

Agilent U1700 Series Handheld LCR Meters

Data Sheet

Test passive components conveniently, affordably and reliably with the Agilent U1700 Series LCR meters - extending the tradition of industry-leading benchtop units

Agilent U1700 Series handheld LCR meters expand Agilent's portfolio of handheld tools into electronics assembly and passive components troubleshooting. Better yet, these handheld models extends the tradition of Agilent's industry-leading benchtop units to more affordable and portable forms. Agilent's latest handheld LCR meters in all-new orange offer capabilities and functionalities equivalent to the A models.



No waiting for quick, basic LCR tests

Sharing a bench LCR meter is practical, but isn't always convenient. With Agilent's new line of handheld LCR meters, you can perform quick, basic LCR measurements at your convenience. Now that they're available at a lower price point compared to traditional benchtop units, everyone on your team can be equipped for passive-component testingon the bench or on the go-without the wait.

Uncompromised quality and reliability

The handheld LCR meters are housed in robust overmold and tested to stringent industrial standards. Each LCR meter is also sealed with a three-year warranty and the assurance that you can test your components with confidence.



Figure 1: Automate the recording of continuous readings when you hook the U1731A/U1731B/U1732A/U1732B to a PC



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Features

- 20.000 counts resolution
- Dual display with backlight (for U1732A/U1732B)
- Wide LCR ranges with 2 to 4 selectable test frequencies
- Auto-calculation of phase angle (for U1732A/U1732B), dissipation factor and quality factor
- Tolerance mode: 1%, 5% and 10% (20% with U1732A/U1732B)
- Relative mode
- Hold and Min/Max/Average recordings
- Data logging to PC with optional **IR-to-USB** cable

Take a closer look

Maximum, Minimum and Average values recording

Visible and audible tolerance mode for component sorting

Backlight function to ease viewing in subdued lighting (U1732A/U1732B only)

Auto-calculation of Phase Angle (U1732A/U1732B only), Dissipation Factor and Quality Factor

One-touch access to inductance, capacitance and resistance measurements



Figure 2: U1732B front view

20,000 counts resolution
 Data Hold function to freeze measured values
 Selection of test frequencies U1731A/U1731B: 120 Hz/1 kHz U1732A/U1732B: 100 Hz/120 Hz/1kHz/ 10 kHz
 Calibration function for greater measurement accuracy
 Guard terminal to be used with SMD tweezer for better noise immunity

Secondary display

U1731A/U1731B Electrical Specifications

Accuracy is expressed as \pm (% of reading + number of least significant digits) at 23 °C ± 5 °C and <75% R.H.

Resistance (Parallel Mode), Test Frequency = 120 Hz/1 kHz

		Ассигасу		
Range	Maximum Display	@ 120 Hz	@ 1 kHz	Note
10 MΩ	9.999 MΩ	2.0% + 8	2.0% + 8	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	0.5% + 5	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	0.5% + 3	-
20 kΩ	19.999 kΩ	0.5% + 3	0.5% + 3	-
2000 Ω	1999.9 Ω	0.5% + 3	0.5% + 3	-
200 Ω	199.99 Ω	0.8% + 5	0.8% + 5	After short cal.
20 Ω	19.999 Ω	1.2% + 40	1.2% + 40	After short cal.

[1] Specifications are based on measurements performed at the test sockets and on battery operation.

[2] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Capacitance (Parallel Mode), Test Frequency = 120 Hz

		Ассигасу		
Range	Maximum Display	Capacitance	DF	Note
10 mF	19.99 mF ^[1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
1000 µF	1999.9 µF ^[2]	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 µF	19.999 μF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
20 nF	19.999 nF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 1 kHz

		Ассигасу		
Range	Maximum Display	Capacitance	DF	Note
1 mF	1.999 mF ^[1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
20 µF	19.999 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 nF	19.999 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
2000 pF	1999.9 pF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

[1] This reading can be extended up to 1999 MAX display with accuracy that is not specified.

[2] This reading can be extended up to 19999 MAX display with accuracy that is not specified.

[3] Q value is the reciprocal of DF.

[4] Cx = Counts of displayed C value. E.g., If $C = 88.88 \ \mu F$ then Cx = 8888.

[5] Specifications are based on measurements performed at the test sockets and on battery operation.

[6] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Inductance (Series Mode), Test Frequency = 120 Hz

		Accuracy		
Range	Maximum Display	Inductance	DF	Note
1000 H	999.9 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
200 H	199.99 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
20 mH	19.999 mH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 1 kHz

		Accuracy		
Range	Maximum Display	Inductance	DF	Note
100 H	99.99 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 mH	19.999 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

[1] Q value is the reciprocal of DF.

