# INSTRUCTION MANUAL OF THE MU-3 SENSOR

1. Introduction

The sensor MU-3 can be used for model on board monitoring of up to three voltages. With the aid of the MU-3 sensor the historical course of particular voltages can be monitored (minimum and maximum values) and the sensor may warn the user if set parameters are violated. Informations of the sensor are transmitted by the Duplex System to the user.

The Duplex System utilizes the 2,4GHz band for communication, which not only transmits model controlling data to the model but also receives useful model data back at the transmitter end. Data collected during operation are transmitted in real time and the actual condition of measured values can be evaluated on the JETIBOX LCD display.

2. Connection

2.1 Connection of the Sensor

It is possible to connect up to 3 independent voltage sources to the MU-3 sensor (see Fig. below). Connect the voltages to the sensor input with correct polarities! After connection of the voltages to the sensor inputs and connection of the sensor to its voltage supply, recognizing of the active inputs will start and after approximately 2 seconds the sensor will be set according to the number of recognized active inputs. The sensor recognizes the input as beeing active if the connected voltage is higher than 0,1V. The connection and the following time calculation until the setting moment is shown in the second line of the JETIBOX terminal. The sensor is permanently set until the time it becomes switched off. When the sensor voltage supply is switched on again there will be initiated a new recognizing process. If the sensor is definitely set, any change of numbers of arbitrary active inputs will trigger an input error announcement. The input error is notificated in the display as well as by an acoustic signal of the transmitter module.
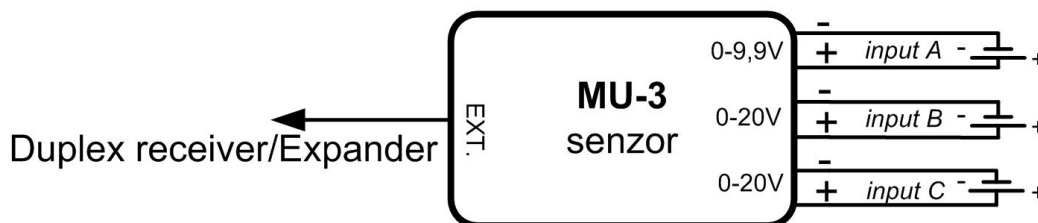
## 2.2 Connecting MU-3 to the JETIBOX

The triple-core cable of the MU-3 sensor with JR plug can be directly connected to the JETIBOX (receptacle marked Pulse, + -). Use the second input of the JETIBOX marked (+ -) for the voltage supply, connect a voltage within a range of 3,5-8,4V. This configuration offers no data transfer via radio link, therefore are data depicted on the JETIBOX LCD-screen only. This wiring enables no generation of acoustic alert signals because the buzzer is part of the transmitter module, which in this case is not connected. Alert signals are only shown on the LCD-display.

## 2.3 Connecting the MU-3 to a DUPLEX receiver

Connect the triple core cable of the MU-3 module with its JR plug to the receptacle on the backside of the DUPLEX receiver (marked Ext.). The MU-3 sensor obtains its current supply

via the receiver. For the purpose of MU-3 sensor parameter adjustments connect the JETIBOX to the transmitter module and switch on DUPLEX receiver and transmitter.
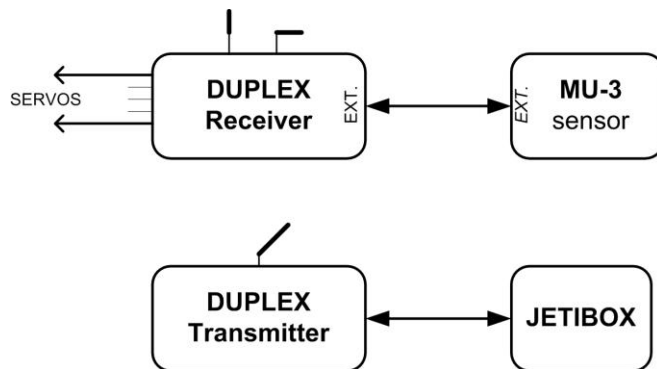
2.4 Connecting MU-3 to a DUPLEX Expander

