

RF Exposure Report

Project Number: 4793973

Proposal Number: SUW-202105000972

Report Number: 4793973EMC02

Revision Level: 0

Client: Mueller Systems, LLC.

Equipment Under Test: Smart Hydrant with BG95 4G LTE Module

Model: Smart Hydrant

FCC ID: 2AXKR-SH-GW-V1

Applicable Standards: 47 C.F.R. §§ 2.1091


FCC KDB 447498 D01 General RF Exposure Guidance v06

FCC OET Bulletin 65

Test Result: Compliant

Report Date: 10 September 2021

Tested by:


Brandon Osborn, Project Engineer

Reviewed by:



Stephen Whalen, SAR/EMC Manager

Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

TABLE OF CONTENTS

1	GENERAL INFORMATION	3
1.1	CLIENT INFORMATION	3
1.1	TEST LABORATORY	3
1.2	GENERAL INFORMATION OF EUT	3
1.3	OPERATING MODES AND CONDITIONS	3
2	RF EXPOSURE	4
2.1	TEST RESULT.....	4
2.2	TEST METHOD.....	4
2.3	SINGLE TRANSMISSION RF EXPOSURE LEVELS (mW/cm ²)	4
2.4	SIMULTANEOUS TRANSMISSION.....	4
3	REVISION HISTORY	5

1 General Information

1.1 Client Information

Name: Mueller Systems, LLC.
Address: 1200 Abernathy Rd NE, Suite 1200
City, State, Zip, Country: Atlanta, GA 30328, USA

1.1 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
Type of lab: Testing Laboratory
Certificate Number: 3212.01

1.2 General Information of EUT

Type of Product: LTE and BLE apparatus for hydrants
FCC ID: 2AXKR-SH-GW-V1
Model Number: Smart Hydrant
Serial Number: Not provided

BLE Frequency Range: 2402 – 2480 MHz
LTE Frequency Range: 1850 – 1910 MHz (LTE Band 2)
1710 – 1755 MHz (LTE Band 4)
699 – 716 MHz (LTE Band 12)
777 – 787 MHz (LTE Band 13)
814 – 849 MHz (LTE Band 5/26)
BLE Modulation: Bluetooth Low Energy – GFSK (1Mbps, 2Mbps)
BLE Antenna: Potted Integrated trace on PCB / 4.3 dBi (max)
LTE Antenna: AVX Ethertronics P822601 FR4 Embedded / 2.6-4.4dBi

Sample Received Date: 07 July 2021

1.3 Operating Modes and Conditions

Maximum power levels were utilized for all calculations. Simultaneous transmission is possible with one LTE band and BLE.

2 RF Exposure

2.1 Test Result

Test Description	Product Specific Standard	Test Result
RF Exposure	FCC Part 1.1310	Compliant

2.2 Test Method

Using the maximum power (including tune-up tolerances), the power density was calculated. Maximum antenna gain was assumed for this exercise.

2.3 Single transmission RF Exposure Levels (mW/cm²)

Band of Operation		Conducted Power w/tolerance dBm	Antenna Gain	Cable Loss	Average EIRP		Distance (R) cm	Power Density EIRP _{avg} /(4πR ²) mW/cm ²	FCC mW/cm ²	% of Limit	Verdict
Type	MHz				dBm	mW					
LTE Band 2	1850-1910	25.0	4.4	0.1	29.3	851	20	0.169	1.00	17%	Pass
LTE Band 4	1710-1755	25.0	4.0	0.1	28.9	776	20	0.154	1.00	15%	Pass
LTE Band 12	699-716	25.0	2.6	0.1	27.6	569	20	0.113	0.47	24%	Pass
LTE Band 13	777-787	25.0	3.0	0.1	28.0	624	20	0.124	0.52	24%	Pass
LTE Band 26	814-849	25.0	3.3	0.1	28.3	668	20	0.133	0.55	24%	Pass
Bluetooth	2400-2483.5	2.4	4.3	0.1	6.6	5	20	0.001	1.00	0%	Pass

2.4 Simultaneous transmission

Based on this design only one LTE Band can transmit at the same time as BLE. Band 26 has the highest percentage of the allowed limit.

Band 26 is 24% + BLE is 0%, totaling 24% of the allowed FCC Exposure limit. Based on the RF exposure table in Section 2.3.

3 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	10 September 2021