

How to Upgrade Firmware by the Bootloader

Model: 08201/08201B, 08202/08202B

DSO082 controller (ATmega64) was preloaded with a bootloader. At powering up the controller first enters the bootloader and stays there for about 2 – 3 seconds, detecting serial port for communications request. If request is found connection will be established. It then receives codes from a host computer and writes to its own flash memory. If no request is detected it will pass control to oscilloscope main firmware and start normal operation.

In order to use the bootloader to upgrade firmware you need the following tools:

- 1) A USB cable with one end being miniUSB type B connector. The other end is standard USB connector on a PC.
- 2) Virtual Communication Port driver from Silicon Lab. This driver creates a virtual COM port in your host when DSO082 is connected to a USB port. Download the driver at link below:
<http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx>.
- 3) An application running on host to communicate with the bootloader. For Windows users this application is called AVRUBD.exe. It was developed by [Shao Ziyang](http://blog.ednchina.com/shaoziyang/) (<http://blog.ednchina.com/shaoziyang/>). It can be downloaded from the JYE Tech web site (<http://www.jyetechnology.com/Products/LcdScope/avrubd.rar>).

First install the VCP driver per instructions enclosed within the software package. For Windows user you can test if the driver is properly installed by connecting DSO082 to a USB port (you don't need to power the oscilloscope. Just connect the cable) and then go to "My Computer -> Properties -> Hardware -> Device Manager". Expand the "Port" item. If you see an extra COM port (usually it is COM x with "x" being 3, 4, or 5) then the driver is working. Disconnect the USB connection and refresh display you should see the COM x disappear.

AVRUBD does not need installation so you can put it anywhere at your convenience. Download new firmware from JYE Tech website and save it to host. Follow steps below to upgrade the oscilloscope.

- 1) Connect DSO082 to a host USB port.
- 2) Run AVRUBD.EXE. Click "Language" and select "English".
- 3) Click at "Options" on the main menu. Change settings on the tab "AVR" as per Fig. 1. The Connect key has to be set to "HEX 64". Flash size should be 64K.
- 4) Change settings on tab "System" as per Fig. 2. Communications protocol should be set to "Lite Xmodem". Increase "Maximum connection count" to 50 or 100. This will make connecting easier.
- 5) Change settings on tab "Com Port" as per Fig. 3. Com port number should be chosen according to the actual port created (the one you saw in installing VCP. **Note** that after VCP driver is installed the virtual com port number could change from time to time, depending on which USB port you plug in and what other applications are running. So check is recommended each time you do the connection). Communication format must be set to **9600 bps, 8N1 with no parity and flow control**.
- 6) Load the firmware (HEX file) to AVRUBD by clicking "File – Load" and selecting your file (the firmware to be flashed).
- 7) Click at "Dn" icon (see Fig. 4, or you can click at "Operate – Download" from the main menu) and power up the oscilloscope immediately. You need to do this quick because the handshaking time is only 1 – 2 seconds. You can also do the other way around by first powering up oscilloscope and then clicking the "Dn" icon right away. You will see AVRUBD is trying to communicate with the bootloader in DSO082. If the handshaking is failed you will see a screen like Fig. 5.
- 8) Otherwise, download is successful if you see a screen like Fig. 6.

After successful upgrading you will see the oscilloscope boots right away. Verify if the displayed firmware version matches the one you downloaded.

