

Keithley 2001 repair - Feature #956

Calibration constants for K2001 units

02/09/2014 03:35 AM - tin

Status:	Closed	Start date:	02/09/2014
Priority:	Normal	Due date:	02/15/2014
Assignee:	tin	% Done:	20%
Category:		Estimated time:	0.00 hour
Target version:			

Description
 Calibration constants from K2001 can be read using GPIB command.
 Table C-2 of 2001-905-01G calibration manual lists the response to the :CAL:PROT:DATA? query. The response is an ASCII string of 99 numbers separated by commas, and is not affected by the FORMAT command. Constants listed in Table C-2 are shown in the order they are sent.

	K2001 #7	K2001 #1		ROM Offset	data format
g1	1.000038E+00	9.997173E-01	RMS gain for 2V, 200V, and 750V AC ranges	0x018	double float IEEE 754
of1	1.533712E-04	-1.583679E-04	RMS offset for 2V, 200V, and 750V AC ranges	0x020	double float IEEE 754
g10	1.000523E+01	1.000293E+01	RMS gain for 200mV and 20V AC ranges	0x028	double float IEEE 754
of10	1.704422E-04	-1.076852E-04	RMS offset for 200mV and 20V AC ranges	0x030	double float IEEE 754
gfwr1	9.999993E-01	9.999961E-01	Average gain for 2V, 200V, and 750V AC ranges	0x038	double float IEEE 754
offwr1	2.698059E-05	-3.915291E-05	Average offset for 2V, 200V, and 750V AC ranges	0x040	double float IEEE 754
gfwr10	1.000433E+01	1.000551E+01	Average gain for 200mV and 20V AC ranges	0x048	double float IEEE 754
offwr10	1.689877E-04	8.726960E-05	Average offset for 200mV and 20V AC ranges	0x050	double float IEEE 754
a100	1.000210E+02	9.998019E+01	100:1 divider attenuation factor	0x058	double float IEEE 754
a500	4.963352E+02	4.962888E+02	500:1 divider attenuation factor	0x060	double float IEEE 754
ofpkpos10	6.097749E-03	1.418733E-02	Positive peak offset for 200mV AC range	0x068	double float IEEE 754
ofpkneg10	1.117921E-02	1.722747E-02	Negative peak offset for 200mV AC range	0x070	double float IEEE 754
ofpk1	4.573312E-03	4.053523E-03	Positive and negative peak offset for 2V, 200V, and 750V AC ranges	0x078	double float IEEE 754
ofpkpos20	6.097749E-03	7.600356E-03	Positive peak offset for 20V AC range	0x080	double float IEEE 754
ofpkneg20	1.117921E-02	7.093666E-03	Negative peak offset for 20V AC range	0x088	double float IEEE 754
div100self	1.125000E+02	1.340000E+02	Self-calibration code for frequency compensation DAC, 100:1 divider	0x090	double float IEEE 754
div500self	9.000000E+01	1.260000E+02	Self-calibration code for frequency compensation DAC, 500:1 divider	0x098	double float IEEE 754
noise10	1.864359E-04	2.238526E-04	Noise factor for 200mV and 20V AC ranges	0x0a0	double float IEEE 754
cf1	1.000331E+00	1.000316E+00	Crest factor correction factor for 2V, 200V, and 750V AC ranges	0x0a8	double float IEEE 754
cf10	1.000021E+00	1.000284E+00	Crest factor correction factor for 200mV and 20V AC ranges	0x0b0	double float IEEE 754
acdclow	1.000346E+00	1.000340E+00	AC-coupled correction factor for 200mV and 2V AC ranges	0x0b8	double float IEEE 754
acdhigh	1.000199E+00	1.000192E+00	AC-coupled correction factor for 20V, 200V, and 750V AC ranges	0x0c0	double float IEEE 754
inputtc	1.081469E-01	1.044814E-01	Input time constant	0x0c8	double float IEEE 754
acdcur	1.000348E+00	1.000487E+00	AC-coupled correction factor for AC current	0x0d0	double float IEEE 754
compval1	1.215000E+02	1.190000E+02	RMS comparator DAC code	0x0d8	double float IEEE 754
div100	1.135000E+02	1.340000E+02	Frequency-compensation DAC code for 20V AC range	0x0e0	double float IEEE 754
div200	1.130000E+02	1.330000E+02	Frequency-compensation DAC code for 200V AC range	0x0e8	double float IEEE 754
div500	9.300000E+01	1.220000E+02	Frequency-compensation DAC code for 750V AC range	0x0f0	double float IEEE 754
div100off	1.000000E+00	0.000000E+00	Frequency-compensation DAC offset for 20V AC range	0x0f8	double float IEEE 754
div200off	5.000000E-01	-1.000000E+00	Frequency compensation DAC offset for 200V AC range	0x100	double float IEEE 754
div500off	3.000000E+00	-4.000000E+00	Frequency compensation DAC offset for 750V AC range	0x108	double float IEEE 754
Check sum		0xA5 0xB4	16-bit summator of cal values 0x18 - 0x108, rotated byte by 4	0x110	2 bytes, 16 bits
dcv[200mV]gain	1.395384E+00	1.385034E+00	200mV DC gain	0x112	double float IEEE

