RFXtrx
USB RF transceiver
User guide

www.rfxcom.com

1. Table of Contents

2. RFXtrx RF transceiver general information

The RFXtrx transceiver is communicating over one USB port with the application.
The RFXtrx enters for 2 seconds the boot loader (red LED is on) and after this it starts the receive/transmit firmware.
For developers, the communication protocols over USB are described in the SDK.

2.1. RFXtrx315 supported protocols

2.1.1. RFXtrx315 configured for 310MHz

Protocol	Enable	receive	transmit
US X10 lighting	X10	Y	Y
US X10 security	X10	Y	Y

2.1.2. RFXtrx315 configured for 315MHz

Protocol	Enable	receive	transmit
Visonic CodeSecure	-	planned	-
Visonic PowerCode	Visonic	Y	Y

2.2. RFXtrx433 supported protocols

Protocol	Type 1	Type 2	Enable protocol	receive	transmit
X10 lighting X10, Xdom, ebode	Y	Y	X10	Y	Y
X10 security	Y	Y	X10	Y	Y
ARC (address code wheels) HomeEasy, KlikAanKlikUit, ByeByeStandBy, Intertechno, ELRO, AB600, Düwi, DomiaLite, COCO	Y	Y	ARC	Y	Y
ByeByeStandBy learning mode	Y	Y	ARC	Y	Y
Byron SX chime	Y	Y	ByronSX	Y	Y
ELRO AB400, Flamingo, Phenix, Sartano, RisingSun, Brennenstuhl	Y	Y	Lighting4	Y	Y
EMW100, EMW200	Y	Y	-	-	Y
MDREMOTE LED dimmer	Y	Y	-	-	Y
Livolo	Y	Y	-	-	Y
Conrad RSL2	Y	Y	RSL	Y	Y
Revolt	-	Y	RSL	Y	-
Energenie ENER010 - 429.935, 5-gang 429.950	Y	Y	-	-	Y
Waveman	Y	Y	-	-	Y
Impuls	Y	Y	-	-	Y
AC (learning button) HomeEasy UK, KlikAanKlikUit, Chacon, NEXA, DI.O, Intertechno	Y	Y	AC	Y	Y
HomeEasy EU	Y	Y	HE EU	Y	Y
ANSLUT	Y	Y	AC	Y	Y
Ikea Koppla	Y	-	-	-	Y
AD LightwaveRF, Siemens	Y	Y	AD	Y	Y
AE Blyss,Thomson	Y	Y	AE	Y	Y
Digimax / TLX7506	Y	Y	X10	Y	-
RTS10 / RFS10 / TLX1206	Y	Y	X10	Y	Y

HE105	Y	Y	-	-	Y
Mertik Maxitrol G6R-H4T1, G6R-H4T ,G6R-H4TB, G6R-H4T21-Z22	Y	Y	Mertik	Y	Y
X10 Ninja/Robocam	Y	-	X10	Y	Y
La Crosse TX2, TX3, TX4, TX7, TX17, WS2300	Y	Y	LaCrosse	Y	-
Alecto WS1200	Y	Y	LaCrosse	Y	-
TFA TS15C, TS34C, 30.3133	Y	Y	Hideki	Y	-
Maverick ET-732	Y	Y	Hideki	Y	-
Oregon 1.0 THR128,THC138, THR138	Y	Y	Oregon	Y	-
Oregon 2.1 / Huger THGN122N, THGR122NX, THGN123N, RGR126, UVN128, UVR128, THGN132N, THGN132ES, UV138, THGR228N, THGRN228NX, THGR238, THGR268, RTGN318, RTHN318, RTGR328N, THGR328N, RTGR368N, THGN500, RGR682, THGR918, BTHR918, BTHR918N, RGR918, STR918, WGR918, RGR928, STR928, THGR928, WGR928, BTHR968,EW109	Y	Y	Oregon	Y	-
Oregon 3.0 PCR800, UVN800, WGR800, WTGR800, TGHN800, TGHN801, THGR810	Y	Y	Oregon	Y	-
Oregon BWR101/BWR102	Y	-	Oregon	Y	-
Oregon GR101	Y	-	Oregon	Y	-
OWL CM113 / CM180, cent-a-meter, Electrisave	Y	Y	Oregon	Y	-
OWL CM119 / CM160 / CM180i	Y	Y	Oregon	Y	-
UPM/Esic (very short receiving range) WT260,WT260H,WT440H,WT450,WT450H,WDS500,RG700	Y	-	Hideki	Y	-
Viking 02035, 02038, 02811	Y	Y	FineOffset	Y	-
KD101 smoke detector	Y	Y	Always on	Y	Y
Alecto SA30	Y	Y	Oregon	Y	Y
Harrison curtain	Y	Y	-	-	Y
BlindsT0: RollerTrol,Hasta,BOFU *receive is only with all other protocols disabled.	Y	Y	BlindsT0	Y*	Y
BlindsT1: Hasta old	Y	Y	BlindsT1	Y	Y
BlindsT2/BlindsT3: A-OK, Ematronic	Y	Y	BlindsT1	Y	Y
BlindsT4: Raex YR1326 T16 motor	-	Y	BlindsT1	Y	Y
BlindsT5: Media Mount projector screen	Y	Y	-	-	Y
BlindsT6: DC106, YOODA, Rohrmotor24 RMF	Y	Y	-	-	Y
BlindsT7: Forest	Y	Y	-	-	Y
ATI Remote Wonder	Y	-	ATI	Y	Y
ATI Remote Wonder Plus	Y	-	ATI	Y	Y
ATI Remote Wonder II (only available in hardware version 1.0)	Y	-	ATI	Y	-
PC Remote	Y	-	X10	Y	Y
RFXSensor	Y	Y	X10	Y	-
RFXMeter	Y	Y	X10	Y	-
RUBiCSON stektermometer 48659, 48695	Y	-	Rubicson	Y	-
Visonic CodeSecure	Y	Y	-	planned	-
Visonic PowerCode	Y	Y	Visonic	Y	Y
Meiantech, Atlantic, Aidebao	Y	Y	Meiantech	Y	Y
Philips SBC SP370 series	Y	-	-	-	Y
Mercury appliance modules	Y	Y	-	-	Y
RGB dx.com 130913	y*	Y	AD	y*	Y
RGB dx.com 67412	y*	Y	AD	y*	Y

y* = receive in Type2 only used to get the RGB remote ID.

2.3. undec on

This parameter is for internal use by RFXCOM.

If new sensor types are released they will most probably not be decoded by the RFXtrx firmware. For this reason we have added the option to enable receive of undecoded messages. This function is only to enable RFXCOM to add this new sensor type in the firmware if possible.

