

4-1/2 Digit High Resolution, High Speed And High Bandwidth!

- Direct 20,000 Counts Accuracies! 20kHz ACV Bandwidth!
AC+Hz Dual Display! nS Measurements!
- VFD V & Hz! BeepLit™ Continuity Tester! Record DC Min/Max Readings Updates 10/sec!
Captures Crest Extremes! Relative Zero! BeepJack™ Input Warning!



BM830 Series
Professional Multimeters

BRYMEN®

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



● **BM839**



● **BM836**

839	836	FUNCTIONS & FEATURES
●	●	3-5/6 Digits & 4-1/2 Digits 20,000 Counts Max Large Easy-To-Read LCD Display
●	●	Nominal 5/Sec Fast Measurements; Fully Auto-Ranging
●	●	61 Segment Analog Bar-graph Updates 60/Sec
●	●	Paper-White Back-Lighted LCD Display
●	●	Dual Digital Display AC + Hz Readings
●	●	AC True RMS Conversion
●	●	Intelligent Auto Power Off
●	●	Data Hold
●	●	Relative Zero Mode
●	●	Crest (Peak Hold) Max/Min Readings
●	●	High-Update Record Max/Min Readings, Update Intervals DC's 100ms / AC's 120ms
●	●	BeepJack™ Input Warning Against Improper Plug In To μ Am/A Terminals
●	●	VFD-V & VFD-Hz Measures Fundamental V & Hz Of Most Variable Frequency Drives
●	●	AC/DC Voltage Ranges 200.00mV To 1000.0V
●	0.09%	Best Basic DCV accuracy upto 0.045%
●	5kHz	ACV Bandwidth Up To 20kHz
●	●	Ohms Ranges 200.00 Ω To 20.000M Ω
●	●	nS Range 60.00nS
●	●	BeepLit™ Continuity Tester. Features Audible Beep & Visible Backlight Effects
●	●	Diode Tester
●	●	Frequency Ranges 9.999Hz To 100.0kHz
●	●	AC/DC μ A, mA & A Ranges 200.00 μ A To 10.000A
●	●	Capacitance Ranges 20.00nF To 20.00mF
●	●	Type-K Temperature -40.0°C To 1090.0°C; Selectable °F Readings
●	●	Optional Purchase Magnetic Hanger
●	●	Rugged Fire Retarded Casing With Battery And Fuse Access Door
●	●	Replaceable Protective Holster With Probe-Holders & Tilt-Stand
●	●	HBC 1kV Fuses Protected On μ Am/A Terminals
●	●	Transient Protection Up To 8kV 1.2/50 μ s Lightning Surge
●	●	LVD Meets EN61010-1/-2-030/-2-033 to Measurement CAT III 1000V & CAT IV 600V
●	●	EMC EN61326-1:2013

4-1/2 Digit High Resolution, High Speed And High Bandwidth!

Direct 20,000 Counts Accuracies! 20kHz ACV Bandwidth! AC+Hz Dual Display! nS Measurements! VFD V & Hz! BeepLit™ Continuity Tester! Record DC Min/Max Readings Updates 10/sec! Captures Crest Extremes! Relative Zero! BeepJack™ Input Warning!

Analog Bar-graph
Fast Update Rate 60/sec

20,000 Counts Max Wide-view LCD Display
5/sec Fast Nominal Update Rate

Dual Digital Display
Simultaneously View Relevant Parameters In Complementary Display

Asic Technology
Allows More Functions & Features At Affordable Prices

Auto & Manual-ranging
Auto-ranging With Manual-ranging Override

Ergonomic Streamline Design
Fits Comfortably In One's Hand

Paper-white Display Backlight
For Easy Viewing In The Dark

Relative Zero Mode
For Convenient Readings Comparison And Offset

Function Selection
Toggle Conveniently Between Primary & Secondary Functions

6,000 / 20,000 Counts Mode
Convenient Selection Of Higher Resolution Vs Higher Decade Limit

mV Ranges
600.0mV Or 199.99mV

Diode Test
For Checking Diodes And Rectifiers

Data Hold
Freezes The Displaying Reading For Later View

BeepLit™ Continuity
Quick Open-short Tests. Beep and Backlight Effects For Noisy Environments

Crest (Peak Hold)
Captures Instantaneous +Peak & -Peak Readings

High Impedance Voltages
1000VAC/DC Measuring Capabilities; High Input Impedance For Load Sensitive Circuits

High-Update Record Max Min
Approx. 2 Times Update Rate To Record Fast Response Max & Min Readings

Hz Of Line Level Voltage
Measures Noisy High Voltage ACV Frequencies In Dual Display

µAm/A +Hz Readings
Measures Currents & Frequencies In Dual Display

VFD V & Hz Feature
Measures Fundamental Voltage & Frequency Of Most Variable Frequency Drives In Dual Display

