



# **Rudder Pedals T-Rudder**

## **Installation and setup manual**

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# Content

- Introduction ..... 3**
  
- Pedals installation ..... 3**
  - 1. General info ..... 3
  - 2. Order of assembly ..... 4
  
- Support shaft height setup ..... 11**
  - 1. General info ..... 11
  - 2. Order of setup ..... 11
  
- Pedals connection ..... 12**
  
- Pedals axis setup ..... 12**
  - 1. General info ..... 12
  - 2. Axis type ..... 13
  - 3. Axis calibration ..... 13
  - 4. Axis parameters setup ..... 14
  - 5. Response curves ..... 14
  
- Variants of pedals steadiness support ..... 15**



## Introduction

T-Rudder pedals let the virtual pilot to control the rudder just like a real pilot. This device has not onboard controller and must be connected to the one of the following devices:

- ▼ Cobra-Z joystick,
- ▼ Tiny Box external controller,
- ▼ ThrottleBox external controller.

Standard UTP cable with two 8 position connectors 8P8C (often called as RJ45) at each end is used for pedals connecting.



The same cables are used for connections between many kinds of devices, such as routers. ADSL modems etc. Do not even try to connect pedals to any device with 8P8C socket! If you connect pedals to any device except above mentioned it will be damaged.

This manual contains recommendations how to assembly and set up pedals.

## Pedals installation

### 1. General info

T-Rudder pedals are delivered partially disassembled. Delivery set is shown on fig. 1.1.

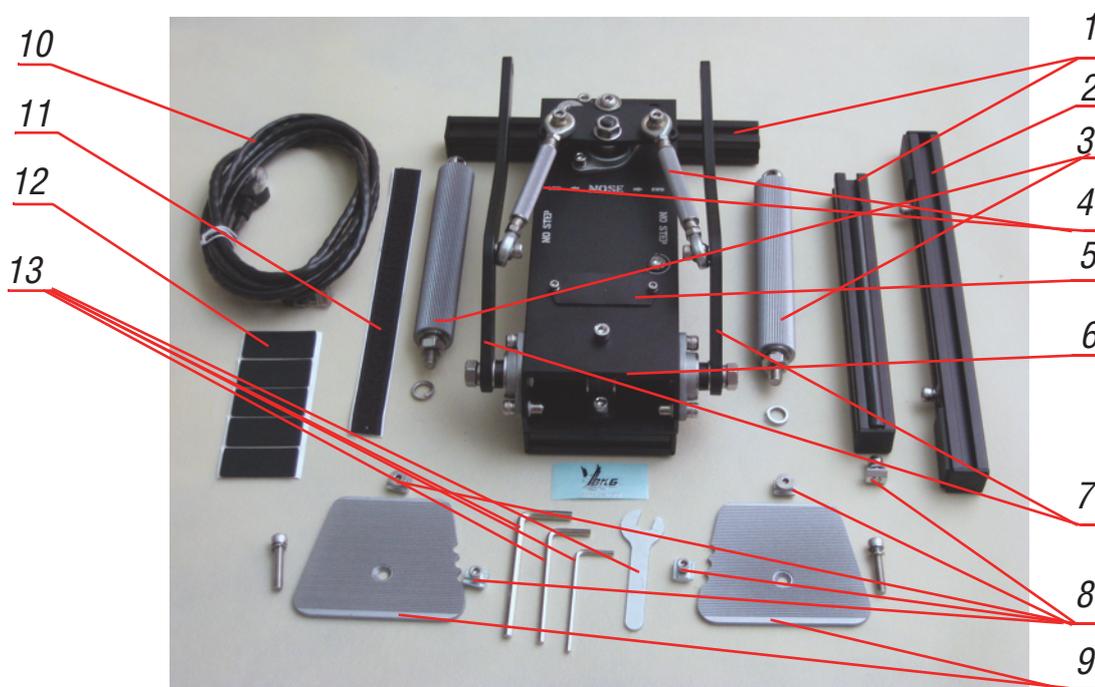


Рис. 1.1.

