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

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SWISS CALIBRATION

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Sporton (Auden)**

Certificate No: **DAE3-577_Nov08**

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 577
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	November 12, 2008
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	30-Sep-08 (No: 7673)	Sep-09
Keithley Multimeter Type 2001	SN: 0810278	30-Sep-08 (No: 7670)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	06-Jun-08 (in house check)	In house check: Jun-09

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	i.V.

Issued: November 12, 2008

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Accreditation No.: **SCS 108**

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:* 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.

Certificate No: DAE3-577_Nov08   Page 2 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1µV ,	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	404.437 ± 0.1% (k=2)	403.882 ± 0.1% (k=2)	404.321 ± 0.1% (k=2)
Low Range	3.93985 ± 0.7% (k=2)	3.94699 ± 0.7% (k=2)	3.94542 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	268 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Input (µV)	Reading (µV)	Error (%)
Channel X	+ Input	200000	200000.5	0.00
Channel X	+ Input	20000	20006.28	0.03
Channel X	- Input	20000	-19997.96	-0.01
Channel Y	+ Input	200000	199999.8	0.00
Channel Y	+ Input	20000	20003.35	0.02
Channel Y	- Input	20000	-20003.31	0.02
Channel Z	+ Input	200000	200000.3	0.00
Channel Z	+ Input	20000	20006.28	0.03
Channel Z	- Input	20000	-19999.42	0.00

Low Range		Input (µV)	Reading (µV)	Error (%)
Channel X	+ Input	2000	2000	0.00
Channel X	+ Input	200	200.64	0.32
Channel X	- Input	200	-199.61	-0.19
Channel Y	+ Input	2000	2000	0.00
Channel Y	+ Input	200	199.39	-0.31
Channel Y	- Input	200	-201.03	0.52
Channel Z	+ Input	2000	2000	0.00
Channel Z	+ Input	200	199.42	-0.29
Channel Z	- Input	200	-200.73	0.36

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	13.38	13.83
	- 200	-13.53	-13.82
Channel Y	200	-5.55	-6.09
	- 200	5.06	5.66
Channel Z	200	-1.00	-0.72
	- 200	-0.80	-0.52

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	-	1.66	0.50
Channel Y	200	1.90	-	3.95
Channel Z	200	-0.95	0.48	-

Certificate No: DAE3-577_Nov08   Page 4 of 5

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	15967	16080
Channel Y	15851	16385
Channel Z	16197	16100

5. Input Offset Measurement

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

Input 10MΩ

	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	1.13	-1.22	2.29	0.58
Channel Y	-1.51	-2.99	0.83	0.52
Channel Z	0.02	-0.89	0.92	0.38

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	198.6
Channel Y	0.2001	199.4
Channel Z	0.2000	198.8

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

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

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Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **DAE4-679_May08**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BA - SN: 679
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	May 21, 2008
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	04-Oct-07 (No: 6467)	Oct-08
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-07 (No: 6465)	Oct-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	25-Jun-07 (in house check)	In house check: Jun-08

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	D. Steffen
Approved by:	Fin Bomholt	R&D Director	F. Bomholt

Issued: May 21, 2008

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Accreditation No.: **SCS 108**

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:* 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.

Certificate No: DAE4-679_May08   Page 2 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1µV ,	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	404.509 ± 0.1% (k=2)	404.928 ± 0.1% (k=2)	405.207 ± 0.1% (k=2)
Low Range	3.98477 ± 0.7% (k=2)	3.94731 ± 0.7% (k=2)	3.98878 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	316 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	200000	199999.5	0.00
Channel X	+ Input	20000	20003.57	0.02
Channel X	- Input	20000	-19999.29	0.00
Channel Y	+ Input	200000	199999.4	0.00
Channel Y	+ Input	20000	20003.45	0.02
Channel Y	- Input	20000	-20004.32	0.02
Channel Z	+ Input	200000	199999.8	0.00
Channel Z	+ Input	20000	20002.50	0.01
Channel Z	- Input	20000	-20004.27	0.02

