

## IRX-10A

### Infrared Remote Control Relay Board

The IRX-10A decodes standard off-the-shelf universal infrared transmitters capable of transmitting standard 12-bit Sony® TV or VCR key codes, providing remote control of four 10-amp relays + four high-current digital outputs.

#### Features

A unique feature of the IRX-10A is its ability to learn new Sony transmitter TV or VCR key codes, allowing the user to select which keys on the transmitter will be used to control individual relays, and digital outputs on the IRX-10A board.

A ULN2803A NPN Darlington transistor array driver provides the control output for each 10-amp mechanical relay, and directly drives each digital output.

Internal clamp diodes in the ULN2803A driver allow the digital outputs to control inductive loads such as mechanical relays, small DC motors, and more. Solid-state relays can also be driven from the digital outputs, allowing direct control of higher current loads supported by the solid-state relay.

LED indicators for each relay and digital output are provided for a visual status of each control outputs ON and OFF state.

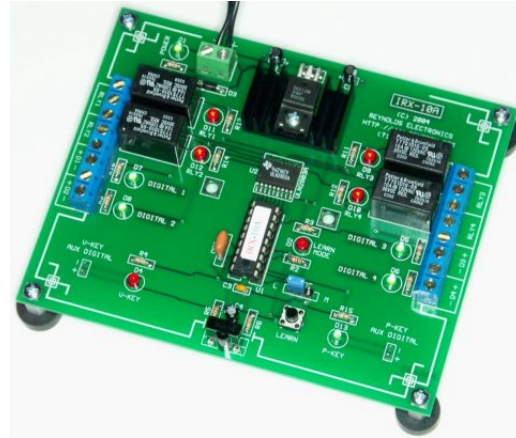
A relay status LED is ON when the relay contacts are closed, and OFF when the relay contacts are open. A digital outputs status LED is ON when the digital output is active, and OFF when the digital output is inactive.

The LED labeled P-Key provides a visual indication that a "power" or control key code is being received. Power keys are IR transmitter key codes that will control the relay & digital outputs.

The LED labeled V-Key provides a visual indication that a compatible 12-bit Sony IR transmitter key code is being received. This LED will be ON while receiving any valid 12-bit Sony key code.

#### Default Control Keys

The IRX-10A decoder IC is pre-programmed to decode keys #1 through #8 on standard 12-bit Sony infrared transmitters. Transmitter keys with corresponding outputs they will control are listed below in table 1.



#### Latching & Momentary Modes

A 3-pin MODE selection header is provided for jumper selection of momentary or latching modes. All relay & digital outputs operate in the same mode, depending on the position of the shorting jumper on the MODE selection header.

In the L position all relay & digital outputs operate in latch mode. Latch mode allows the user to toggle the relay contacts open & closed, and digital outputs ON & OFF with each key press from the IR transmitter. Simply press & release a transmitter key to toggle the state of a relay contact or digital output.

In the M position relay contacts & digital outputs operate in momentary mode. In momentary mode, relay contacts will remain closed, and digital outputs will remain ON until the infrared transmitter key that controls the relay or digital output is released.

Releasing the key on the IR transmitter opens the corresponding relay contact or turns OFF the digital output controlled by the key being pressed.

Connections to relay & digital outputs are made via screw terminals, and clearly labeled on the circuit board silkscreen in front of each relay & digital output connection point.

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Transmitter Key #	Controlled Output	Transmitter Key #	Controlled Output
1	Relay #1	5	Digital Output #1
2	Relay #2	6	Digital Output #2
3	Relay #3	7	Digital Output #3
4	Relay #4	8	Digital Output #4

Table 1

#### Learn Mode

Learn mode provides a simple method for teaching the IRX-10A new 12-bit Sony IR control keys. New control keys are learned in order, starting from Relay #1 to Relay #4, then Digital Output #1 to Digital Output #4.

Status LEDs by each output turn ON to indicate the IRX-10A is learning the new key code for that particular output, and back OFF once the new key code has been learned. The process is very simple. Enter learn mode by pressing the learn switch on the IRX-10A board. The learn mode LED will blink 4 times to indicate the IRX-10A is ready to learn new key codes. Once in learn mode, press the key on your Sony infrared transmitter you want to control Relay #1, and hold the key down until the Relay #1 LED blinks ON, and then OFF. Release the transmitter key immediately once the LED turns OFF. The IRX-10A has now learned the new key to control Relay #1.

Repeat this process until the IRX-10A decoder has learned each new key for all 8 outputs. Once the last new key for Digital Output #4 has been learned, the learn mode LED will flash 4 times indicating the learning process is complete.

Factory default key codes & new key codes learned are stored in non-volatile EEPROM memory inside the IRX-10A decoder IC, and will not be affected by a loss of power. The internal EEPROM memory has a write cycle life expectancy of approximately 1,000,000 writes, so learning new key codes frequently is possible.

#### Restoring Factory Default Key Codes

To restore the factory default key codes used to control the IRX-10A outputs, remove power from the IRX-10A board. Press & hold the learn switch on the IRX-10A, and re-apply power. Hold the learn switch down until the learn LED on the IRX-10A board begins to blink. Once the learn LED begins to blink, release the learn switch. The pre-programmed default factory key codes have now been restored, and the keys shown in table 1 will now control the relay & digital outputs.

#### Auxiliary Digital Outputs

Auxiliary digital outputs labeled P-Key Aux Digital, and V-Key Aux Digital are provided for remote mounting of V-Key & P-Key status LEDs. These outputs can be used to directly drive low-current LEDs mounted externally to the IRX-10A board.

With the IRX-10A board placed inside an enclosure, LEDs can be mounted in holes drilled in the enclosure, and wired back to the auxiliary digital outputs to provide visual status of the V-Key & P-Key LED outputs. Note that the aux digital outputs are limited to 20mA each, so the use of low-current LEDs is recommended. If low-current LEDs are not available, remove the V-Key & P-Key LEDs from the IRX-10A board before wiring remote LEDs into the aux outputs.

