



AV-20-S

NORSEE Service Bulletin

Software Upgrade to 1.7.1



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Patent uavionix.com/patents

1 Revision History

Revision	Date	Comments
A	8/9/2024	Initial release

2 Warnings / Disclaimers

uAvionix is not liable for damages arising from the use or misuse of this product.

This equipment is classified by the United States Department of Commerce's Bureau of Industry and Security (BIS) as Export Control Classification Number (ECCN) 7A994.

These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

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5 Planning Information

5.1 Distribution / Eligibility

The Accomplishment Instructions contained in Section 10 may only be performed by appropriately authorized personnel.

5.2 Applicability

This Service Bulletin applies to the FAA NORSEE-approved uAvionix AV-20-S UAV-1003310-001, with operating software releases 1.1.0 or 1.2.0. Use Table 1 Applicability to determine applicability of the software update.

Table 1 Applicability

Hardware P/N Marking	Applicability
UAV-1003310-001	Verify by procedure

Parts identified above as “Verify by procedure” may have software release 1.1.0 or 1.2.0 installed. To determine what version of software is installed:

1. Navigate to the SETUP page.
2. Press both left and right buttons simultaneously.
3. Highlight SYSTEM INFO with the up or down buttons on the left.
4. Enter the SYSTEM INFO screen by pressing the ‘SEL’ button on the right.
5. If the SW VERSION displayed is 1.1.0 or 1.2.0 proceed with this Service Bulletin.

5.3 Description

This Service Bulletin provides instructions for loading uAvionix AV-20-S UAV-1003310-001 with updated software release 1.7.1.

For increased performance in attitude indicator mode, the pitot and static pneumatic lines shall be connected if not already installed. This Service Bulletin does not describe or provide authority for that work.

5.4 Time Required

For field software update, up to 90 minutes is required to perform this update procedure. Additional time and approval may be required if pitot and static connections are not installed.

5.5 Weight and Balance

No change.

5.6 Electrical Load Data

No change.

5.7 Applicable Publications

The following documents are applicable to the software release 1.7.1.

Table 2 AV-20-S Documents

Title	Part Number	Revision
AV-20-S Installation Manual	UAV-1003613-001	G
AV-20-S Pilot's Guide	UAV-1003614-001	F

6 Required Items

AV-20-S updates are performed using a Windows PC with a serial port and appropriate cable. The following items are required.

Quantity	Description
1	Windows PC running Windows 7 or later
1	Available serial port or appropriate USB to RS-232 converter Examples: UAV-1007465-001, FTDI, Parallax 28030, Sabrent CB-8P6F or similar
2	Female DB-9 connector plus 7 solder or crimp female pins
1	Male DB-9 connector plus 2 solder or crimp male pins
4'	22-24 AWG wire
1	uAvionix AV Update Tool for Windows (UAV-1005199-001)
1	AV-20-S Software as shown in Table 4 Software Update Files.

Table 3 Required Items

Download the software update file below.

Filename	Version	SW Part Number	SHA1 Hash
UAV-1003417-003-av20s-1_7_1-55C62C2.bin	1.7.1	UAV-1003417-003	3f99acbf90f115a0da84372794202a ae71d776dc

Table 4 Software Update Files

uAvionix software update files are available for download from the uAvionix Support website at no charge, at:

<https://uavionix.com/articles/av-20-s-service-bulletin-software-upgrade-1-7-1/>

Click on the link in the section **AV-20-S v1.7.1 Firmware** and save it to your Windows PC or laptop.

The uAvionix AV Update Tool is available on the website linked above in the section **AV Update Tool**. Download it to your PC.

Ensure the software and any necessary update tools have been downloaded prior to visiting the aircraft. An internet connection is required to download the software and application. An internet connection is not required to perform the update.

7 Update Notes

AV-20-S configuration settings will be preserved during the update procedure when possible. However, please take note of all settings before performing the update, and verify settings are correct after the update has been applied. Additional configuration settings have been added. See the installation manual for details for each setting.

If pitot and static lines were not previously connected, ensure appropriate approval and connect the lines now to ensure full performance and functionality.

Ensure you are running a previous version of AV-20-S software. Specifically, your AV-20-S should currently be running 1.1.0 or 1.2.0.

