



CALIBRATION CERTIFICATE

Newton4th Ltd
office@newtons4th.com
www.newtons4th.com

5 Jun 2007 07:18 Script file: KinetiQ 3 phase final electrical v1.07
Automatic Calibration Environment release ACE vl.64
NEWTONS4TH,PPA2530 KinetiQ,00142,1.21
HP3458A,MY45041781

Result log

Verify HV attenuator

	frequency	applied	range	phase 1	phase 2	phase 3	deviation	spec
OK:	55.01 Hz	248.60 V	8	248.61 V	248.55 V	248.60 V	<-0.02%>	[0.34%]
OK:	55.01 Hz	223.71 V	7	223.71 V	223.67 V	223.70 V	<-0.02%>	[0.15%]
OK:	55.01 Hz	170.92 V	6	170.93 V	170.90 V	170.92 V	<-0.01%>	[0.08%]*
OK:	55.01 Hz	52.803 V	5	52.803 V	52.795 V	52.798 V	<-0.01%>	[0.09%]*
OK:	55.01 Hz	16.139 V	4	16.140 V	16.137 V	16.138 V	<-0.01%>	[0.09%]*
OK:	55.01 Hz	4.0562 V	3	4.0555 V	4.0556 V	4.0556 V	<-0.02%>	[0.12%]*
OK:	55.01 Hz	971.26mV	2	971.60mV	971.68mV	971.47mV	< 0.04%>	[0.21%]
OK:	55.01 Hz	258.83mV	1	258.60mV	258.68mV	258.75mV	<-0.09%>	[0.48%]
OK:	400.1 Hz	271.15 V	8	271.13 V	271.07 V	271.12 V	<-0.03%>	[0.32%]
OK:	400.1 Hz	244.00 V	7	244.00 V	243.97 V	243.99 V	<-0.01%>	[0.14%]
OK:	400.1 Hz	186.43 V	6	186.43 V	186.40 V	186.42 V	<-0.01%>	[0.08%]*
OK:	400.1 Hz	57.591 V	5	57.595 V	57.583 V	57.586 V	<-0.01%>	[0.08%]*
OK:	400.1 Hz	17.603 V	4	17.605 V	17.601 V	17.602 V	< 0.01%>	[0.09%]*
OK:	400.1 Hz	4.2378 V	3	4.2377 V	4.2381 V	4.2375 V	<-0.01%>	[0.12%]*
OK:	400.1 Hz	1.0236 V	2	1.0232 V	1.0234 V	1.0233 V	<-0.04%>	[0.20%]
OK:	400.1 Hz	272.61mV	1	272.36mV	272.44mV	272.71mV	<-0.09%>	[0.46%]
OK:	8.001kHz	271.77 V	8	271.74 V	271.70 V	271.75 V	<-0.03%>	[0.35%]
OK:	8.001kHz	244.55 V	7	244.55 V	244.52 V	244.54 V	<-0.01%>	[0.17%]
OK:	8.001kHz	186.85 V	6	186.84 V	186.83 V	186.84 V	<-0.01%>	[0.11%]*
OK:	8.001kHz	61.110 V	5	61.115 V	61.105 V	61.104 V	<-0.01%>	[0.11%]*
OK:	8.001kHz	17.645 V	4	17.646 V	17.644 V	17.643 V	<-0.01%>	[0.11%]*
OK:	8.001kHz	4.1063 V	3	4.1059 V	4.1061 V	4.1059 V	<-0.01%>	[0.15%]*
OK:	8.001kHz	1.0928 V	2	1.0925 V	1.0924 V	1.0926 V	<-0.04%>	[0.22%]
OK:	8.001kHz	273.04mV	1	273.05mV	272.66mV	272.89mV	<-0.14%>	[0.49%]
OK:	48.01kHz	270.87 V	8	270.75 V	270.69 V	270.74 V	<-0.07%>	[0.49%]
OK:	48.01kHz	243.83 V	7	243.72 V	243.69 V	243.71 V	<-0.06%>	[0.31%]
OK:	48.01kHz	186.24 V	6	186.16 V	186.13 V	186.15 V	<-0.06%>	[0.25%]*
OK:	48.01kHz	60.929 V	5	60.925 V	60.913 V	60.917 V	<-0.03%>	[0.25%]*
OK:	48.01kHz	17.592 V	4	17.592 V	17.588 V	17.588 V	<-0.02%>	[0.26%]*
OK:	48.01kHz	4.1013 V	3	4.0994 V	4.0992 V	4.0991 V	<-0.05%>	[0.29%]*
OK:	48.01kHz	1.0911 V	2	1.0897 V	1.0895 V	1.0900 V	<-0.14%>	[0.36%]
OK:	220.0kHz	60.230 V	5	60.237 V	60.227 V	60.237 V	< 0.01%>	[0.87%]*
OK:	220.0kHz	17.414 V	4	17.417 V	17.415 V	17.417 V	< 0.02%>	[0.88%]*
OK:	220.0kHz	4.1043 V	3	4.1041 V	4.1036 V	4.1041 V	<-0.02%>	[0.91%]*
OK:	220.0kHz	1.0910 V	2	1.0911 V	1.0908 V	1.0909 V	<-0.02%>	[0.98%]
OK:	700.1kHz	15.360 V	4	15.352 V	15.345 V	15.342 V	<-0.11%>	[2.61%]*
OK:	700.1kHz	4.1200 V	3	4.1033 V	4.1016 V	4.1010 V	<-0.46%>	[2.64%]*
OK:	700.1kHz	1.0859 V	2	1.0821 V	1.0816 V	1.0814 V	<-0.41%>	[2.71%]
OK:	1.200MHz	6.6451 V	4	6.6409 V	6.6377 V	6.6380 V	<-0.11%>	[4.49%]
OK:	1.200MHz	4.1044 V	3	4.0763 V	4.0725 V	4.0752 V	<-0.78%>	[4.44%]*
OK:	1.200MHz	1.0643 V	2	1.0573 V	1.0561 V	1.0570 V	<-0.77%>	[4.51%]



