Code: 90010408

mini**MAC** ADJUST
Electronic power supply

Dear Customer,
Thank you for your choice of an Alewings product.
The miniMac Adjust is a power supply system able to manage two batteries; it accepts 6 channels incoming from the receiver and controls up to 9 servos coming out.
It is equipped with a voltage regulator programmable at any voltage from 5 and 7,4V up to 30A (peak). It includes circuits for signal amplification and filtering.
Thanks to the integrated "Servo matching" system it is possible to program the outputs of channels 1,2 and 3.
Moreover the miniMAC Adjust includes double electronic switches, double battery voltage indicators and a protection against short circuit for each servo.

⚠️ **WARNING** ⚠️

CAREFULLY READ BEFORE USE

- **Use only Li.Poli 7,4V batteries**

- **Don't invert batteries polarity**

- **Pay attention to polarity of the connecting leads both on receiver and on box side**

- **To invert polarity of leads to the receiver may damage the receiver and/or the device itself.**

- **To invert polarity at servos outputs may damage servos and/or the device itself.**

- **Before connecting servos to the device, make sure you set the voltage output of miniMac at a value lower than or same as the maximum voltage allowed for your servos**

- **During servos programmation make sure that servos connected to the channel you want to program are mechanically disconnected from moving parts. It is recommended to disconnect both the servo arm from the servo and the linkage rod from the moving part.**

NOTE: Each servo output (Master e Slave) is protected against short circuits and overcurrent by a not self-resetting fuse.

- **If too much current is flowing (for example because of the total blocking of a servo) or a short circuit occurs, tha fuse of the output burns.**

- **If the box is unused for more than one week, disconnect both batteries**

⚠️ **NOT SELF - RESETTINGFUSES** ⚠️

EACH SERVO OUTPUT IS PROTECTED BY A NOT SELF-RESETTING FUSE

Nature of fuses is to act as protection; in the case of a short circuit and/or overcurrent:
- **the self-resetting fuse opens (it temporarily cuts the supplying to the servo) and, when cooled, closes again.**
- **the not self-resetting fuse burns (it cuts permanently the supplying to the servo).**

ATTENTION: A FUSES BURNS ONLY IF SHORT CIRCUITS OR OVERCURRENTS OCCUR.

A system protected by not self-resetting fuses has the advantage that, if the fuses burns, this unequivocally means that a particularly high current flow occured.
This is a clear evidence that there is something anomalous, such as:
- **a defective servo**
- **a servo warking too hard because of a wrong positioning of the servo arm or of a wrong setting of the control rod**
- **an extension cable with not well insulated leads**
- **a connector with not well insulated contacts**

The self-resetting fuse, after a short time, closes again, thus restoring a critical situation

The not self-resetting fuse permanently escludes the critical situation, allowing a precise and immediate detection of the problem

NOTE: each fuse is tested by a continuous current flow widely higher than the normal absorbtion of a servo

Connection miniMAC ADJ - Receiver

Mini Mac manages 6 channels from receiver; connect the channels you want to put into the box to the inputs on miniMac referred to as "RX INPUT". Use the 6 exetension leads provided, paying maximum attention to polarity both on the receiver side and on the box side.
Note: it is absolutely not necessary that channel number 1 on the receiver corresponds to channel 1 on the box and so on...

Connection miniMAC - Servos

MiniMac manages in output up to 9 servos, distributed over 6 channels . After assigning the function corresponding to each channel in input, connect their respective servos to outputs referred to as "SERVO OUTPUT".
Pay maximum attention to connectors polarity (see figure 1)
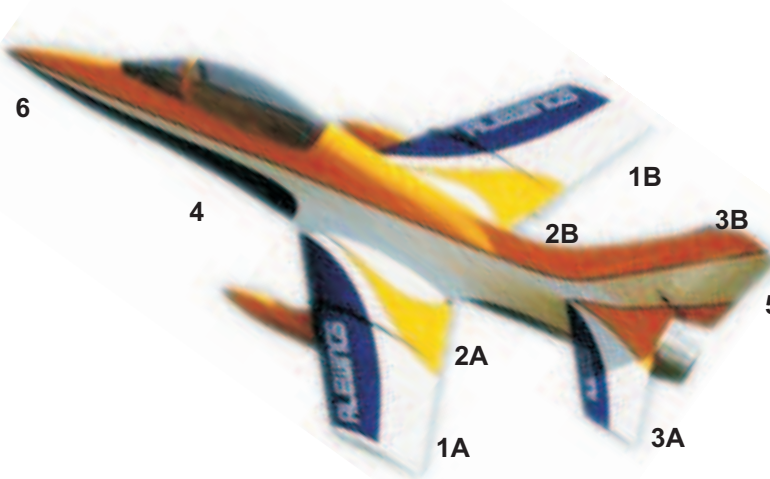Below som example of assignment of channels:

