



NOTICE

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VideoFreeCamSystem.RSI User manual for W Central command mode with Terminal

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0030	Suivi agrement CE & EN	VideoFreeCamSystem.RSI	FCM

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Diffusion interne	Pour information interne	Diffusion externe	Société
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Résumé

Operating Instructions for W panel in command mode

HISTORIQUE DU DOCUMENT

Version	Date (J-M-A)	Initiales auteurs	Objet de la modification	Chapitre
1.0	02-02-2015	GeEu	Création	1...
1.1	24-02-2015	DaLe	MAJ info Ethernet	8
1.2	27-03-2015	GeEu	MAJ mode usine	2

REFERENCES

Référence	Nom

ABREVIATIONS

Abréviation	Désignation

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1. BILL OF MATERIAL

1.1 Hardware

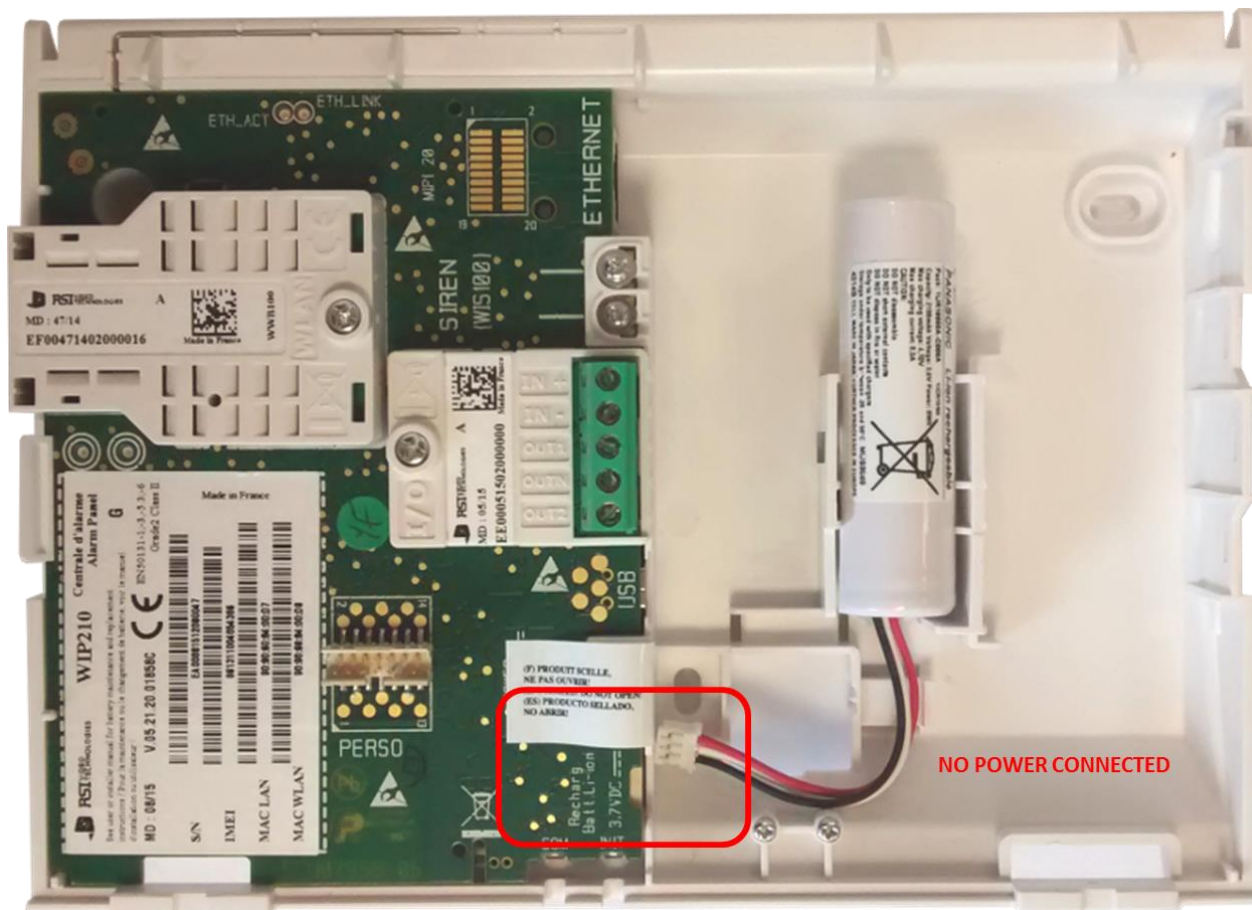
- Computer with USB
- RSI panel to test
- Batteries
- External power supply (if required by the tests)

