

...measurably better

DL9205

EN
61010-1

CAT III
600V

CE

Safety Information

This manual contains information that must be followed for operating the meter safely and maintaining the meter in a safe operating condition. If this meter is not used in the manner specified, the protection provided may be impaired.



Warning! Warns of potential danger, refer to the instruction manual to avoid personal injury or damage to the meter.



Caution! Dangerous voltage. Danger of electrical shock.



Continuous double or reinforced insulation complies with IEC536, class II.



Symbol of conformity, confirms conformity with relevant EU directives. The meter complies with EMC directives (89/336/EEC). Specifically standards EN 50081-1 and EN 50082-1 as well as the Low Voltage Directive (73/23/EEC) described in the standard EN 61010-1.

Safety Information

The meter has been designed in accordance with the safety regulations for electronic measuring instruments, EN 61010-1, IEC 61010.

Voltages above 75V DC or 50V AC may constitute a serious shock hazard.

Before using the meter check for physical damage to the casing in particular around the connectors. If the case is damaged do not use the meter.

Check the test leads for damaged insulation or exposed metal. Check the leads for continuity. Replace damaged leads with identical model or specification before using the meter.

Where applicable use GS38 approved leads (not supplied) these are available from Di-Log. When using test leads keep fingers behind the finger guards.

Do not apply more than the rated voltage, as marked on the meter between the terminals or between any terminal and ground.

Safety Information

Before making a measurement ensure that the rotary switch is set to the appropriate range. Do not turn the rotary switch whilst making a measurement.

Use the appropriate terminals, function and range for your measurements. If the value to be measured is not known use the maximum measurement position and reduce the range step by step until a satisfactory reading is obtained.

Do not use or store the meter in an environment of high temperature, humidity, fumes, vapour, gaseous, inflammable and strong magnetic field. The performance and safety of the user may be compromised in such circumstances.

Disconnect circuit power and discharge all high voltage capacitors before testing resistance, continuity, diodes, capacitance or current.

Before measuring current check the meters fuses and turn off power to the circuit before connecting the meter to the circuit.

Safety Information

Replace the battery as soon as the low battery indicator appears. If the battery is low the meter may give false readings.

Turn the meter power off when not in use,. Remove the battery if the meter is in use for a long period. Constantly check the battery as it may have leaked. A leaking battery will damage the meter.



The meter may only be opened by a qualified service technician for calibration and repair.

Input Limits

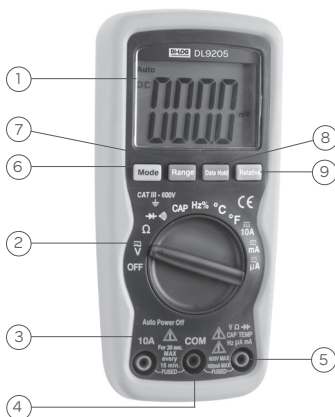
Never apply voltage or current to the meter that exceeds the specified maximum:

Function	Maximum
V DC or V AC	600V DC, 600V AC
mA DC/AC	400mA DC/AC
A DC/AC	10A DC/AC (30 seconds max every 15 minutes)
Frequency, Resistance, Capacitance, Duty Cycle, Diode test, Continuity	250V DC/AC
Temperature	250 V DC/AC

Symbols and Annunciators

	Continuity
BAT	Low Battery
	Diode
DATA HOLD	Data Hold
AUTO	AutoRanging
AC	Alternating Current or Voltage
DC	Direct Current or Voltage

Controls and Inputs



1. 4000 count Liquid Crystal Display with symbolic signs.
2. Function rotary switch.
3. 10A (positive) input jack for 10A DC or AC measurements.
4. COM (negative) input terminal.
5. Positive input terminal.
6. MODE pushbutton.
7. Range pushbutton.
8. Data Hold pushbutton.
9. Relative pushbutton.

Specifications

The instrument complies with: EN61010-1.

Insulation: Class2, Double insulation.

