

303 MHz 6-Function Remote Control Receiver (with On-Board 10-Amp Relays)

The RCRC-6R Series remote control receivers are designed to provide a quick and cost effective solution for a variety of wireless applications. The receiver includes an external antenna, decoder and six 10-Amp on-board relays. The relays are individually configurable for momentary, toggled, or latched operation. The receiver offers excellent sensitivity and selectivity by the utilization of SAW technology and state-of-the-art low noise amplifiers. An external jack is provided, enabling the use of an optional antenna to increase range. Units are designed to work with Applied Wireless KTXWC series handheld transmitters. This is a code-learning receiver, able to learn up to 4 different coded transmitters.



Features

- Matching Transmitters Available
- Six 10-Amp SPDT On-Board Relays
- Long Range – 400 to 900 ft¹
- Integrated Code-Learning Decoder
- Can Learn up to 4 Transmitter IDs
- Highly Secure – 16.7 Million Unique Transmitter IDs
- Momentary, Latched, or Toggle Operation
- 12-24 Volts DC or AC Operation
- Pluggable Screw-Clamp Wiring Connectors
- Active Relay Indicator LEDs
- Received Data / RF Reception Indicator LED

Typical Applications

- Industrial ON/OFF Applications
- Motor Control
- Solenoid Control
- Lighting Control
- Access Control
- PLC Activation

Ordering Information

<i>Frequency (MHz)</i>	<i>Model Number</i>	<i>Matching Hand-Held Transmitter</i>
303.825	RCR303C-6R	KTXW303C6-n N=1 to 6 channels

Optional Accessories

<i>Part Number</i>	<i>Description</i>
610307	AC Power Adaptor, 120VAC-12VDC, 200ma
610300	AC Power Transformer, 120VAC 24VAC, 20VA
269006	AC Power Line Contactor, SPST, 20amp, 24VAC coil

¹ When used with the included whip antenna, unobstructed line of sight range is 400-500 feet. Optional Dipole Antenna is available for longer range. See Antenna Options table.