Connect the triple core cable of the MU-3 module with its JR plug to one of the EXPANDER inputs. The Expander offers the possibility of connecting several telemetry sensors to one receiver. The MU-3 sensor obtains in this case its current supply via the Expander and the receiver.
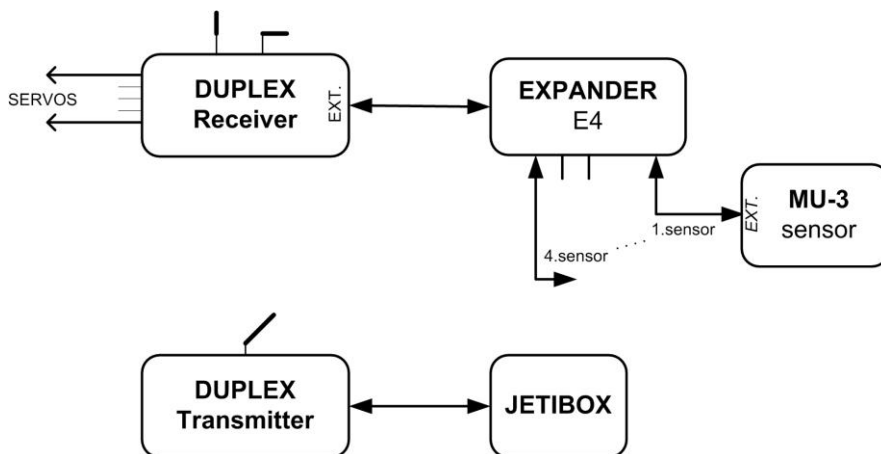
3. Menu navigation

The JETIBOX terminal is used for parameter set-up and data readout. After connection to the MU-3 sensor the introductory display appears, showing in the first line the sensor identification. In the second line indicates the actual voltage of inputs A,B,C. By long pushing down button R (right) a fast deletion of all measured parameters can be triggered. Fast deletion is indicated in the first line of the display by an asterix „*".

By pressing JETIBOX key D (arrow down) you will enter into the MU-3 sensor menu.

3.1 ACTUAL VALUE

MU-3 MENU: *Actual Value* – By pressing the 'D' (Down) button of the JETIBOX, we can view the actual measured values.

A/B/C – indicate actual voltages at all three inputs.

3.2 MIN / MAX – Minimum and Maximum Values

MU-3 MENU: *MIN / MAX* - by pressing key D (arrow down) you will select depiction of voltage extremes which occurred during measurements. Records of extremes are deleted automatically or they can be deleted with the aid of the menu *Setting - Erase Data.* Automatic deletion occurs if the MU-3 sensor has been just connected to the supply voltage and the adjusted voltage, which has been set-up in the menu *Setting Trigger level,* has been exceeded.

If during connection of the sensor the adjusted set-up voltage will not be exceeded, voltages of the preceding operation will be shown.

U MIN/MAX – indicates the minimum and maximum voltage of the at the time selected input (by pressing key D (arrow down) you may continue with depicting of minimum and maximum voltages of particular inputs)

3.3 SETTING - Configuration Options

MU-3 MENU: *SETTING* – By pressing the 'D' (Down) button, we can see the individual parameter settings of the MU-3.

Erase Data – by pressing arrows R and L (right and left) simultaneously you will delete records of the measured parameters

Trigger level – set-up of the voltage value at which, in consequence of its first overstepping after the sensor has been switched on, minimum and maximum values are set to zero and new recordings start.

Trigger level x.xV on A input > – selection of the input, which will be used for automatic deletion of the extreme . (Let us for example set the *Trigger level* to 1,2V and select *input A*. Deletion of the extreme will occur if the voltage at input A will overstep the value 1,2V.)

Beep Alarm A – set-up of the Morse alphabet letter which will represent the alert by an acoustic signal of the transmitter module DUPLEX Tx when the value will fall off of the low voltage set-up at input A.

Beep Alarm B – set-up of the Morse alphabet letter which will represent the alert by an acoustic signal of the transmitter module DUPLEX Tx when the value will fall off of the low voltage set-up at input B.

