LCIE SUD EST
Laboratoire de Moirans
Z.I. Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS - FRANCE

GENERAL INFORMATION

FCCID: **2AIUF-MAST001**

1.1. Product description

PRODUCT	FLOW MASTER
MODEL	MAST001
FCCID	2AUIF- MAST001

ITK Flow Master Description

The ITK Flow Master is the dedicated device used to receive measured data from the Flow sensor* devices.

A single Flow Master comes with an external antenna that should be placed outdoor at 16 feets above ground and can manage until 30 Flow sensors.

The Flow Master is physically connected to a gateway over an UART link through a USB port. It is up to the gateway to recover the data packets sent by the Flow Master and to interpret them into an embedded application software.

* The ITK Flow sensor has been designed for drip irrigation systems of watered crops. Its purpose is to measure the total **amount of water** served on a drip line during an irrigation phase

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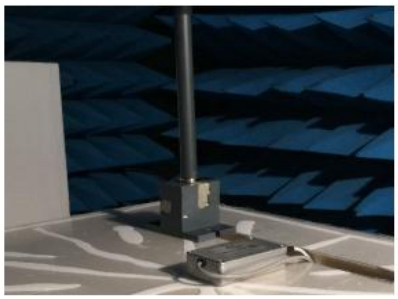
1.2. Tested System Details

Equipment under test (EUT):
MAST001
Serial Number: 0138A7FA & 0138A6C



Photography of EUT

Power supply:
During all the tests, EUT is supplied by V_{nom}: 5VDC
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference	Comments
Supply1	☐ AC ☑ DC ☐ Battery	5VDC	-	USB

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	USB	0.2	☑	☑	☑	-
Access1	SMA	2	☑	☑	☑	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	DELL	-	-

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Equipment information:

EUT information			
RF module:	Low Power Long Range LoRa Technology Transceiver Module		
Frequency Band	[903-927]MHz		
Antenna Type:	☐ Integral	☑ External	☐ Dedicated
Antenna gain:	2.14 dBi ANT-GXS108-CO100B		
Standby mode:	☑ Yes	☐ No	
Equipment intended use:	☑ Fixed	☐ Mobile	
Equipment type:	☐ Production model	☑ Pre-production model	
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery

Channel details:

Channels	CH0	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12	CH13	CH14	CH15
Freq	903	903,8	904,6	905,4	906,2	907	907,8	908,6	909,4	910,2	911	911,8	912,6	913,4	914,2	915
Channels	CH16	CH17	CH18	CH19	CH20	CH21	CH22	CH23	CH24	CH25	CH26	CH27	CH28	CH29	CH30	-
Freq	915,8	916,6	917,4	918,2	919	919,8	920,6	921,4	922,2	923	923,8	924,6	925,4	926,2	927	-

2.2. *EUT CONFIGURATION*

The EUT is set in the following modes during tests with simulator / software (Cloverflow version C0101):
- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
- Permanent reception

All tests are performed at Cmin, Cmid and Cmax.
The power command is set at 87("hexadecimal") by software and not "0E".
Following commands with the specific test software are used to set the product:
1- Time before starting test (60s)
5- Time of a CloverMaster Test (120s)
9 –Time of a FlowSensor Test (63s (max 63s))
==========FCC FlowMeter=======
50 – Timed TX (0A) channel 00, power 86
51 – Timed TX (0A) channel 15, power 86
52 – Timed TX (0A) channel 30, power 86
53 – Timed TX (0A) channel 00, power 86
54 – Timed TX (0A) channel 15, power 86
55 – Timed TX (0A) channel 30, power 86
==========FCC Modem==========
60 – Timed TX (0A) channel 00 (903 Mhz) ,power 87
61 – Timed TX (0A) channel 15 (915 Mhz), power 87
62 – Timed TX (0A) channel 30 (927 Mhz), power 87
63 – Timed TX (0A) channel 00 (903 Mhz), power 87
64 – Timed TX (0A) channel 15 (915 Mhz), power 87
65 – Timed TX (0A) channel 30 (927 Mhz), power 87
==========
q – exit
==========
There are 2 configurations tests (cf §3):
- Configuration 1: The EUT is in TX mode.
- Configuration 2: The EUT is in IDLE mode.

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1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 or ANSI C63.10, FCC Part 15 Subpart C.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.4. Test facility

Tests have been performed **from June 28th to July 5th, 2016**.

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4 and ANSI C63.10 (registration number 94821).
This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-1633 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.