Assignment of miniMac channels on maxi aerobatic plane:
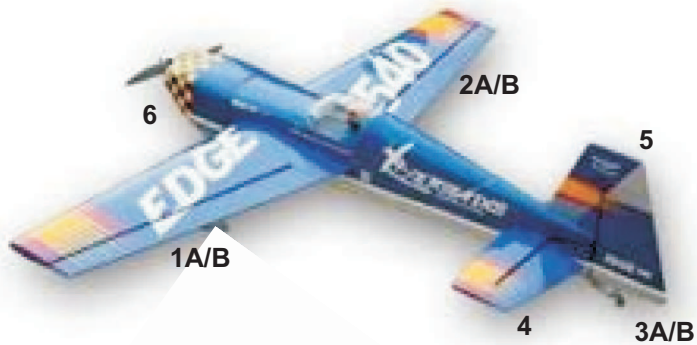
Channel Function

|	
1A/B	AIL left with two servos
2A/B	AIL right with two servos
3A/B	RUD with two servos
4	ELE left with one servo
5	ELE right with one servo
6	THR with one servo

Assignment of miniMac channels on turbine jet:

Channel Function

1A	AIL left
1B	AIL right
2A	FLP left
2B	FLP right
3A	ELE left
3B	ELE right
4	GEAR
5	RUDDER
6	Gear RUDDER

Connect directly into receiver the turbine throttle and other possible channels.

Assignment of miniMac channels on glider:
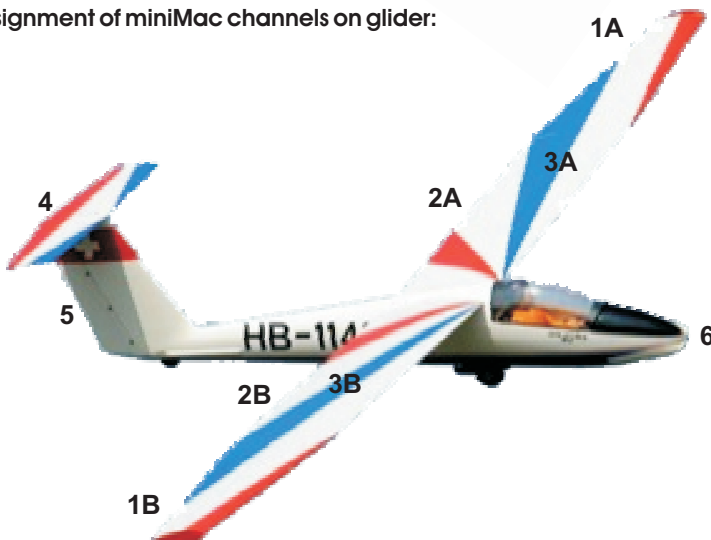
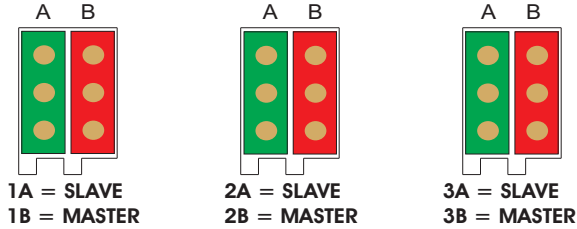| Channel	Function
1A	AIL SX
1B	AIL DX
2A	FLP SX
2B	FLP DX
3A	AIR BRAKE SX
3B	AIR BRAKE DX
4	ELE
5	RUDDER
6	SGANCIO

Connect directly into receiver the throttle and other secondary functions.

NOTE:examples showed here are non-binding and don't cover all possible installations.

