uAvionix AV-Mag
Installation Troubleshooting

UAV-1009030-001

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Revision History

A	4/30/2025	Initial release

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1 Introduction

1.1 Purpose

The purpose of this document is to assist in the identification and troubleshooting of issues related to AV-Mag installation and performance. uAvionix support is available to assist in the troubleshooting process.

2 Service Bulletins

2.1 Verify Latest Service Bulletin

Verify the installation and device firmware comply with the latest posted support bulletin. Each service bulletin details the requirements and instructions for installation or compliance. uAvionix does not recommend engaging in any additional troubleshooting until the installed device complies with the latest service bulletin.

The latest service bulletins can be accessed under the appropriate product at:
https://uavionix.com/support/av-mag-pma/

3 Assumptions

3.1 Equipment Assumptions

The uAvionix AV-Mag is designed to be easy to install and configure. The performance of the AV-Mag is dependent on the condition of the systems of the host aircraft. The AV-Mag will not meet the it's performance specifications if the host aircraft systems are not in good working order.

- Use camp compass when trying to find a good location for the AV-Mag. Anywhere the camp compass is affected by magnetic interference there will be interference for the AV-Mag.

- Non-magnetic screwdriver and wrench should be used for installation.

- Brass fasteners.

- Non-magnetic digital level.

3.2 Installation Assumptions

In order to properly diagnose performance issues, the following must be assumed:

- New wiring is being used. Do not use any existing wiring.

- The instructions were read and carefully followed, as laid out in the installation manual.

- AV-Mag must be installed and wires connected. Check for continuity.

- The AV-Mag will be installed using environmental splices, connector, or soldered connections.

- Serial #4 needs to be set to **AVMAG.**

- Continue with the AV-Mag installation in the install menu.

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- Aircraft does NOT need to be leveled. Use digital level to confirm the roll and pitch angles to be the same between the AV-30 and the AV-Mag.

4 Identifying AV-Mag Performance Issue

The corrective action required to resolve AV-Mag performance depends on the type of issue.

4.1 Flags

4.1.1 NOMAG Flag

When no signal is being received by the AV-30 there will be a NOMAG flag. This can be caused by a few different reasons. Do not continue with installation menu or calibration until the NOMAG Flag is addressed. Any wiring that is incorrect will cause the NOMAG to appear. DO NOT parallel pin 13. **Cap and stow Green, Blue, and White wires from the AV-Mag.**

Table 11 AV-Mag Wiring Guide

Wire	Function	AV-30-C pin
Red	+7 VDC Power	13
Black	Ground	10
Brown	Tx Data (AV-Mag → AV-30-C)	6
Green	Reserved serial input	NC
Blue	Reserved serial output	NC
White	Reserved serial input	NC
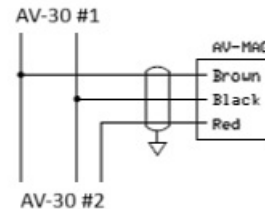
4.1.1.1 Power

The AV-30 provides ~7V of AUX power to the AV-Mag. This is always present on pin 13 of the AV-30. Check this voltage using a DC voltmeter between pin 13 and pin 10. If 7 volts are not seen on pin 13 then test (if installed in a dual installation) the second AV-30 for the same voltage on the same pin even if it is not being used to power the AV-Mag. If the AV-30 does not output 7V then the unit will need to be repaired by uAvionix. Log a Support Ticket at uAvionix Support set up an RMA to repair the Aux Power. If pin 13 is accidentally shorted to ground, it can permanently damage the AV-30. **Do not attempt to route wires when connected to a powered-on AV-30!**

4.1.1.2 Ground

The AV-Mag needs to have a shared ground with the AV-30. The black wire from the AV-Mag will connect with pin 10 of the AV-30. Confirm that the AV-Mag has good ground on pin 10.

4.1.1.3 RS-232

The brown wire of the AV-Mag needs to go to pin 6 of the AV-30. This is the communication wire for RS-232. Confirm a good connection. This wire carries an AC data signal but with most DC voltmeters you can see an average voltage around +/-5Volts.

4.1.1.4 Wiring

Wiring needs to be shielded 3 conductor Mil-spec wire MIL-C-27500. Ground the shield at both the AV-30 and at the AV-Mag.

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4.1.2   MAGCAL Flag

The MAGCAL flag is an indication that the AV-Mag is powered on and communicates properly. The next steps are to complete the AV-Mag software installation and the on-ground calibration procedure.

