



**Your
global
compliance
partner**

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Introduction to D.L.S.

Welcome to D.L.S. Electronic Systems, Inc., one of the largest independent, commercial EMC/EMI (Electromagnetic Compatibility/Interference), Environmental, Wireless and Product Safety compliance testing facilities in North America. Centrally located less than twenty minutes from O'Hare International Airport in suburban Chicago, IL for over 35 years, our engineering staff has been helping numerous manufacturers and marketers of electronic and electrical equipment meet global regulatory and industry compliance needs in a prompt and economical manner. From FCC to CE, to MIL-STD, to RTCA, to SAE, and FDA, we offer a unique global compliance package second to none.

We offer one of the most modern compliance testing laboratories in North America, fully accredited under the ANAB/ANSI National Accreditation Board Program to ISO 17025, by

the American National Standards Institute (ANSI). We have 16 EMC testing chambers, plus two fully enclosed and temperature controlled Open Area Test Sites, a state of the art environmental testing facility, and a full-time Product Safety testing laboratory, operating in three campus, at Wheeling, IL and Genoa City, WI. locations. We offer one of the largest staff of iNARTE engineers in our industry.

D.L.S. supports MIL-STD and Aviation/Avionics testing under MIL-STD-461, RTCA/ DO-160, MIL-STD- 810, MIL-STD-202, MIL-STD-704, MIL-STD-1399, MIL-STD-1275 and several other compliance categories including EMC/EMI, Lightning, Environmental, HIRF, and Power Quality. We maintain status as an iNARTE Certified Organization, as well as meeting ANAB/ANSI, ITAR, ILAC,



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and other certification programs. DER/DAR services are also available.

We specialize in global compliance, including the CE Mark for EMC, R&TTE/RED, Low Voltage, Machinery, Medical MDR and RoHS Directives, and we participate in the CB Scheme program. We offer multiple product safety compliance programs, including CE, CB, CCC, utilizing in-house testing, reducing time to market. Through our global partner lab reciprocity arrangements, we provide a global compliance program that is seamless. We are one of the few organizations that offer both EMC and Product Safety compliance testing within one organization on a global market access basis.

D.L.S. offers hands-on trouble shooting and design assistance as well. We regularly test products for compliance in a number of categories, such as laboratory and test equipment, medical devices, machinery, wireless devices, telecom equipment, commercial avionics and military equipment and devices, to name a few.

We have pioneered a detailed Early Design Evaluation program: a consultation with experienced EMC,

Product Safety, Wireless and Environmental engineers, providing a comprehensive design review of your product, prior to scheduled testing. The review can identify subtle flaws in design, ones that can cause costly engineering time if found during testing.

D.L.S. tests to the EMC Directive and to the Radio Equipment Directive (RED) for telecom and radio transceiver testing requirements for Europe. We also provide additional telecom and wireless testing services, including the CTIA requirements for wireless products and antennas.

We provide comprehensive test reports, designed and compiled by engineers for engineers, available in digital format. The easy-to-read reports provide a certification path that meets compliance requirements on a worldwide basis.

Experience counts when choosing a compliance partner. No other organization, world-wide, can provide the level of expertise in global compliance testing, coupled with the economics of multiple agency approvals, and value added engineering assistance, all at the same time. Make the D.L.S. advantage your advantage today. At D.L.S. we do it all for you.

Shielding Effectiveness

Shielding effectiveness testing is performed in our customized chamber that provides two rooms separated by a welded-in-place, heavy steel constructed common wall.



This inside common wall provides 120 dB attenuation from the first room to the second, up to 40 GHz. Full size transmit and receive antennas are

utilized to give the greatest amount of dynamic range during the testing. The room can easily accommodate panels up to 40 inches by 40 inches, and with special adaptor plates it can accommodate millimeter size samples. The entrance doors are sealed with dual knife edges for ease of entry and for maintaining the overall shielding effectiveness of the chamber.

Following is a partial list of Standards we test to:

- MIL DTL 83528
- IEEE 299

- MIL STD 285, 907B, 1377
- ASTM D 4935
- ECA EIA-364-66A TP 66A
- NSA 65-6, SCTE 48-1-2006

Testing includes but is not limited to:

- Gaskets
- Laminates
- Enclosures
- Conductive Plastics
- Vent Panels
- Cables
- Foils
- Composite Materials
- Conductive Coatings/ Paints
- Electro-Plated Plastics
- Conductive Treated Plastics
- Surface Mount Shields



Cybersecurity Evaluation and Testing Services

D.L.S. offers a comprehensive cybersecurity compliance evaluation and testing service for devices and equipment that have Bluetooth, Wi-Fi, or other wireless connectivity in them and require additional confirmation of secure communications and network protection and useability. This program includes a detailed analysis of the equipment, intended use, and associated risks related to wireless security.

These requirements are becoming more formalized in the various countries that utilize IoT devices, equipment, and technology. Current aspects are referenced below:

European Union

On August 1, 2025, the Radio Equipment Directive (RED) Cybersecurity Requirements for the European Union will go into effect for selling products placed into the market in Europe.

