

# Operators and Maintenance Manual

## Measuring module AUX AVS 02.01



Rev. 01 – May 2017

**Copyright:**

Auto & Aero Technologies Sp. z o.o.  
Mazowiecka 10/5, 20-723 Lublin, Poland  
■ email: [info@aatech.pl](mailto:info@aatech.pl) ■ [www.aatech.pl](http://www.aatech.pl)



## Table of Contents

Introduction .....	3
1. General information .....	4
2. Handling in transport and storage .....	5
3. Installation.....	5
3.1. Environmental specifications.....	5
3.2. Dimensions .....	6
3.3. Mounting .....	6
3.4. Power and wiring.....	7
4. Operation and maintenance .....	8
4.1. Measured signals .....	9
5. Service, diagnostics and repairs .....	9
5.1. Service life.....	9
5.2. Checks .....	10
5.3. Cleaning and conservation.....	10
5.4. Troubleshooting.....	10
5.5. Repairs .....	11
5.6. Re-programming.....	11
5.7. Spare parts.....	12
6. Warranty .....	12

### Copyright:

## Introduction

This flight data monitoring module AUX AVS 02.01 is intended for ultralight, microlight, homebuilt and experimental aircraft. This module is not certified by the FAA and EASA. Fitting of this module to a certified aircraft is subject to the rules and conditions pertaining to such in your country. Please check with your local aviation authorities if in doubt.

This flight data monitoring module AUX AVS 02.01 is an element of the Integrated Avionics System that measures the following engine operation parameters:

- a) Altitude;
- b) Variometer;
- c) Air speed;
- d) Acceleration in 3 axes;

The purpose of AUX AVS 02.01 type measuring module is to collect input. Measured values are communicated to the pilot by means of the following EEM MOT 01 displays type FL....

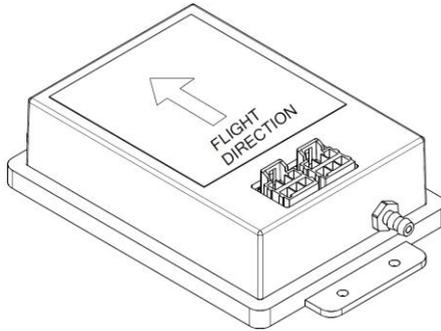
Additionally, the module controls the potentiometer that adjusts display brightness of EEM MOT 01 monitors. A change in the potentiometer's settings is measured by the module and digitally transmitted to the monitors and to the EMS DAQ R02.01 measuring module. The type of the potentiometer is R16148-1A-1-B1K.

The module's casing is made of white ABS. The casing is not air-tight to allow cockpit air to the static pressure sensor. To obtain the value of the total pressure, required for defining air speed, the module is to be connected with Pitot tube; a port for this purpose is located in the front-side wall of the module's casing and requires using a pneumatic hose of 4 mm inside diameter.

Hardware identification plates are located in the front of the casing (Fig. 1).

### Copyright:

**Measuring module AUX AVS 02.01**



**Fig. 1. AUX AVS 02.01 module**

## 1. General information

This manual contains binding information, guidelines and warnings for safe handling and maintenance of this particular instrument before installation, during installation and in its operating phase. This document does not contain rules and guidelines on operation of aircraft instruments at large.

Read the manual thoroughly before turning on the instrument and precisely follow the instructions to install and configure it. This manual does not replace instructions on installation, maintenance and operation of this device in a particular airframe - these are to be prepared by the user. Instructing the pilots and maintenance personnel on operation of the instrument is also the responsibility of the user.

Operation of this device is the sole responsibility of the pilot in command (PIC) of the aircraft. This person must be proficient and carry a valid and relevant pilot's license. This person has to make themselves familiar with the operation of this module and the effect of any possible failure or malfunction. Under no circumstances does the manufacturer condone usage of this instrument for IFR flights.

**Copyright:**

**Measuring module AUX AVS 02.01**

This manual defines the scope of maintenance measures the user is authorised to conduct on their own. Any repairs or modifications outside this scope conducted by the user or contracted to a third party, as well as using non-original parts and subassemblies voids the warranty, relieves the supplier from any liability, making the device lose the status of the product of Auto & Aero Technologies Sp. z o.o. with all the resulting consequences.

