MANUAL

FLOWMETER
MFlow EX

CONTENTS

1. Introduction

The MFlow is a telemetry sensor that measures the flow of the pumped fuel and calculates its amount in the tank. There are two versions of the sensor available. The MFlow-Turbine is a variant designed for the models powered by a jet engine, the MFlow-Gasoline is a variant for the models powered by glow or gasoline motors.

The sensor is compatible with Duplex EX system.

EX telemetry values: actual flow and the amount of the fuel in the tank.

User adjustable parameters, such as tank capacity, depleted fuel alarm, etc.

Firmware updates.

2. Decsription

MFlow consists of the flow sensor and the base. The sensor is connected to the base via a cable with a lock connector. The other cable labeled as „Ext" is used for the DUPLEX system or the JETIBOX. The flow sensor is fitted with these endings according to the type:

- MFlowT 2x FESTO for tubes with the external diameter of 4mm

- MFlowG 2x barbed fittings for tubes with the internal diameter of 2 mm a 2x barbed fittings for tubes with the internal diameter of 3 mm

On the label of the sensor the direction of fuel flow is indicated. This direction must be followed for proper measurements.
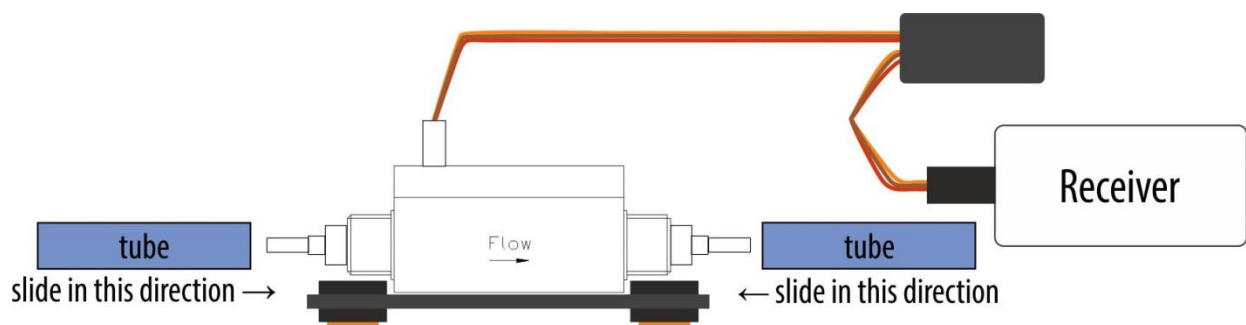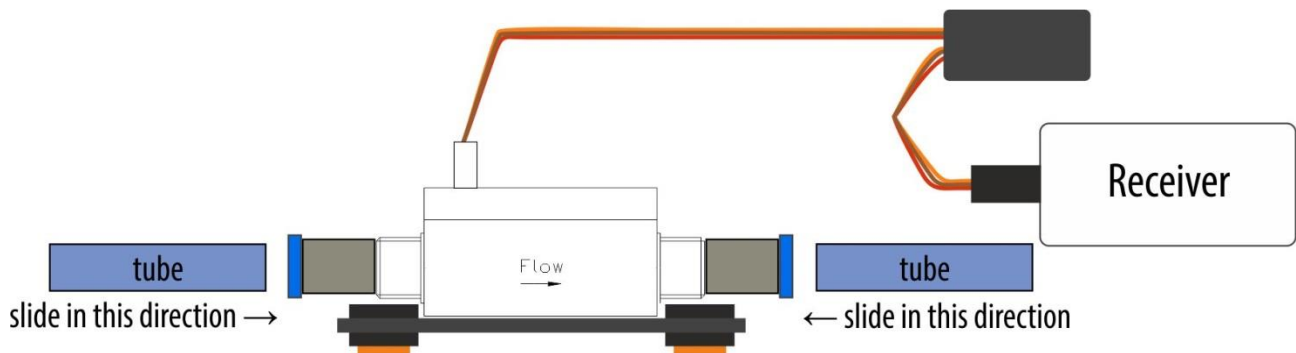
3. Communication of the MFlow sensor

- **Connection of the MFlow to the JETIBOX**

    In this case i tis necessary to use 3.5 – 8.4V power supply, e.g. receiver batteries. The three-wire cable with the JR (black) connector is connected to the JETIBOX (connector labeled as Impuls, + -). This connection makes it possible to generated alarms, since the siren is a part of the transmitter module that is not connected in this case. The alarms are displayed on the JETIBOX display only.

