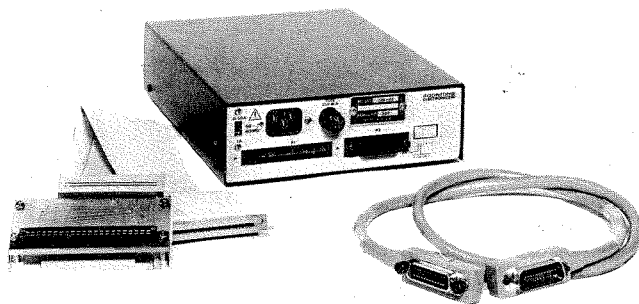


# IEEE-488 Bus Interface Unit Model 10A



- Eliminates compatibility problems of couplers designed for general application.
- Works with all Boonton digital meters including most of those already in use.
- Complete with interconnecting cable and standard bus cable.

The Model 10A IEEE-488 Bus Interface Unit allows all Boonton digital meter type instruments to be adapted for use on the bus. It allows the instrument to become either a talker or listener or both under the direction of a controller such as a bus interfaceable calculator.

The stored program PROM may easily be exchanged to adapt the bus interface unit to each Boonton meter. An option number designates the PROM installed.

## Interface Functions:

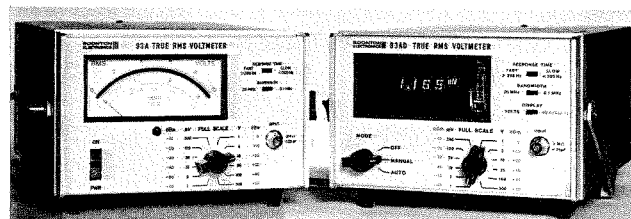
SH1	Source handshake capability
AH1	Acceptor handshake capability
T7	Talker (basic talker, no serial poll, talk only mode, unaddressed to talk if addressed to listen)
L3	Listener (basic listener, listen only mode, unaddressed to listen when addressed to talk)
SRO	No service request capability
RL1	Remote/Local Capability
PPO	No parallel poll capability
DC1	Device clear capability
DT1	Device trigger capability
CO	No controller capability

## Model Selection:

Option	Used With:
10A-01	Model 42BD Microwattmeter
10A-02	Model 62AD 1 MHz Inductance Meter
10A-03	Model 72BD 1 MHz Capacitance Meter
10A-04	Model 92BD RF Millivoltmeter
10A-05	Model 93AD True RMS Voltmeter
10A-06	Model 42CD Microwattmeter

**Available Accessories:** 950033, 950034, 950035 (see accessories).

# True RMS Voltmeters Model 93 Series



The Boonton 93A and 93AD voltmeters are true r.m.s. responding instruments that use backward diodes as balanced, low-level, square-law detectors. Both cover twelve ac voltage ranges from 1 mV to 300 V full-scale. The 1 mV full-scale range provides unmatched sensitivity to measure the low r.m.s. level of noise and of low duty cycle pulse trains. Both r.m.s. voltmeters feature a full 10 Hz to 20 MHz frequency range usable down to the lowest voltage range. A 3 dB bandwidth of 30 MHz assures accurate r.m.s. measurements of complex voltages with significant high frequency energy components, such as narrow pulses and wideband noise. The 93A meter is calibrated with dBm as well as voltage scales. The 93AD has an edge-mounted dBm analog meter in addition to the digital display; an optional dB display provides readings directly in dB with 0.01 dB resolution. Autoranging is also available.

## Data Bus

The Model 93AD may be adapted to the IEEE-488 Standard Data Bus by use of the Model 10A-05 Bus Interface Unit (see below).

## SPECIFICATIONS

### Analog Model 93A

**Voltage Range:** 1 mV to 300 V fs, in 12 ranges.  
**dBm Range:** -68 dBm to +52 dBm (600  $\Omega$  ref.).  
**Selectable Bandwidth:** 10 Hz to 20 MHz or 10 Hz to 100 kHz  
**Basic Accuracy:**  $\pm 1\%$  fs or  $\pm 2\%$  rdg, whichever is better.

**Indicator:** 4½" taut-band meter; scales 0-3, 0-10 and dBm.

**Response Time:** Fast; 1 sec. Slow; 4 sec.

**Crest Factor:** 6 at full scale; 18 at down scale.

**Input:** Impedance: 2 M $\Omega$ , < 25 pF.  
 Equivalent noise: < 35  $\mu$ V.

**DC Output:** +10 V for fs.

**Remote Control:** All functions and ranges commanded with TTL input.

**Options:** See list, page 3.

**Available Accessories:** 950030, 950032, 960000, 93-1A (see accessories).

### Digital Model 93AD

**Voltage Range:** 1 mV to 300 V r.m.s. fs, in 12 ranges.

**dB Range:** 120 dB; resolution, 0.01 dB (optional).

**Selectable Bandwidth:** 10 Hz to 20 MHz or 10 Hz to 100 kHz

**Basic Accuracy:**  $\pm(1\%$  rdg + 1 count) for voltage.  
 $\pm 0.2$  dB for dB option.

**Display:** 3½ digit LED display (4 digits for dBm). Decimal point, units (V, mV, dB), under- and over-range, polarity (dBm only) also indicated. Analog edgometer, scaled over 12 dB range.