8 Update Procedure

8.1 Serial Update Preparation

1. There are two options for wiring. (1) you may modify the existing DB-9 connector or (2) you may build a “Go Between“ wiring harness that can be removed after the update.
2. Option (1) Existing Connector Modification
 - a. Only one new DB-9 Female connector and pins are needed.
 - b. Add wires to pins 3 and 4 to the AV-20-S harness. Add an additional ground wire to either existing the ground from the AV-20-S harness or ground the new wire directly to aircraft ground.
 - c. Connect the other end of these new wires to the new female DB-9 connector according to Table 5 Existing Connector Modification. Upon completion of wiring, connect the new assembly to an available serial port or USB serial adapter.

AV-20-S Pin	DB-9 Standard Pin
3	3
4	2
ground	5

Table 5 Existing Connector Modification

3. Option (2) "Go Between" harness

- a. One male and two female DB-9 connectors and appropriate pins are needed.
- b. Build the wiring harness with the materials with the materials from Table 3. A finished example is shown in Figure 1. The wiring schematic is shown in Figure 2.
- c. Connect the serial+USB cable to your PC and the harness, then connect the harness to the AV-20 and apply power.

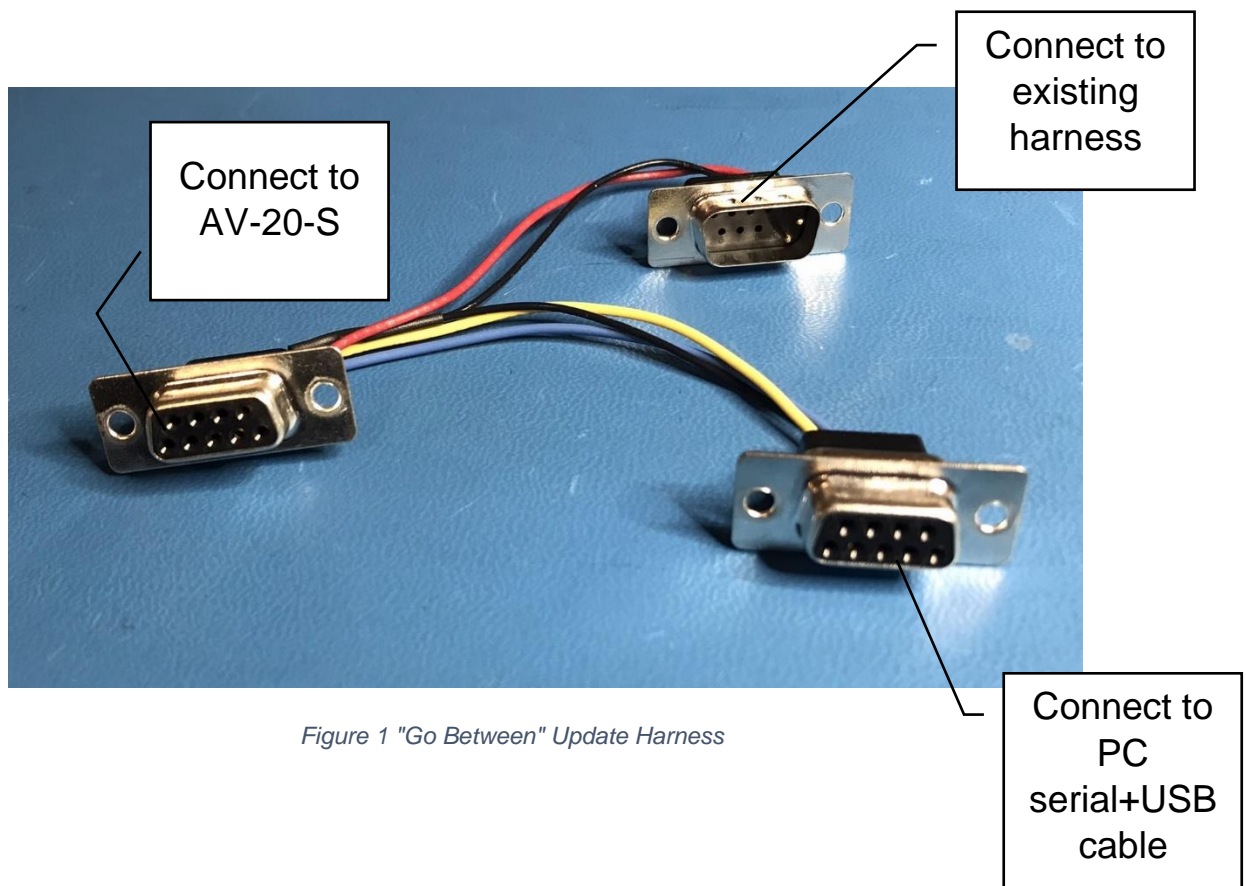


Figure 1 "Go Between" Update Harness

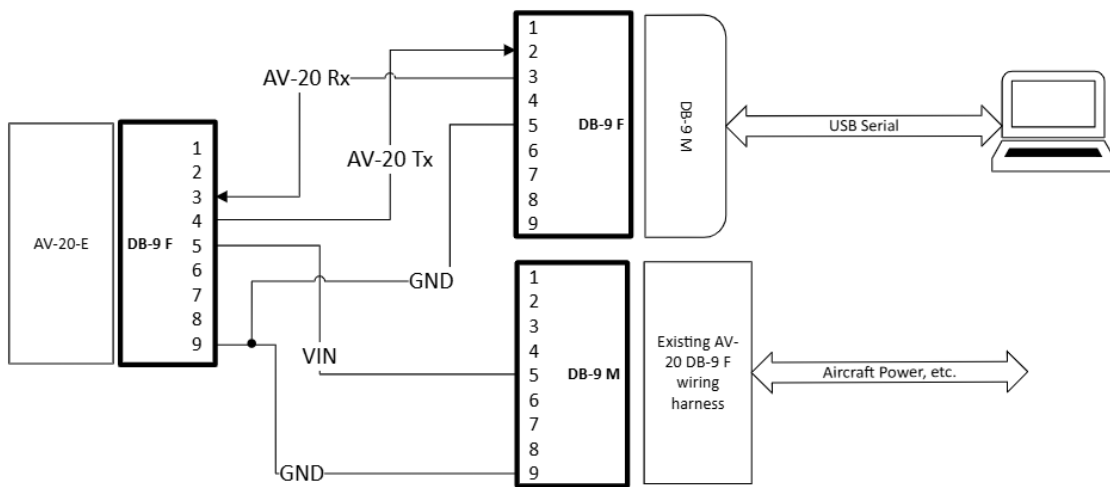
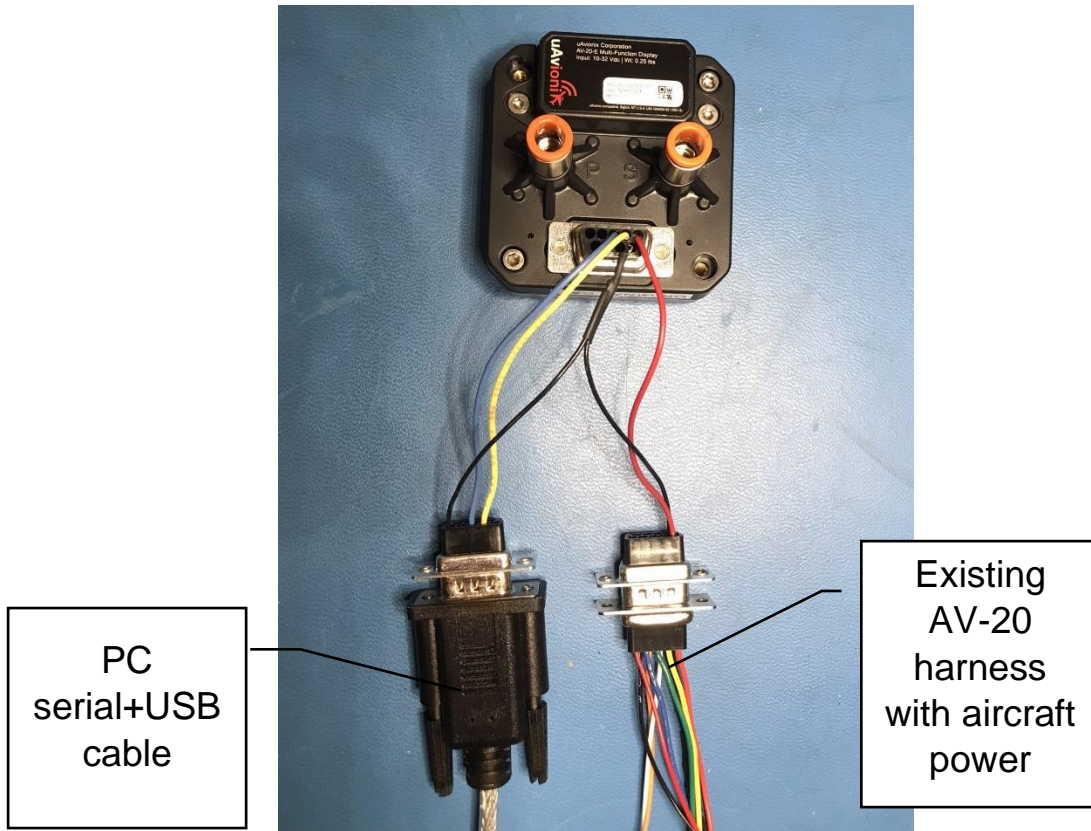


