

Precision Measurement Instruments
for the Aerospace Professional



For over 20 years, TEGAM has consistently delivered accurate testing solutions to the aerospace industry. We support multiple applications on many fixed and rotary wing airframes.

Here are just a few:

1. Verify ground bonds at refueling points
2. Measure continuity and sufficiency of RF shields in cable connections
3. Inspect conductive coatings for coverage and thickness
4. Find metal fatigue cracking and loose rivets
5. Validate grounding on instrument installations
6. Asses the integrity of lightning protection systems
7. Troubleshooting overheat sensor chains



Verifying a lightning wick with the KTL-100 Kelvin clip.



The model R1L-E2A is intrinsically safe, which allows it be used in the presence of aviation fuels.



The HTP-101A pistol grip probes have hardened stainless steel pins that rotate on compression to break through oxides and paint where necessary.






The model R1L-BR being used to verify the integrity of the lightning protection system.






The BCP-10 probes have multiple replaceable tips and are sized for smaller scale work.

TEGAM Bond Testers and LCR Meters are applied in a wide range of military and commercial airframes.



Microohmmeters	R1L-E2A Intrinsic Safe Microohmmeter NSN 6625-01-527-5543	R1L-BR1 Microohmmeter and Bond Tester	R1L-BR Microohmmeter and Bond Tester
Range	R: 2 mΩ to 20 Ω	R: 2 mΩ to 20 Ω	R: 2 mΩ to 20 Ω
Excitation Waveform	130 μA to 1.3 A 	140 μA to 1.4 A 	140 μA to 1.4 A 
Best Accuracy	0.10%	0.20%	0.25%
Best Resolution	R: 1 μΩ	R: 1 μΩ	R: 1 μΩ
Battery Operated	Yes	Yes	Yes
Weight/ Dimensions (HxWxD)	15.1 lb 7.1 in x 17.5 in x 11.5 in	9.8 lb 14.1 in x 10.6 in x 6.1 in	6.7 lb 5 in x 10 in x 9 in
Application	Testing airframe ground bonds, especially around fuel systems.	Bond testing, electric motors, generators, transformer winding, coils, PCBs, resistors testing.	Bond testing, electric motors, generators, transformer winding, coils, PCBs, resistors testing, Helicopter rotor blades.
Main Feature	Intrinsic Safe, Robust Design for Explosive Atmospheres. Specialty Probes. C-UL-US, ATEX	Compact Rugged Design, Includes Four Wire Push Pin & Alligator Clip Probes	Compact Rugged Design

Microohmmeters	1750 High-Speed, Precise Programmable Microohmmeter	R1L-D1 High Accuracy Microohmmeter and RTD Monitor NSN 6625-01-456-9125	252/253 General Purpose Impedance/ LCR Meter NSN 6625-01-474-6981
Range	R: 2 mΩ to 20 Ω	R: 200 mΩ to 2 kΩ	R: 2 Ω to 2 MΩ L: 200 μH to 200 H C: 200 pF to 200 μF
Excitation Waveform	100 nA to 100 mA 	500 μA to 50 mA 	1 μA to 100 mA 
Best Accuracy	0.02%	0.05%	0.25%
Best Resolution	R: 100 nΩ	R: 1 μΩ	R: 1 mΩ L: 0.1 μH C: 0.1 pF
Battery Operated	No	Yes	Optional: 252/SP2596, 253/SP2598
Weight/ Dimensions (HxWxD)	9 lb 5.2 in x 8.5 in x 13 in	10 lb 6 in x 14 in x 11 in	7 lb 4 in x 10 in x 14.6 in
Application	Resistor and fuse, battery cables, contact resistance, electro-plating, thermo-electric cooler, bond testing.	Low resistance measurements on long wires in helicopters, aircrafts, ships, buildings, down well pumps and wind turbines.	Fenwal Fire Sensor conductance testing, incoming component inspection, electronic motos, generators, transformer windings, coils.
Main Feature	Fast (10 ms) and Accurate μΩ Measurements. Standard RS-232 and GPIB Interfaces.	High Resolution Ohmmeter and Very Low Current RTD Monitor in one unit	User friendly, External Bias Terminal, Shielded Kelvin Connections

In aircraft testing, it is often difficult to access the test points. TEGAM has developed a diverse line of probes to make testing easier, and to improve accuracy.



