USER MANUAL
FIBER OPTIC SERVO CONTROLLER

Description

Fibre-optic servo controller was designed as complement to the fibre-optic ignition cutoff. However, nothing stands on the way to exploit it independently.

The main task of controller is a possibility to place throttle servo close to the engine, so the throttle control link is short. Typically disadvantage of such installation is small servo distance and its wires from the engine ignition unit. Taking into account the adverse impact of electromagnetic noise caused by the ignition, which could get to the RC circuit, controller communicates with the receiver exclusively by fibre-optic which is resistant to electromagnetic disruptions. Thanks to that there is a minimum 30 cm distance between the ignition and the RC circuit in the model.
In this case throttle servo is powered by the same package as the ignition unit.

Fibre-optic servo controller can be used also for other purposes than controlling the throttle. It will work everywhere where long wires are adversely affecting the electronics operation. With its help it is possible to control the servo move being in a significant distance or everywhere where a galvanic isolation of implementation servo elements from steering electronics is required.

FORCE Servo controller correctly works with voltage range from 3.6 V on the RC receiver side, and 3.6 V on the servo power supply side. Maximum allowed supply voltage on both sides is 16.0 V. It is necessary to remember not to exceed the allowed servo voltage, and if necessary to use appropriate voltage regulator.

FORCE Servo controller consists of the fibre-optic transmitter module plugged in the RC receiver and powered directly from it. Fibre-optic receiver module powered from the ignition battery. Fibre-optic wire*. For correct operation the device requires separate channel from the receiver (in most cases CH3).

Technical data

Fiber Optic transmitter
- dimensions: 36mm x 11mm x 13mm
- RX plug: Futaba, 3000mm
- power supply: 3,6V – 13,0V
      2 - 3 x (LiPo/Li-Ion/LiFe)
      4 - 9 x (NiMh/NiCd)
- weight: ~ 10,0 gram

Fiber Optic receiver with servo controller
- dimensions: 39mm x 21mm x 13 mm
- power supply plug: Futaba / JR male150mm
- servo plug: Futaba / JR female 150mm
- power supply: 3,6V – 13,0V
      2 - 3 x (LiPo/Li-Ion/LiFe)
      4 - 9 x (NiMh/NiCd)
- weight: ~ 15,0 gram
- load capacity: 5A constant, 30A temporarily

* Delivered fibre-optic wire of length 0.5 m, 0.7 m and 1.0 m. There is a possibility of shortening by the user.
* The *FORCE* cutoff works correctly even with the wire 20.0 m (above this length wasn't tested).
** The *FORCE* cutoff works also with newest high-voltage HV receivers, both in the standard speed mode as well as high HS speed.

Installation

Device must be installed inside the model fuselage. Fibre-optic transmitter with the **RCVR** description is installed near the RC receiver and plugged in its free channel (in case when is supposed to control the servo throttle – channel 3). The fibre-optic receiver along with the servomechanism connected to it may be installed under the engine cowl. Although the device is resistant to vibrations, if possible must install them on elastic foam plate.

Fibre-optic receiver and servo are powered from the ignition battery (output with the **BAT** description) and installed right behind the mechanical power switch with or without voltage stabilizer. Voltage stabilizer should be applied if the level of battery voltage is higher than acceptable voltage by servo or *FORCE* controller. Stabilizer can be installed both before as well as behind the *FORCE* controller.

In order to connect the fibre-optic transmitter with fibre-optic receiver must: Loos the protection nut on the fibre-optic connector, insert reliably the fibre-optic wire into the decisive resistance (in practice the wire slides to depth of 17.0 mm), next tight the nut with suitable sensitive. Good habit may be marking the end of wire e.g. white piece of the tape at distance of 17.0 mm in order to control from time to time the state of its set. The wire if necessary can be shortened to the demanded length using a sharp knife. In addition must pay attention so that the place of cut was possible perpendicular to the wire axis. Fibre-optic wire is very elastic, the minimal radius of bending is 7.0 mm.

Because the main task of *FORCE* servo controller is electric separation of the RC receiver circuits and ignition of the engine, should make every effort so that remaining wires of these circuits won't mix with each other and were possible far away from each other. The only element connective both circuits should be the fibre-optic wire.

First run

During run it is necessary to carry out the calibration of channel in which the *FORCE servo controller* is plugged, analogy like during the regulation of servomechanism end points. Similarly as in case of standard connected servo, the *FORCE* device also passes to servomechanism the Fail-Safe position.

NOTE!!!

Remember that application of security *FORCE* type doesn't justify the implementation of careless electrical installation. All wires and connections should be carefully made and appropriately secured. Additional the safety increase is a task of *FORCE* controller during practicing this hobby, rather than avoiding or eliminating errors of the assembly other elements.

Thank you for the trust and purchase of devices. Simultaneously we wish successful flights and unforgettable moments while piloting your wonderful models.