

ANUMLFRF

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1 Presentation

The ANumLFRF program allows generating LF frames and decoding up to 4 channels simultaneously with 10µs resolution dating.

On each channel, you can have up to 16 different protocols with different baud rate and content. On channels 2...4, you can choose the receiver RF frequency (for example: 315MHz, 433.92MHz, 434.42MHz, depending of the receiver installed boards).

The first channel is reserved for an external receiver (LF 125 kHz for example).

2 Software installation

Note: to install the USB driver, you must have administrator privileges. After this installation, these privileges are not mandatory.

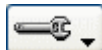
- Copy "ANumLFRF.exe" file in a empty directory
- Copy "Licence.dat" in the directory
- Connect ANumLFRF bench to an USB port
- Install driver (channel A and channel B) with the provided driver "CDM 2.02.04 WHQL Certified".

3 Using overview

When you run ANumLFRF.exe, you can see the main tool bar :



Use :



To configure the hardware, and to manage the configuration file (see [Program configuration](#)) (Too, the only way to quit the program).

LF Config

To define the different LF frames you want to send (see [LF Config page](#))

RF Config

To describe the different RF frames to be decoded (see [RF Config page](#))

Run Config

To define the parameters of the Run tests (see [Run Config page](#))

Run

To start the test (see [Run page](#))

Plugins

To display the additionally plugins according to your licence ([Plugins page](#))

3.1 Help

Help is displayed when you click on  picture.

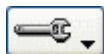
It's a PDF help file with useful links.

This file must be installed in the same directory of the program ANumLFRF.exe

You can download the last version on the site web : ANumSofts.free.fr/ANumLFRF

4 Detailed description

4.1 Program configuration



Clicking on this button display a sub-menu:

New configuration: create a new test configuration

Load configuration: load a defined configuration

Save configuration: save the actual configuration (Hardware, LF, RF, Run configuration)

Hardware: display the dialog box concerning the hardware configuration (see [Hardware configuration](#))

View Log messages: display the dialog box about the information printed during the Start phase (see [Log messages](#))

AutoUpdate configuration: display the dialog box concerning the auto update of the program (see [AutoUpdate configuration](#))

Password: Create or change the password, Delete the password (see [Role management](#))

Licence: display licence information (see [Licence](#))

Help: display this help

Quit: quit the program. If the configuration is modified and not saved, the program inform you.

4.1.1 Hardware configuration

Hardware

Tx

On

COM port

Automatic COM5 Find OK v4.1.1

Manual COM5 Test -

Rx

On

COM port

Automatic COM6 Find OK v4.1.1

Manual COM6 Test -

Acquisitions filter (for baudrate < 12.5kbds Manchester)

Receivers

Get types

Ext	Antenna 1	Antenna2	Antenna3
not connected	not connected	RF 433.92MHz	RF 315.00MHz

? OK Log Display

With this dialog you can:

- indicate the used COM ports
- set a digital filter

- display the installed RF receivers

Find COM ports

In automatic mode, the program finds the appropriate COM port. You can specify one with Manual mode.

The microcontroller version is displayed: v boot.major.minor

Set a digital filter

In case of parasitic noise, you can activate a digital filter on acquisitions.

IMPORTANT: if activated, the used Manchester baud rate must be <12.5 kHz because the digital filter uses an over sampling method.

If no activated, the Manchester baud rate could be specified up to 25 kHz.

Installed RF receivers

If you click on "Get types" button, the RF receivers types on the board are displayed.

Note: during the START sequence, the RF receivers types are displayed on Run page.

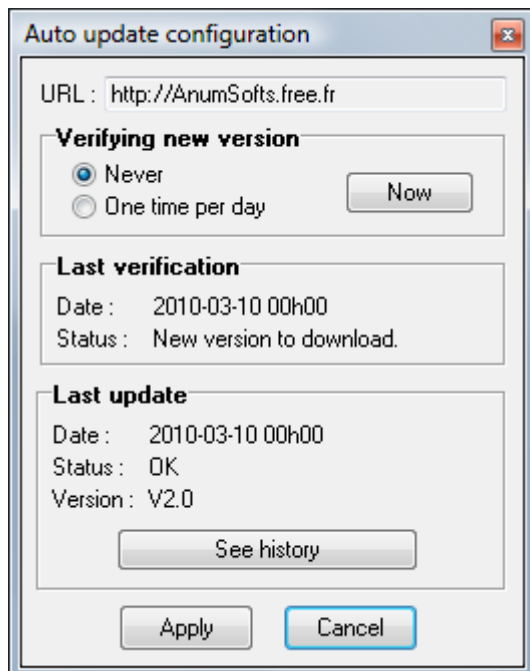
4.1.2 Log messages

Display all Start messages.

Useful to see:

- found COM ports
- installed RF receivers
- channels attribution
- errors of configuration

4.1.3 AutoUpdate configuration



When the program is executed, it verifies if a new version is available. If yes, the program is downloaded and the new program is run instead the old program and the history is displayed.

Options:

Never: no verification is made

One time per day: the verification is made when the program is executed but only one time in the day

You can force the verification with the "Now" button.

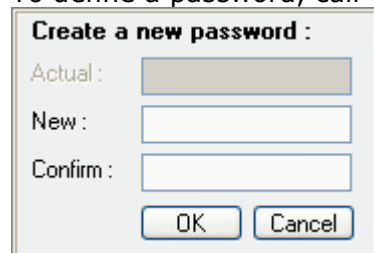
You can see the history of the modifications with the button "See history".

4.1.4 Role management

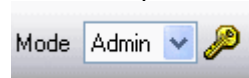
The program has two roles, and possible actions are different:

- **Admin:** all pages are available
- **User:** only Run Config, Run, and Plugins pages are available.

By default, no password is defined, so no password is required to change role User to Admin. To define a password, call "Program configuration" / "Password" menu.



Once the password is defined, an "Key" icon is displayed:



To delete the password, you must enter the actual password.

To modify the existing password, you must enter the actual password.

If a password is defined when the program is launched, the User role is selected.

Note:

When a test is started, only Run page is displayed.

4.1.5 Licence

A "Licence.dat" file is provided by Microtec and must be present in the same directory of the program. This file contains the User name and the serial code.

According to the User name, plugins available are different (see [Plugins page](#)).

4.2 LF Config page

This page allows to define the LF frames and the script.


4.2.1 Frames sheet





This list displays all frame descriptions of LF frame.


Icons :

 Add a new frame description as "NewFrame"

 Delete the selected frame description

 Copy the frame description as "NewFrame"

 Down the selected frame description

 Up the selected frame description

According **Type** description ([LF Data Type](#) or [LFCWType](#)), the fields to fill are different:

For LF Data :

Comment : just a text to explain the description

Name: the description name. This name will appear in the list and can be use in a script.

