



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

PLC Electronic Solutions Ltd
#9 – 3871 North Fraser Way
Burnaby, BC V5J 5G6

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations to which this accreditation applies.

L2368

Certificate Number


ANAB Approval

Certificate Valid: 08/17/2018-10/17/2019
Version No. 002 Issued: 08/17/2018



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 17025:2005

PLC Electronic Solutions Ltd

#9 – 3871 North Fraser Way
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CALIBRATION

Valid to: **October 17, 2019**

Certificate Number: **L2368**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance Generate	(0.22 to 0.4) nF	12 pF	Fluke 5522A Multiproduct Calibrator
	(0.4 to 1.1) nF	0.3 % of reading + 10 pF	
	(1.1 to 3.3) nF	0.4 % of reading + 9 pF	
	(3.3 to 11) nF	0.2 % of reading + 9 pF	
	(11 to 33) nF	0.2 % of reading + 9.0 pF	
	(33 to 110) nF	0.21 % of reading + 5.5 pF	
	(0.11 to 0.33) µF	0.21 % of reading + 30 pF	
	(0.33 to 1.1) µF	0.21 % of reading + 0.8 nF	
	(1.1 to 3.3) µF	0.21 % of reading + 2.5 nF	
	(3.3 to 11) µF	0.21 % of reading + 8 nF	
	(11 to 33) µF	0.33 % of reading + 25 nF	
	(33 to 110) µF	0.38 % of reading + 80 nF	
	(0.11 to 0.33) mF	0.35 % of reading + 0.25 µF	
	(0.33 to 1.1) mF	0.35 % of reading + 0.8 µF	
DC Current Generate	(0 to 0.33) mA	0.12 mA/A + 16 nA	Fluke 5522A Multiproduct Calibrator
	(0.33 to 3.3) mA	80 µA/A + 0.04 µA	
	(3.3 to 33) mA	82 µA/A + 0.21 µA	
	(33 to 330) mA	82 µA/A + 2.1 µA	
	(0.33 to 1.1) A	0.17 mA/A + 32 µA	
	(1.1 to 3) A	0.3 mA/A + 34 µA	
	(3 to 11) A	0.43 mA/A + 0.3 mA	
	(11 to 20.5) A	0.92 mA/A - 0.84 mA	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current Generate Clamp Meters	(20 to 55) A (55 to 150) A (150 to 550) A (550 to 1 025) A	0.34 % of reading + 0.23 A 0.34 % of reading + 0.75 A 0.36 % of reading + 1 A 0.36 % of reading + 2.4 A	Fluke 5522A Multiproduct Calibrator with Fluke 5500A/COIL
DC Current Measure	(0 to 0.1) mA (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (100 to 1 050) mA	28 μ A/A + 1 nA 21 μ A/A + 8.1 nA 21 μ A/A + 0.08 μ A 37 μ A/A + 0.8 μ A 0.11 mA/A + 12 μ A	Agilent 3458A/Opt 002 Multimeter
DC Current Measure with shunt	(1 to 20) A	0.22 mA/A + 13 μ A	Agilent 3458A/Opt 002 Multimeter with Fluke Y5020 Shunt
AC Current Generate	(29 to 330) μ A (10 to 20) Hz (20 to 45) Hz (45 to 1 000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (0.33 to 3.3) mA (10 to 20) Hz (20 to 45) Hz (45 to 1 000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (3.3 to 33) mA (10 to 20) Hz (20 to 45) Hz (45 to 1 000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (33 to 330) mA (10 to 20) Hz (20 to 45) Hz (45 to 1 000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.16 % of reading + 90 nA 0.12 % of reading + 90 nA 0.1 % of reading + 90 nA 0.23 % of reading + 0.13 μ A 0.62 % of reading + 0.16 μ A 0.16 % of reading + 0.32 μ A 0.16 % of reading + 0.12 μ A 0.1 % of reading + 0.12 μ A 0.08 % of reading + 0.12 μ A 0.16 % of reading + 0.16 μ A 0.4 % of reading + 0.24 μ A 0.8 % of reading + 0.5 μ A 0.14 % of reading + 1.6 μ A 0.072 % of reading + 1.6 μ A 0.04 % of reading + 1.6 μ A 0.07 % of reading + 1.6 μ A 0.16 % of reading + 2.4 μ A 0.31 % of reading + 4.5 μ A 0.14 % of reading + 16 μ A 0.072 % of reading + 16 μ A 0.04 % of reading + 16 μ A 0.08 % of reading + 40 μ A 0.16 % of reading + 80 μ A 0.32 % of reading + 0.16 mA	Fluke 5522A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current Generate	(0.33 to 1.1) A		Fluke 5522A Multiproduct Calibrator
	(10 to 45) Hz	0.16 % of reading + 8.5 μ A	
	(45 to 1 000) Hz	0.05 % of reading + 46 μ A	
	(1 to 5) kHz	0.47 % of reading + 0.77 mA	
	(5 to 10) kHz	2 % of reading + 3.9 mA	
	(1.1 to 3) A		
	(10 to 45) Hz	0.16 % of reading + 25 μ A	
	(45 to 1 000) Hz	0.051 % of reading + 90 μ A	
	(1 to 5) kHz	0.47 % of reading + 0.8 mA	
	(5 to 10) kHz	2 % of reading + 3.9 mA	
	(3 to 11) A		
	(45 to 100) Hz	0.051 % of reading + 2.4 mA	
(100 to 1 000) Hz	0.08 % of reading + 1.6 mA		
(1 to 5) kHz	2.4 % of reading + 1.6 mA		
(11 to 20.5) A			
(45 to 100) Hz	0.097 % of reading + 3.6 mA		
(100 to 1 000) Hz	1.2 % of reading + 3.6 mA		
(1 to 5) kHz	2.4 % of reading + 4 mA		
AC Current Generate Clamp Meters (45 to 65) Hz	(20 to 55) A	0.68 % of reading + 0.42 A	Fluke 5522A Multiproduct Calibrator with Fluke 5500A/COIL
	(55 to 150) A	0.68 % of reading + 0.65 A	
	(150 to 550) A	0.68 % of reading + 2 A	
	(550 to 1 025) A	0.69 % of reading + 4.8 A	
AC Current Measure	(10 to 100) μ A		Agilent 3458A/Opt 002 Multimeter
	(10 to 20) Hz	0.4 % of reading + 31 nA	
	(20 to 45) Hz	0.15 % of reading + 31 nA	
	(45 to 100) Hz	0.6 % of reading + 31 nA	
	(0.1 to 5) kHz	0.6 % of reading + 31 nA	
	(0.1 to 1) mA		
	(10 to 20) Hz	0.4 % of reading + 0.2 μ A	
	(20 to 45) Hz	0.15 % of reading + 0.2 μ A	
	(45 to 100) Hz	0.061 % of reading + 0.2 μ A	
	(0.1 to 5) kHz	0.031 % of reading + 0.2 μ A	
	(1 to 10) mA		
	(10 to 20) Hz	0.4 % of reading + 2 μ A	
(20 to 45) Hz	0.15 % of reading + 2 μ A		
(45 to 100) Hz	0.061 % of reading + 2 μ A		
(0.1 to 5) kHz	0.031 % of reading + 2 μ A		



