Rx ver. 3.20

The firmware version 3.20 for Duplex EX receivers brings several new features especially for output pins settings. One of them gives the ability to set the digital interface so that it is possible to set serial communication for control of servo channels on one of the outputs of the receivers, while at the same time generating standard servo outputs for connected servos. This setting is especially advantageous in copter models where a serial interface is used for communication between the receiver and the stabilization system that controls the model. Servo outputs from the receiver are also simultaneously available to control other functions such as the rotation control of a camera without the necessity to use two receivers.

Another new feature of this firmware version is a ability to set each receiver output pin into three modes, namely standard servo output, digital output and digital input. If you set the pin to digital output mode, a servo signal is not generated but permanent voltage levels are still present on the pins. If the servo position on the specified receiver channel is lower than 0% (1.5ms), the output is set to permanent log. 0 (i.e. 0V). If the deflection is higher than 0%, log. 1 (i.e. 3.3V) will be generated on the pin. With logical outputs you can connect to the receiver devices that do not support servo impulse on their input, e.g. lights, sound generators, etc.

Using the receiver pins as inputs is useful for simple feedback, without the use of telemetry sensors. For example if you attach limit switches to the retractable gear, you can have feedback about its condition during the flight (together with logging and alarm functionality).

Setting the receiver can be done using the JETI DC/DS transmitter via the „Device Explorer" menu. To display all adjustable options it is necessary to upload the new receiver configuration to the transmitter SD card (in the Devices directory). Configuration files are included in the transmitter update, version 2.30.

Clarification of certain terms from the setup menu of the receiver:

Rx mode - Normal
- standard receiver mode
- in this mode it is possible to operate just one receiver with one transmitter module
- supports telemetry transmission and wireless JETIBOX terminal

Rx mode - Clone
- monitors existing connection of the transmitter and the receiver operating in the „Normal" mode
- intended solely as a backup connection
- does not support telemetry (indication of the signal strength is not available) nor the wireless JETIBOX terminal
- works in one direction only (receiving), it never transmits
- any number of receivers in Clone mode can be operated simultaneously

FailSafe - Enabled
- in case of Tx signal loss event, the receiver generates last known servo positions for a specified period of "SignalFaultDelay". Then the servo output switches to a mode according to „Signal Fault" setting for the specific output. "Hold", "Out off", and "Fail safe" are possible modes. In "Fail Safe" mode it is then possible to select required servo position (FS position) and the speed of transition into this position (FS Speed).

FailSafe - Disabled
- in case of Tx signal loss event, the receiver stops generating impulses to servos
- if a fixed value of "OutputPeriod" parameter is set (any value other than "Auto"), then in case of Tx signal failure the receiver generates the last known positions to the servos for the period of "SignalFaultDelay".

OutputPeriod
- determines how often the control pulses for servos are generated on the receiver output
- it is possible to adjust 5-30ms output period, eventually Auto period
- when using digital servos, it is advisable to use the Auto option; if the analogue servos are used, then it is recommended to set fixed period (eg. 20 ms).
- use fixed value for Output period (e.g. 20 ms for 8 channel PPM) when PPM output is selected

PPM Mode, UDI Mode - Direct
- output PPM signal contains data directly from the transmitter, without conversions and channel mapping
- conversions and possible channel mapping are applied to output servo impulses only
- different channels might be assigned to the PPM signal and servo output pins

PPM Mode, UDI Mode - Computed
- conversions and prospective mappings are applied to output servo impulses and also to PPM signal

- servo impulses and PPM signal contain the same information

PPM Mode - OutputChannelCnt
- number of channels generated in a single PPM frame
- this number influences minimum possible period of output impulses (output period)
- it is possible to set minimum period approximately as the following formula says:
  OutputPeriod = OutputChannelCnt*2ms+4ms (e.g. for PPM 8 the min. period is ca 20 ms)

Pin Config - servo
- standard impulse output for servos (-100% = 1ms, 0% = 1,5ms / +100% = 2ms)

Pin Config - Digital
- the output pin is in a stable LOW condition (log. 0) if the position of this channel is negative, otherwise this pin is in HIGH condition (log.1)

Pin Config - Input
- 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
- it is allowed to keep the pin disconnected or connected to the common ground of the receiver
- it is not allowed to connect to a different voltage. The pin works exclusively in PullUp mode so all you need to test the function is to connect the signal pin to the ground.

