CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

DLS Electronic Systems, Inc.

1250 Peterson Drive
Wheeling, IL 60090
(and satellite locations as shown on the scope)

Fulfills the requirements of

ISO/IEC 17025:2017

and

U.S. Federal Communication Commission (FCC) EMC and Telecommunications (EC&T) Testing Designation Program

and

Recognition of Telecommunications Testing - Innovation, Science, and Economic Development (ISED) Canada

and

FDA Accreditation Scheme for Conformity Assessment (ASCA) Pilot Program -Basic Safety and Essential Performance of Medical Electrical Equipment, Medical Electrical Systems, and Laboratory Medical Equipment

In the field of

TESTING

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org

Jason Stine, Vice President

Expiry Date: 23 April 2026

Certificate Number: AT-1859

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

U.S. Federal Communication Commission (FCC) EMC and Telecommunications (EC&T) Testing Designation Program [1]

Recognition of Telecommunications Testing - Innovation, Science, and Economic Development (ISED) Canada [2]

FDA Accreditation Scheme for Conformity Assessment (ASCA) Pilot Program – Basic Safety and Essential Performance of Medical Electrical Equipment, Medical Electrical Systems, and Laboratory Medical Equipment [3]

DLS Electronic Systems, Inc.

1250 Peterson Drive
Wheeling, IL 60090
Mark Rozema 847 537 6400

TESTING

Valid to: **April 23, 2026** Certificate Number: **AT-1859**

Testing to meet the requirements of ANAB Supplemental Requirements SR 2437 - FDA Accreditation Scheme for Conformity Assessment (ASCA) Pilot Program - Basic Safety and Essential Performance of Medical Electrical Equipment, Medical Electrical Systems, and Laboratory Medical Equipment [3] **Peterson Drive**

Product Type	Specific Tests or Properties Measured	Specification, Standard Method, or Technique Used	Comments
Various Electronic Medical Products and/or systems associated with it.	Safety testing / analysis for electrical equipment for measurement, control, and laboratory use.	IEC 61010-1 Edition 3.1 2017-01 CONSOLIDATED VERSION	Complete Standard
Various Electronic Medical Products and/or systems associated with it.	Electromagnetic disturbances associated with medical equipment.	IEC 60601-1-2 Edition 4.1 2020-09 CONSOLIDATED VERSION	To the extent of the FDA ASCA partial recognition
Various Electronic Medical Products and/or systems associated with it.	Electromagnetic disturbances associated with medical equipment.	IEC 60601-1-2 Edition 4.0 2014-02	To the extent of the FDA ASCA partial recognition

Test Method	Test Specification(s)	Range	Comments
Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement	EN 55011(2016) + Al (2017) AS CISPR 11:2017 AS/NZS CISPR 11:2011 IEC/CISPR11 ed. 6 – 2015 EN 55011:2016/A11:2020 CISPR 11 Ed. 6.2:2019 CISPR 11 Ed 7.0: 2024 CSA CISPR 11:19	1 GHz	-
Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	IEC/CISPR 14-1:2016/A1:2016 EN 55014-1:2017/A11:2020 EN IEC 55014-1 2021 AS CISPR 14.1:2018 NMX-I-171-NYCE-2016 CISPR 14-1:2020	1 GHz	-
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity	IEC CISPR 14-2 3rd Edition, August 2020 EN 55014-2: 2015 EN IEC 55014-2: 2021	6 GHz	-
Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 55015 (2006) + Al (2007) BS EN 55015 (2006) + A2 (2009) EN 55015:2006/Al :2007/A2:2009 EN 55015 (2013) EN IEC 55015:2019/A11:2020 AS CISPR 15:2017 CISPR 15 Ed. 9.0 b:2018 KS C 9815:2023	1 GHz	-
EN 55022 (2010) Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement	EN 55022 (2010)	1 GHz	-
Electromagnetic compatibility of multimedia equipment. Emission requirements	IEC/CISPR 32:2015 IEC/CISPR 32 Ed. 2.1: 2019 EN 55032:2015/A11:2020 AS/NZS CISPR 32:2015 CAN/CSA-CISPR 32:17	6 GHz	-
Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part I: Emission	EN 55103-1(2009)	-	-

Test Method	Test Specification(s)	Range	Comments
Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase)	EN 61000-3-2 (2014) IEC 61000-3-2 Edition 5.1 (2018) + AMD 1:2020 IEC 61000-3-2:2019, SANS 61000-3-2:2009	-	-
Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase)	JIS C61000-3-2: 2019	-	-
Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase	IEC 61000-4-34:2005/AMD1:2009	-	-
Electromagnetic compatibility (EMC) Part 3.2: Limits - Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase)	AS/NZS 61000.3.2 (2013)	-	-
EMC - Part 3: Limits - Section 3. Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current up to 16 amps	AS/NZS 2279.3 (2012)	-	-
EMC - Part 3: Limits - Section 3: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection	IEC 61000-3-3 Ed. 2.0 (2008) SANS 61000-3-3:2009 IEC 61000-3-3 Ed. 3.0 (2013-05) IEC 61000-3-3 Ed 3.1 (2017) KS C 9610-6-3: 2023	-	-
EMC - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems -Equipment with rated current <=75A and subject to conditional connection	EN 61000-3-11, 1st Ed (2000-08) IEC 61000-3-11 ED. 2.0 (2017)	-	-
Electromagnetic Compatibility (EMC)-PART 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current greater than 16 A and less than or equal to 75 A	IEC 61000-3-12 (2014)	-	-

