

Radio control of mains consumers

Gunther Zielosko

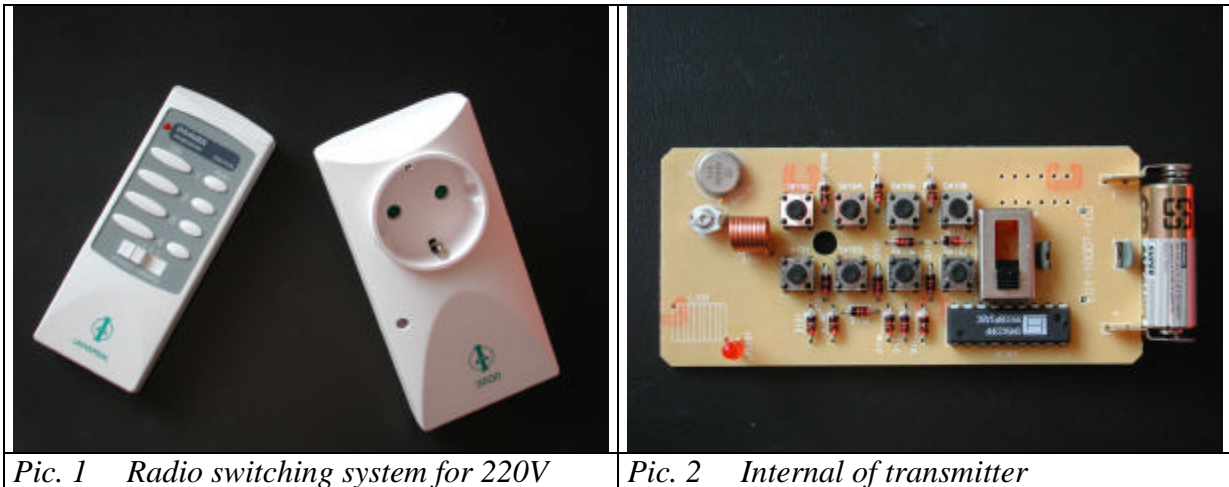
1. The technical progress

Did you ever ask yourself what purpose a radio switching system for power outlets could have, which one can buy in various versions at your local dealer's? OK, you can switch on and off the floor lamp without needing to stand up (If you don't have to go get the remote control, that is...). But else?

If you have a BASIC-Tiger and some knowledge in electronics, you might get an idea. Many electronic engineers are ingenious in quickly building up circuits and developing amazing programs. But having to build a chassis or consider safety regulations at the lighting system, they frequently give up, or - even worse - they build the equivalent to an electric chair. And for exactly those cases there is now a solution!

2. Radio switching system as bridge from BASIC-Tiger to mains

You already detected what we intend to do, we want to switch large loads at the lighting mains with the BASIC-Tiger using a commercial radio switching system. Although the Plug & Play Lab offers efficient relays for switching larger consumers, you must be explicitly warned to couple these with the lighting mains. Neither contact nor fire prevention would be ensured, not to mention the uncomfortable handling. Integrating the BASIC-Tiger into the mains supply is of course technically possible, but no ideal solution. A perfect supply isolation you'll only achieve with optocouplers or just elegantly by radio. The bases for this can very inexpensive be obtained in form of commercial systems, we only need to buy a system of our choice in the DIY store or electronics shop – and we're ready to go. Picture 1 shows such a typical combination of remote control and switchable power outlet, the systems only differ in the level of configuration (How many consumers can be switched, what is the maximum power, is dimming possible etc.) and in price. Choose a system which meets your current and future requirements best.



Once you have the system on your desk, after first tests it the alterations begin. Some principles for all works:

- **The switchable power outlet is taboo!**
- **Only certified consumers are plugged in!**
- **The HF part must remain unchanged, otherwise postal regulations are broken!**

Let's take a closer look at the remote control transmitter. In most cases the housing can easily be opened and you see the fairly simply internal structure (Picture 2). The largest part of the space is taken by the keyboard, various switches and the battery. In our case we see the HF part with an IC in a round metal housing on the left and on the lower right a IC in DIP chassis, which is responsible for coding the transmitted signals. All this may of course look somewhat different for each individual case, but that is hardly important for the further works.

Now we remind us of application note no. 13, in which the keyboard of a foreign device was interfered in an unorthodox way. With small DIL relays (because of the potential separation) we obridged the existing keys and so controlled the unchanged electronics of the respective system "from outside". Exactly that we will do with the remote control of the radio switching system. The effort is limited to the few soldering work for leading out the needed contacts and, if necessary, building in a small connector for plugging the control cable to our BASIC-Tiger. Exactly as in application note no. 13 we determine the inner switching contacts which we want to remote control and connect each of them to a respective relays contact. The relays can be positioned at the control computer, so that through a plug only the lines have to be lead to the key contacts in the housing of the remote control. All this can be accommodated completely in one chassis, when the printed circuit board of the sender is integrated there. In that case you have to take care that the new housing is pervious to HF, sheet metal or soldered base material are not suitable.

With that we are almost finished. We can switch almost all common consumers without any manipulation on the mains supply with the BASIC-Tiger, using suitable systems even dim. On the BASIC-Tiger side we can stick to the system that was introduced in application note

no. 13. But also any other control of the DIL relay(s) is possible, it is only important that the DIL relays are switched over some kind of amplifier (Transistor, logic gate) for security reasons, so the BASIC-Tiger outputs aren't overloaded.

All further works refer solely to the programming of the BASIC-Tiger and are of course task specific, meaning no further suggestions can be made here.

At the end we conclude that the questionable remote control mania is at least of any use for the BASIC-Tiger user.