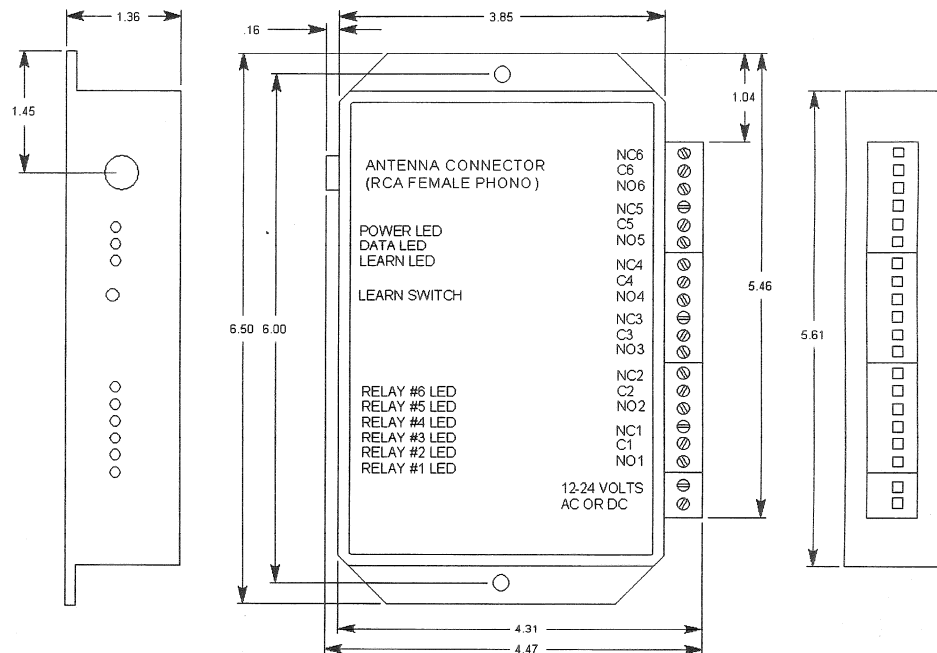
Electrical Characteristics

Sym	Parameter	Min	Typ	Max	Unit
	Operating Voltage Range AC/DC	9.5	12	27	Volts
	Operating Current, quiescent (12VDC)		30		mA
	Operating Current, 6 relays active (12VDC)			270	mA
	Relay Contact Ratings at 28VDC			10	Amps
	Receiver Sensitivity		-112		dBm
f_c	Center Frequency		See Chart		MHz
Z_{in}	Antenna Input Impedance		50		Ohms
T_{op}	Operating Temperature	-20		+60	°C

Antenna Options

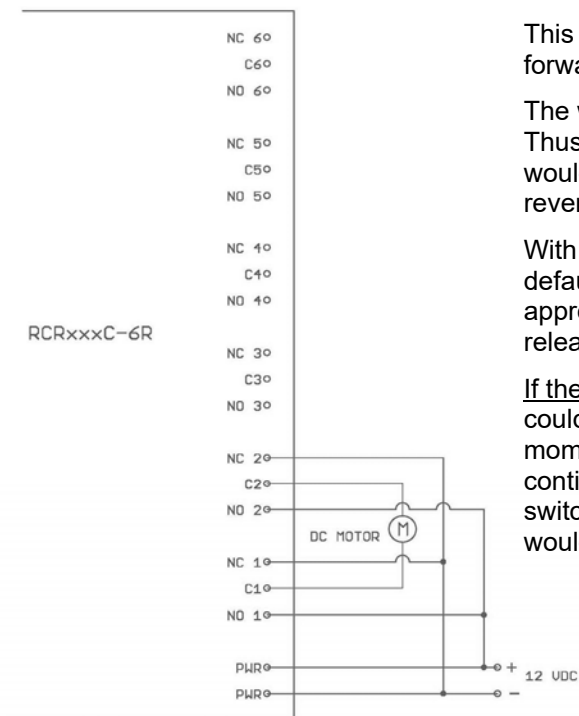
Model (frequency)	Description	Gain (dBd)	Open-Field Range (typical)*	Notes
800014 (303.825MHz)	¼-Wave Whip	-2	400-500 feet	Included with Receiver
DP300A (303.825MHz)	Dipole	0	Up to 900 feet	With 7-ft. cable

*Unobstructed straight line of sight. For best range performance, position antenna vertically, as high above ground level as possible.

Package Dimensions


Specifications subject to change without notice or obligation.

Application Circuit – DC Motor Forward/Reverse Circuit



This is an example of using the RCRC-6R Receiver for wireless forward and reverse remote control of a DC motor.

The wiring diagram shows the motor connected to Relays 1 and 2. Thus it follows that Buttons 1 and 2 on the handheld transmitter would control the motor (e.g. Button 1 for forward, Button 2 for reverse).

With Relays 1 and 2 configured for Momentary Mode (factory default), the motor runs in the desired direction only when the appropriate button on the transmitter is pressed. When the button is released, the motor stops.

If the motor is equipped with limit switches, Relays 1, 2, and 3 could be configured for Latched Mode. In this configuration, a momentary press of Button 1 or 2 would cause the motor to run continuously in the appropriate direction, until it reaches the limit switch. Button 3 can be used to stop the motor at any time (Relay 3 would not be connected to anything).

