



# LinTronic

## **TT455-RT-238 HW5.x and HW6.x**

Controlling  
A10, X10, Xanura, Ebode

And Insteon ?



X10 is a HomeAutomation system sending and receiving:

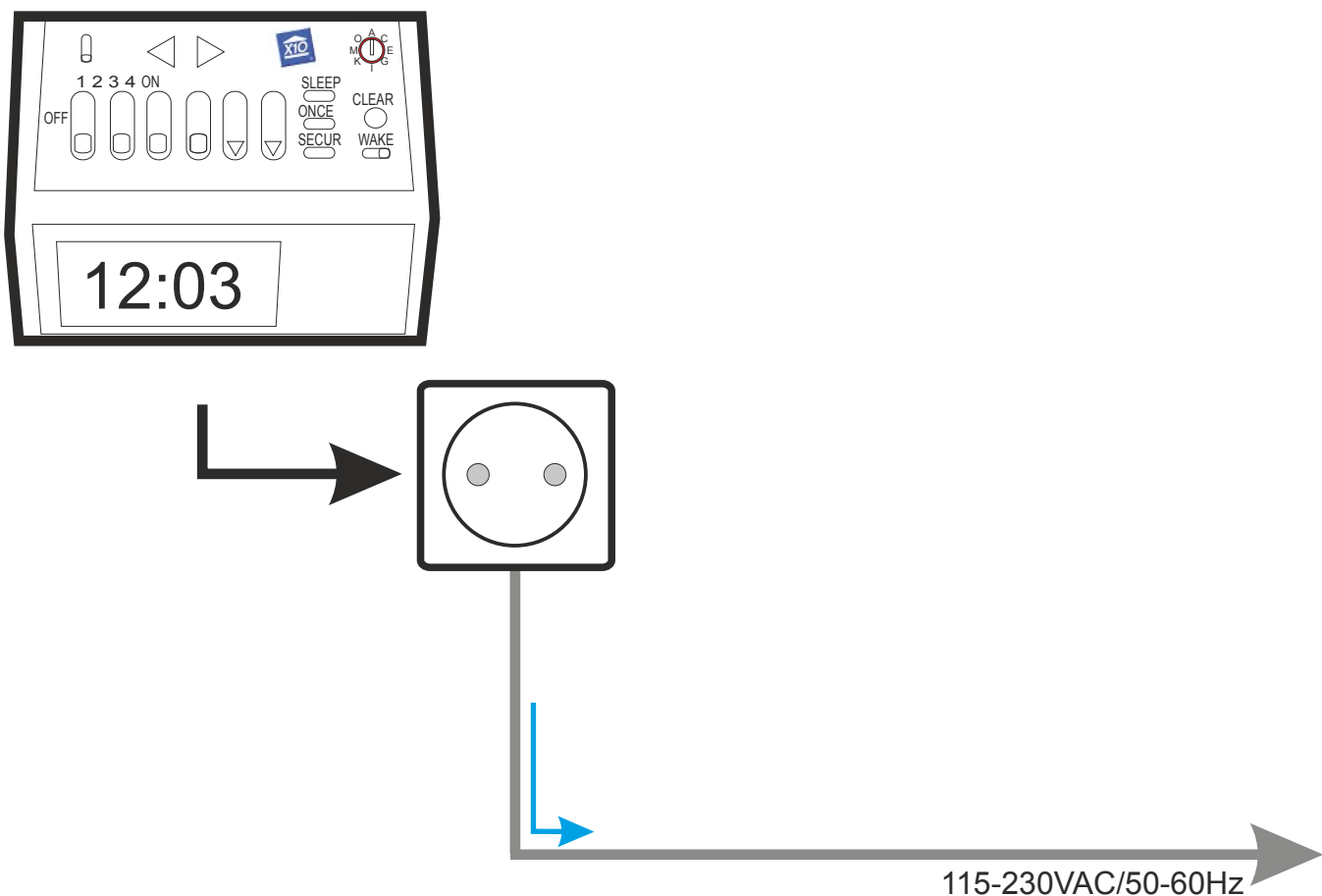
- signals over the existing mains power lines (PLC = Power Line Carrier)
- RadioFrequency signals

The signals can be used to turn On/Off the power to your appliances and to adjust the light level of inside and outside lamps/light.