CALIBRATION CERTIFICATE

Newton's4th Ltd
office@newtons4th.com
www.newtons4th.com

OK: 2.000MHz 6.5335 V 4 6.5244 V 6.5240 V 6.5235 V <-0.15%> [7.37%]
OK: 2.000MHz 4.0393 V 3 4.0314 V 4.0301 V 4.0304 V <-0.23%> [7.32%]*
OK: 2.000MHz 1.0028 V 2 1.0012 V 1.0009 V 1.0009 V <-0.18%> [7.40%]

Verify phase accuracy of HV attenuator

frequency	applied	ranges	A1	V2	A2	V3	A3	deviation	spec
OK: 55.01 Hz	1.9463 V	0.000° 2 8	0.002°	0.004°	0.002°	0.002°	0.002°	< 0.004°>	[0.005°]*
OK: 400.1 Hz	2.0497 V	0.000° 2 8	0.004°	0.002°	0.004°	0.000°	0.004°	< 0.004°>	[0.005°]*
OK: 8.001kHz	2.0531 V	0.000° 2 8	0.001°	0.004°	0.001°	0.002°	0.001°	< 0.004°>	[0.081°]*
OK: 48.01kHz	2.0501 V	0.000° 2 8	-0.006°	-0.001°	-0.007°	0.004°	-0.006°	<-0.007°>	[0.461°]*
OK: 100.0kHz	2.0483 V	0.000° 2 8	-0.004°	0.001°	-0.005°	0.004°	-0.005°	<-0.005°>	[0.955°]*
OK: 220.0kHz	2.0494 V	0.000° 2 8	-0.018°	0.004°	-0.019°	0.009°	-0.019°	<-0.019°>	[2.095°]*
OK: 700.1kHz	2.0401 V	0.000° 2 8	-0.059°	0.532°	-0.070°	-1.113°	-0.063°	<-1.113°>	[6.656°]*
OK: 1.200MHz	1.9975 V	0.000° 2 8	-0.065°	0.041°	-0.072°	0.022°	-0.076°	<-0.076°>	[11.41°]*
OK: 2.000MHz	1.8813 V	0.000° 2 8	0.061°	0.004°	0.098°	0.014°	0.034°	< 0.098°>	[19.01°]*

Verify phase 1 internal shunt calibration

frequency	applied	range	phases	deviation	spec
OK: 55.01 Hz	4.6986 A	8	4.6866 A	<-0.26%>	[1.66%]
OK: 55.01 Hz	4.7025 A	7	4.7018 A	<-0.02%>	[0.58%]
OK: 55.01 Hz	4.6967 A	6	4.6966 A	<-0.00%>	[0.20%]
OK: 55.01 Hz	4.7110 A	5	4.7104 A	<-0.01%>	[0.09%]*
OK: 55.01 Hz	1.7658 A	4	1.7664 A	< 0.03%>	[0.08%]*
OK: 55.01 Hz	263.93mA	3	263.97mA	< 0.01%>	[0.17%]*
OK: 55.01 Hz	154.21mA	2	154.26mA	< 0.03%>	[0.14%]*
OK: 55.01 Hz	31.689mA	1	31.691mA	< 0.01%>	[0.40%]
OK: 400.1 Hz	4.6815 A	8	4.6746 A	<-0.15%>	[1.67%]
OK: 400.1 Hz	4.7047 A	7	4.7092 A	< 0.10%>	[0.58%]
OK: 400.1 Hz	4.6883 A	6	4.6893 A	< 0.02%>	[0.20%]
OK: 400.1 Hz	4.6889 A	5	4.6873 A	<-0.03%>	[0.09%]*
OK: 400.1 Hz	1.7613 A	4	1.7613 A	< 0.00%>	[0.09%]*
OK: 400.1 Hz	263.73mA	3	263.75mA	< 0.01%>	[0.17%]*
OK: 400.1 Hz	154.20mA	2	154.21mA	< 0.00%>	[0.15%]*
OK: 400.1 Hz	31.678mA	1	31.682mA	< 0.01%>	[0.40%]
OK: 8.001kHz	4.6604 A	5	4.6602 A	<-0.00%>	[0.12%]*
OK: 8.001kHz	1.7598 A	4	1.7600 A	< 0.01%>	[0.11%]*
OK: 8.001kHz	261.92mA	3	261.85mA	<-0.03%>	[0.20%]*
OK: 8.001kHz	153.24mA	2	153.20mA	<-0.03%>	[0.17%]*
OK: 8.001kHz	31.489mA	1	31.482mA	<-0.02%>	[0.43%]
OK: 48.01kHz	4.5040 A	5	4.5023 A	<-0.04%>	[0.27%]*
OK: 48.01kHz	1.6897 A	4	1.6886 A	<-0.07%>	[0.26%]*
OK: 48.01kHz	259.92mA	3	259.80mA	<-0.05%>	[0.34%]*
OK: 48.01kHz	151.99mA	2	151.91mA	<-0.05%>	[0.32%]*
OK: 48.01kHz	31.245mA	1	31.239mA	<-0.02%>	[0.58%]
OK: 100.0kHz	4.4950 A	5	4.4988 A	< 0.09%>	[0.45%]*
OK: 220.0kHz	268.46mA	4	268.29mA	<-0.06%>	[1.15%]*
OK: 220.0kHz	268.56mA	3	268.46mA	<-0.04%>	[0.96%]*
OK: 220.0kHz	150.81mA	2	150.74mA	<-0.05%>	[0.94%]*
OK: 220.0kHz	33.589mA	1	33.545mA	<-0.13%>	[1.17%]
OK: 700.1kHz	256.21mA	4	255.02mA	<-0.46%>	[2.89%]*