Frequency: carrier frequency (119.0kHz, 121.9kHz, 125kHz, 128.2kHz, 131.6kHz)

Type: LF Data

Content: description of the content frame. You can input the description with a suit of hexadecimal values, binary values or mixed value.

To use parametric frame, see [Parametric frames](#).

Hexadecimal values have "h" suffix, binary values have "b" suffix.

IMPORTANT: the hexadecimal value is **always** a Manchester value (see [LF Data coding](#)). Binary values are used without coding.

Baudrate: Standard : 1960 bauds to 10000 bauds Manchester. Example, with 3906 bauds, the Manchester bit time is 256µs, half-bit time is 128µs.

The resolution of half-bit is 1µs. So you can have 3906, 3937, 3968, 4000, and so on.

Special : 1ms, 5ms, 10ms, 50ms. These baudrates define the time for one binary bit.

Coding: coding of Manchester values.

With Standard coding, a 0 Manchester bit is coded with two half bits 01

With Inverted coding, a 0 Manchester bit is coded with two half bits 10

Analysis

You can display the binary result of the Content field.

IMPORTANT:

- Each displayed bit is a half-bit.
- For each 1 value, the carrier frequency is ON.
- For each 0 value, the carrier frequency is OFF.
- It's a 0...100% AM modulation.

Example for a LF Data description:

The screenshot shows a software interface with a list of descriptions on the left and a configuration panel on the right. The list has two entries: 'ForceTX' with comment 'Force emission' and 'CW' with comment 'Carrier 125kHz'. The configuration panel for 'ForceTX' includes the following fields:

- Description :**
 - Comment :** Force emission (Text)
 - Name :** ForceTX (Text)
 - Frequency :** 125.0 kHz (dropdown)
 - Type :** LF Data LF CW
 - Content :** 0000h 111000101100110010b 615Eh 13C66C39h (Text)
 - Use @Param or @Param(size) to define a parametric frame
 - Baudrate :** 3906 bauds Manchester (dropdown)
 - Coding :** Standard Inverted
 - Waveform diagram:** Shows two waveforms for 'Standard' and 'Inverted' coding. For 'Standard', 0 is a high pulse followed by a low pulse, and 1 is a low pulse followed by a high pulse. For 'Inverted', 0 is a low pulse followed by a high pulse, and 1 is a high pulse followed by a low pulse.
 - Analysis** button

For LF CW:

Comment: just a text to explain the description

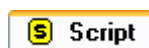
Name: the description name. This name will appear in the list and can be use in a script.

Frequency: carrier frequency (119.0kHz, 121.9kHz, 125kHz, 128.2kHz, 131.6kHz)

Example for a LF CW description:

Comment :	<input type="text" value="Carrier 125kHz"/>	Text
Name :	<input type="text" value="CW"/>	Text
Frequency :	<input type="text" value="125.0"/> kHz	Type : <input type="radio"/> LF Data <input checked="" type="radio"/> LF CW

4.2.2 Script sheet



A script allows to do some actions automatically with a list of commands. Each time you click on a command in the list, a panel is display to input the command parameters.

Icons:

- Add a new command
- Delete the selected command
- Copy the command
- Down the selected command
- Up the selected command
- Delete all the script

Available commands are:

COMMENT: add a comment in the script

DELAY: suspend script execution during the specified time (in ms)

END: stop the script

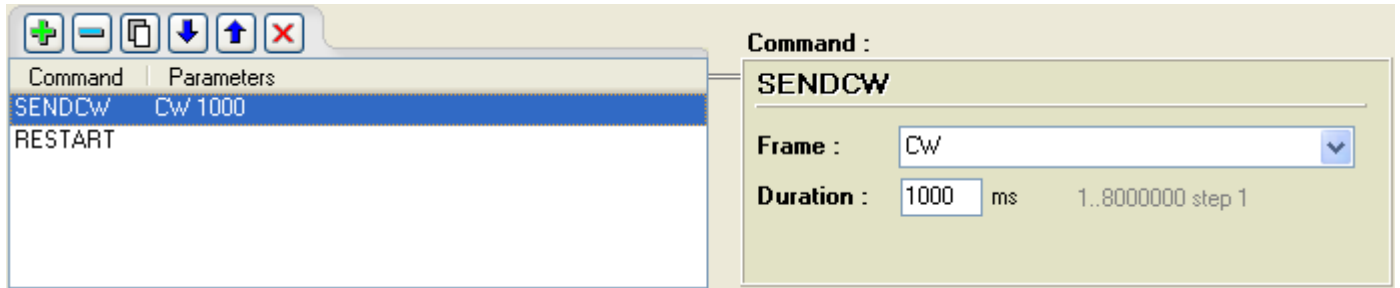
RESTART: re-execute the script from the top

SENDF: send a defined LF Data frame. You must choose the frame in the list and indicate the repetition number and the interframe time.

SENDCW: send a define LF CW frame. You must choose the frame in the list. You must indicate the duration of the carrier emission.

SET: set a value in a parameter (see [Parametric frames](#)). The value can be a suit of hexadecimal values, binary values or mixed value.

Script example :



4.2.3 Parametric frames

Frame description can have one or more parameters in the [content](#) field. This functionality allows to modify the frame content during execution with a script, or for individual frame. Parameter value can be coded with a suit of hexadecimal values, binary values or mixed value.

Syntax: @name(size)

Each parameter has a different name, and you must use "@" character before it.

Inside the brackets, you can define the value size. This size value will format the parameter value to have the right size.

IMPORTANT:

- the value size defines a number of Manchester bits.
- "ID" name must be used for individual frames.

Example :

```
0000h 111000101100110010b 615Eh 33h @ID(24)
```

when ID is represented with 3 bytes

4.3 RF Config page

This page allows to define the RF Descriptions.

