

# Test Report

***Electromagnetic Compatibility (EMC)***



## TESTS ACCORDING TO FCC PART 15B REQUIREMENTS

Equipment Under Test: Temperature Logger

Type / Model: Logmore 2

Customer:  
Logmore Oy  
Vasarakatu 22  
FI-40320 Jyväskylä  
FINLAND

Manufacturer:  
Logmore Oy  
Vasarakatu 22  
FI-40320 Jyväskylä  
FINLAND

FCC Rule Part: FCC CFR 47 Part 15 Subpart B (2018), Class B

Date: 31 July 2019

Issued by: 

Rauno Repo  
Senior EMC/RF Specialist

Date: 31 July 2019

Checked by: 

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Development Engineer

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## **GENERAL REMARKS**

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**RELEASE HISTORY**

<b>Version</b>	<b>Changes</b>	<b>Issued</b>
1.0	Initial release	31 July 2019

## PRODUCT DESCRIPTION

## Equipment Under Test (EUT)

## Temperature logger

Type: Logmore 2  
Serial number: 10010  
HW version: 1.0  
SW version: 1.0

## Description of the EUT

The QR code on the screen changes automatically when a new measurement is saved. This technology syncs history data from the sensors by scanning the QR code with any device (such as your iOS or Android smartphone or a Laser Scanner).

Uploading the data takes less than a second. Combined with cloud service removes the need for manually compiling data from data logger devices.

The highest operation frequency is 25 MHz.

## Type of the EUT

The EUT was tested as a tabletop unit.

## Power Requirements

Rated voltage: Battery operated 3.3 V  
Rated frequency: DC

## Mechanical Dimensions

Height: 6 mm      Length: 47.2 mm      Width: 44.5 mm

## Cable Lengths and Types

- None

## Peripherals

- None

**TEST CONDITIONS****EUT Test Conditions during Testing**

Configuration of the EUT was made to correspond to the actual assembling conditions as far as possible. The EUT was performing continuous temperature logging operation.



**Figure 1.** Test setup diagram. The EUT is a battery-operated device without any cables.

**SUMMARY OF TESTING**

Test Specification	Description of Test	Result
§15.107	Conducted Emissions	N/A <sup>1)</sup>
§15.109	Radiated Emissions (Class B)	<b>PASS</b>

<sup>1)</sup> The EUT is a battery powered device.

**Test Facility**

Testing Laboratory / address: FCC registration number: <b>904175</b>	SGS Fimko Ltd Särkinenmentie 3 FI-00210, HELSINKI FINLAND
Test Site:	<input type="checkbox"/> K10LAB, ISED Canada registration number: <b>8708A-1</b> <input checked="" type="checkbox"/> K5LAB, ISED Canada registration number: <b>8708A-2</b> <input type="checkbox"/> L3LAB <input type="checkbox"/> T10LAB

**TEST RESULTS****Radiated Emissions In The Frequency Range 30 MHz to 1000 MHz**

<b>Standard:</b>	ANSI C63.4	(2014)
<b>Tested by:</b>	RRE	
<b>Date:</b>	13 March 2019	
<b>Temperature:</b>	23 ± 3 °C	
<b>Humidity:</b>	30 - 60 % RH	
<b>Barometric pressure:</b>	860 - 1060 hPa	
<b>Measurement uncertainty:</b>	± 4.5 dB	Level of confidence 95 % (k = 2).

**FCC Rule: 15.107 (a), 15.109(a)****Test plan**

Radiated electric field strength was measured from 30 MHz to 1 GHz in a semi-anechoic chamber. Measurements were done with a resolution bandwidth of 120 kHz. The preview measurements were done with a peak detector and the final measurements with a quasi-peak detector. The EUT was placed on a table 0.8 meters above the ground plane.

X, Y, Z axes orientations were determined, the worst case orientation (Y) was measured.

The measuring distance between EUT and the receiving antenna was 3 meters.

The EUT was working as described in the section "EUT Test Conditions During Testing".

**Radiated measurement settings:****Preliminary testing (30 to 1000 MHz):**

<b>Turntable movement:</b>	20 ° step
<b>Turntable position:</b>	0 ° to 360°
<b>Antenna movement:</b>	1.5 m step
<b>Antenna height:</b>	1.0 m to 4.0 m
<b>Antenna polarization:</b>	Vertical and horizontal

**Final testing (30 to 1000 MHz):**

<b>Turntable movement:</b>	Continuous
<b>Turntable position:</b>	0° to 360°
<b>Antenna movement:</b>	Continuous
<b>Antenna height:</b>	1.0 m to 4.0 m
<b>Antenna polarization:</b>	Vertical and horizontal

