CE

INSTRUCTION MANUAL

HALL EFFECT RPM SENSOR

MRPM HALL
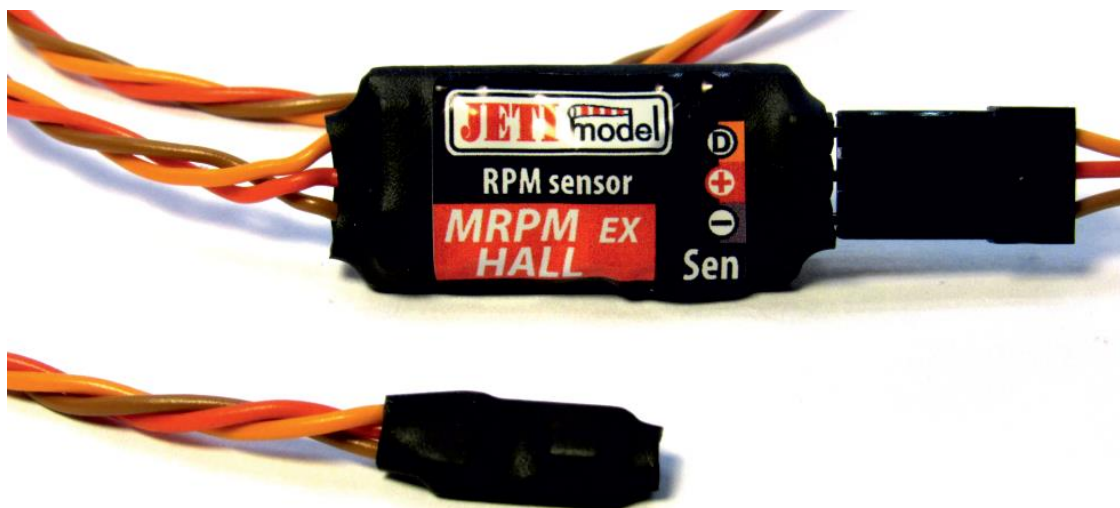
Obsah

1. Introduction

The Jeti Duplex MRPM HALL sensor provides RPM and power level readings using magnetic Hall Effect and rare earth magnet. The MRPM HALL sensor measures the rotation speed and performance of the rotating surface and provides warnings when pre-set parameters are exceeded. All information is transmitted in real time using Jeti Duplex telemetry system.

The new MRPM HALL sensor communicates wirelessly, bi-directionally with the transmitter, not only allowing data to be sent from the receiver to the transmitter but also allowing the receiver in the model to transmit data back to the sensor. In this manner, telemetric data obtained during operation is transferred in real-time and the current state of the system can be presented on the LCD screen of the JetiBox Profi or any of the Jeti DC/DS line of transmitters. The new MRPM2 has been equipped with two independent ports for hall sensor connection. If needed both can be used for attaching magnetic hall sensors and used for measuring two RPM sets individually.
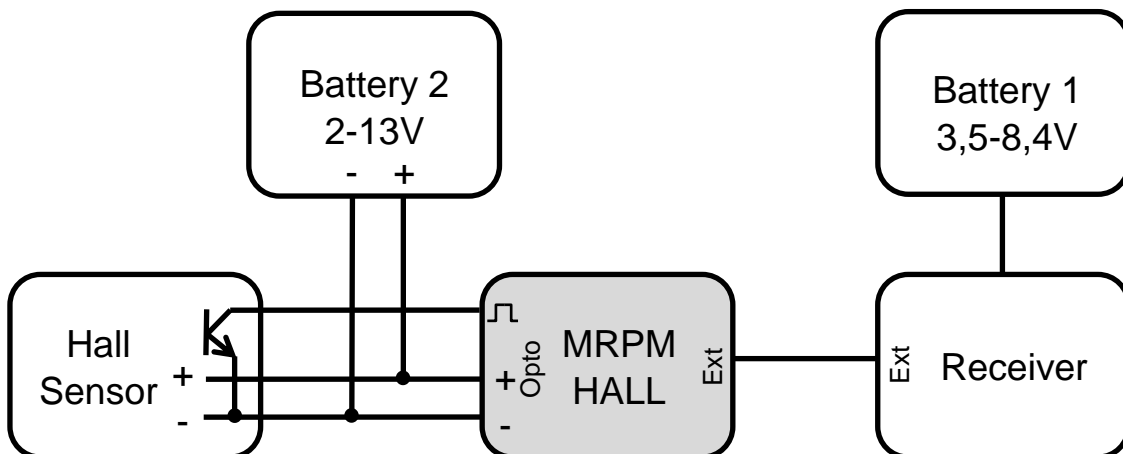
2. Hall Sensor Connection