					754
dcv[200mV]offset	-1.541521E-05	-5.612224E-05	200mV DC offset	0x11a	double float IEEE 754
dcv[2V]gain	1.743986E+00	1.730974E+00	2V DC gain	0x122	double float IEEE 754
dcv[2V]offset	-1.732121E-06	-5.877960E-06	2V DC offset	0x12a	double float IEEE 754
dcv[20V]gain	-6.976404E-01	-6.924144E-01	20V DC gain	0x132	double float IEEE 754
dcv[20V]offset	-1.150898E-05	-3.787601E-05	20V DC offset	0x13a	double float IEEE 754
dcv[200V]gain	1.743655E+00	1.730672E+00	200V DC gain	0x142	double float IEEE 754
dcv[200V]offset	-1.008386E-06	2.410488E-06	200V DC offset	0x14a	double float IEEE 754
dcv[1000V]gain	6.975011E-01	6.922715E-01	100V DC gain	0x152	double float IEEE 754
dcv[1000V]offset	5.484389E-04	-1.772726E-03	1000V DC offset	0x15a	double float IEEE 754
dca[200uA]gain	1.396956E+00	1.386757E+00	200ΩA DC gain	0x162	double float IEEE 754
dca[200uA]offset	-1.814614E-05	1.600430E-04	200ΩA DC offset	0x16a	double float IEEE 754
dca[2mA]gain	1.397030E+00	1.386588E+00	2mA DC gain	0x172	double float IEEE 754
dca[2mA]offset	-2.236752E-05	1.604392E-04	2mA DC offset	0x17a	double float IEEE 754
dca[20mA]gain	1.394508E+00	1.384073E+00	20mA DC gain	0x182	double float IEEE 754
dca[20mA]offset	-2.232714E-05	1.601482E-04	20mA DC offset	0x18a	double float IEEE 754
dca[200mA]gain	1.379412E+00	1.370280E+00	200mA DC gain	0x192	double float IEEE 754
dca[200mA]offset	-2.208545E-05	1.585523E-04	200mA DC offset	0x19a	double float IEEE 754
dca[2A]gain	1.394483E+00	1.384269E+00	2A DC gain	0x1a2	double float IEEE 754
dca[2A]offset	-2.232674E-05	1.601709E-04	2A DC offset	0x1aa	double float IEEE 754
ohm2 ²⁰ gain	1.500375E+00	1.516462E+00	2-wire 20Ω gain	0x1b2	double float IEEE 754
ohm2 ²⁰ offset	-9.411514E-03	-1.058161E-02	2-wire 20Ω offset	0x1ba	double float IEEE 754
ohm2 ²⁰⁰ gain	1.430062E+00	1.430543E+00	2-wire 200Ω gain	0x1c2	double float IEEE 754
ohm2 ²⁰⁰ offset	-9.552922E-04	-1.109982E-03	2-wire 200Ω offset	0x1ca	double float IEEE 754
ohm2[2k]gain	1.787328E+00	1.787851E+00	2-wire 2kΩ gain	0x1d2	double float IEEE 754
ohm2[2k]offset	-9.572465E-05	-1.112534E-04	2-wire 2kΩ offset	0x1da	double float IEEE 754
ohm2[20k]gain	1.965853E+00	1.966221E+00	2-wire 20kΩ gain	0x1e2	double float IEEE 754
ohm2[20k]offset	-1.134743E-05	-1.719503E-05	2-wire 20kΩ offset	0x1ea	double float IEEE 754
ohm2[200k]gain	2.479002E+00	2.475204E+00	2-wire 200kΩ gain	0x1f2	double float IEEE 754
ohm2[200k]offset	-3.401631E-06	-9.457002E-06	2-wire 200kΩ offset	0x1fa	double float IEEE 754
ohm2[2M]gain	2.273309E+00	2.272104E+00	2-wire 2MΩ gain	0x202	double float IEEE 754
ohm2[2M]offset	-2.351793E-06	-7.820685E-06	2-wire 2MΩ offset	0x20a	double float IEEE 754
ohm2[20M]gain	2.503775E+00	2.493262E+00	2-wire 20MΩ gain	0x212	double float IEEE 754
ohm2[20M]offset	-2.496137E-06	-8.477018E-06	2-wire 20MΩ offset	0x21a	double float IEEE 754
ohm2[200M]gain	3.925414E+00	3.909291E+00	2-wire 200MΩ gain	0x222	double float IEEE 754
ohm2[200M]offset	1.234136E-02	-4.004449E-02	2-wire 200MΩ offset	0x22a	double float IEEE 754
ohm2[1G]gain	1.570253E+00	1.563722E+00	2-wire 1GΩ gain	0x232	double float IEEE 754
ohm2[1G]offset	1.234442E-03	-4.003584E-03	2-wire 1GΩ offset	0x23a	double float IEEE 754
ohm4 ²⁰ gain	1.500375E+00	1.516462E+00	4-wire 20Ω gain	0x242	double float IEEE 754
ohm4 ²⁰ offset	3.446987E-05	4.566308E-05	4-wire 20Ω offset	0x24a	double float IEEE 754
ohm4 ²⁰⁰ gain	1.430062E+00	1.430543E+00	4-wire 200Ω gain	0x252	double float IEEE 754
ohm4 ²⁰⁰ offset	3.285450E-05	4.307594E-05	4-wire 200Ω offset	0x25a	double float IEEE 754
ohm4[2k]gain	1.787328E+00	1.787851E+00	4-wire 2kΩ gain	0x262	double float IEEE 754
ohm4[2k]offset	3.026024E-06	4.242987E-06	4-wire 2kΩ offset	0x26a	double float IEEE 754
ohm4[20k]gain	1.965853E+00	1.966221E+00	4-wire 20kΩ gain	0x272	double float IEEE 754
ohm4[20k]offset	3.328274E-06	4.666301E-06	4-wire 20kΩ offset	0x27a	double float IEEE 754
ohm4[200k]gain	2.479002E+00	2.475204E+00	4-wire 200kΩ gain	0x282	double float IEEE 754
ohm4[200k]offset	4.197058E-06	5.874237E-06	4-wire 200kΩ offset	0x28a	double float IEEE 754
n7vref	6.976333E-01	6.923925E-01	7V reference value	0x2d2	double float IEEE 754
rollover	9.999967E-01	9.999954E-01	±2V rollover	0x2da	double float IEEE 754
mux4d711	15813	15897	Multiplexer 4-1/2 digit counts (AC peak)	0x2e2	uint32_t
mux4d711p5	8951	9068	Multiplexer 4-1/2 digit counts (AC peak)	0x2e6	uint32_t
mux4d215	12388	12479	Multiplexer 4-1/2 digit counts (AC peak)	0x2ea	uint32_t
mux4d011	29542	29562	Multiplexer 4-1/2 digit counts (AC peak)	0x2ee	uint32_t
mux4d015	29542	29562	Multiplexer 4-1/2 digit counts (AC peak)	0x2f2	uint32_t