Icons:



Add a new frame description as "NewFrame"



Delete the selected frame description



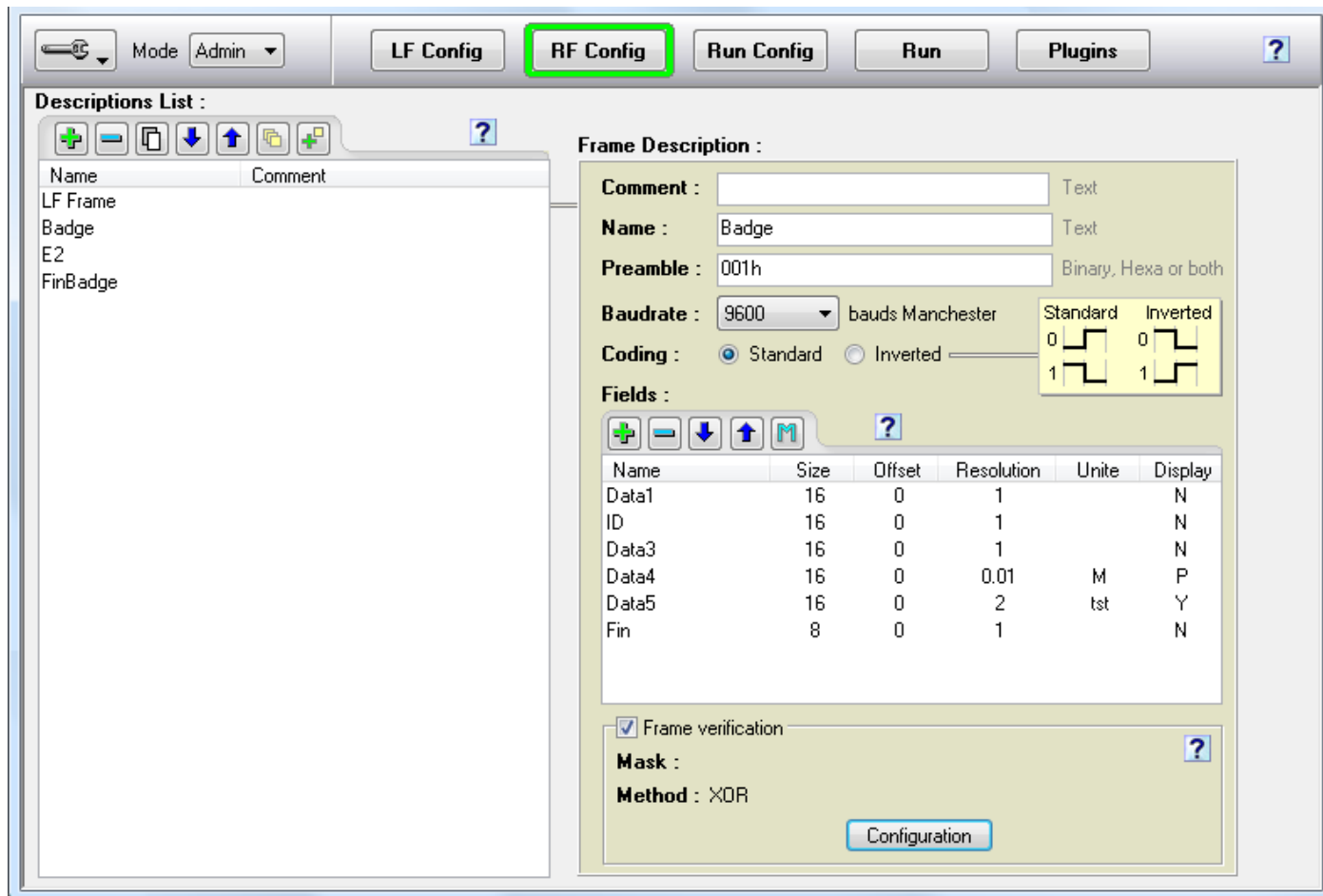
Copy the frame description as "NewFrame"



Down the selected frame description



Up the selected frame description



Comment: just a text to explain the description

Name: the name used for RF Config

Preamble: allows to detect the beginning of the frame (see [IMPORTANT Preamble](#)). Use binary or hexadecimal values.

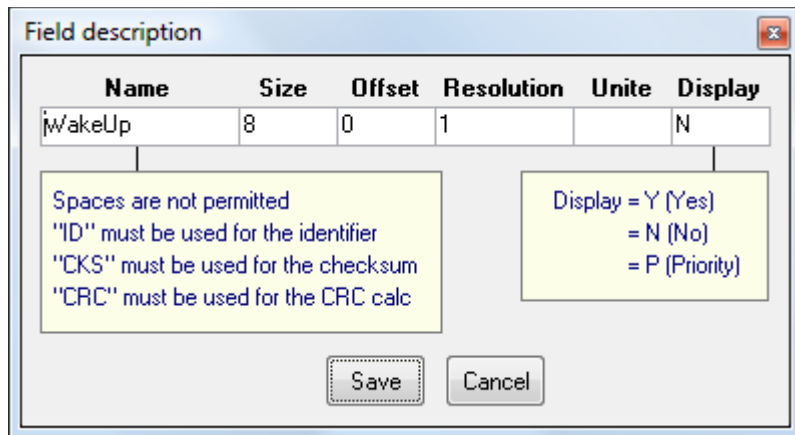
Baudrate: Manchester baudrate. Choose the near wanted value.

Coding: Manchester coding standard or inverted

IMPORTANT : for the preamble, it is advised to not write the exactly preamble because in case of RF receivers, sometimes the first bits are wrong. So when the preamble is "0001h", it's better to write "001h" only.

Fields: it's a list of fields with different parameters for each field. When a frame will be received, all fields will be decoded and displayed.

 This button allows modifying a field description:



Name: name of the field

Size: number of Manchester bits (1...64)

Offset: floating value

Resolution: floating value

Unite: unite of the field value. Must be left empty to have the result in hexadecimal

Display: if "Y" this field will be displayed in the "Rx Bargraph" sheet
if "P" this field will be displayed in the "Rx Bargraph" sheets

Notes:

- If a unite is defined, the value will be calculated with Offset and Resolution values:

$V * \text{Resolution} + \text{Offset}$

- Else, the field will be displayed in hexadecimal without unite.

- you can add, delete, up, down and modify a item in the fields list. To modify an existent field, you can do a double-click on it.

IMPORTANT:

- use "ID" for the name field allows the program to sort the received frames.
- use "CKS" for the name field as frame checksum (if used).
- only 7bits characters can be used. "°C" is no authorized. Use "deg" instead.

CKS Calculation: checksum calculation (see [FrameVerification](#)).

4.3.1 Frame Verification

If "Frame Verification" is checked in RF Config page, a CKS calculation is made.

Only masked values are used.

A field **CKSCalc** is displayed.

If a "CKS" field is defined in the frame description and CKS is checked, another field is displayed:

CKSGood: "1" if the checksum are identical, "0" else.

The line with a bad checksum will be displayed with red background colour.

The mask is defined in hexadecimal form ('0'...'F') without 'h' suffix.

You can add space characters to separate the fields.

