Keysight U1210 Series
Handheld Clamp Meters

Handle big currents – more safely

Data Sheet



KEYSIGHT TECHNOLOGIES

Introduction

Measurements of electrical distribution cables can be challenging and risky. For cables up to two inches in diameter, the Keysight Technologies, Inc. U1210 Series handheld clamp meters enable high-current measurements without breaking the circuit. Unlike most clamp meters, they also include DMM capabilities—resistance, capacitance, frequency and temperature—to simplify troubleshooting during installation and maintenance. Best of all, they provide an extra layer of protection with CAT IV 600V and CAT III 1000 V safety ratings.

Features

- Large clamp opening of 52 mm or 2”
- High measurement capability of up to 1000 A for AC, DC or AC+DC
- CAT III 1000 V/CAT IV 600 V safety rating
- Bluetooth® wireless connectivity (optional U1177A Infrared (IR)-to-Bluetooth Adapter required)
- Includes full-featured DMM with resistance, capacitance, frequency and temperature functions
- High resolution measurements – measure current as low as 0.01 mA
- Peak hold
- Dual ranging mode – manual and auto
- Large dual display
- Min/max recording capability

Key Measurements

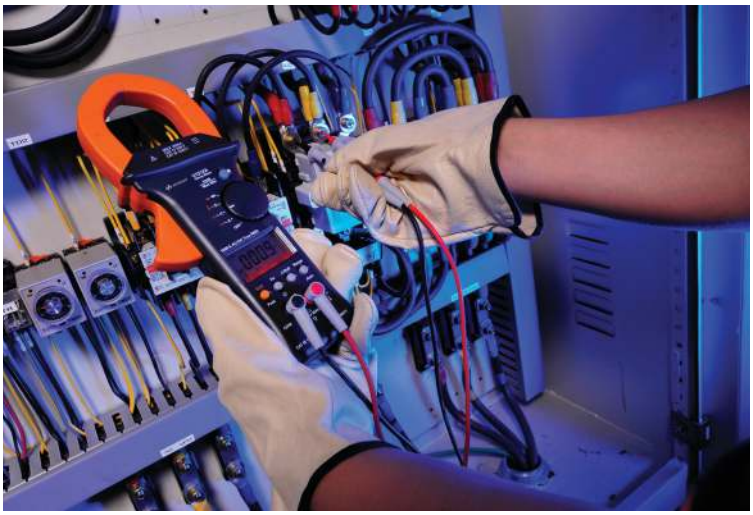
Measure current easily and accurately

Keysight U1210 Series handheld clamp meters come with clamp opening of 52 mm/2 inches and high current measurement capability of up to 1000 A (AC, DC, AC+ DC). With the large jaw size, these handhelds simplify current measurements for thick cables. Clamp on with the U1210 Series and get convenience, versatility and the ability to handle big currents—safely.



Full-featured digital multimeter functions

The U1210 Series handheld clamp meters provide basic functions of a multimeter with wide measurement ranges to cater for a broad range of applications (ACA, DCV, ACV, OHM, audible continuity, diode and frequency tests). These meters also provide auto-ranging capability, built-in peak hold for in-rush current measurement, temperature and capacitance measurement capability, large backlight display and one-hand operation.



Smooth sailing measurements even in a distance

Making current measurements can be strenuously demanding due to its complexity and high current involved. Electrical distribution rooms being typically situated at different areas further complicates maintenance and troubleshooting due to the need to commute back and forth to cross check measurement results.



By adding the new *Bluetooth* capability to your existing U1210 series handheld clamp meters, you are able to make high current measurements in a safer and more convenient manner. With the U1177A Infrared-to-*Bluetooth* adapter, you can easily monitor measurements and log data up 10-metres range across all Android platform devices—an added value for maximum efficiency and productivity in all sorts of hard-to-reach environments.