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current Measure	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (0.1 to 1.05) A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz	0.4 % of reading + 20 μA 0.15 % of reading + 20 μA 0.061 % of reading + 20 μA 0.031 % of reading + 20 μA 0.4 % of reading + 0.2 mA 0.061 % of reading + 0.2 mA 0.081 % of reading + 0.2 mA 0.1 % of reading + 0.2 mA	Agilent 3458A with Option 002
AC Current Measure	(1 to 20) A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz	0.07 % of reading + 0.4 mA 0.07 % of reading + 0.4 mA 0.06 % of reading + 0.4 mA 0.12 % of reading - 0.15 mA	Agilent 3458A/Opt 002 Multimeter and Fluke Y5020 Shunt
DC Power Generate 33 mV to 1020V	0.33 mA to 3 A (3 to 20.5) A	0.027 % of reading 0.1 % of reading	Fluke 5522A Multiproduct Calibrator
AC Power Generate (45 to 65) Hz 33 mV to 1 020V 3mA to 20.5A	(0.5 to 1) PF	$(-0.34 \times \text{PF}) + 0.59 \%$ of reading	Fluke 5522A Multiproduct Calibrator
Resistance Generate	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (330 to 1 100) Ω (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ (330 to 1 100) kΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1 100) MΩ	30 μΩ/Ω + 60 μΩ 28 μΩ/Ω + 30 μΩ 24 μΩ/Ω + 30 μΩ 24 μΩ/Ω + 0.1 mΩ 24 μΩ/Ω - 75 μΩ 24 μΩ/Ω - 0.55 mΩ 24 μΩ/Ω + 1.5 mΩ 24 μΩ/Ω + 0.9 mΩ 24 μΩ/Ω + 2.1 mΩ 27 μΩ/Ω - 10 mΩ 27 μΩ/Ω - 0.15 Ω 50 μΩ/Ω - 0.42 Ω 75 μΩ/Ω + 0.15 kΩ 0.23 mΩ/Ω - 0.13 kΩ 0.41 mΩ/Ω - 36 Ω 0.26 % of reading - 12 kΩ 1.2 % of reading - 10 kΩ	Fluke 5522A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance Measure	(0 to 12) Ω (12 to 120) Ω (120 to 1 200) Ω (1.2 to 12) kΩ (12 to 120) kΩ (120 to 1 200) kΩ (1.2 to 12) MΩ (12 to 120) MΩ (120 to 1 200) MΩ	17 μΩ/Ω + 55 μΩ 17 μΩ/Ω + 0.32 mΩ 12 μΩ/Ω + 0.5 mΩ 12 μΩ/Ω + 3.8 mΩ 12 μΩ/Ω + 32 mΩ 18 μΩ/Ω + 1.1 Ω 24 μΩ/Ω + 22 Ω 0.51 mΩ/Ω + 0.58 kΩ 5.1 mΩ/Ω + 4.9 kΩ	Agilent 3458A/Opt 002 Multimeter
RTD Temperature Generate Electrical Simulation	Cu 427, 10 Ohm (-100 to 260) °C Pt 385, 120 Ohm (-80 to 0) °C (0 to 100) °C (100 to 260) °C Pt 385, 100 Ohm (-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C Pt 3926, 100 Ohm (-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C Pt 3916, 100 Ohm (-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.23 °C 0.06 °C 0.06 °C 0.11 °C 0.04 °C 0.04 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.18 °C 0.04 °C 0.04 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.19 °C 0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.06 °C 0.07 °C 0.08 °C 0.18 °C	Fluke 5522A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RTD Temperature Generate Electrical Simulation	Pt 385, 200 Ohm		Fluke 5522A Multiproduct Calibrator