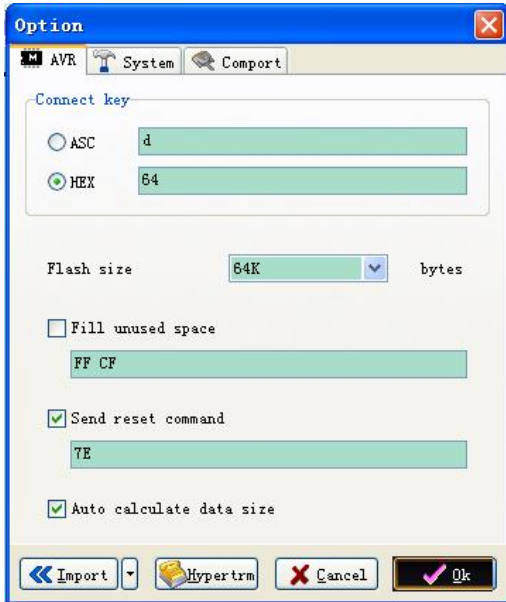


Fig. 1

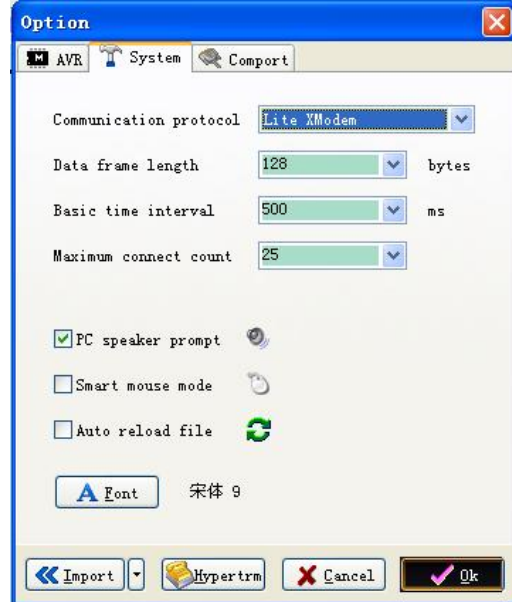


Fig. 2

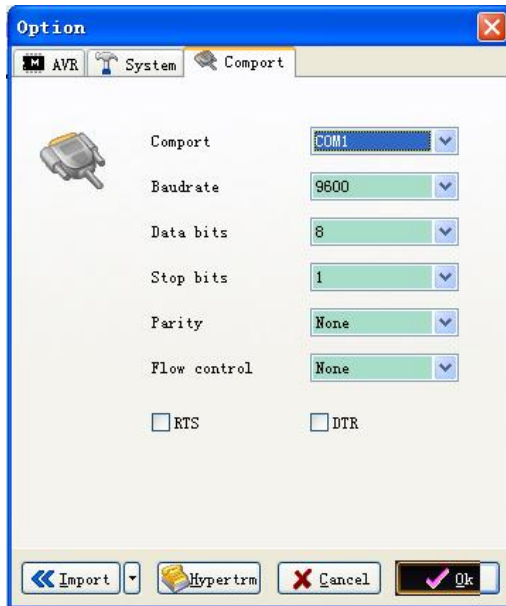


Fig. 3

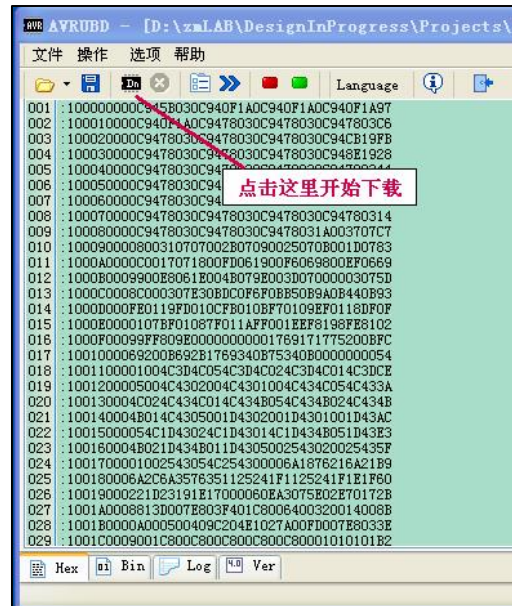


Fig. 4

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AVR AVRUBD - [C:\AVRPGM\113-06201-050.hex]
File Operate Option Help
Flash size: 0x10000/65536
Buffer size: 0x3800/14336
> Start download
$ Send reset command: [7E]
> Start connect
$ <1> Send connect key: 64
$ <2> Send connect key: 64
$ <3> Send connect key: 64
$ <4> Send connect key: 64
$ <5> Send connect key: 64
$ <6> Send connect key: 64
$ <7> Send connect key: 64
$ <8> Send connect key: 64
$ <9> Send connect key: 64
$ <10> Send connect key: 64
$ <11> Send connect key: 64
$ <12> Send connect key: 64
$ <13> Send connect key: 64
$ <14> Send connect key: 64
$ <15> Send connect key: 64
$ <16> Send connect key: 64
$ <17> Send connect key: 64
$ <18> Send connect key: 64
$ <19> Send connect key: 64
$ <20> Send connect key: 64
$ <21> Send connect key: 64
$ <22> Send connect key: 64
$ <23> Send connect key: 64
$ <24> Send connect key: 64
$ <25> Send connect key: 64
X Connect fail
Hex Bin Log Ver

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Fig. 5

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AVR AVRUBD - [C:\AVRPGM\113-06201-050.hex]
File Operate Option Help
> Start download
$ Send reset command: [7E]
> Start connect
$ <1> Send connect key: 64
$ <2> Send connect key: 64
$ <3> Send connect key: 64
$ <4> Send connect key: 64
: 0A 0D ED F1 D4 ED E5 E7          ..今越电
: D7 D3 D6 C8 D7 F7 0D 0A          子制作..
: 0A 0D 4A 59 45 20 54 65          ..JYE Te
: 63 68 0D 0A 0A 0D 57 57          ch...HW
: 57 2E 4A 59 45 54 45 43          W.JIETEC
: 46 2E 43 4F 4D 0D 0A 0A          H.COM...
: 0D 42 4C 3A 20 31 31 33          .BL: 113
: 2D 30 36 32 30 32 2D 30          -06202-0
: 31 30 0D 0A 0A 0D 0D 0A          10.....
$ <5> Send connect key: 64
: B5 C8 B4 FD BD D3 CA D5          等待接收
: C3 DC C2 EB 2E 0D 0A          密码...
$ <6> Send connect key: 64
$ <7> Send connect key: 64
$ <8> Send connect key: 64
$ <9> Send connect key: 64
: B5 C8 B4 FD BD D3 CA D5          等待接收
: CA FD BE DD 2E 0D 0A          数据...
: 43                                  C
: 43                                  C
V Connect success
> Packag [112/112], Data [14.0k/14.0k], Retry [0/0]
V Update success: time elapsed: [16.7s], speed: 0.8k/s.
Hex Bin Log Ver

```

Fig. 6

Revision History

Version	Date	Descriptions
01	2011.02.09	First created