Ex: mask=001F FF 00 FF

hex =1234 56 78 9A BCDEF

Checksum (ADD method) = 14 + 56 + 9A

Calculation methods**ADD:** CKSCalc = byte1 + byte2 + ... + byte_n

Size = 2 or 8 bits

Not = Yes or No for invert the result

XOR: CKSCalc = byte1 XOR byte2 XOR ... XOR byte_n

Not = Yes or No for invert the result

CRC: polynomial function

Polynomial value

Initialization value

XOR output

Size = 8 or 16 bits

CRCa or CRCb method

In the frame verification window, the user can simulate many all the configurations :

Mask : Ex: FF FF FF 00 FF (always in hexadecimal)

Method : ADD XOR CRC

CRC
Decimal values or Hexadecimal values.
Ex: 4129 or 1021h

Polynomial

Initialization

XOR output

Size : 8 16 bits

Algorithm

Simulation result	
<input checked="" type="radio"/> CRC-a	<input type="text" value="62"/> <input type="text" value="3Eh"/>
<input type="radio"/> CRC-b	<input type="text" value="187"/> <input type="text" value="BBh"/>

Simulation
Decimal values or Hexadecimal values.
Ex: 78 or 4Eh

Test frame (bytes list)

A8h
06h
C3h
69h
90h

4.4 Run Config page

In this page, you can modify the behaviour of the test.

4.4.1 LF Parameters

Mode :

M Manual

S Script

B Cyclic broadcast

I Cyclic individual

LF frame : (Data or CW)
MLF5

ON duration : 10 sec

OFF duration : 1 sec

Interframe : 10 msec (Data only)

Different modes are available:

Manual: in this mode, you must send the LF Data frame or LF CW manually

Script: in this mode, the script is executed automatically at then beginning of the test

Cyclic broadcast: a cycle ON-OFF-ON-OFF-.. is executed. The LF frame is sent during all the ON duration.

In case of LF Data frame, you must specify the interframe time (the time between 2 LF frames).

Cyclic individual: first, you must define a parametric frame with "ID" name, and you must define an ID list in ID Filter sheet (see [ID Filter](#)).

A LF frame is sent during all each ONx duration. During ON1, the LF frame is sent with ID n°1, during ON2, the LF frame is sent with ID n°2, and so on until all ID are sent. After, an OFF duration is executed (without LF emission) and the cycle start again.

If 3 ID are listed in ID Filter, a cycle ON1-ON2-ON3-OFF-ON1-ON2-ON3-.. is executed.

4.4.2 Rx Parameters

This sheet allows linking the RF descriptions with the channels.

Channel activation

The screenshot shows a configuration window for 'Logical channels'. It contains four channel slots. The first slot is disabled (checkbox unchecked) and labeled 'LF 125.00kHz'. The second slot is active (checkbox checked) and labeled 'RF 315.00MHz' with 'FSK' modulation; its description is 'TG1B', 'TG1C Diag', and 'TG1C HACD standard'. The third slot is active (checkbox checked) and labeled 'RF 433.92MHz' with 'FSK' modulation; a dropdown menu is open showing options: 'LF 125.00kHz', 'RF 314.82MHz', 'RF 315.00MHz', 'RF 433.92MHz' (highlighted), 'RF 434.42MHz', and 'Specific'. The fourth slot is disabled (checkbox unchecked) and labeled 'RF 433.92MHz' with 'FSK' modulation. An arrow labeled 'Channel activation' points to the checkbox of the fourth slot. A bracket at the bottom labels the entire area as 'Logical channels'.


Logical channels

IMPORTANT:

- the channels represented in this sheet are named "Logical channels". You can choose RF frequency on the channel you want, the program will link automatically "Logical channels" to the correct "Physical channels".
- the channels represented in Run page are named "Physical channels". These channels are depending of installed receiver boards and are automatically detected.

Thus, a configuration will well working with another ANumLFRF tool with another receiver configuration. To configure:

- 1- Select on a channel, a frequency you want decoded (the Specific channel is reserved for specific external receiver)

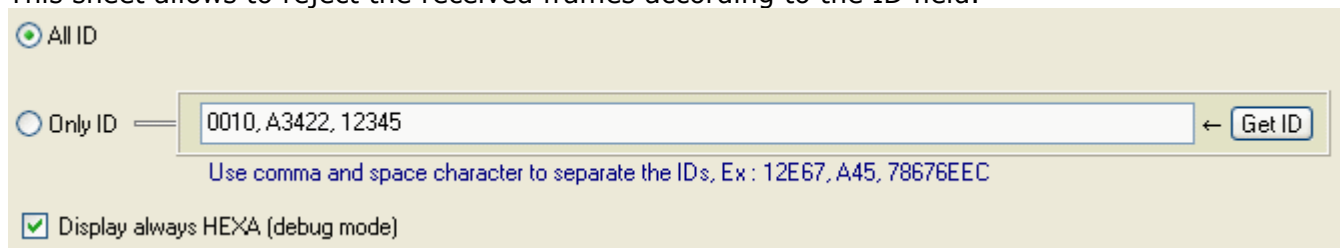
- 2- Select ASK or FSK mode (not available for LF125.00kHz)
- 3- Active or not the channel (became green)
- 4- Add a Description to decode with  the actual RF Config list is displayed

IMPORTANT:

- Up to 16 descriptions for each channel can be used
- Descriptions on a same channel can have different baudrate, different preamble, and different content
- You can use a same description on many "Logical channels" with different frequency
- You can install two receivers with the same frequency and use the first with ASK modulation and the second with FSK modulation.

4.4.3 ID Filter

This sheet allows to reject the received frames according to the ID field.


Mode:

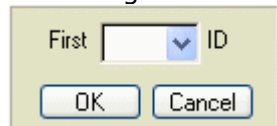
All ID: all frames are displayed

Only ID: only frames with the ID in the list are displayed

IMPORTANT:

- ID must **not** have suffix ("h")

You can get the ID from the received list (after a Run) with using the "Get ID" button.



You must select the number of ID you want. The ID list is sorted by received frames number before. To detect all received frames, you can check "Display always HEXA". So, if a frame with a good preamble but with a wrong data size, the hexa value will be displayed. Useful to correct a bad description.

4.4.4 Options

This sheet allows adjusting the program behaviour:

- The maximum number of lines in "Run" tabs
- Fields coloration: be careful, use a lot of CPU resources
- The number of digits for floating number displays
- The minimum value for analogic displays in "Rx Graphical" sheet
- The maximum value for analogic displays in "Rx Graphical" sheet
- The maximum number of lines for the generation of output files (XML format)
- Generation or not of output files (XML files, see [Generated files](#))

Display	
Max items in 'Rx Full-Datas' list	500
Max items in 'Rx ID-Datas' lists	500
Max ID	100
Fields coloration	<input checked="" type="checkbox"/>
Displayed digits	3
Meter min value	-5
Meter max value	12
Files	
Max XML lines	32000
Don't generate output files	<input type="checkbox"/>

4.4.5 Alert and Warning option

The Alert option allows to monitor one or two specific fields. If the value is out of range, a Warning or an Alert is triggered.