Табл. 1.1.

Номер	Наименование	Примечание
1	Back legs	
2	Foreleg	
3	Support shaft	
4	Syncronizer	
5	False panel	
6	Case	
7	Force lever	
8	Shaped nut with screw	
9	Foot bearing	
10	UTP cable	
11	Velcro strip	For fixation on the pile surfaces.
12	Silicon legs	For installation on the firm and smooth surfaces.
13	Tool set.	

The foreleg is temporary replaced with one of the back legs.

## 2. Order of assembly

You must execute the following operations to assembly the pedals.

1. Unscrew the back leg from the case (fig. 2.2) and take it away.

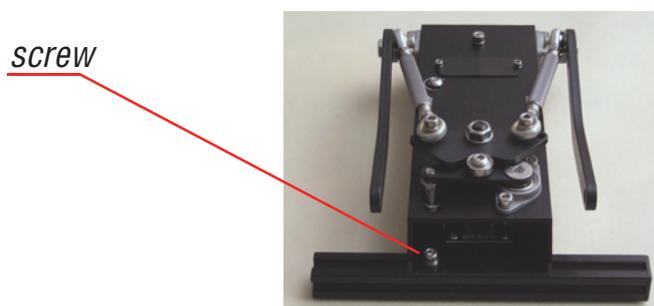


Fig. 2.2.

2. Unscrew false panel from the case (fig. 2.3).

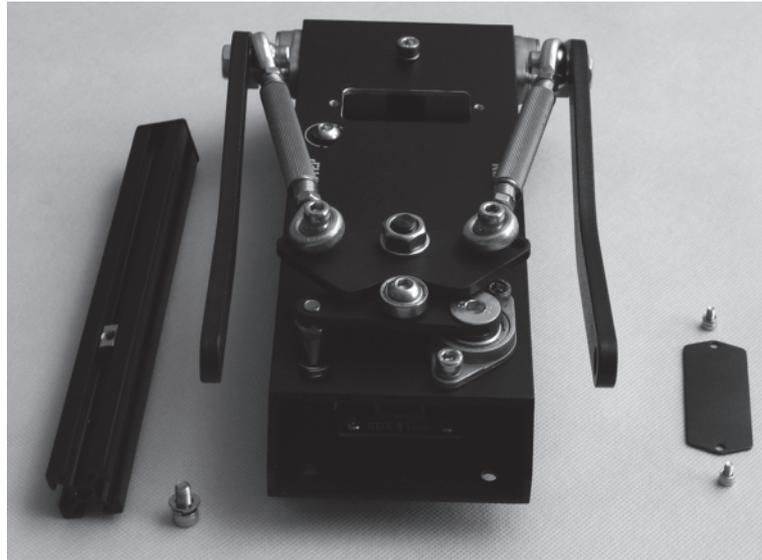


Fig. 2.3.

3. Prepare back legs for foot bearing installation:

3.1. insert two shaped nuts into internal housing of the leg, M5 nut closer to end cap, M4 one closer to the center.

3.2. drive a M4 screw into the nut to fix them both in an extreme position (fig. 2.4).



Fig. 2.4.

4. Attach legs to the case.

4.1. Insert hex tool into the screw head, put spring and plain washers on the screw body (fig. 2.5).

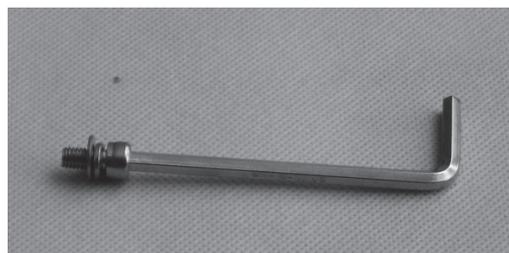


Fig. 2.5.