Low Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	2000	2000	0.00
Channel X	+ Input	200	200.27	0.13
Channel X	- Input	200	-199.47	-0.27
Channel Y	+ Input	2000	1999.9	0.00
Channel Y	+ Input	200	199.26	-0.37
Channel Y	- Input	200	-199.82	-0.09
Channel Z	+ Input	2000	2000	0.00
Channel Z	+ Input	200	199.19	-0.41
Channel Z	- Input	200	-200.77	0.39

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	4.20	4.06
	- 200	-2.14	-1.85
Channel Y	200	6.39	6.01
	- 200	-6.03	-5.79
Channel Z	200	-4.80	-5.16
	- 200	4.08	4.80

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	-	1.42	0.07
Channel Y	200	1.22	-	3.06
Channel Z	200	-1.13	1.08	-

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	16182	17365
Channel Y	15398	16603
Channel Z	16047	16211

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	1.05	-1.09	2.60	0.50
Channel Y	-0.43	-2.28	1.41	0.66
Channel Z	-0.33	-2.83	1.40	0.56

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	198.9
Channel Y	0.2000	197.7
Channel Z	0.1999	196.5

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

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

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Accreditation No.: **SCS 108**

Client **Sporton (Auden)**

Certificate No: **DAE4-778_Sep08**

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BG - SN: 778
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	September 22, 2008
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	04-Oct-07 (No: 6467)	Oct-08
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-07 (No: 6465)	Oct-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	06-Jun-08 (in house check)	In house check: Jun-09

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: September 22, 2008

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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.

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  - *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:* 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.

Certificate No: DAE4-778_Sep08   Page 2 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	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	404.686 ± 0.1% (k=2)	403.490 ± 0.1% (k=2)	405.045 ± 0.1% (k=2)
Low Range	3.99455 ± 0.7% (k=2)	3.96369 ± 0.7% (k=2)	3.99417 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	309 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Input (µV)	Reading (µV)	Error (%)
Channel X	+ Input	200000	200000.3	0.00
Channel X	+ Input	20000	20004.24	0.02
Channel X	- Input	20000	-20002.46	0.01
Channel Y	+ Input	200000	200000.4	0.00
Channel Y	+ Input	20000	20002.60	0.01
Channel Y	- Input	20000	-20002.26	0.01
Channel Z	+ Input	200000	200000.6	0.00
Channel Z	+ Input	20000	20000.78	0.00
Channel Z	- Input	20000	-20005.75	0.03

Low Range		Input (µV)	Reading (µV)	Error (%)
Channel X	+ Input	2000	2000	0.00
Channel X	+ Input	200	199.37	-0.31
Channel X	- Input	200	-200.28	0.14
Channel Y	+ Input	2000	2000	0.00
Channel Y	+ Input	200	199.63	-0.19
Channel Y	- Input	200	-200.88	0.44
Channel Z	+ Input	2000	2000.1	0.00
Channel Z	+ Input	200	198.60	-0.70
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 Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-7.46	-6.40
	- 200	10.00	6.86
Channel Y	200	-2.73	-2.45
	- 200	0.84	0.43
Channel Z	200	-10.91	-10.94
	- 200	7.89	8.22

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	-	3.08	-1.34
Channel Y	200	1.18	-	4.64
Channel Z	200	-1.74	1.44	-

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	16048	16021
Channel Y	16167	15166
Channel Z	16416	15977

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.13	-0.88	0.92	0.33
Channel Y	-0.88	-2.47	0.72	0.55
Channel Z	-1.16	-2.17	-0.19	0.42

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	201.1
Channel Y	0.2000	201.0
Channel Z	0.2001	201.7