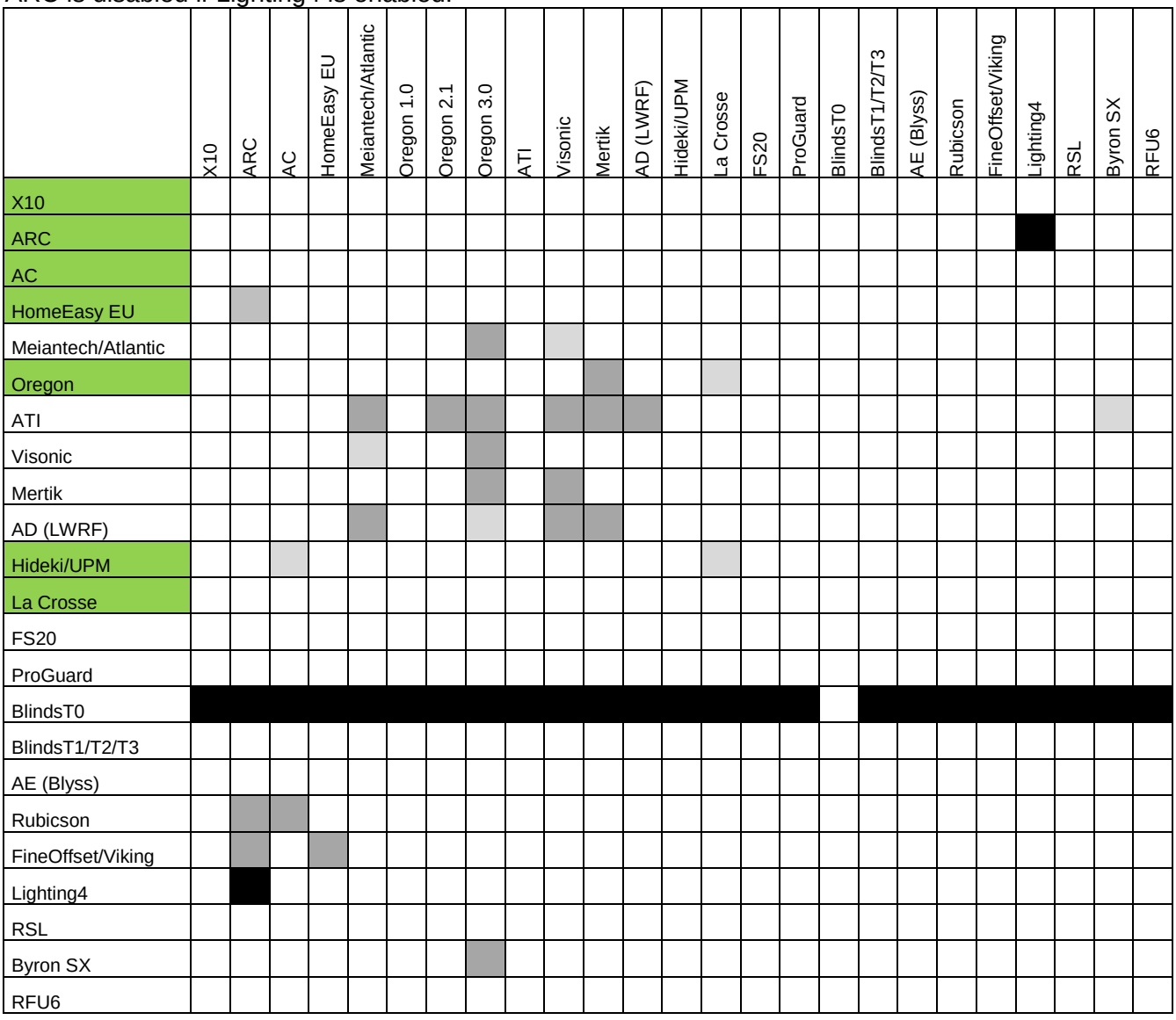
If “undec on” is enabled in normal use the application will receive a lot of undecoded messages mostly as a result of RF noise or disturbed RF packets.

Important: For normal use “undec on” should be disabled!

2.4. Sensitivity influenced by enabled protocols

The sensitivity of the receiver part is highly influenced by the number of protocols enabled. Lesser protocols enabled will make the receiver more sensitive for the enabled protocols.

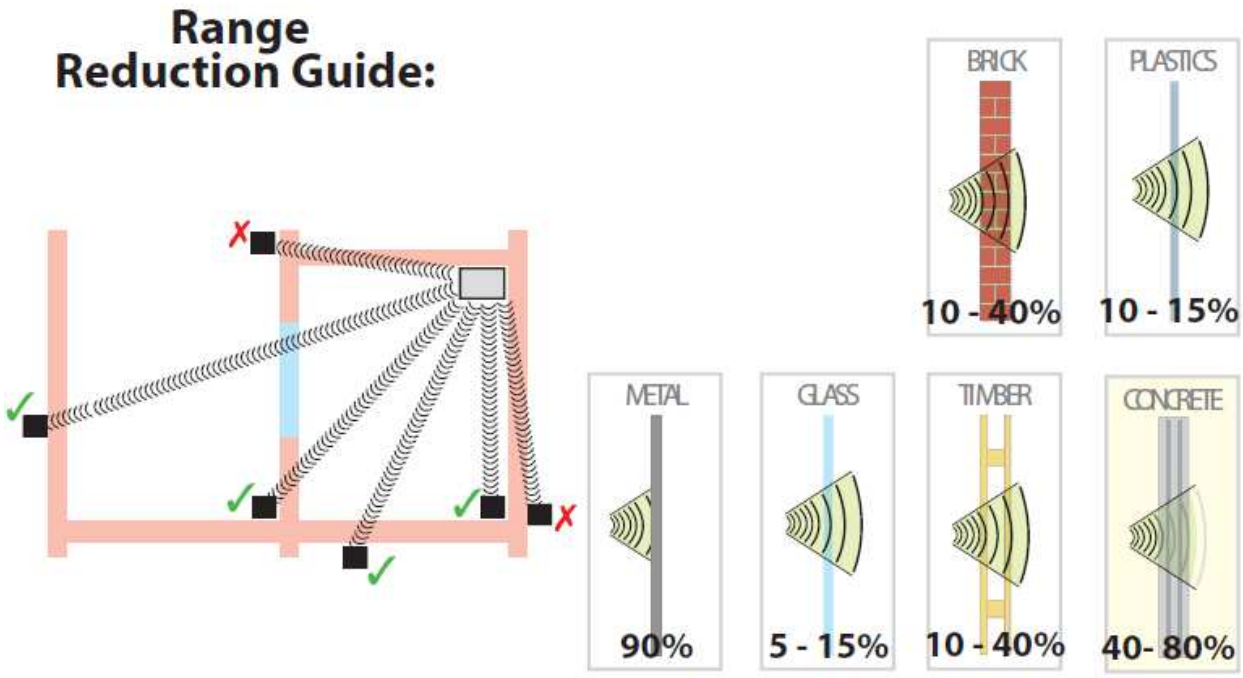
There are a few protocols that will reduce or even eliminate receiving of other protocols if enabled.
For example:
If the AD (LightwaveRF, Siemens) protocol is enabled it can stop receiving of Meiantech / Atlantic, Oregon 3.0,Visonic and Mertik.
All other protocols are disabled if BlindsT0 is enabled.
ARC is disabled if Lighting4 is enabled.



Green = enabled by default

2.5. RF range reduction

The RF signals operating distance is reduced when the signal has to pass through walls.



2.6. Home Automation software

For the list of Home Automation software that supports for the RFXtrx see the web site
www.rfxcom.com

2.7. Dimensions

The dimensions of the RFXtrx are: 83.5 x 42 x 15 mm
Total height from bottom to antenna top is 122mm

2.8. Electrical

The RFXtrx is powered by the 5 Volt of the USB interface.

Operating current;

Receive mode:	28 mA (0.14Watt)
Transmit mode:	45 mA

3. Install the USB driver

The RFXtrx has the FTDI FT232R USB interface chip installed.

The USB drivers are available at http://www.ftdichip.com/Drivers/VCP.htm

4. Run RFXmngr or RFXflash on Linux under Mono

Open a Terminal screen in Linux (Ctrl-Alt-T)

Execute once:

Install Mono:
[sudo] **apt-get install mono-runtime**

Install VisualBasic support under Mono:
[sudo] **apt-get install libmono-microsoft-visualbasic8.0-cil**

If the USB device is created as ttyACMx you will need to create a link between /dev/ttyACMx and a serial port /dev/ttySx.
This is not necessary if the device is created as /dev/ttyUSBx !!
[sudo] **ln -sf /dev/ttyACM1 /dev/ttyS3**

Note: sudo must be entered without brackets [ ]. sudo is required if not running as super user.