Programming and Configuration

Transmitter Learn Mode

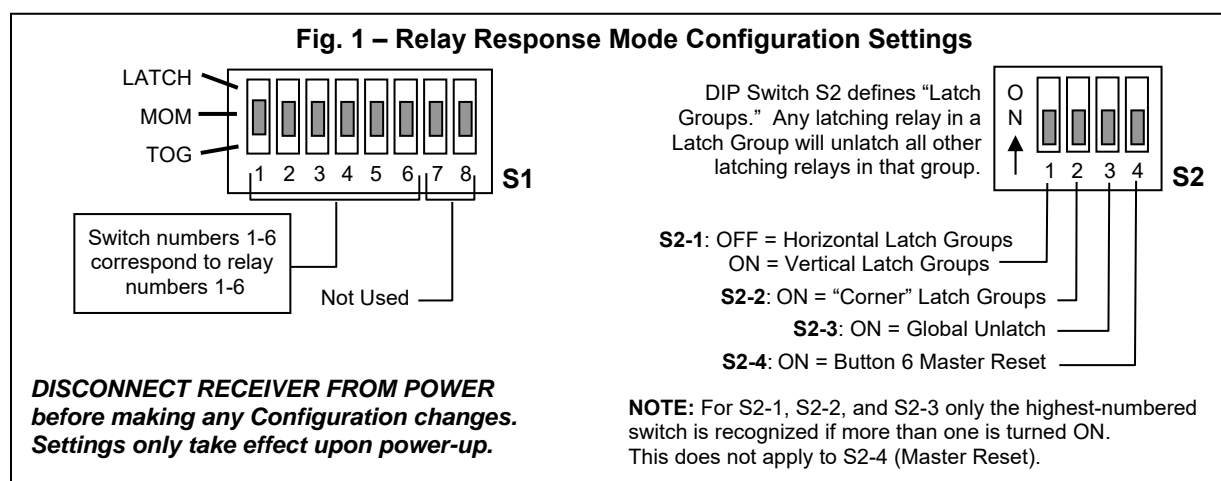
The receiver will learn up to 4 transmitter IDs, storing the IDs in non-volatile flash memory. To learn a transmitter, perform the following steps:

1. Power up the receiver.
2. Remove the receiver antenna.
3. Momentarily press the LEARN button. The LEARN LED will illuminate.
4. Press any button on the transmitter. When the LEARN LED turns off, the transmitter has been learned.
5. To learn another transmitter, repeat steps 3 and 4.

When a fifth transmitter is learned, the first (oldest) transmitter that was learned is eliminated from the receiver's memory and will thus no longer operate the system. Similarly, if the Learn Mode procedure is performed four times with the *same transmitter*, all previously learned transmitters (with different IDs) will be erased from the receiver's memory and will no longer operate the system.

Relay Response Mode Configuration

Each of the six relays of the RCRC6R remote control receiver may be configured for one of three possible "Response Modes." A Response Mode defines how a relay functions when that relay's associated button is pressed on the handheld transmitter (part number KTXWxxxC6). The individual Response Modes for Relay 1 through Relay 6 are determined by the settings of DIP Switches S1-1 through S1-6 respectively, as shown in Fig. 1. The three available Response Modes are Momentary (factory default), Toggle, and Latched. The following sections describe in detail the characteristics of, and configuration settings for, the various Relay Response Modes.



- **Momentary Mode** (factory-default)

A relay energizes when its associated button on the transmitter is pressed. The relay deactivates when the transmitter's button is released (or reception of the transmitter's signal ceases). A relay is configured for Momentary Mode when that relay's associated section of DIP Switch S1 is set to the center (MOM) position.

