

# Central Box



**Central box 310**

**Central box 320**

**EN**

*User Manual*

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# Central Box



## 1 Introduction

English

The Central Box is a switchboard designed for the complete management of servos in a model with an emphasis on safety. The Central Box 320 has a unique design that provides overload protection at each servo output. The Central Box 310 offers maximal unreduced power for each servo (servo outputs do not have overload protection). The Central Box can manage up to two batteries and fully supports the JETI EX telemetry system. Up to three receivers with serial (PPM, EX Bus, S.BUS) output can be connected to the Central Box 310 and 320. With JETI DC/DS transmitter, the full potential of the Central Box can be used, such as an easy way to configure the Central Box, EX telemetry, and very fast servo response. Central Box 310 and 320 have a fully adjustable and very powerful BEC for powering all connected servos.

## 1.1 Attributes

### Central Box 310/320

- Central Box 310 comes as standard without protection fuses on all channels
  - Central Box 320 has overload protection on each channel (8 outputs for high-torque servos and 10 outputs for standard servos)
  - Support of DITEXTD telemetry servos
  - Possibility to connect up to 3 receivers with serial interface to (PPM, EX Bus, S.BUS)
  - Built-in Expander function for up to 4 sensors
  - Input for magnetic switch or RC switch
  - 2 x MPX battery input connectors
  - 100Hz mode of servo outputs (10ms period)
  - Supports EX telemetry (voltage, current, capacity, temperature measurement, ...)
  - Easy settings changes via DC/DS transmitter
  - Firmware updates by user
  - Suitable for use with standard or high voltage (HV) servos
  - Compact size for easy installation
  - Each output is individually configurable (channel assignment, trim, reverse, ATV)
-

## 2 Description

### 2.1 Central Box 310

- **Central Box 310** has 18 outputs for servos (support of DITEXTD telemetry servos).
  - **Each of the outputs** can be operated in these modes:
    - servo output (default setting)
    - Digital output
    - Digital input
    - Ditex
  - **Channels E2, E3 and E4** are also configurable to alternative uses, such as:
    - an input for telemetry sensor
    - EX Bus expander – used for connecting devices which support the EX Bus protocol (the Central Box, a sensor,...)
    - S.BUS Output (only channel E2)
- The **E4** slot is also used for the firmware update connection (using the USBa - USB adapter).
- **E1/R3** port can be configured for use as:
    - an output to connect a JETIBOX or Duplex EX receiver to configure the Central Box
    - an input for telemetry sensors
    - EX Bus expander - used for connecting devices which support the EX Bus protocol (the Central Box, a sensor,...)
    - an input for receiver (supports only EX Bus protocol)
  - **R1** - primary input for connecting receivers with serial output (EX bus, PPM or S.BUS)
  - **R2** - secondary input for connecting receivers with serial output (EX bus, PPM or S.BUS)
  - **SWITCH** - input is reserved for connecting a magnetic switch or RC switch (optional accessories).
  - **BATT1 and BATT2** – MPX connectors for connecting to power the servos and receivers connected to the Central Box.
-

## 2.2 Central Box 320

• **Central Box 320** has 18 outputs for servos (support of DITEX TD telemetry servos) with individual overload protection. Each of the outputs can be operated in these modes:

- servo output (default setting)
- Digital output
- Digital input
- DiteX

• **Channels 1 - 4 and 15 - 18** have protection for high-torque servo up to 60 Kg.cm.

• **Channels 5 - 14** have protection for standard servo up to 30 Kg.cm.

• **Channels E2, E3 and E4** are also configurable to alternative uses, such as:

- an input for telemetry sensor
- EX Bus expander – used for connecting devices which support the EX Bus protocol (the Central Box, a sensor,...)
- S.BUS Output (only channel E2)

The **E4 slot** is also used for the firmware update connection (using the USBa - USB adapter).

• **E1/R3** port can be configured for use as:

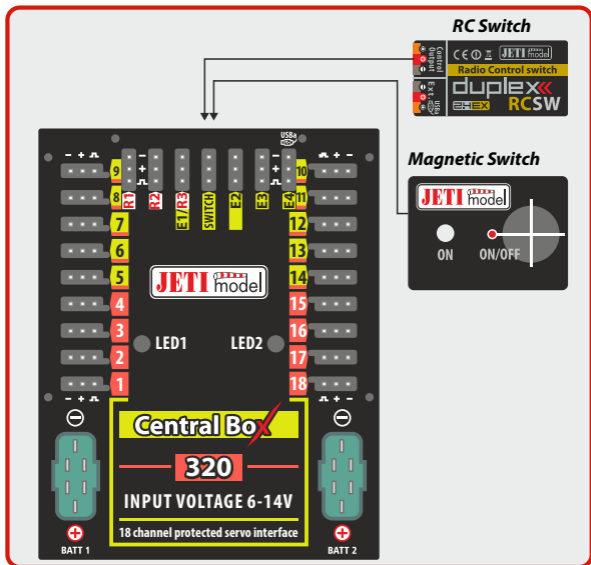
- an output to connect a JETIBOX or Duplex EX receiver to configure the Central Box
- an input for telemetry sensors
- EX Bus expander - used for connecting devices which support the EX Bus protocol (the Central Box, a sensor,...)
- an input for receiver (supports only EX Bus protocol)

• **R1** - primary input for connecting receivers with serial output (EX bus, PPM or S.BUS)

• **R2** - secondary input for connecting receivers with serial output (EX bus, PPM or S.BUS)

• **SWITCH** - input is reserved for connecting a magnetic switch or RC switch (optional accessories).

