

Microprocessor controlled switch-over of back-up batteries ACCUSW 4 (version 4.10)

Operating data: *The appearance and operating data may be changed without prior notice.*

Dimensions:	22 × 27 × 6 mm	Max. current:	10 A (20 A peak)
Weight :	15 g	switching voltage for 4 cells:	≈ 3,80 V
Temperature of the environment:	0°C to 40°C	switching voltage for 5 cells:	≈ 4,25 V
No. of feeding NiCd / NiMH cells:	4 or 5	On-state switch resistance at 25 °C and 5V:	≈ 13 mΩ

The switch is designed for switch-over of dead master receiver batteries (receiver and servos) to the back-up ones.

The switch-over is carried out automatically when the voltage of master batteries drops below set limit. ACCUSW 4 is equipped with a programming connector which is used for setting the number of cells of feeding batteries.

- Programming connector **connected:** 4-cells battery packs
- Programming connector **disconnected:** 5-cells battery packs

Switching voltage is determined before start according to number of cells. Operating conditions are constantly indicated by three LED diodes and acoustically (BEEP). The switch has a special testing feature which (if used) enables to test some conditions of accumulators before flight. It mainly concerns discharged or disconnected accumulators, unsuitably chosen capacitance of batteries for the certain number (and type) of servos used in model, too big internal resistance of batteries or if number of cells of master and back-up batteries differs.

The switch tests the condition of batteries in model under load even before the actual start by moving the servos. After switching on, user is asked by short BEEP to test. Straight afterwards the beep, it is necessary to keep servos moving until next beep is heard – testing is finished. During this time both battery packs are measured under load (green LED illuminates first, then red LED) and their voltage is determined. It is possible to skip this testing under load with servos but in that case it is more difficult to determine the exact condition of used batteries and therefore it is highly recommended to use the testing feature to the full.

The possible switch failure has no negative effect on its functioning. The ACCUSW is always fed from batteries with bigger voltage. **Both battery packs must have the same number of cells!** Capacitance of back-up batteries may be lower than that of master batteries.

Instructions for use:

Good connectors should be soldered to conductors. Battery packs may be connected in any order. Using the programming connector set the number of cells in the battery packs. **Switching on is done by SWITCHING OFF the switch** after which initial setting is done – both LEDs flashes few times. Next, user is asked by a short beep to start the testing and by another beep to finish testing. The testing period – the period when servos must be moving is ca 3s. LED and piezobuzzer may indicate the following conditions:

- 4x beep, 4x one LED flashes (green LED – master batteries, red LED – back-up batteries)
 - the battery pack is not charged to the fullest. User may consider replacing it with a fully charged one (though, it is not necessary)
- piezobuzzer beeps constantly and one LED flashes constantly
 - the battery pack has a different number of cells than it was set, it is necessary to correct it.
- Piezobuzzer beeps constantly and LEDs flash by turns
 - voltage of one of the battery packs is either too high or too low. It is necessary to correct it.

If everything is in order, the switch is ready – receiver and servos are fed from master battery pack, green LED is illuminated. Red LED is illuminated after the switch-over to back-up batteries and also series of long BEEPS will be heard. The energy is now drawn from the back-up batteries. In case that even the back-up batteries are discharged, ACCUSW 4 will connect them both together to keep the needed energy for receiver and servos, both green and red LED are constantly illuminated and piezobuzzer changes tone (short quick BEEPS). It is necessary to land immediately and to replace both battery packs.

If the accumulators are not "hard" enough (they have high inner resistance cells) it is recommended to solder electrolytic capacitor of 220 up to 1000 µF / 10 up to 16 V (low ESR) to the lead-in wires of the accumulator and also to the output conductors of ACCUSW 4. It is necessary to take their polarity into consideration – their negative pole is usually marked.

