



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
 - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
 - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
 - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
 - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
 - *Power consumption:* Typical value for information. Supply currents in various operating modes.

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	403.907 $\pm$ 0.02% (k=2)	404.058 $\pm$ 0.02% (k=2)	404.320 $\pm$ 0.02% (k=2)
Low Range	4.00192 $\pm$ 1.50% (k=2)	4.00376 $\pm$ 1.50% (k=2)	4.00126 $\pm$ 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	188.5 ° $\pm$ 1 °
---	-------------------

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	199993.80	0.18	0.00
Channel X + Input	20003.16	0.95	0.00
Channel X - Input	-19998.97	2.12	-0.01
Channel Y + Input	199993.80	0.41	0.00
Channel Y + Input	20001.19	-0.90	-0.00
Channel Y - Input	-20001.44	-0.25	0.00
Channel Z + Input	199994.01	0.83	0.00
Channel Z + Input	20000.77	-1.25	-0.01
Channel Z - Input	-20001.85	-0.47	0.00

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2002.99	1.51	0.08
Channel X + Input	201.79	-0.04	-0.02
Channel X - Input	-197.88	0.15	-0.08
Channel Y + Input	2002.59	1.25	0.06
Channel Y + Input	201.55	-0.14	-0.07
Channel Y - Input	-198.81	-0.55	0.28
Channel Z + Input	2002.23	1.06	0.05
Channel Z + Input	201.34	-0.14	-0.07
Channel Z - Input	-199.65	-1.30	0.66

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-11.16	-12.57
	- 200	14.01	12.75
Channel Y	200	-6.70	-6.70
	- 200	4.83	5.20
Channel Z	200	-29.15	-29.14
	- 200	27.31	26.83

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	-	-0.05	-2.68
Channel Y	200	5.14	-	0.62
Channel Z	200	9.10	3.46	-

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	16102	14798
Channel Y	16148	16324
Channel Z	16191	17054

5. Input Offset Measurement

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

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	0.06	-1.80	1.14	0.48
Channel Y	-0.21	-1.23	0.76	0.41
Channel Z	-1.25	-3.10	-0.02	0.48

6. Input Offset Current

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

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

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

9. Power Consumption (Typical values for information)

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