

Autonomous Wireless Overflow Detector

Product code: LSC

Tutorial

This device complies with FCC radiation exposure limits set forth for general population. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

CONFIDENTIALITY

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Document updates

Ref	Date	Modification
01A01	2011*09/09	Initial draft
02A01	2014/11/15	Translation
02A04	2018/02/13	FCC warnings updated

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Introduction

The Autonomous Overflow Detector will detect the presence of water (or any conductive fluid) above a threshold (ON/OFF state). The detection area is clearly marked on the case by 2 white lines which allows a precise installation. The user will simply position the detection area at the threshold level required.



A capacitive measure will detect water on the case surface. Note that the measuring system is located inside the case.

In order to improve their accuracy, the capacitive measurements are temperature compensated.

1. Presentation of the Capacitive Technology

The measuring system works around an electrode fixed on the inside of the case, directly behind the detection area. An electric field is triggered from the electrode and travels towards the outside of the case. The electrode and the outside environment (water) on the detection area will then become the 2 terminals of the passive capacitor which will create an electric capacity. This capacity will vary depending on the dielectric constant of the environment and its electrical conductivity.

Based on this principal, the higher the environment's dielectric constant, the higher the capacity measure will be. As an example, the dielectric constant of dry air equals 1, while water's equals 80.

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• Advantages and comparison against mechanical and resistive systems

The advantage of the capacitive technology is the fact that there is no direct contact between the detection system and the environment (which is not the case of conductive systems). Mechanical systems (floaters), are often failing due to clogging, impacts or foreign objects.



Conductive

Mechanical

Capacitive



The abscissa represents the presence of water in percentage. The ordinate indicates a timeline in seconds.

The capacitive measurement cycle of the sensor is 5 seconds. The black curve indicates the presence of water (= capacitive value) at each cycle of measure. The red curve indicate the averaged capacitive value which applies <u>a timed out factor</u> to the detection measured. Based on the type of overflowing events that the user wishes to monitor (with our without taking in consideration short events such as waves), the set-up of this time out factor will vary. If the user wished to monitor short events, the time out time in seconds shall be short (close to 0s). In the contrary if the user only wishes to monitor long lasting overflowing events, the time out time (in seconds), shall be longer (over 30s).

Activation and de-activation of the overflow detection is based on the averaged capacitive value. The detection is activated (ON) when the average capacitive value reached the detection threshold level. The detection is de-activated (OFF) when the above mentioned value decreases below the threshold level, <u>to which is deducted a dielectric hysteresis.</u>

If the user wishes to monitor moist depot, a low threshold shall be selected and vice-versa.

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Refer to part 3.2 for further details.

3. Autonomous overflow detector

3.1 Specifitities

- Radio frequencies:

Output signal

868Mhz (Europe - China) 915MHz (USA - Canada - Australia)

- <u>Measurements:</u> Time outs and detection thresholds.
- <u>Data recovery:</u> Remotely via GSM/GPRS data logger or on site.
- Overflow alarms: Beginning and end of an overflowing event.

Warning:

The Autonomous Wireless Detector features an "earth patch". <u>This patch must be submerged</u> while an overflowing event occurs. The user must install the detector in the following positions:



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3.2. Set-Up with the AVELOUR Software

- Open AVELOUR Software
- Click on "Connect to a Device"
- Select a Wireless Overflow Detector (IJM-6012xxxx)
- On the main screen, click on "Advanced Parameters"

« Overflow Counter » tab :

uvanceu	Jarameters				
General	Overflow Cour	nter Alarms	Files		
lo overflo	N O				
)verflow d	etector	cord overflow			
or official a		oord or onlow			
	Tin	ne to change	10	S S	
	Tim Def	ne to change tection Treshold	10 Low (moist depo	● s sit) = 20%	~

- Select if the user wishes to record overflowing events or not.
- Select the time out lapse: Select the number of seconds after which the overflowing event shall start to be recorded (default = 30s).
- Select the Detection Threshold level:
 - \circ Low (moist deposit) = 20%
 - \circ Average (clogging) = 50%
 - High (body of water) = 80% (Default)
 - \circ Very High = >80%
- Select a Recording Type = Fixed or Rotating (FIFO) [In Expert Mode].

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<u>« Alarms » t</u>	<u>ab :</u>
Parameters	
advanced parameters	
General Overflow_Counter Alarms Files	
Alarm on Overflow 🗹 Minimum time	15 🔹 s
On overflow end	
Send attempts 3 AMin. time between 2 alarms	7200 🗢 s
Advanced parameters Save the parameters	

- Select if the user wishes to trigger alarms at the beginning and/or at the end of an overflowing event.
- Select the time out lapse (minimum time) in seconds after which the alarm shall be triggered. Note that the alarm will only be sent if the overflowing even remains constant during the selected minimum time.

Alarm sending parameters [In Expert Mode]:

- Attempts: In case of a difficult environment between the Detector and the Data Logger, this option allows the user to enable multiple attempts to send the alarm signal. This option automatically stops once the alarm has been successfully received by the Data Logger.
- Minimum time between alarms: This option allows the user to select a minimum time in seconds between 2 alarms in order to optimize the alarm sending cycle.