## 2. Handling in transport and storage

1. The AUX AVS 02.01 module is bubble-wrapped to protect it against vibration and other physical damage, and packed in a cardboard box together with the warranty card.
2. The display must be stored and transported assuring that:
  - the ambient temperature stays in the range of  $10 \div 40^{\circ}\text{C}$
  - the ambient relative humidity stays in the range of  $10\div 90\%$ , safe from condensation.
3. The display should be protected from water.

## 3. Installation

### 3.1. Environmental specifications

The AUX AVS 02.01 module has been designed to be installed in ultralight aircrafts of ceiling not exceeding 4 000 m (13 000 ft). It should be located inside the cockpit and oriented horizontally in the longitudinal axis of the aircraft; the arrow on the casing points in the direction of the flight. The module's location is to assure easy connection to air hoses.

Acceptable ranges of operating parameters are listed below:

- Operating temperature:  $-20^{\circ}\text{C} \div 50^{\circ}\text{C}$
- Short-term operating temperature:  $-25^{\circ}\text{C} \div 60^{\circ}\text{C}$
- Humidity:  $0 \div 95\%$ , no condensation;

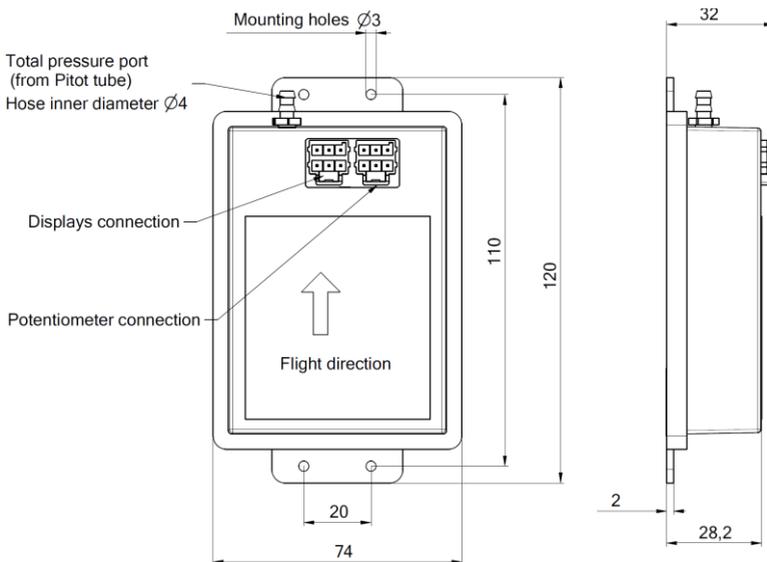
**Copyright:**

**Measuring module AUX AVS 02.01**

- Ambient air pressure:  $45 \div 105$  kPa;
- Vibrations:  $<5$  g at frequencies below 150 Hz;

### 3.2. Dimensions

Outline dimensions of the device are: 74 x 120 x 32 mm (*width x height x depth*), Weight: 85 g.



**Fig. 2. AUX AVS 02.01 module outline drawing**

### 3.3. Mounting

The AUX AVS 02.01 Module should be installed horizontally, along the longitudinal axis of the aircraft, with the arrow on the casing facing the direction of flight. Use mounting holes (shown in Figure 2). The module should be located in a part of the cockpit sheltered from splashes of water of other liquids, and far from sources of electromagnetic radiation as possible.

**Copyright:**

**Measuring module AUX AVS 02.01**

The module is to be connected with Pitot tube to enable measuring air speed. The pitot pressure port is located on the side of the casing that faces flight direction. The pitot pressure hose inside diameter is 4 mm. Static pressure sensor is located inside the module’s casing.

**3.4. Power and wiring**

The AUX AVS 02.01 module is powered from the aircraft power system. Power specifications: nominal supply voltage 12V, acceptable supply voltage range 8 ÷ 30V, current < 12mA.

The AUX AVS 02.01 module is connected to the system by in-built MOLEX Ultra-Fit 3.5 mm 6 pin male connector located at the front of the instrument (left from the direction of flight, see Figure 2).