Overvoltage category: CATIII 600V.

Display:

4000 counts LCD display with function indication.

Polarity: Automatic, (-) negative polarity indication.

Overrange: "OL" mark indication.

Low battery indication: The "BAT" is displayed when the battery voltage drops below the operating level.

Measurement rate: 2 times per second, nominal.

Auto power off: Meter automatically shuts down after approx. 15 minutes of inactivity.

Operating environment: 0 °C to 50 °C (32 °F to 122 °F) at < 70 % relative humidity.

Storage temperature: -20 °C to 60 °C (-4 °F to 140 °F) at < 80 % relative humidity.

For inside use, max height: 2000m

Pollution degree: 2

Power: One 9V battery , NEDA 1604, IEC 6F22.

Dimensions: 150 (H) x 70 (W) x 48 (D) mm

Weight: Approx.: 255g.

Accuracy is given at 18 °C to 28 °C (65 °F to 83 °F), less than 70 % RH

Specifications

DC Voltage (Auto-ranging)

Range	Resolution	Accuracy
400.0mV	0.1mV	$\pm 0.5\%$ of rdg + 2 dgts
4.000V	1mV	$\pm 1.2\%$ of rdg + 2 dgts
40.00V	10mV	
400.0V	100mV	
600V	1V	$\pm 1.5\%$ of rdg + 2 dgts

Input Impedance: 7.8M Ω .

Maximum Input: 600V dc or 600V ac rms.

AC Voltage (Auto-ranging except 400mV)

Range	Resolution	Accuracy
400.0mV	0.1mV	$\pm 1.5\%$ of rdg + 15 dgts
4.000V	1mV	$\pm 1.2\%$ of rdg + 3 dgts
40.00V	10mV	$\pm 1.5\%$ of rdg + 3 dgts
400.0V	100mV	
600V	1V	$\pm 2.0\%$ of rdg + 4 dgts

Input Impedance: 7.8M Ω .

Frequency Range: 50 to 400Hz.

Maximum Input: 600V dc or 600V ac rms.

DC Current (Auto-ranging for μ A and mA)

Range	Resolution	Accuracy
400.0 μ A	0.1 μ A	$\pm 1.0\%$ of rdg + 3 dgts
4000 μ A	1 μ A	$\pm 1.5\%$ of rdg + 3 dgts
40.00mA	10 μ A	
400.0mA	100 μ A	
10A	10mA	$\pm 2.5\%$ of rdg + 5 dgts

Overload Protection: 0.5A / 250V and 10A / 250V Fuse.

Maximum Input: 400mA dc or 400mA ac rms on μ A / mA ranges, 10A dc or ac rms on 10A range.

Specifications

AC Current (Auto-ranging for μA and mA)

Range	Resolution	Accuracy
400.0 μA	0.1 μA	$\pm 1.5\%$ of rdg + 5 dgts
4000 μA	1 μA	$\pm 1.8\%$ of rdg + 5 dgts
40.00 mA	10 μA	
400.0 mA	100 μA	
10A	10 mA	$\pm 3.0\%$ of rdg + 7 dgts

Overload Protection: 0.5A / 250V and 10A / 250V Fuse.

Frequency Range: 50 to 400 Hz.

Maximum Input: 400 mA dc or 400 mA ac rms on μA / mA ranges, 10A dc or ac rms on 10A range.

Resistance (Auto-ranging)

Range	Resolution	Accuracy
400.0 Ω	0.1 Ω	$\pm 1.2\%$ of rdg + 4 dgts
4.000 $\text{k}\Omega$	1 Ω	$\pm 1.0\%$ of rdg + 2 dgts
40.00 $\text{k}\Omega$	10 Ω	$\pm 1.2\%$ of rdg + 2 dgts
400.0 $\text{k}\Omega$	100 Ω	
4.000 $\text{M}\Omega$	1 $\text{k}\Omega$	
40.00 $\text{M}\Omega$	10 $\text{k}\Omega$	$\pm 2.0\%$ of rdg + 3 dgts

Input Protection: 250V dc or 250V ac rms.