Test Method	Test Specification(s)	Range	Comments
Electromagnetic compatibility (EMC) - Part 6-3: Generic standard - Emission standard for residential, commercial and light industrial environments	EN 61000-6-3 (2007), A1(2011) IEC 61000-6-3 Ed. 3.0:2020	-	-
Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments	IEC 61000-6-4:2018 EN IEC 61000-6-4 2019	1 GHz	-
Electromagnetic compatibility (EMC) - Part 6-8: Generic standards - Emission standard for professional equipment in commercial and light-industrial locations	EN IEC 61000-6-8:2020	6 GHz	-
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part I: General requirements	IEC 61326-1 Ed. 2.0 (2012) EN 61326-1:2013, IEC 61326-1: 2020 EN/IEC 61326-1:2021, JIS C61326-1: 2022	6 GHz	-
Electrical equipment for measurement, control and laboratory use. EMC requirements. Requirements. In vitro diagnostic (IVD) medical equipment	EN 61326-2-6:2013 IEC 61326-2-6:2012	6 GHz	-
Electrical equipment for measurement, control and laboratory use. EMC requirements	IEC 61326-2-3 2020	6 GHz	-
Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods	EN 61800-3 (2004) EN IEC 61800-3:2018	6 GHz	-
Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only	ISO 7637-2 (2011)	-	-
Road vehicles - Electrical disturbances from conduction and coupling - Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines.	ISO 7637-3 (2016)	-	-
Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment	CNS 13438 (2006) CNS 15936:2016	6 GHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	IEC/CISPR 11 Ed 6 (2015) AS CISPR 11 (2017) EN 55011:2016/A11:2020 CISPR 11 Ed. 6.2:2019 CSA CISPR 11:19 CISPR 11:2010, SANS 211:2010 CNS 13803:2018	1 GHz	-
Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers	CISPR 12 (2007) + AMD1 (2009) CSA CISPR 11-19	1 GHz	-
Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers (Adopted IEC CISPR 12:2007 + Al:2009, edition 6.1, 2009-03, with Canadian deviations)	CAN/CSA CISPR 12-10 (R2014)	1 GHz	-
Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 1: General EMC requirements under typical electromagnetic environmental conditions (ISO 13766-1:2018)	EN ISO 13766-1:2018	-	-
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission	IEC/CISPR 14-1 (2016) + A I (2016), SANS 214-1:2020 IEC/CISPR 14-1 (2016) + CORI (2016), AS/NZS CISPR 14-1 (2010), AS/NZS CISPR 14.1 (2013)	1 GHz	-
Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment	CISPR 15 (Ed 8.0 2013) CISPR 15:2018, SANS 215:2019	1 GHz	-
Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement	IEC/CISPR 22, Edition 5 (2005) + Al (2005) + A2 (2006)	6 GHz	-
Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment	IEC/CISPR 22, Edition 5.2 (2006-03), IEC/CISPR 22 Ed. 6.0 (2008-09)	6 GHz	-
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	AS/NZS CISPR 22 (2009) +A1 (2010)	6 GHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of on-board receivers	CISPR 25:2021 EN 55025:2017	6 GHz	-
Electromagnetic compatibility of multimedia equipment - Emission requirements	AS/NZS CISPR 32 (2013), CAN/CSA-CISPR 32:17, CISPR 32:2015, SANS 2332:2017 CISPR 32(2015), CISPR 32, Ed. I (2012-01) KS C 9832: 2023	6 GHz	-
Electromagnetic Compatibility Specification For Electrical/Electronic Components and Subsystems	FMC1278 (Oct 7, 2016)	-	-
Industrial, Scientific and Medical (ISM) Radio Frequency Generators	ICES-001 Issue 5 (July 2020)	1 GHz	-
Vehicles, Boats and Other Devices Propelled by an Internal Combustion Engine, Electrical Means or Both; Includes updates one-labelling (Nov 2014) and diesel engine transition period (Feb 2017)	ICES-002 Issue 7, September 2020	1 GHz	-
Information Technology Equipment (ITE) - Limits and methods of measurement	ICES-003 Issue 7 (10-2020)	40 GHz	-
Lighting Equipment	ICES-005 Issue 5 (Dec 2018)	1 GHz	-
Measuring the Effectiveness of Electromagnetic Shielding Enclosures	IEEE Std 299 (2006) IEEE std 299 (2013)	-	-
Agreement of VCCI Council - Technical Requirements: VCCI-CISPR 32:2016 (including radiated disturbance above 1 GHz)	VCCI-CISPR 32 (Nov 2016)	6 GHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Road vehicles - Test methods for electrical disturbances from electrostatic discharge	ISO 10605 (2008) ISO 10605:2008(R2013)	-	-

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 2: Absorber-lined shielded enclosure	ISO 11452-2 (2004) ISO 1452-2 (2019)	-	-
Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 4: Harness excitation methods	ISO 11452-4 (2011)	-	Current
Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 9: Portable Transmitters	ISO 11452-9 (2012)	-	-
Road vehicles - Environmental conditions and testing for electrical and electronic equipment	ISO 16750 (2018)	-	-
Uninterruptible power systems (UPS) - Part 2: EMC Requirements	EN IEC 62040-2 (2018) AS IEC 62040.2 (2019)	-	-
Alarm systems· Part 4 Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems	EN 50130-4:2011 AMD1:2014	-	-
Electromagnetic compatibility of multimedia equipment - Immunity requirements	EN 55035:2017/AC:2019-11	-	-
Electromagnetic compatibility of multimedia equipment - Immunity requirements	CISPR 35 1 ED 2016	-	-
Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use Part 2: Immunity	EN 55103-2:2009/IS1:2012	-	-
Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	IEC 61000-4-2, Ed. 2.0 (2008-12) SANS 61000-4-2:2009	-	-