CALIBRATION CERTIFICATE

Newton4th Ltd
office@newtons4th.com
www.newtons4th.com

OK:	700.1kHz	256.21mA	3	255.04mA	<-0.46%>	[2.69%]*
OK:	700.1kHz	142.59mA	2	142.01mA	<-0.40%>	[2.67%]*
OK:	700.1kHz	34.169mA	1	34.082mA	<-0.25%>	[2.89%]
OK:	1.200MHz	260.20mA	4	257.06mA	<-1.21%>	[4.68%]*
OK:	1.200MHz	260.20mA	3	257.04mA	<-1.22%>	[4.49%]*
OK:	1.200MHz	163.94mA	2	161.96mA	<-1.21%>	[4.46%]*
OK:	1.200MHz	34.711mA	1	34.306mA	<-1.17%>	[4.69%]
OK:	2.000MHz	243.43mA	4	243.34mA	<-0.04%>	[7.59%]*
OK:	2.000MHz	243.44mA	3	243.27mA	<-0.07%>	[7.38%]*
OK:	2.000MHz	142.64mA	2	142.63mA	<-0.01%>	[7.35%]*
OK:	2.000MHz	29.552mA	1	29.590mA	< 0.13%>	[7.63%]

Verify phase 2 internal shunt calibration

	frequency	applied	range	phase2	deviation	spec
OK:	55.01 Hz	4.7245 A	8	4.7211 A	<-0.07%>	[1.65%]
OK:	55.01 Hz	4.7233 A	7	4.7255 A	< 0.05%>	[0.58%]
OK:	55.01 Hz	4.7200 A	6	4.7145 A	<-0.12%>	[0.20%]
OK:	55.01 Hz	4.7197 A	5	4.7185 A	<-0.03%>	[0.09%]*
OK:	55.01 Hz	1.7756 A	4	1.7743 A	<-0.07%>	[0.08%]*
OK:	55.01 Hz	255.07mA	3	255.17mA	< 0.04%>	[0.17%]*
OK:	55.01 Hz	149.47mA	2	149.46mA	<-0.01%>	[0.15%]*
OK:	55.01 Hz	30.736mA	1	30.740mA	< 0.01%>	[0.41%]
OK:	400.1 Hz	4.7236 A	8	4.7224 A	<-0.03%>	[1.66%]
OK:	400.1 Hz	4.7460 A	7	4.7524 A	< 0.13%>	[0.58%]
OK:	400.1 Hz	4.7481 A	6	4.7478 A	<-0.01%>	[0.20%]
OK:	400.1 Hz	4.7571 A	5	4.7574 A	< 0.01%>	[0.09%]*
OK:	400.1 Hz	1.7803 A	4	1.7806 A	< 0.02%>	[0.09%]*
OK:	400.1 Hz	256.20mA	3	256.28mA	< 0.03%>	[0.17%]*
OK:	400.1 Hz	150.22mA	2	150.24mA	< 0.01%>	[0.15%]*
OK:	400.1 Hz	30.898mA	1	30.906mA	< 0.03%>	[0.41%]
OK:	8.001kHz	4.7092 A	5	4.7088 A	<-0.01%>	[0.12%]*
OK:	8.001kHz	1.7641 A	4	1.7657 A	< 0.09%>	[0.11%]*
OK:	8.001kHz	254.42mA	3	254.36mA	<-0.03%>	[0.20%]*
OK:	8.001kHz	148.72mA	2	148.66mA	<-0.04%>	[0.18%]*
OK:	8.001kHz	30.594mA	1	30.599mA	< 0.02%>	[0.44%]
OK:	48.01kHz	4.5679 A	5	4.5671 A	<-0.02%>	[0.27%]*
OK:	48.01kHz	1.7036 A	4	1.7037 A	< 0.00%>	[0.26%]*
OK:	48.01kHz	252.75mA	3	252.77mA	< 0.01%>	[0.35%]*
OK:	48.01kHz	148.24mA	2	148.15mA	<-0.06%>	[0.32%]*
OK:	48.01kHz	30.496mA	1	30.488mA	<-0.03%>	[0.59%]
OK:	100.0kHz	4.5459 A	5	4.5459 A	<-0.00%>	[0.45%]*
OK:	220.0kHz	262.38mA	4	262.11mA	<-0.10%>	[1.15%]*
OK:	220.0kHz	263.40mA	3	263.42mA	< 0.01%>	[0.96%]*
OK:	220.0kHz	148.23mA	2	148.19mA	<-0.02%>	[0.94%]*
OK:	220.0kHz	33.060mA	1	33.082mA	< 0.07%>	[1.18%]
OK:	700.1kHz	252.85mA	4	251.53mA	<-0.52%>	[2.89%]*
OK:	700.1kHz	252.97mA	3	251.70mA	<-0.50%>	[2.69%]*
OK:	700.1kHz	140.86mA	2	140.25mA	<-0.43%>	[2.67%]*
OK:	700.1kHz	33.762mA	1	33.674mA	<-0.26%>	[2.90%]
OK:	1.200MHz	257.50mA	4	254.45mA	<-1.18%>	[4.69%]*