Supplied hall sensor uses standard servo type connector. MRPM HALL sensor uses two inputs, standard configuration can be seen at the (1a) picture. And the OPTO port, that is optically separated from the control system and requires separate power supply (1b).

Pic.1a)
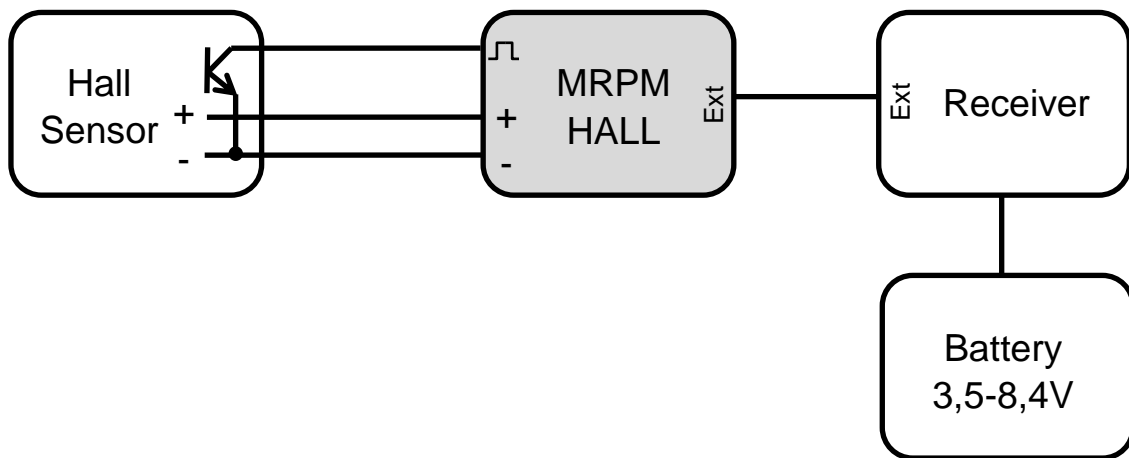
Pic.1b)

Connection with the receiver is done using the EXT cable from the MRPM HALL sensor. If any of the parameters need to be changed, the sensor needs to be connected in bi-directional configuration using EXT port and set for EX Bus configuration.

If the MRPM HALL uses two independent sensors for RPM, both can be powered from the same receiver power source.