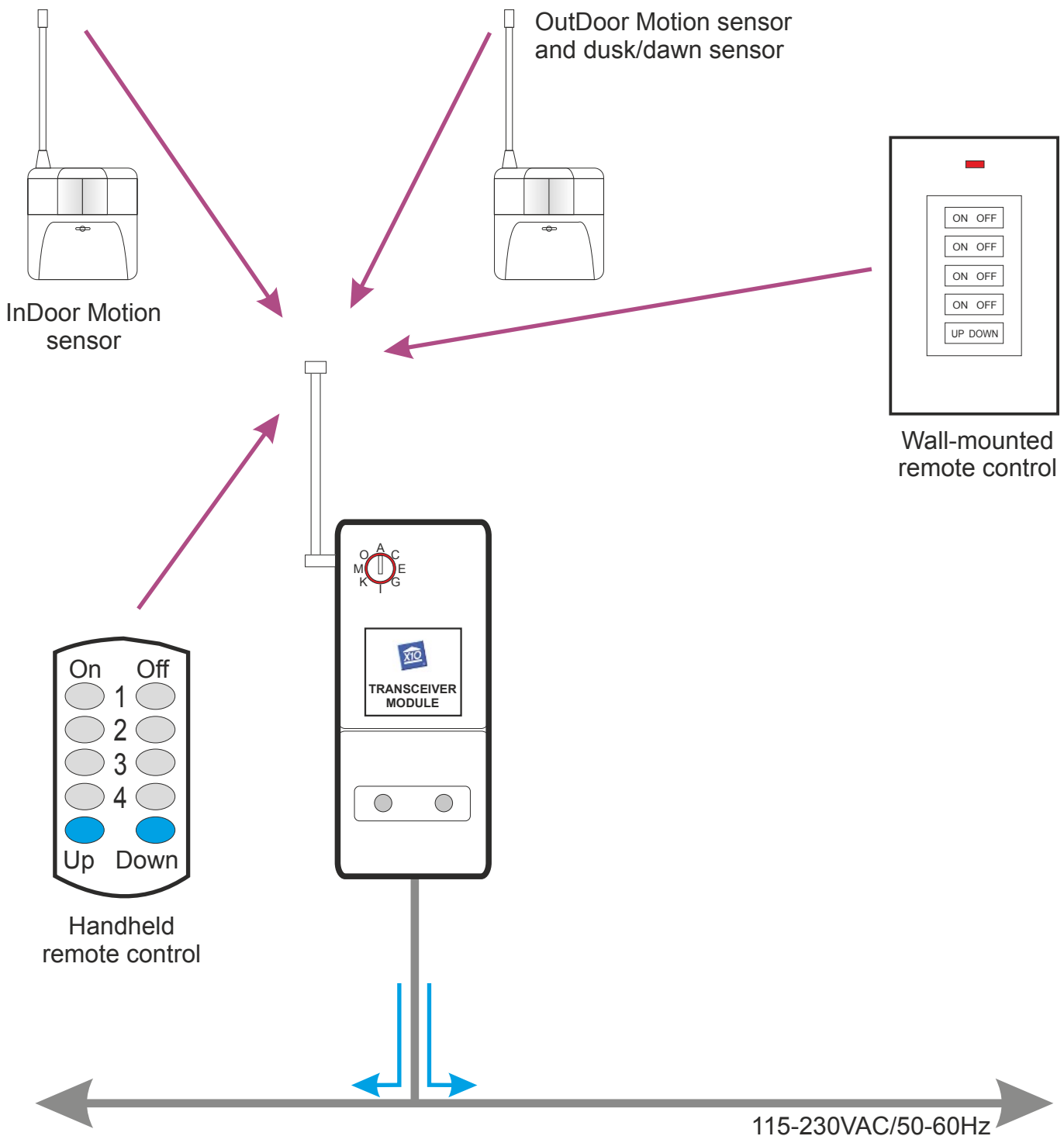
The system offers different type of signal Transmitters and Receivers.

A Transmitter can be a desk-top device connected to the mains, a computer, a remote control or a converter detecting some kind of signal and converting into X10 PLC signals.

A typical Transmitter is the Mini-Timer, which can both work as a smart alarm-clock turning on the light in the morning and/or opening curtains, but also offering random control of the light in your absence to make your Home look occupied.



A wireless receiver is available, receiving signals from wireless handheld remote controls or turning lights On/Off upon signals from wireless motion sensors and/or dusk/dawn sensors.



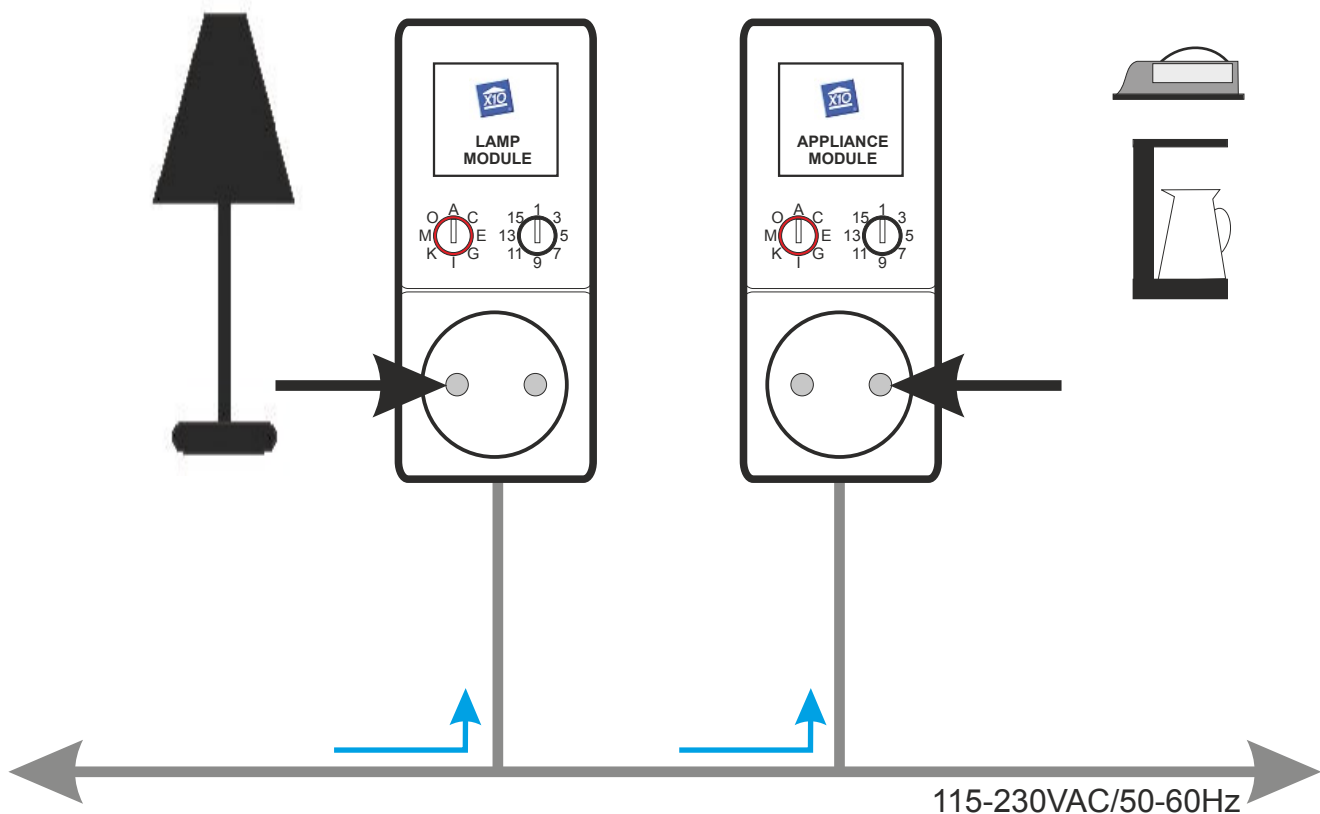
A typical Receiver could be a Lamp Module which turns the connected light On or Off, and adjust the light level Up/Down.