- **BATT1 and BATT2** – MPX connectors for connecting batteries to power the servos and receivers connected to the Central Box.

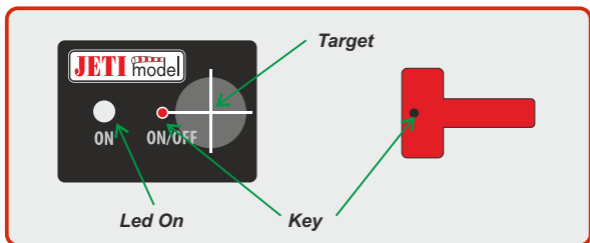


Pic. 1: Description Central Boxu 310/320



## 2.3 Magnetic switch

The magnetic switch is used to turn the CB 310/320 ON or OFF. The magnetic switch is connected to Central Box 310/320 by the interconnection cable from normal Master port on the magnetic switch to a slot labeled "SWITCH" on the Central Box 310/320. To turn on the Central Box using the magnetic switch it is necessary to hold the supplied magnet carrier (key) to the target so that the carrier (key) and the target on the magnetic switch are properly oriented (align the dots).



Green LED

**Fig. 2: Description of magnetic switch and the key**

- flashing LED signals proper detection of the magnet key
- steady LED signals "ON" state

When the magnet key is held to the target in the proper orientation, the green LED glow steadily after 1 second indicating that the electronic switch is turned "ON".

Switching „OFF" is done in a similar manner, when the magnet key is held to the target in the proper orientation, after 1 second, the green LED goes off and the system switches off.

If the switch is not plugged in the Central Box, the Central Box is switched "ON".

The system remembers whether it has been switched "ON" or „OFF". If the system is switched "ON" via the magnetic switch and then the power supply is disconnected, when the batteries are re-connected to the system automatically returns to the "ON" state. For safety

reasons, always switch the system off via magnetic switch before disconnecting the power batteries.

When turning "ON", connect the batteries first and then turn the system on via magnetic switch. Keep the same rule when switching off. First switch the system "OFF" via magnetic switch and then disconnect the batteries.

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## 3 Connection

The Central Box is connected to the power supply, receiver, servos, controller/controllers and eventually sensors. Please follow the subsequent general guidelines about proper connection of the Central Box and these other components.

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### 3.1 Power supply of Central Box 310/320

The Central Box 310/320 can only be powered from batteries connected to **BATT1 or BATT2**. When selecting the power supply it is necessary to follow the power requirements and the number of the servos you use. Batteries for power supply must be sufficiently large to prevent a decrease of the output voltage for servos when loaded (voltage depression) and to allow the overload protection function properly (Central Box 320).

Together, both power supply methods must be able to supply a 20A continuous and 120A peak current. To take full advantage of internal BEC we recommend to power the Central Box from three Lixx cells.

The power batteries are connected to the Central Box using MPX connectors. The Central Box allows up to two batteries to be connected. If the voltage of the batteries is the same, the power can be used from both batteries at the same time. This rule applies to the standard power supply. This means that the power battery voltage should be greater than the required BEC voltage setting. When the voltage of the batteries is different, the power is not shared and each pack is isolated from the other. This allows you to

safely use batteries of different capacity, number of cells, and chemistry type. If the power for the Central Box is provided only from one battery, it can be connected via either the BATT1 or BATT2 input.