- EN 18031-1:2024: Part 1: Internet connected radio equipment
- EN 18031-2:2024: Part 2: Radio equipment processing data, namely Internet connected radio equipment, childcare radio equipment, toys, radio equipment and wearable radio equipment
- EN 18031-3:2024: Part 3: Internet connected radio equipment processing virtual money or monetary value
- ETSI EN 303 645: Cyber Security for Consumer Internet of Things

International

Other standards for industrial products and controls, machinery, medical devices and equipment, and other product categories are in development.

- IEC 62443 Industrial Automation and Control Equipment
- IEC 81001-5-1 Medical Devices
- IEC 62304 Medical Devices
- IEEE 1686 Intelligent Electronic Devices



United States

The FCC is currently creating the “U.S. Cyber Trust Mark” to eventually be implemented for IoT products sold in the U.S. This program is still in its infancy, but additional updates will be forthcoming.

Canada

Canada is currently creating the “CyberSecure Canada Mark” for products sold in Canada. There is no word at this time as to the contents and when it will take effect.



Problem Solving Engineering Staff

D.L.S. offers one of the largest iNARTE certified engineering staffs in the compliance industry, trained not only in performing tests, but also providing mitigation and troubleshooting, compliant to Navy Air Command requirements for iNARTE engineers. We perform this work in our state of the art testing facilities, accredited under the ANAB/ANSI National Accreditation Board program, by the American National Standards Institute (ANSI).

As part of our testing process, D.L.S. offers real time troubleshooting and design assistance during the testing process. No need to take your product back to rework it. We regularly test products for compliance in a number of categories, such as laboratory and test equipment, ITE multimedia equipment, construction equipment, medical devices, machinery, telecom equipment, wireless/radio, commercial avionics and

military avionics, to name a few. Since 1983, this testing experience has exposed our engineering staff to most EMC economically sensitive design solutions.



D.L.S. also provides a substantial inventory of EMC solutions, including capacitors, RF chokes, filters, surface mount shields, EMC gaskets, cable shielding, AC line filters, conductive paints, shielded

windows, and ferrite beads and sleeves. In the hands of an experienced engineer, your testing problems can be easily identified, fixed, and found compliant in the fastest possible time, streamlining your compliance testing.

When problems occur there's no better place to go than to D.L.S. where the engineering staff is experienced in solving design problems with both economy and manufactureability in mind.



Environmental Testing Services

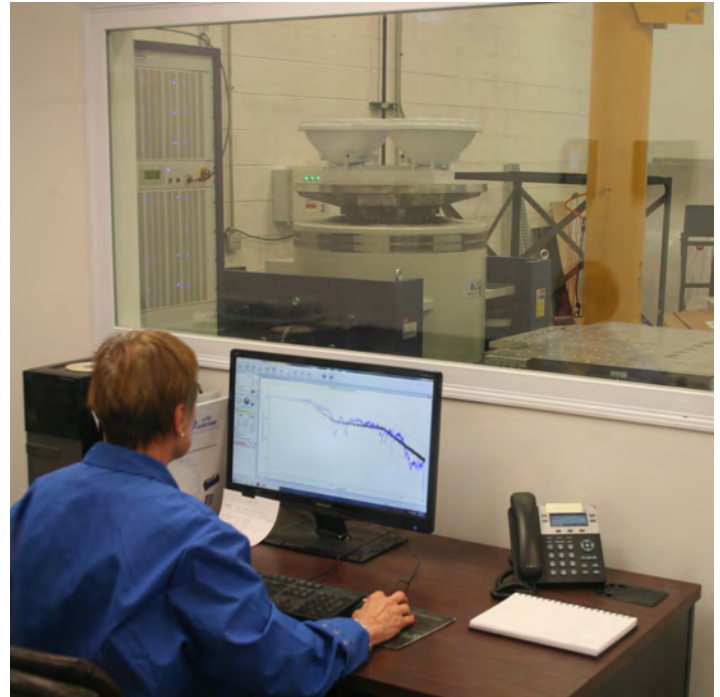
D.L.S. offers a series of comprehensive environmental and mechanical tests under the accredited ANSI/ANAB ISO 17025 program, an ILAC signatory. This globally accepted accreditation covers environmental and mechanical testing that include vibration and shock, temperature extremes, sand and dust, fluid and chemical resistance, altitude, humidity, salt spray, ingress protection, icing, flammability and other related testing services.

Standards that are included are RTCA/DO-160, MIL-STD-810, MIL-STD-202, and several ASTM, ANSI, IEC, ISO, ISTA, NEMA, UL, and SAE standards as well.

The recently expanded environmental testing facility is part of the Wheeling, IL corporate location, and located in the east campus. Equipped with state-of-the-art equipment, and with the 37 plus years of compliance testing experience, D.L.S. is a logical choice when attention to detail is required.