Or an Appliance Module which turn the connected device On or Off.

Such a device could be:

- Spots, Lamps, Stereo set, TV, coffee machine, computer, ironing tools, sprinklers, water pumps, etc.

Special controllers for blinders and shades are available.

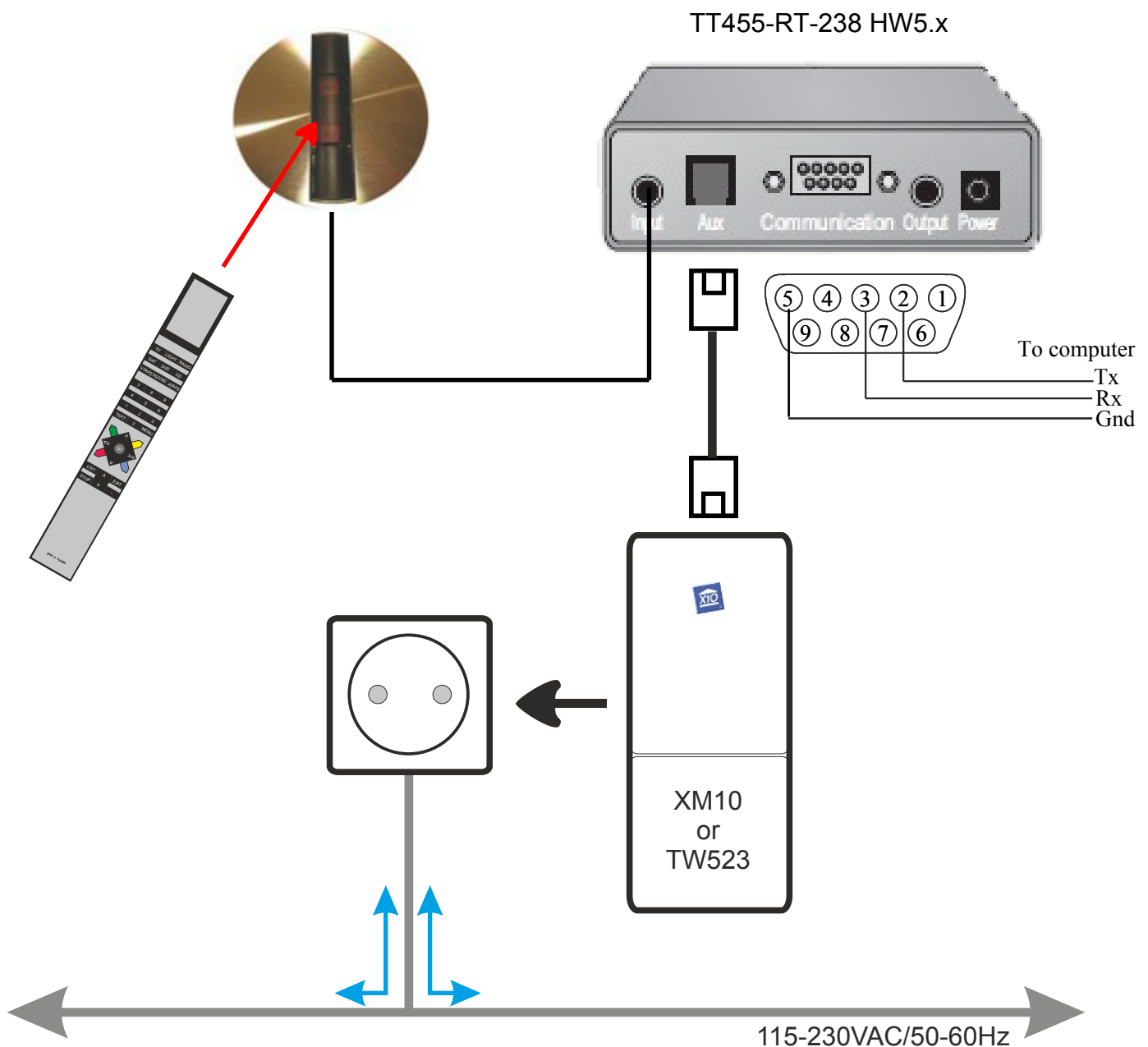


# HW5.x

The TT455-RT-238 HW5.x may be triggered by or control X10 power-line signals. Requires an XM10 or TW523 modem which connects to the back of the TT455-RT-238.

This means you can use X10 signals to control your TT455-RT-238 and hence convert X10 signals into InfraRed, RS232 og digital outputs.

And you can use your B&O remote to send X10 signals onto the powerlines.