	(-200 to -80) °C	0.03 °C	
	(-80 to 0) °C	0.03 °C	
	(0 to 100) °C	0.03 °C	
	(100 to 260) °C	0.04 °C	
	(260 to 300) °C	0.09 °C	
	(300 to 400) °C	0.1 °C	
	(400 to 600) °C	0.11 °C	
	(600 to 630) °C	0.12 °C	
	Pt 385, 500 Ohm		
	(-200 to -80) °C	0.03 °C	
	(-80 to 0) °C	0.04 °C	
	(0 to 100) °C	0.04 °C	
	(100 to 260) °C	0.05 °C	
	(260 to 300) °C	0.06 °C	
	(300 to 400) °C	0.06 °C	
	(400 to 600) °C	0.07 °C	
	(600 to 630) °C	0.09 °C	
Pt 385, 1000 Ohm			
(-200 to -80) °C	0.02 °C		
(-80 to 0) °C	0.02 °C		
(0 to 100) °C	0.03 °C		
(100 to 260) °C	0.04 °C		
(260 to 300) °C	0.05 °C		
(300 to 400) °C	0.06 °C		
(400 to 600) °C	0.06 °C		
(600 to 630) °C	0.18 °C		
DC Voltage Generate	(0 to 0.33) V	16 μV/V + 1 μV	Fluke 5522A Multiproduct Calibrator
	(0.33 to 3.3) V	9 μV/V + 2 μV	
	(3.3 to 33) V	10 μV/V + 20 μV	
	(33 to 330) V	14 μV/V + 0.15 mV	
	(330 to 1 020) V	14 μV/V + 1.5 mV	
DC Voltage Measure	(0 to 0.1) V	8 μV/V + 0.32 μV	Agilent 3458A/Opt 002 Multimeter
	(0.1 to 1) V	6 μV/V + 0.32 μV	
	(1 to 10) V	6 μV/V + 0.8 μV	
	(10 to 100) V	8.2 μV/V + 32 μV	
	(100 to 1 050) V	8.2 μV/V + 0.1 mV	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage Generate	(1 to 33) mV		Fluke 5522A Multiproduct Calibrator
	(10 to 45) Hz	0.74 mV/V + 5 μV	
	45 Hz to 10 kHz	0.13 mV/V + 5 μV	
	(10 to 20) kHz	0.16 mV/V + 6 μV	
	(20 to 50) kHz	0.76 mV/V + 6 μV	
	(50 to 100) kHz	2.7 mV/V + 12 μV	
	(100 to 500) kHz	5.8 mV/V + 60 μV	
	(33 to 330) mV		
	(10 to 45) Hz	0.22 mV/V + 13 μV	
	45 Hz to 10 kHz	0.12 mV/V + 7 μV	
	(10 to 20) kHz	0.13 mV/V + 7 μV	
	(20 to 50) kHz	0.28 mV/V + 8 μV	
	(50 to 100) kHz	0.56 mV/V + 50 μV	
	(100 to 500) kHz	1.6 mV/V + 65 μV	
	(0.33 to 3.3) V		
	(10 to 45) Hz	0.24 mV/V + 40 μV	
	45 Hz to 10 kHz	0.13 mV/V + 50 μV	
	(10 to 20) kHz	0.16 mV/V + 50 μV	
	(20 to 50) kHz	0.24 mV/V + 40 μV	
	(50 to 100) kHz	0.63 mV/V + 80 μV	
	(100 to 500) kHz	1.9 mV/V + 0.46 mV	
	(3.3 to 33) V		
	(10 to 45) Hz	0.25 mV/V + 0.51 mV	
	45 Hz to 10 kHz	0.12 mV/V + 0.5 mV	
	(10 to 20) kHz	0.2 mV/V + 0.5 mV	
	(20 to 50) kHz	0.3 mV/V + 0.5 mV	
	(50 to 100) kHz	0.71 mV/V + 1.2 mV	
	(33 to 330) V		
	(45 to 1 000) Hz	0.16 mV/V + 1.5 mV	
	(1 to 10) kHz	0.17 mV/V + 5 mV	
(10 to 20) kHz	0.22 mV/V + 5 mV		
(20 to 50) kHz	0.33 mV/V + 1.8 mV		
(50 to 100) kHz	1.6 mV/V + 40 mV		
(330 to 1 020) V			
(45 to 1 000) Hz	0.24 mV/V + 7.2 mV		
(1 to 5) kHz	0.19 mV/V + 25 mV		
(5 to 10) kHz	0.23 mV/V + 25 mV		