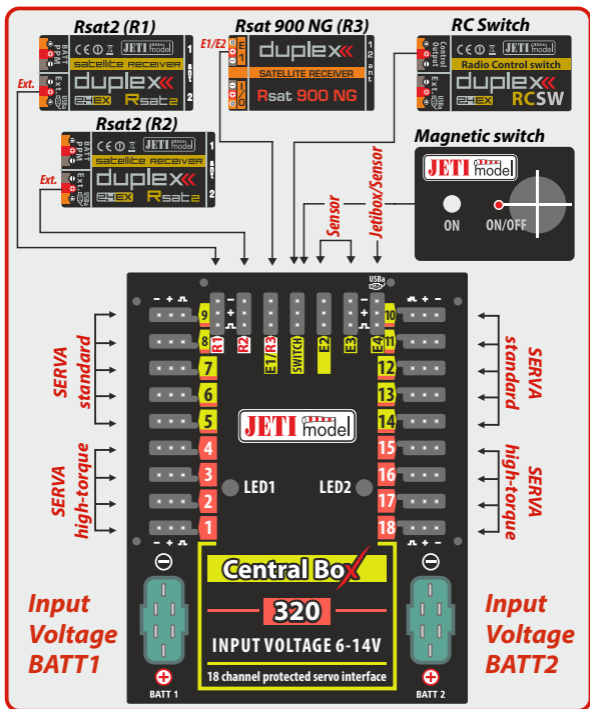


Fig. 3: Example of the Central Box powered for use with HIGH Voltage servos

The voltage stabilization of individual power sources can be deactivated. If the input battery voltage is lower than your settings, or if there is the same voltage on the BEC and on the input battery, then the voltage is not stabilized. For example if 6V are used and the U BEC is set to 8.4V, the voltage of the power supply output is max. 6V, which is not stabilized.

### 3.2 Overload protection of servos (Central Box 320)

The Central Box 320 has an overload protection circuit on every servo output. In case of an overload, the affected servo output is disconnected from the power supply while the remaining servo outputs are still powered.

The Central Box 320 has 8 outputs for high-torque servos and 10 outputs for standard servos. Servo outputs for high-torque servos use resettable fuses with the hold current 6A and trip current 12A (20°C). The other servo outputs use resettable fuses with the hold current 2.6A and trip current 5A (20°C). The hold current means the maximum current which will pass without tripping in 20°C. The trip current means the minimum current at which the fuse will trip in 20°C.

Be aware of the performance of the fuse is strongly temperature dependent. If the ambient temperature is high (more than 50°C) we recommend using the Central Box 310. The same recommendation applies for the mechanical connection of the several servos.

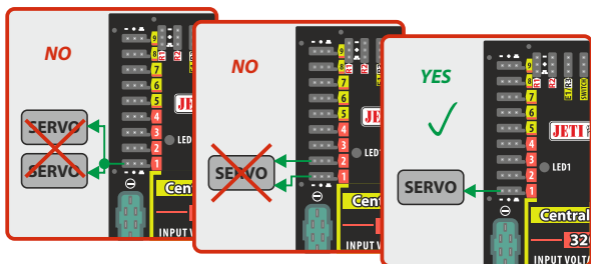


Fig. 4: Correct connection of servos to the Central Box

Central Box 320 generates an alarm if the temperature after the start is higher than 50°C. It is not recommended to operate with Central Box 320 while the initialization temperature is higher than 50°C. Otherwise, the performance of the fuses is degraded.

**Caution:**

***R1, R2, E1/R3, E2, E3 and E4 are not protected against overload. The maximum output current is 200mA for each output. Do not connect anything to the receivers other than the patch cable from the central box***

***It is not recommended:***

- to connect more Central Box outputs to one servo***
- to use a Y cable (connecting two servos to one output)***

### 3.3 Connecting Central Box – EX Bus

Receivers can be connected to the Central Box 310/320 using the **R1, R2 and E1/R3 inputs**.

Input **E1/R3** it's necessary to set to a Receiver.

The serial link of the receivers (Ext.) has to be set to EX Bus.

Configuring the Central Box 310/320 is done directly in the transmitter via EX Bus (Device Explorer).

When operating the Central Box 310/320 with DC/DS transmitter, it is recommended to use two/three receivers communicating with the transmitter in the wireless mode „Double path" and Enable 900 MHz Backup

The Central Box 310/320 can be configured in two ways:

- by JETIBOX connection (directly to the Central Box or wirelessly via the transmitter)
- by DC/DS transmitter via Device Explorer (EX Bus)

***„see. Pic5. "***

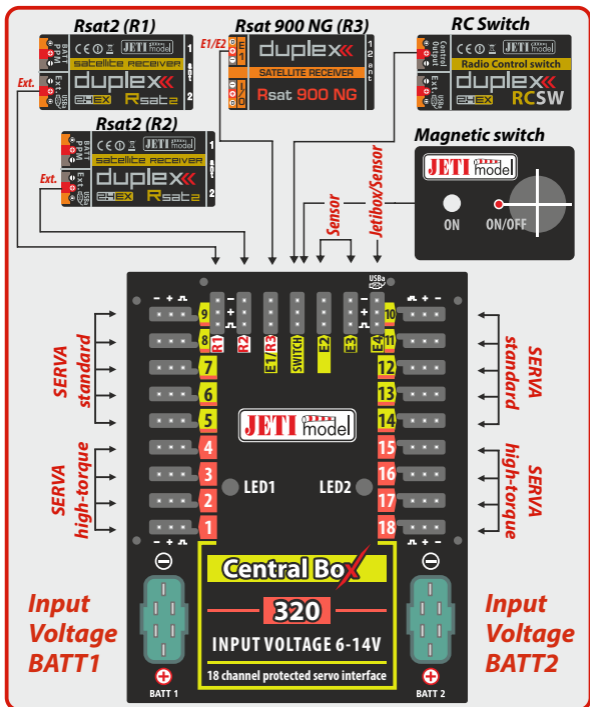


Fig. 5: Block diagram of Central Box 310/320 connection - EX Bus variant

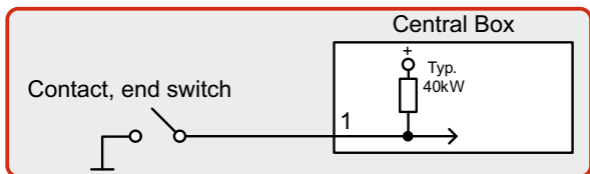
### 3.4 Alternative functions – digital input

Using the pin as an input is useful for simple feedback, without the use of telemetry sensors.