Capacitance (Auto-ranging)

Range	Resolution	Accuracy
4.000 nF	1 pF	$\pm 5.0\%$ of rdg + 50 dgts
40.00 nF	10 pF	$\pm 5.0\%$ of rdg + 7 dgts
400.0 nF	0.1 nF	$\pm 3.0\%$ of rdg + 5 dgts
4.000 μF	1 nF	
40.00 μF	10 nF	
200.0 μF	0.1 μF	$\pm 5.0\%$ of rdg + 5 dgts

Input Protection: 250V dc or 250V ac rms.

Specifications

Frequency (Auto-ranging)

Range	Resolution	Accuracy
9.999Hz	0.001Hz	
99.99Hz	0.01Hz	$\pm 1.5\%$ of rdg + 5 dgts
999.9Hz	0.1Hz	$\pm 1.2\%$ of rdg + 3 dgts
9.999kHz	1Hz	
99.99kHz	10Hz	
999.9kHz	100Hz	
9.999MHz	1kHz	$\pm 1.5\%$ of rdg + 4 dgts

Sensitivity: $>0.5V$ RMS while $\leq 1MHz$;

Sensitivity: $>3V$ RMS while $>1MHz$;

Overload protection: 250V dc or ac rms.

Duty Cycle

Range	Resolution	Accuracy
0.1%~99.9%	0.1%	$\pm 1.2\%$ of rdg + 2 dgts

Pulse width: $>100\mu s$, $<100ms$; **Frequency width:** 5Hz – 150kHz

Sensitivity: $>0.5V$ RMS **Overload protection:** 250V dc or ac rms.

Temperature

Range	Resolution	Accuracy
$-20^{\circ}C \sim +760^{\circ}C$	$1^{\circ}C$	$\pm 3\%$ of rdg
$-4^{\circ}F \sim +1400^{\circ}F$	$1^{\circ}F$	$\pm 5^{\circ}C/9^{\circ}F$

Sensor: Type K Thermocouple.

Overload protection: 250V dc or ac rms.

Specification

Diode Test

Range	Resolution	Accuracy
0.3mA typical	1mV	$\pm 10\%$ of rdg + 5 dgts

Open circuit voltage: 1.5V dc typical.

Overload protection: 250V dc or ac rms.

Audible continuity

Audible threshold: Less than 150Ω ;

Test current: $<0.3\text{mA}$

Overload protection: 250V dc or ac rms.

Operation



Warning:

RISK OF ELECTROCUTION. HIGH-VOLTAGE CIRCUITS, BOTH AC AND DC, ARE VERY DANGEROUS AND SHOULD BE MEASURED WITH GREAT CARE.

1. ALWAYS turn the function switch to the OFF position when the meter is not in use. This meter has Auto OFF that automatically shuts the meter OFF if 15 minutes elapse between uses.
2. If "OL" appears in the display during a measurement, the value exceeds the range you have selected. Change to a higher range.

Note:

On some low AC and DC voltage ranges, with the test leads not connected to a device, the display may show a random, changing reading. This is normal and is caused by the high-input sensitivity. The reading will stabilize and give a proper measurement when connected to a circuit.

Mode Button

To select Diode/Continuity , DC/AC Hz/% Duty

Operation

Range Button

When the meter is first turned on, it automatically goes into AutoRanging. This automatically selects the best range for the measurements being made and is generally the best mode for most measurements. For measurement situations requiring that a range be manually selected, perform the following:

1. Press the RANGE button. The "AUTO" display indicator will turn off.
2. Press the RANGE button to step through the available ranges until you select the range you want.
3. Press and hold the RANGE button for 2 seconds to exit the ManualRanging mode and return to AutoRanging. (If backlight is turned on, please press BACKLIGHT button it will turn off).

Data Hold Button

The Data Hold function allows the meter to "freeze" a measurement for later reference.

