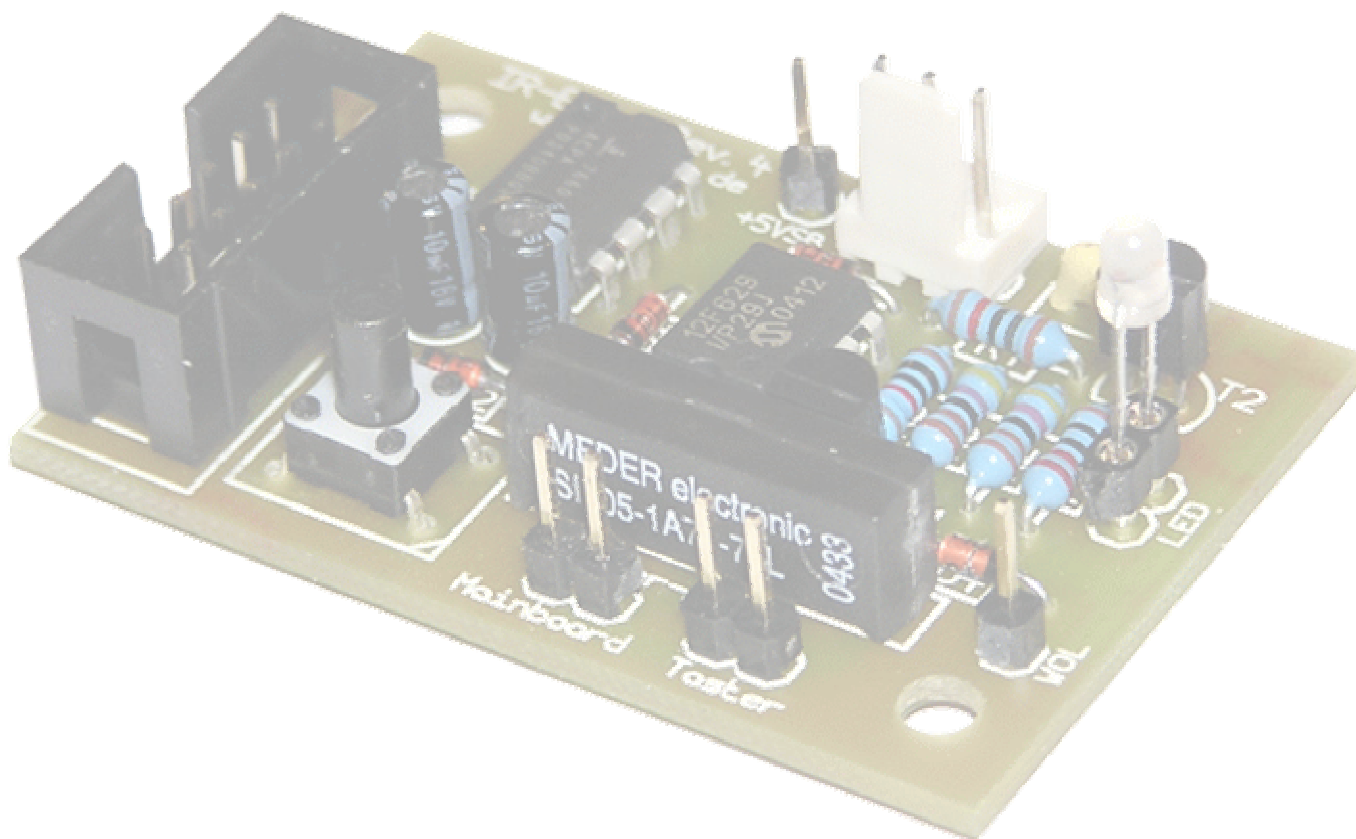


# IR-WAKE-UP-SWITCH REV.4

## Installation and operating instructions



### **Important Note!**

Please read these instructions exactly before you start with the installation of the receiver to avoid damages to your computer!

This device was very carefully developed. We nevertheless cannot assume any liability for damages which result from the installation into your computer.

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## **1. Introduction**

Congratulations on purchasing the IR-Wake-Up-Switch.

