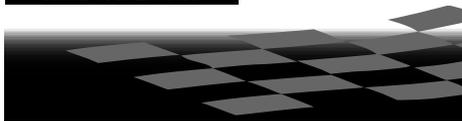


Futaba

FSU2 INSTRUCTION MANUAL

FAIL SAFE UNIT



FOR AM/FM CARS

Use the FSU2 under the following conditions:

For Nicd battery only

- See the [SPECIFICATIONS] section for more information.

For car and boat

- See the [USAGE AND INSTALLATION PRECAUTIONS] section for more information.

FOREWORD

Thank you for purchasing an FSU2 Fail Safe Unit. This FSU2 is simple to install - just connect it between the receiver and servo. However, there are some points that require attention before use. Therefore, please read this manual carefully and use your FSU2 correctly.

FEATURES

Auxiliary safety device that constantly checks the pulse signal from the receiver by means of a CPU and turns on a fail safe (F/S) function if the pulse is disturbed by interference. When the power supply voltage drops, a battery fail safe (B-F/S) function turns on and moves the throttle servo to the preset position (brake or engine slow).

- Compact and lightweight design does not affect servo performance.
- Responds quickly to erroneous operation by interference, etc. and prevents loss of control of R/C models.
- Quick recall function quickly resets the F/S function by normal servo output signal from the receiver when the interference, etc. disappears.
- Use the FSU2 with AM and FM (PPM) systems. Do not use FSU2 with High Response System (HRS).
- The FSU2 is applicable to four-cell and five-cell NiCd batteries. The activation voltage of B-F/S function can be selected depending on the batteries.

NOMENCLATURE AND SETTING

Monitor Lamp (LED)

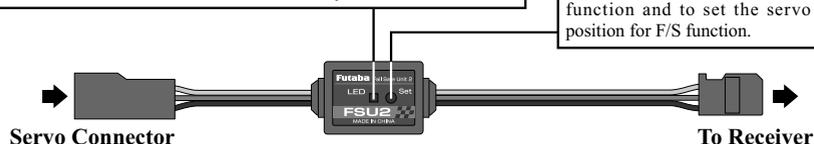
Monitor lamp will light at F/S condition and repeat turning on and off at B-F/S condition.

At normal condition, monitor lamp will blink once or twice depending on the preset activation voltage of B-F/S function.

It is adequate that the monitor lamp blinks once for a four-cell NiCd battery and twice for a five-cell NiCd battery.

Setting Switch (Set)

This is the switch to set the activation voltage of B-F/S function and to set the servo position for F/S function.



How to check the activation voltage of B-F/S function

- 1 Connect the FSU2 between the receiver and the throttle servo.
- 2 Turn on the power of the transmitter first and then the power of the receiver. Check the monitor lamp of the FSU2.
- 3 It is adequate that the monitor lamp blinks once for a four-cell NiCd battery and twice for a five-cell NiCd battery. Otherwise, move on to the next step, "How to change the activation voltage of B-F/S function".

How to change the activation voltage of B-F/S function

- 1 Connect the FSU2 between the receiver and the throttle servo.
- 2 Turn on the power of the transmitter first. Then turn on the power of the receiver while pushing the setting switch, and then release the setting switch.
- 3 Check the monitor lamp of the FSU2 and confirm that the number of blinking is properly set.

*It is not necessary to set B-F/S function every time as its settings are memorized even if the power is disconnected.

How to set the activation position of F/S function

- 1 Connect the FSU2 between the receiver and the throttle servo.
- 2 Turn on the power of the transmitter first. Then turn on the power of the receiver. Now, operate the transmitter to adjust the position of the throttle servo to the position to which the throttle servo will move when the F/S function will work.
- 3 Under this condition, push the setting switch for about two seconds. Then the LED will start blinking rapidly.
- 4 Now, turn off the power of the transmitter, and check if the throttle servo moves to the position you have just set.

*It is not necessary to set the position of the F/S function every time as its settings are memorized even if the power is disconnected. However, it is necessary to check every time whether the activating position is correct.

USAGE AND INSTALLATION PRECAUTIONS

⚠ CAUTION

- ⊗ Since the FSU2 has an original B-F/S function, do not use for aircraft, helicopters, etc. for the following reason.

*Because the B-F/S function resets itself when the battery voltage returns to normal, when the FSU2 is connected to the throttle channel, if the transmitter throttle stick is set to the high position when the voltage recovers, the engine may unexpectedly explode and is very dangerous. When the B-F/S function is turned on, the servo of the connected channel is held in a set position for at least one second. Since the servo may remain in this state depending on the battery and load, the FSU2 is unsuitable for use with helicopters.

- ⊗ Do not use the FSU2 where it will be directly exposed to water, oil, etc.