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Conformity Assessment Procedure for EMS (Electrostatic Discharge Immunity Test)	KS C 9610-4-2:2017	-	-
Electromagnetic compatibility (EMC) - Part 4-3: Testing measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3 Ed. 3.2 (2010) IEC 61000-4-3 Ed. 4.0 (2020) KS C 9610-4-3:2017 EN 61000-4-3:2-006+A2 2010 AS/NZS IEC 61000.4.3:2013 SANS 61000-4-3:2008	-	-
Electromagnetic Compatibility (EMC) — Part 6-3: General Standards — For use in residential, commercial and light industrial environments	KS C 9610-6-3:2017	-	-
Electromagnetic Compatibility (EMC) — Part 6-4: General Standards — Electromagnetic Emission Standards in Industrial Environments	KS C 9610-6-4:2022	-	-
Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test	IEC 61000-4-4 (2012-04) IEC 61000-4-4:2011, SANS 61000-4-4:2011	-	-
Conformity Assessment Procedure for EMS (Electrical Fast Transient/Burst test)	KS C 9610-4-4:2020	-	-
Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5:2005, IEC 61000-4-5(1995), Al (2001), EN 61000-4-5 (1995), A1(2001) SANS 61000-4-5:2006	-	-
Conformity Assessment Procedure for EMS (Surge Immunity Test)	KS C 9610-4-5:2020	-	-
Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6 Ed. 4.0 (2013) SANS 61000-4-6:2017	-	-
Conformity Assessment Procedure for EMS (Conducted disturbances, induced by radio-frequency fields test)	KS C 9610-4-6:2020	-	-

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	IEC 61000-4-8:2.0 (2009) SANS 61000-4-8:2009	-	-
Conformity Assessment Procedure for EMS (Power Frequency Magnetic Field Immunity Test)	KS C 9610-4-8:2017	-	-
Electromagnetic compatibility (EMC). Testing and measurement techniques. Pulse magnetic field immunity test. Basic EMC publication	EN 61000-4-9 (1994), IEC 61000-4-9 (1993)	-	-
EMC - Part 4-9: Testing and Measurement Techniques - Pulse Magnetic Field Immunity Test	IEC 61000-4-9, Ed 1.1 (2001-03) SANS 61000-4-9:2003 IEC 61000-4-9:2.0 (2016)	-	-
EMC - Part 4-10: Testing and measurement techniques - Damped oscillatory magnetic field immunity test	IEC 61000-4-10, Ed 1.1 (2001-03) SANS 61000-4-10:2003 IEC 61000-4-10, Ed 2.0 (2016)	-	-
Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests	IEC 61000-4-11:2020 IEC 61000-4-11:2.0 (2004) SANS 61000-4-11:2005 IEC 61000-4-11:2.1 (2017) IEC 61000-4-11, Ed.1.1 (2001-03), EN 61000-4-11, IEC 61000-4-11(1994), A I (2001) & EN 61000-4-11(1994), Al (2001), IEC 61000-4-11(1994), A1(2000) & EN 610004-11(1994), A1(2001), EN 61000-4-11 (1994), Al (2001), EN 6. 1000-4-11 (2004), KS C 9610-4-11:2020	-	-
EMC - Part 4-12: Testing and measurement techniques - Ring wave immunity test	IEC 61000-4-12:2.0 (2006-09) IEC 61000-4-12:3.0 (2017)	-	-

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Electromagnetic Compatibility (EMC) - - Part 4-13: Testing And Measurement Techniques - Harmonics And Interharmonics Including Mains Signalling At A.C. Power Port, Low Frequency Immunity Tests	IEC 61000-4-13:2009 SANS 61000-4-13:2009	-	-
Electromagnetic Compatibility (EMC) - Part 4-14: Testing And Measurement Techniques - Voltage Fluctuation Immunity Test	IEC 61000-4-14:2009 SANS 61000-4-14:2009	-	-
EMC - Part 4-16: Testing and Measurement Techniques - Test for Immunity to Conducted, Common Mode Disturbances in the Frequency Range Up to150 kHz	IEC 61000-4-16, Edition 1.1 (2002-07) IEC 61000-4-16:1.2 (2011) SANS 61000-4-16:2011 IEC 61000-4-16:2.0 (2015)	-	-
Electromagnetic compatibility (EMC) - Part 4-21: Testing and measurement techniques - Reverberation chamber test methods	IEC 61000-4-21:2.0 (2011)	-	-
Electromagnetic Compatibility (EMC) - Part 4-28: Testing And Measurement Techniques - Variation Of Power Frequency, Immunity Test	IEC 61000-4-28:2009 SANS 61000-4-28:2009	-	-
Electromagnetic Compatibility (EMC) - Part 4-29: Testing And Measurement Techniques - Voltage Dips, Short Interruptions And Voltage Variations On D.C. Input Power Port Immunity Tests	IEC 61000-4-29:2000 SANS 61000-4-29:2005	-	-
Electromagnetic compatibility (EMC) Part 4-39: Testing and measurement techniques – Radiated fields in close proximity – Immunity Test	IEC 61000-4-39 (2017-03)	Discrete test frequencies: 30 kHz, 134.2 kHz and 13.56 MHz.	Limited to radiated fields in close proximity – Immunity Test, specific to IEC 60601-1-2:2020 clause 8.11 (table 11, test frequencies: 30 kHz, 134.2 kHz and 13.56 MHz). Using test methods specified in: IEC 61000-4-39.