- **Toggle Mode**

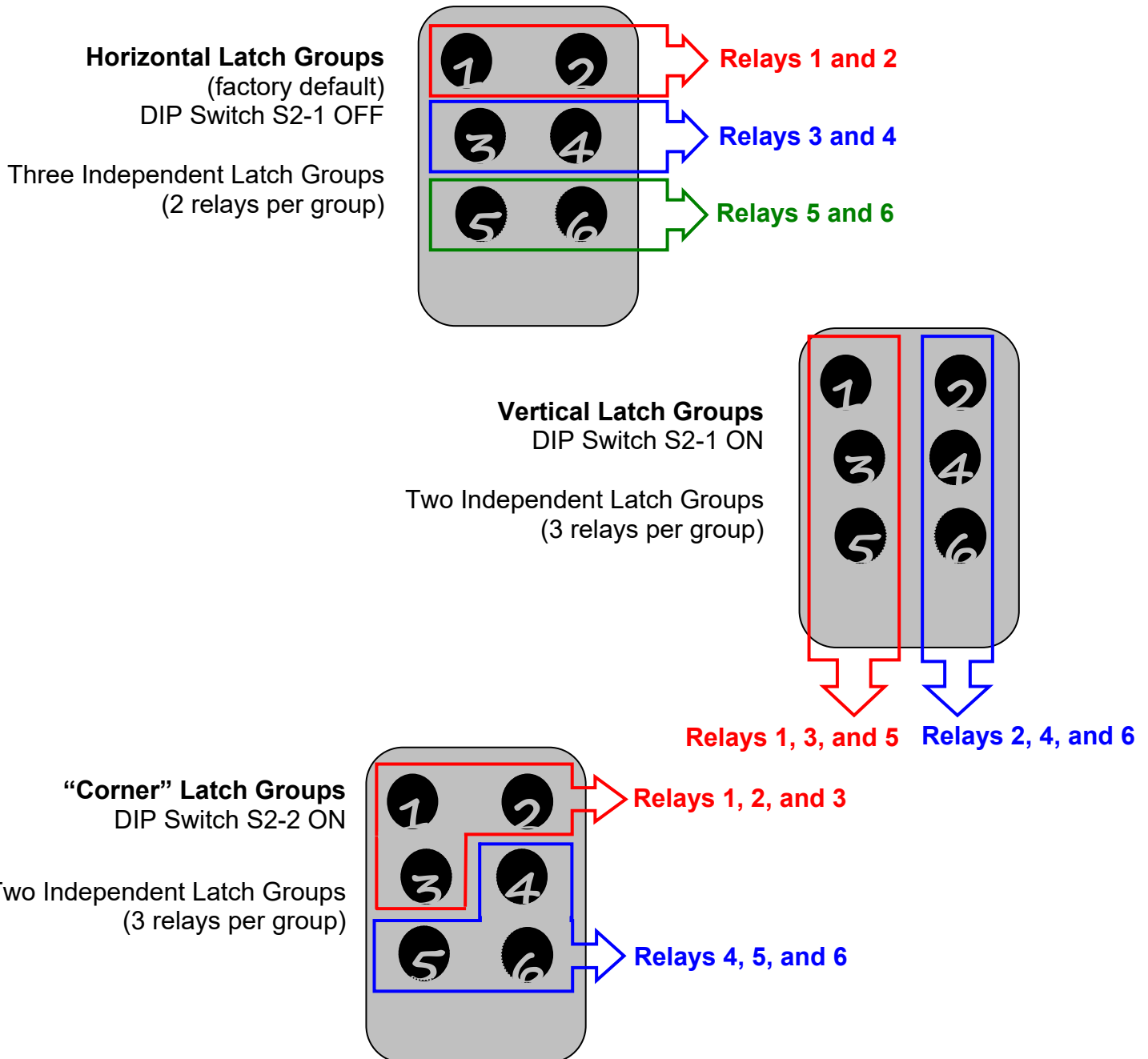
A relay energizes when its associated button on the transmitter is pressed, and remains energized after the button is released. A subsequent press of the same button on the transmitter will deactivate the relay. In this mode, each of the relays is completely independent of the others, thus any number of relays configured for Toggle Mode may be energized at any given time. A relay is configured for Toggle Mode when that relay's associated section of DIP Switch S1 is switched down to the TOG position.

