

Appendix 3

pages 1 - 5

DASY- DOSIMETRIC ASSESSMENT SYSTEM
CALIBRATION REPORT

DATA ACQUISITION ELECTRONICS

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DASY - DOSIMETRIC ASSESSMENT SYSTEM

CALIBRATION REPORT

DATA ACQUISITION ELECTRONICS

MODEL: **DAE2**

SERIAL NUMBER: **213**

This Data Acquisition Unit was calibrated and tested using a FLUKE 702 Process Calibrator. Calibration and verification were performed at an ambient temperature of 23 ± 5 °C and a relative humidity of < 70%.

Measurements were performed using the standard DASY software for converting binary values, offset compensation and noise filtering. Software settings are indicated in the reports.

Results from this calibration relate only to the unit calibrated.

Calibrated by: **M.Bruggmann**

Calibration Date: **15. July 1999**

DASY Software Version: **DASY3 V3.1b**

1a. DC Voltage Measurement (Uncorrected)

DA - Converter Values from DAE

High Range: 1LSB = $6.1\mu\text{V}$, full range = 400 mV

Low Range: 1LSB = 61nV , full range = 4 mV

Software Set-up: Calibration time: 3 sec Measuring time: 3 sec

Setup	X	Y	Z
High Range	400	400	400
Low Range	4	4	4
Connector Position	0°		

High Range	Input	Reading in μV	% Error
Channel X + Input	200mV	200547.9	0.27
	20mV	20055.27	0.28
Channel X - Input	20mV	-20033.57	0.17
Channel Y + Input	200mV	200667.3	0.33
	20mV	20068.99	0.34
Channel Y - Input	20mV	-20053.87	0.27
Channel Z + Input	200mV	200784.2	0.39
	20mV	20080.41	0.40
Channel Z - Input	20mV	-20059.6	0.30

Low Range	Input	Reading in μV	% Error
Channel X + Input	2mV	2003.5	0.18
	0.2mV	200.3993	0.20
Channel X - Input	0.2mV	-200.1245	0.06
Channel Y + Input	2mV	2005.235	0.26
	0.2mV	200.1717	0.09
Channel Y - Input	0.2mV	-200.7442	0.37
Channel Z + Input	2mV	2006.551	0.33
	0.2mV	200.2885	0.14
Channel Z - Input	0.2mV	-201.1353	0.57

1b. DC Voltage Measurement (Corrected, only for DASY3 Systems)

DA - Converter Values from DAE

High Range: 1LSB = $6.1\mu\text{V}$, full range = 400 mV
 Low Range: 1LSB = 61nV , full range = 4 mV

Software Set-up: Calibration time: 3 sec Measuring time: 3 sec

Setup	X	Y	Z
High Range	398.9159773	398.6201318	398.4295847
Low Range	3.99361	3.98857	3.9873
Connector Position	101°		

High Range	Input	Reading in μV	% Error
Channel X + Input	200mV	199995.5	0.00
	20mV	20000.91	0.00
Channel X - Input	20mV	-19991.05	-0.04
Channel Y + Input	200mV	199996.2	0.00
	20mV	20001.45	0.01
Channel Y - Input	20mV	-19992.98	-0.04
Channel Z + Input	200mV	199997.5	0.00
	20mV	20000.91	0.00
Channel Z - Input	20mV	-19992.4	-0.04

Low Range	Input	Reading in μV	% Error
Channel X + Input	2mV	2000.116	0.01
	0.2mV	199.7235	-0.14
Channel X - Input	0.2mV	-199.8753	-0.06
Channel Y + Input	2mV	2000.017	0.00
	0.2mV	199.8119	-0.09
Channel Y - Input	0.2mV	-201.0473	0.52
Channel Z + Input	2mV	2000.26	0.01
	0.2mV	200.1546	0.08
Channel Z - Input	0.2mV	-200.2283	0.11

2. Common mode sensitivity

Software Set-up

Calibration time: 3 sec, Measuring time: 3 sec

Low Range

in μV	Common mode Input Voltage	High Range Reading	Low Range Reading
Channel X	200mV	-2.712976	-3.797071
	- 200mV	2.380407	2.531127
Channel Y	200mV	5.069125	4.02954
	- 200mV	-4.087853	-4.236961
Channel Z	200mV	6.73275	5.42182
	- 200mV	-4.675521	-5.502677

3. Channel separation

Software Set-up

Calibration time: 3 sec, Measuring time: 3 sec

High Range

in μV	Input Voltage	Channel X	Channel Y	Channel Z
Channel X	200mV	-	19.49007	25.63281
Channel Y	200mV	-0.5704527	-	-9.082639
Channel Z	200mV	15.55403	23.71565	-

4. AD-Converter Values with inputs shorted

in LSB	Low Range	High Range
Channel X	15182.99	16413.62
Channel Y	17023.7	16436.12
Channel Z	15787.7	16419.82

5. Input Offset Measurement

Measured after 15 min warm-up time of the Data Acquisition Electronic.
Every Measurement is preceded by a calibration cycle.

Software set-up:

Calibration time: 3 sec
Measuring time: 3 sec
Number of measurements: 100, Low Range

Input 10M Ω

in μ V	Average	min. Offset	max. Offset	Std. Deviation
Channel X	-0.09856	-1.1852	0.754046	0.333138
Channel Y	-0.41017	-1.94325	1.017659	0.37614
Channel Z	-0.04725	-1.01081	0.733325	0.341546

Input shorted

in μ V	Average	min. Offset	max. Offset	Std. Deviation
Channel X	-0.00122	-1.183	1.283425	0.335181
Channel Y	-0.01798	-0.85224	0.610244	0.323221
Channel Z	0.030578	-0.974	0.595501	0.279175

6. Input Offset Current

in fA	Input Offset Current
Channel X	< 100
Channel Y	< 100
Channel Z	< 100

7. Input Resistance

	Calibrating	Measuring
Channel X	199.6 k Ω	20.2 M Ω
Channel Y	199.7 k Ω	20.2 M Ω
Channel Z	199.2 k Ω	20.2 M Ω

8. Low Battery Alarm Voltage

in V	Alarm Level
Supply (+ Vcc)	5.34 V
Supply (- Vcc)	-5.58 V

9. Power Consumption

in mA	Switched off	Stand by	Transmitting
Digital Supply (VCC)	0.011	4.72	12.2
Analog Supply (+ Vcc)	0.003	9.89	9.94
Analog Supply (- Vcc)	0.1	-9.7	-9.8

10. Functional test

Touch async pulse 1	ok
Touch async pulse 2	na
Touch status bit 1	ok
Touch status bit 2	na
Remote power off	ok
Remote analog Power control	ok

Date: 15. 7. 99

Signature: M. Ruggmann