

# The Return Of The Professional Flag-Ship BM850"s" Series

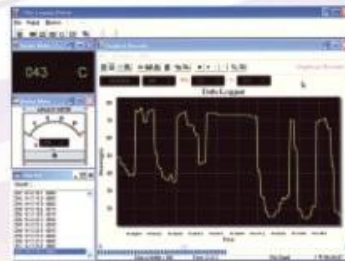
100kHz DC+AC TRMS...500,000 Counts DCV...Yet Only Accept The Best!



**BM850s Series**  
**Professional Multimeter**



BRIGHT PEOPLE'S CHOICE  
<http://www.brymen.com>



● **BM859s**

● **BM857s**

**BRUA-85Xa Interface Kit**  
(optional purchase)

859s	857s	Functions & Features
●	●	6 Digits 999,999 Counts Mode For Hz With 0.002% Accuracy
●	●	5-4/5 Digits 500,000 Counts For DC Voltage Stable Mode
●	●	4-4/5 Digits 50,000 Counts For DC/AC Voltage/Current & OHM
●		T1-T2 Dual Channels Type-K Temperature -50°C To 1000°C
100kHz	20kHz	AC, AC+DC True RMS High Bandwidth Voltage Functions
●	●	Optically Isolated PC-COMM Interface Capability
●	●	BRUA-85Xa Interface Kit For Win 98/ME/NT4/2K/XP/Vista/7/8 (Optional Purchase)
●	●	Audible & Visible BeepJack™ Input Warning Against Improper Plug In
●	●	RECORD Max, Min, Max-Min Readings, Auto-Ranging
●	●	CREST (Peak Hold) Max, Min, Max-Min Readings
●	●	Back-Lighted Large Easy To Read LCD Display
●	●	High Speed Analog Bar-Graph Updates 60/Sec
●	●	Intelligent Auto Power Off (APO)
●	●	Fast Data Measurement 5/Sec
●	●	1000V General (Ohm, Capacitance ... etc.) Input Protection
0.02%	0.03%	High Basic DCV Accuracies
●	●	Fire Retarded Case
●	●	Relative Zero Mode
●	●	Data Hold
●	●	Diode Test
●	●	DC/AC Current 0.01μA To 10A (20A for 30 sec. max with 5 minutes cool down interval)
●	●	DC/AC Voltage 0.01mV To 1000V
●	●	Ohms 0.01Ω To 50MΩ
●	●	Capacitance 10pF To 9999μF
●	●	Fast Audible Continuity < 100μS
●	●	Duty-Cycle % Reading
●	●	Logic Level FREQUENCY 5Hz TO 2MHz
●	●	Line Level FREQUENCY With 4 Trigger Levels
●	●	%4-20mA Process Control Loop Current Reading
●	●	dBm Readings, 20 Selectable Impedance Values
●	●	High Energy HBC Fuses Protected 1000V DC/AC
●	●	Replaceable And Washable Protective Rubber Holster
●	●	Transient Protection Up To 8kV 1.2/50μS Lightning Surge
●	●	LVD Meets EN61010-1 CAT III 1000V & CAT IV 600V
●	●	EMC EN61326-1:2013

