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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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## IS23SC4442 Smart Card (#32321)

The IS23SC4442 Smart Card provides 256 bytes of serial EEPROM accessible by Parallax's Smart Card Reader (#32320). This smart card also provides a 3-bit error counter and 3-byte programmable security code to prevent unauthorized write/erase operations to the card.

Smart cards are used in a variety of applications ranging from telecommunications to personal finance. The IS23SC4442 Smart Card is 256 x 8 bits of EEPROM main memory embedded in a plastic card, the size of a standard credit card. The pins of the IS23SC4442 are accessible through the gold plated contact pads embedded in the card, and when paired with the Smart Card Reader (#32320) can be connected to the I/O pins of a microcontroller.

### Features

- Memory Organization: 256 x 8-bit
- 2.5 ms write time
- 3-byte Programmable Security Code for memory write/erase protection
- 1,000,000 erase/write cycles guaranteed with 10 year data retention
- Compatible with BASIC Stamp & Propeller microcontrollers

### Key Specifications

- Power Requirements: 2.7–5 VDC; 3 mA typical active current
- Communication: I<sup>2</sup>C (CMOS)
- Operating temperature: -22 to +167 °F (-30 to +75 °C)
- Dimensions: 2.5 x 3 in (6.35 x 7.62 cm)



### Application Ideas

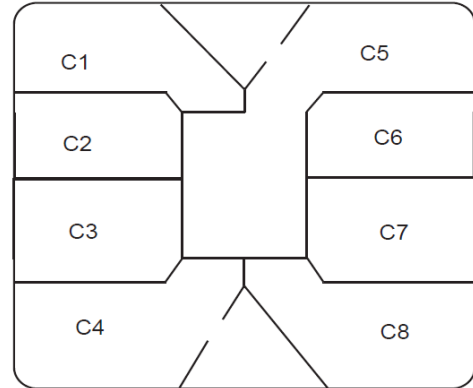
- Security systems
- Data storage
- Tracking systems
- Identity authentication

### Caution!

The IS23SC4442 smart card does have a programmable security code (PSC) to prevent unauthorized erase/write operations to the card. By default, this code is set to \$FFFFFF. A 3-bit error counter (EC) is used to track the number of unsuccessful verifications of the PSC. After three unsuccessful attempts, the EC will lock the chip from further access, and data can only be read and never written or erased from the card again. Please refer to the manufacturer's datasheet for the complete communication protocol.

## Card Contact Definitions and Functions

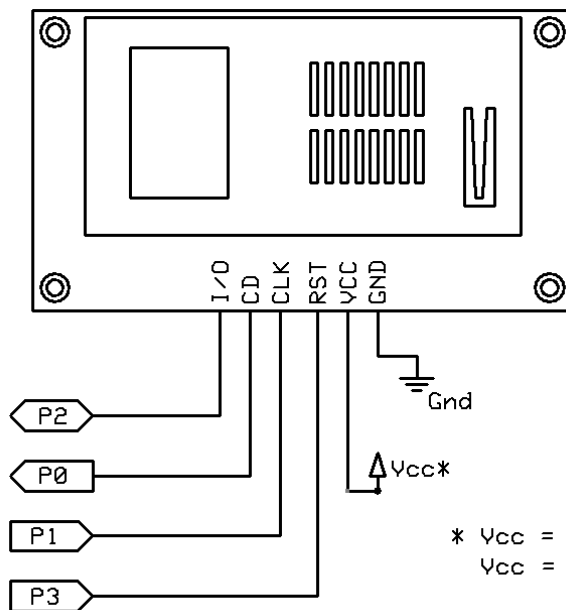
Card Contact	Name	Type	Function
C1	VCC	P	Supply Voltage
C2	RST	I	Reset
C3	CLK	I	Clock Input
C4	NC		No Connect
C5	GND	G	Ground
C6	NC		No Connect
C7	I/O	IO	Bidirectional Data I/O
C8	NC		No Connect



Pin Type: P = Power, G = Ground, I = Input, O = Output

## Connection Diagram

In order to interface with the smart card, a smart card reader must be used. The diagram below demonstrates how to connect the Smart Card Reader (#32320) from Parallax to your microcontroller for use with the example programs included on the IS23SC4442 product page. When inserting the smart card into the reader, be sure the gold contact pads are facing down.



\* Vcc = 5V for BASIC Stamp applications  
 Vcc = 3.3V for Propeller applications

## Resources and Downloads

Check for the latest version of this document, manufacturer's datasheet, and example programs from the IS23SC4442 Smart Card product page. Go to [www.parallax.com](http://www.parallax.com) and search 32321.

### BASIC Stamp<sup>®</sup> Example Code

Example code for the BASIC Stamp 2 can be found on the IS23SC4442 product page. This code demonstrates how to read and write data to the smart card, as well as how to verify the PSC.

This program also uses the Debug Terminal, which is built into the BASIC Stamp Editor software. The software is a free download from [www.parallax.com/basicstampsoftware](http://www.parallax.com/basicstampsoftware).

### Propeller<sup>™</sup> P8X32A Example Code

Example code for the Propeller can be found on the IS234442 product page. This code demonstrates how to read and write data to the smart card, as well as how to verify the PSC.

This program also uses the Parallax Serial Terminal to display the device output. The object and the Parallax Serial Terminal itself are included with the Propeller Tool v1.2.7 or higher, which is available from the Downloads link at [www.parallax.com/Propeller](http://www.parallax.com/Propeller).