Figure 2 "Go Between" Update Harness Schematic

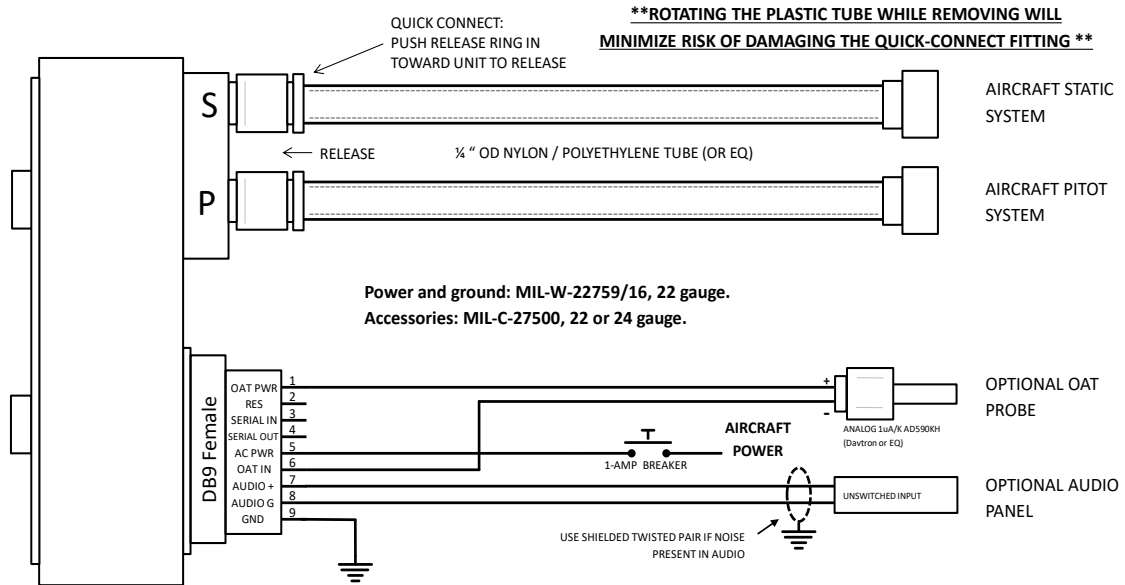


Figure 3 – Wiring Diagram

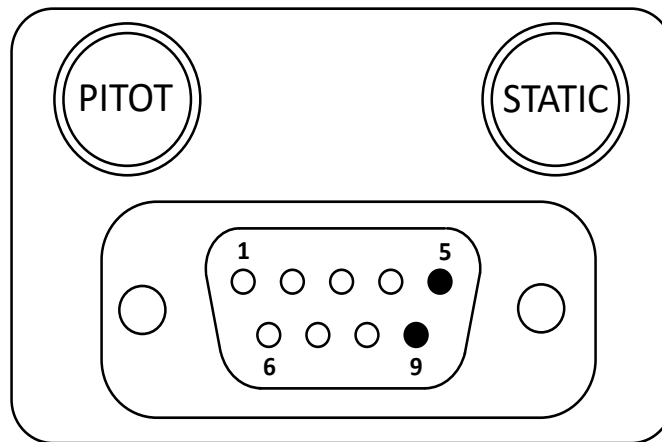


Figure 4 – Unit Connections – DB-9, Male Connector – Rear View

All connections are provided on the single 9-Pin D-sub connector and the two pneumatic fittings.