1A/B   2A/B   3A/B   4   5   6

SLAVE **MASTER**   SLAVE **MASTER**   SLAVE **MASTER**

Programmable servo outputs

A   B   A   B   A   B

1A = SLAVE   **2A = SLAVE**   **3A = SLAVE**
**1B = MASTER**   **2B = MASTER**   **3B = MASTER**

Connection between miniMAC Adjust and servos:
Please connect the servos to the outputs called "Servo output". Make sure to respect the right polarity.

Connection between miniMAC Adjust and receiver:
Use the 6 leads provided and connect the receiver channels to the miniMAC.
PLEASE NOTE: it is not necessary that the channel 1 on the receiver corresponds to the channel 1 on the miniMAC. Pay attention to the lead polarity both on the receiver side and on the box side.
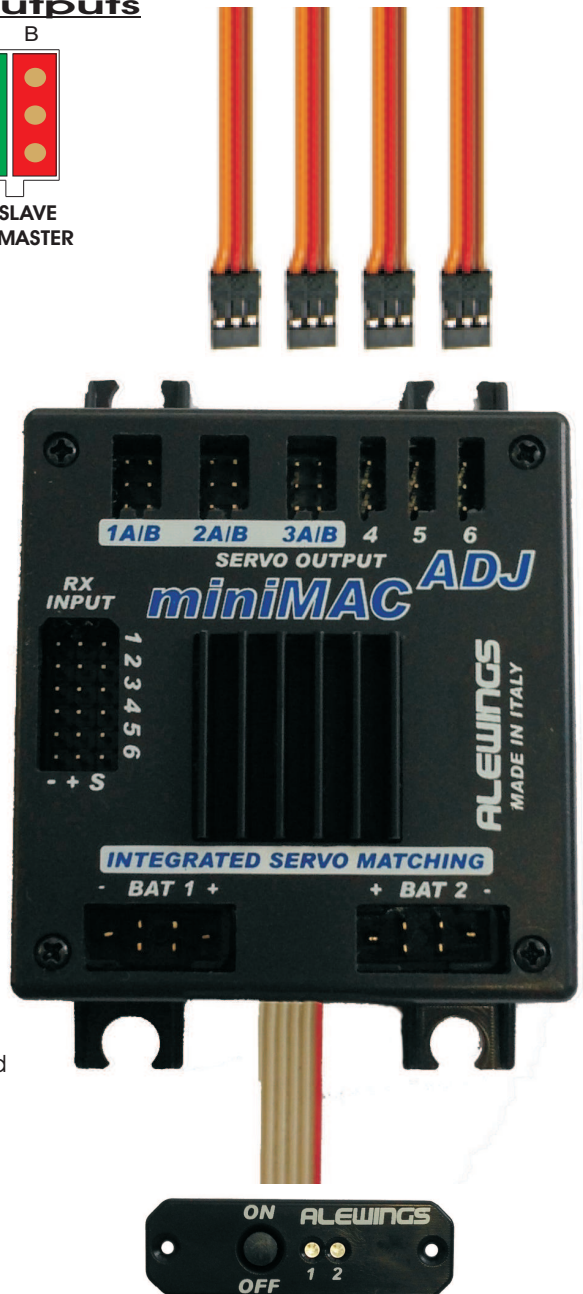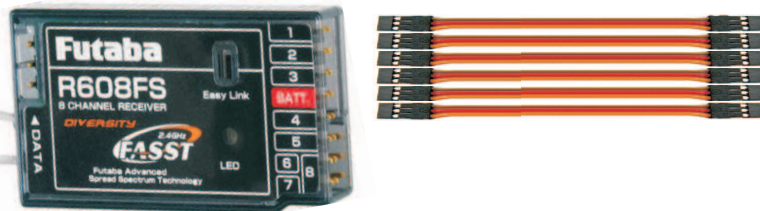
Batteries connection:
Connect batteries with sockets MPX to inputs called "BAT1" and "BAT2" on the miniMAC.