It is nothing new that one can steer a computer with a remote control. It is only a pity that one cannot switch this on with normal IR receivers because the receiver is active only after the start-up of the computer. Therefore we have developed the IR-Wake-Up-Switch for you with whose help you can switch on your computer with every customary remote control.

Frequent application areas for this are living room computers, like HTPC (home theatre pc) or VDR (video disc recorder). However, you can use the IR-Wake-Up-Switch also with your ordinary computer.

In addition the IR-Wake-Up-Switch is also an IR receiver.

This means you can control your computer also with your remote control without needing an additional receiver. Prerequisite for it is a corresponding IR control software, such as LIRC.

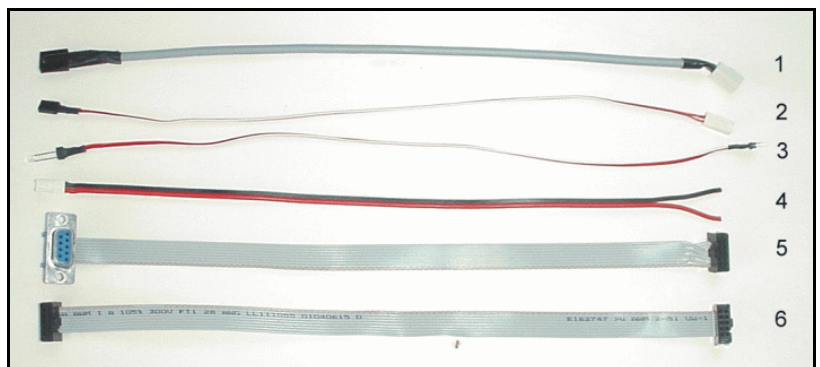
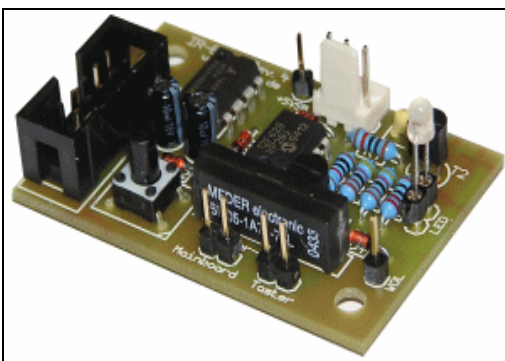
Unlike other available infrared power on solutions which work only with RC5 remote controls our device is compatible with almost all customary remote controls.

### **Notice:**

This device is not suitable to the data transmission with a mobile telephone or PDA.

## **2. Contents of the delivery**

- circuit board which is completely built up and tested
- (# 1) IR receiver chip with connection cable
- (# 2) 3 x single-wired connection cable for power supply, power button or WOL connection
- (# 3) bichromatic LED with connection cable
- (# 4) serial connection cable for the internal or external COM port



### **3. Function description**

The IR-Wake-Up-Switch Rev.4 is a further development of the popular and successful IR-Wake-Up-Switch Rev.3.

You can switch on and also turn off alternatively your computer with the IR-Wake-Up-Switch with every customary infrared remote control.

To this the IR-Wake-Up-Switch is attached to the stand-by power supply of the computer.

The IR-Wake-Up-Switch receives arriving infrared signals and compares these with the stored code.

If the code agrees, a switching impulse is sent to the computer and this switches himself on or turns off.

The IR-Wake-Up-Switch can be trained through a built-in setup mode on the used remote control.

This means the received code is stored and is compared with the arriving codes later.

By this training mode it is possible to use almost every customary infrared remote control.

In addition, the IR-Wake-Up-Switch transmits the received signals to pin 1 (DCD) of the serial interface.

Through this it is possible to control the computer by using a corresponding control software (e.g. LIRC, WinLIRC, Girder, IR assistant etc.).

LinVDR also supports the IR-Wake-Up-Switch if you register this as a "Homebrew" receiver.

#### **3.1 Important innovations opposite the predecessor version:**

- There is no more power-on bug, it works without problems after power failure now.
- The stand-by voltage can be fetched at different connections at the mainboard (PS/2, WOL, USB, etc.)
- The switch-off impulse can be disabled now alternatively.
- The LED functions can be adapted according to your own needs.
- New setup mode over programming button – through this no more jumpers are necessary.
- Wake-On-Ring is possible with the "ASUS Pundit" and other problem boards now.
- An additional connection for Wake-On-LAN is integrated now.
- You can turn off the computer also after a crash by pressing the programmed button on the remote control for at least 4 seconds. (This is only possible if the IR-Wake-Up-Switch is connected to the power button).