CALIBRATION CERTIFICATE

Newton4th Ltd
office@newtons4th.com
www.newtons4th.com

```

OK: 1.200MHz 257.60mA 3 254.51mA <-1.20%> [4.49%]*
OK: 1.200MHz 162.38mA 2 160.38mA <-1.23%> [4.46%]*
OK: 1.200MHz 34.397mA 1 33.997mA <-1.16%> [4.69%]
OK: 2.000MHz 242.24mA 4 242.08mA <-0.07%> [7.59%]*
OK: 2.000MHz 242.25mA 3 241.61mA <-0.26%> [7.38%]*
OK: 2.000MHz 142.00mA 2 141.64mA <-0.25%> [7.35%]*
OK: 2.000MHz 29.438mA 1 29.389mA <-0.17%> [7.63%]

```

Verify phase 3 internal shunt calibration

```

frequency applied range phase3 deviation spec
OK: 55.01 Hz 4.5755 A 8 4.5765 A < 0.02%> [1.71%]
OK: 55.01 Hz 4.5704 A 7 4.5646 A <-0.13%> [0.60%]
OK: 55.01 Hz 4.5745 A 6 4.5745 A < 0.00%> [0.21%]
OK: 55.01 Hz 4.5759 A 5 4.5801 A < 0.09%> [0.09%]*
OK: 55.01 Hz 1.7276 A 4 1.7282 A < 0.03%> [0.09%]*
OK: 55.01 Hz 263.28mA 3 263.23mA <-0.02%> [0.17%]*
OK: 55.01 Hz 153.93mA 2 153.93mA < 0.00%> [0.14%]*
OK: 55.01 Hz 31.616mA 1 31.653mA < 0.12%> [0.40%]
OK: 400.1 Hz 4.6107 A 8 4.6191 A < 0.18%> [1.70%]
OK: 400.1 Hz 4.5958 A 7 4.6021 A < 0.14%> [0.59%]
OK: 400.1 Hz 4.5886 A 6 4.5907 A < 0.04%> [0.21%]
OK: 400.1 Hz 4.5790 A 5 4.5783 A <-0.02%> [0.10%]*
OK: 400.1 Hz 1.7417 A 4 1.7407 A <-0.06%> [0.09%]*
OK: 400.1 Hz 263.36mA 3 263.32mA <-0.01%> [0.17%]*
OK: 400.1 Hz 154.05mA 2 154.06mA < 0.01%> [0.15%]*
OK: 400.1 Hz 31.638mA 1 31.642mA < 0.01%> [0.40%]
OK: 8.001kHz 4.5865 A 5 4.5841 A <-0.05%> [0.12%]*
OK: 8.001kHz 1.7382 A 4 1.7365 A <-0.10%> [0.11%]*
OK: 8.001kHz 262.20mA 3 262.12mA <-0.03%> [0.20%]*
OK: 8.001kHz 153.39mA 2 153.32mA <-0.04%> [0.17%]*
OK: 8.001kHz 31.496mA 1 31.489mA <-0.02%> [0.43%]
OK: 48.01kHz 4.4272 A 5 4.4199 A <-0.17%> [0.27%]*
OK: 48.01kHz 1.6554 A 4 1.6568 A < 0.09%> [0.26%]*
OK: 48.01kHz 259.77mA 3 259.58mA <-0.07%> [0.34%]*
OK: 48.01kHz 151.92mA 2 151.78mA <-0.09%> [0.32%]*
OK: 48.01kHz 31.201mA 1 31.180mA <-0.07%> [0.58%]
OK: 100.0kHz 4.4257 A 5 4.4249 A <-0.02%> [0.46%]*
OK: 220.0kHz 268.09mA 4 268.15mA < 0.02%> [1.15%]*
OK: 220.0kHz 268.02mA 3 267.94mA <-0.03%> [0.96%]*
OK: 220.0kHz 150.44mA 2 150.41mA <-0.02%> [0.94%]*
OK: 220.0kHz 33.512mA 1 33.500mA <-0.04%> [1.17%]
OK: 700.1kHz 254.54mA 4 253.21mA <-0.52%> [2.89%]*
OK: 700.1kHz 254.51mA 3 253.25mA <-0.49%> [2.69%]*
OK: 700.1kHz 141.73mA 2 141.08mA <-0.46%> [2.67%]*
OK: 700.1kHz 33.955mA 1 33.854mA <-0.30%> [2.90%]
OK: 1.200MHz 257.31mA 4 254.08mA <-1.25%> [4.69%]*
OK: 1.200MHz 257.30mA 3 254.06mA <-1.26%> [4.49%]*
OK: 1.200MHz 162.14mA 2 160.06mA <-1.28%> [4.46%]*
OK: 1.200MHz 34.346mA 1 33.921mA <-1.24%> [4.69%]
OK: 2.000MHz 239.79mA 4 240.03mA < 0.10%> [7.59%]*

