

Version 2.0



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The GBSVGA Genie v2.0 is the latest in RGB to VGA converters for use with retro computers that require a 15kHz signal. This unit was originally designed for use with the Myarc Geneve 9640 or TI-99/4A with a AVPC or EVPC video card. However, it can be used with other retro computers that require the 15kHz signal and have the Horizontal Sync.

Features

- ESP8266 WiFi Module for wireless configuration and management
- Socketed ESP8266 WiFi Module for easy replacement
- Utilizes the latest 'gbscontrol' firmware
- Firmware is easily upgradeable
- Power provided from GBS82xx device
- Embedded LM1881 Sync Separator circuit for better video quality
- Audio output port
- VSYNC can be enabled or disabled
- Audio Trimmer to help remove video noise if produced by audio signal
- Standard DB9 Female connector
- Breakout pins to use jumper wires instead of soldering if you want to!
- Designed to fit with a 3D printed case that can house both the GBS8200 and GBSVGA Genie v2!
 - \circ $\;$ See links in document for link to case $\;$

Requirements

See last page for links to items needed

- Computer that requires a 15kHz video signal
- GBS82xx Upscaler unit (has been tested on GBS8200 v4.0 devices)
- Basic soldering skills
- If the computer utilizing the GBSVGA Genie has audio coming through the cable then a pair of PC speakers with 3.5mm stereo jack can be used.
- Some 1" (one inch) wide copper tape
- 4 x 0805 .10uF ceramic capacitors 10v (Surface Mount)
- Some wire (I used a piece of a ribbon cable)
- Solder iron and solder
- Powersupply for GBS8200 should be 5VDC +/- .5v at 2Amps.
- PC/Laptop/Smartphone/Table with WiFi Capability to configure the unit

Installation

There are a few things that need to be done for the unit to be installed. First the pinout of the GBSVGA Genie v2.0 DSUB-9 Female is as follows:

Figure 1		
DSUB 9 Female Pin Number	Function	
1	Not Connected	
2	Ground	
3	Audio	
4	Not Connected	
5	Red	
6	Green	
7	Blue	
8	CSync (Horizontal Sync)	

9 Not Connected

Simply create a cable from the retro computer that will hook up to the GBSVGA Genie following the above pinout and connect to the corresponding pins on the retro computers video. **Please check your specifications for the retro computer to be hooked to verify your pinouts.**

Next the GBS8200 unit will need to have a few modifications to ensure your system generates the best possible video.

The first modification is the simplest to do, simply put a strip of 1" wide copper tape over the DRAM lines to help reduce noise on the video lines. You will need to measure the exact length you need, mine is less than 1.5 inches long. See photo below:



Figure 2

I found a ground on the board I was able to lightly scrape away to review a copper trace to solder to. You can simply solder it with a wire to a ground connector on the back of the board as well.

https://youtu.be/p2HdOKO28FU

The next modifications to the GBS8200 unit require some soldering skills. The first one we will cover is the removal of the Red, Green and Blue potentiometers and bridge the connections to ensure we have accurate color. Turning your potentiometers all the way to the left will provide the correct color on some systems. I have found that removing them produces a good signal as well. This is up to you! If you decide to remove them you may be able to simply clip them off on some boards. Which was my case and then bridge the connections.



Figure 3

Bridge the connection as shown below:



The following fix is recommended to be done on stock GBS8200 boards in order to allow more capacitance for power supply bypassing. This modification and reduce some forms of visible noise on the video output.

You will need four (4) 10uF 10v SMD capacitors in size 0805. Solder the capacitors in parallel to C23, C42, C43 and C48.



The GBS8200 will need a few connections made in order to control the GBSVGA Genie with the ESP8266 WiFi Module for the external firmware to work.

First let's identify the connectors on the GBS8200 upscaler device:



The first thing that needs to be done is a header needs to be installed on P5(if you do not have one there already; most do not). You will have to desolder the holes as they are soldered from the manufacture, or you can simply connect wires to the back side of the unit.

I had some issues with the ground on mine, but I just soldered a wire to the back as stated above.

The next connection we need to make is to the 'DEBUG' pin. This allows the ESP8266 to measure various timings for resolutions. Carefully solder a wire or if you are using a female to female header then a header pin to the DEBUG pin shown below:





Double and triple check your connections and soldering before applying power!

Wiring it all up

The wiring now is simple to connect the GBSVGA Genie to the GBS8200 upscaler.

Now let's go over the GBSVGA Genie v2.0 unit:



1. Solder the Red, Green, Blue, Sync, Ground and VSync wires from the GBS8200 wiring harness to the GBSVGA unit or if using header wires connect to appropriate headers. (See Figure 8)



P11 connector (Figure 9)

- a. Red = RED
- b. Green = Green
- c. Blue = Blue
- d. Gray = Horizonal Sync (CSYNC)
- e. Yellow = Vertical Sync
- f. Black = Ground

Note *** I have seen some units where the Horizontal and Vertical sync lines are reversed on the wiring harness. This is not very common, but does happen occasionally. It will not mess up anything if it is hooked up wrong.

