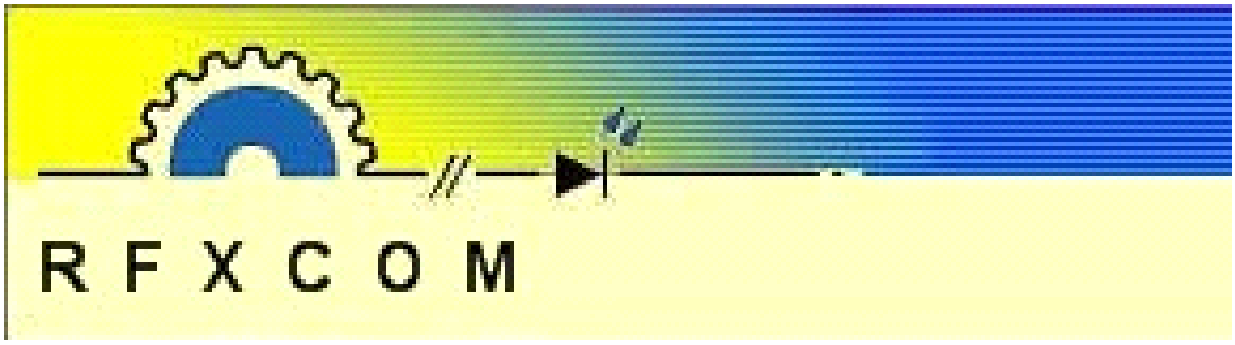


Visonic RF Receiver

www.rfxcom.com

1. Table of Contents

2. IMPORTANT.

Important note: An X10 receiver needs to have version 9 or higher when installed together with a Visonic receiver in an USB interface!

3. Available receivers.

1. 315MHz Master Receiver
2. 315MHz Slave Receiver
3. 433.92MHz Master Receiver
4. 433.92MHz Slave Receiver
5. 868.95MHz Master Receiver
6. 868.95MHz Slave Receiver

4. Receiver installation in an USB module.

Disconnect the USB module completely to be sure it is powerless.
The Master receiver should be plugged in into the J1 connector of the USB module.
An optional Slave receiver must always be plugged in into the J2 connector.
An USB module can only have mounted:

- 1 Master receiver

Or

- 1 Master receiver and 1 Slave receiver

Or

- 1 Transmitter. (4800bd only)

5. Connection to Homeseer.

Install the USB driver. Connect the USB module to the PC. Install the ACRF or W800RF32 plug-in in Homeseer (View-Options-Interfaces) and configure the COM port in the plug-in. It should work now.

6. The RS232 data format used.

- 4800bd, 8 bits data, no parity, 1 stop bit.
- 38400 bd, 8 bits data, no parity, 1 stop bit.

7. Initialization commands.

- F020 = return software version
- F021 = set Slave in RAW mode
- F025 = toggle baud rate
- F027 = set Master in RAW mode
- F028 = X10 mode - standard X10 mode
- F029 = X10 mode - output is 32 bits
- F02A = X10 mode - output is 48 bits
- F02C = X10 mode - output is # of bits received and 48 bits.
- F040 = Visonic mode - output is # of bits received and data bits, the other possible Master or Slave X10 receiver gets X10 disabled.
- F041 = Visonic mode - output is # of bits received and data bits, the other possible Master or Slave X10 receiver gets X10 enabled.

On reception of an initialize command the receiver will respond with a byte equal to the second byte. E.g. if an init command “F029” is received, the receiver responds with “29”.

8. Translation of Visonic codes to X10 codes

The Visonic PowerCode and CodeSecure packets are translated to X10 format when the receiver operates in an X10 mode (F028, F029, F02A or F02C). Packets send by the LCD and the alarm console are not processed in X10 mode.

8.1. Security commands.

Byte 0 is 1st byte of device address
Byte 1 is 2nd byte of device address
Byte 2 is the message code
Byte 3 is complement of Byte 2
Byte 4 is 3rd byte of device address
Byte 5 bit 7 is even parity bit of Byte 4

Byte 2 message codes are:

code	command	keyfob	sensors
0x00	ALERT (max delay)		
0x01	ALERT (bat low, max)		
0x04	ALERT		X
0x05	ALERT (battery low)		X
0x80	NORMAL (max delay)		
0x81	NORMAL (bat low,max)		
0x84	NORMAL		X
0x85	NORMAL(battery low)		X
0x40	ALERT+Tamper (max delay)		
0x44	ALERT+Tamper		X
0xC0	NORMAL+Tamper (max delay)		
0xC4	NORMAL+Tamper		X
0x0C	ALERT		
0x8C	NORMAL		
0x4C	ALERT+Tamper		
0xCC	NORMAL+Tamper		
0x02	ARM AWAY (max)	X	
0x82	DISARM	X	
0x42	Lights On	X	
0xC2	Lights Off		
0x22	PANIC (arm+home)	X	
0x0A	ARM HOME (max)		
0x06	ARM AWAY (min)		
0x86	DISARM		
0x46	Light On		
0xC6	Light Off		
0x26	PANIC		
0x20	Dark sensor		
0x0E	ARM HOME (min)	X	
0x03	PANIC		
0x1C	Temp =< Set		
0x2B	Temp > Set		
0xE0	MOTION		
0xF0	DARKNESS DETECTED		
0xF8	LIGHT DETECTED		

NOTE: in 32 bits, standard X10 mode the bytes are transmitted as:

Received order	Byte 0	Byte 1	Byte 2	Byte 3
Bytes changed of position	Byte 2	Byte 3	Byte 0	Byte 1

Bits order changed 7-0 to 0-7 for all 4 bytes

For the detailed description of the X10 formats see the X10 RF formats document. This document is downloadable at the site www.rfxcom.com

8.2. Sensor address translation.

To avoid as much as possible the creation of duplicated addresses the address in byte 0 and byte 1 is doesn't comply to the X10 standard format for security devices. In this standard the lower nibble of byte 1 is the complement of the lower nibble of byte 0. The upper nibble of byte 1 is equal to the upper nibble of byte 0.