For example: if you attach limit switches to retractable gear, you can have feedback about its condition during the flight. The condition of the digital inputs is sent via EX telemetry and the user can assign sounds or alarms to the events.

Here the pin is configured as an input and its condition (disconnected / connected to the ground) is sent to the transmitter as other telemetry data from the sensors.

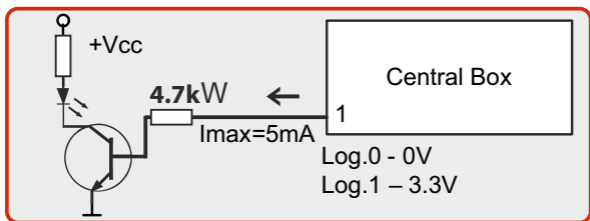
- Only keep the pin disconnected or connected to the common ground of the Central Box.
- Never connect to a different voltage. The pin works exclusively in Pull-up mode.



**Fig. 6 configuration of servo output pin as digital input**

### 3.5 Alternative functions – digital output

In the digital output mode, only the logical level 1 or 0 is generated on the port configured this way. The value of this output is reflecting the assigned output channel and its level. If the servo position of the specified receiver channel is lower than 0%, i.e. 1.5ms (the decision limit point can be set by the user using the „Trigger" parameter), the output is set to permanent log. 0 (i.e. 0V). If the servo position is higher than 0%, log. 1 (i.e. 3.3V) will be generated on the pin. In the digital output mode, no control servo pulses are generated for that particular pin. With digital outputs, the Central Box is even able to control devices that do not use servo impulse as their input, e.g. lights, sound generators, etc. different voltage. The pin works exclusively in Pull-up mode.



*Fig. 7 configuration of servo output pin as digital output*

### 3.6 Installing safety mechanism of connectors

Vibrations in models powered mainly by gasoline engines can lead to accidental disconnection of connectors. To prevent this phenomenon, there is the possibility of installing a safety mechanism to secure all the connectors. Protective elements can be used to fix the JR connectors.

Screw the distance spacer to the holes on the front side of the Central Box. Mount the elements to the spacers and tighten them with M2.5 (torx 8) screws. All the screws are supplied with the safety mechanism of connectors.



## 4 Configuration via JETIBOX

After connecting to the **Central Box 310/320** (output **E4**), a start-up screen appears that contains identification of the device in the first line of the **JETIBOX** display. The second line contains the data showing the consumed capacity of batteries.

By pushing the **R** button (to the right) on the **JETIBOX**, you get to the expander menu.

In the expander menu, the second lines display the sensors that are connected to inputs **E1/R3, E2, E3** and **E4**.

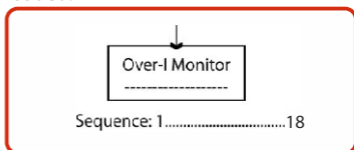
Using buttons **U** and **D** (down and up arrows) of the **JETIBOX** it is possible to browse through the expander inputs. The selected input is marked with a curly bracket brace after the input number, eg. 1}. By pushing the **R** button (right arrow) it is possible to enter a selected sensor, where you can adjust and display its parameters.

### 4.1 Actual values

\*CENTRAL BOX\*:

- **NadProud Monitor (Output voltage) - i**
- **Actual Value** – by pushing the D button (down arrow) you select the display of actual measured values
- **Accu voltage** - shows the actual voltage of both inputs
- **Accu current** - displays the actual current flowing from the battery to the output
- **Accu capacity** - consumed capacity of each battery
- **Output voltage** - Output voltage for servos (BEC output voltage)
- **Over-I Monitor (CB320)** - indication of servo output; (-) output is fine (x) the output is overloaded.

**Outputs are ordered:**



**Fig. 8: Description of outputs**

- **Temperature** - actual temperature of Central Box
  - **Information on the status of receivers** - number of detected channels and the period of signal
- 

## 4.2 Minimum / Maximum values

**\*CENTRAL BOX\*: MIN / MAX** – by pushing the **D** button (downarrow) you select a display of extreme voltage, current, temperature, and status of the receiver, which occurred during the operation.

• **Erase data** – (CB310 and CB320) by pushing the arrows R and L (right and left) together, the minimum and maximum are reset, see "MIN/MAX - Minimum / Maximum".