The D.L.S. group offers a comprehensive environmental testing service, including mechanical, climatic, weather, HASS, and other reliability tests, including:

- Mechanical Shock
- Temperature Extremes
- Chemical Exposure and Fluid Testing - Fungus



Salt Spray/Fog
IP Testing-Water Exposure Wind and Rain
Flammability
Sand and Dust
Humidity
Explosive Atmosphere
Solar Radiation
Package Handling
HASS/HALT



Avionics RTCA/DO-160 C-G Testing Services



RTCA/DO-160 C-G

- Section 4 - Temperature & Altitude
- Section 5 - Temperature Variation
- Section 6 - Humidity
- Section 7 - Mechanical Shock
- Section 8 - Vibration
- Section 9 - Explosive Atmosphere
- Section 10 - Waterproofness
- Section 11 - Fluid Susceptibility
- Section 12 - Sand and Dust
- Section 13 - Fungus Resistance
- Section 14 - Salt Spray
- Section 15 - Magnetic Effect
- Section 16 - Power Input
- Section 17 - Voltage Spike
- Section 18 - Audio Conducted Susceptibility
- Section 19 - Induced Signal Susceptibility
- Section 20.4 - Conducted Susceptibility
- Section 20.5 - Radiated Susceptibility - HIRF
- Section 21 - Radiated Emissions
- Section 22 - Lightning Induced Transients
- Section 23 - Direct Lightning Effects
- Section 24 - Icing
- Section 25 - ESD
- Section 26 - Fire and Flammability

D.L.S. offers compliance testing on Aviation and Avionics platform applications for EMI/EMC, Environmental, Power Quality, and other applicable services. The list of accredited standards includes RTCA/DO-160 for Electromagnetic Compatibility, Lightning, HIRF and Environmental requirements. RTCA/DO-160 defines a series of minimum test conditions (categories) and applicable test procedures for commercial airborne equipment.

D.L.S. has experience testing communications equipment, lighting, passenger entertainment, cockpit equipment and displays, aircraft control and safety equipment, electric power inputs, equipment racks, waste systems, galley equipment, seating systems, aviation related materials and sub components.

D.L.S. offers specially equipped larger testing chambers to support complex systems and equipment, and can provide support equipment such as shielded load rooms, self-contained ethylene glycol and cooling fluids, air conditioning to support unique temperature extremes, ability to control vehicle and related engine exhaust.

D.L.S. supports testing services with one of the largest iNARTE certified engineering staffs in the industry, experienced in all aspects of testing support, mitigation, and troubleshooting, as well as test plan and procedure preparation. D.L.S. supports STC and other replacement product requirements as well.



MIL-STD Testing Services



MIL-STD Testing Services

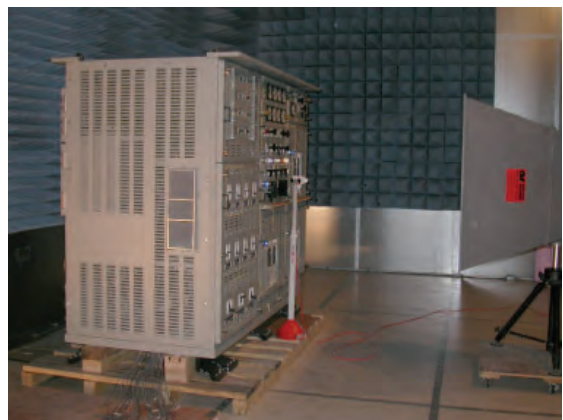
MIL-STD-461 – EMI/EMC
MIL-STD 464 – EMI/EMC – Systems
MIL-STD-810 – Environmental Testing
MIL-STD DTL 83528 – Shielding Effectiveness
MIL-STD-704 – Power Quality for Aircraft
MIL-STD-1275 – Power Quality for Vehicles
MIL-STD-1399 – Power Quality for Ships
MIL-STD-1399 Section 070 – Degaussing
MIL-STD-202 – Environmental Testing
Component Parts
MIL-DTL-16377 – Lighting
MIL-PRF-28800 – Test Equipment
DEF STAN 59-411 – EMI/EMC

D.L.S. offers one-stop testing capabilities on military applications for EMI/EMC, Environmental, Power Quality, and other applicable testing services. The list of accredited standards includes: MIL STD 461, MIL STD 810, MIL STD 202, MIL DTL 83528, MIL STD 704, MIL STD 1275, and MIL STD 1399, and others.

These standards are specific to electrical, electronic, electromechanical equipment, materials, and sub systems for aircraft, shipboard, above and below deck, submarines, communications equipment, vehicles and support equipment, electronic enclosures, electric power inputs, equipment racks, waste systems, galley equipment, and other armed services applications.

D.L.S. offers specially equipped larger testing chambers to support complex systems and equipment and can provide support equipment such as shielded load rooms, self-contained ethylene glycol and cooling fluids, air conditioning to support unique temperature extremes, ability to control vehicle and related engine exhaust.

D.L.S. supports testing services with one of the largest iNARTE certified engineering staffs in the industry, experienced in all aspects of testing support, mitigation, troubleshooting, as well as test plan and procedure preparation.



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Automotive Testing

D.L.S. supports EMC/Electrical and Environmental testing for automotive and related transportation industry applications, such as electrical and electronic controls and modules, entertainment systems, lighting, inherent safety, and other automotive equipment. This includes controls, components, modules and sub-assemblies for motorcycles, scooters, trucks, construction off-road, and agricultural equipment.



D.L.S. is accredited to ISO 17025 and provides OEM, SAE, CE-E-Mark, and other national agency compliance testing services. D.L.S. supports Wi-Fi, Bluetooth, ZigBee qualification and certification services, for both OEM and aftermarket devices.

The D.L.S. iNARTE certified engineering staff supports development work, pre-compliance, mitigation, troubleshooting and consulting services.

