#### Height value for loss of echo

In the field of ultrasonic, a loss of echoes is reflected by the absence of peaks (or a very weak peaks not detected as an obstacle) on echoes that materialize by a maximal height, the Z value defined during the calibration. This function is used when the sensor encounters this situation, to replace this value "a priori" false by another one defined by the user:

The last valid value, a value you define, no value, ...

This option has to be appropriately used, it never should compensate a not completed or not adapted calibration.

On Height valu	e for loss of echo		
Replacement value	Last valid value	~	

#### Programing for flow rate calculation from height measures and control a water sampler

Before completing this chapter, it is important to keep in mind that a flow rate measure is obtained by two factors:

1) the wet area and 2) the average velocity. The sensors described in this document only measure water height (that allows wet area calculation via the collector shape) but never a velocity measure.

Nerveless some tools to transform water height measured in flow rate (then in volume) by conversion table or measuring system on threshold are available. It is the user's responsibility to choose the transforming tool. In this case, it has to be chosen at the beginning of the programing (or to modified) height/flow rate like shown below.

Measures	🚫 Add
Pair devices	Water height
No Pairing configured	Water height -> Flow Water height -> Flow (Process version) Water height + external velocity -> Flow Eilling Level

Once the programing choice has been done, an example sheet of conversion is available:



An Excel file will then open with in summary the different type of use. For example, in case of circular collector, the sheet called Height/surface - circle allows you to generate a value table (mm) / Area (mm<sup>2</sup>) for a circular collector (here for 1500 mm) with the possibility to integrate mud height, this for a scale every 5 mm. Only the yellow cells have to be filled, conversion is done automatically.

vent	turi.xls - LibreOffice	Calc				-				enturi.xls - LibreOffice Calc	
chier	Égition Affichag	e Insertion Format Qutils Données Fegêtre Aide							Eich	ier Édition Affichage Insertion	Format Qutils Données Fen
1				Abc			<b>•</b>	0: 11:0			
888		X (I 🗗 🚾 🐠 🚽 🖬 . 🍞 📣 .		54 V				10 ST		🗎 · 🛄 · 🛄 · 🚺	🔁 🔯 🖌 🖥 🛅 •
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1	A C	D	E	F	G	н	I	J			B
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+	and the second se	Conversion triangulaire (//invator shop)		and an and a second second	Canally	adust Task	niffere Or	51.040	3	Diamètre (mm) =	1600
÷	Kinvater sheri	Conversion mangulaire (Kinvaler-shen)		541-1010	Canal Ve	antur Tech	milliow 94	FLOID	4	Hauteur sédiments (mm) =	= 0
	Kinveter-cener	Conversion rectangulaire (Kinvaler-Carler)		94FL028	Canal Ve	enturi Tech	nillow 94	FL025	5	Échantillonnage (mm) =	5
	Menning	Conversion sans restriction (Manning-Stricker)		54PL050	Canal Ve	inturi Tech	millow 94	FLUGO	6		
	AQUAR	Canal Venturi AQUALYSE AQUAU		94FL100	Canal ve	intun jech	ninow 94	1FL100	7	Hauteur (mm)	Surface (mm <sup>2</sup> )
-	AQUAL	Canal Venturi AQUALYSE AQUA1		24FL250	Canal ve	entun lech	nitiow 94	4FL250	8	0	0.0000
	AQUA2	Canal Venturi AQUALYSE AQUA2		94FL500	Canal Ve	entun lech	niflow 94	1FL500	. 9	5	576,7726
	AQUAS	Canal Venturi AQUALYSE AQUA3		EH QV302	Canal Ve	enturi E&H	302		10	10	1629,7233
	AQUA 4A	Canal Venturi AQUALYSE AQUA4A		EH QV 303	Canal Ve	enturi E&H	303		11	15	2990,9839
	AQUA:48	Canal Venturi AQUALYSE AQUA4B		EH QV 304	Canal Ve	enturi E&H	304		12	20	4600,2827
	AQUAS	Canal Venturi AQUALYSE AQUA5		EH QV 305	Canal Ve	enturi E&H	305		13	25	6422,6007
	MODELEI	Canal Venturi ISMA I		EH QV308	Canal Ve	enturi E&H	306		14	30	8434,1864
	MODELE III	Canal Venturi ISMA II		EH QV308	Canal Ve	enturi E&H	308		15	35	10617,5132
	MODELE III	Canal Venturi ISMA III		EH OV310	Canal Ve	enturi E&H	310		16	40	12958,9308
	MODELENV	Canal Venturi ISMA IV		EH QV313	Canal Ve	nturi E&H	313		17	45	15447,4007
Т	MODELE V	Canal Venturi ISMA V		EH QV 316	Canal Ve	enturi E&H	316		18	50	18073,7433
1	MODELE VI	Canal Venturi ISMA VI		Heut/Surfa	Calcul S	urface d'u	Cercle		19	55	20830,1599
1	MODELE VI	Canal Venturi ISMA VII							20	60	23709,9102
1	94FL001	Canal Venturi Techniflow 94FL001							21	65	26707,0872
1	94FL002	Canal Venturi Techniflow 94FL002							22	70	29816,4542
	94FL005	Canal Venturi Techniflow 94FL005							23	75	33033,3226
-	al second al a				-				24	80	36353,4599
1	+ Sommaire	Kindsvater-Shen rectang contracte ( a finir) Man	ning-Stri	ckler AC	UA0 A	OUA1	AOUA 2	AQUA 3	25	85	39773,0173