- **Minimal voltage** – the lowest voltage detected by the CentralBox on the inputs during its operations
- **Maximal voltage** – the highest voltage detected by the CentralBox on the inputs during its operation
- **Maximal current** – the highest current detected by the CentralBox on the inputs during its operation
- **Min/Max Temper.** - the highest and the lowest temperature of the Central Box during its operation (since the last manual reset)

### **Statistics of the received signal expressed in time**

- **R1**: how long was the signal from the primary receiver available to the Central Box
- **R2**: how long was the signal from the secondary receiver available to the Central Box
- **R3**: how long was the signal from the third receiver available to the Central Box 310/320

### **Statistics of the received signal expressed as a percentage**

- **R1**: what percentage of the total operating time was the signal from the primary receiver available to the Central Box
- **R2**: what percentage of the total operating time was the signal from the secondary receiver available to the Central Box

- **R3**: what percentage of the total operating time was the signal from the third receiver available to the Central Box 310/320
  - **Over-I Monitor (CB320)** - indication of servo output during the operating time of the Central Box; (-) output is fine (x) the output is overloaded
- 

### 4.3 Setting

- \***CENTRAL BOX\*: SETTING** – By pushing the D button (down arrow) you get to the basic setting of the device.
- **Fail Safe** – switches on/off of the Fail Safe function. If the Fail Safe function is deactivated, there is no signal generated in any Central Box outputs at the signal loss. If you activate the Fail Safe function, you can also select how the Central Box responds at the signal loss for each of the individual outputs (OUT off, hold, fail safe).
- **Signal Fault Delay** – the length of time from when the Central Box detects a signal loss to when the programmed Fail Safe output is performed. During this time the last servo input is held. After the selected time has elapsed, the Central Box outputs behave according to setting for each specific output.
- **Output Period** – setting for the period of the output signals (default Auto-synchronous mode with the transmitter). This parameter significantly affects the behaviour of the servos. For analogue servos the reaction (response) accelerates and the power consumption is higher when the values for the output period are lower. This can lead to vibration in some servos if the values are set too low.
- **Rx Switchover (CB 310/320)**
  - **Timeout (150ms)** – If the connection from the receiver is lost for more than 150ms the Central Box switches to another active receiver. This strategy was used in the previous versions of the firmware.
  - **Timeout (80ms)** – If the connection from the receiver is lost for

more than 80ms the Central Box switches to another active receiver.

- **Mixing** – The Central Box combines data from all active receiver inputs and uses it for servos on the packet-by-packet basis. This strategy is available only if receivers are connected to the Central Box via EX Bus. Any other type of serial communication is not supported. Mixing strategy is not suitable for a combination of Assist receiver with standard receiver(s). It could lead to inconsistent servo data if signal from the. We also do not recommend this "strategy" with a 900MHz / 900MHz NG backup receiver.

Please note that the switch over strategy for ports configured as EX Bus output is kept the same as in the Timeout (150ms) mode.

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## 4.4 Out Pin Set

\***CENTRAL BOX\***: **Out Pin Set** – pushing the D button (down arrow) moves you to basic settings of particular outputs of the Central Box.

- **Set Channel/Ext** – select whether the setting will apply to outputs Y1-18 (channel) or Ext.
- **Set Output pin** -selection of the slot that will be used for the following settings. In this menu the output deflection of the selected output is displayed as a percentage. Y1 is the Central Box output labelled 1, Y2 is the Central Box labelled 2, etc.
- **Function** – setup of alternative output functions. This function is available only for these outputs:
  - **Y1 to Y18**: Functions - Servo output, digital input, digital output and Dtex
  - **E1/R3**: Functions - Telemetry input, JETIBOX, EX Bus and receiver
  - **E2, E3** - Functions - telemetry input, EX Bus Expander – for connecting devices supporting communication using the EX Bus protocol, S.BUS output (only for E2)
  - **E4 - Functions** - telemetry input, EX Bus Expander – for connecting devices supporting communication using the EX Bus protocol, JETIBOX

- **SetInChannel** – assigns the input channel (marked as Chx) to a specific output (marked as Yx)
- **Reverse** – reverses the output direction
- **Signal Fault** - setting behavior of the receiver in case of signal loss
- **hold** - repeats the last valid deflection command before signal loss
- **out off** – does not generate any signal for servo in case of signal loss
- **FailSafe** – transition to preset deflection of individual outputs
- **FS position** – setup of the selected output deflection in case of signal loss
- **FS speed** – setup for how quickly the output transitions to its programmed deflection in case of signal loss
- **ATV High Limit Yx** – sets the upper travel (throw) limit of the output
- **ATV Low Limit Yx** – sets the lower travel (throw) limit of the output
- **Output Trim** – setting the neutral deflection of the receiver output
- **Output Group** – setting the output to a selected group of output pulses that will be generated from the receiver at the same time

For the function of digital output it is possible to assign the Y input – adjusting an input channel (labeled as Chx) to a specific output (labeled as Yx)

**TriggerLevel Y** – the decision level for digital output. If the servo position of the specified channel is lower than „TriggerLevelY“, the output is set to log. 0. Otherwise the output is set to logical 1.

