

MPE test report

According to the standard:
CFR 47 FCC PART 15

Equipment under test:
Single Depth Soil Moisture Probe

FCC ID: 2AVO4-SDXXNAK

Company:

SENSOTERRA

Distribution: Mr PRIOUL

(Company: KERLINK)

Number of pages: 6

Ed.	Date	Modified Page(s)	Technical Verification and Quality Approval	
			Name and Function	Visa
0	19-Dec-19	Creation	T. LEDRESSEUR, Radio Technician	

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DESIGNATION OF PRODUCT: Single Depth Soil Moisture Probe

Serial number (S/N): Sample 1: 9000000B (Radiated tests)
Sample 2: 9000000C (Conducted tests)

Reference / model (P/N): SD30AS-1

Software version: lpiot-refdes-1.5.4.

MANUFACTURER: SENSOTERRA
Science Park 106
1098XG Amsterdam
The Netherlands

COMPANY SUBMITTING THE PRODUCT:

Company: KERLINK

Address: 1, rue Jacqueline Auriol
35235 THORIGNE-FOUILLARD
FRANCE

Responsible: Mr Prioul

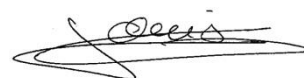
Person(s) present during the tests: Mr Prioul (The first day)

DATES OF TEST: From 16-Dec-19 to 18-Dec-19

TESTING LOCATION: EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE
FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677

TESTED BY: S. LOUIS

VISA:



WRITTEN BY: S. LOUIS

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1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **Single Depth Soil Moisture Probe**, in accordance with normative reference.

The device under test integrates LoRa part.

2. PRODUCT DESCRIPTION

Class: B

Utilization: Residential

Antenna type and gain: integral metallic PIFA antenna / 3 dBi

Power adjusted by software: The power level is tuned to reach max power (22dBm)

Operating frequency band: From 902 MHz to 928 MHz

Power source: 3.6Vdc Lithium Battery

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

Hybrid System:

Frequency tested: 902.3 MHz, 908.7 MHz, 914.9 MHz for transmission
923.3 MHz, 925.1 MHz, 927.5 MHz for reception

Frequencies plan detailed transmitter:

Channel frequencies	LoRa bandwidth (KHz)	Number of channel	Channel width (KHz)
902,3+i*0,2MHz (i=0 à 63)	125	64	200

Frequencies plan detailed receiver:

Channel frequencies	LoRa bandwidth (KHz)	Number of channel	Channel width (KHz)
923,3+i*0.6MHz (i=0 à 7)	500	8	600

Number of channels: 64

Channel spacing: 200 kHz

Modulation: LoRa with spread factor: 7 and 10

DTS System:

Frequency tested: 903 MHz, 907.8 MHz, 914.2 MHz for transmission
923.3 MHz, 925.1 MHz, 927.5 MHz for reception

Frequencies plan detailed transmitter:

Channel frequencies	LoRa bandwidth (KHz)	Number of channel	Channel width (KHz)
$903+i*1,6\text{MHz}$ ($i=0$ à 7)	500	8	600

Frequencies plan detailed receiver:

Channel frequencies	LoRa bandwidth (KHz)	Number of channel	Channel width (KHz)
$923,3+i*0.6\text{MHz}$ ($i=0$ à 7)	500	8	600

Number of channels: 8

Channel spacing: 600 kHz

Modulation: LoRa with spread factor: 7 and 12

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.

They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 (2018) Radio Frequency Devices

ANSI C63.10 2013
Procedures for Compliance Testing of Unlicensed Wireless Devices.

447498 D01 General RF Exposure Guidance v06 RF Exposure procedures and equipment authorization policies for mobile and portable equipment

OET BULLETIN 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

4. RF EXPOSURE

Maximum measured power = 0.162mW at 907.8 MHz

with $P = (E \times d)^2 / (30 \times G_p)$ with $d = 3 \text{ m}$ and $G_p = 2$

In accordance with KDB 447498 D01 General RF Exposure Guidance v06:

$$PSD = EIRP / (4 \times \pi \times R^2)$$

$$\Rightarrow 163 / (4 \times \pi \times (20 \text{ cm})^2) = 0.032 \text{ mW/cm}^2 \text{ (limit = } 0.61 \text{ mW/cm}^2)$$

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.