EMC/Electrical Tests

EMC Tests

- Bulk Current Injection (BCI)
- Conducted Emissions (CE)
- Conducted Transient Emissions (CTE)
- Conducted Transient Immunity (CTI)
- Electrostatic Discharge (ESD)
- Radiated Emissions (RE)
- Radiated Immunity (RI) - (ALSE/REVERB)

Environmental Tests

- Temperature Extremes- Hot-Cold
- Altitude Testing
- Blowing Rain
- Sand and Dust Exposure
- Thermal Testing
- Thermal/Humidity Cycling
- Thermal Shock
- Vibration/Shock
- Humidity – Condensing/Noncondensing
- Solar Exposure
- Salt Spray
- Gravelometer
- Fungus/Mildew
- Chemical/Fluids Resistance
- Chemical/Fluids Immersion
- Effect of Cleaners
- Cracking Resistance

General Standards

- SAE
- ISO
- IEC/EN
- ISO
- CISPR



Automotive Temperature Testing



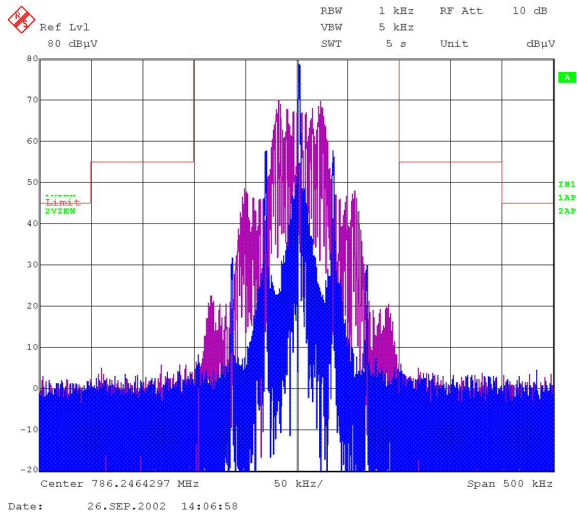
Wireless Device Testing and Certification

Since 1983, D.L.S. has been one of the foremost laboratories for testing wireless communication devices for the United States and Canadian markets. We have full capability to test at frequencies from 20 Hz to 40 GHz at our accredited & FCC/IC registered climate-controlled test sites. We perform all EMC radio testing required by the FCC, Industry Canada and the European Union for many types of radio transceivers. Our considerable experience is to your benefit, allowing quick, complete, and professional service from testing and test reports, all the way through the certification process. We can take care of the entire certification procedure for you in a very cost-effective and efficient manner, allowing you to get to market on time. We also provide consultation and certification for wireless regulatory requirements worldwide.



Some examples of these devices include:

- Bluetooth (Class 1, 2, 3)
- Bluetooth Smart (BLE)
- Zigbee (IEEE 802.15.4)
- ISA 100a (Industrial Automation)
- Wi-Fi (IEEE 802.11b,g,n)
- WLAN
- RFID
- ISM Band transmitters (i.e. Garage Door Openers, Remote Keyless Entry, Security, etc.)
- Z-Wave (ex. 902-928MHz Home Automation)
- Near-Field Communications (i.e. 13.56MHz Secure Payment Transactions, etc.)
- Wireless USB (Keyboards, Mice, Game Controllers, etc.)
- UNII (DLS cannot perform the DFS testing)
- Wireless Power Transfer (Wireless Charging Devices)
- GPS Receivers
- Radar Detectors (i.e. Aftermarket Automotive)



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Emission Testing - FCC, CE, Canada, and Others

Since 1983, D.L.S. has provided global EMC compliance testing, including but not limited to:

- FCC for the United States
- ISED Canada
- CE Mark for the European Union
- UKCA Mark for the UK
- VCCI for Japan
- ACMA for Australia
- BSMI for the Republic of China
- KCC for Korea
- SABS for South Africa

D.L.S. facilities include multiple 10-meter all-weather open area test sites (OATS) at our Genoa City, WI North Campus, fully staffed and equipped with state-of-the-art test equipment. This facility provides testing for large size devices and cabinet racks, with turntables up to 23 feet in diameter and with weight capacity of up to 16,000 pounds. It also supplies DC voltage, and 50/60 Hz single and three phase AC voltages up to 100 Amps.

The open area test sites complement the 16-chamber Main Campus facility in Wheeling, IL, which



includes multiple 3-meter semi-anechoic chambers. Both facilities are fully accredited under the ANAB/ANSI National Accreditation Board program to ISO 17025, by the American National Standards Institute (ANSI), with testing chambers registered with the Federal Communications Commission, Innovation Science and Economic Development (ISED) Canada, and VCCI Japan. D.L.S. provides technical support on testing projects through our engineering staff, with the largest number of iNARTE certified engineers in our industry.

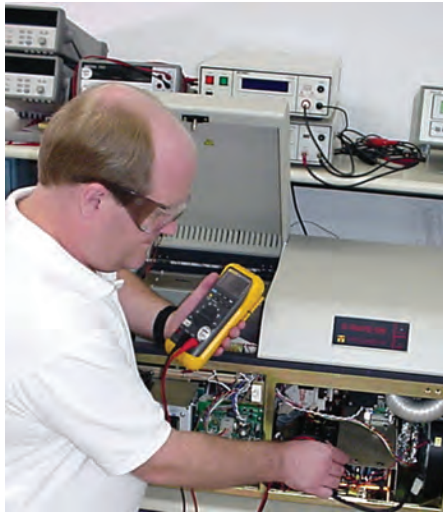
They offer problem solving, trouble shooting, and design support, all hands on, and in real time. Our knowledgeable staff, combined with years of testing experience, allows D.L.S. to provide you with a quick, economical path to compliance.