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Electromagnetic compatibility (EMC) - Part 6 - 1: Generic standards - Immunity for residential, commercial and light-industrial environments	IEC 61000-6-1:3.0 (2016) EN IEC 61000-6-1:2019 EN 61000-6-1 (2007)	-	-
Test Method for Electromagnetic Susceptibility (RRA Announce 2012-22, June 28, 2012) only	KS C 9610-6-1:2019 KS C 9610-6-2:2019	-	-
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments	IEC 61000-6-2:3.0 (2016) EN IEC 61000-6-2:2019 EN 61000-6-2 (2005)	-	-
Medical Electrical Equipment & System Electromagnetic Immunity Test for RFID Readers	AIM 7351731 (2017)	-	-
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2. Immunity - Product family standard	AS/NZS CISPR 14.2 (2015)	-	-
Electromagnetic Compatibility Of Multimedia Equipment - Immunity Requirements	CISPR 24:2010 SANS 224:2010	-	-
Electromagnetic Compatibility Of Multimedia Equipment - Immunity Requirements	CISPR 35:2016 SANS 2335:2018	-	-
Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus	IEEE Std C37.90. 1 (2002) IEEE C37.90.1:2012	-	-
Electromagnetic compatibility measurement procedures and limits for vehicle components (except aircraft) - Conducted immunity, 30 Hz to 250 kHz - all leads	SAE J1113-2 (01-01-2010)	-	-
Direct Injection of Radio Frequency Power	SAE J1113-3 (2006-09)	-	-
Immunity to Radiated Electromagnetic Fields - Bulk Current Injection (BCI) Method	SAE J1113-4 (2004-08)	-	-
Immunity to Conducted Transients on Power Leads	SAE J1113-11 (2006-01)	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Electrical Interference by Conduction and Coupling	SAE J1113-12 (2006-08)	-	-
Electromagnetic Compatibility Measurement Procedure for Vehicle Components – Part 13 - Immunity to Electrostatic Discharge	SAE J1113-13 (2004-11)	-	-
Immunity to Electromagnetic Fields, Absorber Lined Chamber	SAE J1113-21 (2005-10)	-	-
Immunity Radiated Magnetic Fields	SAE J1113-22 (2003-11)	-	-
Immunity to AC Power Line Electric Fields	SAE J1113-26 (July 2001)	-	-
Limits and methods of measurement of radio disturbance characteristics of components and modules for the protection of receivers used on board vehicles	SAE J1113-41 (2000-05)	-	-
Radio Disturbance Characteristics for the Protection of Receivers Used on Board Vehicles	SAE J1113-41 (2006-09)	-	-
Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Immunity	KS C 9814-2:2020, KS C 9814-2:2022	-	-
Testing method of electromagnetic wave endurance of multimedia device	KS C 9835:2019	6 GHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
RTCA/DO-160 Aviation Testing			
Environmental Conditions and Test Procedures for Airborne Equipment- Section 15: Magnetic Effects	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment - Section 16: Power Input	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-