```



CALIBRATION CERTIFICATE

Newton4th Ltd
office@newtons4th.com
www.newtons4th.com

OK: 2.000MHz 239.80mA 3 239.96mA < 0.07%> [7.38%]*
OK: 2.000MHz 140.55mA 2 140.69mA < 0.10%> [7.36%]*
OK: 2.000MHz 29.155mA 1 29.203mA < 0.16%> [7.63%]

Verify external inputs

frequency	applied	ranges	phase 1		phase 2		phase 3		magnitude		phase	
			voltage	current	voltage	current	voltage	current	deviation	spec	deviation	spec
OK: 55.01 Hz	1.3589 V 0.000°	8 8	1.3591 V	1.3592 A -0.000°	1.3591 V -0.000°	1.3592 A -0.000°	1.3589 V 0.000°	1.3591 A -0.000°	< 0.02%>	[0.09%]	<-0.000%>	[0.005%]*
OK: 55.01 Hz	550.86mV 0.000°	7 7	550.92mV	550.94mA -0.000°	550.86mV 0.000°	550.92mA -0.000°	550.81mV -0.000°	550.89mA -0.000°	< 0.01%>	[0.08%]	<-0.000%>	[0.005%]*
OK: 55.01 Hz	164.54mV 0.000°	6 6	164.49mV	164.50mA -0.000°	164.50mV 0.000°	164.51mA -0.000°	164.49mV 0.000°	164.50mA -0.000°	<-0.03%>	[0.08%]	<-0.000%>	[0.005%]*
OK: 55.01 Hz	52.331mV 0.000°	5 5	52.323mV	52.322mA -0.000°	52.318mV -0.000°	52.321mA -0.000°	52.314mV 0.000°	52.319mA -0.000°	<-0.03%>	[0.09%]	<-0.000%>	[0.005%]*
OK: 55.01 Hz	17.436mV 0.000°	4 4	17.433mV	17.432mA -0.001°	17.430mV -0.000°	17.432mA -0.000°	17.429mV -0.000°	17.431mA -0.001°	<-0.04%>	[0.09%]	<-0.001%>	[0.005%]*
OK: 400.1 Hz	1.4315 V 0.000°	8 8	1.4317 V	1.4316 A -0.000°	1.4315 V -0.000°	1.4316 A -0.000°	1.4313 V -0.000°	1.4316 A -0.000°	<-0.02%>	[0.09%]	<-0.000%>	[0.005%]*
OK: 400.1 Hz	580.21mV 0.000°	7 7	580.27mV	580.32mA -0.000°	580.25mV -0.000°	580.31mA -0.000°	580.19mV -0.000°	580.28mA 0.000°	< 0.02%>	[0.08%]	<-0.000%>	[0.005%]*
OK: 400.1 Hz	170.26mV 0.000°	6 6	170.20mV	170.20mA -0.000°	170.20mV -0.000°	170.21mA 0.000°	170.18mV -0.000°	170.20mA -0.000°	<-0.05%>	[0.08%]	<-0.000%>	[0.005%]*
OK: 400.1 Hz	54.146mV 0.000°	5 5	54.136mV	54.136mA 0.000°	54.132mV 0.000°	54.135mA 0.000°	54.128mV 0.000°	54.133mA 0.000°	<-0.03%>	[0.09%]	< 0.000%>	[0.005%]*
OK: 400.1 Hz	18.042mV 0.000°	4 4	18.037mV	18.037mA -0.000°	18.036mV -0.000°	18.037mA -0.000°	18.034mV 0.000°	18.036mA -0.001°	<-0.04%>	[0.08%]	<-0.001%>	[0.005%]*
OK: 8.001kHz	1.3658 V 0.000°	8 8	1.3659 V	1.3659 A -0.000°	1.3659 V -0.000°	1.3659 A -0.000°	1.3657 V -0.000°	1.3659 A -0.000°	< 0.01%>	[0.12%]	<-0.000%>	[0.077%]*
OK: 8.001kHz	615.22mV 0.000°	7 7	615.21mV	615.21mA 0.000°	615.13mV 0.000°	615.20mA -0.000°	615.07mV 0.000°	615.17mA -0.000°	<-0.02%>	[0.11%]	< 0.000%>	[0.077%]*
