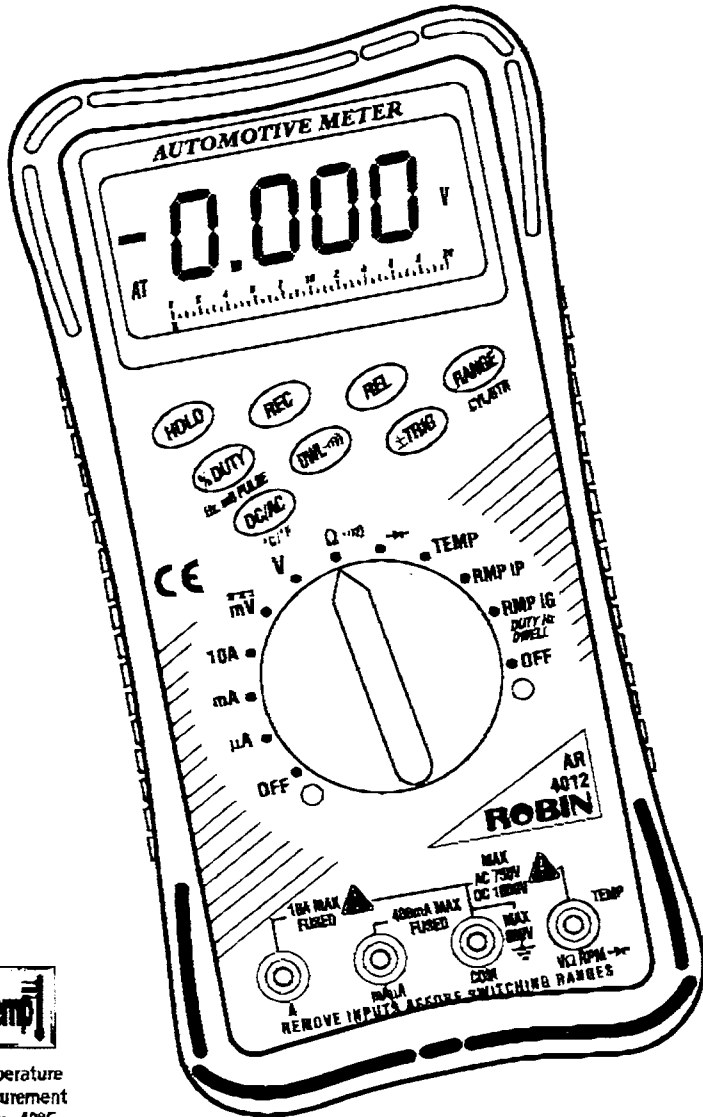


ROBIN



Temperature measurement from -40°C to 1370°C



Fused 10A range for current measurement



Fully autoranging for rapid, easy testing



Diode test with continuity bleeper



Bar Graph display for tracking signals and trend monitoring



Frequency measurement up to 200kHz

AR 4012

Advance Range Digital Multimeter

TECHNICAL SPECIFICATION	
AR 4012	
DC Voltage Range & Accuracy	4V 40V 400V ± (0.3% + 2 dgt) 1000V ± (0.75% + 3 dgt)
AC Voltage Range & Accuracy	4V 40V 400V ± (0.75% + 3 dgt) (50 - 60Hz) 750V ± (0.75% + 5 dgt) (50 - 60Hz)
DC Current Range & Accuracy	400µA 4000µA 40mA 400mA ± (0.5% + 1 dgt) 4A 10A ± (1.0% + 5 dgt)
AC Current Range & Accuracy	400µA 400µ 40mA 400mA 4A 10A ± (1.0% + 5 dgt)
Resistance Range & Accuracy	400Ω ± (0.5% + 10 dgt) 4kΩ 40kΩ 400kΩ 4MΩ ± (0.5% + 3 dgt) 40MΩ ± (1.5% + 10 dgt)
Frequency Range & Accuracy	200Hz 2000Hz ± (0.2% + 2 dgt) 20kHz 200kHz ± (0.05% + 2 dgt)
Temperature Range & Accuracy	± (3.0°C + 1 dgt) (-40°C to -10°C) ± 3°C (-10°C to 20°C) ± (1% + 2°C) (20°C to 400°C) ± 3.0% of reading (400°C to 1370°C)
Dimensions	190 x 40 x 85mm (without holster)
Weight	380g (without holster)

Accessories

Included: Test Leads, Safety Holster, Instruction Manual, Certificate of Conformity.

Optional: Snap-Lok Fused Test Leads, Certificate of Calibration.

The AR 4012 Automotive Multimeter Kit has been specifically developed for the testing of automotive electrical and combustion systems. The instrument was developed for a large national vehicle breakdown organisation and provides all of the tests generally required for garage or field use.

The AR 4012 is provided as a complete kit and includes inductive pick-up coil, K-Type thermocouple, test leads and innovative cable piercing test probes. A comprehensive manual and user guide is also provided.