	KTL-100 Kelvin Klip Leads	HTP-100 Kelvin Pistol Grip Probes	HKC-100 Large Kelvin Test Lead Set	SSP-10 Kelvin Probe, Stainless Steel Pins
Compatible With	R1L-B R1L-BR R1L-D1	R1L-B R1L-BR R1L-D1	R1L-B R1L-BR R1L-D1	R1L-B R1L-BR R1L-D1
Cable Length	7 ft	8 ft	8 ft	10 ft
Pin Center to Pin Center	N/A	0.5 in (1.27 cm)	N/A	0.4 in (1 cm)
Max Jaw Opening	0.6875 in (1.75 cm)	N/A	1.778 in (4.5 cm)	N/A
Replacement Pins	N/A	N/A	N/A	P/N: SSP-10-A (Set of 4)
Connector Type	Dual Banana	Spade Lugs	Dual Banana	Dual Banana

	BCP-10 Kelvin Probe, Copper Pins	HKP-125 Long Lead Heavy Kelvin Klip	HTP-101A Intrinsically Safe Kelvin Pistol Grip Probes	CA-162-36 Kelvin Klips
Compatible With	R1L-B R1L-BR R1L-D1	R1L-B R1L-BR R1L-D1	R1L-E2A	252 252/SP2596 253 253/SP2598
Cable Length	10 ft	125 ft	8 ft	3 ft
Pin Center to Pin Center	0.156 in (0.4 cm)	N/A	0.5 in (1.27 cm)	0.4 in (1 cm)
Max Jaw Opening	N/A	1.778 in (4.5 cm)	N/A	N/A
Replacement Pins	P/N: BCP-10-A through BCP-10-F (set of 10)	N/A	N/A	N/A
Connector Type	Dual Banana	Spade Lugs	Spade Lugs	Special Four Terminal Connector

Convenient probes and temperature calibrators create a comprehensive solution to temperature measurement challenges.



Temperature	819A Single Input Handheld Digital Thermometer	821A Dual Input Handheld Digital Thermometer	840A Temperature Calibrator / Thermometer	845 Temperature Calibrator / Thermometer
Input Thermocouple Type	K, J, T	K, J, T	K, J, T	K, J, T, E, N, B, R, S, G, C, D
Number of Inputs/Outputs	1 thermometer input	2 thermometer inputs	1 calibrator output, 1 thermometer input	1 calibrator output, 1 thermometer input
Accuracy	± (0.1% rdg + 0.6 °C (1.0 °F))	± (0.1% rdg + 0.6 °C (1.0 °F))	± 0.3 °C (± 0.5 °F)	± 0.3 °C (± 0.5 °F)
Resolution	0.1/1 °F or °C	0.1/1 °F or °C	0.1/1 °F or °C	0.1/1 °F or °C
Ramp Function	No	No	No	Yes
Trend Indicators	No	Yes	No	No
Two Year Calibration Guarantee with Three Year Warranty	Yes	Yes	Yes	Yes
Made in USA	Yes	Yes	Yes	Yes

Probes	83115 Surface Probe	8716 Air / Gas Probe	8733 Compact General Purpose / Immersion Probe	87104 Penetration Probe
Probe Style	Surface	Air/Gas	General Purpose	Penetration
Thermocouple Type	K	K	K	K
Temperature Range	-18 °C to 482 °C (0 °F to 900 °F)	-18 °C to 482 °C (0 °F to 900 °F)	-18 °C to 482 °C (0 °F to 900 °F)	-18 °C to 482 °C (0 °F to 900 °F)
Accuracy	± 1.5%	± 1.5%	± 1.5%	± 1.5%
Sheath	8"	8"	3 ¾"	3 ¾"
Cord	3 ft coil	3 ft straight	1 ½ ft coil	1 ½ ft coil
Made in USA	Yes	Yes	Yes	Yes

TEGAM has been providing safety solutions for electrical systems services for three decades.