Take a Closer Look



Large jaw opening of 2 inches to test thick current sources

Capacitance/Diode measurement

Max or Min recording capability

Temperature and audible continuity functions

High measurement capability of up to 1000 A for AC, DC or AC+DC

Large LCD display with maximum reading of 4000 counts

Peak hold function for in-rush current testing

Manual or auto ranging

General Specifications

Title	Specification
Dimension	– U1211A: 106 mm (W) X 273 mm (L) X 43 mm (H) – U1212A and U1213A: 106 mm (W) X 260 mm (L) X 43 mm (H)
Net Weight	– U1211A: 625 grams with batteries included – U1212A and U1213A: 525 grams with batteries included
Display	4 digits with maximum reading 4,100 counts. The 12 Segments analog bar graph and full annunciator. Automatic polarity indication.
Battery	Standard 9 V Battery - Alkaline
Low battery indicator	Battery voltage drops below 6.0 V
Power consumption	– U1211A: 186 mVA maximum – U1212A and U1213A: 220 mVA maximum
Battery life	60 hours (typical)
Connectivity	Wireless *Bluetooth* compatible
Maximum jaw opening	~2 inches
Temperature coefficient	0.12 x (specified accuracy)/°C (from 0 to 18 °C or 28 to 50 °C)
NMRR (Normal Mode Rejection Ratio)	This series has a NMRR specification of > 60 dB at 50 Hz and 60 Hz, which means a good ability to reject the effect of AC noise in DC measurement
CMRR (Common Mode Rejection Ratio)	– U1211A and U1212A have CMRR specifications of > 60 dB at DC to 60 Hz in the ACV function; and > 80 dB at DC, 50 Hz and 60 Hz in the DCV function. – U1213A has a CMRR specifications of > 60 dB at DC to 60 Hz in the ACV function; and > 120 dB at DC, 50 Hz and 60 Hz in the DCV function.
Operating temperature	–10 to 50 °C, 0 to 80 % R.H.
Storage temperature	–20 to 60 °C, 0 to 80 % R.H.
Relative Humidity (R.H.)	Maximum 80 % R.H. for temperature up to 31 °C decreasing linearly to 50 % R.H. at 50 °C
Temperature coefficient	0.1 × (specified accuracy) / °C (from 0 °C to 18 °C or 28 °C to 50 °C)
Safety compliance	EN/IEC 61010-1:2001, ANSI/UL 61010-1:2004, and CAN/CSA-C22.2 No.61010-1-04
Measurement category	CAT III 1000 V/ CAT IV 600 V
EMC compliance	– Certified to IEC61326-1:2005/ EN61326-1:2006 – CISPR 11:2003/ EN 55011:2007 Group 1 class A – Canada: ICES-001:2004 – Australia/New Zealand: AS/NZS CISPR11:2004

Electrical Specifications for U1211A

Accuracy is given as ± (% of reading + number of least significant digits) at 23 °C ± 5 °C, with relative humidity less than 80 % R.H.

ACV/ ACA specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC voltage

Range	Resolution	Accuracy	Overload protection
400 V	0.1 V	0.5 % + 5	1000 V R.M.S
1000 V	1 V	0.5 % + 3	

– *Input impedance: 10 MΩ (nominal)*

AC voltage

Range	Resolution	Accuracy	Overload protection
		45~400 Hz	
400 V	0.1 V	1 % + 5	1000 V R.M.S
1000 V	1 V	1 % + 5	

– *Input impedance: 10 MΩ (nominal) in parallel with < 100 pF*

Voltage (1 ms peak hold)

Range	Resolution	Accuracy	Overload protection
400 V	0.1 V	1 % + 43	1000 V R.M.S
1000 V	1 V	1 % + 43	

– *Specified accuracy for changes > 1 ms in duration*

Diode check/audible continuity test

Range	Resolution	Accuracy	Test current	Open voltage
Diode	0.001 V	0.5 % + 2	Approximately 0.8 mA	< +3.1 V

– *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*

– *Built-in buzzer sounds when reading is below 50 mV approximately and single tone for normal forward-biased diode or semiconductor junction as 0.3 V ≤ Reading ≤ 0.8 V*

Resistance

Range	Resolution	Accuracy	Test current
400 Ω	0.1 Ω	0.5 % + 3	0.8 mA
4 kΩ	0.001 kΩ	0.5 % + 3	80 µA

Notes:

1. *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*
2. *Maximum open voltage: < +3.1 V*
3. *Instant continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω*
4. *The accuracy of 400 Ω and 4 kΩ is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect*

Electrical Specifications for U1211A (continued)

Capacitance

Range	Resolution	Accuracy	Overload protection
400 µF	0.1 µF	2 % + 4	1000 V R.M.S. for circuits < 0.3 A of short circuit current
4000 µF	1 µF	3 % + 4	

– *The accuracy is based on film capacitor or better and use Relative mode to zero residual value*