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage Measure	(12 to 120) mV		Agilent 3458A/Opt 002 Multimeter
	(10 to 40) Hz	0.38 mV/V + 5.8 μV	
	(40 to 1 000) Hz	0.24 mV/V + 4.3 μV	
	(1 to 20) kHz	0.23 mV/V + 4.5 μV	
	(20 to 50) kHz	0.55 mV/V + 9.3 μV	
	(50 to 100) kHz	0.45 % of reading + 6.9 μV	
	(100 to 300) kHz	4 % of reading + 4.5 μV	
	(1 to 12) mV		
	(10 to 40) Hz	53 μV/V + 7.5 μV	
	(40 to 1 000) Hz	48 μV/V + 6 μV	
	(1 to 20) kHz	0.12 mV/V + 5.3 μV	
	(20 to 50) kHz	0.25 mV/V + 8.5 μV	
	(50 to 100) kHz	0.76 mV/V + 6.5 μV	
	(100 to 300) kHz	0.3 % of reading + 13 μV	
	(300 to 1 000) kHz	1 % of reading + 11 μV	
	(0.12 to 1.2) V		
	(10 to 40) Hz	60 μV/V + 62 μV	
	(40 to 1 000) Hz	60 μV/V + 40 μV	
	(1 to 20) kHz	0.12 mV/V + 42 μV	
	(20 to 50) kHz	0.29 mV/V + 40 μV	
	(50 to 100) kHz	0.8 mV/V + 35 μV	
	(100 to 300) kHz	0.3 % of reading + 0.11 mV	
	(300 to 1 000) kHz	1 % of reading + 0.11 mV	
	(1.2 to 12) V		
	(10 to 40) Hz	51 μV/V + 0.8 mV	
	(40 to 1 000) Hz	53 μV/V + 0.49 mV	
	(1 to 20) kHz	0.12 mV/V + 0.42 mV	
	(20 to 50) kHz	0.29 mV/V + 0.38 mV	
	(50 to 100) kHz	0.8 mV/V + 0.24 mV	
	(100 to 300) kHz	0.3 % of reading + 1.1 mV	
(300 to 1 000) kHz	1 % of reading + 1.7 mV		
(12 to 120) V			
(10 to 40) Hz	0.19 mV/V + 5.1 mV		
(40 to 1 000) Hz	0.19 mV/V + 3.6 mV		
(1 to 20) kHz	0.19 mV/V + 3.6 mV		
(20 to 50) kHz	0.34 mV/V + 3.5 mV		
(50 to 100) kHz	1.2 mV/V + 3.2 mV		
(100 to 300) kHz	0.4 % of reading + 10 mV		
(300 to 1 000) kHz	1.5 % of reading + 10 mV		