OK: 8.001kHz	160.47mV 0.000°	6 6	160.41mV	160.41mA -0.000°	160.41mV 0.000°	160.42mA -0.000°	160.40mV 0.000°	160.41mA 0.000°	<-0.04%>	[0.11%]	<-0.000%>	[0.077%]*
OK: 8.001kHz	50.195mV 0.000°	5 5	50.189mV	50.188mA -0.000°	50.184mV -0.000°	50.187mA -0.000°	50.185mV -0.000°	50.185mA -0.000°	<-0.03%>	[0.12%]	<-0.000%>	[0.077%]*
OK: 8.001kHz	16.071mV 0.000°	4 4	16.062mV	16.061mA 0.000°	16.060mV 0.000°	16.061mA 0.001°	16.059mV 0.001°	16.061mA 0.000°	<-0.07%>	[0.12%]	< 0.001%>	[0.077%]*
OK: 48.01kHz	1.3634 V 0.000°	8 8	1.3626 V	1.3625 A -0.001°	1.3624 V 0.000°	1.3625 A -0.001°	1.3623 V 0.000°	1.3625 A -0.000°	<-0.08%>	[0.26%]	<-0.001%>	[0.437%]*
OK: 48.01kHz	614.46mV 0.000°	7 7	614.36mV	614.31mA -0.000°	614.28mV 0.000°	614.31mA -0.001°	614.24mV 0.001°	614.29mA -0.000°	<-0.04%>	[0.25%]	<-0.001%>	[0.437%]*
OK: 48.01kHz	160.10mV 0.000°	6 6	160.00mV	160.00mA -0.000°	159.99mV 0.001°	160.00mA -0.001°	159.99mV 0.000°	159.99mA -0.000°	<-0.07%>	[0.26%]	< 0.001%>	[0.437%]*
OK: 48.01kHz	40.008mV 0.000°	5 5	39.994mV	39.994mA -0.001°	39.990mV 0.001°	39.993mA -0.001°	39.992mV 0.001°	39.992mA -0.001°	<-0.04%>	[0.27%]	<-0.001%>	[0.437%]*
OK: 48.01kHz	12.009mV 0.000°	4 4	11.992mV	11.992mA -0.001°	11.989mV 0.001°	11.991mA -0.002°	11.991mV 0.000°	11.991mA -0.000°	<-0.16%>	[0.28%]	<-0.002%>	[0.437%]*
OK: 220.0kHz	1.3631 V 0.000°	8 8	1.3635 V	1.3634 A -0.004°	1.3634 V 0.000°	1.3634 A -0.004°	1.3634 V -0.001°	1.3634 A -0.003°	< 0.03%>	[0.88%]	<-0.004%>	[1.985%]*
OK: 220.0kHz	613.02mV 0.000°	7 7	613.11mV	613.05mA -0.002°	613.06mV 0.000°	613.05mA -0.005°	613.05mV 0.001°	613.06mA -0.002°	< 0.02%>	[0.87%]	<-0.005%>	[1.985%]*
OK: 220.0kHz	158.92mV 0.000°	6 6	158.92mV	158.94mA -0.003°	158.94mV 0.003°	158.94mA -0.002°	158.94mV -0.000°	158.94mA -0.005°	< 0.02%>	[0.88%]	<-0.005%>	[1.985%]*
OK: 220.0kHz	39.743mV 0.000°	5 5	39.741mV	39.739mA -0.005°	39.737mV 0.002°	39.738mA -0.005°	39.740mV 0.000°	39.738mA -0.005°	<-0.01%>	[0.89%]	<-0.005%>	[1.985%]*
OK: 220.0kHz	11.918mV 0.000°	4 4	11.910mV	11.909mA -0.001°	11.908mV 0.008°	11.909mA -0.003°	11.910mV 0.004°	11.909mA 0.000°	<-0.08%>	[0.90%]	< 0.008%>	[1.985%]*
OK: 700.1kHz	1.3523 V 0.000°	8 8	1.3513 V	1.3505 A 0.001°	1.3513 V -0.003°	1.3513 A -0.010°	1.3507 A 0.003°	1.3507 A 0.003°	<-0.14%>	[2.61%]	<-0.010%>	[6.305%]*