LF Parameters	Rx Parameters	ID Filter	Options	Alert
<input checked="" type="checkbox"/> ACTIVE				
Field name to analyze : Pressure or -none-				
<input type="checkbox"/> TimeOut enabled 2 s If TimeOut occurs (after 1st frame) then active Alert				
Warning (low priority)				
if value <input type="radio"/> < Threshold 2.0 Then <input checked="" type="radio"/> >				
Output <input type="radio"/> Fix <input type="radio"/> Blink 500ms <input type="radio"/> Blink 1000ms <input checked="" type="radio"/> Blink 2000ms				
Wave <input type="radio"/> None <input checked="" type="radio"/> File -none-				
Alert (high priority)				
if value <input type="radio"/> < Threshold 1.5 Then <input checked="" type="radio"/> >				
Output <input type="radio"/> Fix <input type="radio"/> Blink 500ms <input type="radio"/> Blink 1000ms <input checked="" type="radio"/> Blink 2000ms				
Wave <input type="radio"/> None <input checked="" type="radio"/> File -none-				

A Time out can be programmed, and the Alert action is executed if no frame with the specified field is received.

Output represents the logical output on the Ext connector.

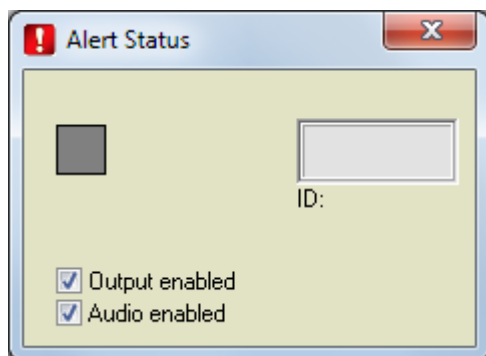
Wave represents a way file to play on the audio output. You need to adjust the volume manually.

After a START, an specific icon is displayed to show that the Alert & Warning option is active.



If you click on this icon, the Alert status is displayed. On this window, some informations are displayed :

- the actual status
- the last field value
- the ID of the frame if a Alert or a Warning has been triggered.



4.5 Run page

On the Run page, you can:

- send LF frames (manually mode)
- see the received frames

IMPORTANT: see [LF Power level](#) chapter.

When you click on Start button, the program:

- initializes the hardware: 2 virtual COM ports ANumTx and ANumRx displayed as green LED
- retrieves the installed receivers boards and displayed their name: Ext, 1, 2, 3. These 4 channels are named "Logical channels".

The LF power level can be adjusted with the track bar. By default, at the Start, the level is to 0. When a LF frame is being sending, the LF emission yellow LED is ON.

Manual mode



If the LF mode is Manual, the available frames list is built.

You can program:

- the number of emitted frames (Cont, 1...255)
- the interframe value (0...255ms). In fact, "0ms" is 100µs

Notes:

- "Cont" is a Continuous mode. A "Stop" button is displayed instead the "Send" button, thus you can stop the LF emission
- Continuous mode is allowed only for LF data frames, not for CW frames.

Script mode



If the LF mode is Script, the script runs immediately.

You can stop the execution with the Stop button.

The elapsed time from Start is displayed.

The current command is displayed, with its order number.

Each command has a order number. You can display all the script with the order numbers with the button View.

Cyclic broadcast

B Mode Broadcast	Elapsed time :	Current cycle :	Sent frames :
	-	-	-

If the LF mode is Cyclic broadcast, the cycle runs immediately and begins with the ON state. The elapsed time from start, the current cycle and the number of sent frames are displayed.

Cyclic individual

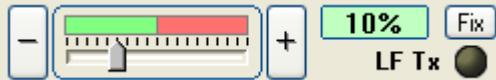
I Mode Individual	Elapsed time :	Current cycle :	Current ID :	Sent frames :
	-	-	-	-

If the LF mode is Cyclic individual, the cycle runs immediately and begins with the ON state for the first ID.

The elapsed time from start, the current cycle, the current ID and the number of sent frames are displayed.

4.5.1 LF power level

The voltage across the LF Antenna could be important with a tuned antenna. The LF level could be limited by the administrator with the fix button.



Thus, a user can not exceed the specified level and a message box is displayed:



In administrator mode, a dialog box is displayed when he want set the level over the fixed level to confirm the new level:



4.5.2 Decoding

When a frame is received with a good preamble, the program looks for the nearest description with 10 bits more (maximum).

If "Displays always HEXA" is checked in Run Config / ID Filter is checked, only Hexa field will be displayed in case of longer frame.

Hexadecimal codes must be multiple of 4 bits with '0' and '1' Manchester bits. In case of Manchester violation code, the code is displayed in binary format:

Ex: [011M]

M = Mark (11)
S = Space (00)

In this example, the last Manchester bit is a Mark bit, thus hexadecimal code is undefined.

4.5.3 Reference time

Some fields are displayed during the decoding:

_RTime : represents the relative time (since Start) in μ s of the **end of the frame**.

_ATime : represents the absolute time (PC time). This time is present just for information because the accuracy is very poor.

_PTime : represents the relative time (since Start) in μ s of the **end of the preamble**.

4.5.4 Rx Full-Datas

On this sheet, the Received frames are decoded and displayed.

Format is like XML with Name="Value".

These lines are saved directly in files.

On each line, you can see:

_RTime: relative time from Start (time of the frame end)

_ATime: absolute time

Channel: physical channel (receiver name)

Desc: description found

Hex: hexadecimal frame

.. defined fields (RFConfig)

CKSCalc: if CKS checked

CKSGood: if CKS checked and CKS field defined

The screenshot shows the ANumLFRF software interface. At the top, there's a control panel with a 'Run' button highlighted in green. Below it, there's a status bar showing '0%' and 'not connected'. The main window is titled 'Rx Full-Datas' and displays a list of decoded data frames. The data frames are in XML format, showing fields like _RTime, _ATime, Channel, Desc, Hex, and Data1. The results directory is set to 'atas\Creat\ANumLFRF\20100315_232425_EMC'.

IMPORTANT:

- for fields with a unit, (ex Temperature), a field with 'U' suffix is created (ex TemperatureU).
- only 7bits characters can be used. "°C" is no authorized. Use "deg" instead.

Icons :

ALL All ID are displayed

FILT Only ID defined in Run Config are displayed

Deb Display always (debug mode)

To measure DeltaT between 2 lines, click on the first, click on the second : the DeltaT is displayed.