AC current

Range	Resolution	Accuracy *N1		
		45~65 Hz	65~400 Hz	400 Hz~1 kHz
40 A	0.01 A	1.0 % + 10	1.0 % + 10	3.0 % + 10
400 A	0.1 A	1.0 % + 5	1.0 % + 5	3.0 % + 5
400~700 A	1 A	1.0 % + 5	1.0 % + 5	3.0 % + 5
700~1000 A	1 A	1.0 % + 5	None	None

– *Maximum overload: 1000 A R.M.S. The accuracy is specified on the symmetrical waveforms.*

– *N1: The maximum verification of current and frequency product is less than 400,000 A x Hz*

WARNING: **The measuring duty cycle should not exceed the following limits.**	
0 ~ 600 A R.M.S.	Continuous
600 ~ 700 A R.M.S.	10 minutes ON, 10 minutes OFF
700 ~ 1000 A R.M.S.	5 minutes ON, 20 minutes OFF

Current (1 ms peak hold)

Range	Resolution	Accuracy	Maximum overload
40 A	0.01 A	2.0 % + 70	1000 A R.M.S.
400 A	0.1 A	2.0 % + 43	
1000 A	1 A	2.0 % + 43	

– *Specified accuracy for changes > 1 ms in duration*

Electrical Specifications for U1211A (continued)

Frequency (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 % + 3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

– *Overload protection: 1000 V; < 20,000,000 V x Hz*

Sensitivity

Frequency sensitivity		
Range	**Minimum sensitivity (R.M.S.)**	
Maximum input for specified accuracy of AC	**40 Hz~2 kHz**	**10~40 Hz or 2~100 kHz**
400 V	6 V	6 V
1000 V	20 V	30 V (< 10 kHz)
40 A	3 A (< 1 kHz)	3 A (< 1 kHz)
400 A	20 A (< 1 kHz)	20 A (< 1 kHz)
1000 A	50 A (1 kHz)	50 A (< 1 kHz)

Electrical Specifications for U1212A

Accuracy is given as ± (% of reading + number of least significant digits) at 23 °C ± 5 °C, with relative humidity less than 80 % R.H.

ACV/ ACA specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC voltage

Range	Resolution	Accuracy	Overload protection
400 V	0.1 V	0.5 % + 3	1000 V R.M.S
1000 V	1 V	0.5 % + 3	

– *Input impedance: 10 MΩ (nominal)*

AC voltage

Range	Resolution	Accuracy	Overload protection
		45~400 Hz	
400 V	0.1 V	1 % + 5	1000 V R.M.S
1000 V	1 V	1 % + 5	

– *Input impedance: 10 MΩ (nominal) in parallel with < 100 pF*

Voltage (1 ms peak hold)

Range	Resolution	Accuracy	Overload protection
400 V	0.1 V	1 % + 43	1000 V R.M.S
1000 V	1 V	1 % + 43	

– *Specified accuracy for changes > 1 ms in duration*

Diode check/audible continuity test

Range	Resolution	Accuracy	Test current	Open voltage
Diode	0.001 V	0.5 % + 2	Approximately 0.8 mA	< +3.1 V

– *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*

– *Built-in buzzer sounds when reading is below 50 mV approximately and single tone for normal forward-biased diode or semiconductor junction as 0.3 V ≤ Reading ≤ 0.8 V*

Resistance

Range	Resolution	Accuracy	Test current
400 Ω	0.1 Ω	0.5 % + 3	0.8 mA
4 kΩ	0.001 kΩ	0.5 % + 3	80 µA

Notes:

1. *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*
2. *Maximum open voltage: < +3.1 V*
3. *Instant continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω*
4. *The accuracy of 400 Ω and 4 kΩ is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect*

Electrical Specifications for U1212A (continued)

Capacitance

Range	Resolution	Accuracy	Overload protection
400 µF	0.1 µF	2 % + 4	1000 V R.M.S. for circuits < 0.3 A of short circuit current
4000 µF	1 µF	3 % + 4	

– *The accuracy is based on film capacitor or better and use Relative mode to zero residual value*

DC current

Range	Resolution	Accuracy	Maximum overload
40 A	0.01 A	1.5 % + 15	1000 A R.M.S.
400 A	0.1 A	1.5 % + 3	
1000 A	1 A	2.0 % + 5	

– *Use Relative mode to zero residual offset*

AC current

		Accuracy *N1		
Range	Resolution	45~65 Hz	65 Hz~1 KHz	Maximum overload
40 A	0.01 A	2.0 % + 10	3.0 % + 10	1000 A R.M.S.
400 A	0.1 A	2.0 % + 5	3.0 % + 5	
1000 A	1 A	2.0 % + 5	3.0 % + 5	