**OppositeDirection Y**- reversing output direction

**FailSafe.Y**- setup of the Central Box behavior in case of the signal loss

- **repeat** – repeating the last valid figure on the output
- **log.1** – logical 1 is generated on the output
- **log.0** – logical 0 is generated on the output

## 4.5 Alarms

- \*CENTRAL BOX\*: Alarms** – pushing the D button (down arrow) moves you to the menu for setting the alarms. If the alarm is set to OFF, the alarm is deactivated.
- **Capacity Alarm** - level of the capacity taken from the battery at which the alarm will sound
  - **Current Alarm** - level of current drawn from the battery at which the alarm will sound
  - **Voltage Alarm** – if the battery voltage drops below this level, the alarm will sound
  - **Short Circuit Alarm (CB320)** - Activating/deactivating the alarm for when the outputs are overloaded
  - **Temperature Alarm** – Activating/deactivating alarms for the Central Box overheating Temperature goes above 70/90°C for Central Box 320/310.
  - **Alarm Rx** – the alarm is generated if the Central Box does not receive any information about valid servo positions from the R1 input for a period longer than 2s
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## 4.6 Service information

- \*CENTRAL BOX\*: SERVICE** – pushing the D button (down arrow) moves you to the display of the firmware version and the menu for restoring the default settings of the Central Box.
- **Language Setup** - (Central Box 310/320) Language of the menu in Jetibox
  - **PresetToSetup** – pushing arrows R and L (right and left) together leads to loading the default settings of the Central Box
  - **CBOXxxx v. xx.xx ID xxxxx:xxxxx** – designation of the product with the firmware version and the serial number (ID)
-

## 5 Configuration via the DC/DS transmitter

The Central Box can be configured by a DC/DS transmitter via the Device Explorer menu. It is necessary to follow these rules for configuring the Central Box via transmitter:

- **Receiver firmware version Duplex (Rx FW 3.25 or REX FW 1.14) and newer (with setting Output mode->EX Bus)**

- The receiver must be connected to the Central Box via EX Bus

- **Transmitter firmware version 5.06 and newer** + the device profile (CBOX310.bin and CBOX320.bin) recorded in the devices directory on the SD card of the transmitter.

When everything is properly connected and configured, the CBOX310/320 item appears in the Device Explorer menu. Entering the item moves you to the configuration menu.

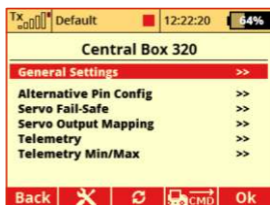


Fig. 9: Device Explorer

## 5.1 Setting

- **Output Period** – setting the output signals period (default: Auto synchronous mode with the transmitter). This parameter significantly affects the behaviour of the servos. For \* servos the reaction (response) accelerates and the power consumption is higher when the values for the output period are lower. This can lead to vibration in some servos if the values are set too low.
- **E1, E2, E3 and E4** – setting alternative functions of the outputs.
  - **JETIBOX (only E4)** – output for connecting JETIBOX or EX telemetry
  - **Telemetry input** – input for connecting telemetry sensor
  - **EX Bus** - EX Bus output
  - **Receiver (only E1)** - possibility of connecting a third receiver
- **Receiver inputs** – Communication protocols which are detected on R1, R2 and E1/R3
- **Switchover strategy** – possibilities of receiver input switching
  - Time out (150ms) - If the connection from the receiver is lost for more than 150ms the Central Box switches to another active receiver. This strategy was used in the previous versions of the firmware.
  - Time out (80ms) – If the connection from the receiver is lost for more than 80ms the Central Box switches to another active receiver.
  - Mixing – The Central Box combines data from all active receiver inputs and uses it for servos on the packet-by-packet basis. This strategy is available only if receivers are connected to the Central Box via EX Bus. Another type of serial communication is not supported. Mixing strategy is not suitable for a combination of Assist receiver with standard receiver(s). It could lead to inconsistent servo data if signal from the Assist receiver is mixed with signal from the standard receiver. **We also do not recommend this "strategy" with a 900MHz/900MHz NG backup receiver.**



Please note that the switch over strategy for ports configured as EX Bus output is kept the same as in the Timeout (150ms) mode.

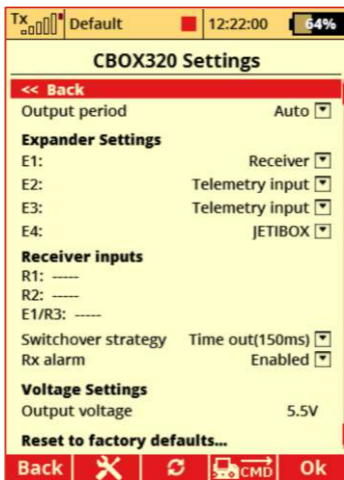


Fig. 10: Device Explorer-General Settings

## 5.2 Alternate functions of pins

Overall setting of alternate functions for individual pins of the Central Box. Possible settings:

- **Servo out.**- servo control signal will be generated for the pin
- **Digi. output** –log. 1 or log. 0 is generated on the output according to the position of the assigned channel and according to the trigger level. If the servo position of the assigned channel is lower than „Trigger“, the output is set to log. 0. Otherwise the output is set to logical 1.
- **Digi. input** – the condition of the pin is sent to the transmitter via EX telemetry.

