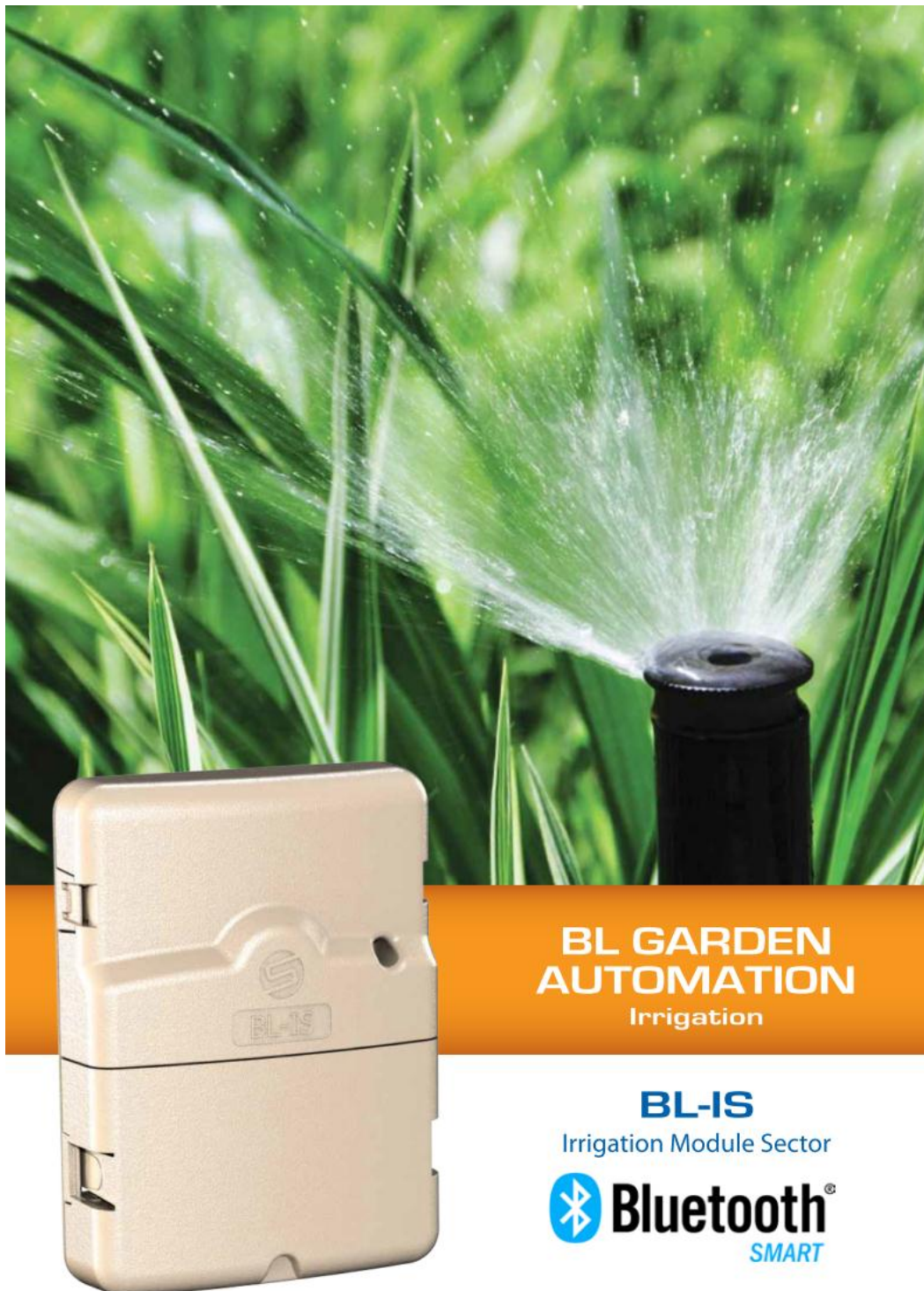| GENERAL INFORMATION |
| --- |

FCCID: YWW-BLIS

1.1. Product description

BL-IS Irrigation Module Secteur

ELECTRONIC MODULE DRIVEN FROM A SMARTPHONE OR A TABLET THANKS TO THE SOLEM "APP" AND BLUETOOTH LOW ENERGY

Applications :

Automatic Irrigation of private gardens, public areas, sport fields….

Features :

- Bluetooth Low Energy communication
- Start/Stop programmable function
- LED indicator for monitoring operation
- Indoor wall mounting, external transformer (230/24) supplied
- Barrier style terminal blocks
- Non volatile memory will save programming in case of power failure
- The internal clock will be maintained for 5 hours in case of power failure
- Programming will resume automatically in case of a power failure of less than 5 hours

Specifications :

- 2, 4, 6 stations
- Master valve connection
- Rain sensor connection
- Bluetooth range : about 10 meters

- Tested on :
- iPhone 4S, 5, 5S, 5C,iPad 3, 4, Mini, Air (iOS 7.0 minimun)
- Samsung Galaxy S3, S4, S5, Note 2 (Android 4.3 minimum)
- Sony Xperia Z, Z1 compact (Android 4.3 minimum)

Electrical Specification :