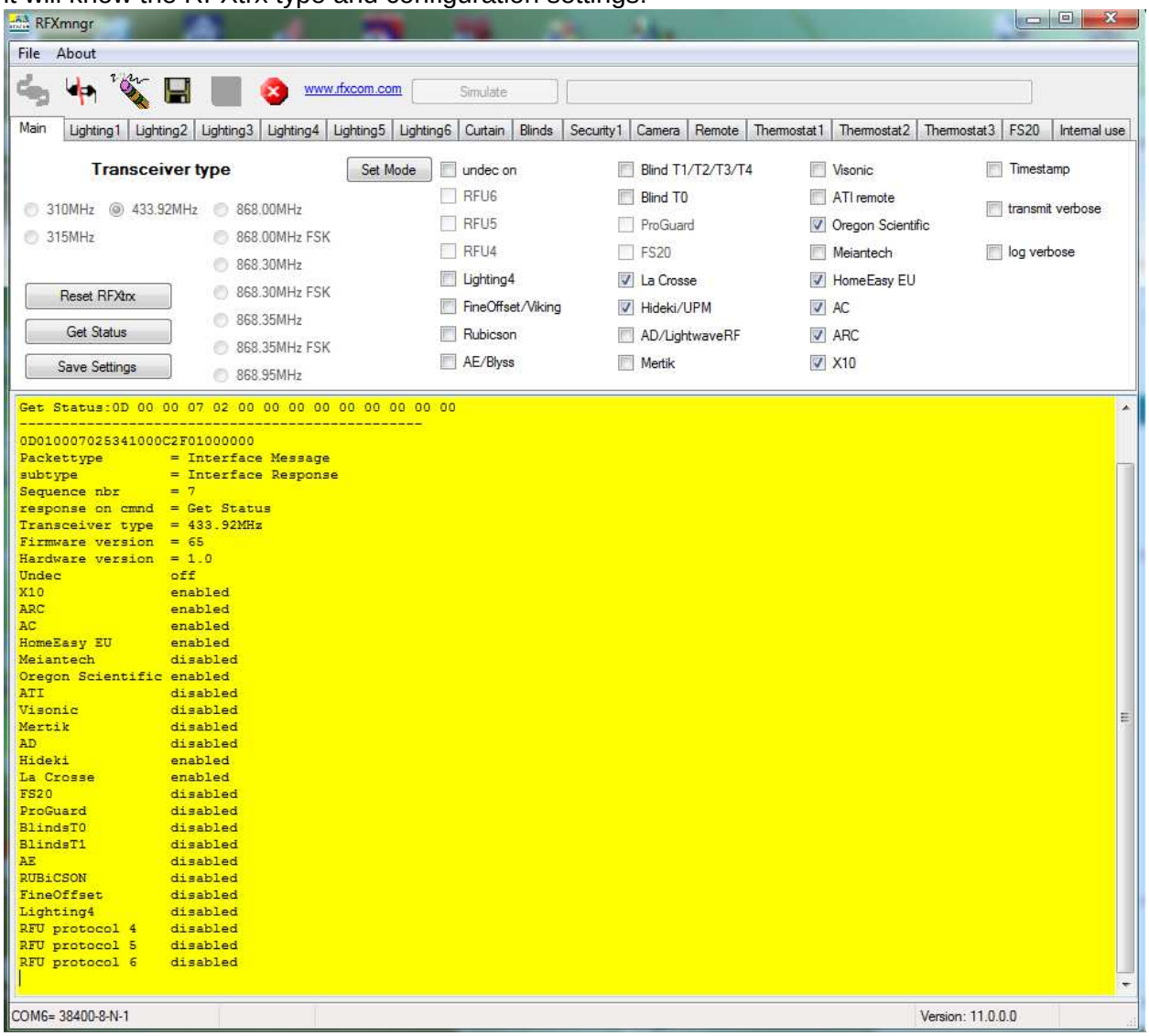
Launch the RFXflash.exe program.
[sudo] **mono RFXflash.exe**

OR

Launch the RFXmngr.exe program.
[sudo] **mono RFXmngr.exe**

5. RFXmngr test program

The RFXmngr program supports decoding of received data and allows you to transmit commands.
After the connection the RFXmngr program transmits a Reset and Get Status command so that it will know the RFXtrx type and configuration settings:



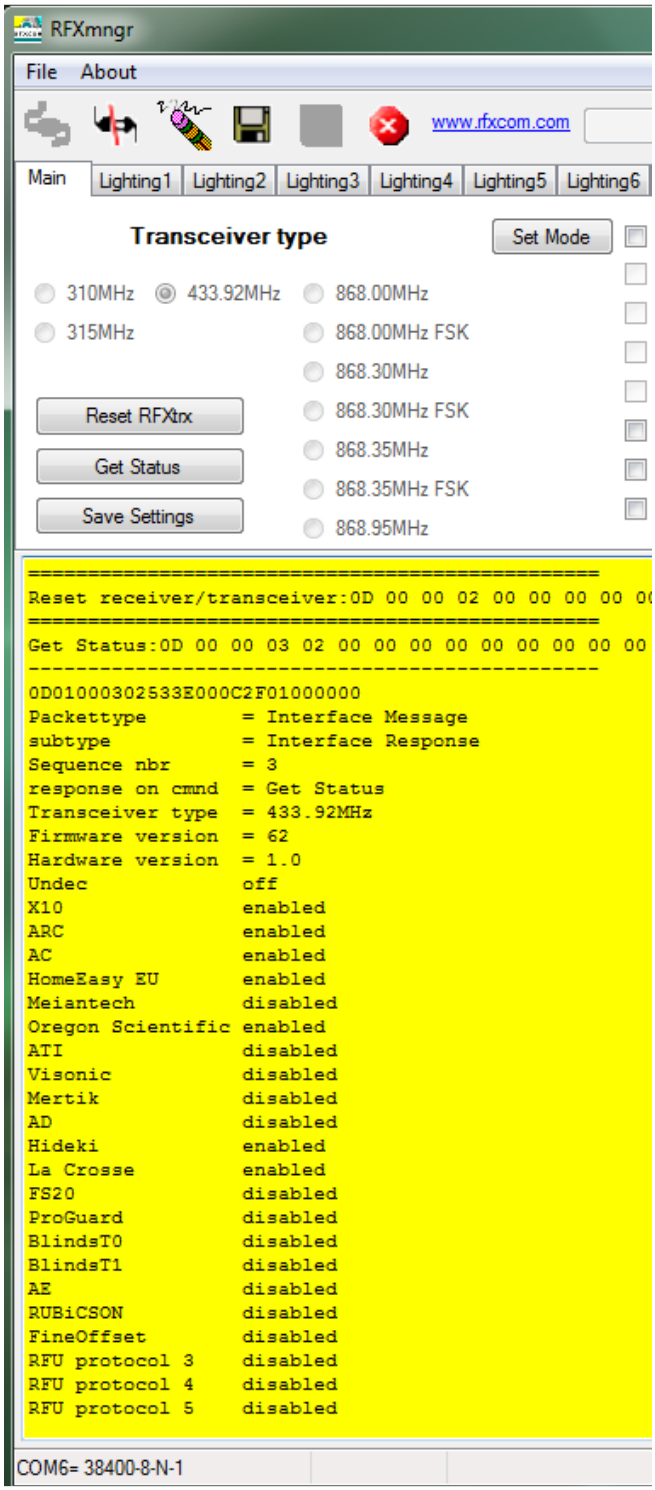
Transmitter protocols are always enabled but receiver protocols can be disabled. This is very useful because the receiver will become more sensitive when protocols not used are disabled. So select only the protocols to be used, click **Set mode** and click **Save Settings**.

Note that these settings are lost after a firmware update and need to be set again.