You need to select, copy the bloc Height/Area in Excel (bellow example) and paste the data from clipboard. Final validation is done by pressing the OK button

A	В					Heig	ht / flow table
<b>IJINUS – HSC</b>	onv – 130130				Paste f	om clipboard N	🛸 Modify units
Sommaire						13	
Diameter (mm) =	1500				Height (mr	n) Flow (m <sup>2</sup> /s)	
Mud height (mm) =	0				435	425357.4	
sampling (mm) =	5				440	432175.3	
					445	439015.9	
Height (mm)	Surface (mm <sup>2</sup> )				450	445878.8	
	0.0000				455	452763.5	
5	576 7726				460	403069.6	
10	1629 7233				470	473544.2	
16	2000 0830				475	480512	
20	4600 2827				480	487499.4	
20	6422 6007				485	494506.1	
30	8434 1864				490	501531.7	
35	10617 5132				495	508575.8	
40	12058 0308				500	515638	
40	16447 4007				505	522717.8	
40	19072 7422				510	529814.9	
50	20220 1600				515	536928.9	
60	20030, 1599				520	544059.4	
66	25705,5102				525	551206.1	
70	20101,0012				530	000068.4	
75	23010,4042						
75	26252 4500				And Country	-14-	Delate line
20	20772 0172				Empty t	aure	
05	43288 4727	Height / flow table	No table	Edit table			X Cancel
50	45200,4721			6			

This operation validates the input of these data in the table by displaying the number of lines, then can activate, depending on calculation needs, flow logs and eventually to control a water sampler.

Flowrate				
To obtain a conversion table, you can use this Exce	<u>el sheet</u>			×
Height / flow table 100 Lines Edit table				
Volume				
Cumulated volume Active Hourty	~			
Record infinite accumulation Off				
Fest measure		🗙 Delete	Cancel	🕝 Ok

Once the programming is done, a resume summarized your different choices

Measures	💿 Add 👻
Water height -> Flow	
Height + Flow measure every <b>5 mins</b> Maximum height <b>3000mm</b> Ultrasonic echoes record <b>Cumulated volume</b> every <b>1 hr</b> Recording will last for about 1 yr 10 mths / Send around 7.2 SMS each day	
🗲 Test measure	🗙 Delete 📝 Edit

Finishing of the programming: you have to validate with the "Program the device" button to send the configuration in the sensor memory:

		Update	e parameters	
Qet configuration	parameters sfully Completed			
<u>, , , , , , , , , , , , , , , , , , , </u>				

After the saving operation is done please check that you have at the top right corner the two green sign showing that the sensor working and recording, and also sending data. You can stop them both by pressing the red Stop icon, if needed.

