

Choice Of Dual Display Performance & Cat IV 1kV Safety!

12kV Transient Protection, DC+AC True RMS, dBm, Duty %, 4 Digit Resolution, nS Conductance... And More!
Ergonomic, Magnetic Hanger, Probe Holders, Tilt stand & Hanger, Battery Access Cover... User-Oriented!
PC-Comm, Bar-graph, Beep/Jack, Crest (Peak), Rec (Min Max/Avg), Relative, Backlit... Full-Features!
AutoCheck+LoZ, EF-Detection, Capacitance, Line Level Hz, T1-T2 Temperature... Full-Functions!



**BM820 Series
Professional Multimeter**

BRYMEN[®]
BRIGHT PEOPLE'S CHOICE
<http://www.brymen.com>



● **BM829**



● **BM827**



● **BM822**



● **BM821**

829	827	822	821	FUNCTIONS & FEATURES
●	●	●	●	4 Digits 10,000 Counts Large Easy To Read LCD Display
●	●	●	●	Fast Measurements, 5/Sec; Fully Auto-Ranging
●	●	●	●	Dual Digital Display
●	●	●	●	41 Segment Analog Bar-graph Updates 60/Sec
●	●	●	●	0.08% High Basic DCV Accuracy
●	●	●	●	Optional Purchase USB Cable & Software For Win98/2k/xp/Vista
●	●	●	●	Intelligent Auto Power Off
●	●	●	●	Data Hold
●	●	●	●	Relative Zero Mode
●	●	●	●	Audible & Visible BeepJack™ Input Warning Against Improper Plug In
●	(AC)	(AC)		AC, AC+DC True RMS Conversion
●	●			Record Max/Min/MAX-MIN/AVG Readings, Auto-Ranging
●	●			Crest (Peak Hold) Max/Min/MAX-MIN Readings, Auto-Ranging
●	●			Non-Contact EF-Detection (NCV)
●	●			Probe-Contact EF-Detection For More Precise Indication Of Live
●				AutoCheck™ Feature (Automatic DCV, ACV & Ohms Selection)
●				Lo-Z Volts To Drain Ghost Voltages (AutoCheck™ Feature)
●				Back-Lighted Large Easy To Read LCD Display
●				dBm Readings, 20 Selectable Impedance Values
●	●	●	●	DCV 0.01mV To 1000V
●	●	●	●	ACV 0.01mV To 1000V
●				AC+DCV 0.01mV To 1000V
●	●	●	●	DCA 0.1μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●	●	●	●	ACA 0.1μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●				AC+DCA 0.1μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●	●	●	●	Ohms 0.1Ω To 60MΩ
●	●			Conductance 0.01nS To 100nS
●	●	●	●	Capacitance 0.01nF To 25mF
●	●			T1 Type-K Temperature Readings -50°C To 1000°C
●				T2 Dual Type-K Temperature Readings -50°C To 1000°C
●	●	●	●	Line Level Frequency 15.00 Hz To 1.000 kHz
●	●	●	●	Logic Level Frequency 5.00 Hz To 1.000 MHz
●	●	●	●	Logic Level Duty Cycle Readings 0.01% To 100.0%
●	●	●	●	Diode Tester
●	●	●	●	Rugged Fire Retarded Casing With Battery Access Door
●	●	●	●	Replaceable Protective Holster With Probe-Holders & Tilt-Stand
●	●	●	●	Optional Purchase Magnetic Hanger
●	●	●	●	600V General (Ohm, Capacitance ... etc.) Input Protection
●	●	●	●	600V High Breaking Capacity Fuses Protected On Current Inputs
●	●	●	●	Transient Protection Up To 12kV 1.2/50μs Lightning Surge
●	●	●	●	LVD Meets EN61010-1 CAT IV 1kV
●	●	●	●	EMC EN61326-1:2006 (EN55022, EN61000-3-2/-3 & EN61000-4-2/-3/-4/-5/-6/-8/-11)

For Those Who Only Accept The Best: Cat IV 1kV!

4 digit High Resolution, High Speed & Dual Display Multi-Features !
Includes NCV EF-Detection, AutoCheck™ & Ghost-Voltage-Buster™ !