#### **3.2 Indications of the LED**

- The LED indicates green for approx. ½ second directly after the connection to the power supply for the confirmation.
- As long as the computer is off, the LED does not react to any keystroke apart from the programmed power-on key.
- If the programmed power-on key is pressed, the computer switches on itself and the LED indicates green until the computer has started (indicating also can be switched off in the setup mode)
- If the computer already is running, the LED indicates fast green at every keystroke of the programmed remote control. (also can be switched off in the setup mode)
- The IR switch should not react on keys of another remote control. (can occur in exceptions if a similar code is used)
- If the programmed key is pressed during the computer is switched on, the LED indicates red and a power off impulse is sent.  
If turning off is deactivated, the LED indicates fast green as in the case of every other key.
- The power off impulse is active until you hold down the key.  
By this you can turn off the computer after a crash by pressing the programmed key for more then four seconds. (This is only possible if the IR-Wake-Up-Switch is connected to the power button).

In the setup mode the LED has another meaning. Look at the chapter "setup mode" later.

## 4. Installation instruction

Disconnect the computer from the main power absolutely before opening the system case!

### **Remove main plug - Turning off doesn't suffice!!!**

Because the computer still is supplied with power in the stand-by mode, parts falling in (screws etc.) can cause irreparable damages to your computer!

Before you fasten the circuit board, you have to choose a suitable space in the system case from which you can connect all cables with the associated connectors without problems.

Please also consider that the receiver chip must be installed at a special place inside the system case so that the signals of the remote control can reach it. (e.g. behind a small opening in the front panel).

The chip can alternatively be led out at the back of the system case and fastened to the side with a double-sided adhesive tape. The receiver works in many cases, too, if you install it at the back the computer, because the reflected light of the remote control still suffices to control the receiver.

If you want to use the LED as a receiving confirmation, you must put it in the front of the computer also. Otherwise you need the LED only during the setup process. After that you can disconnect the LED.

If you have found a suitable space for installing the circuit board, it can be fastened by using the two fastening holes inside the system case. Take absolutely care that no short circuit results from metal parts being under the solder side of the circuit board! (Use perhaps suitable spacers!)

Connect the connection cables now.

Please use the pin assignment description in the appendix to make the correct connections.

Which cables must be attached, depends from the method how the computer should wake up.

Notice the chapter "Wakeup variants" in this document.

### 4.1 Connection to the COM port

Connect the IR-Wake-Up-Switch to the COM port first.

Plug the enclosed flat ribbon cable to **Con7** of the IR-Wake-Up-Switch.

If you use the external COM port plug the other side of the cable into the 9 pin external serial port connector. Otherwise plug this end of the cable onto the internal serial port connector.

**Make sure that you have the pin-1 side of the cable (red wire) matched with the pin-1 side of the connector.**

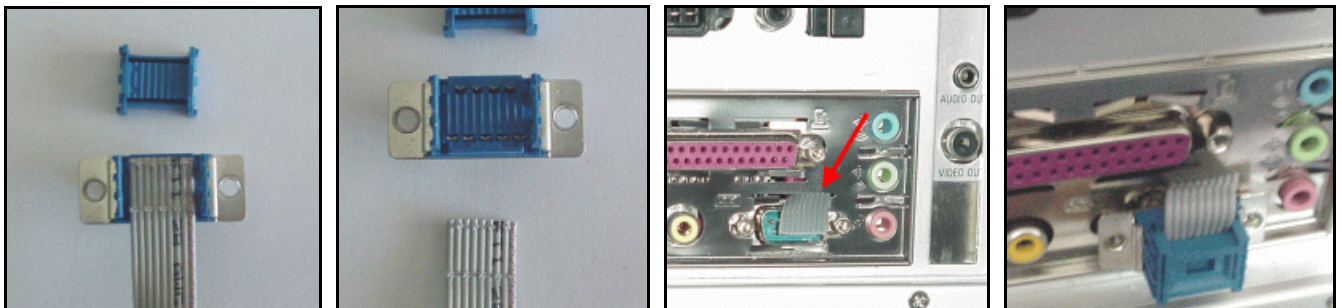
Please take a look into the manual of your mainboard for information of the pin assignment.