	Ijinus - Avelour v6.1	- 🗆 🗡
File 📝 Edit 🖐 Actions 🎤 Options Windows 🛞 H	elp	
Start W IJA0101-00006081 ×		
LNU0600-SIG DM 🔧		sop On 🖻
General Informations		
LNU0600-SIG DM Installed at NEW YORK (Hoboken, NJ) the 01 Jun 2017 b	by DM	
	S Edt	
Measures	Add	
Water height -> Flow		
Maximum height 3000 mm Ultrasonic echoes record Comulated volume every 1 hr Recording will last for about 1 yr 10 mths / Send around 7.2 SMS eac	ch day	
🖐 Test measure	🔀 Delete 🧭 Edt	
Pair devices		
No Pairing configured		
	📝 Edit	
sigFox data sending		
Send data every 1 hr at 34 mins		
🖐 Launch	Cdt	
System options		
Timezone · America/New York		

#### e. Fourth step : Data reading in real time

You Have two possibilities to read the data in real time: By pressing the "**Test measure**" button, or by selecting on the main menu the window "**View broadcast measures**" (Main menu > Windows > View broadcast measures)

View broadcast measures: this option opens a window showing the measures received by radio from Ijinus sensors and loggers nearby.

Ijinus - Avelour v6.4		File 🖉 Edit 🗲 Actions 🥜 Options Wind	dows 😡 Help			
File 🖉 Edit 🖐 Actions 🥜 Options	Windows 😡 Help	Broadcast measures	8199			
📜 Start 🛯 🖓 IJA0101-00008199 ×	Show start screen	SN Name	LastDate	Material height (mm)	Measure temperature (°C)	Flow (m <sup>3</sup> /s)
LNU10V3-3G DM	View broadcast measures	JA0101-00008199 LNU10V3-3G DM	04:19:30	73	25.3	1.74
	New data window	LNU10V3-3G DM     LNU10V3-3G DM     LNU10V3-3G DM	04:19:20	73	25.3	1.74
Water height	📴 Saved devices	IJA0101-00008199 LNU10V3-3G DM     JA0101-00008199 LNU10V3-3G DM	04:19:00 04:18:50	73 52	25.3 25.3	1.74
Us calibration 🔤 Calibration	① Device properties	JA0101-00008199 LNU10V3-3G DM	04:18:40	50 52	25.3 25.3	1.74
Calibration done the 07/25/2018 10:09:0		JA0101-00008199 LNU10V3-3G DM	04:18:20	52	25.3	1.74
Pagard temperature 00	Man DA0101-00008199	Construction of the second sec	04:18:10	52	20.3	1.74

Now you can also press the "Test measure" button for a direct reading

Weter brinks > Elevi	
water height -> Flow	Résultat
Beware I Conversion table is empty Height + Flow + temperature measure every 20 secs Maximum height 5000mm Ultrasonic echose record Recording will last for about 46 days 7 hrs 6 mins / Send around 151.2 SMS each day	Mesure du 28/09/2016 11:26:30 : Hauteur d'eau : 445 mmDébit : 1,148049 m <sup>1</sup> /s
🗲 Test measure	ОК

#### f. Fifth Step : Retrieve and see locally your data by radio

When connected to a sensor, the software directly asks you if you want to retrieve data. After you can find this command from the main menu: Menu > Actions > Retrieve measures

You can view the data, even offline, on graphic and list. A graph configuration module allows you to changes colors, thickness of lines, ..., but also to apply statistical filters and formula to your data.

Ijinus - Avelour	v6.4	Clart		Show List	Copy to clipboard 🔀 Clear	Graph configuration
File Clark	🗲 Actions 🥜 Options 🛛 Windows 😡 Help	Vew all data 🗸 🖌	m Zoom			
Start 1 Start	S Reload device state	T F	Measure temperature	- Flow Material he	om lami	
NU10V3-3	Reload parameters	1 1				
	🄑 Read a log file 🕨 🕨	100 - 77 -		/		110000000
General I	Retrieve measures					
LNU10V3-	Retrieve diagnostic echoes			••		
Installed the 2	Auxiliary Measures (for SMS)	50 - 76.75 -				I
	Clear sensor cache	ŧ Ę			a	105000[20
	K Delete measures		6/1/2017 6:00 AM	7:00 AM	8:00 AM	9:00 AM
Measures	Delete diagnostic echoes	Date	Measure temperature (*F)	) Row (n <sup>1</sup> /s) Material height (n)		
Wator bois	Delete SMS (0 sms to be sent)	31/05/2017 12:05:00 31/05/2017 12:10:00 31/05/2017 12:15:00		36.5354330708661 36.5354330708661 36.5354330708661		
Height + Flo	Remove SMS and data to send by sms	31/05/2017 12:20:00 31/05/2017 12:25:00 31/05/2017 12:25:00		36.496062992126 36.496062992126 36.496062992126		
Maximum he	Notify battery changed	31/05/2017 12:35:00 31/05/2017 12:40:00		36.496062992126 36.496062992126		
Ultrasonic e Recording will L	Reinitialize device (clear configuration data)	01/06/2017 06:45:00 01/06/2017 06:50:00 01/06/2017 08:02:40	76.63999999999999	107991804.267073 56.4566929133858 107991804.267073 56.4173228346457 135.157480314961		

