



D4: DAE SN: 510

IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply utmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration Customer shall remove the batteries and pack the DAE in an antistatic bag. The packaging shall protect the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

Important Note:

Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:

Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Client **Auden ADT**

CALIBRATION CERTIFICATE

Object(s) **DAE3 - SD 000 D03 AA - SN: 510**

Calibration procedure(s) **QA CAL-06.v7
Calibration procedure for the data acquisition unit (DAE)**

Calibration date: **17.08.2004**



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 | 8-Sep-03 | Sep-04 |

| | Name | Function | Signature |
|----------------|-----------------------|--------------|---|
| Calibrated by: | Philipp Storchenegger | Technician |  |
| Approved by: | Fin Bomholt | R&D Director |  |

Date issued: 17.08.2004

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

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X | Y | Z |
|----------------------------|----------------|---------|---------|
| High Range | 403.405 | 403.470 | 403.844 |
| Low Range | 3.95588 | 3.93301 | 3.95923 |
| Connector Angle to be used | in DASY System | | 43 ° |

| High Range | Input (μ V) | Reading (μ V) | Error (%) |
|-------------------|------------------|--------------------|-----------|
| Channel X + Input | 200000 | 199999.5 | 0.00 |
| Channel X + Input | 20000 | 20004.1 | 0.02 |
| Channel X - Input | 20000 | -19988.8 | -0.06 |
| Channel Y + Input | 200000 | 199999.9 | 0.00 |
| Channel Y + Input | 20000 | 19999.3 | 0.00 |
| Channel Y - Input | 20000 | -19993.8 | -0.03 |
| Channel Z + Input | 200000 | 199999.6 | 0.00 |
| Channel Z + Input | 20000 | 20005.6 | 0.03 |
| Channel Z - Input | 20000 | -19995.4 | -0.02 |

| Low Range | Input (μ V) | Reading (μ V) | Error (%) |
|-------------------|------------------|--------------------|-----------|
| Channel X + Input | 2000 | 1999.96 | 0.00 |
| Channel X + Input | 200 | 200.00 | 0.00 |
| Channel X - Input | 200 | -200.34 | 0.17 |
| Channel Y + Input | 2000 | 2000.03 | 0.00 |
| Channel Y + Input | 200 | 199.39 | -0.31 |
| Channel Y - Input | 200 | -200.81 | 0.41 |
| Channel Z + Input | 2000 | 2000.07 | 0.00 |
| Channel Z + Input | 200 | 199.29 | -0.36 |
| Channel Z - Input | 200 | -201.07 | 0.53 |

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Common mode Input Voltage (mV) | High Range Reading (μ V) | Low Range Reading (μ V) |
|-----------|--------------------------------|-------------------------------|------------------------------|
| Channel X | 200 | 17.42 | 16.88 |
| | - 200 | -17.00 | -17.10 |
| Channel Y | 200 | 14.86 | 14.26 |
| | - 200 | -15.53 | -16.14 |
| Channel Z | 200 | -8.63 | -8.44 |
| | - 200 | 7.15 | 7.51 |

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200 | - | 2.45 | 1.22 |
| Channel Y | 200 | 0.25 | - | 4.38 |
| Channel Z | 200 | -1.29 | 0.37 | - |

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 15983 | 16854 |
| Channel Y | 16210 | 16793 |
| Channel Z | 16173 | 16131 |

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|-----------|---------------------------|-------------------------------|-------------------------------|----------------------------------|
| Channel X | 0.46 | -0.28 | 1.02 | 0.27 |
| Channel Y | -1.06 | -1.87 | -0.38 | 0.25 |
| Channel Z | -0.15 | -1.01 | 0.88 | 0.36 |

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance

| | Zeroing (MOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 0.2001 | 201.3 |
| Channel Y | 0.2001 | 199.6 |
| Channel Z | 0.2001 | 200.7 |

8. Low Battery Alarm Voltage

| typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9 |
| Supply (- Vcc) | -7.6 |

9. Power Consumption

| typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.0 | +6 | +14 |
| Supply (- Vcc) | -0.01 | -8 | -9 |