Connection miniMAC - External panel:
Connect the flat cable to the corresponding connector on the external panel.
Later you will have to disconnect again in order to fix the panel on the external side of the fuselage or on the receiver board.
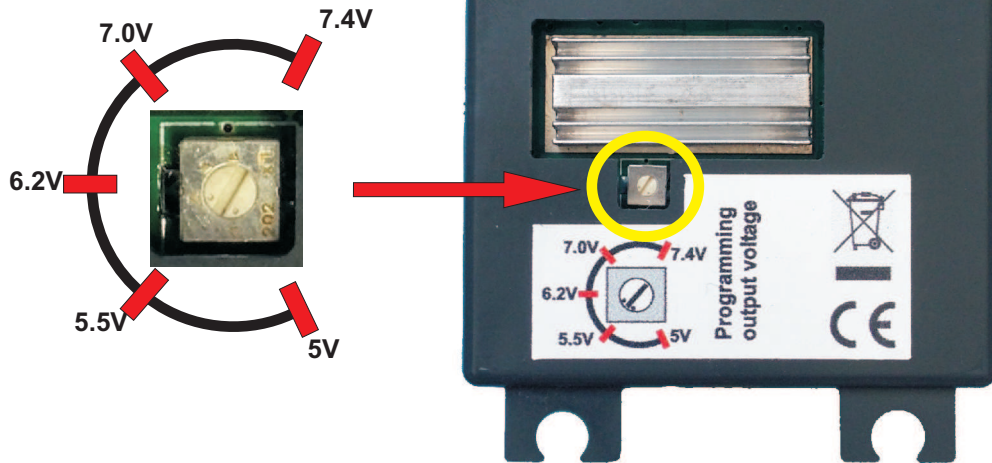**PAY ATTENTION TO POLARITY, THE CONNECTOR SHAPE ALLOWS CONNECTION WITHOUT EFFORT.**

IMPORTANT:
Before connecting batteries, make sure you have selected, at least approximatively, the right miniMac output voltage for your receiver and servos.
SEE THE FOLLOWING PARAGRAPH.

PROGRAMMING
THE OUTPUT VOLTAGE

With a little screwdriver move the trimmer on the back side of the device to the position corresponding to the desired voltage.

If you want to set a voltage between two of the values indicated or approximated to a thenth of Volt, the use of a voltmeter is recommended. Position the tips of the voltmeter on the positive and negative poles of the servo output (you can use an extension lead for an easier operation): moving the trimmer you can program the voltage with maximum precision.

ATTENTION: YOU MUST PROGRAM THE CORRECT OUTPUT VOLTAGE BEFORE CONNECTING THE POWER UNIT TO ANY OTHER DEVICE

STARTING FOR THE FIRST TIME

Before using the MiniMAC please be sure you have correctly connected the box as shown into the paragraph "Connection" and you have chosen the right output voltage for your servos and receiver.

IMPORTANT:

- When you connect the first battery, the device turns automatically on

- Make sure that servos are disconnected from corresponding moving part; the servo blocking at end point may damage the box, the servo and the moving part.

- Make sure to connect the batteries respecting polarity and to use only LiPo 7,4V batteries.

When you connect a battery, the device automatically turns on and the LEDs light up solid blue.

NOTE: the device detects power supply interruptions; for this reason it goes automatically in alarm status when turned on (as if a power failure occured) wit LEDs steady on. See the paragraph " Batteries status" for description of flashes sequences.
So, after connecting both batteries, you have to turn the device off and on again (as shown below) to reset the alarm.

TURNING OFF AND ON:
When the device is on, press the button and keep it pressed for at least 2 seconds to turning it off. The LEDs on the external panel will turn into solid blue and after 2 seconds they will turn off. When you release the button the device is off.

When the device is off, press the button and keep it pressed for at least 2 seconds to turning it on. The LEDs emit 2 sequences of 3 rapid flashes: now the device is ready to use. The LEDs will start flashing at different frequency depending on the state of the two batteries (see the "Batteries state" paragraph).

Two seconds after you turn it on, the device starts to check the status of the two connected batteries.
The LEDs emit different sequences of flashes indicating the voltage of the batteries.
More the flashes are rapid and less the batteries have residual power.

ATTENTION: If the LEDs are solid blue, the device has entered the ALARM status (low or disconnetted batteries). Recharge batteries or check connections.

LEDs FLASHES:
- 1 flash every 3,5 seconds: > 7,5V
- 1 flash every second: > 7,2V
- 1 flash every 0,5 seconds: > 7,0V
- light solid: < 7,0V and/or loss of power supply

To reset the alarm please turn the device off and on again.
If the alarm continues, check the connections and the batteries voltage.

