

MT REVIEW

Mastech Ms8209 Universal Multimeter

By Bob Grove W8JHD

While multimeters abound for general electrical use, nothing comes close to the multiple functions of this recent release from Mastech. The manufacturer refers to this multiple utility as a “5 in 1” concept, since its meter reports sound, light, humidity, temperature, and electrical measurements.

The applications for its many measurements are virtually unlimited. Its numerous electrical units make it invaluable for scientific and electronics test benches. The relative humidity scale finds application in critical gardening and exotic plants as well as environmental facilities for storage and living. The photometer assists photography, filming, video taping and even rare plant growing. And the sound level meter is ideally suited for auditoriums, classrooms, churches and performance halls for acoustics control.

Let’s take a quick look at the scales, units, ranges, and claimed accuracy:

DCV: 0 mV – 600 V (+/-0.7%)
ACV: 0 mV – 600 V (+/- 1.0%; true RMS)
DCA: 0 mA – 10A (+/-0.5%)
ACA: 0 mA – 10A (+/-1.5%)
Ohms: 0 ohms – 40 megohms (+/-1.2%)
Capacitance: 0 nF – 200uF
Frequency: 10 Hz – 200 kHz (+/- 0.5%)
Duty Cycle: 0.1 – 99.9% (+/-3.0%)
Temperature: -20 deg. C. – 1000 deg. C. (+/- 1.0%)
Relative humidity: 30 – 90 %
Sound Level: 35 – 100 dB (0.1 dB/3.5%)
Luminance: 0 – 40,000 Lux (5.0%)
Function transform: DC/AC, selectable
Range transform: Automatic or manual, selectable

The multimeter’s rugged, rubberized enclosure resists splashing and provides durability. The test leads are high-quality rubber insulated, not the stiff plastic normally associated with low-cost meters. A thermistor probe is included for direct-contact temperature measurements.

A built-in prop can be hinged out to stand the meter for convenient viewing. A backlight allows the unit to be clearly read in low light conditions.

A high-quality, zippered, nylon bag is provided, containing pockets to securely hold the meter and test leads. And how many other manufacturers even include a battery?

❖ Let’s test the meter

It’s handy to have so many functions in one instrument, but are they all equally accurate? We decided to take a look, comparing the Mastech 8209 to several other test instruments of known accuracy. Here’s what we discovered.

Since we had an opportunity to evaluate two identical instruments, their responses should be close; they weren’t. As a matter of fact, when compared with instruments of established accuracy, the MS8209 didn’t even come close to its specified



tolerances on several functions.

The better of two was very accurate on AC and DC volts, current (milliamps), resistance (ohms), capacitance (nanofarads) and frequency (hertz), and even sound level (within 4 dB).

But our room temperature was 7 Celsius degrees off (that’s 12 Fahrenheit degrees); the relative humidity read 22% low when compared to an accurate sling psychrometer; and the luminance readout showed no relationship between the lux and 10 lux scale (which should have been related by a factor of 10).

But it’s not all bad news. Checking with the factory, I was able to secure the calibration procedure which is now included with the instruments sold by Grove Enterprises.

If you are looking for a multimeter for the electronics bench with applications for environmental measurements, all at a reasonable cost, then this is the meter for you.

The Mastech MS8209 multimeter with calibration procedure for the technically inclined is available for \$89.95 plus shipping from Grove Enterprises (1-800-438-8155 or <http://www.grove-ent.com>)

Zap Checker 185

By Bob Grove W8JHD

Some months ago we had the pleasure of reviewing the Zap 180, a handy handful of electronics that provided broadband signal detection. This month we take a look at its improved replacement, the ZC185.

Like its predecessor, the new model is a sleek, ergonomically-designed, pocket-sized instrument designed for the detection of signal presence in virtually any part of the radio spectrum. Its specifications are impressive: 3-5000+ MHz bandwidth, high sensitivity (cell phones and covert listening devices [bugs] at 50+ feet, two-way radios at several hundred feet), and signal announcement by meter, LED and silent vibrator.

Since digital bursts are different from constant analog signals, a switch allows selection of either mode for maximum sensitivity.

In weak-signal environments, the linear mode is chosen for highest sensitivity; in strong-signal conditions, a logarithmic setting provides 1000:1 signal-strength variations and their detection. A thumbwheel allows fine adjustments.

The silent vibrator mode allows the instrument to be worn in stealth, revealing the presence of a transmitting device.

A concise and highly-informative set of operating instructions is provided. The instrument is powered by two AA alkaline cells (not provided).

❖ Our field test

The ZC185 is intuitive to operate, but it’s a good idea to read the manual first to fully appreciate its capabilities.

The contoured outline of the case is especially comfortable in the hand. The log/linear mode switch and sensitivity thumbwheel with the on/off switch are easily operated by the thumb.

The LEDs are brilliant and meter response is fast, allowing rapid resolution of signal sources.



As expected, some environments are packed with radio-frequency (RF) signal sources, and the ZC185 is, after all, a field strength meter; as such, it provides a reading of the aggregate of all signals in the environment. Nonetheless, as discrete signal sources are approached, the readings get stronger.

We found the ZC185 to be quite a handy instrument for testing undesirable radiation from consumer electronics, detecting the presence of transmitting devices (welcome and unwelcome), and revealing the general RF conditions in any area.

The new ZC185 Zap Checker is available from Grove Enterprises for \$158.95 (1-800-438-8155; <http://www.grove-ent.com>; or write 7540 Hwy 64 West, Brasstown, NC 28904).