If your mainboard has a type-9 pin assignment (Ground is connected to pin 9) you have to use a special cable. Plug this cable with the cross wired end onto the IR-Wake-Up-Switch and the other end onto your mainboard.

#### Tip for using the external serial port:

Because in this case you must lead the cable out from the system case, you can detach the plug from the cable carefully and lead the cable through the narrow slit over the COM port connector to the outside.

Connect the plug with the cable again now (pay attention to the correct seat of the individual wires) and plug it into the COM port connector.



## 4.2 Wakeup variants

You can choose between 3 different variants now as your computer shall be switched on.

- connect the switch with the wire between the system case power button and the mainboard
- Wake On Ring (WOR) – *only if your mainboard supports this feature.*
- Wake On LAN (WOL) – *only if your mainboard supports this feature.*

Which variant you use primarily depends from what your mainboard supports.

The safest variant is still the connection with the power button to switch on the computer.

This is difficult if the power button is soldered tightly with the Mainboard (e.g. ASUS Pundit), unless you solder a cable to the soldering lands of the button yourself. (You will lose the guarantee)

There are the two possibilities „Wake On Ring“ or „Wake On LAN“ for it.

For this the Mainboard must support at least one of these features and the feature also must be enabled in the BIOS setup utility.

Please gather from the manual of your mainboard which option is supported.

Note:

With most mainboards WOR / WOL works only if the computer was cleanly shut down before.  
Probably it doesn't work after switching off the computer or any power failure.

### 4.2.1 Connecting to the power button

If you want to use this variant, pull the cable at the mainboard off which is connected to the system case power button. (Remember the position at which the plug was)

Plug this cable on **Con5** of the IR-Wake-Up-Switch instead.

Connect two of the enclosed unipolar cables with the plug at the mainboard at which the cable of the system case power button was connected before. Plug the other ends of these cables on **Con6** of the IR-Wake-Up-Switch.

The polarity of the two cables does not play a role in this.

If you use this variant you should set the option "**Power Off By Powerbutton**" at the BIOS setup to "**4 Sec Delay**" so that the computer does not immediately turn itself off if you press the programmed key of your remote control by mistake. Mostly you find this option in the section "**Power Management Setup**" of the BIOS setup utility.

If you should want to turn your computer off (e.g. after a system crash), you simply hold down the programmed key of the remote control (or the power button at the system case) for 4 seconds.

The IR-Wake-Up-Switch recognizes whether the computer is running or not.

You can therefore configure the IR-Wake-Up-Switch also so that it does send a power-on impulse only, but it doesn't send a power-off impulse.

Look to this at the chapter "**setup mode**" later.

Continue now with chapter 4.3 (Connection to the stand-by power supply).

### 4.2.2 Connection to the WOR connector (Wake On Ring)

If you want to turn on your computer by WOR, you do not need to connect further cables.

The IR-Wake-Up-Switch sends a "ring impulse" to the serial interface (COM port) of the computer.

If the mainboard supports this option, the computer switches itself on at this impulse.

To use this feature the option "**Wake On Ring**" in the BIOS setup must be enabled.

(Look at your BIOS setup description)

The Wake On Ring feature doesn't work after switching off the computer by power button or any power failure. In this case you must turn on your computer by the system case power button. The WOR feature should work again after the next shutdown.

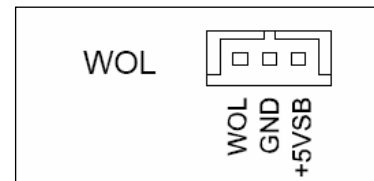
Continue now with chapter 4.3 (Connection to the stand-by power supply).

### 4.2.3 Connection to the WOL connector (Wake On LAN)

If you want to turn on your computer by WOL, connect one of the enclosed unipolar cables with Con2 of the IR-Wake-Up-Switch and plug the other end into Pin 1 of the WOL connector on your mainboard.