Test Method	Test Specification(s)	Range	Comments
RTCA/DO-160 Aviation Testing			
Environmental Conditions and Test Procedures for Airborne Equipment - Section 17: Voltage Spike	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment- Section 18: Audio Frequency Conducted Susceptibility - Power Inputs	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment- Section 19: Induced Signal Susceptibility	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment - Section 20: Radio Frequency Susceptibility (Radiated and Conducted)	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment - Section 20.4: RF Susceptibility, Conducted	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment- Section 20.5: RF Susceptibility, Radiated	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment - Section 20.6: RF Susceptibility (Mode-Stirred)	RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment RF Emissions, Conducted (Section 21)	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment RF Emissions, Radiated (Section 21)	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Environmental Conditions and Test Procedures for Airborne Equipment - Section 22: Lightning Induced Transient Susceptibility	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
RTCA/DO-160 Aviation Testing			
Environmental Conditions and Test Procedures for Airborne Equipment-Section 25: Electrostatic Discharge (ESD)	RTCA/DO-160D RTCA/DO-160E RTCA/DO-160F RTCA/DO-160G	-	-
Aircraft Lightning Test Methods	SAE ARP 5416 (2005-03)	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Product Safety			
Medical electrical equipment-Part 1-2: General requirements for basic safety and essential performance-Collateral Standard: Electromagnetic disturbances - Requirements and tests	IEC 6060l-1-2, Ed. 4 (2014-02) EN 60601-1-2 (2015)	6 GHz	-
Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests	IEC 60601-1-2, Ed. 3.0 (2007), RRL Notice No. 2008-4 (May 20, 2008)	6 GHz	-
Medical electrical equipment Part 2-24: Requirements for the safety of infusion pumps and controllers	EN 60601-2-24 (1994)	-	-
ERM; Electro-Magnetic Compatibility (EMC); Standard for Radio Equipment and Services; Part 1: Common Technical Requirements Harmonized Standard for Electromagnetic Compatibility	ETSI EN 301 489-1 V2.2.3 (2019-11)	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
RF Exposure			
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	EN 62233 (2008) IEC 62233 (2005)	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
RF Exposure			
Assessment of lighting equipment related to human exposure to electromagnetic fields	IEC 62493:2015 BS EN 62493:2015	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
MIL-STD			
Characteristics of 28 Volt DC Electrical Systems in Military Vehicles (Sections 5.3.2.2, 5.3.2.3, 5.3.2.4, 5.3.2.5)	MIL-STD-1275D MIL-STD-1275E	-	-
Interface standard for Shipboard Systems: Electric Power, Alternating Current	MIL-STD 1399 Section 300A MIL-STD 1399 Section 300B	-	-
Aircraft Electrical Power Characteristics	MIL-STD-704, Revision D (Sep 30, 1980), MIL-STD-704 Revision E (May 1, 1991) MIL-STD-704, Revision F (Mar 12, 2004)	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
MIL-STD Conducted Emissions			
Conducted Emissions, Power Leads	MIL-STD-462D, CE101 MIL-STD-461E, CE101 MIL-STD-461F, CE101 MIL-STD-461G, CE101	30 Hz to 10 kHz	-
Conducted Emissions, Power Leads	MIL-STD-462D, CE102 MIL-STD-461E, CE102 MIL-STD-461E, CE102 MIL-STD-461G, CE102	10 kHz to 10 MHz	-
Conducted Emissions, Antenna Terminal	MIL-STD-461E, CE106 MIL-STD-461F, CE106 MIL-STD-461G, CE106	10 kHz to 40 GHz	-
Conducted Emissions, Power and Interconnecting Leads, Low Frequency	MIL-STD-462, CE01	Up to 15 kHz	-
Conducted Emission, Control and Signal Leads	MIL-STD-462, CE02	30 Hz to 20 kHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
Conducted Emissions, Power and Interconnecting Leads	MIL-STD-462, CE03	0.015 to 50 MHz	-
Conducted Emissions, Control and Signal Leads	MIL-STD-462, CE04	30 Hz to 20 kHz	-
Conducted Emissions, Antenna Terminals	MIL-STD-462, CE06	10 kHz to 26 GHz	-
Conducted Emissions, Power Leads, Spikes, Time Domain	MIL-STD-462, CE07	-	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
MIL-STD Conducted Susceptibility			
Conducted Susceptibility, Power Leads	MIL-STD-461E CS101 MIL-STD-461F, CS101 MIL-STD-461G, CS101	30 Hz to 150 kHz	-
Conducted Susceptibility, Antenna Port, Intermodulation	MIL-STD-461E, CS103 MIL-STD-461F, CS103 MIL-STD-461G, CS103	15 kHz to 10 GHz	-
Conducted Susceptibility, Antenna Port, Rejection of Undesired Signals,	MIL-STD-461E, CS104 MIL-STD-461F, CS104 MIL-STD-461G, CS104	30 Hz to 20 GHz	-
Conducted Susceptibility, Antenna Port, Cross-Modulation	MIL-STD-461E, CS105 MIL-STD-461F, CS105 MIL-STD-461G, CS105	30 Hz to 20 GHz	-
Conducted Susceptibility, Transients, Power Leads	MIL-STD-46IF, CS106	-	-
Conducted Susceptibility, Structure Current	MIL-STD-461E, CS109 MIL-STD-461F, CS109 MIL-STD-461G, CS109	60 Hz to 100 kHz	-
Conducted Susceptibility, Bulk Cable Injection	MIL-STD-461E, CS114 MIL-STD-461F, CS114 MIL-STD-461G, CS114	10 kHz to 200 MHz	-
Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation	MIL-STD-461E, CS115 MIL-STD-461F, CS115 MIL-STD-461G, CS115	-	-
Conducted Susceptibility, Damped Sinusoidal Transients, Cables and Power Leads	MIL-STD-461E, CS116 MIL-STD-461F, CS116 MIL-STD-461G, CS116	10 kHz to 100 MHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
MIL-STD Conducted Susceptibility			
Conducted Susceptibility, Lightning Induced Transients, Cables and Power Leads	MIL-STD-461G, CS117	-	-
Personnel Borne Electrostatic Discharge (ESD)	MIL-STD-461G, CS118	-	-
Conducted Susceptibility, Power Leads	MIL-STD-462D, CS101	30 Hz to 50 kHz	-
Conducted Susceptibility, Power Leads	MIL-STD-462, CS01	30 Hz to 50 kHz	-
Conducted Susceptibility, Power Leads	MIL-STD-462, CS02	0.05 to 400 MHz	-
Conducted Susceptibility, Spikes, Power Leads	MIL-STD-462, CS06	-	-
Conducted Susceptibility, Squelch Circuits	MIL-STD-462, CS07	-	-
Conducted Susceptibility, Structure (Common Mode) Current,	MIL-STD-462, CS09	60 Hz to 100 kHz	-
Conducted Susceptibility, Antenna Port, Intermodulation	MIL-STD-462D, CS103	15 kHz to 10 GHz	-

Electromagnetic Compatibility **Peterson Drive**

Test Method	Test Specification(s)	Range	Comments
MIL-STD Radiated Emissions			
Radiated Emissions, Magnetic Field	MIL-STD-462D, RE101 MIL-STD-461E, RE101 MIL-STD-461F, RE101 MIL-STD-461G, RE101	30 Hz to 100 kHz	-
Radiated Emissions, Electric Field	MIL-STD-462D, RE102 MIL-STD-461E, RE102 MIL-STD-461F, RE102 MIL-STD-461G, RE102	10 kHz to 18 GHz	-
Radiated Emissions, Antenna Spurious and Harmonic Outputs	MIL-STD-462D, RE103 MIL-STD-461E, RE103 MIL-STD-461F, RE103 MIL-STD-461G, RE103	10 kHz to 40 GHz	-

Test Method	Test Specification(s)	Range	Comments
MIL-STD Radiated Emissions			
Radiated Susceptibility, Magnetic Field	MIL-STD-461E, RS101 MIL-STD-461F, RS101 MIL-STD-461G, RS101	30 Hz to 100 kHz	-
Radiated Susceptibility, Electric Field	MIL-STD-461E, RS103 MIL-STD-461F, RS103 MIL-STD-461G, RS103	2 MHz to 40 GHz	-
Radiated Susceptibility, Transient Electromagnetic Field	MIL-STD-461E, RS105 MIL-STD-461F, RS105 MIL-STD-461G, RS105	-	

Services performed at satellite laboratory

DLS Electronic Systems, Inc.
166 South Carter Street
Genoa City, WI 53128
Cory Bradshaw 262 279 0210
www.dlsemc.com

TESTING

Testing performed in support of FCC approval procedures for certification [1] **Genoa City, WI**