ATTENTION: the LEDs flashes don't correspond to the instantaneous voltage of the batteries but to the minimum voltage detected since you turned the device on.


Button

LEDs

ALEWINGS

BATT 1   BATT 2
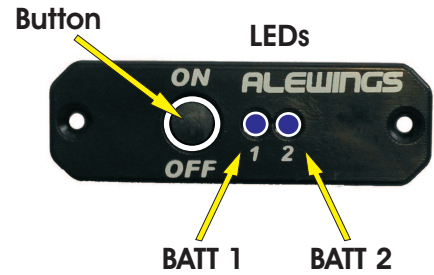
FINE ADJUSTMENT OF OUTPUT VOLTAGE:

If you want to set a voltage between two of the values indicated or approximated to a thenth of Volt, you have to use a voltmeter to read voltage during the setting.
Position the tips of the voltmeter on the positive and negative poles of one servo output.
Pay attention not to cause short circuits:an accidental contacts between poles may burn the fuse.

you can use an extension lead for an easier reading of voltage as shown into the following figure.
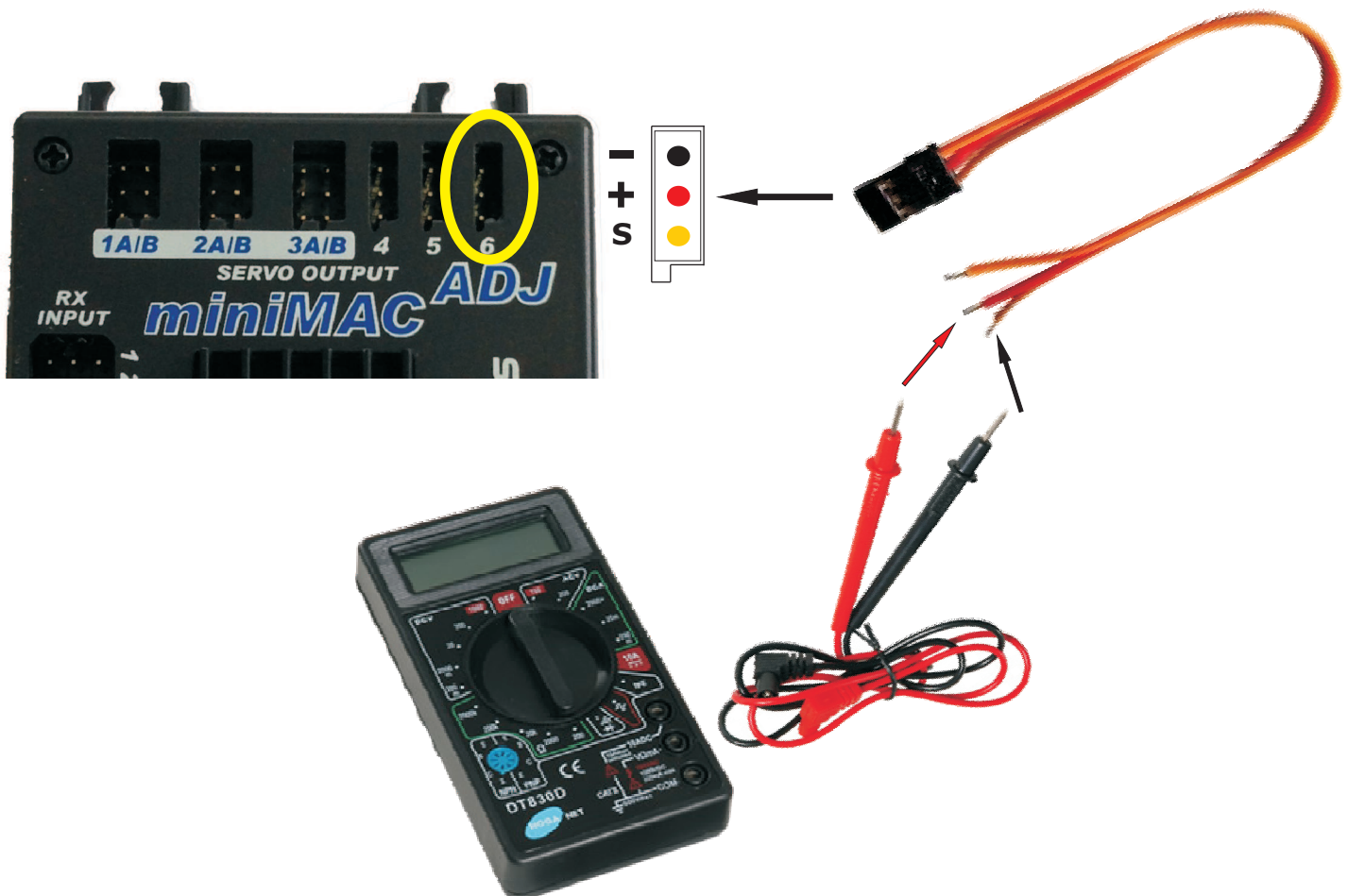
Restoring factory setting for channels 1,2 and 3:

This procedure allows you to reset every single channel to the default settings. If you want to reset all the 3 channels, you have to carry out the same procedure for each channel one by one.

- After connecting as shown into the "Connections" paragraph , check that the device is off.

- Press the button on the back side of the box corresponding to the channel you want to reset and keep it pressed.

- Turn the miniMAC Adjust on pressing the starting button as shown into the paragraph "Use".

- When the miniMAC is on, release the button on the back of the box.
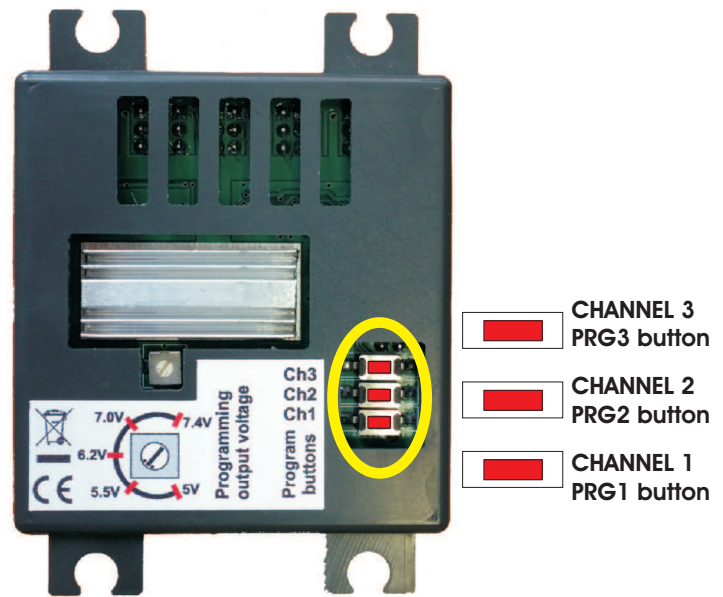
Now the channel is set according to the default values.

This procedure causes the total loss of every programming for the channel.
Servo rotation sense, central position and end points are the same as they come out from the receiver.

Buttons for programming and resetting channels 1,2 and 3

CHANNEL 3
PRG3 button

CHANNEL 2
PRG2 button

CHANNEL 1
PRG1 button

Before proceeding with programmation of a channel, it is suggested to reset it (see previous paragraph).

As example you will find here the procedure for programming the channel 1.
For programming the other channels you have to follow the same procedure acting on the button corresponding to the desired channel.

IMPORTANT: Make sure that servos connected to the cannel you want to program are mechanically disconnected from moving parts. It is recommended to disconnect both the servo arm from the servo and the linkage rod from the moving part.

Programming channel 1:
Turn the device on; make sure that the incoming signal is ok and that the servos connected to the outputs A and B move correctly.
On the back of the box recognize the right button for the channel you want to program: from here on you will act on it.

Identify the servo connected to the MASTER output (1B) and carry out the following settings:
  - choose the rotation sense (REV/NOR function on transmitter)
  - put the servo arm of Master servo in central position
  - from the transmitter (SUBTR function) regulate the central position of the servo and check it connecting the servo to the moving part
    temporarily
  - always from the transmitter (ATV function) regulate the positions of maximum mechanical range of the servo that you can get, taking care
    not to have the servo forced at end points.

Saving central position (CE) and end points (HI and LO) of servo Master:
  - Move the transmitter stick to the central position (CE) and keep it there
  - Press the PRG button and keep it pressed for at least 3 seconds: the central position CE is saved and both servos make a little movement as confirmation.
Note: if saving is not successful (servos make no movements) check that CE position is a valid one by referring to figure n.5

  - Move the transmitter stick to one end point position (i.e. LO) and keep it there
  - Press the PRG button and keep it pressed for at least 3 seconds: the low position LO is saved and both servos make a little movement as confirmation.