The WOL connector is a small three-pole white plug, similar the compact disc drive audio connector of older sound cards.

Look to this in your mainboard description.  
The one in question Pin is marked by "WOL" most.



The option „Wake On LAN“ must be enabled in the BIOS setup so that the computer can switch on itself.  
Look to this in your BIOS description.

The Wake On LAN feature doesn't work after switching off the computer by power button or any power failure.  
In this case you must turn on your computer by the system case power button. The WOL feature should work again after the next shutdown.

Continue now with chapter 4.3 (Connection to the stand-by power supply).

### 4.3 Connection to the stand-by power supply

So that the IR-Wake-Up-Switch also remains ready to receive a signal if the computer has shut down, it must be connected to the standby power supply of the computer. (Called in the following only **+5VSB**)

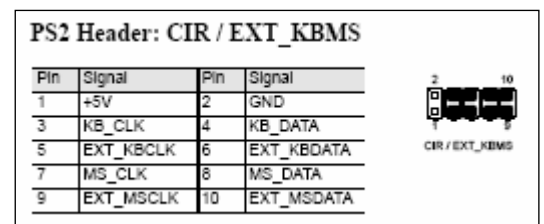
Use one of the three unipolar connection cables for it and plug it on Con1 of the receiver module.  
The second end must be connected with +5VSB. There are several possibilities for it.  
It depends on the used mainboard which possibility exists.  
Also look at the manual of your mainboard to determine the possibilities.  
The standby power is marked by +5VSB most. Look for a free Pin with the name **+5VSB**.

Indication for testing, whether power is on:

As soon as the switch is supplied with power, the LED indicates green for approx. 1 second.  
The receiver is operational now. To this the serial cable must be connected to the COM port.  
In addition, the mains plug must be plugged in. **(After testing plug the mains plug off!)**

#### 4.3.1 Internal PS/2 – Connector (or CIR – Consumer Infrared Module Connector)

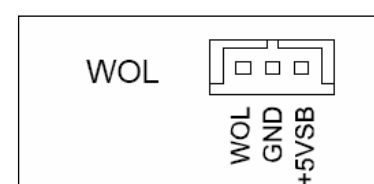
The standby power is available at the internal PS/2 connector at the pin 1.  
If this connector is available at your mainboard, plug the cable on this pin.



#### 4.3.2 Wake On LAN connector

Many mainboards have a WOL connector.  
The +5VSB is available at pin 3 of this connector.  
Plug the cable onto this pin.

The LED indicates green briefly, if the module is operational.





### 4.3.3 Internal USB connector

Many newer mainboards supports the function "USB-Resume" and also provides the standby power for this reason at the USB port. But this is mostly marked by "VCC" or "+5V" only. The "+5VSB" is usually the Pin1 of the internal USB connector.

Here helps only to try out, whether the stand-by voltage is available also if the computer is turned off. Most simply you connect the IR-Wake-Up-Switch there once and then plug the mains plug in. The LED will indicate green once if voltage is available.

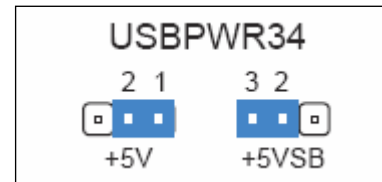
**Important!** Before you continue with the installation, absolutely remove the mains plug again!

Perhaps the option "USB-Resume" also must be activated in the BIOS to switch on the stand-by voltage.

### 4.3.4 USB power jumper (USB Device Wake Up)

Some mainboards (e.g. the "P4S8L" in the "ASUS Pundit") have a jumper to select, whether the "+5V" or the "+5VSB" shall be available at the USB port.