Type of Device Examples	Scope of Accreditation	Supporting FCC Guidance	Comments/Maximum Frequency Tested
Unintentional Radiators (FCC Part 15, Subpart B)	ANSI C63.4-2014	-	Up to 44 GHz
Industrial, Scientific, and Medical Equipment (FCC Part 18) Consumer ISM equipment	FCC MP-5, (February 1986)	-	Up to 44 GHz
Intentional Radiators (FCC Part 15, Subpart C)	ANSI C63.10-2013	558074 D01 DTS Meas Guidance	Up to 44 GHz
U-NII without DFS Intentional Radiators (FCC Part 15, Subpart E) Unlicensed National Information Infrastructure Devices (U-NII without DFS)	ANSI C63.10-2013	KDB Publication 789033	Up to 44 GHz

Testing to Meet the Requirements for Recognition of Telecommunications Testing – Innovation, Science, and Economic Development (ISED) Canada [2] **Genoa City, WI**

Test Method (Standard)	Issue, Date, Amendment	Test Specification(s)	Comments
RSS-GEN	Issue 5, April 2018 Amendment 1, March 2019 Amendment 2, February 2021	General Requirements for Compliance of Radio Apparatus	-
RSS-102	Issue 6, December 2023	Radio Frequency (RF) Exposure compliance of Radiocommunications Apparatus (All Frequency Bands)	-
RSS-102.NS.MEAS	Issue 1, December 2023	Measurement Procedure for Assessing Nerve Stimulation (NS) Compliance in Accordance with RSS-102	-
RSS-210	Issue #10 December 2019, Amendment April 2020	License-Exempt Radio Apparatus: Category I Equipment	-

Testing to Meet the Requirements for Recognition of Telecommunications Testing – Innovation, Science, and Economic Development (ISED) Canada [2] **Genoa City, WI**

Test Method (Standard)	Issue, Date, Amendment	Test Specification(s)	Comments
RSS-247	Issue #3 August 2023	Digital Transmission Systems (DTS), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Networks (LE-LAN) Devices	Without DFS
RSS-248	Issue 2 Dec 2022	Radio Local Area Network (RLAN) Devices Operating in the (5 925 to 7 125) MHz Band	Per ISED notice 2021-DRS0011
RSS-310	Issue #5, January 2020	License-Exempt Radio Apparatus: Category II Equipment	-

Electromagnetic Compatibility **Genoa City, WI**

Test Method	Test Specification(s)	Range	Comments
Industrial, scientific and medical equipment. Radio-frequency disturbance characteristics. Limits and methods of measurement	EN 55011(2016) + Al (2017) AS CISPR 11:2017 AS/NZS CISPR 11:2011 IEC/CISPR11 ed. 6 – 2015 EN 55011:2016/A11:2020 CISPR 11 Ed. 6.2:2019 CISPR 11 Ed. 7.0:2024 CSA CISPR 11:19	6 GHz	-
Electromagnetic Compatibility - Requirements for household appliances, electric tools, and similar apparatus - Part 1: Emission	IEC/CISPR 14-1:2016/A1:2016 EN 55014-1:2017/A11:2020 EN IEC 55014-1 2021 AS CISPR 14.1:2018 NMX-I-171-NYCE-2016 SANS 214-1:2020 AS/NZS CISPR 14-1 (2010) AS/NZS CISPR 14.1 (2013) CISPR 14-1:2020	1 GHz	-
Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	EN 55015 (2006) + Al (2007) BS EN 55015 (2006) + A2 (2009) EN 55015:2006/Al :2007/A2:2009 EN 55015 (2013) EN IEC 55015:2019/A11:2020 AS CISPR 15:2017 CISPR 15 Ed. 9.0 b:2018 CISPR 15 (Ed 8.0 2013) CISPR 15:2018, SANS 215:2019 KS C 9815:2023	1 GHz	-

Test Method	Test Specification(s)	Range	Comments
Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment	EN 55022 (2010) IEC/CISPR 22, Edition 5 (2005) + Al (2005) + A2 (2006) IEC/CISPR 22, Edition 5.2 (2006-03), IEC/CISPR 22 Ed. 6.0 (2008-09) AS/NZS CISPR 22 (2009) +A1 (2010)	1 GHz	-
Electromagnetic compatibility of multimedia equipment. Emission requirements	IEC/CISPR 32:2015 IEC/CISPR 32 Ed. 2.1: 2019 EN 55032:2015/A11:2020 AS/NZS CISPR 32:2015 CAN/CSA-CISPR 32:17 AS/NZS CISPR 32 (2013) CISPR 32:2015 SANS 2332:2017 CISPR 32, Ed. I (2012-01) KS C 9832: 2023	6 GHz	-
Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part I: Emission	EN 55103-1(2009)	-	-
Electromagnetic compatibility (EMC) - Part 6-3: Generic standard - Emission standard for residential, commercial and light industrial environments	EN 61000-6-3 (2007), A1(2011) IEC 61000-6-3 Ed. 3.0:2020	1GHz	-
Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments	IEC 61000-6-4:2018 EN IEC 61000-6-4 2019	1 GHz	-
Electromagnetic compatibility (EMC) - Part 6-8: Generic standards - Emission standard for professional equipment in commercial and light-industrial locations	EN IEC 61000-6-8:2020	6 GHz	-
Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part I: General requirements	IEC 61326-1 Ed. 2.0 (2012) EN 61326-1:2013, IEC 61326-1: 2020 EN/IEC 61326-1:2021, JIS C61326-1: 2022	6 GHz	-
Electrical equipment for measurement, control and laboratory use. EMC requirements. Requirements. In vitro diagnostic (IVD) medical equipment	EN 61326-2-6:2013 IEC 61326-2-6:2012	6 GHz	-