1.2 Software

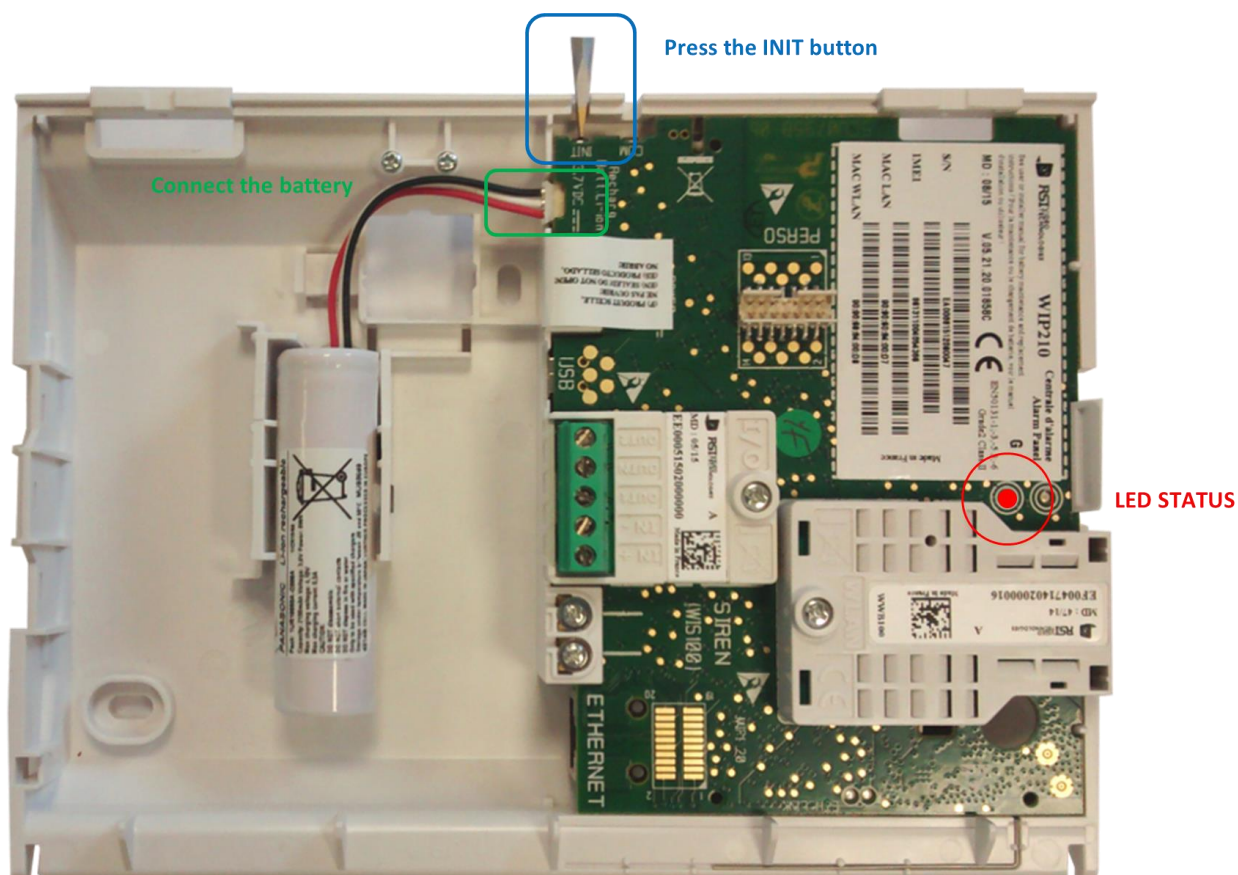
- Terminal (like Hyperterminal, Putty ...)
- Driver for the USB key (on the commercial videofied USB key) (Silicon labs CP210x driver [can be found here](#)).

2. TEST ENVIRONMENT SET-UP

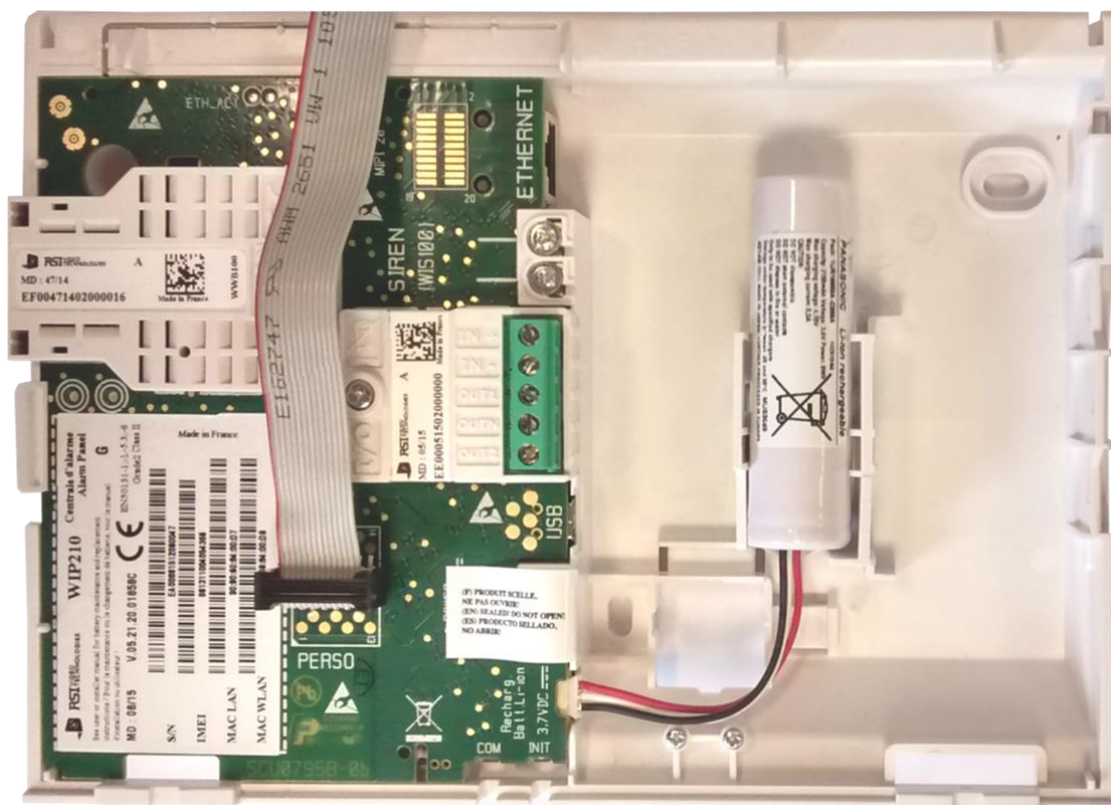
- Disconnect the power supply, USB and the battery