Type-k Temperature
Measurements -40.0°C To 537.0°C, Selectable °C & °F Readings

Beep-jack™ Audible & Visible Warning
Guards Against Improper µAmA & A Terminals Plug In. Decreases Risks Of Damage

Capacitance
7 Ranges Autoranging, 20.00nF To 20.00mF

Resistance
Autoranging 600.0Ω To 60.00MΩ Or 199.99Ω To 19.999MΩ

Intelligent Auto-power-off
To Extend Battery Life; Awake Resets On Significant Operation & Measurements

Transient Protection
Up To 8kV 1.2/50µs Lightning Surge; Superb Protection For Serious Users

LVD Safety
Meets EN61010-1/-2-030/-2-033 CAT III 1kV & CAT IV 600V

ACV True RMS 20kHz Bandwidth
For Non-sinusoidal Waveforms Of Complex Voltage Or Current Signals

Protective Holster
With Holders For Probe Storage And "third Hand" Feature, Replaceable & Washable

EMC
Meets EN61326-1:2013



GENERAL SPECIFICATION

Display: 3-5/8 digits 6,000 counts and 4-1/2 digits 20,000 counts max
 Polarity: Automatic
 3-5/8 digits Update Rate: 5 per second nominal
 4-1/2 digits Update Rate: 5 per second nominal
 81 Segments Bar graph Update Rate: 40 per second max
 Operating Temperature: -10°C to 50°C
 Relative Humidity: Maximum relative humidity 90% for temperature up to 28°C decreasing linearly to 50% relative humidity at 50°C
 Pollution Degree: 2
 IP Rating: IP40
 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 @ (-10°C ~ 18°C or 28°C ~ 50°C), or otherwise specified
 Sensing: AC 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 the corresponding CAN/CSA-C22.2 regulations to Measurement CAT III 1000 V AC & DC and Category IV 600V AC & DC
Overload Protection:
 μA & mA: 0.4A/1kV DC/AC rms, IR 30kA, F Fuse; or better
 A: 11A/1kV DC/AC rms, IR 20kA, F Fuse; or better
 V: 1100V DC/AC rms
 mV, Ω & Others: 1000 V DC/AC rms
Transient Protection: 8kV (1.2/50μs surge)
 E.M.C.: Meets EN61326-1:2013
 ACV of Model 836, in an RF field of 1V/m
 Total Accuracy = Specified Accuracy + 30 digits
 Performance above 1V/m is not specified
 All Other Functions, in an RF field of 3V/m:
 Total Accuracy = Specified Accuracy + 150 digits
 Performance above 3V/m is not specified
Power Supply: Four Alkaline AA batteries (IEC LR6)

Power Consumption: 8mA typical for VFD ACV 4Hz; 6.5mA typical for other functions
Low Battery: approx. 4.0V
APO Timing: Idle for 20 minutes
APO Consumption: 20μA typical
Dimensions: L208mm X W103mm X H64.5mm with holster
Weight: 635 gm with holster
Accessories: Test probe pair, Holster, User's manual, Bkp60 banana plug type-K thermocouple (Model 839 only)
Optional Accessories: BK332 banana plug to type-K socket plug adapter (Model 839 only), BMH-01 magnetic hanger, BMP-88; soft carrying pouch
Special Features: VFD; Dual display +Hz Readings; Selectable 6,000 & 20,000 Counts Resolution; High-Update Record MAX/MIN readings; Crest MAX/MIN readings; Relative Zcr; Display Hold; LCD Backlight; BeepLR™ Continuity Tester, BeepJack™ audible & visible input warning

Electrical Specifications

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 80% relative humidity.
 True RMS voltage & current accuracies are specified from 1% to 100% of range or otherwise specified. Maximum Crest Factor < 1.8:1 at full scale & < 3.8:1 at half scale, and with frequency components fall within the specified frequency bandwidth for non-sinusoidal waveforms.

AC Voltage (8000-count mode)

RANGE	Accuracy	
	BM839	BM836
60Hz ~ 60Hz		
600.0mV, 6.000V, 60.00V, 600.0V, 1000V	0.7% + 3d	0.5% + 3d
40Hz ~ 1kHz		
600.0mV, 6.000V, 60.00V, 600.0V, 1000V	1% + 3d	
1000V	2% + 3d	
1kHz ~ 5kHz		
600.0mV, 6.000V, 60.00V, 600.0V	1.8% + 4d ²	2% + 4d ²
1000V	Unspecified	
5kHz ~ 20kHz ³		
600.0mV, 6.000V, 60.00V	2% + 2d ²	Unspecified
600.0V, 1000V	Unspecified	

Input Impedance: 10MΩ, 110pF nominal
¹Add 0.5% @ bandwidth >4kHz ~ 5kHz
²Add 20d @ reading >80% of range
³Unspecified for < 6% of range