1. Press the DATA HOLD button to "freeze" the reading on the indicator. The indicator "HOLD" will be appear in the display.
2. Press the DATA HOLD button to return to normal operation.

Operation

Relative Button

The relative measurement feature allows you to make measurements relative to a stored reference value. A reference voltage, current, etc. can be stored and measurements made in comparison to that value. The displayed value is the difference between the reference value and the measured value.

1. Perform any measurement as described in the operating instructions.
2. Press the RELATIVE button to store the reading in the display and the **"REL"** indicator will appear on the display.
3. The display will now indicate the difference between the stored value and the measured value.
4. Press the RELATIVE button to return to normal operation.

DC Voltage Measurements



Caution:

DO NOT MEASURE DC VOLTAGES IF A MOTOR ON THE CIRCUIT IS BEING SWITCHED ON OR OFF. LARGE VOLTAGE SURGES MAY OCCUR THAT CAN DAMAGE THE METER.

1. Set the function switch to the V DC position ("mV" will appear in the display).
2. Insert the black test lead banana plug into the negative (COM) terminal and the red test lead banana plug into the positive (V) terminal.
3. Connect the test probe tips to the circuit under test. Be sure to observe the correct polarity (red lead to positive, black lead to negative).
4. Read the voltage in the display. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (-) minus before the value.

AC Voltage Measurements



Warning:

RISK OF ELECTROCUTION. THE PROBE TIPS MAY NOT BE LONG ENOUGH TO CONTACT THE LIVE PARTS INSIDE SOME 240V OUTLETS FOR APPLIANCES BECAUSE THE CONTACTS ARE RECESSED DEEP IN THE OUTLETS. AS A RESULT, THE READING MAY SHOW 0 VOLTS WHEN THE OUTLET ACTUALLY HAS VOLTAGE ON IT. MAKE SURE THE PROBE TIPS ARE TOUCHING THE METAL CONTACTS INSIDE THE OUTLET BEFORE ASSUMING THAT NO VOLTAGE IS PRESENT.



Caution:

DO NOT MEASURE AC VOLTAGES IF A MOTOR ON THE CIRCUIT IS BEING SWITCHED ON OR OFF. LARGE VOLTAGE SURGES MAY OCCUR THAT CAN DAMAGE THE METER.

1. Set the function switch to the V AC position.
2. Insert the black test lead banana plug into the negative (COM) terminal and the red test lead banana plug into the positive (V) terminal.
3. Connect the test probe tips to the circuit under test.
4. Read the voltage in the display. The display will indicate the proper decimal point, value and symbol (AC, V, etc.)

DC Current Measurements



Caution:

DO NOT MAKE CURRENT MEASUREMENTS ON THE 10A SCALE FOR LONGER THAN 30 SECONDS. EXCEEDING 30 SECONDS MAY CAUSE DAMAGE TO THE METER AND/OR THE TEST LEADS.

1. Insert the black test lead banana plug into the negative (COM) terminal.
2. For current measurements up to $4000\mu\text{A}$ DC, set the function switch to the μA position and insert the red test lead banana plug into the (μA) terminal.
3. For current measurements up to 400mA DC, set the function switch to the mA range and insert the red test lead banana plug into the (mA) terminal.
4. For current measurements up to 10A DC, set the function switch to the A position and insert the red test lead banana plug into the 10A terminal.
5. Press the AC/DC button until "DC" appears in the display.

DC Current Measurements

6. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
7. Connect the black test probe tip to the negative side of the circuit. Connect the red test probe tip to the positive side of the circuit.
8. Apply power to the circuit.
9. Read the current in the display. The display will indicate the proper decimal point, value and symbol.

AC Current Measurements



Warning:

TO AVOID ELECTRIC SHOCK, DO NOT MEASURE AC CURRENT ON ANY CIRCUIT WHOSE VOLTAGE EXCEEDS 250V AC.