Pin	Function	Type	Comment
1	OAT Supply	Output	OAT Sensor Supply Line
2	Serial Input	Input	Reserved
3	AV-XPORT Input	Input	RS-232 Software Update
4	AV-XPORT Output	Output	RS-232 Software Update
5	Power	Power	+12 to +28 VDC
6	OAT Sensor	Input	OAT Sensor Input
7	Audio H	Output	Altitude Alerts / Other
8	Audio L	Output	To Audio Panel Ground
9	Ground	Power	To Aircraft Ground

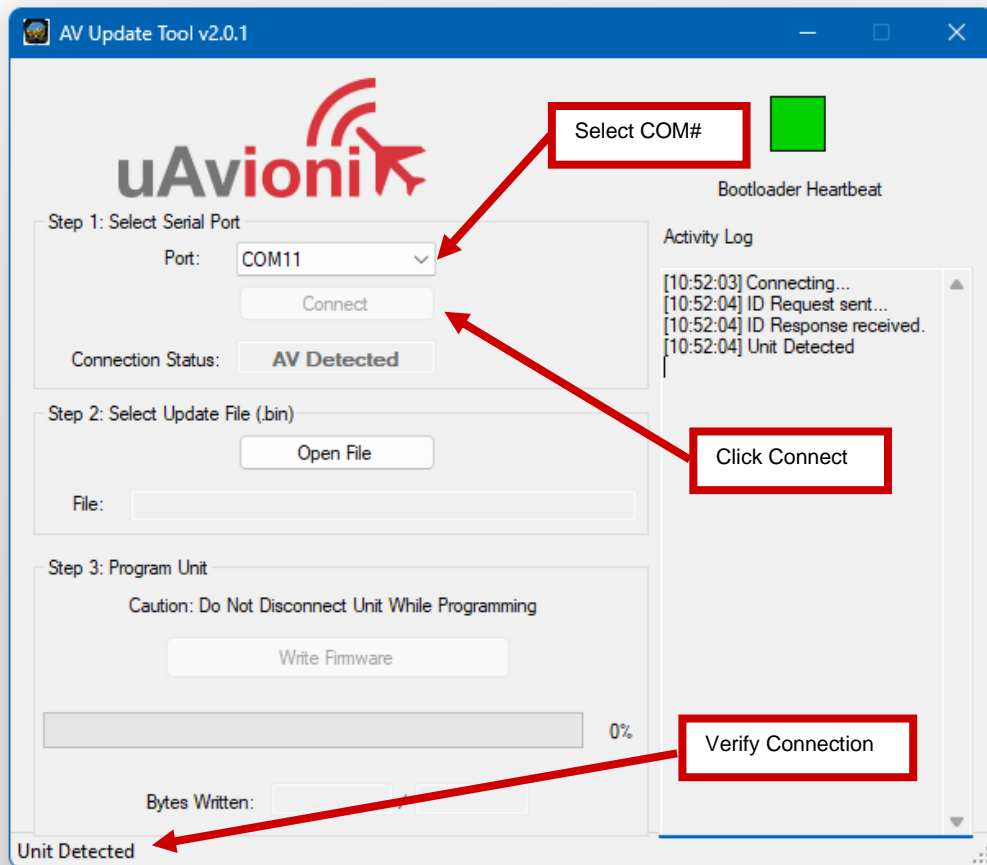
Table 6 Connector Pinout

Pin	Function
1	
2	Serial Output
3	Serial Input
4	
5	Ground
6	
7	
8	
9	

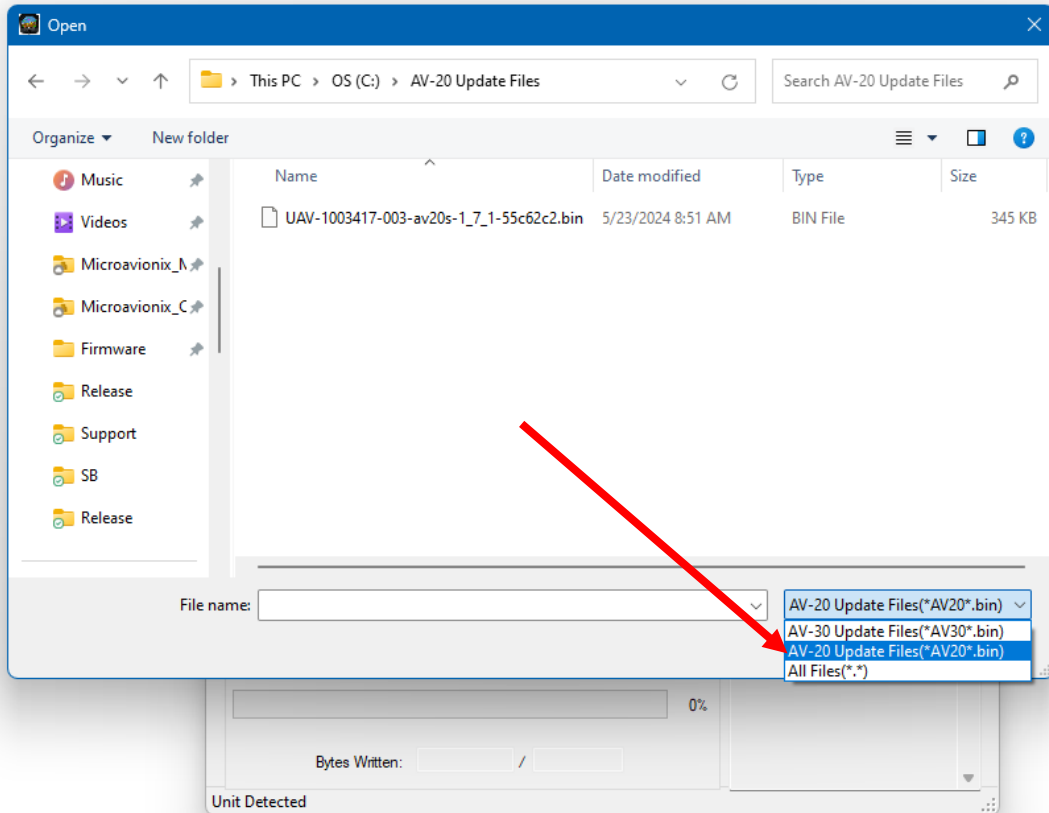
Table 7 Standard DB-9 female pinout for reference

