
RF-Remote Control Light Switch -Bascom

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RF Remote Control Light Switch

This is a remote controllable light switch that comes with an RF remote. The only light switch is across the room from my PC and it's a pretty large room. (The building's basically a 1-room apartment) so this works out great with the remote. Of course since I'm using the remote to cut the lights when I go to bed I'm basically using the remote from two places which brings with it the unavoidable annoyance of the remote being in the wrong place all the time. Which means I have to get up and look for it which is effectively as much of an annoyance as it was meant to solve. So I wanted a second controller that would basically be a stationary switch by my bed so I could leave the portable remote around the desk.

I popped the original remote open to see what I was dealing with. After some research I concluded that LP801B is a PT2262 clone which is a remote control encoder chip. Has a few address and data pins and generates a signal on the output pin based on the configuration of those at the time the enable pin is connected to ground.

At first I didn't think much of it and ordered some PT2262s and made a PCB which is basically a clone of the original remote adapted for components I had lying around (or just stupidly large pads where I had no idea what I was going to use when I made the board)

Not being patient enough however I started looking around to see if anyone's emulated this chip on a microcontroller before. Turns out, several people did.

So I took the code at <http://www.mikroe.com/forum/viewtopic.php?f=13&t=10832> and ported it over to BASCOM for the ATTINY13.

I think that code has a bug though as the logic low component of the synchbit should be 31 times the short-pulse duration according to the datasheet not 7. (He's basically divided the datasheet units by 4 in case anyone actually looks into this) The decoders may not care as it seems to have worked for him. When I got mine to work I was using the datasheet-correct count so I didn't test with that. It took several modifications to my original board to get it working with the attiny. Had to put in 3 zeners as the PT2262 operates directly from 12v which the attiny can't do. I actually fried an ATTINY2313 the first time around because I forgot the two selector/power buttons that were still at 12v. If I knew in advance that I'd be able to do this I would've designed a much smaller board..

I was trying random numbers for the pulse duration and randomly tuning the white variable capacitor but with none of the parameters actually being correct this method was never going to work. After some wasted time I caved and connected the original remote's encoder chip data output pin to the microphone input of my netbook.

Then with the cool Soundcard Oscilloscope to which I could adapt my pulse duration.

At this point I tested my board and while tuning the variable cap it suddenly became dark in the room :) It took a few more iterations to get the delay "just right" but now it works perfectly.

I put it in a small electrical box with 2 push-buttons and installed it in an easy to reach location from the bed.

Some component leg that I forgot to cut (probably a resistor) must have punctured the battery wire though as it drained to 10v by that night and since the circuit is basically open when none of the buttons are pressed that shouldn't happen at all. I did find a puncture mark on the positive lead so that must have been it.. damn. After reseating the board in the box and making sure the battery wires don't pass under any component legs it hasn't happened again.

Project files:

Board

Very large. But the (somewhat smaller, by about 20%, still fairly large) version is on the browsing/printing PC upstairs and I'm too lazy to get it :) Note below on the jumper blocks:

[1] [2] [3]

No connection: FLOAT bit

1+3: Bit 0

2+3: Bit 1

1+2: Short out the battery

And that this PCB is for the PT2262 (and clones) so it needs modifications to be used with an AVR. At least 1 5.1V zener for the CHIPPW and 1 per button.

The board runs off a 23A (12 volt) stack battery. Running from lower voltages may be possible but the RF circuit definitely needs to be retuned.

Schematic

The seemingly unconnected wires from the diodes on the data pins are actually connected to CHIPPW.

PT2262 emulation code in BASCOM

001

\$regfile = "attiny13.dat"

002

\$crystal = 9600000

003

004

Declare Sub Sendbit(byval A As Byte)

005

Declare Sub Alpha()

006

Declare Sub Longa()

007

Declare Sub Synca()

008

009

Dim T As Integer

010
Dim D As Integer

011

012
Dim Number As Byte

013
Number = 10

014

015
Dim X As Byte

016

017

Dataout Alias Portb.2

018

Dataout = 0

019

020

Config Dataout = Output

021

Config Portb.0 = Input

022

Config Portb.1 = Input

023

024

025

If Pinb.0 = 0 Then

026

027

Do

028

029
Sendbit 1 'a0

030
Sendbit 0 'a1

031
Sendbit 0 'a2

032
Sendbit 2 'a3

033
Sendbit 2 'a4

034
Sendbit 2 'a5

035
Sendbit 2 'a6

036
Sendbit 0 'a7

037

038
Sendbit 0 'btn0 (not on my unit)

039
Sendbit 0 'btn1

040

Sendbit 1 'btn2

041

Sendbit 0 'btn3 (not on my unit)

042

Sendbit 3

043

044

Loop

045

046
End If

047

048
If Pinb.1 = 0 Then

049

050
Do

051

052
Sendbit 1 'a0

053
Sendbit 0 'a1

054
Sendbit 0 'a2

055
Sendbit 2 'a3

056
Sendbit 2 'a4

057
Sendbit 2 'a5

058
Sendbit 2 'a6

059
Sendbit 0 'a7

060

061
Sendbit 0 'btn0 (not on my unit)

062
Sendbit 1 'btn1

063
Sendbit 0 'btn2

064

Sendbit 0 'btn3 (not on my unit)

065

Sendbit 3

066

067

Loop

068

069

070
End If

071

072

073
End

074

075

076
Sub Alpha()

077

078
Waitus 261

079

080
End Sub

081

082

083
Sub Longa()

084

085
Alpha

086
Alpha

087
Alpha

088

089
End Sub

090

091
Sub Synca()

092

093
Local Y As Byte

094
For Y = 1 To 31

095
Alpha

096
Next Y

097

098
End Sub

099

100
Sub Sendbit(a As Abyte)

101
Select Case A

102
' 0 bit

103
Case 0:

104
Dataout = 1

105
Alpha

106
Dataout = 0

107
Longa

108
Dataout = 1

109
Alpha

110
Dataout = 0

111
Longa

112
' 1 bit

113
Case 1:

114
Dataout = 1

115
Longa

116
Dataout = 0

117
Alpha

118

Dataout = 1

119

Longa

120

Dataout = 0

121

Alpha

122

' FLOAT bit

123

Case 2:

124
Dataout = 1

125
Alpha

126
Dataout = 0

127
Longa

128
Dataout = 1

129
Longa

130
Dataout = 0

131
Alpha

132
' SYNC bit

133
Case 3:

134
Dataout = 1

135
Alpha

136
Dataout = 0

137
Synca

138

139
End Select

140

141
End Sub

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