1. Wire according to the diagram

2. Mount and configure the AV-Mag

3. Set Serial #4 to AV-Mag

4. Enter install menu and complete the following:
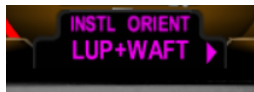
   a. Interference check <10%

   b. Orientation (confirm the correct orientation)

   c. Confirm Install angles

5. Complete the calibration of the AV-Mag.

4.1.2.1   Installation Menu – Interference Check

Enter the installation menu and run tests for the interference check. Finally check that the interference range is less than 10%. If more than 10% then check for the following issues:

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Straight wires: Current through a wire creates a magnetic field around the wire. This magnetic field can be largely cancelled by bundling two wires with current moving in opposite directions, e.g. power and ground.
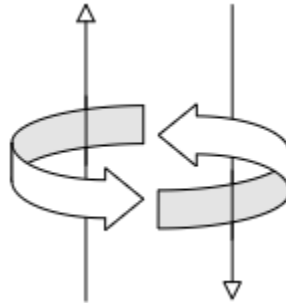
Loop or coil of wire: A loop or coil of wire concentrates the magnetic field when compared to a straight wire carrying the same current. Be mindful to avoid placing the AV-Mag in the middle of even a large loop of wire.
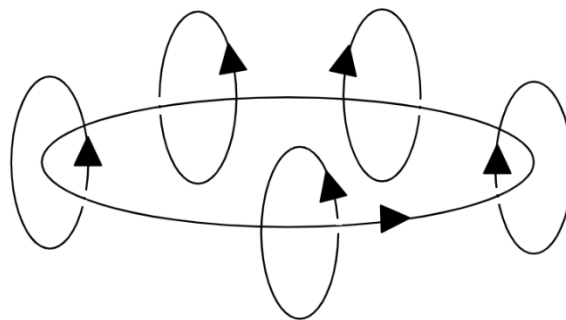
Power and ground from lights that are not tied together. This can cause a magnetic field.
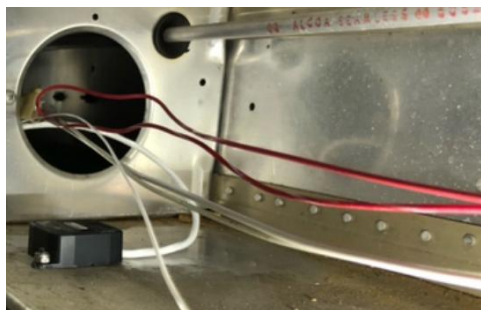
Mounting of the AV-Mag too close to wire bundles especially of high voltage or motors. Try to mount AV-Mag 18-36 inches if possible, from wire bundles or until the interference is within range.

Confirm that the hardware you are using is not magnetic or ferreous metal. (If you can pick it up with a magnet then you shouldn't use it) Do not allow any magnets (e.g. a magnetic screwdriver) near the AV-Mag at any time because it can leave a magnetic imprint on the AV-Mag's internal sensors that will degrade its performance.

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4.1.2.2 Installation menu – Orientation

The AV-Mag may be installed in any orientation aligned with the aircraft fuselage and wings. The orientation needs to be specified in the AV-30 Orientation menu. If the orientation is incorrectly selected, the MAGCAL flag may not extinguish after calibration. Use the table below to identify the menu code that matches your orientation. Think of the wire direction as the direction of the wire bundle coming out of the AV-Mag.

Table 12 - AV-Mag Orientation Options

Menu Option	Label direction	Wire direction
LUP+WAFT	Upward (facing up)	Toward tail (wires aft)
LUP+WFOR	Upward	Toward nose (wires fore)
LUP+WLT	Upward	Toward left wingtip (wires port)
LUP+WRT	Upward	Toward right wingtip (wires starboard)
LDN+WAFT	Downward (facing down)	Toward tail
LDN+WFOR	Downward	Toward nose
LDN+WLT	Downward	Toward left wingtip
LDN+WRT	Downward	Toward right wingtip
LRT+WAFT	Right wingtip (facing starboard)	Toward tail
LRT+WFOR	Right wingtip	Toward nose
LRT+WUP	Right wingtip	Toward sky (wires upward)
LRT+WDN	Right wingtip	Toward ground (wires downward)
LLT+WAFT	Left wingtip (facing port)	Toward tail
LLT+WFOR	Left wingtip	Toward nose
LLT+WUP	Left wingtip	Toward sky
LLT+WDN	Left wingtip	Toward ground
LFOR+WUP	Forward (facing nose)	Toward sky
LFOR+WDN	Forward	Toward ground
LFOR+WLT	Forward	Toward left wingtip
LFOR+WRT	Forward	Toward right wingtip
LAFT+WUP	Aft (facing tail)	Toward sky
LAFT+WDN	Aft	Toward ground
LAFT+WLT	Aft	Toward left wingtip
LAFT+WRT	Aft	Toward right wingtip

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4.1.2.3   Installation Menu – Install Angles

The AV-Mag should be mounted so it is square and plumbs to the line of flight. If the instrument panel is square to the line of flight, install the AV-Mag with a tilt as close as possible to the AV-30's tilt in the panel. If the panel is significantly slanted, install the AV-Mag square and plumb to the flight path instead of trying to match the panel. If there is a large discrepancy from the flight path level, there will be heading error. If not aligned with the line of flight, the heading will be off at the same amount on every heading. Rotate or shim the AV-Mag to remove the error.