- Press the RESET button while connecting the battery
Hold down the INIT button until the status LED is turned off.



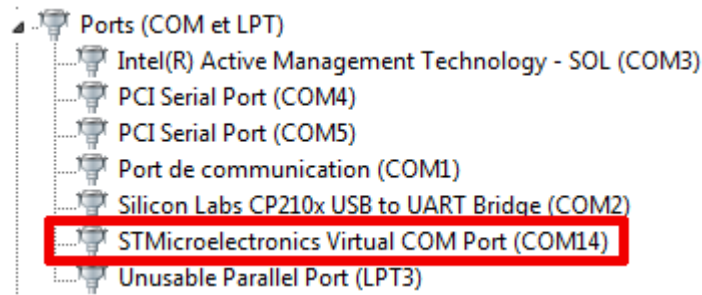
- Plug the ribbon to the RSI panel



- Connect the peripheral USB key to the computer and plug the ribbon in the USB key



- Search and note the STMicroelectronics Virtual COM Port number (STM32 Virtual COM Port driver must be installed)



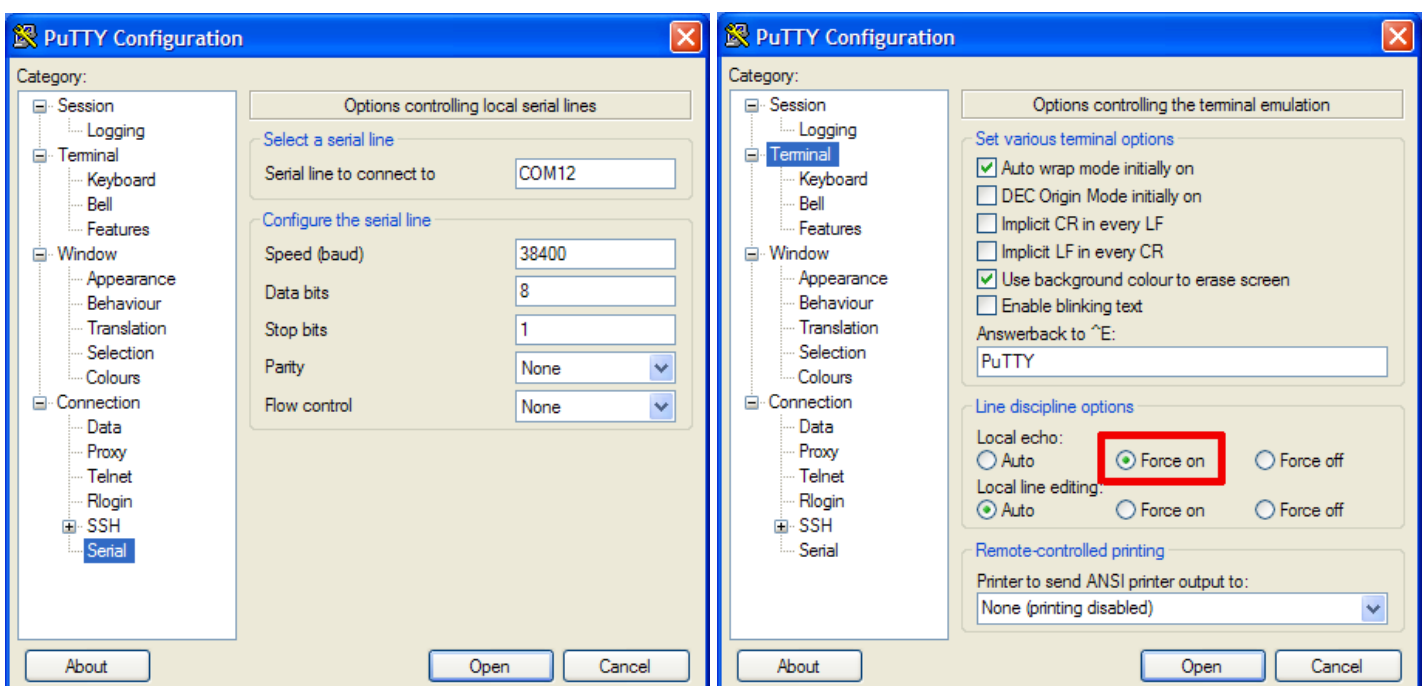
- Launch and configure the Terminal application.

