

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, BeepJack, Crest (Peak), Rec (Min Max Avg), Relative, Backlit... Full-Features!
AutoCheck+LoZ, EF-Detection, Capacitance, Line Level Hz, T1-T2 Temperature... Full-Functions!



BM820s Series
Professional Multimeters



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



● **BM829s**



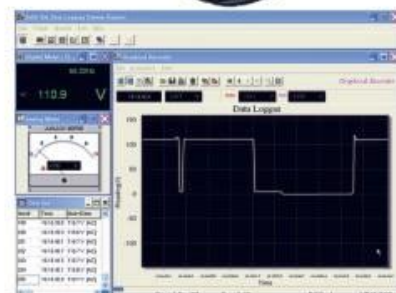
● **BM827s**



● **BM822s**



● **BM821s**



BU-86X Interface Kit
(Optional Purchase)

829s	827s	822s	821s	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/7/8
●	●	●	●	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 Readings, Auto-Ranging
●	●			Record AVG (Average) 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 15.00Hz To 1.000kHz
●	●	●	●	Logic Level Frequency 5.00Hz To 1.000MHz
●	●	●	●	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
●	●	●	●	1000V General (Ohm, Capacitance ... etc.) Input Protection
●	●	●	●	1000V High Breaking Capacity Fuses Protected On Current Inputs
●	●	●	●	Transient Protection Up To 12kV 1.2/50μs Lightning Surge
●	●	●	●	LVD Meets EN61010-1/61010-2-030/61010-2-033 to CAT IV 1000V
●	●	●	●	EMC EN61326-1 (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

DISPLAY BACKLIGHT
FOR EASY VIEWING IN THE DARK

FUNCTION SELECTION
TOGGLE CONVENIENTLY BETWEEN
PRIMARY & SECONDARY FUNCTIONS

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

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

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

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

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

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

dBm FUNCTION
WITH 20 SELECTABLE
IMPEDANCE VALUES

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

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

PC INTERFACE CAPABILITY
OPTIONAL PURCHASE USB CABLE
WITH DATA RECORDING PC SOFTWARE
FOR WIN98/NT4/2K/XP/VISTA

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

ASIC TECHNOLOGY
MORE FUNCTIONS & FEATURES
AT AFFORDABLE PRICES

DUAL DIGITAL DISPLAY
SIMULTANEOUSLY VIEW RELEVANT
PARAMETERS IN COMPLEMENTARY DISPLAY

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

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

DATA HOLD
FREEZES THE DISPLAYING
READING FOR LATER VIEW

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

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

DIODE TEST
FOR CHECKING DIODES
AND RECTIFIERS

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

CURRENT & Hz
MEASURES CURRENT & FREQUENCIES
IN DUAL DISPLAY

ERGONOMIC STREAMLINE DESIGN
FITS COMFORTABLY IN ONE'S HAND

INTELLIGENT AUTO-POWER-OFF
TO EXTEND BATTERY LIFE

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

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

LVD SAFETY
MEETS EN61010-1 ED. 3.0,
EN61010-2-030 ED. 1.0 &
EN61010-2-033 ED. 1.0 to
CAT IV 1kV



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. 7V
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 x (specified accuracy)/°C @ (0°C ~ 18°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	60.00mV	0.12%+2d
	600.0mV	0.06%+2d
V	9.999V, 99.99V, 999.9V	0.08%+2d

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

AC Voltage

Function	RANGE	Accuracy
	50Hz ~ 60Hz	
mV	60.00mV, 600.0mV	0.5% + 3d
V	9.999V, 99.99V, 999.9V	
	40Hz ~ 500Hz	
mV	60.00mV, 600.0mV	0.8% + 4d
V	9.999V, 99.99V	1.0%+4d
	999.9V	2.0%+4d
	500Hz ~ 1kHz	
mV	60.00mV, 600.0mV	2.0% + 3d
V	9.999V, 99.99V	1.0%+4d
	999.9V	2.0%+4d
	1kHz ~ 3kHz	
mV	60.00mV, 600.0mV	2.0%+3d
V	9.999V, 99.99V, 999.9V	3.0%+4d
	3kHz ~ 20kHz	
mV	60.00mV ¹⁾ , 600.0mV ¹⁾	2%+3d
V	9.999V ²⁾ , 99.99V	3dB
	999.9V	Unspecified

¹⁾Specified from 30% to 100% of range.

²⁾for 3kHz ~ 15kHz only

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

dBm

At 600 Ω , -11.76dBm to 54.25dBm,
Accuracy: $\pm$ 0.25dB + 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, 500, 600, 800, 900, 1000, 1200 Ω

AutoCheck™ (DCV)

RANGE	Accuracy
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. 3.0k Ω , 165pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:

18k Ω @100V
125k Ω @ 300V
320k Ω @ 600V
500k Ω @ 1000V

DC AC & AC+DC AC Voltage¹⁾

Function	RANGE	Accuracy
	DC, 50Hz ~ 60Hz	
mV	60.00mV, 600.0mV	0.7% + 6d
V	9.999V, 99.99V, 999.9V	
	40Hz ~ 1kHz	
mV	60.00mV, 600.0mV	1.0%+6d
V	9.999V, 99.99V, 999.9V	2.2%+6d
	1kHz ~ 20kHz	
mV	60.00mV ²⁾ , 600.0mV ²⁾	2.2%+6d
V	9.999V ²⁾ , 99.99V	3dB
	999.9V	Unspecified

¹⁾Specified from 10% to 100% of range for Model 821

Sensing:

Models 829s: AC+DC True RMS
Models 827s & 822s: AC True RMS
Model 821s: Average Sensing
Safety: Double Insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/EN61010-2-030 Ed. 1.0, IEC/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 IV 1000Vac & Vdc.

