

ST14 CODEC – IR/RF Remote Control Encoder/Decoder IC

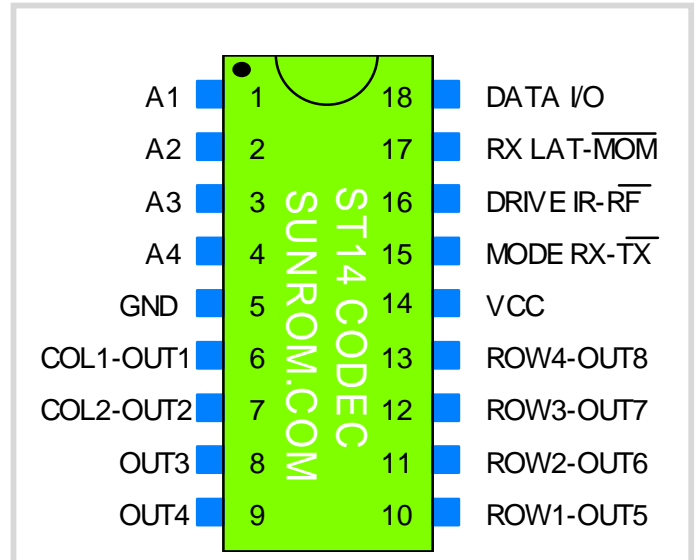
1. Overview

ST14 CODEC is Radio Frequency and Infrared encoder/decoder IC for remote control applications having unique features and flexibility not available with other remote control encoder decoder ICs. ST14 is truly a single-chip remote control solution.

Transmitter and Receiver can operate over Radio Frequency or Infrared having four address and eight data bits. Transmission and Reception over Infrared is achieved by commonly available Infrared LED-Detector and for RF any general purpose RF Transmitter-Receiver pair would suffice.

The ST14 combines the functionality of both encoder and decoder in a single package with several unique features for enhanced operation and a reduced component count for transmitter and receiver circuits.

The MODE RX-TX (pin15) pin configures ST14 IC for encode or decode operation automatically at power-up.



2. Features

- Encode / Decode on single chip
- Built in Oscillator
- Minimum External Components
- Wide operating voltage range. (2.0 - 5.5V)
- Single chip Encoding Decoding Mode
- 40kHz carrier for infrared transmission medium
- 18 pin DIP package

3. Applications

- Burglar alarm system
- Smoke and fire alarm system
- Garage door controllers
- Car door controllers
- Car alarm system
- Security system
- Cordless telephones
- Other remote control systems

4. Pin Definitions

Pin	Name	Description
1-4	A1-A4	4 bit Address Input
5	GND	Ground
6-13	OUT1-OUT8 C1-C2,R1-R4	Output if configured as Decoder 2x4 Matrix Keypad input if configured as Encoder
14	VCC	2 to 5V DC input power
15	MODE RX-TX	Configure chip as Encoder or Decoder Encoder at transmitter side if pin is tied to GND Decoder at receiver side if pin is tied to VCC
16	DRIVE IR-RF	Selects Transmit / Receive by Infrared or Radio Frequency IR Mode if pin is tied to VCC RF Mode if pin is tied to GND Encoder sends 40khz Modulation signal in IR Mode for driving IR LED
17	RX-LAT-MOM	In Decoder Mode Only Latching output (Toggle Output) if pin is tied to VCC Momentary output if pin is tied to GND
18	DATA I/O	Transmit data or Receive data from this pin through IR/RF Interface

5. Encoder

When configured as Encoder the chip will transmit signal containing 4 bit Address A1-A4 and 8 bit of Data as per key pressed from its DATA pin. Removing key pressed input will end the transmission. Infrared transmission will include data modulated for 40 kHz frequency for driving Infrared LED. Radio Frequency Transmission mode will transmit data in bi-phase Manchester encoding.

5.1. Latching Key-Press

With the decoder in latch mode, key press of the encoder must be pressed & released one at a time to toggle decoder outputs on or off individually. Multiple key presses are not allowed on the encoder when the decoder is configured for latch mode.

5.2. Momentary Key-Press

In momentary mode, any combination of key press may be pressed simultaneously.