EASY TEST OF FUNCTIONING OF THE WHOLE SET:

- 1) if the battery packs are in order, disconnect the master battery pack when operating under normal conditions (the green LED is illuminated) – this will simulate drop in voltage of master batteries – the switch should smoothly switch-over to the back-up batteries (green LED turns off – red LED is illuminated) and series of long beeps are heard.
- 2) Connect master batteries back – red LED is still illuminated and now shortly disconnect back-up battery pack and right afterwards connect it back – this will simulate drop in voltage of the back-up batteries – both battery packs will be connected together. Both LED are illuminated and piezobuzzer changes its tone (short quick beeps)

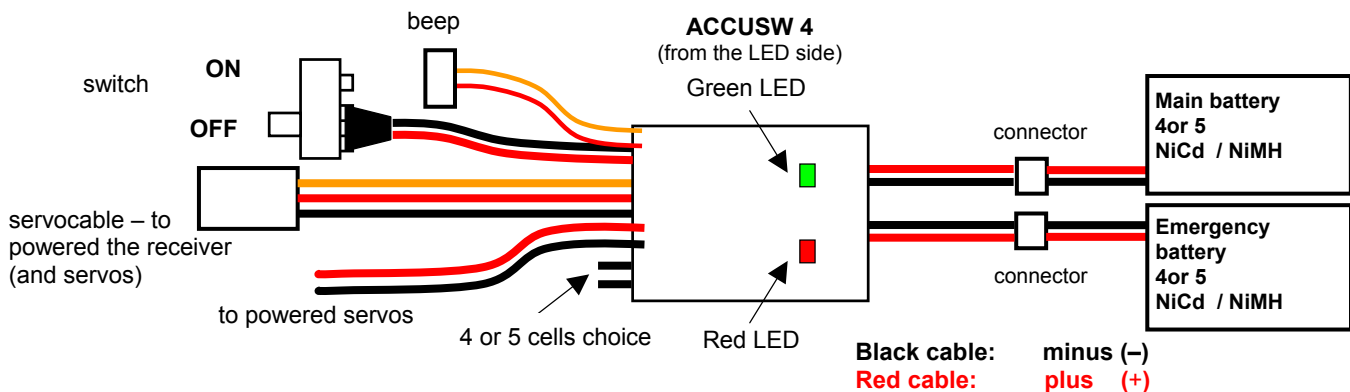
SAFETY WARNING:

Always disconnect both battery packs when not using model. Even switched off ACCUSW 4 draws small current from batteries.

WARNING:

You risk damaging or destroying the switch for:

- connect more battery cells to the switch than the max. number specified in the technical data
- reverse connections to the accumulator
- short-circuit the output wires with the accumulator connected
- current overload with currents higher than those specified in technical data
- water in the switch
- metal objects in the switch (screwdrivers, wires, etc.)



Development, manufacture and servis:

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Indication of operating conditions for ACCUSW 4 (version 4.10)

■ red

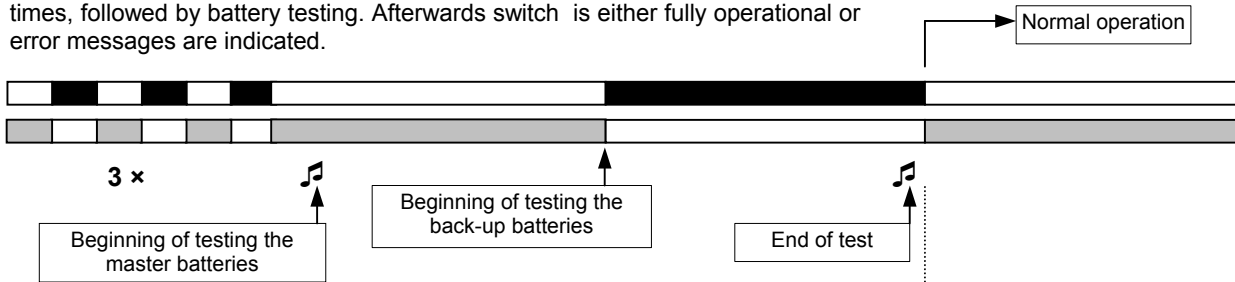
□ green

♪ short beep

♪♪ long beep

Initial setting

Immediately after the switch is turned on, both LEDs will flash by turns three times, followed by battery testing. Afterwards switch is either fully operational or error messages are indicated.