The back leg is attached to the case by two screws. Three adjustment holes make possible to set the angle between the case and the leg thus providing pedal setup for pilot foot size. The screw, driven into the fourth hole, is using as an axis. Before the leg is fixed in a chosen position you can rotate it around this screw.

4.2. Choose an appropriate adjustment hole and insert the screw with washers into it (fig. 2.6).

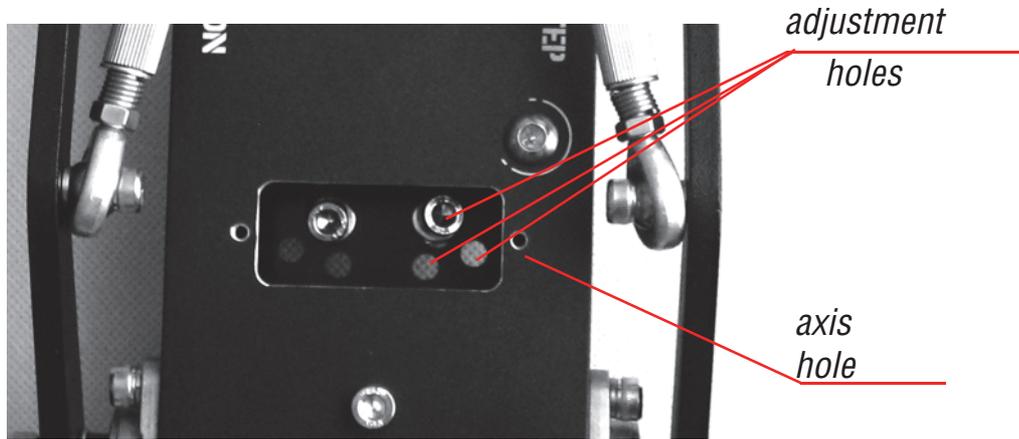


Fig. 2.6.

4.3. Engage shaped nuts on the screws from the outer side of the case (fig. 2.7)

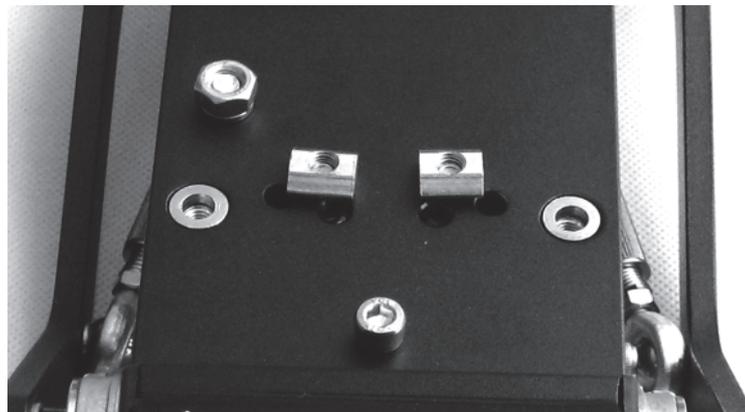


Fig. 2.7.

4.4. Insert engaged shaped nuts into internal housing of the leg (fig. 2.8).

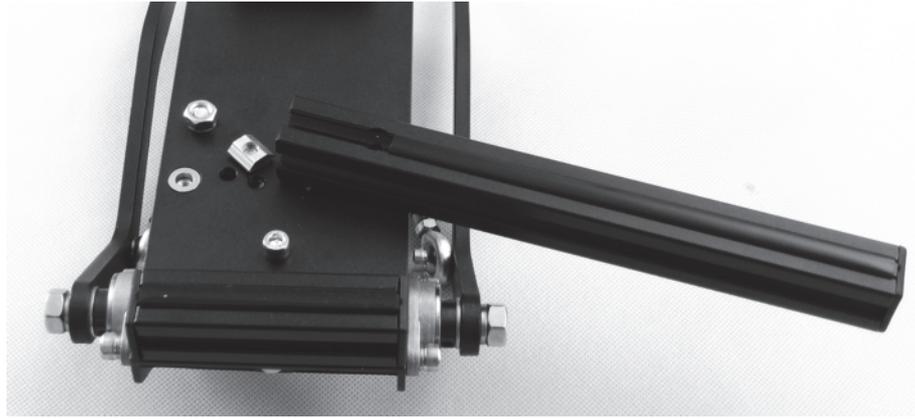


Fig. 2.8.