Config :

- Baudrate : 38400
- Data bits : 8
- Stop bit : 1
- No Parity and no flow control

Optional :

- Force terminal Local echo



- Display status and version number

Command : u

```

u
----- Checklist W PANEL -----
Software pack. : XLP.05.21.14.01858C_ML
Panel Version  : XLP.05.21.14.01858C
Date           : Jan 22 2015
Time          : 16:04:56
Serial nb      : F7000215E20A0001
Manufact Nb    : 5114128900004698
Eth MAC Address: 90:90:60:04:00:0F
WiFi MAC Address: 90:90:60:04:00:10
STM32 FlashSize: 1024 (OK)
STM32 Unique ID: 005000353034510A36333536
Version Radio  : Si4432-B1
Version Flash  : AT45DB161E-SSHD-T
Version Flash2 : EN25Q64
Boot version   : 1.6
---- Hardware status and Resources ----
MainStatus on boot : 0
Hardware Test      : 4F4B (OK)
Functionnal Test   : 4F4B (OK)
Battery Calibration : 04A2 (OK)
VDD EXT Calibration : FFFF (OK)
SI4432 Calibration : 00CB
STM32 ReadOut      : OK
Checksum param perso : OK
Checksum param instal : OK
Resources check    : OK
Panel check        : OK
Struct flh ParamConfig: OK
Struct flash RamBackup: OK
Radio compatibility : OK
Version Frontel Config: XLP051000
Version Frontel Status: FC2043000
Version Frontel Log  : FC2043000
Default language   : US
---- Option boards ----
IO Board : detected
WIFI Board: Detected: 1.2.2.63.4.0.4 at 115200 bps SN: EF00471402000003

```

3. RF COMMANDS WITH TERMINAL

Unmodulated carrier transmission mode:

- 1: Enter command 'RCxx' with xx the correct channel number.
xx : 0 to 3 for EU version and 0 to 24 for US or AUS version (see below).

- 2: Enter command 'RTX' for start transmission.

To stop the transmission, enter command 'RS'.

Modulated carrier transmission mode:

- 1: Enter command 'RCxx' with xx the correct channel number.
xx : 0 to 3 for EU version and 0 to 24 for US or AUS version (see below).

- 2: Enter command 'RTXM' for start transmission.

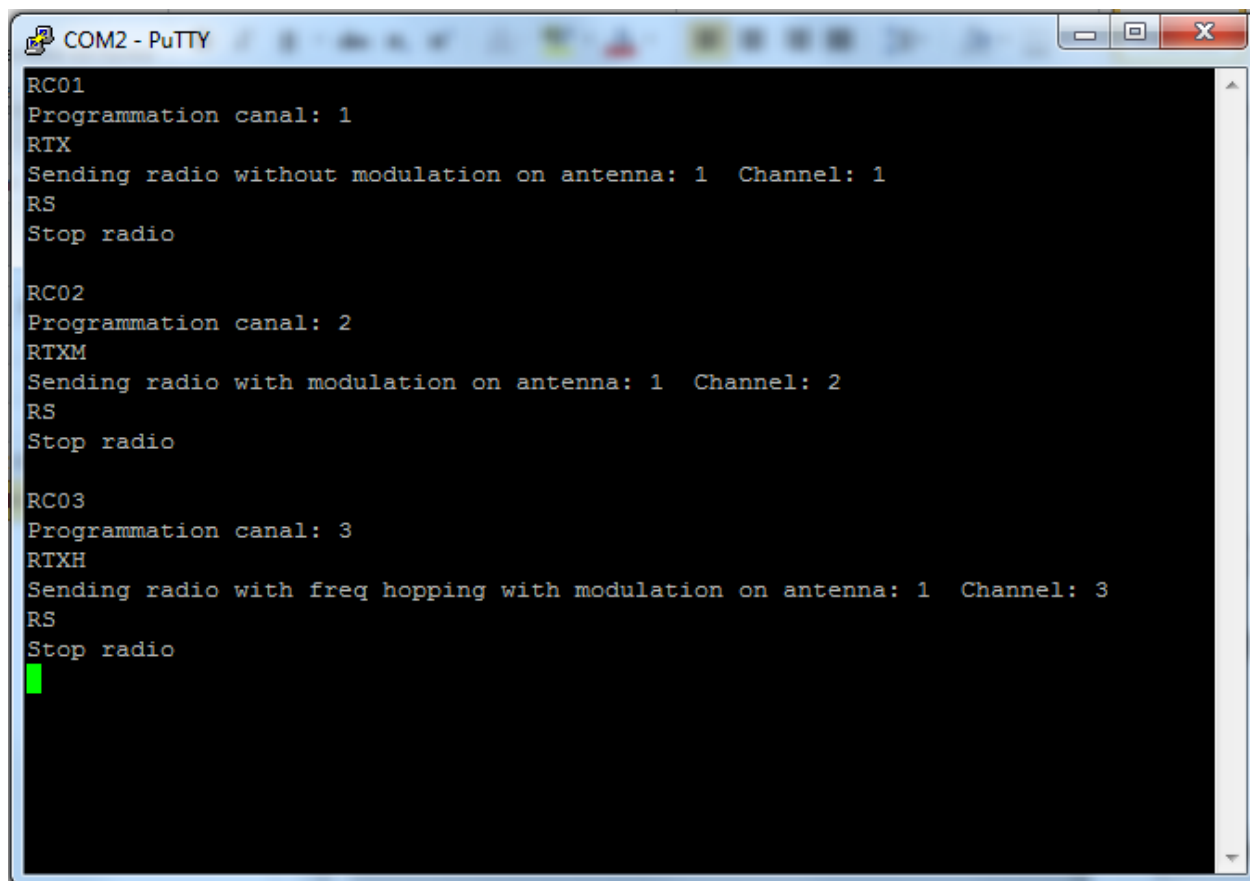
To stop the transmission, enter command 'RS'.