# Proven Accuracy... Certified Safety... Superb Performance

## Superb 0.02% Accuracy, Swift 60/Sec Bargraph + Swift Large-Cx Measurements

### FULLY AUTORANGING

SHORTENS THE TIME TO MEASURE AND INCREASES THE EASE OF USE

### CREST (PEAK HOLD)

CAPTURES INSTANTANEOUS PEAK READINGS AS SHORT AS 0.8ms IN DURATION

### MAX-MIN RECORD

RECORD MAX, MIN, MAX-MIN READINGS, AUTORANGING

### BACKLIGHTED LCD DISPLAY

FOR EASY VIEWING IN THE DARK

### LAST SET FUNCTION DEFAULT

LAST SET FUNCTION WILL BE SAVED AS POWER-UP DEFAULT FOR EASE OF USE

### RANGE

AUTORANGING WITH MANUAL-RANGING OVERRIDE

### T1-T2 TEMPERATURE

2 CHANNELS K-TYPE TEMPERATURE, SELECTABLE °C OR °F MEASUREMENTS

### DIGITAL SIGNAL Hz

FOR LOGIC LEVEL SIGNAL HIGH FREQUENCY MEASUREMENTS

### dBm FUNCTION

WITH 20 SELECTABLE IMPEDANCE VALUES

### 1kV AC VOLTAGE MEASUREMENT

IMPROVED MEASURING CAPABILITIES

### INPUT WARNING

AUDIBLE AND VISIBLE WARNING AGAINST IMPROPER PLUG IN

### FIRE RETARDED CASE

FOR REINFORCED SAFETY

### HBC FUSE PROTECTED

HIGH BREAKING CAPACITY  
1000V (600V FOR BM857)  
CERAMIC FUSE PROTECTED

### PROTECTIVE HOLSTER

INCREASES PRODUCT DURABILITY.  
REPLACEABLE & WASHABLE

### DC+AC TRUE RMS

100kHz VOLTAGE BANDWIDTH TO MEASURES SIGNAL TRUE VALUE REGARDLESS OF WAVEFORMS (20kHz FOR BM857)

### PC INTERFACE CAPABILITY

OPTIONAL PURCHASE RS232C+USB CABLES WITH DATA RECORDING PC SOFTWARE FOR WIN98/NT4/2K/XP/VISTA

### 0.02% HIGH BASIC ACCURACY

WITH LARGE EASY TO READ DISPLAY

### INTELLIGENT AUTO POWER OFF

TO EXTEND BATTERY LIFE

### FAST MEASUREMENTS

DATA 5 TIMES / SEC  
BAR-GRAPH 60 TIMES / SEC

### RELATIVE ZERO MODE

FOR CONVENIENT READINGS COMPARISON & OFFSET

### HIGH RESOLUTION MODE

999,999 COUNTS IN Hz  
500,000 COUNTS IN DCV

### HIGH VOLTAGE Hz

FOR NOISY ELECTRICAL SIGNALS

### DATA HOLD

FREEZES THE DISPLAYING READING FOR LATER VIEW

### %4-20mA LOOP CURRENT

FOR PROCESS CONTROL

### DIODE TEST

FOR TESTING DIODES AND RECTIFIERS

### CAPACITANCE

AUTO-RANGING UP TO 9999µF WITH 1000V (600V FOR BM857) PROTECTION

### AUDIBLE CONTINUITY

FOR QUICK OPEN-SHORT TESTS ON SWITCHES, FUSES, AND WIRES

### EMC

MEETS EN61326-1:2013

### TRANSIENT PROTECTION

UP TO 8kV 1.2/50µs LIGHTNING SURGE, MORE CONFIDENCE FOR SERIOUS USERS

### LVD

MEETS EN61010-1/2-030/2-033  
CAT III 1kV & CAT IV 600V



## GENERAL SPECIFICATIONS

**Display:** 4-4/5 digits 50,000 counts.  
**Selectable stable mode:** 5-4/5 digits 500,000 counts for DC Voltage, & 6 digits 999,999 counts for Hz  
**Polarity:** Automatic  
**Update Rate:**  
 4-4/5 digits fast mode: 5 per second nominal  
 5-4/5 digits stable mode: 1.25 per second nominal  
 42 Segments Bar graph: 60 per second max  
**Operating Temperature:** 0°C to 45°C  
**Relative Humidity:** Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 45°C  
**Pollution degree:** 2  
**Storage Temperature:** -20°C to 60°C, < 80% R.H. (with battery removed)  
**Altitude:** Operating below 2000m  
**Temperature Coefficient:** nominal 0.1 x (specified accuracy)/°C @ (0°C - 18°C or 28°C - 40°C), or otherwise specified  
**Sensing:** AC, AC+DC True RMS  
**Safety:** Double insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/UL/EN61010-2-030 Ed. 1.0, IEC/UL/EN61010-2-033

Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 and CAN/CSA-C22.2 No. 61010-1-12 Ed. 3.0 to Category III 1000V AC & DC and Category IV 600V AC & DC  
**Terminals (to COM) Measurement Category:**  
 V / A / mA: Category III 1000V AC & DC and Category IV 600V AC & DC