**Response Time:** Fast; 1 sec. Slow; 4 sec.

**Crest Factor:** 6 at full scale; 18 at down scale.

**Input:** Impedance: 1 M $\Omega$ , < 25 pF.  
 Equivalent noise: < 35  $\mu$ V.

**Outputs:** BCD (serial) digits, binary range and mode information.

**DC Output:** 10 V for fs.

**Remote Control:** All functions and ranges commanded with TTL input.

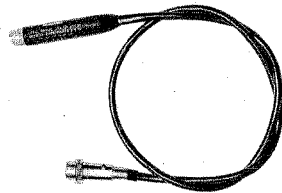
**Options:** See list, page 3.

**Available Accessories:** 950030, 950032, 960000, 93-1A, 93-2A (see accessories).



**91-8B 50 Ohm BNC Adapter.** For 91-12F probes. For measurements up to 600 MHz in a 50 ohm system. Female. Furnished with Millivoltmeter.

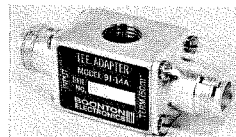
**91-8B/1 75 Ohm BNC Adapter.** For 91-12F probes. Female.



**91-12F RF Probe.** For all RF Millivoltmeters except Model 9200A. 10 kHz to 1.2 GHz; useful response for relative measurements to beyond 4 GHz. Overload protection 10 V ac and 400 V dc. Furnished with Millivoltmeter.

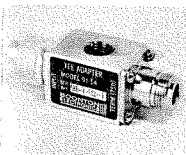


**91-13B Probe Tip.** For 91-12F, 91-4C, and 91-7C. With grounding clip lead for use to approximately 100 MHz. Furnished with Millivoltmeter.



**91-14A 50 Ohm N TEE Adapter.** For 91-12F RF Probe. Permits connection into 50 ohm line; frequency range to 1.2 GHz. Female/Female.

**91-14A/1 75 Ohm N TEE Adapter.** Female/Female. For 91-12F RF Probe.



**91-14B 50 Ohm N TEE Adapter.** Same as 91-14A, except input connector is N male. For 91-12F RF Probe.

**91-14B/1 75 Ohm N TEE Adapter.** Same as 91-14A/1, except input connector is N male. For 91-12F RF Probe.



**91-15A 50 Ohm N Termination.** For 91-14A and 91-14B Tee Adapter.

**91-15A/1 75 Ohm N Termination.** For 91-14A/1 and 91-14B/1 Tee Adapter.



**91-16A Unterminated Type N Adapter.** For 91-12F probes. For coaxial connection up to approximately 100 MHz or to 400 MHz when fed from a low impedance source in an electrically-short system. Female.



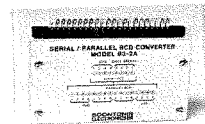
**91-18B Storage Container.** For Voltmeter accessories.

**91-24A 50 Ohm Accessory Kit.** Comprises 91-6C, 91-7C, 91-14A, 91-15A, and 91-18B.

**91-24A/1 75 Ohm Accessory Kit.** Comprises 91-6C, 91-7C, 91-14A/1, 91-15A/1, and 91-18B.



**93-1A High Impedance Probe.** For 93 Series. 10 M $\Omega$ , <11.5 pF input, x 10 attenuation. Six foot lead. Probe tip.



**93-2A BCD Serial/Parallel Converter.** For 93AD. Plugs on rear of unit. Converts serial data output to parallel BCD. TTL/DTL compatible. Sinks 1.6 mA. 1 inch deep.



**102-3A Rack Mounting Brackets.** For 102, 103 series, and 76A. L shaped brackets mount both sides to adapt to 19 inch rack.



**4200-4A Power Sensor.** For 4200. 200 kHz–7 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.

**4200-4B Power Sensor.** For 4200. 200 kHz–12.4 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.

**4200-4C Power Sensor.** For 4200. 200 kHz–1 GHz, 1 nW–10 mW, 75  $\Omega$  type N, 300 mW cw overload.

**4200-4E Power Sensor.** For 4200. 200 kHz–18 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.



**4200-5B Power Sensor.** For 4200. 200 kHz–12.4 GHz, 10 nW–100 mW, 50  $\Omega$  type N, 2 W cw overload.

**4200-5E Power Sensor.** For 4200. 200 kHz–18 GHz, 10 nW–100 mW, 50  $\Omega$  type N, 2 W cw overload.



**4200-7E Power Sensor.** For 4200. 10 MHz–18 GHz, 1  $\mu$ W–10 mW, 50  $\Omega$  type N, 30 mW cw overload.

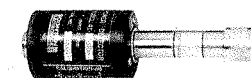


**4210-4A Power Sensor.** For 4210. 200 kHz–7 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.

**4210-4B Power Sensor.** For 4210. 200 kHz–12.4 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.

**4210-4C Power Sensor.** For 4210. 200 kHz–1 GHz, 1 nW–10 mW, 75  $\Omega$  type N, 300 mW cw overload.

**4210-4E Power Sensor.** For 4210. 200 kHz–18 GHz, 1 nW–10 mW, 50  $\Omega$  type N, 300 mW cw overload.



**4210-5B Power Sensor.** For 4210. 200 kHz–12.4 GHz, 10 nW–100 mW, 50  $\Omega$  type N, 2 W cw overload.

**4210-5E Power Sensor.** For 4210. 200 kHz–18 GHz, 10 nW–100 mW, 50  $\Omega$  type N, 2 W cw overload.