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

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

Appendix D - Product Photos
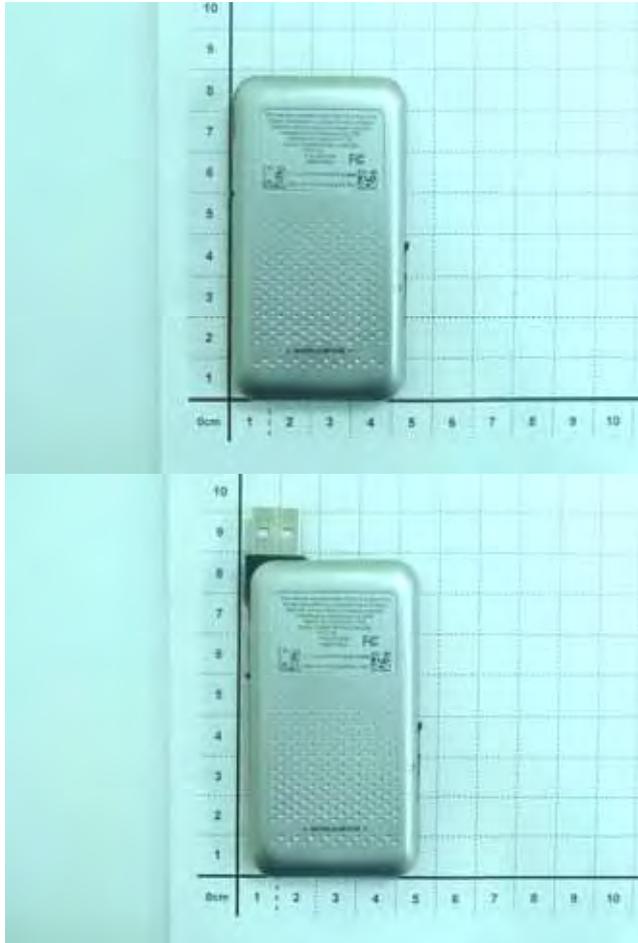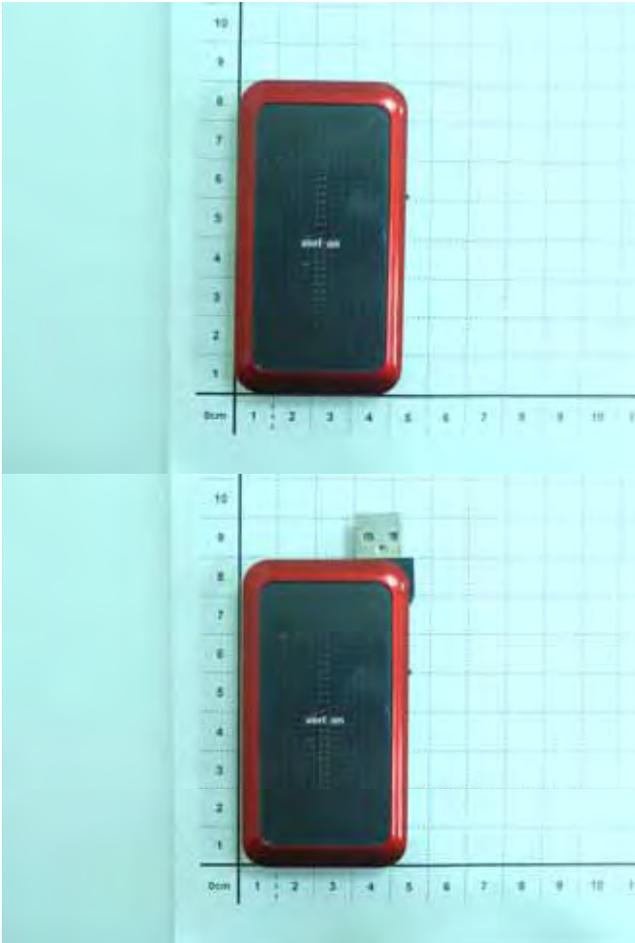
Appendix E - Test Setup Photos

Horizontal Up in Straight Mode

Vertical Front in Straight Mode

Note: The separation distance from DUT to phantom is 5 mm for all test position.