### Overload Protections:

µA & mA : 0.44A/1000V DC/AC rms, IR 10kA, F fuse  
 A : 11A/1000V DC/AC rms, IR 20kA, F fuse  
 V : 1100V DC/AC rms  
 mV, Ω, & Others : 1000V DC/AC rms  
**Transient protection:** 8kV (1.2/50µs surge)  
**E.M.C.:** Meets EN61326-1:2013  
 In an RF field of 3V/m:  
 Capacitance function is not specified  
 Other function ranges:  
 Total Accuracy = Specified Accuracy + 100 digits  
 Performance above 3V/m is not specified  
**Power Supply:** Single Alkaline 9V battery; NEDA1604A, JIS6AM6 or IEC6LF22  
**Power Consumption:** 6mA typical  
**Low Battery:** Below approx. 7V

**APO Timing:** Idle for 17 minutes

**APO Consumption:** 55µA typical for BM857s; 30µA typical for BM859s

**Dimension:** L186mm X W87mm X H35.5mm; L198mm X W97mm X H56mm with holster

**Weight:** 390 gm; 500 gm with holster

**Accessories:** Test leads (pair); Holster; Battery installed; User's manual; Bkp80 banana plug K-type thermocouple x 1 (BM859s only)

**Optional Accessories:** BRUA-85Xa PC Interface kit (BC-85Xa RS232 optical adapter cable + Bs85x software CD + BUA-2303 USB-to-Serial adaptor); Bkb32 banana pins to K-type socket plug adapter (BM859s only)

**Special Features:** Record MAX, MIN, MAX-MIN readings; Crest (Instantaneous Peak hold) MAX, MIN, MAX-MIN readings; Relative zero mode; 500,000 counts high resolution stable reading mode; Backlighted display; dBm readings; T1-T2 differential temperature readings (BM859s only); %4-20mA loop current readings; High noise rejection filtered Line Level Frequency mode; Data Hold; Audible & Visible Input Warning

## ELECTRICAL SPECIFICATIONS

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% relative humidity.  
 True RMS voltage & current accuracies are specified from 5% to 100% of range or otherwise specified. Maximum Crest Factor < 5:1 at full scale & < 10:1 at half scale, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

### DC Voltage

RANGE	Accuracy	
	859s	857s
500.00 mV, 5.0000V, 50.000V	0.02%+2d	0.03%+2d
500.00V	0.04%+2d	0.05%+2d
1000.0V	0.05%+2d	0.1%+2d

Input Impedance: 10MΩ, 30pF nominal (80pF nominal for 500mV range)

### AC & AC+DC Voltage

RANGE	Accuracy*	
	859s	857s
<b>20Hz - 45Hz</b>		
500.00mV, 5.0000V, 50.000V	1.5%+60d	Unspec'd
500.00V, 1000.0V	Unspec'd	
<b>45Hz - 300Hz</b>		
500.00mV	0.3%+20d	0.8%+60d
5.0000V, 50.000V	0.8%+20d	
500.00V, 1000.0V	0.4%+40d	
<b>300Hz - 5kHz</b> <b>300Hz - 1kHz</b>		
500.00mV	0.3%+10d	0.8%+40d
5.0000V, 50.000V, 500.00V	0.4%+40d	2.0%+80d
1000.0V	0.8%+40d (300Hz-1kHz)	1.0%+40d
<b>5kHz - 20kHz</b> <b>1kHz - 20kHz</b>		
500.00mV	0.5%+20d	1dB**
5.0000V, 50.000V	0.8%+20d	2dB**
500.00V	0.5%+20d	3dB**
1000.0V	Unspec'd	Unspec'd
<b>20kHz - 100kHz</b>		
500.00mV	2.5%+40d	Unspec'd
5.0000V, 50.000V	4.0%+40d**	
500.00V, 1000.0V	Unspec'd	

\*From 5% to 10% of range:

accuracy % of reading (or in dB) + 80d

\*\*From 5% to 10% of range:

accuracy % of reading (or in dB) + 180d

\*\*\*From 10% to 15% of range:

accuracy % of reading (or in dB) + 100d

Input Impedance: 10MΩ, 30pF nominal

(80pF nominal for 500mV range)

Residual reading less than 50 digits with test leads shorted.