5.1. Receiver

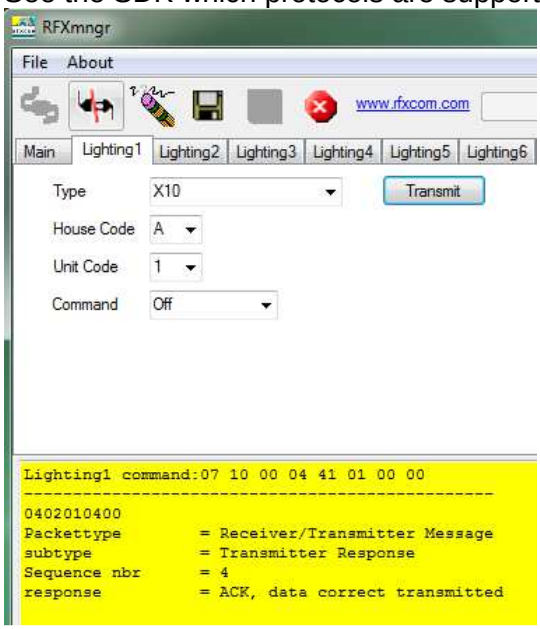
The RF protocols to be received can be configured on the Main tab at **Set Mode**.
Click **Save Settings** to save the selected protocols in non-volatile memory of the RFXtrx. This configuration is now restored every time after a power up.
Note that these settings are lost after a firmware update and need to be set again.

The received RF data is decoded and displayed in the yellow window.



5.2. Transmitter

The tabs after the Main tab are used to send commands to the transmitter.
For example Lighting1 is used to send X10, ARC and some more.
See the SDK which protocols are supported on the different tabs.



The transmitted commands are displayed in the yellow window including the acknowledge send by the RFXtrx, in the example above the 0402010400 = ACK, data correct transmitted.

6. Flash update of the RFXtrx

6.1. Update firmware in the RFXtrx

Firmware is flashed in the RFXtrx using this procedure:

1. Depending on the RFXtrx type download the latest RFXtrx315_yy.hex, RFXrec433_yy.hex or RFXtrx433_yy.hex firmware file.
2. Connect the RFXtrx to a Windows system or Linux under MONO
3. Stop any program that is connected to the RFXtrx.
4. Start the RFXflash program (version 4.0.0.0 or higher)
5. Select the USB RFXtrx COM port and click the CONNECT button, (the red LED should switch on now)
6. Load the correct .hex firmware file for your RFXtrx,
7. Click the WRITE button,
8. Click the Normal Execution mode button.

IMPORTANT:

1. Do not interrupt the flash procedure when started.
2. It can happen that the flash procedure ends with a pop-up screen indicating errors. Just disconnect the RFXtrx and start again at step 5 until the flash procedure if finished without errors.

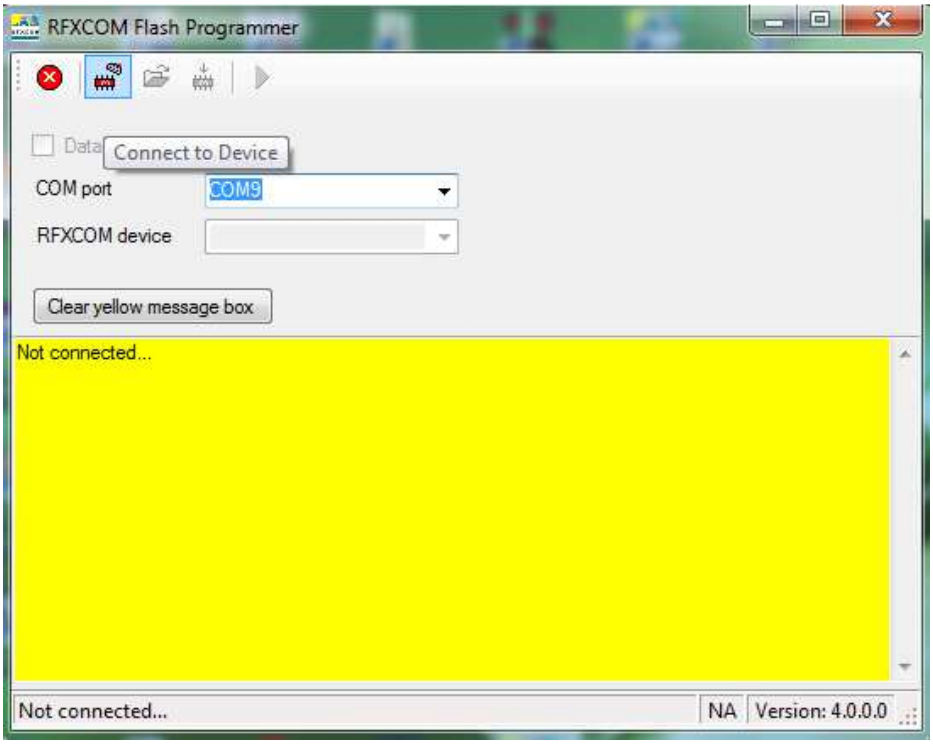
If the red LED does not switch on if you click the CONNECT button:

1. Check if you have selected the correct USB COM port.
2. If you have flashed the RFXtrx before and interrupted the flash procedure it is possible that the RFXtrx does not enter the flash state. Contact support@rfxcom.com for help.

Note: Receiver Settings are lost after a firmware update and have to be set again.

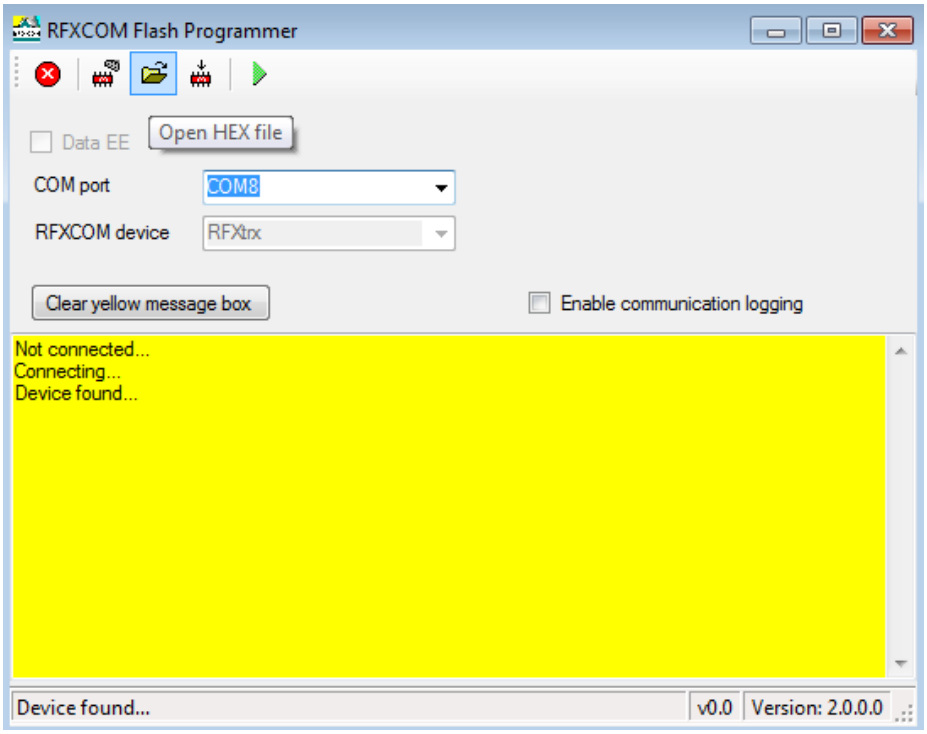
6.2. Update firmware in the RFXtrx step by step

- Click the Connect to Device button.