Horizontal Down in Straight Mode

Vertical Back in Straight Mode

Note: The separation distance from DUT to phantom is 5 mm for all test position.
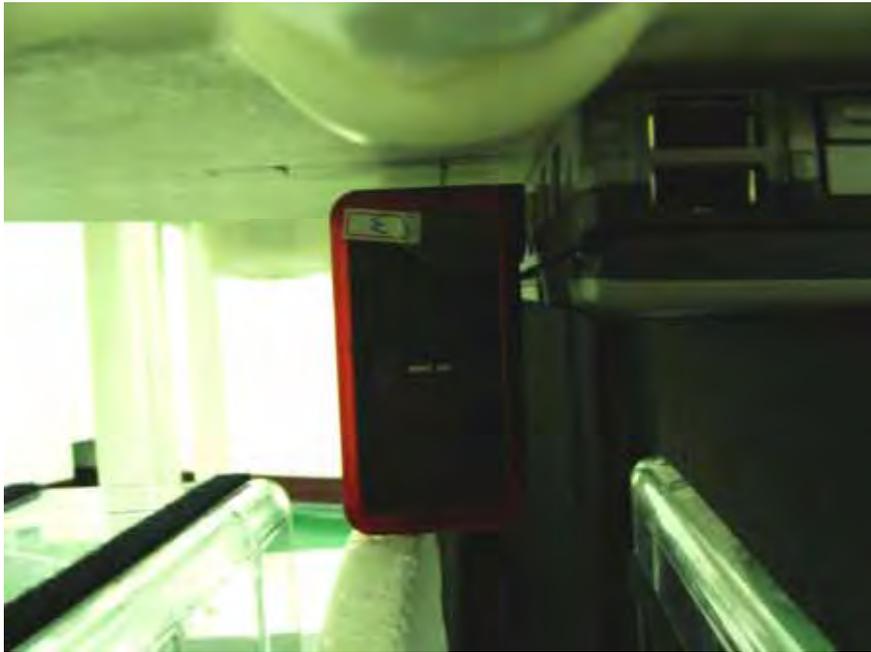
Vertical Back in Vertical Mode

Vertical Front in Vertical Mode

Note: The separation distance from DUT to phantom is 5 mm for all test position.

Horizontal Down in Straight Mode for Back-Off SAR

Note: The separation distance from DUT to phantom is 10 mm for Back-Off SAR test.

Appendix F - FCC 3G SAR Measurement Procedures

Conducted Output Power:

The PBA is fulfilled. The EUT was tested according to the requirements of the FCC 3G procedures and the TS 34.121. The EUT's WCDMA and HSPA function is Release 6 version supporting HSDPA Category 8, and HSUPA Category 5. A detailed analysis of the output power for all WCDMA, HSPDA, and HSPA (HSUPA&HSDPA) modes is provided in the tables below. According to the FCC 3G procedures, handsets with both HSDPA and HSUPA should be tested according to Release 6 HSPA test procedures, and the EUT does not support VOIP function over the HSPA function. Device was tested according to procedure KDB941225 - section Release 6 HSPA Data Devices as documented/evaluated in the following table. Power values for HSPA are less than ¼ dB higher than the basic 12.2 kbps RMC configurations in WCDMA.

WCDMA SAR Test mode - Conducted Power							
Mode	**Setup**	**Cell band (850)**			**PCS band (1900)**		
		CH4132	**CH4182**	**CH4233**	**CH9262**	**CH9400**	**CH9538**
		826.4 (MHz)	**836.4 (MHz)**	**846.6 (MHz)**	**1852.4 (MHz)**	**1880.0 (MHz)**	**1907.6 (MHz)**
R99- WCDMA	**RMC 12.2Kbps**	24.28	24.08	24.08	20.78	20.74	20.57
R5-HSDPA	**HSDPA - subtest 1**	24.15	24.07	23.98	20.90	20.76	20.78
	HSDPA - subtest 2	23.59	23.33	23.44	20.88	20.71	20.73
	HSDPA - subtest 3	23.60	23.45	23.36	20.43	20.27	20.24
	HSDPA - subtest 4	23.45	23.27	23.20	20.38	20.24	20.26
R6- HSPA (HSUPA&HSDPA)	**HSUPA - subtest 1**	23.88	23.78	23.70	20.49	20.52	20.24
	HSUPA - subtest 2	21.53	21.46	21.36	18.45	18.54	18.18
	HSUPA - subtest 3	22.58	22.38	22.33	19.43	19.51	19.26
	HSUPA - subtest 4	22.16	21.85	21.82	18.49	18.58	18.24
	HSUPA - subtest 5	23.81	23.75	23.74	20.48	20.50	20.18