HIGH ACCURACY
0.08% BASIC DCV ACCURACY;
FAST AUTO-RANGING

ANALOG BAR-GRAPH
FAST UPDATE RATE 60/SEC

LARGE 10000 COUNTS LCD DISPLAY
5/SEC FAST NOMINAL UPDATE RATE

AUTO & MANUAL-RANGING
AUTO-RANGING WITH
MANUAL-RANGING OVERRIDE

ASIC TECHNOLOGY
MORE FUNCTIONS & FEATURES
AT AFFORDABLE PRICES

DISPLAY BACKLIGHT
FOR EASY VIEWING IN THE DARK

DUAL DIGITAL DISPLAY
SIMULTANEOUSLY VIEW RELEVANT
PARAMETERS IN COMPLEMENTARY DISPLAY

FUNCTION SELECTION
TOGGLE CONVENIENTLY BETWEEN
PRIMARY & SECONDARY FUNCTIONS

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

nS CONDUCTANCE
nS=1/GΩ VIRTUALLY EXTENDS RESISTANCE
MEASUREMENT TO THE ORDER OF GΩ.
IT IS USEFUL FOR LEAKAGE MEASUREMENTS

EF-DETECTION
BOTH NON-CONTACT (NCV)
& SINGLE-PROBE VOLTAGE
DETECTION FOR IDENTIFYING
LIVE LINES

CREST (PEAK HOLD)
CAPTURES INSTANTANEOUS
+PEAK & -PEAK, AUTO-RANGING

DATA HOLD
FREEZES THE DISPLAYING
READING FOR LATER VIEW

LOGIC LEVEL DUTY%
MEASURES DIGITAL LOGIC LEVEL
DUTY CYCLE % READINGS

MAX MIN AVG RECORD
RECORD MAX/MIN/MAX-MIN/AVG
READINGS; AUTO-RANGING

LOGIC LEVEL Hz
MEASURES DIGITAL LOGIC LEVEL
FREQUENCIES UP TO 2MHz

T1-T2 TYPE-K TEMPERATURE
2 CHANNEL MEASUREMENTS,
SELECTABLE °C & °F READINGS

HIGH IMPEDANCE VOLTAGE
1000VAC/DC MEASURING CAPABILITIES;
HIGH INPUT IMPEDANCE FOR
LOAD SENSITIVE CIRCUITS

DIODE TEST
FOR CHECKING DIODES
AND RECTIFIERS

Hz OF LINE LEVEL VOLTAGE
MEASURES NOISY HIGH VOLTAGE
ACV FREQUENCIES UP TO 200kHz
IN DUAL DISPLAY

CAPACITANCE
UP TO 27mF WITH 1000V PROTECTION;
AUTO-RANGING

dBm FUNCTION
WITH 20 SELECTABLE
IMPEDANCE VALUES

CURRENT & Hz
MEASURES CURRENT & FREQUENCIES
IN DUAL DISPLAY

AUTOCHECK™ FEATURE
AUTOMATIC SELECTION OF
LoZ DCV, LoZ ACV & OHMS

ERGONOMIC STREAMLINE DESIGN
FITS COMFORTABLY IN ONE'S HAND

GHOST-VOLTAGE-BUSTER
LoZ DRAINS GHOST/ STRAY VOLTAGES
LEAVING ONLY HARD SIGNALS
ON METER READINGS

INTELLIGENT AUTO-POWER-OFF
TO EXTEND BATTERY LIFE

PC INTERFACE CAPABILITY
OPTIONAL PURCHASE USB CABLE
WITH DATA RECORDING PC SOFTWARE
FOR WIN98/NT/2K/XP/VISTA

TRANSIENT PROTECTION
UP TO 12kV 1.2/50µs LIGHTNING SURGE;
SUPERB PROTECTION FOR SERIOUS USERS

BEEP-JACK™ AUDIBLE & VISIBLE WARNING
GUARDS AGAINST IMPROPER A-TERMINAL
PLUG IN. DECREASES RISKS OF DAMAGE

AC, AC+DC TRUE RMS MEASUREMENTS
FOR NON-SINUSOIDAL WAVEFORMS
OF COMPLEX VOLTAGE OR CURRENT SIGNALS

PROTECTIVE HOLSTER
WITH HOLDERS FOR PROBE STORAGE
AND 'THIRD HAND' FEATURE,
REPLACEABLE & WASHABLE

LVD SAFETY
MEETS EN61010-1
2ND EDITION CAT IV 1kV

EMC
MEETS EN61326-1:2006 (EN55022,
EN61000-3-2/3 & EN61000-4-2/3/4/5/6/8/11)



BM829, BM827, BM822 & BM821 GENERAL SPECIFICATIONS

Display:
9999 counts: ACV, DCV, Hz & nS
6000 counts: mV, μ A, mA, A, Ohm & Capacitance
Polarity: Automatic

Update Rate:
Digital Display: 5 per second nominal;
41 Segments Bar-graph: 60 per second max
Low Battery: Below approx. 1V

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 0.15 % (specified accuracy) / °C @ (0°C - 19°C or 28°C - 45°C), or otherwise specified