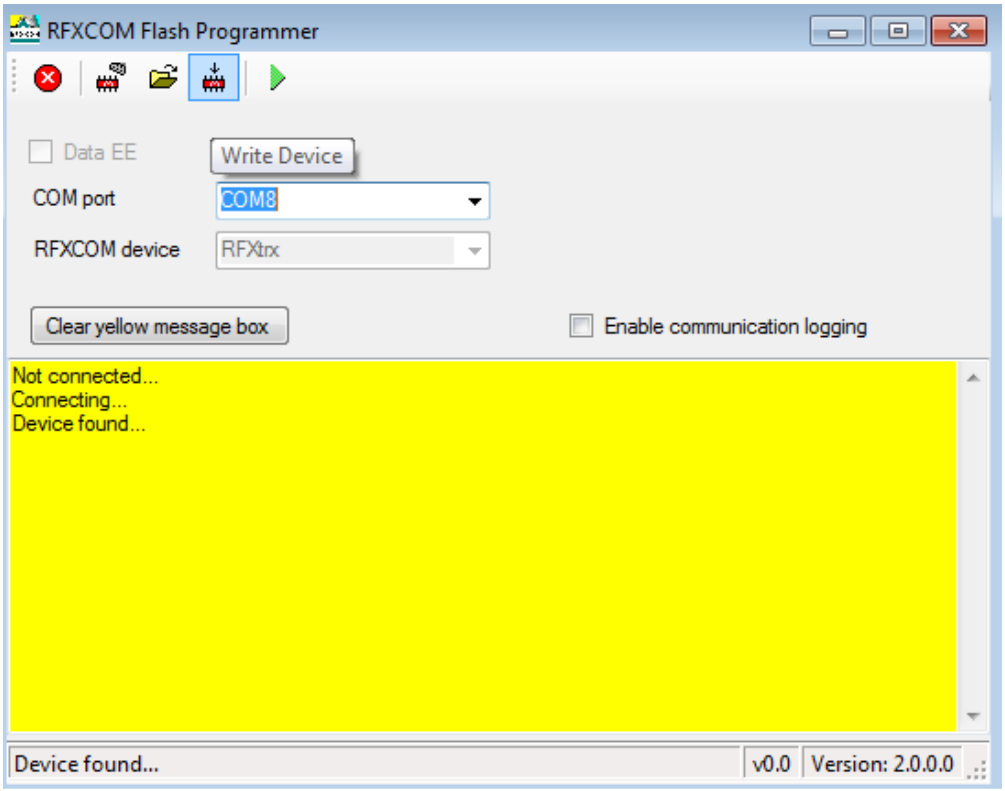


The RFXtrx will automatically switch from normal mode to the bootloader now.

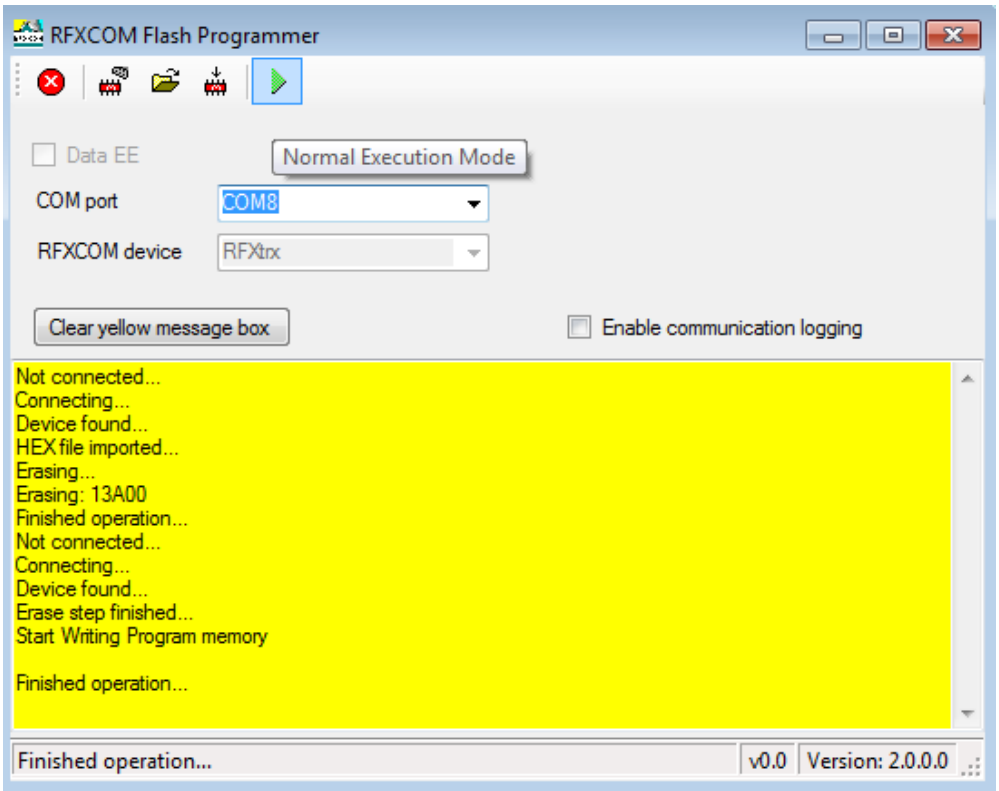
- Click the Open HEX file button and load the RFXtrx***yyy_xx***.hex file
  Be sure to load the latest firmware file for the RFXtrx.
  yyy indicates the RFXtrx frequency, so load the RFXtrx433 for an RFXtrx433!
  xx indicates the firmware version.



- Click the Write device button and the RFXtrx is flashed.



- Click on the Normal Execution Mode button to set the RFXtrx to running mode.



Note: Receiver Settings are lost after a firmware update and have to be set again.

7. RFXtrx433 special device codes

7.1. Remote commands

7.1.1. X10 RF Remote

Dec	Hex	Button
2	02	0
18	12	8
34	22	4
56	38	Rewind
58	3A	Info
64	40	CHAN+
66	42	2
82	52	Ent
96	60	VOL+
98	62	6
99	63	Stop
100	64	Pause
112	70	Cursor-left
113	71	Cursor-right
114	72	Cursor-up
115	73	Cursor-down
116	74	Cursor-up-left
117	75	Cursor-up-right
118	76	Cursor-down-right
119	77	Cursor-down-left
120	78	left mouse
121	79	left mouse-End
123	7B	Drag
124	7C	right mouse
125	7D	right mouse-End
130	82	1
146	92	9
160	A0	MUTE
162	A2	5
176	B0	Play
182	B6	Menu
184	B8	Fast Forward
186	BA	A+B
192	C0	CHAN-
194	C2	3
201	C9	Exit
209	D1	MP3
210	D2	DVD
211	D3	CD
212	D4	PC / Shift-4
213	D5	Shift-5
214	D6	Shift-Ent
215	D7	Shift-Teletext
216	D8	Text
217	D9	Shift-Text
224	E0	VOL-
226	E2	7
242	F2	Teletext
255	FF	Record

7.1.2. ATI Remote Wonder

Dec	Hex	Button
0	00	A
1	01	B
2	02	power
3	03	TV
4	04	DVD
5	05	?
6	06	Guide
7	07	Drag
8	08	VOL+
9	09	VOL-
10	0A	MUTE
11	0B	CHAN+
12	0C	CHAN-
13	0D	1
14	0E	2
15	0F	3
16	10	4
17	11	5
18	12	6
19	13	7
20	14	8
21	15	9
22	16	txt
23	17	0
24	18	snapshot ESC
25	19	C
26	1A	^
27	1B	D
28	1C	TV/RADIO
29	1D	<
30	1E	OK
31	1F	>
32	20	<-
33	21	E
34	22	v
35	23	F
36	24	Rewind
37	25	Play
38	26	Fast forward
39	27	Record
40	28	Stop
41	29	Pause
44	2C	TV
45	2D	VCR
46	2E	RADIO
47	2F	TV Preview
48	30	Channel list
49	31	Video Desktop
50	32	red
51	33	green
52	34	yellow
53	35	blue
54	36	rename TAB
55	37	Acquire image
56	38	edit image
57	39	Full screen
58	3A	DVD Audio
112	70	Cursor-left
113	71	Cursor-right
114	72	Cursor-up
115	73	Cursor-down
116	74	Cursor-up-left
117	75	Cursor-up-right
118	76	Cursor-down-right
119	77	Cursor-down-left
120	78	V
121	79	V-End
124	7C	X
125	7D	X-End

