

Client : **WSCT**

Certificate No: **24J02Z000415**

CALIBRATION CERTIFICATE

Object **DAE4 - SN: 1495**

Calibration Procedure(s) **FF-Z11-002-01**
Calibration Procedure for the Data Acquisition Electronics (DAEx)

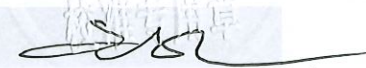
Calibration date: **July 24, 2024**

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	11-Jun-24 (CTTL, No.24J02X005147)	Jun-25

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Jun	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: August 01, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2117
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

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 report provide only calibration results for DAE, it does not contain other performance test results.



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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	404.380 $\pm$ 0.15% (k=2)	404.618 $\pm$ 0.15% (k=2)	404.873 $\pm$ 0.15% (k=2)
Low Range	3.96611 $\pm$ 0.7% (k=2)	3.97363 $\pm$ 0.7% (k=2)	3.99493 $\pm$ 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	109° $\pm$ 1 °
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Tune up procedure

Tune up procedure shall be over the power range or at specific operating power levels.

1. It must provide an operational voltage (3.5 ~ 4.35V DC) to turn on the device and on one certain channel in service mode by means of company proprietary software.
2. . The Base station simulator measures this device for their specific RF characteristics.
3. The maximum gains of each individual device are adjusted until the target value met.

RF average conduct power range:

► 1.1 Wi-Fi(2.4G MAIN ANT1)

Output power of range:

802.11b Max output power = 17.00 ± 1.0 dbm
802.11g Max output power = 20.00 ± 1.0 dbm
802.11n (HT20) Max output power = 19.50 ± 1.0 dbm
802.11n (HT40) Max output power = 19.00 ± 1.0 dbm
802.11ax20 Max output power = 19.00 ± 1.0 dbm
802.11ax40) Max output power = 19.50 ± 1.0 dbm

► 1.2 Wi-Fi(2.4G AUX ANT2)

802.11b Max output power = 19.00 ± 1.0 dbm
802.11g Max output power = 22.00 ± 1.0 dbm
802.11n (HT20) Max output power = 21.00 ± 1.0 dbm
802.11n (HT40) Max output power = 21.50 ± 1.0 dbm
802.11ax20 Max output power = 21.00 ± 1.0 dbm
802.11ax40) Max output power = 21.50 ± 1.0 dbm

► 1.3 Wi-Fi(2.4G MIMO Mode)

802.11n (HT20) Max output power = 23.50 ± 1.0 dbm
802.11n (HT40) Max output power = 23.50 ± 1.0 dbm
802.11ax20 Max output power = 23.00 ± 1.0 dbm
802.11ax40) Max output power = 23.50 ± 1.0 dbm

► 1.4 Wi-Fi(5G)

U-NII-1

Ant 1 802.11a Max output power = 21.00 ± 1.0 dbm

Ant 2 802.11a Max output power = 17.50 ± 1.0 dbm

MIMO 802.11n (HT40) Max output power = 22.50 ± 1.0 dbm

U-NII-2a

Ant 1 802.11n (HT40) Max output power = 20.50 ± 1.0 dbm

Ant 2 802.11a Max output power = 18.00 ± 1.0 dbm

MIMO 802.11n (HT40) Max output power = 22.00 ± 1.0 dbm

U-NII-2c

Ant 1 802.11a Max output power = 20.00 ± 1.0 dbm

Ant 2 802.11a Max output power = 17.50 ± 1.0 dbm

MIMO 802.11n (HT40) Max output power = 21.50 ± 1.0 dbm

U-NII-3

Ant 1 802.11ac(VHT80) Max output power = 22.00 ± 1.0 dbm

Ant 2 802.11a Max output power = 17.00 ± 1.0 dbm

MIMO 802.11ac(VHT80) Max output power = 22.50 ± 1.0 dbm

► 1.5 WIFI6E

U-NII-5

Ant 1 802.11ax-HE20 Max output power = 13.00 ± 1.0 dbm

Ant 2 802.11ax-HE80 Max output power = 18.50 ± 1.0 dbm

MIMO 802.11ax-HE80 Max output power = 19.00 ± 1.0 dbm

U-NII-6

Ant 1 802.11ax-HE40 Max output power = 10.50 ± 1.0 dbm

Ant 2 802.11ax-HE80 Max output power = 18.50 ± 1.0 dbm

MIMO 802.11ax-HE80 Max output power = 19.00 ± 1.0 dbm

U-NII-7

Ant 1 802.11ax-HE40 Max output power = 11.50 ± 1.0 dbm

Ant 2 802.11ax-HE40 Max output power = 18.50 ± 1.0 dbm

MIMO 802.11ax-HE40 Max output power = 19.00 ± 1.0 dbm

U-NII-8

Ant 1 802.11ax-HE40 Max output power = 10.00 ± 1.0 dbm

Ant 2 802.11ax-HE40 Max output power = 18.00 ± 1.0 dbm

MIMO 802.11ax-HE40 Max output power = 19.00 ± 1.0 dbm

► 1.6 BT

GFSK mode Max output power = 10.00 ± 1.0 dbm

Pi/4DQPSK mode Max output power = 10.00 ± 1.0 dbm

8DPSK mode Max output power = 10.00 ± 1.0 dbm

► 1.4 BLE

1Mbps Power Max output power $= -3.00 \pm 1.0 \text{ dbm}$

2Mbps Power Max output power $= -3.00 \pm 1.0 \text{ dbm}$

Then these appropriate gain settings are stored in each device individually. The user has no possibility to change these settings later on, and during manufacturing each device will be individual calibrated. The measurement is done in fully calibrated setup, which is based on the base station simulator. Furthermore, the highest power level is verified afterwards measurement on three channels (low, middle and high)