General	Overflow Counter	Alarms Files		
Number of re	cords in files			
(The "Aux." fi	es are used to retrie	eve data by the GSM	Box)	
Overflow	2000	Aux. Overflow	100	1

« Alarms » tab [In Expert Mode]:

This tab will allow the user to change the size of the main and auxiliary files sent by the Detector.

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Note that auxiliary files are used to send data to the Data Logger and are deleted after each data transfer.

<u>NB:</u>

 To access the Device properties and status: click on File > Device Properties and then click on Refresh. The Icon at the top right corner of the main screen will also indicate the device's status (completely covered in blue = Overflowing event is ON, half covered in blue = event is OFF).

Device	IJM6102-00000054	
Device Version		
Card Version	0087A00	
Software Type	1	
Software Revision	7.00	
Diagnostic		
Device Date	12/11/2014 7:05:15 PM	
Battery	3.49	
Overflow Free Memory	1998 / 2000	
Frame Free Memory	20000 / 20000	
Timer	5	
Cycle	0	
Is Overflow	on	
Statistics		
Reboot Count	10	
Measures Count	-1	
AwakeTime	221696771	
BatteryChangedDate	18/11/2011 12:00:00 AM	

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2. Retrieving measures and graph display of overflowing events:

						ljinus - A	velour v5.3.7.	l							- 0 ×
File Options Act	tions Help				40										-
IJM6102- 🦻	Reload device state		Battery lev	el : 86% 24	.1°C										On
FORMATIONS	Reload informations														
me Overflov 🥥	Reidad parameters				~										
10 A	Retrieve measures		2014 11:25 AN	to Manimum Lung	6/11/2014	1:11 PM (6	measures)								
tallation 547	Auxiliant Maasuras (for	CMC)		Disponibilité	au										
City Sydney	Auxiliary measures (101	2002)	-	Disponibilito											
Place Elizabel X	Delete measures												1		
Date 15/04/20 🗙	Delete diagnostic echo	25													
istaller Jeremy	Read a log file														
nents 🤤	Reinitialize device (clea	r configuration data)													
		2014/10/24 2014/10	N25 2014/10/26 00 00:00:00	2014/10/27 00:00:00	2014/10/28 00:00:00	2014/10/29 00:00:00	2014/10/30 00:00:00	2014/10/31 00:00:00	2014/11/01 00:00:00	2014/11/02 00:00:00	2014/11/03 00:00:00	2014/11/04 00:00:00	2014/11/05 00:00:00	2014/11/06 00:00:00	2014/11/ 00:00:0
		Export the measures	Delete the measures	on the device	Overflow		/	Ψ	*						
	D	arameters					-								
	- 1	idvanced parameters													
		General Overflow Coun	ter Alarms Files	1											
		NO OVERIOW													
	1	vo overnow 🕕 Dverflow detector 🍥 Rec	ord overflow												
	1	No overnow O Dverflow detector () Rec Tim	ord overflow e to change 10	≜ S											
	1	Noovennow U Dvenflow detector () Rec Tim	cord overflow e to change 10	s (body of water) - 5	10%										
		vo overnow O Dverflow detector Rec Tim Det Rec	cord overflow e to change 10 ection Treshold Strong cording type Fixec	् s g (body of water) = ह	0%	v									
Save	Cancel	Vo overnow U Overflow detector I Rec Tim Det Rec dvanced parameters	cord overflow e to change 10 ection Treshold Strong cording type Fixed Save the parameters	s g (body of water) = 8	0%	V									

3.3. Battery life guideline

Capacitive measure cycle	Data retrieving cycle	Battery life
10 sec	12 h	6,52 years
5 sec	12 h	4,91 years
1 sec	12 h	1,66 year

Important / Battery change:

It is paramount that you contact us once the detector's battery reaches the end of its life. IJINUS and IJINUS only will replace the battery and will be able to deliver a sound and certified detector back to the user.



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For each site, the 3 graphs represent:

- The water eight (in mm) measured by an IJINUS Ultrasonic Level Sensor. The horizontal line shows the overflow threshold level.
- The Capacitive detection of water in percentage.
- The Detector status (ON/OFF).

5. Maintenance

The Autonomous Overflow Detector is designed to operate in rough and dirty environments. We recommend a periodic cleaning cycle to optimize use and accuracy.

Refer to the below in case of anomalies

- Absence or incoherence of measures:

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Possible causes	Examples	Corrective actions			
Clogging	Clogging is too important and disturbs the capacitive measurements.	Clean the case's surface with a humid cloth.			
Water proofing issues	The case was damaged by water.	Return the product to IJINUS.			
Damaged case	A foreign object has violently collided with the detector.	The product cannot be used if the detection area is damaged of if it is no longer water proof. Return the product to IJINUS.			
Battery issues	The battery has reached the end of its life.	Return the product to IJINUS for battery replacement			

Safety and recommendations

- Do not open the product's case
- Only use suitable screws on installation (max 6mm diameter).
- Use within the recommended temperature spectrum
- Do not clean with an abrasive product/detergent
- The case must not be modified by the user
- Stock the product between 5°C and 25°C
- Install the product on a flat surface

6. Case technical specificities

- IP68
- High resistance to corrosion
- High resistance to chemical products

7. Warning to users in the United States

Caution: the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

"NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.