D.L.S. prepares and presents documents and test reports to meet administrative requirements, and can perform the certification application service to ensure timely recognition with the concerned agency. Only D.L.S. can offer the experience of thousands of successful projects, complete with certification filings, on a worldwide basis, allowing for a rapid product intro-



Product Safety Compliance Testing

D.L.S., through its Conformity Assessment group, provides global compliance to government directives and regulatory agency requirements. Our state-of-the-art testing facility located in suburban Chicago, IL, is equipped with the latest in testing evaluation equipment and is staffed with experienced Product Safety Engineers, located in the Wheeling, IL East Campus. We offer NRTL, EN, IEC, CCC, KC, CE, UKCA and other global compliance programs.



Staffed with experienced Safety Engineers, D.L.S. Conformity Assessment, Inc. is fully versed in the up-to-date international compliance standards. We have a series of global alliances with partner laboratories, providing multiple outlets for recognition with a primary focus on global market penetration.

D.L.S. works with NRTL test laboratories in several categories. All testing is performed at the in-house facilities within the D.L.S. laboratory campus. We can provide a unique combination of multiple compliance approvals all at one time, in one location, with a focus on speed to market combined with technical engineering support.

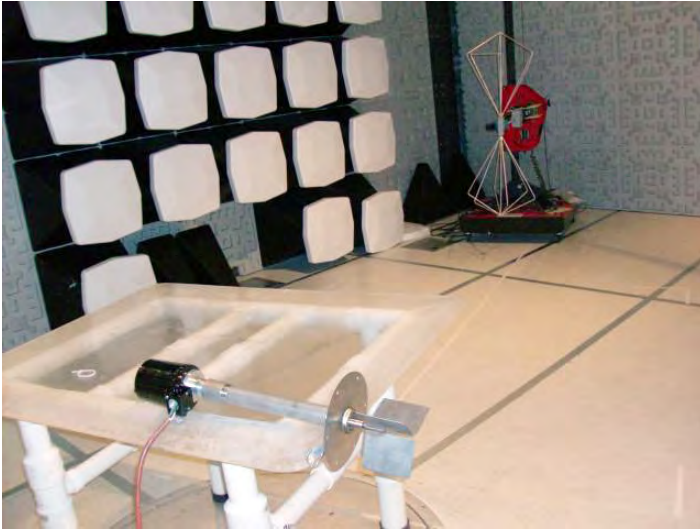
D.L.S. offers special streamlined programs for global compliance, including CE/UKCA Mark compliance testing. These programs facilitate specific markets such as Information Technology Equipment, Audio/Video/Multimedia, Medical Devices, Wireless Communications, Laboratory and Test Equipment, Household Appliances, Restaurant Equipment, and Industrial Controls and Machinery.

D.L.S. CA takes pride in creating unique test setups to meet all applicable safety compliance needs. Power is available for all domestic and international requirements up to and including 480 volts, 3-phase, 100 amps @ 60 Hertz and 400 volts, 3-phase, 100 amps @ 50 Hertz. DC power is available up to and including 100 volts, 28 amps, with additional power available.

The D.L.S. program provides the fastest, most value added safety compliance program in our industry. When combined with our EMC testing services, D.L.S. provides a true one-stop-shop for global compliance needs.



CE and UKCA Mark Compliance Testing



D.L.S. tests electrical and electronic devices to the EMC, Radio Equipment, Low Voltage, Machinery and Medical Equipment requirements for the EU and the UK regulations for CE and UKCA mark compliance. This includes products likely to cause interference or likely to be interfered with under EMC regulations, wireless products such as radio transmitters and receivers, including products that incorporate IoT devices. Also included are products that require electrical product safety evaluation and testing for Radio Equipment, Medical Device, Low Voltage, and Machinery legislation.

Note that as of January 1, 2025, UK compliance will require a separate formal compliance path and is easily

combined with EU and CE mark testing requirements.

Current EU & UK Legislation and Regulatory Requirements:

- CE Mark-Radio Equipment Directive 2014/53/EU
- UKCA Mark-Radio Equipment Regulations 2017

- CE Mark-Electromagnetic Compatibility Directive 2014/30/EU
- UKCA-Electromagnetic Compatibility Regulations 2016

- CE Mark-Low Voltage Directive 2014/35
- UKCA Mark-Electrical Equipment (Safety) Regulations 2016

- CE Mark-Machinery Regulation EU 2023/1230
- UKCA-Supply of Machinery (Safety) Regulations 2008

- CE Mark- Medical Device Regulations 2017/745
- UKCA- Medical Device Regulations 2002

- CE Mark-Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) - Directive 2002/95/EC
- UKCA Mark-The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Both the CE mark and UKCA mark require compliance to all applicable legislative regulations. Many product categories require multiple directives/regulations to be met. Updates to standards need to be considered as well, as withdrawn standards can't be used for compliance confirmation. Contact D.L.S. today to determine the best way to ensure up to date regulatory compliance.



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Medical Device and Equipment Compliance

D.L.S. offers a comprehensive program for compliance evaluation and testing for Medical Devices and Equipment for the US, Canada, EU, UK and other global compliance requirements.