– *N1: The maximum verification of current and frequency product is less than 400,000 A x Hz*

Current (1 ms peak hold)

Range	Resolution	Accuracy	Maximum overload
40 A	0.01 A	2.0 % + 70	1000 A R.M.S.
400 A	0.1 A	2.0 % + 43	
1000 A	1 A	2.0 % + 43	

– *Specified accuracy for changes > 1 ms in duration*

Temperature test

Thermal type	Range	Resolution	Accuracy
K	–200 ~ –40 °C	0.1 °C	1 % + 3 °C
	–40 ~ 1372 °C	0.1 °C	1 % + 1 °C
	–328 ~ –40 °F	0.1 °F	1 % + 6 °F
	–40 ~ 2502 °F	0.1 °F	1 % + 2 °F

Notes:

1. *The accuracy does not include the tolerance of the thermocouple probe, and the meter must be operational for at least one hour*
2. *Do not allow the temperature sensor to contact a surface that is energized above 33 V R.M.S. or 70 V DC. Such voltages will pose a shock hazard.*
3. *The temperature calculation is according to the standard of EN/IEC-60548-1 and NIST175*

Electrical Specifications for U1212A (continued)

Frequency (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 % + 3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

– *Overload protection: 1000 V*

Sensitivity

Frequency sensitivity		
Range	**Minimum sensitivity (R.M.S.)**	
Maximum input for specified accuracy of AC	**40 Hz~2 kHz**	**10~40 Hz or 2~100 kHz**
400 V	6 V	6 V
1000 V	20 V	30 V (< 10 kHz)
40 A	3 A (< 1 kHz)	3 A (< 1 kHz)
400 A	20 A (< 1 kHz)	20 A (< 1 kHz)
1000 A	50 A (1 kHz)	50 A (< 1 kHz)

Electrical Specifications for U1213A

Accuracy is given as ± (% of reading + number of least significant digits) at 23 °C ± 5 °C, with relative humidity less than 80 % R.H.

AC voltage, AC current, AC+DC voltage, AC+DC current specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC voltage

Range	Resolution	Accuracy	Overload protection
4 V	0.001 V	0.2 % + 5	1000 A R.M.S.
40 V	0.01 V		
400 V	0.1 V		
1000 V	1 V	0.5 % + 3	

– *Input impedance: 10 MΩ (nominal)*

AC voltage

Range	Resolution	Accuracy		Overload protection
		45~400 Hz	400 Hz~2 kHz	
4 V	0.001 V	1.0 % + 5	2.0 % + 5	1000 V R.M.S
40 V	0.01 V			
400 V	0.1 V			
1000 V	1 V			

– *Input impedance: 10 MΩ (nominal) in parallel with < 100 pF*

AC+DC voltage

Range	Resolution	Accuracy		Overload protection
		45~400 Hz	400 Hz~2 kHz	
4 V	0.001 V	1.5 % + 9	2.5 % + 9	1000 V R.M.S
40 V	0.01 V			
400 V	0.1 V			
1000 V	1 V			

– *Input impedance: 10 MΩ (nominal) in parallel with < 100 pF*

Voltage (1 ms peak hold)

Range	Resolution	Accuracy	Overload protection
4 V	0.001 V	1.0 % + 43	1000 V R.M.S
40 V	0.01 V		
400 V	0.1 V		
1000 V	1 V		

– *Specified accuracy for changes > 1 ms in duration*

Electrical Specifications for U1213A (continued)

Diode check/audible continuity test

Range	Resolution	Accuracy	Test current	Open voltage
Diode	0.001 V	0.5 % + 2	Approximately 0.8 mA	< +3.1 V

– *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*

– *Built-in buzzer sounds when reading is below 50 mV approximately and single tone for normal forward-biased diode or semiconductor junction as 0.3 V ≤ Reading ≤ 0.8 V*

Resistance

Range	Resolution	Accuracy	Test current
400 Ω	0.1 Ω	0.3 % + 3	0.8 mA
4 kΩ	0.001 kΩ		80 µA
40 kΩ	0.01 kΩ		8 µA
400 kΩ	0.1 kΩ		727 nA
4 MΩ	0.001 MΩ	0.6 % + 3	112 nA
40 MΩ	0.01 MΩ	2.0 % + 5	112 nA

Notes:

1. *Overload protection: 1000 V R.M.S. for circuits < 0.3 A of short circuit current*
2. *Maximum open voltage: < +3.1 V*
3. *Instant continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω*
4. *The accuracy of 400 Ω and 4 kΩ is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect*

