

Di-LOG

...measurably better

Operating Instructions for AC/DC Pocket Digital Multimeter



Instruction Manual for DL115 (v1.1)

Please read this manual before switching the meter on. Important safety information included.

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I. Certificate of conformity

As the manufacturer of the instrument listed below, we declare under our sole responsibility that the product:

Di-LOG DL115

To which this declaration relates is in conformity with the relevant clauses of the following standards:

LVD & EMC

EN 61326

EN 61010-1

EN 61010-02-032

EN 61010-02-033

The instrument has been factory-calibrated during its manufacturing process, ensuring it fully conforms to our rigorous quality assurance procedures. This guarantees exceptional accuracy and reliability for all your measurement needs.

The safety and performance of this instrument is assured when operated within the specifications in this instruction manual.

The product identified above conforms to the requirements of the UK and EU directives for electrical Equipment (Safety) Regulations 2016 (Low Voltage Directive 2014/35/EU) and the Electromagnetic Compatibility Regulations 2016 (EMC Directive 2014/30/EU).

II. Safety



International Safety Symbol

Manual Reference Symbol: Indicates the user must refer to the manual for more information.



Hazardous Voltage Symbol

This symbol, adjacent to a terminal, indicates that under normal use, hazardous voltages may be present.



Double insulation symbol

Indicates the meter is protected by double insulation.
Complies with IEC 536, class II

Safety Notices

- Do not exceed the maximum allowable input range of any function.
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.

WARNINGS!

- Set function switch to the appropriate position before measuring.
- When measuring voltage, do not switch the meter to current or resistance modes.
- When changing ranges using the selector switch always disconnect the test leads from the circuit under test.
- Do not exceed the maximum rated input limits.



Failure to read the instruction manual or to follow the warnings and references contained herein can result in serious bodily injury or instrument damage.

Safety Notices (continued)



CAUTIONS

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair or replace any damage before use.
- Use great care when making measurements if the voltages are greater than 30VAC RMS, 42VAC Peak or 60V DC. These voltages are considered a shock hazard.
- Remove the battery if the meter is to be stored for long periods.
- Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.
- Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the recessed electrical contacts. Other means should be used to ensure that the terminals are not Live following the Safe Isolation Procedure as set out in the Electricity at Work Regulation 1989.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

It is important to check the state of the battery before use and to replace it if necessary.

The meter has been designed in accordance with the safety regulations for electronic measuring instruments:

- **EN 61326**
- **EN 61010-1**
- **EN 61010-02-032**
- **EN 61010-02-033**

The meter may only be inspected and repaired by a qualified service technician for calibration and repair, please refer to section 15 for further information.

Please observe the below maximum input limits on all ranges:

Function	Input Limit
V - AC/DC	600V AC/DC
Resistance, Continuity, Diode Test	600V AC/DC
Frequency & Duty Cycle	600V AC/DC
μ A, mA Current AC or DC	200mA/600V fast acting replaceable Fuse

III. Instrument & Manual Symbols

Symbols displayed on the instrument and in the instruction manual:



Warning! Warns of potential danger, and to com
Suitable for live working.



CE Symbol of conformity confirms conformity with relevant EU directives. The meter complies with EMC directives (2004/08/ EC), the Low Voltage Directive (described in the standard EN 61010-1)



UKCA Symbol of conformity confirms conformity with relevant UK regulations. The meter complies with EMC regulations (SI 2016 No. 1091), the Low Voltage Regulation (described in the standard EN 61010-1)

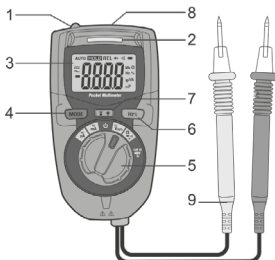


The DL115 meets the standard (2012/19/EU) WEEE Directive in the UK & EU. This marking indicates that this product should not be disposed with other household wastes throughout the EC. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use your local authority return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.



The instruction manual contains information and references, necessary for safe operation and maintenance of the instrument. Prior to using the instrument, the user is kindly requested to thoroughly read the instruction manual and comply with it in all sections.

V. Meter Description

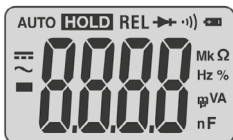


1. Non-contact voltage detector sensor
2. Non-contact voltage indicator
3. LCD display
4. MODE button
5. Rotary function
6. Hz/% & Duty Cycle button
7. Flashlight/Back Light button
8. Flashlight
9. Test leads Input terminal



CAT IV Applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.