- 4.5. Screw the back legs to a case using M5x25 screw with spring washer. Drive the screws into threaded rivet nuts of the axis holes from the external side of the case (fig. 2.9).

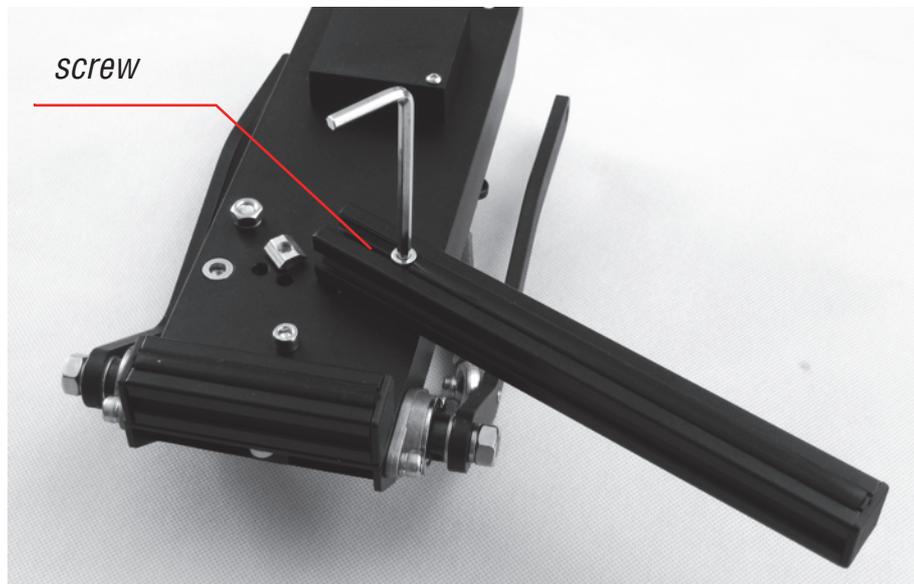


Fig. 2.9.

- 4.6. Check the correspondence between the back legs position and your foot size. Change the angle between the leg and the case using another adjustment hole if needed.
- 4.7. Tighten the screws. An example of back legs installation is shown on fig. 2.10.

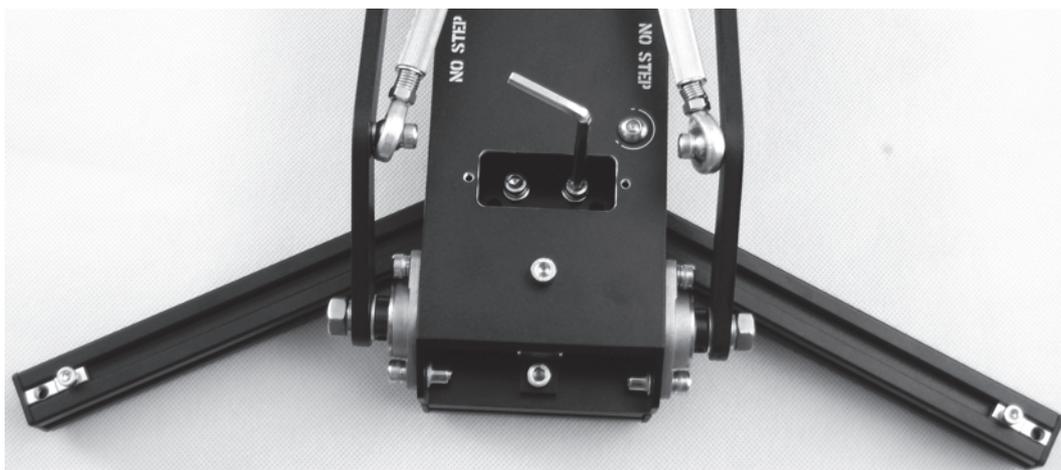


Fig. 2.10.