6. Decoder

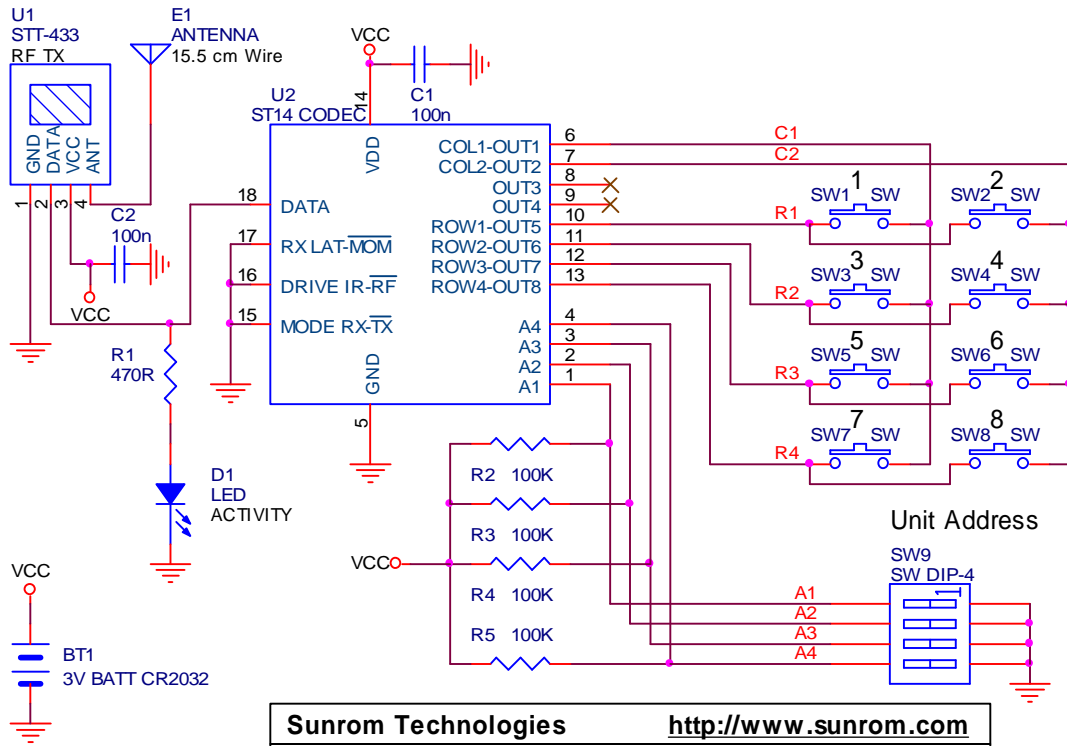
Decoder outputs can sink or source up to 25mA per pin with a total combined device package maximum of 200mA allowing direct remote control of LED's, solid-state relays, and other logic devices without the need for secondary driver circuits.

7. Data & Address Validation

Encoder address pins A1-A4 must be set to the same logic levels as decoder address pins A1-A4. If these do not match, the decoder will ignore data sent from the encoder.