8.2 Serial Update Procedure

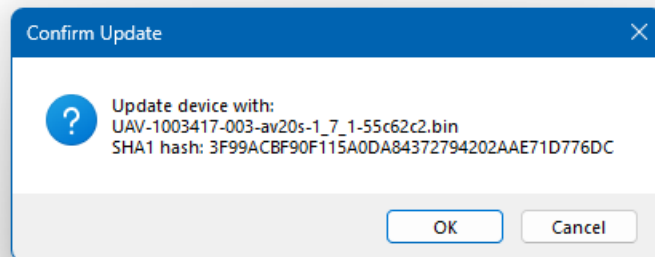
1. Connect the AV-20-S to the Windows PC through the DB-9 connection previously installed in Section 8.1.
2. Apply power to the AV-20-S. Do not interrupt power during the update process.
3. Launch the previously downloaded AV Updater application.
4. On the AV Updater tool, select the appropriate COM Port from the dropdown menu and click "Connect".



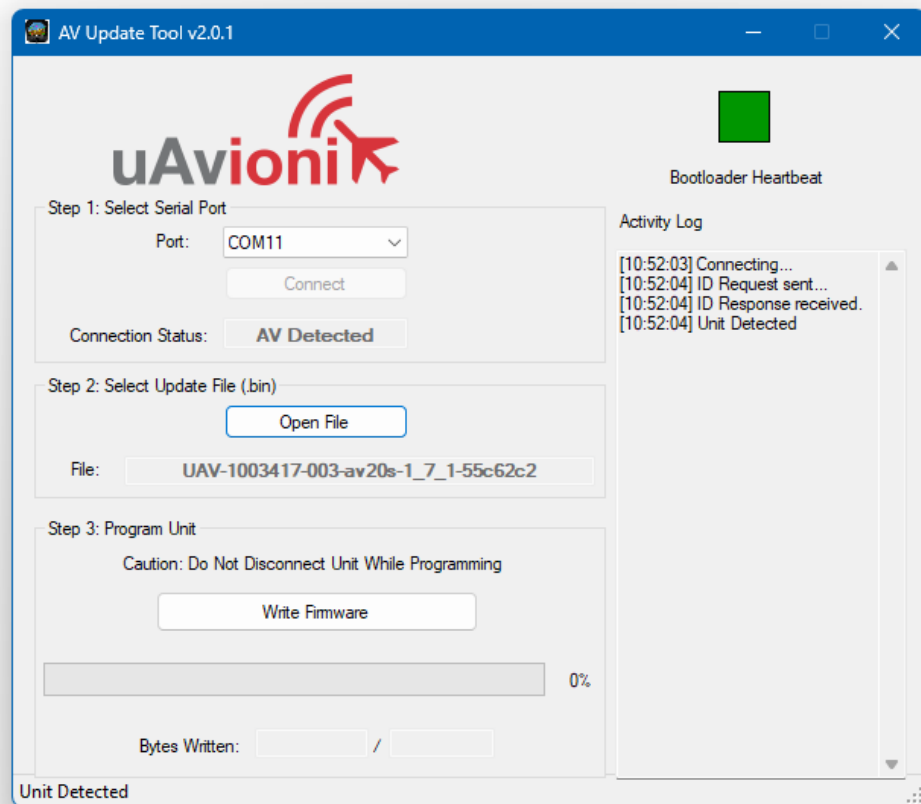
5. Proper connection has been made when the message “Unit Detected” has appeared on the bottom left corner of the AV Updater Tool. The screen on the AV-20-S will go black for the remainder of this procedure. If “Unit Detected” does not appear, re-check your wired connections or contact uAvionix Support for additional guidance.
6. Once proper connection has been made, select the software file to upload to the AV-20-S by clicking “Open File” and selecting the previously downloaded software file as identified in Table 4 Software Update Files. Note that you need to select “AV-20 Update Files” in the lower right corner.