2.1 JetiBox Terminal Connection

1) The three-wire cable with JR connector may be connected directly to the Jeti Box using the Pulse/+/- socket. A power source of 3.5-8.4V must be supplied via the Jeti Box using +/- socket to power the module. In this configuration, the RPM HALL sensor can operate as a stand-alone mobile unit, providing data directly on the screen of the Jeti Box.
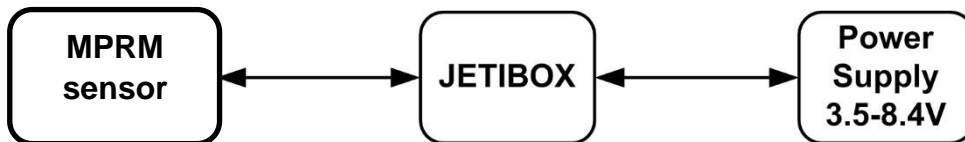
2) Connect the three-wire cable with JR connector directly to the EXT socket on the Duplex receiver. In this configuration the sensor is powered via the receiver. Switching on the transmitter and receiver allows the sensor to be configured correctly for your power system and alarm settings definition.
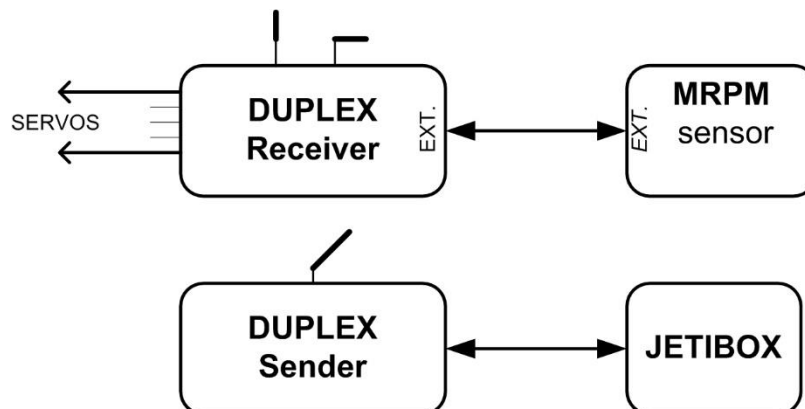
2.2 Min/Max Initialization Setup
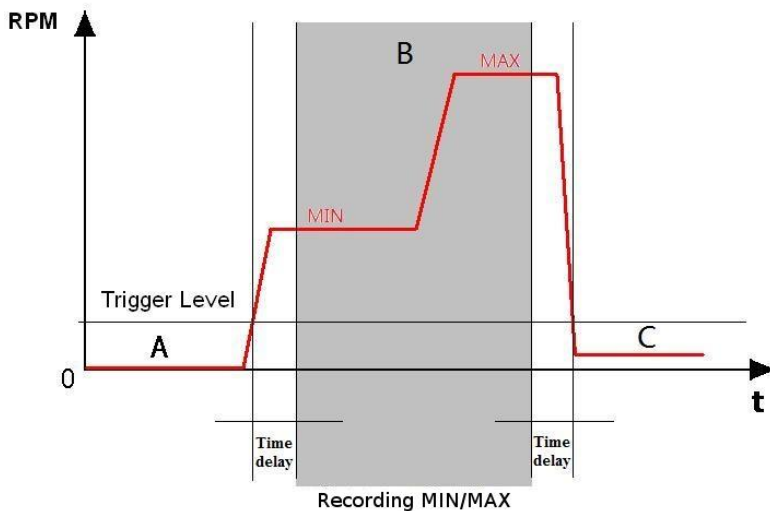
A - The currently measured speed value has not exceeded the minimum threshold. The measured values of Min/Max Power/RPM correspond to the previous session.

B - The currently measured speed value has exceeded the minimum threshold value for a time greater than the configured time delay. The previously measured values for Min/Max Power/RPM will be erased and replaced with the current measurements.

C - The currently measured speed value has remained below the minimum threshold for a time longer than the configured time delay. No measurements are recorded.

3. JetiBox Configuration and Data Display

For parameter settings and real-time data viewing, the Jeti Box terminal must be used. The first line on the LCD screen is the identification of the sensor and the second line provides a value indicating RPM of the Standard (N) and/or Opto (O) input. By pressing down on the R (right) button for a long period, a fast deletion of all measured parameters can be triggered. Fast deletion is indicated in the first line of the display by an asterix „*".

Pressing the D 'Down' button of the JetiBox accesses the menu of the RPM HALL sensor.

- MRPMH MENU: *Actual Value* –Pressing the down button selects between displaying the following actual measured values:

  N-Revol-Power – Shows the actual RPM and power output (W) for standard port
  O-Revol-Power – Shows the actual RPM and power output (W) for OPTO port

- MRPMH MENU: *MIN / MAX* - Navigating the menu of the Jeti Box allows the minimum and maximum extremes of RPM and power output to be viewed. These values are automatically erased from the sensor when the configured trigger level is next exceeded. Alternatively the values can be erased manually using the the "Setting -> Reset Min/Max" option.