The EUT was tested according to the requirements of the FCC 3G procedures and the 3.1.2.3.4.
A detailed analysis of the output power verification is provided as the table below:

| Function Type | Reverse Traffic Channel | Test Mode | Radio Configuration | | Service Option | Data Rates (kbps) | Power Control | Low Ch | Midd Ch | High Ch |
			Forward Traffic Channel (Fwd)	Reverse Traffic Channel (Rvs)				1013	334	777
CDMA2000 Cellular	FCH	1	1	1	55	Full	All Up	24.46	24.27	24.45
		3	3	3	55	Full	All Up	24.47	24.22	24.44
	FCH+SCH	3	3	3	32	FCH:Full,SCH 9.6	All Up	23.63	23.42	23.72
	EVDO Rev.0*	Subtype:0				UL:9.6	All Up	24.41	24.24	24.35
	EVDO Rev.0*	Subtype:0				UL:38.4	All Up	24.36	24.17	24.33
	EVDO Rev.0*	Subtype:0				UL:153.6	All Up	24.33	24.07	24.14
	EVDO Rev.A*	Subtype:0				RETAP_128Kbps	All Up	24.57	24.44	24.58
	EVDO Rev.A*	Subtype:0				RETAP_2048Kbps	All Up	24.61	24.37	24.45
	EVDO Rev.A*	Subtype:0				RETAP_12288Kbps	All Up	24.42	24.48	24.55

| Function Type | Reverse Traffic Channel | Test Mode | Radio Configuration | | Service Option | Data Rates (kbps) | Power Control | Low Ch | Midd Ch | High Ch |
			Forward Traffic Channel (Fwd)	Reverse Traffic Channel (Rvs)				25	600	1175
CDMA2000 PCS	FCH	1	1	1	55	Full	All Up	18.01	16.34	17.86
		3	3	3	55	Full	All Up	17.86	16.16	17.83
	FCH+SCH	3	3	3	32	FCH:Full,SCH 9.6	All Up	17.83	16.02	17.87
	EVDO Rev.0*	Subtype:0				UL:9.6	All Up	18.37	16.32	18.42
	EVDO Rev.0*	Subtype:0				UL:38.4	All Up	18.18	16.25	18.15
	EVDO Rev.0*	Subtype:0				UL:153.6	All Up	17.74	16.02	17.73
	EVDO Rev.A*	Subtype:0				RETAP_128Kbps	All Up	18.59	16.53	18.64
	EVDO Rev.A*	Subtype:0				RETAP_2048Kbps	All Up	18.54	16.61	18.57
	EVDO Rev.A*	Subtype:0				RETAP_12288Kbps	All Up	18.31	16.27	18.47