### g. Sixth step: Data export

From The graph and/or list of data you find the tab "Export the measures" with the choice of different files format and style of reports, from date to date, by month, or simply all data.

Export !	Aeasures	- 0	×
Export Type	Leme export	Vier Vier	w all
Dates Path	Leme export Monthy Excel export : Overflows Northy Excel export : Volume and overflows Excel Export CSV Export Lift atalon export		
		A Pag	in ernort

#### h. Seventh step: Pair devices

Our level sensor can retrieve locally the data from other sensors and logger nearby by radio, and send them with its modem.

To do this you need to check in Avelour what devices can be seen by the logger around it. In the Pair devices part, click the Edit button

Pair devices	
No Pairing configured	
	Edit

Then you need to click the Refresh button to run the test. Simply tick the boxes corresponding to the devices you want to associate.

SN	Name	sms id	·
. IJA0101-00000512			
. IJA0101-00001391			
. IJC0101-00000044		1	
J. IJT3006-00000851		3	
. IJM0110-00000441		4	
. IJM6102-00000292			
. IJM6102-00000269			
J. IJC0101-00000045		2	
J. IJC0101-00000046			
. IJM6102-00000293			
J. IJT3020-0000008			
. IJM0114-00000004			

Check the strength of the radio signal by placing the cursor on the indicator (Be careful the quality of radio signal cannot be compared with cellular values: -70 dB is a bad quality for radio and excellent for cellular communication



#### i. Eighth step : Data sending

As we said at the beginning of the document different ways to send data are possible like SMS or FTP transfer. In this part I will show you the way to do it by FTP. First keep in mind that on the installation location if you already can't find operator signal in surface, it will be even more difficult while under a metal cover in the manhole.

Data sending	
On GPRS / 3G / FTP data sending	
Don't forget to program the APN in the modern section to be able to use the cellular conn	nection.
enod 12h v at 0 mn 🔛>	C
TP / Internet Options	
Force sending of data 🔗 Force data retrieval	
Off SMS data sending	
Modem options	
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem • The SIM code is specific to the SIM card and must be set if the SIM card is locked.	chip and test the connection.
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem • The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware: you have only 3 this I • The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be neede • The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields	chip and test the connection. e operator. d by your operator. apear after a device reset even
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem  The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware: you have only 3 ties 1  The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be neede  The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields  N code  Medem Departing	chip and test the connection. e operator. d by your operator. apear after a device reset even
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem  The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware: you have only 3 ties 1  The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be neede  The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields  IN code Modem Diagnostic	chip and test the connection.
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem  The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware: you have only 3 ties1  The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be neede  The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields  N code  Met parameters  Aent parameters  Aent parameters  Aent parameters  The set of the set of the SIM card and the set of	chip and test the connection.
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem  The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware, you have only 3 thes1  The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be needed The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields  IN code Inactive Program the PIN code APN (data connection) Indem dag Modem Diagnostic Alet parameters Inimum time between two data sending Hour 00 Minute 00 Second	chip and test the connection. a operator. d by your operator. apear after a device reset even Program apn
The "PINcode" and "APN" fields needs to be recorded in the modem chip. Once you filled the fields, you have to Click on the button to record them in the modem  The SIM code is specific to the SIM card and must be set if the SIM card is locked. Beware: you have only 3 thes1  The APN allows the modem to connect to the Internet and is specific to your phone In the advanced parameters, you'll also find PPP parameters that could be needed The PIN code and the APN are recorded directly in the modem chip and can dis if they are still active in the modem chip. Also, If you change the SIM card, remember to set these fields  IN code Inactive Program the PIN code APN (data connection) Indem diag Modem Diagnostic  Alet parameters Inimum time between two data sending 2 Hour 00 Minute 00 Second  Off Send alet SMS	chip and test the connection. a operator. d by your operator. apear after a device reset even Program apn