  N-MIN/MAX RPM, O-MIN/MAX RPM – Shows the minimum and maximum RPM of the propeller
  N-MIN/MAX Power, O-MIN/MAX Power – Shows the minimum and maximum power output of the propeller

- MRPMH MENU: *Setting* – Using the 'down' button of the Jeti Box, the following options can be accessed within this menu:

Erase data – By simultaneously pressing the left and right arrow buttons you can reset min/max values

N-BeepHigh Al, O-BeepHigh Al – Set the Morse code letter to represent alarm from the transmitter module, when configured RPM or power output limits are exceeded

N-BeepLow Al, O-BeepLow Al – Set the Morse code letter to represent alarm from the transmitter module, when configured RPM or power output limits are exceeded

N-n100W, O-n100W – Allows setting of the N-100 value for your propeller. This metric is defined as the speed of the propeller at 100 Watts power and can usually be obtained from your propeller manufacturer. For proper operation of the sensor, this value must be entered appropriately according to your propeller. Common values can be found at www.jetimodel.com

N-Numb.of bl., O-Numb.of bl. – Sets the number of blades of your propeller

N-TriggerLevel, O-TriggerLevel – Sets the threshold RPM at which point maximum/minimum values should be recorded by the sensor. If this value is set to zero, then recording will begin immediately upon connection of the sensor to a power supply and any previously recorded values will be erased.

N-Time delay, O-Time delay – Set a time delay between threshold values at which point recording is set to begin and the actual beginning of recording

Menu pos. 1, Menu pos. 2 – sets the JETIBOX main screen parameters in the bottom row (Options: N-revolution/O- revolution /N-power/O- power = RN,RO,WN,WO)

- MRPMH MENU: ***ALARMS*** – Using the down button, it is possible to change settings of individual alarms. If an individual parameter is exceeded this will be displayed on the second line of the main screen and the alarm will be triggered.
  The first tone of the alarm is generic and the second tone represents the configured letter of the Morse code for the corresponding alarm. If the alarm is set to off, the alarm is disabled.

N-AlarmHighRPM, O-AlarmHighRPM – Setting of the signal for the alarm to be sounded when the configured RPM threshold is exceeded.

N-AlarmLow RPM, O-AlarmLow RPM – Setting of the signal for the alarm to be sounded when the RPM falls below the minimum threshold.

- MRPMH MENU: ***SERVICE*** – by pressing button D (arrow down) you will access production information, firmware version and activate the factory reset.

Factory Defaults – by simultaneous pressing of arrows R and L (right and left) the factory settings of the MRPM HALL are loaded

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

4. DC/DS Transmitter Configuration

The MRPM HALL can be configured using DC/DS transmitter via the Device Explorer menu. It is necessary to follow these rules for configuring the MRPM HALL via transmitter:

- Receiver firmware version Duplex 3.24 and newer (with setting Output mode->EX Bus)
- The receiver must be connected to the MRPM HALL via EX Bus
- Transmitter firmware version 3.02 and newer + the device profile (MRPM HALL.bin) recorded in the Devices directory on the SD card