Telephone 01923 218744 (Sales)

Facsimile 01923 218898

Robin Electronics Limited, Precision Centre, Dwight Road, Watford, Hertfordshire WD1 8HG, England

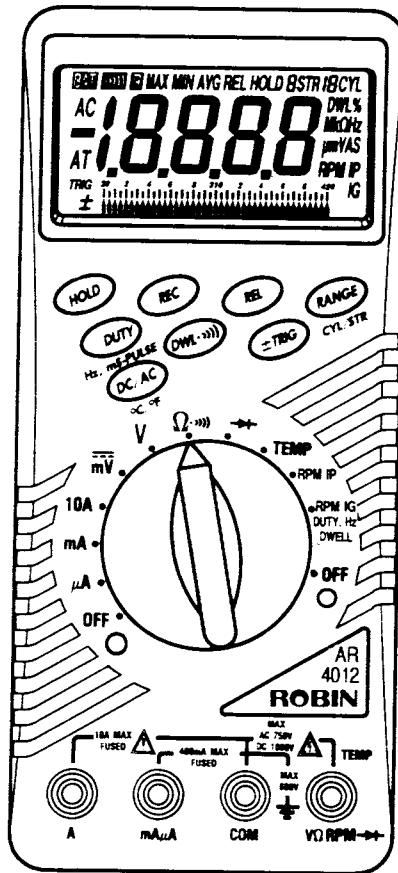
ROBIN

Robin Electronics Limited

Precision Centre, Dwight Road, Watford, Hertfordshire, England WD17 8HG
Tel: 01923 232000 Fax: 01923 218890

ROBIN

ADVANCE RANGE 4000 SERIES AUTOMOTIVE MULTIMETER **AR 4012**



*“Step-by-step”
troubleshooting
guide included.*



Approval No. 861942



Calibration
No. 0544

1. INTRODUCTION

This Meter is a handheld and battery operated DMM-type Automotive Multimeter that is designed and tested according to IEC Publication 1010-1 (EN 61010-1: 1993) (Overvoltage Category II), the EMC Directive (EN 50081-1:1992 and EN50082-1:1992), UL 1244 & UL 201, and other safety standards (see "Specifications").

This User's Manual describes how to use this Meter. You may also need a manual that provides technical information for the vehicle you plan to test. The most important source of information is the vehicle's service repair manuals generally available for purchase through automotive dealers. They are also available through a number of publishers who specialise in providing technical information manuals to the independent repair garages.

This User's Manual should be used as a guide to get you started in troubleshooting. Your real learning can best be accomplished through experience. As you become more proficient in using the Automotive DMM to troubleshoot, you will very quickly learn how certain electrical symptoms can relate to various vehicle problems.

Features:

- Accurate frequency and pulse measurements with 20000 count on the high resolution 4000 count display
- High-speed 41 segment analog bar graph updates 20 times/second
- Accurate automotive electronics test and advanced measurements with DC/AC Volts, DC/AC Amps and Resistance.
- Direct reading of DWELL without using Duty Cycle to Dwell conversion chart when testing electronic fuel injection, feedback carburetors, and ignition systems
- RPM measurement for automotive engines with 1 to 12 Cylinders using the test leads or the Inductive Pickup
- mS-Pulse Width function to test on-time of fuel injectors of both PFI (Port Fuel Injector) type and TBI (Throttle Body Injector) type
- For accurate measurements of RPM, DWELL, DUTY-CYCLE, and mS-PULSE WIDTH OF Injectors, the Meter exercises 7 steps adjustable +/- triggers on 1 to 12 Cylinders, either 2 or 4 Cycle for outboards, motorcycles and conventional engines.
- Temperature measurement up to 2,498°F (or 1,370°C) for catalytic converters, fan switch on/off, etc
- Shielded for testing Marine Engines
- 1P 54 rated for dust and water splash protection

Measurement Limits:

DC Voltage	: 0.1mV to 1000V
AC Voltage	: 1mV to 750V
RPM 1P	: 30 to 9000 RPM
RPM 1G	: 60 to 12000 RPM
DC Amperes	: 0.1 μ A to 10A
AC Amperes	: 0.1 μ A to 10A
Resistance	: 0.1 Ω to 40M Ω
Frequency	: 0.5Hz to 200KHz
% Duty Cycle	: 0 to 99.9%
Dwell	: 0°C to 356.4°
Pulse Width	: 0.002 to 1999.9mS
Temperature	: -40°F to +2,498°F (-40°C to +1,370°C)
Continuity Check	: Beeper Sounds at Approx. <100 Ω on the 4K Ω range.

9. SPECIFICATIONS

Electrical Specifications

Accuracy is given as \pm ([% of reading] + [number of least significant digits]) at 18°C to 28°C with relative humidity up to 80%, for a period of one year after calibration.