*The FSU2 does not have waterproof construction. When using the FSU2 where it may be exposed to water, exhaust gas, etc., waterproof it by placing the unit in a leakproof plastic bag and securing the open end of the bag with a rubber band.

- ⊗ Do not install the FSU2 where it will be directly exposed to strong vibration.

- ⊗ Do not install the FSU2 near the engine or other heat generating parts.

- ⊗ Do not apply voltage exceeding the rated voltage. Do not connect the FSU2 to reverse polarity.

*Repair may be impossible.

- ⊗ Do not connect more than one servo to the output side of the FSU2. Never use a cable splitter to connect multiple servos.

- Ⓢ Install the FSU2 where it will not directly touch other parts, even if the model crashes.

DESCRIPTION OF OPERATION

■ NORMAL OPERATION

The FSU2 relays the signal from wheel, trigger, or stick to its corresponding servo without any delay under the normal operation.

■ F/S FUNCTION OPERATION

Operation by interference

When the interference is weak, the servo horn will intermittently try to move to the F/S set position. If the set position is correctly set at the brake or throttle slow side, it will be difficult for the throttle to fly up and the FSU2 will return the servo to the throttle slow side.

When interference is strong, the F/S function will hold the throttle servo in the preset position. When the interference disappears, the FSU2 will immediately return to the normal operation.

When there is strong interference on the same band nearby and the F/S function is turned on instantly, the other transmitter will control the model. In this case, just because the FSU2 is installed does not mean that loss of control can be prevented. Be very careful during use.

■ B-F/S FUNCTION OPERATION

When the B-F/S function is turned on by a power supply voltage drop during use, the servo horn moves to the preset position for about one second. When the voltage recovers, the servo returns to normal operation. If the voltage drops again, the B-F/S function is turned on again.

When Nicd 4 cells (4.8) or Nicd 5 cells (6V) used

When the voltage drops, the B-F/S function is turned on for about one second. Just because the B-F/S function is reset, do not continue to run the model. Due to the characteristics of the Nicd battery, after the B-F/S function is turned on, the voltage will drop suddenly and the entire system will stop and the servo will stop in an unexpected position and create a very dangerous situation.

Dry cell battery use

The FSU2 cannot be used with manganese or alkali dry cell batteries. A dry cell battery cannot endure a large current draw. If installed in the model, the voltage will frequently drop even through the battery is new.

■ WHEN POWER SUPPLY VOLTAGE DROPS TO 3V OR LESS

Since the CPU does not operate normally, the connected servos do not operate normally. Of course, the F/S and B-F/S functions do not operate normally either.

OTHERS

- This product is designed, manufactured, and sold for use with R/C models. Do not use it for other purposes.
- This product minimizes loss of control of the model due to interference or voltage drops. It does not guarantee safety. Futaba is not responsible for the result of use of this product.
- The specifications and contents of this product are subject to change without prior notice.

REPAIR SERVICE

Before requesting repair, please refer to this instruction manual again and verify your settings. If you are still experiencing trouble, please request service as follows:

Address

Your nearest Futaba dealer.

Repair information

Describe the trouble in as much detail as possible.

- Symptom: Including the state of the set when the trouble occurred.
- Digital proportional set used: Transmitter, receiver, and servo model numbers.
- Car: Type of car.
- Your name, address, and telephone number.

SPECIFICATIONS

Usable receiver power supply

- Nicd 4 cells (4.8V): Cells with a capacity of 270mAh or more
- Nicd 5 cells (6.0V): Cells with a capacity of 500mAh or more
- 6V supplied by BEC internal control amp or regulator

Operating voltage

- 3-7V

B-F/S detection voltage

- 4.8V mode: $4.0 \pm 0.3V$
- 6.0V mode: $5.0 \pm 0.3V$

Current drain

- Approx. 10mA

Input/output pulse width

- 900-2140μsec

Input/output frame width

- 7.8-22.8msec

Size / Weight

- 15.8x21.8x7.7mm (excluding projecting parts) / 6g

NOTE

- Most of the functions of this product are performed by CPU. Therefore, if the CPU is destroyed by immersion in water or oil, or by connection to the wrong polarity, it cannot be repaired. The only repairs possible are replacement of the case, switch, and lead connectors.
- The case of this product is sealed and must be replaced during repair.

Special Markings;

Pay special attention to the safety at the parts of this manual that are indicated by the following marks.

Symbol:  : Prohibited
 : Mandatory

Mark	Meaning
 DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury to the user if not carried out properly.
 WARNING	Procedures which may lead to a dangerous condition or cause death or serious injury to the user if not carried out properly, or procedures where the probability of superficial injury or physical damage is high.
 CAUTION	Procedures where the possibility of serious injury to the user is small, but there is a danger of injury, or physical damage, if not carried out properly.

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