Place the jumper cap so that the option "+5V" is selected and connect the IR-Wake-Up-Switch with the free pin ("+5 VSB"). (e.g. Pin3 in the illustration)



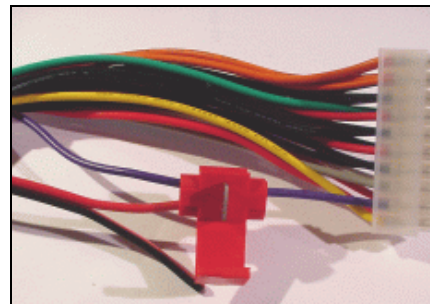
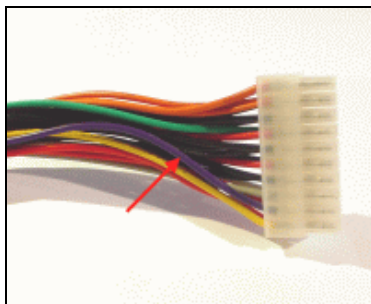
### 4.3.5 Connecting to the ATX power cable connector

If there should be no possibility at your mainboard to get the "+5VSB" directly, it still remains the possibility of getting the stand-by voltage directly at the ATX power cable connector.

To this connect the cable with the wire which is connected to Pin9 of the ATX plug (**mostly purple**).

So that you don't have to cut the wire we recommend the use of a cable branching clamp.

The clamp isn't provided by us anymore, but you can get it at electrical-, home improvement- or car part-markets.



You put the clamp around the purple wire, lead the end of the wire which is to be connected into the opening and then you turn the latch down. Shut the clamp firmly. (It goes very heavily - perhaps use a pliers)

#### 4.3.5.1 Pin assignment of the ATX power cable connector



**Please look absolutely in your mainboard description!**  
You have to use +5V stand-by. (+5V SB)

If you should have doubt, please check the voltage before you connect the circuit board.

**For damages which result from a wrong connection, we cannot assume any liability!**



If the switch is provided with the voltage correctly, the LED indicates green for approx. 1 second. To this, however, the serial cable must be connected to the COM port (Ground is obtained from it). In addition, the mains plug must be plugged in to this. Remove this absolutely again before you continue with the connection of the other cables or assemble your computer again.

**Before you close your system case again, you still must program the receiver.**

## **5. Programming of the receiver (setup mode)**

The new version of the IR-Wake-Up-Switch has a setup mode now. This allows you to adapt the operation of the IR-Wake-Up-Switch to your needs.

The setup mode contains the following functions:

- Choice of the coding of the used remote control
- Training the turn-on code of the remote control
- Choice, whether an switch-off impulse will send or not
- Choice, whether the LED indicates during the start-up of the computer
- Choice, whether the LED flashes at every keystroke at the remote control

### **5.1 Operation of the set-up menu:**

For the simpler operation of the setup mode a button was integrated on the new IR-Wake-Up-Switch

Because no display or navigation possibility exists, the desired menu item is selected by the number of keystrokes corresponding to it.

The LED always gives a confirmation for the chosen point by indicating green as often as the number of the menu item is.

If you are at the desired menu item, you also choose the desired option by the corresponding number of keystrokes. The LED reports the success of the setting by indicating green quickly. After that the setup mode is exited automatically.

If the button was pressed more often than menu items or options are available, the LED indicates red. The setup mode is exited.

Whenever you push the button, do not push it too briefly and not too fast behind each other in order to ensure a correct recognition by the firmware!  
You have approx. ½ second between the individual keystrokes to push the button once more before the corresponding menu item is activated.

All settings carried out remain unchanged also after a main power disconnection or a power failure.

### **5.2 Structure of the menu**

	1 – remote control training	2 – switch on/switch off behavior	3 – Indication on start-up	4 – Indication on keystroke
1	automatic detection	switching on only	LED indicates	LED indicates *
2	„RC5“ code	switching on/off *	LED doesn't indicates *	LED doesn't indicate
3	„space encoded“ code	not available	not available	not available
4 **	„Thomson“ code	not available	not available	not available

The options marked with \* are the default settings at the delivery status.

\*\* This option is available only as of Firmware v1.1 (modules delivered after 5-12-2005)

### 5.2.1 example for the operation

You would like to setup the IR-Wake-Up-Switch so that the LED does not indicate at the start-up (menu item 3, option 2)

- Push the button so often as the number of the desired menu item. In our case **3 times**.
- Wait briefly now, the chosen menu item is confirmed by the LED by indicating green (also 3 times).
- Push the button now according to the desired option. In this case **2 times**.
- The LED indicates for the confirmation now as often as the number of the chosen setting. It then indicates green three times fast to show that the setting was saved

For the other points you proceed simply analogously to this example.