[2] Lx = Counts of displayed L value. E.g., If L = 88.88 H then Lx = 8888.

[3] Specifications are based on measurements performed at the test sockets and on battery operation.

[4] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

U1732A/U1732B Electrical Specifications

Accuracy is expressed as \pm (% of reading + number of least significant digits) at 23 °C \pm 5 °C and <75% R.H.

Resistance (Parallel Mode), Test Frequency = 100 Hz/120 Hz

		Accuracy		
Range	Maximum Display	@ 100 Hz	@ 120 Hz	Note
10 MΩ	9.999 MΩ	2.0% + 8	2.0% + 8	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	0.5% + 5	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	0.5% + 3	-
20 k Ω	19.999 kΩ	0.5% + 3	0.5% + 3	-
2000 Ω	1999.9 Ω	0.5% + 3	0.5% + 3	-
200 Ω	199.99 Ω	0.8% + 5	0.8% + 5	After short cal.
20 Ω	19.999 Ω	1.2% + 40	1.2% + 40	After short cal.

Resistance (Parallel Mode), Test Frequency = 1 kHz/10 kHz

		Accuracy		
Range	Maximum Display	@ 1 kHz	@ 10 kHz	Note
10 MΩ	9.999 MΩ	2.0% + 8	3.5% + 10	After open cal.
2000 kΩ	1999.9 kΩ	0.5% + 5	2.0% + 10	After open cal.
200 kΩ	199.99 kΩ	0.5% + 3	1.5% + 5	-
20 kΩ	19.999 kΩ	0.5% + 3	1.5% + 5	-
2000 Ω	1999.9 Ω	0.5% + 3	1.5% + 5	-
200 Ω	199.99 Ω	0.8% + 5	2.0% + 10	After short cal.
20 Ω	19.999 Ω	1.2% + 40	2.5% + 200	After short cal.

Specifications are based on measurements performed at the test sockets and on battery operation.
 DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Capacitance (Parallel Mode), Test Frequency = 100 Hz/120 Hz

		Accuracy		
Range	Maximum Display	Capacitance	DF	Note
10 mF	19.99 mF ^[1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
1000 µF	1999.9 μF ^[2]	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 µF	19.999 µF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
20 nF	19.999 nF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 1 kHz

		Accuracy		
Range	Maximum Display	Capacitance	DF	Note
1 mF	1.999 mF ^[1]	3.0% + 5 (DF<0.1)	10% + 100/Cx + 5 (DF<0.1)	After short cal.
200 µF	199.99 µF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After short cal.
20 µF	19.999 μF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
2000 nF	1999.9 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
200 nF	199.99 nF	0.7% + 3 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	-
20 nF	19.999 nF	0.7% + 5 (DF<0.5)	0.7% + 100/Cx + 5 (DF<0.5)	After open cal.
2000 pF	1999.9 pF	1.0% + 5 (DF<0.1)	2.0% + 100/Cx + 5 (DF<0.1)	After open cal.

Capacitance (Parallel Mode), Test Frequency = 10 kHz

		Accuracy		
Range	Maximum Display	Capacitance	DF	Note
50 µF	50.0 μF	3.0% + 8 (DF<0.1)	12.0% + 100/Cx + 10 (DF<0.1)	After short cal.
20 µF	19.999 μF	3.0% + 6 (DF<0.2)	5.0% + 100/Cx + 8 (DF<0.2)	After short cal.
2000 nF	1999.9 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
200 nF	199.99 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
20 nF	19.999 nF	1.5% + 5 (DF<0.5)	1.5% + 100/Cx + 6 (DF<0.5)	-
2000 pF	1999.9 pF	2.0% + 6 (DF<0.5)	3.0% + 100/Cx + 6 (DF<0.1)	After open cal.
200pF	199.99 pF	3.0% + 8 (DF<0.1)	5.0% + 100/Cx + 8 (DF<0.1)	After open cal.

[1] This reading can be extended up to 1999 MAX display with accuracy that is not specified.

[2] This reading can be extended up to 19999 MAX display with accuracy that is not specified.

[3] Q value is the reciprocal of DF.

[4] Cx = Counts of displayed C value. E.g., If C = 88.88 μF then Cx = 8888.

[5] Specifications are based on measurements performed at the test sockets and on battery operation.