VI. Symbols Used on LCD Display



V	Voltage
A	Amperes (Amps)
~	Alternating Current (AC)
≡	Direct Current (DC)
-	Minus Sign
Ω	Ohms
•)	Continuity
➔	Diode Test
F	Farads (Capacitance)
Hz	Hertz (Frequency)
%	Percentage (Duty Cycle)
n	Nano
μ	Micro
m	Milli
k	Kilo
M	Mega
OL	Overload/Over Range
⊕ -	Low Battery
AUTO	Auto Ranging

VII. Detailed Specifications: Range & Accuracy

Accuracy is stated at 65°F to 83°F (18°C to 28°C), less than 70% relative humidity

Function	Range	Resolution	Accuracy $\pm$ (% of reading + digits)
AC Voltage (50 to 60Hz)	4.000V	1mV	$\pm$ (1.0% + 8)
	40.00V	10mV	
	400.0V	0.1V	$\pm$ (2.3% + 10)
	600V	1V	
DC Voltage	400.0mV	0.1mV	$\pm$ (0.5% + 3)
	4.000V	1mV	$\pm$ (1.2% + 3)
	40.00V	10mV	
	400.0V	0.1V	
	600V	1V	
AC Current (50 to 60Hz)	400.0 μ A	0.1 μ A	$\pm$ (2.5% + 10)
	4000 μ A	1 μ A	
	40.00mA	10 μ A	
	200.0mA	0.1mA	
DC Current	400.0 μ A	0.1 μ A	$\pm$ (2.0% + 8)
	4000 μ A	1 μ A	
	40.00mA	10 μ A	
	200.0mA	0.1mA	
Resistance	400.0 Ω	0.1 Ω	$\pm$ (0.8% + 5)
	4.000k Ω	1 Ω	$\pm$ (1.2% + 5)
	40.00k Ω	10 Ω	
	400.0k Ω	100 Ω	
	4.000M Ω	1k Ω	$\pm$ (5.0% + 5)
	40.00M Ω	10k Ω	$\pm$ (10.0% + 5)
Capacitance	51.20nF	10pF	$\pm$ (5.0% + 30)
	512.0nF	100pF	$\pm$ (3.0% + 15)
	5.120 μ F	0.001 μ F	$\pm$ (5.0% + 25)
	51.20 μ F	0.01 μ F	
	100.0 μ F	0.1 μ F	

Frequency	9.999Hz	0.001Hz	$\pm$ (2.0% + 5)
	99.99Hz	0.01Hz	
	999.9Hz	0.1Hz	
	9.999kHz	1Hz	
Duty Cycle	0.5 to 99.0%	0.1%	$\pm$ (2.0% + 5)
Pulse Width: 0.1 to 100ms			
Frequency Range: 5Hz to 10kHz			
Sensitivity: >8V RMS			

1. General Specifications

Insulation	Class 2 Double Insulated
Diode Test	Test current of 1mA typical; Open circuit voltage 1.5V DC typical
Continuity Check	Threshold $<100\Omega$;
Low Battery Indication	"  " is displayed
Over-range Indication	"OL" is displayed
Measurements Rate	3 per second. Nominal
Input Impedance	$7.5M\Omega$ (VDC and VAC)
Display	4000 Counts LCD
AC Response	Average Response
AC Voltage Bandwidth	50-60Hz
Operating Temperature	0 to 40°C (32 to 104°F)
Storage Temperature	-10 to 50°C (14 to 122°F)
Operating Humidity	Max $<70\%$
Storage Humidity	$<80\%$
Operating Altitude	2000 metres max
Over Voltage	Category IV 600V
Battery	2 x "AAA" 1.5V
Safety	For indoor use and in accordance with over-voltage Category II, Pollution Degree 2.

2. Operation

Rotate the functional dial on the front of the DL115 from the off position clockwise / anti-clockwise to the function required.

 **WARNING:** Ensure that the test leads are disconnected from any conductors before selecting required function.

3. AC/DC Voltage Measurements

Observe all safety precautions when working on live voltages.

- Set the rotary function switch to the **VAC/VDC/Hz/%** position.
- Press the **MODE** button to select **AC** or **DC** voltage. The “~”(AC) or “=”(DC) symbol will be shown on the LCD display.
- Touch the test lead probes to the circuit under test. When measuring DC voltage, touch the **red probe** to the positive side of the circuit and the **black probe** to the negative side of the circuit.
- Read the voltage in the display.

4. Frequency & Duty Cycle Measurements

 **WARNING:** Observe all safety precautions when working on live voltages.

- Press the **Hz%** button once to select frequency. The “**Hz**” symbol will appear on the display. To select **Duty Cycle**, press the **Hz%** button a second time. The “**%**” symbol will appear on the display.
- Touch the test lead probes to the circuit under test.
- Read the frequency or % duty cycle on the LCD display.
- Pressing the button a third time will return the meter to the voltage function.

5. AC/DC Current Measurement

 **WARNING:** Observe all safety precautions when working on live circuits. Do not measure current on circuits that exceed 500V.

- For current measurements up to 200mA AC/DC, set the rotary function switch to the **mA** position.
- For current measurements up to 4000 μ A AC/DC, set the rotary function switch to the **μ A** position.
- Press the **MODE** button to select **AC** or **DC** current. The “~” (AC) or “=” (DC) symbol will be shown on the LCD display.
- Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
- Touch the test lead probes in series with the circuit being measured. For DC current, touch the **red probe** to the positive side of the circuit and touch the **black probe** to the negative side of the circuit.
- Apply power to the circuit.
- Read the current on the LCD display.