Transient protection:

12kV (1.2/50 μ s surge)

Terminals (to COM) Measurement Category:

V/A/mA μ A: Category IV 1000Vac & Vdc

Overload Protections:

μ A & 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

E.M.C.: Meets EN61326-1:2006 (EN55022, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4,

²⁾Specified from 30% to 100% of range.

³⁾for 1kHz ~ 15kHz only

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

AutoCheck™ (ACV)

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

Lo-Z ACV Threshold:

> 3VAC (50/60Hz) nominal

Lo-Z ACV Input Impedance:

Initially approx. 3.0k Ω , 150pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:

18k Ω @100V
125k Ω @ 300V
320k Ω @ 600V
480k Ω @ 1000V

Ohms

RANGE	Accuracy
600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.1%+3d
6.000M Ω	0.4%+3d
60.00M Ω	1.5%+5d
99.99nS	0.8%+10d

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

AutoCheck™ (Ohms)

RANGE	Accuracy
600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.5%+4d
6.000M Ω	0.8%+3d
60.00M Ω ¹⁾	2.0%+6d

¹⁾Temperature Coefficient: 0.6 x (specified accuracy)/°C @ (0°C ~ 18°C or 28°C ~ 45°C)

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

Audible Continuity Tester

Audible threshold: between 20k Ω and 300k Ω ; Response time < 100 μ s

Capacitance

RANGE	Accuracy ¹⁾
60.00nF, 600.0nF	0.8% + 3d
6.000 μ F	1.0% + 3d
60.00 μ F	2.0% + 3d
600.0 μ F ²⁾	3.5% + 5d
6.000mF ²⁾	5.0% + 5d
25.00mF ²⁾	6.5% + 5d

¹⁾Accuracies with film capacitor or better

²⁾In manual-ranging mode, measurements not specified below 50.0 μ F, 0.54mF and 5.4mF for 600.0 μ F, 6.000mF and 25.00mF ranges respectively

AC & AC+DC Current

RANGE	Accuracy	Burden voltage
	50Hz ~ 60Hz	
600.0 μ A, 6000 μ A	0.6%+3d	0.08mV/ μ A
60.00mA		
600.0mA	1.0%+3d	2.1mV/mA
6.000A, 10.00A ¹⁾	0.8%+6d	0.02V/A
	40Hz ~ 1kHz	
600.0 μ A, 6000 μ A	0.8%+4d	0.08mV/ μ A
60.00mA		
600.0mA	1.0%+4d	2.1mV/mA
6.000A, 10.00A ¹⁾	0.8%+6d	0.02V/A

¹⁾10A continuous, >10A to 20A for 30 second max with 5 minutes

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

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 9V battery; NEDA1604G, JIS006P

IEC6F22, NEDA1604A, JIS6AM6 or IEC6LF22

Power Consumption: 5 mA typical

APD Timing: Idle for 30 minutes

APD Consumption: 60 μ A typical

Dimension: L208mm X W103mm X H64.5mm with holster

Weight: 635 gm with holster

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

BKPS0 banana plug type-K thermocouple (Models 829s & 827s only)

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

BKB32 banana plug to type-K socket plug adaptor

cool down interval

DC Current

RANGE	Accuracy	Burden voltage
600.0 μ A, 6000 μ A	0.2%+4d	0.08mV/ μ A
60.00mA, 600.0mA		2.1mV/mA
6.000A, 10.00A ¹⁾		0.02V/A

¹⁾10A continuous, >10A to 20A for 30 second max with 5 minutes cool down interval

Line Level Frequency (-Hz)

Function Range	Frequency	Sensitivity (Sine RMS)
AC 60.00mV	15.00 ~ 50.00kHz	40mV
AC 600.0mV		60mV
AC 9.999V	15.00 ~ 10.00kHz	2.5V
AC 99.99V		25V
AC 999.9V		100V
AC 600.0 μ A	15.00 ~ 3.000kHz	200 μ A
AC 6000 μ A		600 μ A
AC 60.00mA		40mA
AC 600.0mA		60mA
AC 6.000A		4A
AC 10.00A		6A

Accuracy: 0.04%+4d

Logic Level Frequency & Duty Cycle (D%)

@ DCmV Function	Range	Accuracy ¹⁾
Frequency	5.00Hz ~ 1.000MHz	0.04%+4d
Duty Cycle	0.00% ~ 100.0%	3d/kHz+2d ²⁾

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

²⁾Specified Frequency: 5Hz ~ 10kHz

Non-Contact EF-Detection

Typical Voltage	Bar Graph Indication
20V (tolerance: 10V~36V)	-
55V (tolerance: 23V ~ 83V)	-
110V (tolerance: 59V ~ 165V)	---
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

RANGE	Accuracy
2.000V	1.0%+1d

Test Current (Typically): 0.4mA

Open Circuit Voltage: < 3.5 VDC

Temperature

RANGE	Accuracy
-50°C to 1000°C	0.3%+2°C
-58°F to 1832°F	0.3%+5°F

Type-K thermocouple range & accuracy not included