MVARIO2 EX FAI F5J $C\epsilon$ 🗑   JETI model®

"MVARIO2 FAI F5J" is a special firmware package dedicated to official FAI F5J contests. This package offers a reduced function set compared to default MVARIO2 firmware. This function set includes only the functions needed according to official F5J rules.

This firmware package is compliant with CIAM FAI document *Volume EDIC. Electronic Devices in Competition. 2014 Edition.*

Main features of the FAI F5J firmware package

- Measurement of altitude, pressure, and temperature.
- No indication of climb and descent since no on-line telemetry is allowed.
- No filtration is applied to the sensor's output.
- No adjustable settings available (the MVARIO2 is predefined as an F5J Limiter).
- The sensor doesn't allow restarting of the motor until it is turned off and on again.
- The 'Start Height' is stored in a nonvolatile memory and it is possible to be read next time the power supply is connected.
- The device is compatible with EX Bus protocol, i.e. it is possible to be observed via a special menu in DC/DS JETI model transmitters. However, no telemetry screen is available.
- Firmware updates.

Technical data	MVARIO2
Dimensions	35x16x7mm
Weight with the cables	5 g
Measuring accuracy of absolute/relative altitude	±9m/±3m
Resolution of measured height	0.1m
Measurement range	450÷1100hPa
Operating temperature	-10÷85°C
Supply voltage	3.5 ÷ 8.4V
Current consumption	15mA

Altitude calculation

The altitude is precisely determined according to the following formula:

$$Altitude = K1 \times \left\{ 1 - \left(\frac{P}{P_0}\right)^{K2} \right\}$$ [m],   where   K1 = 44330.76923m,   K2 = 0.190266669   and P_0 = 1013.25 hPa (ISA sea level pressure).
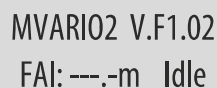
Placement of MVARIO2 sensor:

MVARIO2 is a very sensitive pressure sensor. Any change in pressure causes a change in the indicated altitude, climb rate, etc. The sensor should be mounted in the model in such a way that the sensor is not affected by air pressure flowing inside the model, but only by static atmospheric pressure. In other words, place the sensor in a model where it is only influenced by the static atmospheric pressure. For the most accurate altitude measurement, do not place the sensor near any components that generate heat during flight (e. g. near engines, motors or ESCs).

Connecting the MVARIO2 sensor

MVARIO2 has an **output** marked Ext. and two programmable ports that are labeled as **Ext1/ESC In** and **Ext2/ESC Out.** Using the **Ext.** port of the sensor the data is transmitted to the receiver or to the connected JETIBOX, and it serves as a current supply as well.

MVARIO2 EX FAI F5J

The menu of MVARIO2 sensor:

```
MVARIO2 V.F1.02
FAI: ---.-m  Idle
```

MVARIO2 Main JETIBOX Screen

The main JETIBOX screen shows the device name and a firmware version (always in a form of *V.FX.XX* which means a FAI F5J dedicated firmware). The second line informs about a status of the device (Initialization, Idle, Ready and Running). Alternatively a previously measured 'Start Height' is displayed as well.

- Initialization – this message is displayed after connecting the power source. The sensor is performing altitude auto-zeroing and calibration.

- Idle – the sensor is waiting until the throttle channel is at idle position. The throttle input channel has to be below 1.1ms.

- Ready – the sensor/limiter is ready to start a round. If you push the throttle at this moment (the throttle channel exceeds 1.2ms), the sensor switches itself into a Running mode and starts a 30s countdown.

- After the 30s period has been elapsed or the motor has been stopped by the pilot (whichever occurs first), the sensor waits for the next 10s to determine the value of 'Start Height'. The motor is considered stopped as soon as the throttle channel input goes below 1.1ms.

- The measured altitude is displayed on the main screen without blinking and with no status message.