OK: 700.1kHz	606.11mV 0.000°	7 7	606.00mV	605.61mA 0.008°	605.98mV -0.003°	605.65mA -0.018°	606.02mV -0.002°	605.66mA 0.007°	<-0.08%>	[2.60%]	<-0.018%>	[6.305%]*
OK: 700.1kHz	169.53mV 0.000°	6 6	169.48mV	169.37mA 0.004°	169.48mV 0.006°	169.39mA 0.003°	169.49mV -0.005°	169.39mA -0.002°	<-0.09%>	[2.60%]	< 0.006%>	[6.305%]*
OK: 700.1kHz	41.395mV 0.000°	5 5	41.396mV	41.370mA -0.003°	41.397mV -0.002°	41.375mA -0.014°	41.402mV -0.005°	41.374mA -0.006°	<-0.06%>	[2.62%]	<-0.014%>	[6.305%]*
OK: 700.1kHz	12.252mV 0.000°	4 4	12.246mV	12.238mA 0.008°	12.247mV 0.015°	12.240mA -0.007°	12.248mV 0.007°	12.239mA 0.010°	<-0.11%>	[2.63%]	< 0.015%>	[6.305%]*
OK: 1.200MHz	1.3162 V 0.000°	8 8	1.3161 V	1.3153 A -0.006°	1.3158 V 0.003°	1.3154 A -0.016°	1.3160 V -0.016°	1.3154 A -0.011°	<-0.07%>	[4.41%]	<-0.016%>	[10.81%]*
OK: 1.200MHz	590.85mV 0.000°	7 7	590.81mV	590.45mA 0.004°	590.75mV 0.012°	590.48mA -0.019°	590.76mV -0.004°	590.49mA -0.002°	<-0.07%>	[4.40%]	<-0.019%>	[10.81%]*
OK: 1.200MHz	166.62mV 0.000°	6 6	166.62mV	166.52mA -0.001°	166.59mV 0.007°	166.53mA -0.005°	166.61mV -0.010°	166.53mA -0.018°	<-0.06%>	[4.40%]	<-0.018%>	[10.81%]*
OK: 1.200MHz	40.853mV 0.000°	5 5	40.832mV	40.807mA -0.012°	40.829mV 0.005°	40.811mA -0.012°	40.832mV -0.010°	40.808mA -0.024°	<-0.11%>	[4.42%]	<-0.024%>	[10.81%]*
OK: 1.200MHz	11.995mV 0.000°	4 4	11.935mV	11.929mA 0.008°	11.933mV 0.007°	11.928mA -0.028°	11.935mV 0.004°	11.928mA -0.007°	<-0.20%>	[4.43%]	<-0.028%>	[10.81%]*
OK: 2.000MHz	1.2850 V 0.000°	8 8	1.2857 V	1.2854 A -0.026°	1.2856 V 0.010°	1.2853 A 0.004°	1.2855 V -0.008°	1.2854 A -0.035°	< 0.05%>	[7.30%]	<-0.035%>	[18.01%]*
OK: 2.000MHz	582.69mV 0.000°	7 7	583.05mV	582.95mA -0.010°	583.05mV 0.011°	582.93mA 0.001°	583.02mV 0.012°	582.87mA -0.024°	< 0.06%>	[7.28%]	<-0.024%>	[18.01%]*
OK: 2.000MHz	138.90mV 0.000°	6 6	139.01mV	138.96mA -0.023°	139.01mV -0.000°	138.97mA 0.005°	139.01mV -0.006°	138.96mA -0.056°	< 0.08%>	[7.29%]	<-0.056%>	[18.01%]*
OK: 2.000MHz	37.935mV 0.000°	5 5	37.936mV	37.929mA -0.041°	37.942mV -0.006°	37.933mA -0.005°	37.939mV -0.007°	37.922mA -0.063°	<-0.04%>	[7.31%]	<-0.063%>	[18.01%]*
OK: 2.000MHz	12.677mV 0.000°	4 4	12.663mV	12.660mA -0.014°	12.663mV 0.008°	12.659mA -0.017°	12.663mV 0.018°	12.659mA -0.036°	<-0.14%>	[7.30%]	<-0.036%>	[18.01%]*