If the settings could not be saved, because e.g. the button was pushed more often than options are available, the LED indicates three times fast red. The old settings remain unchanged and the setup mode is exited.

### 5.3 Training the remote control

So that the IR-Wake-Up-Switch can evaluate the signals of your remote control, you have to train it first, which code the used remote control is sending.

To reach the learning mode, you enter the set-up mode (menu item 1), how described above, by pushing the programming button once. (The LED indicates green for the confirmation once.)

Then push the button once again to reach the automatic detection mode. The LED indicates green for the confirmation once again. The receiver waits for an infrared signal now.

Go away at least 2 meters from the receiver and press the desired button of your remote control. If the code was detected the LED indicates green three times fast - the code was stored.

If the code could not be detected obviously, the LED indicates red. In this case you press the button once more and if necessary change the distance to the receiver. Please note that you press the button only briefly and hold the remote control into the direction of the receiver. You can repeat this process until the signal was detected correctly. (indicating green) If the tries remain unsuccessful, you can stop the process by pushing the programming button. In this case, the LED indicates red three times fast, and the previous code remains unchanged.

If Problems should occur at the learning procedure (coding is not detected), you also can give a way of coding. Possible initial settings are in this case "RC5", "Thomson" or "space encoded". The latter one recognizes all possible kinds of coding where the individual bits through the different lengths of the breaks between the pulses of the IR signal are coded. With this mode almost all remote controls which do not use a RC5 code should work.

If you are sure to have a RC5 remote control, you can choose the RC5 code also directly by pushing the button twice. RC5 is usually recognized for certain, however. On the other hand if you are sure to use no RC5 remote control, you can select "space-encoded" directly by pushing the button three times.

If you use a Thomson remote control, you should select the "Thomson" code directly so that the toggle bit is recognized correctly.

If the code was detected correctly (LED has indicated green) the switch is ready to receive and should switch on the computer when the button just programmed is pushed. (Or off if the computer already is running and switch-off is activated).

If you use "Wake On Ring" or "Wake On LAN" it is possible that the computer does not switch itself on. In this case follow the notes in the chapter "Wakeup variants", please.

## **6. Use of an IR control software**

The IR-Wake-Up-Switch is designed to use your remote control to control your computer in addition. To this it is necessary to install a corresponding control software. Programs like LIRC, WinLIRC, Girdler, IRAssistent etc., are suitable to this. You find a link collection to corresponding software in the appendix.

The IR-Wake-Up-Switch transmits the received signals to Pin1 (DCD) of the COM port exactly as in the case of customary "Homebrew" receivers.

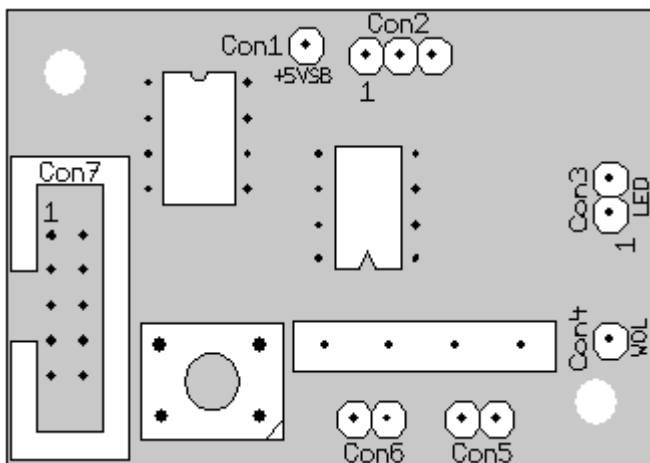
Please gather indications for the installation and the setting of the receiver software from the information of the respective manufacturer.

## **7. Firmware update**

There will not be any firmware updates for the revision 4 because an update would presuppose the desoldering of the controller chip.

## **Appendix**

### **Connector assignment**



#### **Con1: Stand-by voltage connector**

Connect the +5V stand-by voltage supply with this connector. Look to this at chapter 4.3.

#### **Con2: IR receiver connector**

Pin	Signal
1	IR signal
2	Vcc
3	Ground

The IR receiver chip is connected here.