Caution:

DO NOT MAKE CURRENT MEASUREMENTS ON THE 10A SCALE FOR LONGER THAN 30 SECONDS. EXCEEDING 30 SECONDS MAY CAUSE DAMAGE TO THE METER AND/OR THE TEST LEADS.

1. Insert the black test lead banana plug into the negative (COM) terminal.
2. For current measurements up to 4000 μ A AC, set the function switch to the μ A position and insert the red test lead banana plug into the (μ A) terminal.
3. For current measurements up to 400mA AC, set the function switch to the mA range and insert the red test lead banana plug into the (mA) terminal.
4. For current measurements up to 10A AC, set the function switch to the A position and insert the red test lead banana plug into the 10A terminal.
5. Press the AC/DC button until "AC" appears in the display.

AC Current Measurements

6. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
7. Connect the black test probe tip to the negative side of the circuit. And connect the red test probe tip to the positive side of the circuit.
8. Apply power to the circuit.
9. Read the current in the display. The display will indicate the proper decimal point, value and symbol.

Resistance Measurements



Warning:

TO AVOID ELECTRIC SHOCK, DISCONNECT POWER TO THE UNIT UNDER TEST AND DISCHARGE ALL CAPACITORS BEFORE TAKING ANY RESISTANCE MEASUREMENTS. REMOVE THE BATTERIES AND UNPLUG THE LINE CORDS.

1. Set the function switch to the Ω position.
2. Insert the black test lead banana plug into the negative (COM) terminal and the red test lead banana plug into the positive Ω terminal.
3. Connect the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display. The display will indicate the proper decimal point, value and symbol.

Continuity Check



Warning:

TO AVOID ELECTRIC SHOCK, NEVER MEASURE CONTINUITY ON CIRCUITS OR WIRES THAT HAVE VOLTAGE ON THEM.

1. Set the function switch to the position.
2. Insert the black lead banana plug into the negative (-) terminal (COM) and the red test lead banana plug into the positive (+) terminal (Ω).
3. Press the button until the symbol appears in the display.
4. Connect the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately 30Ω , the audible signal will sound. The display will also show the actual resistance.

Diode Test



Warning:

TO AVOID ELECTRIC SHOCK, DO NOT TEST ANY DIODE THAT HAS VOLTAGE ON IT.

1. Set the function switch to $\rightarrow \bullet \rightarrow$ position.
2. Press the $\rightarrow \bullet \rightarrow$ button until the \rightarrow symbol appears in the display.
3. Insert the black test lead banana plug into the negative (-) terminal (COM) and the red test lead banana plug into the positive (+) terminal (Ω).
4. Connect the test probe tips to the diode or semiconductor junction you wish to test. Note the meter reading
5. Reverse the probe polarity by switching probe position. Note this reading.
6. The diode or junction can be evaluated as follows:
 - A. If one reading shows a value and the other reading shows OL, the diode is good.
 - B. If both readings show OL, the device is open.
 - C. If both readings are very small or 0, the device is shorted.

Note:

The value indicated in the display during the diode check is the forward voltage.

Frequency Measurements

1. Set the function switch to the FREQ position.
2. Insert the black test lead banana plug into the negative (-) terminal (COM) and the red test lead banana plug into the positive (+) terminal (F).
3. Connect the test probe tips to the circuit under test.
4. Read the frequency in the display. The digital reading will indicate the proper decimal point, symbols (Hz, kHz) and value.

Capacitance Measurements



Warning:

TO AVOID ELECTRIC SHOCK, DISCONNECT POWER TO THE UNIT UNDER TEST AND DISCHARGE ALL CAPACITORS BEFORE TAKING ANY CAPACITANCE MEASUREMENTS. REMOVE THE BATTERIES AND UNPLUG THE LINE CORDS.

1. Set the function switch to the CAP position. ("nF" and a small value will appear in the display).
2. Insert the black test lead banana plug into the negative (-) terminal (COM) and the red test lead banana plug into the positive (+) terminal (CAP).
3. Connect the test leads to the capacitor to be tested. The display will indicate the proper decimal point, value and symbol.