6. Resistance Measurement

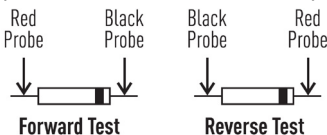
⚠ WARNING: Never test resistance on a live circuit.

- Set the rotary function switch to the “ Ω   $\dashv$ ” position
- Press the **MODE** button until the “ Ω ” symbol appears on the LCD display.
- Touch the test lead probes to the component under test. If the component is installed in a circuit, it is best to disconnect one side before testing to eliminate interference with other devices.
- Read the resistance on the LCD display.

7. Diode Measurement

⚠ WARNING: Never test resistance on a live circuit.

- Set the rotary function switch to the “ Ω   $\dashv$ ” position
- Press the **MODE** button until the “” symbol appears on the LCD display.
- Touch the test lead probes to the diode under test.
- Forward voltage will indicate 0.4 to 0.7 on the LCD display. Reverse voltage will indicate “OL” Shorted devices will indicate near 0 and an open device will indicate “OL” in both polarities.



8. Audible Continuity Measurement

 **WARNING:** Never test diodes on a live circuit.

- Set the rotary function switch to the “ Ω   $\rightarrow$ ” position
- Press the **MODE** button until the “ $\rightarrow$ ” symbol appears on the LCD display.
- Touch the test lead probes to the device or wire under test.
- A beeper will sound if the resistance is approx. **100 ohms** or less and the resistance reading will be shown on the LCD display.

9. Capacitance Measurement

 **WARNING:** Never test capacitors on a live circuit. Safely discharge capacitors before taking a capacitance measurements.

- Set the rotary function switch to the “ Ω   $\rightarrow$ ” position
- Press the **MODE** button until the “ $\rightarrow$ ” symbol appears on the LCD display.
- Touch the test lead probes to the capacitor under test.
- Read the capacitance on the LCD display.
- **Please note:** It may take up to a minute to get a stable reading on a large capacitor.

10. Non-contact Voltage Measurement

 **WARNING:** Risk of Electrocution. Before use, always test the Voltage Detector on a known live circuit to verify proper operation.

- The **non-contact** voltage detector operates when the meter is set to any measuring function. The detector does not operate when Auto Power Off turns the meter off or when the rotary function switch is set to the off position.
- Hold the detector close to the AC voltage being tested.
- If AC voltage within the specified ranges is present, the indicator light will **illuminate RED**.

NOTE: Insulation type and thickness, and distance from the voltage source and other factors may effect operation. Use other methods to verify live voltage if there is any uncertainty

NOTE: The detector is designed with high sensitivity. Static electricity or other sources of energy may randomly trip the sensor. This is normal operation.

NOTE: The detector only activates the indicator light when AC voltage is present. It does not indicate the voltage level on the LCD display.

11. Buttons - Mode/Flashlight/Hz%

-  **Mode Button:** Used to select AC or DC and Ohms, Diode Test, Continuity or Capacitance.
-  **Flashlight/Back Light Button:** Momentarily press the  button to turn the flash light on and off. The back light illuminates the LCD display when the ambient light is too low to view the displayed readings. To turn on, press and hold the  button until the back light turns on. To turn off, press and hold the  button again until the back light turns off.
-  **Hz/% Duty Cycle Button:** Used to select Frequency or % Duty Cycle when the meter is set to voltage.

12. Battery Replacement

 **WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing battery cover.

- Loosen the two Phillips screws on the battery cover.
- Remove the battery cover.
- Replace old batteries with two "AAA" 1.5V batteries.
- Observe correct polarity as shown inside battery compartment.
- Attach the battery cover and secure the screws.

 **WARNING:** To avoid electric shock, do not operate the meter until the battery cover is in place and securely fastened.

13. Maintenance & Cleaning

The maintenance and other services of this instrument must be carried out by the manufacturer or an approved service centre so not to invalidate the warranty. Test leads are classed as a wear and tear item and are available to purchase as an accessory. Please contact product support for more information. The outer casing should be regularly cleaned with either a dry or slightly damp cloth. Do not use detergents, especially if they contain abrasives or solvents.

14. Warranty

Di-LOG instruments are subject to stringent quality controls. If in the course of normal daily use a fault occurs we provide a 24 month warranty (only valid with proof of purchase). Faults in manufacture and material defects will be rectified by us free of charge, provided the instrument has not been tampered with and returned to us unopened. Damage due to dropping, abuse or misuse are not covered by the warranty.

Product Support

support@dilog.co.uk



15. Service & Calibration

To maintain the specified accuracy of the measurement results, the instrument must be recalibrated at regular intervals by Di-LOG. Di-LOG's service partner, Re-CAL Calibration, are the only authorised agent with the facility to adjust and service the DL115 Digital Multimeter. We recommend an annual recalibration period from the date of purchase.

Service & Calibration

www.recal.biz



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Notes

Notes

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