4.8. Install false panel to its place.

5. Install foreleg.

5.1. Drive screws with washers out of shaped nuts (fig. 2.11).

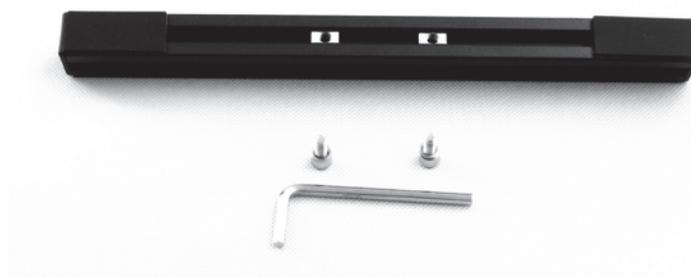


Fig. 2.11.

5.2. Insert unscrewed screws into the holes of the case (fig. 2.12).



Fig. 2.12.

5.3. Engage screws with shaped nuts of the foreleg (fig. 2.13).



Fig. 2.13.

5.4. Align the leg and the forward case side centers (fig. 2.14)

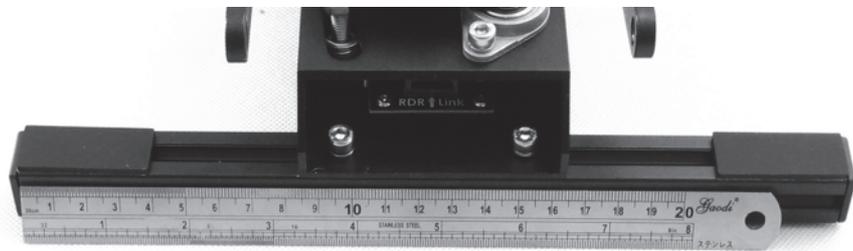


Fig. 2.14.

5.5. Tighten the screws.

6. Install foot bearings.

6.1. Unfix the M4 screw so you can move shaped nuts along the leg freely.

6.2. Engage the M5 screw to the empty shaped nut (fig. 2.15).

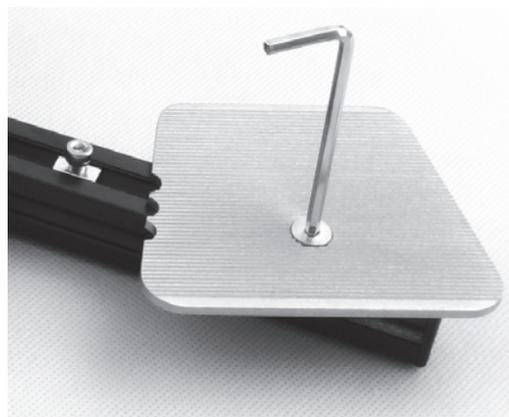


Fig. 2.15.

- 6.3. Choose one of the notches on the side edge of the foot bearing in a correspondense of your foot size and thus the distance between fot bearing and the support shaft (fig. 2.16).