The FDA announced that DLS Electronic Systems has been formally accredited for testing medical devices and related equipment under their ASCA Pilot program. This along with Health Canada, EU Medical Device Regulation 2017/745

for the CE Mark, and the new UK Medical legislation for UKCA Mark provides a combined streamlined process for compliance of medical devices and equipment.

Basic requirements for this compliance program are based on IEC/ANSI/EN/BSI standards for both electromagnetic compatibility and product safety, and wireless requirements if needed.

D.L.S. also supports many collateral or ancillary standards that are required for products or equipment of a specific type, specific intended use, or intended

locations of the intended use that may be required in addition to the basic regulatory requirements.

D.L.S. offers both Electromagnetic Compatibility and Electrical Product Safety testing in one of the largest independent laboratory testing facilities in North America with technical support provided by iNARTE certified engineers.

Common EMC Standards

IEC/EN/ANSI/UL/CAN/AAMI/BS 60601-1-2

General Requirements

AIM Standard - 7351731

Electromagnetic Immunity Test for RFID Readers

Common Product Safety Standards

IEC/EN/ANSI/UL/CAN/AAMI/BS 60601-1-1

General Requirements

IEC/EN/ANSI/UL/CAN/AAMI/BS 60601-1-11

Home Health Care

IEC/EN/ANSI/UL/CAN/AAMI/BS 60601-1-12

Emergency Medical Services Environment

IEC/EN/ANSI/UL/CAN/AAMI/BS 60601-2-10

Muscle and Nerve Stimulators

Find additional information at <https://www.dlsemc.com/medical-device-and-equipment-testing-and-consulting-services>.



Summary

Since 1983, D.L.S. has been providing the very best in global compliance testing services. Today we offer EMC/EMI, Wireless, Product Safety, and Environmental testing and consulting services, and are one of the largest test facilities in North America. With the large variety of testing offered, D.L.S. has great flexibility, which greatly reduces your compliance costs

and time to market. Our experienced engineering staff coupled with our education and consulting programs provide the ultimate level of services for EMC, Product Safety, Wireless, and Environmental compliance at one place and one time. Let our experienced staff provide you with the shortest path to compliance.



**At D.L.S. we prove time and again
that we are your global compliance partner.**



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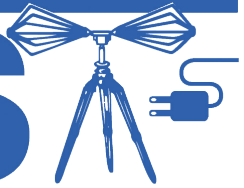
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DLS



Wireless/Radio/IoT and Cybersecurity Evaluation and Testing



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Introduction

D.L.S. Electronic Systems, Inc, is an ISO 17025 accredited Test Laboratory by ANSI under the ANSI National Accreditation Board (ANAB). Our test labs are formally registered with the FCC and ISED Canada, and provide testing to the Radio Equipment Directive (RED) for the European Union and other global requirements.

D.L.S. offers complete services for testing and approvals for wireless devices from start to finish. We will determine all of the applicable regulatory EMC requirements, perform the regulatory testing, ascertain and gather all required documentation and exhibits, complete all official forms and documentation, and obtain certifications necessary that enable you to market your wireless products.

Many products now come with IoT (Internet of Things) and other wireless technologies, and meeting regulatory compliance requirements for the host product and the wireless device has become much more complex. Integration of pre-approved wireless devices into host products often requires re-evaluation of the host product and wireless device. This includes new requirements for cybersecurity.

At D.L.S. we can help determine the process necessary to obtain compliance of the combined product. We are proficient in the testing and certification of products containing licensed and unlicensed transceivers subject to FCC, ISED, European Union Radio Equipment Directive (RED), ANSI C63.4, ANSI C63.10, and other standards.

Regulatory Testing Services

FCC Compliance

- [FCC Part 15.247 & 15.249](#) Bluetooth®, Zigbee®, Wi-Fi/WLAN, RFID
- [FCC Part 15.225](#) Operation within the band 13.110-14.010 MHz
- [FCC Part 15.231](#) Momentary operation of Remote Controls, Alarms, Security Systems
- [Radar Detectors](#)
- [IoT Enabled Devices](#)
- [GPS and Other Receivers](#) Tuned above 960MHz are exempt from FCC authorization. All receivers are still subject to the general operating requirements of 47 CFR 15.5.

ISED Canada Compliance

- [RSS-210, RSS-247, RSS/GEN, RSS-310](#) Bluetooth®, Zigbee®, Wi-Fi/WLAN, RFID, Remote Controls, Alarms, Security Systems
- [RSS-310](#) GPS Receivers
- [Radar Detectors](#)
- [GPS Receivers](#)
- [IoT Enabled Devices](#)



European Union Compliance

Radio Equipment Directive: RED 2014/53/EU

Examples: Bluetooth®, Zigbee®, Wi-Fi/WLAN, RFID, Remote Controls, Alarms, Security Systems, Wireless IoT Devices