Hopping frequency transmission mode :

- 1: Enter command 'RCxx' with xx the correct channel number.
xx : 0 to 24 for US or AUS version (see below).

- 2: Enter command 'RTXH' for start transmission.

To stop the transmission, enter command 'RS'.



```
COM2 - PuTTY
RC01
Programation canal: 1
RTX
Sending radio without modulation on antenna: 1 Channel: 1
RS
Stop radio

RC02
Programation canal: 2
RTXM
Sending radio with modulation on antenna: 1 Channel: 2
RS
Stop radio

RC03
Programation canal: 3
RTXH
Sending radio with freq hopping with modulation on antenna: 1 Channel: 3
RS
Stop radio
```

4. AUS VERSION

4.1 Information

	Min.	Typical	Max.	Unit	Comments
Frequency Band					
ISM Band	915		928	MHz	
Center Frequency		921.5		MHz	
Bandwidth		12.5		MHz	
Spectral Dispersion		FHSS			
Channel Number		25			
Frequency Separation between channels		500		kHz	
Center Frequency Channel n		915,5 +0,5 n		MHz	n : 0 to 24
Frequency Accuracy at 25°C			±12	ppm	
Frequency Stability over temperature :			±10	ppm	(- 10 to + 55°C / ref. 25°C)
Channel Modulation					
Modulation Type		GFSK			
Deviation		±70		kHz	
-20dB Bandwidth		243	500	kHz	RBW:30kHz / VBW:30kHz
Binary Rate		38,67		kbps	~ 19,8MHz/8/64
RF Power					(Conducted Measurements)
TX Power	15	17.5	20	dBm	Delivered to the antenna
Installation Attenuation		6		dB	For optimal efficiency
RX Sensitivity		-103		dBm	

4.2 Frequency mapping

Channel n	Frequency (MHz)	Pseudo Random Rank
0	915.5	0
1	916.0	10
2	916.5	6
3	917.0	16
4	917.5	22
5	918.0	24
6	918.5	3
7	919.0	5
8	919.5	2
9	920.0	18
10	920.5	14
11	921.0	20
12	921.5	12
13	922.0	1
14	922.5	23
15	923.0	11
16	923.5	15
17	924.0	9
18	924.5	7
19	925.0	17
20	925.5	21
21	926.0	19
22	926.5	4
23	927.0	8
24	927.5	13

4.3 Packets formats

A given message is divided in several packets (fixed length = 10 bytes). The preamble packets are transmitted first and contain longer preamble bytes for easier synchronization of the receiver. The following data packets contain the payload (5 bytes). The total number of packets is variable.

Preamble packet :

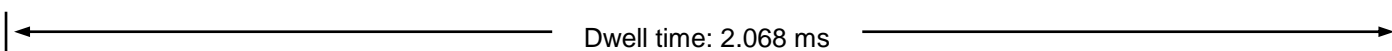
01010101	01010101	01010101	01010101	01010101	01010101	11110010	type hop chan#	8-bit	8-bit
learn	learn	learn	learn	learn	learn	sync-P	xx flag ccccc	syst Id_lo	syst Id_hi

Usage :

pairing	00 preamb async	hop flag + channel #	hop=0 : default hop table
std preamb	01 preamb sync 	hop flag+ down-counter	hop=1 : alternate hop table
resync	11 preamb async	hop flag + channel #	

Data packet :

01010101	01010101	01000001	type dwn cntr	data1	data2	data3	data4	data5	CRC-8
learn	learn	sync-D	10 dddddd	(*)	(*)	(*)	(*)	(*)	



Blank time: ~206.9µs

(*) The data bytes may have any values, included consecutive '0' or '1'. These cases shall not affect the clock recovery function.

5. US VERSION

5.1 Tune Up Information

	Min.	Typical	Max.	Unit	Comments
Frequency Band					
ISM Band	902		928	MHz	
Center Frequency		915.3		MHz	
Bandwidth		22		MHz	
Spectral Dispersion		FHSS			
Channel Number		25			
Frequency Separation between channels		900		kHz	
Center Frequency Channel n		904,5 +0,9 n		MHz	n : 0 to 24
Frequency Accuracy at 25°C			±12	ppm	
Frequency Stability over temperature :			±10	ppm	(- 10 to + 55°C / ref. 25°C)
Channel Modulation					
Modulation Type		FSK			ou GFSK
Deviation		±120		kHz	
-20dB Bandwidth	250			kHz	Min FCC value for 25 ch
Binary Rate		38,67		kbps	~ 19,8MHz/8/64
RF Power					
					(Conducted Measurements)
TX Power	15	17.5	20	dBm	Delivered to the antenna
Installation Attenuation		6		dB	For optimal efficiency
RX Sensitivity		-103		dBm	

5.2 Frequency Hopping

Pseudorandom Frequency Hopping Sequence

Each device contains a table to store the values of all 25 channels. The channels are arranged in a pseudo random sequence has described in the table here below (the channels are numbered from 1 to 25).