8.2.1. PowerCode translation

X10 sensor address byte 0 = PowerCode bit35-28
X10 sensor address byte 1 = PowerCode bit27-20
X10 sensor address byte 4 = PowerCode bit19-12

8.2.2. CodeSecure translation

X10 sensor address byte 0 = CodeSecure Byte 6 + Byte 7: bit 7-4
X10 sensor address byte 1 = CodeSecure Byte 5
X10 sensor address byte 4 = CodeSecure Byte 4

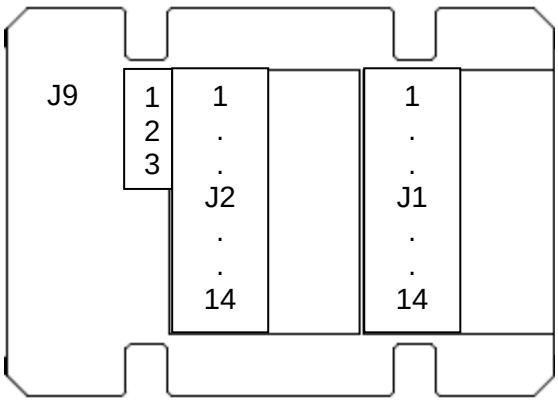
9. Received data in RAW mode

In RAW mode a series of bytes is presented. The first byte is a received High pulse and the next is a Low pulse etc. If an FF is given then the next byte has the same state (High or Low).
Each byte represents a pulse time of: 64usec * hex byte value

10. Handshake signal.

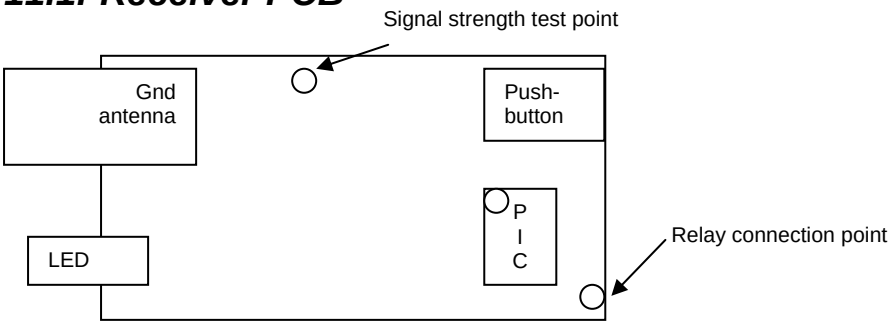
The Master receiver has a Transmit Request input and a Clear to Send output connection. Those signals are used by a transmitter that operates on the same frequency as the Master receiver. Before starting the transmission, the transmitter sends a Transmit Request to the Master receiver. If the Master receiver has not received a signal for about 60ms it responds with a Clear to Send to the transmitter and stops receiving until the Transmit Request is switched of by the transmitter. On the Clear to Send signal the transmitter starts transmitting.
An optional cable between the J9 connector of an USB module connects the handshake signal between the Master receiver and the transmitter.
Connect:

Receiver USB module J9-1	to	Transmitter USB module J9-1
Receiver USB module J9-2	to	Transmitter USB module J9-2
Receiver USB module J9-3	to	Transmitter USB module J9-3



11. DIY options.

11.1. Receiver PCB



11.2. Antenna.

The wire antenna can be replaced by a standard antenna. The cable to be used must be 50ohm coax.

11.3. Pushbutton.

(The pushbutton switch and the 1k series resistor are not installed on the receiver) When the pushbutton input is low, the device address of any received command is saved in EEPROM. When a command with this address is received the Relay output is switched On or Off depending if an Alarm or Normal command is received.

11.4. Relay.

The PCB has a relay connection point which can be used for a relay driver circuit. The maximum output current sunk and sourced is 25mA and 5 volt.

11.5. Signal strength testing.

The PCB has a connection point for measurement of the received signal strength. Connect an oscilloscope to this point and set the channel to 0.5 Volt/Div and 1ms/Div. The received signal is about 2V peak when a signal from a device on short distance is received.

11.6. Create your own program for the microcontroller.

The microcontroller used on the receiver PCB is a Microchip 16F688. This microcontroller can be programmed with a Microchip PICkit 1 Flash starter kit. The 14-pins connector used on the receiver PCB is **NOT** compatible with the 14-pins connector of the PICkit 1 programmer. To connect the receiver PCB to the programmer, create an adapter:

Receiver	Programmer	Signal
Pin 3	pin 3	Pvpp
Pin 4	pin 8	Pclk
Pin 7	pin 7	Pdata
Pin13	pin 13	+5V
Pin 14	pin 14	GND

For more information about PICkit 1 see:
http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=1406&dDocName=en010053

12. Warning:

RF signals are possible disturbed and it has not been justified for this equipment at uses in circumstances where life-threatening or dangerous situations are possible.

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