A confirmation dialog will appear with the filename and a calculated SHA1 hash. To confirm integrity of the file, compare the displayed SHA1 hash to that in Table 4 Software Update Files. Note that the hash is not case sensitive.



7. When confirmed, press OK and the main dialog will re-appear.



8. Select “Write Firmware” to begin the upload.



DO NOT POWER OFF THE AV-20-S OR CLOSE THE UPDATER TOOL UNTIL THE UPDATE IS COMPLETE.

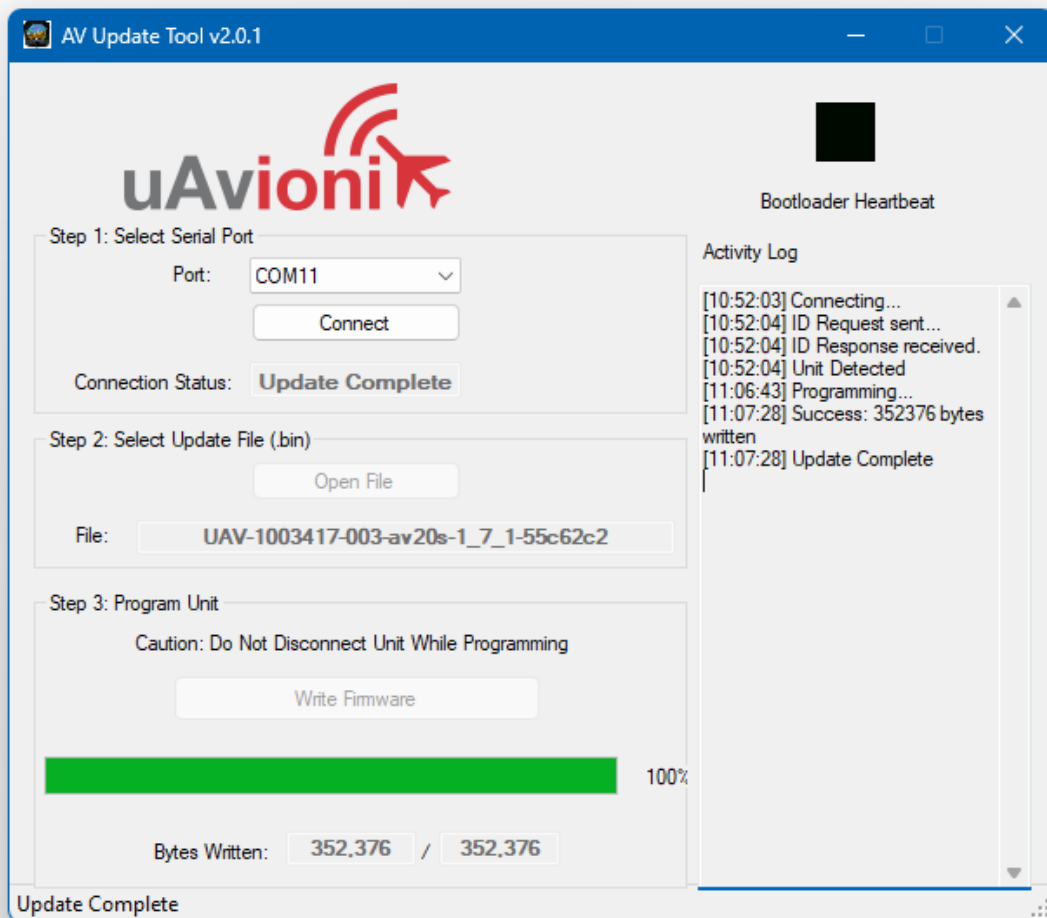


Figure 8-5 AV Update Tool

9. When the AV Update Tool displays “100%” and the lower status reads “Update Complete” the process is complete.
10. The unit will automatically restart. Upon restart of the unit, verify the startup screen indicates the updated software version.