AC Voltage (20000-count mode)

RANGE	Accuracy	
	BM839	BM836
60Hz ~ 60Hz		
199.99mV, 1.9999V, 19.999V, 199.99V, 1000.0V	0.7% + 30d	0.5% + 30d
40Hz ~ 1kHz		
199.99mV, 1.9999V, 19.999V, 199.99V	1% + 30d	
1000.0V	2% + 30d	
1kHz ~ 5kHz		
199.99mV, 1.9999V, 19.999V, 199.99V	1.8% + 40d	2% + 40d ²
1000.0V	Unspecified	
5kHz ~ 20kHz ³		
199.99mV, 1.9999V, 19.999V, 199.99V	2% + 40d	Unspecified
1000.0V	Unspecified	

Input Impedance: 10MΩ, 110pF nominal
¹Add 0.5% @ bandwidth >4kHz ~ 5kHz
²Unspecified for < 6% of range

VFD AC Voltage

RANGE	Accuracy ¹	
	BM839	BM836
10Hz ~ 40Hz		
600.0V, 1000V	4% + 5d	
40Hz ~ 200Hz		
600.0V, 1000V	2.5% + 5d	
200Hz ~ 440Hz		
600.0V, 1000V	8% + 5d ²	

Input Impedance: 10MΩ, 110pF nominal
¹Unspecified for fundamental frequency > 440Hz
²Accuracy linearly decreases from 2.9% + 5d @ 200Hz to 8.0% + 5d @ 440Hz

DC Voltage (8000-count mode)

RANGE	Accuracy	
	BM839	BM836
600.0mV	0.09% + 1d	0.18% + 1d
6.000V, 60.00V	0.045% + 1d	0.09% + 1d
600.0V, 1000V	0.09% + 1d	0.18% + 1d

Input Impedance: 10MΩ, 110pF nominal

DC Voltage (20000-count mode)

RANGE	Accuracy	
	BM839	BM836
199.99mV	0.09% + 6d	0.18% + 6d
1.9999V, 19.999V, 199.99V	0.045% + 6d	0.09% + 6d
1000.0V	0.09% + 6d	0.18% + 6d

Input Impedance: 10MΩ, 110pF nominal

Ohms (8000-count mode)

RANGE ¹	Accuracy	
	BM839	BM836
600.0Ω	0.16% + 3d	0.3% + 3d
6.000kΩ, 60.00kΩ	0.16% + 1d	0.3% + 1d
600.0kΩ	0.3% + 1d	0.6% + 1d
6.000MΩ ²	0.5% + 1d	0.7% + 1d
60.00MΩ ³	1.5% + 3d ⁴	2% + 3d ⁴
60.00nS ⁵	2.0% + 10d ⁶	

¹Open Circuit Voltage: 1.7VDC typical
²Constant Test Current: 0.2μA Typical
³Constant Test Current: 0.02μA Typical
⁴Add 1% @ >20MΩ
⁵Add 30d @ < 20% of range

⁶Add 2% @ operation temperature >35°C

Ohms (20000-count mode)

RANGE ¹	Accuracy	
	BM839	BM836
199.99kΩ ²	0.16% + 20d	0.3% + 20d
1.9999kΩ, 19.999kΩ	0.15% + 6d	0.3% + 6d
199.99kΩ	0.3% + 6d	0.6% + 6d
1.9999MΩ ³	0.6% + 6d	0.7% + 6d
19.999MΩ ⁴	1.5% + 30d ⁵	2% + 30d ⁵

¹Open Circuit Voltage: 1.7VDC typical
²Specified with input lead resistance been offset by REL▲ or Shift (short) feature
³Constant Test Current: 0.2μA Typical
⁴Constant Test Current: 0.02μA Typical
⁵Add 2% @ operation temperature >35°C

BeepLR™ Continuity Tester

Continuity Threshold: Between 20Ω and 350Ω
 Response time: < 30ms
 Audible Response: Beep sound
 Visible Response: LCD Backlight

Diode Tester

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
2.700V	1.5% + 4d	0.4mA	< 2.8 VDC

Capacitance

RANGE	Accuracy ¹
20.00nF	1% + 6d
200.0nF, 2.000μF, 20.00μF, 200.0μF, 2000μF	1% + 2d
20.00mF	2% + 2d

¹Accuracies with film capacitor or better

Temperature (BM839 only)

RANGE	Accuracy ^{1,2}
-40.0°C ~ 0.0°C	1% + 2.0°C
0.0°C ~ 50.0°C	1% + 1.0°C
50.0°C ~ 1090.0°C	1% + 1.5°C
-40.0°F ~ 32.0°F	1% + 3.6°F
32.0°F ~ 122.0°F	1% + 1.8°F
122.0°F ~ 1984.0°F	1% + 2.7°F