- **Latched Mode**

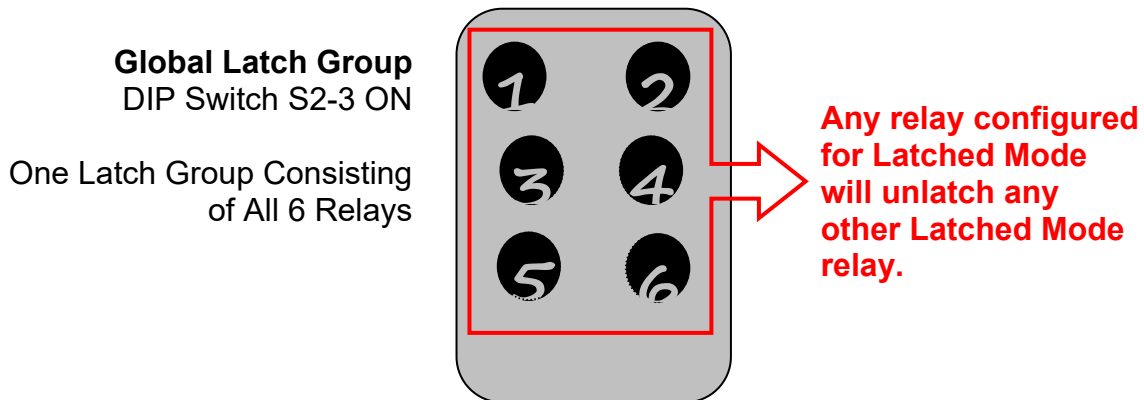
A relay energizes when its associated button on the transmitter is pressed, and remains energized after the button is released. That relay is turned off when another Latched Mode relay is activated. A relay is configured for Latched Mode when that relay's associated section of DIP Switch S1 is switched up to the LATCH position. (section continues on next page)

• **Relay Response Mode Configuration – Latched Mode** (continued)

If any relays are configured for Latched Mode, a “Latch Group” must also be selected via DIP Switch S2 (refer to Fig. 1). A Latch Group consists of two or more relays. Only one relay within a Latch Group can be energized at any given time. The receiver offers four different Latch Groups: Horizontal, Vertical, Corner, and Global. Each Latch Group is organized by the physical orientation of the buttons on the handheld transmitter, as shown in the following four illustrations. The desired Latch Group may be selected via DIP Switch S2 (refer to Fig. 1).



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Relay Response Mode Configuration – Latched Mode (continued)**Master Reset Function** (optional)

In addition to the Latch Groups described above, the RCRC6R receiver provides an optional Master Reset function. If the Master Reset function is enabled, pressing Button 6 on the transmitter will turn off any relay(s) that is(are) energized (either latched or toggled) at that time. When the Master Reset function is enabled, Relay 6 is non-functional (does not respond to Button 6 on the transmitter), regardless of the Response Mode to which it is configured (via DIP Switch S1-6). The Master Reset function is enabled by setting DIP Switch S2-4 to its ON position.

Miscellaneous Considerations for Configuration

- When changing any DIP Switch settings, the receiver **MUST** be disconnected from power. Configuration changes do not take effect until the receiver is powered up (i.e. the DIP Switches are only interrogated by the receiver's microprocessor at power-up initialization).
- DIP Switch S1-7 and S1-8 are not used. They are reserved for future product enhancements.
- For DIP Switches S2-1, S2-2, and S2-3 only the highest-numbered switch is recognized if more than one is turned on. This does not apply to S2-4 (Master Reset).

Application Note: Factors Affecting Range Performance

The RF signal from the handheld transmitter will penetrate non-metallic building surfaces, but is blocked (and reflected) by metal objects and materials. As an example, signal reception through typical wood frame and drywall construction is generally quite good, however the signal can be significantly attenuated if the wall is covered with wire mesh and stucco. Substituting an Applied Wireless Dipole Antenna, or Active (amplified) Dipole Antenna (see Antenna Options table) for the receiver's standard whip antenna will significantly extend reception range. For maximum range performance, the receiver's antenna (whip or dipole) should be oriented vertically, and placed as high above ground level as possible.