HS Series Encrypted Remote Control Encoder and Decoder

The HS Series is an ideal encoder and decoder for one-way remote control and Remote Keyless Entry (RKE) applications requiring the highest level of security. The series uses CipherLinx®-encrypted remote control technology, which is based on a core algorithm developed by the United States National Security Agency (NSA). This provides a highly secure remote control link while offering numerous innovative features.

The protocol was evaluated by Independent Security Evaluators (ISE) and they concluded that "…the CipherLinx® protocol in the HS Series is well-designed and is an excellent choice for applications requiring a secure unidirectional link."

High Security: The HS Series uses the CipherLinx™ algorithm, which is based on Skipjack, a cipher designed by the U.S. National Security Agency (NSA). The CipherLinx™ algorithm uses Skipjack in a provably secure authenticated encryption mode both to encrypt 8 bits of button states, a 40-bit counter and 80 bits of integrity protection with an 80-bit key. It never sends or accepts the same packet twice, never loses sync and changes codes with every packet, not just every button press.

Secure Key Generation: The key used by the HS Series is created by the end user through a series of button presses in a truly random fashion. There are no seed values to be programmed into the parts and no list of keys that could be compromised. Everything is held in the parts.

Robust Protocol: The HS Series uses a robust serial protocol that is far more immune to noise and the jitter caused by low cost radios. This equates to a much longer range and better performance within that range than comparable devices.

Encoder/Decoder Configuration: The HS Series is configured by connecting pins to supply or ground. There is no software or programming required.

More Buttons: The HS Series supports up to 8 data lines that can be connected to buttons, contacts or microcontroller lines. This offers more functionality than many similar parts.

Control Permissions: The HS Series can be configured so that certain encoders can only activate certain outputs on the decoder. This allows the creation of user groups and relationships rather than an all-or-nothing activation.

Encoder PIN: The encoder can be configured with an optional PIN. This 4-button combination must be entered before the encoder will respond to button presses. This adds a layer of security to the physical transmitter as well as having a highly secure transmission.

Transmitter Identification: The decoder outputs a binary number identifying the encoder that sent the transmission. This allows access attempts to be logged.

Low Power: The HS Series has extremely low power consumption, making it ideal for applications with a limited power supply, such as a coin cell battery.
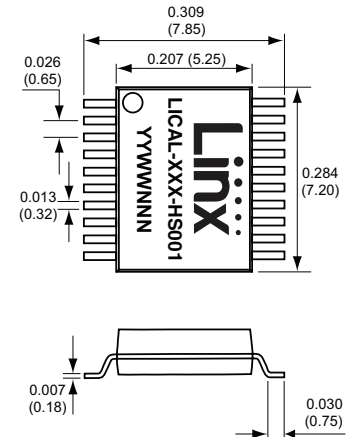
| Specifications	
Operating Voltage	2.0 to 5.5VDC
Supply Current	370µA
Power Down Current	0.1µA
Response Time	67ms
Operating Temperature Range	−40 to +85°C

Applications
- Door and Gate Openers
- Remote Device Control
- Call Systems
- Home / Industrial Automation
- Remote Status Monitoring
- Lighting Control

Typical Application Circuits

When activated, the encoder encrypts the current states of its inputs and its address into a packet and outputs a digital data stream. This data can be sent to a decoder by RF modules, infrared link or even a wire. The decoder checks the received packet to make sure there are no errors and decrypts the data. If everything is good, then the decoder replicates the encoder's input states on its outputs. These outputs are connected to whatever circuitry is required by the application.

The circuits below show typical applications of the HS Series encoder and decoder.
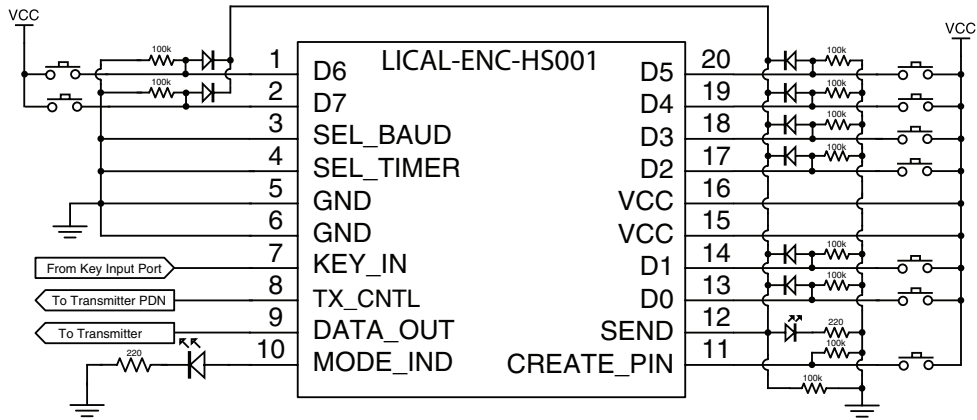
HS Series encoder
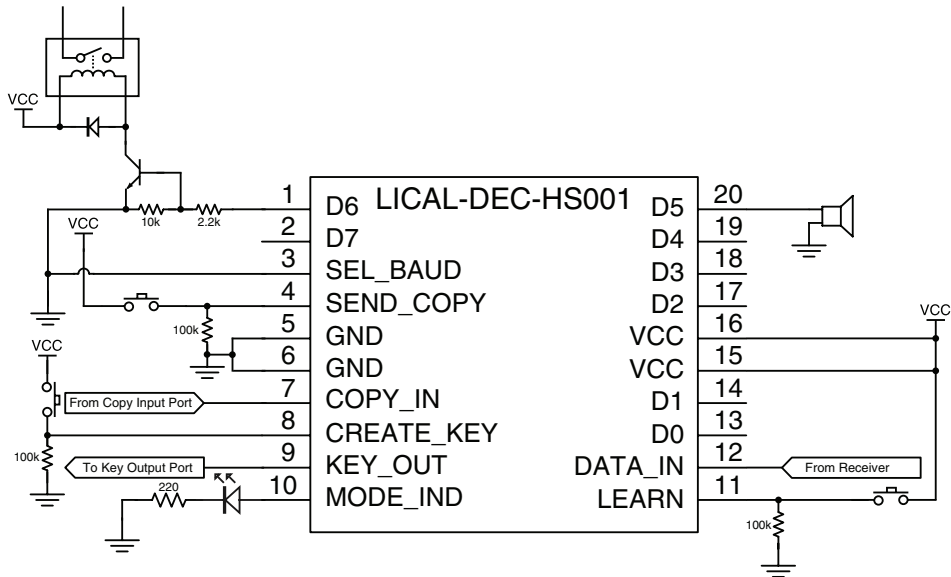
HS Series decoder

Ordering Information	
Part Number	Description
LICAL-ENC-HS001	HS Series Encoder
LICAL-DEC-HS001	HS Series Decoder
MDEV-LICAL-HS	HS Series Master Development System with LR Series Modules

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