Capacitance

Range	Resolution	Accuracy	Overload protection
4 µF	0.001 µF	1 % + 4	1000 V R.M.S. for circuits < 0.3 A of short circuit current
40 µF	0.01 µF		
400 µF	0.1 µF	2 % + 4	
4000 µF	1 µF	3 % + 4	

– *The accuracy is based on film capacitor or better and use Relative mode to zero residual value*

DC current

Range	Resolution	Accuracy	Maximum overload
40 A	0.01 A	1.5 % + 15	1000 A R.M.S.
400 A	0.1 A	1.5 % + 3	
1000 A	1 A	2.0 % + 5	

– *Use Relative mode to zero residual offset*

Electrical Specifications for U1213A (continued)

AC current

		Accuracy *N1		
Range	**Resolution**	**45~65 Hz**	**65 Hz~1 KHz**	**Maximum overload**
40 A	0.01 A	2.0 % + 10	3.0 % + 10	1000 A R.M.S.
400 A	0.1 A	2.0 % + 5	3.0 % + 5	
1000 A	1 A	2.0 % + 5	3.0 % + 5	

– *N1: The maximum verification of current and frequency product is less than 400,000 A x Hz*

AC+DC current

		Accuracy		
Range	**Resolution**	**45~65 Hz**	**65 Hz~1 kHz**	**Maximum overload**
40 A	0.01 A	3.5 % + 25	4.5 % + 25	1000 A R.M.S.
400 A	0.1 A	3.5 % + 9	4.5 % + 9	
1000 A	1 A	4.5 % + 9	5.0 % + 9	

Current (1 ms peak hold)

Range	Resolution	Accuracy	Maximum overload
40 A	0.01 A	2.0 % + 70	1000 A R.M.S.
400 A	0.1 A	2.0 % + 43	
1000 A	1 A	2.0 % + 43	

– *Specified accuracy for changes > 1 ms in duration*

Temperature test

Thermal type	Range	Resolution	Accuracy
K	–200 ~ –40 °C	0.1 °C	1 % + 3 °C
	–40 ~ 1372 °C	0.1 °C	1 % + 1 °C
	–328 ~ –40 °F	0.1 °F	1 % + 6 °F
	–40 ~ 2502 °F	0.1 °F	1 % + 2 °F

Notes:

1. *The accuracy does not include the tolerance of the thermocouple probe, and the meter must be operational for at least one hour*
2. *Do not allow the temperature sensor to contact a surface that is energized above 33 V R.M.S. or 70 V DC. Such voltages will pose a shock hazard.*
3. *The temperature calculation is according to the standard of EN/IEC-60548-1 and NIST175*

Electrical Specifications for U1213A (continued)

Frequency (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 % + 3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

– *Overload protection: 1000 V; < 20,000,000 V x Hz*

Sensitivity

Frequency sensitivity		
Range	**Minimum sensitivity (R.M.S.)**	
Maximum input for specified accuracy of AC	**45 Hz~2 kHz**	**10 Hz~200 kHz**
4 V	0.3 V	0.6 V
40 V	2 V	3 V
400 V	20 V	30 V (< 100 kHz)
1000 V	50 V	50 V (< 10 kHz)
40 A	3 A (< 1 kHz)	3 A (< 1 kHz)
400 A	20 A (< 1 kHz)	20 A (< 1 kHz)
1000 A	50 A (< 1 kHz)	50 A (< 1 kHz)

Duty cycle

Mode	Range	Accuracy of full scale
AC coupling	0.1 %~99.9 %	0.3 % per kHz + 0.3 %

Notes:

1. *The accuracy for duty cycle is based on a 4 V square wave input to the DC 4 V range and maximum frequency up to 2 kHz. The duty cycle range can be measured within 5 %~95 % as the signal frequency > 20 Hz.*

Ordering Information

Standard shipped accessories
– Test leads – 4-mm probes – Soft carrying case – Quick Start Guide – Certificate of Calibration (CoC)

Optional accessories		
U1168A		Standard test lead kit
U1162A		Alligator clips
U1175A		Soft carrying case
U1186A		K-type thermocouple and adapter
U1177A		Infrared (IR)-to-*Bluetooth* Adapter



Did you know?

Ensure that the clamp meter measures only one conductor at a time. Measuring multiple conductors may cause inaccuracy in measurement reading due to vector sum of the currents flowing in the conductors.

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