[6] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

Inductance (Series Mode), Test Frequency = 100 Hz/120 Hz

		Accuracy		
Range	Maximum Display	Inductance	DF	Note
1000 H	999.9 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
200 H	199.99 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
20 mH	19.999 mH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 1 kHz

		Accuracy		
Range	Maximum Display	Inductance	DF	Note
100 H	99.99 H	1.0% + (Lx/10000)% + 5	2.0% + 100/Lx + 5	After open cal.
20 H	19.999 H	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
2000 mH	1999.9 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
200 mH	199.99 mH	0.7% + (Lx/10000)% + 5	1.2% + 100/Lx + 5	-
20 mH	19.999 mH	1.0% + (Lx/10000)% + 5	3.0% + 100/Lx + 5	After short cal.
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 5	10.0% + 100/Lx + 5	After short cal.

Inductance (Series Mode), Test Frequency = 10 kHz

		Accuracy		
Range	Maximum Display	Inductance	DF	Note
1000 mH	999.9 mH	2.0% + (Lx/10000)% + 8	2.0% + 100/Lx + 10	-
200 mH	199.99 mH	1.5% + (Lx/10000)% + 8	2.0% + 100/Lx + 10	-
20 mH	19.999 mH	1.5% + (Lx/10000)% + 10	3.0% + 100/Lx + 15	-
2000 µH	1999.9 µH	2.0% + (Lx/10000)% + 10	8.0% + 100/Lx + 20	After short cal.

[1] Q value is the reciprocal of DF.

[2] Lx = counts of displayed L value. E.g., If L = 88.88 H, then Lx = 8888.

[3] Specifications are based on measurements performed at the test sockets and on battery operation.

[4] DUT and test leads need to be properly shielded by connecting to the guard terminal, if necessary.

General Specifications

Parameter	U1731A/U1731B		U1732A/U1732B		
Measurements	L/C/R/D/Q		L/C/R/D/Q/0		
Tolerance mode	1%, 5%, 10%		1%, 5%, 10%, 20%		
Test frequency (Accuracy = ±0.1% of actual test frequency)	Test frequency setting	Actual test frequency	Test frequency setting	Actual test frequency	
	120 Hz	120 Hz	100 Hz	100 Hz	
	1 kHz	1010 Hz	120 Hz	120 Hz	
			1 kHz	1010 Hz	
			10 kHz	9.6 kHz	
Measuring circuit mode	Inductance (L): Defaults to series mode Capacitance/Resistance (C/R): Defaults to parallel mode				
Display	L/C/R : Maximum display 19999 D/Q: Maximum display 999 (Auto range)				
Backlight	Available for model U1732A/U1732B				
Ranging mode	Auto and Manual				
Test signal level	~0.6 V _{RMS}				
Measurement rate	1 reading/s, nominal				
Response time	~1 s/DUT (manual range)				
Auto power-off	~5 mins without operation				
Power supply	 9 V Alkaline battery (ANSI/NEDA 1604A or IEC 6LR61) AC power adapter and cord available as options 				
Power consumption	 ~40 mA (on battery operation) 0.08 mA after auto power-off 				
Input protection fuse	0.1 A/250 V				
Battery life	7 hours (typical) without backlight and based on new alkaline				
Low battery indicator	+ – will appear when the voltage drops below ~ 6.8 V				
Operating environment	0 °C to 40 °C; 0 to 70% relative humidity (R.H.)				
Storage environment	–20 °C to 50 °C; 0 to 80% R.H. non-condensing				
Temperature coefficient	0.15 x (specified accuracy)/°C (0 °C to 18 °C or 28 °C to 40 °C)				
Weight	330 g				
Dimensions (H x W x D)	184 mm x 87 mm x 41 mm				
Safety and EMC compliance	IEC 61010-1:2001/EN 61010-1:2001 (2 nd Edition) Pollution Degree 2, IEC 61326-2-1:2005/ EN 61326-2-1:2006, ICES-001:2004, AS/NZS CISPR11:2004				
Calibration	One-year calibration cycle recommended				
Warranty	anty • 3 years for main unit • 3 months for standard shipped accessories				

Ordering Information



Standard shipped items

Standard U1731A, U1731B, U1732A and U1732B ordering include:

- Quick Start Guide
- Certificate of Calibration (CoC)
- Alligator clip leads
- 9 V Alkaline battery

Option U1731A-SMD and U1732A-SMD ordering includes (For A series handheld LCR meters only) : SMD tweezer and soft carrying case in addition to the standard shipped items

Recommended accessories



U1174A Soft carrying case

U5481A IR-to-USB cable



U1782A SMD tweezer





U1781A Alligator clip leads