  - Move the stick to the opposite end point position (HI) and keep it there
  - Press the PRG button and keep it pressed for at least 3 seconds: the high position HI is saved and both servos make a little movement as confirmation.

Choice of the rotation sense for the SLAVE output:
  - Press briefly the PRG button to choose the rotation sense between right and reversed
  - Keep pressed the button for at least 3 seconds in order to save the setting: the rotation sense is saved and both servos make a little movement as confirmation.

At this point both servos are in central position (CE).

Programming the central position (CE) for the SLAVE output:

- Put the servo arm of servo Slave in central position and temporarily connect the servo to the moving part
- Move the transmitter stick to one or to the other end point to define the direction of the servo movement; press the PRG button to define the correction amount (maintaining the stick on the choosen side): if you press one single time the servo moves of 0,1°, if you keep the button pressed for more than one second, the servo moves quickly and continuously.
When you reach the desired position of the servo, release the PRG button and move the stick to the centre again.
- Unloock the uniball or the metal clevis connecting the servo to the moving part
- Press the PRG button (with the transmitter stick in the central position) for at least 3 seconds: the new central position CE for the slave output is now saved.

The servos automatically go to the next step i.e. to the low end point position (LO) recorded before.

IMPORTANT: Remember to disconnect the servo from the moving part before saving the position in order to avoid excessive efforts of the servo itself when it automatically goes to next step. (It or the device may be damaged)

Programming the low end point position (LO) for the SLAVE output:
- Temporarily connect the servo to the moving part taking care that it is not forced. (It should be, don't connect, correct the end point position and try again).
- Move the transmitter stick to one or to the other end point to define the direction of the servo movement; press the PRG button to define the correction amount: if you press one single time the servo moves of 0,1°, if you keep the button pressed for more than one second the servo moves quickly and continuously.
When you reach the desired position (servo Slave aligned with servo Master), release the PRG button and move the stick at the centre again.
- Unloock the uniball or the metal clevis connecting the servo to the moving part
- Press the PRG button (with the transmitter stick in the central position) for at least 3 seconds: the new LO position for the slave output is now saved.

The servos automatically go to the next step, i.e. to the high end position (HI) saved before.

IMPORTANT: Remember to disconnect the servo from the moving part before saving the position in order to avoid excessive efforts of the servo itself when it automatically goes to next step. (It or the device may be damaged)

Programming the high end point position (HI) for the SLAVE output:
- Temporarily connect the servo to the moving part taking care that it is not forced. (It should be, don't connect, correct the end point position and try again).
- Move the transmitter stick to one or to the other end point to define the direction of the servo movement; press the PRG button to define the correction amount: if you press one single time the servo moves of 0,1°, if you keep the button pressed for more than one second the servo moves quickly and continuously.
When you reach the desired position, (servo Slave aligned with servo Master), release the PRG button and move the stick at the centre again.
- Unloock the uniball or the metal clevis connecting the servo to the moving part
- Press the PRG button (with the transmitter stick in the central position) for at least 3 seconds: the new HI position for the slave output is now saved.

Automatically the device comes out from the programming modality and goes back to the operating modality.

WHEN YOU HAVE YET CARRIED OUT THE PROGRAMMING:

If you enter again into the programming menu after you have carried out the programming of the CE, HI and LO positions for the MASTER output and you have chosen the rotation sense for the SLAVE output, you directly go to the programming of CE, Hi and LO positions for SLAVE outputs. To carry out again the programming of CE, HI and LO positions for the MASTER output and the choice of the rotation sense for the SLAVE output, you have to reset the channel (see the "Default setting" paragraph).

Note: the programming menu is a sequencial one; if you want to go to the next step (without changing setting), you have to keep pressed the PRG button for at least 3 seconds (saving of the data).

