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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 $\mu$ 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	405.212 $\pm$ 0.02% (k=2)	405.495 $\pm$ 0.02% (k=2)	404.992 $\pm$ 0.02% (k=2)
Low Range	4.00132 $\pm$ 1.50% (k=2)	4.00055 $\pm$ 1.50% (k=2)	4.01173 $\pm$ 1.50% (k=2)

## Connector Angle

Connector Angle to be used in DASY system	316.5 $^{\circ}$ $\pm$ 1 $^{\circ}$
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## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

High Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	200030.95	-10.22	-0.01
Channel X + Input	20006.14	0.69	0.00
Channel X - Input	-20003.24	2.19	-0.01
Channel Y + Input	200030.42	-10.80	-0.01
Channel Y + Input	20003.36	-1.94	-0.01
Channel Y - Input	-20006.62	-1.11	0.01
Channel Z + Input	200032.70	-0.21	-0.00
Channel Z + Input	20002.68	-2.63	-0.01
Channel Z - Input	-20006.13	-0.53	0.00

Low Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	2001.20	-0.10	-0.01
Channel X + Input	200.69	-0.63	-0.31
Channel X - Input	-198.00	0.79	-0.40
Channel Y + Input	2001.03	-0.13	-0.01
Channel Y + Input	200.67	-0.54	-0.27
Channel Y - Input	-199.46	-0.59	0.30
Channel Z + Input	2001.23	0.11	0.01
Channel Z + Input	200.07	-1.08	-0.54
Channel Z - Input	-199.93	-0.98	0.49

### 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 ( $\mu\text{V}$ )	Low Range Average Reading ( $\mu\text{V}$ )
Channel X	200	0.85	-1.33
	- 200	2.39	0.51
Channel Y	200	20.36	19.83
	- 200	-23.04	-22.89
Channel Z	200	-19.87	-20.86
	- 200	19.46	19.34

### 3. Channel separation

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

	Input Voltage (mV)	Channel X ( $\mu\text{V}$ )	Channel Y ( $\mu\text{V}$ )	Channel Z ( $\mu\text{V}$ )
Channel X	200	-	2.15	-3.05
Channel Y	200	6.25	-	4.13
Channel Z	200	7.88	3.65	-



#### 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	16193	15359
Channel Y	15873	13390
Channel Z	16219	17704

#### 5. Input Offset Measurement

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

Input 10M $\Omega$

	Average ( $\mu$ V)	min. Offset ( $\mu$ V)	max. Offset ( $\mu$ V)	Std. Deviation ( $\mu$ V)
Channel X	0.28	-0.85	1.34	0.49
Channel Y	-1.28	-2.53	0.12	0.49
Channel Z	-0.63	-2.60	0.79	0.52

#### 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