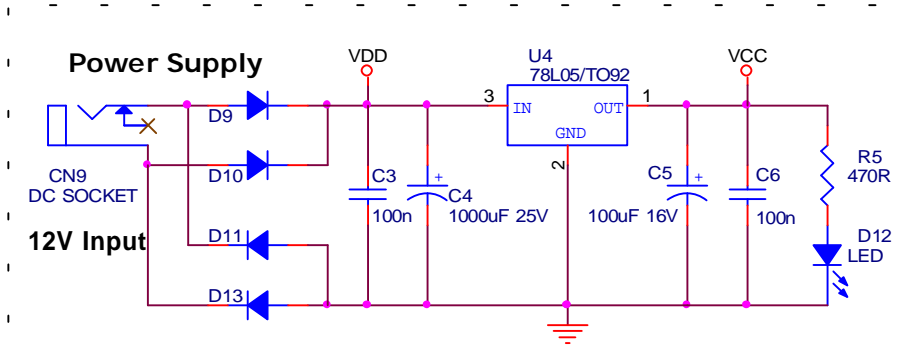
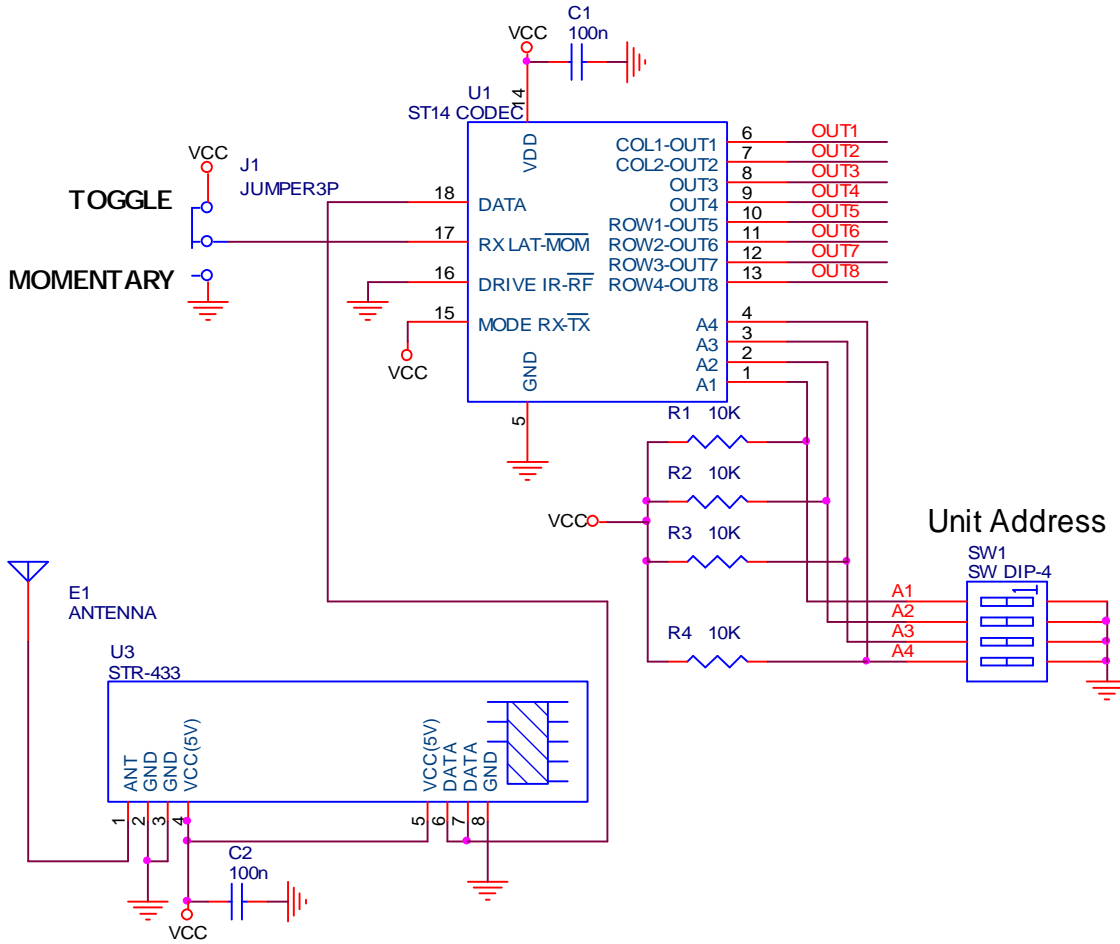
Important: Address input pins A1-A4 & configuration selection input must always be connected to Vdd or circuit ground depending on the mode required. Allowing any of these input pins to “float” (leaving them un-connected) will cause erratic results.

8. Transmitter Application Schematic (Encoder)



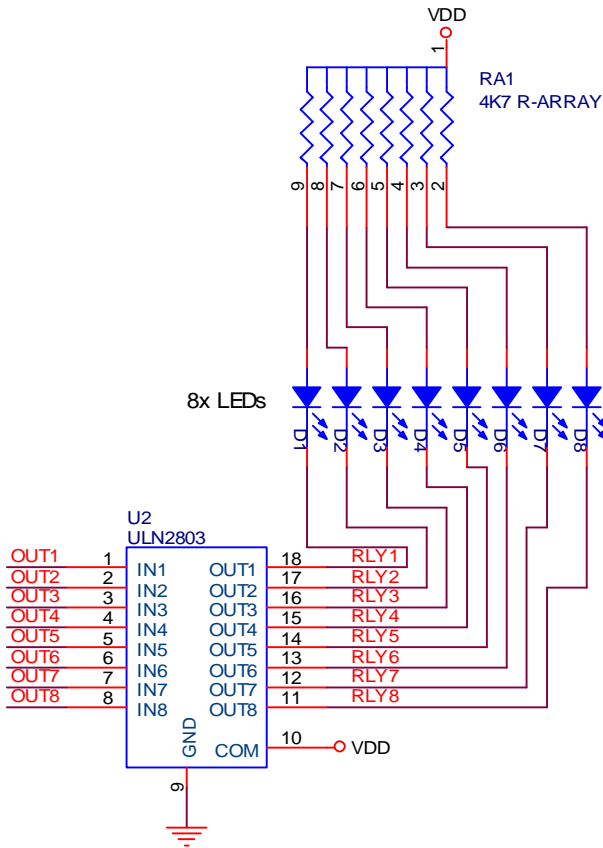
Sunrom Technologies		http://www.sunrom.com	
Title Eight Channel RF Remote Control Transmitter			
Code 1001-3506		Rev 1	
Date: Sunday, September 30, 2007	Sheet 1	of	1