4.5.5 Rx ID-Datas

On this sheet, the Received frames are sorted by ID. You can select the ID you want in the left list. Format is the same as RX Full-Datas else only same ID lines are sorted.

IMPORTANT:

- only 100 different IDs can be memorised
- when 100 different IDs are yet memorised and another one occurs, it will take the place of the one who has the least of received frames.

The screenshot shows the ANumLFRF software interface. At the top, there is a control bar with a 'Run' button highlighted in green. Below it, a status bar shows '0%' and 'not connected'. The main interface is divided into several sections: 'Mode Manual', 'LF frames', 'N Frame', and 'Interframe'. The 'Rx ID-Datas' tab is selected, showing a list of IDs in the left pane and their corresponding data fields in the right pane. The data fields include RTIME, ATIME, CHANNEL, DESC, and HEX. The 'DeltaT' field is currently empty.

To measure DeltaT between 2 lines, click on the first, click on the second : the DeltaT is displayed.

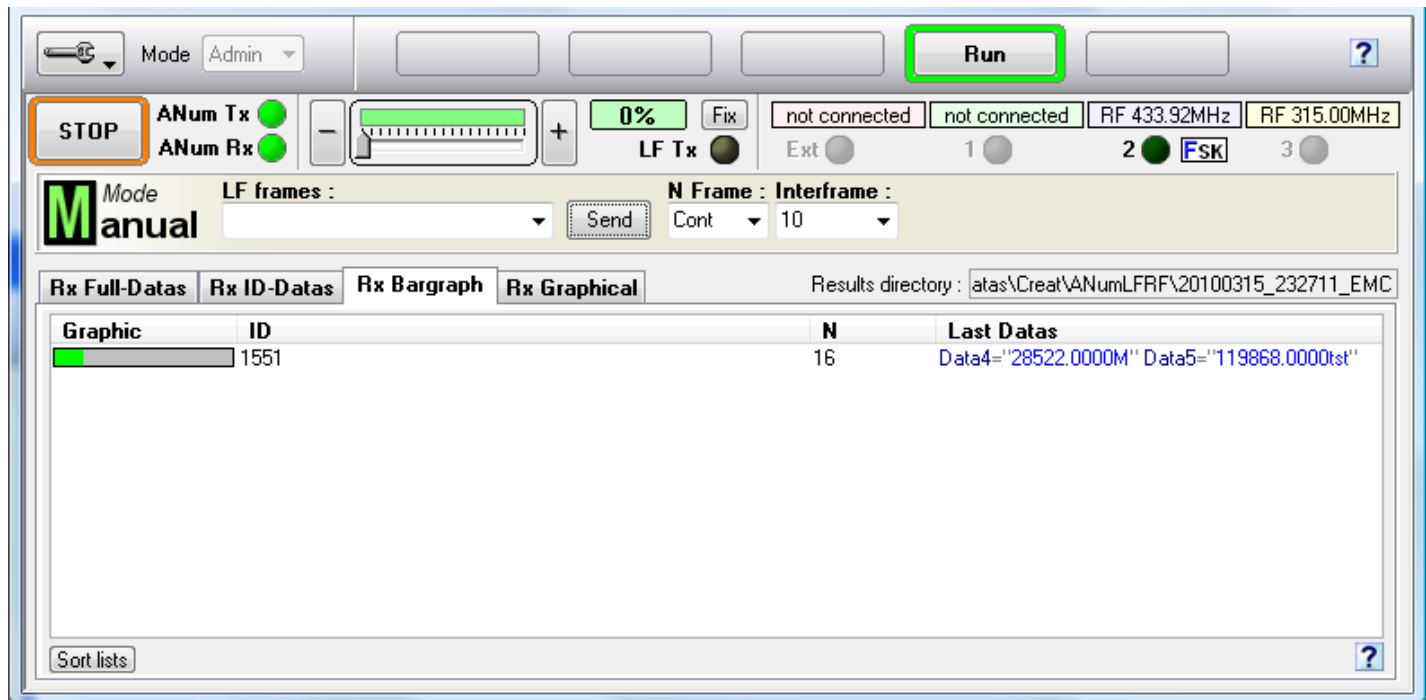
4.5.6 Rx Bargraph

On this sheet, the received frames are displayed by ID. For each ID:

- the number of received frames is display
- only fields with Display="Y" or "P" in RF Config are displayed (see [Fields parameters](#) display parameter)
- a bar graph with an automatic range (every 100 values)

IMPORTANT :


- Unit (if exists) is displayed at the end of the value.



4.5.7 Rx Graphical

On this sheet, the received frames are displayed on a panel with analogic form:

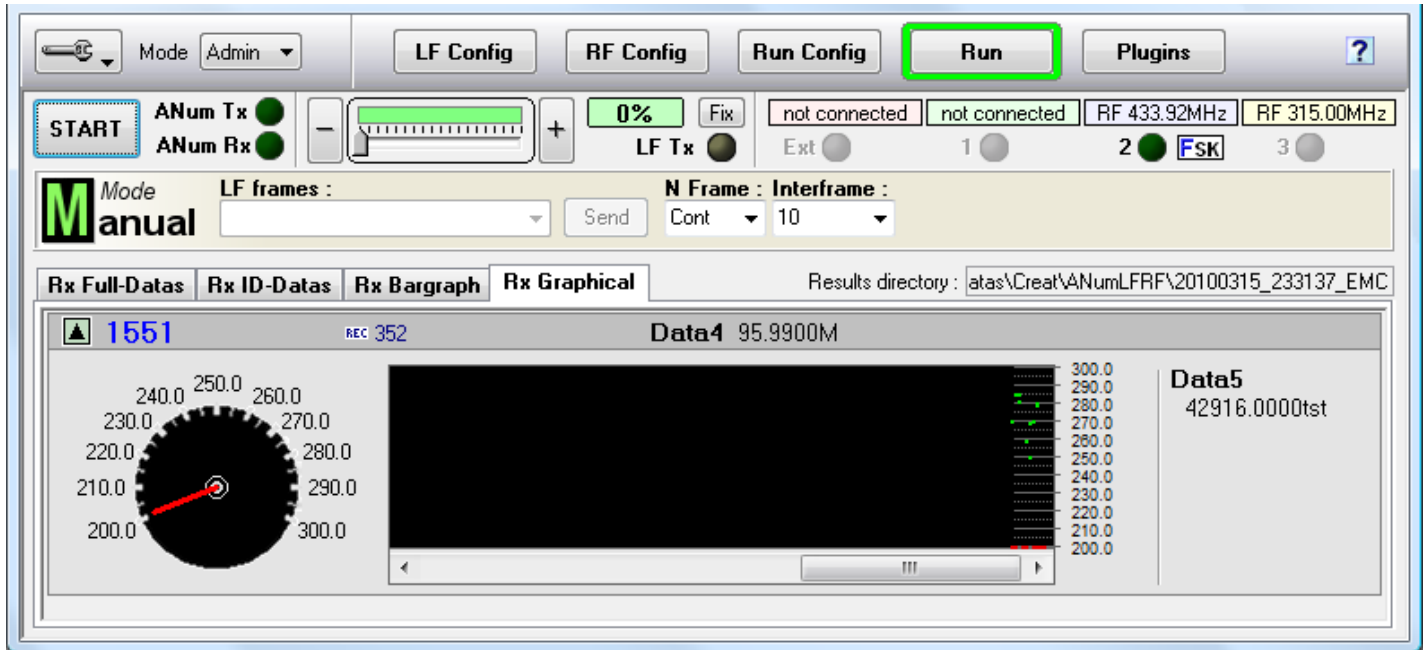
- on the top bar : ID, number of received frames, Primary value (the field with Display="P" in RF Config)