- **Connection of the MFlow to the DUPLEX receiver**

    When connected this way, it is possible to connect one MFlow sensor powered from the receiver. The three-wire cable with the JR (black) connector is connected to the DUPLEX receiver (via Ext. input).
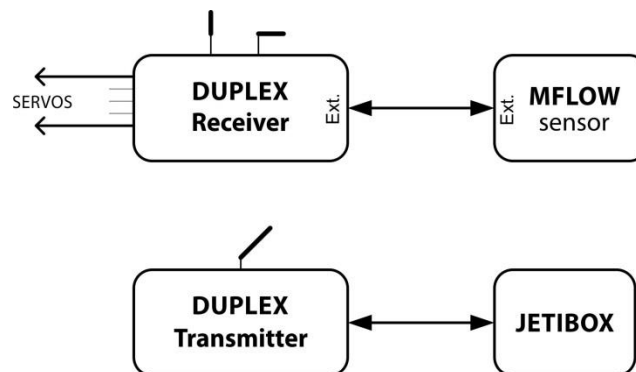
- **Connection of the MFlow to the DUPLEX receiver via Expander**

    In this case it is possible to process data from more sensors powered from the Expander at the same time. The three-wire cable with the JR (black) connector is connected to the Expander input.
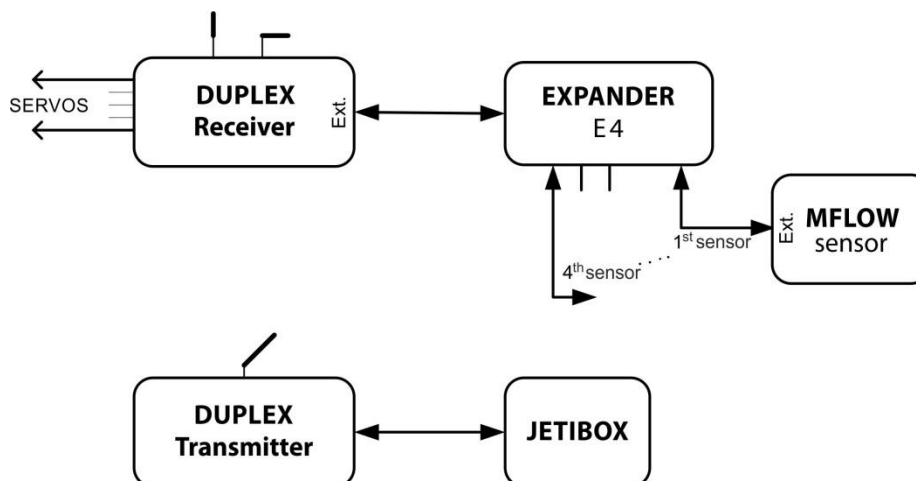
4. MFlow Menu

Setting the parameters and reading the data is carried out via JETIBOX. After the MFlow is connected (see chapter 3), a welcome screen appears on the JETIBOX display, with the device identification in the first line and with the amount of fuel in the tank. The second line consists of a bar graph and the amount of fuel in the tank in percent. The bar graph specifying the amount of fuel in the tank consists of ten positions. The amount is signaled by the number of filled positions. „X" symbol is one step of the bar graph and corresponds with 10% of residual fuel.

Pushing the R button (right) causes fast reset of all measured parameters.

To check the execution of the fast reset, a "*" symbol is indicated in the first line of the display.

Pushing the D button (down) on the JETIBOX gets you to the MFlow.ed menu.

- ACTUAL VAL.

    MFlow MENU: *ACTUAL VAL.* – by pushing the D button (arrow down) you select displaying actual measured values.

    Residual volume – depicts actual amount of fuel in the tank. The total capacity of the tank is set via „SETTING" → „Tank volume".

    Flow – depicts actual fuel flow.

- AVG / MAX – Averages / Maximums

    MFlow MENU: *AVG / MAX* – by pushing the D button (arrow down) you select depicting statistical data of fuel flow recorded during the operation. The records are deleted automatically or can be reset manually in *Setting → Erase data.* Automatic reset is carried out just once after the device is switched on, precisely when the actual flow exceeds the level set in „*SETTING →Flow trigger"*. If the trigger level is not exceeded after the start, the data of previous operation are depicted.

    MAXIMAL FLOW – shows maximal fuel flow during the operation since the last reset.