8.1. Receiver Application Schematic (Decoder)

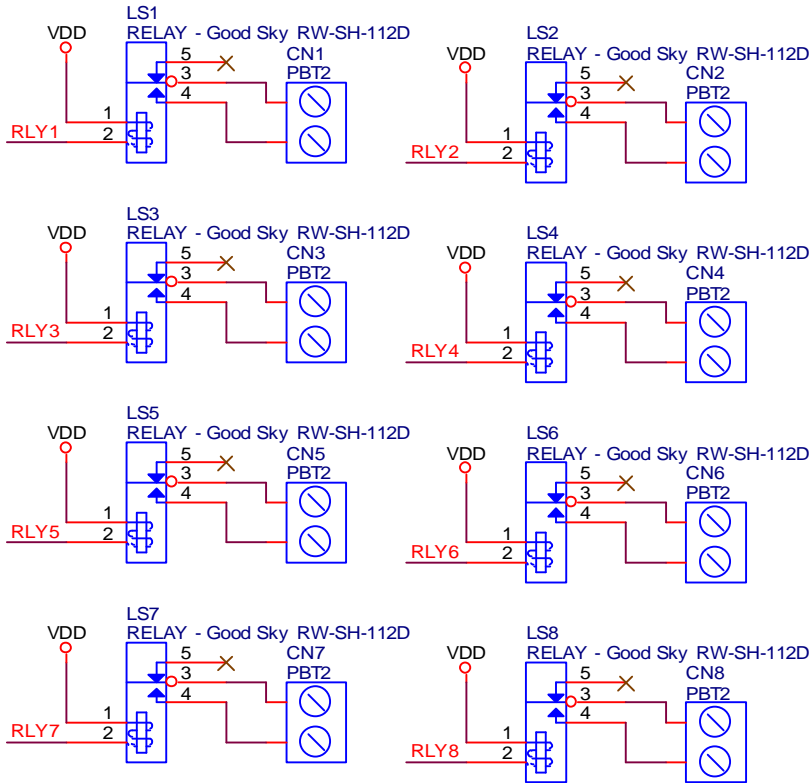


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Title Eight Channel RF Remote Control Receiver			
Code 1001-3507		Rev 1	
Date: Friday, September 21, 2007	Sheet 1	of 1	

Relay Driver



Relay Connections

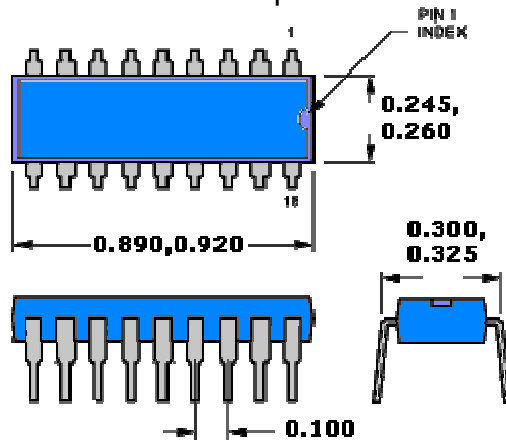


9. Electrical Specifications

Parameter	Value
Maximum Input/Output Sink/Source Current On Any Pin	25mA
Maximum Input/Output Sink/Source Current Total	200mA
Operating Voltage	3.0-5.0V DC
Avg. No Load Operating Current	0.1 mA @5.0VDC
Carrier Frequency / Duty Cycle +/- 2%	40kHz / 50%

9.1. Chip Description

The ST14 – CODEC is available in a 18 pin DIP package (0.3" width). Outputs and inputs are TTL and CMOS compatible.



9.2. Ordering Information

Model	Description
ST14	ST14 CODEC - IR/RF Remote Control Encoder/Decoder I.C.