Test Method	Test Specification(s)	Range	Comments
Electrical equipment for measurement, control, and laboratory use. EMC requirements	IEC 61326-2-3 2020	6 GHz	-
Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods	EN 61800-3 (2004) EN IEC 61800-3:2018	6 GHz	-
Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only	ISO 7637-2 (2004) ISO 7637-2 (2011)	-	-
Road vehicles - Electrical disturbances from conduction and coupling - Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines.	ISO 7637-3 (2016)	-	-
Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment	CNS 13438 (2006) CNS 15936:2016	6 GHz	-
Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of off-board receivers	CISPR 12 (2007) + AMD1 (2009) CAN/CSA CISPR 12-10 (R2014)	1 GHz	-
Earth-moving and building construction machinery — Electromagnetic compatibility (EMC) of machines with internal electrical power supply — Part 1: General EMC requirements under typical electromagnetic environmental conditions (ISO 13766-1:2018)	EN ISO 13766-1:2018	-	-
Vehicles, boats and internal combustion engines - Radio disturbance characteristics - Limits and methods of measurement for the protection of on-board receivers	CISPR 25:2021 EN 55025:2017	6 GHz	-
Electromagnetic Compatibility Specification For Electrical/Electronic Components and Subsystems	FMC1278 (Oct 7, 2016)	-	-
Industrial, Scientific and Medical (ISM) Radio Frequency Generators	ICES-001 Issue 5 (July 2020)	1 GHz	-

Electromagnetic Compatibility **Genoa City, WI**

Test Method	Test Specification(s)	Range	Comments
Vehicles, Boats and Other Devices Propelled by an Internal Combustion Engine, Electrical Means or Both; Includes updates one-labelling (Nov 2014) and diesel engine transition period (Feb 2017)	ICES-002 Issue 7, September 2020	1 GHz	-
Information Technology Equipment (ITE) - Limits and methods of measurement	ICES-003 Issue 7 (10-2020)	40 GHz	-
Lighting Equipment	ICES-005 Issue 5 (Dec 2018)	1 GHz	-
Agreement of VCCI Council - Technical Requirements: VCCI-CISPR 32:2016 (including radiated disturbance above 1 GHz)	VCCI-CISPR 32 (Nov 2016)	6 GHz	-

Electromagnetic Compatibility **Genoa City, WI**

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Road vehicles - Test methods for electrical disturbances from electrostatic discharge	ISO 10605 (2008) ISO 10605:2008(R2013)	-	-
Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 4: Harness excitation methods	ISO 11452-4 (2011)	-	Current
Road vehicles - Component test methods for electrical disturbances from narrowband radiated electromagnetic energy - Part 9: Portable Transmitters	ISO 11452-9 (2012)	-	-
Road vehicles - Environmental conditions and testing for electrical and electronic equipment	ISO 16750 (2018)	-	-
Immunity to Radiated Electromagnetic Fields - Bulk Current Injection (BCI) Method	SAE J1113-4 (2004-08)	-	-
Immunity to Conducted Transients on Power Leads	SAE J1113-11 (2006-01)	-	-
Electrical Interference by Conduction and Coupling	SAE J1113-12 (2006-08)	-	-

Electromagnetic Compatibility **Genoa City, WI**

Test Method	Test Specification(s)	Range	Comments
Immunity Standards			
Electromagnetic Compatibility Measurement Procedure for Vehicle Components – Part 13 - Immunity to Electrostatic Discharge	SAE J1113-13 (2004-11)	-	-
Limits and methods of measurement of radio disturbance characteristics of components and modules for the protection of receivers used on board vehicles	SAE J1113-41 (2000-05)	-	-
Radio Disturbance Characteristics for the Protection of Receivers Used on Board Vehicles	SAE J1113-41 (2006-09)	-	-

Electromagnetic Compatibility **Genoa City, WI**

Test Method	Test Specification(s)	Range	Comments
Product Safety			
Medical electrical equipment-Part 1-2: General requirements for basic safety and essential performance-Collateral Standard: Electromagnetic disturbances - Requirements and tests	IEC 60601-1-2, Ed. 4 (2014-02) EN 60601-1-2 (2015)	6 GHz	-
Medical electrical equipment - Part 1-2: General requirements for safety - Collateral standard: Electromagnetic compatibility - Requirements and tests	IEC 60601-1-2, Ed. 3.0 (2007), RRL Notice No. 2008-4 (May 20, 2008)	6 GHz	-
Medical electrical equipment Part 2-24: Requirements for the safety of infusion pumps and controllers	EN 60601-2-24 (1994)	-	-
ERM; Electro-Magnetic Compatibility (EMC); Standard for Radio Equipment and Services; Part 1: Common Technical Requirements Harmonized Standard for Electromagnetic Compatibility	ETSI EN 301 489-1 V2.2.3 (2019-11)	-	-

Test Method	Test Specification(s)	Range	Comments
RF Exposure			
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	EN 62233 (2008) IEC 62233 (2005)	-	-
Assessment of lighting equipment related to human exposure to electromagnetic fields	IEC 62493:2015 BS EN 62493:2015	-	-

Services performed at satellite laboratory

DLS Electronic Systems, Inc.
200 E. Marquardt Drive (East Campus)
Wheeling, IL 60090
Mitch Gaudyn 847 537 6400
mgaudyn@dlsemc.com www.dlsemc.com

