

CALIBRATION CERTIFICATE

ATEC Asset ID



29061

Work Order



2024004933

Certificate Number: 2024004933

Asset ID 29061
Manufacturer Keysight Technologies
Model Number KEYS-DAQ973A
Serial Number MY59000162
Description 3-Slot Data Acquisition/
Switching/Datalogger Unit 6 1/2 Digit
Internal DMM

Initial Condition	In Tolerance
Final Condition	In Tolerance
Calibration Date	11/11/2024
Due Date	1/13/2027
Temperature C°	23.69
Humidity	33.5
Procedure	Keysight DAQ973A Manual Performance Verification
	Rev. Revision

Customer Name: Advanced Test Equipment Corp
Customer Address: 10401 Roselle St San Diego , CA 92121
Comments:

This Calibration is traceable to the International System of Units (SI), through National Metrology Institutes (NIST, PTB, NRC, NPL, etc.), radiometric techniques, or natural physical constants. This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval of Advanced Test Equipment Corporation (ATEC). The calibration has been completed in accordance with ATEC's Active Use Calibration System. ATEC conforms to the requirements of the Quality Management System registered to ISO 9001:2015 (QAS International; US2790).

Standards Used

<u>Model</u>	<u>Manufacturer</u>	<u>Serial</u>	<u>Asset ID</u>	<u>Due Date</u>
FLUK-5720A-003	Fluke	9190206	11771	1/9/2025
FLUK-5520A	Fluke	9440009	15420	2/26/2025

Keysight DAQ973A Manual Performance						
Manual Template		Pass	Found / Left			
TEST DESCRIPTION		TRUE VALUE	Lower Limit	TEST RESULT	Upper Limit	Status
Zero Offset						
Channel 303 DC Voltage 100mV Range		0.000 mV	-0.006 mV	0.000 mV	0.006 mV	Pass
1 V		0.000000 V	-0.000006 V	0.000000 V	0.000006 V	Pass
10 V		0.000000 V	-0.000040 V	0.000000 V	0.000040 V	Pass
100 V		0.00000 V	-0.00060 V	0.00000 V	0.00060 V	Pass
300 V		0.0000 V	-0.0060 V	0.0000 V	0.0060 V	Pass
4-wire Resistance						
100 Ohm		0.000 Ohm	-0.006 Ohm	0.000 Ohm	0.006 Ohm	Pass
1000 Ohm		0.000 Ohm	-0.007 Ohm	0.000 Ohm	0.007 Ohm	Pass
10 kOhm		0.000000 kOhms	-0.000050 kOhms	0.000000 kOhms	0.000050 kOhms	Pass
100 kOhm		0.00000 kOhms	-0.00050 kOhms	0.00000 kOhms	0.00050 kOhms	Pass
1 MOhm		0.000000 MOhm	-0.000005 MOhm	0.000000 MOhm	0.000005 MOhm	Pass
10 MOhm		0.000000 MOhm	-0.000100 MOhm	0.000000 MOhm	0.000100 MOhm	Pass
2-wire Resistance (use Null)						
100 MOhm		0.0000 MOhm	-0.0010 MOhm	0.0000 MOhm	0.0010 MOhm	Pass
1000 MOhm		0.0000 MOhm	-0.0100 MOhm	0.0000 MOhm	0.0100 MOhm	Pass
Channel 321 DC Current						
1A Range		0.00000 A	-0.00010 A	0.00000 A	0.00010 A	Pass
100 mA		0.0000 mA	-0.0050 mA	0.0000 mA	0.0050 mA	Pass
10 mA		0.0000 mA	-0.0020 mA	0.0000 mA	0.0020 mA	Pass
1 mA		0.000000 mA	-0.000050 mA	0.000000 mA	0.000050 mA	Pass
DC Voltage Gain						
Channel 302 NPLC 10	100mV Range	100.000 mV	99.989 mV	99.999 mV	100.011 mV	Pass
		-100.000 mV	-100.011 mV	-99.999 mV	-99.989 mV	Pass
1 V Range		1.000000 V	0.999959 V	1.000003 V	1.000041 V	Pass
		-1.000000 V	-1.000041 V	-1.000005 V	-0.999959 V	Pass
10 V Range		4.00000 V	3.99984 V	4.00002 V	4.00016 V	Pass
		10.00000 V	9.99966 V	10.00007 V	10.00034 V	Pass
		-10.00000 V	-10.00034 V	-10.00010 V	-9.99966 V	Pass
100 V Range		100.0000 V	99.9954 V	100.0002 V	100.0046 V	Pass
		-100.0000 V	-100.0046 V	-100.0002 V	-99.9954 V	Pass
300 V range		300.000 V	299.982 V	299.998 V	300.018 V	Pass
		-300.000 V	-300.018 V	-299.998 V	-299.982 V	Pass
Ohms Gain	4-wire					
100 Ohm		100.000 Ohm	99.988 Ohm	99.990 Ohm	100.012 Ohm	Pass
1 kOhm		1.000000 kOhm	0.999953 kOhm	0.999995 kOhm	1.000047 kOhm	Pass
10 kOhm		10.00000 kOhm	9.99955 kOhm	10.00009 kOhm	10.00045 kOhm	Pass
100 kOhm		100.0000 kOhm	99.9955 kOhm	100.0021 kOhm	100.0045 kOhm	Pass
1 MOhm		1.000000 MOhm	0.999925 MOhm	1.000023 MOhm	1.000075 MOhm	Pass
10 MOhm		10.0000 MOhm	9.9974 MOhm	9.9987 MOhm	10.0026 MOhm	Pass
10 MOhm	2-Wire	10.0000 MOhm	9.9974 MOhm	10.0010 MOhm	10.0026 MOhm	Pass
100 MOhm		100.000 MOhm	99.649 MOhm	99.967 MOhm	100.351 MOhm	Pass
DC Current Gain	Channel 321					
1 A Range		1.0000 A	0.9991 A	0.9999 A	1.0009 A	Pass
100 mA Range		100.000 mA	99.945 mA	100.008 mA	100.055 mA	Pass
10 mA Range		10.000 mA	9.993 mA	10.000 mA	10.007 mA	Pass
1 mA Range		1.00000 mA	0.99945 mA	0.99999 mA	1.00055 mA	Pass
Frequency						
10 Hz @ 0.1V		10.000 Hz	9.997 Hz	10.002 Hz	10.003 Hz	Pass
300 kHz @ 0.01 V		300.000 kHz	299.790 kHz	300.023 kHz	300.210 kHz	Pass
AC Voltage Gain	Channel 302					
100 mV Range	1kHz	100.000 mV	99.930 mV	99.991 mV	100.070 mV	Pass
50 kHz		100.000 mV	99.900 mV	99.988 mV	100.100 mV	Pass
300 kHz		100.00 mV	98.90 mV	100.08 mV	101.10 mV	Pass
1 V 1kHz		1.0000 V	0.9993 V	1.0000 V	1.0007 V	Pass
50 kHz		1.0000 V	0.9990 V	1.0001 V	1.0010 V	Pass