## IMPORTANT NOTES REGARDING X10

**“X10 PLC” must be turned on in Settings in the Memory Map**

Reading X10 signals from the powerlines, is a very timeconsuming process requiring a lot of resources of the microprocessor, as it must scan the powerlines more than 500 times pr second in order to detect the signals properly.

Furthermore it must sample about 50 bits and check for correct pattern for the House, Address and Function codes.

In order to optimize the detection of the B&O remote, we do not want to use resources to scan the powerlines, if you are not even using X10.

In order for the TT455-RT-238 to determine whether an XM10/TW523 modem is actually connected, the following power-up procedure is required:

1. Insert phone cable into the TT455-RT-238
2. Insert phone cable into the XM10/TW523
3. Insert XM10/TW523 into the mains power outlet
4. Apply power to the TT455-RT-238

The TT455-RT-238 will now measure the mains powerlines frequency:

- 50 Hz for Europe (23 vac)
- 60 HZ for USA (115 vac)

The TT455-RT-238 will send a command onto the RS232 comport to advise a computer about the frequency detected:

```
<0001048001050131>
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The blue 048001 means that an X10 carrier is detected.

The red 050 (000, 050 or 060) indicates the carrier frequency.

If the mains powerlines frequency cannot be measured, then the TT455-RT-238 will not spend time on scanning the power lines for X10 signals, meaning that you will not be able to send or receiver powerline signals.

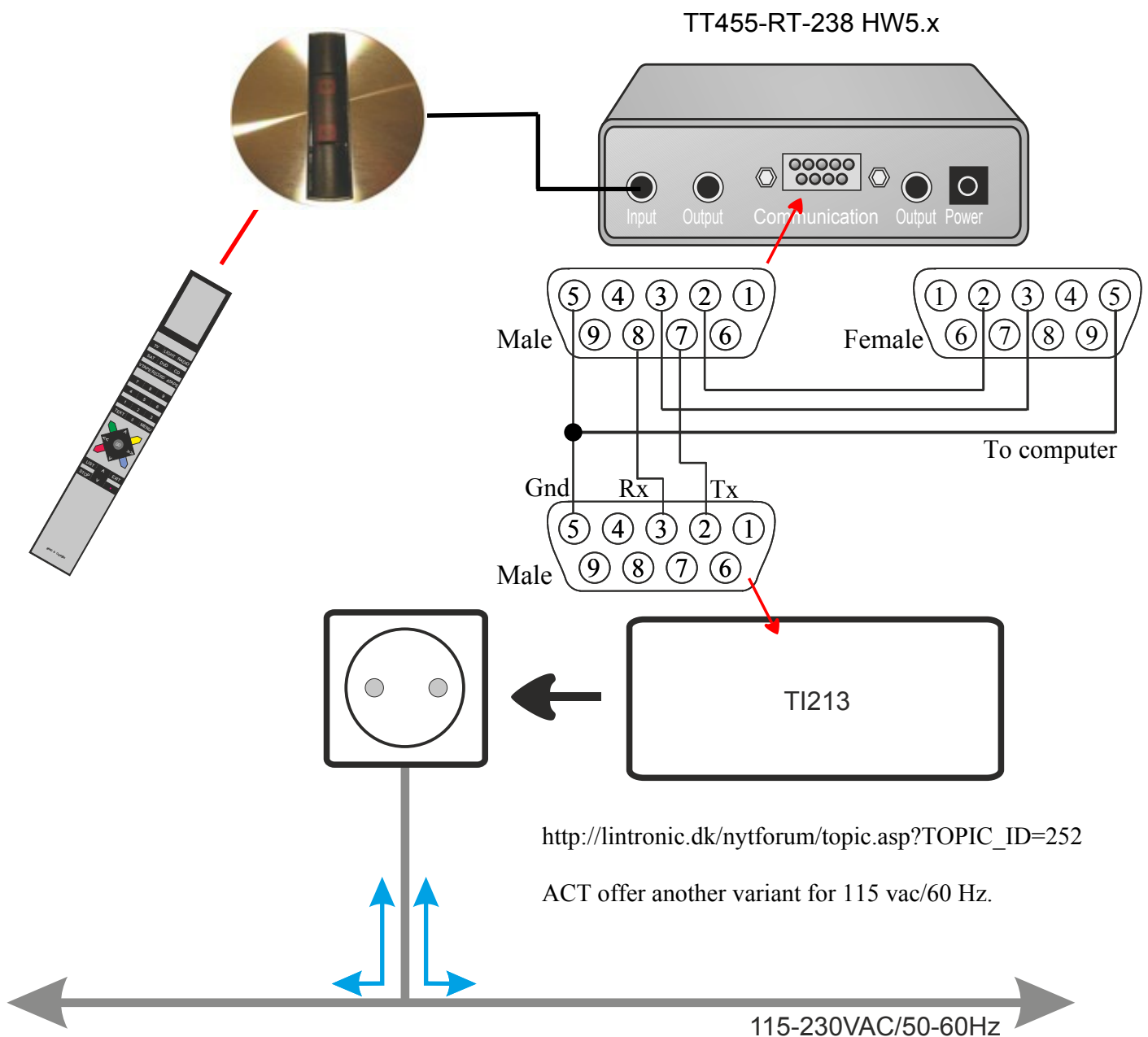
You will still be able to send infrared signals (IR and IRRF).

# HW6.x

The TT455-RT-238 HW6.x may be triggered by or control X10 power-line signals. Requires a TI103 modem which connects to the RS232 port of the TT455-RT-238.

This means you can use X10 signals to control your TT455-RT-238 and hence convert X10 signals into InfraRed, RS232 og digital outputs.

And you can use your B&O remote to send X10 signals onto the powerlines.

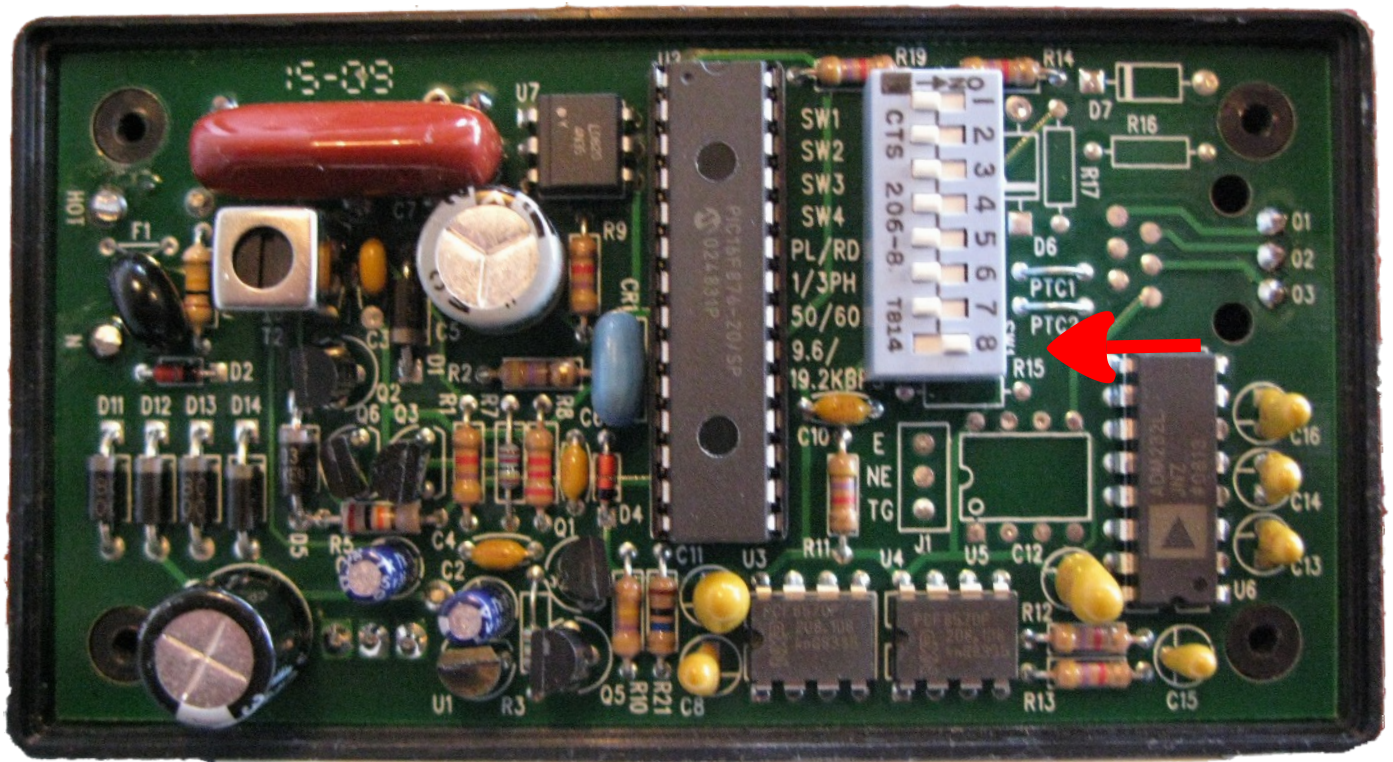


## IMPORTANT NOTES REGARDING X10

Commands to read from or control the TI213, are send out on the baudrate of the TT455-RT-238.

The default baudrate of the TT455-RT-238 is 19200 bps.  
The default baudrate of the TI213 is 9600 bps.

So, either you must set the TT455-RT-238 to 9600 bps,  
or you must set the TI213 to 19200 bps (recommended) as shown below (DIP 8 = ON)



## IMPORTANT NOTES REGARDING X10

**“X10 PLC” must be turned on in Settings in the Memory Map**

Reading X10 signals from the powerlines, is a timeconsuming process requiring some resources of the microprocessor, as it must send out an RS232 command at least once a second in order to read the TI213.