When everything is properly connected and configured, the MRPM HALL item appears in the Device Explorer menu. Entering the sensor menu lets you access to the configuration.
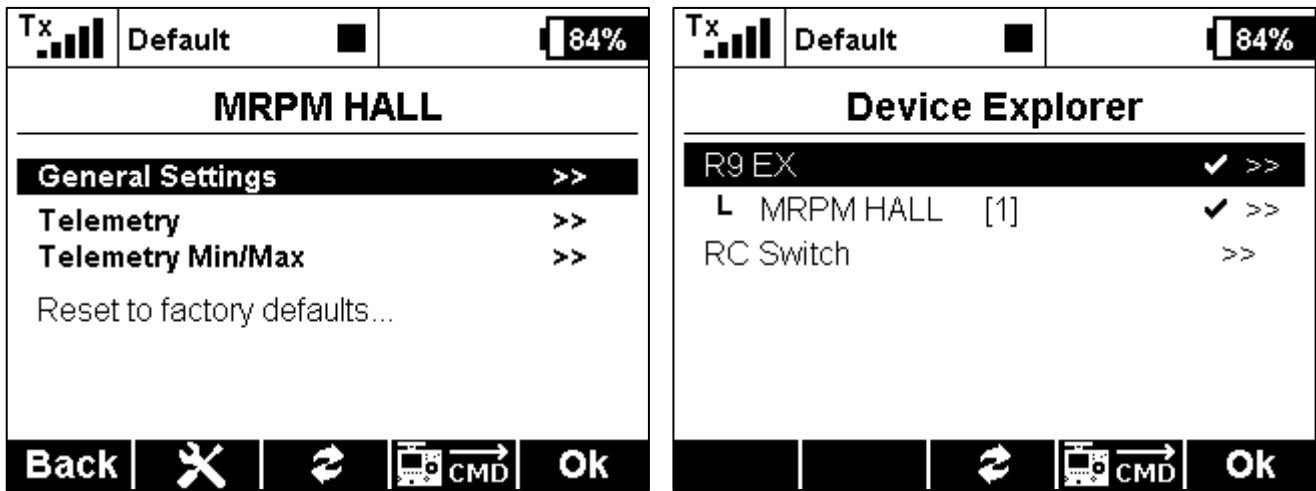
Screenshot 1: Device Explorer (MRPM HALL)

- ***Reset to factory settings*** - loading the default settings of the MRPM HALL

4.1. Main Parameter Setup for Standard and Opto Inputs

- ***n100W*** - Allows setting of the N-100 value for your propeller. This metric is defined as the speed of the propeller at 100 Watts power and can usually be obtained from your propeller manufacturer. For proper operation of the sensor, this value must be entered appropriately according to your propeller. Common values can be found at www.jetimodel.com
- ***Number of blades*** – Set the number of blades of your propeller.
  Trigger level - Sets the threshold RPM at which point maximum/minimum values should be recorded by the sensor. If this value is set to zero, then recording will begin immediately upon connection of the sensor to a power supply and any previously recorded values will be erased.
- ***Time delay*** - Set a time delay between threshold values at which recording begins and the actual beginning of the recording.
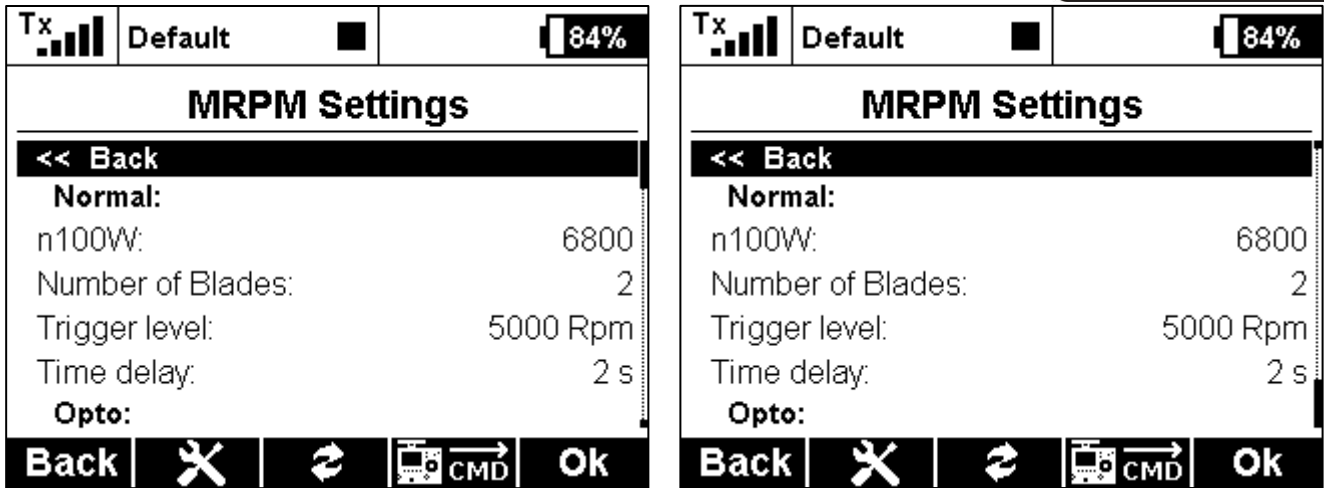
Screenshot 2: Device explorer: Settings

