only controls that are not programmable are the Calibration Factor and Zero controls.

GPiB Compatibility

The models 42BD and 42CD, when combined with Boonton's Bus Interface Unit, Model 10A, become fully compatible with IEEE-488 bus. All front panel functions except the Power ON/OFF, Zero, and Calibration Factor control are under control of the GPiB.

Application

The 42 Series digital power meters are particularly well suited for integration into systems. Programmability and BCD serial by digits data output is standard. Autoranging, a serial to parallel converter, and dBm readout options are available.

POWER METERS

RF Microwattmeter

Models 42B/BD/C/CD (Continued)

Specifications

	42B	42BD	42C	42CD
	Analog	Digital	Analog	Digital
Power Range	1 nW (-60 dBm) to 10 mW (+10 dBm).		10 nW (-50 dBm) to 100 mW (+20 dBm).	
FS Ranges	10 nW, 100 nW, 1 μW, 10 μW, 100 μW, 1 mW, 10 mW.		100 nW, 1 μW, 10 μW, 100 μW, 1 mW, 10 mW, 100 mW.	
Max. Safe Overload	300 mW CW (+25 dBm).		2 W CW (+33 dBm).	
Instrumentation Error	±0.5% fs ±0.15 dB, >10 nW. ±1.0% fs ±0.15 dB, <10 nW.	±0.25% fs ±0.15 dB, >10 nW. ±1.0% fs ±0.15 dB, <10 nW.	±0.5% fs ±0.15 dB, >100 nW. ±1.0% fs ±0.15 dB, <100 nW.	±0.25% fs ±0.15 dB, >100 nW. ±1.0% fs ±0.15 dB, <100 nW.
	For dB option, add ±0.1 dB, -40 to +10 dBm fs.		For dB option, add ±0.1 dB, -30 to +20 dBm fs.	
Calibration Factor Control	Variable ±1 dB, 0.1 dB increments.			
Display	4½ inch taut-band meter; top scale, dBm, red -11 to 0 dBm; bottom, power, black, 1 to 10.	3½ digits, power, fs count of 1000; 4 digits for dBm, 0.001 dB resolution (-09 option) vertical analog edgometer in dBm; 200 ms display period, 75 ms encode period.	4½ inch taut-band meter; top scale, dBm, red, -11 to 0 dBm; bottom, power, black, 1 to 10.	3½ digits, power, fs count of 1000; 4 digits for dBm, 0.001 dB resolution (-09 option) vertical analog edgometer in dBm; 200 ms display period, 75 ms encode period.
Zero Drift	1 nW/hr. max. on 10 nW range.		10 nW/hr. max. on 100 nW range.	
Waveform Response	1 nW to 10 μW, true average power; above 10 μW, average power of sinewave.		10 nW to 100 μW, true average power; above 100 μW, average power of sinewave.	
DC Output	0 to 10 V on each range, proportional to input power; 9 kΩ source, 1 mA max. into 1 kΩ.			
Temperature Influence	Temperature range 21°C to 25°C 18°C to 30°C 10°C to 40°C		Additional error: Instrument 0 dB 0 ±0.2	Detector 0 dB ±0.1 ±0.2
RFI	No detectable radiated or conducted leakage from instrument or power detector.			
Input Step Function Response Time	full-scale 10 μW to 10 mW, 100 ms full-scale 10 nW to 1 μW, 1 s		full-scale 100 μW to 100 mW, 100 ms full-scale 100 nW to 10 μW, 1 s	
Commands	Logic level zero selects manual disable and input range; logic 0 <0.7, logic 1, 2.4 to 5.2 V.	Logic level zero selects manual disable, encode trigger, encode hold, and input range; logic 0 <0.7, logic 1, 2.4 to 5.2 V. With options, selects power or dBm, and autorange.	Logic level zero selects manual disable and input range; logic 0 <0.7, logic 1, 2.4 to 5.2 V.	Logic level zero selects manual disable, encode trigger, encode hold, and input range; logic 0 <0.7, logic 1, 2.4 to 5.2 V. With options, selects power or dBm, and autorange.
Data Outputs	N.A.	1-2-4-8 BCD data, serial by digits; 1-2-4 range information. Overrange, underrange, encode complete. Logic 0 <0.7, logic 1, 2.4 to 5.2 V.	N.A.	1-2-4-8 BCD data, serial by digits; 1-2-4 range information. Overrange, underrange, encode complete. Logic 0 <0.7, logic 1, 2.4 to 5.2 V.
Power Consumption	8 W, 117/235 V ±10%, 50-400 Hz.	15W, 117/235 V ±10%, 50-400 Hz.	8 W, 117/235 V ±10%, 50-400 Hz.	15W, 117/235 V ±10%, 50-400 Hz.
Dimensions	5.2 in (13.2 cm) high, without feet, 8.3 in (21.1 cm) wide, without handle, and 12.0 in (30.5 cm) deep.			
Weight	Net 7 lbs. (3.2 kg), with detector and cable. Shipping 11 lbs. (5.0 kg).	Net 9.5 lbs. (4.3 kg), with detector and cable. Shipping 12.5 lbs. (5.7 kg).	Net 7 lbs. (3.2 kg), with detector and cable. Shipping 11 lbs. (5.0 kg).	Net 9.5 lbs. (4.3 kg), with detector and cable. Shipping 12.5 lbs. (5.7 kg).
Options	-08, rear input signal. -11, reversed scales.	-01, autoranging. -08, rear signal input. -09, dBm readout, display and outputs in power or dBm. -21, serial to parallel data.	-08, rear signal input. -11, reversed scales.	-01, autoranging. -08, rear signal input. 09, dBm readout, display and outputs in power or dBm. -21, serial to parallel data.
Accessory Required	One or more of the 41-4 series power sensors. A five foot power sensor cable, Model 41-2A is supplied with each sensor ordered.		One or more of the 41-5 series power sensors. A five foot power sensor cable, Model 41-2A is supplied with each sensor ordered.	
Accessories Available	41-2A/10 Sensor/Probe Interconnecting Cable (10 ft.) (M/M). 41-2A/20 Sensor/Probe Interconnecting Cable (20 ft.) (M/M). 41-2A/50 Sensor/Probe Interconnecting Cable (50 ft.) (M/M). 41-2A/100 Sensor/Probe Interconnecting Cable (100 ft.) (M/M). 950006 Adapter 50 Ω N:75 N (M:F). 950030 Rack Mtg. Kit, Dual. 950032 Rack Mtg. Kit, Single. 951049 20 dB Attenuator, DC to 8 GHz, 25 Watts.			
		950033 Rack Mtg. Kit, Single (10A at rear main unit). 950034 Rack Mtg. Kit, Dual (10A at rear main unit). 950035 Rack Mtg. Kit, Single (10A at side main unit).		950033 Rack Mtg. Kit, Single (10A at rear main unit). 950034 Rack Mtg. Kit, Dual (10A at rear main unit). 950035 Rack Mtg. Kit, Single (10A at side main unit).