 Next solder the 5v power connector used on P9 to the GBSVGA Genie power input lines (see Figure 8).



P9 Connector (Figure 10)

Now let's connect it all!

- 1. Connect the P11 connector to the GBS8200
- 2. Connect the debug wire to the debug pin on the GBS8200 then to the GBSVGA Genie unit.
- 3. Connect SDA from GBSVGA Genie to SDA pin on GBS8200 (P5 Figure 12)



Figure 12

- 4. Connect SCL pin from GBSVGA Genie to SCL pin on GBS8200 (P5 Figure 12)
- 5. Connect 3.3v pin from GBSVGA Genie to 3.3v pin on GBS8200 (P5 Figure 12)
- 6. Connect Ground pin from GBSVGA Gennie to Ground pin on GBS8200 (P5 Figure 12)
- 7. Connect the P9 power connector to the GBS8200
- 8. Connect the VGA monitor to the VGA Output of the GBS8200 as shown in figure 6
- 9. Connect the DB9 Male video cable to the GBSVGA Genie's Video Input
- 10. Connect PC speakers or video output cable (3.5mm) to GBSVGA Genies Audio Output
- Ensure the jumper is bridged across both pins on the GBS8200 P8 position. This enables the external firmware to be used. (required for the GBSVGA Genie to function)
 See Figure 7
- 12. Connect power supply to GBS8200 upscaler
 - a. I use a power supply that has a on/off switch like he one below:



When the GBS8200 is powered up a blue led should come on briefly on the WeMOS D1 mini WiFi module.

After a 5 to 10 seconds the 'gbscontrol' wifi network should be discoverable from your smartphone, table, PC, etc.

To connect to the 'gbscontrol' wifi network to configure you will need to join it temporarily. For more indepth explanation over gbscontrol please visit:

https://github.com/ramapcsx2/gbs-control/wiki/Web-GUI

The below screenshots are from my Windows 10 PC

- 1. Open 'WiFi Settings'
 - a. Windows \rightarrow Settings
 - b. Click 'Wifi'
 - c. Click 'Show Availabe Networks'

Settings		– 🗆 X
ගි Home	Wi-Fi	
Find a setting	Wi_Fi	Connect to a wireless network
Network & Internet	On Show available networks Hardware properties	If you can't find the network you want to connect to, select Show available networks to open the list of available networks, select the one you want, select Connect, and then follow the instruction
na Wi-Fi	Manage known networks	Still can't connect? Open the troubleshooter
12 Fthernet	Hotspot 2.0 networks	
		Related settings
ි Dial-up	Hotspot 2.0 networks might be available in certain public places, like airports, hotels, and cafes.	Change adapter options
% VPN	Let me use Online Sign-Up to get connected	Change advanced sharing options
Airelana mada	On On	Network and Sharing Center
(i) Mobile hotspot	When this is turned on, you can see a list of network providers for Online Sign-Up after you choose a Hotspot 2.0 network.	Windows Firewall
🕒 Data usage		Have a question?
Proxy		Troubleshooting network connection issues
		Get help
		Make Windows better
		Give us feedback

d. Click 'gbs control' network



e. Uncheck connect automatically and click the 'Connect' button.



f. When prompted for the WiFi password enter 'qqqqqqqq' without the quotations and click 'Next' to join the network.



Once connected you can now open a browser and navigate to <u>http://192.168.4.1</u> and the WebGUI will be shown as seen below:



For more detailed information regarding the gbscontrol WebGUI please visit:

https://github.com/ramapcsx2/gbs-control/wiki/Web-GUI

Once configured you will want to disconnect from the WiFi network so your PC, smartphone, tablet, etc will work on your previous network.

<u>Troubleshooting</u>

No Picture

- Are SDA / SCL reversed? It's safe to reverse them and try again.
- The debug pin does not have to be connected for gbscontrol to work at a basic level.
- Forgot to install the jumper that disables the GBS original controller firmware?
- when using a sync stripper: Is the LM1881 source voltage 5V?

To Debug Issues

The Arduino IDE serial monitor shows debug information at 115200 baud.

If your ESP8266 is connected to a computer via USB, you can access this serial monitor to find out more about the issue.

In the Arduino IDE, you need to select an ESP8266 board that matches your hardware (if unsure, select "LOLIN(WEMOS) D1 R2 & mini").

<u>Links</u>

<u>'gbscontrol' color fix</u> <u>'gbscontrol' Power Fix</u> <u>GBS8200 DRAM Noise Fix</u> <u>0805 10uF 10v Capacitors</u> <u>Copper Foil Tape with Conductive Adhesive</u>

<u>Support</u>

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subject=Support