### Ohms

RANGE	Accuracy	
	859s	857s
500.00Ω	0.07%+10d	0.1%+6d
5.0000kΩ, 50.000kΩ, 500.00kΩ	0.07%+2d	0.1%+6d
5.0000MΩ	0.2%+8d	0.4%+6d
50.000MΩ	2.0%+8d	2.0%+8d

Open Circuit Voltage: < 1.3VDC (< 3VDC for 500Ω range)

### Audible Continuity Tester

Audible threshold: between 20kΩ and 200kΩ Response time < 100µs

### Crest mode (Instantaneous Peak Hold)

Accuracy: Specified accuracy ± 100 digits for changes > 0.8ms in duration

### AC & AC+DC Current

RANGE	Accuracy		Burden Voltage
	859s	857s	
<b>50Hz - 60Hz</b>			
500.00µA, 5000.0µA	0.5%+50d	1.0%+40d	0.15mV/µA
50.000mA, 500.00mA			3.3mV/mA
5.0000A, 10.000A*			45mV/A
<b>40Hz - 1kHz</b>			
500.00µA, 5000.0µA	0.7%+50d	1.0%+40d	0.15mV/µA
50.000mA, 500.00mA			3.3mV/mA
5.0000A, 10.000A*			45mV/A
<b>1kHz - 10kHz</b>			
500.00µA, 5000.0µA	2.0%+50d	Unspec'd	0.15mV/µA
50.000mA, 500.00mA			3.3mV/mA
5.0000A, 10.000A*	Unspec'd	Unspec'd	45mV/A

\*10A continuous, >10A to 20A for 30 second max with 5 minutes cool down interval

### DC Current

RANGE	Accuracy	Burden Voltage
500.00µA	0.15%+20d	0.15mV/µA
5000.0µA	0.1%+20d	0.15mV/µA
50.000mA	0.15%+20d	3.3mV/mA
500.00mA	0.1%+30d	3.3mV/mA
5.0000A	0.5%+20d	45mV/A
10.000A*	0.5%+20d	45mV/A

\*10A continuous, >10A to 20A for 30 second max with 5 minutes cool down interval

### DC Loop Current %4-20mA

4mA = 0% (zero)  
 20mA = 100% (span)  
 Resolution: 0.01%  
 Accuracy: ± 25d

### dBm

At 600Ω, -11.76dBm to 54.25dBm,  
 Accuracy: ± 0.25dB + 2d (@40Hz - 20kHz)  
 Input Impedance: 10MΩ, 30pF nominal  
 Selectable reference impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000, 1200Ω

### Diode Tester

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
2.0000V	1%+1d	0.4mA	< 3.5 VDC

### Capacitance

RANGE	Accuracy*
50.00nF	0.8% + 3d
500.0nF	0.8% + 3d
5.000µF	1.5% + 3d
50.00µF	2.5% + 3d
500.0µF**	3.5% + 5d
9999µF**	5.0% + 5d

\*Accuracies with film capacitor or better

\*\*In manual-ranging mode, measurements not specified below 45.0µF and 450µF for 500.0µF and 9999µF ranges respectively

### T1-T2 Dual Temperature (BM859s only)

RANGE	Accuracy
-50.0°C to 1000.0°C	0.3%+1°C
-58.0°F to 1832.0°F	0.3%+2°F

Thermocouple range & accuracy not included

### Hz Line Level Frequency

Function RANGE	Sensitivity (Sine RMS)	Range
500mV	100mV	10Hz ~ 200kHz
5V	1V	10Hz ~ 200kHz
50V	10V	10Hz ~ 100kHz
500V	100V	10Hz ~ 100kHz
1000V	900V	10Hz ~ 10kHz

Accuracy: 0.02%+4d

### Hz Logic Level Frequency

RANGE	Accuracy
5.0000Hz-2.00000MHz	0.002%+4d

Sensitivity: 2.5Vp square wave

### %Duty Cycle

RANGE	Accuracy
0.1% - 99.99%	3d/kHz+2d

Input Frequency:

5Hz - 500 kHz, 5V Logic Family



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