Frequency, RPM, Duty Cycle, Dwell and Pulse Width

FUNCTION	RANGE	RESOLUTION	ACCURACY	PULSE WIDTH	
				RANGE (ms)†	RESOLUTION (ms)
Frequency (0.5Hz to 200KHz)	199.99**	0.01Hz	$\pm(0.05\% + 2)$	1999.9	0.1
	1999.9**	0.1Hz	$\pm(0.05\% + 2)$	5.00	0.01
Pulse Width ($> 2\mu s$)	19.999KHz	0.001KHz	$\pm(0.05\% + 2)$		
	200KHz	0.1KHz	Unspecified		
RPM IP	30-9,000	1 RPM	± 2 RPM		
RPM IG	60-12,000	1 RPM	± 2 RPM		
% Duty Cycle*	0.0-99.9% (30 RPM to 19,999 RPM, Pulse Width $> 2\mu s$)				
Dwell*	0.0-356.4° (30 RPM to 19,999 RPM, Pulse Width $> 2\mu s$)				
Pulse Width*	0.002-1999.9mS (30 RPM to 19,999 RPM, Pulse Width $> 2\mu s$)				

†Pulse Width range is determined by RPM.

*For rise $> 1\mu s$ Duty Cycle accuracy: Within $\pm(0.2\%$ per KHz $+0.1\%$),

Pulse Width accuracy: Duty Cycle accuracy $+1$ digit

**The Frequency (Hz) of RPM (DUTY, Hz, DWELL) mode has only these 2 range specifications.

Voltage

FUNCTION	RANGE	RESOLUTION	ACCURACY	INPUT IMPEDANCE
DC V	4 V	1mV	$\pm(0.3\% + 2$ dgts)	Approx. 11M Ω
	40 V	10mV		Approx. 10M Ω
	400 V	0.1 V		
	1000 V	1V	$\pm(0.75\% + 3$ dgts)	
DC mV	400mV	0.1mV	$\pm(0.3\% + 2$ dgts)	$> 100m\Omega$

FUNCTION	RANGE	RESOLUTION	ACCURACY		INPUT IMPEDANCE
			50Hz-60Hz	45Hz-1KHz	
AC V (45Hz to 1KHz)	4V	1mV	$\pm(0.75\% + 3$ dgts)	$\pm(2.5\% + 5$ dgts)	Approx. 11M Ω
	40V	10mV			Approx. 10M Ω
	400V	0.1 V			
	750V	1 V	$\pm(0.75\% + 5$ dgts)		

Current

FUNCTION	RANGE	RESOLUTION	ACCURACY	INPUT IMPEDANCE
DC A	400 μA	0.1 μA	$\pm(0.5\% + 1$ dgt)	100 $\mu V/\mu A$
	4000 μA	1 μA		1.2mV/mA
	40mA	0.01mA		
	400mA	0.1mA		
AC A (45Hz to 1KHz)	4A	0.001A	$\pm(1.0\% + 5$ dgts)	75mV/A
	10A	0.01A		
	400 μA	0.1 μA		100 $\mu V/mA$
	4000 μA	1 μA		1.2mV/mA
AC A (45Hz to 1KHz)	40mA	0.01mA	$\pm(1.0\% + 5$ dgts)	1.2mV/mA
	400mA	0.1mA		75mV/A
	4A	0.001A		
	10A	0.01A		

Specifications

Ohms and Diode Test

FUNCTION	RANGE	RESOLUTION	ACCURACY	OPEN CIRCUIT VOLTAGE
Ohms	400Ω	0.1Ω	±(0.5% + 10 dgts)	< 1.2V
	4KΩ	1Ω	±(0.5% + 3 dgts)	
	40KΩ	10Ω		
	400KΩ	0.1KΩ		
	4MΩ	1KΩ		
	40MΩ	10KΩ	±(1.5% + 10 dgts)	
Continuity	Open Circuit Voltage: < 1.2V Threshold: Approx. < 100Ω			
Diode Check	Open Circuit Voltage: < 3V Max. Test Current: 2.5mA			

Temperature specification

RANGE	RESOLUTION	ACCURACY
-40°C to -10°C (-40°F to 14°F)	0.1°C (0.1°F)	±(3.0°C + 1 dgt) ±(3.0°F + 1 dgt)
-10°C to 20°C (14°F to 68°F)	0.1°C (0.1°F)	±3.0°C (±3.0°F)
20°C to 400°C (68°F to 400°F)	0.1°C (0.1°F)	±(1.0% + 2°C) ±(1.0% + 2°F)
400°C to 1,370°C (400°F to 2,498°F)	1°C (1°F)	±3.0% of reading (±3.0% of reading)

* This specification is effective at the ambient temperature of 23°C only.

Max Min Average Recording

Response Time: 250ms to 80%

Accuracy: ± 20 digits for changes > 250ms in duration (± 60 digits in AC)