## Test results

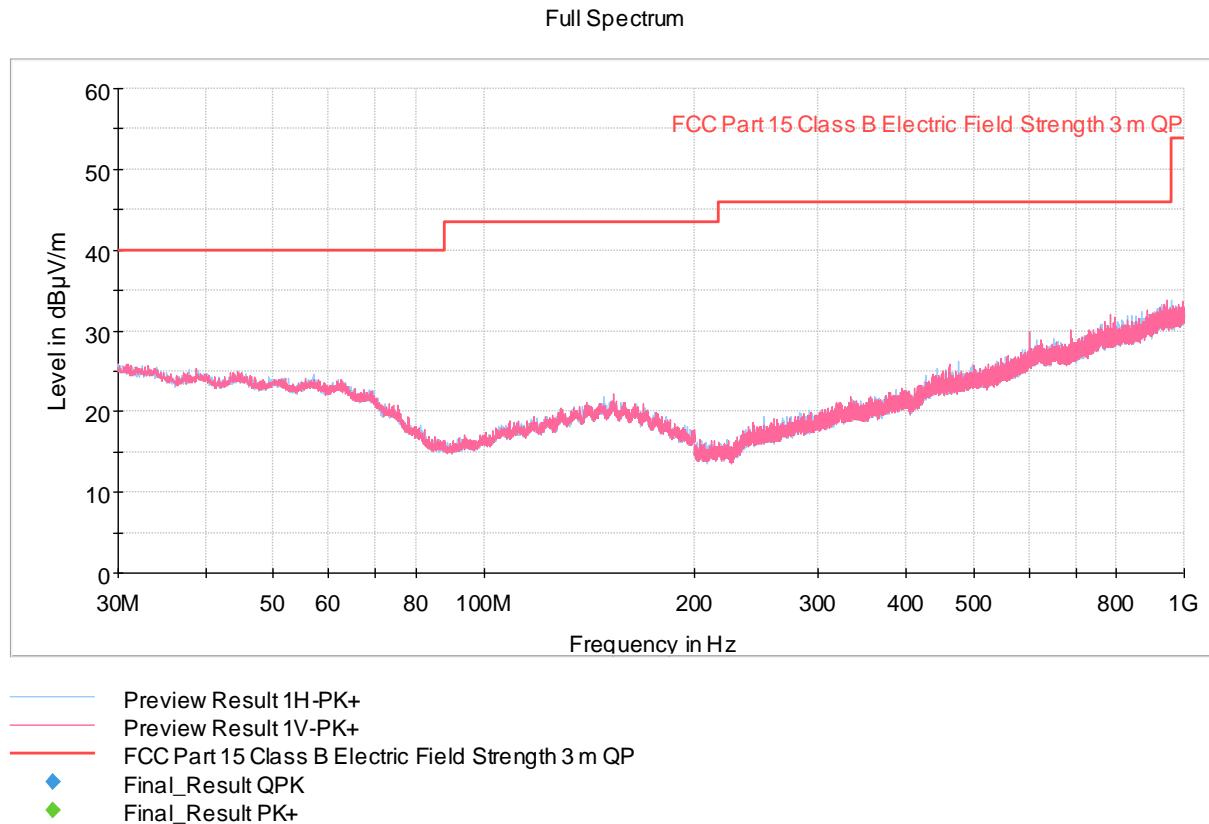


Figure 2. Measured curve with peak-detector

Table 1: Quasi-peak measurement from the worst frequencies

Frequency (MHz)	QuasiP (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.030000	23.8	1000.0	120.000	400.0	V	75.0	16.9	16.2	40.0
38.820000	22.7	1000.0	120.000	250.0	V	255.0	16.9	17.3	40.0
43.710000	22.9	1000.0	120.000	100.0	V	45.0	17.6	17.1	40.0
50.550000	22.7	1000.0	120.000	400.0	V	15.0	17.8	17.3	40.0
57.000000	22.3	1000.0	120.000	400.0	V	195.0	17.8	17.7	40.0
62.190000	22.3	1000.0	120.000	400.0	V	285.0	17.5	17.7	40.0

Correction factor (dB) in the final result tables contains the sum of the transducers (antenna + amplifier + cables).

QuasiPeak values are measured values corrected with the correction factor.

**TEST EQUIPMENT****Radiated Emissions**

Equipment	Manufacturer	Type	Inv or serial	Prev Calib	Next Calib
TURNTABLE	MATURO	DS430 UPGRADED	inv:10182	-	-
MAST & TURNTABLE CONTROLLER	MATURO	NCD	inv:10183	-	-
ANTENNA MAST	MATURO	TAM 4.0E	inv:10181	-	-
ATTENUATOR	PASTERNACK	PE 7004-4	inv:10126	2017-12-30	2019-12-30
TEST SOFTWARE	ROHDE & SCHWARZ	EMC-32	-	-	-
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW26	inv:10679	2018-06-26	2019-06-26
ANTENNA	SCHWARZBECK	VULB 9168, 30-2000MHz	inv:8911	2018-10-25	2020-10-25