#### **Con3: LED connector**

Pin	Signal
1	anode red / cathode green
2	anode green / cathode red

A bichromatic LED whose colour is dependent on the polarity becomes connected here. When you switch on the device the LED indicates green briefly. If the LED indicates red instead, plug the cable in opposite direction onto the connector.

#### Con4: Wake On LAN connector

If you want to have your computer switched on by Wake On LAN, you connect one of the unipolar cables here and connect the other end with the WOL-Pin of the WOL connection on the mainboard.

#### Con5: Connector for the system case power button

Connect the system case power button of your computer here.

Note:

*This connection is only used if the IR-Wake-Up-Switch shall switch on your computer over the mainboard's power button connection.*

*If you use Wake On Ring or Wake On LAN to switch on the computer instead, connect the power button directly at the mainboard. In this case **Con5** and **Con6** are not connected.*

#### Con6: Connector for the mainboard's power button connection

Connect this connection over two of the enclosed unipolar cables with the mainboard's power button connector. It is no matter, which wire to which pin you connect.

Note:

*This connection is only used if the IR-Wake-Up-Switch shall switch on your computer over the mainboard's power button connection. (look also **Con5**)*

#### Con7: Connector for the serial interface

Pin	Signal
1	<b>DCD (infrared input)</b>
2	Not used
3	Not used
4	Not used
5	<b>Ground</b>
6	Not used
7	<b>RTS (ready to send)</b>
8	Not used
9	<b>RI (ring indicator)</b>
10	Not used

Connect this connection with the serial interface port of your computer. Use the enclosed interconnecting cable for it.

Use only a connecting cable suitable for that one of your pin assignment.

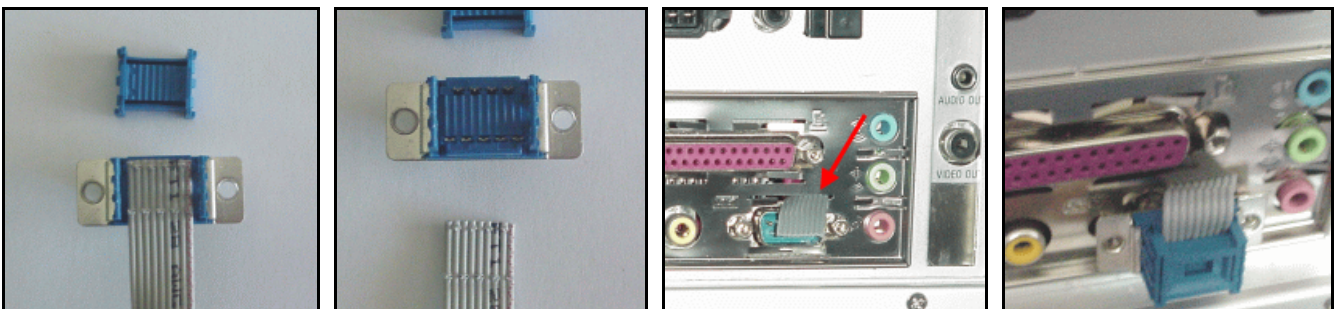
The use of a wrong cable can destroy the IR-Wake-Up-Switch.

If you have doubt, you compare your pin assignment with the assignment shown on the left side.

Tip for using the external serial port:

Because in this case you must lead the cable out from the system case, you can detach the plug from the cable carefully and lead the cable through the narrow slit over the COM port connector to the outside.

Connect the plug with the cable again now (pay attention to the correct seat of the individual wires) and plug it into the COM port connector.



## Link collection

- **IR-Wake-Up-Switch homepage** <http://www.atric.de/IR-Einschalter>  
Indications for the IR-Wake-Up-Switch, firmware update,  
programming software, current version of this manual, FAQ  
*Only in German at this time*
- **LIRC – homepage** <http://www.lirc.org>  
IR receiver software for Linux
- **WinLIRC** <http://winlirc.sourceforge.net>  
LIRC version for Windows
- **Girder** <http://www.girder.de>  
IR control software for Windows
- **IR-Assistant** <http://www.irassistant.com>  
IR control software for Windows
- **ulce** <http://www.mediatexx.com>  
IR control software for Windows