RF TEST REPORT

Product Name: Quantum Connectivity Gateway

Model Name: QCG

FCC ID: 2BNDS-QCG

Issued For : Steelwrist AB

Titangatan 9, 17592 Rosersberg, Sweden

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

Report Number:	LGT24L181HA02
Sample Received Date:	Dec. 25, 2024
Date of Test:	Dec. 25, 2024 ~ Mar. 31, 2025
Date of Issue:	Mar. 31, 2025

TEST REPORT CERTIFICATION

Applicant:	Steelwrist AB
Address:	Titangatan 9, 17592 Rosersberg, Sweden
Manufacturer:	Steelwrist AB
Address:	Titangatan 9, 17592 Rosersberg, Sweden
Product Name:	Quantum Connectivity Gateway
Trademark:	Steelwrist
Model Name:	QCG
Sample Status:	Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR §2.1091 KDB 447498 D01 General RF Exposure Guidance v06	PASS

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Revision History

Rev.	Issue Date	Revisions
00	Mar. 31, 2025	Initial Issue

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	Quantum Connectivity Gateway	
Trademark:	Steelwrist	
Model Name:	QCG	
Series Model:	N/A	
Model Difference:	N/A	
Frequency Bands:	Bluetooth	2402~2480 MHz
	Cat-M	Band 2:1850~1910MHz Band 4:1710~1755MHz Band 12: 699-716MHz
Rating:	Input: DC 12~24V	
Hardware Version:	09	
Software Version:	N/A	

1.2 TEST LABORATORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate:	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.
Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)
Limits for Occupational / controlled Exposures			
0.3-3.0	614	1.63	*(100)
3.0-30	1842/f	4.89/f	*($900/f^2$)
30-300	61.4	0.163	1.0
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
0.3-1.34	614	1.63	*(100)
1.34-30	824/f	2.19/f	*($180/f^2$)
30-300	27.5	0.073	0.2
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

* = Plane-wave equivalent power density.

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

2.3 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

2.5 TEST RESULT

Turn up Result

Mode	Turn up Power
LTE CAT-M B2	21±1dBm
LTE CAT-M LTE B4	21.5±1dBm
LTE CAT-M LTE B12	21.5±1dBm
BLE-GFSK	3±1dBm
BLE-GFSK	8±1dBm

The MPE result of worst mode:

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Duty cycle factor	Max Power (dBm)	Max Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/cm²)	Ratio
LTE	707.5	22.5	0	22.5	177.83	2.6	1.82	0.064	0.472	0.136

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Max Turn up Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/cm²)	Ratio	Result
BLE J1	2480	4.00	2.51	0.22	1.05	0.001	1	0.001	Pass
BLE J7	2480	9.00	7.94	-1.72	0.67	0.001	1	0.001	Pass

Multiple transmission:

0.472+0.001+0.001 =0.474＜1

Note:

1. The Maximum Power Density is less than the limit, complies with the exemption requirements.

APPENDIX I - PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Note: Please see LGT24L181EM02_APPENDIX II.

※※※※※END OF THE REPORT※※※※※