Channel n	Fequency (MHz)	Pseudo Random Rank
0	904.5	0
1	905.4	10
2	906.3	6
3	907.2	16
4	908.1	22
5	909.0	24
6	909.0	3
7	910.8	5
8	911.7	2
9	912.6	18
10	913.5	14
11	914.4	20
12	915.3	12
13	916.2	1
14	917.1	23
15	918.0	11
16	918.9	15
17	919.8	9
18	920.7	7
19	921.6	17
20	922.5	21
21	923.4	19
22	924.3	4
23	925.2	8
24	926.1	13

Equal Hopping Frequency Hopping Use

Each device handles a pointer which indicates the next channel to be used.

This pointer is incremented at each hope and it returns to the value 1 after the value 25.

In this way, all channel are used the same amount of time, in average.

Please note that not all channels are used for each transmission.

5.3 Packets formats

A given message is divided in several packets (fixed length = 10 bytes). The preamble packets are transmitted first and contain longer preamble bytes for easier synchronization of the receiver. The following data packets contain the payload (5 bytes). The total number of packets is variable.

Preamble packet :

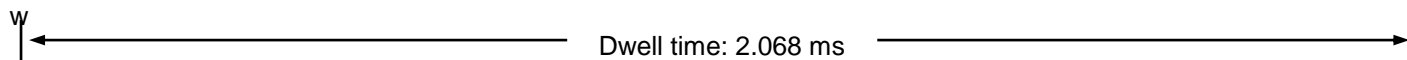
01010101	01010101	01010101	01010101	01010101	01010101	11110010	type hop chan#	8-bit	8-bit
learn	learn	learn	learn	learn	learn	sync-P	xx flag ccccc	syst Id_lo	syst Id_hi

Usage :

pairing	00 preamb async	hop flag + channel #	hop=0 : default hop table
std preamb	01 preamb sync 	hop flag+ down-counter	hop=1 : alternate hop table
resync	11 preamb async	hop flag + channel #	

Data packet :

01010101	01010101	01000001	type dwn cntr	data1	data2	data3	data4	data5	CRC-8
learn	learn	sync-D	10 dddddd	(*)	(*)	(*)	(*)	(*)	



Blank time: ~206.9µs

(*) The data bytes may have any values, included consecutive '0' or '1'. These cases shall not affect the clock recovery function.

6. EUROPE VERSION

6.1 Tune Up Information

	Min.	Typical	Max.	Unit	Comments
Frequency Band					
ISM Band	868,1		869,1	MHz	
Bandwidth		2		MHz	
Channel Number		5			
Frequency Separation between channels	300			kHz	
Frequency Accuracy at 25°C			±12	ppm	
Frequency Stability over temperature :			±10	ppm	(- 10 to + 55°C / ref. 25°C)
Channel Modulation					
Modulation Type		GFSK			
Deviation		50		kHz	
Binary Rate		19,53		kbps	Low speed video
		38,4			High speed video
		9,76			Wiselink
RF Power					(Conducted Measurements)
TX Power		17		dBm	Delivered to the antenna
Installation Attenuation		6		dB	For optimal efficiency
RX Sensitivity		-106,3		dBm	

Data frequencies

Channel n	Frequency (MHz)
0	868,1
1	868,5
2	868,8
3	869,1

Video frequency

Channel n	Frequency (MHz)
0	869,531

6.2 Packets formats

Preamble packet :

Division asynchronous format																				
Préamb 1	Préamb 2	Préamb 3	Préamb 4	Préamb 5	Préamb 6	Préamb 7	Préamb 8	Préamb 9	Préamb 10	Préamb 11	Préamb 12	Préamb 13	Préamb 14	Préamb 15	Sync 1	Sync 2				
01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01010101	01111111	00000000				
Octet 1	Octet 2	Octet 3	Octet 4	Octet 5	Octet 6	Octet 7	Octet 8	Octet 9	Octet 10	Octet 11	Octet 12	Octet 13	Octet 14	Octet 15	Octet 16	Octet 17	Octet 18	Octet 19	Octet 20	Octet 21
Introduction on 18 bytes																		Pattern synchro 3 oct.		
Division SPI format																				

Payload :

Division asynchronous format										
Sign+len	Sign+type	adresse	data				
0 sslllll	110 ssstt	ttt10era	aaaaa1	0xxxxxxx	10xxxxxx	x10xxxxx	xxx10xxx	xxxxx1	0 x	xxxxxxx1
Octet 1	Octet 2	Octet 3	Octet 4	Octet 5	Octet 6	Octet 7	Octet 8	Octet 9	Octet 10	Octet ...
Division SPI format										