TEST DESCRIPTION	TRUE VALUE	Lower Limit	TEST RESULT	Upper Limit	Status
300 kHz	1.000 V	0.989 V	1.002 V	1.011 V	Pass
10 V Range 1 kHz	10.0000 V	9.9980 V	9.9997 V	10.0020 V	Pass
1 kHz	1.0000 V	0.9975 V	1.0000 V	1.0025 V	Pass
10 Hz	10.000 V	9.993 V	9.998 V	10.007 V	Pass
100 Hz	10.000 V	9.993 V	10.000 V	10.007 V	Pass
20 kHz	10.000 V	9.993 V	9.999 V	10.007 V	Pass
50 kHz	10.000 V	9.990 V	9.999 V	10.010 V	Pass
100 kHz	10.000 V	9.980 V	9.999 V	10.020 V	Pass
300 kHz	10.000 V	9.890 V	10.003 V	10.110 V	Pass
100 V Range 1kHz	100.00 V	99.93 V	100.00 V	100.07 V	Pass
50 kHz	100.00 V	99.90 V	99.99 V	100.10 V	Pass
300 kHz	70.00 V	69.20 V	70.05 V	70.80 V	Pass
300 V Range 1 kHz	300.00 V	299.67 V	300.02 V	300.33 V	Pass
50 kHz	210.00 V	209.58 V	209.98 V	210.42 V	Pass
300 kHz	70.00 V	68.40 V	70.13 V	71.60 V	Pass
AC Current Gain Channel 321					
1 A Range 1 kHz	1.0000 A	0.9986 A	0.9995 A	1.0014 A	Pass
5 kHz	1.0000 A	0.9986 A	1.0000 A	1.0014 A	Pass
100 mA Range 10 Hz	100.00 mA	99.86 mA	100.01 mA	100.14 mA	Pass
1 kHz	100.00 mA	99.86 mA	100.01 mA	100.14 mA	Pass
5 kHz	100.00 mA	99.86 mA	100.01 mA	100.14 mA	Pass
10 mA Range 1 kHz	100.00 µA	95.90 µA	100.00 µA	104.10 µA	Pass
1 kHz	1.000 mA	0.995 mA	1.001 mA	1.005 mA	Pass
1 kHz	10.000 mA	9.986 mA	9.999 mA	10.014 mA	Pass
5 kHz	10.000 mA	9.986 mA	9.995 mA	10.014 mA	Pass
1 mA Range 1 kHz	1.0000 mA	0.9986 mA	1.0000 mA	1.0014 mA	Pass
5 kHz	1.0000 mA	0.9986 mA	1.0000 mA	1.0014 mA	Pass
100 µA Range 1kHz	100.00 µA	99.86 µA	100.00 µA	100.14 µA	Pass
5 kHz	100.00 µA	99.86 µA	100.02 µA	100.14 µA	Pass

-- End of measurement results--

Calibrated by: Sara Mostafidi

Approved by: Jamison Berg