Megohmmeter

MODEL R1M-A

- Measures up to 200 GΩ in 6 Selectable Ranges
- Measurement Accuracy ± 5%
- 50, 100, 250, 500 V Test Voltage
- 3 1/2 Digit Display
- Rugged Weather Tight Case
- Versatile Test Probes
- NSN: 6625-01-344-9273

Description

The Model R1M-A is a portable Megohmmeter designed to measure high values of resistance associated with the measurement of insulation resistance. It has six resistance ranges from 1 MΩ full scale to 200 GΩ full scale. Four test voltages of 50, 100, 250, and 500 volts DC are provided (50 V maximum to be used with resistances less than 1 MΩ). Resistance readings are displayed on a 3 1/2 digit LCD.

The R1M-A is packaged in a rugged, weather tight case, designed to withstand the wear and tear of industrial and military applications, and has a gasket lid. An internal compartment is provided to store the line cord and a set test cables.



Hand Held Megohmmeter

MODEL R1M-B

- 1 to 200 MΩ
- 500 V Test Voltage
- Simple One Range Operation
- Measures AC RMS Voltage to 600 V
- LED on When Voltage is Present
- Rugged to Mil Specifications
- Single Push Button For Test
- 9 V Battery Operation
- NSN: 6625-01-353-7077

Description

The Model R1M-B Handheld Voltmeter/ Megohmmeter is designed to measure insulation resistance in "live" circuits, which may have voltage present. It can be connected to 600 V RMS AC or DC without damage, and its mode of operation is automatic. It has no fuse to replace. The R1M-B will operate after a drop from a height of four feet to a concrete floor. All units are tested in an environmental chamber at 71° C and 95.5% RH.

The R1M-B complies with MIL-PRF-28800, Type III, Class 3, Style E for rugged operational environments and shipboard applications. These units perform under the extremes of heat, cold, humidity, shock, vibration, and operator abuse.

Phase Sequence Indicator

MODELS T-470A / T-471A

- Instantly and clearly identify A/B/C circuits
- Protects user and equipment
- Fast and easy way to make three-phase connections
- Open phase lights both lamps
- T-470A: 115 TO 700 V, 400 Hz
- T-471A: 115 TO 700 V, 50/60 Hz



1000 V AC/DC Safety Voltmeter – Category III & IV

MODEL 110A

- 1000 Volts AC and DC
- Single switch, single range
- Eliminates arc-flash potential during line clearing
- Tested to 2,500 Volts
- 1MΩ of resistance in each test lead to limit current
- IEC 61010-1 Overvoltage Protection Category III to 1,000 V, Category IV to 600 V, CE, CSA and UL approved
- Auto Power Off
- 1 year warranty (Made in USA)



Fundamentals of Low Level Resistance Measurements

A Seminar Offered by TEGAM

Not all ohmmeters operate the same way, or are useful for all applications. Application requirements should always be considered when selecting an ohmmeter. The purpose of this seminar is to build a knowledge base of resistance measurement fundamentals through the discussion of various measurement techniques and demonstration of those techniques on various test subjects. Attendees will learn how to evaluate the specific test requirements for their specific applications and develop the best performance criteria for the instruments they use in those applications.

In this seminar attendees will learn:

- The difference between resolution, accuracy and precision.
- The difference between 2, 3 and 4-wire resistance measurement, how they impact accuracy, and how to eliminate test accuracy errors.
- What a thermal voltage offset is and how it affects the accuracy of a microohm measurement.
- How to define and compare "speed" and "accuracy" across various microohmmeters.
- How to make accurate resistance measurements in inductive environments.
- Risks when making resistance measurements in hazardous or explosive environments.
- Considerations when marking ground bond measurements on various surfaces and materials.

This informative seminar is offered on request. Please contact TEGAM if interested.

Our expert team is here to create a solution with you for your specific measurement.



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Certifications

*TEGAM, Inc. meets the requirements of ISO/IEC 17025:2005 "General Requirements for the Competence of Testing and Calibration Laboratories" through A2LA Certification Number 2018.01.

*The R1L-E2A Intrinsically Safe Bond Meter meets the latest international standards, including ATEX Ex ia IIA T4 Ga and C-UL-US Listed Class I, Div. 1, Group D in compliance with ANSI/UL 913-1988, Fifth Edition, 21 February, 1997.



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