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage Measure	(120 to 700) V (10 to 40) Hz (40 to 1 000) Hz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.38 mV/V + 4.4 mV 0.38 mV/V + 3.3 mV 0.59 mV/V + 3 mV 1.2 mV/V + 2.3 mV 3 mV/V + 1.8 mV	Agilent 3458A/Opt 002 Multimeter
Thermocouple Temperature Generate and Measure Electrical Simulation	Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type C (0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 000 to 2 316) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C Type J (-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C Type K (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1 000) °C (1 000 to 1 372) °C Type L (-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.42 °C 0.36 °C 0.34 °C 0.35 °C 0.29 °C 0.33 °C 0.29 °C 0.42 °C 0.67 °C 0.42 °C 0.2 °C 0.19 °C 0.2 °C -0.23 C 0.23 °C 0.16 °C 0.14 °C 0.16 °C 0.2 °C 0.2 °C 0.13 °C 0.11 °C 0.16 °C 0.35 °C 0.3 °C 0.22 °C 0.15 °C	Fluke 5522A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouple Temperature Generate and Measure Electrical Simulation	Type N (-200 to -100) °C	0.35 °C	Fluke 5522A Multiproduct Calibrator
	(-100 to -25) °C	0.23 °C	
	(-25 to 120) °C	0.21 °C	
	(120 to 410) °C	0.21 °C	
	(410 to 1 300) °C	0.26 °C	
	Type R (0 to 250) °C	0.52 °C	
	(250 to 400) °C	0.38 °C	
	(400 to 1 000) °C	0.37 °C	
	(1 000 to 1 767) °C	0.41 °C	
	Type S (0 to 250) °C	0.45 °C	
	(250 to 1 000) °C	0.39 °C	
	(1 000 to 1 400) °C	0.39 °C	
	(1 400 to 1 767) °C	0.45 °C	
	Type T (-250 to -150) °C	0.54 °C	
	(-150 to 0) °C	0.3 °C	
(0 to 120) °C	0.26 °C		
(120 to 400) °C	0.26 °C		
Type U (-200 to 0) °C	0.44 °C		
(0 to 600) °C	0.23 °C		
Oscilloscopes DC Voltage 50 Ohm 1 M Ohm Square Wave into 50Ω (10 Hz to 10 kHz)	1 mV to 6.6 V 1 mV to 130 V (1 to 25) mVpp (25 to 110) mVpp (0.11 to 2.2) Vpp (2.2 to 6.6) Vpp	0.2 % of reading + 35 μV 0.04 % of reading + 35 μV 0.2 % of reading + 40 μV 0.2 % of reading + 40 μV 0.2 % of reading + 40 μV 0.2 % of reading + 120 μV	5522A/SC1100 Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscopes Square Wave Into 1MΩ (10 Hz to 1 kHz)	(1 to 25) mVpp	0.085 % of reading + 35 μV	5522A/SC1100 Multiproduct Calibrator
	(25 to 110) mVpp	0.085 % of reading + 35 μV	
	(0.11 to 2.2) Vpp	0.085 % of reading + 45 μV	
	(2.2 to 11) Vpp	0.085 % of reading + 150 μV	
	(11 to 130) Vpp	0.085 % of reading + 2 mV	
Square Wave Into 1MΩ (1 to 10) kHz)	(1 to 25) mVpp	0.2 % of reading + 40 μV	
	(25 to 110) mVpp	0.2 % of reading + 40 μV	
	(0.11 to 2.2) Vpp	0.2 % of reading + 40 μV	
	(2.2 to 11) Vpp	0.2 % of reading + 80 μV	
	(11 to 130) Vpp	0.2 % of reading + 800 μV	
Rise time 5 mV to 2.5 V	(200 to 300) pS		
	10 kHz to 2 MHz	75 ps	
Sine Level Flatness 5 mV to 5.5 V	(100 to 350) pS	75 ps	
	(2 to 10) MHz	75 ps	
	50 kHz Ref	1.7 % of reading + 0.25 mV	
	50 kHz-100 MHz	3.7 % of reading + 0.25 mV	
	(100 to 300) MHz	4.2 % of reading + 0.26 mV	
(300 to 600) MHz	5.7 % of reading + 0.27 mV		
	(600 to 1 100) MHz	6.6 % of reading + 0.25 mV	
Time Marker ²	(0.05 to 5) s	(800 x t + 20) μs/s	
	20 ms to 1 ns	2 μs/s	
Pulse Width Frequency	(4 to 500) ns	2 μs/s	
	10 Hz to 1 100 MHz	2.1 μHz/Hz	