Examples of Rx setup

1) classic setup of a single receiver (for any analogue/digital servos)
- servo impulses are generated on servo outputs
- each output can be assigned to one of the groups from A to H
- servo outputs assigned to one group are generated at the same time
- between two consecutive servo groups there is a delay of 2.5ms.

FailSafe	OutputPeriod	SerialLink	Rx mode
Enabled	17 ms	JETIBOX	Normal

2) classic setup of a single receiver (for digital servos)

FailSafe	OutputPeriod	SerialLink	Rx mode
Enabled	Auto	JETIBOX	Normal

3) the second receiver as a backup (clone mode)
- monitors existing connection between the transmitter and the receiver in "Normal" mode
- does not support telemetry (or an indication of the signal strength)
- works in receiving direction only, it never transmits
- any number of receivers in Clone mode can be operated simultaneously

FailSafe	OutputPeriod	SerialLink	Rx mode
Enabled	17 ms (or Auto)	JETIBOX	Clone

4) receiver with PPM output
- possibility to select PPM pos./neg.
- PPM output is on SAT2 output (if it exists), alternately SAT1 (if it exists), alternately on the last servo output (then the number of servo output is decreased by one) depending upon your selected receiver
- the servo impulses are generated on the other servo outputs
- all the servo outputs are generated simultaneously during the gap between PPM frames (outputs are then in one group)

FailSafe	OutputPeriod	SerialLink	Rx mode	OutputChannelCnt	PPM Mode
Enabled	20 ms	JB,PPM pos.	Normal	8	Direct

5) receiver with PPM output in the function of backup receiver (example of RSAT2 settings)
- PPM output is on SAT2 output (if it exist), alternately SAT1 (if it exists), alternately on the last servo output (then the number of servo output is decreased by one) depending upon your selected receiver the servo impulses are generated on other servo outputs
- all the servo outputs are generated simultaneously during the gap between PPM frames (outputs are then in one group)
- no output repetition or fail safe is carried out. Every time the receiver gets the data packet, output impulses and PPM burst are generated once maximally.
- if the data from the transmitter is not available for the receiver, all the outputs are in Out-Off mode

FailSafe	OutputPeriod	SerialLink	Rx mode	PPM Mode
Disabled	Auto	JB,PPM pos.	Normal	Direct

6) receiver with EX Bus output
- suitable especially for connection to JETI model devices (such as Central Box)
- EX Bus is present at Ext. receiver connector and the telemetry sensors are then connected to the nearest EX Bus expander (e.g. Central Box)
- after the receiver is switched on (with the transmitter turned off) it is possible to connect JETIBOX to the receiver via Ext. connector. After the transmitter is switched on, the serial protocol on Ext. connector changes to EX Bus and the configuration using connected JETIBOX is not possible until the transmitter is switched off or the Rx mode is changed.

FailSafe	OutputPeriod	SerialLink	Rx mode
Enabled	17 ms (or Auto)	EX Bus	Normal

7) receiver with UDI output
- suitable for connection of devices with unidirectional UDI interface (e.g. VBar)
- UDI output is present on SAT2 output (if it exists), alternately SAT1 (if it exists), alternately on the last servo output (then the number of servo outputs is decreased by one) depending upon your selected receiver
- the servo impulses are generated on other servo outputs it is possible to connect telemetry sensors to the Ext. connector as usual.

FailSafe	OutputPeriod	SerialLink	Rx mode	UDI Mode
Enabled	17 ms (or Auto)	JB,UDI	Normal	Direct