IJINUS - 25 ZA de Kervidanou 3 - 29300 MELLAC - FRANCE - www.ijinus.com - sales@ijinus.com

#### First of all you need to:

- Insert in the sensor sim holder a regular size data SIM card with at least 5 Mo per month available. While buying the card please ask the APN of the operator, as well as the PIN code if any. We will need these informations. The cellular antenna has also to be connected to the connector on top of the sensor.

- Set now your timezone in the System options menu:

🤌 System options					
Timezone	Americas  Vinknown Region	(Indianapolis)	✓ 4:53 AM EDT		
View advanced paramete	Europe Americas Asia Africa			Cancel	© Ok
	Atlantic Ocean				

- After clicking the Edit button, choose the sending period, define to send every day or only some of them. You can define several periods by clicking on the green + icon. Depending on your configuration you may need to choose a minimum delay between 2 anticipated data sending.

Data sending	
On GPRS / 3G / FTP data sending	
On't forget to program the APN in the modem section to be able to use the cellular connection.	×
Period 12 h v at 0 mn	O
FTP / Internet Options	
FTP Usemame default ijinusFTP	

- If the sim card is locked, please enter your code (if any) and press the **Inactive** button (that will turn green, and become **Active**) and **Program the pin code** button.

- Enter your APN code and press the Program APN button.

A message will confirm the success for each operations.

PIN code	Inactive 0000 Program the PIN code	APN (data connection)	M2m	Program apn
Modem diag	(1) Modem Diagnostic			

By default, the parameters are set to send the data to our server as we propose a **web platform www.ijitrack.com** with different services to manage them. So **if you choose this option, you don't have to change the FTP Username**.

Period 12 h v at 0 mn 😁 >	
FTP / Internet Options	
FTP Usemame default jijnusFTP	
Actions	
Force sending of data 🦻 Force data retrieval	

At this step you can run a sending test by pressing the **Force data retrieval** button and check on www.ijitrack.com, in your account, if the sensors data appears. Of course if your account is already created. Please ask otherwise our customer service to do so for you. You should also write the **Rfid product number** on the label of the sensor, the **address of the installation**, you will need them later to set up the sensor on our web platform.

The **modem diagnostic** button available on the modem configuration allows a better diagnostic of the 2G, 3G, LTE or NB-IoT reception by doing multiple measurements.



If you use the advanced mode, you also do continuous modem measurements on a longer period. These options are practical to know on what side of the manhole to place the antenna before drilling in the concrete under the cover plate and inserting it.

#### **Advanced parameters**

If you need to send the data to **your server**, first click the "View advanced parameters", then the FTP / internet Options will appear as well PPP options in the modem options. You need to fill in **your own information details** regarding your server access. Your server administrator can provide to you those information.

	🥜 View adv	vanced parameters	
FTP / Internet Opti	ions		
FTP Usemame	define	FTP Password define	
FTP Server	define ftp.ijitrack.com	FTP Server port define 21	\$
Attempts to connect	define 3	Timeout to connect define 15	\$
Timeout for ftp	define 30	Use ftp passive mode	
Sntp server	define pool.ntp.org	]	
Sent files options			
Zip before send	Off		
Send as CSV files	On	separator tabulation	~
Actions			
Force sending of data	a 🦻 Force data retrieval		
Off SMS data se	ending		
Modem options			6
PIN code Inac	Program the PIN code	APN (data connection)	Program apn
PPP phone Acti	ve	PPP user Active	
PPP password Acti	ve		

After completing this chapter please press the Program the devise button, the configuration will be sent by radio to the sensor.