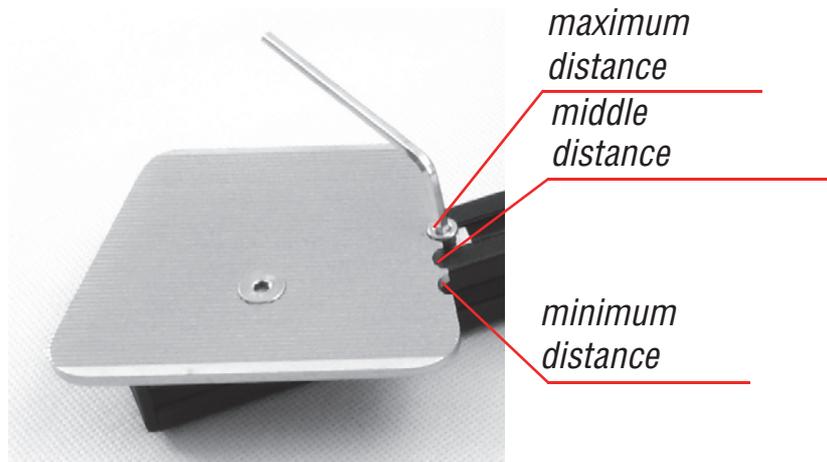


Fig. 2.16.



The leading edge of the foot bearing must be parallel to the foreleg .

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- 6.4. Fix the foot bearing using M4 screw with the shaped nut.
7. Install support shafts.
  - 7.1. Put spring washer on the shaft screw body.
  - 7.2. Drive support shaft screw into the force lever hole and tighten it using hex tool (fig. 2.17) or screwdriver.

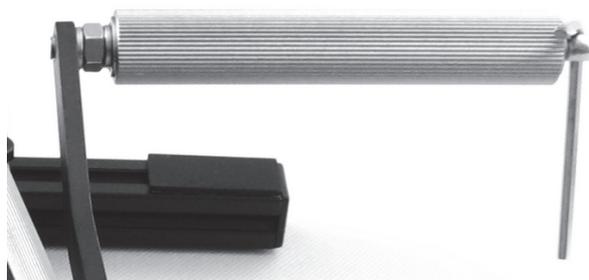


Fig. 2.17.

T-Rudder pedals installation is completed.

## Support shaft height setup

### 1. General info

Usability of pedals is provided by support shaft height. You must rotate sincronizers to set up this height. The height of both shafts in neutral rudder position must be the same.

### 2. Order of setup

To set up support shaft height, execute the following operations.

1. Unclench synchronizer springs, turning off compressing nuts by included wrench (fig. 2.1).



Fig. 2.1.

2. Rotate ribbed tube of the synchronizer to set appropriate support shaft height.



Do not install support shaft too high! In this case the parts of pedals construction will be loaded too much and can be destroyed. Rotating ribbed tube do not unscrew threaded rod end of the bearings from it!

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3. Ensure that the height is in acceptance limits.
  - 3.1. Pull down support shaft till it touches the foreleg damper.
  - 3.2. Look at the frame in the case (fig. 2.2). The gap between the body of the spring loaded screw and frame edge must be at least some millimeters.