THE SCREEN OF THE AV-20-S WILL GO BLACK WHILE THE DEVICE REBOOTS, THIS BEHAVIOR IS NORMAL AND THE STARTUP SCREEN WILL APPEAR AFTER REBOOTING.

11. If the unit was removed to perform the update it can now be reinstalled as per the installation manual.
12. If a Go Between harness was used, remove it now and reconnect the original connector. Any new wiring added for the update process should be properly secured.
13. Following the completion of update, follow Section 10 to perform required post-installation procedures.

9 Troubleshooting

The following steps are to aid in identifying update issues:

Issue	Possible Reason and Remedy
Update Tool	
Update Tool does not connect	Check wiring. <ul style="list-style-type: none"> - AV-20-S must be powered separately from serial cable. Serial end of cable does not provide power. - Check pinouts. - Check signal ground wire.
	Check COM port. <ul style="list-style-type: none"> - Does a new COM port get created when the cable is plugged into the USB port? Try another port or check for a Windows device driver problem. Follow cable manufacturer instructions. - Are you using the COM port associated with the USB cable? - Are you using the recommended USB cable? - Is another application using this COM port?
Unit has black screen after update	Update was interrupted before it could complete <ul style="list-style-type: none"> - Boot into bootloader mode as follows: - Press and hold bottom left and right buttons while powering up. - Hold for 10 seconds before releasing - Retry the update with the updater tool - Make sure power stays on during the update
	Device settings may need to be reset <ul style="list-style-type: none"> - Hold upper and lower left buttons while powering up. - Release buttons after splash screen has cleared
	Contact Product Support
Calibration Operations	
Pitot Zero will not run	Device detects airborne condition based on vibration <ul style="list-style-type: none"> - Isolate the device from strong vibration sources like air data test sets, machinery, etc.
Airspeed trim will not run	Device detects airborne condition based on vibration <ul style="list-style-type: none"> - Isolate the device from strong vibration sources like air data test sets, machinery, etc.
Hard Calibration will not run	Device detects airborne condition based on airspeed <ul style="list-style-type: none"> - Run Pitot-Zero operation first, then retry hard Calibration - Calibrate airspeed trim, then retry
Altitude trim will not run	Device detects airborne condition based on airspeed <ul style="list-style-type: none"> - Run Pitot-Zero operation first, then retry altitude trim - Calibrate airspeed trim, then retry

10 Post-Accomplishment Verification and Actions

10.1 Verify Update Versions

On restart, verify that the startup screen displays the correct version number. Access the SETUP page to complete post-accomplishment verification steps.

1. Navigate to the SETUP page.
2. Press both left and right buttons simultaneously.
3. Highlight SYSTEM INFO with the up or down buttons on the left.
4. Enter the SYSTEM INFO screen by pressing the 'SEL' button on the right.
5. If the SW VERSION displayed is 1.7.1, the update is verified.

If the new software version is not 1.7.1, contact uAvionix Support.

11 System Checkout

Review the settings in the aircraft log book and verify that the AV-20-S settings are intact. Review the “AV-20-S Installation Manual” UAV-1003613-001 Rev G §9 *Instructions for Continued Maintenance & Operation* prior to returning to service.

Version 1.7.1 and greater uses pitot-static data to assist the attitude algorithm. Performing the **Air Data – Pitot Zero** procedure found in the Installation Manual is particularly important.

It is strongly recommended to execute a Hard Cal calibration procedure, and to calibrate airspeed and altitude with an air data test set in addition to the Pitot-Zero.

12 Support

For additional questions or support please visit:

<http://www.uavionix.com/support/>

13 Maintenance Record

When post-accomplishment verification and system checkout is completed, make appropriate entries in the Aircraft Maintenance Log Book.

Maintenance Record

Service Bulletin UAV-1007937-001 Rev A to install software v1.7.1 for FAA NORSEE AV-20-S UAV-1003310-(____), has been complied with.



A copy of this form must be submitted by visiting:

<https://uavionix.com/logbook/>

Date:	By:
Aircraft Information	
Make:	Model:
Serial Number:	Registration Number:
AV-20-S Information	
Serial Number:	
Hardware Part Number:	UAV-1003310-_____
Customer Information	
Name:	
Email:	
Telephone:	