ERROR MESSAGES:

Battery pack is not charged to the fullest before start

Some of the battery packs (or both) is not charged to the fullest. LED corresponding with the not fully charged battery pack (green – master batteries, red – back-up batteries) flashes 4 times and simultaneously 4 beeps are heard. The other LED is always illuminated constantly. It is very easy to determine which battery pack is not fully charged. It depends on user whether he decides to replace the battery pack with fully charged one or whether he will continue in operating.

– (JUST WARNING)

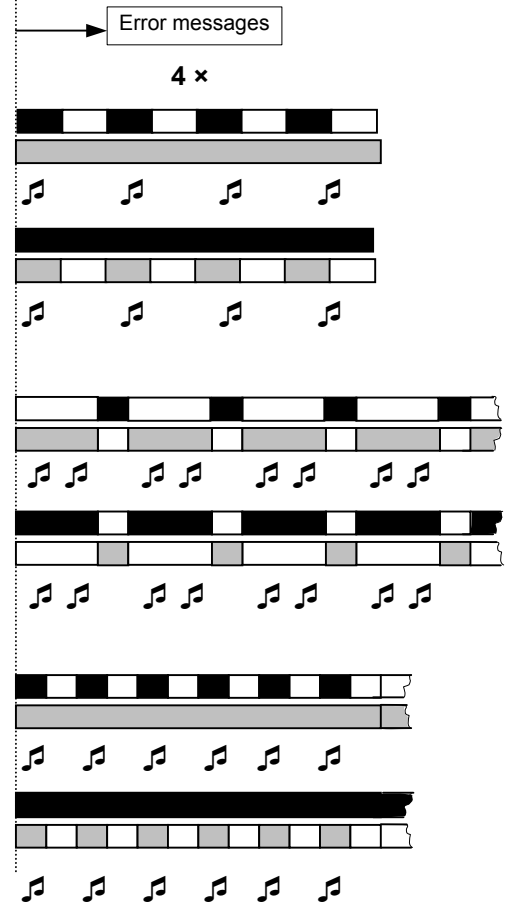
Battery pack is dead (even before start), not connected or has more than 6 cells

Voltage of one of the battery packs is too low or it exceeds the limits. It is not possible to operate with such battery pack. Unsuitable or dead battery pack is indicated by longer lasting flash of the corresponding LED, piezobuzzer is beeping.

– IT IS NOT POSSIBLE TO START !

The number of cells of the master battery pack and of the back up one different

The number of cells of the master battery pack and of the back-up pack differs. It is not possible to operate with such accumulators – the same number of cells in the master battery pack as in the back-up battery pack is necessary for correct functioning of the switch. In this case the corresponding LED (green – master batteries, red- back-up batteries) flashes constantly and piezobuzzer beeps. Other LED is illuminated constantly.



CONDITIONS DURING OPERATION:

Switch over from master battery pack to back-up pack

When voltage of the master battery pack drops below set voltage the swith-over to back-up batteries is carried out. Green LED is turned off, red LED is illuminated. Long slow beeps can be heard constantly.

– BE CAREFUL,
energy is now drawn from back-up batteries!

Connection of both battery packs together

This situation can only occur after it has already been swithed-over to the back-up batteries and also the voltage of back-up batteries drops under set limit. In this case, receiver and servos will be fed from both battery packs together, both LEDs will be illuminated, piezobuzzer will change tone into short quick Beeps. You are using the last bits of energy left.

– It is necessary to land IMMEDIATELY !