7.1.3. ATI Remote Wonder Plus

Dec	Hex	Button
0	00	A
1	01	B
2	02	power
3	03	TV
4	04	DVD
5	05	?
6	06	Guide
7	07	Drag
8	08	VOL+
9	09	VOL-
10	0A	MUTE
11	0B	CHAN+
12	0C	CHAN-
13	0D	1
14	0E	2
15	0F	3
16	10	4
17	11	5
18	12	6
19	13	7
20	14	8
21	15	9
22	16	txt
23	17	0
24	18	Open Setup Menu
25	19	C
26	1A	^
27	1B	D
28	1C	FM
29	1D	<
30	1E	OK
31	1F	>
32	20	Max/Restore Window
33	21	E
34	22	v
35	23	F
36	24	Rewind
37	25	Play
38	26	Fast forward
39	27	Record
40	28	Stop
41	29	Pause
42	2A	TV2
43	2B	Clock
44	2C	TV
45	2D	VCR
46	2E	RADIO
47	2F	TV Preview
48	30	Channel list
49	31	Video Desktop
50	32	red
51	33	green
52	34	yellow
53	35	blue
54	36	rename TAB
55	37	Acquire image
56	38	edit image
57	39	Full screen
58	3A	DVD Audio
112	70	Cursor-left
113	71	Cursor-right
114	72	Cursor-up
115	73	Cursor-down
116	74	Cursor-up-left
117	75	Cursor-up-right
118	76	Cursor-down-right
119	77	Cursor-down-left
120	78	Left Mouse Button
121	79	V-End
124	7C	Right Mouse Button
125	7D	X-End

7.1.4. Medion Remote

Dec	Hex	Button
0	00	Mute
1	01	B
2	02	power
3	03	TV
4	04	DVD
5	05	Photo
6	06	Music
7	07	Drag
8	08	VOL-
9	09	VOL+
10	0A	MUTE
11	0B	CHAN+
12	0C	CHAN-
13	0D	1
14	0E	2
15	0F	3
16	10	4
17	11	5
18	12	6
19	13	7
20	14	8
21	15	9
22	16	txt
23	17	0
24	18	snapshot ESC
25	19	DVD MENU
26	1A	^
27	1B	Setup
28	1C	TV/RADIO
29	1D	<
30	1E	OK
31	1F	>
32	20	<-
33	21	E
34	22	v
35	23	F
36	24	Rewind
37	25	Play
38	26	Fast forward
39	27	Record
40	28	Stop
41	29	Pause
44	2C	TV
45	2D	VCR
46	2E	RADIO
47	2F	TV Preview
48	30	Channel list
49	31	Video Desktop
50	32	red
51	33	green
52	34	yellow
53	35	blue
54	36	rename TAB
55	37	Acquire image
56	38	edit image
57	39	Full screen
58	3A	DVD Audio
112	70	Cursor-left
113	71	Cursor-right
114	72	Cursor-up
115	73	Cursor-down
116	74	Cursor-up-left
117	75	Cursor-up-right
118	76	Cursor-down-right
119	77	Cursor-down-left
120	78	V
121	79	V-End
124	7C	X
125	7D	X-End

7.2. Harrison address conversion to switch settings

The address used is converted to the address selected in the Harrison curtain motor using the table below.

switch	1	2	3	4		5	6	7	8
	H	H	H	H		X	X	X	X
A	0	1	1	0	1	0	0	0	0
B	0	1	1	1	2	0	0	0	1
C	0	1	0	0	3	0	0	1	0
D	0	1	0	1	4	0	0	1	1
E	1	0	0	0	5	0	1	0	0
F	1	0	0	1	6	0	1	0	1
G	1	0	1	0	7	0	1	1	0
H	1	0	1	1	8	0	1	1	1
I	1	1	1	0	9	1	0	0	0
J	1	1	1	1	10	1	0	0	1
K	1	1	0	0	11	1	0	1	0
L	1	1	0	1	12	1	0	1	1
M	0	0	0	0	13	1	1	0	0
N	0	0	0	1	14	1	1	0	1
O	0	0	1	0	15	1	1	1	0
P	0	0	1	1	16	1	1	1	1

H H H H = House code
X X X X = device code

Switch position in the motor:
Up = 1
Middle = not used!!!!
Down = 0

Examples:
If you assign the address E7 (1000 0110) to the curtain motor then set the switches to: 1=up, 2=down, 3=down, 4=down, 5=down, 6=up, 7=up, 8=down

If you assign the address A2 (0110 0001) to the curtain motor then set the switches to: 1=down, 2=up, 3=up, 4=down, 5=down, 6=down, 7=down, 8=up

7.3. Flamingo, AB400, IMPULS, Sartano, Brennenstuhl switch settings

Use type ELRO AB400D
Note that the HC (House Code A-P) is the house code used in programs and has no direct relation with the A,B,C,D,E buttons on the remotes!

	1 2 3 4		5 A B C D E		5 A B C D E	<== switches
	1 2 3 4		5 6 7 8 9 10		5 6 7 8 9 10	<== OR switches
HC		DC		DC		
A	0 0 0 0	1	0 0 0 0 0 0	33	0 0 0 0 0 1	
B	0 0 0 1	2	0 0 0 1 0 0	34	0 0 0 1 0 1	
C	0 0 1 0	3	0 0 1 0 0 0	35	0 0 1 0 0 1	
D	0 0 1 1	4	0 0 1 1 0 0	36	0 0 1 1 0 1	
E	0 1 0 0	5	0 1 0 0 0 0	37	0 1 0 0 0 1	
F	0 1 0 1	6	0 1 0 1 0 0	38	0 1 0 1 0 1	
G	0 1 1 0	7	0 1 1 0 0 0	39	0 1 1 0 0 1	
H	0 1 1 1	8	0 1 1 1 0 0	40	0 1 1 1 0 1	
I	1 0 0 0	9	1 0 0 0 0 0	41	1 0 0 0 0 1	
J	1 0 0 1	10	1 0 0 1 0 0	42	1 0 0 1 0 1	
K	1 0 1 0	11	1 0 1 0 0 0	43	1 0 1 0 0 1	
L	1 0 1 1	12	1 0 1 1 0 0	44	1 0 1 1 0 1	
M	1 1 0 0	13	1 1 0 0 0 0	45	1 1 0 0 0 1	
N	1 1 0 1	14	1 1 0 1 0 0	46	1 1 0 1 0 1	
O	1 1 1 0	15	1 1 1 0 0 0	47	1 1 1 0 0 1	
P	1 1 1 1	16	1 1 1 1 0 0	48	1 1 1 1 0 1	
		17	0 0 0 0 1 0	49	0 0 0 0 1 1	
		18	0 0 0 1 1 0	50	0 0 0 1 1 1	
		19	0 0 1 0 1 0	51	0 0 1 0 1 1	
		20	0 0 1 1 1 0	52	0 0 1 1 1 1	
		21	0 1 0 0 1 0	53	0 1 0 0 1 1	
		22	0 1 0 1 1 0	54	0 1 0 1 1 1	
		23	0 1 1 0 1 0	55	0 1 1 0 1 1	
		24	0 1 1 1 1 0	56	0 1 1 1 1 1	
		25	1 0 0 0 1 0	57	1 0 0 0 1 1	
		26	1 0 0 1 1 0	58	1 0 0 1 1 1	
		27	1 0 1 0 1 0	59	1 0 1 0 1 1	
		28	1 0 1 1 1 0	60	1 0 1 1 1 1	
		29	1 1 0 0 1 0	61	1 1 0 0 1 1	
		30	1 1 0 1 1 0	62	1 1 0 1 1 1	
		31	1 1 1 0 1 0	63	1 1 1 0 1 1	
		32	1 1 1 1 1 0	64	1 1 1 1 1 1	

