

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland

Client

CALIBRATION CERTIFICATE

Object(s) **DAE3 - SN:558**

Calibration procedure(s) **QA CAL-06 v2
Calibration procedure for the data acquisition unit (DAE)**

Calibration date: **March 07, 2003**

Condition of the calibrated item **In Tolerance (according to the specific calibration document)**

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 International standard.

All calibrations have been conducted in the closed laboratory facility; environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01	Sep-03

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bornhoff	R&D Director	

Date issued: March 07, 2003

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

1. DC Voltage Measurement

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	405.010098	404.9037428	405.0817835
Low Range	3.972	3.95185	3.96828
Connector Position	86 °		

High Range	Input	Reading in μV	% Error
Channel X + Input	200mV	200000	0.00
	20mV	20003.4	0.02
Channel X - Input	20mV	-19993	-0.04
Channel Y + Input	200mV	200001	0.00
	20mV	20002.7	0.01
Channel Y - Input	20mV	-19993	-0.04
Channel Z + Input	200mV	200000	0.00
	20mV	20000.8	0.00
Channel Z - Input	20mV	-19997.7	-0.01

Low Range	Input	Reading in μV	% Error
Channel X + Input	2mV	2000.2	0.01
	0.2mV	200.04	0.02
Channel X - Input	0.2mV	-200.81	0.41
Channel Y + Input	2mV	2000.1	0.00
	0.2mV	199.47	-0.27
Channel Y - Input	0.2mV	-201.01	0.50
Channel Z + Input	2mV	1999.9	0.00
	0.2mV	198.68	-0.66
Channel Z - Input	0.2mV	-201.1	0.55

2. Common mode sensitivity

Software Set-up

Calibration time: 3 sec, Measuring time: 3 sec

High/Low Range

in μV	Common mode Input Voltage	High Range Reading	Low Range Reading
Channel X	200mV	-1.0284	-1.5716
	- 200mV	3.9204	1.3725
Channel Y	200mV	6.7686	5.874
	- 200mV	-6.8145	-8.0898
Channel Z	200mV	2.1943	2.766
	- 200mV	-2.52	-4.6218

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	-	0.88082	0.19177
Channel Y	200mV	0.049124	-	0.25676
Channel Z	200mV	-2.1226	-0.89508	-

4. AD-Converter Values with inputs shorted

in LSB	Low Range	High Range
Channel X	16492	16236
Channel Y	16307	15690
Channel Z	16461	16033

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	-0.52	-1.64	0.60	0.43
Channel Y	-2.05	-3.65	0.06	0.51
Channel Z	-0.34	-2.05	0.43	0.37

Input shorted

in μ V	Average	min. Offset	max. Offset	Std. Deviation
Channel X	0.04	-0.84	1.09	0.41
Channel Y	-0.77	-2.08	0.17	0.40
Channel Z	-1.01	-1.68	-0.38	0.24

6. Input Offset Current

in fA	Input Offset Current
Channel X	< 25
Channel Y	< 25
Channel Z	< 25

7. Input Resistance

	Calibrating	Measuring
Channel X	200 k Ω	200 M Ω
Channel Y	200 k Ω	200 M Ω
Channel Z	200 k Ω	200 M Ω

8. Low Battery Alarm Voltage

in V	Alarm Level
Supply (+ Vcc)	7.66 V
Supply (- Vcc)	-7.53 V

9. Power Consumption

in mA	Switched off	Stand by	Transmitting
Supply (+ Vcc)	0.000	5.83	14.1
Supply (- Vcc)	-0.011	-7.86	-9.13

10. Functional test

Touch async pulse 1	ok
Touch async pulse 2	ok
Touch status bit 1	ok
Touch status bit 2	ok
Remote power off	ok
Remote analog Power control	ok
Modification Status	B – C