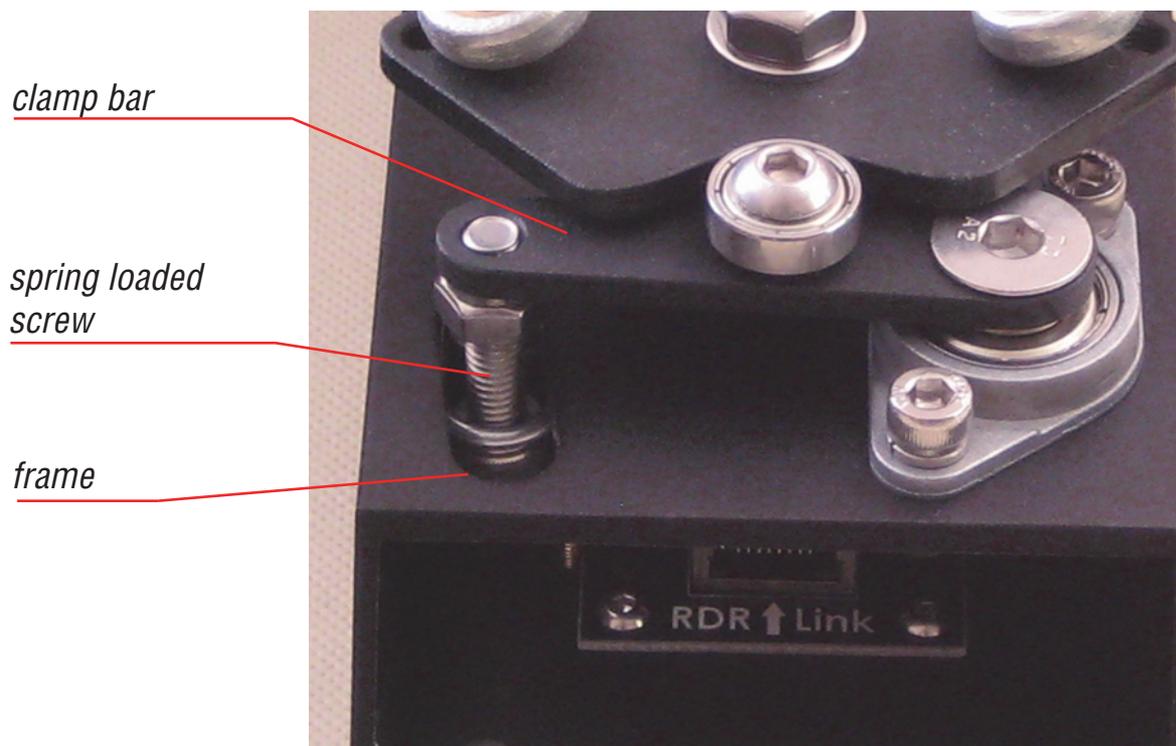


Fig. 2.2.

4. Tighten the nuts, thus compressing the springs to solid state.
5. Set up the height of the next support shaft by the same manner.

## Pedals connection

Use included patch cord to connect the pedals to any controller. Plug one end of the cable into **RDR Link** socket on the fore side of the case of the pedals. The other end plug into **RDR Link** socket of Tiny Box controller or if you use ThrottleBox controller to **Pedals** socket. These controllers connect to USB port.

## Pedals axis setup

### 1. General info

MARS sensor of the pedals is a **Rx** axis for Tiny Box controller. You must set up the parameters of this axis using configuration program. Use this link <http://ftp.vkb-sim.pro/Programms/> to download this program.

This manual describes only few opportunities of this program. Detailed description you can find in *VKB NJoy32 controller configurator User manual*. Use link <http://ftp.vkb-sim.pro/Documentations/> to download file *controller.pdf* (Only Russian language now).

## 2. Axis type

MARS sensor is a digital device. You must properly set its type. Activate **Physical Axes** tab (fig. 2.1).

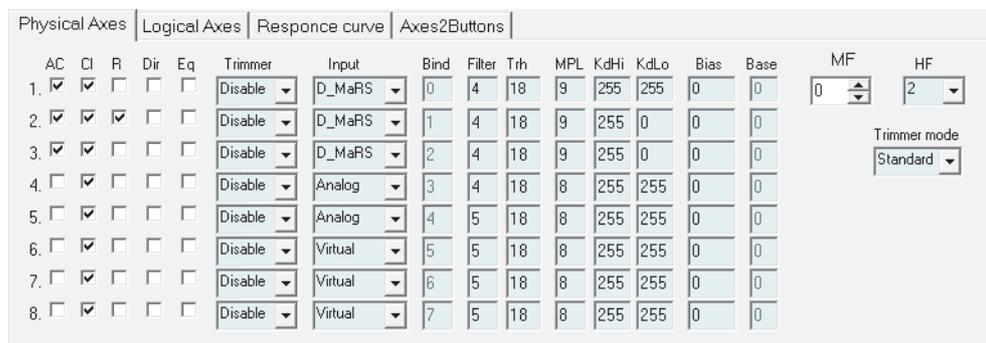


Fig. 2.1.