- **Telemetry input** - input for connecting telemetry sensor with automatic detection of the connected EX Bus sensor
- **EX Bus** – data output sending channel positions, telemetry, and device configuration
- **Ditex** – support of telemetry DITEXTD servos



Fig. 11

## 5.3 Servo Fail-Safe

In all connected receivers we recommend disable Fail-Safe and set it in the Central Box only.

- **Fail Safe** – switches on/off the Fail-Safe function. If the Fail-Safe function is deactivated, there is no signal generated in any Central Box outputs at signal loss. If you activate the Fail-Safe function, the behaviour of the Central Box output corresponds with the setting of individual outputs (Out off, Hold, Fail-Safe).
- **Fail-Safe Delay** – the period of time during which the last valid servo positions are repeated if the signal loss is detected. After the selected time has elapsed, the Central Box outputs behave according to setting for each specific output.
- **Fail-Safe setup now ...** - sets the current position for the Fail- Safe value
- **Mode** - Fail-Safe mode for a specific Central Box output
  - **Hold**: repeats the last known servo position before the signal loss
  - **Out OFF**: does not generate any signal for servos in case of the signal loss

- **Fail-Safe:** generates pre-set servo position (value) if signal loss is detected. Can be programmed with slowdown (Speed)

The Fail-Safe position can be immediately applied to the Central Box output if the cursor is on the „**Value**“ menu item and you push the **F4** function key. „**F4 (Apply)**“.



Fig. 12: Device Explorer-Fail Safe

## 5.4 Servo Output Mapping

- **Servo No.** – assigning outputs of the transmitter to the Central Box outputs (Output pin).
- **Group** – assigns specific output to the group of output impulses that will be generated from the receiver in the same time



Fig. 13: Device Explorer-Servo Output Mapping

## 5.5 Telemetry

- **Temp.** – actual temperature of the Central Box
- **Shorted outputs No. (CB320 only)** – actual number of overloaded outputs
- **Voltage** – actual voltage of individual outputs of the Central Box
- **Current** – actual current drawn from the battery
- **Capacity** – capacity taken from the batteries

Tx		Default		12:22:30		64%	
<b>CBOX320 Telemetry</b>							
<b>&lt;&lt; Back</b>							
Temp.	0°C	Shorted outputs No:		0			
		Input 1		Input 2			
Voltage		0.0 V		0.0 V			
Current		0.00 A		0.00 A			
Capacity		0 mAh		0 mAh			
Output voltage				0.0 V			
<b>Fuses status</b>							
Output 1	2	3	4				
	✘	✘	✘	✘			
Output 5	6	7	8				
	✘	✘	✘	✘			
Output 9	10	11	12				
	✘	✘	✘	✘			
Output 13	14	15	16				
	✘	✘	✘	✘			
Output 17	18						
	✘	✘					
Back		✘		↻		CMD	
						Ok	

Fig. 14: Device Explorer-Telemetry

## 5.6 Telemetry Min/Max

- **Clear Min/Max switch** – here you can assign a control (switch, stick or knob) on the DC/DS transmitter which clears the recorded battery capacity and minimum/maximum values in the Central Box.

- **Clear Now** – allows you to immediately clear the recorded battery capacity and minimum/maximum values in the Central Box.

For description of individual items, see the chapter Minimum/Maximum values.

CBOX320 Min/Max			
<< Back			
<b>Clear Min/Max switch</b>		... ▾	
» Clear now...			
	Input 1	Input 2	
Min. voltage	0.0 V	0.0 V	
Max. voltage	0.0 V	0.0 V	
Max. current	0.00 A	0.00 A	
Min. temperature	0 °C		
Max. temperature	0 °C		
<b>Statistics</b>			
Rx1 time:	00: 00: 00	0%	
Rx2 time:	00: 00: 00	0%	
Rx3 time:	00: 00: 00	0%	
<b>Fuses status (long term)</b>			
Output 1	2	3	4
x	x	x	x
Output 5	6	7	8
x	x	x	x
Output 9	10	11	12
x	x	x	x
Output 13	14	15	16
x	x	x	x
Output 17	18		
x	x		