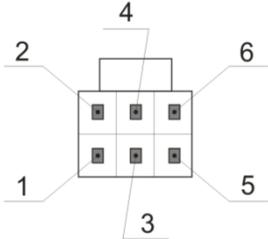
A schematic diagram of the connection to communication connector (display connector – left) is shown in Figure 3 and in Table 1.

The power supply (pins no. 5 and 6) requires 0.5 mm<sup>2</sup> wires.

Data bus (pins no. 3 and 4) requires twisted pair wires (2 x 0.5mm<sup>2</sup>) according to DIN VDE 0814 (Fig. 3). Twisting should continue to the pins of the connector.

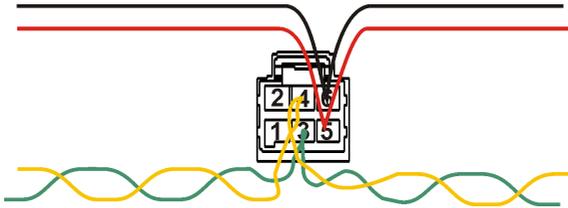
Pins 1 and 2 are to be left unconnected.

**Tab. 1. Display connector pin assignment and pin insertion view**

Pin number	Function	Connector schematic
1	Reserved (do not connect)	
2	Reserved (do not connect)	
3	RS A	
4	RS B	
5	GND	
6	+12 V	

**Copyright:**

**Measuring module AUX AVS 02.01**

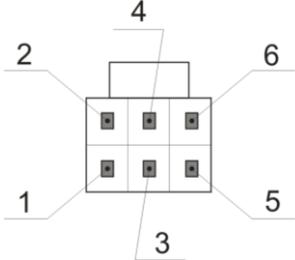


**Fig. 3. Wire twisting and connection**

A schematic diagram of the connection to potentiometer connector (right connector) is shown in Table 2.

The connection requires 0.5 mm<sup>2</sup> wires.

**Tab. 2. Potentiometer connector pin assingment and pin insertion view**

Pin number	Function	Connector schematic
1	Reserved (do not connect)	
2	Reserved (do not connect)	
3	Reserved (do not connect)	
4	Power	
5	GND	
6	Signal	

## 4. Operation and maintenance

**The module is to be connected to EEM MOT 01 displays type FL, EMS DAQ R02.01 and diagnostic connector by RS485.**

**Copyright:**

#### 4.1. Measured signals

The type and value range of signals measured by the Module are listed in Table 3.

Tab. 3 Signals processed by AUX AVS 02.01 Module

No.	Parameter	Measurement range	Accuracy
1	Altitude – determined based on the measured static pressure and the reference pressure set up by the pilot	0 ÷ 4000 m	± 8 m
2	Variometer – determined/indications based on changes of the determined altitude	± 12 m/s	± 0.2 m/s
3	Airspeed – determined based on the dynamic pressure measured differentially between the total pressure in the Pitot tube and the static pressure in the pilot's cabin)	25 ÷ 250 km/h	± 5 km/h
4	Acceleration (3 axis)	± 100 m/s <sup>2</sup>	± 5 m/s <sup>2</sup>
5	Brightness level requirement (signal from potentiometer)	10 ÷ 100 %	± 5 %

## 5. Service, diagnostics and repairs

### 5.1. Service life

- a) TBO of the module is not defined.
- b) In the case of failure or error, the module must not be used any more.

**Copyright:**

## 5.2. Checks

The following checks are recommended:

- 1) At pre-flight check:
  - a. Turn on the power to check if operational (the EEM MOT 01 type FL... monitors should display data);
- 2) After 100 hours of flight:
  - a. Check the instrument's electric connections;
  - b. Turn on the power on to check if operational (check if EEM MOT 01 FL... monitors display data);
  - c. Change the position of potentiometer and check changes of displays brightness level.

## 5.3. Cleaning and conservation

The casing is to be buffed with water-damped soft cloth. Optionally, if very dirty, can be cleaned with cloth sparingly damped with mild soap solution. Caution: avoid spilling liquids over the device.