Electrical Specifications

Accuracy is $\pm$ (reading digits + number of digits) or otherwise specified, at 23°C $\pm$ 5°C & less than 75% relative humidity.
True RMS voltage & current accuracies are specified from 10 % to 100 % of range or otherwise specified. Maximum Crest Factor < 2:1 at full scale & < 4:1 at half scale, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

DC Voltage

Function	RANGE	Accuracy
mV	60.0mV	0.12%+2d
	600.0mV	0.06%+2d
V	9.999V, 99.99V, 999.9V	0.06%+2d

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for 600mV range)

AC Voltage

Function	RANGE	Accuracy
	50Hz - 60Hz	
mV	60.0mV, 600.0mV	0.5% + 3d
V	9.999V, 99.99V, 999.9V	0.5% + 3d
	40Hz - 500Hz	
mV	60.0mV, 600.0mV	0.8% + 4d
V	9.999V, 99.99V	1.0%+4d
	999.9V	2.0%+4d
	500Hz - 1kHz	
mV	60.0mV, 600.0mV	2.0% + 3d
V	9.999V, 99.99V	1.0%+4d
	999.9V	2.0%+4d
	1kHz - 3kHz	
mV	60.0mV, 600.0mV	2.0%+3d
V	9.999V, 99.99V, 999.9V	3.0%+4d
	3kHz - 20kHz	
mV	60.0mV ¹ , 600.0mV ¹	2%+3d
V	9.999V ¹ , 99.99V ¹	3d
	999.9V	Unspecified

¹Specified from 30% to 100% of range.

Rfor 3kHz - 15kHz only

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for mV ranges)

dBm

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

Auto/CheckTM (DCV)

Function	RANGE	Accuracy
V	9.999V, 99.99V, 999.9V	0.5%+3d

Lo-Z DCV Threshold:

> +1.5VDC or < -1.0VDC nominal

Lo-Z DCV Input Impedance:
Initially approx. 3.9k Ω , 155pF nominal; impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances by display

voltages typically are:

19k Ω @100V	
125k Ω	@ 300V
320k Ω	@ 600V
500k Ω	@ 1000V

DC AC & AC+DCTM Voltage¹

Function	RANGE	Accuracy
	DC, 50Hz - 60Hz	
mV	60.0mV, 600.0mV	
V	9.999V, 99.99V, 999.9V	0.7% + 6d
	40Hz - 1kHz	
mV	60.0mV, 600.0mV	1.0%+6d
V	9.999V, 99.99V, 999.9V	2.2%+6d
	1kHz - 20kHz	
mV	60.0mV ¹ , 600.0mV ¹	2.2%+6d
V	9.999V ¹ , 99.99V ¹	3d
	999.9V	Unspecified

¹Specified from 10% to 100% of range for Model B21

²Specified from 30% to 100% of range.

Rfor 1kHz - 15kHz only

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for mV ranges)

Sensing:

BM829: AC+DC True RMS
BM827 & 822: AC True RMS
BM821: Average Sensing
Safety: Double insulation per IEC61010-1 2nd Ed., EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No. 61010.1.4.9.2 to Category IV 1000Vac & Vdc.
Transient protection: 12kV (1.2/50 μ s surge)

Terminals (to COM) Measurement Category:

V: Category IV 1000Vac & Vdc

mA μ A: Category IV 600Vac and 300Vdc

A: Category IV 600Vac and 300Vdc

Overload Protection:

μ A & mA: 1A500Vac, IR 10kA or better, F fuse

A: 10A/500Vac, IR 100kA or better, F fuse

mV, Ω , & Ohms: 600Vdc and Vac rms

E.M.C.: Meets EN61326-1:2006 (EN55022, EN61000-3-2,

Auto/CheckTM (ACV)

Function	RANGE	Accuracy
	50Hz - 60Hz	
V	9.999V, 99.99V, 999.9V	1.0%+4d

Lo-Z ACV Threshold:

> 3VAC (50/60Hz) nominal

Lo-Z ACV Input Impedance:
Initially approx. 3.9k Ω , 155pF nominal; impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances by display

voltages typically are:

19k Ω @100V	
125k Ω	@ 300V
320k Ω	@ 600V
460k Ω	@ 1000V

Ohms

Function	RANGE	Accuracy
Ω	600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.1%+3d
	6.00M Ω	0.4%+3d
	60.0M Ω	1.9%+5d
	99.99k Ω	0.8%+10d

Open Circuit Voltage: < 1.2VDC (< 1.0VDC for 60M Ω range)

Auto/CheckTM (Ohms)

Function	RANGE	Accuracy
Ω	600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.9%+4d
	6.00M Ω	0.8%+3d
	60.0M Ω	2.0%+5d

Open Circuit Voltage: < 1.2VDC (< 1.0VDC for 60M Ω range)