Temperature Measurement

Warning:

TO AVOID ELECTRIC SHOCK, DISCONNECT BOTH TEST PROBES FROM ANY SOURCE OF VOLTAGE BEFORE MAKING A TEMPERATURE MEASUREMENT.

1. If you wish to measure temperature in °F, set the function switch to the °F range. If you wish to measure temperature in °C, set the function switch to the °C range.
2. Insert the type K thermocouple probe black test lead banana plug into the negative COM terminal and the red test lead banana plug into the positive Temp terminal.
3. Connect the Temperature Probe head to the part whose temperature you wish to measure. Keep the probe connected to the part under test until the reading stabilizes (about 30 seconds).
4. Read the temperature in the display. The digital reading will indicate the proper decimal point and value.

Warning:

TO AVOID ELECTRIC SHOCK, BE SURE THE THERMOCOUPLE HAS BEEN REMOVED BEFORE CHANGING TO ANOTHER MEASUREMENT FUNCTION.

Replacing the Battery



Warning:

TO AVOID ELECTRIC SHOCK, DISCONNECT THE TEST LEADS FROM ANY SOURCE OF VOLTAGE BEFORE REMOVING THE BATTERY DOOR.

1. When the batteries become exhausted or drop below the operating voltage, "BAT" will appear in the right-hand side of the LCD display. The battery should be replaced.
2. Disconnect the test leads from the meter.
3. Open the battery door by loosening the screw using a Phillips head screwdriver.
4. Insert the battery into battery holder, observing the correct polarity.
5. Put the battery door back in place. Secure with the two screws.
6. Follow instructions for installing battery. See the Battery Installation section of this manual.



Warning:

TO AVOID ELECTRIC SHOCK, DO NOT OPERATE THE METER UNTIL THE BATTERY DOOR IS IN PLACE AND FASTENED SECURELY.

Note:

If your meter does not work properly, check the fuses and battery to make sure that they are still good and that they are properly inserted.

Replacing the Fuses

Warning:

TO AVOID ELECTRIC SHOCK, DISCONNECT THE TEST LEADS FROM ANY SOURCE OF VOLTAGE BEFORE REMOVING THE FUSE DOOR.

1. Disconnect the test leads from the meter and any item under test.
2. Open the fuse door by loosening the screw on the door using a Phillips head screwdriver.
3. Remove the old fuse from its holder by gently pulling it out.
4. Install the new fuse into the holder.
5. Always use a fuse of the proper size and value (0.5A/250V fast blow for the 400mA range, 10A/250V fast blow for the 10A range).
6. Put the fuse door back in place. Insert the screw and tighten it securely.

Warning:

TO AVOID ELECTRIC SHOCK, DO NOT OPERATE YOUR METER UNTIL THE FUSE DOOR IS IN PLACE AND FASTENED SECURELY.

Clamp AC/DC Clamp RCD Voltage μF 16th Edition Multimeter
Multimeters Phase Rotation Clamp Voltage 16th
Voltage 16th Edition kHz Ω Resistance Continuity Loop
AC/DC $^{\circ}\text{C}$ Phase Rotation

Notes

Notes

Voltage 16th Edition Phase Rotation Clamp Ω
kHz
Resistance Continuity Loop
Phase Rotation Portable

Warranty & Maintenance

24 Month Warranty

Di-Log instruments are subject to stringent quality controls. If in the course of normal daily use a fault occurs we will provide a 24 month warranty (only valid with invoice).

Faults in manufacture and materials defect 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 is not covered by the warranty.

Outside the warranty period we offer a full repair and re-calibration service.

Maintenance

WARNING Do not attempt to repair or service your meter unless you are qualified to do so and have the relevant calibration, performance test and service information. To avoid electrical shock or damage to the meter do not get water inside the case.

Periodically wipe the case with a damp cloth and mild detergent. Do not use chemical solvent.

Clean the input terminals with cotton bud, as dirt or moisture in the terminals can affect readings.

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