WCDMA Setup Configuration:
    a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
    b. The RF path losses were compensated into the measurements.
    c. A call was established between EUT and Base Station with following setting
        i. Data rates: Varied from RMC 12.2Kbps.
        ii. RMC Test Loop=Loop Mode 1
        iii. Power Ctrl Mode= All Up bits.
    d. The transmitted maximum output power was recorded.

```
+-------------------------------------------------+
|  +------------------+                           |
|  |    Wireless      |                           |
|  | Communication    |                  +------+ |
|  |   Test  Set      |                  |      | |
|  |              ◎---+----------------◎-+ EUT  | |
|  |     RF  IN       |                  +------+ |
|  +------------------+                           |
+-------------------------------------------------+
```
Setup Configuration
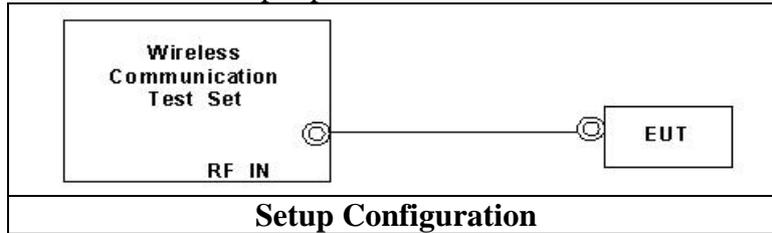
HSDPA Setup Configuration:
    a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
    b. The RF path losses were compensated into the measurements.
    c. A call was established between EUT and Base Station with following setting:
        i. Set Gain Factors(βc, and βd) and parameters were set according to each
        ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121.
        iii. Set RMC12.2Kbps + HSDPA mode.
        iv. Set Cell Power = -86 dBm
        v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
        vi. Select HSDPA Uplink Parameters.
        vii. Set DeltaACK , DeltaNACK and DeltaCQI =8.
        viii. Set Ack-Nack Repetition Factor to 3
        ix. Set CQI Feedback Cycle (k) to 4 ms
        x. Set CQI Repetition Factor to 2 .
        xi. Power Ctrl Mode= All Up bits.
    d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSPA (HSUPA & HSPDA) Setup Configuration:
a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
  i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  ii. Set the Gain Factors (βc, and βd) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121.
  iii. Set Cell Power = -86 dBm
  iv. Set Channel Type = 12.2k + HSPA
  v. Set UE Target Power
  vi. Power Ctrl Mode= Alternating bits.
  vii. Set and observe the E-TFCI
  viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtests' E-TFCI.
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide " HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18"

```
                        Call Setup Screen
Call Control      Active Cell Operating Mode          Call Parms
                                                      Cell Power
 Channel                  UE Information
(UARFCN) Info     IMSI:                                 -86.00
                  IMEI:                               dBm/3.84 MHz
                  Power Class:                        Channel Type
   Cell                                               12.2k + HSPA
 Parameters  ▽
                  UE Expected Open Loop Transmit Power
                  Initial PRACH TX Power:   -11.70 dBm  Paging Service
 Generator        Initial DPCCH TX Power:    -0.56 dBm   RB Test Mode
   Info
                  Uplink Parameters          Value
 Uplink           PRACH Preambles             64    ↑     HSPA
 Parameters  ▽    PRACH Ramping Cycles(MMAX)   2         Parameters
                  Available Subchannels (Bit Mask) 000000000001
  UE Rep          Uplink DPCH Scrambling Code  0       34.121 Preset
  Meas            Uplink DPCH Bc/Bd Control  Manual    Call Configs ▽
                  Manual Uplink DPCH Bc       11
  Close           Manual Uplink DPCH Bd       15         Channel
  Menu            Maximum Uplink Transmit Power Level 21 dBm (UARFCN) Parms
                        Active Cell       Sys Type: UTRA FDD
                           Idle
 2 of 4                    IntRef Offset              1 of 3
```

Example for HSPA Subtest 1, and other subtests following table, C11.1.3
(Gain Factors (βc = 11 and βd = 15))

```
                        Call Setup Screen
Call Control      Active Cell Operating Mode        Serving Grant
                                                      AG Mode
 Additional               UE Information             Single Shot
  Screens         IMSI:
                  IMEI:
                  Power Class:                      Single Shot AG
   Cell                                             20: (119/15)^2
 Parameters  ▽
                  UE Expected Open Loop Transmit Power
                  Initial PRACH TX Power:   -11.70 dBm
 Generator        Initial DPCCH TX Power:    -0.56 dBm  Send Single Shot
   Info                                                Absolute Grant
                       Call Processing Status
                  Current Service Type:  None
 Uplink           MM Status:      Abs Single Shot AG    Send Relative
 Parameters  ▽    GMM State:     Index 15: (67/15)^2 ↑   Grant Up
                  Current DPCH   Index 16: (75/15)^2
  UE Rep              HSUPA In   Index 17: (84/15)^2 Information Send Relative
  Meas            UE Rep E-DCH   Index 18: (95/15)^2 DSCH Cat:  ----  Grant Down
                  Last Received  Index 19: (106/15)^2  Ratio:  ---- %
Trig Output Setup Throughput:    Index 20: (119/15)^2 ↓  ---- kbps  Return
Sys Frame Clock   ACKs Transmitt                     smitted:  ----
                        Active Cell       Sys Type: UTRA FDD
                           Idle
 2 of 4                    IntRef Offset              1 of 2
```