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power Measure ² Relative 100 kHz to 26.5 GHz	(-160 to 0) dB	390 μdB/dB + 0.09 dB + M	R&S FSMR 27 Measuring Receiver



Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power Measure ² Absolute	(-30 to 20) dBm (0.01 to 1.4) GHz	0.14 dB	R&S FSMR 27 Measuring Receiver with NRP-Z22 Power Sensor
	(1.4 to 4) GHz	0.15 dB	
	(20 to 33) dBm (0.01 to 1.4) GHz	0.21 dB	
	(1.4 to 4) GHz	0.22 dB	
	(-30 to 20) dBm (4 to 18) GHz	0.21 dB + M	
	(20 to 33) dBm (4 to 18) GHz	0.25 dB + M	

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency Generate	(0.01 to 120) Hz (120 to 1 200) Hz 1.2 kHz to 2 MHz	2 μHz/Hz + 60 μHz 2 μHz/Hz + 10 μHz 2 μHz/Hz + 5 μHz	Fluke 5522A Multiproduct Calibrator
	10 MHz	41 pHz/Hz	GPS10RBN Frequency Standard
	10 Hz to 40 GHz	0.58 nHz/Hz + 0.18 mHz	GPS10RBN Frequency Standard with Signal Generator
Frequency Measure	20 Hz to 4 GHz (4 to 26.5) GHz	0.58 nHz/Hz + 0.12 Hz 1.3 nHz/Hz	GPS10RBN Frequency Standard with R&S FSMR26 Receiver

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95% of reading.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. M = mismatch error, t = period in seconds
3. This scope is formatted as part of a single document including Certificate of Accreditation No. L2368.


 Vice President