4.2. Telemetry

- *Revolution* – The revolutions per minute of the propeller
- *Power propeller* – The actual power of the propeller in watts
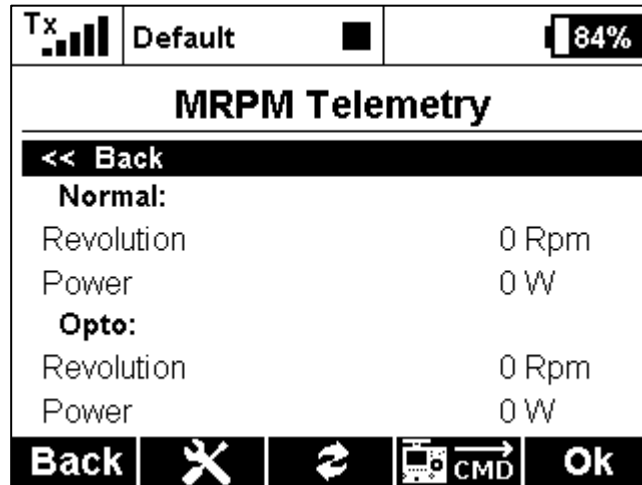
Screenshot 3: Telemetry

4.3. Telemetry Min/Max

- *Clear Min/Max switch* - here you can assign a control on the DC/DS transmitter which clears the recorded minimum/maximum values of revolution and power of the MRPM HALL.
- *Clear now* - allows you to immediately clear the recorded minimum/maximum values in the MRPM HALL.
- *Minimum Revolution* - the data of minimum revolution of the motor
- *Maximum Revolution* - the data of maximum revolution of the motor
- *Minimum Power* - the data of minimum power of the motor
- *Maximum Power* - the data of maximum power of the motor
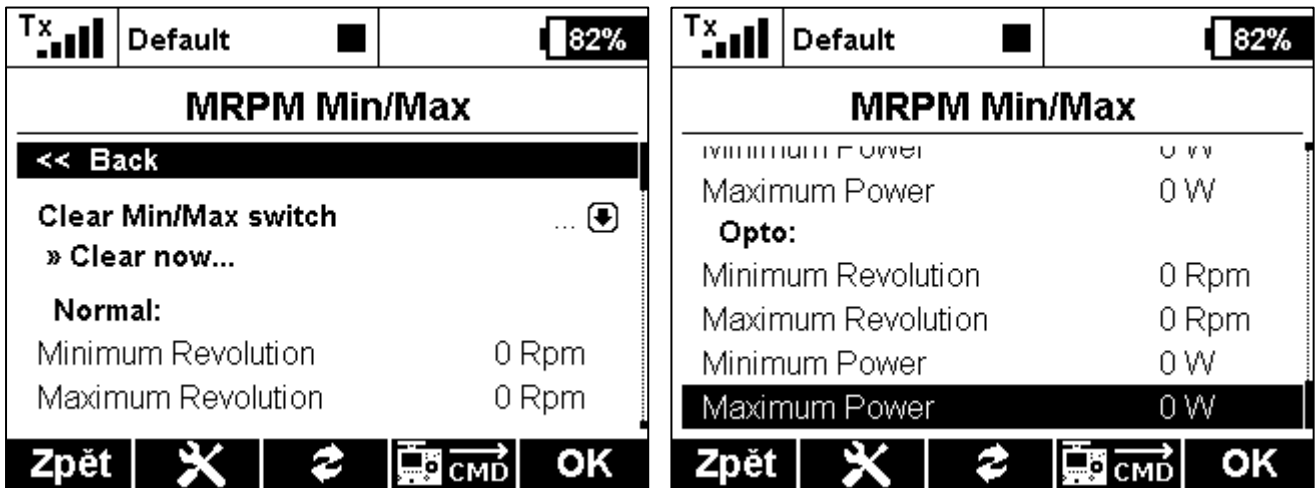
Screenshot 4: Telemetry Min/Max