In order to optimize the detection of the B&O remote, we do not want to use resources to read the TI213, if you are not even using X10.

In order for the TT455-RT-238 to determine whether a TI213 modem is actually connected, the following power-up procedure is required:

1. Insert custom made RS232 cable into the TT455-RT-238
2. Insert custom made RS232 cable into the TI213
3. Insert TI213 into the mains power outlet
4. Apply power to the TT455-RT-238

After power-up, the TT455-RT-238 will wait 10 seconds before starting to read data from the TI213. This delay period allows you to connect the TT455-RT-238 to the computer and start a configuration without the TT455-RT-238 sending out data to the TI213 every second. If the TT455-RT-238 detects the Configurator during the first 10 seconds, it will abort reading the TI213 every second and wait for a new power-up.

After the 10 seconds delay - if no computer is detected - TT455-RT-238 will detect the TI213 and send a command to the computer to advise whether a TI213 was detected on comport 1:

<0001048006000131>

The blue 048006 means that a TI213 was tested.

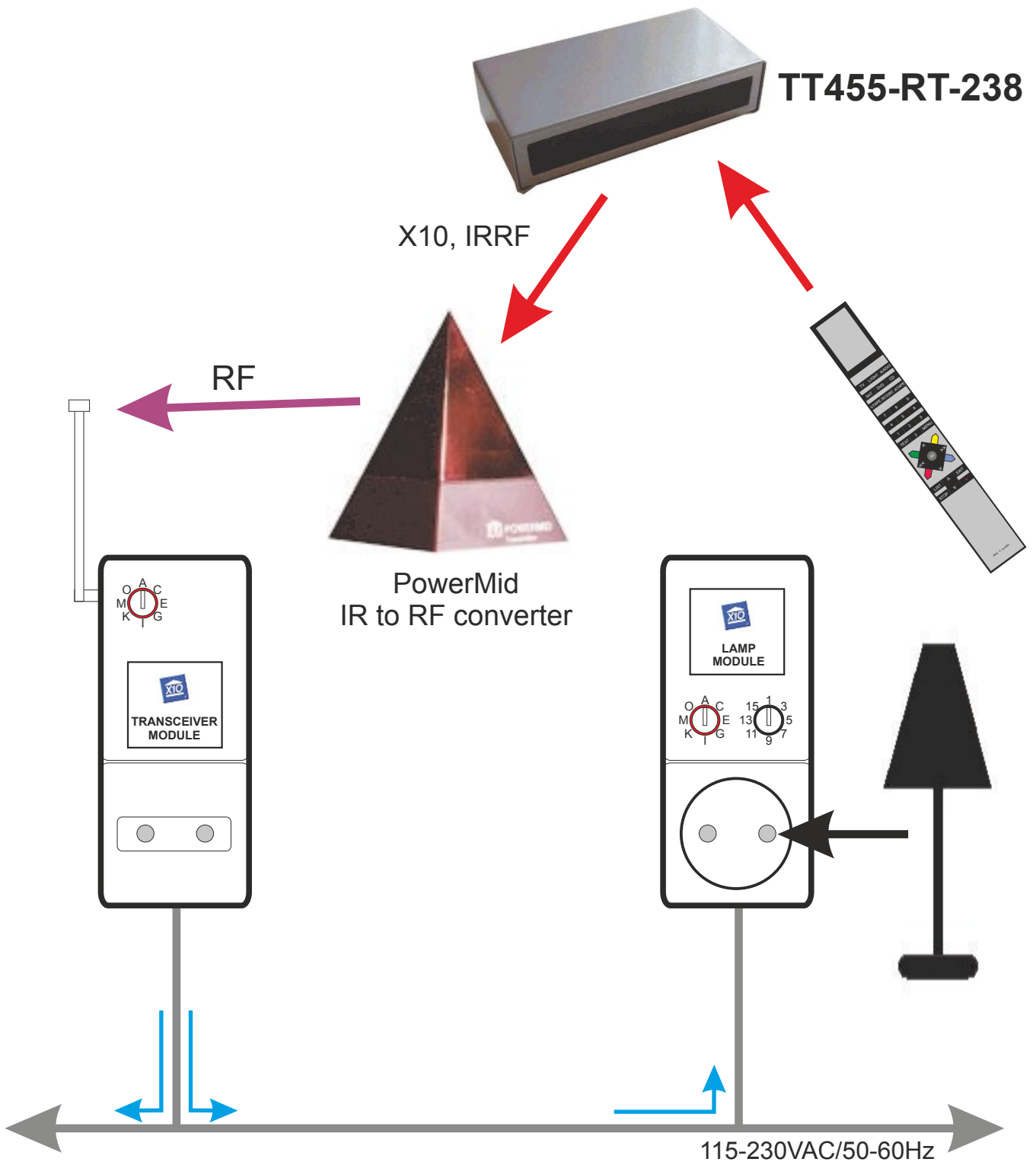
The red 000 (000 or 213) indicates whether it was detected (000 = not present).

If the TI213 cannot be detected, then the TT455-RT-238 will not spend time scanning for it, meaning that you will not be able to send or receiver powerline signals.