- [EN 300 220 Series](#) Short Range Devices (SRD); Radio equipment to be used in the 25MHz to 1000MHz frequency range
- [EN 300 328](#) Wideband Transmission Systems; Data transmission equipment operating in the 2.4GHz ISM band
- [EN 300 330](#) SRD; Radio equipment - 9kHz to 25MHz frequency range and inductive loop systems in the 9kHz to 30MHz frequency range
- [EN 300 440](#) SRD; Radio equipment- 1GHz to 40GHz frequency range
- [EN 301 489-1](#) EMC for radio equipment and services; Part 1: Common technical requirements; covering article 3.1(b) of Directive 2014/53/EU and article 6 of Directive 2014/30/EU
- [EN 301 489-3](#) Specific conditions for SRD operating on frequencies between 9kHz and 40GHz
- [EN 301 489-17](#) Specific conditions for Broadband data transmission systems
- [EN 18031-X](#) Common security requirements for radio equipment
 - Part 1: Internet connected radio equipment;
 - Part 2: radio equipment processing data, namely Internet connected, childcare, toys, and wearable radio equipment;
 - Part 3: Internet connected radio equipment processing virtual money or monetary value
- [ETSI EN 303 645](#) Cyber Security for Consumer Internet of Things: Baseline Requirements
- [IEC 62443](#) Security of Industrial Automation and Control Systems

Our capabilities and expertise includes additional standards for wireless technologies and products.

Cybersecurity

D.L.S. provides cybersecurity evaluation and testing services for devices and equipment that have wireless connectivity such as Bluetooth, Wi-Fi, Zigbee, or other wireless protocols, using our six-point program.

1. **Applicability Check**
2. **Documentation Review**
3. **Functional Testing**
4. **Security Testing**
5. **Final Assessment**
6. **Formal Confirmation Report**

Cybersecurity requirements are becoming more formalized in the various countries that utilize IoT devices, equipment, and technology.

Common Requirements:

EU- Radio Equipment Directive

US-Cyber Trust Mark

Canada-CyberSecure Canada Mark

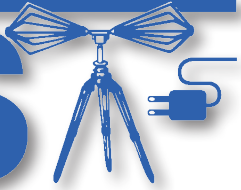


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Wireless • Environmental

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RTCA

SAE



Introduction

D.L.S. Conformity Assessment performs a series of comprehensive environmental and mechanical tests under the accredited ANSI/ANAB ISO 17025 program. This globally- accepted accreditation covers environmental and mechanical testing that includes vibration and shock, temperature extremes, sand and dust, fluid and chemical resistance, altitude, humidity, salt spray, ingress protection, icing, flammability and other related testing services.

Standards include: RTCA DO-160, MIL-STD 810 and 202, and several ASTM, ANSI, IEC, ISO, ISTA, NEMA, UL, and SAE standards as well.



Also:

- Temperature Extremes
- Vibration
- Altitude-Decompression
- Mechanical Shock
- Chemical and Fluid Testing-Fungus
- Salt Spray/Fog
- IP Testing-Water Exposure Wind & Rain
- Flammability
- Sand and Dust
- Humidity
- Explosive Atmosphere
- Solar Radiation
- Package Handling

MIL-STD 810

Currently, D.L.S. performs the entire environmental suite of tests up to the current revision level of H. These tests are often performed in addition to EMI related tests.

- Method 500 Low Pressure (Altitude)
- Method 501 High Temperature
- Method 502 Low Temperature
- Method 503 Temperature Shock
- Method 504 Fluid Contamination
- Method 505 Solar Radiation
- Method 506 Rain
- Method 507 Humidity
- Method 509 Salt Fog
- Method 510 Sand and Dust
- Method 511 Explosive Atmosphere
- Method 512 Immersion Testing
- Method 513 Acceleration
- Method 514 Vibration
- Method 515 Acoustic noise
- Method 516 Shock
- Method 517 Pyroshock
- Method 518 Acid Atmosphere
- Method 519 Gunfire Shock
- Method 520 Temperature, Humidity, Vibration, & Altitude
- Method 521 Icing/Freezing Rain
- Method 522 Ballistic Shock
- Method 523 Vibro-Acoustic/Temperature
- Method 524 Freeze / Thaw
- Method 525 Time Waveform Replication
- Method 526 Rail Impact
- Method 527 Multi-Exciter
- Method 528 Mechanical Vibrations of Shipboard Equipment



Cage Code
#OKP98

RTCA DO-160

Currently, D.L.S. performs the entire environmental suite of tests up to the current revision level of G. These tests are often performed in addition to EMI related tests.

- Section 4 Temperature and Altitude
- Section 5 Temperature Variation
- Section 6 Humidity
- Section 7 Mechanical Shock
- Section 8 Vibration
- Section 9 Explosive Atmosphere
- Section 10 Waterproofness
- Section 11 Fluid Susceptibility
- Section 12 Sand and Dust
- Section 13 Fungus
- Section 14 Salt Spray
- Section 26 Fire and Flammability



Additional standards

- SAE
- ASTM/ANSI
- IEC

Additional Services

D.L.S. offers a series of support related value-added services. These include program management, engineering development assistance, including product evaluations and test plan preparation from our experienced technical staff.

D.L.S. can offer a one stop shop for projects that involve EMC, Product and Electrical Safety, and Environmental testing under a single project, with a valued added engineering support staff, and experienced program coordinators.

Make D.L.S. your choice for global compliance for your environmental testing needs.



www.dlsemc.com

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EMC • Product Safety
Environmental Testing
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D.L.S. Electronic Systems, Inc.