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JETI model ®

Possibilities of MVARIO2 connection:

1. **Connected directly to the JETIBOX**. In this case it is necessary to use the power supply of 5 to 8.4V, e.g. the receiver battery. The three-wire cable with the JR connector *(black connector)* is connected to the JETIBOX (the connector labeled Impulse, + -). **Use this connection to read the value of FAI altitude ('Start Height').**
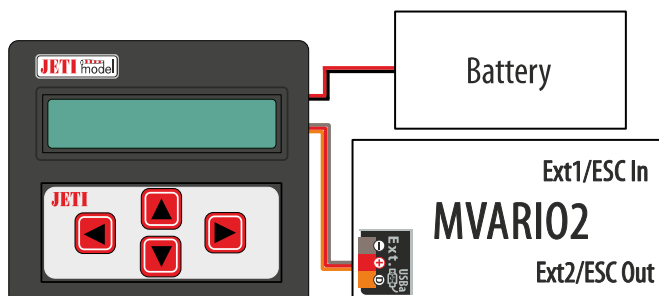
Connection of the MVARIO2 directly to the JETIBOX

2. **MVARIO2 connected directly to the receiver input (Ext.) with the F5J Limiter function.** The three-wire cable with the JR connector (*the black connector*) is connected to the Duplex receiver (the input labeled Ext.). Now bring the throttle control channel from the receiver to the **Ext1/ESC In** port using the three-wire cable with the JR connectors. Connect the speed controller to **Ext2/ESC Out**. Here two types of connection are possible, depending on the fact if the connected controller has the circuit for voltage stabilization (BEC) or not. **In case you use a controller with a BEC circuit, we strongly recommend to place the MVARIO2 in a location where there is no possibility of random tearing out of the wires from the device. Or it is advisable to bridge the power supply with a special cable that will bring the power directly from the controller to the receiver.**
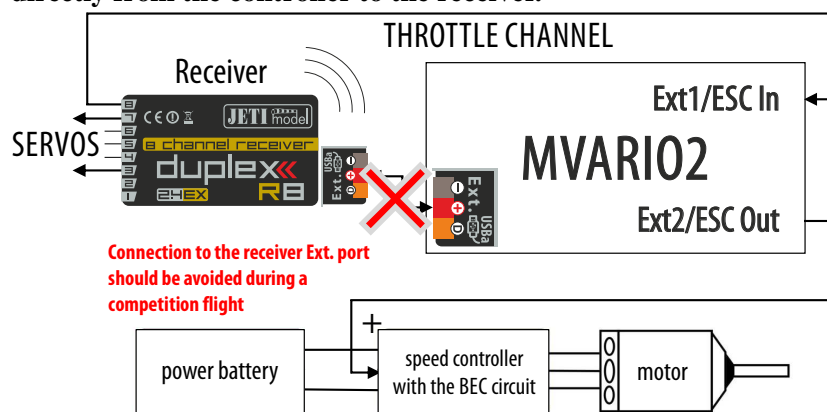
MVARIO2 connected directly to the receiver.

MVARIO2 EX FAI F5J
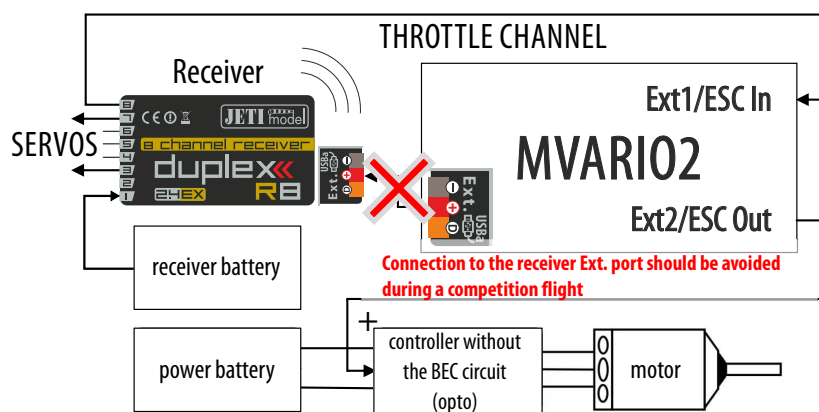
MVARIO2 connected directly to receiver with a separate receiver battery.

Please note that at a competition you might be asked by the organizers to remove the AMRT device (Altimeter/Motor Run Timer, in this case MVARIO2) from your model for independent testing. For such a case please obtain a suitable socket to socket cable equipped with JR connectors for connecting to the test equipment. An additional cable is therefore required.

This product is guaranteed for 24 months from the date of purchase, provided that it has been operated in accordance with these instructions at the prescribed load and becomes mechanically damaged. Proof of purchase required for any warranty claim. For customer service, see your JETI dealer or the manufacturer.

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