Example: AG – Index = 20 for HSPA subtest 1

```
                          Call Setup Screen
┌──────────────┬──────────────────────────────────┬──────────────────┐
│ Screen Ctrl  │   Recorded E-TFCI Information     │  E-TFCI Record   │
├──────────────┤                                   ├──────────────────┤
│   Channel    │                                   │ E-TFCI Rec Count │
│ (UARFCN) Info│ ┌──────────────────────────────┐  │        15        │
│              │ │    E-TFCI Recording State    │  │                  │
│              │ │            Idle              │  │                  │
│    HSPA      │ └──────────────────────────────┘  │ Start Recording  │
│ Information  │ ┌──────────────────────────────┐  │  E-TFCI Values   │
│              │ │    Recorded E-TFCI Values    │  │                  │
│E-TFCI Recording│  1: 75  11: 75  21:----  31:----  41:----          │
│  Information │ │  2: 75  12: 75  22:----  32:----  42:----          │
│              │ │  3: 75  13: 75  23:----  33:----  43:----          │
│              │ │  4: 75  14: 75  24:----  34:----  44:----          │
│              │ │  5: 75  15: 75  25:----  35:----  45:----          │
│              │ │  6: 75  16:----  26:----  36:----  46:----  Send Step Up│
│              │ │  7: 75  17:----  27:----  37:----  47:----  TPC Bit Pattern│
│              │ │  8: 75  18:----  28:----  38:----  48:----          │
│    Clear     │ │  9: 75  19:----  29:----  39:----  49:----  Send Step Down│
│   UE Info    │ │ 10: 75  20:----  30:----  40:----  50:----  TPC Bit Pattern│
│              │ │                              │                    │
│   Return     │ │            15/15             │  │     Return       │
└──────────────┤ └──────────────────────────────┘  ├──────────────────┘
               │ ⊟ Background │Active Cell│      │Sys Type: UTRA FDD│
               │              │ Connected │                         │
               │              │   │IntRef│Offset│                   │
```

Example: Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1

CDMA2000 Setup Configuration:

Setup Configuration
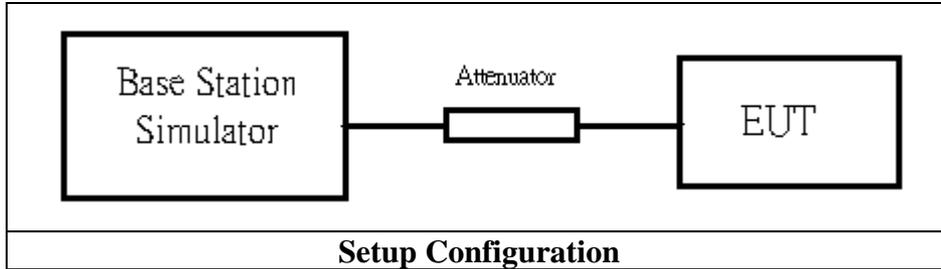
2. The EUT was connected to Base Station, Agilent 8960.
   Refer to the drawing of Setup Configuration.
3. The RF path losses were compensated into the measurements.
4. A call was established between EUT and Bsae Station with following setting:
   a. Set the test mode1 and test mode 3.
   b. Set the Power control All Up for (FCH) and (FCH+SCH).
5. The transmitted maximum output power was recorded.

Test Mode 1 in Radio Configuration 1 (FCH)

Test Mode 3 in Radio Configuration 3 (Service Option32)

1xEV-DO setting with RTAP 153.6kbps

Reference:

[1] 941225 D01 SAR test for 3G devices v02, SAR Measurement Procedures for 3G Devices CDMA 2000/Ev-Do/WCDMA/HSDPA/HSPA Oct. 2007 Laboratory Division Office of Engineering and Technology Federal Communications Commission

[2.] TS 34.121 Universal Mobile Telecommunications System (UMTS); Terminal Conformance Specification, Radio Transmission and Reception (FDD)

[3.] HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18

[4.] 3.1.2.3.4 Maximum RF Output Power 3GPP2 C.S0033-0 Version 2.0, Date: 12 December 2003 Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal