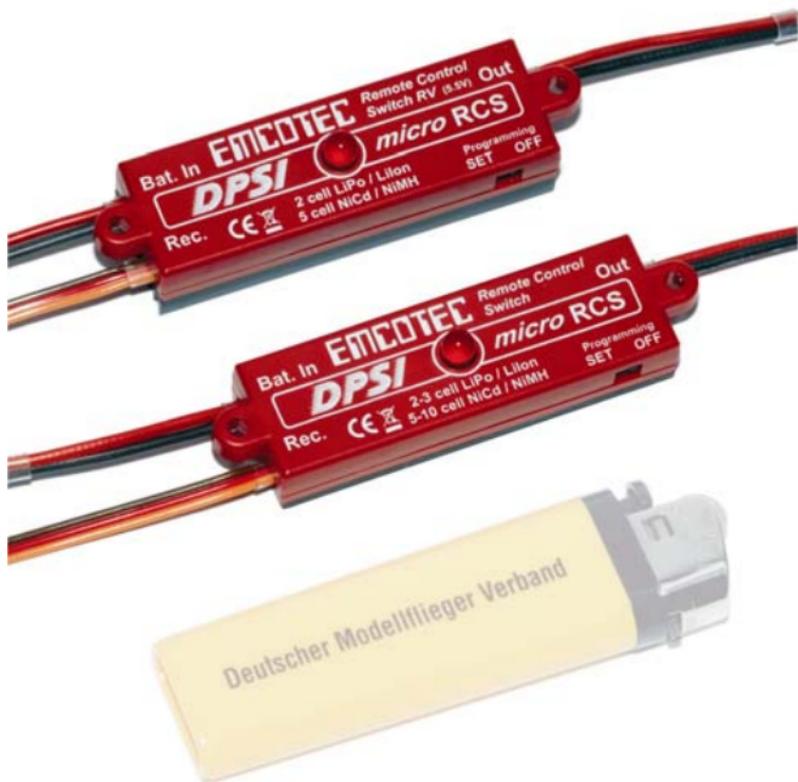


DPSI *micro* 

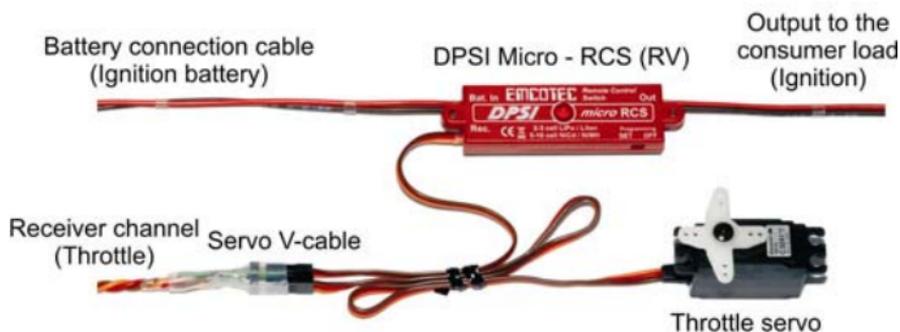
RCS / RCS RV

Operating Manual

English



Remotely controlled On-Off-Switch for NiCad/NiMH/Lilon and LiPo batteries including voltage regulation (RV version), voltage monitoring and protection against total discharge



Example: „Ignition switch“

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1. Preface

With this product of the EMCOTEC **DPSI Micro** family you purchased a high grade, modern and secure power supply system. We thank you for your faith in EMCOTEC GmbH and assure you that you have made the right decision!

Years of experience in development and manufacturing of electronic systems as well as the knowledge of the world's best model airplane pilots has influenced the development of the **DPSI Micro** systems. All products are manufactured at EMCOTEC GmbH in Germany on our own production line. Extensive optically and electronically end tests for every system which leaves our house, assure that you, our customer, acquire an absolute reliable product, which considerably increases the reliability of your valuable RC-Model.

Of course, the products of the **DPSI Micro** family not only have been tested extensively in the laboratory, but also went through intensive flight-testing. Extensive series of tests with especially in house developed data loggers have been accomplished to measure the real current consumption in model airplanes. Like done in the automobile industry an FMEA (**F**ailure **M**ode and **E**ffect **A**nalysis) reduces the possibility of damage and malfunction on operating errors to a minimum.

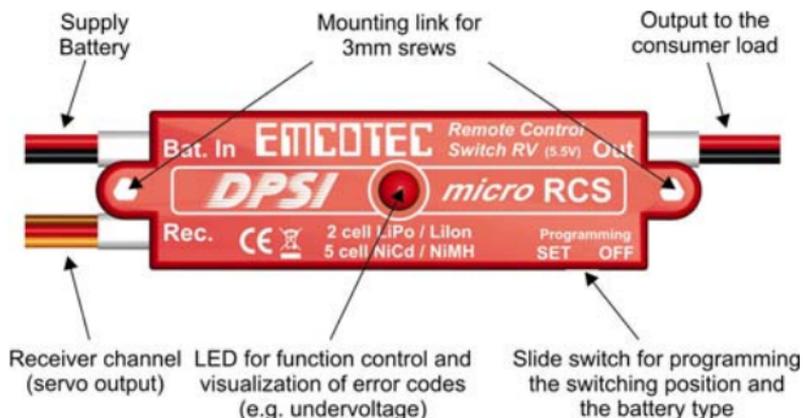
We kindly ask you to read these operating instructions carefully and to observe the installation hints. Thus, errors can be avoided in advance.

We are all ears for your wishes and questions. Challenge us!

Bobingen, May 2007

The Staff of EMCOTEC GmbH

DPSI Micro – RCS RV:



2. Characteristics

This operating manual describes two products from the **DPSI Micro** Family: the “**RCS**” (**R**emote **C**ontrol **S**witch) and the “**RCS RV**” (**R**emote **C**ontrol **S**witch – **R**egulated **V**oltage).

2.1. DPSI Micro - RCS

The **RCS** (**R**emote **C**ontrol **S**witch) is an electronically On-/Off-Switch which is actuated by remote control. It is connected to a receiver output (e.g. throttle servo).

Switching position can be freely programmed. This switch is e.g. applicable as ignition switch for ignition systems as used for gasoline engines. If throttle trim is at lowest, the ignition is turned off, at idle the system is turned on.

Because the switched voltage and continuous current can be up to 12 volts and up to 8 amps, respectively, the **DPSI Micro – RCS** is best applicable for other consumers as well, such as illuminations, pumps and similar.

The circuitries of receiver and load to be switch are totally galvanically (electrically) separated by two optically-coupled devices; no negative influence of the receiving equipment can happen.

An integrated micro controller reliably monitors the battery voltage of the consumer by using an intelligent algorism (IVM) and warns of eventual low voltage by blinking codes with an ultra bright indicator LED. Here, 5- up to 10-cell NiCad/NiMH batteries as well as 2- up to 3-cell Lilon/LiPo batteries are supported.

2.2. DPSI Micro - RCS RV

The **DPSI Micro - RCS RV** corresponds to the **RCS** in its functions. Single difference is the regulated constant output voltage of 5.5 volts; therefore, the allowable input voltage is limited to max. 8.4 volts (e.g. 2-cell LiPo battery). This is especially of interest for ignition systems of gasoline engines which must not be supplied with an unregulated voltage of e.g. 2-cell LiPo batteries, because their voltage is too high.

By using a linear regulator (not a switching one) and the galvanically separation (optically-coupled device) of both circuitries, the **DPSI Micro - RCS RV** does not generate any disturbances, which could influence the radio reception.

The generously dimensioned heat sink allows for high current loads of 3 amps continuous current when using 2-cell LiPo batteries. The **RCS RV** also monitors the battery voltage (selectable for NiCad, NiMH, Lilon and LiPo batteries). Errors and eventual occurring low voltage are reliably indicated by blink codes.

2.3. Safety Features of DPSI Micro systems

♦ Low Voltage Warning:

In order to communicate the discharge state of the battery to the user (e.g. ignition battery), an integrated micro controller monitors the all voltages by using an intelligent algorism. Error indications (e.g. battery voltage too low) are unambiguously displayed with a central ultra bright LED.

Hint:

The **DPSI Micro RCS** systems are programmed for 2-cell LiPo batteries at delivery. If other battery types are to be used, the corresponding type has to be programmed prior to usage!

♦ Quiescent Current Consumption:

The battery does not need to be removed from the **DPSI Micro RCS (RV)** during longer pauses (e.g. in winter), because the self discharge of the battery is much higher than the quiescent current of the **DPSI Micro**, which virtually is not measurable. Here too, the **DPSI** systems are unique.

♦ Protection against total discharge (activated at delivery):

As an additional specialty, the **RCS (RV)** protects the battery from total discharge by simply turning the consumer off, if so desired. Especially as far as LiPo batteries are concerned, total discharge is a costly experience, because the batteries are damaged in this case. Battery damage is inhibited by this programmable turn-off feature!

♦ Failsafe-Turn-Off (activated at delivery):

A failsafe turn-off feature tops the functionality. This means, the consumer (e.g. ignition system) is turned off if no valid signal from the receiver is received or recognized. This function is programmable, too. Because especially ignition systems for gasoline engines are often responsible for disturbances of the receiver, the source of this disturbance is turned off by this failsafe turn-off feature.

♦ Function control:

In order to provide function control, an ultra bright LED is built into the **DPSI Micro** systems. It even signals over large distances that the system is turned on and indicated the state of the equipment by different blink codes (e.g. low voltage).

3. DPSI Micro RCS-Versions in key words

- Electronically, fail safe On-/Off-switch; controllable from the transmitter (e.g. by throttle trim or other actuator)
- Separation of the circuitries of receiver and consumer by two high speed optically-coupled devices
- Switching position for turning on or off of the consumer is freely programmable
- **Failsafe function**, i.e. the consumer is turned off automatically, if no valid signal from the receiver is recognized for approx. 2.5 seconds (programmable)
- Voltage regulation to 5.5 volts for **RCS RV**
- **RCS RV** can handle up to 5W power dissipation (3A continuous current*)
- Loadable up to 20A pulse peak current
- 2-cell Lilon / LiPo batteries or 5 / 6-cell NiCad / NiMH batteries usable (**RCS RV**)
- 2- up to 3-cell Lilon / LiPo batteries or 5- up to 10-cell NiCad / NiMH batteries usable (**RCS**)
- **IVM** (Intelligent Voltage Monitoring) – intelligent voltage monitoring with optically indication for different battery types (programmable)
- **Protection against total discharge**, i.e. the consumer is automatically turned off, before damage to the battery can occur (programmable)

- Special grounding concept and 4-fold Multilayer-PCB for undisturbed operation and highest safety
 - High grade plastic die casting housing
 - Large area heat sink for deflecting heat
 - Each system 100% tested
 - Total weight only approx. 22g/0.7 oz. (**RCS**) and 28g/0.9 oz. (**RCS RV**) incl. all connection cables
 - Developed and manufactured by the market leader for RC power supplies (Made in Germany)
- * Higher power dissipation (higher maximum current) possible at active cooling (airflow)

4. Packing Contents

Shipment of **DPSI Micro - RCS (RV)**:

- **DPSI Micro - RCS (RV)** base device
- Self adhesive polyethylene mat as vibration protection
- 2 pieces of counter-sunk head screws M3x12 (Phillips)
- 2 pieces of screwing collars
- Operating Instructions
- EMCOTEC 3D sticker

Hint:

If used as switch for ignition systems for gasoline engines, the **RCS (RV)** can be driven in parallel to the throttle servo. In order to connect the servo as well as the **RCS (RV)** to the receiver, a corresponding servo-V-cable is available with order number A81040.

Each **DPSI Micro** system is tested for each function several times prior to delivery!

5. Mounting Instructions

5.1. Mounting the DPSI Micro

Hint:

Prior to mounting the **DPSI Micro** it is reasonable to program switching thresholds and battery type because the sliding switch of the **DPSI Micro** is still easily accessible.

It is most reasonable to mount at the fuselages outside wall. The LED of the **DPSI Micro RCS** systems is well viewable from the outside. A small hole of 5mm/0.2" suffices. The LED pokes out from the fuselage's side. The **DPSI Micro** could then be glued to the fuselage's inner side using e.g. silicone. That's the simplest method.

More elegant is to screw down the **DPSI Micro**. The hole is to drill with 5mm/0.2" for the LED, both outer screwing points using a 3mm/0.12" drill.

Now, both screws are put through the screwing holes. The screws serve as positioning helpers for the self adhesive cellular rubber, which itself serves as vibration protection. It is pushed over both screws from the inside and glued to the inner side of the fuselage. This anti-vibration mat is not mandatory, but advisable for combustion engines. Even small fuselage bumps are compensated.

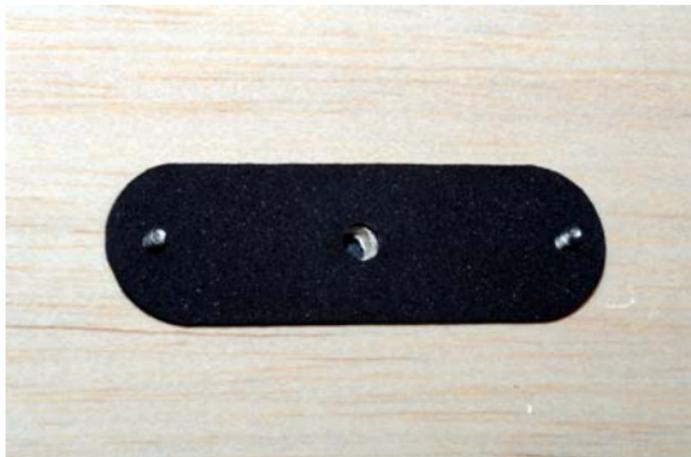
The **DPSI Micro** is now screwed by both M3 screws. The screwing collars enlarge the supporting area and therefore inhibit damage to the fuselage wall. The screw entries in the **DPSI Micro** are made up such, that the screws are self cutting. Please do not tighten the screws so that the cellular rubber is pressed too much.

If desired, the connection cables (Graupner/JR/UNI contact) can be secured by plug protectors (article number A86015) against sliding out.

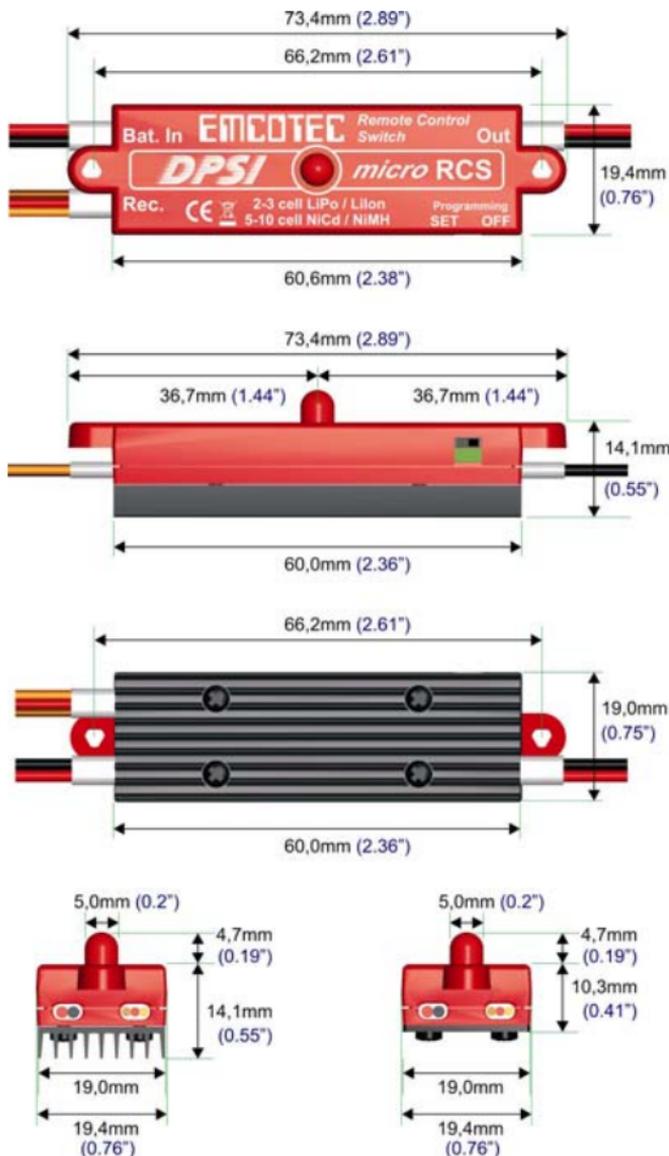
Side view of **DPSI Micro** (here DPSI RV) mounted to sidewall of fuselage:



View to cellular rubber on inner wall of fuselage:



5.2. Dimensions of the DPSI Micro RCS (RV)



Hint:

DPSI Micro systems are not protected against wrong polarity due to design! Please make sure that the batteries are always correctly connected, i.e. red wire to positive, black wire to negative. Better double check!

6. Charging the Consumer Battery

If charging of the battery (e.g. ignition-battery) shall be possible even if the battery is still connected to the **RCS (RV)**, a second cable has to be soldered to the battery which serves as charging cable. This cable is then in parallel to the connection cable of the **RCS (RV)**.

For LiPo batteries, which are still connected to the **RCS** system during charging, charging devices with limiting step up converter must be used. If the step up converter is not limiting, eventual voltage peaks can damage the electronics of the **RCS (RV)**.

Hint:

It is possible to charge the battery (via additionally soldered charging cable) if it is still connected to a **RCS (RV)**. Please always observe correct polarity of charging device!

Hint:

If LiPo batteries are in use, charging can take place by usage of the balancer connector. This is possible e.g. with the EMCOTEC balancer charging cable (article number A51000) in conjunction of an ORBIT pocket loader (article number A61000).

7. Indicator-LED

The central LED of the **DPSI Micro - RCS (RV)** displays different states of the system:

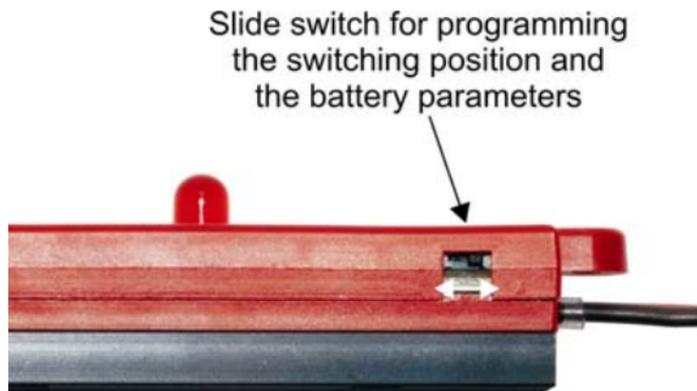
- When turning the receiver set on, the programmed battery type is indicated by blink codes (see page 19).
- Then, always a 2.5 second pause follows.
- From now on, errors or the status of the **RCS (RV)** is displayed.
 - a. A shortly flashing LED indicates a turned off consumer (e.g. ignition).
 - b. A steadily illuminated LED shows that the consumer is turned on (e.g. ignition on).
 - c. A quickly (5Hz), symmetrically blinking LED means, that a failsafe condition was encountered, i.e. a valid signal from the receiver was not sampled for at least 2.5 seconds. This indication is also displayed if failsafe-turn-off was not activated. This is not reversible (i.e. stays on until turning the system off).
 - d. A slowly (1Hz) symmetrically blinking LED means, that the protection against total discharge was activated, i.e. the consumer will be turned off if the battery gets empty. This indication is note reversible (i.e. keeps on until receiver is turned off).
 - e. 3 times shortly flashing, followed by a short turn on event shows low voltage of the consumer battery. This output is repeated every 3 seconds and is active until turning the system off.
- LED indication codes for a consumer being turned on/off are not displayed anymore in case of an error code of the c., d. and e. type.

8. Programming

Programming of the parameters of the **DPSI Micro - RCS (RV)** is done by using the sliding switch, which has a “SET” and an “OFF” position (see imprint on housing). Programming is better done prior to final mounting into the model, because the switch is perhaps not accessible any more after mounting. During normal operation, the switch **MUST** be in the “OFF” position! The switch itself can only be moved using a very small screwdriver or the peak of a needle. This is intentionally designed to prohibit mistakenly manually switching.

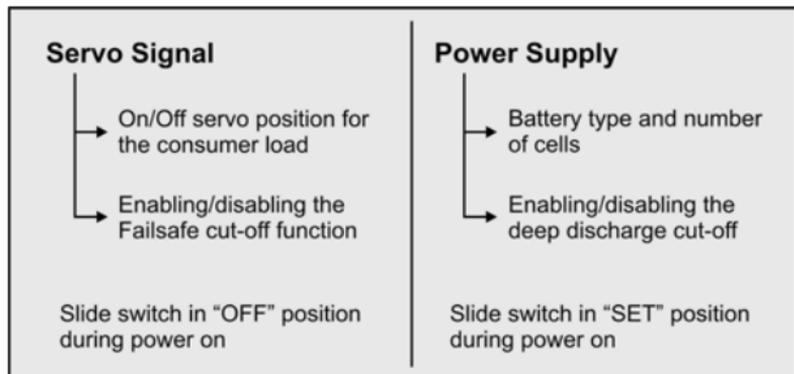
Hint:

The sliding switch for programming the **DPSI Micro - RCS (RV)** is to be moved only by a very small screwdriver or the peak of a needle. Please do not use rough tools or similar.



Programming is accompanied and controlled by different indications of the central LED in the **RCS (RV)**.

There are two “functional groups” to be programmed for the **DPSI Micro - RCS (RV)**. One group refers to the servo signal, the other to the current supply:



Programming:

It does not matter, which parameter or group is programmed first. Important is the position of the sliding switch during turning the **DPSI Micro RCS (RV)** (= > receiver) on.

For programming, the receiver as well as the consumer (e.g. ignition) must be connected. The transmitter must be turned on too, so that the **RCS (RV)** receives valid servo signals and therefore does not fall into failsafe mode, otherwise displaying failsafe errors.

8.1. Programming Parameter “Servo-Signal”

The servo signal is necessary to commit exact thresholds for the consumer, i.e. at which servo position the **RCS (RV)** should turn the consumer on or off. The failsafe-function refers to the servo signal too, because a missing or wrong servo signal means failsafe state.

After turning the receiver on, there are 10 seconds left for starting programming “turn on position of the **RCS (RV)**“. Afterwards, sliding the switch has no effect anymore.

Example: Usage as an ignition switch

- 1.) Adjustment of throttle linkage and programming of throttle servo, so that everything works correctly (correct deflection and direction of rotation).
- 2.) Eventually testing the motor without **RCS (RV)**, in order to optimally evaluate trim values of the throttle channel.
- 3.) If all works correctly, put the **DPSI Micro - RCS (RV)** in between ignition battery and ignition system (e.g. using a V-cable in parallel to the throttle servo).
- 4.) Position throttle-stick to idle.
- 5.) Get throttle-trim to the position, where the ignition system should turn on.
- 6.) Turn transmitter on.
- 7.) Turn receiver on (receiver set). Hint: When turning on, the programmed battery type is generally indicated by blink codes of the LED.
- 8.) Now move the sliding switch of the **RCS (RV)** into the “SET” position within 10 seconds using a small screwdriver (activating programming mode is only possible within 10 seconds).
- 9.) Now the ignition system will be turned on (LED steadily on).
- 10.) Position throttle-stick of the transmitter to “engine off” (throttle-trim at lower end).
- 11.) Move sliding switch to “OFF” position. Now await 5 seconds for restart.
- 12.) If the failsafe function is to be activated: move sliding switch within the 5 seconds into the “SET” position and immediately back to “OFF” position. As soon as the switch is in the “SET” position, the LED is on for 5 seconds. This indicates an activated failsafe function.
If the switch is not moved to the “OFF” position, the LED blinks with 2.5 Hz (until switch is moved to “OFF”).

- 13.) The **RCS (RV)** now executes a reset (restart) and uses the newly programmed values.

In principal, programming of the turn-on position occurs via two thresholds (stick positions of the transmitter): an “On”-position and an “Off”-position. Based on both positions, direction of rotation of the servo is recognized automatically, too.

If the **RCS (RV)** is to be manipulated via a switch at the transmitter, this switch must cause two different servo positions: an on-position (e.g. +100%) and an off-position (e.g. -100%). See more about programming switch actuators for the transmitter in the manufacturer’s manual.

8.2. Programming Parameter „Current Supply“

Because there is an intelligent battery monitoring integrated into the **RCS (RV)**, the used battery type must be made known (e.g. if a 5- or 6-cell NiCad/NiMH or a LiPo battery is used). The battery type must be programmed once – the type is stored inside the micro controller of the **RCS (RV)**, until eventually reprogramming is desired.

After turning the **DPSI Micro** on by the receiver set, the battery type is indicated by blink codes of the LED. The LED blinks 1 up to 10 times (depending on battery type), and is then off for 2.5 seconds. Only then, the switch status of consumer (e.g. Ignition on) or possible errors (e.g. low voltage) are indicated.

Battery types are defined as follows (number of blink codes of the LED right after turning the receiver set on):

Blink-Code	Battery-Type / Programming
1x Blinking	All tests deactivated / no error indication
2x Blinking	2 LiPo cells (7,4V)
3x Blinking	3 LiPo cells (11,1V)
5x Blinking	5-cells battery (NiCad / NiMH)
6x Blinking	6-cells battery (NiCad / NiMH) or 2-cells Lilon
7x Blinking	7-cells battery (NiCad / NiMH)
8x Blinking	8-cells battery (NiCad / NiMH)
9x Blinking	9-cells battery (NiCad / NiMH) or 3-cells Lilon
10x Blinking	10-cells battery (NiCad / NiMH)

Gray background:

Only for **DPSI Micro – RCS** (WITHOUT voltage regulation) possible or reasonable.

Battery type “2x blinking” (2-cell LiPo battery) is preprogrammed at delivery. Protection against total discharge is activated.

If “1x blinking” (all tests deactivated) is selected, the **RCS** system does not sample any voltages anymore. No empty batteries or other (battery)-errors are indicated!

Prior to turn on for programming, the sliding switch must be moved to the “SET” position. After turn on, the activated programming mode is displayed by the LED (3 seconds on, then 6 seconds off).

Example: 5-cell NiMH battery

- 1.) Move sliding switch of the **DPSI Micro - RCS (RV)** to “SET”-position.
- 2.) Turn transmitter on.
- 3.) Turn receiver (set) on.
- 4.) LED of the **RCS (RV)** is on for 3 seconds and then off for 6 seconds (display: start programming mode)
- 5.) LED flashes 1 time shortly (=> deactivate tests).
- 6.) 3 seconds pause.
- 7.) LED flashes 2 times shortly (=> 2 LiPo cells).
- 8.) 3 seconds pause.
- 9.) LED flashes 3 times shortly (=> 3 LiPo cells).
- 10.) 3 seconds pause.
- 11.) LED flashes 5 times shortly (=> 5 NiCd/NiMH cells).
- 12.) Now, move sliding switch within 3 seconds to “OFF”-position.
- 13.) The programmed battery type is repeated as blink codes by the LED (i.e. 5 times blinking). Then, await 5 seconds for restart.
- 14.) If protection against total discharge is to be activated: within the 5 seconds, move sliding switch to “SET”-position and immediately back to “OFF”-position. As soon as the sliding switch is in the “SET”-position, the LED is turned on for 5 seconds. This indicates the activation of the protection against total discharge. If the switch is not moved back to the “OFF”-position, the LED blinks with 2.5 Hz (until switch is moved to “OFF”).
- 15.) The **RCS (RV)** resets (restart) and executes the new values.

Hint:

If using 2-cell Lithium-Ion batteries (Lilon), the battery type “6 times blinking” is to select (corresponding to 6 NiCad/NiMH cells). This best fits the discharge curve of Lilon batteries.

8.3. Programming (Quick Reference)

Group "Servo-Signal"	Group "Current-Supply"
Teach in switching threshold	Teach in battery type
Switch starting position: "OFF"	Switch starting position: "SET"
Position servo channel to correct turn-on position (e.g. just under throttle idle).	Wait, until correct battery type is displayed by blink codes (e.g. 2 times for a 2-cell LiPo battery).
Move switch to "SET"-position.	Move switch to "OFF"-position.
Position servo channel to defined secure turn-off position (e.g. engine off), to recognize servo direction of rotation.	
Move switch to "OFF"-position.	
If desired, programming the options:*	
Failsafe Turn-Off	Protection against total discharge
Activating failsafe turn-off:	Activating protection against total discharge:
Move switch to "SET"-position within 5 seconds. LED is on for next 5 seconds.	Move switch to "SET"-position within 5 seconds. LED is on for next 5 seconds.
Wait (approx. 0.1 - 1 second)	Wait (approx. 0.1 - 1 second)
Move switch to "OFF"-position**.	Move switch to "OFF"-position**.

*If no failsafe turn-off or no protection against total discharge is desired, the switch is kept in the "OFF"-position and is not moved after programming the switching threshold or the battery type.

**If the switch is not set back to the "OFF"-position within the given time, the LED steadily blinks after 10 seconds (with 2.5 Hz). The switch must then be moved to the "OFF"-position, in order to stop blinking. The selected option is stored in any case! Therefore, quick blinking can also mean that the switch is not set to the "OFF"-position during programming.

Special cases:

- If a programmed option is to be deactivated (failsafe turn-off or protection against total discharge), reprogramming of the switching threshold or battery type is to be repeated.
- If the switch threshold is programmed without a valid servo signal, the stored value is unchanged!
- During programming, no monitoring of the battery voltage takes place.
- If battery type 1 is programmed (=> all tests deactivated), an eventually following programming of the protection against total discharge remains inactive!

Hint:

If the **RCS (RV)** is to be used as an ignition switch, all adjustments should be already done on the model (throttle linkage with servo, end positions, direction of rotation, etc).

If e.g. the **RCS (RV)** is to be used for switching illumination, all settings should be already done at the transmitter (programming mixers, switches or similar).

If in doubt, connect a servo in parallel to the **DPSI Micro - RCS (RV)** to "visualize" the switching thresholds (e.g. using the EMCOTEC Servo-V-Cable, article number A81040).

9. Error Indications

There is an internal micro controller inside the **DPSI Micro - RCS (RV)** which constantly monitors the battery voltage of the consumer. An intelligent algorithm makes sure, that a low voltage is not just redetected by a short lowered voltage. Therefore, the internal resistance of the battery cells, which is different amongst the different battery types, has only very low influence. The algorithm is especially designed for operating RC models. Herewith, recognition of low voltage is reliably possible.

The central LED indicates different error types by blink codes:

Low voltage:

— — — —————
Error signal: LED blinks 3 x 0.05s on with 0.05s pause each, then 1s on

If the voltage of the battery drops below a certain point, the corresponding blink code is output. The capacity of the battery is still sufficient for one flight before recharge is in order. Nevertheless, the battery should be recharged immediately if the error code is displayed, assuming, the correct battery type is programmed. This error code is repeated every 3 seconds. If this error is once qualified, it remains active until the **DPSI Micro - RCS (RV)** is turned off.

Hint:

The limits for low voltage recognition are especially designed for RC models. If used for other purposes, the **DPSI Micro - RCV (RV)** can eventually output wrong information. If this is the case (and if felt disturbing), just turn off the error output (see "programming the battery type").

Hint:

If the **DPSI Micro - RCS (RV)** starts outputting error codes after a short period of time, although the battery is fully charged, probably a wrong battery type is programmed. Perhaps a battery is in use with a too high internal resistance, and breaking down under load. Therefore only use batteries with high current load capabilities!

Total discharge:

Error signal: LED blinks constantly with 1 Hz

This error is indicated if the minimum voltage threshold of the battery (not the receiver-, but the consumer-battery) is reached and the protection against total discharge is activated. This error is displayed until turning off, independent of other errors. If additionally to this error a failsafe situation occurs, the failsafe error is displayed and the output of the total discharge error is interrupted. The consumer (e.g. ignition) is turned off. Turn-off thresholds for protecting against total discharge are defined as follows:

2x LiPo	3x LiPo	5x NiMH	6x NiMH	7x NiMH	8x NiMH	9x NiMH	10x NiMH
6.0V	9.0V	4.5V	5.4V	6.3V	7.2V	8.1V	9.0V

Failsafe:

Error signal: blinks constantly with 5 Hz

It is diagnosed as a failsafe condition if no valid signal is received from the receiver for at least 2.5 seconds. It is considered as an error if servo pulses are outside of their allowable range as well as erroneous gaps in between consecutive pulses. This error is output until turning the system off, independent of other errors. If the failsafe option is activated at the same time, the consumer (e.g. ignition) is turned off. This error has highest priority.

10. Safety Instructions

- In general, all connecting lines should be run so that they do not come into contact with moving or hot parts of the model (such as servos, gears or sound absorbers).
- The **“DPSI Micro”** must be protected from humidity and moisture.
- The **“DPSI Micro”** must be located at a sufficient distance from neighboring surfaces to enable good heat dissipation of the cooling element.
- Improper handling of the **“DPSI Micro”** can result in serious damage/injury to property or persons!
- Carry out a general inspection of all connections in your model before each use! All plugs must be correctly polarized and have clean contacts (i.e. fit tightly). Loose cables present a potential hazard!
- Under no circumstances may power sources that do not meet the specified voltages be used.
- The current-conducting contacts of the connector plugs may not be short-circuited. If you fail to observe this warning, the short-circuited cables may overheat and even melt.
- The **“DPSI Micro”** may not be taken apart or technically altered under any circumstances.
- Never use the **“DPSI Micro”** for purposes other than for RC model making as a hobby. Above all, their use in passenger-carrying equipment is strictly prohibited.
- Operate the **“DPSI Micro”** only with the remote control components provided for model making.
- Always ensure that you have fully charged batteries when operating your model. Empty batteries inevitably lead to failure of the RC components, which cause the model to crash.
- Do not expose the **“DPSI Micro”** to any extremely hot or extremely cold temperatures, moisture or humidity. This would lead to danger of malfunction, damage or decreased efficiency.