mux4d0150	29540	29561	Multiplexer 4-1/2 digit counts (AC peak)	0x2f6	uint32_t
mux4d011p5	29542	29561	Multiplexer 4-1/2 digit counts (AC peak)	0x2fa	uint32_t
mux4dF150	1282	1296	Multiplexer 4-1/2 digit counts (AC peak)	0x2fe	uint32_t
mux4dF15	6456	6461	Multiplexer 4-1/2 digit counts (AC peak)	0x302	float IEEE 754
i20	9.300236E-03	9.133327E-03	20Ω range current source value	0x306	float IEEE 754
i200	9.757503E-04	9.681874E-04	200Ω range current source value	0x30a	float IEEE 754
i2k	9.757503E-04	9.681874E-04	2kΩ range current source value	0x30e	float IEEE 754
i20k	8.871397E-05	8.803561E-05	20kΩ range current source value	0x312	float IEEE 754
i200k	7.035033E-06	6.993260E-06	200kΩ range current source value	0x316	float IEEE 754
i2m	7.671572E-07	7.618376E-07	2MΩ range current source value	0x31a	float IEEE 754
i20m	6.965424E-08	6.942609E-08	20MΩ range current source value	0x31e	float IEEE 754
i200m	4.442807E-09	4.427848E-09	200MΩ range current source value	0x322	float IEEE 754
i1g	4.442807E-09	4.427848E-09	1GΩ range current source value	0x326	float IEEE 754

0x32a offset - 2 bytes - 0x05 0x97

Calibration date - ASCII MM/DD/YY on offset 0x32c - 8 bytes

0x334 offset - 0x00

Next calibration date - ASCII MM/DD/YY on offset 0x335 - 8 bytes

Big endian

History

#1 - 02/09/2014 03:36 AM - tin

- Description updated

#2 - 02/13/2014 07:05 PM - tin

- Description updated

#3 - 12/05/2016 04:04 AM - tin

- Status changed from In Progress to Closed