Choose **D\_MaRS** value from **Input** combobox. This choice corresponds to digital MARS sensor. Check **AC** (Autocalibration) option. It allows automatic calibration of the pedals with every connection.

## 3. Axis calibration

Checked **AC** option generally provides automatic calibration of the axis. For properly autocalibration pedals must be in neutral position. If it is needed you can calibrate pedals manually.



It is not recommended to calibrate pedals by Windows tools. If you have calibrated the pedals in such manner, you must run DXTweak program to return them to initial state. Push **Device Defaults** button and then **Apply** button.



If any joystick with more than six axes is connected to a computer, DXTweak will not work properly. In this case disconnect such joysticks.

To calibrate pedals execute the following operations.

1. Activate **Physical Axis** tab and check **CI** option for calibrated axis.
2. Activate **Tools** tab.
3. Push **Start Calibr** button.
4. Move pedals between extreme positions for some times.
5. Push **End Calibr** button.

You may push **Cancel Calibr** button to reject calibration and do not save its results. When you complete calibration check its results using, for example, DXTweak program.

If when the pedal is in extreme position but marker is not on range limit, it is recommended to increase the support shaft height (see “Support shaft height setup” on page 11). If it is impossible, set **Mpl** value equal to 10.

#### 4. Axis parameters setup

Set deadzones of the pedal axis using **DzLo** field (deadzone in the center) and **DzHi** field (deadzones on range limits).

Use **Df** option in the **Common** group to control the dynamic filtering of axis response. Set degree of filtration in **Filter** field and its treshhold in **Trh** field.

Set number of digits for the axis in the **Precis** field on the **Logical Axes** tab (fig. 4.2). Recommended value for digital sensor MARS is 10.

You can choose name of the axis from **HID Usage** combobox. It is needed, for example, If some connected devises have axis with the same names. Be carefully changing this parameters! In some cases the renamed axis will not work. If it happens restore initial axis name.

Physical Axes								Logical Axes								Response curve		Axes2Buttons	
En	Vs	In	Cn	5	6	7	8	ID	Size	Precis	HID Usage	Dz Lo	Dz Hi	Combine	Sign	#Axis	%	FA3 val	
1.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	2	11	Rx	30	50	Off	-	1	0	0	
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	2	10	Ry	100	70	Off	-	1	0	0	
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	2	10	Rz	100	70	Off	-	1	0	0	
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	2	10	Rx	0	0	Off	-	1	0	0	
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	2	10	Ry	0	0	Off	-	1	0	0	
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	2	10	Rz	0	0	Off	-	1	0	0	
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	2	10	Slider	0	0	Off	-	1	0	0	
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	2	10	Dial	0	0	Off	-	1	0	0	

Fig. 4.2.

#### 5. Response curves

Use the controls on the **Response curve** tab to set up response curve of the axis. Execute the following operations.

1. Select the string with number, corresponding to the calibrated axis. For T-Rudder pedals it is the first axis.
2. Move sliders to shape response curve. The values in the fields will correspond to sliders positions.

**Linked** option enables to link sliders positions. If the option is checked, when you move one slider, the adjacent ones will move too. Set the degree of dependence between sliders using **Q-Factor** slider.

3. If you want to apply custom shaped response curve to the axis, check **Eq** option on **Physical Axis** tab for it.

## **Variants of pedals steadiness support**

Rubber end caps of the legs provide pedals steadiness on most kinds of surfaces.

If you want to have additional steadiness on firm and smooth surfaces, such as parquet, laminated flooring board, marble etc., you can use included self-adhesive silicon legs. Fasten two silicon legs onto the foreleg, one onto every back legs and shortcross support.

To fix the pedals on the pile surfaces you can use included velcro strip. Extract rubber end caps from the foreleg and stick this strip on it.