11. Technical Data of the DPSI RCS (RV)

Current Source (Consumer battery)	RCS RV: 5 or 6-cell NiCad / NiMH batteries, 2-cell Lithium-Ion or Lithium-Polymer batteries RCS: 5 up to 10-cell NiCad / NiMH batteries, 2 up to 3-cell Lithium-Ion or Lithium-Polymer batteries
Operating Voltage Range	4.8V.... 14V
Nominal Input Voltage	6.0V.... 12V
Output Voltage	RCS RV: 5.5V regulated / RCS: full battery voltage
Quiescent Current (when off)	<1 μ A
Quiescent Current (when on)	Approx. 6mA – Consumer Off Approx. 17mA – Consumer On (+ consumer)
Max. Continuous Current (15 minutes for LiPo batteries)	RCS RV: 3A / RCS: 8A
Max. Peak Current (10 seconds for LiPo batteries)	10A
Max. Peak Current (20ms)	20A
Ripple RCS RV 0.1A / 8A	Approx. 200mV
Max. Power Dissipation	5W
Galvanically Separation to Receiver Circuitry	Two high-speed optically-coupled devices
Input Voltage from Receiver Circuitry	1.3V up to 8.4V
Current Consumption from Receiver Circuitry	7 ... 18mA depending of receiver voltage
Servo Pulse Width	0.9msec up to 2.1msec
Error Recognition Failsafe	Pulse length < 0.7msec or > 2.3msec Pulse distance < 10msec or > 40msec
CE-Test	According to 2004/108/EC
Environmental Conditions	-10°C / 14°F.... +50°C / 122°F
Permissible Temperature Range	-25°C / 77°F.... +85°C / 185°F (Storage)
Dimensions	73.4mm x 19.4mm x 14.1mm (2.9"x0.76"x0.55")
Screwing Diameter for Mounting	2 x 3mm / 0.12" 66.2mm / 2.6" spacing
Diameter LED	5mm / 0.2"
Weight	RCS RV: approx. 28g/0.9oz. RCS: approx. 22g/0.7oz.
Warranty	24 month

Technical modifications and errors excepted!

12. Warranty

EMCOTEC GmbH shall issue a 24-month warranty on the “**DPSI Micro**“. The guarantee period shall begin with delivery of the equipment by the retailer and shall be not extended by any guarantee repair or guarantee replacement.

During the period of guarantee, the warranty shall cover the repair or replacement of any proven manufacturing or material defects at no charge. There shall be no specific entitlement to repair work. In case of a guarantee claim, the manufacturer shall reserve the right to exchange the equipment for a product of equal value if repair of the item is not feasible for economic reasons. There shall be no assumption of liability for consequential damages that are brought about by a proven defect during operation of the “**DPSI Micro**“. There shall be no extended claims for damages.

- All transportation, packaging and travel expenses shall be borne by the purchaser.
- No liability shall be assumed for any damages during transport.
- If repair is needed, the equipment must be sent to the appropriate service center of the respective country or directly to EMCOTEC GmbH.
- The guarantee shall only be valid when the following conditions are met:

The guarantee document (original invoice) must include the delivery date, the company stamp, the serial number and signature of the retailer.

No intervention in the equipment may have been undertaken.

It must have been operated in accordance with our operating instructions.

Only the power sources and other accessory devices and components that were recommended by us may have been used.

- The guarantee document, the original invoice and other pertinent information regarding the malfunction (a short description of the defect) must be included with the transmittal.
- The equipment must still be the property of the initial purchaser.
- If equipment is sent in that later proves to be functional following an initial inspection, we shall impose a flat processing fee of € 15.
- In all other respects, the general business terms and conditions of EMCOTEC embedded controller technologies GmbH shall apply for any items not listed.

(C) EMCOTEC embedded controller technologies GmbH

(P) May 2007 Version 1.0 from May 1st, 2007

Robert Hussmann

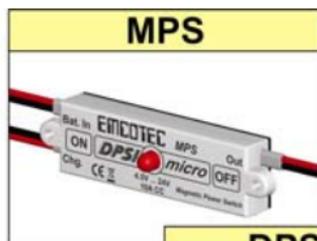
www.emcotec.de

www.rc-electronic.com

shop.rc-electronic.com

Please have a look at other products of the **DPSI Micro family**, too:

DPSI *micro*

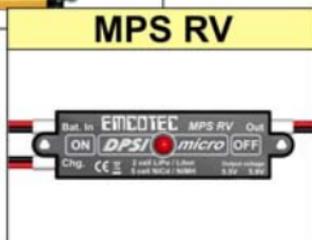


Electronic power switch
for 4.5V up to 24V
including magnetic
actuator



The smallest battery switch
of the world for all battery types
with regulated output voltage,
voltage monitoring and
magnetic actuator

Electronic power switch
with regulated output voltage,
voltage monitoring
and magnetic actuator



Receiver-Diversity with receivers you trust!

The DPSI TWIN Mini allows for diversity operation using receivers you can trust. This means: no compromises in selecting the receivers and therefore total independence of manufacturers. Two receivers are to be connected to the DPSI TWIN Mini. In case of a malfunction or disturbance of a receiver, automatic switch over to the other receiver takes place. All servos still function. Switching occurs that fast, that the pilot does not even recognize it. All modulation modes can be used, such as PPM, PCM, PCM1024, SPCM or IPD without any restriction. Due to switching up to 16 channels, Futaba G3 receivers are applicable too, as well as shortly available new receivers with even more channels. Therefore, the DPSI TWIN Mini is primed for the future.



EMCOTEC: quality of the finest!

Legal information:**Trademarks:**

The following names are registered trademarks:

- EMCOTEC
- DPSI - Dual Power Servo Interface
- DPSI RV

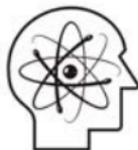
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Manual Note:

EMCOTEC GmbH reserves the right make changes to this manual and to equipment described herein without notice. Considerable effort has been made to ensure that this manual is free of errors and omissions. We shall not assume responsibility or liability for any errors that may be contained in this manual nor for any incidental, concrete or consequential damage that may arise from the provision of this manual, or the use of this manual in operating the equipment, or in connection with the performance of the equipment when so operated.



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