*Military Standard
&
Commercial Avionics
Testing Services*



www.dlsemc.com

Overview

D.L.S. Electronic Systems, Inc. offers a complete RTCA DO-160, MIL-STD-461, MIL-STD-810, MIL-STD-704, MIL-STD-1275, MIL-STD-1399 and MIL-STD 464 testing package, including EMI/EMC testing, Power Quality, and Environmental requirements. D.L.S.'s main facilities are located in Wheeling, IL, a Chicago suburb conveniently located 30 minutes from O'Hare making it a few hours from just about everywhere. We offer one of the largest, independent testing laboratory under one roof, with 16 testing chambers and one of the largest staff of Certified iNARTE Engineers of any testing facility.



Our testing chambers include several that are 36'x 26'x 20' and are complete with auxiliary equipment for air and exhaust handling, temperature control, special chillers, and drive stands to meet a variety of testing requirements. No project is too large for our engineering staff.

D.L.S. has established strong relationships with government agencies that provide witness and verification of compliance. Through these relationships, D.L.S. has been able to facilitate most testing requirements, even under the most time sensitive schedules. This includes DCAS, DER, and FAA requirements. D.L.S. can provide and coordinate DAR/DER activities as well.

D.L.S. tests to industry standards including Boeing, Airbus, FAA, and SAE requirements. D.L.S. offers testing levels to 200 V/m, with new HIRF capabilities, up to 40 GHz, 3000 VPM.

D.L.S. truly provides the best value for your compliance testing dollars: unparalleled facility capacity, state-of-the-art equipment, and seasoned engineers that provide not only testing expertise, but design and mitigation experience as well. From the initial design review, through set-up, calibration, testing program, and final reports, D.L.S. offers a professional program, second to none.



RTCA Testing Services

RTCA DO-160 C-G

(EMI, Environmental, & HIRF)

- Section 4 - Temperature & Altitude
- Section 5 - Temperature Variation
- Section 6 - Humidity
- Section 7 - Mechanical Shock
- Section 8 - Vibration
- Section 9 - Explosive Atmosphere
- Section 10 - Waterproofness
- Section 11 - Fluid Susceptibility
- Section 12 - Sand and Dust
- Section 13 - Fungus Resistance
- Section 14 - Salt Spray
- Section 15 - Magnetic Effect
- Section 16 - Power Input
- Section 17 - Voltage Spike
- Section 18 - Audio Conducted Susceptibility
- Section 19 - Induced Signal Susceptibility
- Section 20.4 - Conducted Susceptibility
- Section 20.5 - Radiated Susceptibility
- Section 21 - Radiated Emissions
- Section 22 - Lightning Induced Transient Susceptibility
- Section 23 - Direct Lightning Effects
- Section 24 - Icing
- Section 25 - ESD
- Section 26 - Fire and Flammability



DER/DAR Services

iNARTE Engineers

Mitigation Services

EMI/EMC Seminars

Senior Level

Consultants on Staff

Military Testing Services

MIL STD 461 A-G - EMI

- | | |
|--|--|
| CE101 - Power Leads | RE101 - Magnetic Field |
| CE102 - Power Leads | RE102 - Electric Field |
| CE106 - Antenna Terminal | RE103 - Antenna Spurious
& Harmonic Outputs |
| CS101 - Power Leads | RS101 - Magnetic Field |
| CS103 - Intermodulation | RS103 - Electric Field |
| CS104 - Rejection Unwanted | RS105 - Transient EM Field |
| CS105 - Cross Modulation | |
| CS106 - Transients - Power Leads | |
| CS109 - Structure Current | |
| CS114 - Bulk Cable Injection | |
| CS115 - Bulk Cable Injection; Impulse Excitation | |
| CS116 - Damped Sinusoidal Transients | |
| CS117 - Lightning Induced Transients | |
| CS118 - Electrostatic Discharge | |

MIL STD 810 - ENVIRONMENTAL

- Method 500 - Low Pressure (Altitude)
- Method 501 - High Temperature
- Method 502 - Low Temperature
- Method 503 - Temperature Shock
- Method 504 - Fluid Contamination
- Method 505 - Solar Radiation
- Method 506 - Rain
- Method 507 - Humidity
- Method 509 - Salt Fog
- Method 510 - Sand and Dust
- Method 511 - Explosive Atmosphere
- Method 512 - Immersion Testing
- Method 513 - Acceleration
- Method 514 - Vibration Testing
- Method 515 - Acoustic Noise
- Method 516 - Shock
- Method 517 - Pyroshock
- Method 518 - Acid Atmosphere
- Method 519 - Gunfire Shock
- Method 520 - Temperature, Humidity, Vibration, & Altitude
- Method 521 - Icing/Freezing Rain
- Method 522 - Ballistic Shock
- Method 523 - Vibro-Acoustic/Temperature
- Method 524 - Freeze/Thaw
- Method 525 - Time Waveform Replication
- Method 526 - Rail Impact
- Method 527 - Multi-Exciter
- Method 528 - Mechanical Vibrations of Shipboard Equipment



Additional Services:

MIL-STD-704, 1275, 1399 Power Quality

MIL-STD-464

Materials Testing

Shielding Effectiveness

Radome Transitivity

HASS Testing

Wireless Transmitters

Test Plan and Procedure Preparation

Harness/Cable Testing

Consulting

Cage Code #OKP98



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Environmental • Wireless

Testing & Consulting

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