TESTING

Mechanical **Marquardt Drive**

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Vibration, Shock, Op-Shock	RTCA/DO-160; MIL810; UL991; MIL STD 202; IEC 60068 MIL-DTL-83528	Aviation, Automotive, Consumer Electronics	ETS Solutions LDS Dytran Accelerometers
Crash Safety Acceleration	RTCA/DO-160; MIL810; UL991 MIL STD 202; IEC 60068	Aviation, Automotive, Consumer Electronics	VST CSAT Centrifugal Static Acceleration Tester Dytran Accelerometers
Thermal Exposure, Humidity Exposure	RTCA/DO-160; MIL810; UL991 MIL STD 202; IEC 60068	Aviation, Automotive, Consumer Electronics	Thermotron, Ransco, Espec, Cincinnati Sub Zero
Solar Radiation	MIL STD 810; ASTM G155, ASTM G6695, ASTM D2565, ISO 16474-2, ISO 4892-2, ASTM D7869, ISO 105-B06, -B10, JASO M346, M351, SAE J2412, J2527 or Per Customer Requirement	Aviation, Automotive, Consumer Electronics	Q-Lab, Q-Sun Xenon Arc Chamber
Dust/Sand Exposure	RTCA/DO-160 Rev B-G MIL810 Rev B-G	Aviation, Automotive, Consumer Electronics	Custom Vaisala Temp/Humidity Probe Goyen Particle Sensor
Salt Fog Exposure	RTCA/DO-160; MIL810; UL991 MIL STD 202; ASTM B117	Aviation, Automotive, Consumer Electronics	Singleton Corp.
Altitude Testing	RTCA/DO-160; MIL810 MIL STD 202	Aviation	Tenney
Ingress Protection against water	IEC 60529, ISO 20653	Consumer & Industrial Products	Water fixtures/nozzles, Cole Parmer

Mechanical **Marquardt Drive**

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Ingress Protection against dust	IEC 60529, ISO 20653	Consumer & Industrial Products	Dust Chamber/Vacuum pump/gages, Cole Parmer
Waterproofness	RTCA/DO-160 MIL810; IEC 60529, ISO 20653	Aviation, Automotive, Consumer Electronics	Water Drip Fixture
Immersion	RTCA/DO-160 MIL STD 810 IEC 50529, ISO 20653	Aviation, Automotive, Consumer Electronics	Water Immersion Tank
Fluids Susceptibility/Also Electrical	RTCA/DO-160 MIL STD 810; MIL STD 202	Aviation, Automotive, Consumer Electronics	Thermotron, Ransco, Espec, Cincinnati Sub Zero
Icing	RTCA/DO-160 MIL STD 810	Consumer & Industrial Products	Thermotron, Ransco, Espec, Cincinnati Sub Zero
Fire/Flammability	RTCA/DO-160 MIL STD 810; UL94 IEC 60695	Consumer & Industrial Products	Fire Hood/ Burners/Fixtures
Explosive Atmosphere	MIL-STD-810G, Method 511.5, RTCA/DO-160G, Section 9	Aviation, Automotive, Consumer Electronics	Explosive Atmosphere Chamber Gas Analyzer Temp Monitoring
Hail Impact Resistance	ASTM F370	Aviation Transparent Enclosures	Hail Test Rig
Drop	MIL-STD-810; ISO 16750-3	Consumer & Industrial Products	Drop Test Fixture
Gravel Bombardment	SAE J400; ASTM D3170	Aviation, Automotive, Consumer Electronics	Gravelometer

Electrical **Marquardt Drive**

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Input current	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1 EN 60335	Consumer & Industrial Products	Voltech / APT

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Temperature Rise / Heating	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1 EN 60335	Consumer & Industrial Products	Agilent / Omega
Grounding / Bonding Test	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1 EN 60335	Consumer & Industrial Products	Associated Research
Insulation Resistance Test	IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 60730-1; IEC 60664, EN 60335	Consumer & Industrial Products	Associated Research
Dielectric / Electric Strength Test	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Associated Research
Lock Rotor Fault Test, Component Fault Test-Overload, Component Fault Test-Short Circuit / Output	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Agilent / Omega
Leakage Test, Residual Voltage Test	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Bapco

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Battery Reverse Polarity	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Fluke / Voltech / Agilent
Power Supply Interruption Test	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Inspection per IEC 60601-1 – Clause 16.8
Limited Current / Power Test, Hazardous Voltage Measurement	IEC/EN/UL/CSA 60950-1; IEC/EN/UL/CSA 60065; IEC/EN/UL/CSA 61010-1; IEC/EN/UL/AAMI ES/CSA 60601-1; IEC/EN/UL/CSA 60730-1; IEC 60060; IEC 60092; IEC/EN/UL 62368-1, EN 60335	Consumer & Industrial Products	Agilent / Fluke

Notes:

1. Meets the requirements of the FCC equipment authorization program as detailed in 47 CFR Part 2 Subpart J as defined in the ANAB SR 2412 U.S. Federal Communication Commission (FCC) EMC and Telecommunications (EC&T) Testing Designation Accreditation Program. Recognition by the FCC can be confirmed by visiting their website https://apps.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm.
2. Testing performed to meet the Requirements for Recognition of Telecommunications Testing – Innovation, Science, and Economic Development (ISED) Canada. Recognition by ISED can be confirmed by visiting their website https://www.ic.gc.ca/eic/site/mra-arm.nsf/eng/h_nj00091.html.
3. Testing to meet the requirements of ANAB Supplemental Requirements SR 2437, FDA Accreditation Scheme for Conformity Assessment (ASCA) Pilot Program – Basic Safety and Essential Performance of Medical Electrical Equipment, Medical Electrical Systems, and Laboratory Medical Equipment. Recognition by the FDA can be confirmed by visiting their website https://www.fda.gov/medical-devices/standards-and-conformity-assessment-program/asca-accredited-testing-laboratories.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. AT-1859.

Jason Stine, Vice President