You will still be able to send infrared signals (IR and IRRF).

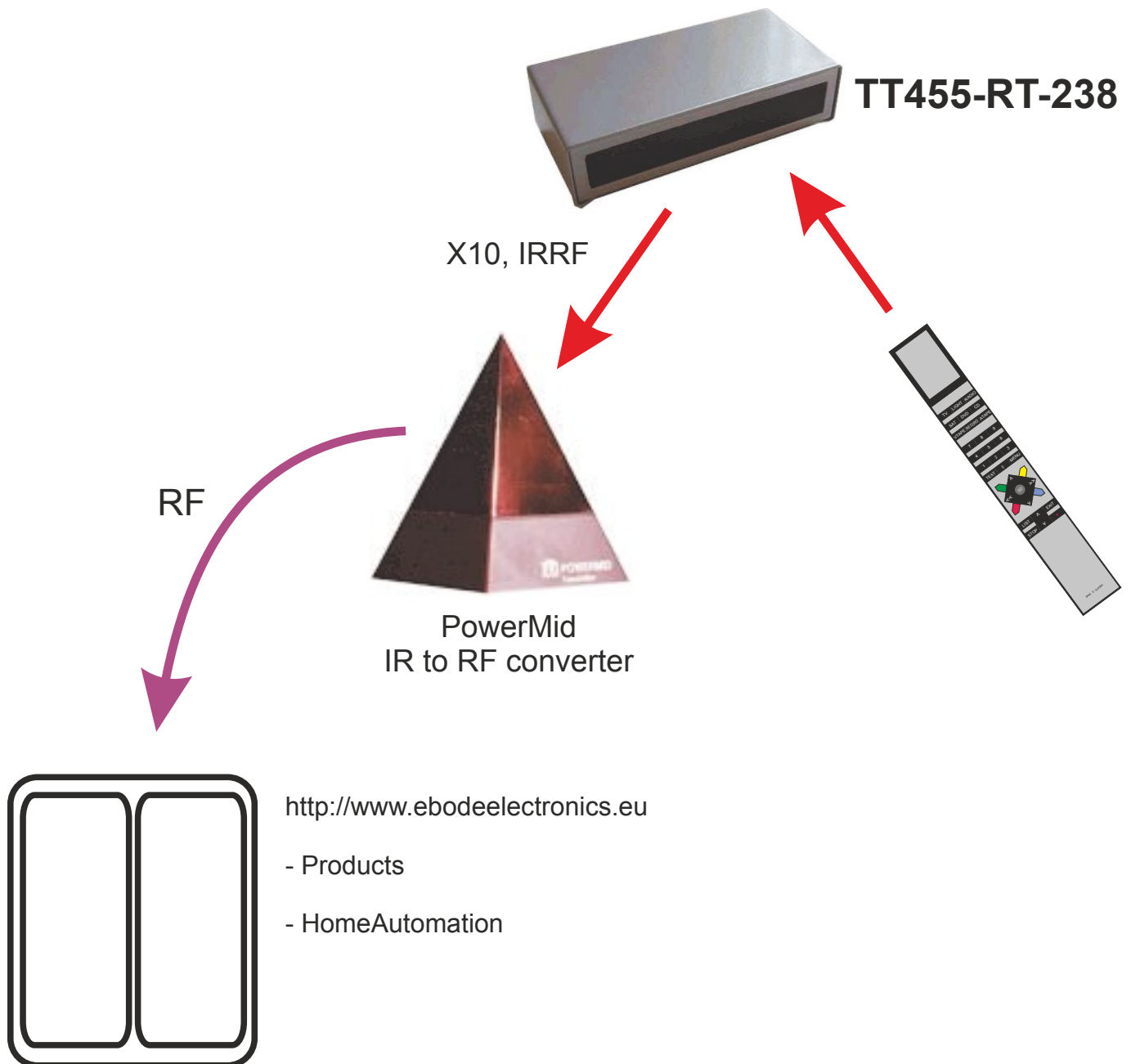
# HW5.x / HW6.x

The TT455-RT-238 may send X10 IR or X10 RF commands (RF require the PowerMid and one/more TM13s to receive the RF signals).



# HW5.x / HW6.x

The TT455-RT-238 may send out X10 RF commands (RF require the PowerMid)  
- in order to control EBODE products.

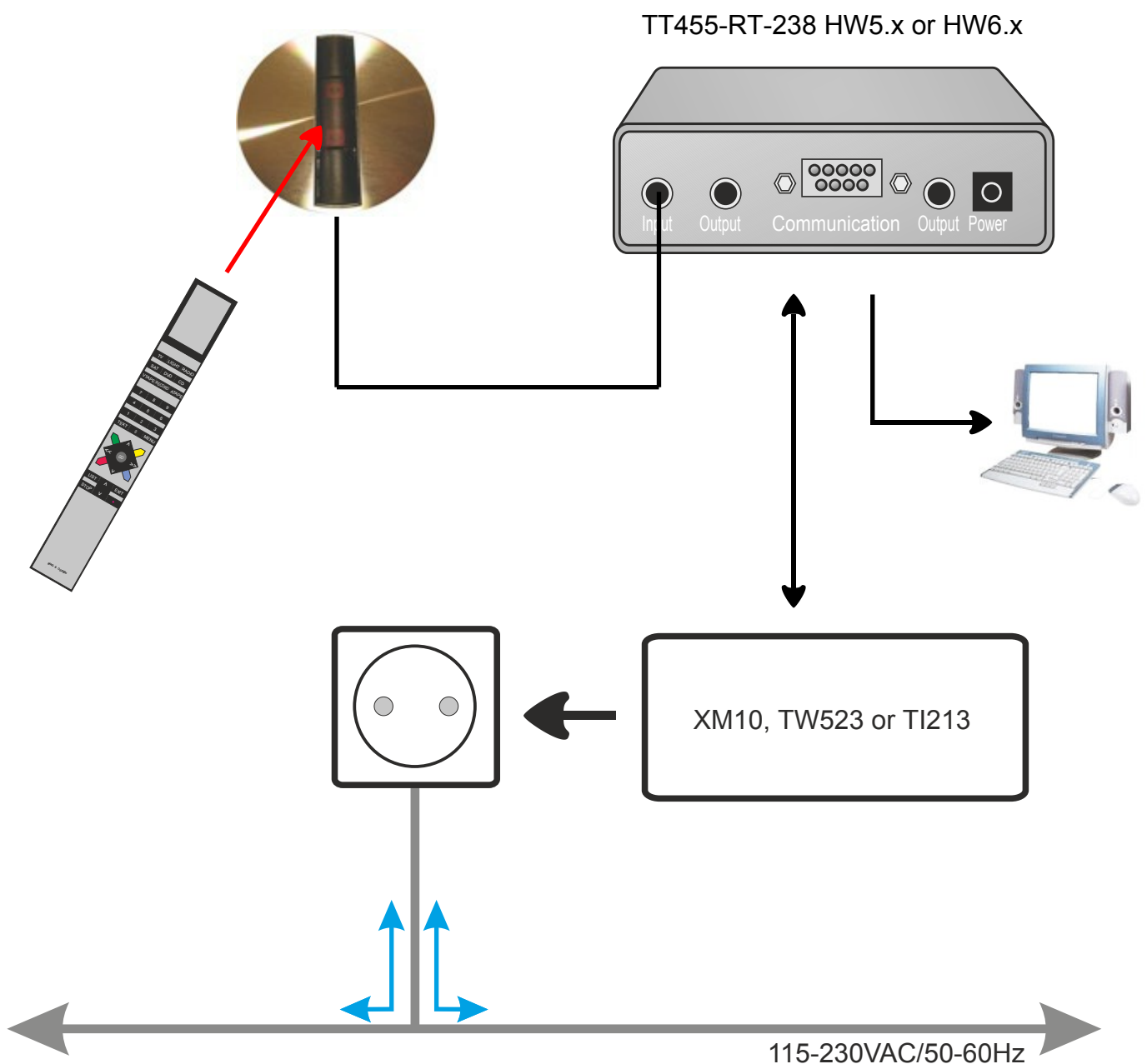


# HW5.x / HW6.x

Regardless of whether you own a TT455-RT-238 HW5.x or HW6.x they can both send the detected X10 signals to the computer, and they can both be controlled from the computer.

You can send X10 IR signals, you can send X10 RF signals and you can send X10 Power Line Carrier signals.

Contact us if you need more info about the protocol.



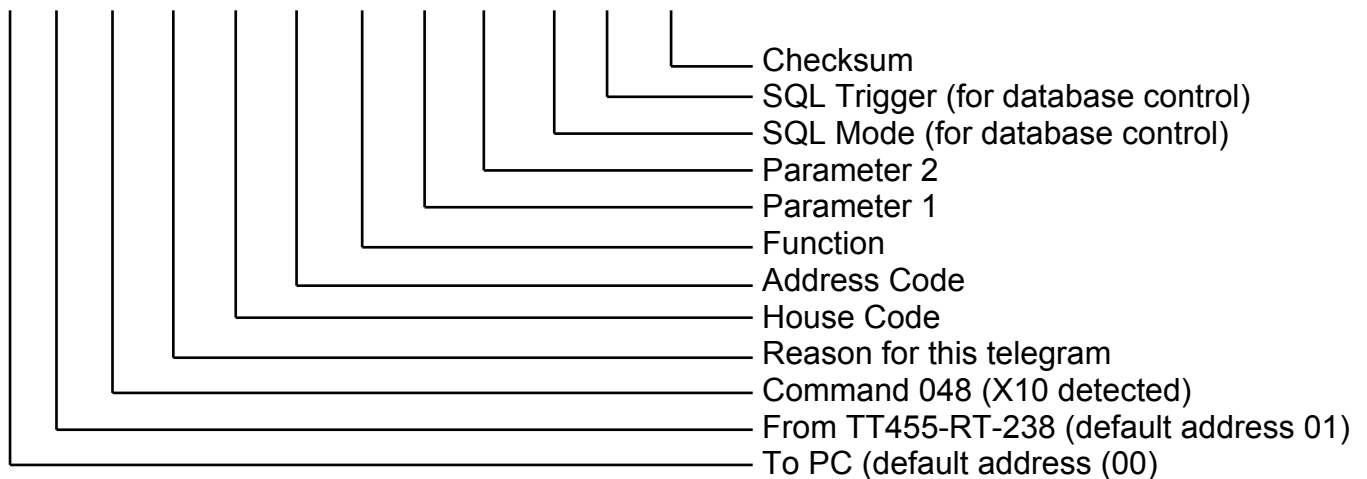
# HW5.x / HW6.x

## Detected X10 signals sends an RS232 command to the computer

When an X10 Power Line Command is detected, an instruction telegram is send to the computer:  
<0001048002001001002000000142002236>

We now split this into sections

00 01 048 002 001 001 002 000 000 142 002 236



### Reason for telegram

XM10_NOISE	001	(noise on the powerline)
XM10_FREQUENCY	002	(mains line frequency 0, 50 or 60 HZ)
XM10_HAF	003	(House, Address and Function detected)