4.1.3   AV-Mag Calibration

A 12-point calibration is required to calibrate the AV-Mag. This will be completed on the **ground**. A compass rose is a good reference but if one is not available, knowing only **North** is sufficient to complete the calibration. Follow on-screen instructions and use the arrows to measure the 30 degree heading intervals. Evenly spaced 30-degree intervals are key to a good calibration. Once the calibration is completed then the flag should be extinguished. If not, then most likely the orientation is not set correctly.

4.2   Heading Jumping

If the installation and calibration have been completed and you have a jumping heading check the following:

4.2.1   Grounding of Strobe or lights

Grounds of lights should be run inboard of the AV-Mag to prevent interference. If the AV-Mag is mounted inside the wing the ground wire should be run from the wingtip light or the taillight to the cockpit to prevent interference.

If AV-Mag is mounted on the wingtip then the shield of the AV-Mag needs to be grounded at the same location as the ground of the wingtip light for the least amount of interference.

5 Troubleshooting

The following summarizes several corrective actions observed to resolve AV-Mag installation issues. The issues below have been observed to affect the AV-Mag performance.
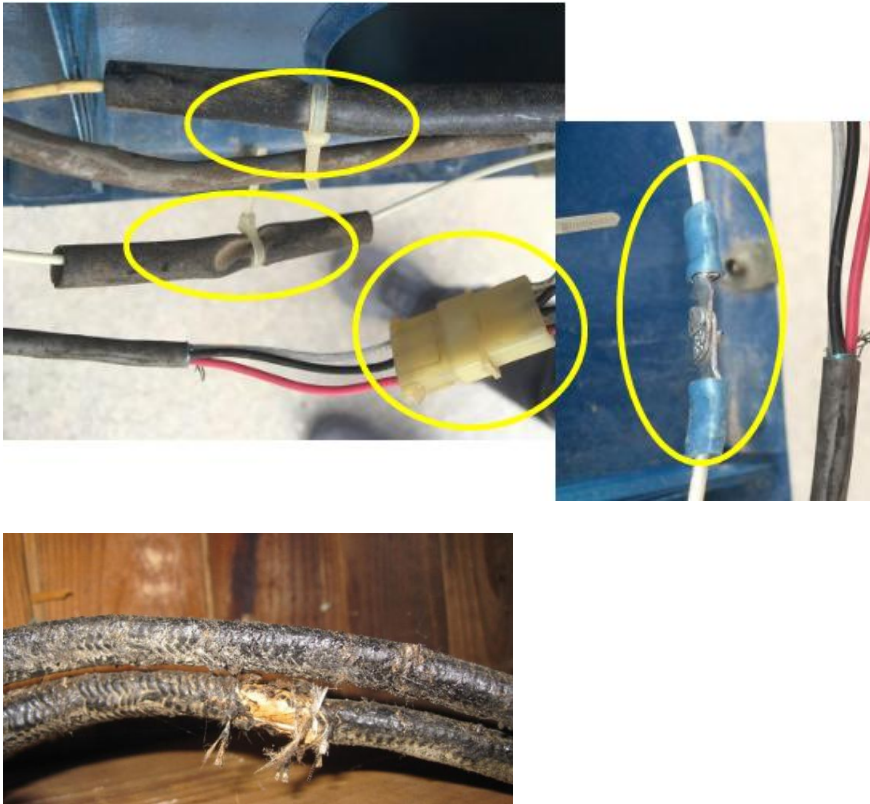
5.1   Wiring Considerations

5.1.1   Existing Electrical System and Wiring Condition

The AV-Mag is a magnetometer that is sensitive to electrical interference. Consideration should be given to the aircraft's existing wiring. A navigation light that pulses, flickers or occasionally loses power may not have been apparent to the owner/operator. As with any avionics the AV-Mag will be sensitive to EMI from older wiring, coiled wiring, high resistance, poor termination and grounding and bonding issues. Any EMI that is apparent in the installation can cause jumps in heading or incorrect heading to be displayed.

The following pre-existing electrical issues have been determined to be the root cause AV-Mag poor performance issues:

- Use of *knife* or *handshake* connectors.

- Chains of multiple unnecessary terminations/connectors or incorrect splicing.

- Failed/incorrect crimps/termination.

- Corroded bonding/ground lugs.

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- Installation of the AV-Mag too close to motors, blowers, ELT, steel, or lights.

If after an installation any irregularities are shown more investigation will be required.

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6 Need Additional Support?

Contact uAvionix Support. A support ticket can be submitted at https://uavionix.com/support.
Video of how to complete the on ground calibration can be found on our uAvionix YouTube channel:
Tech Tip Tuesday: AV-Mag Calibration

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