Beep Alarm C – set-up of the Morse alphabet letter which will represent the alert by an acoustic signal of the transmitter module DUPLEX Tx when the value will fall off of the low voltage set-up at input C.

Beep Error – Set up of a morse code letter representing an input error. If after an identification sequence the number of active inputs changes, an input error will be generated and this error will be announced acoustically by emitting the above mentioned morse code letter. This function may be deactivated by pushing and holding of the button L (left).

3.4 ALARMS

MU-3 MENU: *ALARMS* – by pressing key D (arrow down) you are entering the area of adjusting particular alerts. If any of the set-up parameters is overstepped, the JETIBOX LCD-display will in the second line of the basic menu alternately show the original indication and the matching alert, the beeper of the transmitter module will sound an alert. The first tone is an announcement tone and the second tone sequence is the Morse alphabet signal of the matching alert. If one of the alerts is switched OFF, there will be no alert audible.

A Low Volt. Al. – set-up of the low voltage signal at input A. If the measured voltage at input A falls off of the set value, the alert will become activated.

B Low Volt. Al. – set-up of the low voltage signal at input B. If the measured voltage at input B falls off of the set value, the alert will become activated.

C Low Volt. Al. – set-up of the low voltage signal at input C. If the measured voltage at input C falls off of the set value, the alert will become activated.

3.5 SERVICE

MU-3 MENU: *SERVICE* – by pressing button D (arrow down) you will change to depiction of the firmware version and to renewal of the sensor default setting.

Factory Defaults – by simultaneous pressing of arrows R and L (right and left) the factory settings of the MU-3 are loaded.

MU-3 v. xx.xx ID xxxxx:xxxxx – product marking with firmware version and series number (ID).

4. Technical Specification of the MU-3

Technical Data	MU-3
Dimensions	36 x 20 x 5 mm
Weight incl. wiring	18 g
Range of measured data	A: 0-9,9V B,C: 0-20V
Measurement accuracy	1%
Temperature range of operation	- 10°C till + 85° C
Supply voltage	3,5 – 8,4V
Current consumption	8 mA

5. Firmware Update

The equipment firmware may be updated by a PC via the **converter unit JETI USB Adapter**. In the USB Adapter instructions you will find a description of the installation procedure of the USB Adapter controller as well as the update program.

6. Warranty

The MU-3 carries a warranty valid 24 months from the date of purchase under the condition that it has been operated as per these instructions and there is no mechanical damage. All servicing and repairs during and after the warranty period is carried out by the manufacturer.

The manufacturer hopes you enjoy this product: JETI model s.r.o. Příbor, www.jetimodel.cz

7. Menu Diagram of MU-3

MU-3 A/B/C input
5.4/11.4/19.8V

MU-3 MENU
ACTUAL VAL ↓

A / B / C
5.4/11.4/19.8V

Particular voltages

↑ *MU-3 MENU*
MIN/MAX ↓

U MIN/MAX
A# 3.8/5.5V

U MIN/MAX
B# 10.8/12.5V

U MIN/MAX
C# 15.8/19.9V

Maximal Voltage
Minimal Voltage

Maximal Voltage
Minimal Voltage

Maximal Voltage
Minimal Voltage

↑ *MU-3 MENU*
SETTING ↓

Erase data
Press ←┘

Start trigger
< 5.0 V >

Trig. lev. 5.0V
on A input >

Beep Alarm A
< W >

Beep Alarm B
< X >

Beep Alarm C
< Y >

Beep Error
< E >

Manual erase data

A:0-9.9V
B,C:0-20V

A-C input

A-Y letters
step 1 letter

A-Y letters
step 1 letter

A-Y letters
step 1 letter

OFF;
A-Y letters
step 1 letter

↑ *MU-3 MENU*
ALARMS ↓

A Low volt. Al.
< OFF >

B Low volt. Al.
< OFF >

C Low volt. Al.
< OFF >

0-9.9V
step 0.1V

0-20.0V
step 0.1V

0-20.0V
step 0.1V

↑ *MU-3 MENU*
SERVICE ↓

PresetToSetup←┘
Factory Defaults

MU-3 v. XX.XX
ID XXXXX:XXXXX