    AVG FLOW – average flow rate during the operation since the last reset.

- SETTING

    MFlow MENU: *SETTING* – pushing the D button (arrow down) gets you to the basic setting of the MFlow device.

    Erase data – Pressing left and right arrows simultaneously deletes the averages and maximums, see chapter „*AVG / MAX – Averages / Maximums"*.

    Tank volume – Setting the capacity of the tank.

    Flow trigger – If the fuel flow after switching on does not exceed the set level, the values from previous operation of the sensor are depicted.

    The level that initiates the reset of AVG/MAX values and measured tank contents is set in „*Tank volume"*. This automatic setting of the tank contents does not have to be carried out if you select „*Disable"* in „*Auto erase"*.

Auto erase – the function of automatic reset of the consumed fuel amount after exceeding the „*Flow trigger*".

- ALARMS

  MFlow MENU: *ALARMS* – pushing the D button (arrow down) gets you to setting individual alarms. If any set parameter is exceeded, then the JETIBOX display shows in its first line of the welcome screen alternatively the original image and the relevant alarm, and the siren of the transmitter module announces the alarm. The first tone is warning, the second is a Morse code symbol of the relevant alarm.

  Volume alarm – setting the alarm of remaining fuel. If the measured tank contents gets under this limit, the alarm is activated.

  Max. flow alarm – setting the flow alarm. If the actual flow exceeds the set limit, the alarm is activated.

- SERVICE

  MFlow MENU: SERVICE – pushing the D button (arrow down) depicts the firmware version and restoring the factory defaults of the device.

  PresetToSetup – simultaneous pressing the R and L buttons (right and left) starts factory defaulting of the MFlow device.

  MFlow v. xx.xx ID xxxxx:xxxxx – device identification, firmware version, and the serial number (ID).

5. Instalation

Put the flow detection sensor to the horizontal position in the model. The sensor can be mounted to the model using 4 mounting holes for M3 screws that are placed around the sensor. The sensor must be firmly attached to the model to prevent accidental disconnection of the tubes during the vibrations of the model. The tubes are connected to the sensor using end-pieces mounted to the sensor. Always make sure that the tubes are sufficiently pushed onto the sensor end-pieces.

6. Firmware update

The MFlow allows updating of its firmware via PC. Updating is done using the JETI USB adapter. The USB adapter drive installation instructions can be found in the USB adapter instruction booklet.

7. Technical data

Technical data	**MFlow-Turbine**	**MFlow-Gasoline**
Measurement range	20-800 ml/min	20-800 ml/min
Measurement accuracy	±2%	±2%
Tubing connection	2x Festo Ø4mm	2x barbed fittings Ø2 a Ø3
Dimensions	77x41x30 mm	72x41x30mm
Weight	40g	40g
Power supply range	5-8.4V	5-8.4V
Operating temperature range	-20°C÷80°C	-20°C÷80°C

8. Warranty

For the product we grant a warranty of 24 months from the day of purchase under the assumption that it has been operated in conformity with these instructions at recommended voltages and that it has not been damaged mechanically. Warranty and post warranty service is provided by the manufacturer.

We wish you successful flying with the products of: **JETI model s.r.o. Příbor, www.jetimodel.cz**

Main Switch tree diagram:

MFlowT 500ml XXXXXXXXX 100%	→	* MFLOW MENU * ACTUAL VAL ↓	↔	Residual volume 500ml 100%	↔	Flow 0 ml/h

Actual amount of fuel in the tank in ml and % | Actual flow

* MFLOW MENU *
← AVG/MAX → ↔ MAXIMAL FLOW
0 ml/min ↔ AVG FLOW
0 ml/min

Maximal fuel flow | Average fuel flow

* MFLOW MENU *
← SETTING ↓ ↔ Erase data
Press ←→ ↔ Tank volume
← 500 ml ↓ ↔ Flow trigger
↑
100ml/min ↓ ↔ Auto erase
← Enable

Manual data deletion | Setting the capacity of the tank 100 -10.000 ml | Flow trigger level | Enable/Disable

MFLOW MENU
← ALARMS → ↔ Volume Alarm
← 33% → ↔ Max. flow Alarm
OFF →

0 - 100 % | Off resolution

* MFLOW MENU*
← SERVICE ↔ PresetToSetup ←→
Factory Defaults ↔ MFLOW v. X.XX
ID XXXXX:XXXXX