



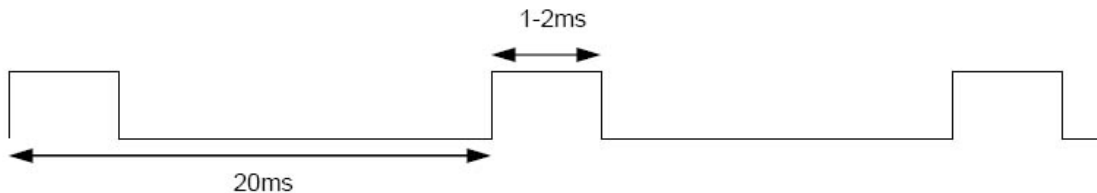
RCATS Electronic Switches FAQ

Last revised 5-30-07 by M. Luvara

Q. How do I operate the RCATS series of electronic switches?

A. Simply connect the switch to an open port on your receiver or servo controller. It is common practice to connect the switch to a retract or toggle switch on your transmitter. Ensure that the travel on your transmitter is set to +/- 100% travel for operation. The switch is designed to trigger on either side of a servo's center pulse (1.5ms). Typical servo equipment operates in a range of 1-2ms servo pulses and these pulses are typically separated by a duration of 20ms, or sent at a rate of 50Hz (50 times per second). The duration of the pulse (1-2ms) tells the servo what command to hold.

A quick primer on servo pulse theory



Q. What switch do I need for my application?

A. This certainly depends on the application.

For an **electronic ignition**, or an application where the default state is "open", we recommend the RC-100, wired in series with your existing ignition switch. This is a normally open switch, that when power is removed to it, will "open circuit", disconnecting the circuit that it is connected to.

For a **magneto engine**, we recommend the RC-100X switch, wired in parallel with your existing manual kill switch. This switch can actually be configured in either a normally open or normally closed circuit. Because it will operate in a normally closed position, this is optimal for a magneto engine. To stop a magneto engine from running, one wants to ground the magneto line. If power is removed to the RC-100X (configured for normally closed position), the relay will go to a closed state, thus killing the motor. Because it goes to a normally closed state when power is removed, this adds an additional level of safety in ensuring a motor is not live.

Whether you are using an electronic ignition or magneto engine, we still highly recommend that you install a manual switch in reach of a person for ultimate safety.

If you are utilizing the switch for lights, electric retracts, robots, or some other application, choose the switch based on the desired default configuration (on or off) and the desired current rating.

Q. Will the switches cause interference if I install them in my model?

A. This is a common question for us. The short answer is NO. The RC-100, RC-100X, RC-110, or RC-100FO do not directly link your receiver or electronics to your ignition or magneto. These switches are not electrically connected through a direct path to your motor. The RC-100FO adds an additional level of insurance by decoupling the signal line through an optical path. We have not found this to be necessary, unless in a case of extremely long wire situations or high RF environments. Quite honestly, we sell a lot more of the standard RC-100 series than the FO version.

The long answer is more complicated. One has to understand electronics and what causes interference to explain this. There are two types of radio emissions that can be classified as "noise". The first is CONDUCTED emissions. These are unintentional radio frequencies which are being conducted down a piece of wire, or conductor. The second is RADIATED emissions. These are frequencies being given off by a circuit or wire, into the air, or free space, much like your radio transmitter. Any type of electronic equipment can pick up or transmit. Some are easier than others. The bottom line is that any piece of wire is an antenna that can transmit or receive signals. If the wire length of your servo lead happens to be the right wavelength (or a function of) for a certain frequency, it is possible to either emit or pick up a signal that could cause interference within your system. It is possible through a combination of systems to magnify an existing problem, thus causing interference. Any time you add new equipment, whether it be a switch, extra servo extension, or electronic device, a thorough radio range check should be performed. Electromagnetic interference is a tricky subject and it still surprises the experts. For example. The wavelength of 72MHz can be derived by the following (assuming permittivity of free space):

$C = \lambda V$, where C=speed of light, λ (lambda) = wavelength and V= Frequency

Solving for wavelength (λ), $\lambda = C/V = 3 \times 10^8 / 72 \text{MHz} = 3 \times 10^8 / 72 \times 10^6 = 4.16$ meters or 13.65 ft.

R/C transmitters are typically $\frac{1}{4}$ wavelength, being 3.5 feet or so. Receivers are about $\frac{1}{8}$ wavelength at around 18 inches. The point is that a wire of this length is more capable of picking up this frequency.

Q. How many amp switch do I need for a kill switch on my ignition or magneto engine?

A. The RC-100 or RC-100X, which are 5 Amp rated switches, should work fine for your application. We have the RC-110 (10 Amp version) for high current applications and are not aware of any engines that require more than 5 Amps for a kill switch. The ratings on these switches are for constant current. Short term bursts above the rated levels are probably not an issue. Check with us for further details.