



RC6 Dual Motor Differential Drive System

RF control data is delivered via 2 balanced RS485 data pairs, one for each direction. All 5 lines are used in all RC6 data cables.

Each motor driver uses a White Rodgers high-current main contactor relay (the safety actuator) to open the motor power circuit in the event of a fault. The electronic circuitry driving this actuator operates independently from the rest of the controller. It must continually see a healthy control heartbeat to keep the contactor closed. Most faults anywhere in the system, from the transmitter all the way to the contactor driver, will open the contactor and disconnect motor power.

MOTOR POWER MUST BE WIRED THROUGH THE CONTACTOR FOR THIS SAFETY SYSTEM TO OPERATE AS DESCRIBED. The contactor is external to the RC6 controller.

Releasing the deadman switch on the transmitter disables the heartbeat, causing actuators to open. Thus, the actuator system is tested regularly by using the deadman switch.

SOME FAULTS CANNOT BE DETECTED BY THIS SYSTEM. It cannot detect human error. It cannot detect most mechanical faults. These could include, but are not limited to, a stuck deadman switch, or a damaged gearbox/key/keyway/shaft/motor.

THE SYSTEM OPERATOR IS ULTIMATELY RESPONSIBLE FOR SAFETY. Methods should be determined for swiftly manually disabling devices at any time by opening the power circuit.

If used, electric brakes should require power to release, and be engaged by default. This ensures brakes are active in the event of a power failure.

Brakes are engaged via the brake power driver when motor power has dropped to zero for approximately 1 second. When brakes engage, the motor power driver switches to open circuit and no electronic holding is provided. When motors are commanded to move, electrical holding power is applied a few milliseconds before the brake is released.

BEWARE OF THE POTENTIAL FOR ROLLING, COASTING, AND DRIFTING IF BRAKES ARE NOT USED. This is generally not a problem when using high-ratio gearboxes and operating on a flat and level surface.

Differential drive, or "tank drive" requires both motors to spin at the same speed to move in a straight line. A fault of one motor and not the other results in a sharp turn. To minimize the likelihood of this occurrence, a second set of contacts on the main-contactor relay (the safety actuator) is wired back to a limit-switch input on the other motor driver. Thus, if one contactor is not engaged, both motor drivers will be disabled.

BEWARE OF MOTOR WIRING FAULTS BETWEEN THE DRIVER POWER OUTPUT, CONTACTOR RELAY, AND MOTOR. Such a fault could result in a steering failure that is not detected by the limit switch lock-out system.

SYSTEM SAFETY CAN BE ENHANCED BY USING THE 3 REMAINING LIMIT SWITCH INPUTS. Each limit switch input has a setup parameter to select "Open to Run" or "Close to Run". The latter (Close to Run) is generally considered safer. Avoid limit switch circuits that disable only one driver and not the other.

LIMIT SWITCHES DO NOT CAUSE THE MAIN CONTACTOR TO OPEN. THUS, THEY DO NOT CAUSE THE OTHER MOTOR DRIVER TO BE DISABLED AUTOMATICALLY.

Contact RC4 Wireless for additional technical support and assistance.

USE AT OWN RISK. Soundsculpture / RC4 accepts no liability whatsoever for the use of this system. All liability rests with the user. Do not operate any wireless motion system without live human monitoring. Never disable any provided safety system, including deadman switch or main contactor relays. Test system operation regularly. Create, document, and practice emergency response plans.

DO NOT ALLOW CONNECTIONS, WIRING, BATTERIES, OR ELECTRONIC SYSTEMS TO OPERATE HOT. If connectors or wiring are hot, stop using them immediately. Replace any faulty connectors, ensure all connections are tight and safe.

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RC6 Wireless Differential Drive System (Dual Motor)

Size A3	FCSM No.	DWG No.	Rev 1.1
Scale		Sheet	