¹Accuracies assume meter interior has the same temperature of the ambient (isothermal stage) for a correct junction voltage compensation. Allow enough time to reach the isothermal stage for a significant change of ambient temperature. It can take up to an hour for changes > 5°C.
²Type-K thermocouple range & accuracy not included

DC current (8000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
600.0μA ¹	0.18% + 4d	0.36% + 4d	0.2mV/μA
600.0μA ¹	0.18% + 2d	0.36% + 2d	0.2mV/μA
60.00mA ²	0.18% + 4d	0.36% + 4d	3.0mV/mA
600.0mA ³	0.3% + 3d	0.6% + 3d	3.0mV/mA
6.000A	0.6% + 4d	0.6% + 4d	30mV/A
10.00A ⁴	0.7% + 2d	0.8% + 2d	30mV/A

¹μA/mA DC accuracies will be affected by extreme interior temperatures of the meter. For rated accuracies, allow 6 to 20 minutes cool down interval after measuring A-currents of 3 to 10A continuously.
²< 400mA continuous; >400mA for <1.1 hours on per >20 minutes off
³10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

DC current (20000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
199.99μA ¹	0.18% + 40d	0.36% + 40d	0.2mV/μA
1999.9μA ¹	0.18% + 20d	0.36% + 20d	0.2mV/μA
19.999mA ²	0.18% + 40d	0.36% + 40d	3.0mV/mA
199.99mA ³	0.18% + 30d	0.36% + 30d	3.0mV/mA
1.9999A	0.6% + 40d	0.6% + 40d	30mV/A
10.000A ⁴	0.7% + 20d	0.8% + 20d	30mV/A

¹μA/mA DC accuracies will be affected by extreme interior temperatures of the meter. For rated accuracies, allow 6 to 20 minutes cool down interval after measuring A-currents of 3 to 10A continuously.
²10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

AC current (8000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
	40Hz ~ 3kHz		
600.0μA, 6000μA	1% + 2d	1.2% + 2d	0.2mV/μA
60.00mA, 600.0mA ¹	1% + 4d	1.2% + 4d	3mV/mA
6.000A, 10.00A ²	1% + 4d	1.2% + 4d	30mV/A
	3kHz ~ 5kHz		
600.0μA, 6000μA	2% + 2d	Unspecified	0.2mV/μA
60.00mA, 600.0mA ¹	Unspecified	Unspecified	3mV/mA
6.000A, 10.00A ²	Unspecified	Unspecified	30mV/A

¹< 400mA continuous; >400mA for <1.1 hours on per >20 minutes off
²10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

AC current (20000-count mode)

RANGE	Accuracy		Burden Voltage
	Model 839	Model 836	
	40Hz ~ 3kHz		
199.99μA, 1999.9μA	1% + 20d	1.2% + 20d	0.2mV/μA
19.999mA, 199.99mA	1% + 40d	1.2% + 40d	3mV/mA
1.9999A, 10.000A ¹	1% + 40d	1.2% + 40d	30mV/A
	3kHz ~ 5kHz		
199.99μA, 1999.9μA	2% + 20d	Unspecified	0.2mV/μA
19.999mA, 199.99mA	Unspecified	Unspecified	3mV/mA
1.9999A, 10.000A ¹	Unspecified	Unspecified	30mV/A

¹10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

- Hz Line Level Frequency

Function RANGE	Sensitivity (Sine RMS)	Range
199.99mV, 600.0mV	40mV	6Hz ~ 100kHz
1.9999V, 6.000V	0.4V	10Hz ~ 50kHz
19.999V, 60.00V	4V	10Hz ~ 30kHz
199.99V, 600.0V	40V	10Hz ~ 56Hz
1000.0V, 1000V	400V	10Hz ~ 440Hz
VFD 600.0V	40V	10Hz ~ 440Hz
VFD 1000V	400V	10Hz ~ 440Hz
199.99μA, 600.0μA	40μA	
1999.9μA, 6000μA	400μA	
19.999mA, 60.00mA	4mA	10Hz ~ 5kHz
199.99mA, 600.0mA	40mA	
1.9999A, 6.000A	0.6A	
10.000A, 10.000A	6A	10Hz ~ 3kHz

Accuracy: 0.01%+4d

High-Update Record mode

DC functions update interval 100ms, nominal response to 85%;
 For changes > 200ms in duration:
 8000-count mode: Specified accuracy ± 12 counts
 20000-count mode: Specified accuracy ± 120 counts
 AC functions update interval 120ms, nominal response to 85%;
 For changes > 350ms in duration and input > 6% of range:
 8000-count mode: Specified accuracy ± 30 counts
 20000-count mode: Specified accuracy ± 300 counts

Crest mode

DC/AC functions
 For changes > 5ms in duration:
 6000-count mode only: Specified accuracy ± 150 counts