Fig. 15: Device Explorer-Telemetry Min/Max

## 5.7 Reset to factory settings

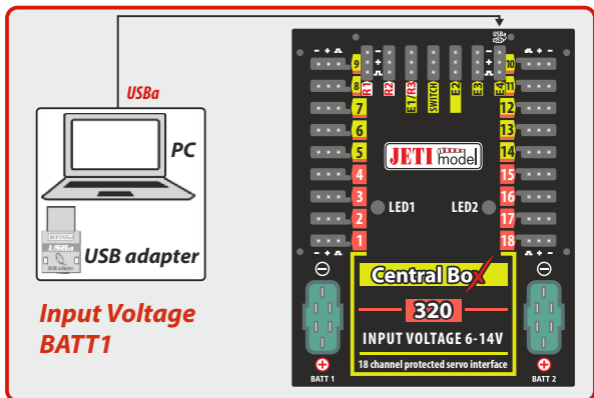
- **Reset to factory settings** – reset to factory setting of the Central Box (you can find it in the general settings)

## 6 Firmware update

Central Box allows firmware update via a PC. The update is performed using the JETI USBa (USB adapter). The procedure is as shown below:

On the manufacturer internet pages ([www.jetimodel.com](http://www.jetimodel.com)), under „**Support**“; you will find an Jeti Studio program with the most recent firmware. Download it to your PC and install.

1. Start the Jeti Studio update program on your PC and select the correct COM port for connected USB adapter.
2. Connect the Central Box output labelled E4 with the USB adapter by means of interconnection cable.
3. Connect the Central Box to the power supply (BATT1 or BATT2). Switch on the Central Box using the magnetic switch or the RC switch.
4. Jeti Studio automatically detects the connected device and offers you the latest FW update.
5. Select FW and click the **“Update”** button. The update starts and runs automatically.



## 7 Safety precautions for working with magnets

Because the Central Box is put into operation via magnet, it is necessary to follow safety precautions for handling magnets. The magnet is mounted in a hard aluminium carrier.

1. Keep the magnetic key a safe distance from all devices that could be damaged by the magnet, such as TV, credit cards, computers, etc. The magnet may interfere with the function of pacemakers!
  2. Keep magnets away from children because of the danger of swallowing or pinching!
-

## 8 Technical specifications of the Central Box

Technical data for Central Box 310/320	
Supply Voltage	6 – 14 V
Number of connectable battery cells.	2-3 LiXX
Sustained current	25 A
Peak current (2s)	230 A
Number of servo outputs	to 18
Idle current	80 $\mu$ A
Regulation of output voltage (BEC)	5 up to 8.4 V
Operational temperature	-20°C up to +75°C
Weight	135g
Dimensions	66x107x21 mm
Dimensions Magnetic switch	45x26x11 mm
Number of channels with protection for standard servo (up to 30Kg/cm)(CB320)	10
Number of channels with protection for standard servo (up to 60Kg/cm) (CB320)	8

## 9 Warranty, service and the technical support

### Warranty and service

This product is covered by warranty for 24 months after the day of purchase provided that it has been operated in accordance with these instructions at the specified voltage and is not mechanically damaged. When claiming warranty repairs for the product, always attach a proof of purchase. Warranty and post-warranty service is provided by your dealer or the manufacturer.

### Technical support

In case you are not sure about the setup or some functions of the product, do not hesitate to contact our technical support.

You can contact either your dealer, or directly the manufacturer JETI model s.r.o..

For further information see our webpages [www.jetimodel.com](http://www.jetimodel.com).





## Declaration of Conformity

in accordance with the regulations of EU Directive EMC 2014/30/EU, RoHS 2011/65/EU and (EU) 2015/863

This declaration of conformity is issued under the sole responsibility of the manufacturer.

**Producer:** JETI model s.r.o.  
Lomená 1530, 742 58 Příbor, Česká republika  
IČ 26825147

### Declares, that the product

**Type designation:** Central Box  
**Model number:** 310, 320

**The stated product complies with essential requirements of EMC 2014/30/EU, RoHS Directive 2011/65/EU and (EU) 2015/863.**

Harmonised standards applies:

#### **Protection requirements concerning electromagnetic compatibility [6]**

EN 61000-6-3:2007 + A1:2011

#### **Electrical Safety and Health [3.1(a)]**

EN 62368-1:2015  
EN 62479:2010

#### **RoHS**

EN 50581:2012

Signed for and on behalf of:

  
**Ing. Stanislav Jelen**  
Managing Director



**Elektrická zařízení opatřená symbolem přeškrtnuté popelnice nesmějí být vyhazována do běžného domácího odpadu, namísto toho je nutno je odevzdat ve specializovaném zařízení pro sběr a**

**recyklaci. V zemích EU (Evropské unie) nesmějí být elektrická zařízení vyhazována do běžného domácího odpadu (WEEE - Waste of Electrical and Electronic Equipment - Likvidace elektrických a elektronických zařízení, směrnice 2002/96/EG).**

**Nežádoucí zařízení můžete dopravit do nejbližšího zařízení pro sběr nebo recyklačního střediska. Zařízení poté budou likvidována nebo recyklována bezpečným způsobem zdarma. Odevzdáním nežádoucího zařízení můžete učinit důležitý příspěvek k ochraně životního prostředí.**





**JETI model s.r.o.**

**Lomená 1530, 742 58 Příbor  
Czech Republic**

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[info@jetimodel.cz](mailto:info@jetimodel.cz)**