# 5. Elements for good practice and installation examples

We propose here, and without being exhaustive, some elements of good practice such as:

- The sensor have to front and be perpendicular to the surface water to be measured. This surface has to be stable and without ripples for more accuracy, without foam). If possible, it shouldn't be any obstacle between the sensor and the water surface (if you can't avoid it, please refer to the calibration chapter to mask it with a filter).

- The calibration is compulsory and the verification of the max distance (Z) very important.

Calibration has to be checked at least once a year.

- Sensors with ultrasonic technology don't need much maintenance, but at least once every six months you should clean it, check on-site the presence of debris, floating debris, anything hang to the sensor

Finally, below are some photos of sensors installed in different environments:



Venturi type channels:

#### Measurement in collectors:



## CSO, SSO applications:



## Angle adaptor fixation :



Install in river:



#### Installation on lamp post



Positioning different type of antenna in manhole:



Positioning of a Sigfox antenna



Insertion of cellular antenna in the concrete when sensor install under a manhole cover

Positioning of a **Sigfox** antenna 1

## 6. Procedure for inserting the SIM card

Loggers with 2G/3G or 2G/LTE/NB-IoT modem need a SIM CARD to send data.

The card holder is located on the board. Following steps need to be respected to ensure proper operation of the device :

- The sensor must be in standby mode (no connection with our software Avelour or USB) for the modem to recognize the SIM card.

- Unscrew the ring then take off the cover.

- It is imperative not to leave the sensor open too long (max 2 min) the desiccant bags may absorb too much moisture and do not fulfill their role thereafter (condensation)

- Insert the SIM card (beveled edge side up right).

- Place the lid back (mind the notch) on the threads and screw back the ring to the end.



# 7. Procedure for removing a battery

- Unscrew the cover
- Remove the battery from its housing and disconnect.
- Throw away the desiccant bags present in the sensor if they are green
- Connect the new battery (the connector is keyed)

## At restart, the indicator light must flash Red/Green, and then the light has to flash every 10 seconds

- **Insert the new desiccant bags** on the side of the battery, then screw the cover back into place.

- Set the battery removing by connecting with the software Avelour to your logger sensor.

#### Warnings:

Use only battery provided by IJINUS. Warning – Potential electrostatic charging hazard.







# 8. WARNING TO USERS IN CANADA / ATTENTION POUR LES UTILISATEURS AU CANADA

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

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

/

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) il ne doit pas produire de brouillage, et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.

Dans le but de réduire les risques de brouillage radioélectrique à l'intention d'autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent appareil est conforme aux niveaux limites d'exigences d'exposition RF aux personnes définies par Industrie Canada. Cet appareil doit être installé afin d'offrir une distance de séparation d'au moins 20cm avec l'utilisateur, et ne doit pas être installé à proximité ou être utilisé en conjonction avec une autre antenne ou un autre émetteur.

Si l'antenne est amovible (CNR-GEN):

This device has been designed to operate with the antenna(s) listed below, and having a maximum gain of OdBi. Antennas not included in this list or having a gain greater than OdBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

List of acceptable antenna(s):

- IJINUS - BOE type

Ce dispositif a été conçu pour fonctionner avec les antennes énumérées ci-dessous et ayant un gain maximal de OdBi. Les antennes non incluses dans cette liste ou dont le gain dépasse OdBi sont strictement interdites pour l'exploitation de ce dispositif. L'impédance d'antenne requise est 50Ω.

Liste des antennes acceptables :

IJINUS - BOE type

# 9. WARNING TO USERS IN THE UNITED STATES

#### Federal Communication Commission Interference Statement 47 CFR Section 15.105(b)

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 instructions, 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 the interference by one 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 a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device A0102 complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### NO UNAUTHORIZED MODIFICATIONS

#### 47 CFR Section 15.21

**CAUTION:** This equipment may not be modified, altered, or changed in any way without signed written permission from *JINUS*. Unauthorized modification may void the equipment authorization from the FCC and will void the *JINUS* warranty.

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

# 10.Document History

Date	Revision	Writer(s)	Changes
2018-11-09	A01	ALG	Creation with document identification from existing user manual
2019-07-12	A02	DM	Adding procedure and image modifications
17/02/2022	A03	AT	Update for V4 product line