XM10_HF	004	(House and Function detected)
XM10_EXTENDED	005	(Extended command detected)
TI213_DETECTED	006	
TEST	007	

### House Code

From 001 (A) to 016 (P)

### Address Code

From 001 (A) to 016 (P)

### Function

AllUnitsOff	0	HailRequest	8	Parameter 1 - extended data
AllUnitsOn	1	HailAck	9	Parameter 2 - extended data
On	2	PresetDim	10	
Off	3	PresetDim_High	11	
Dim	4	ExtendedData	12	
Bright	5	StatusIsOn	13	
AllLightOff	6	StatusIsOff	14	
ExtendedCode	7	StatusRequest	15	

# HW5.x / HW6.x

## SQL MODE / TRIGGER

The SQL mode/Trigger are calculated from the detected House, Address and Function.

### Example

HouseCode A = 142  
Address 4 ON = 26

ASCII of HouseCode + 77, A = 65 + 77 = 142  
(Address - 1) \* 8 + Function = (4 - 1) \* 8 + 2 = 26

HOUSE	MODE	ADDRESS	0 ALL UNITS OFF	1 ALL UNITS ON	2 ON	3 OFF	4 DIM	5 BRIGHT	6	7
A	142	1	0	1	2	3	4	5	6	7
B	143	2	8	9	10	11	12	13	14	15
C	144	3	16	17	18	19	20	21	22	23
D	145	4	24	25	26	27	28	29	30	31
E	146	5	32	33	34	35	36	37	38	39
F	147	6	40	41	42	43	44	45	46	47
G	148	7	48	49	50	51	52	53	54	55
H	149	8	56	57	58	59	60	61	62	63
I	150	9	64	65	66	67	68	69	70	71
J	151	10	72	73	74	75	76	77	78	79
K	152	11	80	81	82	83	84	85	86	87
L	153	12	88	89	90	91	92	93	94	95
M	154	13	96	97	98	99	100	101	102	103
N	155	14	104	105	106	107	108	109	110	111
O	156	15	112	113	114	115	116	117	118	119
P	157	16	120	121	122	123	124	125	126	127