The panel can be minimized with  button

- Analogic counter
- Historic display
- Other fields (the fields with Display="P" in RF Config).

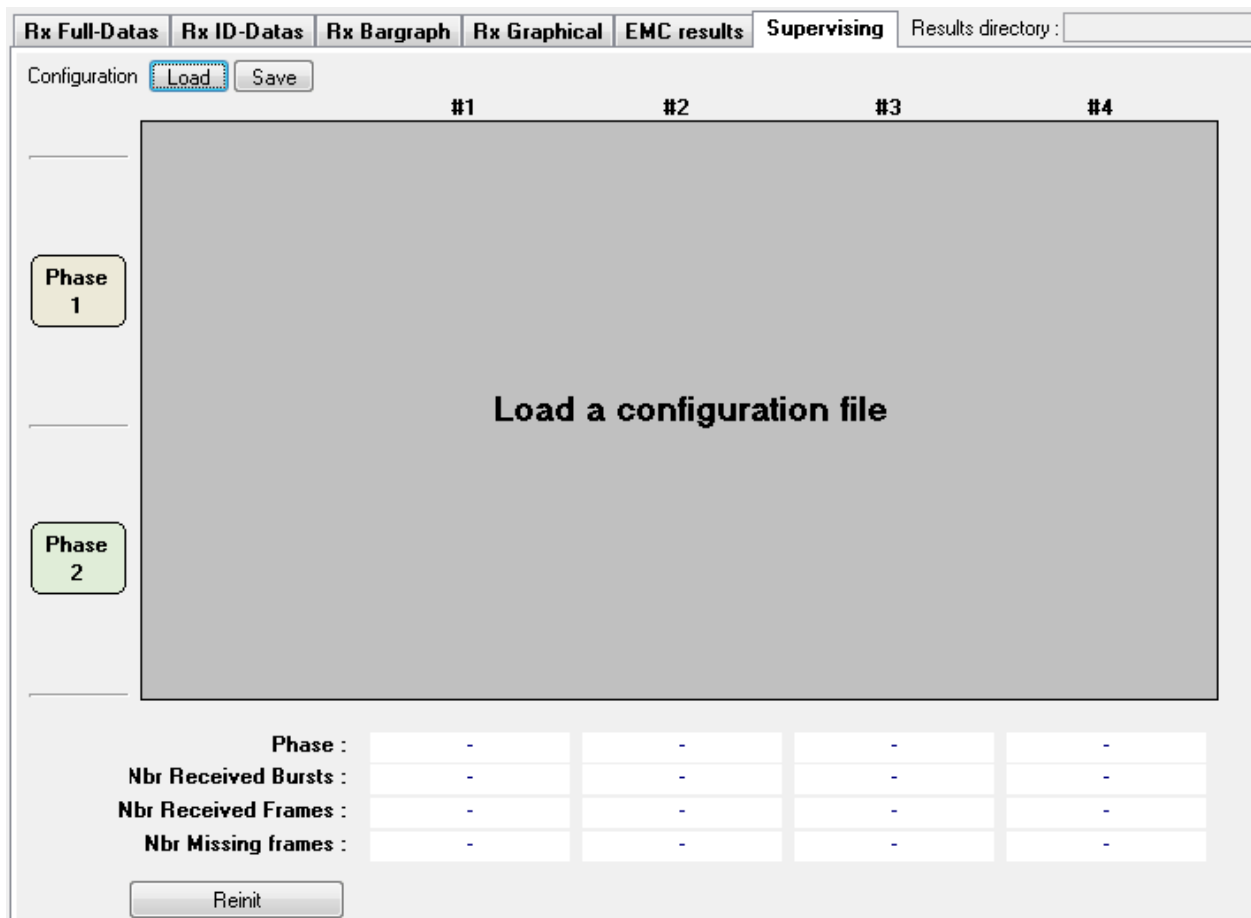
IMPORTANT :

- up to 8 different ID can be displayed at the same time
- only 1 field can have Display="P"
- only the 3 first fields with Display="P" can be displayed
- The screen shifts every second with a 500 points memory (so 8mn30). If many frames are received in the same second, all values are displayed. So, it's easy to see the min and the max received values
- The range of analogic counter and historic display is defined in Run Config page, Options sheet. If the new value is outside the defined range, the point is displayed with red color.



4.5.8 Supervising

On this sheet, some parameters can be monitored.



To active a function, you must load a configuration file with *Load* button.

The format of this configuration file is .CSV

So you can write it with Excel or with a simple text editor.

The first column is a Captions column, so you can modify the text as you want. This column is read and display by ANumLFRF.

Example of CSV file :

```
ID;1551;0;0;0;
Enabled;1;0;0;0;
Field;Mode;0;0;0;
Value;4B;0;0;0;
Nbursts;2;0;0;0;
InterBurst min (ms);6700;0;0;0;
InterBurst max (ms);6900;0;0;0;
Nframes;18;0;0;0;
InterFrame min (ms);11;0;0;0;
InterFrame max (ms);13;0;0;0;
Enabled;1;0;0;0;
Field;Mode;0;0;0;
Value;4B;0;0;0;
Nbursts;2;0;0;0;
InterBurst min (ms);13000;0;0;0;
InterBurst max (ms);16000;0;0;0;
Nframes;18;0;0;0;
InterFrame min (ms);11;0;0;0;
InterFrame max (ms);13;0;0;0;
```

When you load a configuration file, you can modify directly the values with ANumLFRF (but not the first first column).