7. GSM COMMANDS WITH TERMINAL

Starting GSM module :

Command : 'M1'

Stopping GSM module :

Command : 'M7'

Enter PIN code :

Command : 'AT+CPIN=0000' with 0000 the correct PIN code

Band selection for registration in GSM simulator :

- 1: Start the GSM module with the command « M1 », a confirmation message must be displayed.
- 2: Enter « AT#AUTOBND=0 »
- 3: Enter « AT#BND=x » with « x » as follow :
<band>
0 - GSM 900MHz + DCS 1800MHz
1 - GSM 900MHz + PCS 1900MHz
2 - GSM 850MHz + DCS 1800MHz
3 - GSM 850MHz + PCS 1900MHz
- 4: Save these settings : enter « AT&W »
- 5: Stop the GSM module : « M7 », a confirmation message must be displayed.
- 6: Wait 5 seconds
- 7: Start again the GSM module with the command « M1 », a confirmation message must be displayed.

Now the GSM module is ON and well set.

8. ETHERNET COMMANDS WITH TERMINAL

Starting Ethernet module

Command : "WIZ1"

Configuration of the local IP address of the module - 192.168.100.90

Command : "WIP 192.168.100.90"

Now, it's possible to do a « ping » at this address **192.168.100.90**.

Stopping Ethernet module

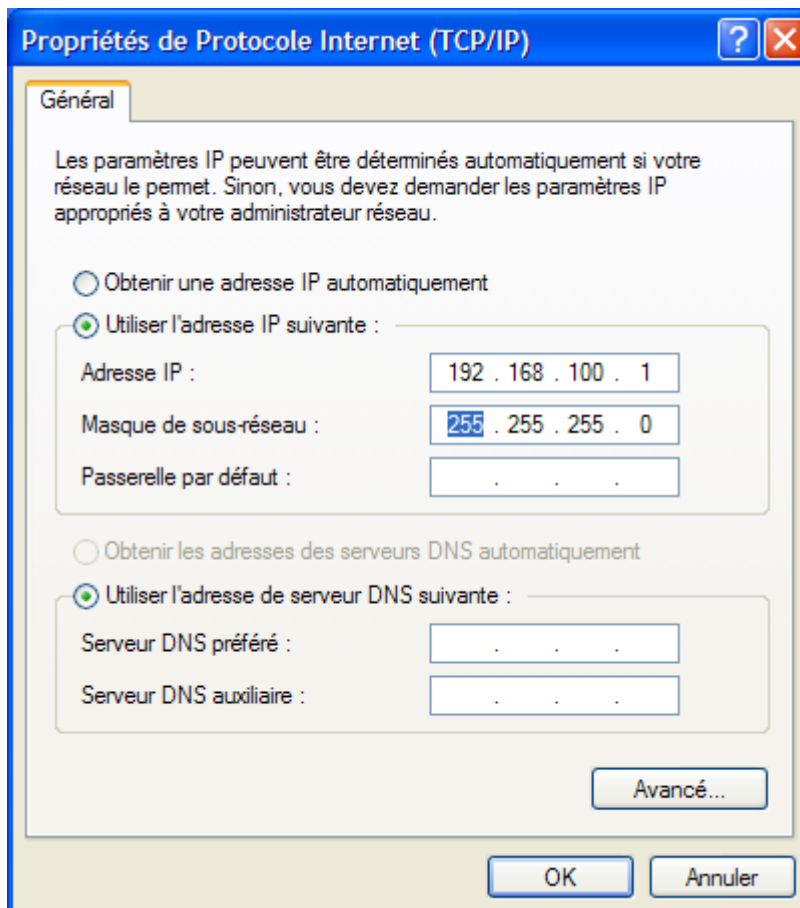
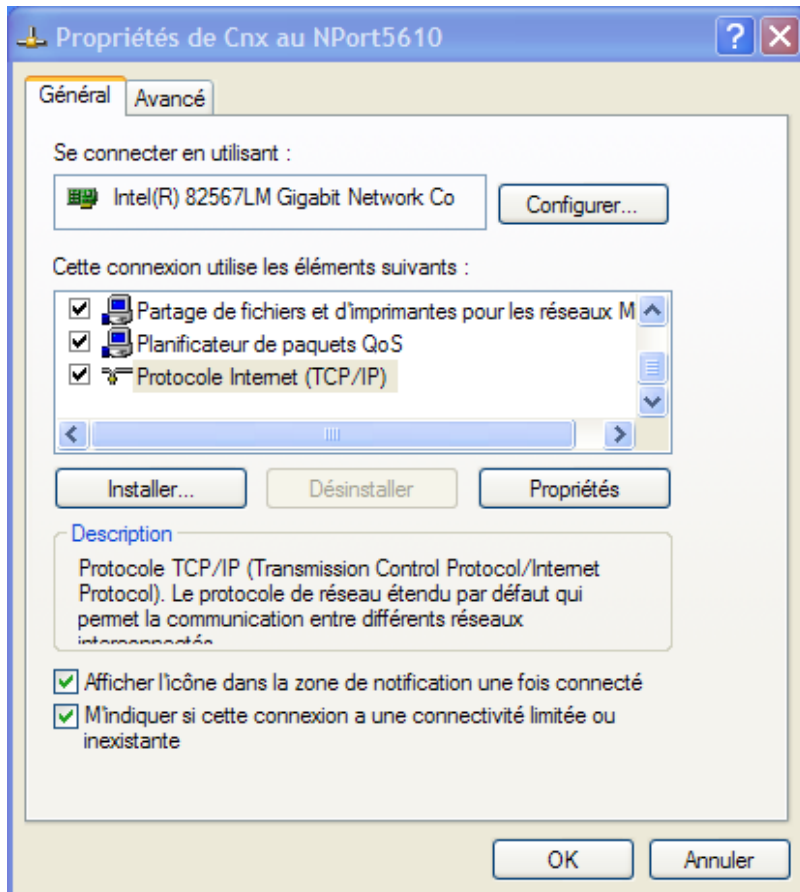
Command : "WIZ0"

```

----- ETHERNET HELP -----
WIP xxx.xxx.xxx.xxx : Set IP local address
    ex: WIP 123.123.123.123
WIT : Check Wiznet data R/W
WIZ1: Switch on  Wiznet module
WIZ0: Switch off Wiznet module
WIZL: Check Lan Detect
WIZR aa xxxx: Read one byte from Wiznet module
    'aa' can have following values: 'CR' 'nG', 'nT', 'nR'
        'CR': means Common Register
        'nG': n is the socket number, G means General Register