Audible Continuity Tester

Audible threshold: between 200 Ω and 300k Ω ; Response time < 100 μ s

Capacitance

Function	RANGE	Accuracy
pF	60.0pF, 600.0pF	0.8% + 3d
nF	6.000nF	1.5% + 3d
μ F	60.00 μ F	2.5% + 3d
	600.00 μ F ¹	3.5% + 5d
	6.000mF ¹	5.0% + 5d
	25.00mF ¹	6.5% + 5d

¹Measures with film capacitor or better

2m manual-ranging mode, measurements not specified below 50.0 μ F, 0.5mF and 5.4mF for 600.0 μ F, 6.000mF and 25.00mF ranges respectively

AC & AC+DC Current

Function	RANGE	Accuracy	Burden voltage
	50Hz - 60Hz		
μ A	600.0 μ A, 6000 μ A	0.6%+3d	0.08mV μ A
mA	60.0mA	1.0%+3d	1.5mVmA
A	6.00A, 10.00A ¹	0.8%+6d	0.04VA
	40Hz - 1kHz		
μ A	600.0 μ A, 6000 μ A	0.8%+4d	0.08mV μ A
mA	60.0mA	1.0%+4d	1.5mVmA
A	6.00A	1.0%+4d	0.04VA
	6.00A, 10.00A ¹	0.9%+6d	0.04VA

¹10A continuous, >10A to 15A for 30 second max with 5 minutes cool down interval

DC Current

Function	RANGE	Accuracy	Burden voltage
μ A	600.0 μ A, 6000 μ A	0.6%+3d	0.08mV μ A
mA	60.0mA, 600.0mA	0.2%+4d	1.5mVmA
A	6.00A, 10.00A ¹	0.8%+6d	0.04VA

¹10A continuous, >10A to 15A for 30 second max with 5 minutes cool down interval

EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11)

In 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 9V battery; NEDA1604G, JIS006P

ECOFIT2, NEDA1604A, JIS006A or IEC61722

Power Consumption: 5 mA typical

APC Timing: Idle for 30 minutes

APC Consumption: 60 μ A typical

Dimensions: L208mm X W103mm X H94.5mm with holster

Weight: 635 gm with holster

Accessories: Test lead pair; battery installed; user's manual;

BM829 banana plug type-K thermocouple (BM829 & BM827 only)

Optional purchase accessories: USB Interface kit BU-86X;

BM832 banana plug to type-K socket plug adapter

Line Level Frequency (Hz)

Function Range	Frequency	Sensitivity (Sine RMS)
AC 60.0mV	15.00 - 50.00kHz	40mV
AC 600.0mV		60mV
AC 9.999V		2.5V
AC 99.99V	15.00 - 10.00kHz	25V
AC 999.9V		200V
AC 600.0 μ A		800 μ A
AC 60.0mA	15.00 - 3.000kHz	40mA
AC 600.0mA		60mA
AC 6.000A		4A
AC 10.00A		6A

Accuracy: 0.04%+4d

Logic Level Frequency (Hz) & Duty Cycle (D%)

Function	Range	Accuracy ¹
Frequency	5.00Hz - 1.000MHz	0.04%+4d
Duty Cycle	0.00% - 100.0%	3d/kHz $\pm$ 2d ²

¹Sensitivity: 2.5Vp (Square wave) for 3V & 5V Logic Family

²Specified Frequency: 5Hz - 10kHz

Non-Contact EF-Detection

Typical Voltage	Bar Graph Indication
20V (tolerance: 10V-36V)	-
99V (tolerance: 22V - 85V)	-
110V (tolerance: 50V - 160V)	-
220V (tolerance: 124V - 330V)	-
440V (tolerance: > 250V)	-

Indication: Bar graph segments & audible beep tones proportional to the field strength

Detection Frequency: 50/60Hz

Detection Antenna: Top end of the meter

Probe-Contact EF-Detection:

For more precise indication of live wires, such as distinguishing between live and ground connections, use the Red (+) test probe for direct contact measurements.

Crest mode (Instantaneous Peak Hold)

Accuracy: Specified accuracy adds 250 digits for changes > 1.0 ms in duration

Record mode

Accuracy: Specified accuracy adds 10 digits for changes > 100 ms in duration

Diode Tester

Function	RANGE	Accuracy
V	2.000V	1.0%+1d

Test Current (Typically): 0.4mA

Open Circuit Voltage: < 3.5 VDC

Temperature

Function	RANGE	Accuracy
$^{\circ}$ C	-50 $^{\circ}$ C to 1000 $^{\circ}$ C	0.3%+2 $^{\circ}$ C
$^{\circ}$ F	-58 $^{\circ}$ F to 1832 $^{\circ}$ F	0.3%+5 $^{\circ}$ F

Type-K thermocouple range & accuracy not included



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