

How to program your own Vicol-Audio volume controller

We use and recommend <u>usbtinyisp</u> as a very good programmer.

It is a very popular AVR programmer, very well documented, easy to make, works great with avrdude, is AVRStudio-compatible and tested under Windows, Linux and MacOS X.

Unless you want to build your own usbtinyisp from scratch, a kit with all components is available at <u>http://www.adafruit.com/products/46</u>

Detalied instructions on how to install this device under Windows, Linux and MacOS X can be found here <u>http://www.ladyada.net/make/usbtinyisp/avrdude.html</u>

Just a small parenthesis

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In case you are are compiling avrdude from source, as we did, you may get an error at first run (libtinfo.so.5 not found). This may be solved by creating a symbolic link inside lib directory: cd /lib

ln -s libncurses.so.5.9 libtinfo.so.5

}

Next step is to get an Atmel AVR fuse calculator. Use Google to search for one, or use this one <u>http://www.engbedded.com/fusecalc/</u>

In our particular case (ATMega16) AVRDUDE arguments are -U lfuse:w:0xd4:m -U hfuse:w:0xd9:m

Connect your usbtinyisp with ISP connector to Vicol-Audio volume-controller board and power up the board.

Connect your usntinyisp to PC – please note that if you run Windows you need <u>http://www.ladyada.net/make/usbtinyisp/download.html</u>, no drivers are needed for Linux/Unix/MacOS X.

Test your communication with microcontroller (command you need to type is in red, output in blue): root@tibix:/# avrdude -c usbtiny -p m16

avrdude: AVR device initialized and ready to accept instructions

avrdude: Device signature = 0x1e9403

avrdude: safemode: Fuses OK

avrdude done. Thank you.



Next step is to write fusebit (command you need to type is in red, output in blue):

root@tibix:/# avrdude -c usbtiny -p m16 -U lfuse:w:0xd4:m -U hfuse:w:0xd9:m

avrdude: AVR device initialized and ready to accept instructions

avrdude: Device signature = 0x1e9403 avrdude: reading input file "0xd4" avrdude: writing lfuse (1 bytes):

avrdude: 1 bytes of lfuse written avrdude: verifying lfuse memory against 0xd4: avrdude: load data lfuse data from input file 0xd4: avrdude: input file 0xd4 contains 1 bytes avrdude: reading on-chip lfuse data:

avrdude: verifying ... avrdude: 1 bytes of lfuse verified avrdude: reading input file "0xd9" avrdude: writing hfuse (1 bytes):

avrdude: 1 bytes of hfuse written avrdude: verifying hfuse memory against 0xd9: avrdude: load data hfuse data from input file 0xd9: avrdude: input file 0xd9 contains 1 bytes avrdude: reading on-chip hfuse data:

avrdude: verifying ... avrdude: 1 bytes of hfuse verified

avrdude: safemode: Fuses OK

avrdude done. Thank you.

Now change directory to where your firmare is located and proceed with last step.



Write firmware to chip (command you need to type is in red, output in blue):

root@tibix:/home/tibi//firmware# avrdude -c usbtiny -p m16 -U flash:w:ATM16_SHT_R2R_LCD_Vicol.hex

avrdude: AVR device initialized and ready to accept instructions

avrdude: Device signature = 0x1e9403 avrdude: NOTE: FLASH memory has been specified, an erase cycle will be performed To disable this feature, specify the -D option. avrdude: erasing chip avrdude: reading input file "ATM16_SHT_R2R_LCD_Vicol.hex" avrdude: input file ATM16_SHT_R2R_LCD_Vicol.hex auto detected as Intel Hex avrdude: writing flash (14830 bytes):

avrdude: 14830 bytes of flash written avrdude: verifying flash memory against ATM16_SHT_R2R_LCD_Vicol.hex: avrdude: load data flash data from input file ATM16_SHT_R2R_LCD_Vicol.hex: avrdude: input file ATM16_SHT_R2R_LCD_Vicol.hex auto detected as Intel Hex avrdude: input file ATM16_SHT_R2R_LCD_Vicol.hex contains 14830 bytes avrdude: reading on-chip flash data:

avrdude: verifying ... avrdude: 14830 bytes of flash verified

avrdude: safemode: Fuses OK

avrdude done. Thank you.

Disconnect usbtinyisp and power off/on Vicol-Audio volume-controller. Congratulations, you volume-controller is ready for use with a new firmware !