Examples:

A1	0 0 0 0 0 0 0 0 0 0
A15	0 0 0 0 1 1 1 0 0 0
N2	1 1 0 1 0 0 0 1 0 0
N11	1 1 0 1 1 0 1 0 0 0

0 = switch off
1 = switch on

7.4. Energenie 5-gang 429.950

To know the codes to use open the remote and check the 1 to 5 jumpers connected.
If a jumper connection is open it is a 1. If connected it is a 0 (zero)

```
   1 2 3 4    jumper setting in the remote
HC=========
A  0 0 0 0
B  0 0 0 1
C  0 0 1 0
D  0 0 1 1
E  0 1 0 0
F  0 1 0 1
G  0 1 1 0
H  0 1 1 1
I  1 0 0 0
J  1 0 0 1
K  1 0 1 0
L  1 0 1 1
M  1 1 0 0
N  1 1 0 1
O  1 1 1 0
P  1 1 1 1
```

If jumper 5 is open (1) than add 5 to the remote code.

Examples:

Jumper	Button	Code
1 2 3 4 5		
1 0 0 0 0	1	I1
1 0 0 0 1	1	I6

7.5. Phenix, IDK YC-4000S switch settings

Use type ELRO AB400D
Note that the HC (House Code A-P) is the house code used in programs and has no direct relation with the A,B,C,D,E buttons on the remotes!

HC	switch 1 2 3 4	DC	switch 5 A B C D
A	0 0 0 0	1	0 0 0 0 0
B	0 0 0 1	2	0 0 0 1 0
C	0 0 1 0	3	0 0 1 0 0
D	0 0 1 1	4	0 0 1 1 0
E	0 1 0 0	5	0 1 0 0 0
F	0 1 0 1	6	0 1 0 1 0
G	0 1 1 0	7	0 1 1 0 0
H	0 1 1 1	8	0 1 1 1 0
I	1 0 0 0	9	1 0 0 0 0
J	1 0 0 1	10	1 0 0 1 0
K	1 0 1 0	11	1 0 1 0 0
L	1 0 1 1	12	1 0 1 1 0
M	1 1 0 0	13	1 1 0 0 0
N	1 1 0 1	14	1 1 0 1 0
O	1 1 1 0	15	1 1 1 0 0
P	1 1 1 1	16	1 1 1 1 0
		17	0 0 0 0 1
		18	0 0 0 1 1
		19	0 0 1 0 1
		20	0 0 1 1 1
		21	0 1 0 0 1
		22	0 1 0 1 1
		23	0 1 1 0 1
		24	0 1 1 1 1
		25	1 0 0 0 1
		26	1 0 0 1 1
		27	1 0 1 0 1
		28	1 0 1 1 1
		29	1 1 0 0 1
		30	1 1 0 1 1
		31	1 1 1 0 1
		32	1 1 1 1 1

7.6. HE105 switch settings

Unitnr	HE105 switches				
	1	2	3	4	5
0	0	0	0	0	0
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0
11	0	1	0	1	1
12	0	1	1	0	0
13	0	1	1	0	1
14	0	1	1	1	0
15	0	1	1	1	1
16	1	0	0	0	0
17	1	0	0	0	1
18	1	0	0	1	0
19	1	0	0	1	1
20	1	0	1	0	0
21	1	0	1	0	1
22	1	0	1	1	0
23	1	0	1	1	1
24	1	1	0	0	0
25	1	1	0	0	1
26	1	1	0	1	0
27	1	1	0	1	1
28	1	1	1	0	0
29	1	1	1	0	1
30	1	1	1	1	0
31	1	1	1	1	1

7.7. MDREMOTE

This MDREMOTE has been tested.
http://www.ultraleds.co.uk/mini-dimmer-with-rf-remote-control-12-or-24v-dc-12a-maximum.html

The RFXtrx433 can only transmit MDREMOTE commands.

Procedure to find the ID of the MDREMOTE:
In RFXmngr enable the X10 protocol and enable “Undec on”
Press a button on the MDREMOTE remote.
The undecoded message contains the ID in the 2nd and 3rd byte, for example:

```
----------------------------------------------
08030C0220AF6801D1
Packettype      = UNDECODED RF Message
UNDECODED NEC:20AF6801D1
```

The 2 bytes after 20 is the MDREMOTE ID, in this example AF 68

7.8. Blyss commands

Some Blyss devices, like the Blyss motors, require a special command sequence number. To simplify it; 0,1,2,3,4,0,1,…
This sequence number is normally created by the Blyss remote but now also by the RFXtrx433.

If you use a Blyss remote and the application (Domoticz, DomotiGa, Homeseer…) does not sync with the received Blyss command you will see that you need to send multiple commands with the RFXtrx433 before the Blyss device will respond.
For example,
The Blyss remote transmits with the sequence numbers 0,1,2
If the RFXtrx433 transmits now with sequence number 0 it will not be seen by the Blyss device as a valid command and at the time the RFXtrx433 transmits the commands 1,2,3 the command will be detected as valid when it receives the command with sequence number 3.

The same is true for the remote. If you transmit commands with the RFXtrx433 and after that with a Blyss remote you need to transmit several commands with the remote before the Blyss device responds.

I guess the same behaviour will show if you use multiple Blyss remotes.

7.9. How to find the dx.com RGB LED strip driver ID

Flash the RFXtrx433 with Type2 firmware to be able to receive the remote ID in RFXmngr.
In RFXmngr enable only the AD protocol.

```
----------------------------------------------
0A140605FCC48B00010081
Packettype    = Lighting5
subtype       = RGB TRC02
Sequence nbr  = 5
ID            = FCC48B
Command       = On
Signal level  = 8
```

If necessary flash the RFXtrx433 back to Type1 if Type2 does not support devices you need. (See chapter 2.2)

8. Transmit undecoded ARC commands.

Plug-in modules or other equipment with a PT2262 can be controlled using Lighting4.
There are a lot of brands using the PT2262 and some of them use the same timing (350) as used by the ARC devices but a different protocol definition.

Messages will be received as undecoded ARC messages if the protocol definition does not match the definition of the ARC protocol. Remote commands are received as ARC commands with a wrong house and device code and/or command code or as undecoded ARC messages if “undec on” is enabled. Decoding of these remotes is therefore not possible because they overlap the ARC protocol partly.
But transmitting these commands is possible using the Lighting4 command.