Verify phase accuracy across ranges

frequency	applied	ranges	A1	V2	A2	V3	A3	deviation	spec
OK: 55.01 Hz	583.17mV 0.000°	7 7	-0.000°	-0.000°	-0.000°	0.000°	-0.000°	<-0.000%>	[0.005%]*
OK: 55.01 Hz	583.16mV 0.000°	7 8	-0.000°	0.000°	-0.000°	0.000°	-0.000°	<-0.000%>	[0.005%]*
OK: 55.01 Hz	583.18mV 0.000°	8 7	-0.000°	-0.000°	-0.000°	-0.000°	-0.000°	<-0.000%>	[0.005%]*
OK: 400.1 Hz	614.25mV 0.000°	7 7	-0.000°	-0.000°	0.000°	-0.000°	-0.000°	<-0.000%>	[0.005%]*
OK: 400.1 Hz	614.27mV 0.000°	7 8	0.000°	-0.000°	0.000°	-0.000°	0.000°	< 0.000%>	[0.005%]*
OK: 400.1 Hz	614.28mV 0.000°	8 7	-0.000°	0.000°	-0.000°	-0.000°	-0.000°	<-0.000%>	[0.005%]*



CALIBRATION CERTIFICATE

Newton's4th Ltd
office@newtons4th.com
www.newtons4th.com

```

OK: 8.001kHz 615.24mV 0.000° 7 7 -0.000° -0.000° -0.000° 0.000° -0.000° <-0.000°> [0.081°]*
OK: 8.001kHz 615.23mV 0.000° 7 8 0.007° 0.000° 0.007° 0.000° 0.007° < 0.007°> [0.081°]*
OK: 8.001kHz 615.22mV 0.000° 8 7 -0.007° 0.000° -0.007° 0.000° -0.007° <-0.007°> [0.081°]*
OK: 48.01kHz 614.41mV 0.000° 7 7 -0.000° 0.000° -0.001° 0.001° 0.000° <-0.001°> [0.461°]*
OK: 48.01kHz 614.41mV 0.000° 7 8 0.038° 0.001° 0.037° 0.001° 0.038° < 0.038°> [0.461°]*
OK: 48.01kHz 614.45mV 0.000° 8 7 -0.039° 0.001° -0.040° 0.000° -0.039° <-0.040°> [0.461°]*
OK: 100.0kHz 613.63mV 0.000° 7 7 -0.001° 0.001° -0.003° 0.001° -0.001° <-0.003°> [0.955°]*
OK: 100.0kHz 613.65mV 0.000° 7 8 0.078° 0.001° 0.077° 0.001° 0.079° < 0.079°> [0.955°]*
OK: 100.0kHz 613.64mV 0.000° 8 7 -0.082° 0.001° -0.084° -0.000° -0.082° <-0.084°> [0.955°]*
OK: 220.0kHz 612.98mV 0.000° 7 7 -0.002° 0.000° -0.005° 0.001° -0.002° <-0.005°> [2.095°]*
OK: 220.0kHz 612.96mV 0.000° 7 8 0.175° 0.001° 0.174° 0.001° 0.175° < 0.175°> [2.095°]*
OK: 220.0kHz 613.00mV 0.000° 8 7 -0.182° 0.002° -0.186° -0.002° -0.183° <-0.186°> [2.095°]*
OK: 700.1kHz 606.10mV 0.000° 7 7 0.007° -0.004° -0.019° -0.003° 0.007° <-0.019°> [6.656°]*
OK: 700.1kHz 606.08mV 0.000° 7 8 0.569° 0.003° 0.559° -0.002° 0.568° < 0.569°> [6.656°]*
OK: 700.1kHz 606.10mV 0.000° 8 7 -0.563° -0.004° -0.588° -0.012° -0.564° <-0.588°> [6.656°]*
OK: 1.200MHz 590.82mV 0.000° 7 7 0.002° 0.011° -0.023° -0.005° -0.003° <-0.023°> [11.41°]*
OK: 1.200MHz 590.82mV 0.000° 7 8 0.960° 0.010° 0.944° -0.005° 0.951° < 0.960°> [11.41°]*
OK: 1.200MHz 590.84mV 0.000° 8 7 -0.955° 0.003° -0.982° -0.010° -0.962° <-0.982°> [11.41°]*
OK: 2.000MHz 552.09mV 0.000° 7 7 -0.013° -0.003° -0.015° 0.004° -0.028° <-0.028°> [19.01°]*
OK: 2.000MHz 552.08mV 0.000° 7 8 1.545° 0.009° 1.576° 0.006° 1.530° < 1.576°> [19.01°]*
OK: 2.000MHz 552.06mV 0.000° 8 7 -1.586° -0.003° -1.595° -0.014° -1.603° <-1.603°> [19.01°]*

```

Verify dc accuracy

	applied	ranges	V1	A1	V2	A2	V3	A3	deviation	spec
OK: DC	1.7451 V	8 8	1.7456 V	1.7455 A	1.7453 V	1.7455 A	1.7452 V	1.7454 A	< 0.03%>	[0.26%]*
OK: DC	-2.0262 V	8 8	-2.0266 V	-2.0263 A	-2.0265 V	-2.0264 A	-2.0261 V	-2.0264 A	< 0.02%>	[0.24%]*
OK: DC	779.40mV	7 7	779.43mV	779.37mA	779.34mV	779.39mA	779.30mV	779.33mA	<-0.01%>	[0.22%]*
OK: DC	-672.18mV	7 7	-672.07mV	-672.17mA	-672.02mV	-672.10mA	-671.88mV	-672.06mA	<-0.04%>	[0.24%]*
OK: DC	156.17mV	6 6	156.19mV	156.20mA	156.17mV	156.17mA	156.16mV	156.16mA	< 0.02%>	[0.28%]*
OK: DC	-226.94mV	6 6	-226.89mV	-226.89mA	-226.93mV	-226.93mA	-226.90mV	-226.91mA	<-0.02%>	[0.22%]*
OK: DC	54.041mV	5 5	54.062mV	54.037mA	54.043mV	54.030mA	54.049mV	54.024mA	< 0.04%>	[0.29%]*
OK: DC	-42.465mV	5 5	-42.415mV	-42.440mA	-42.423mV	-42.450mA	-42.414mV	-42.448mA	<-0.12%>	[0.34%]*
OK: DC	17.141mV	4 4	17.178mV	17.163mA	17.167mV	17.152mA	17.174mV	17.149mA	< 0.21%>	[0.32%]*
OK: DC	-16.892mV	4 4	-16.850mV	-16.863mA	-16.852mV	-16.876mA	-16.847mV	-16.873mA	<-0.27%>	[0.32%]*

NOTES

- Results not marked with * are verified with less than 50% input signal
- Nominal full scale range values:

voltage inputs:	1V	3.16V	10V	31.6V	100V	316V	1kV	3.16kV
current inputs:	100mA	316mA	1A	3.16A	10A	31.6A	100A	316A
external inputs:	1mV	3.16mV	10mV	31.6mV	100mV	314mV	1V	3.16V
- Specification applied is 90% of full published specification

All 299 tests passed