## 5.4. Troubleshooting

- a) If information is not displayed on some of the monitors (FL type) when power is applied (Fig. 4), check connection inside measurement module. Check:
  - power connection; ensure that your power supply is capable of supplying at least 8 volts, and no more than 30 V.
  - data bus connection;

### Copyright:

**Measuring module AUX AVS 02.01**



**Fig. 4. Indication of no connection to measurement module**

- a) If the system does not react to brightness adjustment, check connection with potentiometer;
- b) In the case of the module's failure or malfunction, turn power off and on again.
- c) If the above does not solve the problem, the module needs to be replaced.
- d) A defective module must not be used.

## 5.5. Repairs

Repairs and inspections of the module can be conducted only by its manufacturer.

The module does not contain any user-serviceable parts. Unauthorized repairs or modifications may result in permanent damage to the equipment and void the warranty.

If the module fails, return the device to the Manufacturer with description of the failure circumstances and symptoms.

## 5.6. Re-programming

Modifications to the module's settings can be introduced by means of service software provided by the Manufacturer and the dedicated diagnostic interface.

**Copyright:**

**Measuring module AUX AVS 02.01**

The instrument's firmware updates are to be conducted on the basis of the bulletins published by the Manufacturer. The updates can be introduced by means of service software provided by the Manufacturer and the dedicated diagnostic interface.

**5.7. Spare parts**

The module does not contain any user-serviceable parts. The user is not allowed to disassemble it nor replace any subassemblies.

**6. Warranty**

1. Auto & Aero Technologies Sp. z o.o. warrants this product to be free from defects in materials and workmanship.
2. Auto & Aero Technologies Sp. z o.o. warrants proper operation of the product if it is used in accordance with its intended purpose and in accordance with the Operators and Maintenance Manual.
3. Auto & Aero Technologies Sp. z o.o. warrants this product for 12 months from date of purchase.
4. Auto & Aero Technologies Sp. z o.o. will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labour. The customer is, however, responsible for any transportation cost. The repair or replacement will be completed within 30 days from delivery of the product to Auto & Aero Technologies Sp. z o.o. However, if the failure is possible to be eliminated by means of updating the product's firmware, and if Auto & Aero Technologies Sp. z o.o. provides the customer with appropriate service tools, the Customer will conduct firmware update by themselves.
5. Any warranty repair will extend the warranty for the time of the repair.

**Copyright:**

**Measuring module AUX AVS 02.01**

6. If a valid warranty claim is lodged within months 7 to 12 after date of purchase, the warranty extends for a further 6 months after completion of the warranty repair.
7. This warranty does not cover failures due to:
  - a) mechanical damages and damages resulting from them,
  - b) unauthorised repairs,
  - c) damage caused by abuse or misuse,
  - d) unauthorised alterations to hardware or software.
8. The warranty does not cover claims that arise from the product parameters unless they are different from values declared by Auto & Aero Technologies Sp. z o.o.
9. The warranty does not cover activities that belong to normal operation such as cleaning and conservation, operation checks, and periodic inspections according to the Operators and Maintenance Manual.
10. The Customer loses all rights arising from the warranty if the product's protective seals are found to be tampered with.
11. The rejection of Auto & Aero Technologies Sp. z o.o. to conduct a warranty repair voids the warranty.

**Copyright:**



The information in this document is subject to change without notice and should not be construed as commitment by Auto & Aero Technologies Sp. z o.o.

These technical data and the information embfomied therein are the property of Auto & Aero Technologies Sp. z o.o., and shall not, without prior written permission of Auto & Aero Technologies Sp. z o.o., be disclosed in whole or in part to third parties. This statement shall be included on any reprfromuction of these data, in whole or in part. The Manual must remain with the engine/aircraft in case of sale.

Copyright 2017 © - all rights reserved.

Other names in this documentation are used purely for ease of identification and may be trademarks of the respective company or owner.  
Approval of translation has been done to best knowledge and judgement - in any case the original text in English language is authoritative.

**Copyright:**

Auto & Aero Technologies Sp. z o.o.  
Mazowiecka 10/5, 20-723 Lublin, Poland  
■ email: [info@aatech.pl](mailto:info@aatech.pl) ■ [www.aatech.pl](http://www.aatech.pl)