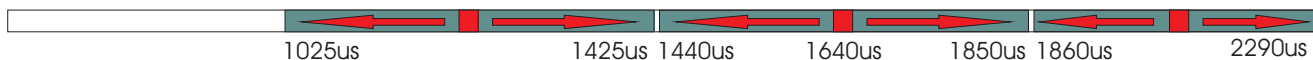**Available range for recording the center position CE for the master output**
Attention: you will not be able to record the center position CE out of this range

760us		1350us	1500us	1650us		2290us
MINIMUM						MAXIMUM
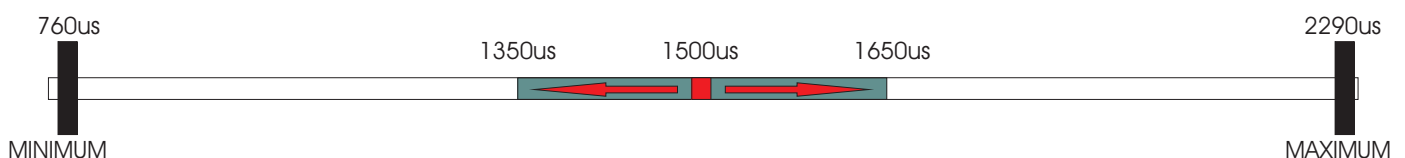
Example of programming with CE position recorded at 1500usec

| 815us | 1015us | 1215us | 1300us | 1500us | 1700us | 1720us | 1920us | 2120us |

Example of programming with CE position recorded at 1640usec (upper position)

| 1025us | 1425us | 1440us | 1640us | 1850us | 1860us | 2290us |

Example of programming with CE position recorded at 1360usec (downer position)

| 760us | 1155us | 1160us | 1360us | 1560us | 1570us | 1980us |

FIXING

Preparing the device for fixing:

Take the small bag containing 4 black rubber dampers, 4 small brass tubes and 4 self-threading screws.
Insert the four rubber dampers provided into apposite seats at the base of the device.
Insert the four brass small tubes into holes in dampers so that they exit just a little both above and below.
Prepare the four self-threading screws provided that you will use for fixing the device.

Preparing the mounting surface (hereinafter called rx plate):

-Case 1: fixing the device directly to rx plate: position the device into desired place and drill for holes for screws. Create into rx plate some openings in correspondence with heat sinks and air intakes of the device, so that air can pass and cool it. With device into mounting position, insert the four screws and tight them until they touch the brass small tubes.

Don't tight too much, don't press dampers.

-Case 2: fixing the device with spacers: position the device into desired place and create four spacers at least 10mm thick in correspondence with fixing holes. Drill four holes for screws; with device into mounting position, insert the four screws and tight them until they touch the brass small tube.

Don't tight too much, don't press dampers.

Fixing the external panel:

Using the shape provided as a guide, create the opening and the fixing holes for the external panel into the fuselage or the rx plate.
Fix it using the self-threading screws provided.

WARNING

This is not a toy.

Pay close attention to the following points, as the non observance of them can destroy the product, nullify your warranty and lead to property damages or personal severe injuries!

- Never leave the product unattended while it is switched on, in use or connected with a power supply. If a defect occurs, it could set fire to the product or to the surroundings.
- Avoid incorrect connections or connections with reversed polarity.
- All wires and connections have to be well insulated. Short-circuits might destroy the product.
- Never allow this product or other electronic components to come into contact with water, oil, fuels or other conductor liquids, as these could contain minerals, which are harmful for electronic circuits. If this happens, stop the use of your product immediately and let it dry carefully.
- Always wire up all the parts of the equipment carefully. If any of the connections loosens, due to vibrations, you might damage your device.
- Never cut off or modify the original plugs
- Never change the polarity of the receiver connectors
- Do not open the product and never solder on the PCB

SPECIFICATIONS

Dimensions:	80x61x23mm
	45x15mm External panel
Weight:	70gr without cables
Operating Voltage:	from 6,0V to 8,4V
Batteries:	Two 7,4V LiPoli batteries
Output Voltage:	Stabilized Voltage
	Programmable between 5V and 7,4V
Maximun current:	20A continuous - 30A peak
Maximum current for each output:	3A continuous with protection against short circuits
Maximun current drain:	about 100mA when the leds are ON
Current drain when device is OFF:	about 150uA instantaneous (100mA after a month unused)
Warking temperature:	-10° up to +60°C

These specifications may be changed without advance notice.

WASTE DISPOSAL

At the end of its life cycle this product is subject to special waste disposal and it cannot be disposed with urban waste