5. Firmware update

MRPM HALL allows firmware update via a PC. The update is performed using the JETI USBa.

- Procedure:
  - o Find the program to update to the latest firmware on the manufacturer's website under "downloads". Download it to your PC.
  - o Connect the USB adapter to your computer. The procedure of installing drivers for the USB adapter is to be found in the user manual for the USB adapter.
  - o Start the firmware update program on your PC.
  - o Connect the USB adapter via three-wire cable to the EXT of the MRPM HALL (black JR connector).
  - o When connected, the update of the device starts.

6. Technical data

Technical data	**MRPM HALL**
Measurement accuracy	10 rpm
Power supply range	3,5-8,4V
Power supply of opt	2-13V
Power consumption	15mA
Weight	5g
Dimensions	12,5x25x5,5 mm
Operating temperature range	-10°C÷85°C

Technical data	**Hall Sensor Included**
Power supply range	3-24V
Weight	2,5g
Dimensions	6x3x12 mm
Operating temperature range	-40°C÷125°C

7. 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 or your Jeti dealer.

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

8. Diagram menu of the JETIBOX

```
*MRPMH*
  0RO      0RN
     ↕
*MRPMH MENU*  ←→  *MRPMH MENU*  ←→  *MRPMH MENU*  ←→  *MRPMH MENU*  ←→  *MRPMH MENU*
ACTUAL VALUES ->    <- MIN/MAX ->      <- SETTING ->      <- ALARMS ->        <- SERVIS
     ↓                   ↓                   ↓                   ↓                   ↓
N-Revol-Power       N- MIN/MAX RPM      Erase data          N-AlarmHighRPM      Stiskem vyber <-->
  0RPM    0W          0/        0       Press <- ->           Off ->            VychoziNastaveni
     ↓                   ↓                   ↓                   ↓                   ↓
O-Revol-Power       N- MIN/MAX POWER    N-BeepHigh Al       O-AlarmHighRPM      MRPM2  V.0.00
  0RPM    0W          0/        0        <-    H    ->         Off ->           ID XXXXX:XXXXX
                         ↓                   ↓                   ↓
                    O- MIN/MAX RPM      O-BeepHigh Al       N-AlarmLow RPM
                      0/        0        <-    H    ->         Off ->
                         ↓                   ↓                   ↓
                    O- MIN/MAX POWER    N-BeepLow Al        O-AlarmLow RPM
                      0/        0        <-    L    ->         Off ->
                                             ↓
                                        O-BeepLow Al
                                         <-    L    ->
                                             ↓
                                        N-n100W
                                         <-  6800  ->
                                             ↓
                                        O-n100W
                                         <-  6800  ->
                                             ↓
                                        N-Numb.of bl.
                                         <-    2    ->
                                             ↓
                                        O-Numb.of bl.
                                         <-    2    ->
                                             ↓
                                        N-TriggerLevel
                                         <-  5000  ->
                                             ↓
                                        O-TriggerLevel
                                         <-  5000  ->
                                             ↓
                                        N-Time delay
                                         <-    2s    ->
                                             ↓
                                        O-Time delay
                                         <-    2s    ->
                                             ↓
                                        Menu pos. 1
                                         <-   RO   ->
                                             ↓
                                        Menu pos. 2
                                           RN   ->
```