	#1	#2	#3	#4	
Phase 1	ID	1551	0	0	0
	Enabled	1	0	0	0
	Field	Mode	0	0	0
	Value	4B	0	0	0
	Nbursts	2	0	0	0
	InterBurst min (ms)	6700	0	0	0
	InterBurst max (ms)	6900	0	0	0
	Nframes	18	0	0	0
	InterFrame min (ms)	11	0	0	0
	InterFrame max (ms)	13	0	0	0
Phase 2	Enabled	1	0	0	0
	Field	Mode	0	0	0
	Value	4B	0	0	0
	Nbursts	2	0	0	0
	InterBurst min (ms)	13000	0	0	0
	InterBurst max (ms)	16000	0	0	0
	Nframes	18	0	0	0
	InterFrame min (ms)	11	0	0	0
	InterFrame max (ms)	13	0	0	0
	Phase :	-	-	-	-
	Nbr Received Bursts :	-	-	-	-
	Nbr Received Frames :	-	-	-	-
	Nbr Missing frames :	-	-	-	-

Reinit

4 different ID could be defined (#1 .. #4). The defined ID value must be the exact text of the received value in the frame.

Two phases could be defined. For each phase, there are these parameters :

- **Enabled** : if 1, the phase is active and the cell is green. If 0, the phase is inactive.
- **Field** : define the name of the field in the received frame to decide if this frame must be or not used in Supervising.

- **Value** : define the value of the field in the received frame to decide if this frame must be or not used in Supervising.
- **Nbursts** : define the number of bursts in the phase. A burst contains **Nframes**.
- **InterBurst min** : define the minimum time in ms, between two bursts . This used time is always `_RTime` field, so the time at the end of a received frame.
- **InterBurst max** : define the minimum time in ms, between two bursts.
- **Nframes** : define the number of frames in a burst.
- **InterFrame min** : define the minimum time in ms, between two frames in a burst . This used time is always `_RTime` field, so the time at the end of a received frame.
- **InterFrame max** : define the minimum time in ms, between two frames.
(Only InterFrame max is used for time-out calculation, at this moment).

The configuration must be loaded or modify before START, because the parameters are freezed during a RUN.

On a START action, the result display show

Phase :	Wait..	-	-	-
Nbr Received Bursts :	0	-	-	-
Nbr Received Frames :	0	-	-	-
Nbr Missing frames :	0	-	-	-

The actual phase is displayed and "Wait.." is displayed until a right frame is received.

When all frames and bursts are received, the Phase text shows "End".

If some frames are missing, the number of missing frames is displayed (in red) on the Supervising sheet:

Phase :	End	-	-	-
Nbr Received Bursts :	4	-	-	-
Nbr Received Frames :	64	-	-	-
Nbr Missing frames :	8	-	-	-

The missing frames are displayed in real time in the XML output files :

```

_RTime="2108.390" _ATime="4/16/2012 11:39:39 PM" _PTime="2097.672" Channel="2-RF 433.92MHz" Desc="Badge" Hex="CECF15514BED210E6556FF"
_RTime="2120.230" _ATime="4/16/2012 11:39:39 PM" _PTime="2109.502" Channel="2-RF 433.92MHz" Desc="Badge" Hex="CECF15514BED210E6556FF"
_RTime="2132.070" _ATime="4/16/2012 11:39:39 PM" _PTime="2121.342" Channel="2-RF 433.92MHz" Desc="Badge" Hex="CECF15514BED210E6556FF"
_RTime="2143.910" _ATime="4/16/2012 11:39:39 PM" _PTime="2133.182" Channel="2-RF 433.92MHz" Desc="Badge" Hex="CECF15514BED210E6556FF"
_RTime="2155.740" _ATime="4/16/2012 11:39:39 PM" _PTime="2145.022" Channel="2-RF 433.92MHz" Desc="Badge" Hex="CECF15514BED210E6556FF"
_RTime="2159.390" _ATime="4/16/2012 11:39:39 PM" _PTime="2156.862" Channel="2-RF 433.92MHz" Desc="FinBadge" Hex="BE[11SS]" Data1="2FB"
_RTime="2170.000" _ATime="4/16/2012 11:39:39 PM" _PTime="2170.000" Channel="Supervising" Desc="Timeout" ID="1551"
_RTime="2185.000" _ATime="4/16/2012 11:39:39 PM" _PTime="2185.000" Channel="Supervising" Desc="Timeout" ID="1551"

```

In the example, I use a binary file with :

Phase1 : 2 bursts with 16 frames

Phase2 : 2 bursts with 16 frames

And I specify NFrames=18 for each burst. So 8 frames are missing.

IMPORTANT NOTE : the time-out is *InterFrame max* or *InterBurst max* time + 2ms.

So, the *Supervising Timeout* line in XML file shows the emplacement of the end of the missing frame.

You can press **Reinit** Button to restart Supervising without STOP and re-START.

4.5.9 Generated files

If enabled (see [Options](#)) the program save all information in files.
At each Start, a directory is created. The name is like this:
"YearMonthDay_HourMinuteSecond_Filename"

Filename is the name of the configuration file.

Example:

"20080113_102857_API"

The configuration file is copied in this directory.

All datas (received frames) are saved in files, XML format.

Thus, you can open them directly with Excel.

A full datas file and a file for each found ID are created.

Created files are limited to 32000 lines (Excel compatibility).

The file number is incorporated to the filename.

The first created file is "..#000001.xml"

When 32000 lines are reached, a new file is created ("..#000002.xml")

Full-Datas file

The full datas file name is like this:

"Filename_**Full**#number.xml"

With :

- Filename as configuration file
- Full is a fixed text
- number as file number (6 characters)

ID-Datas file

"Filename_**ID**#number.xml"

With :

- Filename as configuration file
- ID is the ID value
- number as file number (6 characters)

4.6 Save an Reload last acquisitions

In the main menu, there are 2 menu items :

- *Save last acquisitions*

After a Run, the last 82 seconds of acquisitions can be saved in a file.

- *Reload last acquisitions*

A saved binary file can be reloaded to test different configurations with same stimulus.

4.7 Plugins page

According the licence, some plugins are available.

4.7.1 DRUCK

The Druck plugin allows measuring Pressure on a GE Druck (DPI 142/150 series) with a GPIB interface, to measure pressure.

Contact technical service for more information : ANumSofts@free.fr

4.7.2 EMC

The EMC plugin allows to verify content of RF frames, in different situations for EMC tests.

Contact technical service for more information : ANumSofts@free.fr

4.7.3 DataLogger

The DataLogger plugin allows to remote a Acquisition Central with a GPIB interface, to measure acceleration, temperature, voltage.

Contact technical service for more information : ANumSofts@free.fr

5 DLL Using

ANumLFRF is available too in DLL format.

Thus, with another program you can do the same actions that the GUI program:

- send LF frames
- received decoded RF frames

Contact technical service for more information : ANumSofts@free.fr