        'nT': n is the socket number, T means Transmit Buffer
        'nR': n is the socket number, R means Receive Buffer
    'xxxx' is sub-address in hexa
        ex: WIZR CR 0000
        ex: WIZR 2G 0001
        ex: WIZR 1T 0000
        ex: WIZR 0R 00F2
WIZW aa xxxx yy: Write one byte from Wiznet module
    'aa' can have following values: 'CR' 'nG', 'nT', 'nR'
        'CR': means Common Register
        'nG': n is the socket number, G means General Register
        'nT': n is the socket number, T means Transmit Buffer
        'nR': n is the socket number, R means Receive Buffer
    'xxxx' is sub-address in hexa
    'yy' is the value to write in hexa
        ex: WIZW CR 0000 01
        ex: WIZW 2G 0001 00
        ex: WIZW 1T 0000 F3
        ex: WIZW 0R 00F2 05
WIZTCPC n 123.123.123.123 pppp: Start a TCP Connection
    'n' is the socket number to use for this connection (0 to 7)
    '123.123.123.123' is the remote IP address to connect to
    'pppp' is the remote port number to connect to
WIZTCPD n: TCP Disconnection on socket 'n'
WIZTCPSENDPATTERN n ssss: send a pattern of 'sss' bytes
    'n' is the socket number number to send data to
    A TCP connection must be previously opened (with WIZTCPC command)

WIZ1
OK_wiz1
WIP 192.168.100.90
IP address programmed: 192.168.100.90

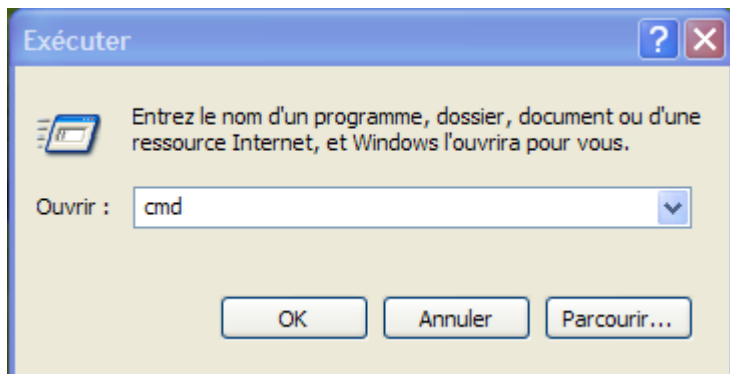
```

Configuration of the local IP address of the PC - 192.168.100.1

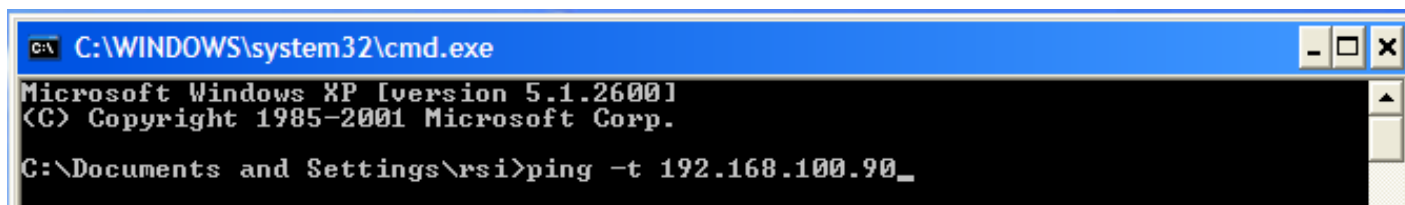
- It's necessary to take a null modem cable.

Starting “ping” command

Open “command prompt”



Enter command : “ping -t 192.168.100.90” and press on “Enter”



Stopping “ping” command

Press on “Ctrl + C”