- AC power
    Primary power: 230V-50Hzz
    Secondary power : 24V-50Hz
- Maximun consumption 0.75 A on the secondary (18VA)
- Ability to power a 24Vac solenoid valve plus a master valve (or pump start relay)
- Surge protection to 4kV on all inputs / outputs

Dimensions :

- Width : 11 cm
- Height : 14,5 cm
- Depth : 3,6 cm

Models :

- BL-IS2 : 2 stations
- BL-IS4 : 4 stations
- BL-IS6 : 6 stations

SOLEM
ÉLECTRONIQUE

1.2. Tested System Details

2.	SYSTEM TEST CONFIGURATION

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
BL-IS6
Serial Number: BL6IS-0000B7, BL6IS-020FFE and 143923680115

Photography of EUT

Power supply:
During all the tests, EUT is supplied by V$_{nom}$: 24VAC
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☑ AC ☐ DC ☐ Battery	24VAC	-	-

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1			☐	☐	☐	
Access1	USB	1	☐	☐	☐	Temporary USB installed for the reception of different orders (power, choice of channel, modulation etc.)
Access2	I/O	0.5	☑	☐	☑	-
Access3	I/O	0.5	☑	☐	☑	-
Access4	I/O	0.5	☑	☐	☑	-
Access5	I/O	0.5	☑	☐	☑	-
Access6	I/O	0.5	☑	☐	☑	-
Access7	I/O	0.5	☑	☐	☑	-

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	ThinkPad Tseries	L3-B746308/01	-
Power supply 24VAC	Ktec KA12A240075015U	-	-
Samsung Note 2	GT-N7100	RF1D23CJW4H	With software "Toolbox BL-CEM"

Equipment information:

Type:	**Bluetooth Low Energy v4.0**
Frequency band:	[2400 – 2483.5] MHz
Sub-band REC7003:	Annex 3 (a)
Spectrum Modulation:	☑ DSSS (Tested like it)
Number of Channel:	40
Spacing channel:	2MHz
Channel bandwidth:	1MHz

Transmit chains:	☑ 1	☐ 2	☐ 3	☐ 4
	☑ Single antenna	☐ Symmetrical		☐ Asymmetrical
	Gain 1: 3dBi	Gain 2: dBi	Gain 3: dBi	Gain 4: dBi
Beam forming gain:	☐ Yes: dB		☑ No	
Receiver chains:	☑ 1	☐ 2	☐ 3	☐ 4
Type of equipment:	☑ Stand-alone	☐ Plug-in		☐ Combined
Ad-Hoc mode:	☐ Yes		☑ No	
Adaptivity mode:	☐ Yes (Load Based)	☐ Off mode		☑ No
	Clear Channel Assessment Time:		None	
	q value for Load Based Equipment:		None	
Duty cycle:	☑ Continuous duty	☐ Intermittent duty		☐ Continuous operation
Equipment type:	☑ Production model	☐ Prototype		
Chip Reference:	nRF51822 By Nordic Semiconductor			

Temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ °C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 55°C	☐ °C
Test source voltage:	☑ AC: 24	☐ DC:	☐ Battery:	

LCIE

Laboratoire de Moirans

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CHANNEL PLAN			
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
Cmin: 0	2402	Cmid: 20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	Cmax: 39	2480

DATA RATE		
Data Rate (Mbps)	**Modulation Type**	**Worst Case Modulation**
1	GFSK	☑

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2.2.   EUT CONFIGURATION

The EUT is set in the following modes during tests with simulator / software (v1.93b): "Terminal"
- Permanent emission with modulation on a fixed channel in the data rate that produced the highest power
- Permanent reception
- The Power order sent for the Module is set at -4dBm.

2.3.   EQUIPMENT MODIFICATIONS

☐ None   ☑ Modification: The capacity C22 (1pF) between antenna and C15 (capacity) is removed, see following map:
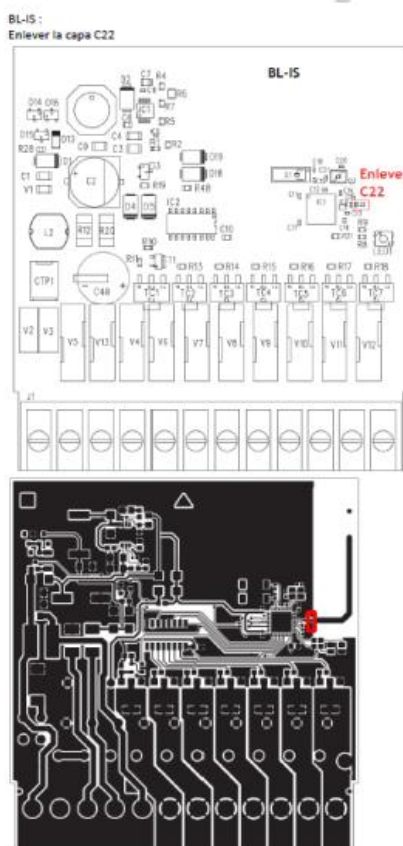
1.3.   Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003, 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 on from November 17th to 26th, 2014.

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 C63.4-2003 in a letter dated March 25th, 2008 (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.