So if we receive this command UNDECODED ARC:18014403:
(18 is not used)

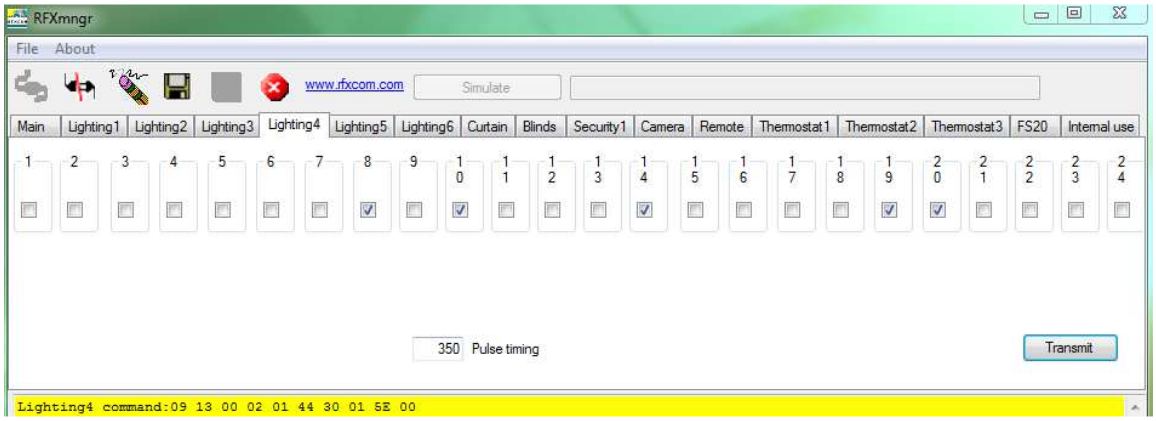
hex to binary table

```
0=0 0 0 0
1=0 0 0 1
2=0 0 1 0
3=0 0 1 1
4=0 1 0 0
5=0 1 0 1
6=0 1 1 0
7=0 1 1 1
8=1 0 0 0
9=1 0 0 1
A=1 0 1 0
B=1 0 1 1
C=1 1 0 0
D=1 1 0 1
E=1 1 1 0
F=1 1 1 1
```

0 1 4 4 0 3 = selection box 0000 0001 0100 0100 0000 0011
Not selected = 0, box selected = 1

And the Lighting4 command contains the same “undec code” 01 44 03:
Lighting4 command:09 13 00 04 **01 44 03** 01 5E 00
pulse timing is 350 = hex 015E

Another example:
For this command UNDECODED ARC:18014430 set on the Lighting4 tab in RFXmngr selection box 1 to 24 to 0 1 4 4 3 0 = 0000 0001 0100 0100 0011 0000



9. Known Lighting4 devices

9.1. Proluxx projection screen

Use Lighting4 with a pulse timing of 360

UP	1110 1101 0101 1001 0101 0010	ED 5A 52
STOP	1110 1101 0101 1001 0101 1000	ED 5A 58
DOWN	1110 1101 0101 1001 0101 0100	ED 5A 54
RESET	1110 1101 0101 1001 0101 0001	ED 5A 51

9.2. Kingpin (KP100) projection screen

Use Lighting4 with a pulse timing of 1040

UP	1110 0001 0100 0010 0010 0010	E1 42 22
STOP	1110 0001 0100 0010 0010 0100	E1 42 24
DOWN	1110 0001 0100 0010 0010 1000	E1 42 28
PROGRAM	1110 0001 0100 0010 0010 0001	E1 42 21

9.3. Mercury remote control mains sockets

http://mercury.avsl.com/product?range=ME5124
Use Lighting4 with a pulse timing of 188

1 OFF 01000100010101010011 1100
1 ON 01000100010101010011 0011

2 OFF 01000100010101011100 1100
2 ON 01000100010101011100 0011

3 OFF 01000100010101110000 1100
3 ON 01000100010101110000 0011

4 OFF 01000100010111010000 1100
4 ON 01000100010111010000 0011

5 OFF 01000100011101010000 1100
5 ON 01000100011101010000 0011

10. EC Declaration of Conformity

EC Declaration of Conformity CE

RFXCOM declares that the product:

RFXtrx

Brand: RFXCOM Type: RFXtrx433

conforms with the essential requirements and other relevant provisions of the following directives and complies with the following standards applied:

R&TTE Directive 99/5/EC	EN 300 220-1 V2.3.1 (2010-02)
	EN 300 220-2 V2.3.1 (2010-02)
Low-voltage Directive 2006/95/EC	IEC 60950-1 (2005-12)
EMC Directive 2004/108/EC	EN 301 489-1 V1.9.2 (2011-09)
	EN 301 489-3 V1.4.1 (2002-08)

11. 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.

12. Copyright notice

13. Revision history

Version 0.0 – August 18, 2011
Initial version.
Version 1.0 – October 30, 2011
RFXflash under Mono added.
Version 2.0 – December 30, 2011
Updated for the production version with FTDI USB chip
Version 2.1 – January 18, 2012
Link for ACM to serial port added in Linux instruction.
EC Declaration of Conformity added
Version 2.2 – February 8, 2012
Protocols overview added
Screen dumps updated
Version 2.3 – February 16, 2012
Novatys planned
Version 2.4 – February 25, 2012
General information updated
Version 2.5 – March 1, 2012
Chapter added how to run RFXmngr or RFXflash on Linux.
Version 2.6 – March 14, 2012
Code tables added
Cresta, UPM added
Version 2.7 – March 15, 2012
Flash procedure updated
Version 2.8 – March 31, 2012
Phenix table added
Version 2.9 – March 31, 2012
AB400 and Phenix address extended
Version 2.10 – April 16, 2012
Linux USB - tty configuration updated
Version 2.11 – May 14, 2012
List of supported protocols updated.
Version 2.12 – June 8, 2012
Chapter added how to run RFXmngr or RFXflash on Mac OS
Version 2.13 – July 15, 2012
List of supported protocols updated
Version 2.14 – August 4, 2012
List of enabled protocols influence added
RFXtrx315 added
Version 2.15 – August 18, 2012
Enabled protocols table changed
Version 2.16 – August 26, 2012
Rubicson stektermometer added
ATI Remote Wonder II added
Version 2.17 – August 28, 2012

Table “sensitivity influenced” updated
Version 2.18 – September 18, 2012
Chapter 2.3 updated: BlindsT0 disables all other protocols
Version 2.19 – September 25, 2012
RFXFlash version required changed to 4.0.0.0
Version 2.20 – September 28, 2012
RF range reduction guide added
Version 2.21 – October 18, 2012
BlindsT2 and BlindsT3 added
Version 2.22 – October 24, 2012
Sartano added
Version 2.23 – October 31, 2012
Sensitivity table updated
Version 2.24 – November 7, 2012
Protocol table extended with the protocols to enable for receive
Version 2.25 – November 14, 2012
HE105 switch settings added
Version 2.26 – November 28, 2012
undec on explained
Version 2.27 – December 4, 2012
Use of Lighting4 commands for undec ARC
Brennenstuhl added
Version 2.28 – December 18, 2012
Receiver tab removed from RFXmngr
Version 2.29 – December 27, 2012
Lighting4 receive added
Version 2.30 – January 1, 2013
Raex motor added
Version 3.00 – January 4, 2013
RFXtrx433 Type1/Type2 firmware added
Version 3.01 – February 4, 2013
Supported protocols list updated
Version 4.00 – February 21, 2013
Chapter 8 - Lighting4 screen updated for RFXmngr 11.0.0.0
Known Lighting4 chapter added
Version 4.01 – March 13, 2013
Receive of LaCrosse sometimes influenced by enabled Hideki
Version 4.02 – June 8, 2013
MDREMOTE LED dimmer added www.ultraleds.co.uk
Conrad RSL2 added
Energenie added
Version 4.03 – September 27, 2013
How to find the MDREMOTE ID (chapter 7.6)
WS1200 added
Byron SX Chime added
Version 4.04 – November 15, 2013
Maverick ET-732 added
Alecto SA30 added
Oregon EW109 added
Revolt added
Version 4.05 – December 5, 2013
Blyss command explanation added.
Lighting4 - Mercury added
Lighting5 – RGB controller added http://dx.com/p/rf-remote-touch-rgb-controller-130913
Version 4.06 – December 27, 2013
Chapter 2.2 updated
Version 4.07 – February 10, 2014
Chapter 7.8 added: how to find the dx.com RGB LED strip driver ID

Version 4.08 – March 20, 2014
ARC and Oregon3.0 updated in table 2.4.
Energenie 5-gang 429.950 added
Version 4.09 – April 4, 2014
BlindsT6 - DC106, YOODA, Röhrmotor24 RMF added
Version 4.10 – April 7, 2014
BlindsT7 - Forest added